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ARTICLE

Scientific Knowledge, Perception and Attitudinal Changes during Corona Pandemic

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ABSTRACT

This paper is based on a survey study conducted during the lockdown period in India. The data was collected through online and off-line questionnaire. Response to the call was received from 27 provinces of India but the sample remained northern-state-centric. The lockdown prevented us from organising face-to-face interviews. We received 2780 filled-in questionnaires, out of which 2223 were found to be valid and were subjected to data analysis. The article deals with description of pandemic as it developed, the scientific information that was communicated to the public, the level of absorption of this information and the perceptions that resulted in attitudinal changes during the first phases of the pandemic. Based on the univariate analysis the paper presents the percentage response distribution. Evidently, the surge of the pandemic created a new normal in a very short period of time and brought about significant attitudinal changes among the public.

KEYWORDS: Covid-19, Corona, Scientific attitude, Communication, Perceptions, Superstitions, Authority of science, Scientific temper

The Origin of the Pandemic

The present pandemic, referred to as a Corona Tsunami by many, originated in Wuhan city, on 17th November 2019, and swept the entire globe in a very short period of time. The *South China Morning Post* reported that the 'Government records suggest first person infected with new disease may have been a Hubei resident aged 55'; he was designated as 'Patient

Zero'[1]. Initially the scientific community was taken by surprise, the surge of patients who were suffering from cold and cough, which in many cases led to pneumonia and death, was increasing at a fast pace. The investigations showed that 'it was pneumonia with unknown causes', it was a new disease. By mid-January the infection had spread in the city and many provinces, and had also crossed international borders[2]. As scientific investigations progressed the name of the virus that caused the disease also changed, from 'Wuhan Virus' to 'Novel Corona Virus-2019 (nCoV-19)' to '2019 novel coronavirus (2019-nCoV)' to 'Covid-19 Virus' to 'SARS-CoV-2'. Covid-19 was the name given to the disease.

As the pandemic expanded, the citizens were asked to observe social distancing. The World Health Organisation issued warnings and the panic spread like wildfire. In the next two months almost the entire globe was facing the pandemic, more than two hundred countries reported infected cases and most of these imposed lockdown. The panic was overwhelming and the perceived threat was unprecedented. All economic, cultural, social and religious activities suddenly stopped.

Scientific Community Rose to the Occasion

As 'the epidemiological, clinical, laboratory, and radiological characteristics, treatment, and clinical outcomes of 41 laboratory-confirmed cases infected with the virus were being probed and reported, a team of 'researchers led by Dr. Wang Jianwei at the Chinese Academy of Medical Sciences, Institute of Pathogen Biology, China, used next generation sequencing (NGS) to definitively identify the pathogen causing illness in Wuhan[3]. Yet there were many unknown scientific aspects of the disease which needed time to investigate. The scientific community all over the world rose to the occasion and tried to minimise the 'unknown'.

The scientific knowledge known and unknown about the novel virus, was to be communicated to the 'scientific community', 'policy makers', 'health workers' and above all to the general public, which if left uninformed was at ever the greater risk of getting infected unconsciously and thereby becoming symptomatic or asymptomatic carrier. Based on the

knowledge generated in the laboratories, it was their duty to suggest what individual and collective measures could be taken to ensure personal security and also to contain the spread. There is enough evidence that the community of scientists performed their duty diligently.

There are two distinct channels of information available to the scientific community. Firstly, information generated had to be reported in academic journals and secondly, the validated information was to be communicated in easy, understandable and actionable language through the mass media. A cursory scanning of literature shows that the number of research papers published in scholarly academic journals, on almost every aspect of Covid-19 and SARS-CoV-19 have increased exponentially. Munafo in an interview was quite categorical, "The speed with which the global scientific community has risen to this sudden pressing need is remarkable."[4] He further adds that journals are publishing pre-prints without peer review and considering the enormity of the pandemic and urgency of action this is a correct decision. It is unprecedented that during such a short period of time a virus has received so much of academic attention. Correspondingly, mass media was also flooded with information on the pandemic, virus, safety measures, lockdown, etc., on 24X7 basis.

Communication of Scientific Information

It has been reported by many scholars that, in normal times, science fares poorly in terms of both quality and quantity of space on all channels of information[5,6]. Politics, economics, entertainment and even games get a better treatment compared to science. The relationship between scientists and media has always remained a complex one.[7] Some scholars place the apathy of media towards science in the huge cultural distance between the two and others place it in the nature of scientific activities and disinterestedness of scientists to popularise their findings.[8] But in times of crisis the equations change a great deal. Recent episodes have shown that media's hunger for scientific information related to a crisis such as, nuclear disaster, Tsunami, earthquake, hurricanes and pandemic increases many folds. During these periods scientists, experts, research journals, doctors, health workers become major sources of information.

