

# **Systematic Review in Health Care Policy and Practice**

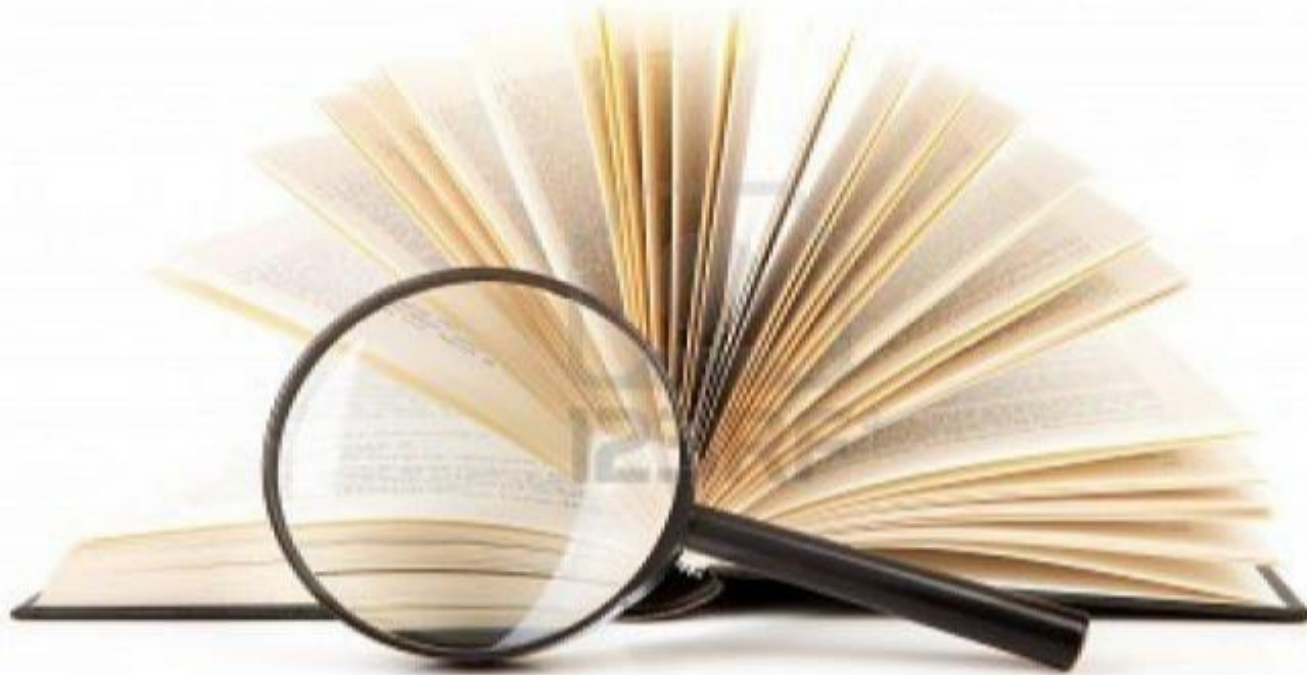
**Binaya Chalise**

**10 November 2016**

**Institute of Medicine Global Health  
Alumni, Kathmandu, Nepal**

# Session Overview

- Traditional vs. Systematic Review
- Application in Health Care Policy and Practice
- Criticism and Challenges
- Ways Forward



# Literature Review

# Traditional Review

1. **Editorial:** Editor's comment regarding a current issue of journal or health care event
2. **Commentaries/Op Ed:** Views of commentator based on personal wisdom to provoke scholarly dialogue
3. **Unsystematic Review:** A narrative synthesis of previously published literatures.

# Role of Traditional Reviews

- Provide an overview of an area
- Provide a rationale for new research
- Describe the history or development of a problem
- Describe cutting-edge research developments
- Discuss data in light of underlying theory and context
- Draw analogies or combine different disciplinary perspectives
- Opinion pieces are a source of expertise

# Criticism – Traditional Review

- Lack of transparency
  - criteria used in searches, selection, analysis of literature may be unknown (undisclosed)
- Possibility of bias
  - *e.g. only a small proportion of the available literature might be considered as eligible*
  - *e.g. lack of objective criteria may favor one sort of information over another*
- Differences in study methods not necessarily considered
- Review may be incomplete

# Systematic Reviews

How do we make sense of the thousands of scientific papers published each week?



