Analysis of youths' perspective in India on and during the pandemic of Covid-19

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Abstract:

Around the world, almost all countries have sought to stop the spread of the 2019 novel coronavirus (Covid-19) by lockdown and quarantine protocols, implemented from local to the national scale. For every scientific development and policy implementation which comprehensively connects this pandemic, the event is not very sound about the extensive socio-economic impact ushered with this disaster. In this paper, using a combined qualitative-quantitative approach, Q method, we have tried to assess the peoples' discernment from different perspectives. This work was done through questionnaire survey method, during the national level lockdown 1.0 in India. We have differentiated the perception of youth respondents into 7 factors taking 6 dimensions on Covid-19 pandemic (viz. science, society, environment, economy, politics and religion). This work yielded a firsthand ground level insight on the comprehensive but diverse responses from the youths and their opinion for Covid-19 pandemic in India. We are hopeful that this work might open new avenues to understand the people-Covid-19 connection, both for future research and policy implementation.

Keywords: Covid-19; pandemic; Q methodology; Principal Component Analysis; India;

Introduction:

The Novel Coronavirus (Covid-19) has created unexpected stagnation around the globe. This third zoonotic human coronavirus (CoV) of this century emerged in December 2019 in Wuhan, Hubei Province, PR China (Zhu et al., 2020; Hui et al., 2020). The coronaviruses comprise a large family of RNA viruses that cause respiratory and intestinal infections in animals and humans. Similar to this one, two infections also emerged previously, named severe acute respiratory syndrome coronavirus (SARS-CoV, in 2002) and Middle East respiratory syndrome coronavirus (MERS-CoV, in 2012). The novel Wuhan virus comes under different names (2019-nCoV in the research literature, SARS-CoV-2 by International Committee on Taxonomy of Viruses, COVID-19 by WHO).

After Covid-19 cases were first reported to the World Health Organization on 31st December 2019, within three and a half months it was declared a pandemic by WHO (World Health Organization, 2020). India reported its first Covid-19 case from Kerala on 30th January. On 24 March, the Government of India declared 21-day Nationwide lockdown (25th March to 14th April, Lockdown 1.0), then 17-day lockdown (from April 15th. to May 3rd, Lockdown 2.0) which was again decided to continue up to 17th. May 2020 (Lockdown 3.0).

There are various popular and intensive research works are going on, mainly concentrated on medical (vaccines), nature and spread of SARS-CoV-2 and also governmental policies. It is hardly we could find any work on understanding the common peoples' sufferings during a lockdown or after lockdown period, either in local or to a global scale.

This study was conducted within the first phase of the lockdown period of 21 days. The survey was done using electronic media only.

The complexity of Covid-19 pandemic:

The main objective of the study was to understand different perspective and opinions expressed by Indians during the lockdown and their belief system which characterizes their behaviour. Historically, it has been seen that in time of different pandemics, different types of belief systems and conceptions had emerged. According to Greek historian Procopius, in the time of Justinian plague of 541 AD, people believed that the plague was caused by demons. To prevent the demon from entering home doors were kept locked. Many Christian people thought (not rare even today) that getting some virulent infection was a punishment from God for their sins (Stafford & Flatley, 2018). The plague was caused due to *Yersinia pestis* bacteria carried out

by the black rat (*Rattus rattus*) and Oriental rat flea (*Xenopsylla cheopis*). The transmission occurred mainly due to black rats which were used to travel on grain ships and carts from North Africa to Constantinople (Horgan, 2014).

Similarly, in the case of Black Death which had affected Europe in 1347 and claimed 200 million lives in 4 years, the same microbe, *Yersinia pestis* which caused the Justinian plague was responsible for Black Death. Any scientific understanding was not present at that time but people understood that it had something to do with proximity. So, newly arrived sailors at the port were kept in forced isolation in their ships for 40 days which was known as *quarantino* to prove that they were not sick. The word quarantine originated from that time and situation (Roos, 2020).

