

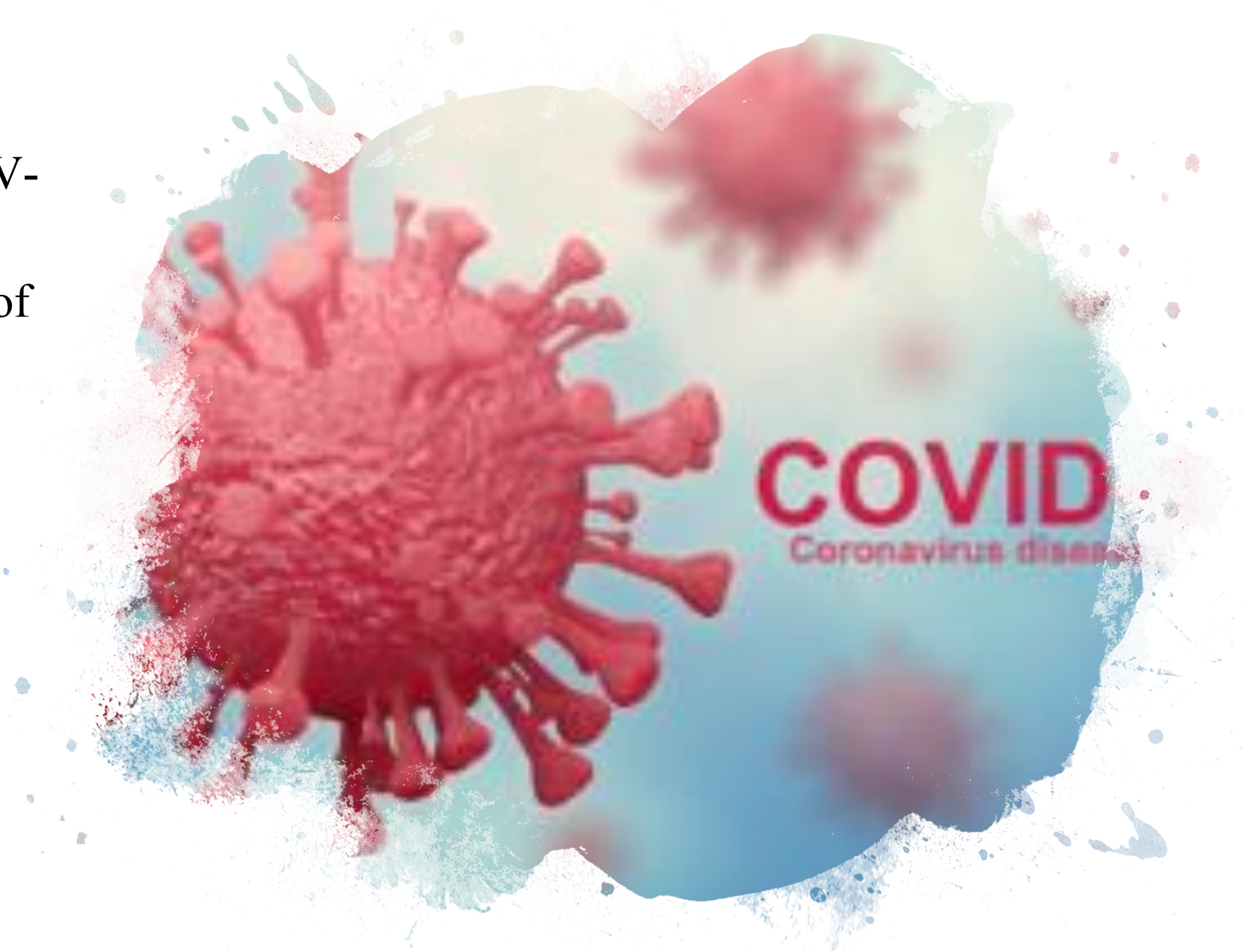


SYSTEMS REFLEX AND RESPONSE TO THE SPREAD OF CORONA VIRUS IN MOST AFFECTED COUNTRIES AROUND THE WORLD

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INTRODUCTION

COVID-19 or corona virus(SARS-CoV-2) has emerged as a deadly global pandemic which has affected millions of lives so far, as the transmission rate of virus is rapid. Many countries has adapted many strategies to combat the spread of virus which definitely had an impact on the transmission.



