

ANNUAL REPORT (2014-2015)



DESERT MEDICINE RESEARCH CENTRE

(Indian Council of Medical Research)

New Pali Road, Jodhpur-342 005

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सचिव, भारत सरकार

स्वास्थ्य अनुसंधान विभाग

स्वास्थ्य एवं परिवार कल्याण मंत्रालय

एवं

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भारतीय आयुर्विज्ञान अनुसंधान परिषद

स्वास्थ्य अनुसंधान विभाग

स्वास्थ्य एवं परिवार कल्याण मंत्रालय

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Message

It gives me immense pleasure to learn that Desert Medicine Research Centre (ICMR), Jodhpur is bringing out its Annual Report for the year 2014-15, a document of its yearlong dedicated work addressing public health issues by collaborating with all stake holders.

The organization of 'Rajasthan Conclave-2' by DMRC resulted in further strengthening of collaborative research in the State. It is heartening to note that 12 MoUs with State Health Department, State Medical Colleges, AIIMS, Jodhpur and State Universities have been signed. This will create a good research environment in medical colleges and universities in years to come which ultimately will be beneficial for community at large.

The Centre was also a facilitator in the establishment of Model Rural Health Research Unit (MRHRU), of Department of Health Research at Bhanpur Kalan, Jaipur which made appreciable progress in developing infrastructure and initiating scientific studies.

I am happy to note that besides carrying out many important studies to address public health issues, the TB lab of the centre has been certified by RNTCP for culture and DST for first line Anti-TB Drugs.

I congratulate the Director, Scientists and staff of the Centre for bringing out this annual report. I am sure that the efforts of collaborative research put up by the centre to address public health issues, the science persuaded to uplift the health of a common man, the efforts for improving health of tribes and the efforts made towards achieving goals of MRHRU, all would certainly lead to fulfil the health needs of the common man in the region.

(Soumya Swaminathan)

PREFACE

The commitment of the centre right from its inception in the year 1984 has been to work for the uplift of the health of a common man in the desert region, which has been attempted through various research projects undertaken in the field of Communicable and Non-Communicable diseases and Nutrition. Realizing the importance of a collaborative research to address multidisciplinary health issues, the centre for the last three years has put up a lot of efforts in bringing all the stake holders together. The organization of 'Rajasthan Conclave-1' in 2013 was an attempt to sensitize faculty of medical colleges and universities for collaborative research. In the following year 'Rajasthan Conclave-2' was organized and 12 MoUs with state government, medical colleges and universities were signed for various scientific studies. These studies pursued in the centre during the year.

Studies on Impact of irrigation change on the prevalence of malaria; Surveillance of insecticide resistance among malaria vectors; alternate use of insecticide treated bed nets for the protection against malaria; method for drug sensitivity testing of *M. tuberculosis* from sputum samples; active screening to detect un-registered open cases of tuberculosis are important employing applied aspects.

The studies on Effectiveness of diet and life-style intervention for hypertension and on development of appropriate intervention model using existing health system for the improvement of nutritional status of vulnerable segment of population will yield useful information on Non-Communicable and Nutritional issues in the community. An on-going study on Nutritional status of elderly rural population and development of appropriate intervention model using existing health system would provide lead for broad based state level intervention strategy.

Useful data have been generated through the units of National Nutrition Monitoring Bureau (NNMB), Biomedical Informatics and Tribal Health Research Unit of ICMR established in the centre. The centre also participated in Annual Health Survey of Ministry of Health & Family Welfare and Register General of India.

The studies on Gene Characterization of H1N1 viruses, Gene Sequences of dengue viruses and their cross infections, Mapping of mosquito breeding and location of vertebrate hosts of JE virus using RS and GIS strengthen our knowledge for better understanding of challenges put up by the upcoming communicable diseases.

During the year the TB lab of centre has been certified by RNTCP for culture and DST for first line Anti-TB Drugs, which adds a feather to our dedication towards working for public health.

As a facilitator in establishing MRHRU at Bhanpur Kalan, Jaipur, a venture of Department of Health Research, Government of India to transfer the technology to the rural masses for improving their health, the centre closely monitored the construction of the building, procurement of equipment, recruitment

of staff and helping the faculty of SMS Medical College, Jaipur in developing the research proposals to be undertaken at the unit. Three research projects pertaining to Nutrition, Active Screening of TB and Use of Contraceptives have already been initiated.

The centre is also committed for implementation of Rajbhasa Policies through holding regular review meetings, active participation in Town level Rajbhasa committee and organisation of Hindi Week.

I am confident that with the involvement and support of all stake holders and also the dedication of team DMRC, we would be contributing to bring better health for the people of the state.



(Dr. G. S.Toteja)
Director

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1. COMMUNICABLE DISEASES

1.1 Comparative study of Gene characterization of Influenza A pandemic (H1N1) 2009 viruses from virus isolates of 2009 pandemic and 2012 re-emerging viruses in western Rajasthan: Phylogenetic analysis and molecular characterization

Principal Investigator: *Dr. Vinod Joshi, Scientist 'G'*

Co-Investigator: *Dr. P. K. Khatri, Professor & Head, Dept. of Microbiology, Dr. S. N. Medical College, Jodhpur*

Commencement: September, 2014 **Duration:** Three Years **Current Status:** On going
Funding Agency: Department of Biotechnology, Govt. of India (Extramural)

OBJECTIVES

1. Comparative study of Gene sequences of virus isolates of influenza A pandemic (H1N1) 2009 viruses caused pandemic in 2009-10 and re-emergence during 2012.
2. Genome analysis of sequences obtained in available data base to study regional strain specificity of viruses.
3. Extrapolation of sequences over clinical conditions of patients to study possible viral genomic basis of clinical conditions.

PROGRESS

Sample Selection: Throat swab samples as collected from the suspected patients of Swine flu by the OPD staff of Medical College hospitals of Jodhpur were used for the present study. The history of the patients as Serious, Recovered or Death case was taken as the basis of selection of sample.

Laboratory Experiments: Confirmation of Diagnosis employing RT-PCR. The samples found positive (as per hospital records) for the three Pandemic Influenza genes viz; Inf A, Sw A, Sw H were selected for the detailed study of genomics. The diagnostic tests were performed as the repeat study to confirm the virus positive status of the sample (Fig. 1). Real Time PCR was employed as per the protocol notified by the WHO.

Whole Genome Sequencing of H1N1 virus: Virus amplification. Throat swab samples as collected from the patients were inoculated into Allantoic and Amniotic cavities of embryogenated chick eggs (About 10 days old). After 24 hours of incubation at 37^o C the virus was harvested from the egg cavities.

1. COMMUNICABLE DISEASES

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Co-Investigator: *Dr. P. K. Khatri, Professor & Head, Dept. of Microbiology, Dr. S. N. Medical College, Jodhpur*

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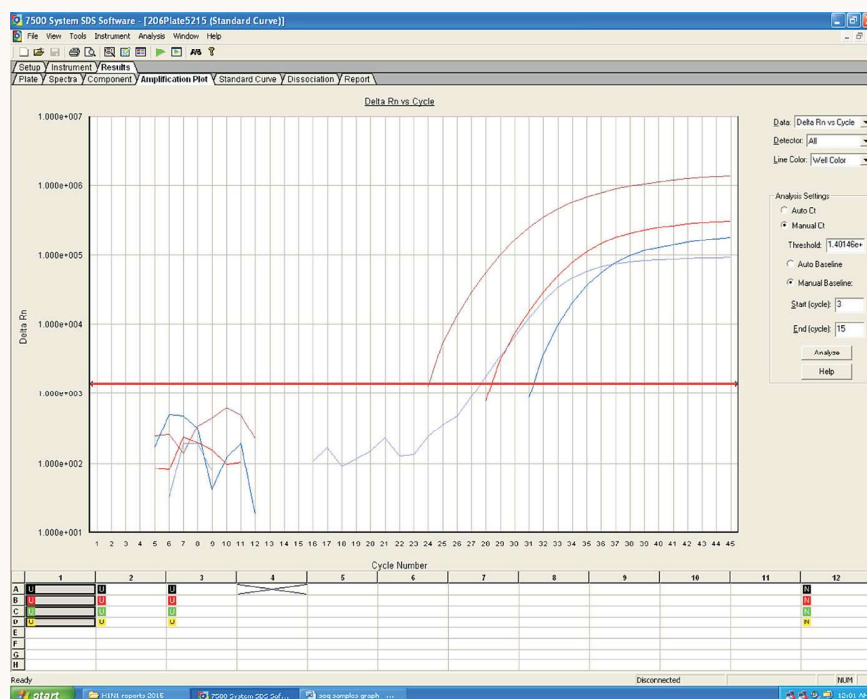


Fig. 1. A graph showing H1N1 positive swab sample of patient.

Gene segment specific amplification of sample employing Reverse Transcriptase PCR. All the 8 gene segments viz., HA, PB1, PB2, PA, NP, NA, M and NS constituting Pandemic Influenza A (2009) H1N1 virus were amplified employing PCR following manufacturer's protocol.

Agarose-Gel assay of amplified products of gene segments. For confirmation of amplified products of each segment amplified, Agarosegel assays were performed to obtain the bands based on molecular weights of each amplified gene segment (Fig. 2).

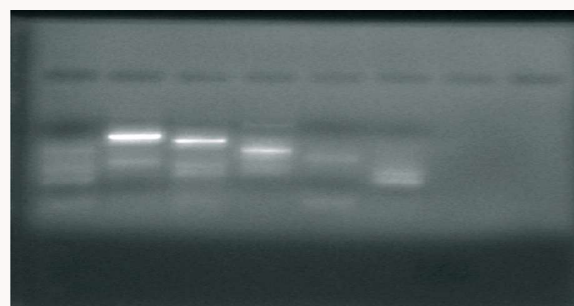
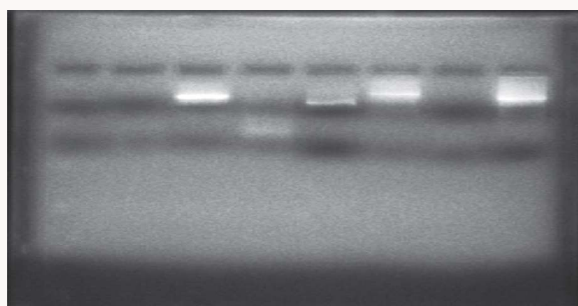


Fig.2. Agarose-gel assays of few gene segments amplified using PCR.

Cycle sequencing and purification of amplified c-DNA. Each gene segment amplified were subjected to cycle sequencing using di-deoxy process and individual c-DNA pairs of nucleotides were obtained which were finally subjected to Sequencing. Sequencing analysis is given in Table 1.

Table 1. Sequence Analysis employing Bio-informatics: HA Gene analysis Region 639-747.

Bioinformatics Analysis	Result and Details
Raw Sequence Quality (in percentage):	45.7
Raw Sequence Length (no. of basepairs):	470
Sequence Quality after filtering (CV $\geq$ 20):	94.7
Sequence length after filtering:	109
Manual Editing of bases after filtering:	NO
Details of H1N1 reference fragment details:	FJ966960 H1N1 A California 2009 complete cds HA gene segment 4 reference sequence
Assembly with reference genome (Yes/No only):	YES
If Yes for Assembly then details of variation:	One Variation (First Attachment)
Details of Amino Acid Variation from reference:	One Variation (Second Attachment)
Any Other:	

1.2 Standardization of a rapid method for direct drug sensitivity testing of *Mycobacterium tuberculosis* from sputum samples

Principal Investigator: Dr. Murli Lal Mathur, Scientist 'G'

Co-Investigator: Dr. P. K. Khatri, Professor & Head, Dept. of Microbiology, Dr. S. N. Medical College, Jodhpur and Dr. K. C. Agarwal, Professor & Head, Dept. of TB & Chest Diseases, Dr. S. N. Medical College, Jodhpur

Commencement: April, 2013 **Duration:** Two Years **Current Status:** Completed

Funding Agency: Desert Medicine Research Centre (Intra-mural)

OBJECTIVE

1. To standardize safe, simple, economic, closed method of direct drug sensitivity testing of *M. tuberculosis* from sputum samples in seven days.

PROGRESS

The new method was used for 226 sputum samples. The results of new method were compared with those of LPA/cartridge based nucleic acid amplification testing (CBNAAT) or proportion method. We received 226 sputum samples from laboratory of KN Chest hospital with suspicion of MDR-TB or District TB Clinic Jodhpur. These included samples of indoor as well as outdoor patients. Our method was followed and results were available on 7th day for all 226 samples, 91 were found sensitive to rifampicin, 47 were found resistant to rifampicin. For 14 samples, results of first day smear and seventh day smear were same and therefore no conclusion could be drawn (indeterminate result), one showed confluent rapid growth and NTM was suspected in it, 66 were AFB negative on day zero as well on day 7 and 06 showed gross contamination. Results of LPA were available for 61 of these samples after two months, as shown in Table 1.

LPA showed 15 as resistant to rifampicin, of which six were also detected as resistant by our method, giving sensitivity of 40.0% (95% CI 15.2 to 64.8). LPA showed 28 as sensitive to rifampicin, of which three were AFB negative on day zero, of remaining 25, 18 were also detected as sensitive by our method, giving specificity of 72.0% (95% CI 54.4 to 89.6).

Table 1. Results of new method as compared to results of LPA (Line Probe Assay).

Results of our method	Results of LPA					
	Negative	Contamination	NTM	Resistant	Sensitive	Total
Indeterminate	0	0	1	0	2	3
NTM	0	0	1	0	0	1
Negative	14	0	0	0	3	17
Contamination	0	1	0	0	1	2
Resistant	0	0	0	6	4	10
Sensitive	1	0	0	9	18	28
Total	15	1	2	15	28	61

Out of 226 samples examined by us, results of CBNAAT (Cartridge Based Nucleic Acid Amplification Testing) were available from DTC Jodhpur. The results are shown in Table 2. CBNAAT showed 09 as resistant to rifampicin, of which 03 were also detected as resistant by our method, giving sensitivity of 33.3.0% (95% CI 2.5 to 64.1). CBNAAT showed 31 as sensitive to rifampicin, of which ten were

AFB negative on day zero, of remaining 21, 15 were also detected as sensitive by our method, giving specificity of 71.4% (95% CI 52.1 to 90.7).

Table 2. Results of new method as compared to results of CBNAAT (Cartridge Based Nucleic Acid Amplification Testing).

Results of our method	Results of CBNAAT					
	Negative	Contamination	Error	Resistant	Sensitive	Total
Indeterminate	0	0	0	3	4	7
Negative		1	0	1	10	40
Contamination	0	0	0	0	0	0
Resistant	0	0	0	3	2	5
Sensitive	2	1	1	2	15	21
Total	30	2	1	9	31	73

All 226 sputum samples examined by us were also inoculated by us on LJ medium, however since these were required for new method and since these were not decontaminated before inoculation, as a result most of them showed contamination on LJ. Those samples yielding growth on LJ were subjected to DST (Drug sensitivity testing) by proportion method using LJ medium. Results of which were compared to our new method as shown in Table 3.

Table 3. Results of new method as compared to results of Proportion Method.

Results of our method	Results of Proportion Method				
	Contamination	Culture Negative	Resistant	Sensitive	Total
Indeterminate	0	1	2	6	9
Negative	7	26	2	6	41
Contamination	0	0	0	0	0
Resistant	2	0	4	5	11
Sensitive	9	4	3	19	35
Total	18	31	11	36	96

In all 27 samples were found to be resistant to rifampicin by at LAP/CBNAAT/proportion method, of which 13 were also detected as resistant by our method giving sensitivity of 48.15% (95% CI 29.3 to 67.0). In all 69 samples were found to be sensitive to rifampicin by LAP/CBNAAT/proportion method, of which 13 were AFB negative on day zero, of remaining 56, 38 were also detected as sensitive by our method, giving specificity of 67.9% (95% CI 55.6 to 80.1). The new method showed very low sensitivity and specificity which seems to be unacceptable. The method was not found performing satisfactorily.

1.3 Rapid culture and direct drug sensitivity testing of *Mycobacterium tuberculosis* to isoniazid and rifampicin using liquid culture media

Principal Investigator: Dr. Murli Lal Mathur, Scientist 'G'

Co- Principal Investigator: Dr. P. K. Khatri, Professor & Head, Dept. of Microbiology, Dr. S. N. Medical College, Jodhpur and State Tuberculosis Officer, Rajasthan

Commencement: September, 2013 **Duration:** Two Years **Status:** Ongoing

Funding Agency: ICMR (Extramural)

OBJECTIVES

1. To Standardize and evaluate rapid method for culture and sensitivity of *M. tuberculosis*.
2. To support RNTCP with culture of *Mycobacterium tuberculosis* from sputum samples.

PROGRESS

The new method was used by us for 298 sputum samples received from laboratory of K. N. Chest Hospital or District TB Clinic Jodhpur. All these were processed and inoculated on LJ medium. Out of 298 samples those, which showed growth on LJ medium, were also subjected to drug sensitivity testing by proportion method using LJ Medium. Our method was followed blindly and results were available on 7th day and proportion method was carried out by different person who got results after about two months. Results of our method as compared to proportion method are shown in Table 1 and 2.

Table 1. Results of new method for rifampicin as compared to results of Proportion Method.

Results of our method	Results of Proportion Method		
	Resistant to RIF	Sensitive to RIF	Total
Indeterminate	5	32	37
Resistant to RIF	20	25	45
Sensitive to RIF	23	60	83
Total	48	117	165

Of all samples found resistant to rifampicin by proportion method, our method detected resistance to rifampicin in 20 samples and labeled 23 as sensitive giving sensitivity of 46.5% 95% CI 31.6 to 61.4%). Of all samples found sensitive to rifampicin by proportion method, our method detected sensitive to rifampicin in 60 samples and labeled 25 as resistant giving specificity of 70.6% 95% CI 60.9 to 80.3%).

Out of 45 samples labeled resistant to rifampicin by our method, 20 were also found resistant by proportion method, giving Positive Predictive Value of 44.4% (95% CI 29.9 to 59.0%).

Out of 83 samples labeled sensitive to rifampicin by our method, 60 were also found sensitive by proportion method, giving Negative Predictive Value of 72.3% (95% CI 62.7 to 81.9%).

Table 2. Results of new method for isoniazid as compared to results of Proportion Method.

Results of our method	Results of Proportion Method		
	Resistant to INH	Sensitive to INH	Total
Indeterminate	7	15	22
Resistant to INH	21	16	37
Sensitive to INH	18	33	51
Total	46	64	110

Of all samples found resistant to isoniazid by proportion method, our method detected resistance to isoniazid in 21 samples and labeled 18 as sensitive giving sensitivity of 53.8% 95% CI 38.2 to 69.5%).

Of all samples found sensitive to isoniazid by proportion method, our method found 33 samples sensitive to isoniazid and labeled 16 as resistant giving specificity of 67.3% 95% CI 54.2 to 80.5%).

Out of 37 samples labeled resistant to isoniazid by our method, 21 were also found resistant by proportion method, giving positive likelihood ratio of 56.7% (95% CI 40.7 to 72.7%).

Out of 51 samples labeled sensitive to isoniazid by our method, 33 were also found sensitive by proportion method, giving negative likelihood ratio of 64.7% (95% CI 51.6 to 77.8%).

There were two main reasons of poor sensitivity of the method, contaminants overgrew *M. tuberculosis* in some samples and period of seven days was too short to detect growth of *M. tuberculosis*. We have addressed both these issues, to check growth of contaminants, and started another better method of sterilization of our culture medium and we have started taking observations on 11th day in addition to 7 days. After making these modifications in original method, we are getting improved results. We observed growth in 12 out of 14 samples (85.7%) in control (without drug) in 11 days, while growth was observed in only 8 samples (57.1%) in 7 days. Results of proportion method are still awaited in these 14 samples.

We were not able to procure Rifampicin from Sigma, the Rifampicin of CDH, which we are using does not mention potency factor or date of manufacture or expiry. The potency of this rifampicin might be low, which might be a factor responsible for detection of false resistance. NTI, Bangalore has been contacted to provide solution of this problem, which will be implemented. After making these modifications, this method is likely to perform better.

We have applied for accreditation of our laboratory by RNTCP for drug sensitivity testing of *M. tuberculosis*. Consequently, our lab was visited by team of RNTCP. At our laboratory, we have standardized Proportion method using LJ medium for drug sensitivity testing of *M. tuberculosis*. We have sent results of drug sensitivity testing of *M. tuberculosis*, using proportion method from 100 sputum samples to NTI Bangalore. They selected 20 of these, culture of which was sent by us to NTI for proficiency testing.

1.4 Surveillance of pyrethroid resistance in important malaria vectors of western Rajasthan and studies on genetic and biochemical mechanisms of pyrethroid resistance in *Anopheles stephensi*

Principal Investigator: Dr. Karam V. Singh, Scientist 'F'

Co- Principal Investigator: Dr. S. K. Bansal, Scientist 'F' (upto October, 2014) and Dr. Himmat Singh, Technical Assistant (upto June, 2014)

Commencement: June, 2012 **Duration:** Two Years **Status:** Completed

Funding Agency: Vector Science Forum, ICMR (Extramural)

OBJECTIVES

1. Periodic monitoring of insecticide susceptibility of *An. stephensi* and *An. culicifacies* to synthetic pyrethroids in the areas of their use to assess the development of insecticide resistance
2. Development of pyrethroid resistant strain of *An. stephensi* in the laboratory and investigation of the inheritance pattern of pyrethroid
3. Elucidation of the biochemical mechanism of pyrethroid resistance in *An stephensi* using laboratory selected strain and field collected resistant strains

PROGRESS

The studies were initiated in June 2012 in three desert districts i.e. Barmer, Bikaner and Jaisalmer, where synthetic pyrethroids have already been introduced as indoor residual spray under national control programme. From each district ten villages, having different spray histories of last three years, were selected for the study. Entomological surveys were conducted in each village for the collection of adult and larval forms of anopheline vector species from human- and cattle- sheds for the presence of adult form and domestic and peridomestic containers, tanka in each households, community tanks, ponds, ditches, 'Digis' (open cement tanks for collection water for village supply), etc for the presence of larval forms. The insecticide susceptibility status of the collected individuals was determined as per WHO method. The progress report of the work carried-out during the report period is as under:

Vector Species Prevalence

For the prevalence of important malaria vectors of desert parts of Rajasthan, during pre-monsoon season the entomological surveys were conducted in 30 villages, 10 villages from each study district viz. Barmer, Bikaner and Jaisalmer in April-May, 2014. The district-wise observations on the vector prevalence are as below:

Barmer district: The field studies in this district have been carried-out during pre-monsoon season in all 10 study villages (Table 1). From four study villages both *An. stephensi* and *An. culicifacies* were collected and from the same no. of villages only *An. stephensi*, however in Goliya and Kawas villages no adult anophelines were collected. The per man hour density (PMHD) of *An. stephensi* was recorded highest in village Jasol (PMHD: 25.2) and minimum (PMHD: 1.3) in village Thob (Table 1). *An. culicifacies* was also recorded maximum (PMHD: 4.4) in village Jasol, but the minimum (PMHD: 0.3) in village Nimbla.

