



Systematic Reviews

(vs literature reviews)

Prof. Anne-Marie Glenny

Trusted evidence.
Informed decisions.
Better health.



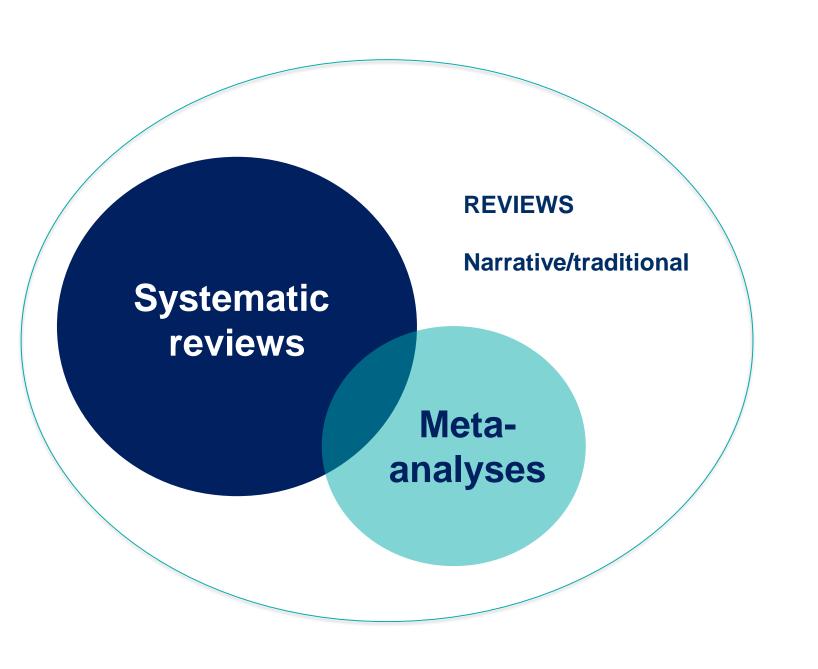
The National Institute for Health Research (NIHR) is

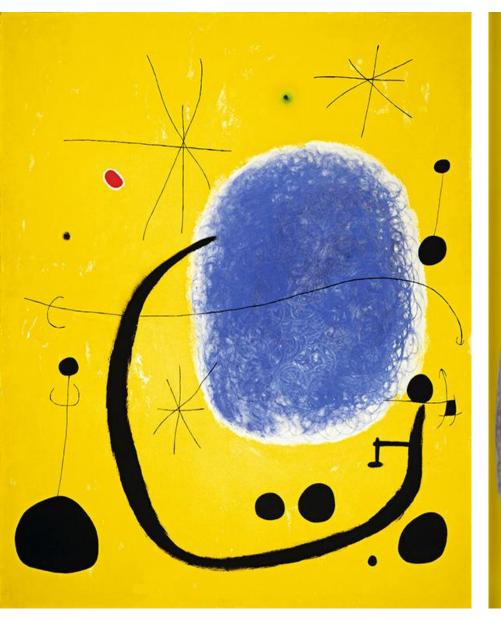
the largest single funder of Cochrane Oral Health

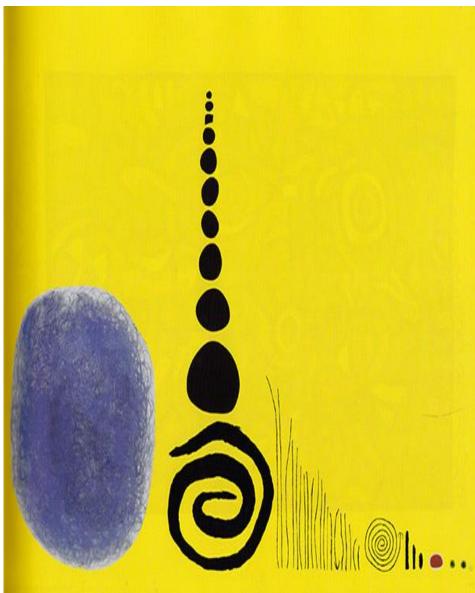
What are systematic reviews?