OBJECTIVES

1

To Analyze if the initial steps taken by the government and health systems have prevented or at least controlled the rapid transmission of corona virus since the detection of the first case in a country

2

To analyze how different actions have led the course of virus transmission developed in causing a large number of case fatalities

3

To find out if the readiness and previous experience of containing an outbreak has helped in reducing the transmission rate

METHODOLOGY

Reflex : The initial steps taken before or from the first appearance of a corona virus case in a country is taken to be reflex .

Response: The gradual measures implemented as the cases hiked are taken to be responses to prevent the adverse situation.

Factors considered in evaluation:

- Lockdown and social distancing measures
- testing and mortality rates
- healthcare facilities and medical team preparation

USA

REFLEX: The *initial* responses of the country mainly concentrated on CDC to control the inflow of positive cases to the country from china by monitoring the passengers travelling from abroad.

RESPONSE:

- ❖ **TESTING:** restricted to passengers with travel history, primary contacts. Discrepancies in authorization to labs. FDA restrictions.
- ❖ **LOCKDOWN MEASURES:**
 - decentralized govt system, restrictions placed way later.
 - not identical measures in all states Due to this variation, internal movement started to raise and contact tracing became more difficult.
 - Public protest against lockdown and movement restriction were raised at a point.
- ❖ **HEALTH FACILITIES AND MEDICAL TEAM PREPARATION:** on an average, US has 2.97 doctors per 1000 population.
 - Postponement of elective surgeries
 - Reduced demand on doctors related to other treatments.
 - Imported prophylaxis drugs from other countries.
 - Provided in home service/home quarantine due to lack of facilities

Analysis of reflex and response:

- Constraint: lack of clinical knowledge about disease transmission and progression
- denial and dysfunction at the highest levels of government during early period
- Sluggish response of govt impose restrictions for 6 weeks.
- Limited testing in initial phases Because of the restricted social movement and lockdown, supply chain management has also been affected which was in turn required at a point of crisis
- Decentralized power in implementation of preventive measures at different levels

RUSSIA

REFLEX:

- A corona virus taskforce was created on January 29.
- closed the border with China and screened incoming passengers and finally halting all incoming air traffic
- Hospitals were refitted, doctors retrained, and protective gear and equipment sent to every hospital in the country.

RESPONSE:

❖ TESTING:

- testing systems developed and deployed all over by end of January.
- convoluted, three stage testing regime that involved sending tests to Western Siberia and waiting a few days for the results.

❖ LOCKDOWN MEASURES:

- strict lockdown implemented from March 22. Quite unlike the top-down Russian decision-making system, this decree means regional leaders will take decisions based on variations in spread of corona virus.
- few states have adopted measures requiring residents to download QR codes that authorities can use to keep tabs on their movement before leaving the house.

❖ HEALTH FACILITIES AND MEDICAL TEAM PREPARATION:

- delivered medical assistance to some hard-hit countries like Italy, Serbia and USA, before even the pandemic has hit the country.
- Shortage of PPE have led to a high transmission rate within hospitals among patients, doctors, nurses and healthcare workers.
- Russia's doctors and nurses have been outspoken about the lack of medical supplies and the false information being propagated by the government concerning the corona virus.

❖ MORTALITY RATE:

- has a near-perfect Core Capacities Index score, the monitoring framework developed to assess a nation's compliance with standards and requirements promulgated under WHO's 2005 International Health Regulations
- mortality rate has remained below the world average mortality rate of corona virus. The nation also has a higher number of ventilators per capita than most Western states, which could help explain the remarkably low mortality rate throughout April.

■ ISSUES:

- Political issues: 2020 Russian constitutional referendum postponed.
- Allegations over false information of cases and deaths (the introduction of criminal liability for the dissemination of "false information" about the corona virus,)

ANALYSIS OF REFLEX AND RESPONSE

- Delayed testing results
- exortion of the medical resources when needed, by the time when the cases started to rise in their own country.(help to other countries)
- Weak response from govt due to disturbances in administrative authorities
- Ambiguity in current situation, concerns over falsification of data

CHINA

- *REFLEX:*

- Initially has not responded to the treat of pandemic from a doctor who has reported a series of cases.
- Notified to WHO in late december about the issue, though there were allegations that cases started to show up since november 2019.