Bikaner district: The field studies in this district too have been carried-out during pre-monsoon in all 10 study villages namely Khara, Shobhasar, Kodamdesar, Jagdewala Naal, Uttamdesar, Bhanipura, Kakku, Diyatra and Napasar. *An. stephensi* was recorded from all the study villages during pre-

monsoon season, whereas, *An. culicifacies* along with *An. stephensi* only from seven villages except Khara, Kakku and Napasar. The per man hour density (PMHD) of *An. stephensi* was recorded highest in village Shobhasar (PMHD: 23.5) and minimum (PMHD: 0.3) in village Napasar (Table 2). *An. culicifacies* was recorded maximum (PMHD: 13.3) in village Shobhasar, but the minimum (PMHD: 0.5) in village Diyatra.

Jaisalmer district: The field studies in this district too have been carried-out during pre-monsoon in all 10 study villages. Both *An. stephensi* and *An. culicifacies* were recorded from seven study villages except Gomath, Indra Nagar and That. The per man hour density (PMHD) of *An. stephensi* was recorded highest in village Hameera (PMHD: 7.7) and minimum (PMHD: 0.3) in village That. *An. culicifacies* was recorded maximum (PMHD: 11.3) in village Raimala, but the minimum (PMHD: 0.3) in village Satyaya.

Current susceptibility status of malaria vector species:

The current susceptibility status of *An. stephensi*, in Barmer district, was determined against DDT, malathion, alpha-cypermethrin, cyfluthrin and permethrin (Table 1). *An. stephensi* in village Baitu was found susceptible to alpha-cypermethrin (Mortality: 100.0%), cyfluthrin (Mortality: 100.0%), permethrin (Mortality: 100.0%) and malathion (Mortality: 100.0%), and intermediate resistant to DDT (Mortality: 86.7%); in village Jasol, resistant to DDT (Mortality: 33.3%), intermediate resistant to malathion (Mortality: 93.3%) and cyfluthrin (Mortality: 93.3%), and susceptible to alpha-cypermethrin (Mortality: 100.0%) and permethrin (Mortality: 100.0%); in village Rani intermediate resistant to DDT (Mortality: 73.3%) and cyfluthrin (Mortality: 98.0%), susceptible to alpha-cypermethrin (Mortality: 100.0%) and permethrin (Mortality: 100.0%); and in village Gunga susceptible to alpha-cypermethrin (Mortality: 100.0%).

In Bikaner district, the current susceptibility status of *An. stephensi* was detected against DDT, malathion, alpha-cypermethrin, cyfluthrin and permethrin (Table 2). *An. stephensi* in village Napasar was found susceptible to DDT (Mortality: 100.0%), alpha-cypermethrin (Mortality: 100.0%), cyfluthrin (Mortality: 100.0%) and permethrin (Mortality: 100.0%); in village Naal resistant to DDT (Mortality: 66.7%), intermediate resistant to alpha-cypermethrin (Mortality: 97.7%) and susceptible to cyfluthrin (Mortality: 100.0%) and permethrin (Mortality: 100.0%); in village Diyatra, intermediate resistant to DDT (Mortality: 80.0%) and susceptible to malathion (Mortality: 100.0%), alpha-cypermethrin (Mortality: 100.0%), cyfluthrin (Mortality: 100.0%) and permethrin (Mortality: 100.0%); in village Kakku resistant to DDT (Mortality: 60.0%) and susceptible to malathion (Mortality: 100.0%), alpha-cypermethrin (Mortality: 100.0%), cyfluthrin (Mortality: 100.0%) and permethrin (Mortality: 100.0%); in village Khara intermediate resistant to DDT (Mortality: 87.5.0%), malathion (Mortality: 90.0.0%) and cyfluthrin (Mortality: 97.5%) and susceptible to alpha-cypermethrin (Mortality: 100.0%) and permethrin (Mortality: 100.0%); and in village Shobhasar resistant to DDT (Mortality: 48.0%), intermediate resistant to malathion (Mortality: 96.0%) and alpha-cypermethrin (Mortality: 96.0%) and susceptible to cyfluthrin (Mortality: 100.0%) and permethrin (Mortality: 100.0%).

Table 1. Susceptibility status of *An. stephensi* collected from study villages of Barmer district against different insecticides.

S. No.	Village	Species	Insecticide & diagnostic Dose	Exposure Time (in Hrs)	% Mortality	Susceptibility Status*
1.	Baitu	<i>An. stephensi</i>	DDT, 4.0%	1.0	86.7	IR
			Malathion, 5.0%	1.0	100.0	S
			α - cypermethrin, 0.05%	1.0	100.0	S
			Cyfluthrin, 0.15%	1.0	100.0	S
			Permethrin, 0.75 %	1.0	100.0	S
2.	Jasol	<i>An. stephensi</i>	DDT, 4.0%	1.0	33.3	R
			Malathion, 5.0%	1.0	93.3	IR
			α - cypermethrin, 0.05%	1.0	100.0	S
			Cyfluthrin, 0.15%	1.0	93.3	IR
			Permethrin, 0.75 %	1.0	100.0	S
3.	Rani	<i>An. stephensi</i>	DDT, 4.0%	1.0	73.3	IR
			Malathion, 5.0%	1.0	86.7	IR
			α - cypermethrin, 0.05%	1.0	100.0	S
			Cyfluthrin, 0.15%	1.0	98.0	IR
			Permethrin, 0.75 %	1.0	100.0	S
4.	Gunga	<i>An. stephensi</i>	α - cypermethrin, 0.05%	1.0	100.0	S

*S- Susceptible, R- Resistant, IR- Intermediate Resistant

In Jaisalmer district, the current susceptibility status of *An. stephensi* was detected against DDT, malathion, alpha-cypermethrin, cyfluthrin and permethrin (Table 3). *An. stephensi* in village Awai was found intermediate resistant to DDT (Mortality: 82.5%) and susceptible to malathion (Mortality: 100.0%), alpha-cypermethrin (Mortality: 100.0%), cyfluthrin (Mortality: 100.0%) and permethrin (Mortality: 100.0%); in village Hameera and Indra nagar was found susceptible to alpha-cypermethrin (Mortality: 100.0%); in village Satyaya susceptible to malathion (Mortality: 100.0%), alpha-cypermethrin (Mortality: 100.0%), cyfluthrin (Mortality: 100.0%) and permethrin (Mortality: 100.0%); in village Raimala resistant to DDT (Mortality: 10.0%), intermediate resistant to alpha-cypermethrin (Mortality: 96.0%) and susceptible to malathion (Mortality: 100.0%); in Sultana village intermediate resistant to DDT (Mortality: 80.0%) and susceptible to alpha-cypermethrin (Mortality: 100.0%), cyfluthrin (Mortality: 100.0%) and permethrin (Mortality: 100.0%); in village That intermediate resistant to DDT (Mortality: 87.5%), malathion (Mortality: 96.0%) and alpha-cypermethrin (Mortality: 90.0%), resistant to cyfluthrin and susceptible to only permethrin (Mortality: 100.0%).

Table 2. Susceptibility status of *An. stephensi* collected from study villages of Bikaner district against different insecticides.

S. No.	Village	Species	Insecticide & diagnostic Dose	Exposure Time (in Hrs)	% Mortality	Susceptibility Status*
1.	Napasar	<i>An. stephensi</i>	DDT, 4.0%	1.0	100.0	S
			α - cypermethrin, 0.05%	1.0	100.0	S
			Cyfluthrin, 0.15%	1.0	100.0	S
			Permethrin, 0.75 %	1.0	100.0	S
2.	Naal	<i>An. stephensi</i>	DDT, 4.0%	1.0	66.7	R
			α - cypermethrin, 0.05%	1.0	97.7	IR
			Cyfluthrin, 0.15%	1.0	100.0	S
			Permethrin, 0.75 %	1.0	100.0	S
3.	Diyatra	<i>An. stephensi</i>	DDT, 4.0%	1.0	80.0	IR
			Malathion, 5.0%	1.0	100.0	S
			α - cypermethrin, 0.05%	1.0	100.0	S
			Cyfluthrin, 0.15%	1.0	100.0	S
			Permethrin, 0.75 %	1.0	100.0	S
4.	Kakku	<i>An. stephensi</i>	DDT, 4.0%	1.0	60.0	R
			Malathion, 5.0%	1.0	100.0	S
			α - cypermethrin, 0.05%	1.0	100.0	S
			Cyfluthrin, 0.15%	1.0	100.0	S
			Permethrin, 0.75 %	1.0	100.0	S
5.	Khara	<i>An. stephensi</i>	DDT, 4.0%	1.0	87.5	IR
			Malathion, 5.0%	1.0	90.0	IR
			α - cypermethrin, 0.05%	1.0	100.0	S
			Cyfluthrin, 0.15%	1.0	97.5	IR
			Permethrin, 0.75 %	1.0	100.0	S
6.	Shobhasar	<i>An. stephensi</i>	DDT, 4.0%	1.0	48.0	R
			Malathion, 5.0%	1.0	96.0	IR
			α - cypermethrin, 0.05%	1.0	96.0	IR
			Cyfluthrin, 0.15%	1.0	100.0	S
			Permethrin, 0.75 %	1.0	100.0	S

*S- Susceptible, R- Resistant, IR- Intermediate Resistant

Table 3. Susceptibility status of *An. stephensi* collected from study villages of Jaisalmer district against different insecticides.

S. No.	Village	Species	Insecticide & diagnostic Dose	Exposure Time (in Hrs)	% Mortality	Susceptibility Status*
1.	Away	<i>An. stephensi</i>	DDT, 4.0%	1.0	82.5	IR
			Malathion, 5.0%	1.0	100.0	S
			α - cypermethrin, 0.05%	1.0	100.0	S
			Cyfluthrin, 0.15%	1.0	100.0	S
			Permethrin, 0.75 %	1.0	100.0	S
2.	Hamira	<i>An. stephensi</i>	α - cypermethrin, 0.05%	1.0	100.0	S
3.	Indra Nagar	<i>An. stephensi</i>	α - cypermethrin, 0.05%	1.0	100.0	S
4.	Satyaya	<i>An. stephensi</i>	Malathion, 5.0%	1.0	100.0	S
			α - cypermethrin, 0.05%	1.0	100.0	S
			Cyfluthrin, 0.15%	1.0	100.0	S
			Permethrin, 0.75 %	1.0	100.0	S
5.	Raimala	<i>An. stephensi</i>	DDT, 4.0%	1.0	10.0	R
			Malathion, 5.0%	1.0	100.0	S
			α - cypermethrin, 0.05%	1.0	96.0	IR
6.	Sultana	<i>An. stephensi</i>	DDT, 4.0%	1.0	80.0	IR
			α - cypermethrin, 0.05%	1.0	100.0	S
			Cyfluthrin, 0.15%	1.0	100.0	S
			Permethrin, 0.75 %	1.0	100.0	S
7.	That	<i>An. stephensi</i>	DDT, 4.0%	1.0	87.5	IR
			Malathion, 5.0%	1.0	96.0	IR
			α - cypermethrin, 0.05%	1.0	90.0	IR
			Cyfluthrin, 0.15%	1.0	70.0	R
			Permethrin, 0.75 %	1.0	100.0	S

*S- Susceptible, R- Resistant, IR- Intermediate Resistant

Laboratory selection studies to establish a synthetic pyrethroid resistant strain

Laboratory selection studies to establish alpha-cypermethrin resistant strain of *An. stephensi* are continued. The strain collected from Kakku village of Bikaner district, has been selected for the purpose, as village Kakku since last 2 years has no history of any insecticide spray and the strain of the village was susceptible to alpha-cypermethrin. The selection studies using LT80 (selection pressure) value have been conducted to develop alpha-cypermethrin resistant strain for undertaking biochemical studies.

Utilization of Finding

The findings of the studies have revealed that *An. stephensi*, the important vector of malaria in the study areas, have developed resistance to the synthetic pyrethroids namely alpha-cypermethrin and cyfluthrin, which are being used under the national programme as indoor residual spray in the study areas for the control of malaria vector species.

1.5 Impact of irrigation change on the prevalence of malaria in arid and non-arid parts of Rajasthan

Name of Principal Investigator: Dr. Karam V. Singh, Scientist 'F'

Name of Co-PI with designation: Dr. S. K. Bansal, Scientist 'F' (upto October, 2014), Dr. Himmat Singh, Technical Assistant (upto June, 2014)

Commencement: September, 2013 **Duration:** Three Years **Status:** Ongoing

Funding Agency: Department of Science and Technology, Climate Change & Health Network (Extramural)

OBJECTIVES

1. To study the impact of irrigation change on the ecological conditions with respect to vector prevalence and malaria incidences.
2. To determine key factors influencing vector/malaria prevalence and distribution using RS and GIS.

PROGRESS

The investigations to study the impact of irrigation change on the prevalence of malaria have been initiated in two ecologically different districts, Jaisalmer and Banswara, which have both canal irrigated and rain fed agricultural areas. In each district a total of 08 villages, 04 in canal irrigated area and 04 in non-irrigated/rain fed, have been selected for conducting the studies. In Banswara district, two areas, Kushalgarh Block, which represent characteristics of rain fed agriculture and Partapur block, characterized with canal irrigated agriculture, have been included. In Kushalgarh block four villages viz., Bhagatpura, Potaliya, Kotda and Nathpura have been included in the study based on the past malaria incidence, whereas from Partapur block four villages namely Kheda, Nawagaon, Bhagora and Bodiya have been selected. In Jaisalmer district too two study areas i.e. Nachna Block which represent the canal irrigated agriculture and Pokaran Block which represent desert characteristics and has rain-fed agricultural practices. In Nachna block four villages viz., Awai, Madasar, Sankaria and Shekhon ka Tala in Canal irrigated area have been considered for the study, however, in Pokaran block the selected study villages are Ujjala, Mandwa, Beethuwas and Jhalaria.

During the report period the studies have been conducted in both Banswara and Jaisalmer districts, covering four villages (Kheda, Bhagora, Bhagatpura and Kotda) from Banswara and two villages (Awaay and Sankaria) from Jaisalmer district. In Banswara, two villages i.e. Kheda and Bhagora from canal irrigated area and two villages i.e. Bhagatpura and Kotda from non-irrigated rain-fed agricultural area, whereas, in Jaisalmer district two villages i.e. Awaay and Sankariya, from canal irrigated area, have been covered.

In the study villages, the entomological survey have been carried-out as per project protocol, surveying 10 house-holds for mosquito collection for 10 minutes and then recording associated data on the breeding and resting habitats of anophelines, climatic conditions and the type of house-holds, besides parasitological survey of fever cases for the detection of malaria parasites in the community. The records water bodies in the village, the vegetation and prevailing atmospheric conditions were also recorded.

In Banswara district, 04 anopheline species viz., *Anopheles culicifacies*, *An. stephensi*, *An. annularis* and *An. subpictus* were recorded (Table 1), whereas, from Jaisalmer district only one species viz., *An. stephensi* was recorded (Table 2).

Table 1. Prevalence of malaria vectors in canal-irrigated and non-irrigated areas of Banswara district during March month.

Study Area	Study Villages	Anopheline Species Collected	Mosquito Density (PMHD)*
Canal Irrigated	Kheda	<i>An. culicifacies</i>	20.8
		<i>An. stephensi</i>	9.6
		<i>An. annularis</i>	1.3
		Total	37.7
	Bhagora	<i>An. culicifacies</i>	8.4
		<i>An. stephensi</i>	3.0
		<i>An. annularis</i>	8.6
		<i>An. subpictus</i>	4.3
		Total	24.2
Non-irrigated	Bhagatpura	<i>An. stephensi</i>	10.0
		<i>An. annularis</i>	0.2
		Total	10.3
	Kotda	<i>An. stephensi</i>	25.9
		<i>An. subpictus</i>	3.5
		<i>An. culicifacies</i>	3.3
		Total	32.7

*PMHD-Per Man Hour Density

Table 2. Prevalence of malaria vectors in canal-irrigated areas of Jaisalmer district during February month.

Study Area	Study Villages	Anopheline Species Collected	Mosquito Density (PMHD)*
Canal Irrigated	Away	<i>An. stephensi</i>	1.2
	Sankaria	<i>An. stephensi</i>	3.6

*PMHD-Per Man Hour Density

In Banswara district, the highest anopheline density was recorded in Kheda village (PMHD: 37.7), followed by Kotda (PMHD: 32.7), Bhagora (PMHD: 24.2) and Bhagatpura (PMHD: 10.3). *An. culicifacies* was recorded from 03 villages, with highest density in Kheda village (PMHD: 20.8), whereas, *An. stephensi* from all 04 villages, with highest density in Kotda village (PMHD: 25.9). Like *An. culicifacies*, *An. annularis* was also reported from 03 villages, highest in Bhagora (PMHD: 8.6) *An. subpictus* was recorded from 01 village each from canal irrigated and non-irrigated areas with higher density in canal irrigated area (PMHD: 4.3). It is clear from the data that the densities of *An. culicifacies*, *An. annularis* and *An. subpictus* species, except *An. stephensi*, was recorded higher in canal irrigated area (PMHD: 14.6, 4.9 & 2.2 respectively) than non-irrigated area (PMHD: 1.7, 0.1 & 1.8 respectively), which indicates that in canal irrigated area, the prevailing weather conditions are more suitable for the occurrence of these vector species than non-irrigated one. On the contrary, *An. stephensi* exhibited higher density (PMHD: 17.9) in non-irrigated area than canal irrigated one (PMHD: 6.3). The overall density of anopheline species in canal irrigated villages, recorded higher (PMHD: 30.9) than non-irrigated villages (PMHD: 21.5) also indicates that the prevailing environmental conditions in canal irrigated area support the prevalence of these vector species in the area more.

The data on the prevailing temperature and relative humidity, both inside and outside the house-holds, was also recorded during the field investigations. It was observed during the investigations that the intra-domiciliary temperature-range in canal irrigated villages, from 25 to 32°C is more suitable for the survival of the anopheline vector species than prevailing in non-irrigated villages (29-36 °C). The intra-domiciliary relative humidity in canal irrigated area was recorded in higher range (54-39 & 40-27%) during the survey than non-irrigated area (30-32 & 28-19%).

In Jaisalmer district the studies could be carried-out only in two villages in canal irrigated area during February month and only *An. stephensi* in very low density was recorded in Awaay and Sankaria villages (PMHD: 1.2 & 3.6). The studies in all the villages will be done during pre-monsoon month.

Expected Outcome

The study would identify the eco-environmental factors supporting the vector populations as well as malaria prevalence and based on which the key eco-environmental factors will be identified in view to utilize them in future as early warning tool.

1.6 Current status of insecticide resistance among mosquito vectors in Rajasthan State - a collaborative study

Principal Investigator(s) : *Dr. Karam V. Singh, Scientist 'F', DMRC and Dr. P. C. Dhandhoria, Addl. Director, DMHS, GOR*

Co- Principal Investigator(s) : *Dr. Himmat Singh, Technical Assistant, DMRC(upto June, 2014) and Mr. Mukesh Saxena, Entomologist, DMHS, GOR*

Collaborators: *1. Prof. N. P. Singh Head, Zoology Department, Rajasthan Univ., Jaipur 2. Dr. Aarti Prasad, Assoc. Prof., Zoology Department, MLS Univ., Udaipur*

Commencement: April, 2014 **Duration:** Three Years **Status:** Ongoing

Funding Agency: Desert Medicine Research Centre (Intra-mural)

OBJECTIVES

1. To determine the current status of insecticide resistance against the compounds being used under national control programme for adults and larval forms in the state,
2. To determine the biochemical mechanisms involved in the development of insecticide resistance among vectors in view to elucidate cross-resistance and develop resistance management strategies

PROGRESS

To determine the current insecticide resistance status of mosquito vector species ten districts viz., Alwar, Banswara, Barmer, Bharatpur, Bikaner, Dholpur, Jodhpur, Nagaur, Pratapgarh and Udaipur were selected initially on the basis of prevalence of malaria of past year and were considered problem (risk) districts by the State Government during 2014. The studies during the report period could be carried-out only in two districts i.e. Bikaner and Nagaur districts. In each district, as per project protocol, two PHCs having high malaria incidence/prevalence were to be selected and in each PHC two villages, again on the basis of malaria cases reported during previous year. In Bikaner district, the studies were conducted in two villages i.e. Jamsar and Khara of Jamsar PHC, and in Nagaur district in the villages Alaay and Chauwandia of Alaay PHC.

The mosquito collection was done during dawn hours using sucking tube method. The collected anopheline mosquitoes were stored in Burraud cages and transported to the laboratory for conducting the experiments. The tests for determining the insecticide resistance were conducted as per the standard WHO method. The tests were conducted against three insecticides i.e. DDT, alpha-cypermethrin and cyfluthrin, which are being used under national malaria control programme as indoor residual sprays.

The insecticide susceptibility tests were conducted on the malaria vector species *Anopheles stephensi* collected from Jamsar village of Bikaner district and Chauwardia and Alaay villages of Nagaur district (Table 1).

Table 1. Susceptibility status of malaria vector species collected from study villages against different insecticides

District	Village	Vector Species	Insecticide & diagnostic Dose	Percent Mortality (%)	Susceptibility Status*
Bikaner	Jamsar	<i>An. stephensi</i>	DDT 4.0%	85.7	IR
Nagaur	Chawandia	<i>An. stephensi</i>	DDT 4.0%	86.6	IR
			α - cypermethrin 0.05%	100.0	S
			Cyfluthrin 0.15%	100.0	S
	Alaay	<i>An. stephensi</i>	DDT 4.0%	92.0	IR
			α - Cypermethrin 0.05%	100.0	S
			Cyfluthrin 15.0%	100.0	S

*S- Susceptible, IR- Intermediate Resistance

The results of the experiments conducted for the determination of insecticide resistance status of *An. stephensi*, a malaria vector, revealed that in Bikaner district, village Jamsar, *An. stephensi* species was found Intermediate Resistant against DDT (MORTALITY: 85.7%). In Nagaur district in both the villages, Chauwandia and Alaay, the species against DDT was found again Intermediate Resistant (MORTALITY: 86.6%), however, against alpha-cypermethrin and cyfluthrin it was found totally susceptible (MORTALITY: 100.0%).

Expected Outcome

The findings of the study would give a clear cut picture of the areas where the vector species have developed insecticide resistance against particular insecticide(s), the areas where they are still susceptible or have started developing resistance. The information on biochemical resistance mechanism(s) would help in detecting resistance at an early stage, besides cross-resistance, so that timely management can be implemented.

1.7 Mapping of mosquito breeding habitats and location of vertebrate hosts in North and Southern parts of Rajasthan state prone for emergence of JE virus using space technology (RS & GIS)

Principal Investigator: Dr. P. C. Kanojia, Scientist 'E'

Co-Investigator: Dr. Rakesh Paliwal, Scientist SE, RRSC, Jodhpur and Dr. Himmat Singh, TA (upto June, 2014)

Commencement: August, 2012 **Duration:** Three Years **Current Status:** Completed.