- A review that has a clearly formulated question, uses explicit methods to derive an answer to that question, based on relevant research evidence
- Systematically locating, appraising and synthesising evidence from scientific studies in order to obtain a reliable overview
- Aim to find all studies addressing the review's question using an objective and transparent process

Systematic review	Literature Review
Comprehensive overview of primary research addressing a focused question; follows a predefined protocol	Overview of a topic using unstructured approach



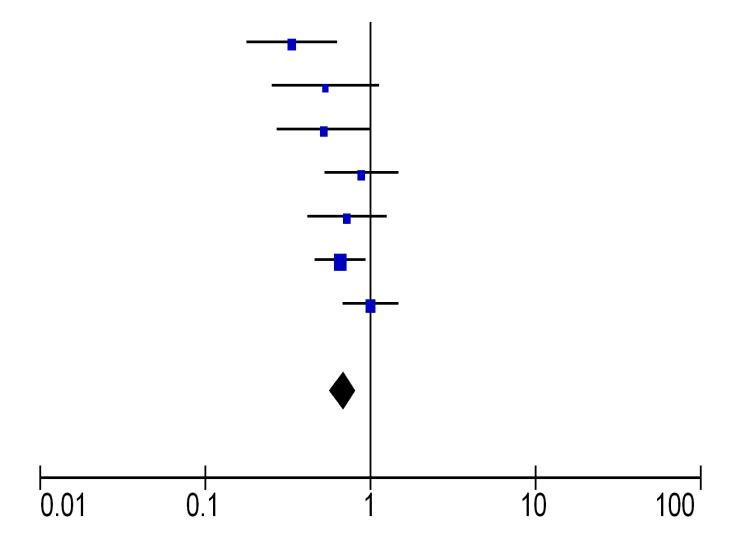




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City of City Magness with a 10% observation for the city of the ci		Review: Oral hygiene ca Comparison: 1 Chlorhes Outcome: 1 Incidence of	cidine versus placebo/u	ts to prevent ventilator-a sual care	ssociated pneumonia			
Commission on Charles 2: In Japanese 100 Carles 100 Car	Early, sine	Study or subgroup	Chlorhexidine Pl	acebo/Usual care	Odds Ratio	Weight	Odds Ratio	
market Subsection Springers of Charles and Charles	ventil	1 Chlambanidina aslutia	n/N	n/N	M-H,Random,95% CI		M-H,Random,95% CI	
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Single SEL Annual OF SE Administration (B) Sec Self-Collect Of SE		Chen 2008 (1)	16/60	28/60		7.9 %	0.42 [0.19, 0.89]	
		Panchabhai 2009	14/88	15/83	-	7.4 %	0.86 [0.39, 1.91]	
THE PART OF PERSONS ASSESSED.		Bellissim o-Rodrigues	2009 16/64	17/69	-	7.6 %	1.02 [0.46, 2.24]	
Control of the last of the las		Grap 2011 (2)	7/21	10/18		3.3 %	0.40 [0.11, 1.47]	
MINE I THE REPORT OF THE PARTY		Jacomo 2011 (3)	16/87	11/73	-	6.9 %	1.27 [0.55, 2.94]	
Statement by the same parties		Ozcaka 2012	12/29	22/32		4.8 %	0.32 [0.11, 0.92]	
./	COMO!	Subtotal (95% CI) Total events: 86 (Chlorho Heterogeneity: Tau² = 0. Test for overall effect: 2 :	15; Chi² = 10.19, df = 6	515 sual care) (P = 0.12); ² =41%	•	43.1 %	0.60 [0.38, 0.94]	
2000		2 Chlorhexidine gel vers	us placebo (no ťbrushi)	ng in either group)		2.0%	0.2010.05.0.571	
The state of the s	1	Fourrier 2000 Fourrier 2005	5/30 13/114	14/28		3.8 % 7.0 %	0.20 [0.06, 0.67] 1.09 [0.48, 2.51]	1
400	2 plc	Koeman 2006	13/114	23/130				
