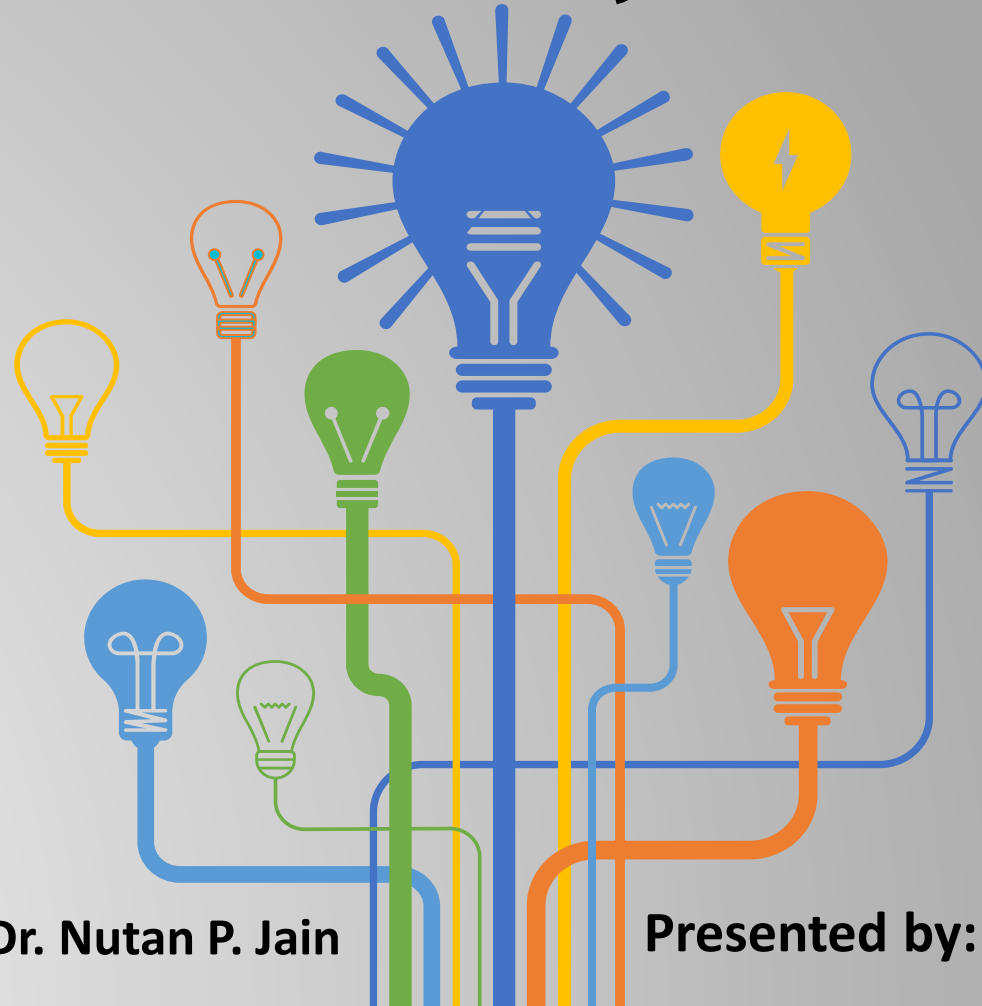


# Successful Models to Combat with COVID-19: A Study



Guided by: Dr. Nutan P. Jain

Presented by: Dr. Aishwarya Shityalkar (0868)

# BACKGROUND

- In December 2019, Wuhan Municipal Health Commission (WMHC) reported 27 cases of viral pneumonia with recent exposure to wildlife animals at Huanan Sea-food wholesale market in Wuhan, China.
- WHO declared coronavirus outbreak a Public Health Emergency of International Concern on January 31, 2020, and a pandemic on March 11.
- As of June 30, 2020, the global COVID-19 burden is at 10,360,822 cases with a death toll of 507,014. India's cases stand at 5,66,840 with a death toll of 16,893.
- Public health response globally: flattening the curve via dual ideas of containment and preventive measures.
- The focus of this study is on epidemiology, its public health implications, how the outbreak has spread in India and the measures taken to keep it all in check. Also, we will be focusing on the concentrated efforts taken by various regions in India like Kerala (state level) and Agra and Bhilwara (district level).