Funding Agency: Vector Science Forum - ICMR

OBJECTIVES

1. Mapping of mosquito larval habitats, particularly *Cx. tritaeniorhynchus* and *Cx. vishnui* sub-group of mosquitoes and location of vertebrate hosts (pigs) which play major role in transmission of Japanese encephalitis virus (JE) using RS and GIS technologies.
2. To identify JE prone areas with the help of RS and GIS in conjugation with eco-entomological studies in the proposed study sites.
3. To develop early warning system of JE occurrence.

PROGRESS

Field and laboratory studies commenced under **ICMR-VSF** funded project entitled "Mapping of mosquito breeding habitats and location of vertebrate hosts in North and Southern parts of Rajasthan state prone for emergence of JE virus using space technology (RS & GIS)" were continuing during the year 2014-15 with a view to collect more relevant ground data on remaining aspects of the project.

To achieve the targets, field visits were made to seven villages viz., Sardargarh, 6 GB (Jaitsat), Central Cattle Breeding Farm (Sriganganagar), Lakhuwali, Mukkasar, Tibbi & Lalgadiya- Ki- Dhani, (Hanumangarh) in order to collect adult specimens as well as immature stages of mosquitoes from different breeding habitats. Besides this, new location of paddy birds roosting places and breeding places of mosquitoes were also identified. Geo-coordinates of mosquito breeding habitats & location of paddy birds' roosting places were also recorded.

Sampling of JE mosquito larvae of JE vectors

A total of 958 mosquito larvae belonging to 6 species along with 3 JE vectors namely *Cx. tritaeniorhynchus*, *Cx. quinquefasciatus* and *An. subpictus* were collected from different breeding habitats. Breeding habitats like Paddy fields, Trenches and canals yielded maximum numbers of JE vectors. Habitats-wise distribution of mosquito larvae are mentioned in Table 1.

Table 1. Record of breeding of different mosquitoes species in the study village of Sri-Ganganagar & Hanumangarh district during the year 2014

Name of Locality/ District	Sardargarh (Jaitsar)	CCBF	6GB (Jaitsar)	Hanumangarh	Lakhuwali	Makkasar	Lalgaddiya ki Dhani
	Sri Ganga nagar	Sri Ganganagar	Sri Ganga nagar	Highway	Hanuman garh	Hanuman garh	Hanumangarh
Habitats	Trenches	Canal	Paddy field	Paddy field	Paddy field	Paddyfield	Paddy field
Species							
<i>An. culicifascies</i>	+	+	—	+	+	+	—
<i>An. subpictus</i> *	+	+	—	—	—	—	+
<i>An. stephensi</i>	+	+	+	+	—	—	—
<i>An. pulcharimus</i>	—	+	—	+	—	—	—
<i>Cx. quinquefasciatus</i> *	—	+	—	—	—	—	—
<i>Cx. tritaeniorhynchus</i> *	—	+	+	+	—	—	+

* JE vector

Sampling of adult JE vectors from different resting places

A total of 277 adult mosquitoes representing 9 species were sampled from different resting habitats. Among the species collected 3 were JE vectors viz., *Cx. tritaeniorhynchus*, *Cx. quinquefasciatus* and *An. subpictus*. District & village-wise distribution of mosquitoes along with JE vectors are mentioned in Table 2.

Table 2. Records of adult JE vectors from different resting habitats at Sri-Ganganagar & Hanumangarh district during the year 2014

Name of locality	CCBF	6GB (Jaitsar)	Tibbi	Lakhuwali	Makkasar	Lalgaddiya ki Dhani
	Sri Ganganagar	Sri Ganganagar	Hanumangarh	Hanumangarh	Hanumangarh	Hanumangarh
Habitats	Cattle shed	Cattle shed	Cattle shed	Cattle shed	Cattle shed	Cattle shed
Species						
<i>An. stephensi</i>	—	+	+	+	—	—
<i>An. subpictus</i> *	+	+	—	—	—	—
<i>An. pulcharimus</i>	+	+	+	+	—	+
<i>Ae. aegypti</i>	—	—	—	+	—	—
<i>Ae. caspius</i>	+	+	—	—	+	—
<i>Ae. pipersalatus</i>	+	—	—	+	—	—
<i>Ae. lineatopennis</i>	+	—	—	—	—	—
<i>Cx. quinquefasciatus</i> *	—	—	+	—	—	—
<i>Cx. tritaeniorhynchus</i> *	+	—	+	+	—	+

* JE vectors

Search for location vertebrate hosts

During the course of study, Sri-ganganagar and Hanumangarh district were searched for location of pig sties and roosting places of ardiel birds. Table - 3 shows the location of birds' colonies.

Table 3. Location of birds' colonies & Geo-coordinates of collection sites at Sri- Ganganagar & Haumangarh district

S. No.	District	Name of the place	Geo-coordinates	Remarks
1.	Sri-Ganganagar	Sardargarh	N- 29.23495 E- 73.44871	Perennial pond
2.	„	Sardargarh Rly. Station	N- 29. 22060 E- 73. 44931	Paddy growing area
3.	„	Jaitsar	N- 29. 22292 E- 73.43751	Paddy growing area
4.	„	Jaitsar Road	N- 29. 22161 E- 73. 42522	Road side trenches
5.	„	Jaitsar Rly. station	N- 29. 20953 E- 73.40608	Paddy growing area
6.	„	Sutargarh (CCBF)	N- 29. 21557 E- 73. 52303	Forest Water body Bird Colony
7.	„	6GB village	N- 29. 19045 E- 73. 39816	Paddy field
8.	Hanumangarh	Near Tibbi village	N- 29. 33460 E- 74. 26765	Paddy growing area
9.	„	Tibbi (Talwara Jhil)	N- 29. 32632 E- 74. 30423	Paddy growing
10.	„	Near Distt. Jail	N- 29. 36335 E- 74. 16557	Paddy bird colony
11.	„	Lakhuwali	N- 29. 28006 E- 73. 03581	Paddy growing area
12.	„	Lal dadiya-Ki- Dhani	N- 29.58971 E- 74.33296	Paddy field

Progress on RS & GIS Component

The field based mosquito habitats locations have been converted in spatial domain using latitude and longitude values in GIS (Geographical Information System) environment. Based on field data, the study area has been prepared using SOI topomaps for both north and southern region of the project. The *Figure-1* and *Figure-2* shows the north and south region respectively.

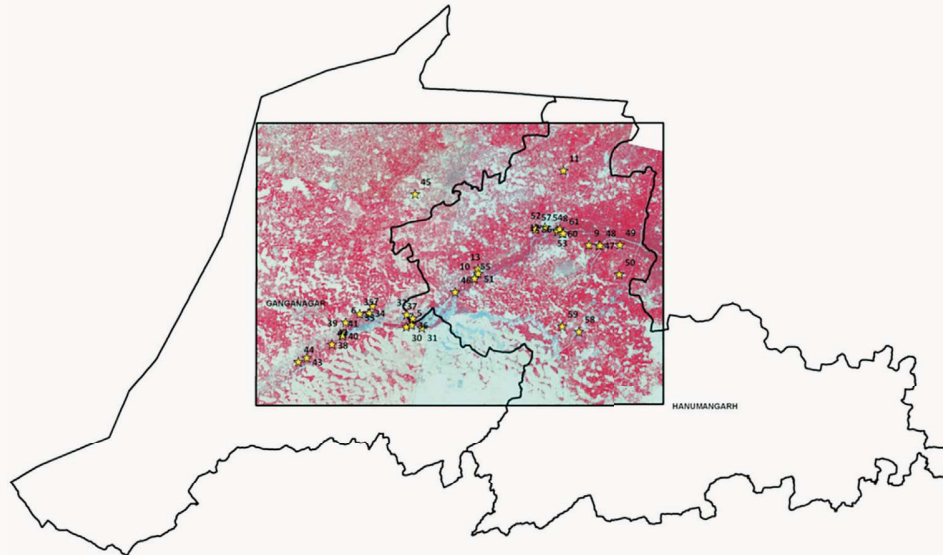


Fig. 1. (North region: Part of Sri-Ganganagar & Hanumangarg district).

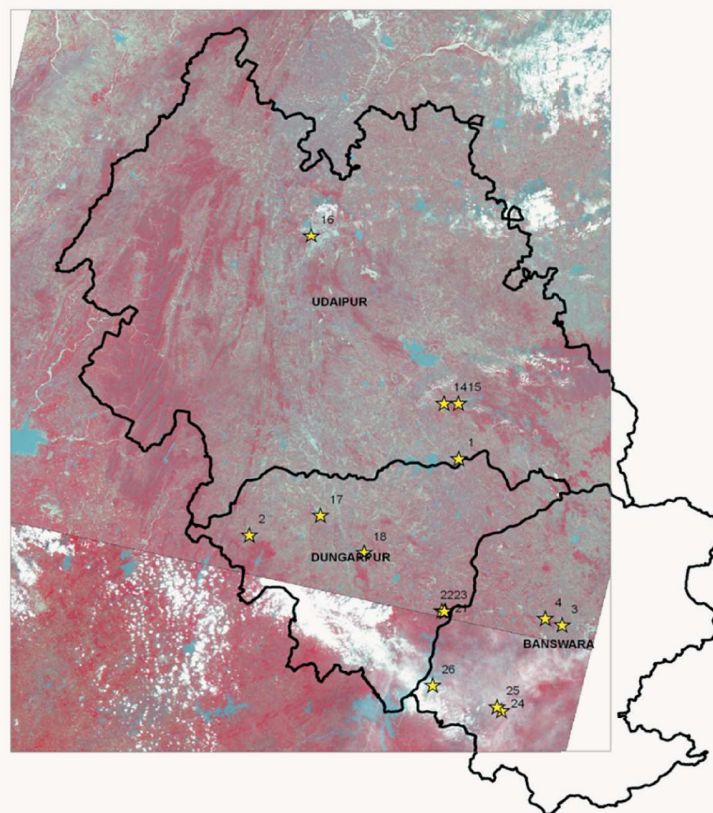


Fig. 2. (South region: Part of Udaipur, Dungarpur & Banswara district).

Procurement of satellite data

At the same time using above mentioned latitude and longitude extent, the Resourcesat-2 LISS-III data has been ordered from NDC, NRSC, Hyderabad. The details of the data are mentioned in Table 4.

Table 4. Path/Row specification of Resourcesat-2 Satellite data

Data	Region	Path/Row
Resourcesat-2 (LISS III and LISS IV)	North Region:	92/50
	Sri-Ganganagar, Hanumangarh	93/50
	South Region:	94/54
	Udaipur, Dungarpur, Banswara	94/55

Topomaps

The Survey of India topographical maps (1:50000 scale) are also used for base data preparation. The details of topomaps are mentioned in Table 5.

Table 5. Topographical map grids cover the study area

Districts	Map Sheet Grid No.
North Region (Sri-Ganganagar and Hanumangarh)	44G11, 44G12, 44G14, 44G15, 44K02, 44K03, 44K05, 44K06, 44K07, 44K10, 44K11
Southern Region (Udaipur, Dungarpur and Banswara)	45L04, 45H10, 46E02, 46E07, 46E09, 46I01, 46I02, 46I03, 46I06

Preparation of spatial data

Extraction of the study area based on the field observations is completed. Prepared GIS database for mosquito breeding habitats based on the field data collection. Base data preparation viz.; roads, rail network, canal network, drainage, settlement location with names is in progress

Use of RS and GIS Software

The satellite data (existing) processing have been done using ERDAS Imagine 2013 and ArcGIS 2010 GIS software have been used for creation various spatial layers.

1.8 Structural Bio-informatics study of inhibitory role of secondary metabolites of *Calotropis procera* on Sterol carrier protein (AeSCP-2) of *Aedes aegypti*.

Principal Investigator: Manju Singhi, Scientist 'D'

Commencement: January, 2015 **Duration:** Three years **Status:** Ongoing

Funding Agency: Desert Medicine Research Centre (Intra-mural)

OBJECTIVES

1. To derive structure and orientation of AeSCP-2 protein and latex compounds of *C. procera* for its possible interaction .
2. Identification, implication and isolation of larvicidal compounds inhibiting AeSCP-2 Protein and establishment of its role as new larvicidal compound.

PROGRESS

Present study aims to identify an inhibitory compound in latex of *Calotropis procera*, which can cause physiological incapacitation in mosquito larvae to inhibit Sterol carrier protein i.e. AeSCP-2, responsible for converting Phyto-sterols into essential cholesterol. Cholesterol absorption in insect can provide a target sight for the development of new insecticide. The Phyto-compound present in the *C. procera* as larvicide will be screened by determining their ability to interact with AeSCP-2 and its subsequent inhibition using bio-informatics tools. The knowledge derived from this research will aid for rational design of new insecticide for mosquito control.

Target protein - Three dimensional crystallographic structure of Aescp-2 protein was downloaded from Protein Data Bank (www.rcsb-pdb.org) in pdb format. PDB ID 2KSH corresponds to Apo structure of *Aedes* Sterol Carrier protein type 2 isolated from *Aedes aegypti* mosquito (Fig. 1).



Fig. 1. NMR structure of *Aedes* Sterol Carrier Protein-2.

Protein-Ligand docking steps

- Aescp-2 PDB ID 2KSH structure was prepared to be utilized as docking input using Dock Prep Module of Chimera software.
- Three dimensional structure of selected ligand compound in sdf format was converted to Mol 2 format using *Chimera* software.
- Dock prepared structure of Aescp2 (PDB Id 2KSH) as protein and Mol 2 format as ligand were submitted to PAR Dock server (<http://www.scfbio-iitd.res.in>).

- Docked output were downloaded and were then analyzed for energy minimization, Hydrogen bonding between ligands and docked structure visualization using Chimera tool.
- Docking with PAR Dock resulted top four docking models (Docking of Aescp-2 with selected ligand) sorted in order of maximum energy release predicted by docking. Predicted binding affinity has been calculated as shown in Table 1.

Table 1. Docking of Aescp-2 with selected ligand

S. No.	Docking model	Predicted binding affinity
1	Docking model-1	- 4.64 kcal/mol
2	Docking model-2	- 4.39 kcal/mol
3	Docking model-3	- 4.31 kcal/mol
4	Docking model-4	- 4.27 kcal/mol

The top ranked model represents the most stable complex of protein with ligand and hence taken into consideration for further analysis for hydrogen bonding and docked structure visualization. Hydrogen bonds between ligand and protein (Aescp-2 PDB 2KSH) were computed using top ranked docking output of PAR Dock. Hydrogen bonds were computed with surface binding analysis module of chimera software. Number of hydrogen bonds along with their details of Amino acid residue of 2KSH and atoms of ligand are given in table-3 and structure of docked pose shown in fig.2 & 3.

Table 2. Number of hydrogen bonds along with their details of Amino acid residue of 2KSH and atoms of ligand

Docking model	H-bond Donor (Amino acid Residue and atom)	H-bond Acceptor (Amino acid Residue and atom)	Hydrogen (Amino acid Residue and specifier)	Distance between donor nuclei and Acceptor atom (Angstrom)	Distance between hydrogen of donor and Acceptor atom (Angstrom)
1	MET 1 N	DRG 111 O1	MET 1 H1	2.736	1.852
2	MET 1 N	DRG 111 O3	MET 1 H3	3.236	2.565
3	MET 1 N	DRG 111 O6	MET 1 H1	3.181	2.278
4	GLN 36 NE2	DRG 111 O	GLN 36 2HE2	2.922	2.002
5	DRG 111 O7	MET 1 O	DRG 111 H36	2.648	1.781

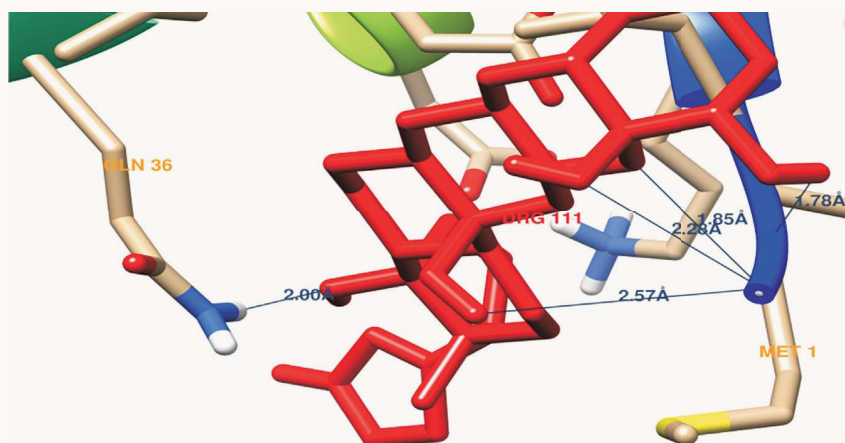


Fig. 2. Structure Visualization docked pose..

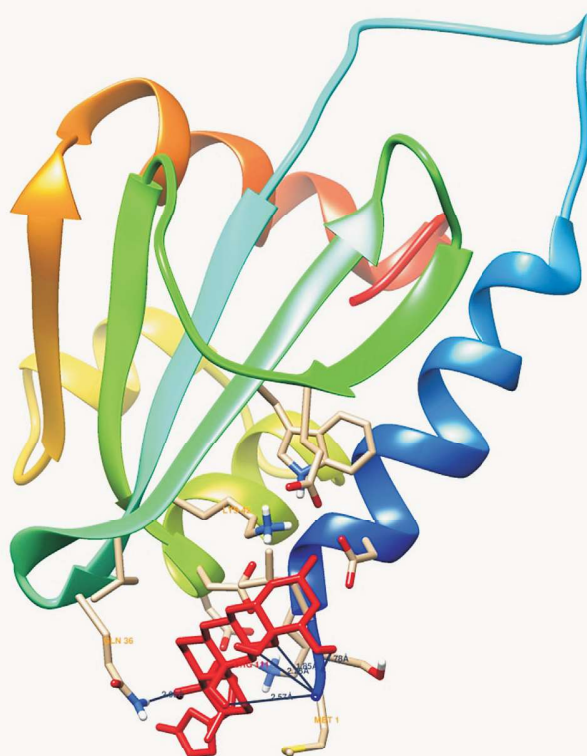


Fig. 3. Macromolecular visualization of Docked output.

1.9 Use of insecticide treated nets (ITNs) in alternative forms for the protection against malaria transmission in the desert region

Principal Investigator: Dr. S. S. Mohanty, Scientist- 'D'

Commencement: September, 2013 **Duration:** Three Year **Status:** Ongoing

Funding Agency: Desert Medicine Research Centre (Intramural)

OBJECTIVES

1. Evaluation of the effectiveness of the insecticide treated nets (ITNs) with community participation and acceptance of use of ITNs in alternate forms in the desert part of India.

PROGRESS

The effect of the insecticide treated nets below the beds and curtains for the control of malaria was evaluated in Pokaran Community Health Centre of the Jaisalmer district. Out of the six villages, three villages were selected for the evaluation of the insecticide nets and three villages for the control (no nets). The impregnation of nets and curtains used in the door, window and wardrobes was done with deltamethrin at a concentration of 1g/meter². The impregnation was done in the presence of the villagers and volunteers. They were trained and educated how to impregnate and use insecticide treated nets. The base line survey was conducted in the six villages for the collection of the entomological and malaria epidemiology data. The base line surveys were made in the post monsoon period (September, 2013) and in winter season (January 2014). Mosquito collections were done in the months of July, August, November and March in the control villages and insecticide treated net distributed villages. The entomological and malaria epidemiology surveys were also conducted during the intervention and post-intervention period. The percentages of reduction of mosquito density in the houses of the insecticide treated nets distributed villages were significantly higher (t test, $P=0.016$) than the houses of the control villages (Fig-1). The per man hour density (pmh) of female anopheline mosquito was reduced in the three insecticide treated nets distributed as 72% (T-1, Nathusar), 58% (T-2, That) and 75% (T-3, Billia). 33% per man hour density (pmh) of female anopheline mosquito was increased in the control village Kelawa and Devalpura, whereas in the control village Ujjala 18% increase of pmh was reported. The effectiveness of the insecticide treated has been found for three months. The difference of densities of mosquitoes between the rooms where the impregnated nets were present and no net in the treated net distributed village was highly significant (t test, $P<.01$).

Fever cases were diagnosed for malaria in the control and insecticide treated bed net distributed villages. *Plasmodium vivax* and *Plasmodium falciparum* malaria cases were reported from the study villages. Higher malaria cases were detected in the control villages than the insecticide treated bed net distributed villages (Fig.2). The percentage of reduction of malaria cases in the insecticide treated net villages was significantly (t test, $P=0.0007$) higher than the control villages.

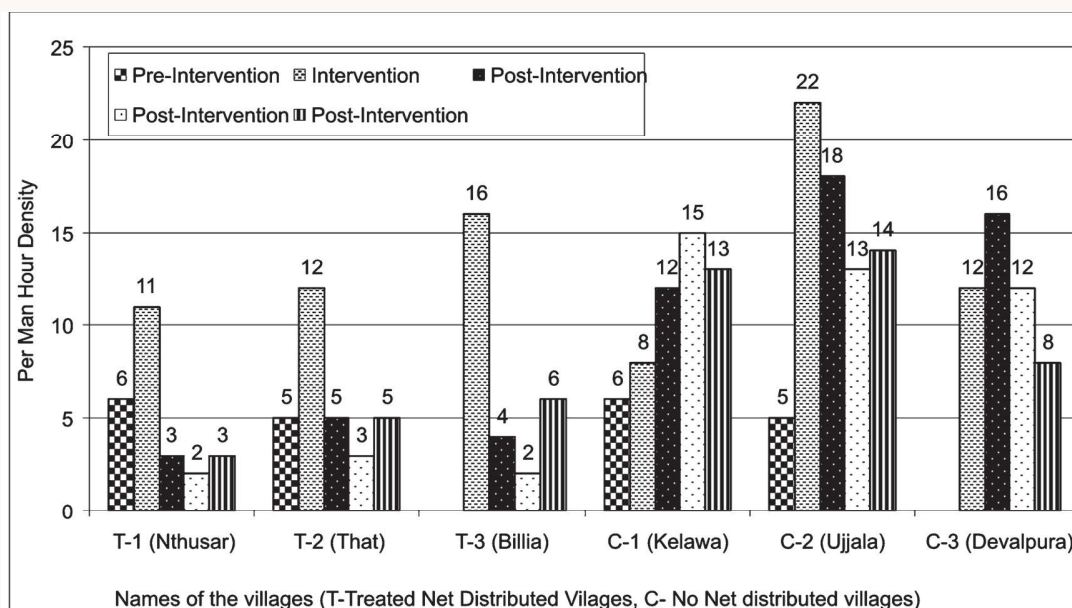


Fig. 1. The per man hour density (pmh) of female Anopheline mosquitoes in the deltamethrin treated nets distributed villages and control villages during the pre-intervention, intervention and post-intervention period.

