SITUATION ANALYSIS OF COVID-19 IN BIHAR STATE OF INDIA

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INTRODUCTION

COVID-19

Coronaviruses (CoVs) belong to the subfamily of Orthocoronavirinae in the family Coronaviridae. The name coronavirus is derived from the Latin corona, meaning crown for their crown-like spikes on their surface. Common human coronaviruses cause mild symptoms of the common cold – 229E (alpha coronavirus), NL63 (alpha coronavirus), OC43 (beta coronavirus), HKU1 (beta coronavirus). Other human coronaviruses cause symptoms that are potentially severe and are fatal in nature – MERS-CoV (the beta coronavirus that causes Middle East Respiratory Syndrome, or MERS), SARS-CoV (the beta coronavirus that causes severe acute respiratory syndrome, or SARS), SARS-CoV-2 (the novel coronavirus that causes coronavirus disease 2019 or COVID-19). Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) is the name given to the 2019 novel coronavirus by the World Health Organization with International Committee on Taxonomy of Viruses (ICTV) on February 11, 2020. COVID-19 is the name given to the disease associated with the virus called Coronavirus.

CONTD…

- Total number of confirmed cases worldwide is approximately 15 million.
- India is at 3rd position in world in terms of total coronavirus cases after US and Brazil having 9,70,169 confirmed cases, 3,31,122 active cases,6,13,734 recovery and 24,919 deaths till July 15th, 2020.
- Bihar ranks 17 in India having 20,173 confirmed cases, 6,483 active cases, 13,533 recovered and 157 deaths till July 15th, 2020.

Timeline

COVID-19 Progress steps

2019.12	2020.01	2020.03	2020.05	2020.07
December 1st, 2019 First case was identified in city of Wuhan, China.	January 30th, 2020 India identified its first case of COVID-19 which has a travel history from Wuhan, China. Bihar: No such cases found till date.	March 22nd, 2020 First case was identified from Munger district of Bihar. India: 403 Bihar: 2	May 31st, 2020 Total number of confirmed cases found are: India: 1,90,648 Bihar: 3,807	July 15th, 2020 Total number of confirmed cases found are: India: 9,70,169 Bihar: 20,173

LITERATURE REVIEW

COVID-19

Varsha K. conducted a study on “Novel Coronavirus (COVID-19) in India: Current Scenario” in which she explained the basic protocols as per Government of India advisories. In her study, she has described the most possible mode of transmission, diagnosis, treatment, some basic advice and guidelines instructed by WHO, Ministry of Health and Family Welfare, Govt. of India and ICMR.

Tridip et al. conducted a study on “Assessment of Lockdown Effect in Some States and overall India: A Predictive Mathematical Study on COVID-19 Outbreak” in which they proposed different mathematical models and parameters for the study. Three different models (mathematical, statistical forecast, ensemble) were chosen for the study during March 14, 2020 till May 3, 2020. These models were used for the observation of daily cases in six different locations.

Richa et al. conducted a literature review on “COVID-19 Sets off Mass Migration in India” in which she described about reverse migration of laborers/workers from various states of the country to their native places.

OBJECTIVES

BROAD OBJECTIVE

- To observe the current scenario of COVID-19 in the state of Bihar during the 4 lockdown phases in India

SPECIFIC OBJECTIVE

- To study coronavirus situation analysis in the districts of Bihar.
- To study key indicators such as mortality, recovery rate of COVID-19 disease.
- To enlist the measure steps taken by the government and at community level in lockdown and unlock phases.

Data Source

- COVID19 INDIA
- Ministry of Health and Family Welfare
- World Health Organization
- Bihar Health Department

METHODOLOGY

Study Type: Quantitative Observational study

Study Duration: 3.5 Months (April 1, 2020 – July 15, 2020)

Sample Size: The selection area of sample is throughout the India and districts of Bihar, which comprises of various portions i.e., number of confirmed cases, active cases, recovery, deaths.