- *RESPONSE:*

- Case identification and surveillance: more than 1,800 teams of epidemiologists assigned to trace followups for cases and contacts
- street camera system to detect people without mask and fine. (used during SARS outbreak)

❖ LOCKDOWN MEASURES:

- announced a lockdown in Wuhan and Hubei province cities on January 24, by (closing the airports and suspension of all public transport)
- announcement was made one day before the Spring Festival in China.

▪ HEALTH CARE FACILITIES:

- Built hospitals which can accommodate 1000 covid-19 patients at once in 10 days.
- As many of the deaths were from the older age groups, China focused on building special centers to treat old and critically ill patients where the principle of “Four Concentrations” was implemented with a focus on concentrating on the patients, medical experts, resources, and treatment.
- more than 40,000 healthcare workers were deployed and medical resources were mobilized from across the country to support the response in Wuhan

ANALYSIS OF REFLEX AND RESPONSE:

- Though the deadly virus which caused pandemic has originated from china, through its intense measures to control the transmission, somehow, the country has reduced the numbers of new positive cases to very few now
- However, it may have worked in china due to their strong communist party's effective command and control mechanisms and its uncompromising restrictions on information in the early stages of the crisis that helped China

INDIA

▪ REFLEX:

- Initial reflex aimed at surveillance, quarantine and risk based categorization of returnees from china.
- .Screening international passengers as early as mid-January.,
- in order to respond or react to the situation, the Indian government has imposed a strict lockdown as a measure to control the spread of virus in initial stages itself

▪ RESPONSE:

- ❖ Lockdown measures: implemented nationwide lockdown since march 22,2020. lockdown was lifted in phases gradually, which led to heavy internal migration of public within states due to unprecedented lockdown.
- ❖ Testing:
 - Though during lockdown period, testing was not done vigorously due to lack of testing kits and the deliberate procedure to get the results.
 - Also, states have been performing tests according to their comforts and hence, there is no proper graph to say that every state has been on the same page while some are testing vigorously and some states are very poor at tackling the situation.
 - Maharashtra has gradually observed community transmission at a point of time. In such case, testing for those only who had symptoms was done.

Analysis of reflex and response:

- ✓ mainly concentrated on flattening the curve before it has reached its peak in the beginning itself.
- ✓ lack of awareness of the vulnerability of millions of the country's migrant workers, who were made to suffer needlessly because of the panicky approach of completely shutting down all domestic transport.
- ✓ Testing confined to only symptomatic patients in few states. Few of the reports say that there may be a lot more asymptomatic cases in India, hence testing enough of the population should be mandatory in such cases which was not given ultimate importance.

ITALY

REFLEX:

- On 31 January, the Italian government suspended all flights to and from China and declared a state of emergency.
- a new decree imposing the quarantine of more than 50,000 people from 11 municipalities in Northern Italy.
- Italian military and law enforcement agencies into action
- People with symptoms advised to call the 112 emergency number, instead of going directly to hospitals

RESPONSE:

❖ LOCKDOWN MEASURES:

- territory was divided into 3 areas namely
 - ✓ red zone (where the entire population is under quarantine)
 - ✓ yellow zone (where social and sport events are suspended and schools, theatres, clubs and cinemas are closed)
 - ✓ The rest of the national territory, where safety and prevention measures are advertised in public places and special sanitization are performed on means of public transport.
- Penalties for violations



❖ Testing: mainly on symptomatic subjects.

- Tests were not performed initially in health care professionals (who could, therefore, have contributed to the spread of the disease) as well as in symptomatic patients at home

❖ Mortality: large accusations of inavailability of treatment services.

- More than two-thirds of these patients had diabetes, cardiovascular diseases, or cancer, or were former smokers. The cause of the high mortality is because of the age factor and the underlying co morbidities. However, inaccessibility to the health services is also considered as one of the reasons for the highest reporting of the deaths.

❖ Health care services:

- hospital contamination.

- The workforce of the healthcare system underwent massive reorganization.

- Healthcare workers were also affected by corona virus infections with high predominance of women nurses.

