In the last edition of E-Samvaad, we had highlighted that the fight against COVID-19 was at a crucial stage. Globally as well as for India it was important to remain cautious. But it seems that we as a community have loosened the shackles around coronavirus. As is evident, the month of April 2021 has seen an exponential upsurge in the number of daily cases of coronavirus, which has again put tremendous pressure on the healthcare infrastructure. Rapid re-emergence of COVID-19 has been caused by laxity, COVID inappropriate behavior, and also due to various unidentified coronavirus mutants. Some mutations of concern—UK, Brazilian, and South African variants, have been demonstrated to have higher transmissibility. Whereas, we have also found a double mutant in India and there is some data demonstrating a higher transmission.

However, this time we have diagnostic tools to tackle the infection, our healthcare workers are better equipped and more informed about the virus, and most importantly, we have COVID-19 vaccines to counter the pandemic. At this junction, inoculation of frontline workers and senior citizens in the first phase of vaccination has been valuable. The government’s decision to open vaccination for all citizens between 18 to 45 years of age is a welcome move. It is also a matter of respite that India’s indigenous COVID-19 vaccines ‘COVAXIN’ developed in collaboration with ICMR and Bharat Biotech International Limited has proven efficacy against the South African, UK, Brazil and double mutant strain (first observed in India).

The COVID-19 vaccines reduce the chances of developing severe infection and death due to the disease. It was also found that positive cases after the second shot from COVISHIELD were 0.03 percent and 0.04 percent for COVAXIN, which strongly suggests that people must get vaccinated and not postpone it.

Vaccines are one of the most important public health tools we have to mitigate the impact of infectious diseases. While some vaccines prevent infections from gaining a foothold in our body, others reduce the severity of illnesses. Currently available COVID-19 vaccines belong to the second category: they are disease-modifying vaccines.

Even as a multitude of factors come together to defeat the pandemic, the individual responsibility of maintaining COVID appropriate behavior, maintaining physical distancing, and responsible use of masks cannot be ignored. One must also shun any vaccine hesitancy and get vaccinated at the earliest opportunity for the safety of self and for others.
ICMR study shows COVAXIN neutralizes multiple variants of SARS-CoV-2

- ICMR-National Institute of Virology successfully isolated and cultured multiple variants.
- COVAXIN has demonstrated neutralisation potential against the UK, Brazil and South African variant.
- COVAXIN has been developed in collaboration of ICMR and Bharat Biotech Ltd.

India’s indigenous COVID-19 vaccine COVAXIN developed in collaboration with Indian Council of Medical Research (ICMR) and Bharat Biotech International Limited has been found to neutralise multiple variants of SARS-CoV-2 and effectively works against the double mutant strain found in India. ICMR-National Institute of Virology, Pune researchers used the sera collected from 28 people who had participated in the COVAXIN phase-2 trial. They also collected sera samples from 17 people who were infected with older strains of SARS-CoV-2 virus and had recovered. The study has been published in bioRxiv, an open access preprint repository for the biological sciences and can be accessed at https://www.biorxiv.org/content/10.1101/2021.04.23.441101v1.full.pdf

New variant of the coronavirus, which was initially found in Maharashtra and now prevalent across the country, has resulted in a spike in the number of daily recorded cases. Several variants SARS-CoV-2 have been reported in India during January to April 2021 which includes B.1.1.7 (United Kingdom), B.1.351 (South Africa), and B.1.1.28 (Brazil P1, P2) strain. ICMR-National Institute of Virology has successfully isolated and cultured these variants. COVAXIN has demonstrated neutralisation potential against the UK variant and Brazil variant. Along with showing efficacy against the double mutant variant, the vaccine was also found to be inhibiting severe forms of the disease post-vaccination.

Dr. Samiran Panda, Head, Epidemiology and Communicable Disease, ICMR and Director, National AIDS Research Institute said, “The study found that the neutralising capacity against the double mutant (B.1.617) variant was found to be good in both groups- people who have received the vaccine and those who have recovered from COVID-19,” India is entering phase 3 of the vaccination drive to vaccinate everyone above the age of 18 from May 1st, 2021 onwards. The assurance of neutralisation of double mutant strain by indigenous vaccine COVAXIN will provide the much-needed boost for the vaccination programme.
Few post-vaccine infections reinforces efficacy of COVAXIN and COVISHIELD

- Only 0.04% tested positive after 2nd dose of COVAXIN and 0.03% after COVISHIELD.
- Instance of breakthrough infections do not undermine the efficacy of the vaccines.
- COVAXIN has shown 78% overall efficacy and 100% efficacy against severe COVID-19 disease in interim phase–III trials.