Type of Data: Secondary Data Collection

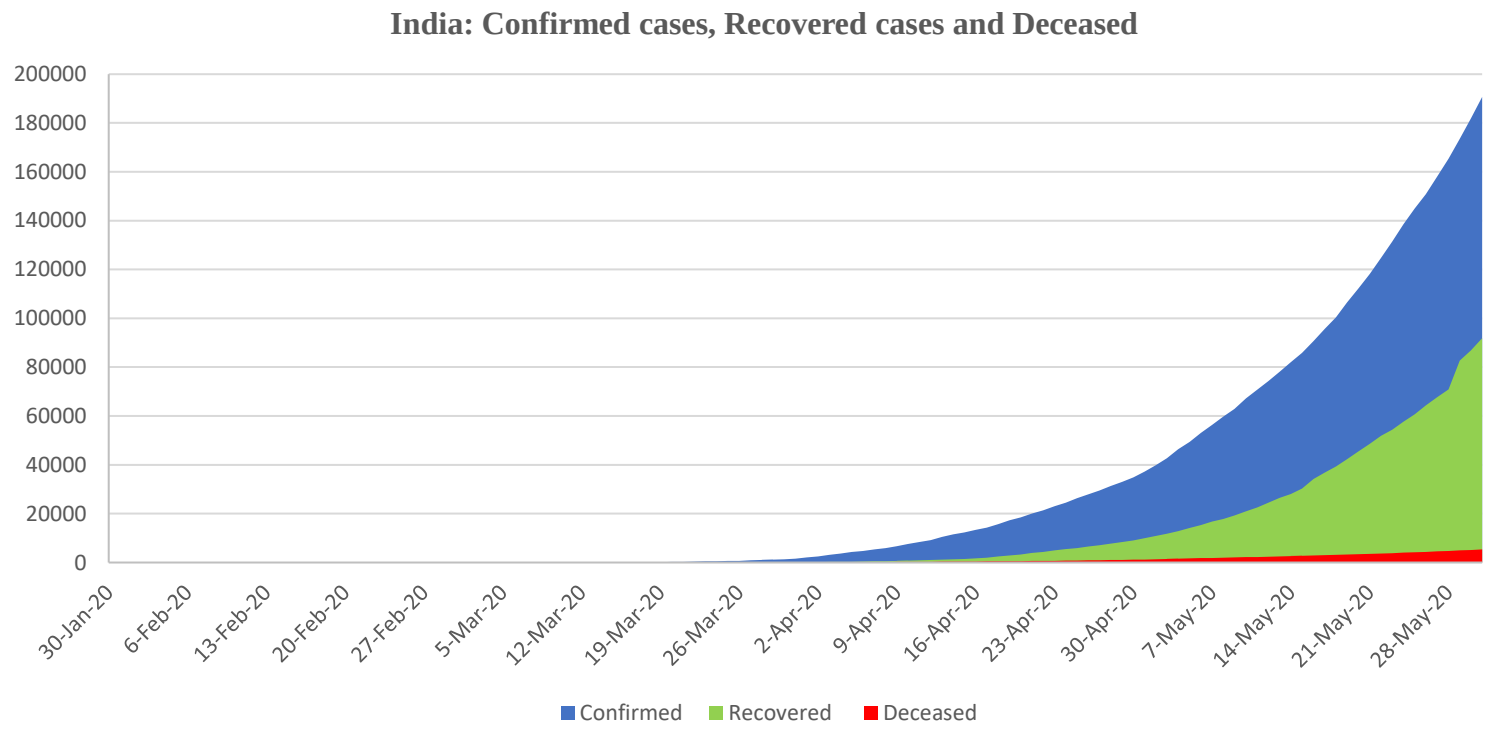
Study Tool: Microsoft Excel

MODE OF DATA COLLECTION

Source of data was different websites and repository system like Git-hub repository which include the information collected by various departments and organizations all over India. Bihar data is taken from Health Department, Govt. of Bihar. Git-hub repository is taken as it handles the general information of COVID-19.