## OBJECTIVE OF THE STUDY



To review the epidemiology of COVID-19;



Extensive data search was done from sources like academic articles, soft copies of newspaper and official websites of WHO, CDC etc.



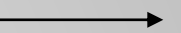
To study various efforts made by Government of India to curb COVID-19; and



Secondary data was studied from official website of MoHFW, state government portals, soft copies of newspaper etc.



To review some of the effective models like Agra, Bhilwara and Kerala used to overcome COVID-19



Secondary data was sourced and the models were reviewed against a public health framework designed from guidelines given by WHO and MoHFW.

## METHODOLOGY

# LITERATURE REVIEW

## Severe Acute Respiratory Syndrome (SARS)

- Outbreak was caused by SARS-CoV pathogen which originated in Guangdong province, southern China in November 2002.
- 8096 cases were reported with 774 deaths across 26 countries and 5 continents during the SARS epidemic. Amongst the cases 21.27 per cent (1706 cases) were HCW.
- CFR stands at 9.56 % with a incubation period of 4.6 days (2-8 days).
- SARS-CoV was detected in Himalayan palm civets and racoon dog in southern China with its reservoir being Chinese horseshoe bat.
- Symptoms include high fever, dry cough, shortness of breath, pneumonia, headache, muscle pain, diarrhoea, loss of appetite etc.

## Public health interventions for SARS:

- Studies done in Singapore and China showed the public health interventions like isolation of cases, quarantine of their contacts, enhanced surveillance, effective contact tracing, rapid containment due to strong political commitments, robust leaderships, high level of professionalism, dedication of HCWs, and strong community support.
- Closure of schools and public places, cancellation of public holiday.
- Screening at point of arrival and restriction of entry in the country, encouraging rapid reporting to healthcare setting and isolation, rigorous IPC in healthcare setting, restrictions on movement within country.

# LITERATURE REVIEW

## Middle East Respiratory Syndrome (MERS)

- Outbreak was caused by MERS-CoV pathogen which originated in Saudi Arabia. As of January 2020, 2519 confirmed MERS cases had been seen with 866 associated deaths in around 27 countries.
- CFR stands at 34.38 per cent with incubation of 5 days (2-15 days).
- It is zoonotic in origin with dromedary camels as the reservoir host.
- Symptoms include pneumonia with acute respiratory distress syndrome and life threatening complications like septic shock and multiorgan failure.
- A study showed out of 952 cases about 27 per cent were HCW and the intrahospital transmission was mainly due to failure to isolate patients, inadequate compliance with IPC, overcrowding and close proximity with patients in Healthcare setting.

## Public health interventions for MERS:

- Surveillance on travel to Middle East if showing signs and symptoms of MERS.
- Adherence to respiratory hygiene in healthcare settings, prompt institution of contact and airborne isolation for cases.
- Rapid identification of patients, proper quarantine measures should be followed to significantly limit the spread of the virus in hospital settings.
- Nosocomial transmission from patient to HCW and vice versa can be controlled by physically separating the patients and setting up isolation wards or establishing isolation hospitals to avoid patient to patient transmission. Measures like proper IPC, awareness and preparedness in the early stage of disease outbreaks, and usage of personal protection equipment to be practiced.

# RESULTS: *Epidemiology of COVID-19 and public health interventions*

Source of origin and genome type

Signs, symptoms, risk factors and case type

Transmissibility indicators

Mortality indicators

- Planning and implementation of public health interventions at country, state and district levels.
- Calculation of period of isolation and quarantine for cases and contacts.
- Contact tracing and surveillance leading to early detection of respective contacts and suspected cases.
- Self-reporting, preventive health measures like head-washing, personal hygiene and respiratory etiquettes.
- Movement restrictions, avoidance of mass gatherings and other law enforcements.
- Transmission can be intervened by measures like surveillance, contact tracing, law enforcements with respect to distancing, implementation of IPC, personal hygiene measures etc.
- Epidemiological indicators help to analyse the ground reality and hence interventions can be relaxed or made stringent accordingly.

