

APPROACHES TOWARDS COMBATING COVID 19 IN INDIA

SUMMER TRAINING REPORT

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CERTIFICATE

This is to certify that Dr. Nikhita Bhalla has undergone the Summer Training from April-May2020. The candidate herself completed the report assigned to her during the summer training. Her approach to the report was sincere and proactive. This summer training is in partial fulfilment of the course requirement recommended for the award of MBA in Health and Hospital Management.

I wish her success in all her future endeavours.

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ABBERRVIATIONS/ACRYNOMS

WHO- World Health Organization

ICMR- Indian Council of Medical Research

WISK- Walk in sample kiosk

NSPCD- National Surveillance Program of Communicable Disease

MOHFW- Ministry of Health Family Welfare

PPE- Personal Protection Equipment

GPS- Global Positioning System

CCTV- Closed Circuit Television

ASHA- Accredited Social Health Activist

GOI- Government of India

APPROACHES TOWARDS COMBATING COVID 19 IN INDIA

INTRODUCTION

The world was in the grip of a new pandemic, caused by a noble virus named, COVID 19, this virus is a major threat to the human lives because of its contagious nature and the long-time harmful effects on the human beings including mortality in few cases. The medical fraternity is struggling to find a vaccine for the virus and most of the hospitals in many countries are overburdened with the admission of the patients suffering from Covid 19.

India is one of the most populous nations in the world and due to the contagious nature of the virus, it was imperative for the Government of India to take steps to mitigate the harmful effects of Covid 19. The carrier of the virus could have come into India from different parts of the world; therefore, the strategy of the government was to control the disease in the beginning stage itself. The challenges for the country are many like identification of isolation wards, restricting the movement to reduce human to human spread, empowering the hospitals with the requisite protective gears, apparatus, equipment, medicines, and many other issues. It was equally important for the State Government to participate in the implementation of the guidelines given by the Government of India and Indian Council of Medical Research (ICMR).

There is no precedent in the history of Independent India, on the pandemic from highly contagious disease. The challenges for Government of India to deal with Covid-19 hence are not only new but also huge. Therefore, the best way to control the spread of Covid-19 was to monitor it at the start. The study conducted here is based on the approaches taken by different states and districts in the initial days of the spread of the Covid 19 disease. The methods adopted by states on how to restrict the spread, protect the community and reduce the death rate from the pandemic are important factors for the study.

OBJECTIVES

The objectives of the study are as follows: -

- To review the Covid-19 progression in various states of India from 30th January to 14th April 2020.
- To review various efforts made by the Government of India as well as other State Governments in India to contain Covid-19.
- To identify the best practices used by different states, in dealing to suppress the spread of Covid-19.

METHODOLOGY

To conduct the study following steps were taken: -

Step 1: Review the online information, newspapers, websites, TV news and published articles related to covid 19. The keywords used were WHO, pandemic, covid 19, progression in India, Bhilwara model, Kerala model and Agra model.

TABLE 1 – Number of Articles Reviewed by the Keywords

KEYWORDS	ARTICLES REFERRED	ARTICLES SELECTED
WHO	15	10
Pandemic	8	6
Covid 19	10	8
Progression in India	12	10
Bhilwara model	6	4
Kerala model	5	3
Agra model	5	2

Step 2: To understand the covid 19 progression data was studied on daily basis at 11 am every day in terms of number of new cases, number of death rates, number of recovered cases and total active positive cases.

Step 3: Duration of the study period was decided as 30th January – 14th April 2020, based on the first case that came in India till the first lockdown announced by the GOI.

Step 4: States to be studied, in-depth were decided based on the availability of the information.

Step 5: Indicators were decided on the basics of progression of the pandemic, measures undertaken to address and to know about the covid-19 disease during a specific period.

Step 6: The key indicators used for the study were causation of an outbreak of covid-19 in India, majorly affected states, steps taken by the various State Government to curb covid-19. i.e. surveillance of the population, controlling transmission of disease, screening of population, monitoring and treatment of covid-19 active cases, doubling time, and usage of PPE.

REVIEW ABOUT THE PREVIOUS PANDEMIC: -

India has witnessed a pandemic's in its history but at a smaller scale or confined to a localized place and definitely not at such a large scale as covid 19. The pandemic in the 21st century witnessed in India is known as the SARS- COV. This disease was caused by the SARS virus in late 2002 and early 2003 and it was a worldwide outbreak. India had remained largely unaffected by the SARS outbreak. There were around three positive cases and around ten suspected cases in India. The global SARS outbreak lasted from late 2002 to mid-2003. During this time, 8000 people fell sick and 774 people died. The SARS infection had worst affected some countries like China, Singapore, Canada. But India responded well by not allowing the virus to reach the country, it was easier back then i.e. early 2003, as international travel was less at that point, it was around 1.2 lakh/week compared to today i.e. 6 lakh/week as on January- March 2020. This was a main reason SARS outbreak did not spread as far as its new cousin. Passengers were screened for SARS at the Indian airport's, more like the current Covid 19 self-declaration performance. Those with SARS symptoms were asked to self-monitor their symptoms for the next 10 days and report to local to health authorities if SARS signs were observed.

Another step forward was to expand the five-year pilot project by National Surveillance Program for Communicable disease. (NSPCD) from five districts in 1997 to over 100

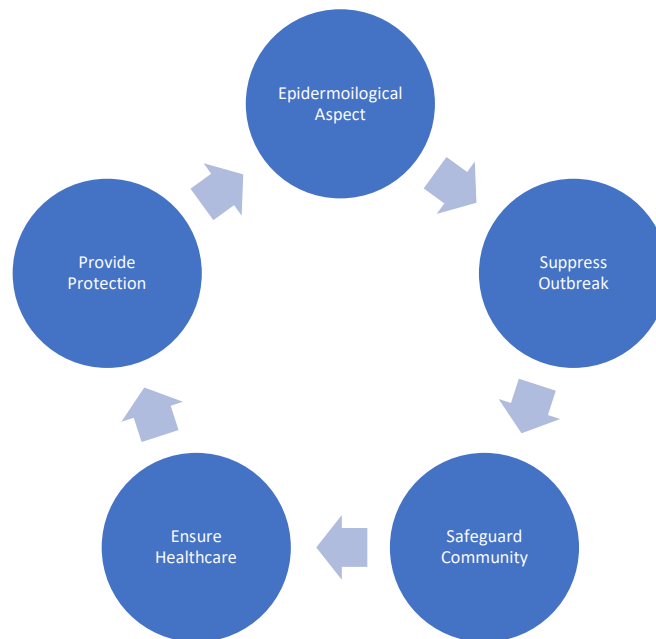
districts. The situation came under control after it was realized sometime in March 2003 that PPE can prevent healthcare workers from contacting SARS virus. A unique response from Air India pilots was seen by refusing to fly to SARS affected countries.

