

A Study on COVID-19 Lockdown Impact on Food, Agriculture, Fisheries and Precautionary Measures to Avoid COVID-19 Contamination

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ABSTRACT

The COVID-19 epidemic which is spreading quickly is no longer a regional issue, it is an international concern calling for a global response as both lives and livelihoods are at risk from this pandemic. We are sure that it will eventually retreat, but we don't know how quickly this will happen and affect elements of both food supply and demand significantly. The Border closures, quarantines, and market, supply chain and trade disruptions could restrict people's access to sufficient/diverse and nutritious sources of food, especially in countries hit hard by the virus or already affected by high levels of food insecurity. To develop evidence-driven strategies to reduce adverse impacts of COVID-19 on food, agriculture and fisheries research data are needed. The main purpose of current study was to assess the impact of COVID-19 lockdown on Food, Agriculture and Fisheries. The results of our study based on online survey choosing 400 respondents at random from J&K revealed that in response to statements related to the assessment of the impact of COVID-19 lockdown on Food, Agriculture and Fisheries, majority of the respondents (84.5%) agree that vegetable prices and of other eatables increased, 87.5% of respondents revealed that livelihoods

are severely impacted, 83.5% of respondents agree that the storage and marketing problem greatly affected the livelihood of fishing community and 88.5% respondents agree that COVID-19 lockdown impacted the air quality. The study reveals that 87.5% reported that they were getting information on coronavirus from news outlets, 63.5% from friends, 46.5% from social media, 28.5% getting information from health organizations, 23.5% from health professionals and 3% from other sources. The study, further revealed that majority of the respondents (87.5%) were practicing social distancing, 71.5% respondents were frequently washing hands with soap and water, 39.5% respondents were wearing face masks, 38.5% respondents were stocking up on essentials, 27.5% respondents were using hand sanitizers, 27% respondents were working from home and 14.5% stocking up on medication. The study also revealed that as guide by WHO and health ministry (87.5%) respondents were practicing social distancing, 71.5% were frequently washing hands with soap and water, 39.5% were wearing face masks, 38.5% were stocking up on essentials, 27.5% were using hand sanitizers, 27% were working from home and 14.5% stocking up on medication. The respondents (52.5%) revealed that they do not believe home remedies can help against the COVID-19, 86%

do not believe that coronavirus is less threatening than the flu, 81% do not believe that at present any antibiotic can kill COVID-19 and 46.5% feel very stressed because of COVID-19 threat. The study also revealed that 71.5% respondents believe that COVID-19 lockdown will impact food, 61.5% believe it will impact agriculture and 54.5% believe that it will impact fisheries. In case we are not able to control COVID-19 spread quickly then hunger/poverty threat may be more dangerous than COVID-19 threat. The researchers suggested that policy makers, health providers and religious scholars should provide mental support as is needed at this time to the vulnerable group in J&K as COVID-19 is not going away any time soon. To cope with COVID-19 threat and lockdown stress, we should follow WHO guidelines as well as health ministry. We should keep ourselves busy in physical activities, religious activities and social work to avoid COVID-19 stress.

Keywords: Food; Corona virus; Agriculture; epidemic; precaution; Fisheries; Kashmir; Statistics

INTRODUCTION

The world at present is facing an unprecedented threat from the COVID-19 pandemic caused by the SARS-CoV-2 virus (referred to as the COVID-19 virus). The maximum countries worldwide are following the advice from the World Health Organization (WHO) regarding the introduction of physical distancing measures as one of the ways in which transmission of the COVID-19 disease can be reduced to a greater extent. Emergence of novel coronavirus (SARS-CoV-2) in Wuhan China has added new member to the human coronavirus family. Sea food market in Wuhan has been treated as epicenter of this fatal disease (Chen et al, 2020). Although phylogenetic studies have shown that the bats appear to be the reservoir of SARS-CoV-2, but intermediate host detail is still under investigation. Persistence of SARS-CoV-2 is more stable on plastic and stainless steel as compared to cardboard or copper with virus load detected up to 72 hours after application on these surfaces (Chen et al, 2020). Recent studies examined

