



Supplemental Data

Supplemental Data S1: Search strategy

Supplemental Data S2: Data collection and quality assessment items

Supplemental Table S3: Assessment of risk of bias of observational studies–ROBIN-1

Supplemental Table S4: Assessment of risk of bias of systematic reviews–AMSTAR-2

S1: Search strategy

Databases: Medline

Search dates: Initial search September 15, 2020, search closure November 2, 2020

Main search strategy

Database(s): Ovid MEDLINE(R) ALL 1946 to September 17, 2020

Table S1-1: MEDLINE search strategy

#	Searches	Results
1	Public Health Surveillance/	3,993
2	Sentinel Surveillance/	6,430
3	surveillance?.mp.	233,740
4	Population Surveillance/	59,756
5	Epidemiological Monitoring/ or (epidemiog* adj3 monitor*).mp.	7,449
6	Data Collection/ or (data adj3 collecti*).mp.	192,413
7	(cnisp or Canadian Nosocomial Infection Surveillance Program).mp. or Canadian Nosocomial Infection Surveillance Program.au.	65
8	(cihi or Canadian Institute for Health Information).mp.	452
9	Biosurveillance/ or biosurveillanc*.mp.	349
10	ipac.mp.	259
11	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10	423,818
12	Hospital Records/ or (hospital adj3 records).mp.	17,614
13	Patient Discharge Summaries/	253
14	Medical Records/	65,546
15	Electronic Health Records/	20,349
16	Medical Records Systems, Computerized/	19,065
17	((medical adj3 record*) or (medical adj3 chart*) or (clinical adj3 data) or (medical adj3 data) or (health adj3 data) or (health adj3 record*)).mp.	421,004
18	(medical adj3 report*).mp.	14,734
19	hospital.mp. or Hospitals/	1,294,875
20	(acute care or emergency care).mp. or Emergency Medical Services/	72,271
21	long term care.mp. or Long-Term Care/	38,529
22	(healthcare adj3 epidemiolog*).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]	482

Table S1-1: MEDLINE search strategy (continued)

#	Searches	Results
23	Tertiary Care Centers/ or tertiary.mp. or Tertiary Healthcare/	263,965
24	(administrative adj3 data).mp.	12,430
25	Patient Discharge/ or (patient adj3 discharg*).mp.	45,255
26	discharge abstract database.mp.	283
27	Registries/	91,150
28	registr*.mp.	292,506
29	12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28	2,158,497
30	(healthcare-associated adj3 infection*).mp.	3,721
31	(health care-associated adj3 infection*).mp.	1,850
32	(hospital adj3 infection*).mp.	12,938
33	(hospital-acquired adj3 infection*).mp.	5,108
34	(hospital-associated adj3 infection*).mp.	353
35	(healthcare-acquired adj3 infection*).mp.	231
36	(health care-acquired adj3 infection*).mp.	103
37	nosocomial.mp.	31,164
38	infection prevention.mp.	5,676
39	Infection Control/	25,320
40	Cross Infection/	57,096
41	infection control.mp.	41,454
42	cross infection*.mp.	58,588
43	(healthcare infection* or health care infection*).mp.	154
44	HAI.mp.	4,521
45	HAIs.mp.	1,271
46	(healthcare adj3 epidemiology).mp.	347
47	Clostridium difficile/	9,460
48	(cdi or Clostridium difficile Infection*).mp.	9,241
49	(cdad or Clostridium difficile associated disease*).mp.	909
50	Methicillin-Resistant Staphylococcus aureus/	14,737
51	(mrsa or Methicillin-Resistant Staphylococcus aureus).mp.	33,422
52	Vancomycin-Resistant Enterococci/	680
53	(vre or Vancomycin-Resistant Enterococci).mp.	4,639
54	(cpe or carbapenemase-producing Enterobacteriaceae).mp.	8,046
55	Surgical Wound Infection/	36,666
56	((surgical site adj3 infection*) or (surgical wound adj3 infection*)).mp.	42,603

**Table S1-1: MEDLINE search strategy (continued)**

#	Searches	Results
57	ssi.mp.	6,974
58	Pneumonia, Ventilator-Associated/	3,545
59	((ventilator-associated adj3 event) or (ventilator-associated adj3 pneumonia)).mp.	6,435
60	vae.mp.	484
61	(central line adj3 infection*).mp.	1,399
62	Catheter-Related Infections/	5,142
63	(catheter adj3 infection*).mp.	9,843
64	(clabsi or cauti).mp.	827
65	(bloodstream or blood-stream or bsi).mp.	649
66	Urinary Tract Infections/	39,164
67	(uti or (urinary tract adj3 infection*)).mp.	61,525
68	antimicrobial resist*.mp.	24,521
69	Drug Resistance, Microbial/ or (microb* adj3 drug resistance).mp.	58,582
70	(aro or aros or Antibiotic-Resistant Organism*).mp.	1,565
71	30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or 70	331,641
72	exp canada/ or canada?.mp.	198,411
73	quebec?.mp.	20,457
74	nunavut?.mp.	633
75	northwest territories?.mp.	715
76	territoires du nord-ouest.mp.	3
77	ontario?.mp.	43,226
78	british columbia?.mp.	14,706
79	colombie-britannique.mp.	90
80	alberta?.mp.	13,115
81	saskatchewan?.mp.	4,035
82	manitoba?.mp.	5,174
83	yukon?.mp.	706
84	newfoundland?.mp.	2,368
85	labrador?.mp.	3,585
86	terre-neuve.mp.	22
87	new brunswick?.mp.	1,536
88	nouveau-brunswick.mp.	32
89	nova scotia?.mp.	3,743
90	nouvelle-ecosse.mp.	40
91	prince edward island?.mp.	637
92	maritimes?.mp.	200
93	72 or 73 or 74 or 75 or 76 or 77 or 78 or 79 or 80 or 81 or 82 or 83 or 84 or 85 or 86 or 87 or 88 or 89 or 90 or 91 or 92	219,305
94	11 and 29 and 71 and 93	327