CONCEPTUAL FRAMEWORK-

The framework used to examine the various models, used by Indian states to contain covid-19, is by referring to the data available in open source. The important features assessed for the effectiveness of the various models include the broad categories described as follows:

-

FIGURE 1 – Conceptual Framework



Epidemiological Aspects - To study the epidemiological indicator like the outbreak statistics of the number of the active positive cases, number of recoveries, number of deaths, transmission time, measures to flatten the curve and testing symptomatic as well as asymptomatic people for covid-19. There are two methods of testing available for ascertaining covid-19 infection namely: viral test and antibody test.

A viral test result indicates the presence or absence of infection at the time of the test.

An antibody test result gives information about the previously suffered infection.

Suppression of Outbreak – Monitor the dispersion of positive cases and infected clusters to avoid population spread by quickly identifying and isolating all cases, providing proper care, and monitoring quarantining and helping all contacts.

Community Safety– Reducing disease transmission within the environment through contextual infection prevention and control measures, monitoring areas through efficient surveillance, human screening, population-level physical distance measures, sufficient reduction of non-essential intercity travel by rail or road and the intra-state travel.

Healthcare - Reducing mortality by delivering adequate clinical treatment to those affected by covid-19, ensuring the continuity of critical health and services, and protecting frontline workers and vulnerable communities.

Provision of Protection - Develop safe and effective physical preventive barriers to protect the covid warriors. Physical protection barriers like PPE and innovative measures like WISK for use by the hospitals, laboratories, doctors, nurses, paramedics, health workers, taskforce and other personnel involved in containing covid-19.

CORONA VIRUS

A virus is sub-microscopic in size, which usually thrives inside a live cell of any organism like a human body, animals, plants, and other living organisms. There are more than a million types of viruses found in the ecosystem of the earth. The scientist or virologist have been able to recognise and carry out research on a few thousand species of viruses only.

The virologists have identified one type of virus, namely the coronavirus belonging to a family of corona viridae and as examined by them under a microscope, the virus has a shape like a crown or is coronal in appearance, hence, the name coronavirus. The World Health Organisation or WHO defines coronaviruses as a large family of viruses which cause illness ranging from the common cold to more serious diseases. WHO has also classified the virus as zoonotic, this means that the virus is transmitted in between animals and human beings. The corona virus was first reported to infect human beings in the year 2002. It is believed that corona virus came to humans from the animal reservoir of horseshoe bats. The WHO says that the humans infected with this virus usually show common signs of infection of the respiratory symptoms which may be accompanied by cough, shortness of breath, fever, and difficulty in breathing. In more severe cases a person may develop the symptoms of pneumonia, severe acute respiratory syndrome, or SARS, in short, kidney failure and even death.

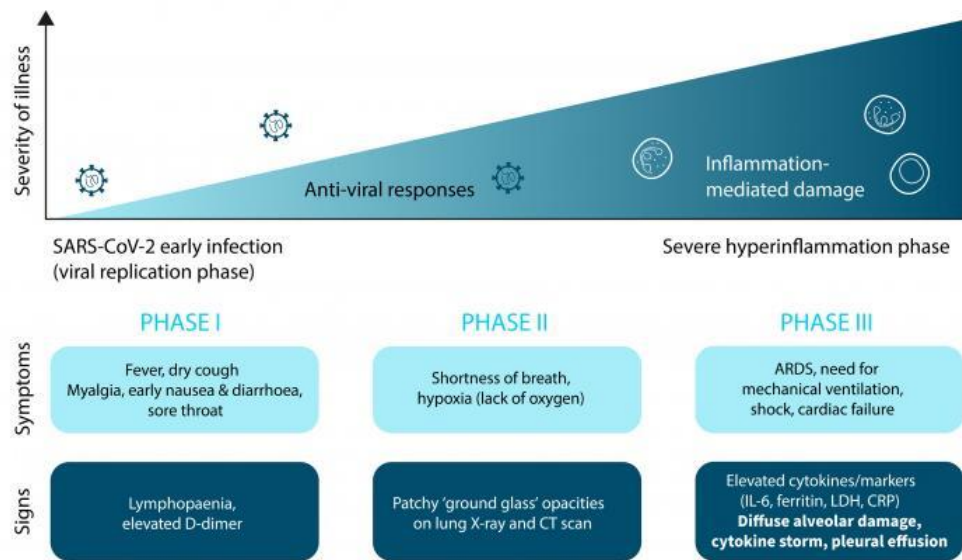
A new strain of coronavirus which was not seen before or novel coronavirus originated in China and many Chinese people in Wuhan city developed the disease due to this novel coronavirus in November - December 2019. The novel coronavirus spread fast amongst the people and a large population in China developed the disease due to infection of this virus, therefore, it was revealed to the world by China. Since the novel coronavirus causes extreme acute respiratory syndrome or SARS, the International Committee on Taxonomy of Viruses has named the disease caused by this virus as SARS-CoV-2. There was a SARS-CoV outbreak in 2003, which was different from the outbreak caused by the novel coronavirus of 2019. Hence, the WHO has named the infectious disease as Corona Virus Disease 2019 or covid-19 in short and the virus as covid-19 Virus.

The covid-19 virus is primarily spread from people to people during close contact, often via small droplets produced by coughing, sneezing, or talking. The droplets can also be thrown by an infected individual when exhaling heavily. The droplets usually fall onto the surfaces or the ground rather than travelling to long distances. People can also become infected if they contact or touch the surfaces contaminated by the infected droplets and thereafter, they accidentally or intentionally touching their mouth, eyes, or nose. It is believed that the virus can survive up to 72 hours.

In an individual, the common symptoms include dry cough, shortness of breath, joint pains, and fever. If complications develop, the symptoms include pneumonia and acute

respiratory distress syndrome. The incubation period can range from 3 days to 14 days. The disease is contagious during the first three days after the onset of symptoms, although spread may be possible before symptoms appear i.e. asymptomatic cases and in later stages too.

FIGURE 2- Growth and Severity of Covid 19 along with Signs and Symptoms



Source - <https://www.google.com/search?q=image+for+progression+of+covid+19>

The above image is about covid-19 and it represents the growth or severity of illness in three phases along with the signs and symptoms of each phase.

The **2019–20 coronavirus pandemic**, according to the WHO is an ongoing pandemic caused due to Covid-19 or SARS-CoV-2. The outbreak was identified in Wuhan city which is in Hubei province of China and WHO was made aware of this on 31st December 2019. The World Health Organization declared that the outbreak constituted a Public Health Emergency of International Concern on 30 January 2020 and recognized it as a pandemic on 11 March 2020. As of 31st March 2020, more than 0.75 million cases of covid-19 have been reported in 202 countries and territories, which has resulted in more than 36,400 deaths and more than 85,000 people have recovered, although there may be a possibility of reinfection or relapse. India as on 15th April 2020 reported a total of 11,933 cases of covid-19, of which 1,344 cases were cured and 392 deaths occurred due to this disease.

PROGRESSION OF COVID-19 IN INDIA

The first case in India was reported on the 30th January 2020 in the state of Kerala, two more cases were reported in Kerala on 3rd February 2020; all these cases were the students who were studying in the Wuhan city of China and had returned due to spread of covid-19 there. There were no significant cases in India nor was the spread seen in Kerala during the rest of the February month. However, 22 new cases were reported on 4th March 2020, these fresh cases contained a large group of Italian tourists, which had 14 members infected with Covid-19.