the patterns of molecular divergence between SARS-CoV-2 and other coronaviruses (Kirchdoerfer and Ward, 2019). The lessons learnt from the 2014 EVD epidemic in West Africa are clear; while health concerns remain an immediate and primary priority, we cannot ignore livelihoods and impacts linked to food protection since we are already on the verge of worsening humanitarian crises in countries. Globally, there is enough food for everyone so no need for the world to be panic. Policy makers should keep this in mind that virus threat is yet worldwide so they need to be careful not to repeat mistakes made during the 2007-08 food crisis which turned health crisis into food crisis. Worldwide food supply chain is complex web that involves producers, consumers, agricultural and fishery inputs, processing and storage, transportation and marketing etc. The virus is spreading and COVID-19 positive cases are increasing daily so in future food system will be challenged if COVID-19 lockdown continues. There is strong proof that COVID-19 is a respiratory disease and therefore food cannot be the cause of its transmission, because there is no evidence of this virus that suggests the transmission through food. The virus must need host that too an animal or a person. Recent findings have clearly demonstrated that COVID-19 is spread by direct touch with respiratory droplets (WHO, (COVID-19) Situation Report – 66). Breathing droplets as a function of becoming heavy may be collected on various surfaces and the individual may become affected as they come into contact with these surfaces (Liu et al., 2020). The various types of these surfaces involve doors, gates, knobs, and other widely used surfaces. As recent research on the COVID-19 have clearly demonstrated, that the virus stays active on plastic and stainless steel for up to 72 hours while its lifespan is 24 hours in the case of cardboard (Chen et al, 2020). Therefore, bearing in mind the rate of transmission of this virus and its transmission paths in

particular, it is necessary to introduce specific hygienic measures for food industry (<http://www.fao.org/3/a1552e/a1552e00.pdf>). The food as such will not be the origin of infection, but the packaging product may be a suitable surface for the virus to be attached. If this situation prevails, it will generate a catastrophe, thus rendering it mandatory for the food and food manufacturing industry to take the precautions as given by the WHO time and again and bring the graph of this epidemic down. The initiatives may include sufficient worker safety and continuous decontamination of the industry with the chemicals approved by the WHO. The food factories need to take the requisite measures to hold the food products and distribute the goods. In Recent case in South Delhi India, a pizza delivery boy was found to be positive and all of the boy's contacts were tested and it was noticed that 70 people were found positive giving an impression that adequate care should be taken when distributing the food products. As per the OPHI data, it is clearly mentioned that drinking water is essential for the living standards and WHO 2019 reports that much of the global disease burden and weakened immune systems are linked to unsafe drinking water. As per Peiris *et al.*, 2003, SARS epidemic had potential links to water and wastewaters. Drinking of the water regularly and staying well hydrated helps our immune system. There is actually little proof of COVID-19 virus replication in drinking water or waste (WHO, 2011 and Water and Sanitation (Water Research Australia, 5 March 2020). The anatomy and chemical composition of COVID-19 virus is very close to that of other human surrogate coronaviruses with proof of both surviving in the field and successful inactivation mechanisms. Although there is not any proof of COVID-19 transmission via waters but that doesn't mean we will not take proper precautions for safe drinking waters. Proper measures should be taken to improve the water quality. As COVID-19 has been declared as pandemic and every possible

step should be taken to decrease the graph of this deadly disease. The first and important thing is to consider the alternatives where direct contact can be minimized. Decontamination tunnels should be established at every check point to minimize any threat that is coming from outside. Vehicles carrying the essential supplies must be decontaminated and also the supply should not be utilized immediately, thereby giving proper time for its distribution. Proper handling procedures should be followed for the supply of these goods.

The COVID-19 lockdown and the fear of the pandemic will affect agriculture start ups and companies having less manpower at physical office spaces and moreover for start ups to work from home at initial stage is not feasible for their growth. The Prime Minister of India announced the extension of lockdown till 17 May 2020 to combat the COVID-19 outbreak and flatten increasing curve of the COVID-19 positive cases. The report published by Barclays cut its growth forecast for the country to 0% for calendar year 2020 from its earlier projection of 2.6%, holding that the economic fallout will be worse than it had earlier estimated. The economic loss is estimated to be close to \$234.4 billion or 8.1% of GDP, assuming that India will remain under a partial lockdown at least until the end of May 2020. This is much higher than the \$120 billion which was estimated earlier for roughly the same time period previously. It is expected that due to current lockdown the agriculture startups will not be able to escalate the services and the need of the customer will change. According to the France water authority, traces of coronavirus have been found in water which may worsen the condition of aquatic life including fish. Fish and other aquatic foods are a key part and a highly nutritious food group of major social, cultural and economic significance. Disruptions in supply chains for fish and aquatic foods are already happening due to disruptions in transportation, trade, and