# *Efforts made by Government of India to curb COVID-19*



Lockdowns



Travel-entry restrictions and  
evacuation of Indians' from  
abroad



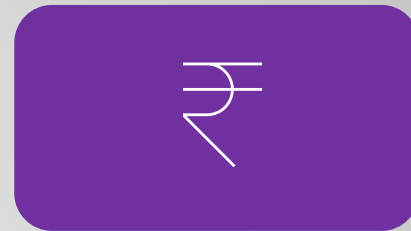
Issuance of  
guidelines



Upscaling  
healthcare facilities



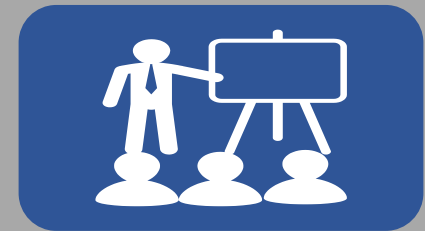
Legal front



Socio-economic  
front



Research and vaccine  
development



Risk communication and  
community engagement

| <b>Phase</b> | <b>Total<br/>Number<br/>of cases</b> | <b>Active<br/>Number<br/>of cases</b> | <b>Recovered<br/>Number of<br/>cases</b> | <b>Total<br/>Number<br/>of deaths</b> | <b>Number of<br/>Tests<br/>conducted</b> | <b>Recovery<br/>rate<br/>( %)</b> | <b>Doubling<br/>time (In<br/>days)</b> | <b>Case fatality<br/>rate (%)</b> |
|--------------|--------------------------------------|---------------------------------------|------------------------------------------|---------------------------------------|------------------------------------------|-----------------------------------|----------------------------------------|-----------------------------------|
| Pre-lockdown | 468                                  | 424                                   | 35                                       | 9                                     | 14,915                                   | 7.47                              | 3.4                                    | 1.92                              |
| Lockdown 1.0 | 10,376                               | 8988                                  | 1035                                     | 353                                   | 401,586                                  | 19.36                             | 8.6                                    | 3.30                              |
| Lockdown 2.0 | 41,656                               | 29381                                 | 10886                                    | 1389                                  | 1,046,450                                | 27.41                             | 11.5                                   | 3.25                              |
| Lockdown 3.0 | 128,172                              | 90927                                 | 34224                                    | 3021                                  | 2,279,324                                | 37.5                              | 13.8                                   | 3.1                               |
| Lockdown 4.0 | 182,143                              | 89995                                 | 86984                                    | 5164                                  | 41,032,300                               | 47                                | 15.4                                   | 2.83                              |
| Unlock 1.0   | 566,840                              | 215125                                | 334821                                   | 16893                                 | 90,561,700                               | 59.1                              | 19                                     | 2.78                              |

## *Various Models to overcome COVID-19:*

### **Public Health Interventions to Control and Suppress COVID-19 Transmission**



# ***Agra Model: Cluster containment model***

## **STATE/DISTRICT LEVEL PREPAREDNESS:**

- Immediately planned and sealed a 3 km radius around epicenter of cases' household.
- Isolation and quarantine facilities set up using PPP model.
- Training provided for teams going for surveillance and HCPs.

## **CONTAINMENT PLANNING AND LAW ENFORCEMENT**

- On detection of case RRTs screened contact, tested as needed and shifted patient to isolation.
- Disinfection team disinfected the house for three days and an area of 3 km was sealed with buffer of 5 km around it.
- Restrictions in sealed areas and lockdowns as announced by GOI.

## **SURVEILLANCE AND AGGRESSIVE CONTACT TRACING**

- Teams of two members made up 1,248 teams and carried out intensive contact tracing in 1.63 households and covered 9.3 lakh people.
- Limited to containment zones.

