

Supplementary Material

S1. Example of the search strategy used to identify relevant papers for the umbrella review across primary medical care

1. antimicrobial steward* mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
2. antibiotic steward* mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
3. antibiotic resistance mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
4. “antibiotic use” mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
5. antimicrobial mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
6. antibiotic resistance mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
7. 1 or 2 or 3 or 4 or 5 or 6

8. primary medical care mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
9. primary care mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
10. primary health care mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
11. primary healthcare mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
12. general practi* mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
13. outpatient mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
14. medical mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
15. 8 or 9 or 10 or 11 or 12 or 13 or 14

16. systematic review*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]

17. 7 and 14 and 16

S2. Example of the search strategy used to identify relevant papers for the systematic review across primary dental care

1. antimicrobial steward* mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]

2. antibiotic steward* mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]

3. antibiotic resistance mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]

4. “antibiotic use” mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]

5. antimicrobial mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]

6. antibiotic resistance mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]

7. 1 or 2 or 3 or 4 or 5 or 6

8. dental mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]

9. oral health mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]

10. dentist* mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]

11. 8 or 9 or 10

12. intervention* mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]

13. audit mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]

14. outreach mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]

15. trial* mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]

16. 12 and 13 and 14 and 15

17. 7 and 11 and 16

Table S1. Methodological quality assessment of systematic reviews included in the umbrella review across primary medical care using the Critical Skills Appraisal Programme (CASP) checklist for systematic reviews.

	A) Are the results of the review valid?					B) What are the results?		C) Will the results help locally?		
	Clear question?	Right type of papers?	All relevant studies included?	QA of included studies	Reasonable to combine results?	Overall results	Precision?	Applicability of results	All important outcomes?	Are the benefits worth the harms and costs?
Arroll et al, 2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
de Bont et al, 2015	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes

Huang et al, 2013	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	Yes	Yes
Holsteige et al, 2015	Yes	Yes	Yes	Yes	No	Yes	Can't tell	Yes	Yes	Yes
Hu et al, 2016	Yes	Yes	Yes	Yes	Can't tell	Yes	Can't tell	Yes	Yes	Yes
Kochling et al, 2018	Yes	Yes	Yes	Yes	Can't tell	Yes	Can't tell	Yes	Yes	Yes
Lane et al, 2018	Yes	Yes	Yes	Yes	Can't tell	Can't tell	Can't tell	Yes	Yes	Yes
O'Sullivan et al, 2016	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Saha et al, 2019	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	Yes	Yes
Vodicka et al, 2013	Yes	Yes	Yes	Yes	Can't tell	Yes	Can't tell	Yes	Yes	Yes

Table S2. Methodological quality assessment of studies included in the systematic review across primary dental care using the Quality Assessment Tool for Studies with Diverse Design (QATSSD). The second mark relates to the scores of the second marker who undertook a parallel assessment of all studies in the systematic review.

	1. Explicit theoretical framework	2. Statement of aims/ objectives in main body of report	3. Clear description of research setting	4. Evidence of sample size considered in terms of analysis	5. Representative sample of target group of a reasonable size	6. Description of procedure for data collection	7. Rationale for choice of data collection tool(s)	8. Detailed recruitment data	9. Statistical assessment of reliability and validity of measurement tool(s)
Chate et al, 2006	2 or 1	3 and 3	3 and 2	0 and 1	2 and 2	2 and 2	0 and 2	2 and 1	2 and 0
Elouaflaoui et al, 2016	3 and 3	3 and 3	3 and 3	3 and 3	3 and 3	3 and 3	2 and 2	3 and 3	3 and 2
Palmer et al, 2001	3 and 3	3 and 3	3 and 3	2 and 0	1 and 3	3 and 3	1 and 1	2 and 1	1 and 1
Seager et al, 2006	3 and 3	3 and 3	3 and 3	3 and 3	3 and 3	3 and 3	1 and 2	3 and 3	2 and 1
Teoh et al, 2020	2 and 2	3 and 3	3 and 2	3 and 3	2 and 3	3 and 3	1 and 1	2 and 3	1 and 1
Zahabiyoun et al, 2015	3 and 2	3 and 3	1 and 1	0 and 0	0 and 0	2 and 2	1 and 1	1 and 1	1 and 0

Table S2 (continued)