Indigenous COVID-19 vaccine COVAXIN, developed by ICMR in collaboration with Bharat Biotech International Limited and Serum Institute of India (SII) and AstraZeneca/Oxford University’s vaccine COVISHIELD has shown very few post-vaccine infections. Post vaccination data underlines the efficacy of both the vaccines as effective prevention against coronavirus.

Post vaccination data results have shown very encouraging results. According to the analysis done by ICMR, of the 9.3 million who received the first dose of COVAXIN, only 4,208 tested positive; and of the 1.7 million who received the second dose, 695 tested positive. Similarly, for COVISHIELD, of the 100.3 million who received the first dose, 17,145 tested positive; and of the 15 million who got the second dose, 5,014 tested positive. This translates to only around 2 - 4 cases per 10,000 people vaccinated.

Prof. (Dr.) Balram Bhargava, Director General, Indian Council of Medical Research said in weekly press briefing that, “These vaccines, definitely protect against disease. However, the immune response begins to develop usually two weeks after every dose and there are variations within individuals, too. Even after the first dose, if exposure to the virus happens, one can test positive.”

However, these instances of breakthrough infections do not undermine the efficacy of the vaccines. According to the data there could be two key reasons for this, firstly healthcare and frontline workers, who were among the first to be vaccinated, were as a population far more exposed to the virus and therefore more susceptible. Secondly, the emergence of the highly transmissible newer variants may have contributed to instances of infection among those vaccinated.

Indigenous vaccine COVAXIN developed by Indian Council of Medical Research (ICMR) in partnership with BBIL, has shown 78% overall efficacy and 100% efficacy against severe COVID-19 disease in interim phase–III trials. Earlier, The Drugs Controller General of India (DCGI) after recommendation of subject expert committee of Central Drugs Standard Control Organization (CDSCO) had given approval for restricted emergency use on 3rd January, 2021. After approval, India embarked on world’s largest COVID-19 vaccination drive on 16th January 2021.
ICMR releases findings of National Clinical Registry for COVID-19

- Finding provides insight on infection and mortality among COVID-19 cases in second wave.
- Relative increase in instances of shortness of breath as a symptom among new cases.
- NCR is a tool for formulating patient management strategies and predicting disease severity.

Indian Council of Medical Research (ICMR) has come out with findings of National Clinical Registry (NCR) for COVID-19. This finding gives insight on how infection and mortality among COVID-19 patients have changed during second wave in comparison to first wave. ICMR has analyzed the data of hospitalised COVID-19 patients during the duration of first wave (September- November 2020) and second wave (March-April 2021).

The finding states that there is a slight increase in the 10-20 years age group in the current wave 8.5% compared to 8.07% earlier. There is an increase in cases among those in the 40-70 years age group from the previous wave, and the same fraction of those in the 30-40 years age group persists. A marginally higher proportion of patients younger than 20 years were present in the second wave (5.8%) compared to the first (4.2%). In the first wave, 25.5% of the patients were 20-40 years old compared to 23.7% in the ongoing second wave.

In terms of mortality, there were 22% deaths among those in the 70-80 years in the second wave compared to 19% in the first wave, and 9.8% deaths in those above 80 compared to 7.8% previously. However, there is no evidence of any change in patterns of death in the younger age groups of 30-70 years, with about 70% deaths during both waves falling in this age bracket.

NCR data also revealed that, there was a relative increase in instances of those manifesting shortness of breath as a symptom. Almost 47% of symptomatic patients presented shortness of breath in the second wave compared to 41% in the first wave. In other, greater proportion manifested symptoms were of fast breathing, cough, chills, joint pain, and fatigue in the first wave than in the second wave.

ICMR had launched National clinical registry for COVID-19 last year. This registry collects systematic data on clinical signs & symptoms, laboratory investigations, management protocols, clinical course of COVID-19 disease, disease spectrum and outcomes of patients. The data serve as an invaluable tool for formulating appropriate patient management strategies, predicting disease severity. Dedicated COVID-19 hospitals and health centres are serving as primary sites for data collection. These sites have been trained, mentored and supervised by 15 medical institutes of repute across the country.
ICMR to Conduct Study on Using Drones to Deliver COVID-19 Vaccine

- Drone delivery model being studied for delivery of COVID-19 vaccines.
- ICMR will conduct feasibility study in collaboration with IIT, Kanpur.
- Special exemption by Civil Aviation Ministry to conduct trials.