- Considerate deaths among health practitioners

- Healthcare workers in Italy paid a very high price with more than 11,000 confirmed cases, 100 clinicians killed by COVID-19 and many with burnout syndrome.

ANALYSIS OF REFLEX AND RESPONSE:

- ✓ Different regions in Italy ended up putting in place different policies, which had a clear impact on the virus' spread.
- ✓ Italy, like majority of nations, was not prepared for the rapid spread of the pandemic, and many protection systems such as masks, produced almost exclusively abroad, were not sufficient even for health personnel
- ✓ In addition, there are simply not enough ventilators for all patients who need them, raising important ethical issues. By losing the front-line warriors in healthcare due to the infection spread, proper health care delivery was compromised leading to even graver situation.

SPAIN

REFLEX:

- the first positive case in Spain was registered on Jan 31, yet post mortem was not conducted till March.
- On March 8, the same day a quarantine zone was declared across much of Northern Italy, the Spanish government was encouraging people across the country to take to the streets for International Women's Day protests.

▪ *RESPONSE:*

❖ Lockdown measures:

- lockdown was imposed on 14 March 2020. By late March, the Community of Madrid has recorded the most cases and deaths in the country.
- Military and police forces deployed by March end.

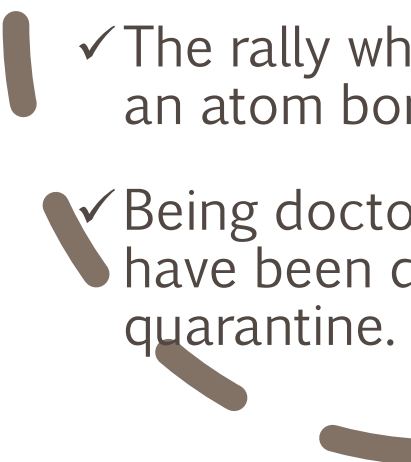
❖ Testing:

- testing was not done initially as the cases started to show up.
- Once the peak subsided, Spain published the results of a country-wide sero-prevalence survey,



❖ **Mortality:** From 17 March to 14 April, the death rate in Spain was 68% higher than usual and 21,882 excess deaths occurred, with vast majority of excess mortality observed among those older than 74 years. The peak of excess deaths occurred during the week of 27 March to 3 April and was five times larger than the flu season of 2019.

ANALYSIS OF REFLEX AND RESPONSE:

- ✓ The rally which was taken place on occasion of international women's day has acted as an atom bomb to set off the virus spread enormously among people
 - ✓ Being doctors affected by the virus, personnel required to treat the affected patients have been decreased as most of the doctors and health line workers are to be placed in quarantine.
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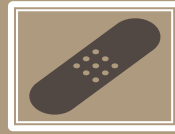
FINDINGS



LOCKDOWN MEASURES

Despite the measures followed, the impact was observed only when related to

- Duration of lockdown and other measures(testing,treatment)taken during that period
- Time of implementation of lockdown(difference between india and china)
- Strictness with which lockdown is implemented



PREVIOUS EXPERIENCE OF CONTAINING AN OUTBREAK



HEALTHCARE SERVICES

almost inadequate healthcare supplies and resources and lost frontline healthworkers due to transmission.

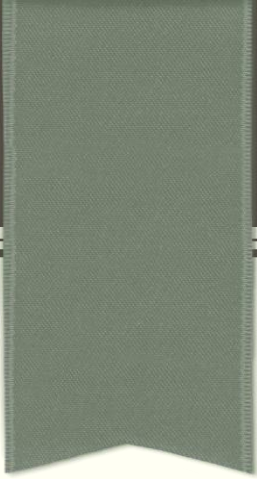


TESTING

Inadequate testing and duration of interpretation of results

CONCLUSION/SUGGESTIONS:

- Despite the measures taken by the governments to curb the virus transmission, the cases are still prevalent and continue to show up till date. In many countries, Under reporting of confirmed cases, deaths has remained a biggest concern
- Effective crisis management requires more than whole-of-society mobilization rather than to depend completely on the government to take care
- Considering that each community is unique, assessment should be done of the possible benefits and negative consequences of each strategy adopted
- In addition, countries should work on enhancing their systems and personnel in order to be more prepared for future outbreaks and reduce consequences when they strike.
- In a scenario, where, in most countries, there was insufficient medical equipment, limited doctors, also the risk of front-line healthcare workers being most affected by the infection, a new reformed health infrastructure has to be formed.



