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**Everything is complex,
nothing is simple in
healthcare - potential
and limits of
systematic reviews to
inform health policy
decisions**



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Introduction

- Traditionally, systematic reviews have considered relatively simple interventions (for example, what are the benefits and harms of drug x)
- Increasingly systematic reviews are considering more complex interventions
 - biologics
 - complementary therapies
 - surgeon or therapist delivered interventions
 - team based care
 - quality improvement and organisation of care issues
 - health policy issues

Introduction

- Further the implementation of many simple interventions (eg influenza vaccination) often involves complexity:
 - who should deliver the intervention (family physicians, nurses, occupational health, public health, other)?
 - what knowledge and skills do they require?
 - where should the intervention be delivered (family practice, community clinic, workplace, other)?
 - how do we ensure patient attendance (mass media campaigns, community campaigns, reminders, other)?
 - what information do patients need about aftercare

Introduction

- In this presentation, I hope to:
 - explore the implications of complexity for the conduct and interpretation of systematic reviews
 - and to demonstrate some examples of knowledge tools try to promote the use of systematic reviews of complex interventions in health system and policy decisions

Cochrane Effective Practice and Organisation of Care (EPOC) Group

EPOC aims to undertake systematic reviews of interventions to improve health care systems and health care delivery including:

- Professional interventions (e.g. continuing medical education, audit and feedback)
- Financial interventions (e.g. professional incentives)
- Organisational interventions (e.g. the expanded role of pharmacists)
- Regulatory interventions

Ballini, Bero, Eccles, Grimshaw, Gruen, Lewin, Mayhew, Munabi-Babigumira, Oxman, Pantoja, Paulsen, Shepperd, Tavender, Zwarenstein (2010). *Cochrane Library*.

Cochrane Effective Practice and Organisation of Care (EPOC) Group

Progress to date - register and reviews

- Register of 7000+ primary studies
 - RCTs, CBAs, ITSs
- 68 reviews, 46 protocols
- Overviews of reviews (Bero 1998, Grimshaw 2001)
- Collaborating with over 600 researchers globally

Ballini, Bero, Eccles, Grimshaw, Gruen, Lewin, Mayhew, Munabi-Babigumira, Oxman, Pantoja, Paulsen, Shepperd, Tavender, Zwarenstein (2010). *Cochrane Library*.

Outline

- Complexity in systematic reviews
- Issues relating to the conduct of the effectiveness of complex interventions
- Using systematic reviews to answer other types of questions for health system and policy decisions
- Use of systematic reviews in health system and policy decisions
- Practical tools to support the use of systematic reviews in health system and policy decisions

Complexity in systematic reviews

Complexity may be due to:

- characteristics of the intervention
- contextual factors
- multiple outcomes
- methodological issues relating to the conduct of interventions.

Complexity in systematic reviews

- These factors may result in greater variability or *heterogeneity* of estimates of effectiveness of such interventions: the real effect on an intervention may vary both in magnitude and direction depending on the modifying effect of such factors.
- Under such circumstances, reviewers need to consider in general whether primary research studies are sufficiently similar to be considered for inclusion within a single meaningful systematic review and in particular whether it is appropriate to undertake meta-analysis.

Complexity in systematic reviews

- Complexity due to characteristics of intervention:
 - the intervention is intrinsically complex (multifaceted) e.g. all interventions delivered by a multi disciplinary team
 - the intervention is a heterogeneous mix of effective and ineffective components.

Complexity in systematic reviews

- Complexity due to contextual factors:
 - The effectiveness of an intervention is modified by patient factors, provider and health care delivery factors.
e.g. (1) the effectiveness of the intervention may be modified by the context in which it operates
 - mass media HIV awareness campaigns.

Complexity in systematic reviews

- Complexity due to contextual factors
 - e.g. (2) the effectiveness of intervention is modified by diversity in patient population or in the interaction of the patient with the intervention
 - differential benefits of antiplatelet and cholesterol lowering therapies in high and low risk patient groups

Complexity in systematic reviews

- Complexity may be due to:
 - characteristics of the intervention
 - contextual factors
 - multiple outcomes
 - methodological issues relating to the conduct of interventions.
- Often multiple sources of complexity exist.
- These issues form a spectrum.

