Internship Training

at

PATH, New Delhi

An analysis of Kerala's healthcare Model in Managing COVID 19

by

Surabhi Vinod

PG/19/91

Under the guidance of

Dr. Manish Priyadarshi

PGDM (Hospital and Health Management)

2019-21

International Institute of Health Management Research
New Delhi

Internship Training

at

PATH, New Delhi

An Analysis of Kerala's Healthcare Model in Managing COVID 19

by

Surabhi Vinod

PG/19/91

Under the guidance of

Dr. Manish Priyadarshi

PGDM (Hospital and Health Management)

2019-21

International Institute of Health Management Research
New Delhi

(Completion of Dissertation from respective organization)

The certificate is awarded to

Surabhi Vinod

in recognition of having successfully completed his/her
Internship in the department of

Monitoring, Evaluation and Learning

and has successfully completed his/her Project on

An Analysis of Kerala's Healthcare Model in Managing COVID 19

15th March to 15th June

PATH, New Delhi

He/she comes across as a committed, sincere & diligent person
who has a strong drive & zeal for learning.

We wish her all the best for future endeavours.

AIKANT BHATTI

Dr. Aikant Bhatti
Training & Development

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Surabhi Vinod** student of PGDM (Hospital & Health Management) from International Institute of Health Management Research, New Delhi has undergone internship training at PATH, New Delhi from **15th March to 15th June.**

The Candidate has successfully carried out the study designated to him during internship training and his/her approach to the study has been sincere, scientific and analytical.

The Internship is in fulfilment of the course requirements.

I wish him all success in all his/her future endeavours.

Ms. Divya Aggarwal
Associate Dean, Academic and Student Affairs
IIHMR, New Delhi

Dr. Manish Priyadarshi
Associate Professor
IIHMR, New Delhi

Certificate of Approval

The following dissertation titled **"An analysis of Kerala's Healthcare Model in managing COVID 19"** at **"PATH, New Delhi"** is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **PGDM (Hospital & Health Management)** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation.

Name Signature

_____

_____

Certificate from Dissertation Advisory Committee

This is to certify that **Ms. Surabhi Vinod** a graduate student of the **PGDM (Hospital & Health Management)** has worked under my guidance and supervision. She is submitting this dissertation titled "**An analysis of Kerala's healthcare model in managing Covid 19** "at "**PATH**" in partial fulfillment of the requirements for the award of the **PGDM (Hospital & Health Management).**

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

AIKANT BHATTI

Dr Manish Priyadarshi,
Associate Professor,

IIHMR Delhi,

Dr. Aikant Bhatti
Senior Monitoring, Learning and Evaluation Officer
PATH

INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH, NEW DELHI

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **an analysis of Kerala's Healthcare Model in Managing COVID 19** and submitted **by Surabhi Vinod Enrolment No. PG/19/91**

under the supervision of D**r. Manish Priyadarshi** for award of PGDM (Hospital & Health Management) of the Institute carried out during the period from **15th March to 15th June** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Signature

FEEDBACK FORM

Name of the Student: Surabhi Vinod

Dissertation Organization: PATH

Area of Dissertation: An analysis of Kerala's healthcare Model in managing Covid 19

Attendance: 100%

Objectives achieved: Learned the concepts and practical application of monitoring, learning and evaluation skills in global public health projects.

Deliverables:

- Supported preparation of Health Facility Assessment Report for multi-country project titled Tools for Integrated Management of Childhood Illness (TIMCI).
- Supported with data analysis of health facility preparedness for roll-out of TIMCI
- Lead development of manuscript for hypertension project
- Supported development of terms of reference for M&E positions.

Strengths:

- Quick learner
- Persistent
- Self-starter
- Honest

Suggestions for Improvement:
Should take up working opportunities at district/ state level in public health space to get in-depth understanding of system.

Suggestions for Institute (course curriculum, industry interaction, placement, alumni):
If possible the institute should engage with the organization during the teaching period.

Signature of the Officer-in-Charge/ Organization Mentor (Dissertation)

Date: 20th June 2021

Place: New Delhi

Acknowledgements

The achievement of my research would never have happened without the cooperation, support and guidance of many people who contributed to my valuable experience.

Three months internship at PATH, New-Delhi was an enriching experience.

I wholeheartedly thank PATH, New-Delhi for providing me a golden opportunity for doing my internship and learning from the organization. I am grateful to my mentor Dr. Aikant Bhatti for his invigorating help everywhere during this period.

I express my gratitude to Dr Sutapa Bandyopadhyay Neogi for arranging the summer internship in good schedule.

