

REGIONAL MEDICAL RESEARCH CENTRES

To deal with health problems of the regional and marginalised population, ICMR has established a total of 5 Regional Medical Research Centres at Port Blair (Andaman Nicobar), Bhubaneswar (Odisha), Jodhpur (Rajasthan), Dibrugarh (Assam) and Gorakhpur (UP). The effort of these institutes is to focus on the regional health problems and find suitable solutions with the help from the respective state governments. The significant outcome of the research activities carried out by these centres during 2018-19 is mentioned below.

INTRAMURAL RESEARCH

ICMR-REGIONAL MEDICAL RESEARCH CENTRE, BHUBANESWAR

RMRC, Bhubaneswar was established in 1981 under the 6th five-year plan period to undertake research activities in both communicable and non-communicable diseases, human resource development programme and in establishing strong linkage with State Health Department in finding solutions to the regional health problem. The centre in the past three decades has worked effectively towards identifying regional health problems and contributed significantly in evaluation & implementation of government health programme & policies.

Regional Virology Research & Diagnostic Laboratory

The centre has been upgraded to Regional Laboratory for virology research and diagnostics

and catering service to Chhattisgarh and Andhra Pradesh in addition to Odisha.

- The centre is rendering diagnostic services to the referral cases from various medical colleges, tertiary hospitals, and IDSP.
- The VRDL of the centre is recognised as apex referral lab for Dengue, Chikungunya and JE by NVBDCP and state referral lab for diagnosis of H1N1 cases.
- The unit is also investigating the various outbreaks of viral aetiology.
- Diagnostic facility was provided to more than 45,000 patients suspected of viral illness admitted to different secondary/ tertiary care hospitals of the state.
- The observations on clinical presentation and viral agent identification improved the clinical diagnosis by the physicians of the region through information sharing and publications.
- Part of laboratory network for enhancing diagnostic capabilities for surveillance, outbreaks and epidemics investigations of high-risk group of viral pathogens causing viral hemorrhagic Fevers.
- The laboratory is a part of different national/ CDC/WHO surveillance network in the state like Measles, Rubella, Dengue, ZIKA, Respiratory viruses including antiviral susceptibility in H1N1 cases.
- During 2018-19 around 30 outbreaks were investigated suspected for viral origin including Dengue, Chikungunya and Hepatitis.

- The centre is supporting training and technical man power development in the state as well as state and medical colleges of Chattishgarh and Andhra Pradesh for laboratory detection of different viral diseases and outbreak investigation.

NATIONAL REFERENCE LABORATORY FOR TUBERCULOSIS

- NABL accreditation obtained for the NRL for Tuberculosis in August 2018
- A total of 3142 presumptive MDR TB cases were tested for diagnosis of MDR TB from ten districts of Odisha and three North eastern states (Meghalaya, Sikkim and Nagaland). Out of 3142 specimens received, 2516 specimens were tested by LPA and 27 (1.1%) were detected as MDR TB patient and referred to DR TB sites for DOTS Plus treatment.
- A total of 2654 samples were tested by GeneXpert; out of which 529 were found as MTB positive among which 29 specimens were found as Rifampicin resistant, which were referred to districts for DOTS Plus treatment initiation.
- A total of 513 specimens of patients suspected for XDR-TB were subjected to 2nd line LPA; of which 18 were XDR and 134 were found resistant to Fluoroquinolones .
- A total of 418 specimens of MDR-TB patients on DOTS Plus treatment were processed for follow up culture.
- In 2018 a total of 261 presumptive TB & 106 follow up sample were tested at DMC out of which 28 and 11 are AFB positive respectively.
- Provided technical support for establishment of nine TB containment laboratories in eight states

REGIONAL HUB FOR HEALTH TECHNOLOGY ASSESSMENT

- The centre is one of the 6 regional hubs for the Health Technology Assessment and catering

services to 4 states - West Bengal, Bihar, Jharkhand in addition to Odisha.