## **CASE MANAGEMENT; TEST- ISOLATE-QUARANTINE-CARE**

- RRTs transferred cases to isolation and quarantine centers.
- Local testing setup was done and by June 28, about 21,541 testing done

## **USE OF TECHNOLOGY**

- Use of existing Smart City Integrated with Command and Control Centre (ICCC) as war rooms.
- GPS for contact tracing and to check on movements in facilities and drones used to keep check on large gatherings

## **RISK COMMUNICATION AND AWARENESS**

- Risk communication mainly done by ASHAs during surveillance.
- Central helplines established to reach out to citizens and coordinate responses.

# Agra Model

## COMMUNITY ENGAGEMENT AND MULTISECTORAL COORDINATION:

- Multifunctional district teams were setup for centralised and coordinated response management.
- The State, district administration and frontline workers including police officers, ASHAs, ANMs and AWW coordinated to ensure multisectoral coordination to effectively implement the Agra model.



### Strengths of the model:

- Efficient use of technology for contact tracing, maintaining the law and coo-ordination.
- Practicable as it targets vulnerable 3 km radius and buffer zones.
- Quick screening, identification of contacts therefore faster mobilization to facilities.



### Limitations of the model:

- Too good too soon approach
- Lack of unified front
- Lack of community adherence
- PPP model failure
- Law enforcement

# ***Bhilwara Model: Ruthless containment model***

## **STATE/DISTRICT LEVEL PREPAREDNESS:**

- Surveillance picked up pneumonia like cases in the district and testing was done immediately.
- By the next day itself containment plans ready, sealing of borders and isolation of district was done along with law enforcement of curfew.

## **CONTAINMENT PLANNING AND LAW ENFORCEMENT**

- Brijesh Bangar Hospital was the epicenter, 1 km area sealed. Suspects were isolated and 15k-20k patients were contact traced who were in contact with HCPs.
- Section 144 of CrPC enforced followed by Maha Curfew

## **SURVEILLANCE AND AGGRESSIVE CONTACT TRACING**

- Within 3 days since the first case 850 teams surveyed about 56,025 houses and 280,937 people. By March 31, the whole district with approx 30 lakh people was surveyed, which later was rechecked in three phases.

## **CASE MANAGEMENT; TEST-ISOLATE-QUARANTINE-CARE**

- Aggressive door to door screening led to isolation and quarantine at a faster pace. Laboratory was setup and by April 13 (in a month) about 3800 tests were done.
- Treatment was given at district hospital. Staff was given rotational duties of 1-week duty followed by 2 weeks of quarantine.

## **USE OF TECHNOLOGY**

- War room set up in district with representatives of health dpt, local administration and police.
- 24\*7 helpline was established.
- GIS tracking used to monitor people under home quarantine.

## **RISK COMMUNICATION AND AWARENESS**

- Extensive risk communication and awareness was carried out by the district collector, corona captains and corona fighters during door-to-door survey.

# Bhilwara Model

## COMMUNITY ENGAGEMENT AND MULTISECTORAL COORDINATION:

- A vast multisectoral coordination was used right from local administrative authorities (both city and rural levels), ASHAs, ANMs, medical workers, frontline workers, police personnel, corona captions, corona fighters and public participation.
- Supply of essential was done door-to-door, addressing even the migrant workers and medical care for all done using multisectoral entanglement.



### Strengths of the model

- Immediate call of local government authorities, swift planning, law enforcement.
- Focused on active surveillance of each and every individual.
- Multisectoral coordination facilitated public adherence.



### Limitations of the model

- Door-to-door screening difficult in densely populated areas.
- Scarcity of trained human resources.
- Law enforcement and isolation of district kept cases low, picture might change after relaxations in lockdown.

# ***Kerala model: Trace-Test-Contain via isolation and quarantine-Treat model.***

## **STATE/DISTRICT LEVEL PREPAREDNESS:**

- Immediate action started since January when cases were identified in Wuhan.
- Leadership and governments' call of declaring a health emergency in the state by February 03, 2020.
- Healthcare ramping was fast as they had experience in Nipah outbreak and floods.