In order to tackle the pandemic on a war footing, the Indian Council of Medical Research (ICMR) has used the latest and path-breaking technologies which helped expedite the process to develop vaccines in record time. Similarly, vaccine distribution is being aided in large part by innovative technologies. The use of drone technology is being included as a critical component of vaccine distribution strategy to deliver vaccines to the remotest areas in the country in a time-sensitive manner.

The Ministry of Civil Aviation and the Directorate General of Civil Aviation (DGCA) has granted permission to the ICMR to conduct trials for delivery of COVID-19 vaccines using drones. The ICMR will conduct the feasibility study in collaboration with the Indian Institute of Technology, Kanpur. This permission has been granted for a period of one year.

ICMR had sought an exemption from the rules that ban the use of drones for payload delivery. The Civil Aviation Ministry swiftly responded to the request and granted permission in view of the requirements. The testing for the drones will be conducted on the IIT campus itself. After successfully completing the first phase in which the drones will be flown within range of sight, the second phase will focus on the operation of drones beyond the line of sight. Once this succeeds in the second round, clearance will be sought from the Ministry of Home Affairs and Ministry of Civil Aviation to kick start vaccine distribution using drones.

Drone technology in India is still in nascent stages, yet is developing with speed with intent. Harnessing this technology to deliver medications and vaccines has potential in resolving rural health inequities, cost-saving, adherence to strict timelines, and improving accessibility to difficult geographies. ICMR has earlier successfully established COVID-19 testing laboratory in the remotest parts of India including Leh Ladakh and Andaman and the Nicobar Islands. This innovation will boost the ongoing mass vaccination efforts in India.
ICMR organized an International Symposium on ‘One Health in India: Research informing biosafety, preparedness, and response’

- International Scholars exchange insights on One Health concept which provides a holistic approach to healthcare.
- Union Minister MoHFW launched a special edition of IJMR focused on ‘One Health’.
- High-level steering committee for eco-health initiatives constituted.

Indian Council of Medical Research organized a virtual International Symposium & Workshop on One Health in India: Research informing biosafety, preparedness, and response on 12th April 2021. Hon’ble Minister of Health and Family Welfare Dr. Harsh Vardhan presided over the symposium as a chief guest. The inter-ministerial symposium was attended by Dr. K Vijayraghavan, Principal Scientific Advisor, Government of India, Dr. Renu Swaroop, Secretary, Department of Biotechnology, Smt. Uma Devi, Additional Secretary, Environment, and Climate Change, Shri. Trilochan Mahapatra, Secretary, Department of Agriculture Research and Education, Shri. Atul Chaturvedi, Secretary, Department of Animal Husbandry and Dairying, Prof. Ashutosh Sharma, Secretary, Department of Science and Technology and eminent participants from the United Kingdom, United States of America, Japan, Canada, and Russia.

On this occasion a special issue of Indian Journal of Medical Research (IJMR) was also launched, which corroborates studies on One Health, managing endemic and emerging epidemic threats. The meeting followed the Hon’ble Minister of Health and Family Welfare’s direction on the constitution of a high-level group on Eco-Health and convening of cross-sector learning and collaborative events. In his inaugural
address, the Hon’ble minister of Health and Family Welfare Dr. Harsh Vardhan said that Human health can’t be seen in isolation and the current COVID-19 pandemic is more than a reminder of that. This international symposium focusing on One Health Approach recognizes that the health of people is closely connected with the health of animals, shared environment and a lot of factors are to be understood as shaping our healthcare landscape.

He appreciated ICMR for the release of a special issue of IJMR on One Health and hoped that this will add to the body of literature and also provide pointers for the most relevant issues that need further research.

Prof. (Dr.) Balram Bhargava, Secretary, Department of Health Research and Director General, ICMR said that concept of ‘One Health’ is one of the most important weapons against the threats to lives on earth. One Health remains an important agenda and such efforts will help establish India as a force in the sphere of One Health in the world.

Secretaries/Representation from all Science and Technology agencies (DST, DBT, and DARE) attending the symposium also gave their remarks. The symposium was divided into three sessions. First session was focussed on global perspectives towards One Health and second session saw eminent scholars providing their insight on global perspective on One Health and third session was focused on country specific One Health responses and initiatives.