For the first time in the early 15th. Century, plague-stricken London imposed laws for separation and isolation of the infected people. Infected people and their homes were meticulously marked. There was also a belief that animals like cats and dogs were the carriers of the disease and massacred the system ruthlessly (Roos, 2020).

Similarly, there are also many stories and theories regarding later epidemics and pandemics and current Covid-19 is not an exception. A wide range of reasons is being discussed on the internet and social media about its causes, like - habitat destruction and wild animal contact (Vidal, 2020), astrological reasons (Sastharam, 2020), a bio-weapon (Sharma, 2020) and many more. There is also diverse opinion on how to combat Covid-19, like - social isolation and proper sanitization (WHO, 2020a), consumption of indigenous medicines (Chandna, 2020), herd immunity (The Economic Times, 2020), Vaccination (The Mercury News, 2020) etc. Naturally, flooded information in electronic, social and print media, 21st-century information and rationality characteristics are very different from its previous pandemics and also very chaotic (The Print, 2020). In such a situation WHO Director-General compelled to state: “We’re not just fighting an epidemic; we’re fighting an infodemic” (WHO, 2020b).

Q -Methodology:

Q-methodology was first proposed in 1935 by William Stephenson (Stephenson, 1953). It is a combination of quantitative and qualitative methods capable of discerning existing subjective perspectives on a controversial area. It based on a structured exploratory statistical approach to reveal stakeholder’s viewpoint on a matter under investigation (Zabala et al., 2018). It can be used in various fields for understanding stakeholder’s perspective on issues like tourism (Fairweather & R. Swaffield, 2001), conservation research (Rastogi et al., 2013), linguistics

(Lundberg, 2019), sustainability (D'Amato et al., 2019), medical research (Stenner et al., 2000) etc. The details of Q-methodology is given by Job & De Graaf, (2016) and Watts & Stenner, (2005). In this study, some brief steps were adopted for designing and conducting the study adapted from authors Sexton et al. (1998) and Zabala et al. (2018).

Applying Q-methodology:

Research Design:

The first step of the research is to develop a concourse containing all possible statements about different opinions on a subject under study. In this study, the focus was of people's perspective on Covid-19 and their priorities on such issues while living with the crisis. Since main opinions and speculations in public perceptions are generally generated through the dissemination of opinions and theories on electronic media such as television, social media and internet, the concourse is created using news items, magazine articles, blogs, WhatsApp messages and as well as rumours and speculations heard in conversations. 61 most prominent and relevant statements, which represent the large concourse, were kept as the Q-set for conducting the study.

A normally distributed response chart was made (Figure 1). The chart was made in an editable word document, so the respondents can replace the chart values with the desired statement numbers. Respondents are instructed to fill all the 61 statements in 61 boxes of the Q-response chart, so a forced response and revealed preference filling-up method has been used.

Figure 1: Q Response Chart

The response chart was made without giving a neutral point at the middle because of the diverse issues included in the Q-set which could result in shifting of zero salience. Rather the participants were encouraged to fill the response chart according to their agreement to disagreement or vice-versa (Webler et al., 2009).

Data collection:

The respondents or the P-sample is taken from various fields of society and locations all over India for conducting the study. Snowball sampling has been used for collecting the information. The questionnaires are sent in editable document format to the immediate contact person through electronic communication (using WhatsApp and Email) and asked for further dissemination. Apart from the Q-sort data, some information has been taken for understanding the respondent's characteristics and their respective perceptions. A total of 90 participants located in 18 States in India were surveyed. Age, sex, education level, monthly income, current designation, affiliated organization details of all the respondents were taken into account. Among the 90 respondents, 4% did not reveal their monthly income details. The demographic characters are depicted in Figure 2.

Figure 2. The demographic composition of the participants

The participants are characterised through (a) age, (b) level of education, (c) gender and (d) income.

