RESEARCH PROJECT: FACILITATION OF STUDY ON IMPACT OF COVID-19 ON AGRARIAN POPULATION OF HOWRAH.

DATE: 26th JUNE, 2020

INTRODUCTION:

A novel disease COVID-19, which evolved in Wuhan, China in December 2019, has spread throughout the world The pandemic is causing heightened level of concern and massive public reaction as it continues to hamper multiple aspects of peoples' lives. Implementation of strict social distancing and quarantine has affected the socio-economic aspects of peoples' lives causing financial loss, health insecurity. In order to respond to the crisis and to cushion Indians from the adverse effects of the COVID-19, the Government of India is taking various measures. The pivotal task has also been protecting the village community of the Nation which hosts millions of habitants. There is a pressing need to sensitively analyse this impact on the agrarian population. The UGC has undertaken a programme in this respect and urged Vice-Chancellors and Principals of their affiliated colleges to facilititate the study of 5-6 villages adjoining the institution.

SURVEY OBJECTIVE

In adherence to the above programme Dr. Kanailal Bhattacharyya College undertook the following project in its endeavour to study to the impact of COVID-19 in the five adjoining villages of the institution in Amragori Gram panchayat, Joypur, Howrah on 26th June, 2020

A dedicated research team has been constituted for this purpose under the Chairmanship of Prof (Dr) Swapan kumar Das (Hon'ble GB member of Dr. Kanailal Bhattacharyya College) and Dr.Nemai Bhattacharya, formerly Professor,Department of Microbiology and Incharge Virology Division, School of Tropical Medicine, Kolkata .

Co-ordinators: 1) Dr. Kaustubh Lahiri (Principal)
2) Prof. Anasua Chatterjee(department of Political science) and
3) Dr. Sudipta Bhowmik(Department of Zoology)

Research Team:1) Dr. Prabir Kumar Sanki(Department of Commerce)
2) Prof. Subhas Dolui(Department of Commerce)
3) Shri Bhaskar Ghose
4) Arpan Mullick
5) Suraj Roy

The aimed of the present study is to

1) Assess the awareness of COVID-19 among the respondents
2) The appropriate protective measures undertaken to combat COVID-19 and their overall perception about the disease.

METHODOLOGY

This study has been conducted in 5 villages namely Mahakalpur, Nakubar, Godalia, Manuchak North and South respectively under Amaragori Gram Panchayt, Joypur, Howrah through cross-sectional structured interview with self-developed questionnaire from the chosen area of study. Around 200 respondents have been interviewed, selected by convenience sampling. The study covered social background (i.e. name, permanent residential address, gender, age, caste,) of the respondent, awareness level in the village regarding COVID 19-(precautionary measures, norms of movement etc),challenges posed and overall perception of the community. Response from interview has been analyzed and study report uploaded on the University Activity Monitoring Portal. (https://www.ugc.ac.in/uamp). For analysing the awareness level and perception about preventive measures a 5 point indicator have been chosen with level 1 –inaccurate,2-slightly inaccurate, 3- moderately accurate,4- accurate and 5- highly accurate.

PROJECT REPORT

Introduction

COVID-19 is a viral respiratory illness caused by a novel coronavirus called SARS CoV2 which affects upper respiratory tract (sinuses, nose, and throat) or lower respiratory tract (windpipe and lungs). Within a few weeks after the outbreak of SARS-COV-2 it caused thousands of deaths worldwide giving a massive jolt to the global economy and human habits.

It was first identified during an outbreak of respiratory illness in Wuhan City, Hubei Province, China [1]. It was initially reported to the WHO on December 31, 2019 and on January 30, 2020. The WHO declared the COVID-19 outbreak a global health emergency [2,3] and on March 11, 2020, the WHO declared COVID-19 a global pandemic (i.e. "occurring over a wide geographic area and affecting an exceptionally high proportion of the population." [4]. WHO chose to term the illness caused by SARS-CoV-2 as COVID-19 (which stands for "corona virus disease 2019") to avoid stigmatizing the virus's origins in terms of populations, geography, or animal associations [5,6]. On February 11, 2020, the Corona virus Study Group of the International Committee on Taxonomy of Viruses issued a statement announcing an official designation for the novel virus: severe acute respiratory syndrome corona virus 2 (SARS-CoV-2 formerly called 2019-nCoV) [7].

Corona viruses are a large group of RNA viruses (characterized by a high mutation rate, up to a million times higher than that of their hosts), of which 7 are known to cause disease in humans. SARS-CoV, MERS-CoV and SARS-CoV-2 can cause severe disease, whereas HKU1, NL63, OC43 and 229E are associated with mild symptoms [8]. They are named "corona" (like a crown) because their membranes are studded by spike-like proteins. A concern regarding corona viruses is that they are zoonotic i.e. they can spread from animals to humans and take more virulent forms. The animal source has not yet been confirmed, but in the previous 20 years, there have been two corona virus outbreaks arising from bat-to-human transmission that infected thousands of people. Severe acute respiratory syndrome (SARS) emerged in 2002 and the Middle East respiratory syndrome (MERS) was first reported in 2012. Both SARS and MERS had higher mortality rates than COVID-19 but the rate of human to human transmission was slow. SARS-CoV-2 is likely one such enveloped, +ssRNA virus, belonging to the Beta corona virus genus that has at least 70% similarity in

genetic sequence to SARS-CoV [9] and postulated to have originated in a large animal and seafood market.

The unique features of SARS-COV-2 includes the most variable receptor-binding domain (RBD) in the spike protein that binds with high affinity to its receptor ACE2 (Angiotensin converting enzyme II which is most abundant in type II alveolar cells of the lungs) from humans, ferrets, cats and other species with high receptor homology to initiate mebrane fusion during infection [10,11] and O-linked glycans flanking the polybasic cleavage site at the junction of S1 and S2 [12,13] which are thought to create a 'mucin-like domain' to shield epitopes on the SARS-CoV-2 spike protein in order to facilitate immune evasion [14].