- Working on current assignment on Diagnostic Validation and Health Technology Assessment of 'SOHUM' Neonatal Hearing Screening Device
- The device 'Sohum' was designed by the School of International Biodesign (SIB) startup, Sohumi Innovation Labs India Pvt. Ltd. by Dept. of Biotechnology (DBT), Govt. 2017.
- The assigned proposal has been approved by the Technical Appraisal Committee (TAC) of HTAIn, Ethical Committee of ICMR-RMRC, and Odisha State Ethical Committee. Permission and necessary information has been also obtained from the concerned stakeholders.
- All the necessary tools required for the data collection has been developed and validated.
- More than one third of the data has been collected for Out of Pocket Expenditure (OOPE) among the targeted facilities and sampled population.
- Two systematic reviews have been registered in Prospero and are in final stage of submission.
- Further, the SOHUM device has been also validated in the community settings for the feasibility study.

MRHRU, TIGIRIA

- A baseline household survey was conducted during this period on Socio-demographic & Morbidity status of various villages in and around the MRHRU.
- The household survey on Socio-demographic & Morbidity status was conducted at Baliput village, Tigiria block of Cuttack June – July 2018 to identify the different health problems prevalent in that locality.
- Among 1009 study participants, 188 (18.6%) had chronic illnesses (83% with single disease and 17% having multi-morbidity).

- Facility level data collection of CHC Tigiria and CHC Bindhanima was conducted on February 2019.
- The ten most common health problems for seeking OPD care were found to be URTI, Ophthalmic diseases, Gastroenteritis, Hypertension, gynaecological conditions, Skin & VD, Parasitic diseases and Injuries & Wounds.
- A cohort is being developed in Tigiria block with representation of rural and tribal population.

Anthrax in Odisha: A roadmap for elimination

- Knowledge Attitude Practice (KAP) analysis study on Anthrax was carried out in 4 most effected indigenous population dominated district (Koraput, Rayagada, Malkangiri and Sundargarh) of Odisha.
- The study involved household survey, FGDs, IDIs of the stakeholders.
- 557 households covered in 4 endemic districts.
- 49 IDIs and 11 FGDs were conducted with officials representing various stake holders.
- 20% and 48% of the respondents never heard about Anthrax disease and were unaware of the mode of transmission.
- About 18% of the respondents were found to consume dead animals.
- Butchering and deskinning of dead animal accounted for majority (36%) of the Anthrax cases (88) interviewed.
- Awareness among the respondents, Interdepartmental coordination and a proper vaccination programme were identified as main roadblocks in control & management of Anthrax in these districts.

Japanese Encephalitis Virus infection in Malkangiri District: Pre & Post Vaccination Period

- A network has been established between Regional Medical Research Centre and district health system for AES/JE diagnosis which include sample collection, sample transportation and reporting. RMRC, Bhubaneswar has been recognized as apex laboratory for the diagnosis of JE by the state government.
- From total 2263 villages, 41 villages were selected using PPS sampling method.
- From each village, 10 households were selected by systematic sampling method and those houses where more than one child in age group between 1 and 15 were there, only one child was selected by KISH selection method
- Total of 410 children were enrolled for the vaccination survey
- The survey revealed that 96.71% children between the age group of 9 month to 15 years have received JE vaccine

Prevalence of asymptomatic malaria infection below 5 years and mode of transmission in Kalahandi district of Odisha

- Malaria is responsible for the greatest public health problems in Odisha and the study was carried out with a objective to determine the prevalence of asymptomatic Plasmodium infection below 5 year children and to determine the per man hour density and transmission potential of vectors in Kandhamala district of Odisha.
- Phiringia, Khajuripada, Kajamandi Nuagaon, Tumudi Bandha and Daringibadi blocks of Kandhamal district were selected based on the API.
- A total of 130 slides were collected from under five children and RDT was done for all.
- Only one case was positive for RDT and blood slide examination in Phiringia Block.

- Similarly, 168 samples were collected from Khajuripada block and none were found positive.
- 218 samples were collected from Tumudibandha and five samples were found to be positive by both RDT and blood slide examination.