labour. Falling production from reduced fishing efforts and delayed stocking of aquaculture systems will lead to lower supplies, access, and consumption of these foods. Decreased consumer demand and increased transaction costs will have a knock-on effect that will push the price of fish and aquatic foods up and make them less affordable for poor consumers. Many people employed in these supply chains, such as fish vendors, processors, suppliers or transport workers will lose their jobs. In India, fisheries is an important sector of nutrition and food security. More than nine million people are directly dependent on fisheries for their livelihood. It employs over 14 million people and contributes to over 1 percent of the India's Gross Domestic Product. It is expected that COVID-19 lockdown have significant impact on many human activities including livelihoods, food and nutrition security, gender equality, jobs and potential social unrest. In view of the vast literature available on COVID-19, we chose present study to access the impact of COVID-19 lockdown on food, agriculture, fisheries and discuss precautionary measures to avoid COVID-19 Contamination.

MATERIAL AND METHODS

In the current online survey conducted in Kashmir valley a well-developed pretested questionnaire was used to collect the information from a sample of 400 people selected using stratified random sampling technique through Google Classroom, Social media (Facebook and WhatsApp). The respondents under study were explained the purpose of the study to get their consent. The present survey was conducted to assess the concerns about COVID-19 and Impact on Food, Agriculture and Fisheries. The sample size for our study was computed using the formula given as (Cochran, 1997)

$$n = \frac{Z_{\alpha}^2 P(1 - P)}{d^2}$$

Here, we take $p=0.5$, $Z_{\alpha}=1.96$ and $d=0.05$ which gives the sample size $n \sim 384$ and we

decided to chose $n = 400$ for this study. The data collected by online survey was tabulated and analyzed and interpreted statistically. Statistical software SPSS (version 21) was used for analysis purpose.