Bats, serving as natural reservoirs of coronaviruses,[15,16] is the probable reservoir of SARS-COV-2 also [17].The whole genome sequence of SARS-COV-2 suggests that it is ~96%similar to bat SARS-CoV related coronaviruses (SARSr-CoV; RaTG13) but lacks the 6 key residues in RBD sequence essential for successful human infection [18] indicating that there must be an intermediate host facilitating transfer to humans. The sequence of human ACE-2 receptor is found to be more similar to Pangolin than to bats [17]. The six key residues of the RBD domain of the virus are found to be strikingly similar to some Malayan pangolin (*Manis javanica*) corona viruses illegally imported into Guangdong province. Recent studies cannot exclude the chances that pangolins acquired SARS-COV-2 related virus independently from bats or other animals and may serve as the intermediate reservoir of the virus that played an important role in the evolution of the virus required for infecting humans .However, their role in the emergence of human SARS-CoV-2 remains to be fully confirmed. Both the bat beta corona viruses and the pangolin beta corona viruses sampled thus far do not have polybasic cleavage sites. Therefore the polybasic cleavage site may have appeared in the virus by a natural evolutionary process involving mutations, insertions and deletions near the S1–S2 junction of corona viruses during undetected human-to-human transmission after an initial zoonotic event [18]. However none of the animal corona viruses sampled so far have sufficient similarities to have acted as the direct progenitor of SARS-COV-2 [18]. Reports show the emergence of new mutational hotspots in the genome of SARS-COV-2 in different geographic locations over time modulating its virulence and evolvability conferring viral adaptability, drug resistance, immune evasion and thus affecting mortality rates [19].

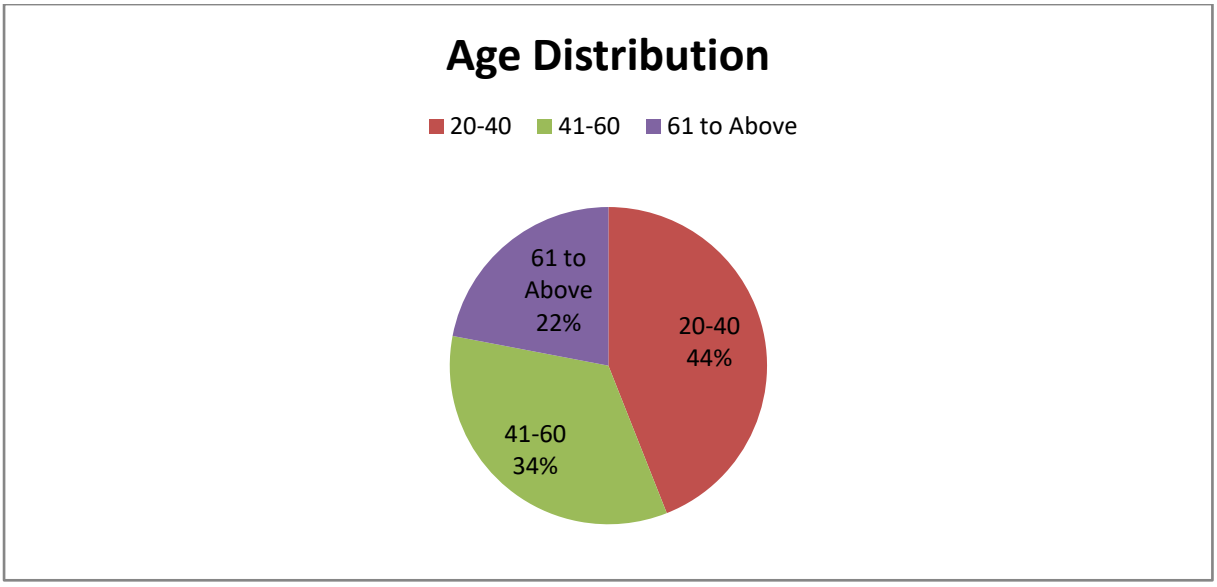
The routes of transmission of COVID-19 seems to be through large respiratory droplets and direct or indirect contact with infected secretions [20]. The incubation period of COVID-19 is

said to be between 2 to 14 days [21]. Among those who become infected, some show no symptoms and others show symptoms like: Respiratory symptoms, Fever, Cough, Shortness of breath, Breathing difficulties, Fatigue, Sore throat [22]. Patients showing severe symptoms like pneumonia, and in some instances, ARDS, sepsis and septic shock, persistent chest pain or pressure, bluish lips or face, inability to arouse, need immediate hospitalisation.[22,23] Although the virus infects people of all ages, but older people (people over 70 years of age) and people with serious chronic illnesses such as Diabetes, Cardiovascular disease, Chronic respiratory disease, Cancer, Hypertension, Chronic liver disease are at a higher risk of getting severe COVID-19 disease [24].