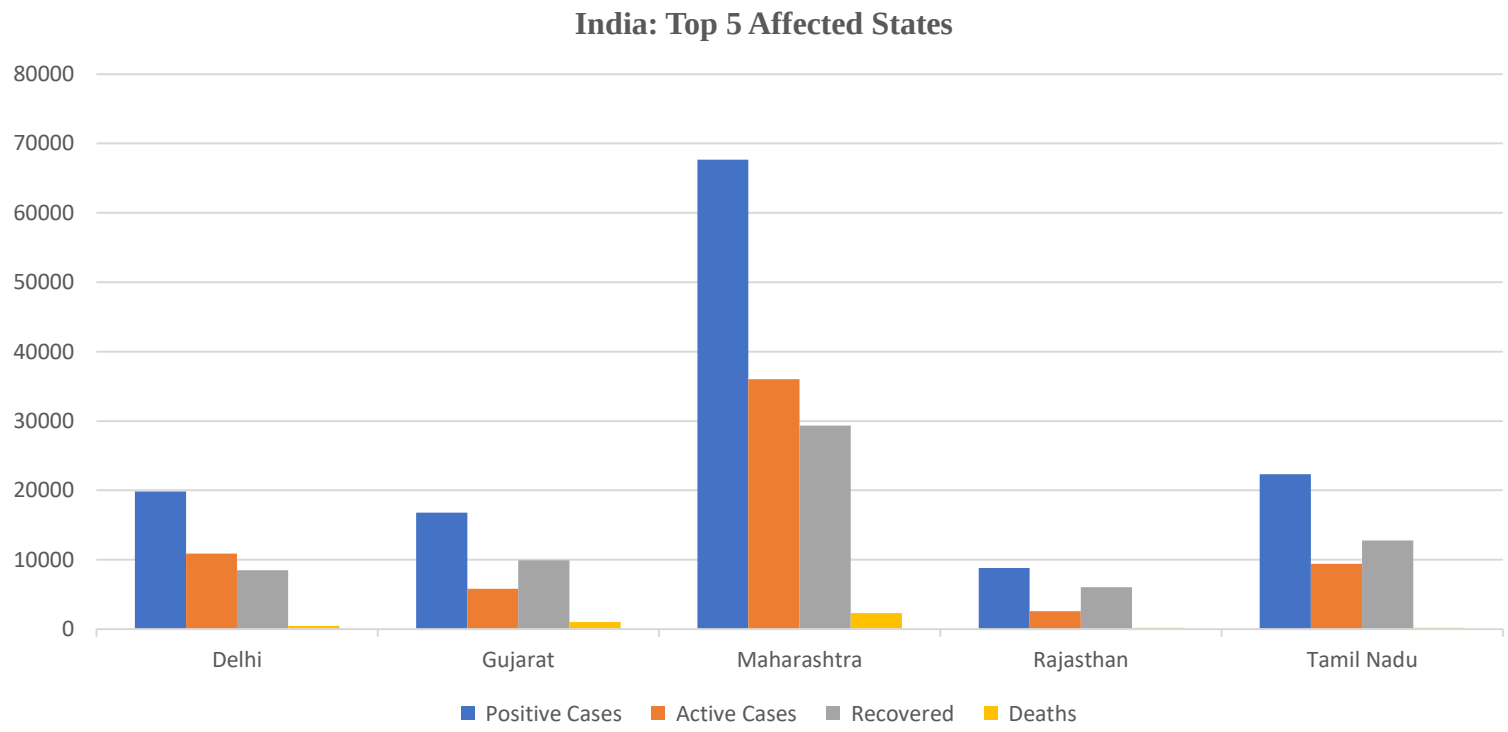
RESULTS

COVID-19



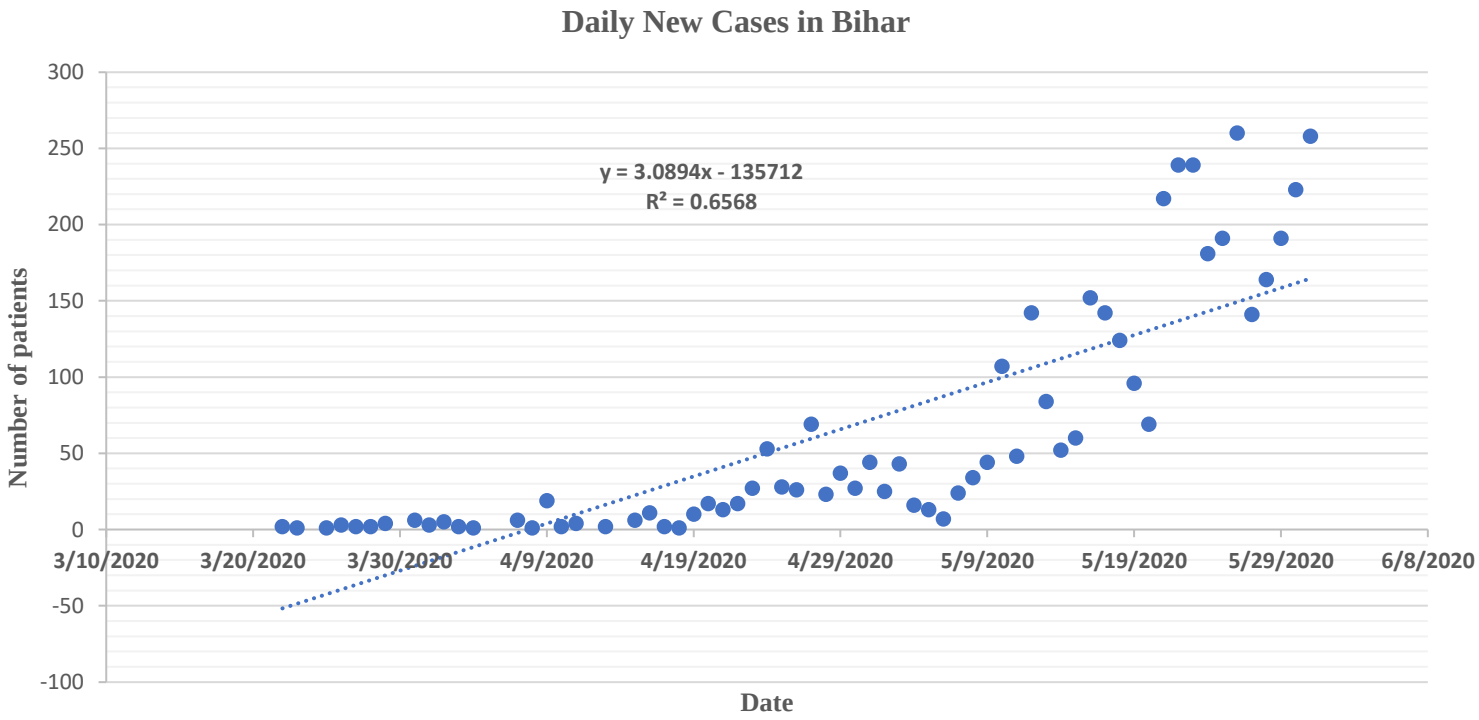
Graph shows the steep increase in the terms of confirmed cases in the mid of April, 2020.

CONTD...



Graph shows the number of confirmed, active, recovered and death cases of top affected states of India.

CONTD...



Graph represents scatter plot of daily new cases in Bihar.