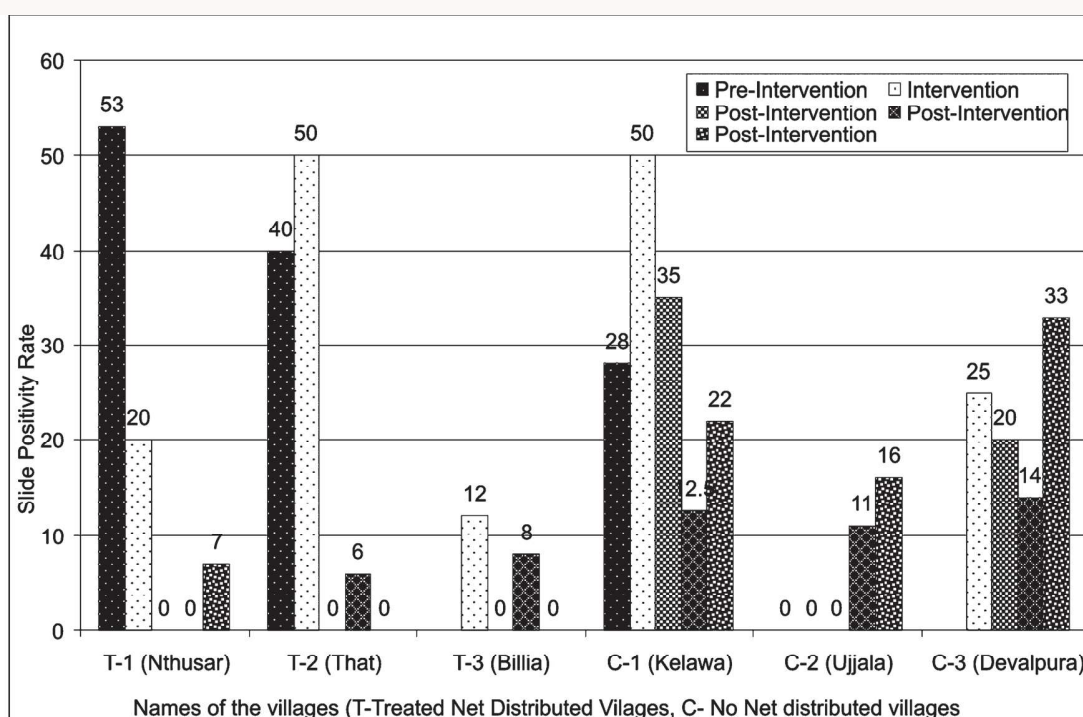


Fig. 2. Malaria cases in the control and insecticide treated bed net villages.

1.10 Operationalization of Real-Time Health Information Management System for Malaria in Jaisalmer District (Rajasthan)

Principal Investigator: *Dr. A. K. Dixit, Scientist 'F'*

Co- Investigator *Dr. M. S. Chalga, Scientist 'B', ICMR*

Collaborator: *Joint Director, Medical & Health Services, Jodhpur Zone, Jodhpur*

Commencement: June, 2014 **Duration:** Two Years **Status:** Ongoing

Funding Agency: ICMR (Translational Research Project)

OBJECTIVE

1. To operationalize the IT based Real-Time Health Information management system for malaria in Jaisalmer District of Rajasthan.

PROGRESS

The study actually began on 1st June, 2014 with the joining of two Data Entry Operators. Both the data entry operators were provided with initial basic training of project and working of the system. After complete training of the project in first month, the existing IVRS system was tested if it was working properly to receive data with calls. The testing phase was successful and IVRS system was ready to start up collecting data sent by state health workers ANM and Lab Technicians.

As the present study is done in a wider area (entire district), a heavy duty RT-HIMS system is required. Because of the limitations of existing IVRS system through which only one call can be received at one point of time, this limitation shows call engaged while other Lab technician tried to send data if one call is already connected with the server. Therefore a need of advanced IVRS software was felt to overcome this issue. With advanced IVRS software, IVRS server can connect approx. 30 calls simultaneously at one point of time. This system is being developed by configuring a Server technology based computer system with server operating system to serve as RT-HIMS system. Since many callers calling simultaneously is expected, multiple telephone lines are required. Thus ISDN PRI telephone line is proposed, capable to handle 30 callers parallel on the line at the same time. To handle such ISDN PRI, capable IVRS software is proposed.

A technical specification committee was called in December, 2014 to review the proposal and has given its recommendations, which has been approved by the competent authority. The purchase of the system is under way. It will be installed at Desert Medicine Research Centre and will be kept online for 24 hrs a day. The toll free telephone will be connected to RT-HIMS server as it will facilitate health workers to connect at no cost to IVRS, anytime, from anywhere, using telephone or STD booths or their mobiles. Health workers will be given training to use interactive voice response technology to feed their report. The system will collect the real-time information from health workers through toll free telephone, will transfer it to Database Server and would publish the baseline & real-time information, analyzed reports and maps on the website.

In order to proceed further in this project, we required a database with complete contact details of ANMs and Lab Technicians working in PHCs and Subcentres of Jaisalmer District. This database was to be collected and then installed and fed into the system along with their respective codes. Every person sending data has been given a particular code in order to get right data from right candidate. To accomplish this task, we visited CHMO office, Jaisalmer in September 2014. We met CHMO Jaisalmer and through his support, we could collect blockwise details of all ANMs and Lab Technicians working

in Subcentres and PHCs. CHMO staff helped us in collecting data of all the 3 blocks of Jaisalmer district. We also discussed CHMO about our previous work done with their cooperation in Block Pokaran of Jaisalmer District. We met Data Manager, Mr. Tarun Gautam, working at CHMO Office in Jaisalmer. He helped us in getting required data from the database of his computer.

The health workers from all the three blocks of the district were contacted. List of all such workers with the centre of their attachment, and their mobile numbers was prepared. This information is fed into the system along with their respective codes. Particular code to every person attached with the system, identified for sending the real time data has been given in order to get right data from the right informant. A second visit to the district was made to have village wise data. With this visit of the district, we could have complete village wise data enclosed in Appendix 1. This makes us ready to initiate work on the existing IVRS system, till purchase of advanced IVRS system gets processed. In existing IVRS system, placed at DMRC and used in earlier study in Pokran tehsil of the district, lab technicians or ANMs make a call on toll free number and this call is directly transferred to the IVRS server. In this IVRS server, through a pre-recorded voice questionnaire data is collected in sequential manner.

2. NON-COMMUNICABLE DISEASES

2.1 Effectiveness of diet and lifestyle intervention through Information Education and Communication (IEC) tools with Angan Wadi Centres (AWCs) as the centre of knowledge dissemination for hypertension (including hypercholesterolemia and diabetes) risk reduction- a cluster randomized controlled trial

Principal Investigator: *Dr. K.R. Haldiya, Scientist 'G' (till July, 2014)*

Co-Investigator: *Dr. Raman Sachdev, Scientist 'E'*

Commencement: January, 2014 **Duration:** Three years **Status:** Ongoing (6 months extension)

Funding Agency: ICMR Task Force Extra-mural

OBJECTIVES

General Objective:

To assess the effectiveness of diet and lifestyle intervention through Information Education Communication (IEC) tools with Angan Wadi Centres (AWCs) as the centre of knowledge dissemination for Non-communicable Disease risk reduction.

Specific Objectives:

Primary Objective:

To assess the effectiveness of intense versus of usual IEC interventions on diet and lifestyle modifications delivered by existing community level health workers (ASHA or equivalent) on population level blood pressure

Secondary Objectives:

1. To assess the operational feasibility of integrating NCD risk reduction in community health programmes through existing community level health care volunteers such as ASHA or equivalent.
2. To assess the usefulness of trained healthcare workers to affect changes in dietary fat, fibre and salt, tobacco and alcohol consumption and increasing physical activity
3. To assess the efficacy of these interventions to evaluate changes in lipid levels and glycemia.

PROGRESS

The project was initiated in January, 2014 and the project staff including the co-investigator received training on mapping and listing of house holds of the site. They were also trained on baseline data collection including physical anthropometric measurements as well as collection of blood samples from the recruited participants, their transportation to CNRT Laboratory, New Delhi for serology

and biochemical analysis by the co-ordinating agency CCDC, New Delhi. After the training, work of mapping and listing of households in all the selected 12 clusters of Kotra tehsil of Udaipur district was started. All the 12 clusters were categorized into two groups i.e. control group and intervention group. Each cluster represents one or more than one Anganwadi centre. A total of 3600 participants (300 in each cluster) were required to be covered from all the selected clusters of the study area.

Listing and mapping of the households of all the selected 12 clusters of Kotra tehsil of Udaipur district was done and submitted to the co-ordinating centre, CCDC, New Delhi for allocation of randomization. After receiving the randomized list from the coordinating centre CCDC, New Delhi baseline survey in the selected clusters including recruitment of the participants, Physical anthropometry examination and collection of blood samples (after obtaining the written consent) from the recruited participants was started. Two teams were formed by the Co-Investigator for the baseline survey work. Each team comprised of two members along with one team supervisor who supervised the work of both the teams. The coverage is given in Table1.

Table 1. Details of baseline recruitments from April, 2014 to March, 2015

S. No.	Name of the clusters	# Main questionnaires filled	# Physical Anthropometry & BP measurement done	# Blood samples collected	# Data entry done online	# 24 hrs dietary recall done
1.	Malviya	192	-	-	162	4
2.	Malwa ka Chora	187	116	132	115	3
3.	Rujiya Khunna	36	33	-	11	-
4.	Kham	-	-	-	-	-
5.	Digawari Kalan	306	73	24	99	5
6.	Kada	207	63	-	114	13
7.	Kyari	271	75	103	140	13
8.	Teja Ka Was	256	138	89	41	9
9.	Kotra	339	200	137	137	7
10.	Kala Khetar	-	-	-	-	-
11.	Nayawas	300	127	-	52	4
12.	Sulav	290	-	-	137	9
Total		2384	825	485	1008	67

Baseline work including recruitment of the participants, physical anthropometry and collection of blood samples was initiated in 10 clusters. In Phase I the teams recruited the participants and collected their demographic data and recorded information on life style, physical activity and diet and nutrition from all the selected clusters of study area in the pre-designed printed schedules. As such, till the period under report, a total of 2384 participants have been recruited from 10 clusters. After initial recruitment of the participants, camps were organized to collect blood samples from the recruited participants and simultaneously physical anthropometry and BP measurements of the participants were also done in the camp. A total of 825 physical anthropometry and BP measurements of recruited participants have been done by the team. Similarly, 485 blood samples from Malwa ka Chora, Kyari, Kotra and Digawari kalan clusters have also been collected till March 2015 and transported in dry ice to CNRT Laboratory, New Delhi and individual reports of the investigations as received from CNR were made available to the participants on next visit.

The data collected in the field was entered online in the DISHA Study Software by the investigators on coming back to the headquarters, DMRC, Johdpur. A total of 1008 main questionnaires of recruited participants have been entered online by the investigators for the purpose of analysis at the CCDC, New Delhi.

2.2 Nutritional status of elderly rural population and development of appropriate intervention model using existing health system

Principal Investigator: Dr. Madhu B. Sing, Scientist 'F'

Co-Principal Investigators: Dr. Arvind Mathur, Principal, Dr. SN Medical College, Jodhpur; Dr. Harish Aggarwal, Dr. SN Medical College, Jodhpur; Dr. M.P. Soni, M/O Incharge, CHC, Luni; Mr. R.K. Kalunda, Technical Officer, DMRC

Collaboration: State Health Department, Dr. SN Medical College, Jodhpur and CNRT Laboratory, (ICMR), New Delhi

Commencement: October, 2013 **Duration:** Three years **Status:** Ongoing

Funding Agency: Desert Medicine Research Centre, Jodhpur (Intramural)

OBJECTIVES

1. Clinical assessment of the elderly population
2. To assess the anthropometric measurements of the elderly population
3. Assessment of micronutrient deficiencies viz Iron, Zinc, Vitamin A and E, Calcium, Selenium, and lipid profile
4. Assessment of the dietary intake of the elderly population
5. To develop an intervention model using existing health system

PROGRESS

This is a collaborative project. During the reported period, 400 elderly people have been registered covering 5 AW centres from Luni village and one AW center from Dandiya village. Elderly individuals below the age of 60 years have not been registered for the study. All the registered subjects were brought to Luni CHC by respective Aganwari Workers of Luni and Dandiya village for examination. All the registered subjects were interviewed / examined at Luni CHC level by Medical officer and DMRC team for Demographic profile, complete present, past, occupational, family and social history, complete general physical examination i.e. health status, Co-Morbid diseases i.e. Diabetes Mellitus, Hypertension, CVD, and COPD and other general morbidities, Health care need and expectations. Nutritional status assessment was done by using 18 items (30 points) Mini nutritional assessment scale. Blood samples (venous blood 5 ml) have been collected from all the enrolled elderly individuals for biochemical assessment of HB, Iron, Vitamin A, E, trace elements Zn, Se, Ca and lipid profile.

Transportation of sample: WHO method has been followed for transportation of blood samples from field to DMRC, Jodhpur and CNRT, Delhi. Cold chain has been maintained during transportation.

Analytical Method Used

Hemoglobin: Indirect cyanmethemoglobin method, Iron: Fully automatic auto analyzer

Vitamin A and E: Using the HPLC method of Bieri et al (1979), Trace elements Zn, Se, Ca: AAS by AOAC official method (2005) / ICPMS, Lipid profile: Fully automatic auto analyzer

Those elderly individuals, who were unable to visit Luni CHC, were interviewed / examined at their Households.

Analysis of 400 elderly population (150 males & 250 females) revealed that 63.7% belong to 60-70 years age group. Analysis revealed that 96.3% were Hindus, 65.3% were married, 30.5% widows, 1.5% were separated and, 0.2% were single. Majority of elders (92%) live with family whereas 3.5% live alone. Illiteracy observed to be high in females (96%) than males (66.7%). The percentage of working males was 41.3%, out of which, mainly involved in agriculture (47.3%) and labour (37.3%) whereas 52.7% were pensioners. Smoking was 48.7% among males, (mainly Bidi 41.2% and Gutka 36%), whereas 9.6% in females (Table 1.)

Table 2 showed the Health Status of elderly population revealing that overall 65.3% elderly had poor vision. 31.3% hearing difficulty, 33% had disturbed sleep, and breathlessness (32.3%). Overall Knee and Back pain were high i.e. 51.5% & 46.2%, comparatively higher in case of females than males. Chest pain was 14.5%. Other problems were Frequent headache (12.3%), Fever in last 1 month (5%) and Falls in last 6 months (4%) and depression (2.5%). The overall prevalence of Hypertension was 23.3%, COPD 5.5%, Diabetes Mellitus 4.5%, Asthma 4.3% and IHD, 1.7% (Table 3). Evidence of arthritis was observed higher among females (67.6%) than males (50.7%). Central Nervous System Examination of Elderly showed that overall weakness of limbs was 4%, abnormal movements were 1.7% and abnormal speech was 0.7 percent.

Analysis of Mini Nutritional Assessment Scale showed that 58.5% were found to be at risk of malnutrition whereas 27.5 percent were malnourished (Score >23.5). Overall 82.8 percent anaemia was observed which was higher in females (91.1%) than males (69.3%). Moderate & severe anaemia was 23.5 percent and 3.5 percent respectively, higher in females than males. Main Micronutrient deficiencies observed among elderly population were serum calcium 53.6 percent serum zinc deficiency 44.2 percent serum iron 22.8 percent and serum retinol deficiency 13.1 percent. Hyperlipidemia (>200 mg/dl) among elderly population was 10.7%, higher in females (13.9%) than males (5.6%). High triglycerides (>150mg/dl) were observed among 37.5% whereas 71.6 percent elderly population had HDL lower than 40 mg/dl.

Dietary intake analysis (24 hours recall method) of 400 elderly individuals revealed that their diet was deficient in fibres (28.1% in males & 32.4% in females), Vitamin C (64.4% in males & 54.5% in females), Folate (6.7% in males & 24.9% in females), Beta carotene (84.7% in males & 88.1% in females), Energy (12.1% in males & 12.5% in females), Zinc, Vitamin 6 and Niacin.

Analysis of overall social interaction of elderly population showed 43.7 percent reduction (36% males & 48.4% females). Regarding analysis of whether their health needs are taken care of, overall 52 percent elderly population took medicines on ad-hoc basis where as 39.3 percent took regular medicines.

After baseline survey, three-day training program' from 25th to 27th August, 2014 as Phase-II training of all the Accredited Social Health Activist (ASHA) /Anganwadi Workers (AWs)/ Sahyogini workers, MPW along with Sarpanch, Ward Panch, Key persons of the village at CHC, Luni, was organized. The aim of the training was to create awareness among the grass root level health functionaries regarding health promotion of elderly population, co-morbidities and their prevention, intervention through nutritional counselling stressing the Role of dietary fibres, Oils rich in MUFA & PUFA, Consumption of Iodized salt in daily diet of elderly population and their association with diseases, Micronutrient deficiencies and its prevention and dietary modification stressing the role of enhancers and inhibitors in diet along with the consumption of diet rich in micronutrients i.e 'Interactive Session' with trainees was organized so that they can do further nutrition intervention for the prevention and cure of different morbidities/infections, peculiar to geriatric at the household level of the registered elderly population in their respected Aganwari areas. Hands on training have been given to them so that they can further impart this knowledge to all the elderly registered in their respective area.

Intervention/IEC: After second phase training, intervention has been started from the month of September onwards following three approaches i.e.

1. Individual approach at household level: Each AW/ASHA workers of the five AW centers of Luni village and one AW center of Dandiya village imparted the knowledge to all the elderly population at household level for three to five days in their respected area under the supervision of the research team monthly. All the AW workers have prepared the registers (six) for registering elderly in their respective areas, at household level and imparting them IEC to them monthly at household level including young women of the household who are preparing the food. This intervention will be done for one year.
2. Group approach: Lecture are delivered at all six AW centers of Luni and Dandiya Village of quarterly, at one place by the PI and had group discussions with the elderly registered in the study area along with local leaders of the study area for effective dissemination of the knowledge at community level.
3. Mass approach: Educational printed material, in local language, in the form of pamphlets has been distributed to all Aganwari workers in the study area.

All the AWs/ASHA workers are motivating the elderly population registered in their areas for getting them examined at CHC level monthly up to one year and get therapeutic supplementation for Iron, Zinc, Calcium, and Selenium etc. by Medical officer of CHC from the government supply based on the results of the biochemical analysis of blood.

Nutrition intervention is going on. Nutritional counseling is being provided to all elderly population by Trained AWs/ASHA etc in their respective areas at HHS level registered earlier monthly. All the AWs/ASHA workers of six AW centers of Luni and Dandiya village are visiting the households of elderly population registered in the study, monthly from 3 to 5 days and according visits entering in their respective registers. Research team is supervising monthly from 3 to 5 days. Till now intervention has been done for five months. Group approach is also being done by research team quarterly.

After follow up of six months, and one year, all the registered subjects will again be examined for all the parameters as done in the beginning of the study. The results of all the parameters will be compared for assessing the impact of the intervention, in terms, IEC (nutritional counseling) and therapeutic supplementation to all elderly enrolled in the study area, utilizing the existing health system at PHC/CHC level.

Table 1. Socio-demographic profile of elderly population

Number examined	N= 400				Gross Total	
Elderly characteristics	Number		Number			
Sex	Male	Percentage	Female	Percentage	N	%
	150	37.5	250	62.5	400	100
Age (Years)						
60-70	99	66.0	156	62.4	255	63.7
70-80	37	24.7	62	24.8	99	24.7
80-90	12	8.0	28	11.2	40	10.0
90 & above	2	1.3	4	1.6	6	1.6
Education						
Illiterate	100	66.7	240	96.0	340	85.0
Literate	17	11.3	6	2.4	23	5.8

Primary	12	8.0	2	0.8	14	3.5
Middle	7	4.7	1	0.4	8	2.0
Secondary	11	7.3	1	0.4	12	3.0
College	3	2.0	0	0.0	3	0.7
Present occupation						
HW	9	6.0	69	27.6	78	19.5
Pensioner	79	52.7	162	64.8	241	60.3
Working(specify)	62	41.3	19	7.6	81	20.2
Previous occupation						
Labour	56	37.3	151	60.4	207	51.7
Agriculture	71	47.3	76	30.4	147	36.8
Business	3	2.0	4	1.6	7	1.8
Professional	4	2.7	2	0.8	6	1.5
White collar	13	8.7	0	0.0	13	3.2
Other	3	2.0	17	6.8	20	5.0
Smoking Habit						
Yes	73	48.7	25	9.6	97	24.2
No	77	51.3	226	90.4	303	75.8

Table 2. Health status of Elderly population

Health Status N=400	Male		Female		Total	
	N	%	N	%	N	%
Vision						
Eye Sight Poor	85	56.7	176	70.4	261	65.3
Eye surgery in past (Yes)	37	24.7	81	32.4	118	29.5
Hearing						
Hearing difficulty	47	30.7	78	31.2	125	31.3
Use of hearing aid	16	10.7	22	8.8	38	9.5
Sleep Disturbed	41	27.3	91	36.4	132	33.0
Breathlessness	60	40.0	69	27.6	129	32.3
Pain/ Discomfort abdomen	16	10.7	50	20.0	66	16.5
Appetite Less	24	16.0	48	19.2	72	18.0
Can chew well	65	43.3	128	51.2	193	48.3
Can swallow well	8	5.3	14	5.6	22	5.5
Bowel Habits (constipation)	17	11.3	47	18.8	64	16.0
Urinary symptoms						
Problem in passing in urine	14	9.3	32	12.8	46	11.5
Frequency in the night	13	8.7	27	10.8	40	10.0
Cloth wetting	5	3.3	8	3.2	13	3.3
Pain in body						
Knee joint	66	44.0	140	56.0	206	51.5
Finger joints	9	6.0	25	10.0	34	8.5
Back pain	49	32.7	136	54.4	185	46.2
Pain in neck	13	8.7	40	16.0	53	13.3
Cardiac Problems						
Chest pain	21	14.0	37	14.8	58	14.5

Dizziness	21	14.0	57	22.8	78	19.5
Unconsciousness (Last 6 months)	1	0.7	5	2.0	6	1.5
Weight loss (Last 6 months)	3	2.0	14	5.6	20	5.0
Other problems						
Fever (Last 1 month)	6	4.0	14	5.6	20	5.0
Falls (Last 6 months)	5	3.3	11	4.4	16	4.0
Fracture (Last 6 months)	1	0.7	3	1.2	4	1.0
Seizures	2	1.3	0	0.0	2	0.5
Paralytic attacks	0	0.0	0	0.0	0	0.0
Frequent headache	11	7.3	38	15.2	49	12.3
Depression	3	2.0	7	2.8	10	2.5
Cold feet	1	0.7	0	0.0	1	0.3

Table 3. Co-morbid diseases among elderly population

Co-morbid diseases	Male		Female		Total	
	No	%	No	%	No	%
Diabetes Mellitus	6	4.0	12	4.8	18	4.5
IHD	3	2.0	4	1.6	7	1.7
Hypertension	25	16.7	68	27.2	93	23.3
Asthma	10	6.7	7	2.8	17	4.3
COPD	20	13.3	2	0.8	22	5.5
TB	3	2.0	0	0.0	3	0.7
Parkinsonism	0	0.0	1	0.4	1	0.3
Cancer	0	0.0	0	0.0	0	0.0

2.3 National Nutrition Monitoring Bureau Jodhpur Unit - Assessment of Diet and Nutritional Status of Urban Population and Prevalence & Determinants of Hypertension and Diabetes among adults in India

Principal Investigator (Jodhpur Site): Dr. G. S. Toteja, Scientist 'G' & Director

Commencement: November, 2012 **Duration:** Up to July, 2015 **Status:** Ongoing
Funding Agency: ICMR, New Delhi (Extramural)

OBJECTIVES

1. To assess the current status of food and nutrient intake among different age/gender/physiological activity groups of urban population in all the NNMB States.
2. To assess the current nutritional status of all the available individuals in the selected HHs in terms of anthropometry and clinical examination.
3. To assess the history of morbidity during previous fortnight among all the individuals covered for anthropometry.
4. To assess the prevalence and determinants of overweight and obesity, hypertension, diabetes mellitus and dyslipidemia among the urban adult men and women (≥ 18 years).
5. To assess body composition using bio-electrical impedance assessment (BIA)/ skin-fold thickness at 4 sites among adults covered for anthropometry.
6. To assess knowledge and practices about obesity, hypertension, diabetes and dyslipidemia, among adults and Assessment of lifestyle patterns and risk behaviours of adults.
7. To assess the infant and young child feeding practices among the mother of < 3 year children.