The month of March saw a steep rise of the covid-19 patients in most of the country. The patients detected with covid-19 mostly had a travel history to one of the epidemic centres situated in various countries of the world. The first death due to covid-19 in India was reported on 12th March 2020. The deceased was a 76 years old man who had returned from Saudi Arabia. One Sikh preacher who had earlier travelled to Italy and Germany and got infected with covid-19 there attended a festival gathering of Sikhs at Anandpur Sahib from 10th to 12th March 2020. It was later traced that, the infected Sikh preacher had spread covid-19 to further 27 people, who had come in contact with him, during the Sikh festival. The Punjab Govt. had to quarantine over 40,000 people in 20 villages of Punjab to prevent further spread of the disease.

In the early part of the March month, a Muslim religious congregation was organised by a group called Tablighi Jamaat in Nizamuddin area of New Delhi. It is believed that about 9000 Muslim missionaries from all the states of India had travelled to and from New Delhi for the event. Besides, there were about 960 foreigners who travelled for the event from 40 various countries. The congregation lasted for a few days and it turned out to be a hotspot because many people got the covid-19 infection from the event. By the end of March, numerous cases of covid-19 in India were traced back to the Muslim gathering at New Delhi. In all, 23 states and union territories of India, had people who got infected with covid-19 because of Tablighi Jamaat congregation. The confirmed cases of covid-19 rose to 100 cases by 15th March 2020 and to a figure of 1000 by 28th March. 10,000 on 14th April, till the first lockdown. As on 6th April 2020, in Mumbai's Wockhardt Hospital, 26 nurses and 3 doctors were said to be infected with the covid 19 virus. The hospital was declared a containment zone and was shut down. It is said to happen due to the negligence of the hospital administration, that the infections spread. As on 15th April there were 11,933 numbers of cases in India and 392 deaths.

The table below is compiled to depict the progression of covid-19 in India. The cases of covid-19, after the first detection on 30th Jan, remained confined to Kerala state for the first fortnight i.e. till 14th Feb 20 and the state of Kerala accounted for 50% cases till 29th Feb 20 i.e. by the second fortnight. In the third and fourth fortnight, out of the total number of cases in India, nearly 40% and 30% of covid-19 cases respectively, were in the three Indian states of Kerala, Rajasthan, and Uttar Pradesh combined. The spread or increment in numbers is as shown below.

TABLE2- FORTNIGHTLY PROGRESSION OF COVID-19 IN INDIA

State Time Period	Kerala	Rajasthan	Uttar Pradesh	India
30 th January – 14 th February 2020	1	0	0	1
15 th February – 29 th February 2020	2	0	0	4
1 st March – 15 th March 2020	24	4	13	110
16 th March – 31 st March 2020	241	93	104	1,397
1 st April 2020 – 14 th April 2020	387	1076	735	11,933

EFFORTS MADE TO CONTAIN COVID-19 IN INDIA

The Government of India (GoI) since January 2020 monitored the spread of covid-19 worldwide and its progression within the country. The Govt. ministries and agencies maintained constant contact with their counterparts in the covid-19 affected foreign countries, to understand the spread rate, measures are taken to arrest the spread, treatment procedures, vaccine or medication being used and monitoring of the population.

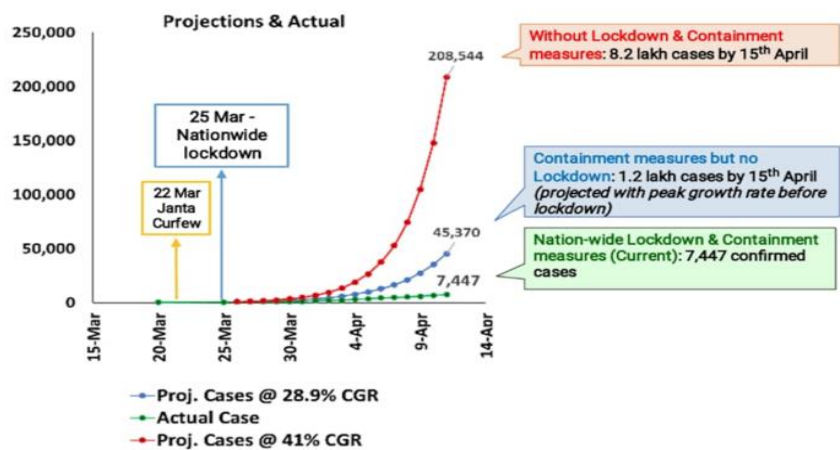
The WHO Country Office for India has been working closely with the Ministry of Health and Family Welfare (MoHFW) on preparedness and response measures for covid-19, including surveillance and contact tracing, laboratory diagnosis, risk communications and community involvement, hospital preparedness, infection prevention and control and containment plan implementation.

India is the world's second-most populous nation and population density is also high. So, the Indian Govt., invoking the rules set out in the Outbreak Diseases act of 1897, covid 19 proclaimed an outbreak. The ministries assigned tasks to various industries to make sure that adequate supplies of essentials are available to fight the epidemic of covid-19. The essentials identified by the various ministry were medicines, protective materials, medical materials, food supplies and transportation for distribution of the supplies. The Govt. also issued an advisory for maintaining social distancing and use of masks by the people who have flu-like symptoms.

To prevent the spread of covid-19, initially all the educational institutions be it schools or colleges and many commercial establishments like malls, cinema halls, theatres etc were shutdowns. The thermal screening of the air travellers was started at the airports. The state Govt. was asked to set up quarantine areas and to ensure facilities for providing treatment to the covid-19 infected people. Since most of the covid-19 cases detected in India were linked to them having travelled abroad or the visitors from foreign countries, the Govt. suspended all the visas given to the foreign nationals, except for the diplomatic and official visas.

On 22nd March 2020, Sunday, the Indian citizens voluntarily and to show the solidarity, observed curfew for 14 hours from 7 am, based on the call given by the Prime Minister (PM) of India. Further from 24th March midnight, the Govt. ordered a nationwide lockdown to control the spread of covid-19. The lockdown of the nation was a required step by the Govt. of India, to build a strategy to combat Covid-19 and save the citizens from the miseries as was being faced by other countries.

Figure 3 **Criticality of Lockdown & Containment for India**



Source- <https://www.google.com/search?q=criticality+of+lockdown+covid+19>

The above graph namely 'Criticality of Lockdown and Containment for India', depicts how the lockdown and containment measures have helped to restrict the number of cases or slow the community spread in a given time frame in India.

The state govt were asked to maintain the supplies of all the essentials like medicines, vegetables, fruits, grocery etc. Further measures at district level were set up to deal with covid-19 patients. Certain steps the district magistrate was required to take to control the covid-19 are listed as follows: -

Trace travel history and contacts of the covid 19 positive patient.

Declare strict curfew in the marked containment zone.