Complexity in systematic reviews

- For any individual review, the reviewer has to decide whether issues relating to complexity are sufficiently important to need addressing in the review.
- This requires careful thought at the time of formulating the review question and writing the protocol.

Conducting systematic reviews of the effectiveness of complex interventions

- **Chapter 5: Defining the review question and developing criteria for including studies**
- **Chapter 6: Searching for studies**
- Chapter 7: Selecting studies and collecting data
- Chapter 8: Assessing risk of bias in included studies
- **Chapter 9: Analysing data and undertaking meta-analyses**
- Chapter 10: Addressing reporting biases
- Chapter 11: Presenting results and 'Summary of findings' tables
- **Chapter 12: Interpreting results and drawing conclusions**

Conducting systematic reviews of the effectiveness of complex interventions

Chapter 5: Defining the review question and developing criteria for including studies

- Defining the question
- Lumping versus splitting
- Definition of intervention
- Choice of study designs

Conducting systematic reviews of the effectiveness of complex interventions

Chapter 5: Defining the review question and developing criteria for including studies

- Defining the question
- **Lumping versus splitting**
- Definition of intervention
- **Choice of study designs**

Conducting systematic reviews of the effectiveness of complex interventions

Chapter 9: Analysing data and undertaking meta-analyses

- **Analytical approach**
- **Handling common methodological errors**

Conducting systematic reviews of the effectiveness of complex interventions

Chapter 9: Analysing data and undertaking meta-analyses

- **Analytical approach**
- Handling common methodological errors

Chapter 5: Defining the review question and developing criteria for including studies

Lumping and splitting

- Does CME work?
- In health care professionals, does CME lead to better prescribing practice?
- In family doctors, does a two day workshop improve appropriateness of antibiotic prescribing?

Lumping and splitting

- The 'lumping' rationale
 - systematic reviews aim to identify the common generalisable features within similar interventions
 - minor differences in trial design are not important
- 'Lumped' reviews
 - allow generalisability and consistency of findings to be assessed across wide range of settings and populations
 - reduced risk of bias or chance results

Lumping and splitting

- The 'lumping principle'
 - the results of two interventions should be combined unless there are good grounds to believe they will have *opposing* effects

Lumping and splitting

- The 'splitting' rationale
 - it is only appropriate to combine trials which are very similar in design, patient selection, intervention characteristics and outcome recording
- Split reviews avoid combining 'apples and oranges'

Lumping and splitting

- Reviews can be split by:
 - Participants
 - Interventions
 - Outcome
- Very narrowly focused reviews are *de facto* subgroup analyses

Lumping and splitting: Practical considerations

- Lumped reviews
 - Challenging
 - Logistically (large number of included studies)
 - Analytically
 - Heterogeneity expected
 - Interpretation may be challenging
 - seeing the woods for the trees
- Split reviews
 - Easier, quicker, “cleaner”

Lumped or split?

Lumped

- Audit and feedback: effects on professional practice and health care outcomes
- Educational games for health professionals
- Mass media interventions: effects on health services utilisation
- Tailored interventions to overcome identified barriers to change: effects on professional practice and health care outcomes

Split

- Capitation, salary, fee-for-service and mixed systems of payment: effects on the behaviour of primary care physicians
- Interventions for reducing medication errors in children in hospital
- Patient reminder and recall systems to improve immunization rates

Chapter 5: Defining the review question and developing criteria for including studies

- Although the arguments for randomised trials are as compelling in studies of complex interventions, at times might be ethically, logistically and practically not possible to conduct individual patient randomised trial
- EPOC reviews include
 - Cluster randomised trials
 - Controlled before and after studies
 - Interrupted time series

Chapter 5: Defining the review question and developing criteria for including studies

- Inclusion of additional designs raises methodological issues concerning:
 - How to identify studies
 - How to assess risk of bias
 - How to incorporate studies in analyses
 - How to handle common methodological problems (eg unit of analysis errors in cluster randomised trials)
 - How to interpret results especially relating to uncertainty due to use of 'weak' designs
- Inclusion of these designs has prob increased EPOC workload by 50-100% (not for the faint hearted)