The recent pandemic is no exception. Media channels hunted scientific information from various sources and repeatedly communicated it to the public. Scientists are often rejected as jargonists who use difficult language, which cannot be understood by the common citizens. In fact during the crisis media also helped in popularising the so-called jargons. Thanks to the media, technical terms such as 'Covid-19', 'SARS', 'MERS', 'RNA', 'DNA', 'Social Distancing', 'Sanitizing', 'Aerosols', 'Virus Load', 'Host Cell', etc., became part of normal conversation among the common citizens. Based on the scientific information related to the processes involved in propagation of the pandemic, people's attitude, practices and actions changed almost overnight. This massive shift was also unprecedented; wearing masks, keeping distance, sanitizing hands, quarantine and repeatedly washing hands were the result of perceptions that were built due to scientific information and advice given by the scientific community and popularised by the media.

Myths Churning Mills also worked Overtime

In times of disaster superstition, conspiracy theories, fake news and pseudo-science also have a field day. The myths churning mills also work overtime to generate new products and jostle for space on media channels. More often than not media channels oblige them and circulate myths and superstitions widely.

As soon as the present project was launched we also started collecting information about the myths, superstitions, fake news and conspiracy theories that were being circulated in the media. A fairly exhaustive list of myths and supervisions is attached with this preliminary report. However, the list cannot be taken as complete because even at the time of preparation of this report news myths and atrocious pseudo-scientific claims related to corona virus were being made and circulated.

It was important for us to probe how scientific information fares compared to anti-science. Which of the two gets absorbed and becomes part of the thought structure of common citizens and to what extent it is retained. Evidently, scientific information and myths and superstitions tend to set people on quite divergent paths of perception building and safety measures that they finally adopt. For example, 'drinking cow urine can cure Covid-19' or 'chanting holy verses will ward off the virus' will lead to very

different set of actions compared to the belief that 'Corona virus spreads through aerosols which come out during cough and sneezing'. It will not be out of place to mention that among hundreds of the myths these two were repeatedly circulated and highlighted in the Indian subcontinent. For us it was important to find out, which of the two, scientific information or myths and superstitions, determined the attitude of people towards the corona pandemic.

Receptivity and Absorption of Scientific Information

A study carried out during the last plague outbreak in India (1994), concluded that in times of crisis peoples' urge to know and receptivity of scientific information related to the topical visitation increases exponentially, especially if the visitation is perceived as life threatening.[9] A common citizen gathers bits and pieces of facts and figures from various sources and only trustworthy information after testing on the anvil of cultural thought complex is absorbed and used for attitudinal change and necessary actions.

The plague outbreak was a localised phenomenon, limited to a few areas of western India. The corona pandemic is global and has had enormously big ramifications. However, the above conclusion drawn in 1994 appears to be valid during the present pandemic as well.

Public Perception, Knowledge and Attitude During the Crisis

This study used survey research methods to gauge the extent of knowledge regarding the SARS-COV-2 virus and the disease it causes COVID-19 among a section of the Indian population. About 3500 persons were contacted requesting them to fill a semi-structured questionnaire during the month of May 2020, out of which about 2780 (1694 English online, about 586 Hindi online and 500 offline) responded to our call. The data collection commenced on 7 May 2020, and concluded on 21 May 2020. The printed questionnaires have not yet reached us from a few parts of the country. Those hand filled questionnaires will be included in the final analysis after data inputting.

Among the responses we obtained, people from north India represented the most (58% of the total), although we received responses from South, and North-eastern regions as well. In total, 27 provinces (States and Union Territories) were represented in the sample.

Respondents were predominantly male (62%), young graduates/post-graduates working in the Service sector (either government or private sector) – reflecting mostly an urban, middle class population of India.

Evidently, since the SARS-CoV-2 and its associated disease was designated as 'novel', the scientific knowledge level of experts and the common citizens was not very different in the initial period. During this vacuum of information vigorous efforts were made to spread both, superstitions and pseudo science. The data analysis clearly shows that an overwhelming majority rejected the former and formed their opinion based on scientific information which was communicated by experts after proper research.

Surprisingly, most of the respondents (about 80%) cited Internet as the source of their information on Covid-19 and the pathogen that causes this disease. TV scored the second most popular position as the source of information. Knowledge regarding the pathogen – that it is a virus, which has bats as host reservoir and that it originated in Wuhan, China – is quite prevalent among the respondents.