Send patients family and high-risk contacts for testing.

Use Govt-identified polio sectors to push teams into the area.

Conduct door to door checks in the containment zone.

The area is sanitized with sodium hypochlorite.

Ensure the supply of essentials in the containment zone.

PERSONAL PROTECTIVE KIT

Personal Protective Equipment or PPE in abbreviated form consists of protective clothing, goggles, gloves, masks, or any other garment designed to protect the wearer's body from infection or injuries of any kind.

The following strategies will mitigate the use and need for PPE while ensuring that there is no compromise to the safety of health care and others the protection of health care workers and others, from exposure to the covid-19 virus in health care settings, is not compromised.

1. The use of telemedicine and telephones was initially used, wherever possible to evaluate suspected cases of covid-19, thereby minimizing the need for people to go to health care faculty.
2. Physical barriers were used to minimize exposure to the covid-19 virus, such as glass or plastic windows frames. This approach has been implemented out in areas of the health care setting where patients will first be present, such as triage and screening areas, the registration desk at the emergency department, or at the pharmacy window where medication is collected.
3. Postpone the elective, non-emergency procedure and hospitalizations, minimize the number of recurrent patients' visits, implement telemedicine and telephone approaches whenever possible so that health care staff, wards and PPE can be realigned for in which covid-19 patients seek treatment.

4. Cohort confirmed covid-19 patients without coinfection with no coinfection with other transmissible microorganisms to streamline the workflow and facilitate widespread use of PPE.
5. Designate dedicated health care workers/teams only for covid-19 patient care only to be able to use PPE for longer periods of time.
6. Limit the number of health care staff accessing from entering the rooms of covid-19 patients if they are not involved in providing direct care. Streamline the workflow and reduce it to a safe level care requiring face-to-face interaction between health worker and patient. Consider bundling activities to minimize the amount of times a room is entered and plan which activities will be performed.
7. Consider using specific PPE only if is in direct close contact with the patient or when touching the environment.
8. Visitors should not be allowed to visit confirmed or likely covid-19 patients, but if strictly necessary, restrict the number the number of visitors.

POPULAR MODELS TO DEAL WITH COVID-19

Model- It is a thing used as an example to follow or imitate.

The covid-19 virus, which is believed to have originated in China, was transmitted to other countries by the affected persons, travelling from China to the various cities of these nations. Similarly, the only means of introduction of the virus in India, could have been by the affected people as and when they arrive at various states of India. The GoI in the meantime, undertook many initiatives to defend the country against covid-19. The initiatives include screening of travellers, lockdown of the nation accompanied with numerous containment measures. The effectiveness of any action taken with specific aim is best assessed through SWOT analysis, this is enumerated subsequently.

The first case of covid-19 was detected in Kerala, the other states too meanwhile devised their strategies to deal with the virus. The steps taken by the administration of Bhilwara district in Rajasthan, were very effective in dealing with covid and was covered much in news. In Uttar Pradesh, the Agra district is a major tourist destination as it is the home to Taj Mahal. Hence, the steps conceptualised and implemented to contain covid at Agra is worth the research. In this study therefore, the models of these three places are discussed to examine India's initial response in dealing to suppress the spread of covid 19.

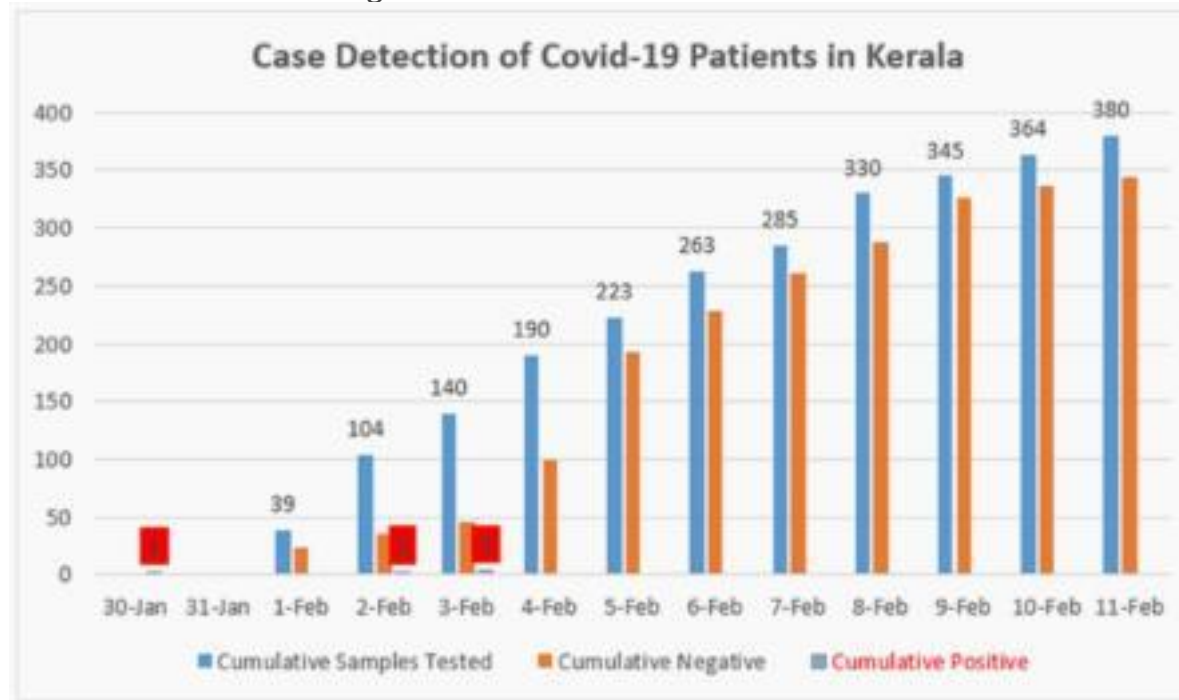
KERALA MODEL

Kerala has porous borders, numerous migrant workers, and a large expatriate population continues to move back and forth and whose remittances are the economy of the state. In the battle against coronavirus and in mitigating the difficulties caused by taking steps to control covid 19, Kerala has done better than other states. This may have been the first state to display symptoms of the infections.

EPIDEMOLOGICAL ASPECT- The state initially had a high number of incidents, but it is currently in the tenth place of nations. The state recorded three deaths more than two months after the pandemic outbreak and more than 370 confirmed cases of the infection.

More than 100,000 people live in solitary confinement at home or in specified institutions. Many believe Kerala has flattened the curve at a time when infection is on the rise.

FIGURE 4- Screening of case detection of Covid-19 in Kerala



Source- <https://www.google.com/search?q=covid+19+kerala+model+graphimage>

The above graph is about screening or testing for the detection of the cases of the Covid patients in Kerala over the initial phase of the spread. The graph is for a certain period i.e. 30th January to 11th February 2020. The information is on the cumulative number of people tested for the Covid disease, number of positive cases detected and number of negative cases.