Chapter 9: Analysing data and undertaking meta-analyses

- Reviews of complex interventions likely to be extremely heterogeneous – frequently review authors conclude that it would be inappropriate to conduct formal meta-analysis of the included studies.
- Non meta-analytical methods poorly developed and problematic

Chapter 9: Analysing data and undertaking meta-analyses

- Vote counting methods
 - Add up the number of positive and negative comparisons
 - Comparisons with a positive direction of effect (irrespective of statistical significance)
 - Number of comparisons with statistically significant effects
 - Conclude whether the interventions were effective on this basis

Chapter 9: Analysing data and undertaking meta-analyses

Problems with vote counting

- Fail to provide an estimate of the effect size of an intervention
 - Equal weight to comparisons that show a 1% change or a 50% change
- Ignores the precision of the estimate from the primary comparisons
 - Equal weight to comparisons with 100 or 1000 participants

Chapter 9: Analysing data and undertaking meta-analyses

Problems with vote counting

- Problems handling studies where statistical significance is uncertain
 - Unit of analysis errors
- Problems handling small under powered studies
 - Potentially clinically significant but statistically insignificant effects would be counted as 'no effect comparisons'

Chapter 9: Analysing data and undertaking meta-analyses

Alternative approaches

- Describe the range and distribution of effects across studies and explore probable explanations for the variation that is found
- In recent EPOC reviews, we have reported:
 - the median effect size across comparisons
 - interquartile range of observed effects
- In the primary analysis of 88 comparisons of audit and feedback compared to no intervention. The adjusted risk difference of compliance with desired practice varied from a 16 % absolute decrease in compliance to 70% increase in compliance (median = 5% absolute increase, inter-quartile range = +3% to +11%)

Chapter 9: Analysing data and undertaking meta-analyses

- These approaches allow the reader to assess
 - Likely effect size
 - Consistency of effects across all included studies
 - Whether these effects differ between studies with and without unit of analysis errors
- and
 - Use information from all studies but do not have the same statistical uncertainty of the effects as we would using a vote counting approach

Syntheses of other types of information about complex interventions

- In addition to understanding benefits and harms of complex interventions, decision makers often need additional information about:
 - Epidemiology of problem
 - Context in which complex interventions have been successfully used
 - Human resources and infrastructure needed to deliver complex interventions
 - Citizens' values and attitudes towards complex interventions
 -

Syntheses of other types of information about complex interventions

- These factors are often poorly reported (if at all) in primary reports of the effects of complex interventions
- However information may be available from other research traditions (eg process evaluation data, qualitative studies of citizens' values etc)
- Syntheses of these bodies of research highly relevant and useful for health system and policy decisions

Syntheses of other types of information about complex interventions

- Methods to conduct systematic reviews of qualitative studies have been developed and are being refined
- These methods tend to be interpretive and to go under a great many names:
 - Narrative summary
 - Thematic analysis
 - Grounded theory
 - Meta-ethnography
 - Meta-study
 - Realist synthesis
 - Cross-case techniques
 - Content analysis
 - Case survey
 - Qualitative comparative analysis
 - Bayesian meta-analysis

Evidence informed decision making

Managers and policymakers can find themselves in three situations that require them to characterize policy options

1. An issue is already on the decision agenda and a policy option effectively selected to address the problem, in which case the best that managers and policymakers can often do is to identify how to maximize the benefits from the selected policy option, minimize its harms or risks, optimize the impacts achieved for the money spent, and (if there is substantial uncertainty about the policy option's likely costs and consequences) design a monitoring and evaluation plan

Evidence informed decision making

Managers and policymakers can find themselves in three situations that require them to characterize policy options

2. Managers and policymakers are actively engaged in events in which policy options are being discussed or promoted, in which case they need to assess the policy options being presented to them as well as the problem and politics streams within the policymaking process that will determine whether the policy option comes up for serious consideration