During the first session, presentations were given by Prof. Jeremy Farrar, CEO, Wellcome Trust on global overview. Dr. Casey Barton Behravesh, Director, One Health Office, National Center for Emerging and Zoonotic Infectious Diseases, CDC talked about the need for global partnerships. Dr. Aubrey Miller, Senior Medical Advisor, Office of the Director, National Institute of Environmental Health Sciences presented on strategic initiatives. Dr. Mohan Gupte, Former Director, ICMR-National Institute of Epidemiology & Guest Editor One Health special issue of IJMR spoke on India perspective response.

Special remarks were made by Dr. Bhupendra Nath Tripathi, Deputy Director General (Animal Science), ICAR Headquarters, Shri Kamal Kishore, Director National Council for Disease Control and Member, National Disaster Management Authority, Prof. Vivek Kapur of PennStatue University and his colleague Cheryl Stroud Executive, Director One Health Commission.

‘One Health’ concept is a collaborative, multisectoral, and transdisciplinary approach. With the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment.
It is an important occasion, where we see ministries from science and technology, health research, environment and forest, animal husbandry all have come together, as One Health is a topic which covers all of this. One health as a concept is a very useful overarching concept, which needs specificity to have utility. Otherwise it runs the risk of becoming like other broad concepts like ‘world peace’.

In India we have multiple One Health services all being independently developed, it can be made into a good thing when all these groups focus on areas relevant to their mandate and also come together. For example, ICMR and Health Development focusing on the Human side but working closely with animal husbandry, environment and forest and each one stressing on their strength and partnering together. There is also a need to ensure that what happens nationally is linked to international structures, so that in the context of climate change, sustainable development and challenges of biodiversity; we have a 360 degree perspective.

The world is rapidly shrinking because of travel, technology and digital aspects. Our economies are entangled and supply lines are interconnected and thus we must look at One Health. A compelling lesson of COVID-19 times is that all products, technologies and solutions that came with speed, scale and accuracy during COVID-19 times were made possible because of “triple-helix” working together which is industries and start ups on one side, academia, R&D labs and knowledge producers on another and the government as the third front. We had a shared purpose and shared vision which made it possible for three of these to come together spontaneously; along with international cooperation.

One Health is a holistic way of looking at health and not limited just to crisis management. It allows us to see health as a well being and prepare ourselves for the next crisis which may come around. We need to have all the infrastructure and human resources in place before the next crisis turns up because it is on these foundations that we base our response.
Pandemic risks are multiplying rapidly due to global trends and anthropogenic changes including deforestation and increased livestock production. With a growing population and growing demand for animal meat there is an urgent need to produce more food. Yet rapid expansion of livestock farming, agricultural intensification and subsequent wildlife habitat encroachments created a system of potential spillover of pathogens from wildlife to livestock and humans. As such a strong prevention, surveillance and response capacity in the animal health sector that works in harmony with the human and environment health sector is a prerequisite. It is a cost effective way to prevent the emergence and spread of zoonotic diseases, which have significant economic and public health consequences. One Health approach is a comprehensive approach and allows leveraging efforts of human, animal and environment health sectors to respond to pandemic disease threats. Instead of initiative becoming One Health and many voices, let us make it a genuine collaborative effort.

There are various aspects of One Health consisting of soil, ecosystem, plant, animal and human beings in continuum and we are working to build capacity. In context with newer challenges of climate change, most importantly there is a need for mega global networks so that we are working in a unified manner for all sectors coming together in multidisciplinary mode to understand the issues particularly human-animal interfaces which are not very clearly understood thus far.

One Health is globally recognised as a program which is envisaged to deal with problems connected with not just human health but also goes beyond these sectors and deals with zoonotic diseases, antimicrobial resistance, vector borne diseases, food safety as well as environmental issues. This is the most opportune moment given the global threat of COVID-19 to the very civilization. I congratulate the department of health research which has brought everyone concerned on a single platform to deliberate and plan future course of action.

This is the right time to devise a long term strategy in a holistic, integrated and proactive manner towards One Health initiative taking into account the interconnected health of animals, human beings, environment, disease prevention and control measures. Therefore there is a need to strengthen integrated approaches for management of zoonotic diseases through multi-sectoral coordination of various departments like the environment and forest, wildlife department, animal husbandry, veterinary departments, public health departments, department of biotechnology by proactive monitoring and putting surveillance mechanisms in place. This symposium will benefit in advancing the biosafety preparedness and response on One Health initiative in India.
When epidemics occur they cause four interlocking circles; the first circle in the middle which is the smallest is of the direct health consequences of the epidemic, the second circle which is bigger is of the indirect health consequences, the third circle is the economic impact, trust in government, education, trade travel, remittances, and country’s national and international debt. The economic impact will be profound and will take a long time to recover hence a bigger circle. The fourth is geopolitics. The pandemic is worsened by geopolitics.