SUPPRESSION OF OUTBREAK- Kerala opted for a technology-run model for its district Pathanamthitta that grows throughout India. The state created a database of all those that had joined the district after the first case was identified in early, March. This helped the officials to reach out quickly to the ones needed it. Apart from that it produced a family route map that first contracted Coronavirus. The route chart in the form of illustrations allowed us to know whereabouts of family's history and prompted them to identify themselves if they had been in contact. It should be remembered that the family of three had come from Italy and thus infected their relatives. All those who followed the route chart, were screened, and checked themselves, resulting in early identification of potential district events. All those who had told to quarantine themselves were given a regular call to check them up. Around 4000 people were tested on who had entered the area. Besides this contact tracing and border screening was also done. Technology, which was the hallmark of Pathanamthitta layout, was extensively used. An application called CoronaRM was also used, especially for those who had been put under quarantine. The software helped classify the whereabouts of the quarantine citizens, so they could be easily monitored if they violated it. As a result, in a couple of days the new cases slowed down to single digit rise.

COMMUNITY SAFETY - Some of the steps to tackle the Covid-19 spread is enumerated below.

It started through a relatively high number of testing, scrutiny, surveillance, quick identification of the affected and infected cases, efficient isolation and quarantine measures and unfailing daily follow up.

Route maps of virus carriers were prepared diligently, and contacts were traced and isolated or quarantined

The state's main strength is its effective public health system. It also has the experience of defeating the Nipah virus in 2018

The lockdown was enforced well, with violations coming down every day

The government created awareness in the community about the steps needed to contain the pandemic

The people who were under quarantine, their needs were well taken care of by door to door delivery

The state has a very efficient public distribution system and it was used to distribute essential commodities to the family members

The state achieved this by proactive planning, extensive testing, and tracing isolation.

The state waged the war against the pandemic. From the start of detecting infections, the machinery swung into actions, from primary health centres, district hospitals, health inspector, law enforcement agencies, to elected panchayats and municipalities.

It was the first state in India to deploy the RT- PC rapid testing kits.

It had started screening people at airports since January as mostly cases were from outside India of people having travel history.

Kerala advised 28 days quarantine period.

The local village council galvanised local health and community workers and opened a community kitchen to feed the people in isolation.

They have been providing free lunches for more than 1,200 people in the area to residents and stranded migrant workers. Local health officers ensure that villagers on medication get their pills on time.

Regional city council galvanised regional health and community staff and opened a community kitchen to feed the hungry residents.

They were given free lunches to local residents and stranded migrant workers for more than 1,200 people in the city. Local health officials ensure medicinal villagers get their pills on time.

50 police officers, paramedics, and volunteers were split into teams.

The families were retraced using GPS data mined from mobile phones and surveillance footage taken from the airport, streets, and stores.

All those with symptoms were taken to a government facility, where they were tested and isolated, their samples were flown to the national institute of virology 700 miles. By

February, a 24-member state response team was coordinating with the police and public officials across Kerala.

Kerala's strong public health infrastructure, and a tradition of vibrant grassroots democracy that essentially devolves power to the village councils. This assisted mainly in community outreach, systematic touch tracing and mass quarantine. The Communist government released ample information about the developments every day. "The decentralised health care system was a major game changer and with the approval of the citizens, village councils took upon themselves to enact and control mass quarantine. "Economists like Jacob John claim that the devolution of power in Kerala local government, community-led village councils, proactive municipalities have helped the state tackle two consecutive floods and an outbreak of the vicious Nipah virus in the last three years. The three-tiered public health program, which involves operating community hospitals, is the culmination of a more than half-century old history of healthcare investment. "Kerala," Dr John says, has invested more than other Indian states on health and education.

PROVIDE PROTECTION - To minimise the use of Personal Protection Equipment (PPE) and to deal with its shortage, Kerala has developed Walk-In Sample Kiosk (WISK):

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The Ernakulam government medical college hospital along with the association of the district administration developed WISK.

It was developed on the lines of the sample collection method adopted in South Korea.

The kiosk, fitted with ultraviolet light, gloves and exhaust fan, itself will function as a personal protection kit.

The health worker will remain in the kiosk and collect the throat swab using the gloves attached to it

The gloves would be sanitised after each use.

Apart from cost effectiveness, WISK also enables swift sample collection especially in the case of mass collection drives.

Covid 19 suspects are taken to designated hospitals in ambulances for sample collection.

This would be carried out to any place for carrying out mass sample collection drive.

The district collector, said that WISK is an ideal solution to reduce single usable personal protection kit use, which cost up to Rs. 1,000.

The production cost of WISK was around Rs. 40, 000 and it could be brought down in case of mass production.

Two kits were developed in Ernakulam district hospital. the district administration also took support from voluntary organizations in developing off more WISKS.

Even after Covid 19 the WISKS can be used as a safety apparatus for health workers for sample collection and thereby the use of single – use of items could be reduced.

SWOT Analysis of Kerala Model

Strength Experience of dealing with diseases. Strong public health infrastructure. Higher literacy rate.	Weakness Market failures as each component is intertwined with each other. High susceptibility of the disease.
Opportunities Decentralized governance system. Developing a vaccine for Covid 19. Setting up community kitchens.	Threat Citizens returned from foreign countries. Breach of lockdown protocols.

AGRA MODEL

Agra was one of India's first clusters – defined as highly populated, and it continues to have one of the highest district-wise instances. Nevertheless, the effectiveness of it in being able to monitor the spread of the disease from spreading furthermore than the positive affected areas was first found in cases detected or cluster areas. Joint Secretary gave a presentation on the “The Agra Model of Containment”. The success of the model was on the three key factors containment, isolation, and expansion. Six persons in Agra contracted the infection from the person and highlighted the need to set up a containment plan to curb the cluster of cases in Agra.

EPIDEMOLOGICAL ASPECT- In Uttar Pradesh, the first Covid-19 case was confirmed in Ghaziabad district on 5th March 2020. The reported positive Covid cases at Uttar Pradesh rose to 735 by the 15th of April. The first Covid-19, in Agra was seen on 25th February, when a resident from Delhi returned from Italy and reached Agra and visited many places which including factories, restaurants, and even family house. Five days later on, 2nd March he entered the district hospital, when six people had been contaminated by the same patient a need to highlight the incident was required and a plan was placed in place to curb containment in Agra's mass areas.

SUPPRESS OF OUTBREAK- *Containment*

There is no official definition of a Covid-19 cluster, but it could be defined as a high caseload region. By making early detections and breaking the chain of transmission, the

cluster containment strategy is intended to contain the disease within the specified geographical region.

The containment strategy is implemented by rapid response teams comprising members of civil and police forces. Coordinated staff collaborate with public advocacy professionals such as assisted social health activists (ASHAs).

The solution consists primarily of timely inspection and sensitization of any household within a 3-km radius of a house/property in which an individual has been diagnosed.

This area has been further demarcated as a containment zone, meaning a complete ban on entry and exit except for the delivery of essentials. Adjoining areas up to a given radius are marked as a buffer zone.