I would like to express my special appreciation and thanks to, Dr. Manish Priyadarshi (Associate Professor, IIHMR Delhi) who has been a tremendous mentor for me. I would like to thank you for encouraging my research and providing me with all your support.

Table of Contents

ORGANIZATIONAL PROFILE

PATH is a world, non-profit global health organization based in Seattle, with 1,600 employees in additional than 70+ offices round the world. Its president and CEO is Nikolaj Gilbert, who is additionally the administrator and CEO of Foundations for Appropriate Technologies in Health, PATH's Swiss subsidiary. PATH focuses on five platforms—vaccines, drugs, diagnostics, devices, and system and repair innovations—to develop innovations and implement solutions that save lives and improve health, especially among women and girls.

The organization was launched in 1977 by three researchers, PATH was quite a new health organization: a non-profit that may deliver the expertise, resources and innovations to enhance health for all.

The model pioneered transformed the way the world sees health and development. Today Path is harnessing the ability of data and digital tools. Forging unexpected partnerships across borders and sectors. Defending against new disease threats and epidemics. Creating models to remodel health provision. And fostering innovation in communities everywhere to bring good health—and the roles and economic stability that include it—within reach of more people faster.

PATH includes a team of innovators working to accelerate health equity so all people and communities can thrive. They advise and partner with public institutions, businesses, grassroots groups and investors to resolve the World’s most pressing health challenges. Their team includes scientists, health professionals, business leaders, engineers, advocates and experts from dozens of other specialties. They work in more than 70 countries to remodel bold ideas into sustainable solutions that improve health and wellbeing for all.

Mission

Its mission is to improve the health of people around the world by advancing technologies, strengthening systems and encouraging healthy behaviours. In serving this mission PATH is committed to lawful, responsible and ethical behaviour in all their activities.

Strategy

PATH's strategy was updated in 2019, uniting the PATH global team to pursue the ambitious goal of shaping the world set by the United Nations: By 2030, improve health outcomes for more than 1.4 billion people in low-resource settings by creating and advancing quality health solutions.

Contributing to this single, unified goal will help coordinate PATH's various plans and initiatives, while aligning overall efforts with other peer organizations that contribute to the United Nations Sustainable Development Goals.

As they contribute to this bold United Nations Sustainable Development Goal, with simultaneously achieve the following milestones:

- Help 1.3 billion women and children end preventable deaths and improve health outcomes.
- Reduce the incidence and mortality of infectious diseases for 1.2 billion people.
- Reduce the incidence and mortality of non-communicable diseases for 2.8 million people.

They have also developed a set of specific strategic goals for 2019-2020, focusing on leading global capabilities in primary health care, malaria, vaccines and data, and digital

excellence. PATH will continue to develop solutions and work in health areas that go well beyond these four strategic areas.

PATH specializes in developing, presenting and expanding solutions to World's most pressing health challenges in the following areas:

1. Advocacy and Policy

Their advocacy and policy professionals around the world ensure that those responsible for change are fully supported and informed to make evidence -based decisions to improve the health and lives pf women and children in low- and middle-income countries.

2. Devices

PATH distils cutting-edge medical technologies at their core, then reinvent them into affordable, reliable, and easy-to-use tools suitable for places with limited resources, power shortages, or few well-trained medical staff.

3. Diagnostics

It develops develop affordable, portable, and easy-to-use diagnostic tools and technologies that can get results quickly, so patients can receive the right treatment at the right time, every time.

4. Digital Health

We help countries develop and expand digital technology, make better use of better data, ensure that no children miss the vaccine, every medical staff has received training to track and treat patients, and valuable medical resources are sent to where they are most needed.

5. Drug

We continue to prove that it is possible to invent and promote affordable and effective medicines to prevent and treat poverty-stricken diseases such as HIV, malaria, diarrhoeal diseases and infections, and deliver them safely to those who need them.

6. Healthy Behaviours

From soap operas to social media, we use data-driven communication strategies to eliminate taboos that hamper health. We open doors for individuals and communities to adopt and maintain behaviours and tools that fight disease and improve health.

7. Market Development

We work with countries and work on a global scale to assess the supply and demand of healthcare products and establish a market that meets the five A requirements: affordability, availability, quality assurance, appropriate design and awareness.

8. Monitoring and Evaluation

To monitor and evaluate work to measure its impact, understand which interventions are effective, and track changes over time. By sharing experiences and lessons with the global health community, translating knowledge into future success and greater impact.

9. Primary Healthcare

With product development and systems innovation as the link, they work with countries and partners to reinvent primary health care through a people-oriented and data-driven approach, so that everyone has a fair chance of health and wellness.

