Supplementary materials to "Prevalence and risk factors of community-associated methicillin-resistant *Staphylococcus aureus* (CA-MRSA) carriage in Asia-Pacific region from 2000 to 2016: A systematic review and meta-analysis"

Contents

Appendix I. Search strategy for and number of records returned from MEDLINE, EMBASE and PubMed

This search strategy was developed based on a list of terms related to CA-MRSA and was reviewed by authors. Literature searches were performed with three electronic databases including MEDLINE (via OvidSP, 1946 onwards), EMBASE (via OvidSP, 1910 onwards) and PubMed from January 2000 to May 2017. The search strategy and the results of record breakdowns returned from the three databases are shown one by one below:

MEDLINE

Step	Terms input	Results
1	CA-MRSA* or methicillin resistant staphylococcus aureus* or community acquired methicillin resistant staphylococcus aureus* or community associated methicillin resistant staphylococcus aureus* or MRSA*	23863
2	community* or community-acquired* or community setting* or community-associated* or community-onset*	410019
3	Prevalence* or Risk factors* or Frequency* or Colonization* or Carriage* or Protective factors* or Predictive factors*	1894600
4	Bangladesh* or Bhutan* or Korea* or India* or Indonesia* or Maldives* or Myanmar* or Burma* or Nepal* or Sri Lanka* or Thai* or Thailand* or Timor-Leste* or Australia* or Brunei* or Cambodia* or China* or Cook Islands* or Fiji* or Japan* or Kiribati* or Lao* or Malaysia* or Marshall Islands* or Micronesia* or Mongolia* or Nauru* or New Zealand* or Niue* or Palau* or Papua New Guinea* or Philippines* or Samoa* or Singapore* or Solomon* or Tonga* or Tuvalu* or Vanuatu* or Vietnam* or Hong Kong* or Taiwan*	906146
5	1 and 2 and 3 and 4	299
6	Limit to 01/01/2000 to 19/05/2017	289
7	Limit to human subjects	283

EMBASE

Step	Terms input	Results
1	CA-MRSA* or methicillin resistant staphylococcus aureus* or community acquired methicillin resistant staphylococcus aureus* or community associated methicillin resistant staphylococcus aureus* or MRSA*	47808
2	community* or community-acquired* or community setting* or community-associated* or community-onset*	539323
3	Prevalence* or Risk factors* or Frequency* or Colonization* or Carriage* or Protective factors* or Predictive factors*	2623635
4	Bangladesh* or Bhutan* or Korea* or India* or Indonesia* or Maldives* or Myanmar* or Burma* or Nepal* or Sri Lanka* or Thai* or Thailand* or Timor-Leste* or Australia* or Brunei* or Cambodia* or China* or Cook Islands* or Fiji* or Japan* or Kiribati* or Lao* or Malaysia* or Marshall Islands* or Micronesia* or Mongolia* or Nauru* or New Zealand* or Niue* or Palau* or Papua New Guinea* or Philippines* or Samoa* or Singapore* or Solomon* or Tonga* or Tuvalu* or Vanuatu* or Vietnam* or Hong Kong* or Taiwan*	1513268
5	1 and 2 and 3 and 4	481
6	Limit to 01/01/2000 to 19/05/2017	469
7	Limit to human subjects	392

PubMed

Step	Terms input	Results
1	CA-MRSA* or methicillin resistant staphylococcus aureus* or community acquired methicillin resistant staphylococcus aureus* or community associated methicillin resistant staphylococcus aureus* or MRSA*	26237
2	community* or community-acquired* or community setting* or community-associated* or community-onset*	557105
3	Prevalence* or Risk factors* or Frequency* or Colonization* or Carriage* or Protective factors* or Predictive factors*	2048751
4	Bangladesh* or Bhutan* or Korea* or India* or Indonesia* or Maldives* or Myanmar* or Burma* or Nepal* or Sri Lanka* or Thai* or Thailand* or Timor-Leste* or Australia* or Brunei* or Cambodia* or China* or Cook Islands* or Fiji* or Japan* or Kiribati* or Lao* or Malaysia* or Marshall Islands* or Micronesia* or Mongolia* or Nauru* or New Zealand* or Niue* or Palau* or Papua New Guinea* or Philippines* or Samoa* or Singapore* or Solomon* or Tonga* or Tuvalu* or Vanuatu* or Vietnam* or Hong Kong* or Taiwan*	4440826
5	1 and 2 and 3 and 4	462
6	Limit to 01/01/2000 to 19/05/2017	448
7	Limit to human subjects	373