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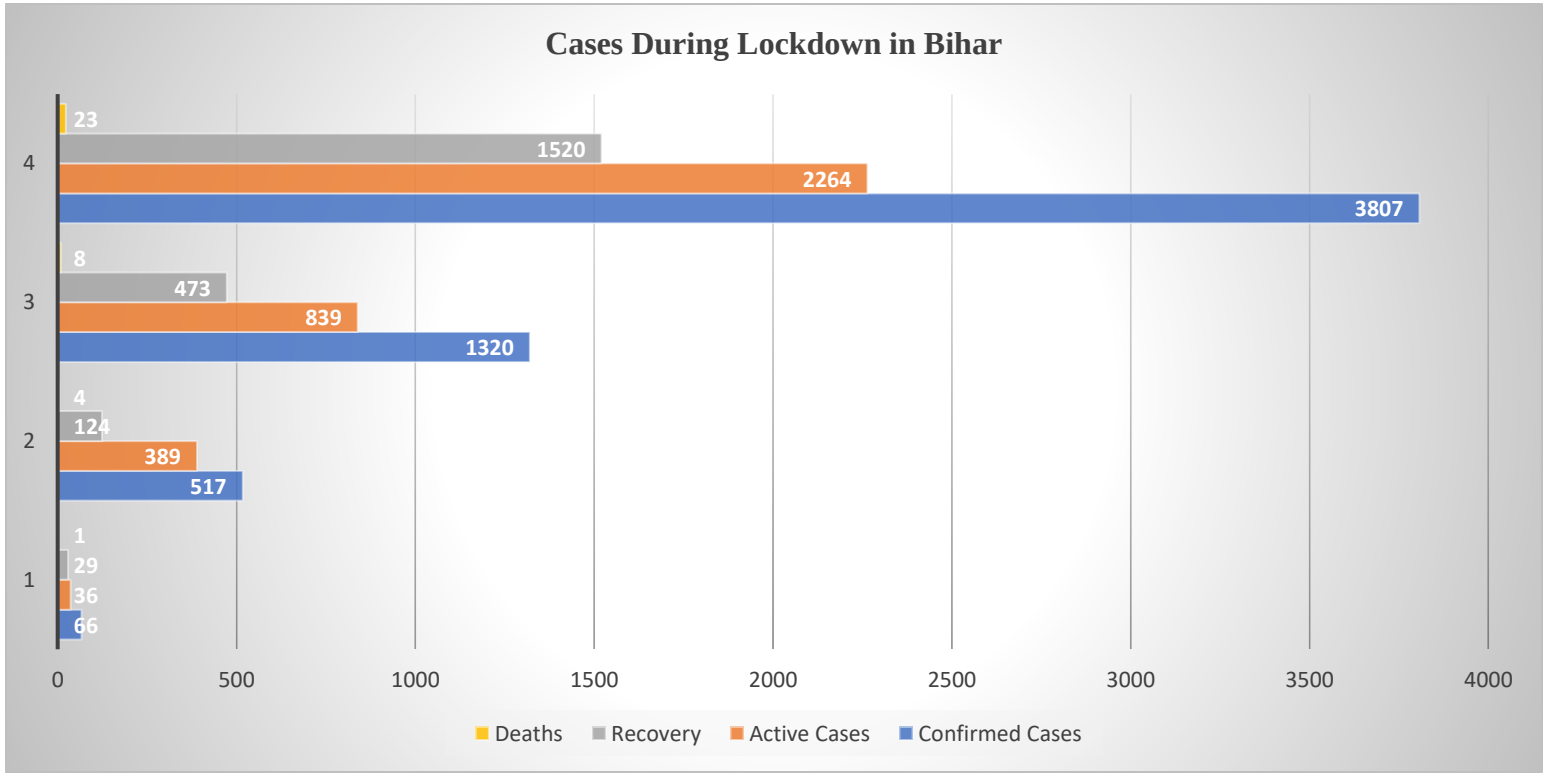
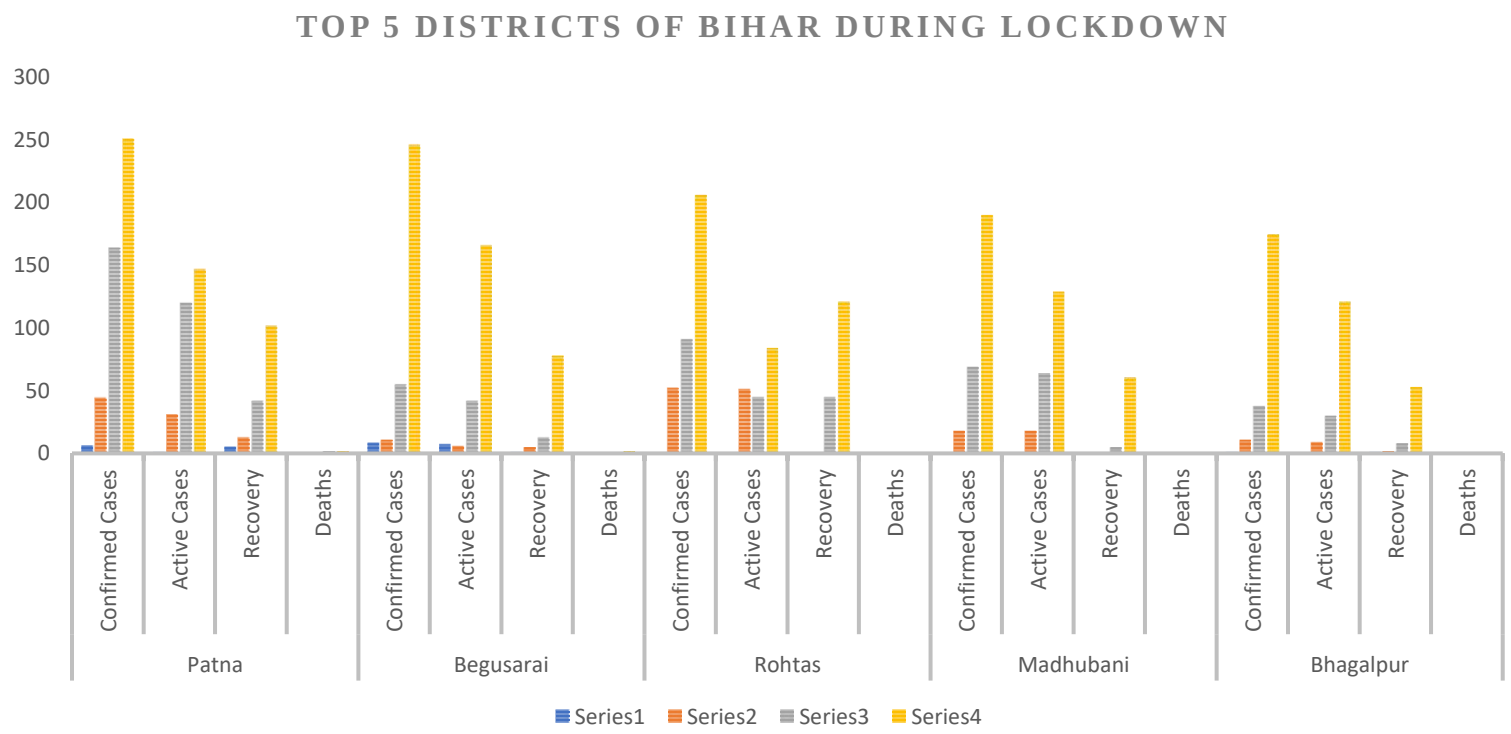