COMMUNITY SAFETY - *Isolation*

The infected person is asked to reveal the places they visited and people they encountered meeting during the 14 days preceding diagnosis (the incubation period of Covid-19 is 14 days). However, the information had not been taken at face value.

An electronic surveillance was carried out such as checking mobile phone, GPS, and CCTV camera history.

The electronic surveillance has also been used to ensure the primary range of 3 km is sealed round the clock with a drone control device to ensure no one steps out from their home at all. Agra was witness to 92 events, out of which eight of them had recovered while one had died.

The remaining 83, none of which is vital, were found in hospitals.

The isolation process consists of through contact tracing, containment area inspection and monitoring all suspicious cases and high-risk contacts.

Agra chief medical officer said teams travelled door to door in the designated areas and advised people with symptoms such as cough, fever and breathing difficulty to get themselves tested and stay in home quarantined, besides sensitising them to stay alert and look for symptoms and report if any. It was an arduous process.

The authorities encountered new challenges daily basis as the identification of successful cases involved hundreds of contacts in various locations and monitoring of their wellbeing.

Expanding Facilities

Once a cluster has been established, the authorities immediately begin to broaden the laboratory testing capacity and plan to ensure that ample hospital beds are available to cope with any rise in the cases.

According to a presentation by the health ministry, 1,248 teams were deployed for door-to-door screening teams have been deployed in Agra. Each team had two members, including an auxiliary nurse-midwife/ASHA/anganwadi worker, and they altogether reached out to 9.3 lakh people. The survey identified almost 2,500 patients with symptoms, who were further monitored to contain the outbreak.

Some hotels were repurposed as paid quarantine centres, with private participation.

Agra currently has 566 beds for paid quarantine at 3-star hotels, along with further 3,000 beds provided for free for health staff, among others.

Apart from all this, a citizen's self-registration portal connected to the Agra smart city website was introduced by the district government. This platform enables citizens to assess their risk of infection while also providing helpline numbers.

Patients identified as medium and high risk are then contacted by the district administration.

SMART CITY COMMAND CENTRE SEVERES AS A WAR ROOM

The Agra district administration also operated simultaneously worked on other fronts, such as ensuring distribution, chain management and transportation of essential commodities within and outside the city, along with providing food and shelter for the homeless and needy people through a helpline which also arranged animal feeding.

Technology has helped streamline the process, organizing frontline workers coordinate activities using war rooms of the current Smart City Integrated Command and Control Centre. Cameras across the city were also used to identify a crowd that would appear as a red pop-up in the war room in every part of the city, in which reports were sent to the local police teams to disperse them.

Wherever people came in large numbers to buy vital goods in the city, local providers and medical supplies were found, a door-to-door delivery network was set up, electronic monitoring via war room also helped curb lockdown breaches as hundreds of online challengers were released.

In addition, a host of other steps were also taken by the Agra district administration – those with a history of international travel were required to apply for voluntary screening at district hospitals by 31st March or face legal proceedings. However, as of March 17th, Taj Mahal tourist permit was revoked, and hotels and restaurants urged shutdowns.

Many hotspots in 15 districts of Uttar Pradesh, including Agra, are currently sealed, until 14 April, after being classified as covid-19 "hotspots"

SWOT Analysis of Agra Model

Strength Effective administration. Adequate health care facilities. Good accessibility to healthcare.	Weakness Tourists who visited, Taj Mahal, could be carry for the virus Densely Populated
Opportunities Developing a vaccine for Covid 19. Setting up community kitchens. Home Quarantine.	Threat Citizens returned from foreign countries. Breach of lockdown protocols. Dwindle the economy. Unavailability to track – densely populated.

BHILWARA'S MODEL

Bhilwara, a small town in the Mewar region of Rajasthan, was feared to become Indian epicentre of outbreak for global pandemic commonly known as Covid-19. At one instance a well-known private hospital's doctors and staff were feared to have treated or made an intangible contact with 6000 people in 3 days and to have put entire city in the most worrying times in its own history. This business city as potential "**Italy of India**" at a point when Italy had seen nearly 100,000 cases of Coronavirus. In this testing times, Bhilwara Administration and Local Government along with Medical Staff, held their nerves, put their heart in the right places and called the Final War against the pandemic in such a planned manner that most developed nations of the globe could not have missed paying attention to.

EPIDEMOLOGICAL ASPECT- Bhilwara administration, to prevent the city entering 3rd Stage of spread called Community Transmission, immediately sealed all the borders in the strictest manner possible. The city administration with the help of Hospital Staff identified 6000-7000 people who might have gotten into touch with the Hospital Staff in 7 days between 16th March and 23rd March. These 7000 people were mandated into self-isolation with constant follow-ups from administration about the symptoms. Since the first patient was identified on 19th March, there were 27 fresh cases of infection in next 3 days. This was the tipping point for the local administration and then begun and massive operation by locking down the entire city.

SUPPRESS OF OUTBREAK - Some of the steps to tackle the Covid-19 spread is enumerated below.

PHASE 1

- Isolating the hotspot
- Curfew under Section 144 of CrPc
- Essentials services open for two days

PHASE 2 – Total Shutdown

- City borders were sealed
- District border was sealed with checkpoints at entry /entry positions
- Neighbouring districts were required to seal their boundaries with areas affected.
- Total ban on goods and private vehicles.
- Containment and buffer zones were declared no-movement zones.

Identifying Clusters: -

- Cluster mapping done to identify potential Covid 19 hotspots
- Six areas have been identified and special teams have been formed to constantly screen suspected cases of corona.

Daily Disinfection Protocol: -

- Barrier and isolation areas
- Places where positive cases were found
- All ambulances, fire forces and police services
- Centres Screening and quarantine
- Collectorate departments, police lines and other public agencies – dealing departments.
- Town wards

QUARANTINE AND ISOLATION WARDS: -

- 27 hotels with a total of 1,547 rooms
- 22 institutions/ hostels with a capacity of 11, 659 beds
- District hospital with 200 beds and space to expand accommodation to 427 beds
- 4 private hospitals with isolation wards of 25 beds each

SURVEY STATISTICS

FIRST PHASE

March 18 – 26

SECOND PHASE

March 24 to April 2

THIRD PHASE

March 27 to April 3

3, 874 Teams

4,41,953 Houses surveyed

22, 39,134 People screened

17, 597 Suspected cases isolated and tested

SCREENING STRATEGY

- Survey teams were trained by specialists to recognize symptoms of influenza like illnesses
- Each person with a history of foreign travel was screened
 - Areas were demarcated for the survey to avoid duplication and omission
 - One supervisor assigned to each ten survey teams.
 - A 24-hour war room was set up with the support of state rapid response team, WHO and police
 - A dedicated screening and testing centre were established
 - Arrangements were made to monitor home quarantine of all suspected cases of influenza like illness
 - Screening and testing were prioritised for the private hospital identified as the epicentre of the outbreak
 - Survey teams traced all ICU patients, OPD visitors and contacts of doctors and nursing staff
 - Testing was prioritised for people identified as contacts of all positive cases
 - Screening and testing net gradually expanded to include health workers and staff to other private hospitals.