Appendix II. Reference list of the 27 articles adopted from Annex 2 of "World Health Organization Antimicrobial Resistance: Global Report on Surveillance"

1. Dutta S, Hassan MR, Rahman F, Jilani MS, Noor R. Study of antimicrobial susceptibility of clinically significant microorganisms isolated from selected areas of Dhaka, Bangladesh. *Bangladesh Journal of Medical Science.* 2013;12(1):34.

2. Singhi S, Ray P, Mathew JL, Jayashree M. Nosocomial bloodstream infection in a pediatric intensive care unit. *Indian J Pediatr.* 2008;75(1):25-30.

3. Bandekar N, Vinodkumar CS, Basavarajappa KG, Prabhakar PJ, Nagaraj P. Bacteriology and antibiogram of burn infection at a Tertiary Care Center. *Appl Microbiol.* 2011;5(1):781-786.

4. Batabyal BI, Biswas S, Mandal B, Desai PD, De Sarkar. Oral suffering and antimicrobial susceptibility of Staphylococcus aureus in a dental hospital in Kolkata, India. *Int J Pharm Bio Sci*. 2012; 3(4):620-629.

5. Chande CA, Shrikhande SN, Jain DL, Kapale S, Chaudhary H, Powar RM. Prevalence of methicillin-resistant Staphylococcus aureus nasopharyngeal carriage in children from urban community at Nagpur. *Indian J Public Health.* 2008;53(3):196-198.

6. Dubey D, Rath S, Sahu MC, Pattnaik L, Debata NK, Padhy RN. Surveillance of infection status of drug resistant Staphylococcus aureus in an Indian teaching hospital. *Asian Pac J Trop Dis.* 2013; 3(2):133-142.

7. Hanumanthappa AR, Jayasimha VL, Vishwanath G, Vijayanath V. Methicillin resistant Staphylococcus aureus amongst the patients in burns unit. *Appl Microbiol.* 2012;6(1):475-478.

8. Indian Network for Surveillance of antimicrobial resistance (INSAR) group. Methicillin resistant Staphylococcus aureus (MRSA) in India: Prevalence & susceptibility pattern. *Indian J Med Res.* 2013;137(2):363.

9. Martínez-Aguilar G, Avalos-Mishaan A, Hulten K, Hammerman W, Mason Jr EO, Kaplan SL. Community-acquired, methicillin-resistant and methicillin-susceptible Staphylococcus aureus musculoskeletal infections in children. *Pediatr Infect Dis J*. 2004;23(8):701-706.

10. Kumar S, Joseph N, Easow J, et al. Prevalence and current antibiogram of staphylococci isolated from various clinical specimens in a tertiary care hospital in Pondicherry. *Internet J Microbiol.* 2012;10(1):1937-43.

11. Patted SM, Chinagudi S, Soragavi VR, Bhavi SB. The prevalence of MRSA infection in orthopaedic surgery in a Medical College Hospital: A 2-year analysis. *Biomed Res*. 2013; 24(1).

12. Ramana KV, Mohanty SK, Wilson CG. Staphylococcus aureus colonization of anterior nares of school going children. *Indian J Pediatr.* 2009;76(8):813-816.

13. Rongpharpi SR, Hazarika NK, Kalita H. The prevalence of nasal carriage of Staphylococcus aureus among healthcare workers at a tertiary care hospital in assam with special reference to MRSA. *J Clin Diagn Res.* 2013;7(2):257.

14. Pathak A, Marothi Y, Kekre V, Mahadik K, Macaden R, Lundborg CS. High prevalence of extended-spectrum β-lactamase-producing pathogens: results of a surveillance study in two hospitals in Ujjain, India. *Infect Drug Resist.* 2012;5:65.