## **CASE MANAGEMENT; TEST-ISOLATE-QUARANTINE-CARE**

- When entering state mandatory quarantine of 28 days. By June 29, 180,617 people were under surveillance with 177955 in quarantine and 2662 in isolation.
- By June 30, Kerala had done 171,846 tests with 46689 samples of high risk groups as sentinel surveillance.

## **CONTAINMENT PLANNING AND LAW ENFORCEMENT**

- Containment followed similar guidelines as central government and zones remained containment zone for minimum seven days in case no new cases were detected.

## **USE OF TECHNOLOGY**

- Use of graphical route maps of cases.
- Calls for psychological support and reassurance.
- Database of all cases across state maintained including primary and secondary contacts of cases, traced and identified on live geo-map.

## **SURVEILLANCE AND AGGRESSIVE CONTACT TRACING**

- All incoming passengers were screening and surveillance was put in place. Health check up booths were established at rail, airports and state borders.
- Aggressive contact tracing done for ex. By April for 300 cases 1.75 lakh were traced.

## **RISK COMMUNICATION AND AWARENESS**

- Break the chain campaign, Kerala Arogyam portal, Covid Jagratha portal, DHS website, and dashboard.kerala for risk communication.
- Establishment of telemedicine portal e-sanjeevani for psychological support.

# Kerala Model

## COMMUNITY ENGAGEMENT AND MULTISECTORAL COORDINATION:

- Hon'ble CM and Health Minister led from the front in the Kerala model and facilitated inter-sectoral coordination with local government authorities, police personnel, volunteers, as well as community participation.
- SannadhaSena and Kudumbashree volunteers were prime examples of community engagement.



### Strengths of the model

- Immediate and timely actions, announcements of partial lockdowns where needed, formulation of line of action from first case, aggressive screening, high-level political and administrative commitment, excellent healthcare investment, community participation.
- The model of trace-test-isolate and treat made sure no cases were undetected.
- Mental health support deserves praises.
- Robust grass root level primary healthcare system, expertise in disaster management from Nipah and floods.