Analysis

For analysis, open-source software KADE (1.1.0) (Banasick, 2019) and free R-package ‘qmethod’(Zabala, 2014) have been used. Principle Component Analysis (PCA) is applied for the extraction of factors. 7 factors or viewpoints are selected for explanation according to the following criteria: (a) the first criterion is the eigenvalues of the factors should be >1 taken were lesser values do not significantly distinguishable for any more viewpoints (Watts & Stenner, 2005a); (b) the second criterion is for considering shared perspective for at least two significant Q-sort loadings have to be retained in each factor (Brown, 1980); (c) the third criterion is to have factors explaining the variance of at least over 50% (D’Amato et al., 2019). The Intersection of the three criteria resulted in 7 factors which are used in the study and given in Table 1. After 30th-factor eigenvalue came out to be >1 , hence the column is not included in Table 1. The largest correlation coefficient among factors is also shown in the table as mentioned by Shen et al. (2020). Auto-flagging is done at $p < 0.05$ level and requiring a majority of common variance. For obtaining clearer and more interpretable structures of the result, Varimax rotation is applied.

Table 1: Criterion for choosing numbers of viewpoints

Factors	Largest Factor Correlation Coef.	% Explained Variance	Min. two Q-sort per Factor
2	0.80	40	Yes
3	0.74	44	Yes
4	0.70	47	Yes
5	0.67	50	Yes
6	0.61	53	Yes
7	0.56	56	Yes
8	0.59	59	No

Limitations

Since the survey was done using the internet, it restricted the reach of the survey to a larger community. The survey can only be responded by people having internet connections and computers which are still not present in many areas of India. Although any query or problem

posed before any respondent while answering the questionnaire guidance was given over the phone, or in-person and card-based physical Q-sorting could have captured relatively clearer pictures and opinions but impossible during the lockdown period. Also, as the familiarity with technology was a prerequisite to answer the questions, could have played an important role in the exclusion of the older population in participating in the survey. All the mentioned factors are supposed to limit the generalization of the study and can be regarded as major limitations of the conducted study.

Results:

Among the extracted factors, F1 covers 36% of total variance followed by 4% for F2 and F3 both. For the rest of the factors explained variance of 3% for each factor. 42% of participants loaded significantly to the factors 1-7, having 6,3,3,4,10,4,8 numbers of significant loadings respectively. Factor scores for each statement are given in Table 2. For further information, refer the supplementary table 1 and 2.

Table 2: List of statements (Q-Set) with factor scores.

Distinguishing statement numbers for each factor are set in bold, Consensus statements which have Z-scores are statistically similar across 7 factors, (statements 7 & 51) are in italics. Composite Q-sort of all 7 factors is shown in Supplementary Figure.

St. No	Statement	F1	F2	F3	F4	F5	F6	F7
1	Using sanitizer or washing hands with soap reduces infection risk from Corona.	5	5	5	3	4	5	4
2	The public should wear a face mask when leaving home.	3	-5	4	1	1	3	4
3	After Corona, the world will act as a single unified family.	-5	0	-4	0	-4	-5	-3
4	Antibiotics are effective in preventing & treating Corona.	-1	-5	3	3	-2	2	-4
5	Cases in India are low due to insufficient testing of Corona.	4	1	-4	5	5	1	2
6	Casual behaviours of suspected individuals are to blame for creating a Corona mess in India.	1	4	4	5	3	-1	5