PROGRESS

The National Nutrition Monitoring Bureau (NNMB) was established under the aegis of Indian Council of Medical Research in the year 1972, with the Central Reference Laboratory at the National Institute of Nutrition (NIN), Hyderabad and its ten units in the states of Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, Maharashtra, Gujarat, Madhya Pradesh, Orissa, West Bengal and Uttar Pradesh. In 2012, NNMB has been expanded to six more states namely Assam, Andaman & Nicobar Islands, Bihar, Rajasthan, Puducherry and New Delhi.

The Bureau since its inception has been carrying out '*diet and nutrition surveys*' on a regular basis in the rural and tribal areas. NNMB has also been evaluating the various on-going Nutrition Intervention Programs in the country.

The data generated by NNMB is used by Planning Commission and Department of Women and Child Development, Government of India, the respective State governments, institutions such as Agricultural universities, Home science colleges, medical colleges, international organizations such as UNICEF, WHO, FAO, CARE and several other voluntary organizations.

In 2012, NNMB has been expanded to six more states which included Rajasthan as well. The unit is currently working on the project "*Assessment of Diet and Nutritional Status of Urban Population and Prevalence & Determinants of Hypertension and Diabetes among adults in India*". The survey is planned to be carried out in 5 selected cities of Rajasthan namely Jaipur, Jodhpur, Kota, Hanumangarh and Dholpur by the NNMB team which comprises of a Medical officer, Nutritionist, Social Worker and Lab Technician.

The project was initiated in November, 2012. Initially, various wards of Jodhpur city were being surveyed to collect the basic demographic details and anthropometric data. Several biochemical investigations such as fasting blood glucose, lipid profile and blood pressure were also being carried in adults participating in the survey. The preliminary analysis of the data collected from Jodhpur revealed that around 12.0 percentage of adults were diabetic; 14.0 percentage ypertensive and 17.0 percentage ypercholestrolemic.

The team surveyed various wards of Jaipur also and reported 13.0 percentage adults diabetic; 17.0 percentage ypertensive and 16.0 percentage hypercholestrolemic.

Currently survey is being carried out in Kota since October, 2014. 589 households have been covered of which 1188 adults (≥ 18 years), 280 adolescents (12-18 years) and 108 infants (≤ 3 years) are surveyed for basic demographic data, anthropometric measurements, biochemical investigation which included total lipid profile and fasting blood glucose for adults and dietary survey.

2.4 Improving Health and nutritional status of vulnerable segment of population by implementing multi-component health and nutrition education intervention as a sustainable model of intervention – 4 Districts, Rajasthan

Coordinator : *Dr. G. S. Toteja, Scientist 'G' & Director*

Co-Principal Investigator: *Dr. A. K. Dixit, Scientist 'F', Dr. P.K. Anand, Scientist 'D' Dr. R. Fotedar, Scientist 'C' and Dr. N.N. Mandal, Scientist 'B'*

Commencement: September, 2014 **Duration:** Three years **Status:** ongoing

Funding agency: Indian Council of Medical Research (ICMR) (Extramural)

OBJECTIVE

1. To improve health and nutritional status of vulnerable segment of population by implementing multi-component health and nutrition education intervention, focusing on dietary counseling and modification keeping in view the cultural and socio-economic status of population.

OTHER OBJECTIVES

PHASE I (Formative Research) study:

1. To assess the awareness about the current and existing national/state nutrition programmes targeted for various segments of population;
2. To identify strengths and weaknesses in implementation and monitoring of existing national/ state nutrition programmes;
3. To assess health seeking behavior and practices among adolescents, women of reproductive age (especially pregnant and lactating women as well as mothers of pre-school children) group and children;
4. To assess knowledge and practice of pregnant, lactating mothers, functionaries of ICDS/MDM about nutrition, food safety and hygiene;
5. To estimate hemoglobin and serum levels of ferritin, folic acid, vitamin B12, CRP, Vitamin A, Vitamin E, Zinc, Selenium, Copper among children (<5 years), pregnant women and adolescent girls, and
6. To estimate urinary iodine excretion levels and iodine levels in household salt samples.

PHASE II (Intervention) study:

1. To identify the gaps in implementation and monitoring of the current national/ state level nutrition programmes and promote inter-sectoral convergence for its effective implementation.
2. To formulate low-cost balanced diets based on locally available foods which are acceptable to the community.
3. To assess personal and environmental simple hygiene measures to prevent diarrheal infections and infestations.
4. To develop an appropriate and sustainable health and nutrition education intervention for disseminating the same to all stakeholders.

PHASE III (Impact evaluation) study:

1. To assess the impact of the multi-component health and nutrition on intervention on the following domains:
 - improvements in the coverage of beneficiaries for various national/ state nutrition programmes
 - improvement in delivery of various national nutrition programmes,
 - improvement in nutrition knowledge and practices of beneficiaries of the programmes and functionaries,
 - changes in dietary and hygiene practices of beneficiaries,
 - change in the nutritional status.

PROGRESS

Under the multi centered task force study entitled ‘Improving Health and nutritional status of vulnerable segment of population by implementing multi-component health and nutrition education intervention as a sustainable model of intervention’ ICMR is financially supporting four districts namely Chittorgarh, Churu, Jodhpur, and Kota in Rajasthan. This report briefs about the progress made under this study in selected four districts of Rajasthan during financial year 2014-15. During the reporting period following activities were undertaken under the project:-

- Selection of study villages
- Recruitment of project staff
- Development and finalization of interview schedules
- Workshops & training of staff and scientists
- Data collection under Phase-I

Two sub-districts/blocks were selected from each of the selected districts i.e. Chittorgarh, Churu, Jodhpur, and Kota. From each selected block 5 villages were selected adopting probability proportionate to size sampling. In each selected district 10 villages were selected and villages were covered in Phase-I. Sample size estimated at village level was 96 individuals including 24 pregnant women, 48 under 5 years age children and 24 adolescent girls. At district level the sample size was 960 individuals including 240 pregnant women, 480 children and 240 adolescent girls. During the Pre-Intervention evaluation study socio-demographic information, current health problems and nutrition deficiency signs, sanitary and hygiene practices, health seeking practices data is being collected along with anthropometric measurements. Subjects covered in phase-I in selected 4 districts are given in Tables-1-4.

Table 1. Subjects coverage in district Chittorgarh

Sr. No.	Villages of Chittorgarh	Mother of infant + Pregnant	Infant + 1-5 yrs	Adolescent girls	Sample covered
1.	Bansen	16+22=38	16+36=52	26	116
2.	Bhadesar	18+24=42	18+36=54	27	123
3.	Bhadsora	04+22=26	04+45=49	26	101
4.	Dhamana	14+22=36	15+34=49	25	110
5.	Goraji ka Nimbada	13+24=37	13+36=49	26	112
6.	Hathiyana	13+25=38	13+36=49	24	111
7.	Kanoj	09+15=24	07+49=56	30	110
8.	Khodeep	20+24=44	18+24=42	24	110
9.	Mugana	08+23=31	08+23=31	24	086
10.	Tana (Singhpur)	15+21=36	15+35=50	24	110
Total		352	481	256	1089

Table 2. Subjects coverage in district Kota

Sr. No.	Villages of Kota	Mother of infant + Pregnant	Infant + 1-5 yrs	Adolescent girls	Sample covered
1.	Amarpura	20+03=23	13+37=50	24	97
2.	Julmi	15+09=24	23+25=48	25	97
3.	Mayla	13+13=26	16+35=51	24	101
4.	Pipalda Kalan	04+02=06	04+08=12	01	19

Table 3. Subjects coverage in district Churu

Sr. No.	Villages of Churu	Mother of infant + Pregnant	Infant + 1-5 yrs	Adolescent girls	Sample covered
1.	Bandhanau Dikhnada	18+24=42	18+38=56	29	127
2.	Binadesar Bidawatan	24+24=48	24+28=52	24	124
3.	Derajsar	31+12=43	31+55=86	32	161
4.	Kanwari	27+24=51	27+23=50	24	125
5.	Khuri	21+23=44	21+27=48	25	117
6.	Menasar	20+13=33	20+52=72	29	134
7.	Noonwa	18+09=27	18+29=47	19	93
8.	Rajasar Panwaran	18+24=42	18+30=48	25	115
9.	Rooplisar	09+17=26	09+51=60	25	111
10.	Sonpalsar	13+23=36	13+35=48	23	107
Total		392	567	255	1214

Table 4. Subjects coverage in district Jodhpur

Sr. No.	Villages of Jodhpur	Mother of infant + Pregnant	Infant + 1-5 yrs	Adolescent girls	Sample covered
1.	Anwana	13+20=33	13+17=30	24	87
2.	Bana ka bas	10+22=32	10+24=34	24	90
3.	Basni Danwara	14+24=38	14+33=47	24	109
4.	Ghewara	10+23=33	10+33=43	21	97
5.	Gumanpura	09+15=24	10+13=23	15	62
6.	Khirjan Tibna	12+14=26	14+27=41	24	91
7.	Nandiya Khurd	18+11=29	18+22=40	24	93
8.	Setrawa	23+08=31	15+12=27	19	77
9.	Sointra	33+15=48	18+16=34	31	113
10.	Somesar	28+27=55	29+33=62	24	141
Total		349	381	230	960

2.5 Nutritional status along with morbidity and mortality of under five children in Jodhpur District of Rajasthan - A follow up study of earlier registered Neonates and Infants up to 5 years

Name of Principal Investigator: Dr. Ranjana Fotedar, Scientist 'C'

Name of Co-PI with designation: Dr. Madhu B. Singh, Scientist 'F', Dr. M. S. Chalga, Scientist 'B' and Mr. Pankaj Kumar, RA

Commencement: September, 2010 **Duration:** 5 years **Status:** Completed (Field Work)

Funding Agency: Desert Medicine Research Centre (Intramural)

OBJECTIVES

1. To study profile of Health and Nutritional Status of earlier registered neonates & infants followed up to 5 years of age group by means of anthropometry, and clinical examination for nutritional deficiency signs along with feeding practices and their follow up to 5 years of age group at the interval of 6 months.
2. To study the types of morbidity, mortality and their causes of earlier registered neonates & infants followed up to 5 years of age group.
3. To study the time trend analysis of growth and nutrition of earlier registered neonates & infants followed up to 5 years of age group.

PROGRESS

This is continuation of the earlier project study entitled 'Nutritional status along with morbidity and mortality of Neonates and Infants in Jodhpur district'. It is a follow up study on earlier registered 300 neonates & infants from 28 villages (Fig. 1 and Table 1) from Luni Panchayat Samiti of Jodhpur district which has been followed up to 5 year of age group at an interval of 6 months in the above mentioned project. The study has been continued on same 300 subjects as mentioned above. In 2012-13, 275 under five children completed at the age of 1½ years, 273 under five children completed at the age of 2 years and 275 under five children completed at the age of 3 years out of 300 earlier registered neonates & infants.

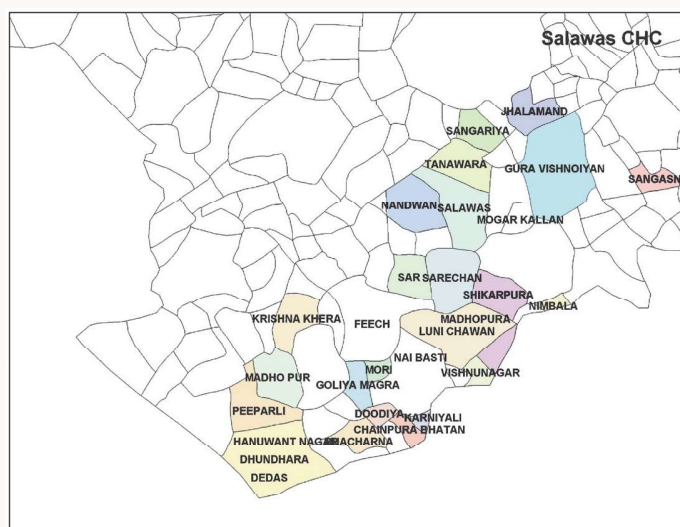


Fig. 1. Map of study villages.

Table 1. List of Villages from Salawas CHC from where the earlier registered neonates and infants were covered

S. No.	Villages	S. No.	Villages
1	Tanavda	15	Shikarpura
2	Sangaria	16	Jhalamand
3	Salawas	17	Nimbla
4	Nandvan	18	Guda Bishnoi
5	Sarecha	19	Sangasani
6	Sar	20	Bacharna
7	Mogarkalla	21	Chainpura Bhatan
8	Feach	22	Karnayali
9	Dhundhara	23	Modi
10	Hanwant Nagar	24	Golia Magra
11	Piparli	25	Madopur
12	Dedas	26	Dudia
13	Luni	27	Nai Basti
14	Vishnu Nagar	28	Krishna Kheda

Under five children which have been earlier registered as Neonates & Infants were distributed according to different Months / Years as given in Table 2.

From April 2013 to March 2014 covered 250 under five children have been covered up to the age of 5 years. 28 villages of Salawas CHC of Jodhpur District - Tanavda, Sangaria Phata, Salawas, Nandwan, Sarecha-Kheda, Sar, Feach, Mogarkalla, Shikarpura, Guda Bishnoi, Sangasni and Nimbla Gaon. Each earlier registered child / infants are followed up every six month for clinical examination of nutritional deficiencies, morbidities, mortality, anthropometry, immunization, mile stones, feeding practices and socio-cultural causes for mortality. Their mothers were also interviewed. The Data Entry and Analysis is under process.

From April 2014 to March 2015 covered remaining 50 under five children i.e. total 300 under five children up to 5 years have been completed (Field Work Part) by July 2014. The analysis & data entry up to 1½ years and up to 2 years children has been completed & their tables are given in the last year's Annual Report 2013-14. Now remaining 2½ years, 3 years, 3½ years, 4 years, 4½ years & up to 5 years children data entry & analysis part are under process

Table 2. Distribution of under Five Children according to different Months / Years

S. No.	Months / Years (Neonates)	Neonates (0-7 days)	Infants (1 year)	1½ year	2 years	2½ years	3 years	3½ years	4 years	4½ years	5 years
1.	Sept 2007 to Dec 2007 (1 to 58)	58	Sept 2008 to Dec 2008 (58-8)	50 Mar 2009 to June 2009 (50-1) (49 + 1) Child come back	50 Sept 2009 to Dec 2009 (50-1) (49-1)	48 Mar 2010 to June 2010	48 Sept 2010 to Dec 2010	48 Mar 2011 to June 2011	48 Sept 2011 to Dec 2011	48 Mar 2012 to June 2012	48 Sept 2012 to Dec 2012
2.	Jan 2008 to Apr 2008 (59 to 128)	70	Jan 2009 to Apr 2009 (70-6)	63 July 2009 to Oct 2009 (64-1)	63 Jan 2010 to Apr 2010	63 July 2010 to Oct 2010	63 Jan 2011 to Apr 2011	63 July 2011 to Oct 2011	63 Jan 2012 to Apr 2012	63 July 2012 to Oct 2012	60 Jan 2013 to Apr 2013
3.	May 2008 to Aug 2008 (129 to 190)	62	May 2009 to Aug 2009 (62-6)	55 Nov 2009 to Feb 2010 (56-1)	55 May 2010 to Aug 2010	55 Nov 2010 to Feb 2011	55 May 2011 to Aug 2011	55 Nov 2011 to Feb 2012	55 May 2012 to Aug 2012	55 Nov 2012 to Feb 2013	53 May 2013 to Aug 2013
4.	Sept 2008 to Dec 2008 (191 to 250)	60	Sept 2009 to Dec 2009 (60-3)	57 Mar 2010 to July 2010	57 Sept 2010 to Dec 2010	57 Mar 2011 to July 2011	57 Sept 2011 to Dec 2011	57 Mar 2012 to July 2012	57 Sept 2012 to Dec 2012	57 Mar 2013 to July 2013	55 Sept 2013 to Dec 2013
5.	Jan 2009 to July 2009 (251 to 300)	50	Jan 2010 to July 2010	50 July 2010 to Jan 2011	50 Jan 2011 to July 2011	50 July 2011 to Jan 2012	50 Jan 2012 to July 2012	50 July 2012 to Jan 2013	50 Jan 2013 to July 2013	50 July 2013 to Jan 2014	50 Jan 2014 to July 2014
6.	Sept 2007 to July 2009	300	Sept 2008 to July 2010	277 Mar 2009 to Jan 2011	275 Sept 2009 to July 2011	273 Mar 2010 to Jan 2012	273 Sept 2010 to July 2012	273 Mar 2012 to Jan 2013	273 Sept 2011 to July 2013	273 Mar 2013 to Jan 2014	266 Sept 2012 to July 2014

The analysis of the children belonging to two and half years age group (N= 273) revealed that that 41.0 percent were males and 59.0 percent were females (Table 3).

Table 3. Sex wise distribution of children of 30 months age group covered

Males		Females		Total
112	41.0%	161	59.0%	273

Main morbidities observed among children of 30 months age group were, fever (10.9%), GIT (7.3%), acute respiratory infection (7.3%), polio and epilepsy (0.47%) as shown in Table 4. Regarding nutritional deficiency signs, it was observed that discoloration of hair, a sign of protein calorie malnutrition was observed to be high i.e. 65.2%. Lip Cheilosis, a sign of vitamin B deficiency was observed to be 9.5%.

Table 4. Distribution of children of 30 months age group according to Morbidity

Morbidity	Total N=273	Percent
N.A.D.	201	73.6
Fever	30	10.9
GIT	20	7.3
ARI	20	7.3
Polio	1	0.4
Epilepsy	1	0.4

Out of 300 neonates registered earlier, 13 died up to the age of one year and 10 were not available/ not co-operated. The children followed up to the age of 24 months were 273, out of which 1 died between 1-1/2 year and 2 years age. No mortality was observed between two and four & half years. (Table 5). Mortality between one & half year – two years age group was 03.3/1000 whereas Mortality up to four & half years age (0-54 months) was 56.7/1000 (Table 5).

Table 5. Distribution of neonates according to mortalities rate (N=300)

Types	Age	No.	Per 1000's
Perinatal*	0-7 days	3	10.0/1000
Neonatal*	0-28 days	4	13.3/1000
Post-neonatal* (Infant)	29 days-12 months (1 year)	6	20.0/1000
Mortality between one year and one & half year age group	1 year- 1-1/2 year	3	10.8/1000
Mortality between one & half year and two years age group	1-1/2 year - 2 years	1	03.3/1000
Mortality between two year and four & half years age group	2 years - 4-1/2 year -	0	-
Total Mortality up to four & half years age group	0-54 months	17	56.7/1000

* Earlier completed project on Neonate

Now remaining 2½ years, 3 years, 3½ years, 4 years, 4½ years & up to 5 years children data entry & analysis are remaining to be done.

EXPECTED OUTCOME

Results of the study will be helpful in formulation of simple interventional plan for under five children for reduction of under nutrition, morbidity and mortality among under five children and their parents especially mother of under five children and reduce the health problems in the second phase of study. The Research output of this project will also help in developing package for under 5 children, which will be useful to State Health Department Functionaries in the second phase of study.

3. OTHER SCIENTIFIC STUDIES

3.1 Annual Health Survey- Clinical Anthropometric and Biochemical Component (CAB) - 2013-14

Co-ordinator: Dr. G. S Toteja, Scientist 'G' & Director;

Co-Principal investigators: Dr. K. R. Haldiya, Scientist 'G', Dr. S. K. Bansal, Scientist 'F', Dr. Madhu B. Singh, Scientist 'F', Dr. S. S. Mohanty, Scientist 'D'

Commencement: September, 2013 **Duration:** One year & 4 months **Status:** Completed

Funding Agency: Ministry of Health & Family Welfare, Govt Of India.

OBJECTIVES

1. To provide training to Health investigators & supervisors recruited by surveyed agencies
2. To estimate Hb of blood filter spot samples of surveyed population of Rajasthan sent by surveyed agencies
3. To make & analyse blood filter spot samples being sent to other collaborative institutes for inter laboratory quality assurance

PROGRESS

During the reported period, an intensive training was provided to field survey teams consisting of health supervisors and health investigators of surveyed agencies with 15 members. Overall five trainings were provided. They were trained so that they acquire the skills to use instruments/equipments to be used in the survey and measure the parameters accurately, to perform quality control procedures to ensure accuracy in measurements and to learn the infection control and waste disposal practices to be used in the field. In each training, one session was for providing the orientation to the survey, the tools and techniques to be used for the survey. This was followed by skill development sessions during which the trainees practiced the techniques on each others and on samples of blood already collected and provided by the institution for the trainees. They were then taken to the hospital/PHC/CHC and finally to the community settings to undertake the measurements. Repeat measurements performed by each trainee were as follows:

- Height 50 times in adults - 6 times in children
- BP 6 times in adults
- Pipette out 20 µl from anti-coagulated blood 75 times
- Collect blood by finger prick in 5 atleast three persons and pipette out in duplicate from each prick accurately
- Check blood sugar 6 times each as duplicate samples
- Check iodine content in salt

During the training, the participants were given repeated exposures on various tools for measuring health indicators/parameters. They were also taken to CHC and Anganwadi Centre, Salawas for field visit. On the last day, post-training evaluation of all the trainees was done.