10. Vaccines

We bring together partners in the public and private sectors to promote vaccines at all stages of development, from discovery to delivery. We create ingenious technologies and strategies to help countries bring them to those who need them.

PATH's work in India

Since 1978, we have been working with public and private partners here to address health challenges, share technical knowledge, and increasingly support local innovation.

There are more than 22 states where PATH is accelerating health equity ion India.

200+ staff working towards health impact

40 million + lives improved by our work every year.

Eliminating infectious diseases

They develop and implement new methods to prevent, manage, and eliminate infectious diseases, prepare for potential epidemics, and respond to tuberculosis, HIV, and neglected tropical diseases (such as visceral leishmaniasis, lymphatic filariasis, dengue, malaria). Challenge and reduce mortality. rate caused by acute encephalitis syndrome We provide technical support to states to implement innovative solutions, institutionalize sustainable participation models, strengthen the monitoring, follow-up and training of medical personnel, and collect and analyse data on these diseases.

Advancing immunization and vaccine access

PATH cooperate with the leading vaccine manufacturer of India and we provide a lifeguard vaccine. Stakeholders conducts a prostate study on new candidates and performs clinical evaluation, and ultimately helps develop an innovative approach for the introduction of new vaccines and strengthen the immunization system.

With our partner, we have developed a first-year old Indian vaccine for Rotavirus. There are 20 years of experience in the progress of the immune services of Japanese encephalitis in India. Test the scalability of a new cold chain device, such as a cryoprocessed vaccine carrier that allows a safe transport of vaccines.

Improving family health and nutrition

India accounts for 40% of the global burden of Low Birthweight babies and 17% of global maternal deaths. they work with partners to improve new-born nutrition and provide basic health care interventions for mothers and babies to improve health outcomes. Also, tools to improve the accurate detection and diagnosis of diseases in children under the age of five. PATH works with the government to increase access to high-quality, affordable reproductive health products. To solve the problem of micronutrient malnutrition and anaemia, and have worked with stakeholders to introduce fortified rice into the government's food safety net program.

Driving digital health and innovations to scale

PATH is at the forefront of advancing India's digital transformation. Support the development and implementation of digital tools in public health projects to improve the effectiveness of projects and the government’s ability to use data. They also have an expert system integration platform called Impact Lab to support the journey of innovators from the laboratory to the market. Bring together governments, non-profit organizations, the private sector, regulatory agencies, and international organizations to promote the acceptance of such innovations in local and global health systems.

Learnings:

During the Internship Period, I was attached as Monitoring, Evaluation and Learning Intern.

My key tasks/ responsibilities were:

- Monitoring, Evaluation and Learning (MEL) activities for different on-going
- projects.
- Editing and formatting the MEL sections of the proposals being developed.
- Literature review, scientific writing and Editing.
- Developing and updating Monitoring & Evaluation training materials.
- Developing a repository of list of indicators along with references for different
- Public Health programmes.

I was able to learn and explain the rationale for having a sound MEL system, how to carry out literature search and reference them, to collate data for PHC, CHC and district hospitals, log frame matrix and to develop indicators.

DISSERTATION REPORT

An analysis of Kerala's healthcare model managing covid 19 pandemic.

Introduction

"As the world was experiencing an unprecedented destruction of citizens' lives and jobs it has triggered a wide variety of responses from governments around the world. When even the greatest superpowers were not able to battle the coronavirus, the Indian coastal state of Kerala has bravely faced the covid 19 pandemic, it managed to flatten the curve over a longer period of time during the first two stages of infection". (1)

"On March 11, 2020 the world health organization declared the COVID-19 as a pandemic, A couple of weeks later, on March 24, 2020, the Prime Minister of India announced a nationwide lockdown, at that point Kerala had reported 107 COVID-19 cases, accounting for one-fifth of the total number of India and the largest of all states. A few months later, the state's expertise in responding to the pandemic was hailed as the Kerala Model, encouraging the rest of the world to learn from its experience".(2)

"Kerala informed the first positive case of coronavirus in India on January 30, 2020, when three medical students from Wuhan University returned home. however the state was well equipped under the leadership of former science professor and then Health Minister Shailaja, who has demonstrated her leadership by successfully handling the Nipah virus outbreak in Kerala in 2018".(3)

"Before the second wave of cases came through a group of non-resident Keralites who returned from Italy in early March 2020. The number of new cases increased in March and April 2020, reaching a peak of 39 cases on March 27, then slowly declined, reaching 0 new cases in early May. As of May 10, it had 512 confirmed cases, 489 recovered, only 20 were still active and only 3 people have died, while other states were struggling. In the first phase of the pandemic, Kerala became a model for pulling down the Covid-19 curve.