<https://www.youtube.com/watch?v=2tSJdS9Zukc&t=94s>



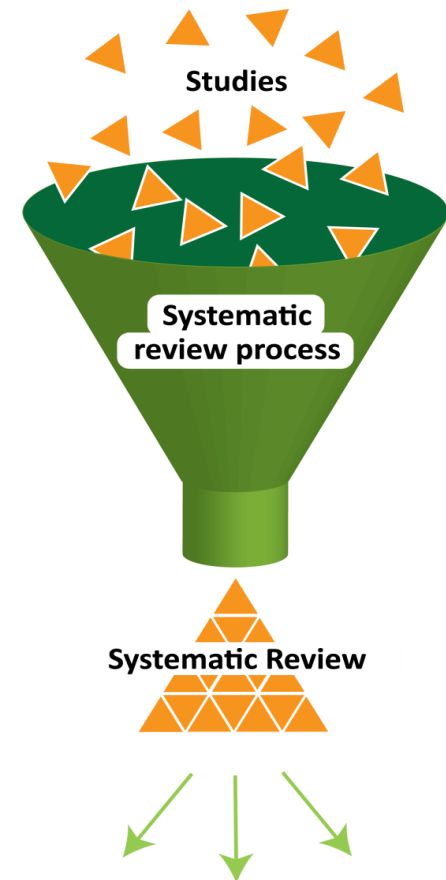
<https://www.youtube.com/watch?v=egJIW4vkb1Y&t=105s>



# Systematic Review

1. Define the research question
2. Search and selection of studies
3. Critical evaluation of studies for biases
4. Data Collection
5. Data analysis and presentation
6. Interpretation of results and drawing conclusion
7. Communicating Reviews

The Concept of a Systematic Review



# Difference (Cook et al, 1997)

	<b>Narrative</b>	<b>Systematic</b>
Question	Broad	Focused
Source	Non-Specific	Comprehensive
Search	Potentially Biased	Explicit Strategy
Selection	Cherry Picking	Criterion Based
Appraisal	Subjective	Rigorous
Synthesis	Quali	Quali/Quant
Inference	Judgmental	Evidence Based

# Application: Policy & Practice

## Dynamic Technology/Intervention

- Quickly provide a medium for practitioner to gain access to comprehensive and pre-filtered evidence

## Emerging RCTs in Clinical Practice

- Provide accurate and authentic conclusion that are generalized

# Application: Policy & Practice

## Reduce Evidence - Intervention Gap

- E.g. delay in using corticosteroid for women in premature labor until 1991. Similar case in use of thrombolytic therapy in acute myocardial infraction (David, 2005)

## Answer Uncertain Clinical/Policy Question

- E.g. In elderly patient at risk of fall, does use of Vitamin D reduces risk of having a fall?

# Application: Policy & Practice

## Determine Risk Factor

- The risk factors may be a predictor of outcome
- E.g. A systematic review concluded that premature newborns in ICU are at particular risk of pneumonia. This information is useful to install improved incubator (Ralf, 2006)

# Application: Policy & Practice

## Policy Analysis Tool

- Policy makers rarely have the resources and skills to appraise published literatures
- Systematic reviews are key source of information for communicating policy alternatives, priorities and vested interest in the form of policy brief and plain language summaries.

# Application: Policy & Practice

## Research Tool

- A powerful tool to document evidence gap in literature, and to set future research agenda
- New hypothesis can be established about the causes of heterogeneity across subgroup or setting
- Systematic review principle can be applied to .  
improve quality of traditional reviews E.g.  
Rapid systematic Review

# Myths of SR

- Not just reviews of RCTs
  - *E.g. a question of patients' experiences would examine qualitative studies*
- Can report findings relevant to social world – complex interventions and those that are organizationally or socially complex
  - *E.g. Cochrane reviews - reviews from the Cochrane Consumers and Communication assess complex, multifaceted interventions*
  - *See Petticrew BMJ 2003: Systematic reviews from astronomy to zoology*



# Some Criticism

- Hierarchy of evidence – privileges a narrow spectrum of research: especially trials or other quantitative data
- Currently available systematic review do not reflect developing country need
  - E.g. Cochran review of effectiveness have not addressed many common conditions of developing countries (McMichel, 2006).