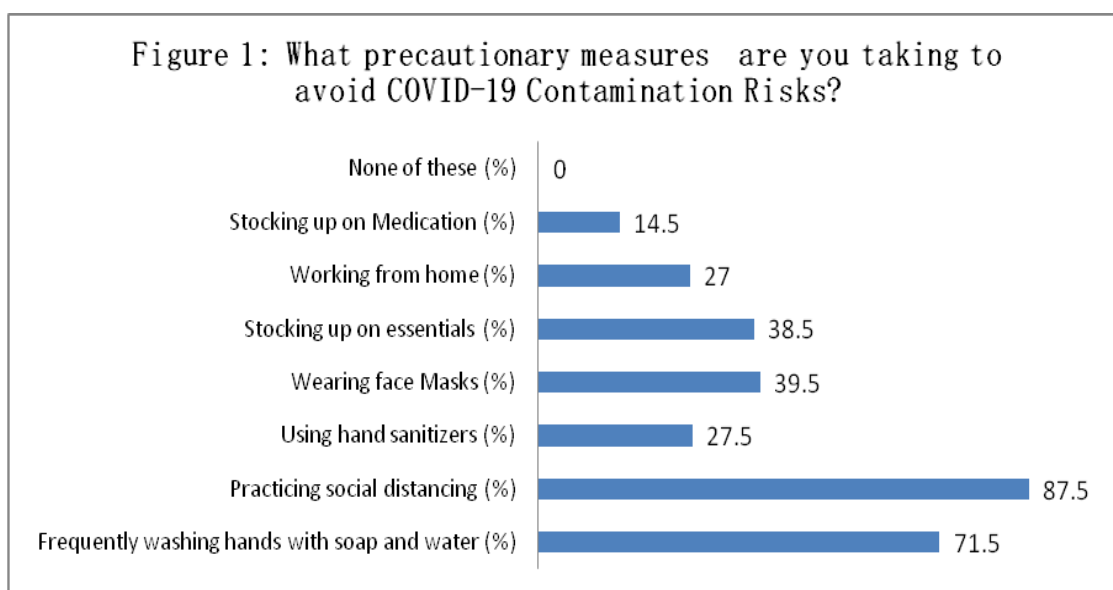
RESULTS AND DISCUSSION

The data presented in Table 1, reveals that in response to statement 1, majority (84.5%) respondents agree, in response to statement 2, majority (73.5%) disagree, in response to statement 3, majority (92.5%) agree, in response to statement 4, majority (84.5%) disagree, in response to statement 5, majority (96.0%) agree, in response to statement 6, majority (53.5%) disagree, in response to statement 7, majority (53.0%) of respondents reported that they don't know, in response to statement 8, majority (85.5%) disagree, in response to statement 9, majority (73.5%) agree, in response to statement 10, majority (87.5%) agree, in response to statement 11, majority (46.0%) disagree, in response to statement 12, majority (55.0%) disagree, in response to statement 13, majority (91.5%) agree, in response to statement 14, majority (87.0%) agree, in response to statement 15, majority (64.5%) agree, in response to statement 16, majority (83.5%) disagree, in response to statement 17, majority (41.5%) disagree, in response to statement 18, majority (43.5%) reported that they don't know, in response to statement 19, majority (88.5%) agree, in response to statement 20, majority (44.5%) disagree and in response to statement 21, majority (53.5%) disagree. It is observed that the price of daily use commodities increased due to COVID-19 lockdown. The government as well as people should take utmost care, not to allow food supply by any person having symptoms of COVID-19. In general, people should take precautionary measures as per guidelines of WHO and health ministry to minimize the risk of infection. The government and civil society should check cleanness of market and rates to defend people from COVID-19 infection and loot of businessman's.

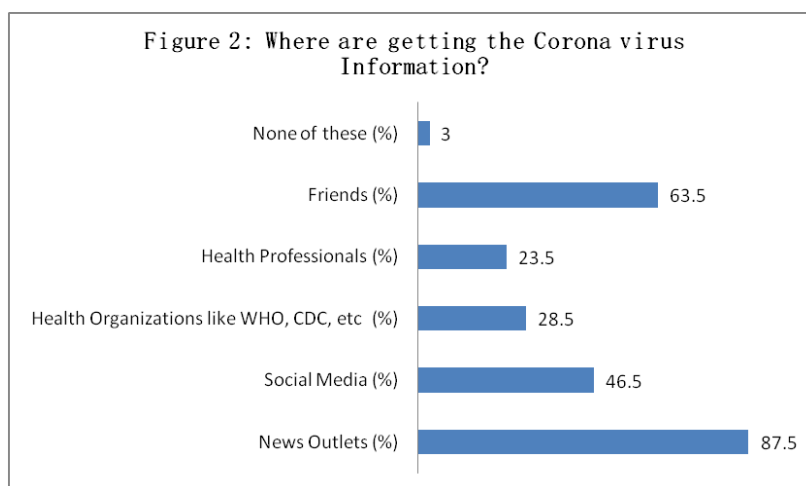
Table 1: Impact of COVID-19 lockdown on Food, Agriculture and Fisheries as per respondents

S.NO.	Question asked	Agree (%)	Disagree (%)	Don't Know (%)
1	Have the vegetable prices and of other eatables increased?	84.5	9.0	6.5
2	Have the farmer employment increased?	3.0	73.5	23.5
3	Is there a rise in the prices of beef and live/feeder cattle?	92.5	3.0	4.5
4	Is there increase in rice supply in market?	2.5	84.5	13.0
5	Is there sharp decline in driving across the state?	96.0	1.0	3.0
6	Has the prices of rice and wheat increased?	42.0	53.5	4.5
7	Is there enough availability of items in stores?	19.5	27.5	53.0
8	Has shopping increased?	4.5	85.5	10.0
9	Has household income changed?	73.5	5.5	21.0
10	Will the livelihoods be severely impacted?	87.5	2.5	10.0
11	Has the food consumption increased?	41.5	46.0	12.5
12	Are there enough food stocks in households?	23.5	55.0	21.5
13	Has the access to market effected?	91.5	1.5	7.0
14	The Corona virus poses a global threat?	87.0	4.5	8.5
15	The fisheries sector may have a threat in future?	64.5	18.0	17.5
16	The storage and marketing problem greatly affected the livelihood of fishing community?	83.5	3.5	13.0
17	Fishermen are likely to be one of the hardest hit due to the drop in daily income?	26.5	41.5	32.0
18	The COVID-19 will impact on attitude of people towards sea food?	23.5	33.0	43.5
19.	The COVID-19 lockdown impacted the air quality?	88.5	5.5	6.0
20.	Russian poplars are not harmful in general so no link with COVID-19?	21.5	44.5	34.0
21.	We are not concerned much about mask wearing, air purification?	18.0	53.5	28.5