INTRODUCTION TO SYSTEMATIC REVIEW AND META ANALYSIS

Subtitle





INTRODUCTION

- “Introduction to systematic review and Meta-analysis” is an online course of 35 hours of teaching from Coursera platform provided by John Hopkins University. **Systematic reviews** are a type of literature review that uses systematic methods to collect secondary data, critically appraise research studies, and synthesize findings qualitatively or quantitatively. Systematic reviews may examine clinical tests, public health interventions, environmental interventions, social interventions, adverse effects, and economic evaluations. **Meta-analysis** is the statistical procedure for combining data from multiple studies. When the treatment effect (or effect size) is consistent from one study to the next, **meta-analysis** can be used to identify this common effect

OBJECTIVES

- Learn the steps that comprise systematic review and meta-Analysis.
- To be able to read and understand the literature related to systematic review and meta-Analysis in future.
- Be able to integrate the results of systematic reviews into the wor

COURSE CONTENTS:

- Introduction to systematic review and meta analysis
- Framing the question
- Finding the evidence- searching principles
- Assessing the risk of bias in clinical trials
- Minimizing bias
- Qualitative synthesis and interpreting results
- Planning the Meta analysis
- Statistical methods for meta analysis

STEPS IN CONDUCTING A SYSTEMATIC REVIEW :

- Frame research question (PICO/PICOS)
- Develop search strategy
- Develop protocol
- Run search strategy in at least two databases
- Retrieve and duplicate citations
- Develop system for screening titles / abstracts and full texts
- Retrieve and screen full texts
- Develop forms for assessing 'risk of bias' and extracting data
- Clean and manage data
- Conduct qualitative synthesis
- Conduct meta-analysis (if appropriate)

LEARNINGS

Framing question

- While framing the question, consider PICO/PICOTS

P – population/patients

I – intervention/exposure

C – comparison groups

O – outcome

T- Timing (duration of minimum follow up)

S – Setting (primary care, specialty, inpatients)

Example of framing a question:

- is drug therapy associated with long-term morbidity and mortality in older persons with moderate hypertension

P – Older persons with moderate hypertension

I – drug therapy

C – Not mentioned

O – long-term morbidity and mortality

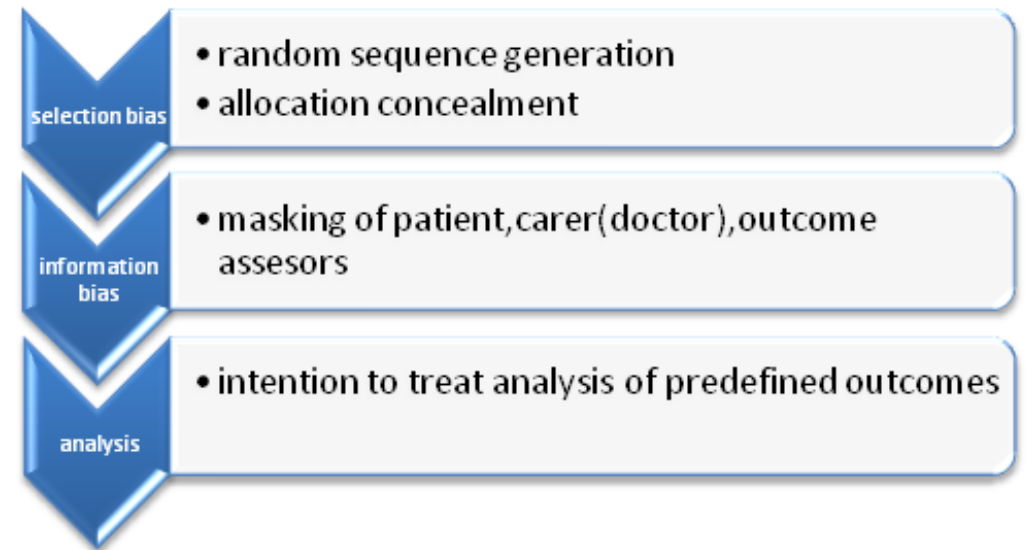


FINDING EVIDENCE/SEARCH STRATEGY

- key sources for data
- key electronic databases- (Medline/pub med, EMBASE, COCHRANE central Registrar of controlled trials, national and regional databases (LILACS0), subject specific databases (CINAHL, psych INFO, OT seeker)
- controlled vocabulary (indexing)
- indexing of RCT and observational studies
- other sources: (trial registers, gray literature searching, personal contacts)