7	<i>China has concealed actual data about the spread of Corona.</i>	2	3	2	2	2	3	2
8	Climate change is a major driver of this pandemic	-4	2	0	2	0	3	-2
9	Extreme weather (Cold winter and Hot summer) will kill Corona.	-4	-4	0	0	-2	-5	-5
10	Complete lockdown of national, transit borders and social distancing (like China) for this pandemic is necessary.	4	5	3	1	3	4	5
11	Consumption of indigenous natural materials is the solution to the Corona crisis.	0	-1	-1	0	-3	4	-3
12	Control by Police or Military forces is a necessary step to stop the pandemic.	1	-2	1	0	1	5	2
13	Corona is a bioweapon made by China for attacking rich countries.	-1	-3	-2	4	-2	0	3
14	Corona will affect everybody equally.	-3	2	-5	2	-1	-2	-5
15	Eventually, Corona will infect everybody.	-2	-1	-4	-3	-1	0	-3
16	The economic loss will be far more devastating than the loss of life.	-2	4	1	-5	4	4	-4
17	Developing and poor countries cannot afford complete isolation.	1	3	3	4	4	2	3
18	Eating and trade of wild animals is the cause of Corona.	-3	0	0	1	1	0	-1
19	Western countries (Europe, UK, USA etc.) underestimated Corona pandemic.	-1	3	2	4	3	1	3
20	Every 100 year, this type of pandemic takes place recurrently on earth.	1	0	0	3	1	2	-1
21	Fear and state of emergency due to Coronavirus is an exaggeration.	-1	2	-4	2	-2	1	-4

22	Food price will become unaffordable gradually for middle- and lower-class people in India due to lockdown.	3	4	3	1	0	1	-1
23	Funds of religious institutions should be used now to fight the Corona outbreak.	2	1	4	4	2	4	4
24	The government should tax the big businesses and multinational corporations for combating the crisis.	0	1	4	2	2	3	0
25	Govt should curtail other funds and pour it to fight Corona pandemic.	0	2	2	1	0	1	1
26	Govt. is understating actual data regarding the pandemic in India.	2	2	-1	-1	-1	0	-1
27	Govt. should sanitize migrants & slum-dwellers for the sake of the whole country.	1	1	2	-2	-3	1	0
28	In a time of pandemic emergency Govt. cannot afford to focus on the deprived group of people (daily wage earners, migrant labours etc.)	-1	-1	-5	-1	-4	-4	-3
29	Low risk (young and healthy) population should go to work to save the economy.	-4	-4	-1	1	0	-4	-2
30	Globalization is one of the important factors for the spread of Coronavirus.	-2	2	2	-1	3	0	3
31	Covid-19 is just another common flu with a high transmission rate.	-2	0	1	-1	-1	1	-1
32	Being confined in the home during lockdown gives a good opportunity to connect with near and dear ones.	0	3	0	0	1	2	2
33	Continuation of complete lockdown is the only way to eradicate Corona virus infection	4	-2	0	-3	-1	0	0
34	Malaria prone areas will not be affected by Corona.	-2	-3	-3	-3	-3	-3	1

35	Isolation for preventing Corona outbreak will result in deterioration of mental health.	0	0	1	0	2	2	0
36	Migrant labourers returning from effected metropolitan cities will spread the virus to rural India.	1	1	1	-1	2	2	1
37	Large scale testing (mass testing like south Korea) is necessary to stop Corona outbreak.	3	1	1	3	3	2	3
38	Inherent immunity of rural people will result in a lower death rate in rural India.	-1	-3	-1	1	-3	0	-2
39	Nature is reclaiming its space and healing itself as humans are retreating to their homes.	0	3	2	3	0	0	1
40	Nature is taking revenge on humankind for their actions.	-1	-2	1	0	-2	-3	0
41	No guaranteed income in the absence of work in India is forcing people to break lockdown.	3	4	1	-1	1	-1	0
42	A vegetarian diet can prevent Corona.	-4	-4	0	-1	-4	-4	-4
43	Not enough awareness about the pandemic and planetary health resulted in the present outbreak.	2	0	3	-1	1	-1	-1
44	Economic and healthcare infrastructure is insufficient for combating Coronavirus in India.	5	0	5	2	1	-2	-2
45	Pandemic is a divine punishment for the sins of humankind.	-3	-2	-1	-2	-5	-2	-2
46	Pandemics will be more frequent in future.	0	1	0	-2	0	-2	1
47	People coming from abroad (who are Corona affected) should be prosecuted.	-3	0	-3	0	-4	-3	2