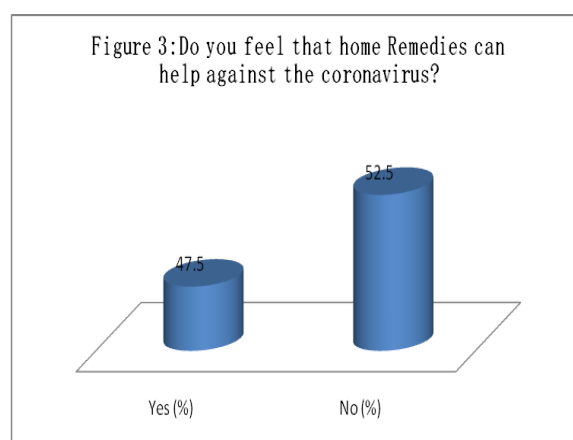
The data presented in Figure 1, revealed that majority of the respondents (87.5%) were practicing social distancing, 71.5% respondents were frequently washing hands with soap and water, 39.5% respondents were wearing face masks, 38.5% respondents were stocking up on essentials, 27.5% respondents were using hand sanitizers, 27% respondents were working from home, 14.5% stocking up on medication and 0% respondents do not follow none of these. The respondents in majority believe that they were taking precautionary measures but not to the extent as guide by WHO, health and welfare ministry because of lack of facilities. The coronavirus is much more dangerous than influenza viruses, hence worldwide the exponential rise in COVID-19. The demand for chicken drops 60% in India. In India Farmers are resorting to panic sales even as they seek government assistance as the Covid-19 crisis is more widespread than the bird flu outbreak of 2006, which was restricted to western parts of the country.



The data presented in Figure 2, reveals that majority of the respondents (87.5%) reported that they were getting information on coronavirus from news outlets, 63.5% respondents reported that they were getting information from friends, 46.5% respondents were getting information on coronavirus from social media, 28.5% respondents were getting information health organizations, 23.5% respondents were getting information on coronavirus from health professionals and 3% respondents were getting information from none of these. It is important that everyone stay aware of the latest information on the COVID-19 outbreak, available on the national, state and local public health authority to protect self and prevent its spread till some vaccine/treatment is developed to cure COVID disease.

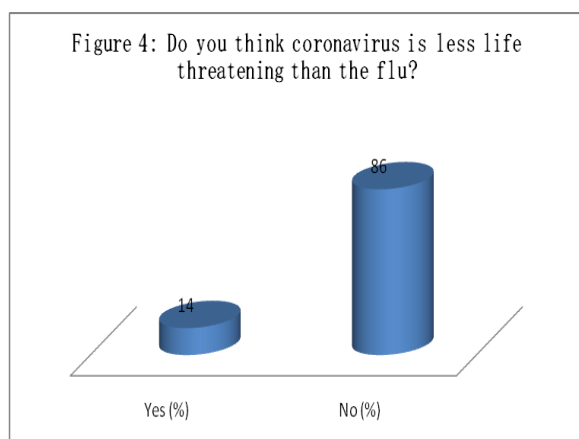


The data presented in Figure 3, revealed that majority of the respondents (52.5%) do not believe that home remedies can help against the coronavirus. However, 47.5% respondents believe home remedies can help against the coronavirus. The water, sanitation and hygiene (WASH) services are also at risk of disruption by COVID-19 lockdown measures, posing further threats especially to children’s health through water-borne diseases. Worldwide there is not currently a *cure* for COVID-19 or a vaccine *against* COVID-19. In absence of any treatment, certain supplements and *natural remedies can* prepare our immune system *to do battle against* the dangerous infection caused by the novel *coronavirus* (COVID-19). The respondents in majority believe that we can prevent spread of COVID-19 by taking precautions.