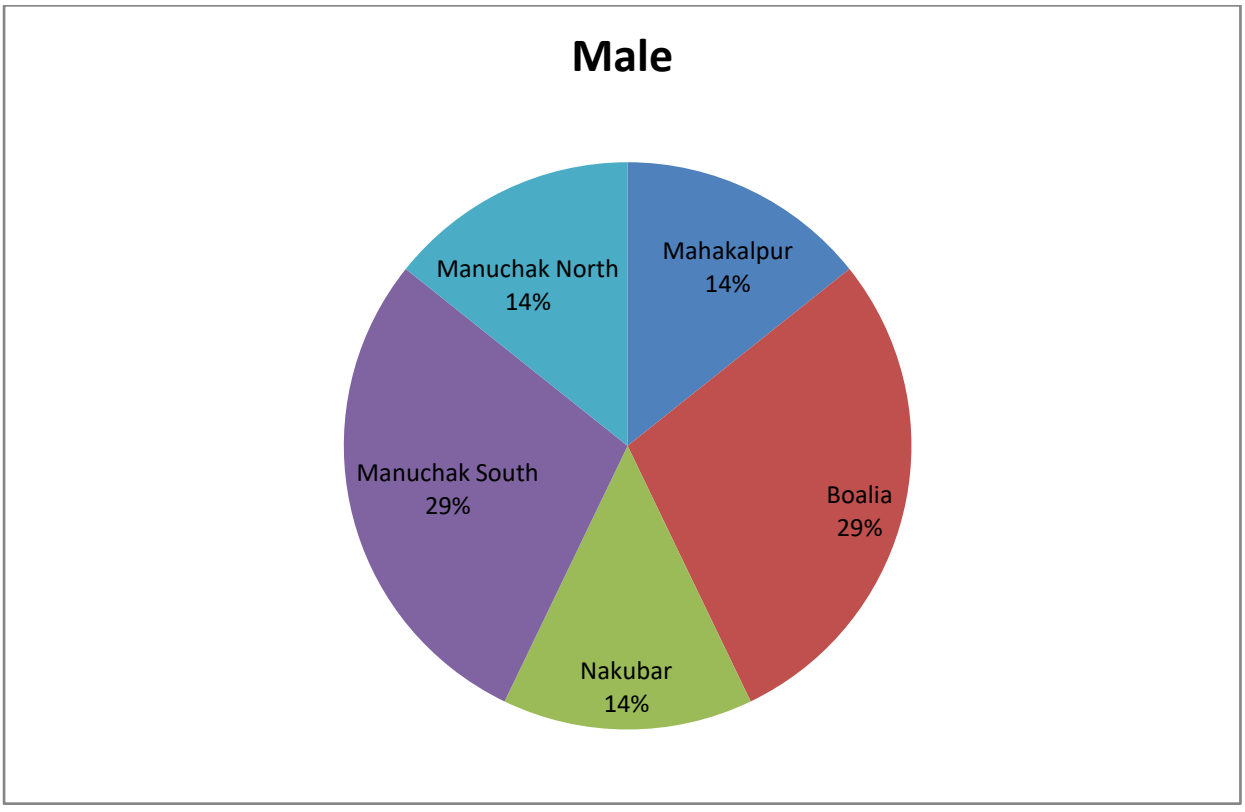
The lungs are the most affected organs in this disease because ACE-2 receptors are most abundantly present in it [25]. Since ACE2 is abundantly expressed in the glandular cells of gastric, duodenal and rectal epithelium, endothelial cells and enterocytes of the small intestine ,as well as in heart, the virus affects gastrointestinal organs and cardiovascular system [26,27,28]. SARS-COV-2 may also affect the central Nervous System [29,30] and kidneys [31]. Clinical investigations in patients with COVID-19 has shown cytokine storm syndrome characterized by strong upregulation of cytokine and interferon production in SARS-CoV2- induced pneumonia [32]. No medication or vaccine is approved with specific indication for treatment of the disease [33]. International research on vaccines and medicines in COVID-19 is underway by government organisations, academic groups, and industry researchers.[34, 35]. Passive immunization method of transferring purified and concentrated antibodies from a COVID-19 survivor for treatment of COVID-19 is under investigation.[36] WHO has suggested some preventive measures like practicing hand and respiratory hygiene, wearing masks, maintaining social distance(approximately 2 meters), avoid touching nose, eyes, mouth to prevent transmission of the disease.[37,38]

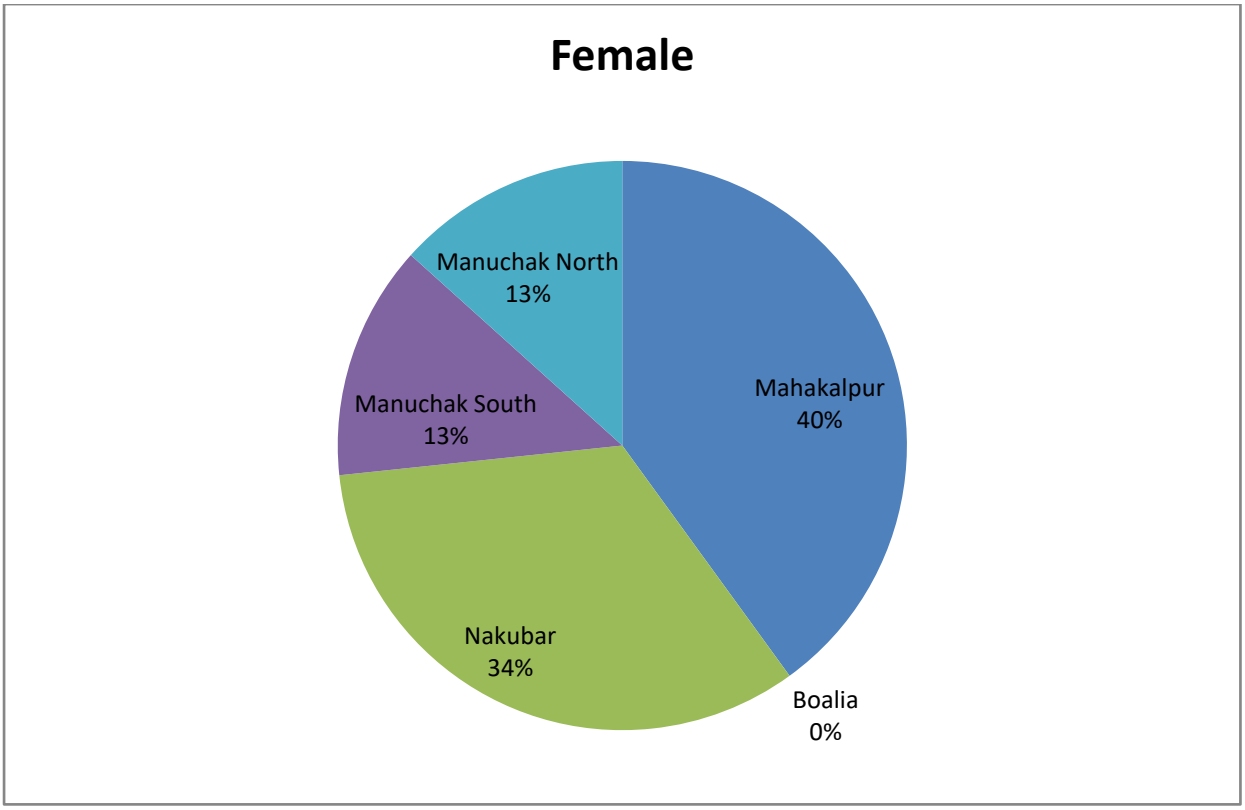
The project was undertaken in five selected villages under Amaragori Gram panchayat, Joypur Howrah namely Mahakalpur, Boalia, Nakubar, Manuchak North and Manuchak south respectively. The chosen population are particularly peasants and work as agricultural labours and some of them are also engaged as migrant workers. The following figure represents the **Age-wise representation** of data.