For nearly half a century, Kerala has been known for its “model” or development model. It has achieved a high level of social and human development and has rapidly reduced chronic poverty and endemic deprivations despite the economic downturn and income”.(3)

Kerala's case fatality rate is still one of the lowest in the world, with the much wealthier Punjab suffering 3.5%, Maharashtra 2.6%, and Gujarat 2.1% (as of December 8, 2020).

“The Economist claimed that the processing of Kerala, “Bargain abatement” with “stellar results”, implying successful containment at very little expense. The low-cost technology to fight the pandemic highlights the part of “frugal innovation” established and planned by the Kerala Government. Governments around the world have deployed many technical tools in an attempt to maintain a leading position and flatten the curve. As we all know, resource constraints trigger high-quality, cost-effective solutions.” (2)

“Kerala’s response to COVID-19, while focussed on the health system, involved the mobilization of many other sectors. To control a pandemic that are spread by social activities essential to the functioning of society and spread between different regions based on population interactions, response measures must be broader than the health system to be effective. The core of Kerala's response to COVID is the strong social pact between the people and the country, based on the awareness of the people, high social capital and trust in their government.” (2)

This study aims to analyse the Kerala’s successful flattening of the COVID 19 curve in the first phase of the pandemic.

Rationale

The study will focus on a detailed analysis of healthcare model put forward by Kerala and effective measures taken to battle the covid 19 Pandemic through a set of public and government actions.

Objectives

1. To describe the path of the pandemic crisis, the timely and effective steps taken to control the pandemic through its covid policies.

2. To highlight Kerala's response to the pandemic and to examine the basic and systematic aspects in the state's success.

Methodology

Study design: Qualitative, descriptive study done using secondary data sources.

Inclusion Criteria: Relevant articles after 2019 which were available for public use.

Data sources: Articles that met the inclusion criteria were sourced from PubMed, research gate, google scholar, websites of relevant organizations and various news articles' website.

Article extraction: by typing the keywords on the search bar of the websites listed above and applying time filters for extracting data was made available for public use after the year 2019.

Data Analysis: content analysis of the selected articles will be done to summarize the relevant data.

Review of the literature

"The initial case of Covid-19 was reported on January 30, 2020. In the first stage, a total of three cases were reported. They received proper isolation, observation, and treatment in the hospital. The first Corona Centre was opened in Kochi, a government medical school. No one else is affected by them".

"As the author Jayesh s and Shilpa Sreedharan suggests In the first stage, the measures taken by the Kerala government can successfully restrict the virus to travellers from China, and not allow new cases of transmission. No cases were reported in the following month. In the second stage, some close measures and welfare measures were taken to flatten the curve of new cases. In the third stage, due to the arrival of cross-regional and international travellers, the number of cases increased relatively. The withdrawal from community broadcasting remains strong".(4)

"A study titled Kerala's Innovation and Flexibility for covid-19 Recovery: storytelling using systems, this article uniquely introduces the case of Kerala, using systems thinking methods to tell stories. This case is not a demonstration of innovation or flexibility, but a set of interrelated Covid-19 innovation and flexibility in Kerala. Kerala's Covid-19 recovery strategy has a strong social structure, experienced leadership, which is conducive to the Nipah virus outbreak, and a strong public health system, involving a flexible system intertwined with society, police, communication innovation and technology".(3)

"Political commitments, along with decentralized governance, transparency and government accountability, prevent the country from entering the "denial" phase that other countries have suffered. Literacy plays an important role in the responsible behaviour of people, cooperating with the authorities and seeking timely treatment, thus

limiting community transmission. The social fabric of the State reflects extremely high levels of trust in the institutions and elected representatives".

"The key message from Kerala's experience is that the best way and time to prepare for an epidemic is long before it starts, and your resilience will continue in adversity. It provides clear lessons for the rest of India, both in responding to the current crisis or preparing for the next one".(5)

"By studying the Covid experience of different countries, researchers realized that various types of "social capital" are important resources that countries can effectively use to fight the pandemic. Jyotsna Jalan and Arijit Sen Reveals the positive impact of a country's social capital (measured by the country's electoral turnout) on the outcome of the epidemic in seven European countries (Austria, Germany, Italy, the Netherlands, Sweden, Switzerland and the United Kingdom)".

"It is important to realize that if the social contract between a country and its citizens is a valuable asset for developed countries to fight epidemics, then it is even more valuable for less developed countries".