COMMUNITY SAFETY - Bhilwara's Model of tackling Covid 19 is a seven-step strategy:

-

- The first step was to isolate the district by imposing a strict curfew, sealing the borders with check posts at entry and exist points, suspending all the essential services except healthcare and police.
- The second step included mapping the Covid 19 hotspots and keeping strict vigil, ensuring zero movement.
- The third step, the local administration carried out was door to door screening while identifying people with influenza like illness and sending health workers to visit them, twice daily. More 22 lakh people were screened and some of them were screened more than once.

- The fourth step was the administration implementing aggressive contact tracing while pacing all persons who came in contact with infected persons under strict home quarantine.
- The fifth step was the increasing quarantine facilities as the government facilities were unable to handle the strain. There were four administration and 27 hotels with 1, 541 rooms, which the district administration took over.
- The sixth step was to monitor the rural areas. the monitoring was increased in the rural areas as they tend to be more and expansive compared to urban areas
- In addition to this disinfection drive was conducted all over the town for several days.

SWOT Analysis of Bhilwara s Model

Strength Small Town Less Populated Contact Tracing can be done easily. Existing infrastructure was converted to isolation wards.	Weakness Lack of infrastructure. Accessibility to major town. Lack of awareness among people.
Opportunities Developing a vaccine for Covid 19. Setting up community kitchens. Home Quarantine.	Threat Failure in contract tracing may lead to worsening of present situation. Dwindle the economy and overgrowth of the nation.

CONCLUSION

In this study, it has been learnt that the novel corona virus is highly contagious, and it has a harmful effect on the community if the spread of the virus is not contained. The progression rate of covid 19 has been high in many of the countries. In India, the medical institutions along with Government of India and the State Governments took many measurable steps to contain the spread of covid-19, besides imposition of the lockdown to prepare for the long fight. Since there was no template available to deal with this crisis pan India, there were number of initiatives undertaken by the Government, public and private agencies. The initiatives by the agencies, during the outbreak of novel corona virus in India, were taken at an earlier stage, hence, the control of covid-19 progression was effectual.

The efforts, made by the Indian Government and many public and private bodies within the states, turned out to be successful, in meeting with the objectives to deal with covid-19. The study conducted here, has put forth the approaches by the three states of India to combat covid-19. The three states namely Rajasthan, Kerala, and Uttar Pradesh, accounted for 40% of covid-19 cases in India, in the first 45 days. The best practices adopted to combat the spread of covid 19 has been reflected as different models in these three states.

The analysis, of the effectiveness, of the various actions taken by these states for containing covid-19 pandemic, within the period from 30th January to 14th April 2020, can be reviewed in context of factual figures. The state of Rajasthan in this period had tested a total of 42,578 number of people for covid-19, of these 1076 were found to be active cases, with 147 already recovered cases and 11 deaths, the doubling time in Rajasthan was 5 days. The state of Kerala in this period had tested a total of 16,430 number of people for covid-19, of these 387 were found to be active cases, with 218 already recovered cases and 2 deaths, the doubling time in Kerala was 18 days. The state of Uttar Pradesh in this period tested people for covid-19 and found 735 to be active cases, with 57 already recovered cases and 11 deaths, the doubling time in Uttar Pradesh was 6 days.

It can be concluded that all the three models have been very much successful in formulating and implementing steps to combat the covid-19 disease. The task for the Governments to stop the community spread and take measures to protect the people was enormous. The various agencies contributed whole heartedly to strengthen India's approach to combat covid-19.

REFERENCES

- Arshiya Mahajan and Himanshu Agarwal, Covid 19, Swot Analysis, 11th May 2020
(Jill Seladi-Schulman, 2020)
(Wikepedika , 2020)
(mohfw.gov.in, 2020)
(Biswas, 16th april 2020)
(DNA Web Team, 2020)
(Dutta, 29 May 2020)
(WHO, 2020)
(Wikipedia, 2020)
(Ivailo Izvorski, 2020)

Ehealth- MORE THEN JUST AN ELECTRONIC RECORD

SUMMER TRAINING REPORT

eHealth- More than just an electronic record

By Dr. Nikhita Bhalla

Under the Guidance of

Mr. Tim Shaw

MBA Hospital and Health Administration

2019-2021



Indian Institute of Health Management and Research

The IIHMR University, Jaipur

CERTIFICATE

This is to certify that Dr. Nikhita Bhalla has undergone the Summer Training from April-May 2020. The candidate herself completed the report assigned to her during the summer training. Her approach to the report was sincere and proactive. This summer training is in partial fulfilment of the course requirement recommended for the award of MBA in Health and Hospital Management.

I wish her success in all her future endeavours.

Dr. Nutan P. Jain
(Professor)
IIHMR University

P. R. Sodani
(Dean)
IIHMR University

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REPORT

S. NO.		
1.	STUDENTS NAME	Nikhita Bhalla
2.	ROLL NO.	0948
3.	WEBSITE	Coursera
4.	NO. OF HOURS	15 hours
5.	NO. OF CREDITS	NA
6.	DURATION	5 weeks of content, 2-3 hrs. /week
7.	COURSE INSTRUCTOR	Tim Shaw
8.	OBJECTIVE OF COURSE	To incorporate eHealth in everyday practice and improve the quality of health and healthcare worldwide.

COURSE INFORMATION: -

The course e health care is multidisciplinary in nature and seeks to connect health professionals, educators, executives, administrators, and researchers with a global audience to focus on the potential effect of eHealth on care integration. This discusses the wide- ranging application of technology, current and emerging trends, and highlights both local and international eHealth practice and research.

MODULE 1 - Fundamentals of eHealth

OBJECTIVE - To understand the basic of ehealth care and where it has headed and what are its future perspectives.

CONTENT - The module one included the basic of e healthcare i.e. e healthcare is basically referred as the use electronic health records and the devices mainly used in this sector. Main feature is that technology is helping to connect the health provider with the health consumer at ease of their home. It is more widely used in rural areas as to reduce the time travel by both the health care provider as well as the seeker. eHealthcare was explained in depth by different healthcare consumers and providers. A quiz was taking to know the current and futuristic aspects of eHealthcare

METHODOLOGY - Videos and recordings were shown along with the presentations, quiz was also done to know the current and the future aspects of ehealth and eHealthcare models via clinical practices.

KEY LEARNINGS -

- Definitions of eHealth from both health consumers and professionals.
- Developed an insight into the fundamental principles of eHealth.
- Appraised my own awareness of eHealth in current practice.
- To learn the current and future challenges of eHealth for both health consumers and health practitioners.