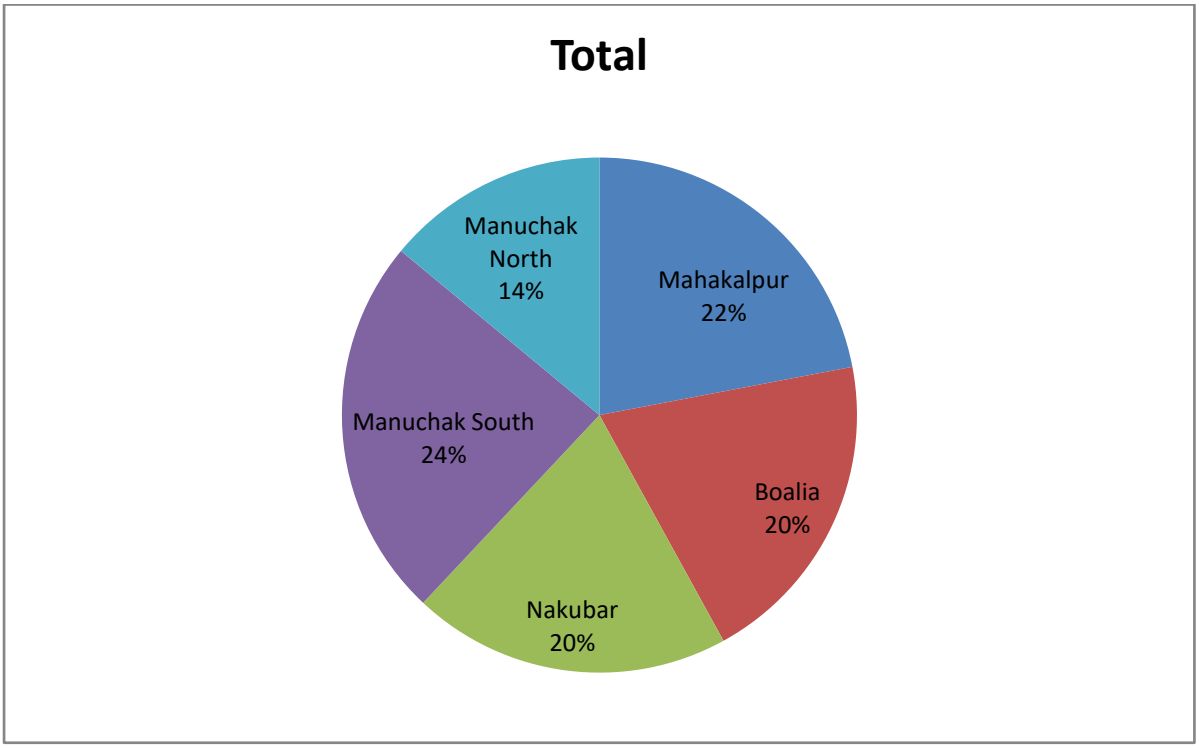
Age	20-40	41-60	61 to Above
Male	60	52	28
Female	28	16	16
Total	88	68	44

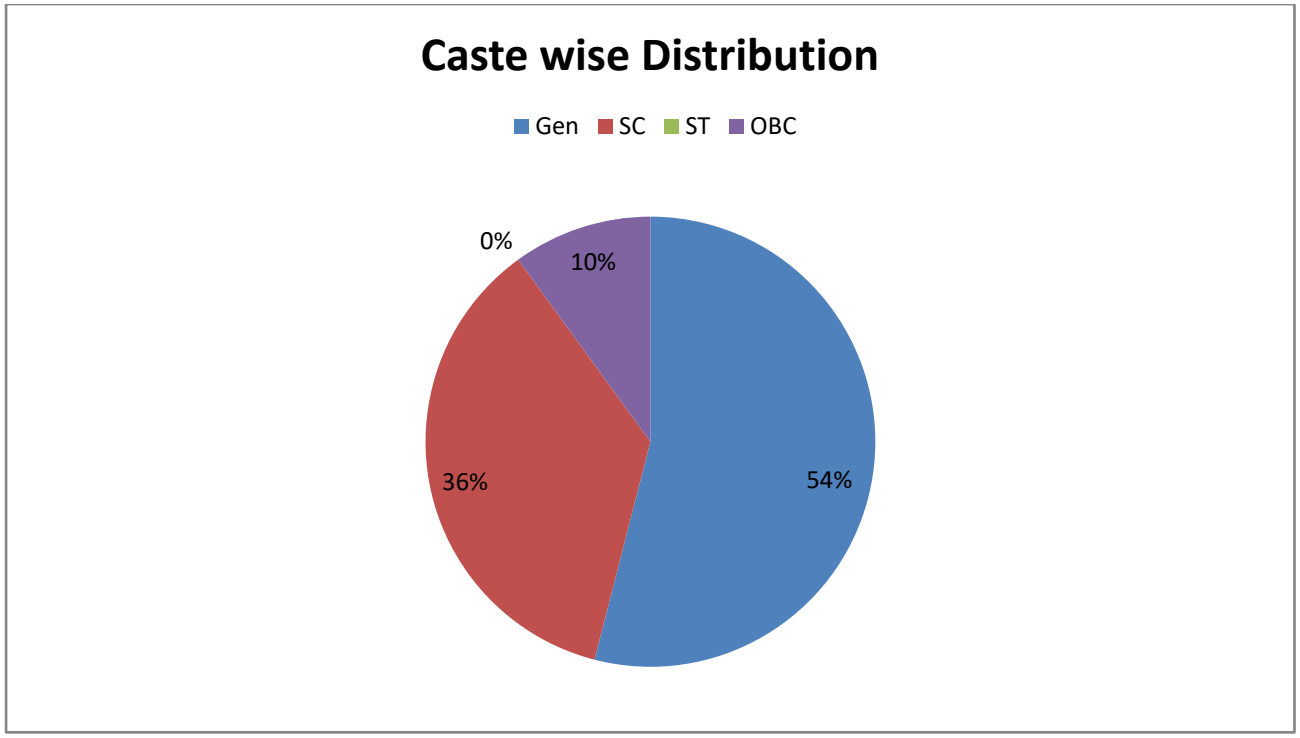


Gender-wise representation of respondents chosen from each village. Out of 200 respondents 22% is from Mahakalpur, 20% each from Nakubar and Boalia, 24% from Manuchak South and 14% from Manuchak North respectively.