Inter Laboratory Quality Assurance

Inter Laboratory Quality Assurance for estimation of Hb was also exercised monthly among the seven institutions i.e. National Institute of Nutrition, Hyderabad, Regional Medical Research centre, Bhubaneswar, Regional Medical Research centre, Dibrugarh, Regional Medical Research centre, Jabalpur and Nutrition Foundation of India and NIHFWD, Delhi.

Haemoglobin estimation:

Central Biochemical Research Laboratory has analysed 81,533 blood filter spot samples received from two survey agencies during this reported period. A total of 32 districts from seven major divisions namely Ajmer, Bharatpur, Bikaner, Jaipur, Jodhpur, Kota, Udaipur were covered in Rajasthan. From each district 12 PSU and 1500 households were covered. Total of 49500 households were covered in Rajasthan. Out of 32 districts, 14 districts were undertaken for study by Academy of management study covering 168 PSU. 18 districts were covered by Sambodhi research and communication Pvt ltd covering 217 PSU. Blood filter spot samples received from surveyed agencies by DMRC were estimated for haemoglobin by cyanmethaemoglobin method. Total of 1,02,027 samples from 385 PSU were analyzed by DMRC of which 49666 samples were received from Zone1 (AMS) and 52361 samples were received from Zone 2 (Sambodhi) as shown in Tables 1-2.

Table 1. Month wise details of No of Samples Analysed from Agencies

Month-wise Samples Analyzed							
S. No.	Year	Month	No of Hb estimation done			No of QA Hb samples	Total (row)
			Single	Duplicate	Total		
1.	2013	November	2926	229	3155	50	3205
		December	3219	91	3310	90	3400
2.	2014	January	4546		4546	100	4646
		February	4292		4292	90	4382
		March	2747		2747	90	2837
		April	4845		4845	120	4965
		May	7816		7816	80	7896
		June	11503		11503	110	11613
		July	16202		16202	100	16302
		August	12741		12741	70	12811
		September	13537		13537	90	13627
		October	11575		11575	90	11665
		November	6078		6078	100	6178
		December				90	90
		Total	102027	320		1270	103617

Table 2. Summary of No of Samples Analyzed from Agencies

Sl. No.	Name of agency	No. of districts	No. of PSU	No. sample analyzed
1.	AMS	14	168	49666
2.	Sambodhi	18	217	52361
	Total	32	385	102027

The results of haemoglobin estimation of above samples are being sent to survey conducting agencies for further analysis.

This survey will help to improve health and nutrition status by planning district specific interventions based on magnitude of the problem in different districts so as to reduce the gap between districts, states and segments of population.

3.2 Biomedical Informatics Centre of ICMR

Coordinator: *Dr. G. S. Toteja, Scientist 'G' and Director, DMRC, Jodhpur*

Principal Investigator: *Dr. Vinod Joshi, Scientist 'G'*

Co- Principal Investigators: *Dr. Manju Singhi, Scientist 'D', Dr. P. K. Anand, Scientist 'D', Dr. S. S. Mohanty, Scientist 'D'*

Commencement: July, 2013 **Duration:** Five Years **Status:** Ongoing

Funding Agency: ICMR, New Delhi (Extramural)

OBJECTIVES

1. To identify genetic loci associated with diseases of National interest such as Diabetes, Cancer, Stress, Mental illness etc. in Indian population.
2. To develop solutions for controlling pathogens causing diseases of National interest Such as Tuberculosis, Malaria, and AIDS etc.
3. To develop a National Repository of clinical information/data, high-throughput data, Genotype and phenotype.
4. To promote applications of cutting-edge technologies in medical research.

PROGRESS

During Second Year of BIC, there were two main work objectives as follows:

1. Malaria Incidence and role of Meteorological Parameters: Computational analysis and statistical modeling of chronological data.
2. Capacity Building workshops on bioinformatics for faculty members of medical colleges and universities of the state.
 1. Malaria Incidence and role of Meteorological Parameters

Data of malaria incidence, meteorological parameters were required for carrying out study. Inclusion criteria was to include arid areas of western Rajasthan. Data of Malaria incidence for years 2005-2014 was obtained from Department of Medical and Health, Government of Rajasthan for Jodhpur zone comprising six districts of Rajasthan state namely Jaisalmer, Jodhpur, Sirohi, Jalore, Barmer, Pali. Rainfall data for period of 2005-2011 was obtained from web resource of Water Resources Department, Government of Rajasthan. Year-wise data of other Meteorological parameters *viz.*, Relative Humidity, Maximum Temperature, Minimum Temperature were obtained from Department of Economics and Statistics, Government of Rajasthan for same districts however, the data were available only for period 2005-2011 years.

Pearson correlation coefficient analysis was conducted for investigating an association between Malaria Incidence and rainfall. 'CORREL' function of excel was executed for analysis. For multivariate analysis, wherein objective was to investigate dependence of a dependent parameter (malaria incidence) on combination of several independent parameters (rainfall, relative humidity, maximum temperature, minimum temperature, average temperature). Multivariate analysis was carried out using Microsoft Excel add-in 'Analysis Toolpak' and analysis was carried out using 'Regression Module'. Dependent Variable values were entered in 'y values' and independent variables in "x values". Multiple Linear Regression was carried out with 50% confidence interval with line and residual plots.

Inferences:

1. Higher correlation (>0.7) amongst rainfall and malaria incidence in Barmer and Jaisalmer.
2. Results Suggest rainfall has higher role in high arid areas in malaria incidence.
3. All combinations explain role of individual factors
4. Efficiency of model varies with combinatory factors and place.
5. Similar study with lengthy chronological records of varied data is required for better understanding.
6. Model with rainfall and relative humidity are best explanatory so far.

2. Bioinformatics Workshop

Two workshop on “Applications of Bioinformatics tools and databases in Biomedical Research”, held on 23-24th September 2014 and 28-29th March 2015 at Desert Medicine Research Center, (Indian Council of Medical Research), New Pali Road, Jodhpur. Two days workshop was organized with the objective to promote bioinformatics and its utilization amongst Medical faculty members / medical post-graduates.

Both workshops were attended by almost 40 participants. There were 21 faculty members as participants from various medical colleges and 19 from DMRC.

During the course of workshop following keynote addresses were delivered:

1. Bioinformatics centres of ICMR: Present Status and Future Scope
2. Essential bioinformatics tools for protein structures & function prediction
3. Modern Biology Tools for Medical Research
4. Introduction to Biostatistics
5. Computational Systems Biology: Application to Biomedical research
6. Sequence Retrieval & Analysis, Literature Search & Data mining
7. Analysis of the bortezomib inhibitor docked within the catalytic subunits of the *Plasmodium Falciparum* 20S Proteasome.
8. Tools for Systems Biology.
9. Protein-protein interaction study of pathogenic microbe: A network biology approach

Extensive hands-on session was also conducted in which participants were taught about using online NCBI tools and databases viz. NCBI, BLAST, PDB, BLASTN, BLASTP, BLASTX, TBLASTN Nucleotide, Gene, Pubmed, Protein etc., RSCB-PDB database, SIDER (Drug Side Effects Database) using of molecular visualization of 3-D structures of proteins using Pymol, SwissPDB viewer and systems biology with the help of Cytoscape tool. Workshop ended with a valedictory session wherein participants shared their views, experience and ideas about learning experience during the workshop and possible collaborative research ideas arising out of knowledge acquired.

Following recommendations were made:

- To focus on organizing and utilizing patient record databases of clinicians.
- To promote collaborative research.

- Bioinformatics workshop should be continuous activity.
- An e-consortium should be setup by DMRC when participants / members share their work and experience
- The participants of this workshop should also be invited in the next workshop besides new participants so as to maintain continuity and their work can also be assessed.
- The next workshop may have following components:
 - One session should be devoted to basics of bioinformatics
 - One session should have the presentation on available databases and looking into the gaps in these databases
 - One session can focus on specific subject
- Relevant literature and handouts may be sent to participants 10 days before commencement of workshop.
- Local participants should meet once in a month for continuity and development of possible research proposals. Outstation participants if wish may join.

4. POST-DOCTORAL & RESEARCH ASSOCIATESHIP (PDF) STUDIES

4.1 Determination of Sero Type Specific Gene Sequences of Dengue Viruses and their Cross Infections from Human Serum and Mosquito Samples for Risk of Dengue Hemorrhagic Fever in Western Rajasthan

Fellow: Dr. Annette Angel

Guide: Dr. Vinod Joshi, Scientist 'G'

Commencement: March, 2014 **Duration:** Two Years **Status:** Ongoing

Funding Agency: ICMR, New Delhi (PDF Fellowship Project)

OBJECTIVES

1. Determination of type specific whole genome sequences of dengue viruses (DEN-1, 2, 3 & 4) isolated from field caught mosquitoes and human serum samples.
2. Study of heterogeneity of cross infections of circulating extrinsic and intrinsic virus strains as possible cause of Dengue Hemorrhagic Fever in disease endemic settings.
3. Application of viral genomics for demarcation of risk areas for DHF.

PROGRESS

The work undertaken pertains to our focus on study of interaction of extrinsic and intrinsic Dengue virus types to lead to a particular clinical stage including Dengue Hemorrhagic Fever. For this purpose we have selected few households from where the patients were reported during dengue outbreak. The patient serum was collected by the staff of the hospital where they were treated and collection of *Aedes* mosquitoes (Larval & Adult) was made by the DMRC team. First we studied virological details of dengue virus from the human patients whose samples were referred to DMRC lab for serological and molecular tests. Collection of *Aedes* mosquitoes (Larval & Adults) was made from all the 34 houses from where dengue patients were reported and tested positive by our laboratory. Details of type specific virus isolations are provided in Table 1. From house no. 1 where one dengue patient harboring DEN-2 was observed, only 1 out of 4 mosquitoes was dengue positive. In house no. 2 from where also 1 patient of dengue harboring DEN-2 was observed, only 2 out of 7 mosquitoes tested positive showed dengue virus.

The observations show that DEN-2 and DEN-3 were observed in patient serum. If we see the dengue virus typing details in mosquitoes of house no. 1, only two mosquitoes were observed infected in house and these individual mosquitoes showed three dengue strains viz; DEN-2, DEN-3 & DEN-4. The serum sample was subjected to c-DNA sequencing for viral RNA using two of the five fragments of DEN-2. The sequences obtained were put in BLAST database and BLAST search confirmed DEN-2 virus. Further work on the sequencing is in progress.

Table 1. Gene sequencing of DEN virus types in mosquito sample (Extrinsic) in household no. 1

Sample code : 1B_{m6}



Lane 1 (DEN-1)	Lane 2 (DEN-2)	Lane 3 (DEN-3)	Lane 4 (DEN-4)
x	✓	✓	✓

Sequencing observations for Den 2

Dengue virus genome	1-2958bp (frag 1)	1651- 4484bp (frag 2)	3664-6497bp (frag 3)	6193-8488bp (frag 4)	7669-10723bp (frag 5)
Genomic region sequenced	✓	✓	✓	Under process	Under process
Sequence match observed when aligned using BLAST	✓	✓	✓	-	-

Sequencing observations for Den 3

Dengue virus genome	1-2380bp (frag 1)	2035- 4356bp (frag 2)	3532-6360bp (frag 3)	6032-8361bp (frag 4)	8025-10707bp (frag 5)
Genomic region sequenced	Under process	Under process	Under process	Under process	Under process
Sequence match observed when aligned using BLAST	-	-	-	-	-

Sequencing observations for Den 4

Dengue virus genome	1-2550bp (frag 1)	1909- 4993bp (frag 2)	4778-7309bp (frag 3)	7203-9687bp (frag 4)	9608-10653bp (frag 5)
Genomic region sequenced	Under process	Under process	Under process	Under process	Under process
Sequence match observed when aligned using BLAST	-	-	-	-	-

4.2 Determination of Micronutrient Deficiency Disorders among Pregnant women and their association with the outcome of the pregnancy with respect to LBW babies - A hospital based study

Fellow: Dr. Neetu Parihar, Research Associate

Guide: Dr. Madhu Bala Singh, Scientist 'F'

Co- Guide: Dr. Ranjana Desai, Professor & Unit Head, Department of Gynecology & Obstetrics, Umaid Hospital, Jodhpur

Commencement: July, 2013 **Duration:** Three years **Status:** Ongoing

Funding Agency: ICMR, New Delhi (PDF Fellowship Project)

OBJECTIVES

1. To determine the level of following micronutrients in blood samples of pregnant women of 3rd trimester
 - Hematological: Hb, Iron, Ferritin, Folic acid, B12
 - Vitamins: A, E, C
 - Trace elements: Zn, Se, Cu
 - Hormones: T3, T4, & TSH
 - Urine Iodine Excretion level
 - Salt Iodine
2. To determine the association of LBW babies with micronutrient deficiencies of 3rd trimester pregnant women
3. Dietary Intake of micronutrients in 3rd trimester of pregnant women

PROGRESS

This project has been initiated in collaboration with the Department of Gynecology & Obstetrics, Umaid Hospital, Jodhpur. All the pregnant women of 3rd trimester attending the Ummaid Hospital (Government hospital) of Jodhpur district has been enrolled and data during the reported period has been collected from 154 pregnant women of 3rd trimester. Till now total of 230 pregnant women of 3rd trimester has been registered. Pregnant women of 1st and 2nd trimester and all the pregnant women suffering from chronic diseases have not been included in the study. Those pregnant women who are intending to deliver elsewhere have also been excluded from the study.

All the registered pregnant women of 3rd trimester have been interviewed for their socio-demographic profile recording parameters such as age, caste, religion, education, occupation, monthly income, physiological status and smoking Habit and following nutritional deficiency signs

- Signs of anemia (platinichia and koilonichia),
- Night blindness,
- Bitot Spot, and
- Goiter by examining the thyroid gland using the standard method as recommended by the joint WHO / UNICEF / ICCIDD.

Dietary intake and Anthropometry: Using 24 hour dietary recall method, dietary intake has been collected from 154 enrolled women during this reported period. Till now dietary intake of 230 pregnant women of 3rd trimester has been collected. Birth weight, Recumbent length & Head circumference of 111 new born babies of the enrolled pregnant women have been taken within 48 hours adopting WHO method during this reported period. A total of 187 new born has been followed up till now.

Collection of samples:

Blood: Each subject has been given a code number that was also the same on the collection tube, cryotube and prescribed form. Blood samples (venous blood 5 ml) have been collected in two tubes i.e. EDTA Tube and SST tubes from all 154 enrolled pregnant women during the reported period. 20 µl of blood have been spotted on filter paper (Whatmen No. 1). Serum and plasma has been separated in the DMRC lab following the standard procedure.

Urine: A casual urine sample have been collected from 154 registered pregnant women for estimation of Urinary Iodine Excretion (UIE) levels to assess the Iodine nutriture status.

Salt: Sample of 20 gm. salt consumed in their families have been collected in auto seal LDPE pouches. Iodine content of salt sample will be estimated using standard iodometric titration method. Salt samples having iodine content less than 15 ppm will be classified as with inadequate iodine.

Transportation of sample: WHO Manual has been followed up for transportation of blood samples from hospital to DMRC, Jodhpur and CNRT lab, Delhi. Cold chain has been maintained for their transportation.

The distribution of the 230 pregnant women of 3rd trimester collected so far has been shown in Table 1. Preliminary analysis of 230 pregnant women revealed that 74.3 percent were Hindus whereas 25.2 percent were Muslims. The distribution of 230 pregnant women of 3rd trimester according to anemia on the basis of haemoglobin estimation and revealed that 29.6 percent pregnant women were non anemic whereas 70.4 percent were anemic. The percentage belonging to severe anemia was 4.8 percent.

Table 1. Socio-demographic profile of pregnant women participating in the study

Pregnant women Characteristics	Number	Percentage
Number Examined	230	
Duration of Pregnancy (months)		
Seven	30	13.0
Eight	107	46.6
Nine	93	40.4
Age Years		
18-25	168	73.0
26-35	61	26.6
36-45	01	0.4
Religion		
Hindu	171	74.3
Muslim	58	25.2
Sikh	01	0.4
Caste		
General	70	30.5
OBC	90	39.2

SC	27	11.7
ST	04	1.7
Minority	39	16.9
Education		
Illiterate	24	10.4
Literate	12	5.2
Primary	45	19.6
Middle	38	16.6
Secondary	64	27.8
College	47	20.4
Occupation of women		
GNM	01	0.4
Government Teacher	01	0.4
Pharmacist	01	0.4
Private Teacher	01	0.4
House Wife	226	98.4
Occupation of Husband		
Agriculture Labour	05	2.2
Service	100	43.5
Business	40	17.4
Artisans	13	5.6
Other Labour	67	29.1

The biochemical analysis of seventy six samples of serum and plasma done till now is given in Tables 2 and 3. Deficiency of serum zinc was found 15.8 percent, whereas, serum copper and serum selenium was observed to be in excess quantity i.e. 61.8 and 5.3 percent respectively.

Table 2. Distribution of pregnant women according to Ferritin Estimation

Pregnant Women	Normal (>15ng/ml)		Deficient (< 15ng/ml)	
	N	%	N	%
Pregnant N = 76	33	43.4	43	56.6

Reference for Cut off: WHO 2001

Table 3. Distribution pregnant women according to Vitamin B12 Estimation

Pregnant Women	Normal (>203pg/ml)		Deficient (< 203pg/ml)	
	N	%	N	%
Pregnant N = 76	45	59.2	31	40.8

Reference for Cut off: WHO Technical Consultation, 2008

Biochemical analysis of vitamin A, E and C deficiency revealed that pregnant women suffered from high Vitamin A deficiency i.e. 42.1 percent whereas Vitamin C deficiency was 14.5 percent. No pregnant women of 3rd trimester suffered from Vitamin E and Selenium deficiency.

Analysis of 76 pregnant women of 3rd trimester according to T3, T4 and TSH hormones revealed that no Pregnant women of 3rd trimester suffered from T3 and TSH hormone deficiency whereas T4

hormone deficiency was 6.6 percent. Pregnant women of 3rd trimester showed hike in level of TSH hormone (11.8%).

Epidemiological criteria, as prescribed by WHO, for assessing iodine nutrition is based on median urinary iodine concentrations / levels. Analysis of 76 urine samples has been done so far. The median urinary iodine values were observed to be less in pregnant women (112.5 mcg/l) according to WHO cut off points (150 mcg/l). The proportion of pregnant women showing UIE level below 50 mcg/l was 18.4 percent whereas in 65.8 percent pregnant women, the median UIE was below the optimal values of median UIE indicating an unsatisfactory situation.

Analysis of Dietary intake of 230 pregnant women revealed that their diet was deficient w.r.t. RDA (ICMR) in energy (9.7%), Protein (21.6%), Fiber (38.6%), Calcium (26.4), Iron (47.2%), Zinc (38.9%), Folate (69.7%) and Vitamin B12 (85.8%).

Out of 230 registered women, 187 deliveries were followed within 48 hours till now. It was observed that 68.4 percent deliveries were normal, whereas 31.6 percent were Cesarean.

5. STUDIES FACILITATED AT MODEL RURAL HEALTH RESEARCH UNIT (MRHRU), BHANPUR KALAN, JAIPUR

5.1 Improving Health and nutritional status of vulnerable segment of population by implementing multi-component health and nutrition education intervention as a sustainable model of intervention – Model Rural Health Research Unit, Jaipur, Rajasthan

Coordinator : *Dr. G. S. Toteja, Scientist 'G' & Director*

Co-Principal Investigator: *Dr. A. K. Dixit, Scientist 'F', Dr. Manju Singhi, Scientist 'D' and Dr. P. K. Dam, Technician Officer*

Commencement: August, 2014 **Duration:** Three years **Status:** Ongoing

Funding agency: Department of Health Research (DHR), Government of India

OBJECTIVE

1. To improve health and nutritional status of vulnerable segment of population by implementing multi-component health and nutrition education intervention, focusing on dietary counseling and modification keeping in view the cultural and socio-economic status of population.

Background:

Based on data of under-nutrition and anemia as revealed by District Level Household Survey (DLHS-2) carried out during 2002-2004, Planning Commission of India had identified 200 districts in the country as high burden districts, where the prevalence of under-nutrition and anemia were high. Out of the 200 districts identified, Ministry of Women & Child Development has initiated the study in 100 districts in first phase. On the directives of the Planning Commission, the current study was planned by ICMR with an aim to improve the nutritional status of the vulnerable population in some of these districts.

This study is based on Pre- and Post-Intervention evaluation design.

PROGRESS

This report briefs about the progress made under this study at MRHRU, Bhanpur Kalan, Jaipur, Rajasthan during financial year 2014-15. The activities are being coordinated and facilitated by Dr. G.S. Toteja, Director, DMRC, Jodhpur. Faculty of SMS Medical College, Jaipur are equally collaborating in this study at MRHRU, Jaipur. During the reporting period following activities were undertaken under the project:-

- Selection of study villages
- Recruitment of project staff

- Development and finalization of interview schedules
- Workshops & trainings of staff and scientists
- Data collection under Phase-I

Two sub-districts/blocks were selected from Jaipur district including one block of MRHRU. From each selected block 5 villages were selected adopting probability proportionate to size sampling. In district Jaipur 10 villages were selected and all villages were covered in Phase-I. Sample size estimated at village level was 96 individuals including 24 pregnant women, 48 under 5 years age children and 24 adolescent girls. At district level the sample size was 960 individuals including 240 pregnant women, 480 children and 240 adolescent girls.

From these villages information on individuals knowledge, attitude, practice and perception about anaemia, vitamin A deficiency and their understanding about the same, ongoing government programmes, their significance, nutritional needs during special physiological conditions like pregnancy and lactation, knowledge about importance of Iron & Folic Acid tablets, regular tetanus toxoid injections during pregnancy and immunization schedule for the child, infant and young child feeding practices, general hygiene practices, health seeking behaviour etc. were collected using a pre-tested questionnaire and interview schedule.

Simultaneously medical/ paramedicals officials viz. medical officer, child development project officer, anganwadi supervisor, auxiliary nurse mid-wife, anganwadi worker and accredited social health activists in catchment area were interviewed on their knowledge, attitude, practice and perception with respect to nutritional problems and programmes of Government of India. Anthropometric measurements i.e. height (nearest 0.1 cm) and weight (nearest 0.5 kg) is being assessed by using standardized equipment. Clinical examination is being carried out to assess presence of nutritional deficiencies signs.

During phase-I, information on socio-demographic status, current health problems and nutrition deficiency signs, sanitary and hygiene practices, health seeking practices is being collected along with anthropometric measurements.

Population segment covered in phase-I is given in Table-1.