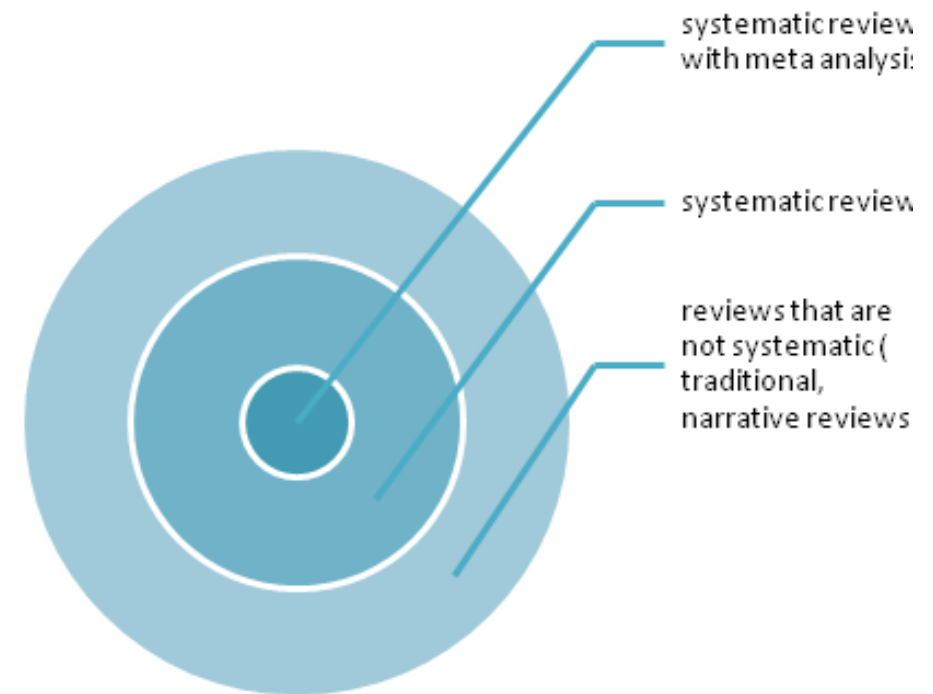
ASSESSING RISK OF BIAS IN CLINICAL TRIALS

- Elements of study quality that can be assessed by reading study report: internal validity, external validity, relevance, originality, ethics
- That cannot be assessed: protocol violations, quality of record keeping, quality of study procedures, degree to which report reflects the actual study, fabrication and falsification of details



PLANNING META-ANALYSIS AND SYSTEMATIC REVIEW

- ❑ **META ANALYSIS:** it is an optional component of systematic review. It refers to the statistical analysis of a large collection of analysis results from individual studies for the purpose of integrate the findings. Meta-Analysis are done only when studies are comparable, homogenous.
- ❑ statistical analysis which combines the results of several independent studies considered by the analyst to be combinable.
- ❑ Each study will have that summary measure. Meta-analysis estimates the overall measure effect as an average.
- ❑ In meta-analysis, we consider weighted average to estimate overall measure effect.
- ❑ There are two types of models for conducting meta-analysis, fixed and random meta-analysis.



Differences between fixed and random meta-analysis

Fixed meta-analysis

- Conduct , if heterogeneity is absent
- Assumes the size of treatment effect be same across all the studies & variation due to chance
- $\text{Weight} = 1/\text{variance}(1/\text{SE}^2)$
- When heterogeneity exists, we get
 - A pooled estimate which may give too much weight to large studies
 - A narrow confidence interval
 - p-value which is too small

Random meta-analysis

- Conduct if heterogeneity is present
- Assumes the size of treatment effect does vary between studies
- $\text{Weight} = 1/\text{variance}(1/\text{SE}^2 + \text{variance between studies})$
- When heterogeneity exists, we get
 - A different pooled estimate with different interpretation
 - A wider confidence interval
 - A larger p-value



THANKYOU