Systematic review strategy

Database(s): Ovid MEDLINE(R) ALL 1946 to
January 28, 2021

Table S1-2: MEDLINE search strategy for systematic review

#	Searches	Results
1	Public Health Surveillance/	4,252
2	Sentinel Surveillance/	6,513
3	surveillance?.mp.	240,786
4	Population Surveillance/	60,356
5	Epidemiological Monitoring/ or (epidemiog* adj3 monitor*).mp.	7,639
6	Data Collection/ or (data adj3 collecti*).mp.	196,544
7	(cnisp or Canadian Nosocomial Infection Surveillance Program).mp. or Canadian Nosocomial Infection Surveillance Program.au.	66
8	(cihi or Canadian Institute for Health Information).mp.	464
9	Biosurveillance/ or biosurveillanc*.mp.	356
10	ipac.mp.	266
11	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10	434,933
12	Hospital Records/ or (hospital adj3 records).mp.	17,959
13	Patient Discharge Summaries/	256
14	Medical Records/	65,656
15	Electronic Health Records/	21,058
16	Medical Records Systems, Computerized/	19,075
17	((medical adj3 record*) or (medical adj3 chart*) or (clinical adj3 data) or (medical adj3 data) or (health adj3 data) or (health adj3 record*)).mp.	434,477
18	(medical adj3 report*).mp.	15,090
19	hospital.mp. or Hospitals/	1,325,849
20	(acute care or emergency care).mp. or Emergency Medical Services/	73,846
21	long term care.mp. or Long-Term Care/	39,192
22	(healthcare adj3 epidemiolog*).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]	498
23	Tertiary Care Centers/ or tertiary.mp. or Tertiary Healthcare/	270,564
24	(administrative adj3 data).mp.	12,982
25	Patient Discharge/ or (patient adj3 discharg*).mp.	46,668
26	discharge abstract database.mp.	297
27	Registries/	93,309
28	registr*.mp.	306,325
29	12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28	2,216,248
30	(healthcare-associated adj3 infection*).mp.	3,897
31	(health care-associated adj3 infection*).mp.	1,907
32	(hospital adj3 infection*).mp.	13,354
33	(hospital-acquired adj3 infection*).mp.	5,305



Table S1-2: MEDLINE search strategy for systematic review (continued)

#	Searches	Results
34	(hospital-associated adj3 infection*).mp.	370
35	(healthcare-acquired adj3 infection*).mp.	249
36	(health care-acquired adj3 infection*).mp.	106
37	nosocomial.mp.	31,881
38	infection prevention.mp.	6,112
39	Infection Control/	26,248
40	Cross Infection/	57,657
41	infection control.mp.	43,061
42	cross infection*.mp.	59,222
43	(healthcare infection* or health care infection*).mp.	157
44	HAI.mp.	4,661
45	HAIs.mp.	1,335
46	(healthcare adj3 epidemiology).mp.	357
47	Clostridium difficile/	9,526
48	(cdi or Clostridium difficile Infection*).mp.	9,534
49	(cdad or Clostridium difficile associated disease*).mp.	911
50	Methicillin-Resistant Staphylococcus aureus/	15,096
51	(mrsa or Methicillin-Resistant Staphylococcus aureus).mp.	34,266
52	Vancomycin-Resistant Enterococci/	714
53	(vre or Vancomycin-Resistant Enterococci).mp.	4,756
54	cpe.mp.	8,379
55	Surgical Wound Infection/	37,058
56	((surgical site adj3 infection*) or (surgical wound adj3 infection*)).mp.	43,297
57	ssi.mp.	7,218
58	Pneumonia, Ventilator-Associated/	3,598
59	((ventilator-associated adj3 event) or (ventilator-associated adj3 pneumonia)).mp.	6,591
60	vae.mp.	520
61	(central line adj3 infection*).mp.	1,453
62	Catheter-Related Infections/	5,253
63	(catheter adj3 infection*).mp.	10,022
64	clabsi.mp.	858
65	cauti.mp.	671
66	Urinary Tract Infections/	39,480
67	(uti or (urinary tract adj3 infection*)).mp.	62,542
68	antimicrobial resist*.mp.	26,152
69	Drug Resistance, Microbial/ or (microb* adj3 drug resistance).mp.	58,884
70	(aro or aros or Antibiotic-Resistant Organism*).mp.	1,595
71	30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or 70	339,566
72	11 and 29 and 71	10,333
73	systematic.m_titl.	171,615
74	72 and 73	126
75	limit 74 to yr="1995 - 2020"	123