Evidence informed decision making

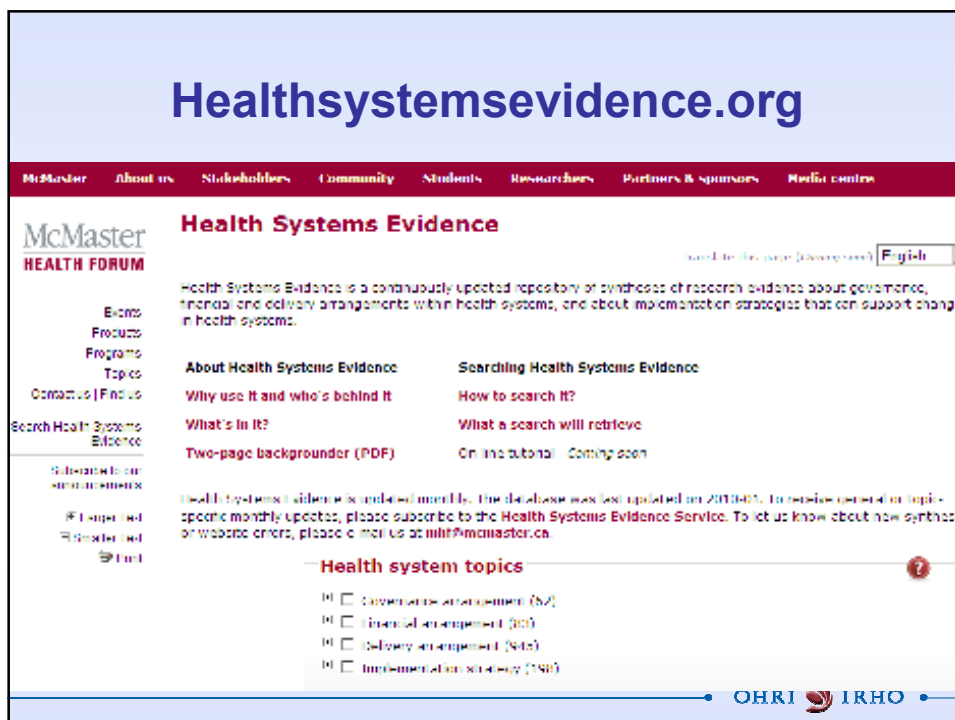
Managers and policymakers can find themselves in three situations that require them to characterize policy options

3. Managers and policymakers face a tabula rasa (clean slate) in which they themselves have the opportunity to define a problem, identify and characterize policy options, and look for events within the political stream that might allow them to act

Promoting use of systematic reviews in health systems and policy decision making

- Common criticisms of systematic reviews by policy makers
 - No relevant reviews
 - Reviews difficult to access
 - Reviews difficult to understand
- John Lavis and colleagues have created healthsystemsevidence.org to address these criticisms and facilitate use of reviews in health systems and policy decision making

Healthsystemsevidence.org



The screenshot shows the homepage of [Health Systems Evidence](http://healthsystemsevidence.org). The page features a navigation menu at the top with links for McMaster, About us, Stakeholders, Community, Students, Researchers, Partners & sponsors, and Media centre. The main content area includes a search bar, a description of the evidence repository, and sections for 'About Health Systems Evidence' and 'Searching Health Systems Evidence'. A sidebar on the left contains links for McMaster Health Forum, Events, Products, Programs, Topics, Contact us, and Search Health Systems Evidence. At the bottom, there is a 'Health system topics' section with a list of topics and their respective counts.

McMaster HEALTH FORUM

Health Systems Evidence

Health Systems Evidence is a continuously updated repository of syntheses of research evidence about governance, financial and delivery arrangements within health systems, and about implementation strategies that can support change in health systems.

About Health Systems Evidence

- Why use it and who's behind it
- What's in it?
- Two-page backgrounder (PDF)

Searching Health Systems Evidence

- How to search it?
- What a search will retrieve
- On-line tutorial - Coming soon

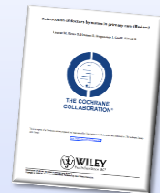
Health systems evidence is updated monthly. The database was last updated on 2010-01. To receive general or topic-specific monthly updates, please subscribe to the Health Systems Evidence Service. To let us know about how syntheses or website errors, please e-mail us at hlitf@mcmaster.ca.