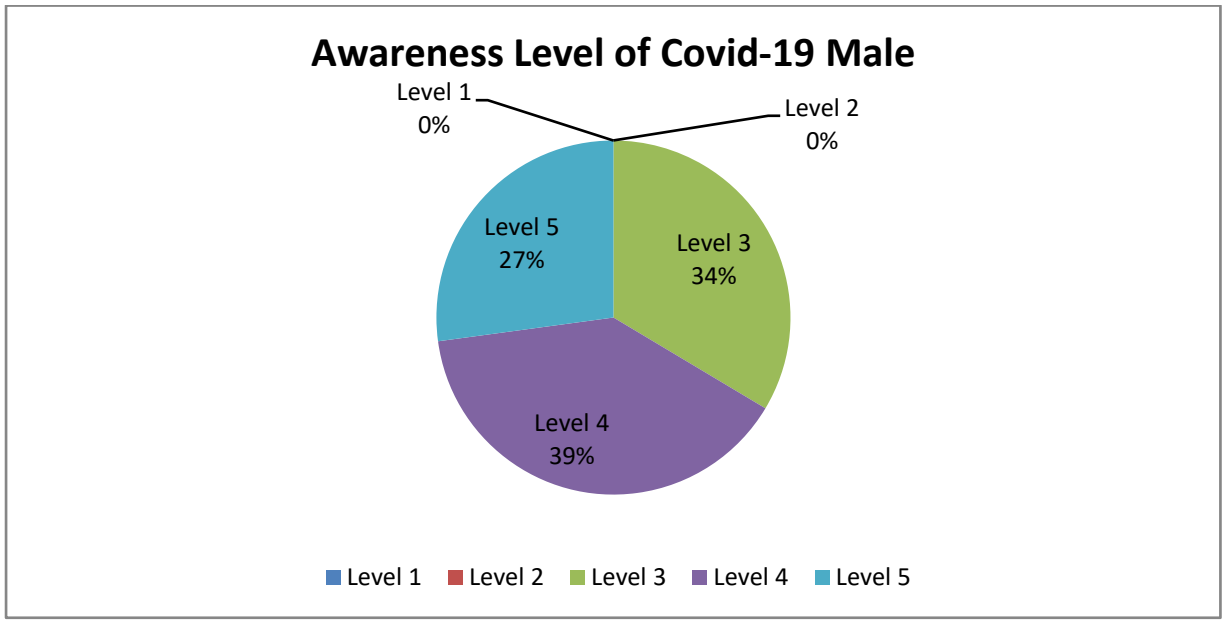

Female
Manuchak North
13%
Mahakalpur
40%
Manuchak South
13%
Nakubar
34%
Boalia
0%

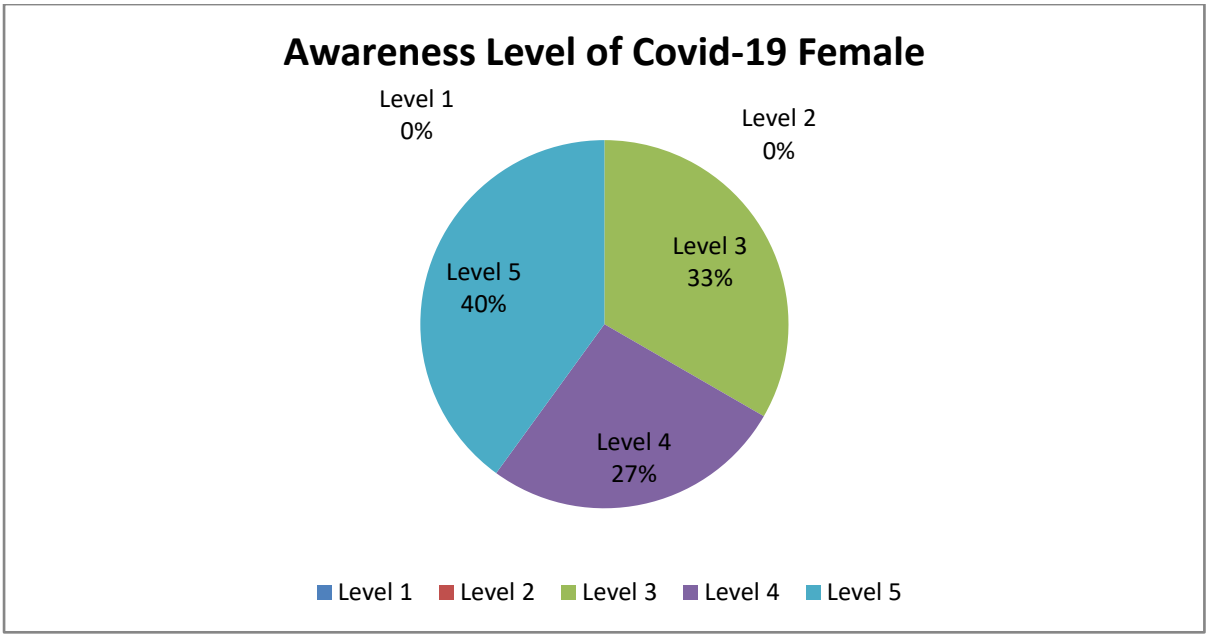

Total
Manuchak
North
14%
Mahakalpur
22%
Manuchak South
24%
Boalia
20%
Nakubar
20%