S2: Data collection and quality assessment items

Data collection items

General information

Title

First Author

Journal

Year of publication

Province(s)

Conflict of interest

Study details

Objective

Design

Settings

Duration of the study

Summary of the method

Summary of the data analysis

Data

Type of healthcare-associated infection (HAI)

Type of surveillance

Source of data

Outcomes and results

Summary of the result

Conclusion

Limitation

General comment

**Table S2-1: Assessment of risk of bias of observational study–ROBIN-1 form item**

Domains of bias			Response options	Categories for risk of bias
Pre-intervention	At intervention	Post-intervention	Yes; Probably yes; Probably no; No; No information	Low risk; Moderate risk; Serious risk; Critical risk
Bias due to confounding	Bias in classification of interventions	Bias due to missing data		
		Bias due to deviations from intended interventions		
Bias in selection of participants into the study		Bias in measurement of outcomes		
		Bias in selection of reported result		

Table S2-2: Assessment of risk of bias of systematic review–AMSTAR form item

Item number	Item description
Question 1	Did the research questions and inclusion criteria for the review include the components of PICO?
Question 2	Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?
Question 3	Did the review authors explain their selection of the study designs for inclusion in the review?
Question 4	Did the review authors use a comprehensive literature search strategy?
Question 5	Did the review authors perform study selection in duplicate?
Question 6	Did the review authors perform data extraction in duplicate?
Question 7	Did the review authors provide a list of excluded studies and justify the exclusions?
Question 8	Did the review authors describe the included studies in adequate detail?
Question 9	Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review?
Question 10	Did the review authors report on the sources of funding for the studies included in the review?
Question 11	If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results?
Question 12	If meta-analysis was performed, did the review authors assess the potential impact of risk of bias in individual studies on the results of the meta-analysis or other evidence synthesis?
Question 13	Did the review authors account for risk of bias in individual studies when interpreting/discussing the results of the review?
Question 14	Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review?
Question 15	If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review?
Question 16	Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?

**Table S3: Assessment of risk of bias of observational studies–ROBIN-1**

First author, date	Confounding	Selection	Classification of intervention	Missing data	Deviation from intended intervention	Measurement of outcome	Selection of reported result	Overall risk of bias
Crocker <i>et al.</i> , 2020	Low	Low	Low	Low	Low	Low	Low	Low
Pfister <i>et al.</i> , 2020	Low	Low	Low	Low	Low	Low	Low	Low
Lee <i>et al.</i> , 2019	Low	Low	Low	Low	Low	Low	Low	Low
Rennert-May <i>et al.</i> , 2018	Low	Low	Low	Low	Low	Low	Low	Low
Ramirez-Mendoza <i>et al.</i> , 2017	Low	Low	Low	Unclear	Low	Low	Low	Low
Rusk <i>et al.</i> , 2016	Low	Low	Low	Low	Low	Low	Low	Low
Daneman <i>et al.</i> , 2011	Low	Low	Low	Low	Low	Low	Low	Low
Leal <i>et al.</i> , 2010	Low	Low	Low	Unclear	Low	Low	Low	Low
Daneman <i>et al.</i> , 2009	Low	Low	Low	Unclear	Low	Low	Low	Low
Lethbridge <i>et al.</i> , 2020	Low	Low	Low	Unclear	Low	Low	Low	Low
Almond <i>et al.</i> , 2020	Low	Low	Low	Unclear	Low	Low	Low	Low
Daneman <i>et al.</i> , 2012	Low	Low	Low	Low	Low	Low	Low	Low

Table S4: Assessment of risk of bias of systematic reviews–AMSTAR-2

AMSTAR-2 item number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Van Mourik <i>et al.</i>	Yes	No	Yes	Partial yes	Yes	Yes	Yes	No	Partial yes	No meta-analysis	No meta-analysis	No meta-analysis	Yes	Yes	No meta-analysis	Yes
Leal <i>et al.</i>	Yes	No	Yes	Partial yes	Yes	Yes	Yes	Partial yes	No	No meta-analysis	No meta-analysis	No meta-analysis	No	No	No meta-analysis	Yes
Freeman <i>et al.</i>	Yes	No	Yes	Partial yes	No	No	Yes	Partial yes	Partial yes	No meta-analysis	No meta-analysis	No meta-analysis	Yes	No	No meta-analysis	Yes
Streefkerk <i>et al.</i>	Yes	No	Yes	Partial yes	Yes	Yes	Yes	Partial yes	No	No meta-analysis	No meta-analysis	No meta-analysis	No	No	No meta-analysis	Yes