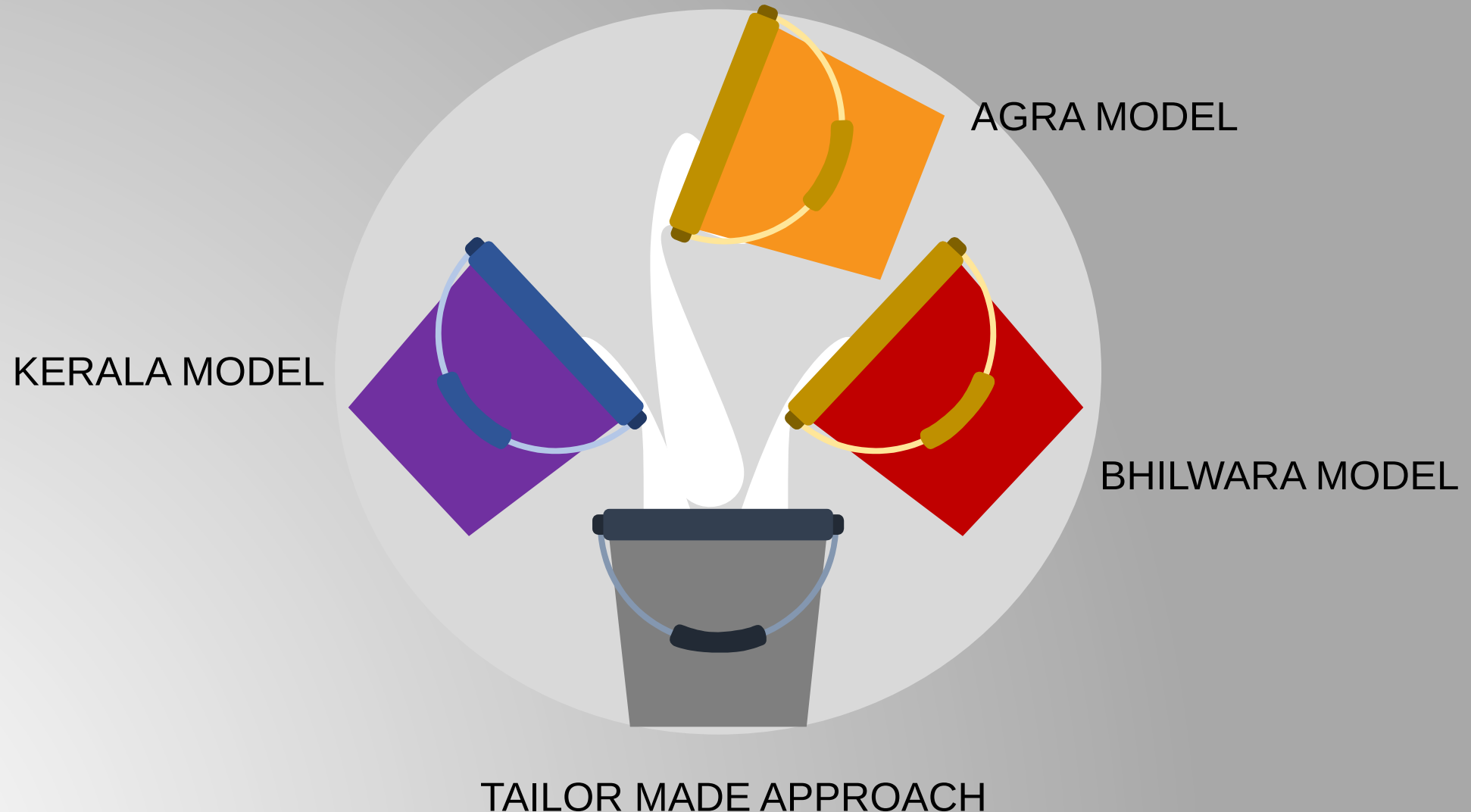


### Limitations of the model

- Application of the trace-test-isolate and treat model needs a good infrastructure, investment in healthcare settings, huge numbers of human resources, and availability of testing facilities which are not available in other places.
- Community participation and literacy are vital in public adherence which can be a miss.

## DISCUSSION:

The models hereby discussed have its own flavours based on its location, healthcare infrastructure, government bodies and local administration, varying leaderships, population density, literacy rate and community participation. Hence, a tailor-made approach to be implemented.



# CONCLUSION

- Understanding epidemiology of the new virus helps formulate and implement public health interventions.
- Both data analysis and public health expertise to be used wisely while implementing the interventions as India is a land of geographical and cultural variation.
- Government needs to focus on improvising surveillance, investing in healthcare, awareness and risk communication.
- Public health professionals have been a backbone in planning and implementation of interventions in the pandemic and hence strengthening of public health workforce is the need of the hour.
- All models fair out for success only when the pillars of unified governance and multisectoral coordination, immediate and timely actions under good leaderships, prompt surveillance systems, good infrastructure and investment and lastly public and community adherence are in place.

# ONLINE COURSE: COVID-19 CONTACT TRACING BY JOHN HOPKINS UNIVERSITY

## Objectives of the course

To learn about SARS-CoV-2, its natural history, incubation period, infectious period and clinical presentation of the disease



To understand contact tracing and its steps/protocol to be followed



To understand ethical considerations



To identify some of the barriers in contact tracing



To understand strategies to overcome the barriers

## Methodology



The course was available on Coursera



The lectures were delivered via videos and PowerPoint presentations



For application of concepts call recordings were demonstrated in simulation kind of setting

# Learnings of the course

## Basics of COVID-19

- Causative virus is called SARS-COV-2.
- Common signs and symptoms are fever, fatigue, chills, myalgia, cough, loss of taste or smell, difficulty breathing, sore throat.
- Risk factors mainly include pre-existing medical conditions, co-morbidities and old age (>65 years of age).
- The main mode of transmission is via respiratory droplets from coughing, sneezing or coming in contact with surfaces infected.