Strengthening the existing ICDS-MIS cell integrating components of ICT-Real time monitoring & supporting convergent action plans of the National Nutrition Mission (NNM) in Odisha

- State level inception was conducted explaining salient points through video conference.
- Four batches of ToT of ICDS supervisors, CDPO's and Programme Officers and DPMs conducted for 136 participants of 15-high burden district and trained on measuring anthropometric parameters besides supportive supervision, monitoring of nutritional indicators and preparation of context specific convergent nutrition action plans.
- The concurrent monitoring team analyzing the ICDS data generated through e-pragati and RRS and cross validated with primary field data duly collected by administering checklists in the Anganwadi centers.
- The teams have visited 4 districts (Sambalpur, Khordha, Dhenkanal, Koraput), 11 blocks, 15 sectors and 27 Anganwadi centers and findings shared with WCD department.
- Currently working on identifying key indicator, base line status, bottlenecks and suggested specific action for multi sector convergent nutrition action plan.
- Analysis of the blue print of the ICDS MIS cell structure incorporating best practices, capacities and HR and annual costs of running the same study of MIS systems of line departments such as H&FW, PR&DW,

RWSS, S&ME at state and district levels is being done.

Study on Mid-Day Meal programme in Odisha: Impact Evaluation

- The study covered 11, out of 30 districts across division in Odisha covering 362 schools under 112 clusters, 37 blocks.
- Total 51414 children aged 6-14 years covered, 48.7% of them are boys and 52.3% girls
- Enrolment of girls students are high in every category i.e. SC (50.3%), ST (50.4%), and others (51.5%).
- More than 70% of schools have functional kitchen cum store and 9.1% schools depends on central kitchen. Only 28.2% schools use LPG for cooking. Food safety is maintained in majority schools.
- Many schools are not maintaining records and registers such as Bank pass-book (61.9%), Cash book (50.3%), Guard register (49.2%), Stock & consumption (65.7%), Visitors/ Observation (38.1%). Awareness on objectives and entitlement of MDM is poor among school teachers.
- Potable water is available in 88% of MDM schools. 2.5% samples tested coliform positive, depend mainly hand pump, bore wells and tap water.
- Toilet facility is there in 97%, while 75% of them are currently in use and 69% of schools have separate toilet facility.
- Assessment of nutritional status revealed that 22% of children (15886) in MDM schools are underweight and 31% are stunted, while 9% are overweight or obese.
- Mean haemoglobin is 11.5 g/dl, 58% are anaemic and 22%, 34.7% and 0.1% are mildly, moderately and severely anaemic.
- Overall, there has been significant improvement in quality of MDM programme

implementation and monitoring services by stakeholders.

Diseases profiling of Primitive Vulnerable Tribal Group of the state

- The study was conducted from 1st July, 2018-28th February, 2019 in 17 Micro project areas of PVTGs in Odisha.
- In this study, it was found that there was 64.2% wasting (weight for height) with 40.1% in severe category and 52.1% stunting (height for age) compared to 37.1% severe category among the under-five children.
- Stunting was high among the girls of this age group than the boys.
- Around 73.2% were underweight (weight for age) out of which 51% of them had severe malnutrition. Likewise, in the age group of 6–18 years, centre found 43.7% stunting and 60% wasting with higher proportion of girls malnourished.
- Iron deficiency anaemia is a matter of great concern and the PVTG women are worst affected with 75% prevalence.
- Sickle cell anaemia is also an issue in Saora, Langia Saora, Paudi Bhuiyan, Kutia Kondha, Dongoria Kondha, Didayi and Juang PVTG groups. In fact, skin-disease (10.4%) and syphilis (4%) were more prevalent among the Lodhas.
- Hypertension (29% in Kharia, Mankidia) and diabetes (12% amongst Lodha) have arrived with other Non-Communicable Diseases (NCD) but the burden of infectious diseases such as malaria (Asymptomatic: 45.3% in Kutia Kondha, Kondhamal 40% in Paudi Bhuiyan, Sundargarh; Symptomatic: 12% Kutia Kondha, Kalahandi), acute respiratory infections (33% in Paudi Bhuiyan, Anugul; 20% Paudi Bhuiyan, Sundargarh; 20.7% in Bonda; 19.4% in Saora), skin infections (14.1% in Saora, Tumba; 12% in Saora, Gajapati;

11.2% in Dongaria Kondha, 10.4% in Lodha), diarrhoea (3.8% Paudi Bhuiyan, Sundargarh) and intestinal parasitism remains high compared to NCDs .

- Study also observed that Rh-negative blood type is a problematic factor among the pregnant women of Chutkia Bhunjia PVTG which may be properly addressed by the local PHCs.