Graph shows the cases in Bihar during lockdown 1, 2, 3 & 4

CONTD...



Series 1,2,3,4 are the phases of lockdown 1,2,3,4 respectively. Each district shows increase in number of cases during lockdown phase 4.

CONTD...

States	Testing Done	Confirmed per Million	Active	Recovery Rate	Mortality Rate	Average Growth Rate
Maharashtra	14,13,185	2256.51	40.56%	55.37%	3.96%	3%
Tamil Nadu	17,36,747	2005.68	31.18%	67.39%	1.43%	3%
Delhi	7,36,436	5904.56	15.22%	81.80%	2.98%	1%
Karnataka	9,02,026	718.15	58.94%	36.25%	1.97%	7%
U.P	8,89,986	127.28	30.44%	66.73%	2.83%	3%
Bihar	3,37,212	168.78	32.14%	67.08%	0.78%	6%

Table shows the testing done in different states of India comparing with Bihar (Till July 15th, 2020). It includes the recovery rate, mortality rate and average growth rate due to COVID-19.

CONCLUSION

The present study concludes the impact of COVID-19 in the state of Bihar. Bihar has 9,988 confirmed cases at that time where **Patna** the capital of Bihar was most affected among 38 districts with 735 confirmed cases, 402 active cases, 326 recovered and 7 deaths till June 30, 2020.

Bihar is the 3rd most populated state in India as per 2011 census, and testing done in the state is approximately 2197 test per million which is poorer compared to other states. Several precautionary measures taken by the Government of India such as “Janta Curfew”, complete lockdown and districts are divided into three zones i.e., Red Zone, Orange Zone and Green Zone during 2nd phase of lockdown. To control the outbreak every person should follow the Government advisories and protocols and should socially distance themselves.

REVISED GUILDLINES

COVID-19

- The person should be clinically assigned as a very mild/pre-symptomatic/asymptomatic case by the treating medical officer. Such cases should have the requisite facility at their residence for self-isolation and also for quarantining the family contacts.
- The health status of those under home isolation should be monitored by the field staff/surveillance teams through personal visit along with a dedicated call center to follow up the patients on daily basis.
- Patients suffering from immune compromised status (HIV, Transplant recipients, Cancer therapy etc) are not eligible for home isolation.
- The States/UTs shall ensure that all passengers shall undergo thermal screening at the point of departure and only asymptomatic passengers are allowed to board the flight/train/bus.
- Asymptomatic passengers will be permitted to go with the advice that they shall self-monitor their health for 14 days. In case, they develop any symptoms, they shall inform the district surveillance officer or the state/national call center.
- Hospitals shall activate its Hospital Infection Control Committee (HICC).The HICC in the health facility is responsible for implementing the Infection Prevention and Control (IPC) activities and organizing regular trainings on IPC for HCWs.

LIMITATIONS

- Data obtained was in unstructured format.
- Replication of several data.
- Several inputs were missing in Age and gender column.
- Involvement of many organizations which leads to error in collecting & filling data.
- Unnecessary columns are provided.

REFERENCES

COVID-19

1. H. Li, S.-M. Liu and X.-H. Yu et al., **Coronavirus disease 2019 (COVID-19): current status and future perspectives**, International Journal of Antimicrobial Agents, https://doi.org/10.1016/j.ijantimicag.2020.105951
2. Lai C-C., **Asymptomatic carrier state, acute respiratory disease, and pneumonia due to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2): Facts and myths,** Journal of Microbiology, Immunology and Infection, https://doi.org/ 10.1016/j.jmii.2020.02.012
3. Varsha Kachroo, **Novel Coronavirus (COVID-19) in India: Current Scenario,** International Journal of Research and Review, http://www.ijrrjournal.org/IJRR_Vol.7_Issue.3_March2020/IJRR0058.html
4. Tridip Sardar, Sk Shahid Nadim, Sourav Rana, Joydev Chattopadhyay, **Assessment of Lockdown Effect in Some States and Overall India: A Predictive Mathematical Study on COVID-19 Outbreak**, Chaos, Solitons and Fractals (2020), doi: https://doi.org/10.1016/j.chaos.2020.110078

Introduction to Systematic Review and Meta-Analysis

Introduction

- **Introduction to Systematic Review and Meta-Analysis** is an online course offered by Johns Hopkins University on an online learning platform, Coursera. It is a 6-week graded course with 9 modules along with 2 peer reviewed assignments.
- The course has two instructors, Dr. Tianjing Li, an Assistant Professor of Epidemiology and Dr. Kay Dickersin, Professor of Epidemiology at John Hopkins University. The course introduces to comprehensive methods for performing systematic review and meta-analysis.