# Some Criticism

- Many reviews cannot be implemented in resource poor region
  - Do not highlight the features of the settings in which studies were conducted, particularly those features that might modify the impacts of a policy option. Nor do they provide information about factors modifying the policy option/intervention (Lavis et al, 2009).

# Systematic Review Network

Organization	Scope of Review
Alliance for Health Policy and System Research	Health System Research
Campbell Collaboration	Crime, Justice and Education
<b>Cochran Collaboration</b>	<b>Health Care</b>
Collaboration for Environmental Evidence Center	Environmental Science
EPPI Center	Social Policy, Public Health, Health Promotion
Joanna Briggs Institute	Health Care
3IE Group	Social Policy
Center of Systematic Review	Health System

# #1 Research Question

- What is the focus of Review?
  - Areas: intervention, drugs, services, technology etc.
  - Intention: Risk factor, exposure, intervention, process etc.
- Carefully developed review question determines search strategies and inclusion criteria
- Always powerful to express review question in PICO statement

# #2 Search & Selection of Studies

- Published and unpublished studies are retrieved based on the PICO statement
- Need support from Librarian skilled in database search
- Need to perform multiple database search
- Researchers need to develop a search strategies
- Search strategies should be replicable

## #2 Search & Selection of Studies

- Studies matching the study questions are screened from the identified studies
- Identified studies are judged against PICO statement to determine the eligibility of study to be included in the review
- Two reviewers independently select studies from the pool of retrieved studies

# #3 Critical Appraisal

- Studies that are deemed to be relevant to the study question advance to the critical-appraisal
- Two independent reviewer appraise full text using an established framework and checklist
- Quality appraisal should assess bias, confounding and the preciseness of study findings

# #4 Data Extraction

- Involves summarizing and synthesizing the results, and includes both numeric and nonnumeric data.
- Data extraction form that is design during the planning stage is used by two reviewers working independently.
- Should record study characteristics and bibliographic informations



# # 5 Data Analysis & Presentation

- Result of primary studies are analyzed and presented by using qualitative and quantitative methods.
- Qualitative - themes are narrated and findings are summarized in a table or using a graphical display.
- Quantitative - Meta analysis - it is the statistical methods to combine results of two or more than two primary studies

# # 5 Data Analysis & Presentation

- Meta analysis is not mandatory in all systematic review.
- It is used when study results are homogeneous across primary studies
- It might be useful when sample size of primary studies are small
- If the findings are substantially heterogeneous across primary study then qualitative synthesis is sufficient

# # 6 Communicating Review

- Different form of communication
- Plain Language Summary
- Policy Brief
- Policy Analysis Paper
- Ministerial Briefing
- Parliamentary Submission Paper
- Info-graph
- Opinion Paper
- Abstracts

# PICOs

- A review question should address the following issue
- Who will be the participants/people ?
- What intervention will be included?
- What are the Comparisons?
- What primary and secondary outcome you aim to report?
- What study design will be included?

# Participant/Population

- Reviewer should first define the disease or conditions under investigation using the explicit criteria. Then the broader population of interest such as age sex education status etc.
- Any restrictions with respect to specific population characteristics or settings should be based on a sound rationale.

# Participant/Population

- Following factors should be considered while determining criteria for participants
- Disease/condition
- Relevant demographic factors
- Settings
- Possible subset of populations
- Population that might modify the outcome of intervention in other way

# Intervention

- What are experimental and control of interest. For example intervention vs. placebo or one intervention vs. the other

# Outcome

- include all outcomes that are likely to be meaningful to policy makers
- Outcomes may include survival (mortality), clinical events (e.g. strokes or myocardial infarction), patient-reported outcomes (e.g. symptoms, quality of life), adverse events, burdens (e.g. demands on caregivers, frequency of tests, restrictions on lifestyle) and economic outcomes (e.g. cost and resource use)



# Outcome

- Review authors should consider how outcomes may be measured
- Outcomes may be measured objectively (e.g. blood pressure, number of strokes) or subjectively as rated by a clinician, patient, or carer (e.g. disability scales).