Feasibility of using two simple tools for improving documentation during childbirth in Peripheral health facility

- Two simplified tools viz. “prashav sheet” and “still birth case sheet”, developed by maternal health division, ICMR, were pilot studied to assess the feasibility and effectiveness of the tools in labour room documentation.
- Labour room documentation improved in the intervention sites.
- The still birth case sheet was found to be quite useful and effective to find the possible or associated risk factors with the still birth, which can be addressed later.
- The partograph portion in prashav sheet was found to be easy and well appreciated.
- Adherence to partograph plotting and its completeness improved after intervention.
- Effectiveness with respect to early detection of any complication and prompt management was found to be better in intervention facilities.
- The simplified discharge sheet was user friendly and less time taking.

HRD for health research in the area of health informatics

- DHR, has sanctioned a project entitled “Human Resource Development for Health Research in the area of Health Informatics” under HRD scheme.
- Focusing towards the objective, the centre had organized 45 days training programmes on

different modules which were attended by 25 participants (representatives from state health officials, clinicians, research scholars and scientists) per programme.

- The topics that were focused in the programme were Evidence Synthesis and Systematic Review, Economic Evaluation of health programmes, Qualitative Research Methods, SPSS/STATA, Development of disease registry, Principles of Project Management and M&E, Principles and Practice of Implementation Research, National Ethical Guidelines for bio-medical Research, Health Communication, Biomedical Informatics, Research Methodology, Scientific paper Writing (Basic and Advanced), Referencing/literature survey/bibliography.
- The training was disseminated by renowned health professionals/scientists of the country.

PUBLIC HEALTH

Outbreak Investigation

The centre has supported both field and laboratory investigation for management of outbreak due to pandemic H1N1, ChikV, Dengue, JE, Chandipura, Measles, Rubella, Chicken Pox and Hepatitis A, E reported in the region by immediate diagnosis and recommendation for control, within minimum turnaround time. The reports were provided to respective authority within 6-24 hours in emergency/outbreak situations. During 2018-19 around 30 outbreaks were investigated for jaundice, chickenpox, AES/JE, Dengue and Measles. The scientists from the centre have been part of the central team deputed as Emergency Medical response for investigation and containment of Avian Influenza in Odisha.

Supporting programme implementation through research

The centre is involved in various projects on evaluation of government programme and policies. Mid-day Meal programme evaluation is being carried out with support of Dept. of School & Mass Education, Govt. of India. The centre is also involved in health impact assessment of Pradhan Mantri Ujjwala Yojna (PMUY). The centre has been designated as apex laboratory for JE diagnosis by the state government and has been supporting the various programmes of NVBDCP, IDSP and implementation of RNTCP. The Health Technology Assessment of a neonatal hearing impairment device, SOHUM is being carried out prior to its introduction into RBSK. The centre has 2 field units in tribal dominated districts of Rayagada & Kalahandi, an outpatient facility which is attending patients and dispensing free drugs and a Model Rural Health Research unit in Tigriria and is currently developing a cohort population (including rural, urban & tribal) for various studies and intervention for improving the health condition.

Organised data systems and platforms for research

The library of the centre has been upgraded to National Information Centre for Public Health Research. The library of the centre is acting as knowledge resource centre and catering service to various medical colleges, hospitals, academic and research institution. The centre has been undertaken various projects on documenting the health profile of Primitive Vulnerable tribal group of the state. The centre is also working on developing human resource for Public Health informatics. A rare disease registry is also being developed by the centre.

UNITS OF RMRC

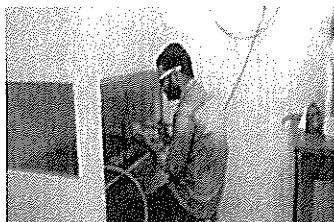


Fig. 1: Field unit in Rayagada.



Fig. 2: Out-patient facility.



Fig. 3: Model Rural Health Research unit, Tigiria.

OUTBREAK INVESTIGATIONS

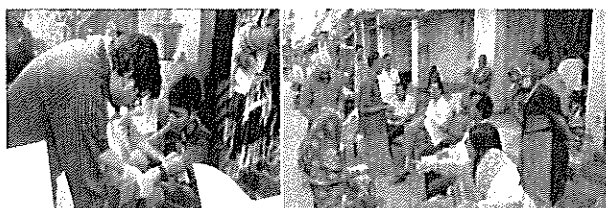


Fig. 4: Dengue Outbreak Investigation



Fig. 5: Part of central team for Emergency Medical Response for Avian Influenza outbreak.