## Contact Tracing

- Helps in identifying potential transmitters of virus and prevents the spread of the virus
- For calculation of isolation period, a case if showing symptoms on day X they have to be in isolation for 10 days or until asymptomatic which is  $x+10$  days.
- To identify a contact, if a case is symptomatic on day X then the contacts from 2 days prior to day X have to be considered. Quarantine of  $X+14$  days suggested.

## Steps of contact tracing

- Steps include calling the case, calling the contacts and regular check ins.
- First step involves introducing yourself, inquiring about the case and ones they came in contact with and further instructions on isolation and precautions are given.
- Then call the contact and make them aware of the exposure and give instructions for quarantining and assessing if any symptoms are present.
- Regular follow ups of both case and contact need to be done

# Learnings of the course

## Ethical considerations in tracing

- Personal, identifiable medical information should be kept private and not released without their consent.
- A contact tracer has to trace contact information regardless of their religion, race, sexual orientation, community, wealth etc.
- Autonomy, confidentiality, privacy and justice are vital; however, contact tracing has to strike a balance for the public good.

## Barrier or common complexities

- The contacts can become ill, migration, incorrect information about case or contact.
- Unable to reach case or contact due to geographical barriers, language barriers may arise, age of the case or contact or their deteriorating of health.
- Some context complexities can be change of protocols, case or contact unable to isolate due to difficulty in limiting people from contacting.
- Complexities need to be effectively tackled with proper planning and understanding of the issue.

## Tips for effective communication

- Rapport is needed in contact tracing as it enables us to ask and get accurate information from the case or contact.
- Be assertive.
- Use simpler words like sick, being around someone sick.
- Communicate one question or message at one time. Practice active listening.
- Do not offer personal opinions and instead redirect them to the concerned people.

# Conclusion

- The course enables us to understand the basics of COVID-19 with respect to the clinical manifestations and its transmission in the community.
- Delivers the importance of contact tracing, its role in inhibiting the transmission of the virus, and the protocols/framework to be followed in investigating a case and finding the contact.
- Ways to balance the strike between public good and the factors like privacy, autonomy, confidentiality etc. and teaches us ways to handle complexities and challenges in the procedure of contact tracing.
- The entire course is laid down in a proper framework and address the chronology of protocols and has crisp and clear teachings to formulate them in actual contact tracing scenarios.

# ONLINE COURSE: MARKET RESEARCH AND CONSUMER BEHAVIOR OFFERED BY IE BUISNESS SCHOOL

## Objectives of the course

To understand consumer behaviour and the process a consumer goes through from identifying a need to buying the said product/service.



To understand the consumer behaviour pattern and help take sound marketing decisions or build strategies oriented to marketing.



To understand the need of Market Research and its applications.



To study the process of Market Research and its implications on decision-making.

## Methodology



The course was available on Coursera



The lectures were delivered via videos and PowerPoint presentations



For application of concepts simulation kind of activities were demonstrated.

# Learnings of the course:

## Consumer Behavior Module

- Understanding that consumer is the first and most important aspect of marketing.
- How attitudes and thought process of consumers are important to be understood for any product or service to be a successful model.
- It helped understand the stages of consumer decision process and continuum of buying behaviour of the consumers based on different categories of products like durables., clothing and daily consumer packaged products.

## Market Research Module

- The positive relationship between market research and taking marketing-oriented decisions.
- The stages of market research process: right from formulation of the problem, determining the research design, the variables of the research, designing data collection methods and data collection tools, collecting the data, analyzing the data and coming to a decision based on hypothesis testing at the end.
- Market research is a fundamental and crucial step at any stage of marketing or taken a decision related to marketing of the service or product as it facilitates the manager with meaningful insights to help take decisions at hand.
- The step of marketing research can be applied not only to know the consumers but also to understand the 3Cs and 4Ps of marketing.

## Conclusion:

- The course Consumer Behaviour and Market Research helps in beginner level understanding of the concepts of marketing.
- Well structured and ample examples were given to help understand the facts.
- However, the teachings were already delivered in depth by my professor in college during the first year of academics. Therefore, no such additional gain of knowledge post the course; however, it helped in revising the topics.



**THANK YOU**

