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Indian Council of Medical Research (ICMR)

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Indian Council of Medical Research (ICMR)

The Indian Council of Medical Research (ICMR), New Delhi, the apex body in India for the formulation, coordination and promotion of biomedical research, is one of the oldest medical research bodies in the world. They will participate in the Smart India Hackathon 2017 with 28 problem statements.

Solutions for Health Account Scheme to be more user friendly

#IMR28 Total Submissions : 11

ICMR is running a field trial of health account scheme (https://healthaccountsscheme.nic.in/) . We face difficulties in entering real time health data where there is no internet- (only 15 % population have internet access in Arunachal Pradesh and even at district headquarters problem of net availability and speed is

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Sample Data : Annexure L2

PARTICIPATE

Tracking tuberculosis through a sensor based GPS enabled technology

#IMR27 Total Submissions : 8

Each year about 2.2 million people develop TB in India and an estimated 220,000 die from the disease. TB can affect any age, caste or class but cases are mainly poor people. Slum dwellers, tribal populations, prisoners and people already sick with compromised immune systems are over-represented among the cases, compared to their numbers in the population. Between 2006 and 2014, TB cost the Indian economy a massive USD 340 billion.

TB treatment & care in India is provided by the government's Revised National TB Control Programme (RNTCP) as well as through private sector health providers. The notification of TB cases is estimated to be only 58%. This could be even higher.

A tracking device is required to help public health officials better understand the network this airborne disease creates as it passes through the community. This would allow the public health workers to carry out targeted vaccination, detection and treatment. The ultimate goal is to lower the number of missing cases.

Sample Data Required: No

PARTICIPATE

Creating awareness for stroke through gaming : Time is Brain

and a half hour of initiation of symptoms. However, most of the patients are not able to recognize the symptoms. This leads to death and disabilities.

Gamifying stroke symptoms, diagnosis and treatment has the potential to help in creation of awareness and prevent death and disabilities.

Facts about Stroke : Annexure K annexure-k

PARTICIPATE

Interlinking studies on Bhopal Gas Victim

#IMR25 Total Submissions : 9

After the Bhopal disaster, several smaller studies had been executed to assess the effects of gas on various aspects of health of population/individuals. Consolidation of these studies will help in getting a holistic overview of the effect of gas in an individual The identifiers for the different study is not uniform and thus pose difficulty in inter linking of information from various studies.

We would like to develop mechanisms or programme for interlinking of the different studies

Sample Data Required: Annexure J annexure_j

PARTICIPATE

A tracking system for migrant workers working in silica exposed working environment

#IMR24 Total Submissions : 5

can be followed up

Sample Data Required: No

PARTICIPATE

Automated MeSH annotation of text using machine learning

#IMR23 Total Submissions : 9

Annotation of text includes attaching subject, author and other meta tags to any given text. There is no tool available for annotating text using standard vocabulary. MeSH is controlled standard vocabulary for annotating text.

In this proposal we would like to develop an automated text annotation tool using machine learning techniques. Annotations and associated text (~23 million) available in PubMED may be used for developing machine learning models. There are many Indian journals which are non-indexed and hence are not significantly highlighted at International level (https://indmed.nic.in). This application will increase the visibility of research published in these non-indexed journals to International community

Sample Data Required: No

PARTICIPATE

A tool for reporting publications from ICMR funded research

#IMR22 Total Submissions : 5

The Reporter database should be able to provide a single repository of reports , publications and patents and several tools to access reports and publications from each ICMR institute and different areas under extramural funding.

Further, the reporter should also be able to categorize ICMR funded extramural research by location. An ICMR Data Book may be created to provide basic summary statistics in tables and charts, on extramural grants, number of trainees and fellows supported through ICMR grants.

Sample Data : Provided as ANNEXURE I1 annexure-i1 and I2 annexure-i2

PARTICIPATE

Data security

#IMR21 Total Submissions : 10

Collection, management and analysis of data is absolutely essential for medical research. However, inability of identify system vulnerabilities often results in data corruption and loss. There are many tools available to identify vulnerabilities and security, however, these require expertise for running and analysis.

An easy and user-friendly tool for identifying vulnerabilities in internet connected computer/systems/devices used in ICMR is required. The system should identify vulnerable computers/ports in our ICMR/Institutional network , be user-friendly access so that even non-technical users can identify vulnerable programs in their computers, suggest preventive measures using knowledge-base or Artificial Intelligence and identify attacked PCs/ servers/equipment

Sample Data Required: No

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On this portal, a researcher should be able to find and secure funding for proposals from government and private national (e.g. ICMR, DBT, DST, CSIR, DRDO, TATA trust, INFOSYS Foundation, etc) and international agencies (NIH. CIHR, MRC, Bill & Melinda Gate Foundation, Wellcome Trust, etc).