Course Objectives

An Introduction to Systematic Review and Meta-analysis was created with three objectives,

1. To learn the steps that comprise a systematic review and meta-analysis.
2. To be able to read critically in the future, read the literature of a systematic review and meta-analysis.
3. To be able to integrate the results of systematic reviews in research or clinical practice.

Course Contents

Introduction: Definition of Meta-analysis by Glass (1976), “The statistical analysis of a large collection of analysis results from individual studies for the purpose of integrating the findings.” Meta-analysis is an optional component of a systematic review.

There are seven steps to perform a Systematic Review:

1. Establish a research team
2. Develop a protocol
3. Data collection, locating the studies and screening the results
4. Abstract data and appraise risk of bias in the individual studies
5. Synthesize findings, interpret, and assess overall body of evidence
6. Summarize in a Report
7. Update

Framing the Question:

Components of Well-Constructed and Answerable Clinical Questions,

- **P** – Patients or populations

- **I** – Interventions/Exposure
- **C** – Comparison group(s)
- **O** – Outcome

Finding the Evidence - Searching Principles:

Key Sources for searching evidences: MEDLIME/PUBMED, EMBASE, Cochrane Central Register of Controlled Trials (CENTRAL), LILACS, CINHAL, PsychINFO, OTSeeker, ProQuest, Opengrey or SIGLE.

Assessing the Risk Of Bias in Clinical Trials:

There are three main types of bias:

- Selection bias
- Information bias
- Bias in the analysis.

MINIMIZING METABIAS:

Reporting guidelines that help identify areas to consider for reducing bias:

- PRISMA: It is the reporting guideline for systematic reviews of clinical trials.
- MOOSE: It is old but still useful reporting guideline for observational studies.

QUALITATIVE SYNTHESIS: It is defined as “an assessment of the body of evidence that goes beyond factual descriptions or tables. That, for example, simply detail how many studies were assessed, the reasons for excluding studies. The range of study sizes and treatments compared, or the quality of each study as measured by a risk of bias tool.”

PLANNING THE META-ANALYSIS:

Analysis Plan:

- Obtain size of effect from similar studies estimating the same effect – Method: Standard pair-wise meta-analysis
- Compare multiple intervention for the same condition – Method: Network meta-analysis.
- Investigate the relationship between the size of an effect and characteristics of the studies – Method: meta-regression.

Types of Data:

- Dichotomous data (dead or alive)
- Continuous data (blood pressure)
- Ordinal data (none/mild/moderate/severe)
- Counts of infrequent event (number of strokes)
- Time-to-event (survival times)

STATISTICAL METHODS FOR META-ANALYSIS:

1. Fixed Effects Model
2. Random Effects Model

Methodology

- The course is a 6-week online course (approximately 16 hours) divided into 9 modules. The course has 41 videos, 3 readings and 2 peer graded assignments. Weeks 2 to 5 have a graded quiz of 5 questions at the end of the module.
- All the videos are concise and in lucid English language with subtitles to understand. The course is very insightful and contains a discussion page for learners to discuss and ask doubts to the course guide. There are various appropriate pictures and tables used for better understanding.

Key Learnings

- Describe the stages of conducting a systematic review.
- Formulating an answerable research question using the “Participants Interventions Comparisons Outcomes (PICO)” framework.
- Collection and extraction of data from clinical trial studies.
- Critically appraise the risk of bias of studies.
- Explain and interpret the results of meta-analyses.

References

- https://www.coursera.org/learn/systematic-review

THANK YOU