	10. Fit between stated research question and method of data collection	11. Fit between stated research question and format and content of data collection tool e.g. interview schedule	12. Fit between research question and method of analysis	13. Good justification for analytical method selected	14. Assessment of reliability of analytical process	15. Evidence of user involvement in design	16. Strengths and limitations critically discussed	Total	% Total	Average total
Chate et al, 2006	3 and 3	0 and 0	3 and 3	2 and 2	0 and 0	3 and 0	1 and 1	28 and 23	67 and 55	61
Elouaflaoui et al, 2016	3 and 3	2 and 0	3 and 3	3 and 2	3 and 0	3 and 2	3 and 3	46 and 38	96 and 90	93
Palmer et al, 2001	3 and 3	0 and 0	3 and 3	2 and 2	0 and 0	1 and 0	0 and 1	28 and 27	67 and 64	66
Seager et al, 2006	3 and 3	0 and 0	3 and 3	3 and 3	0 and 0	2 and 3	2 and 1	37 and 37	88 and 88	88
Teoh et al, 2020	3 and 3	2 and 0	3 and 3	2 and 2	2 and 0	1 and 0	2 and 3	35 and 32	73 and 75	74
Zahabiyoun et al, 2015	0 and 0	0 and 0	3 and 3	2 and 1	0 and 0	1 and 0	1 and 1	19 and 15	45 and 36	41

Table S3 Mapping the ten systematic reviews of the umbrella review to their 111 constituent primary research studies from which metrics used to assess success of AMS interventions originated

[illegible]

Little et al, 2001 ⁶⁰	✓									
Little et al, 2005 ⁶¹		✓								
Little et al, 2013 ⁶²						✓				
Llor et al, 2011 ⁶³						✓				
Llor et al, 2012a ⁶⁴					✓					
Llor et al, 2012b ⁶⁵					✓					
Lundborg et al, 1997 ⁶⁶									✓	
Lundborg et al, 1999 ⁶⁷									✓	
Macfarlane et al, 1997 ⁶⁸		✓								
Macfarlane et al, 2002 ⁶⁹		✓								
Madridejos-Mora et al, 2004 ⁷⁰									✓	
Magrini et al, 2014 ⁷¹									✓	
Mainous et al, 2000 ⁷²								✓		✓
Margolis et al, 1992 ⁷³										✓
Martens et al, 2006 ⁷⁴									✓	
McGinn et al, 2013 ⁷⁵			✓			✓				
Meeker et al, 2016 ⁷⁶						✓				
Melbye et al, 1995 ⁷⁷					✓					
Naughton et al, 2009 ⁷⁸									✓	
Ndefo et al, 2017 ⁷⁹									✓	
Olson et al, 2011 ⁸⁰							✓			
Peterson et al, 1997 ⁸¹									✓	
Price et al, 2014 ⁸²							✓			
Pshetizky et al, 2003 ⁸³				✓						
Razon et al, 2005 ⁸⁴										✓
Regev-Yochay et al, 2011 ⁸⁵				✓						✓
Roque et al, 2016 ⁸⁶									✓	
Saint et al, 1999 ⁸⁷									✓	
Santoso et al, 1996 ⁸⁸									✓	
Schaffner et al, 1983 ⁸⁹									✓	
Shah et al, 2014 ⁹⁰							✓			
Simonsen et al, 2011 ⁹¹							✓			

Smabrekke et al, 2002 ⁹²									✓
Smeets et al, 2009 ⁹³								✓	
Stewart et al, 2000 ⁹⁴								✓	
Sustersic et al, 2013 ⁹⁵		✓							
Taylor et al, 2005 ⁹⁶				✓					✓
Temte et al, 1999 ⁹⁷							✓		
Van Driel et al, 2007 ⁹⁸								✓	
Vellinga et al, 2016 ⁹⁹								✓	
Veninga et al, 2000 ¹⁰⁰								✓	
Vervloet et al, 2016 ¹⁰¹								✓	
Vinnard et al, 2013 ¹⁰²								✓	
Weiss et al, 2011 ¹⁰³								✓	
Welschen et al, 2004 ¹⁰⁴								✓	
Wheeler et al, 2001 ¹⁰⁵				✓					
Wilf-Miron et al, 2012 ¹⁰⁶								✓	
Wilson et al, 2003 ¹⁰⁷									✓
Worrall et al, 2010 ¹⁰⁸						✓			
Zelicoff et al, 2001 ¹⁰⁹							✓		

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