To find if the respondents believed in sections of media that Coronavirus is bio-engineered, we asked them on the origins of this virus; 42 percent thought that it had evolved through natural processes. One in three respondents (31.9%) believed that it is manmade, and 24 percent reported that they do not know about this matter.

Thanks to a media blitz, eight among ten respondents could visually identify the shape of the virus correctly.

As many as 75% of the respondents were aware of the human-to-human transmission of the Coronavirus, particularly through droplets ejected by sneezes and coughs of the infected persons.

The data analysis has shown that about 70 per cent of the respondents identified metal and plastic as two surfaces on which they thought that the virus could survive for the longest period. A small percentage mentioned paper and wood as the surfaces on which the Coronavirus can survive.

About 80 per cent of all respondents reported that they wash hands every time they touch a foreign object. A further 10 per cent reported that they do not wash their hands, about 5 per cent did not reply.

Knowledge about the incubation period and symptoms of the disease are also high among the respondents. In the absence of a vaccine and curative medicine against Covid-19, about 90% of the respondents mentioned all the nonmedical public health containment strategies, such as, 'social distancing', 'use of masks', 'use of sanitizers' and 'frequent washing of hands'.

The analysis revealed that 70 per cent of all the respondents believed that they are at risk of contracting Covid-19.

About 64 per cent of all the respondents mentioned that they fear contracting Covid-19 when they go out in the public, evidently the fear still loomed large at the time of the survey.

Surprisingly, the fear of death from this disease is quite low among the respondents, about 85% of the respondents thought infected persons can recover from the symptoms of this disease.

Knowledge about testing for infection was also high among the respondents – about 70% of them mentioned Swab Test/PCR.

Stigmatization and othering is a usual process in all epidemics throughout the world and from historical times. We probed this aspect by asking respondents as to whom they would fix the responsibility for spreading this disease in India. About 75 percent of the respondents clearly stated that it has come with those who have travelled into India from abroad.

A very small section, about 4.9 per cent, thought that it has been brought and spread into the country by Tablighi Jamat, which is a religious organisation of Sunni Muslims. The campaign by many media channels had failed to convince the majority.

About 4.4 percent blamed the rich and 0.3 per cent thought the poor must be blamed for spreading the scourge.

We inquired the respondents on their attitudes and experiences of the 'lockdown' imposed by the Government of India – throughout the country. About 55 per cent of all respondents thought that the lockdown has helped to overcome the pandemic. When asked about the biggest problem(s) they faced during the lockdown, 24 per cent of all the respondents said that they did not face any problem. Of those who reported the problems about 31 per cent said that restrictions on movements was the biggest problem, 22 per cent reported that they lost jobs and earnings, another 16 per cent said procurement of groceries. A small percentage (3.1%) of the respondents reported that they faced hunger and starvation during the lockdown.

Surprisingly, 88.7 per cent supported the closure of all religious places and 90 per cent thought that India needs more hospitals than religious places of worship.

On the utility of social distancing, we asked the respondents if this measure would 'retard' or 'eradicate' Covid-19. In their replies, about 72 per cent of the respondents mentioned that this measure would 'retard'. Another 20 per cent suggested that social distancing would eradicate the pandemic. About 80 per cent of the respondents thought that they would continue to adhere to safety measures that they had been practicing during the lockdown.

Conclusion

The survey was carried out at the appropriate time. It was necessary to capture the knowledge, perception and attitudinal changes driven by the pandemic and lockdown during the crisis period. Such studies have far reaching consequences for future disaster management. It was also important to record that in such panic situations, how people react, do common citizens fall back on age-old myths and superstitions or do they access scientific information and use it to face the crisis. From the data analysis it is quite evident that majority of common citizens have rejected myths, superstitions, and conspiracy theories. Scientific information communicated by the scientific community, science

communicators, doctors and experts through various media channels have shaped the perceptions and thereby actions of common citizens.

On the efficacy and trust scale, TV and Internet stand out as most effective in communicating science related to the Covid-19 virus. Since the survey was conducted during the lockdown period it can be concluded that the crisis of this nature on the one hand leads to enhanced efficiency of science communicators and media channels, and on the other hand, it also increases the receptivity of deeper, valid and usable science, among the common citizens.

In a highly culturally diverse country that India is, in a short period of time, an overwhelming majority of people adopted measures suggested by the scientific community. They willingly gave up age-old religious practices and there was no resistance when the government suggested that all religious places should be immediately closed down. The ground for this attitudinal change had been prepared by information that pandemic could be fatal and spreads through physical contact. The Covid-19 crisis has caused a social upheaval of unprecedented dimensions and societies are passing though a new normal. Future studies will show us if this normal will leave a long-lasting impact on the scientific temper of common citizens or else its impact will taper off and fade away.

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