15. Kaistha N, Mehta M, Singla N, Garg R, Chander J. Neonatal septicemia isolates and resistance patterns in a tertiary care hospital of North India. *J Infect Dev Ctries.* 2009; 4(01):055-057.

16. Eshwara VK, Munim F, Tellapragada C, Varma M, Lewis LE, Mukhopadhyay C. Upsurge of MRSA bacteraemia in south Indian tertiary care hospital: An observational study on clinical epidemiology and resistance profile. *Int J Infect Dis.* 2012;16:e224.

17. Jha LK. Prevalence of methicillin resistant Staphylococcus aureus (MRSA) among skin infection cases at a hospital in Chitwan, Nepal. *Nepal Med Coll J.* 2010;12(4): 224-228.

18. Easow JM, Joseph NM, Dhungel BA, Chapagain B, Shivananda PG. Blood Stream Infections among febrile patients attending a Teaching Hospital in Western Region of Nepal. *Australas Med J.* 2010;3(10):633-637.

19. Kumari N, Mohapatra TM, Singh YI. Prevalence of Methicillin-resistant Staphylococcus aureus (MRSA) in a Tertiary-Care Hospital in Eastern Nepal. *J Nepal Med Assoc.* 2008;47(170):53-56.

20. Tiwari HK, Das AK, Sapkota D, Sivrajan K, Pahwa VK. Methicillin resistant Staphylococcus aureus: prevalence and antibiogram in a tertiary care hospital in western Nepal. *J Infect Dev Ctries.* 2009;3(09):681-684.

21. Rijal KR, Pahari N, Shrestha BK, et al. Prevalence of methicillin resistant Staphylococcus aureus in school children of Pokhara. *Nepal Med Coll J.* 2008;10(3): 192-195.

22. Sapkota K, Basnyat SR, Shrestha CD, Shrestha J, Dumre SP, Adhikari N. Prevalence of Methicillin Resistant Staphylococcus aureus (MRSA) in tertiary referral hospital in Nepal. *International Journal of Infectious Diseases.* 2010;14:e347.

23. Shrestha B, Pokhrel B, Mohapatra T. Study of nosocomial isolates of Staphylococcus aureus with special reference to methicillin resistant S. aureus in a tertiary care hospital in Nepal. *Nepal Med Coll J.* 2009;11(2):123-126.

24. Shrestha B, Pokhrel BM, Mohapatra TM. Staphylococcus aureus nasal carriage among health care workers in a Nepal Hospital. *Braz J Infect Dis.* 2009;13(5):322.

25. Gomes PL, Malavige GN, Fernando N, et al. Characteristics of Staphylococcus aureus colonization in patients with atopic dermatitis in Sri Lanka. *Clin Exp Dermatol.* 2011;36(2):195-200.

26. Bao L, Peng R, Ren X, Ma R, Li J, Wang Y. Analysis of some common pathogens and their drug resistance to antibiotics. *Pak J Med Sci.* 2013;29(1):135.

27. Lim LG, Tan XX, Woo SJ, et al. Risk factors for mortality in cirrhotic patients with sepsis. *Hepatol Int.* 2011;5(3):800-807.

Appendix III. Eligible criteria for studies included in this systematic review

Items	Description
(1) Study design	Observational studies including case-control studies[1], cohort studies and cross-sectional studies
(2) Population	General population or a clearly defined sub-group population
(3) Region	Countries within Asia-Pacific region which included member states listed in the WHO regional offices for South-East Asia and Western Pacific, additionally with Hong Kong and Taiwan
(4) Definitions of CA-MRSA	In so far as the articles reported (i) MRSA in the community; and/ or (ii) MRSA diagnosed in hospital within 48 hours of admission, and the subjects did not expose to any healthcare risk factors in prior to the admission, where healthcare risk factors included but not limited to exposure to hemodialysis, surgery, residence in a long-term care facility or hospitalization during the previous year, or had previous isolation of MRSA; and/or (iii) MRSA isolates from human subjects matched with a known CA-MRSA strain; and/or (iv) Other definitions of CA-MRSA stated in the articles.
(5) Outcomes	In so far as the articles reported (i) Prevalence of CA-MRSA carriage, respectively, in community and hospital settings, within Asia-Pacific region; and/ or (ii) Risk factors and/or protective factors of CA-MRSA carriage. Carriage of CA-MRSA is defined as any clinical or sub-clinical carrier of CA-MRSA. To this end, we included studies that reported the prevalence of CA-MRSA colonization and/or infection
(6) Study period	Between 1 January 2000 and 31 December 2016
(7) Settings	Community or hospital-based
(8) Language	Chinese or English