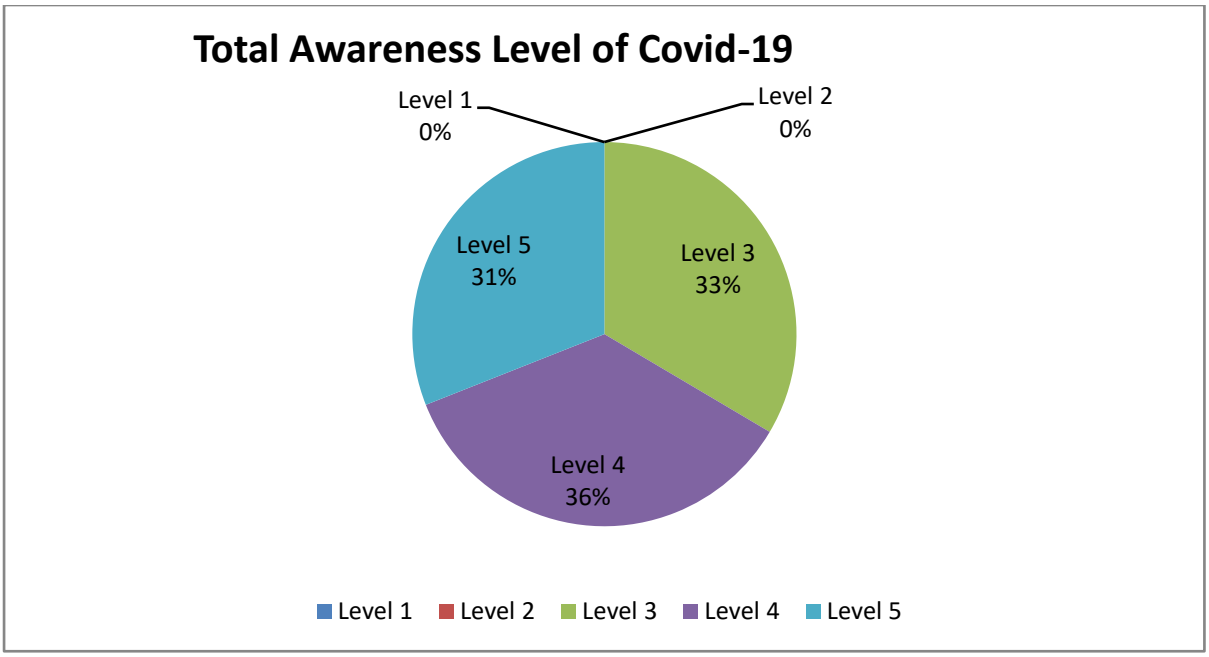


Awareness level of Respondents on Covid-19

In order to assess the awareness level a 5 point indicator was chosen with 1 being inaccurate and 5 being highly accurate. Based on the above indicator it is observed that 27% males are highly accurate at level 5 compared o 40% females, 39% males are accurate at level 4 compared to 27% females and 34% male population are moderately accurate compared to 33% female population. Thus it can be inferred that the female population are well aware of the corona virus and their symptoms. In total out of 200 respondents 31% are highly accurate, 36% are accurate and 33% are moderately accurate about Covid-19.