48	Political parties are taking undue advantage of the situation for their personal goals.	2	-1	-2	0	2	-2	1
49	As a result of the pandemic outbreak, there is a possibility of social chaos & anarchy.	0	-2	-2	-2	0	1	1
50	Precautionary materials (Mask, gloves etc.) and preventive measures are being enjoyed by the rich.	2	-2	-3	2	-1	-1	0
51	<i>Country's rich are giving the virus to the poor.</i>	-2	-3	-3	-2	-2	-4	-2
52	We should all keep faith in God for getting out of the crisis.	-3	-3	-1	-5	-5	-1	1
53	Slums & chawls will be more affected in future than the other city dwellers or rural populace.	1	-1	2	-3	0	-1	2
54	There are not enough materials (mask, personal protective equipment, kits etc.)	4	-2	-1	-2	2	-1	4
55	There is no specific medicine to prevent Corona to date.	3	-1	-3	-3	5	3	2
56	There is not enough investment in R&D to prepare the vaccine.	2	0	-2	-4	-1	-2	-1
57	The Coronavirus outbreak will ensure “Survival of the fittest”.	-1	1	-1	-2	-3	-3	0
58	Treatment will not be affordable by the poor of the country.	0	2	0	-4	-1	0	-1
59	The vaccine is the only solution to eradicate Corona.	1	-1	-2	1	4	-3	0
60	Wildlife habitat destruction has resulted in Corona outbreak.	-2	-1	-2	-4	0	-1	-2
61	Youth will not be affected by Corona.	-5	-4	-2	-4	-2	-2	-3

As per the basic philosophical purpose of Q-methodology, the results have been described as a hybrid of quantitative and qualitative aspects. The major findings of this research are discussed separately under the caption of quantitative and qualitative.

Quantitative:

For the highest priority level (+/-5, innermost circle), among the 7 factors (Fs), F2 gives all (100%) importance; F1, F3 and F7 give 50% importance to 'Science' of Covid-19. However, F4, F5 and F6 give 50% importance in the selection of statements related to 'Economy', 'Religion' and 'Society' of Covid-19 respectively. Only F6 and F7 have given minute importance (25%) to 'Environment'. Among all of the 7 Fs (Fig 3), none has included 'Politics' of Covid-19 in their statement of choices at any highest priority level. For the second-highest priority level (+/-4, second circle from centre), F1 and F6 have given equal importance to science and economy; F2 and F4 have given importance to economy; F5 and F7 give importance to science and only F3 put importance to society at this level. For the choice of topic to be included in this level, F1 and F5 have the lowest coverage whilst F3 and F4 have the highest coverage, among all factors. For the third-highest priority level (+/-3, third circle from centre), only F2 has given highest importance to politics, all the remaining Fs have given importance to science. F2 has the highest and F4 has the lowest coverage of topics at this level. For the fourth highest priority level (+/-2, fourth circle from centre), F1 has given importance to two sub-topics (politics and economy); while all the remaining factors have given importance to one sub-topic only (economy, politics, politics, politics, science and society, F2 to F7 respectively). F3 and F6 have opted out religion and politics at this level. For the fifth highest priority level (+/-1, fifth circle from centre), F1, F2, F3 and F7 have given importance to one sub-topic only (society, science, science and society, respectively); while F5 and F6 given importance to two sub-topics and F4 have given importance to 3 sub-topics. Among the 7 factors, only F4 and F5 have opted out religion and environment, i.e. lowest coverage at this level. Other 4 factors have included all 6 sub-topics here. For the lowest priority level (0, outermost circle), F2, F4, F5 and F7 have given importance to one sub-topic only (society, society, environment and science, respectively). F1 and F6 have given importance to 4 sub-topics and remaining factor (F3) has given importance to 2 sub-topics in this level. F1 and F6 have highest sub-topic coverage (n=5), while F2 and F5 have lowest sub-topic coverage (n=3) at this level.

Figure 3. Choice of sub-topics related to Covid-19 outbreak in India.

Here, seven diagrams represent 7 factors. Six similar centred rims represent 6 layers of selection (+/-5 to 0, from the centre to periphery) for 7 groups (i.e. factors). Each of the 6

colours depicted in colour code, represents six sub-topics related to Covid-19 outbreak as per the statements.