Health system topics

- Governance/management (52)
- Financial management (30)
- Delivery management (245)
- Implementation science (190)

Healthsystemevidence.org

- Over 1300 citations
 - policy briefs
 - overviews of systematic reviews
 - systematic reviews
 - Cochrane reviews and protocols



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Healthsystemevidence.org

- Scenario:
 - What is the evidence about the effect of role substitution in primary care on patient outcomes and resource utilization?



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Health system topics

- Governance arrangement (62)
- Financial arrangement (83)
- Delivery arrangement (945)
 - To whom care is provided & with what efforts to reach them (222)
 - By whom care is provided (467)
 - System - Need/demand/supply (5)
 - System - Recruitment/retention/transitions (9)
 - System - Performance management (5)
 - Workplace conditions - Provider satisfaction (3)
 - Workplace conditions - Health & safety (8)
 - Skill mix - Role performance (20)
 - Skill mix - Role expansion or extension (88)
 - Skill mix - Substitution (82)

Healthsystemsevidence.org

Your search returned 24 results. [Show search terms](#)

Type of address	Type of address	Health system topic	Title	Year first evidence searched	Query string	Number of publications	Number of primary research publications	Number of secondary research publications	Change # page
1	System - Substitution	Health system topic: Skill mix - Substitution	System - Substitution	2000	Health system topic: Skill mix - Substitution	82	0	82	1/1
1	System - Substitution	Health system topic: Skill mix - Substitution	System - Substitution	2000	Health system topic: Skill mix - Substitution	82	0	82	1/1
7	System - Substitution	Health system topic: Skill mix - Substitution	System - Substitution	2000	Health system topic: Skill mix - Substitution	82	0	82	1/1
7	System - Substitution	Health system topic: Skill mix - Substitution	System - Substitution	2000	Health system topic: Skill mix - Substitution	82	0	82	1/1
7	System - Substitution	Health system topic: Skill mix - Substitution	System - Substitution	2000	Health system topic: Skill mix - Substitution	82	0	82	1/1

Healthsystemsevidence.org

Type of evidence	Type of system	Health system type(s)	Year	Study year covered	Quality rating	Costs (which studies provide data on total costs)	Sensitivity analysis and/or cost level	Abstract page number
1	Primary care	Health systems • Community health centers • Federated health systems • Health Maintenance Organizations (HMOs)	2007-2008	2007-2008	High	\$100,000-\$500,000 (median: \$200,000)	None	1000
User-friendly summary • Summary available in English (with abstract in Spanish) • Evidence of Review (Evidencia de Revisión)			Individual papers • Peer-reviewed			Full-text reports • Peer-reviewed		

Links to any freely available user-friendly summaries, scientific abstracts, and full-text reports.

Health Systems Evidence — 1-page summary

Return to search results table
Return to search interface
Translate this page (Coming soon) [English] [2]

Title	Role of Medication in Improving Primary Care
Type of synthesis	Systematic review (abstract)
Type of question	Health services
Health system type(s)	Delivery, management • Delivery details provided • Health care - Role of Medication
Last year literature searched	2007
Quality rating	Q11 (QPN) (Quality: not recommended for use)
Countries in which studies (included in the synthesis) were conducted	Not reported
User-friendly summary	Radioforum Cochrane Evidence (RAC) Policy Update Initiative Database of Review of Effects (DARE) Re for Change
Keywords checked	#44684 Cochrane Library
Full-text report	Cochrane Library (Free - Online Version)
Citation	Laurant, H., Beever, T., Hamers, R., Desprez, S., Grol, R., Grol, D. Substitution of doctors by nurses in primary care. <i>Cochrane Database of Systematic Reviews</i> 2008;(3):Art. No. CD007271. DOI: 10.1002/14651055.CD007271.pub2

Policy/Evidence Alerts: Reviews and accessible evidence from The Cochrane Library

Home / Evidence Alerts / Evidence Alerts

Substitution of doctors by nurses in primary care

Substitution of doctors by nurses in primary care (Review) [Review] [Evidence] [Alerts]

Review Title

Substitution of doctors by nurses in primary care (Review) [Review] [Evidence] [Alerts]

Authors: Laurent N, Harper D, Harman R, Desprez J, Goh S, Zobel S
 Summary based on: Substitution of doctors by nurses in primary care (Review) [Review] [Evidence] [Alerts]

Background: The review is based on the following question: "What is the effect of substitution of doctors by nurses in primary care?"