We must be bring interdisciplinary to bear on these challenges. Inter-disciplinarity is needed between animal and human sectors, between social sciences and medical sciences, innovation, commercialization, and all of the aspects that are required in order to make a successful system. However, we must not be too bland or broad and inter-disciplinarity must not become an excuse for inaction.

The One Health approach is critically important because diseases can spread between animals and humans resulting in zoonotic diseases and it is important to have people working for human health, animal health and environmental health and other relevant partners coming together to coordinate, collaborate and communicate with the ultimate goal of achieving best possible health outcomes. When talking about One Health, it is important to have a common definition so all relevant partners can be on board. Different sectors have different languages and the same words might mean different things in animal health versus public health. It is important to have a common foundation. One Health is a team sport and partnerships are the key.

We have spent a lot of time and energy building a framework for emergency management and response but not so much a framework for the collection of scientific and research information required to be able to respond effectively both at the national and global level.

The path forward to building a “One Health” evidence base for improved preparedness, response and recovery includes establishing a common One Health global framework to drive data collection; Building a global community of practice; empowerment of data collection and reporting guidelines with communities; training of diverse stakeholders; curricula; exercises; centers of excellence and translation to public health practice; mitigation, treatment, resilience and sustainability.
Understanding oneness and dependence on each other helps avoid harmful actions of humankind to the environment in the present era of Anthropocene. Historically, the responses of human civilization to outbreaks have been highly reactive. Once the threat disappears, the responses also vanish. The epidemic amnesia is a global phenomenon and can be traced over centuries.

Further, there is no proof of principle for One Health today, thus there is a need for developing a model to demonstrate the feasibility and effectiveness of One Health approach. Advocacy for a collaborative and communicative trans-sectoral approach is a must. The creation of a political will and policy framework will make possible any such activity. We need to ensure that even during peacetime we keep on working towards one health and the institute that we will establish in Nagpur will facilitate such coming together in the times to come.

Dr. Mohan Gupte
Former Director
ICMR-National Institute of Epidemiology

Several suggestions for success of One Health would be to have a central command to look after it. There should be close coordination between ICMR and ICAR with other health departments and animal husbandry and poultry departments and to have integrated international systems. We also need more strategy and research on influenza and coronavirus.

Dr. Bhupendra Nath Tripathi
Deputy Director General (Animal Science)
ICAR

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Dr. Sujeeet Kumar Singh
Director
National Centre for Disease Control

Congratulations to ICMR for taking initiative in the field of One Health. The presence of so many dignitaries and highest-level key stakeholders underlines the importance of the One Health approach. From the Indian perspective, One Health and preparedness are very important and very pertinent.

An important aspect of One Health is surveillance; there is a need for coordinated surveillance across various sectors. Surveillance in the animal sector, human sector, and other sectors are very important for detecting early warning signals which are a key guiding force to have a proactive approach. The approach we have been following in dealing with important zoonotic infections has been more of reactive nature. Surveillance systems in each sector need to talk to each other. Regular meetings between surveillance officers of each sector will happen, they will be able to provide early warning signals which will help to detect the movement of infections from one area to another.
Those of us who work on disasters have abandoned the use of the term natural disasters. There may be hazards that are natural, for example when an earthquake occurs it may be natural, but when it kills people there is nothing natural about it. It happens because we live in earthquake-prone areas and make weak buildings. That applies to all disasters, there are no natural disasters, and they are all man-made disasters. There is no use in looking at risks at the level of assets: capital assets, or human assets. All risks are systemic for all disasters. The effects ripple across systems and it is important to take a systematic approach to disaster risk management as opposed to reducing risks and vulnerability at the level of assets. In that context what is being proposed by the One Health approach really fits right in.

While we have been talking about global networks and grand challengers, action must be local. For the implementation of One Health, central support is necessary but not sufficient. Specific programs and long-term investments are needed for building inter-sectoral trust and capabilities (people, processes, technology, communication); shared accountability systems, focus on results, and building an evidence base to help inform and develop sustainable market and policy drivers.

India has an excellent opportunity to lead globally while acting locally to improve human, animal, and environmental health.
ICMR is available on Facebook, Twitter and Instagram. For latest update about COVID-19 and other medical research breakthroughs, you can follow ICMR’s Official handles.
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