# Study Design

- Certain study designs are more appropriate than others for answering particular questions.
- Authors should consider a priori what study designs are likely to provide reliable data with which to address the objectives of their review.

# Study Design

- questions about the effects of health care, the focus primarily should be on randomized trials.
- Randomization is the only way to prevent systematic differences between baseline characteristics of participants in different intervention groups

# Are mass media effective in preventing adolescent smoking?

P	I	C	O	S
Adolescent 10 to 19 years	TV Radio Poster Billboard	No Intervention	Self reported smoking	RCT Quasi RCT Before After Trial

# Challenges: Conducting SR

- Extensively resource intensive and time consuming
- Limited amount of primary research is conducted in developing countries
- Access to Wide range of Database and peer reviewed Journals
- Limited human resource, lack of motivation and funding
- Skills to retrieve and analyze trials
- System capacity to demand and use systematic review

# Possible Solutions

- Establishing membership with research network
- Training workshop for systematic review authors
- Strengthening institutional capacity such as IT and access to Journal
- Sensitization and training workshop with specialized group

# Possible Solutions

- Considering unconventional reviews such as review of observational studies
- Researchers –Policymakers networking
- Collaborating with developed country researchers
- Seeking funding opportunities and calls

# Reference

- Bennett, N.R., Cumberbatch, C. and Francis, D.K., 2015. 'There are challenges in conducting systematic reviews in developing countries: the Jamaican experience'. *Journal of clinical epidemiology*, 68(9), pp.1095-1098.
- Cook, D.J., Mulrow, C.D. and Haynes, R.B., 1997. Systematic reviews: synthesis of best evidence for clinical decisions. *Annals of internal medicine*, 126(5), pp.376-380.
- David A. F., 2005. 'Clinician's guide to systematic reviews and meta-analysis', *Wisconsin Medical Journal*, 104(3), pp. 25–29.
- Garg, A.X., Hackam, D. and Tonelli, M., 2008. 'Systematic review and meta-analysis: When one study is just not enough'. *Clinical Journal of the American Society of Nephrology*, 3(1), pp.253-260.
- Green, B.N., Johnson, C.D. and Adams, A., 2006. 'Writing narrative literature reviews for peer-reviewed journals: Secrets of the trade'. *Journal of Chiropractic Medicine*, 5(3), pp.101-117.
- Haddaway, N.R. and Pullin, A.S., 2014. The policy role of systematic reviews: Past, present and future. *Springer Science Reviews*, 2(1-2), pp.179-183.
- Lavis, J.N., Oxman, A.D., Souza, N.M., Lewin, S., Gruen, R.L. and Fretheim, A., 2009. 'SUPPORT Tools for evidence-informed health Policymaking (STP) 9: Assessing the applicability of the findings of a systematic review'. *Health Research Policy and Systems*, 7(1).



# References

- Mallett, R., Hagen-Zanker, J., Slater, R. and Duvendack, M., 2012. 'The benefits and challenges of using systematic reviews in international development research'. *Journal of Development Effectiveness*, 4(3), pp.445-455.
- Manchikanti, L., Datta, S., Smith, H.S. and Hirsch, J.A., 2008. 'Evidence-based medicine, systematic reviews, and guidelines in interventional pain management: Part 6, systematic reviews and meta-analyses of observational studies'. *Pain Physician*, 12(5), pp.819-850.
- McMichael, C., Waters, E. and Volmink, J., 2005. 'Evidence-based public health: What does it offer developing countries?'. *Journal of Public Health*, 27(2), pp.215-221.
- Oliver, S., Bangpan, M., Stansfield, C. and Stewart, R., 2015. 'Capacity for conducting systematic reviews in low-and middle-income countries: A rapid appraisal'. *Health Research Policy and Systems*, 13(1), p.1.
- Ralf W. S., 2006. *The Role of Systematic Reviews in Evidence-Based Practice, Research, and Development*. Austin, USA: Southwest Educational Development Laboratory.
- van Teijlingen, E.R., Simkhada, B., Ireland, J.C., Simkhada, P.P. and Bruce, J., 2012.' Evidence-based health care in Nepal: The importance of systematic reviews'. *Nepal Journal of Epidemiology*, 1(4), pp.114-118.