Table 1. Sample coverage in Model Rural Health Research Unit, Jaipur

Sl. No.	Villages of Jaipur district	Mother of infant + Pregnant	Infant + 1-5 yrs	Adolescent girls	Sample covered
1.	Bhanpur Kalan	20+00=20	12+39=51	32	103
2.	Bhaopura	18+25=43	21+27=48	24	115
3.	Chawand Ka Mand	18+00=18	13+28=41	15	74
4.	Jaisinghpura	13+24=37	14+32=46	26	109
5.	Kalwara	08+21=29	18+34=52	25	106
6.	Mahapura	05+23=28	08+39=47	23	98
7.	Mathasoola	14+22=36	17+34=51	27	114
8.	Neota	25+14=39	24+22=46	20	105
9.	Papar	05+24=29	20+48=68	35	132
10.	Siroli	07+24=31	25+38=63	24	118
Total		310	513	251	1074

5.2 Study of active screening to detect un-registered open cases of tuberculosis

Principal Investigator: Dr. P. K. Anand, Scientist 'D'

Co-Investigator: Dr. M. L. Mathur, Scientist 'G', DMRC, Dr. Monika Rathore, Assoc. Prof., Dept. Social & Preventive Medicine, SMS Medical College, Jaipur, Dr. Vishal Sharma MO, Community Health Centre - Bhanpur Kalan, Dr. P. K. Dam TO-A, DMRC and Sh. Chet Ram Meena TA, DMRC

Commencement: August, 2014 **Duration:** Two years **Current Status:** Ongoing

Funding Agency: Desert Medicine Research Centre, Intra-mural

OBJECTIVES

1. To find out proportion of undetected open cases of tuberculosis in rural area of CHC Bhanpur Kala, Jaipur
2. To find out cost of detecting additional open cases of pulmonary tuberculosis through active screening of general population

PROGRESS

The above mentioned project was recommended by Project Review Committee of the Model Rural Health Research Unit, Bhanpur Kalan, Jaipur, Rajasthan. During active screening, investigators visited households in study village and invited available adult household respondent in the study. After taking consent of respondent, investigator asked him/her about socio-economic status, family structure, tuberculosis history, suspected clinical symptoms, and awareness on tuberculosis disease, its diagnosis and treatment by administering the semi-structured pre-tested questionnaire. So far total 341 individuals residing in 48 households in village Bhanpur Kalan were screened for the presence of undiagnosed open case of tuberculosis. During active screening we did not find any unregistered open case of tuberculosis so far. The characteristics of respondents and their awareness about tuberculosis are given in Table 1.

Table 1. General characteristics of the respondents during active screening and their awareness on tuberculosis, diagnosis and treatment

Characteristics	Categories	Total respondents (n=48)
Gender	Male	25 (52.0%)
	Female	23 (48.0%)
Social groups	General	31 (64.6%)
	OBC	3 (6.3%)
	SC	12 (25.0%)
	ST	3 (6.3%)
Does TB transmit from patient to other person?	Yes	35 (72.9%)
	NO	6 (12.5%)
	Don't know	3 (6.3%)
Do TB diagnosis & treatment are available free of cost at government health centres?	Yes	36 (75.0%)
	NO	4 (8.3%)
	Don't know	6 (12.5%)
DOTS is for	TB	20 (41.7%)

	Other disease	1 (2.0%)
	Don't know	21 (43.7%)
Do you know the way TB diagnosed at government health centres?	Sputum test	30 (62.5%)
	Other test	1 (2.0%)
	Blood test	2 (4.1%)
	Don't know	13 (27.1%)
How TB transmits?	By coughing, sneezing by TB patients	30 (62.5%)
	Other way/Don't know	8 (16.6%)
Is TB treatable	Yes	40 (83.3%)
	NO	1 (2.0%)
	Don't know	3 (6.25%)

Note: Sum of the totals in some characteristics fall short on account of NON-response

6. LIST OF PAPER PUBLISHED (FROM APRIL 2014 TO MARCH, 2015)

1. Bansal SK, Singh Karam V, Sharma Sapna. Larvicidal potential of wild mustard (*Cleome viscosa*) and gokhru (*Tribulus terrestris*) against mosquito vectors in the semi-arid region of Western Rajasthan. *Journal of Environmental Bioilogy* 2014; 35: 327-32.
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3. Singh Himmat, Marwal Robin, Sharma Anusha, Singh Karam V. Predatory habits of *Lutzia* (*Metalutzia*) *fuscana* (Wiedmann) (diptera: Culicidae) in the arid environments of Jodhpur, western Rajasthan, India. *Arthropods* 2014; 3: 70-79.
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11. Angel A, Angel B, Joshi V, Kucheria K. 2014. Sequential emergence of serological responses of human hosts in a progressive outbreak of Dengue and Dengue Hemorrhagic Fever in Rajasthan, India. *Indian Journal of Applied Research* 2014; 4: 24-26.

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13. +Jain P, Gulati S, Toteja GS, Bakhshi S, Seth R, Pandey RM. Serum Alpha Tocopherol, Vitamin B12, and Folate Levels in Childhood Acute Lymphoblastic Leukemia Survivors With and Without Neuropathy. *Journal of Child Neurology* 2014 (published online 22 May 2014):DOI: 10.1177/0883073814535495
14. +Bansal PG, Toteja GS, Suman R. Plasma vitamin C status of adolescent girls in a slum of delhi. *Indian Pediatrics* 2014; 51: 932-3.
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17. +Bansal PG, Toteja GS, Bhatia N. Nutrient Intake Amongst Adolescent Girls Residing in An Urban Slum of Delhi. *Indian Journal of Applied Research* 2015; 5: 288-290.

+Work done at Centre for Promotion of Nutrition Research and Training with special focus on North East, Tribal and Inaccessible population. (ICMR Campus-II),3, Red Cross Road, Tuberculosis Association of India,1st Floor, Near Parliament, New Delhi-110001

7. CONFERENCES/SEMINARS/OFFICIAL MEETINGS ATTENDED AND TALK DELIVERED BETWEEN APRIL, 2014 TO MARCH, 2015

Dr. Karam V. Singh, Scientist 'F'

1. *Project Review Committee meeting of Environment Research Programme (EnvRP)*, Ministry of Environment & Forest, Paryavarn Bhawan, New Delhi on 1st May, 2014 and discussed project report.
2. Project Monitoring Meeting of DST CCP network on '*Climate Change and its impact on Health*' on 9th January, 2015 at the Centre for Atmospheric Sciences, Indian Institute of Technology, Delhi.

Dr. Madhu B. Singh, Scientist 'F'

1. Delivered a talk on '*Micronutrient Deficiency Disorders & Dietary counselling for Rural Population*' in 'Workshop on Desert Medicine' at Air Force Station, Jodhpur on 6th September, 2014 organized by Air Force Station, Jodhpur on 6th September, 2014 at Station Medicare centre, Air Force Station, Jodhpur.
2. Delivered a lecture on '*Hygiene and Nutrition*' in a seminar on "*Swatch Bharat Campaign*" organized by DMRC for School children from Jhalamand Senior Secondary School, Jodhpur on 2nd October, 2014 at DMRC.
3. Delivered a talk on '*Health and Dietary of elderly population*' in Hindi Week organized by DMRC at Jodhpur from 7th to 14th September, 2014.
4. Participated and displayed the research work of DMRC in a '*2nd Rajasthan Science Congress*' at Dr. K.N. Modi University, Niwai, Rajasthan from 1st May, to 3rd May, 2014 which was organized by Dr. K.N. Modi University.
5. Participated and displayed the research work of DMRC in a '*Kisan Mela and Farmers Innovation Day*' at CAZRI, Jodhpur on 24th September, 2014, organized by Central Arid Zone Research Institute at CAZRI, Jodhpur.

Dr. Manju Singhi, Scientist 'D'

1. Participated in one day workshop and delivered lecture on "prevention of vector borne diseases by control of mosquitoes" in one day workshop on "*Desert Medicine*", September 6th, 2014 organized by Air force station, Jodhpur.
2. Participated in workshop "Applications of Bio-informatics tools and databases in bio-medical Research" on 23-24th November, 2014 organized by DMRC

3. Participated in 3 days workshop on '*3rd Rajasthan Science Congress*' and demonstrated achievements and contribution of ICMR- DMRC by poster exhibition to state Health personals, students and scientists at Manipal University, Jaipur from February 28th - 3rd March, 2015.

Dr. P. K. Anand, Scientist 'D'

1. Delivered an invited popular lecture on 'Hygiene measures and their role in preventing spread of diseases' in Raj Bhasa Hindi at Air Force Station, Jodhpur, Western Rajasthan on 6th September, 2014 on awareness day organized by Air Force Station, Jodhpur.
2. Participated in ICMR Exhibition held during Rajasthan Science Congress from 28th February 2015 to 2nd March 2015 at Manipal University, Jaipur. Research findings of DMRC were displayed in exhibition for general public and research findings were explained whenever asked by viewers.

8. SCIENTIFIC ADVISORY COMMITTEE

Prof.(Dr.) N. K. Mehra Head, Department of Transplants Immunology & Immunogenetics All India Instt. Of Medical Sciences Ansari Nagar, New Delhi - 110 029	Chairperson
Prof.(Dr.) R. C. Mahajan INSA Professor of Eminence House No. 276 Sector - 6, Panchkula – 134 109	Member
Prof.(Dr.) Aloke Kalla Emeritus Professor (UGC) Department of Anthropology University of Delhi, Delhi - 110 007	Member
Prof.(Dr.) F. U. Ahmed Director Integral Institute of Medical Sciences and Research Dean, Faculty of Medicine, Integral University, Lucknow - 226 026	Member
Prof.(Dr.) D. C. S. Readdy Prof. & Head (Retd.) Department of Community Medicine BHU, Varanasi - 221 005	Member
Prof.(Dr.) P. L. Joshi Former Director, NVBDCP House No. 580 Metro View Apartment Sector - 13, Pocket- B Dwarka, New Delhi - 110 075	Member
Dr. A. V. Kurpad Dean & Head Institute of Population Health & Clinical Research St. John's Medical College Bangalore - 560 034	Member

Prof.(Dr.) Vinod Paul
Prof. & Head
Department of Paediatrics
AIIMS
New Delhi - 110 029

Member

Prof.(Dr.) Ashutosh Nath Aggarwal
Additional Professor
Department of Pulmonary Medicine
PGIMER, Chandigarh - 160 012

Member

ICMR Institutes

Dr. S. P. Tripathy
Scientist-G & Director
National JALMA Institute for Leprosy &
Other Mycobacterial Diseases, Tajganj
Agra - 282 001

Dr. Arvind Pandey
Scientist-G & Director
National Institute of Medical Statistics
Ansari Nagar, New Delhi - 110 029

Dr. S. M. Mehendale
Scientist-G & Director
National Institute of Epidemiology
Second Main Road, Tamil Nadu Housing Board
Ayapakkam, Chennai - 600 077

Ex-Officio

Dr. V. M. Katoch, Secretary, DHR &
Director-General, Indian Council of Medical Research
V. Ramalingaswami Bhawan
New Delhi - 110 029

Dr. D. K. Shukla, Scientist 'G' & Head,
Division of Non-Communicable Diseases
Indian Council of Medical Research
V. Ramalingaswami Bhawan
New Delhi - 110 029

Dr. B. R. Meena,
Director, Public Health
Directorate of Medical Health Services
Swasthya Bhawan
Jaipur - 302 005

Member Secretary

Dr. G. S. Toteja, Scientist 'G' & Director
Desert Medicine Research Centre
New Pali Road
Jodhpur - 342 005

Statutory Members

Dr. Neena Valecha,
Scientist-G & Director,
National Institute of Malaria Research
Sector-8
Dwarka
New Delhi - 110 077

Dr. Pradeep Das,
Scientist-G & Director,
Rajendra Memorial Research Institute of
Medical Sciences
Agam Kuan
Patna - 800 007

Dr. B.K. Tyagi, Director-in-Charge
Centre for Research in Medical Entomology
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Madurai - 625 002

Dr. S. K. Kar,
Scientist-G & Director
Regional Medical Research Centre
Chandrasekharapur
Nandankanan Road
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Dr. J. Mahanta,
Scientist-G & Director,
Regional Medical Research Centre NE Region
Post Box No. 105
Dibrugarh - 786 001

Dr. Neeru Singh,
Scientist-G & Director,
Regional Medical Research Centre for Tribals
RMRC Complex, Nagpur Road
P.O. Garha, Jabalpur - 482 003

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Scientist-G & Director,
Regional Medical Research Centre
Post Bag No. 13,
Port Blair - 744 101

Dr. P. Jambulingam,
Scientist-G & Director,
Vector Control Research Centre
Medical Complex
Indira Nagar, Puducherry - 605 006

Dr. D.T. Mourya,
Scientist-G & Director,
National Institute of Virology
20-A, Dr. Ambedkar Road
Post Box No.11, Pune - 411001

Vector Borne Diseases Science Forum (VBDSF) Experts

Dr. Rashmi Arora ,
Head, Division of ECD/ Representative,
Indian Council of Medical Research
Ansari Nagar
New Delhi - 110 029

Dr. Sarala Subharao,
Former Director, NIMR
Address: Apartment No. 704, Block No. 13,
East End Apartment, Mayur Vihar, Phase-I, New Delhi - 110 069

Dr. A.P. Dash,
Former Director,
NIMR: Address: Former Regional Advisor(VBDC),
WHO-SEARO, Flat No. 112 FF,
Milano Mahagun Mansion II, Plot No. 1/4 Vaibhavkhand,
Indrapuram, Ghaziabad - 201 014, U.P.

Director
National Vector Borne Disease Control
Programme
22-Sham Nath Marg
Delhi - 110 054

9. ETHICS COMMITTEE

S. No.	Name & Address	Status	Discipline
1.	Dr. Adesh Mathur, Prof. & Head (Retd.), Dept. of Pharmacology S. N. Medical College, Jodhpur Email: adeshmathur123@yahoo.co.in	Chairperson	Clinician
2.	Dr. Alok Gupta, Professor, Department. of Medicine, S. N. Medical College, Jodhpur Email: dralokgupta@gmail.com	Co-Chairperson	Clinician
3.	Dr. K. V. Singh, Scientist-F, Desert Medicine Research Centre, Jodhpur-342005 Email: karamvs@gmail.com	Member Secretary	Basic Scientist
4.	Dr. R. S. Tripathi, Principal Scientist, Central Arid Zone Research Institute, Jodhpur Email: rstripathi@cazri.res.in	Member	Basic Scientist
5.	Dr. S.P. Gupta, Prof. & Head, Department of Sociology, JNV University, Jodhpur Email: spgupta1957@yahoo.co.in	Member	Social Scientist
6.	Dr. Lalita Vatta, Asstt. Prof., Dept. of Home Science, JNV University, Jodhpur Email: ikvatta@gmail.com	Member	Social Scientist
7.	Mr. M.S. Godara, Advocate, 68-A, Laxmi Nagar, Basni -Ist, Jodhpur	Member	Legal Expert
8.	Mr. T.R. Bhandari, Advocate, Gulab Vatika, Paota 'C' Road, Jodhpur Email: trideep@synco.co.in	Member	Legal Expert

- | | | | |
|-----|--|--------|------------------------------|
| 9. | Mr. Sumer Mal Jangid, 245, Sector H-2,
Sangariya Industrial Area,
Jodhpur
Email: siajodhpur@gmail.com | Member | Person from the
Community |
| 10. | Mr. S.P. Goyal,
Branch Manager,
Oriental Insurance, Jodhpur
Email: sumitgoyal@yahoo.com | Member | Person from the
Community |

10. SCIENTISTS AND STAFF

Dr. G. S. Toteja, Director

SCIENTISTS

1. Dr. K. R. Haldia, Scientist - G (up to 31 July, 2014)
2. Dr. Vinod Joshi, Scientist - G
3. Dr. M. L. Mathur, Scientist - G
4. Dr. Karam V. Singh, Scientist - F
5. Dr. S. K. Bansal, Scientist - F (up to 31 Oct, 2014)
6. Dr. S. P. Yadav, Scientist - F (up to 31 Oct, 2014)
7. Dr. Madhu B. Singh, Scientist - F
8. Dr. A. K. Dixit, Scientist -F
9. Dr. Raman Sachdev, Scientist - E
10. Dr. Phoolchand Kanojia, Scientist - E
11. Dr. Manju Singhi, Scientist - D
12. Dr. P. K. Anand, Scientist - D
13. Dr. S. S. Mohanty, Scientist - D
14. Dr. Ranjana Fotedar, Scientist - C
15. Dr. N. N. Mandal, Scientist - B

TECHNICAL OFFICERS

1. Dr. P. K. Dam
2. Dr. Manjeet Chalga (up to June, 2014)
3. Sh. Raj Kumar Kalundha
2. Sh. Anil Purohit

TECHNICAL ASSISTANTS

1. Dr. Himmat Singh (up to June, 2014)
2. Sh. Pankaj Kumar
3. Sh. Chet Ram Meena
4. Sh. Rajneesh Kumar

LABORATORY TECHNICIANS

1. Sh. Pooran Mal Meena
3. Sh. Ramesh Chandra Sisodiya
4. Sh. Santosh Kumar Dhawal
5. Sh. Rohit Prasad Joshi
6. Sh. Rajendra Kumar Chouhan
7. Sh. Trilok Kumar
8. Sh. Bhawar Manohar Singh

ACCOUNTS OFFICER

1. Sh. Anil Kumar

SECTION OFFICER

1. Sh. Narender Bajaj

OFFICE ASSISTANTS

1. Smt. Neelam Devi
2. Sh. Dharam Pal Belani
3. Sh. Rajinder Singh
4. Sh. Joginder Singh

JUNIOR HINDI TRANSLATOR

1. Smt Kanchan Bala

UPPER DIVISION CLERK

1. Sh. Shamshad Ali
2. Sh. M. C. Pargi
3. Smt. Chandra Kala
4. Sh. Yash Pal Singh

STENOGRAPHER

1. Vacant

LOWER DIVISION CLERK

1. Sh. Ram Nivas
2. Sh. Nand Kishore
3. Sh. Manohar Singh Seervi

HINDI TYPIST

1. Vacant

DRIVERS

1. Sh. Raghu Nath Singh
2. Sh. Mohd. Gaffar
3. Sh. Ishwar Khetani
4. Sh. Manohar Singh
5. Sh. Rana Ram
6. Sh. Naveen Kumar (up to Feb, 2015)

LABORATORY ATTENDANTS /ATTENDANTS

1. Sh. Banwari Lal, Laboratory Attendant
2. Sh. Sridhar Bohra, Laboratory Attendant
3. Sh. Lal Chand Bandra, Laboratory Attendant
4. Sh. Raghu Nath Singh Bisht, Animal Attendant
5. Sh. Babu Lal Bunker, Animal Attendant
6. Sh. Mahaveer Prasad, Animal Attendant
7. Sh. Satya Prakash, Animal Attendant (up to Aug, 2014)

8. Sh. Mahesh Chand Sharma, Attendant
9. Sh. Jodha Ram, Attendant
10. Smt Laxmi Kanta, Attendant
11. Sh. Khushal Singh, Attendant
12. Sh. Ram Lal, Peon
13. Sh. Ladhu Ram, Peon
14. Smt. Sua Devi, Sweeper

PROJECT STAFF

1. *National Nutrition Monitoring Bureau, Jodhpur Unit-PI: Dr. G. S. Toteja, Scientist 'G' & Director*
 1. Dr. Rameshwar Lal, Scientist - B
 2. Ms. Kanchan Jaiswal, Research Assistant, (Nutrition)
 3. Mr. Nikhil Batra, Research Assistant (Sociology)
 4. Bharat Jawa, Field Attendant
2. *Surveillance of pyrethroid resistance in Anopheles stephensi strains of Rajasthan and studies on genetic and biochemical mechanisms of pyrethroid resistance in An. stephensi-PI: Dr. Karam V. Singh, Scientist 'F'*
 1. Mr. Robin Marwal, Junior Research Fellow
 2. Mr. Prashant, Insect Collector
 3. Mr. Deva Ram, Insect Collector
3. *Mapping of mosquito breeding habitats and location of vertebrate hosts in North and Southern parts of Rajasthan state prone for emergence of JE virus using space technology (RS & GIS) (3Years - to be initiated after ethical clearance)-PI: Dr. P.C. Kanojia, Scientist 'E'*
 1. Mr. Tejendra Kumar, Research Assitant
 2. Mr. Devendra Singh Ranawat, Research Assitant
 3. Mr. Bhanwar Lal, Insect Collector
 4. Mr. Hari Singh/Mahipal Singh, Insect Collector
4. *Biomedical Informatics Centre of ICMR, Dr GS Toteja, Scientist 'G' & Director, Dr. Vinod Joshi, Scientist 'G'*
 1. Mr. Rajendra Baharia, Scientist 'C'
 2. Mr. Ajay Joshi, Scientist 'B'
 3. Ms. Suman Rathore, Research Assitant
 4. Mr. Manoj Kumar, Attendent
5. *Rapid culture and direct drug sensitivity testing of Mycobacterium tuberculosis to isoniazid and rifampicin using liquid culture media. PI: Dr M.L. Mathur, Scientist 'G'*
 1. Dr. Jyoti Gaur, Scientist 'C'
 2. Mrs. Soniya Sharma, Research Assitant
 3. Mr. Atif Iqbal, Research Assitant
6. *Annual Health Survey- Clinical Anthropometric and Biochemical Component (CAB) Syrvey-PI: Dr. K. R. Haldia, Scientist 'G'*
 1. Ms. Neha Deora, Lab Supervisor
 2. Mr. Padma Ram, Lab Technician

3. Mr. Rishi Pal, Lab Technician
 4. Mr. Prakash Kumar, Lab Technician
 5. Mr. Narpat Singh, Lab Technician
 6. Mr. Romesh Mathur, Lab Technician
 7. Ms. Anita Bansal, Lab Technician
 8. Mr. Deepanshu, DEO
 9. Mr. Jitesh, DEO
 10. Mr. Dinesh, Daily Wages Worker
10. *Impact of Irrigation change on the prevalence of malaria in arid and non-arid parts of Rajasthan– PI: Dr. Karam V. Singh, Scientist ‘F’*
1. Mr. Prakash Kalwani, Junior Research Fellow
 2. Mr. Kan Singh, Project Assistant
 3. Ms. Ritika Panda, Project Assistant I
 4. Ms. Noopur Jaipal, Project Assistant I
11. *Effectiveness of diet and lifestyle intervention through Information Education Communication (IEC) tools with Angan Wadi Centres (AWCs) of Tribal population of Udaipur District of Rajasthan as the centre of knowledge dissemination for hypertension (including hypercholesterolemia and diabetes) risk reduction – a cluster randomised controlled trial-PI: Dr. K.R. Haldia, Scientist ‘G’*
1. Mr. Dolat Singh Shekhawat, Research Assitant
 2. Ms. Sonika Parmar, Research Assitant
12. *Determination of Micronutrient Deficiency Disorders among Pregnant women and their association with the outcome of the pregnancy with respect to LBW babies - A hospital based study (PDF Project) - Guide : Dr. M.B. Singh, Scientist ‘F’*
1. Dr. Neetu Parihar, Research Associate
13. *Determination of Sero Type Specific Gene Sequences of Dengue Viruses and their Cross Infections from Human Serum and Mosquito Samples for Risk of Dengue Hemorrhagic Fever in Western Rajasthan (PDF Project) - Guide : Dr Vinod Joshi, Scientist ‘G’*
1. Dr. Annette Angel, Research Associate
14. *Operationalization of Real-Time Health Information Management System for Malaria in Jaisalmer District of Rajasthan - PI: Dr A. K. Dixit, Scientist ‘F’*
1. Sh. Shailesh Vyas, Data Entry Operator
 2. Ms. Divya Sharma, Data Entry Operator
15. *Comparative study of Gene characterization of Influenza A pandemic (H1N1) 2009 viruses from virus isolates of 2009 pandemic and 2012 re-emerging viruses in western Rajasthan: Phylogenetic analysis and molecular characterization- PI: Dr. Vinod Joshi, Scientist ‘G’*
1. Ms. Bennet Angel, Research Associate