"Kerala's understanding in the first wave of the coronavirus pandemic suggests that enough social capital, in the form of public trust and public action, is not only necessary for the effective containment of the pandemic, but can be sufficient. If this is the case, then the pandemic containment approach does not necessarily ought to placed one set of lives and livelihoods in opposition to another".(6)

"A comparative analysis was conducted to compare and understand the experiences of Kerala and New York to highlight differences in the approach of two systems. It states that scientific detection strategies, active contact tracing and group management strategies have helped Kerala prevent community transmission for a long period of time. Ninety percent of the positive cases were found in people under observation during the

first two stages of Kerala coronavirus infection. The credit should be attributed to Kerala's strong local governance, effective social structure and close multi-level public health structure".

"Soumodip Sarkar discover the mechanisms that work when KSG implements and uses thrifty technology as a platform to assist decision-making and counter-pandemic strategies. I find that the frugal innovations promoted by the government, research institutions and private sector participants have rich interactions, and these innovations are both cheap and effective. The study defines and promotes the concept of Government Frugal Innovation (GFI), and provides valuable information and tools to help the government respond to and effectively respond to this crisis, and encourages the rest of the world to learn from Kerala's experience".(2)

"The state government's rapid response to COVID-19 can be attributed to its past experience and investment in emergency preparedness and response to the outbreak during the Kerala flood in 2018, especially during the 2019 NIPAH outbreak".

"The state has Adopted innovative methods and helpful disaster management planning expertise, you can quickly deploy resources and work with key stakeholders to provide a timely and comprehensive response. Active monitoring, the establishment of regional control rooms for monitoring, capacity building of frontline health workers, risk communication and strong community participation, and addressing the psychosocial needs of vulnerable groups are some of the key strategic interventions implemented by the state government to keep the disease under control. Control".(7)

"Kerala's formula for success is simple, with priority testing, extensive contact tracking, and promoting social distancing. In addition to the two factors that contributed to this success, the 'strong' primary health care system and the way they dealt with another deadly virus outbreak before two years (Nipah virus outbreak in Kerala in 2018)".(8)

Findings

“Since the Nipah outbreak, Kerala learned that transparency helps to respond more effectively. The mainstream media were selected as partners for public health emergencies, which is the practice of the Nipah era. Regularly provide accurate information on the number of people under observation, the number of people tested, the number of positive cases, and the number of deaths”. (2)

Health system preparedness

Kerala's credit for flattening the curve in the early phase is due to pioneering plans and actions that have learned lessons from the containment of Nipah. As early as January, n-Corona guidelines were developed for hospitals comprised of state medical boards, rapid response teams, and state monitoring teams. A multidisciplinary team was formed to perform on-site monitoring, hospital admissions, logistics and other monitoring, a reference guide was developed to transform a hospital into a specialized COVID hospital, and isolation beds were designated to deal with the sudden increase. [5,8] Increase the value of hospital capacity. The health system is provided by inputs from the "Aardram" mission that began in 2016.(5)

Effective risk communication strategy

To disseminate health-related information, Kerala relied on innovative and inexpensive means. Before closing in mid-March, Kerala State Government launched a "break the chain" campaign. Use text messages with a slogan (use soap or disinfectant, use masks and maintain social distancing), whose main objective is to inform about the importance of hygiene. The event then involved well-known celebrities and cartoonists who designed cartoons via text messages on public walls. "Break the Chain" kiosks are installed at entrances to residential areas, main offices and bus stations to maximize

exposure. It is inexpensive and effective to install information kiosks, and they were installed in places with a high risk of infection. (2)

The Kerala Arogyam portal, the website of the DHS WhatsApp group disseminated complete information about COVID-19. Transparent communication focused on people's participation and daily updates from the prime minister strengthened trust in the government.(5)

In order to track the movement of confirmed cases, the state prepared a geo-tagged map and distributed it through major media to inform the risk assessment. The media also shared the experiences of those who have gone through isolation, self-isolation and even completion of treatment, and recorded their experiences, thereby providing people with a rich source of reflection content.