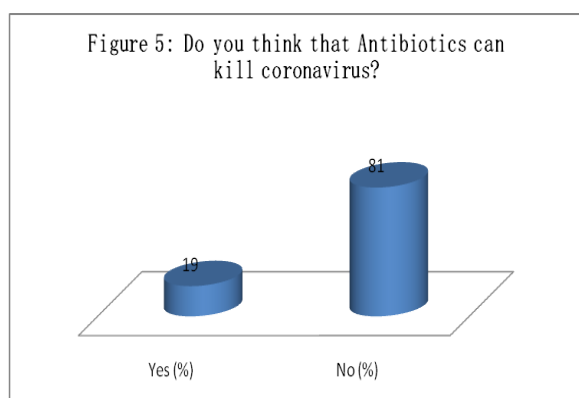


The data presented in Figure 4, revealed that majority of the respondents (86%) do not believe that coronavirus is less threatening than the flu, only 14% respondents believe coronavirus is less threatening than the flu. The respondents in majority believe that we can prevent ourselves from COVID-19 by delaying contact with COVID-19. The COVID-19 spread besides creating health problems created social, economic and religious problems also (Bilal et al., 2020). It is also

reported that in addition to poor children, there are other vulnerable child populations worldwide for whom the effects of the pandemic risk being especially severe and whose protection warrants special attention (UNICEF, 2017). It is important people help each other and follow health advisory to improve immune system till some treatment may be developed to control the spread of COVID-19.

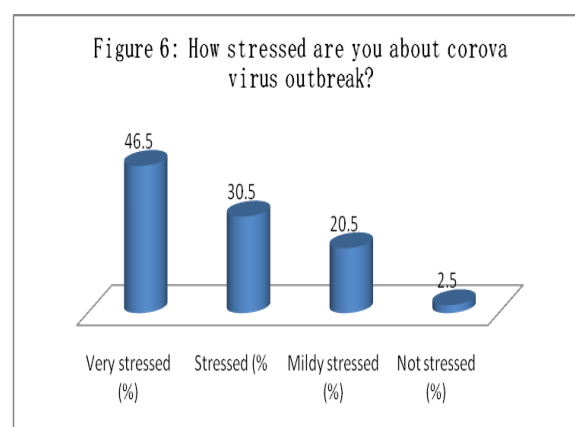


The data presented in Figure 5, revealed that majority of the respondents (81%) do not believe that at present any antibiotic can kill corona virus, only 19% respondents believe antibiotic can work to cure COVID-19. The doctors at present are treating symptoms of COVID-19 not COVID-19. The biggest lesson never to be forgotten once we get out of the current pandemic, through united efforts, is without health there is no economy.



The data presented in Figure 6, revealed that majority of the respondents (46.5%) feel very stressed, 30.5% feel

stressed, 20.5% feel mildly stressed and 2.5% reported that they do not feel stressed because of COVID-19 threat. In fact, majority of the people consider this as an unprecedented health crisis with potentially more grievous consequences than the earlier flu. COVID-19 has emerged as a global pandemic which costs more than 2.6 lakh lives upto 5 May, 2020. The people in J&K feel stressed on examining medical facilities as resources of country as in India there is a shortage of PPE kits, hydroxychloroquine (HCQ) tables, masks and ventilators.

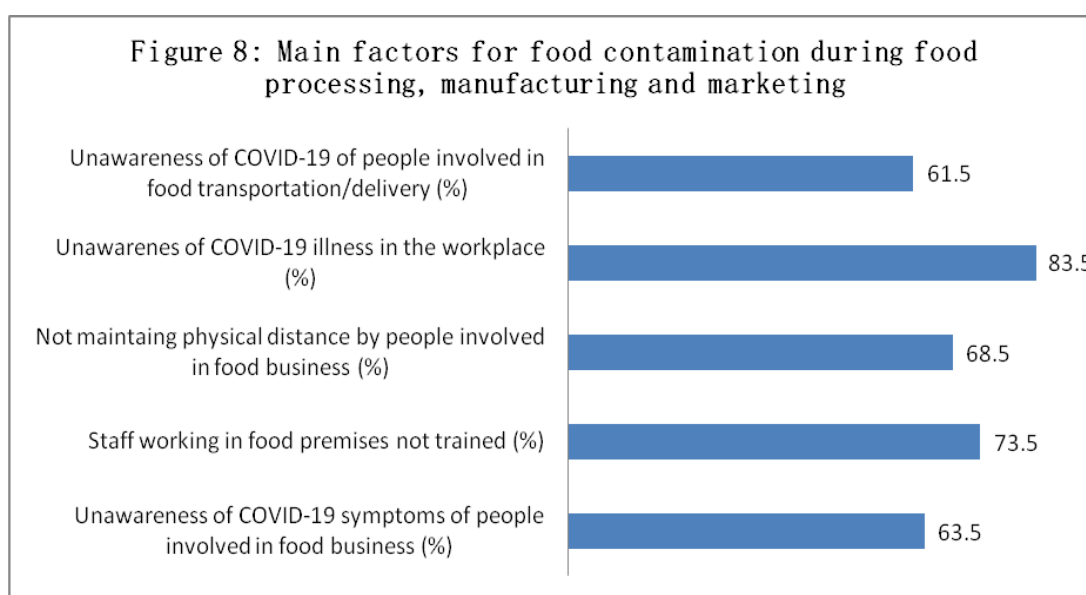
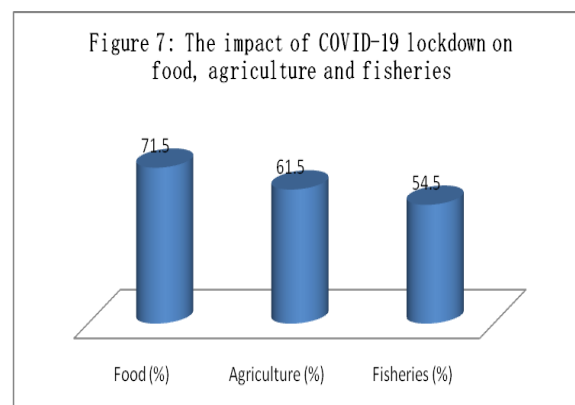