FIELD STUDIES

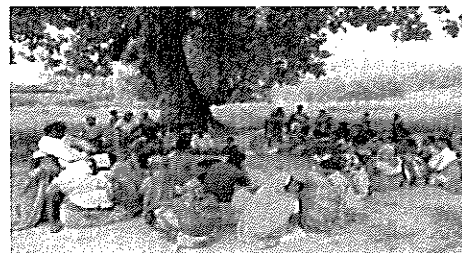


Fig. 6: FGD In Sundargarh.



Fig. 7: IDI with DFO, Koraput.



Fig. 8: Nutrition Survey.



Fig. 9: Disease profiling of PVTG.



Fig. 10: TB-nutrition study.



Fig. 11: Diagnostic validation of SOHUM device.



Fig. 12: Qualitative IDI with SN at DHH Kalahandi.

COMMUNITY OUTREACH & AWARENESS PROGRAMMES



Fig. 13: India International Science Festival.



Fig. 14: 2nd edition of Odisha Vikash Conclave (OVC)-2018.

STRENGTHENING OF HEALTH RESEARCH CAPACITY



Fig. 15: ICMR-IIT KGP-JIM MedTech Internship programme, 2018



Fig. 16: Diarrhoea conclave with NGO & stake holders.

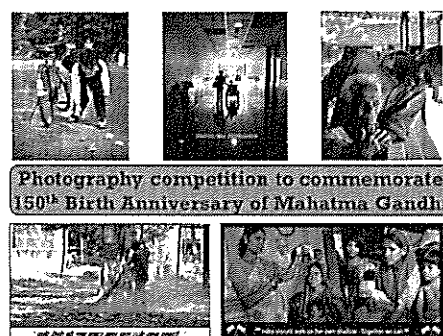


Fig. 17: Photography competition to commemorate 150th Birth Anniversary of Mahatma Gandhi.

ICMR-REGIONAL MEDICAL RESEARCH CENTRE, PORT BLAIR

RISK REDUCTION/ ELIMINATION OF INFECTIOUS DISEASES

Effectiveness and operational feasibility of mass DEC fortified salt as a supplementary intervention to mass drug administration towards elimination of the lone foci of diurnally subperiodic *Wuchereria bancrofti* in Andaman & Nicobar Islands

Diurnally sub periodic form of *Wuchereria bancrofti* is endemic only in five islands of the Nancowry group of islands. Although 6 rounds of mass administration of DEC and Albendazole under the programme to eliminate lymphatic filariasis has been carried out, microfilaraemia (*Mf*) rate > 1% still existed in the islands. The effectiveness and feasibility of DEC fortified salt (DEC +Iodine) as a supplementary measure to MDA to achieve LF elimination was assessed. MDA was supplemented with DEC-iodine double fortified salt in 12 villages (Study arm) while MDA alone was continued in

the remaining 14 villages (control arm). One-year salt distribution could reduce *Mf* prevalence below 1% in all the 12 villages (Study arm). In the control arm *m/f* persisted with more than 1% in 4 out of 14 villages. Antigenemia prevalence in the age class 2-3 years in the DEC salt arm was reduced to zero from baseline 59 prevalence of 0.7%.

Spatial and temporal variations of potential malaria vector(s) and associated species of *Anopheles* in Andaman and Nicobar Islands

A study was conducted to identify the anopheline fauna and assess the status of malaria vector(s) in Andaman & Nicobar Islands. The study was conducted in 3 villages each from each of the 9 tehsils. Nicobar district recorded the highest density both for culicines and anophelines. Anopheline per-dip density was 2.38, 2.74 and 4.43 in three districts during the 3rd cycle and 3.72, 2.86 and 4.72 in the 4th cycle. Anopheline immatures were recorded from 23 different habitats types. Pupal stage of anophelines were found in nine habitats of South Andaman which included: cess pool, pond, rainwater pool, tyre print, mangrove swamp, kutchra drain, dam and stream margin. A total of ten anopheline species were identified. A new molecular form of *An. barbirostris* was identified from Andaman and Nicobar Islands, which was closely related to *Anopheles barbirostris* form A (A3).