Qualitative:

Factor 1: *Bolstering Government responsibility but not sure about hampering regular economic structure.*

This viewpoint highlights the importance of government responsibility and pro-activeness (44: +5, 33: +4, 54: +3, 26: +2, 48: +2, 26: +2, 50: +2), however concerns were explicit that whether government should touch existing economic structure or not (25: 0, 24: 0). This viewpoint strongly prioritizes youth's safety in the coming days (61: -5, 29: -4). This group is well aware of public health information regarding Covid-19. However, it seems that they lack accuracy in this regard. Also, they lack pace with the fast-changing scientific developments on Covid-19. They also strongly support both the use of centralized control of law and order along with sufficient utilization of modern science and technology to combat with Covid-19 by minimizing damage. They are also unaware or undecided about collateral problems that might come up with Covid-19 and efficacy of indigenous materials ('totka') for solving this problem. They are also dubious about the scientific solution of this pandemic.

Factor 2: *Expresses the government's shortcomings and mismanagement of economic activities but also focuses on positive sides of the pandemic.*

This viewpoint strongly emphasizes on complete lockdown is indispensable in this situation (like China) (10: +5); but have worries on its feasibility from economic angles (16: +4, 41: +4, 22: +4, 58: +2, 25: +2). This viewpoint also underlines the government's mismanagement to combat with the pandemic. One respondent stated that "This pandemic is a classic example of mismanagement. Doctors are not getting masks while the public is hoarding them." From that perspective, this viewpoint disagrees with the 'lack of medical equipment' statement (54: -2) and strongly advocates on proper and efficient management for tackling the pandemic (2: -5, 12: -2). This view also focuses on the positive sides of the pandemic (39: +3, 32: +3). This group are also well aware of public health information regarding Covid-19. They strongly support the use of centralized control of law and order and sufficient application of modern science and technology to minimize the damage caused by Covid-19 pandemic. Though they are not sure about what scientific background and implementable methods might control this pandemic.

Factor 3: *Believes in government actions and transparency as well as an existing medicinal cure.*

In this viewpoint, one respondent stated that “Govt is doing their best they can in this situation. And they must look after the daily wage earners and migrant labourers because if these people get infected, they can affect others.” It reflects the viewpoint’s support for the government transparency and well-meaning actions (26: -1, 48 -2) as well as concern for migrant labourers for the sake of the whole country (28: -5, 27: 2). This viewpoint also believes that there is an existing cure (4: +3, 55: -3) and hence it is not an exceptional virus (31: +1). It also advocates aggressive government action to collect economic resources to control the situation (23: +4, 24: +4, 25: +2) and supply it to necessary areas (44: +5). This group is well aware and in favour of abiding by the public health directives regarding Covid-19. They are unaware or undecided about dietary recommendations and lockdown. They are also in favour of the use of centralized control of law and order over sufficient utilization of modern science to minimize damage caused by Covid-19.

Factor 4: *Skeptical about the natural origin of the pandemic.*

This viewpoint is sceptical about the current pandemic and believes it is made as a bio-weapon made by China (13: +4) and western countries have underestimated the crisis (19: +4) and India is no other exception (5: +5, 6: +5). It has nothing to do with wildlife habitat destruction and awareness about planetary health (60: -4, 43: -1). This view also believes there is a medical cure (4: +3, 55: -3, 21: +2) and probably that is was causing to disagrees with insufficiency of current infrastructure (54: -2, 56: -4).

Factor 5: *Prioritize on what is observable and firmly against statements concerning divinity.*

This viewpoint gives most emphasis on the current state of the crisis (55: +5, 5: +5, 59: +4, 37: +4) and believes that globalization is a reason for the spread of the virus (30: +3). This viewpoint also believes that economic stagnancy can also be detrimental (16: +4, 17: +4). Further, this view strongly disagrees with any association with divinity (45: -5, 52: -5).