The data shown in figure 7, reveals that 71.5% respondents believe that COVID-19 lockdown will impact food, 61.5% believe it will impact agriculture and 54.5% believe that it will impact fisheries. The reduced household income due to COVID-19 lockdown will create health problems for poor families as it will force poor families to cut back on essential health and food expenditures. The Food and Agriculture Organisation (FAO) expects shifts in the supply of and demand for food worldwide. Further, it warns of a world “food crisis” if countries do not protect vulnerable people from hunger and malnourishment, and de-clog food supply chains. The United Nations has warned the world that the Covid-19 crisis around the world could trigger “food shortages” and World Food programme (WFP) has noted that the Covid-19 crisis is “threatening to affect millions of people already made vulnerable by food insecurity and malnutrition.” The small and marginal

farmers will be badly affected if due to COVID-19 lockdown they are unable to continue working their land, earn remunerative product prices, and gain access to markets for purchase or sale agricultural produce. Indian Government agri-research body, The Indian Council of Agricultural Research (ICAR) apex body for coordinating, guiding, and managing research and education in agriculture in the entire country under the aegis of Ministry of Agriculture and Farmers Welfare is assessing the impact of Covid-19 lockdown on agriculture and allied sectors and taking measures to minimise its effect on the country's food security. ICAR is preparing documents on the possible impact of COVID-19 lockdown on agriculture and allied sectors and it is expected that ICAR study will help the government to take further action so that the food system remains unaffected. It is very important to note that the corona virus will enter business premises only when an infected person enters or contaminated products or items are brought into the premises.

The data shown in Figure 8, reveals that 63.5% respondents believe that unawareness of COVID-19 symptoms of people involved in food business, 73.5% respondents believe that staff working in

food premises not trained, 68.5% respondents believe that people involved in food business not maintain physical distance, 83.5% respondents believe that unawareness of COVID-19 illness in the workplace and 61.5% respondents believe that unawareness of COVID-19 disease by people involved in food transportation/delivery are the main risks for food contamination. To minimize the spread of COVID-19 infection via food industry it is very important people involved in food business should be provided written instructions and training on how to prevent the spread of COVID-19 infection. The trained people should be involved in food business who practically follow WHO and health ministry guidelines.





In Kashmir valley very few people were seen fishing during current lockdown. In a group discussion, the fishers reported that in general they are following COVID-19 lockdown as they don't find easy market for sale of their catch. They don't have storage facilities so they fear fish catch may get wasted or caught by police. How long people will survive with no work, little money? India nears the end of Lockdown 3.0, a last word on reopening of economic activity or extension of curbs is yet to come as it is a big issue for policy makers, government to continue COVID-19 lockdown (15 months approximately) till some vaccine is developed. We have to start work in a systematic way to defend ourselves from COVID-19 infection as well as from starvation and depression. The coronavirus COVID-19 is affecting 212 countries and territories around the world and 2 international conveyances. Globally, till today as on 12-05-2020, there are 4,270,751 Covid-19 positive cases and more than 287,540 people have died due to Covid-19 so far and people across the world rejoin work and get out of their houses fearing a second wave of coronavirus infections. The fears regarding a second wave of coronavirus are coming true for many countries which have loosened their restrictions. Germany has seen a cluster of cases revolving around a slaughterhouse and in South Korea reported 88 new cases from a single nightclub where a Covid-19 afflicted customer had visited. Similarly,

there is a rise in COVID-19 cases in Russia, USA, Pakistan etc.