Objectives: The review is based on the following question: "What is the effect of substitution of doctors by nurses in primary care?"

Search: The review is based on the following question: "What is the effect of substitution of doctors by nurses in primary care?"

Selection: The review is based on the following question: "What is the effect of substitution of doctors by nurses in primary care?"

Analysis: The review is based on the following question: "What is the effect of substitution of doctors by nurses in primary care?"

Conclusions: The review is based on the following question: "What is the effect of substitution of doctors by nurses in primary care?"

Keywords: Substitution of doctors by nurses in primary care

References: The review is based on the following question: "What is the effect of substitution of doctors by nurses in primary care?"

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Health Systems Evidence — 1-page summary

Return to search results table | Return to search interface | Translate this page (Coming soon) [English] [4]


Print

Title	Substitution of doctors by nurses in primary care
Typical systematic	Systematic review (Evidence)
Typical question	Effectiveness
Health system issue(s)	Delivery management • System data is provided • Evidence is available
Last year literature searched	2010
Quality rating	Q11 (QDN)20 rating (more information here)
Countries in which studies (included in the synthesis) were conducted	Not reported
How to find summary	Androscott Evidence Center (AEC) Policy System Evaluation Database of Review of Effects (DARE) for Change
Keywords obtained	Published Cochrane Library
Full-text report	Cochrane Library (Free - Online Version)
Citation	Laurent N, Harper D, Harman R, Desprez J, Goh S, Zobel S. Substitution of doctors by nurses in primary care. Database of Review of Effects (DARE) for Change. ID:J00274661826.C0001271.0002.


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Substitution of doctors by nurses in primary care (Review)

Laurant M, Reaves D, Hermans R, Braspenning J, Grol R, Sibbald B




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Promoting use of systematic reviews in health systems and policy decision making

SUPPORT Tools for evidence-informed health Policymaking (STP)

Report from Norwegian Knowledge Centre for the Health Services
(Norskisratt kunnskapssenter for helsepolitiikk) No. 4-2010



kunnskapssenteret

Background: Knowing how to find and use research evidence can help policy-makers and those who support them to do their jobs better and more efficiently. Each chapter presents a proposed tool that can be used by those involved in finding and using research evidence to support evidence-informed health policymaking. The book addresses four broad areas: 1) Supporting evidence-informed policymaking, 2) Identifying needs for research evidence in relation to three steps in policymaking processes, namely problem clarification, options framing, and implementation planning, 3) Finding and assessing both systematic reviews and other types of evidence to inform these steps, and 4) Going from research evidence to decisions. • Each chapter begins with between one and three typical scenarios relating to the topic. These scenarios are designed to help readers decide on the level of detail relevant to them when applying the tools described. Most chapters are structured using a set of questions that guide readers through the proposed tools and show how to undertake activities to support evidence-informed policymaking efficiently and effectively.

Other resources

- SUPPORT tool is a series of 18 papers about how policy makers can better use research evidence to support their decision making
- Available through Health Research Policy and Systems <http://www.health-policy-systems.com/supplements/7/S1>

Summary

- There is increasing awareness of value of systematic reviews of complex interventions to inform health system and policy decisions
- The conduct of systematic reviews of complex interventions are particularly challenging due to issues relating to:
 - lumping and splitting
 - intervention definition
 - inclusion of broad range of study designs
 - identification of sources of heterogeneity
 - analytical challenges

Summary

- Further syntheses of other types of knowledge also frequently needed to supplement evidence on benefits and harms of complex interventions
- Substantial methodological innovation in this area currently
- Policy makers often unaware of the availability of relevant reviews and find them difficult to access and understand
- Healthsystemevidence.org and SUPPORT tool are practical tools to support policy makers to make better use of reviews in decision making

Contact details

- Jeremy Grimshaw - jgrimshaw@ohri.ca
- EPOC – epoc@uottawa.ca
- healthsystemsevidence.org
- SUPPORT - <http://www.health-policy-systems.com/supplements/7/S1>