Technological Innovations

The start-up department also showed a sense of responsibility. The "KSUM Project" such as "Crowdsourcing Ideas and Solutions" puts various start-ups into action. "Technological innovations" such as telemedicine applications and robots developed by start-ups helped to control "local transmission" in the long term. (4)

Technological innovation rooted in a multifaceted and interdisciplinary approach brings together universities, industry and government to create innovation in the state. Corona safe Network, a crowdsourcing innovation, QuikDr, a mobile app that helps provide free medical advice and consultations via video conferencing, and a shortcut KIOSK for COVID-19 inspections are notable innovations.(5)

Laboratory Support

"Recognizing the urgency of testing and diagnosis, the centre approved the National Institute of Virology (NIV) Alappuzha and NIV Pune to analyse the samples. Currently, there are 38 private laboratories and 28 government approved laboratories for real-time polymerase chain reaction testing, 22 TruNAT facilities, and 14 CB-NAAT facilities. [15,16] 22 hospitals also have sample collection and processing facilities. State, which includes 14 district hospitals, 8 medical schools and 200 Taruk hospitals".(5)

Containment and testing

"The State adopted a screening policy based on infection input and transmission methods. It h ordered to use (Molbio Diagnostics) to test for COVID-19 in the public and private sectors. It is particularly noteworthy that, compared to the core guidelines, they adopted an active monitoring strategy to extend the incubation period to 28 days instead Isolate for 14 days. By April, as part of the enhanced testing policy, more than 3,000 samples were tested every day for community transmission. After the June 8 shutdown, it was decided to use ICMR kits to run 15,000 antibody tests each week to check for community spread".(5)

"Kerala's containment strategies included two emerging secondary structures: Fences and isolation.

Taking into account Kerala's previous experience with the Nipah virus, Kerala began screening passengers a week earlier than other states and closed the airport alongside other states on March 22. The state closed schools on March 10 and banned social and cultural gatherings. Kerala has also promoted the 'close-up model', which means that all

people with a 3 km radius (key area) and a buffer zone (5 km) of positive cases will be screened for symptoms.

In additional containment plan, a Kerala businessman in Japan came up with a me Track application to monitor the effective quarantine.

This app enables officials in Kerala to track and isolate cases, and delivers an online site for healthcare managers to monitor all quarantine activities in actual time using a dashboard".(2)

For the health-care professionals

"Following the axiom of "minimize risk as much as possible", the capacity-building training program has been used at an early stage, combining teaching methods and input from infection control experts from medical schools".(2)

"with the intention to enhance the abilities of scientific researchers, the Indian Institute of f Technology and management in Kerala has released a brand new search engine, vilokana.in, that is a specialized tool which can assist scientists, doctors, and researchers behavior associated COVID -19 within the modern studies. despite the fact that there are numerous search engines or even web sites like Reddit which can help researchers, COVID-19 has a Kerala historical past and incorporates a whole lot of research and virus discoveries precise to India. different capabilities (which includes false data detection and brief precis of get right of entry to articles) offer extra features."

Screening, case reporting, surveillance and quarantine

“All international passengers were inspected by health personnel at the four airports. All symptomatic people were transferred to the health centre for swab collection and then admitted to the hospital. Asymptomatic people were subjected to home isolation. Developed COVID-19 guidelines, specially arranged for foreign tourists coming to Kerala, and it worked very well.

Through the powerful system of daily case reporting and decentralized monitoring, the onset of symptoms were determined by telephone consultations twice a day, and suspects were transported to the centre in designated ambulances through "DISHA" (24/7 telephone service)”.(5)

“In the field, the monitoring system led by the health department displayed community-based characteristics, including elected representatives, especially village committees, members of the “Kudumbashree” Self-Help Group (SHG) system, and the citizens themselves”.(5)

The department of police security was actively involved in this process.

The Police has additionally released an internet platform for folks

that want to tour urgently to use for a car pass via the portal

www.bypass.bsafe.kerala.gov.in. motorists need to carry a self-assertion form with itinerary info or go to the neighbourhood police station

to obtain a car bypass. through the portal, motorists

can enter their journey information and the local police will check their approval request.

Resource Management

Kerala’s open-supply method specializes in two additives: Corona Literacy project (to spread focus approximately how the virus is spread and preventive measures to be taken) and Corona Care center (a brief facility created to enhance the present healthcare infrastructure).

lookingaheadto a surprising increase, enough private protective equipment was purchase d and stockpiled. The masks and hand sanitizers were produced domestically with the aid of Kudumbashree at the equal time, nearby studies and development (R&D) have been working tough to improve take a look at systems and centers, and have been keen to check superior technological interventions which include plasma remedy.

“Kerala start-up challenge (KSUM), a central authority subsidized business improvement organization t also stepped in to connect engineering abilties with KSG-powered start-america to make sure the fast development of required technologies. The "Breath of wish" software become an interdisciplinary group of IT experts, physicians and biomedical engineers, whose purpose become to broaden modern scientific gadgets, which includes half of ventilators and face masks. KSUM additionally uses its Fablabs to sell the development of many scientific products, consisting of mask and breathing products”.