CONCLUSION

The respondents in majority were following precautionary measures to avoid COVID-19 infection as per WHO and state guidelines on pandemic that is regularly thoroughly clean hands with soap and water, maintaining physical distancing and staying home, avoid touching eyes, avoid touching nose and mouth, keep up to date on the latest COVID-19 hotspots (cities and local areas where COVID-19 is spreading widely). The contaminated hands can travel the virus to a person although the likelihood of an infected person contaminating commercial goods is small and the risk of COVID-19 infection spread from a package that has been moved, travelled, and exposed to different conditions and temperature is slow also. To decrease food contamination and the spread of COVID-19 infection, it is very essential people involved in food industry should be provided written instructions and training on how to prevent the spread of COVID-19 infection. The current COVID-19 pandemic all over the world is causing general concern among the people. The novel coronavirus has spread widely in India relatively recently compared to other countries, and the number of reported infections is low so far, with 70,827 cases with 2,294 deaths and in J&K there are 884 positive cases with 9 deaths, recovery rates across the world are around

35% as on May 12, 2020. In J&K The COVID-19 lockdown impacted the psychological wellbeing of entire community and if the COVID-19 lockdown continues for a long time or spread of disease is not controlled soon, it may result in more dangerous threat, hunger/poverty. The COVID-19 lockdown may help in limiting the health crisis, but complete shutdown of all economic activities except essential services will create an economic crisis and misery for the poor, with massive job losses and rising food insecurity. In any disaster or pandemic situation the poor sections of society are always the hardest hit. In India about 85% of farm households being small and marginal farmers, and a significant part of the population being landless farm laborers, welfare measures with sincere implementation to contain any damage from COVID-19 are definitely going to help them. The main focus of Indian of the Government therefore has to be to protect the lives of every citizen in the present crisis. The economic shock will likely be much more severe for India, for two reasons. First, pre-COVID-19, the economy of India was already slowing down, compounding existing problems of unemployment, low incomes, rural distress, malnutrition, and widespread inequality. Second, India's large informal sector is particularly vulnerable. There are disruptions in agriculture supply chains because of transportation problems and other issues due to COVID-19. The prices for wheat, vegetables, and other crops have declined, yet consumers are often paying more. The closure of hotels, restaurants, sweet shops, and tea shops during the COVID-19 lockdown is depressing milk sales, poultry, sea foods as due to misinformation especially on social media, that these are the carriers of COVID-19. The COVID-19 lockdown may result in many deaths due to starvation as per experts. We will never know how many people died of starvation, because no state government will admit to starvation deaths (indianexpress.com, dated 4/5/2020). In our

study, majority (87.5%) of the people understudy were practicing social distancing, 71.5% were frequently washing hands with soap and water, 39.5% were wearing face masks, 38.5% were stocking up on essentials, 27.5% were using hand sanitizers, 27% were working from home and 14.5% stocking up on medication. The respondents in majority believe that they were taking precautionary measures but not to the extent as guide by WHO, health and welfare ministry because of lack of facilities. The COVID-19 lockdown has choked off almost all economic activity, causing untold misery for informal workers and the poor, who lead precarious lives facing hunger and malnutrition. The people involved in agriculture, fishery, poultry, migrant, and other informal workers were hardest-hit during the COVID-19 lockdown period. The best way to address this urgent need is to use social safety nets extensively to stabilize their lives with food and cash. The Indian government as well as several state governments have announced many relief packages. It is important to record that the corona virus will enter business premises only when an infected person enters or contaminated products or items are brought into the premises. To cope with second and third wave of coronavirus, people should follow WHO guidelines and health ministry, keep themselves busy in physical activities, religious activities and social work. The researchers finally suggested that policy makers, health care providers and religious scholars should provide mental support to the vulnerable group. To survive in presence of COVID-19, people should take precautionary measures till some treatment is developed for COVID-19 infection.

Source of Conflict: All the authors declare that are no conflict of interests

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