Investigation and containment of the post-flood outbreaks of leptospirosis in Kerala, August-September 2018

A team from the Centre was deputed to Kerala to carry out research and public health activities during the post-flood outbreaks of leptospirosis in Kerala during August 2018 as per the requirements of the state health department. The team established facilities for laboratory diagnosis of leptospirosis at field unit of ICMR-NIV, Alappuzha. Based on MAT titres Australis, Canicola and Icterohaemorrhagiae were the common infecting serogroups. The team also helped in monitoring the outbreak trend and participated in public awareness programmes for implementation of the control strategies. A coverage

evaluation survey for doxycycline prophylaxis and an evaluation of the effectiveness of doxycycline prophylaxis in preventing leptospiral infection, disease and death were conducted by the Centre, NIE and DHS, Kerala. A preliminary analysis of the data on efficacy of doxycycline prophylaxis showed that the strategy had an efficacy of 98.6% (95% CI: 89.9, 99.8) and the prevented fraction in the population was 48.4% (95% CI: 40.6, 50.0).

HEALTH AND NUTRITION OF MARGINALIZED COMMUNITIES

Health and nutritional status of Jarawas

A study was conducted to assess the present health and nutritional status of the Jarawa population. A total of 382 Jarawas were contacted and among them 204 were males and 178 were females. The sex ratio was 872.5 (95% CI: 818.9, 915.0). Out of the 72 children in the age group 0-59 months, 45 (62.5%) had BMI within normal range, five (6.9%) had severe thinness and four (5.6%) thinness. Out of the 141 school aged children (60 – 228 months of age) and among them 114 (80.9%) had normal BMI, 13 (9.2%) had thinness and 14 (10%) were overweight or obese. Out of the 169 adults, 36 (21.3%) adults had thinness, 22 (13%) were overweight or obese. Anaemia prevalence was 70% (163/233). Prevalence of hypertension was 2.2%. Serum cholesterol levels >200gm/dL was seen in 11 (5.0%) and triglyceride > 200 mg/L in 6 (2.7%). HDL levels < 40 mg/dL was prevalent in 73 (33.2%) of the Jarawas.

Health and nutritional status of Onges of Little Andaman

A health and nutritional survey was carried out among the Onges of Little Andaman. The present population of Onges consists of 118 individuals, 63 males and 55 females with an overall sex ratio of 878 females per 1,000 males. Out of the 21 pre-school children, 17 (81.0%) had normal BMI for their age and gender while two (9.5%) each were overweight and obese. Out of the 44 school aged children, 28 (63.6%) had BMI within normal range for their age and gender. While 15 (34.1%)

children had thinness, one boy was overweight. There were a total of 53 Onges adults above the age of 19 years. While 28 (52.8%) of the Onges had normal BMI values, 21 (39.6%) were underweight and 4 (7.6%) were either overweight or obese. Anaemia prevalence was 60.2% and hypertension prevalence was 15.5% (15/58). Four (4.9%) of the 92 Onges screened had cholesterol level > 200 mg/dL and none had triglyceride level > 200 mg/dL. HDL levels < 40 mg/dL were observed in 38 (41.3%) of the Onges.

ECOLOGY AND ENVIRONMENTAL MICROBIOLOGY

Developing the model of *Anopheles* mosquito breeding parameters and their physico-chemical determinants and application of the model for environmental monitoring of risk *Anopheles* breeding in the context of Global Climate Change

The project is funded by the DST under the National Mission on the impact of climate change on health of the tribal communities residing in the island of Car Nicobar. The objective of the study was to develop a model to predict risk of *Anopheles* breeding. A total of 683 observation in 21 types of water habitats were made. The analysis identified eight variables as significantly associated with the risk of *Anopheles* breeding. A multiple binary logistic regression yielded a model with four predictor variables. A pH ≥ 8.3 , dissolved oxygen ≥ 16 , nitrite ≥ 0.026 and ammonia ≥ 0.36 were found to be protective against breeding risk. The study yielded statistical models for risk of breeding as well as *Anopheles* immature abundance. But these models need refinement before evaluating their predictive abilities.