Treatment Protocols and drug Access

The unified clinical management guidelines provided by the national team of experts, including standard treatment in intensive care, help reduce the mortality of patients in COVID hospitals in Kerala.

“Kerala’s estimated death rate (CFR) and lagging death rate (LCFR) are approximately 0.5% and 2.01%, respectively, which are far below the national averages of 2.8% and 5.9%. An important predictor of low mortality may be rapid hospitalization and early treatment, which occurs on average within 2.4 days of symptoms. Lopinavir/ritonavir and remdesivir were being tested, and tocilizumab, steroids and convalescent plasma were being used on a case-by-case basis, and the consensus of the State Medical Council”(5)

Health Infrastructure

“The government medical school adopts dynamic planning to deal with extreme situations, establishing isolation wards and intensive care unit (ICU) facilities, and district hospitals that separate isolation wards. Initially, a total of 3,600 beds out of 28,000 beds were dedicated to COVID-19 patients. The state enlisted the support of private hospitals and even drew a map of empty houses owned by non-resident Indians. The state has now identified approximately 100,000 hospital beds, which can increase to 200,000 in an emergency. [5] There are currently 300 COVID care centers and approximately 29 CFTLCs (First Line Treatment Centers), which are operational”.(5)

Social security and support

“In early march, the state announced 20,000 crore aid program Social security pensions, assistance from 5.1 million welfare funds to beneficiaries, interest-free loans to members of self-help groups, free rationing through the public distribution system, and door-to-door food for Anganwadi beneficiaries are some of the key assistance measures. Kudumbashree workers prepare approximately 300,000 meals a day for approximately 2.5 million guest workers in 20,000 camps. The helpline allowed the elderly to obtain food and medicine through volunteers.the policy of "no one left behind" was implemented”.(5)

Support of individuals and Community Organizations

Economically wealthy families donated outhouses and annexes for used as public isolation areas and even helped with meals to remoted sufferers.

Village councils took the duty to screen the suspected covid sufferers with the consent from the humans.

Many students device up themselves to set up covid check-kiosks of their neighbourhoods.

Psychological Assistance

“A telemedicine portal, e-sanjeevani and mental support were kept in location . mental health professionals such as psychiatrists, social workers, clinical psychologists and counsellors had been deployed to provide assist advert guidance to the humans in isolation via phone counselling. The state adopted a an inclusive approach, they catered to people with special needs of mentally ill patients, children, migrant labourers and elderly people living alone”.(5)

“This lesson was learned by the state from the Nipah outbreak where the families had to undergo great stress.

All these steps provided support to the population and also minimized the needs to break social distancing norms”.(2)

“During the current wave in 2021, Between May 1st and 22nd this year, Kerala recorded 1,862 Covid deaths, with a mortality rate of over 0.3%. of these, the Thiruvananthapuram region accounted for the best variety of deaths (1420) and a mortality fee of 0.63%. As of may also 22, the total wide variety of energetic cases within the country turned into 289,283, with a test effective rate of 22.63%”.

“Kerala has developed various strategies to govern the second one wave and opened domestic care centers in all rural areas wherein the high-quality fee exceeds 30%. It has also set up a project force to offer aid to infected and quarantined human beings. similarly to setting up a 24-hour telemedicine helpline, healthy volunteers also document the status of the infected man or woman, along with blood oxygen level, in the domestic isolation in all

quarantine regions.The data is sent to the medical team, which decides whether the patient needs hospitalization or home care.(9)

In this way, government testing, contact tracing, and isolation strategies were transformed into public actions".(6)

Conclusion

“Kerala's success story in containing COVID-19 is based on a solid foundation of infrastructure successfully created to support social and human development, including an efficient public health service delivery system. It has the lowest mortality rate and highest recovery rate. Active surveillance, contact tracing and group management strategies have helped Kerala in preventing community transmission for a long period of time. My finding suggested that the state relied on innovative and inexpensive media, using various platforms, print, digital, and social platforms to methodically circulate preventive measures.

This case demonstrates a set of interrelated Covid-19 innovations and flexibility in Kerala. Its Covid-19 recovery strategy has a strong social structure, experienced leadership, is conducive to the Nipah virus outbreak, and a strong public health system, involving the flexibility of society, police, communication innovation and interlocking technology system.”(3)

“Literacy plays an important role in the responsible behaviour of people, cooperating with the authorities and seeking timely treatment, thus limiting community transmission.