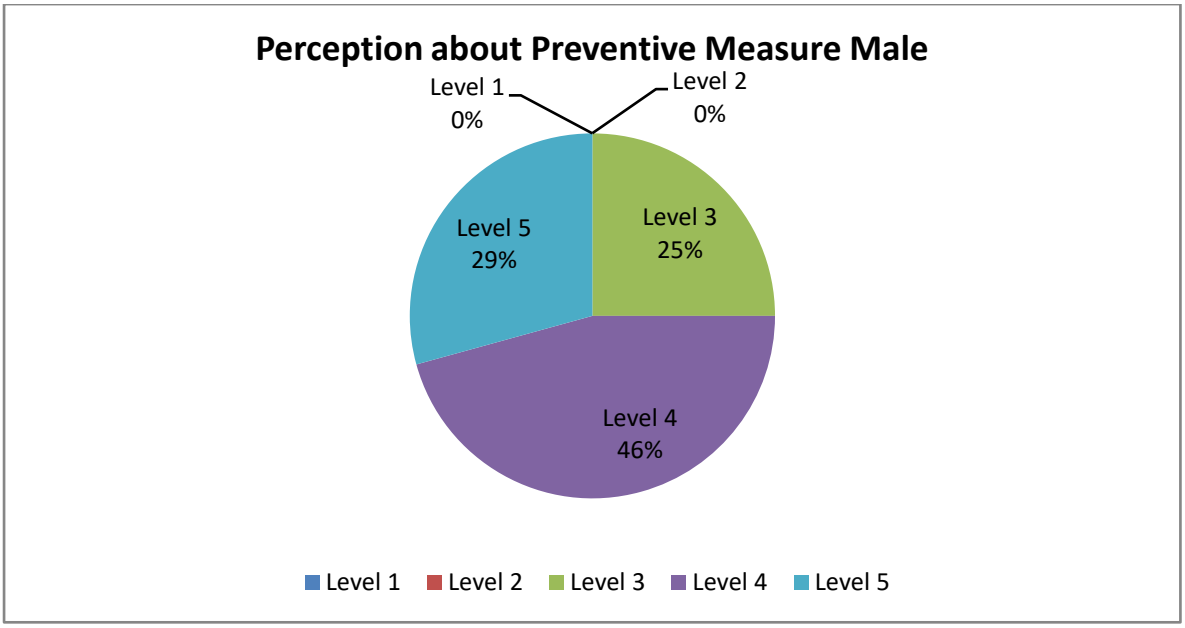


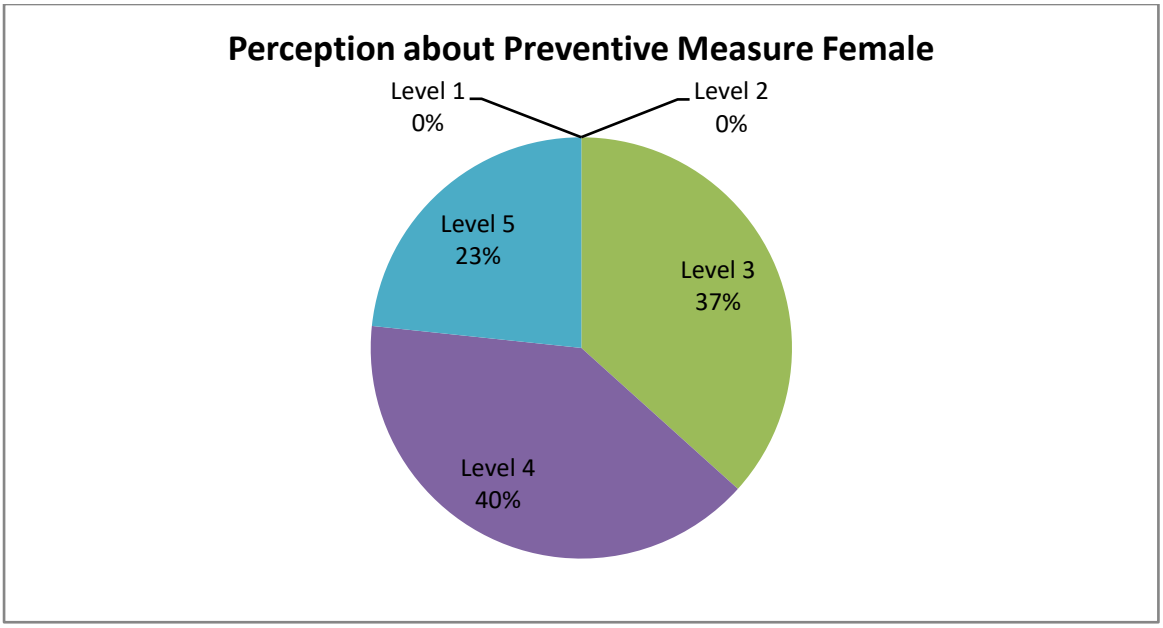


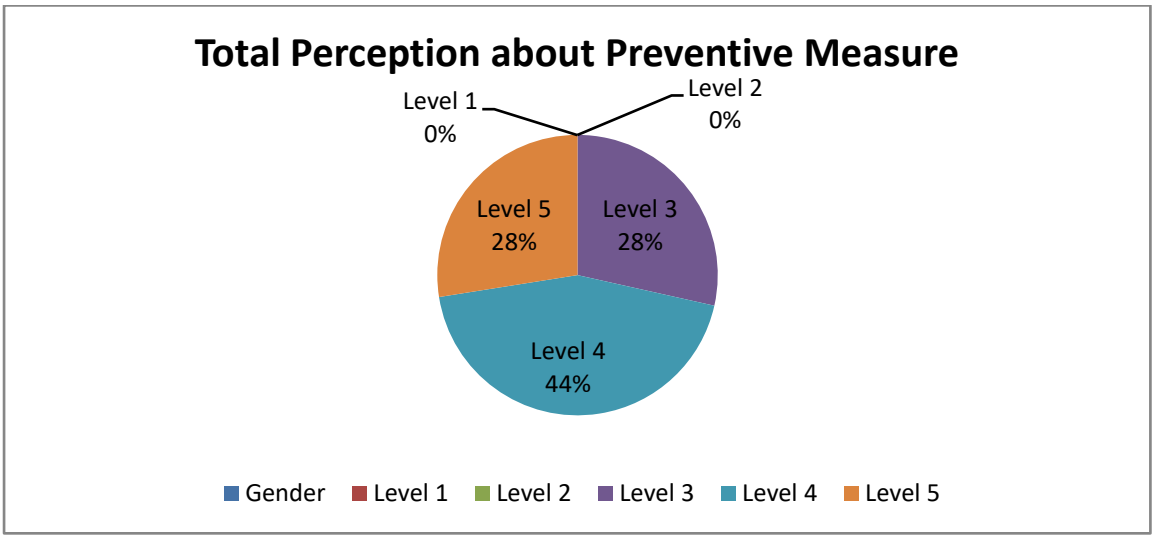


Perception of respondents regarding preventive measures to be adopted against spread of Covid-19;

In this section it is observed that 29% males are highly accurate at level 5 compared o 23% females, 46% males are accurate at level 4 compared to 40% females and 25% male population are moderately accurate compared to 37% female population. In total it can be said that out of 200 respondents, 28% are highly accurate ,44 % are accurate and 28% are moderately accurate about the preventive measures to be undertaken to combat Covid-19


Perception about Preventive Measure Male
Level 1
0%
Level 2
0%
Level 3
25%
Level 4
46%
Level 5
29%
Level 1
Level 2
Level 3
Level 4
Level 5


Perception about Preventive Measure Female
Level 1
0%
Level 2
0%
Level 3
37%
Level 4
40%
Level 5
23%


Total Perception about Preventive Measure
Level 1
0%
Level 2
0%
Level 3
28%
Level 4
44%
Level 5
28%
Gender
Level 1
Level 2
Level 3
Level 4
Level 5

References:

1. CDC. 2019 Novel Coronavirus, Wuhan, China. CDC. Available at https://www.cdc.gov/coronavirus/2019-ncov/about/index.html. January 26, 2020.
2. Gallegos A. WHO Declares Public Health Emergency for Novel Coronavirus. Medscape Medical News. Available at https://www.medscape.com/viewarticle/924596. January 30, 2020.
3. Ramzy A, McNeil DG. W.H.O. Declares Global Emergency as Wuhan Coronavirus Spreads. The New York Times. Available at https://nyti.ms/2RER70M. January 30, 2020.
4. The New York Times. Coronavirus Live Updates: W.H.O. Declares Pandemic as Number of Infected Countries Grows. The New York Times. Available at https://www.nytimes.com/2020/03/11/world/coronavirus-news.html#link-682e5b06. March 11, 2020.
5. Coronavirus Updates: The Illness Now Has a Name: COVID-19. The New York Times. Available at https://www.nytimes.com/2020/02/11/world/asia/coronavirus-china.html. February 11, 2020.
6. WHO Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020. Available at https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020. February 11, 2020.
7. Gorbalenya AE. Severe acute respiratory syndrome-related coronavirus – The species and its viruses, a statement of the Coronavirus Study Group. Available at https://doi.org/10.1101/2020.02.07.937862. February 11, 2020; Accessed: February 13, 2020.
8. Corman VM, Muth D, NiemeyerD & Drosten C. Hosts and Sources of Endemic Human Coronaviruses Adv. Virus Res. 100, 163–188 (2018).
9. Hui DS, I Azhar E, Madani TA, Ntoumi F, Kock R, Dar O, et al. The continuing 2019-nCoV epidemic threat of novel coronaviruses to global health - The latest 2019 novel coronavirus outbreak in Wuhan, China. Int J Infect Dis. 2020 Jan 14. 91:264-266.
10. Zhou, P. et al. A Pneumonia Outbreak Associated With a New Coronavirus of Probable Bat Origin. Nature Nature 579, 270–273 (2020).
11. Wu, F. et al. A new coronavirus associated with human respiratory disease in China Nature 579265–269(2020) (2020).
12. Wrapp, D. et al. Cryo-EM structure of the 2019-nCoV spike in the prefusion conformationScience 367, Issue 6483, pp. 1260-1263 2020.
13. Chan, C.-M. et al. Spike Protein, S, of Human Coronavirus HKU1: Role in Viral Life Cycle and Application in Antibody Detection, Exp. Biol. Med. 233, 1527–1536 (2008).
14. Bagdonaite, I. & Wandall, H. H. Global aspects of viral glycosylation Glycobiology 28, 443–467 (2018).
15. Cui J,Li F,Shi Z-L.Origin and evolution of pathogenic coronaviruses. Nat Rev Microbiol 2019;17:181-92
16. Li X,Song Y,Wong G et al.Bat origin of a new human coronavirus:there and back again.Sci china Life Sci 2020;63:461-2
17. Lam, T.T., Jia, N., Zhang, Y. et al. Identifying SARS-CoV-2-related coronaviruses in Malayan pangolins. Nature (2020). https://doi.org/10.1038/s41586-020-2169-0
18. Andersen, K.G., Rambaut, A., Lipkin, W.I. et al. The proximal origin of SARS-CoV-2. Nat Med 26, 450–452 (2020). https://doi.org/10.1038/s41591-020-0820-9
19. Pachetti et al. J Transl Med (2020) 18:179 https://doi.org/10.1186/s12967-020-02344-6
20. Public Health England. COVID-19: epidemiology, virology and clinical features. https://www.gov.uk/government/publications/wuhan-novel-coronavirus-background-information/wuhan-novel-coronavirus-epidemiology-virology-and-clinical-features. Accessed 14 March 2020

21. Centers for Disease Control and Prevention. Coronavirus Disease 2019 (COVID-19): Symptoms. https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html Accessed 14 March 2020
22. World Health Organisation. Clinical management of severe acute respiratory infection when novel coronavirus (2019-nCoV) infection is suspected. January 2020. https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf Accesed 15 March 2020
23. Centers for Disease Control and Prevention. Coronavirus Disease 2019 (COVID-19): Symptoms. https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html
24. World Health Organisation. Coronavirus disease 2019 (COVID-19) Situation Report - 51. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200311-sitrep-51-covid-19.pdf?sfvrsn=1ba62e57_10 Accessed 14 March 2020
25. Verdecchia P, Cavallini C, Spanevello A, Angeli F (June 2020). "The pivotal link between ACE2 deficiency and SARS-CoV-2 infection". European Journal of Internal Medicine. 76: 14–20.
26. Gu J, Han B, Wang J (May 2020). "COVID-19: Gastrointestinal Manifestations and Potential Fecal-Oral Transmission". Gastroenterology. 158 (6): 1518–1519.
27. Hamming I, Timens W, Bulthuis ML, Lely AT, Navis G, van Goor H (June 2004). "Tissue distribution of ACE2 protein, the functional receptor for SARS coronavirus. A first step in understanding SARS pathogenesis". The Journal of Pathology. 203 (2): 631–7. doi:10.1002/path.1570
28. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, et al. (February 2020). "Clinical Characteristics of 138 Hospitalized Patients With 2019 Novel Coronavirus-Infected Pneumonia in Wuhan, China". JAMA. 323 (11): 1061–1069. doi:10.1001/jama.2020.1585
29. Li YC, Bai WZ, Hashikawa T (February 2020). "The neuroinvasive potential of SARS-CoV2 may play a role in the respiratory failure of COVID-19 patients". Journal of Medical Virology. 92 (6): 552–555. doi:10.1002/jmv.25728
30. Baig AM, Khaleeq A, Ali U, Syeda H (April 2020). "Evidence of the COVID-19 Virus Targeting the CNS: Tissue Distribution, Host-Virus Interaction, and Proposed Neurotropic Mechanisms". ACS Chemical Neuroscience. 11 (7): 995–998.
31. Wadman M (April 2020). "How does coronavirus kill? Clinicians trace a ferocious rampage through the body, from brain to toes". Science. doi:10.1126/science.abc3208
32. Mehta P, McAuley DF, Brown M, Sanchez E, Tattersall RS, Manson JJ (March 2020). "COVID-19: consider cytokine storm syndromes and immunosuppression". Lancet. 395(10229): 1033–1034. doi:10.1016/S0140-6736(20)30628-0
33. Li G, De Clercq E (March 2020). "Therapeutic options for the 2019 novel coronavirus (2019-nCoV)". Nature Reviews. Drug Discovery. 19 (3): 149–150. doi:10.1038/d41573-020-00016-0
34. Dhama K, Sharun K, Tiwari R, Dadar M, Malik YS, Singh KP, Chaicumpa W (March 2020). "COVID-19, an emerging coronavirus infection: advances and prospects in designing and developing vaccines, immunotherapeutics, and therapeutics". Human Vaccines & Immunotherapeutics: 1–7. doi:10.1080/21645515.2020.1735227
35. Zhang L, Liu Y (May 2020). "Potential interventions for novel coronavirus in China: A systematic review". Journal of Medical Virology. 92 (5): 479–490. doi:10.1002/jmv.25707
36. Casadevall A, Pirofski LA (April 2020). "The convalescent sera option for containing COVID-19". The Journal of Clinical Investigation. 130 (4): 1545–1548. doi:10.1172/JCI138003
37. World Health Organization. Coronavirus disease (COVID-19) advice for the public. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public Accessed 14 March 2020
38. World Health Organisation. Rational use of personal protective equipment for coronavirus disease 2019 (COVID-19). https://apps.who.int/iris/bitstream/handle/10665/331215/WHO-2019-nCov-IPCPPE_use-2020.1-eng.pdf Accessed 14 March 2020.