Study of in vivo leptospiral biofilms and their role in transmission and pathogenesis, chronicity of leptospirosis

Centre's earlier studies have demonstrated formation of Leptospiral biofilms and observed abundantly from paddy field surface water, stagnated rain water bodies, domestic sewer and walls of urban sewage canals. A preliminary study was conducted

in vitro using the strains recovered earlier from the patients with varying clinical syndromes to identify the strains capable of forming biofilms. Among the 24 isolates/strains studied for ability to form biofilm, 10 (41.6%) isolates/strains were capable of forming biofilm *in vitro*. Six isolates were obtained from mild case of illness and among these 2 (33.3%) were able to form biofilm *in vitro*, whereas among the 18 isolates obtained from severe cases, 8 (44.4%) showed the ability to form *in vitro* biofilm. The results indicate that *in vitro* biofilm forming strains are more likely to produce severe disease than strains incapable of forming biofilms *in vitro*.

BASIC AND APPLIED RESEARCH

Whole genome sequencing to understand virulence factors of infecting *Leptospira* serovars /strain with varied clinical manifestations

A total of 40 leptospiral strains were included in the study, of which 39 were recovered from the patients with varying clinical syndromes. Whole genome sequencing of all 40 leptospiral strains has been completed raw reads were assembled and developed *de novo* contigs. Development of scaffolds has been initiated. The data generated from the strain isolated from sheep which had history of fever with jaundice was analysed along with set of whole genome data available on database from different genera of leptospires showed that the strain is closely related to *Leptonema*. The species under the genera *Leptonema* is considered as non-pathogenic. However pathogenic status of this genus could not be ruled out as several intermediate species (consisting of strains both pathogenic and non-pathogenic) have been reported in the recent past. In this study centre reported for the first time isolating strains belonging to *Leptonema* from sheep, pig and rat.

Phytochemical investigation and anti-malarial activity evaluation of medicinal plants used by indigenous tribes of Andaman and Nicobar Islands

The centre recently undertook studies on the prevailing traditional health practices in different

island groups. As a part of this, crude extracts from 15 medicinal plants were tested for malarial activity, of which 8 indicated anti-malarial potential. Five of these plants were further analysed to identify the pharmacologically active compounds. A total of 12 compounds were isolated from hexane extract of plant AN-K-511. The full structural information of the isolated compounds was obtained by various physical and spectroscopic methods, including, IR, UV, low and high-resolution mass spectroscopy, and ¹H, ¹³C NMR including 2D NMR methods (COSY, NOESY, HMQC, and HMBC). Out of twelve active compounds obtained, six tested for anti malarial activity and one compound showed activity.

Characterization of proteins involved in the adhesion of *Leptospira* to epithelial cells and macrophages and their function

In this project, we are aiming to identify interacting molecules on real time basis by cross linking and identifying the molecules that take part in interaction. This will make it easy to know the role of these molecular interactions. A total 2957 proteins were identified which accounts 78.79% of the *Leptospiral* proteins. Fractionation using Trion X-114 was found efficient in enriching cytoplasmic proteins in the aqueous fraction, inner membrane protein in the pellet fraction and OMPs in the detergent fraction evidenced from their abundance in the respective fractions in tune with their predicted functional correlation. Only 19.66% of the predicted proteins were found abundant in the outer membrane. This shows that though 89.4% of OMPs expressed and available in the cell, only 17.57% were found abundant on the outer membrane. The presence of those OMPs on outer membrane may be limited in response to their requirement on the membrane. This scenario also will be considered in further analysis wherever the interacting partner is OMP.

PUBLIC HEALTH

- Generated evidence for the effectiveness and feasibility of supplementing mass drug administration of DEC and albendazole with

replacement of iodized salt with salt double fortified with DEC and iodine in hastening the reduction in microfilaraemia rate and thereby, elimination of lymphatic filariasis in Nancowry group of islands, the only focus of diurnally subperiodic *W. bancrofti* filariasis in India.