Going by the numbers, Kerala has attained the pandemic more effectively than many other states. In addition to responding to the Covid-19 virus, Kerala has also adopted a number of welfare procedures to make the lives of Kerala citizens more comfortable. Kerala's proposed model to combat Covid-19 can be considered a benchmark on how to properly utilize the public health sector.” (4) “The key message from Kerala’s

experience is that the best way and time to prepare for a pandemic is long before it starts, and its resilience will continue in the face of adversity. It suggests clear instructions for the rest of India, both in answering to the current crisis or formulating for the succeeding one".

Discussion

“Kerala not only stands out in India, but also stands out internationally, and has become a lesson for others to learn. My results show that behind the miracles are a series of measures implemented by the government, whose collective actions and interactions helped in fighting the pandemic. Low-cost and effective technical solutions have formed a corpus of frugal innovations initiated by Kerala. They complement each other and their systematic interaction helps Kerala's resistance to COVID-19.

For example, mobile applications were used to act as a one-stop source. A search engine that empowers medical researchers. COVID-19 Crowdsource platform and others that provide real-time analysis of cases and daily updates. In the serious shortage of PPE, KSG presented a fashionable solution for protective equipment and worked with starters to create a large amount of disinfectant and toilet monitoring system. To capture suspected cases, KSG combined readily available technologies to provide inexpensive test kits, facilitating easy collection, low portable work booth installation, and intensive contact tracking.

In addition to food, they also supported with the provision of medical supplies, such as the creation of telemedicine applications for medical consultations. These measures are encouraged not only to the physical and mental health of residents, but also to minimize the need to break the rules of social distancing. Groceries and necessities were provided regularly with the help of volunteers and decentralized agencies such as panchayat and municipalities”.(2)

“Social Media also plays a important role in crisis situation. The Kerala Police social media team often adds humorous content to provide a kind of infotainment. The messages used in social networks are reproduced with other strategies, such as Break the Chain and SMS.

We can only hope that the lessons learned from best practices from Kerala and other states and countries during the Covid 19 pandemic will continue to resonate with the people of India and the world as they may be rethinking and reimagining a better world. the post-Covid era”.(10)

Limitations

Mostly articles were focussed on initial phase of covid-19.

Limited number of scientific articles.

Methodologies of some of the articles were not properly explained.

Ethical considerations

The data used for the study will not be misused for any other purpose.

Use of the data will not lead to any damage or distress.

References will be given at the end of the study.

This study does not contain any studies with human participants.

References

1. R Heera and R Rajeev. Curbing COVID-19: Kerala model. pubmed [Internet]. 2020; Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7802861/

2. Soumodip Sarkar. Breaking the chain: Governmental frugal innovation in Kerala to combat the COVID-19 pandemic. pubmed [Internet]. 2020; Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7717778/

3. Elias AA. Kerala's Innovations and Flexibility for Covid-19 Recovery: Storytelling using Systems Thinking. pubmed [Internet]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8021297/

4. Jayesh Scorresponding author1 and Shilpa Sreedharan2. Analysing the Covid-19 Cases in Kerala: a Visual Exploratory Data Analysis Approach. pubmed [Internet]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7426205/

5. Asma Ayesha Rahim and Thomas V. Chacko1. Replicating the Kerala State's Successful COVID-19 Containment Model: Insights on What Worked. pubmed [Internet]. 2020; Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7745804/

6. Jyotsna Jalan 1 AS 2. Containing a pandemic with public actions and public trust: the Kerala story. 2020; Available from: https://pubmed.ncbi.nlm.nih.gov/32836353/

7. WHO. Responding to COVID-19 - Learnings from Kerala. 2020 [Internet]. Available from: https://www.who.int/india/news/feature-stories/detail/responding-to-covid-19---learnings-from-kerala

8. Kim Sulaiman, Muhammad T, Rishad Rishad Ap AK. Trace, Quarantine, Test,

Isolate and Treat: A Kerala Model of COVID-19 Response. 2020; Available from: https://www.researchgate.net/profile/Muhammad-T/publication/349144754_Trace_Quarantine_Test_Isolate_and_Treat_A_Kerala_Model_of_COVID-19_Response/links/6022bd4f458515893992f101/Trace-Quarantine-Test-Isolate-and-Treat-A-Kerala-Model-of-COVID-19-Response.pdf

9. Jacob J. How Kerala is planning to control second Covid wave, step up vaccination. 2021; Available from: https://www.indiatoday.in/india-today-insight/story/how-kerala-is-planning-to-control-second-covid-wave-step-up-vaccination-1806823-2021-05-25

10. Jos Chathukulama and JT. The Kerala model in the time of COVID19: Rethinking state, society and democracy. pubmed [Internet]. 2020; Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7510531/