Factor 6: *Advocates strong action for combating the crisis economically and health-wise.*

This viewpoint supports strong action by the government for combating the crisis (12: +5) and economy what will face severe loss in future (16: +4) and there are chances of anarchy (49: +1). This viewpoint believes that indigenous natural material consumption can be one solution to this crisis (11: +4) and vaccination alone will not be a worthy solution (59: -3).

Factor 7: *Advocates strong control methods and victims of infodemic.*

This viewpoint supports strong top-down control by the government against infodemic (33: +5). This viewpoint almost completely disregards any role of religion for the cause of this pandemic (15: -2) and in favour of utilizing their resources to combat crisis (17: +4). This viewpoint is very sceptic about China, western countries and its role in this pandemic (39 & 5: +3, 2: +2).

Conclusion:

From this work, many issues came up as problems at this time of the pandemic, which needs to be addressed. Part of the youths is much worried and obsessed with the geopolitics of Covid-19. They are intended in blaming for the country which is responsible or spread the deadly virus intentionally or not. Some of the youths are a strong believer of utilizing culturally inherited indigenous cures ('totka') as a medicine instead of utilizing modern science optimally which in turn might result in lack of scientific temperament among the community. Some are very doubtful about the probable effects of this pandemic on a larger economy, from local to a global scale, part of which can be assigned as poor understanding about the present status of the global economy. Some respondents have mixed this awesome pandemic with their respective religious beliefs and biases. Some of them are even in favour of taking this situation as it is destined to happen or is happened as a boon towards minimizing anthropogenic damages to the global environment. There is also a significant void in the context of possessing basic understanding about wildlife habitat destruction, climate change, extreme weather events, ecological restoration or fundamental know-how about pandemics. In any general population of any country, youths are usually the most adaptive, well connected and well-informed hub of the total population. But unfortunately, in India, this biggest hub is not fully aware of having faulty understanding, bewildered interpretation and baffled attitudes to tackle this grave situation. The reason might be wide socio-economic disparities, lack of proper scientific education and attitude, inaccessible and inadequate public health system, the prevalence of religious fundamentalism, hunger and food insecurity, unemployability, widespread poverty and lack of efficient governance etc.

Scope of further research:

In a broader perspective, regarding the utilization and applicability of this Q-methodology, the following suggestions are forwarded which can also be interpreted as a drawback in this specific work and to be pondered upon for future research work.

First, for a geographically big country (like – India), it is important to perform this method with specific focus to different regions. This would result in a spatially distributed understanding keeping sub-national levels (district or municipality to state level) in focus.

Second, as there are so many environmental or socio-economic problems in modern times, it would be better to frequently and periodically assess scenarios (incidents or trends about already happened or might arise in near future) for better apprehension and mitigation of those probable situations.

Third, this should be customized to include all the actors of an incident (i.e. government, private sector, common public etc.) to complement each of the actors to others' necessities and actions comprehensively which would lead to better cooperation and cohesion towards solving a problem with efficacy.

Fourth, this should include all groups of actors in a hierarchical chain. This should be done both by taking top-down and bottom-up approaches. Thus, each actor can be well aware of all others' actions of that level existing in that chain.

Fifth, this approach should consider occupational diversification or sector-specific like agriculture, business, industry, service etc. so that their understanding about the problems, requirements and availability of respective sectors in terms of production, consumption and distribution is comprehensive.

Sixth, this approach should be stage-specific to formulate the policies for different purposes and different stages like before the incident (frequently, to understand what is needed and where), during the incident (to realize the efficacy of ongoing programs for adaptability) and after the incident (for feedback, towards solidifying more well-informed strategies for policymakers in future), if and when, something similar happens.

Seventh, this approach should inclusive of gender, demography, income, education, employment and inequality etc. It will be helpful to judge the scenario with comprehensive appropriateness, but also to understand different interactions, effects and causative factors.

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A. K. H. has introduced Q methodology to this working group and helped in checking the draft.

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