11. केन्द्र में राजभाषा को प्रोत्साहन

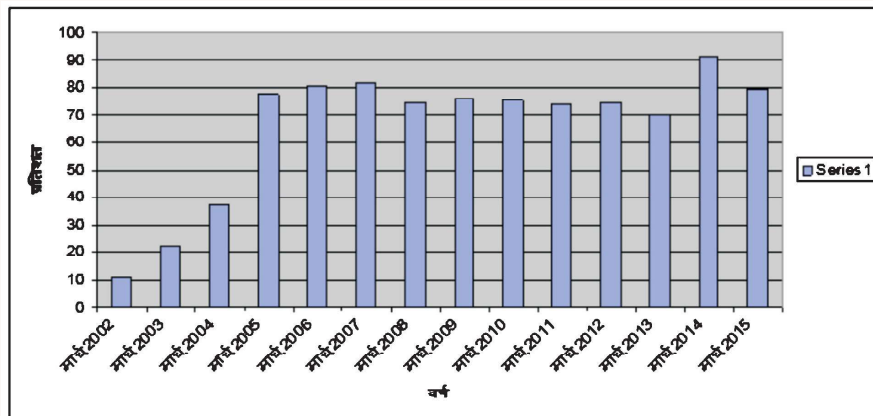
1. त्रैमासिक पत्रिका 'चेतना' का प्रकाशन

केन्द्र की विभिन्न गतिविधियों एवं वैज्ञानिक कार्यों के बारे में जन-साधारण को जानकारी प्रदान करने के उद्देश्य से एवं राजभाषा कार्यों के प्रोत्साहन के लिए वर्ष 2002 से त्रैमासिक पत्रिका "चेतना" का प्रकाशन किया जा रहा है। अप्रैल-जून, 2007 से यह पत्रिका द्विभाषी रूप में प्रकाशित की जा रही है। इस पत्रिका में पाठकों के लिए स्वास्थ्य संबंधी उपयोगी लेख भी प्रकाशित किए जाते हैं। प्रस्तुत है वर्ष 2014-15 में प्रकाशित पत्रिकाओं की एक झलक :



2. हिन्दी में पत्राचार

राजभाषा विभाग, गृह मंत्रालय, भारत सरकार द्वारा प्रतिवर्ष जारी वार्षिक कार्यक्रम में निर्धारित लक्ष्यों में से हिन्दी में पत्राचार के प्रतिशत का निर्धारित लक्ष्य प्राप्त करना भी एक है। इस लक्ष्य को ध्यान में रखते हुए केन्द्र द्वारा विशेष प्रयास किए जा रहे हैं। प्रस्तुत है पिछले कुछ वित्तीय वर्षों के अंत में प्राप्त प्रतिशत की एक झलक :



3. हिन्दी कार्यशालाओं का आयोजन



4. राजभाषा कार्यान्वयन समिति की बैठकें



केन्द्र में हर तिमाही में राजभाषा कार्यान्वयन समिति की बैठकें आयोजित की जाती हैं। यह समिति केन्द्र की राजभाषा गतिविधियों की समीक्षा करती है तथा राजभाषा कार्यों की उत्तरोत्तर प्रगति हेतु अपने सुझाव देती है। वर्ष 2014-15 में यह बैठकें दिनांक 16 मई, 25 अगस्त, 20 नवम्बर, 2014 तथा 27 मार्च, 2015 को आयोजित की गई।

5. हिन्दी सप्ताह समारोह का आयोजन



निबन्ध प्रतियोगिता में भाग लेते प्रतिभागी



प्रश्न मंच के निर्णायक डॉ. किशोरी लाल रैगर तथा श्रीमती मधुबाला चारण

हिन्दी सप्ताह के अन्य कार्यक्रमों में निबन्ध लेखन प्रतियोगिता एवं प्रश्न मंच प्रतियोगिताओं का आयोजन किया गया। समापन समारोह में श्री अभय कुमार गुप्ता, मुख्य राजभाषा अधिकारी एवं अपर मंडल रेल प्रबंधक, मंडल रेल प्रबंधक कार्यालय, जोधपुर मुख्य अतिथि थे एवं डॉ. किशोरी लाल रैगर, प्रोफेसर, हिन्दी विभाग, जय नारायण व्यास विश्वविद्यालय, जोधपुर तथा श्रीमती मधुबाला चारण, सहायक निदेशक (राजभाषा), केंद्रीय रुक्ष क्षेत्र अनुसंधान केन्द्र, (काजरी), जोधपुर विशिष्ट अतिथि थे।

हिन्दी सप्ताह के दौरान हिन्दी में अपनी प्रस्तुतियां देते हुए :



डॉ. मुरली लाल माथुर, वैज्ञानिक 'जी'



डॉ. शेषपाल यादव वैज्ञानिक 'एफ'



डॉ. मधुबाला सिंह वैज्ञानिक 'एफ'



डॉ. आशुतोष कुमार दीक्षित वैज्ञानिक 'एफ' एवं राजभाषा प्रभारी



श्रीमती कंचन बाला कनिष्ठ हिन्दी अनुवादक



सुश्री सुमन राठौड़, अनुसंधान सहायक

डॉ. मुरली लाल माथुर, वैज्ञानिक 'जी' ने सिलीकोसिस' रोग के लक्षण, कारण एवं बचाव के उपायों पर; डॉ. शेषपाल यादव, वैज्ञानिक 'एफ' ने हिन्दी की दशा और दिशा पर; डॉ. मधुबाला सिंह, वैज्ञानिक 'एफ' ने वृद्धजनों के स्वास्थ्य पर; डॉ. आशुतोष कुमार दीक्षित, वैज्ञानिक 'एफ' एवं राजभाषा प्रभारी ने डीएमआरसी में राजभाषा अनुपालन की प्रगति और संपादन कला पर; श्रीमती कंचन बाला, कनिष्ठ हिन्दी अनुवादक ने 'हिन्दी हमारी भाषा, हमारी पहचान' विषय पर अपने विचार प्रस्तुत करते हुए "सुनहरा भविष्य सुनहरी आशा, मेरा देश मेरी भाषा" नामक एक वृत्तचित्र प्रस्तुत किया तथा सुश्री सुमन राठौड़, अनुसंधान सहायक ने हिन्दी की दशा पर स्वरचित कविता पाठ किया।



डॉ. जी. एस. टोटेजा, निदेशक, डीएमआरसी एवं डॉ. संजीव केन्द्र के तकनीकी अधिकारी श्री अनिल पुरोहित पुरस्कार लेते मिश्रा, निदेशक, अखिल भारतीय आयुर्विज्ञान संस्थान (एम्स), हुए जोधपुर

दिनांक 15 सितम्बर, 2014 को हिन्दी सप्ताह पुरस्कार वितरण कार्यक्रम आयोजित किया गया। पुरस्कार वितरण के लिए अखिल भारतीय आयुर्विज्ञान संस्थान (एम्स), जोधपुर के निदेशक डॉ. संजीव मिश्रा को मुख्य अतिथि के रूप में आमंत्रित किया गया था। डॉ. मिश्रा ने हिन्दी सप्ताह के दौरान आयोजित प्रतियोगिताओं के विजेताओं को नकद पुरस्कार एवं प्रमाण पत्र प्रदान किए।

6. केन्द्र के वैज्ञानिकों द्वारा वैज्ञानिक सम्मेलन में हिन्दी का प्रयोग



डॉ. प्रवीण कुमार आनन्द, वैज्ञानिक 'डी' हिन्दी में अपनी प्रस्तुति देते हुए

एयर फोर्स स्टेशन, जोधपुर में दिनांक 6 सितम्बर, 2014 को 'मरु-चिकित्सा' पर एक कार्यशाला का आयोजन किया गया। इस कार्यशाला में केन्द्र के डॉ. प्रवीण कुमार आनन्द, वैज्ञानिक 'डी' ने हिन्दी में 'स्वच्छता व रोगों की रोकथाम में उसकी भूमिका' पर व्याख्यान देते हुए दैनिक जीवन में इन उपायों को अपनाने पर बल दिया जो संचारी रोगों की रोकथाम के लिए बेहद महत्वपूर्ण हैं।



डॉ. प्रदीप कुमार दाम, तकनीकी अधिकारी हिन्दी में अपनी प्रस्तुति देते हुए

राष्ट्रीय व्यावसायिक स्वास्थ्य संस्थान, अहमदाबाद में "वर्तमान परिपेक्ष्य में पर्यावरण एवं व्यावसायिक स्वास्थ्य" विषय पर दिनांक 20-21 फरवरी, 2015 को आयोजित हिन्दी वैज्ञानिक संगोष्ठी का आयोजन किया गया। इस संगोष्ठी में केन्द्र के डॉ. प्रदीप कुमार दाम, तकनीकी अधिकारी ने "राजस्थान में औषधीय पौधों की जैव-विविधता के संरक्षण में रुकावटें : स्थिति विश्लेषण और उपचारी उपाय" विषय पर अपना शोध पत्र हिन्दी में पढ़ा।

12. IMPLEMENTATION OF RESERVATION POLICY FOR SCHEDULED CASTES

Regarding the implementation of reservation policy for scheduled castes in the Centre, the following measures were taken during the report period.

- i. In each selection committee for the recruitment of the staff directions for including the scheduled castes representative have been followed.
- ii. In both, direct recruitment as well as in promotions the policy of Government was followed in toto and the relaxations/concessions were given to Scheduled Castes employees as per the guidelines.
- iii. The Centre has no back log of Scheduled Castes on vacancy based roster in all categories prior to 01. 01.1997 and the short fall as switching over to post based roster vide DOP&T O.M. No. 36012/12/96-Estt.(Res) dated 02.07.1997. During the report period no vacancy has been filled-up under Special Recruitment Drive.
- iv. For ensuring the implementation of the government policies for Scheduled Castes and review and monitoring of rules of reservation and service safeguard provided to the Scheduled Castes under the constitution, the Centre has 'SC-ST Cell', a designated 'Liaison Officer' and a 'Grievances Committee'. However, during the report period no complaint of any type was received by the above statutory bodies/officials.

Besides above, the information on the implementation of the government policies for Scheduled Castes monitoring of rules of reservation and service safeguard provided to the Scheduled Castes under the constitution, has been provided by the Centre as and when required for monitoring or review purposed.

Organization of 31st Foundation Day - 27th June, 2014

	
Lighting the ceremonial lamp before Goddess Saraswati	Dignitaries on Dias
	
Welcome address by Dr. G. S. Toteja, Director, DMRC	Prof. Ram Gopal deliberating on Holistic Personality
	
Felicitation of staff members on successful completion of 25 years of service	
	
Release of DMRC Magazine "Chetna"	Chief Guest Dr. T. S. Rathore addressing the audience

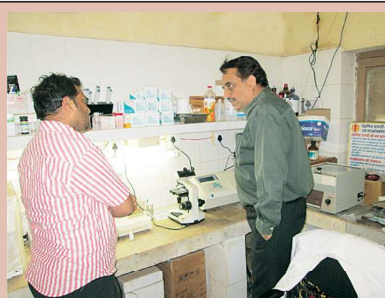
Director & Scientists visiting Saharia village and faculty of Jhalawar Medical College for collaborative Efforts



Director DMRC discussing various health problems in Saharia tribe with health workers/‘Asha Sahyogini’, 1st April, 2014.



Director, DMRC and scientists visited CHC, Shahbad. There is a Malnutrition Treatment Centre (MTC) in CHC Shahbad. Mal-nourished children are admitted in MTC camp, 1st April, 2014.



Director, DMRC observing laboratory diagnostic facilities i.e. biochemical, microbiological and serological diagnostic at CHC, Shahbad, 1st April, 2014.



Director, DMRC and scientists discussing collaborative research issues with the Principal, Jhalawar Medical College, 1st April, 2014.



Director, DMRC observing laboratory facilities of Jhalawar Medical College, 1st April, 2014.

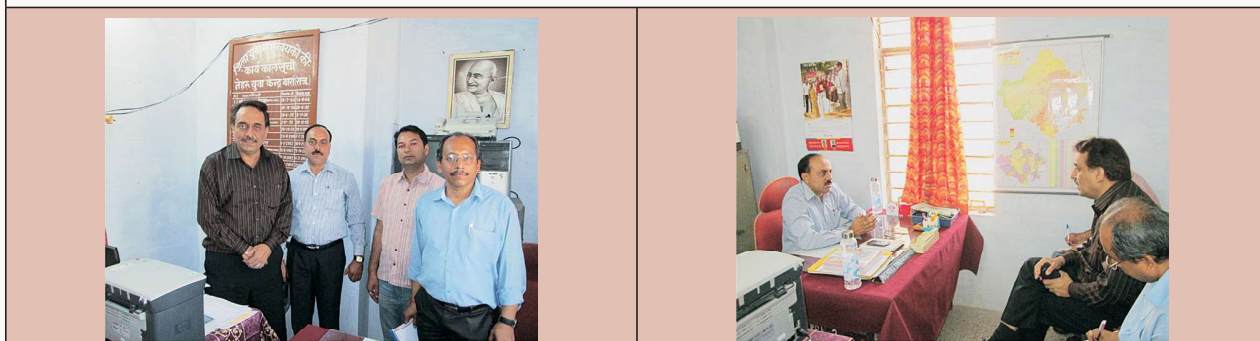


Survey of local health problems of Peepalda Saharia Village of Kishanganj, 1st April, 2014.





Survey of local health problems of Shubhdhara Saharia Village of Shahbad, 1st April, 2014.



Meeting with the Coordinator, Nehru Yuva Kendra, Baran, Rajasthan to discuss collaborative issues, 1st April, 2014.



Meeting with Additional District Magistrate, Shahbad to discuss collaborate issues to include them in research studies of DMRC, 1st April, 2014.

Diagnosis of Swine Flu (H_1N_1)



Director, DMRC having discussion with the Principal & Controller, Dr. S. N. Medical College, Jodhpur for the Diagnosis of Swine Flu, 23rd April 2014

Participation of the centre in '2nd Rajasthan Science Congress'



Centre's participation in 'Second Rajasthan Science Congress' held at Dr. K.N Modi University, Niwai, Rajasthan from 1-3, May, 2014



DMRC and ICMR staff receiving award for excellent participation.

Presentations by project staff



Project staff encouraged in scientific presentations : Presentations by project staff on scientific issues, 16th May, 2014.

Anti Terrorism Day



Anti Terrorism Day was observed in DMRC on 21st May, 2014. Dr. Vinod Joshi, Scientist 'G' administered the oath of anti-terrorism to all the officers, employees and Project Staff of the Centre.

Promotion of DMRC Staff



Dr. Manjeet Singh Chalga selected on the post of Scientist 'B' in Indian Council of Medical Research, New Delhi and Dr. Himmat Singh Scientist 'B' in National Institute of Malaria Research, Indian Council of Medical Research, New Delhi, June, 2014

Meeting of Ethics Committee

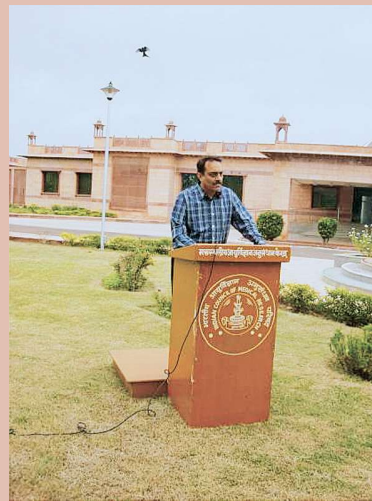


Meeting of Ethics Committee of the Centre under the chairmanship of Dr. Adesh Kumar Mathur, Former Professor & Head, Department of Pharmacology, S. N. Medical College, Jodhpur (Pharmacologist), 24th July, 2014

Independence Day Celebrations



Hoisting of flag by the Director



Address by the Director



DMRC Staff present on the occasion
Independence Day celebration 15th August, 2014

Training programme for health promotion of elderly population



Training of all the Accredited Social Health Activist (ASHA)/Anganwadi Workers (AWs)/ Sahyogini workers along with Sarpanch, Ward Panch of the village under the project on 'Nutritional status of elderly rural population and development of appropriate intervention model using existing health system', 25th to 27th August, 2014

Training for diagnosis of H1N1 Virus



Institutional training for H1N1 Virus handling by use of molecular - biological tools in virology; 6-28th August, 2014 to the project staff of Bio-medical Informatics Centre project and students.

Handing/Taking over of the new Guest House



Meeting for Handing/Taking over of the newly constructed Guest House of the Centre with National Projects Construction Corporation (NPCC), Jodhpur Unit, 7th September, 2014

Participation of the Centre in Workshop on Desert Medicine at Air Force Station, Jodhpur, 6th September, 2014



Dr. G.S. Toteja, Director, DMRC as Chief Guest



Dr. Madhu B. Singh, Scientist F giving her presentation



Dr. Manju Singhi, Scientist C giving her presentation



Dr. P. K. Ananad, Scientist C giving his presentation

Organization of Workshop on “Application of Bioinformatics tools and Databases in Biomedical Research”



Organization of a two day Bioinformatics Workshop on titled "Applications of bioinformatics tools and databases in biomedical research" at Desert Medicine Research Centre, Jodhpur, 23-24 September, 2014. Director, DMRC, Experts and participants present in the workshop

Organization of ‘Rajasthan Conclave-2, 21st to 23rd September, 2014



Lighting of the lamp by Dr. V. M. Katoch, Secretary, Department of Health Research and Director General, Indian Council of Medical Research



Address by Dr. V. M. Katoch, Secretary, Department of Health Research and Director General, Indian Council of Medical Research



Signing on Memoranda of Understanding (MOUs) between Department of Health, Govt. of Rajasthan, State Medical Colleges & DMRC on various projects



Scientific Session in progress

Scientists present in Rajasthan Conclave -2



Director, DMRC asking for the views of participants during Velidictory Session of Rajasthan Conclave -2

Velidictory Session chaired by Dr. Kiran Kucheria & Prof. Ram Gopal

Scientific Advisory Committee Meeting, 20th September, 2014



Dr. V. M. Katoch, Secretary, DHR and Director General, ICMR, Mrs. Dharitri Panda, Sr. F.A., ICMR, Prof. N. K. Mehra, Chairman and Members of SAC



SAC Members present in the meeting



Release of DMRC Annual Report, 2013-14 both in Hindi and in English during the meeting

Inauguration of Newly Constructed Guest House by Director General



Inauguration of newly constructed Guest House of the Centre by Dr. V. M. Katoch, Secretary, DHR and Director General, ICMR on 20th September, 2014



Plantation by Dr. V. M. Katoch, Secretary, DHR and Director General, ICMR near Guest House



Plantation by Sh. T. S. Jawahar, IAS, Sr. DDG (Admn.), ICMR near Guest House

Participation of the Centre in 'Kisan Mela and Farmers Innovation Day'



Participation of the Centre in 'Kisan Mela and Farmers Innovation Day' at CAZRI, Jodhpur, 24th September, 2014



Director and staff taking oath of cleanliness, 2nd October, 2014



organization of a voluntary 'Kar Sewa' under the cleanliness campaign launched by the Govt. of India, in all the three parking areas of the new building of the Centre, 26th February, 2015



Vigilance Awareness Week



Director and staff taking oath of fidelity of truth and honesty
Vigilance Awareness week observed in DMRC from 27th October to 1st November, 2014 to raise awareness for improvement of the system and procedures and redressal of grievances.

Superannuation of DMRC Scientists



Retirement of Dr. K. R. Haldiya from the post of Scientist G, 31st July, 2014.



Dr. S. K. Bansal and Dr. S. P. Yadav got retired from the post of Scientist 'F' on 31st October, 2014.

National Unity Day



Observance of the birth anniversary of late Sardar Vallabhbhai Patel as 'Rashtriya Ekta Diwas' (National Unity Day), 31st October, 2014.



Director and staff listening to Director General & Secretary on the eve of Unity Day

Republic Day Celebrations



Hoisting of flag by the Director

Address by the Director

DMRC Staff present on the the occasion

Republic Day celebration in the Centre on 26th January, 2015

Workshop on “Applications of Bioinformatics tools and databases in Biomedical Research”



With the objective to promote bioinformatics and its utilization amongst Bio-medical professionals a two days workshop on “Applications of Bioinformatics tools and databases in Biomedical Research” was organized in the Centre on 28-29th March 2015.

Participation of the Centre in 3 rd Rajasthan Science Congress



Dr. Manju Singhi and Dr. Praveen Anand, Scientist-D participated in 3rd Rajasthan Science Congress held at Manipal University, Jaipur, Rajasthan from February 28th -3rd March 2015 organized by 'Vaigynik Drashtikon society' (VDS) with the support of Defense Research & Development Organization, Indian council of Medical Research , Dept. of Science & Technology & Indian Council of Agriculture Research.

Promotions & Appointments



The scientists and employees of the Centre got promoted this year. Dr. A. K. Dixit and Dr. Raman Sachdev to the post of Scientist 'F' and Dr. Manju Singhi, Dr. P. K. Anand and Dr. S. S. Mohanty to the post of Scientist 'D'; Sh. Anil Purohit to the post of Technical Officer 'A' and Sh. Rajneesh Kumar got promoted to the post of Technical Assistant respectively. Also, Dr. N. N. Mandal joined the Centre on the post of Scientist 'B'.

Biometric Machine now functional in DMRC



In pursuance of instructions by Govt. of India and the directions given by Indian Council of Medical Research, a Biometric Machine was installed in the Centre on 16.10.2014 on trial basis. After initial experiments, now this machine is properly functioning. The DMRC staff is making an entry in this machine either by their photograph or finger print while coming in or going out from the Centre.

Progress of Model Rural Health Research Unit



Discussion with Sarpanch of Bhanpur Kalan and officials of CPWD, Jaipur



Discussion with MRHRU Staff

Model Rural Health Research Unit (MRHRU) for Rajasthan is be established in the premises of Community Health Centre, at Bhanpur Kalan, District Jaipur. Desert Medicine Research Centre (DMRC), Jodhpur is the facilitating institute of this unit. The construction work of the building is in progress. The staff appointed for this unit has joined. One consultant is already there. The three research projects are ongoing in this unit.

Obituary



Sh. Satyaprakash, Animal Attendant of Desert Medicine Research Centre expired on 31st August, 2014 due to illness.