- For the first time in the country, centre carried out a comprehensive health and nutritional survey among the isolated tribe, Jarawas. The survey showed that the tribe is suffering from high prevalence of anaemia and that hypertension and dyslipidaemias are starting to become prevalent among the adults.
- Health and nutritional profile of three tribes viz., Onges, Andamanese and Shompen were updated with the results of recent surveys among them. These recent surveys showed that Shompen under-five children no longer have high prevalence of under-nutrition as was reported earlier. However, about 45% of the adults are either overweight or obese. IgG antibodies against measles and rubella were observed in older children and adults indicating natural infection with these viruses.
- A statistical model of Anopheles breeding risk based on physico-chemical parameters of the habitats was developed. The model showed that a pH \geq 8.3, dissolved oxygen \geq 16, nitrite \geq 0.026 and ammonia \geq 0.36 were found to be protective against breeding risk.
- A study on biofilm forming ability of *Leptospira* strains revealed that the severity of the disease caused by these strains showed that *in vitro* biofilm forming strains are more likely to produce severe disease than strains incapable of forming biofilms *in vitro*.
- Whole genome analysis showed that a strain that morphologically resembled *Leptospira* and isolated from a sick sheep was actually *Leptonema*, which was thought to be non-pathogenic. This is the first report of isolating strains belonging to *Leptonema* from sheep, pig and rat.

- Phytochemical investigation and anti-malarial activity of medicinal plants used by indigenous tribes of Andaman and Nicobar Islands identified with newer compounds in their crude extracts and showed antimalarial activity.

ICMR-DESERT MEDICINE RESEARCH CENTRE, JODHPUR

DMRC, Jodhpur has been working for two major research projects viz: Early Detection of Breast Cancer and Sick Cell Anaemia. Other studies are mainly on Iodine Deficiency Disorder among pregnant women and estimation of the burden of TB among the tribal population and malnourished children

Strengthening State Non Communicable Disease Programme For Early Detection of Breast Cancer Involving Strategic Education And Awareness Among The Women: A Joint Programme of State Govt And ICMR- Desert Medicine Research Centre, Jodhpur.

The aim of the study is to strengthen state breast cancer screening programme and develop a referral system for diagnosis and treatment of suspected cases at state medical colleges/ District Hospitals. During the year 2018-19; a total of 25258 women from Jalore, Pali and Jodhpur districts have been covered and information about awareness about signs and symptoms and risk factors of breast cancer were collected. A total of 17529 women have also been imparted training for breast self examination. A total 229 suspect cases of Breast Cancer have been identified and cases have been recommended to consult PHC Medical Officer.

Sickle Cell Anaemia

Sickle cell disease is a group of genetically transmitted blood disorders. Probable estimate of magnitude of the problem of sickle cell disorders in the state of Rajasthan shows that it is a significant health problem. Present study is being carried out in the three blocks of the Tribal Sub Plan (TSP) areas reported high prevalence in our studies i.e.

Sajjangarh block of Banswara district, Kotra block of Udaipur district and Abu Road block of Sirohi District. Bhils are found predominant in Sajjangarh block of Banswara district whereas Garasiya tribe mostly residing nearby areas of Gujarat border i.e Kotra and Abu Road blocks. The screening work is being carried out jointly with Medical & Para medical staff of State Medical & Health Department, Udaipur. Total 36709 individuals have been screened so far out of which 4949 (13.48 %) individuals found confirmed positive cases.

Consumption pattern of food and food products/ items high in fat, salt and sugar among selected cities/ towns and rural population of India

The project was initiated with the objective to assess the consumption pattern of food and food products/ items high in fat, salt and sugar, from organized and unorganized sectors. Jaipur is one of the study sites under this multi-centric study, being carried out at 16 locations in the country and coordinated by Division of Nutrition, ICMR, New Delhi. A total of 947 and 620 households have been covered so far in Jamwa Ramgarh block and Chomu block, respectively of Jaipur district. The anthropometric parameters of the individuals residing in all 1567 houses have also been taken.

Iodine Deficiency Disorder (IDD)

ICMR has initiated a task force study on "Assessment of Iodine status among pregnant women in selected districts of India" during 2017 at 10 locations in the country. DMRC, Jodhpur is one of the participating centres of longitudinal study under which Jaisalmer District, Rajasthan is being covered. So far, the centre has recruited 223 pregnant women in first trimester and is being followed. Around 698 blood samples and 698 urine samples of pregnant women and 698 salt samples from their houses have been collected and analysed. Dietary intake and food frequencies of all the pregnant and lactating individuals has been carried out. Anthropometry of all the pregnant and lactating individuals has been conducted. The height & weight of the infants was taken.