Sample Data Required: No

PARTICIPATE

A tool for Mining MEDLINE/Pubmed for identifying subject Experts

#IMR19 Total Submissions : 12

With the rapid development of biomedical sciences, a great number of documents have been published to report new scientific findings and advance the process of knowledge discovery. Pubmed comprises more than 26 million citations for biomedical literature from MEDLINE, life science journals and online books. It is thus not easy for scientific professionals to find experts from India on a certain topic in the biomedical domain from databases like Pubmed. A novel solution for finding relevant biomedical expert from India (having high impact publications) for a specific topic query by mining MEDLINE/Pubmed and other relevant data sources is required for engaging them in various scientific committees and undertaking peer review process for screening projects submitted by different investigators at ICMR. Further, the system may allow an ICMR program officer to initiate a crosstalk between subject experts on a topic of interest for identifying priority areas for research.

Sample Data Required: No

PARTICIPATE

To monitor the logistics of cold chain in immunization programme

efficacy. At least 25 per cent of the vaccines go waste even before reaching the doctors and patients while many lose their efficacy by the time they are administered. There are a few key factors that contribute to this wastage. One is the cold chain infrastructure, the ability to store, transport and sell temperature sensitive products. The second problem is frequent power outages, so that even if cold chain infrastructure is available, lack of real-time monitoring of temperature will lead to 25% wastage. This is a major challenge to the government which is trying to expand the immunisation coverage.

An end-to-end IT solution for cold chain monitoring is required. A real time electronic vaccine intelligence network which will enable vaccine stock management as well as monitoring of cold chain temperature through smart wireless sensor based technology, sending data to the cloud and alerts to pharma and logistic chains is required.

Sample Data Required: No

PARTICIPATE

Monitoring in Occupational health

#IMR17 Total Submissions : 12

Health of workers and Work place health issues are a significant challenge for a developing country like India. Presently, a certain number of notifiable diseases are reported under the Factories Act. Many workplaces and unorganized workers are covered under the ESI benefit scheme and take treatment in the ESI medical Institutions. There is scope for improving the data on occupational health for planning specific public health interventions.

A real time monitoring of workers health problems to provide leads on work place issues like exposures at workplace or any outbreaks or epidemics is necessary at the level of the ESI medical institution, district level , state level Dept. of Public health. This common monitoring platform can also provide data on workers who

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PARTICIPATE

High precision speech to text converters with language translators for use in Electronic Patient Record software

#IMR16 Total Submissions : 7

EPR (Electronic Patient Record) facilitates research on patient data by aiding in creation of disease-specific databases and data mining. Additionally, it saves paper and reduces errors caused by writing.

The poor use of EPRs in Indian government hospitals, has led to a huge loss of patient information. An important reason for poor use of EPR has been that the number of patients visiting the hospitals is huge and resources are limited.

Software that aids in real time conversion of speech to electronic data with in-built language translators is needed. This will facilitate capturing the patient information to a format that can aid in database/repository creation of several diseases. Tools for analysis of captured information will help in disease diagnosis and better patient management.

Sample Data Required: No

PARTICIPATE

Texture and cell organlees analysis to identify potential cell abnormalities

#IMR15 Total Submissions : 4

of cytoplasm granularity, texture and color.

Video : Annexure H video-probem-statement-15-16

PARTICIPATE

Identifying cell boundaries from video data

#IMR14 Total Submissions : 9

Automated identification of cell boundaries from the pathological slides holds tremendous potential for cancer diagnosis. Most image analysis tools for the above purpose use high resolution images which are first difficult to take and second require high RAM for analysis.

In this proposal we would like to develop a solution for capturing a regular video of the slide by moving a regular camera, decomposing the video to frames and identifying cell boundaries in frames using regular image analysis techniques.

Video : ANNEXURE H video-probem-statement-15-16

PARTICIPATE

Pipeline for developing pangenome from short-reads

#IMR13 Total Submissions : 5

Pangenome is union-set of genes from strains of given species. Pan and core genome is very important for identifying biomarkers, surrogate markers, vaccine and drug candidates. There are tools available for developing pan-genome using binary matrix.

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Interactive Application mapping pin codes of entire country

#IMR12 Total Submissions : 8

India is a vast country divided into revenue districts for administrative purposes and has diverse health care facilities in urban and rural areas.