APPLICATIONS-

1. Virtual reality – it is a powerful tool used for diagnosis which helps doctors and physicians to carry out accurate diagnosis. It can be done in combination with other methods such as MR/CT scans and eliminates the need of any kind of invasive techniques, making it a pain- free experience for patients. It provides a patient – specific 360 view.
2. Robotics - It helps in relieving health care providers from the routine task and also make medical procedures safer and lesser costly.
3. Digital imaging – It is used to provide services via internet like telemedicine. It also uses IoT devices for electronic record.
4. Computer assisted surgery- It uses robots and wireless communication to perform surgery.
5. E-Ambulance – *It is a smart ambulance of wearable devices in a wireless sensor network for an e-health application.*

MODULE 2- Health in Our Hands

OBJECTIVE- To know, learn and understand what exactly health in our hands means and how social media and apps help to achieve the health goals for any individual.

CONTENT- The module two includes the understanding of one's health in one's hand. It focuses on the human computer interaction by helping to understand that how people use apps to meet healthcare goals. A cycle is involved to study the user, sharing ideas, and then moving on to building the systems. The cycle continues once the user has used the app, then they are asked again and observed how they have used it and then do some more designing.

The research in the effectiveness of apps and mobile technology is still growing. The young and well CRC has made some developments in strides of mental health. It allows to examine the quality of information about mental health provided through apps. The next outcome of this is to evaluate it on number of scales and to also adapt it for different areas of health. The Young and Well Centre, Australia studies the role of technology on young

people's lives. The consumer is not only able to take health into one's hands but also monitors the circumstances while taking control of it, especially in chronic ailments.

METHODOLOGY – Videos and presentations were used to explain the concepts along with an assignment was done on reviewing one's favourite app.

KEY LEARNINGS-

- Learned how technologies help consumers participate in healthcare.
- Evaluating health solutions.
- Understanding the use of health apps.
- Highlighting the importance of having a health app makes decision faster.

APPLICATIONS-

1. health (Mobile health) e.g. mobile apps
2. Healthcare score cards - They have the potential to improve the patient experience by storing medical key data and medication history and by serving as an electronic prescription.
3. Portable/Wearable Devices e.g. Fitbits, Holter meter
4. Online health information – It helps by making healthcare access to all and provides a platform where the consumer is well aware of his/her conditions.
5. Social Media – It provides health care professionals a platform to debate health care policy and practice issues to promote health behaviours, to engage with public and to educate and interact with patients, caregivers, and students.

MODULE 3 – Data and the “Quantified self”

OBJECTIVE- To acquire knowledge on the kind of health data collected now and its transformation in the future.

CONTENT- The most exciting and challenging aspect to managing healthcare data relates to how we link the data from all devices and apps and mainstream it and use the data stored and shared with our health professionals. Digitalizing medical records helps in tracking patient's medical history over time. It also helps to provide downstream information on individual or team performance and to link with quality improvement programs. The ability to use digital care to transform care is yet to be achieved. The data is available in massive, this can be related to our genomes or can be collected from mobiles, tests, and procedures. Improvements in data storage analysis help in expanding the knowledge of individual and community health and wellbeing. E.g.- To incorporate the application of super computers to know patients respond to the treatment.

Collecting numerous data especially health care comes with a cost i.e. to keep it safe. eHealthcare is a machine with all its clogs, privacy and security are like the oil that lubricates the clog, without it everything may just breakdown. Data can be secured by securing it in cloud or by processing data in genomics which requires trust, there are number of algorithms and software pipelines used. The data collected is being researched in terms of clinical practice, quality improvement and professional development.

KEY LEARNINGS-

- Learn about electronic health records and their application.

- Use of patient reported data in practice.
- Privacy and security of data.
- Data used for improving future performance.

METHODOLOGY - Well explained videos were used along with presentations to help understand the concepts.

APPLICATIONS –

1. EMR (electronic Medical record) – It is a digital version of patient's medical history from a single facility, many organizations use applications to allow patients record to be viewed by multiple facilities.
2. Multi-media (e.g. CDROM) - It plays an important role for the people with special medical informatics, rehabilitation, and assistive and preventive healthcare.
3. Wearable and portable monitoring systems - It plays a role in non-invasive monitoring of physiological functions i.e. the measurement of the body vital signs, like ECG and variables such as respiratory rate, heart rate, temperature, and blood oxygen saturation.
4. Health portals – It helps in providing an easy access to the patient's healthcare information and services. An effective e healthcare may backend medical services effectively.
5. Computer-based patient record systems - It helps in providing clinical functions like health information and data, results management, order entry, support, and decision support.
6. Healthcare audits
7. Clinical Decision System (CDS)

MODULE 4 - Interacting with Health Professionals using Technologies

OBJECTIVE- To understand the link between technology and health professionals.

CONTENT- Technology has always been a part of e health, 1930s it became a huge part of Australia to support rural care. As well as to support seas and remote areas. Tele health is becoming an increasing routine. Virtual consultation takes place and patients are counselled and given advice over skype. E Health not only uses technology to consult patients but also uses technology for other treatments. Many like telemedicine, tele health, mobile health, tele conferencing are used to adapt eHealthcare with patients. The technology has been used over 100 years to enhance communication in healthcare. Tele medicine is integrated with mainstream health to realize the full benefits. The drawback is that the synergy and connections between and across the range of disciplines that deal with complex problem is not created. The community is diverse and unaware of education and health programs that we need to start young.

Health professionals are still trying to come up with a good my health page where, patients past and present history is clearly available while linking it to the modern systems and monitoring the health of the patient. Professionals like engineering, IT, clinicians, health care specialists but also social sciences and humanities are coming together to build a community of research, education and practice which is unparalleled and unique.

KEY LEARNINGS –

- Improving access to healthcare.
- Innovations in healthcare.
- Supporting health professionals.

METHODOLOGY- Videos and concepts were explained well and quiz was taken to learn how doctors' practice clinical using ehealth.

APPLICATIONS –

1. Find and book a specialist online
2. Telemedicine- It is used when the patient and health care professionals are geographically distant. It is also used for educating patients, carers, and relatives on managing health problems by facilitating remote monitoring and delivery.
3. Rehabilitation - The use of rehabilitation in e healthcare is for providing rehabilitation care i.e. after a stroke or a surgery, virtual reality, telerehabilitation.
4. Get online consultation (E-consultation)
5. Low cost therapies – Online consultation are able at cheaper costs then e.g. Mental Health
6. Patient Communication- It includes mobile telemedicine, emergencies, health monitoring, surveillance, and access to information for health care professionals at the point of care.

CONCLUSION

This course provided insight into the use of healthcare data, including an overview of best practices and the practical realities of obtaining useful information from digital health systems via the understanding of the fundamental concepts of health data analytics. I understood why data quality is essential in modern healthcare, as they are guided through various stages of the data life cycle, starting with the generation of quality health data, through to discovering patterns and extracting knowledge from health data using common methodologies and tools in the basic analysis, visualization and communication of health data. It enabled me to –

1. Identify digital health technologies, health data sources, and the evolving roles of health workforce in digital health environments
2. Understand key health data concepts and terminology, including the significance of data integrity and stakeholder roles in the data life cycle
3. Use health data and basic data analysis to inform and improve decision making and practice.
4. Apply effective methods of communication of health data to facilitate safe and quality care.

I also acquired knowledge of how eHealth technologies are developed and used in practice, by means of a variety of case studies, assignments, and examples.