	during	Cabov 2010	1/17	6/23		8.5 % 1.2 %	0.53 [0.26, 1.10] 0.18 [0.02, 1.64]	
The state of the s	ad social address as		•	•				
2000	an otal vilato	Sebastian 2012 (4)	12/41	14/45		6.0 %	0.92 [0.36, 2.30]	
rerir	e and sodium bicari	Subtotal (95% CI) Total events: 44 (Chlorhe Heterogeneity: Tau² = 0. Test for overall effect: Z :	21: Chi ² = 7.23. df = 4	340 ual care) (P = 0.12); I ² =45%		26.5 %	0.57 [0.31, 1.06]	
		3 Chlorhexidine solution Tantipong 2008	n versus placebo (ť brust 5/58	ning both groups) 10/52		4.2 %	0.40 [0.13, 1.25]	
moal sing ad in his	anicial	Scannapieco 2009 (5)	14/100	12/49	-	6.6 %	0.50 [0.21, 1.19]	
con learning an nech	al a.	Berry 2011	1/71	4/78 —		1.2 %	0.26 [0.03, 2.42]	
A comparison solution or al cleansing and inches or al cleansing in mechanical in mechanical control of the con	100	Subtotal (95% CI) Total events: 20 (Chlorhe Heterogeneity: Tau² = 0. Test for overall effect: Z :	229 exidine), 26 (Placebo/Us 0; Chi² = 0.33, df = 2 (P = 2.45 (P = 0.014)	179 ual care) = 0.85); 2 = 0.0%	•	12.0 %	0.44 [0.23, 0.85]	
one ador.	-	4 Chlorhexidine gel vers Kusahara 2012 (6)	us placebo (tbrushing t	ooth groups)	1			
A fair	The state of the s					6.7 %	1.03 [0.44, 2.42]	
The Barbara		Subtotal (95% CI) Total events: 15 (Chlorho Heterogeneity: not applio Test for overall effect: Z	46 exidine), 16 (Placebo/Us table = 0.06 (P = 0.95)	50 ual care)		6.7 %	1.03 [0.44, 2.42]	
	San Care Care Care Care Care	5 Chlorhexidine solution Munro 2009 (7)	n versus usual care (som 38/92	e t'brushing in each gro 55/100	up)	11.7 %	0.58 [0.32, 1.02]	
w del	1000000	Subtotal (95% CI)	92	100		11.7 %		
The There	C. T. S. C.	Total events: 35% (Chlorho Heterogeneity: not applic Test for overall effect: Z :	exidine), 55 (Placebo/Us cable	ual care)		ILI A	0.58 [0.32, 1.02]	
		Total (95% CI) Total events: 203 (Chlori Heterogeneity: Tau ² = 0. Test for overall effect: Z Test for subgroup differe	06; Chi² = 20.19, df = 1 = 3.96 (P = 0.000074)	6 (P = 0.21); I ² = 21%	•	100.0 %	0.60 [0.47, 0.77]	
t pl	200			0.01	0.1 1 10	100		
1	1000		Favoi	ırs chlorhexidine	Favours placebo/u	ı care		
	120	The same of		1				- Andrews
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Why are systematic reviews important?