A mapping of entire country in terms of metropolitan/city,district,sub-district/taluk, town, village, hamlet level with reference to pin codes, wards will help in mapping the healthcare system as well as identifying the location of persons / cases participating in different health surveys/registries. This mapping should be interactive, pictorial and easy to use

Sample Data Required: No

PARTICIPATE

To create a repository for equipments under ICMR's intramural program

#IMR11 Total Submissions : 3

ICMR intramural research program (IRP) has 32 institutes around the country catering to different areas of health research. ICMR's IRP can push biomedical science forward by sharing access to state-of-the-art facilities and resources. By combining forces, Intramural investigators can find new ways to answer research questions that no single person could accomplish alone. Further the facilities can be made available to researchers funded by ICMR under extramural program.

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Sample proforma : Annexure G annexure-g

PARTICIPATE

Improving malaria surveillance in hard to reach areas

#IMR10 Total Submissions : 4

The biggest burden of malaria in India is borne by the most backward, poor and remote parts of the country. Surveillance is the key to malaria control. Hard to reach areas pose challenge to surveillance. Difficult terrain, insurgency, inadequate supply chain management, vacancies of public health personnel often make surveillance a challenging task.

There is need to introduce innovative strategies to improve surveillance. The technology should be effective in rapidly detecting cases and treating malaria in the remote areas.

Proforma: ANNEXURE F annexure-f

PARTICIPATE

Development of an automated reminder system for cervical cancer screening in HIV patients

#IMR9 Total Submissions : 7

Cervical cancer is a one of the highest-burden cancers among Indian women. Indian women living with HIV are at 15.7[95% CI 11.0-22.0] times higher risk of developing cervical cancer as compared to other women in same population. Systematized and well executed cervical cancer screening programs are known to significantly reduce cervical cancer burden.

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Dummy excel based database of persons attending HIV clinic: Annexure E1 annexure-e1

Format of Individual E-Card for Cervical Cancer Screening : Annexure E2 annexure-e2

Technical requirements: Annexure E3 annexure-e3

PARTICIPATE

Tablet based 'App' for collection of community health data

#IMR8 Total Submissions : 28

National Institute of Epidemiology (NIE), Chennai is conducting many research studies by keeping the health of the community as main focus. Our staff are visiting the community to collect the data regarding their health, demographic characteristics etc. Currently paper based data collection is practiced, which need more man power and other consumables. A Tablet based 'app' for data collection is very much needed as against the present manual data entry method. Real time analysis will add more value to this module.

Sample Formats:

The variables (data) may be in the following formats:

1) Participant's id: xxxxx
2) House Hold No.: xxxxx
3) Age: xx
4) Sex: x
5) Height (CM): xxx.xx

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To Collect and Analyze Vital Statistics events of the Civil Registration System(CRS) : Real time transfer of Birth and death information from rural area to server/central level through APP

#IMR7 Total Submissions : 12

Seventy per cent of population in India resides in rural area. Birth and Death registration in the rural area are incomplete and the available data takes time to reach at the central level. An APP has the potential of real time transfer of this information directly from the rural area to the designated centre. A form (as per provisions of the Act) needs to be filled. However, only information sent by a designated person or informant (information verified by designated persons as per the Registration of Births and Deaths Act) will be collected in database. Authentication checks will be required. Alternate provision of sending data from a birth or death certificate can also be provided. The system will undergo a field trial once developed.

Sample Formats: Annexure C and D annexure-c-and-d

For Registrars and informants for rural areas see https://des.kar.nic.in/docs/crs_desc.pdf

PARTICIPATE

To develop Acute Coronary Syndrome Risk Predicting model using MACE sample data

#IMR6 Total Submissions : 9

ICMR’s Management of Acute Coronary Event (MACE) registries are ongoing in 39 centres around the country to assess real time outcomes in patients with ACS (heart attack).The registry will benefit from having an ACS risk model predicting the risk of heart attack and death in next six months of the acute event in the App (e,g. GRACE ACS Risk Model ; https://www.outcomes-umassmed.org/grace/acs_risk/acs_risk_content.html).

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Development of App for Data Collection in Management of Acute Coronary Event Registry

#IMR5 Total Submissions : 7

ICMR's Management of Acute Coronary Event (MACE) registries are ongoing in 39 centres around the country to assess real time outcomes in patients with ACS (heart attack). The registry is planned to be made open to all hospitals in order to expand the network. An app for collecting data on the prescribed format (is required.

Proforma : https://14.139.60.56:8085/

Login ID- demo ; Password – demo123

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Last Updated:December 1, 2016 at 11:28 am -- innov-web-sp-83-196.mygov.in