- Ensure that healthcare decisions are informed by high quality and timely research evidence
- Formulate policy and develop guidelines
- Reduce large quantities of information into manageable portions
- Efficient use of resources
- Increased power/precision
- Limit bias and improve accuracy







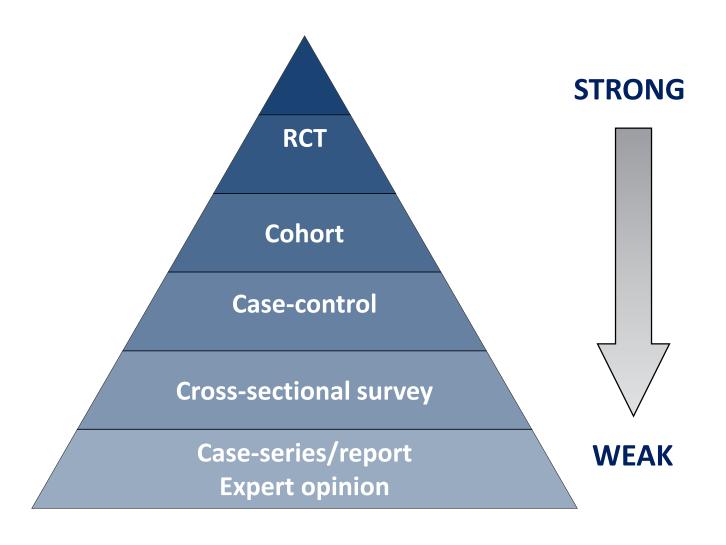
1	Define the question (PICO)
2	Plan eligibility criteria
3	Plan methods
4	Search for studies
5	Apply eligibility criteria
6	Collect data
7	Assess studies for risk of bias
8	Analyse and present results
9	Interpret results and draw conclusions
10	Improve and update review

This question is...

- The lynchpin of a systematic review protocol
- Leads on to inclusion and exclusion criteria
- Helps build up a search strategy
- Gets authors thinking about what data to extract, and what quality criteria are important
- Allows authors to decide on their analysis now

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Hierarchy of evidence



Possible scenarios

Question not related to effectiveness of an intervention

- Adopting clinical genomics: a systematic review of genomic literacy among physicians in cancer care. (Dung Ha et al 2018)
- Cost-utility analyses of diagnostic laboratory tests: a systematic review (Fang el al 2011)
- Obesity-Related Genes and Oral cancer: A Bioinformatics Approach and Systematic Review (Santos et al, 2016)

RCTs not feasible in area of study

Penicillins for the prophylaxis of bacterial endocarditis in dentistry. (Oliver 2004)

Supplement a review of RCTs

 Comparative efficacy and safety of long-acting oral opioids for chronic non-cancer pain: a systematic review. (Chou 2003)

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Search strategy

- Needs to be as comprehensive as possible
- Consider:
 - Electronic databases (Cochrane Controlled Trials Register, Medline, Embase);
 - Reference lists;
 - Handsearching;
 - English language/non-English language;
 - Sources of ongoing and/or unpublished studies

Reporting biases

- Statistically significant 'positive' results are:
 - more likely to be published
 - publication bias
 - more likely to be published rapidly
 - time lag bias
 - more likely to be published in English
 - language bias
 - more likely to be cited by others
 - citation bias

Publication bias

 Empirical evidence that positive results more likely to be published than negative results

(Scherer 2007, Decullier 2005, Decullier 2007)

• OR = 3.90, 95% CI 2.68 to 5.68

(Hopewell 2008)

Publication bias | an example

- Systematic review of reboxetine, a third-generation antidepressant
- 13 trials, published and unpublished data
- 74% of patient data previously unpublished
- Reboxetine is "overall an ineffective and potentially harmful antidepressant"
- Contradicts findings of previous reviews which considered only published data

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Unbiased selection & data extraction process

Selection of relevant papers

 Data extraction to a predefined data extraction form

 Process should be conducted independently by at least two reviewers

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Risk of bias assessment

- Process should be conducted independently by at least two reviewers
- Results of the assessment should be reflected in the analysis
- Can be used:
 - As a threshold for inclusion of studies;
 - As a possible explanation for differences in results between trials;
 - In sensitivity analyses;
 - As weights in statistical analysis of the results

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Study synthesis

- Appropriate pooling
 - qualitative (narrative)
 - quantitative (meta-analysis)

 Clear presentation of individual studies included in the review

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