Remarks:

1. The inclusion of case-control studies allows for data collection among subgroups.

Appendix IV. Data extraction form for an individual study

Title:		
Basic information		
Author		
Country		
Journal		
Year of publication		
Source of funding		
Methods		
Study design		
Study population		
Study setting		
Recruitment time period		
Recruitment location		
Definitions of CA-MRSA		
Data collection		
Methods of isolates collection		
Methods of isolates testing		
Outcome measurements		
Age range		
Sex	Male:	Female:
Health status		
Overall CA-MRSA prevalence rate		
CA-MRSA prevalence rate among MRSA		
CA-MRSA prevalence rate among *S.aureus*		
Significant risk factors for CA-MRSA carriage		
Drug resistance		

Remarks: If the data were reported as composite measures, review authors would make a judgment to extract the most comprehensive and accurate data from the composites and used in analysis.

Appendix V. Risk of bias assessment checklist for cross-sectional study

	Y = Yes P= Partial N= No
External validity	
1. Was the sampling frame a true or close representation of the target population? **Remarks and description:**	Y/ P/ N
Internal validity	
2. Were data collected directly from the subjects (as opposed to a proxy)? **Remarks and description:**	Y/ P/ N
3. Was an acceptable case definition used in the study? **Remarks and description:**	Y/ P/ N
4. Was the study instrument that test MRSA of interest shown to have validity and reliability? **Remarks and description:**	Y/ P/ N
5. Was the same mode of data collection used for all subjects? **Remarks and description:**	Y/ P/ N
6. Were the numerator(s) and denominator(s) for the parameter of interest appropriate? **Remarks and description:**	Y/ P/ N
Overall risk of bias	Low/ High

Remarks:

1. A study was classified as low risk of bias if all of the answers in the checklist are yes. Studies that failed to fulfill these criteria would be classified as high risk of bias.
2. The checklist is modified from Hoy D, Brooks P, Woolf A, et al. Assessing risk of bias in prevalence studies: modification of an existing tool and evidence of interrater agreement. *J Clin Epidemiol*. 2012;65(9):934-939.

Appendix VI. Risk of bias assessment checklist for cohort study

Selection

1) Appropriate representativeness of the exposed cohort?
   a) Truly representative of the average CA-MRSA of community members or population subgroups in the community
   b) Somewhat representative of the average CA-MRSA carriage of community members or population subgroups in the community
   c) Selected group of users e.g. nurses, volunteers
   d) No description of the derivation of the cohort

2) Appropriate selection of the non-exposed cohort?
   a) Drawn from the same community as the exposed cohort
   b) Drawn from a different source
   c) No description of the derivation of the non-exposed cohort

3) Appropriate ascertainment of exposure?
   a) Secure record (e.g. surgical records)
   b) Structured interview
   c) Written self-report
   d) No description

Comparability

4) CA-MRSA being controlled?
   a) Study controls for CA-MRSA carriage
   b) No description

Outcome

5) Appropriate assessment of outcome?
   a) Independent blind assessment
   b) Record linkage
   c) Self report
   d) No description

6) Adequacy follow up for all subjects?
   a) Complete follow up - all subjects accounted for
   b) Subjects lost to follow up unlikely to introduce bias - small number lost - > ____ % (select an adequate %) follow up, or description provided of those lost)
   c) Follow up rate < ____% (select an adequate %) and no description of those lost
   d) No statement

Overall risk of bias: Low/ High

Remarks:

1. A study was considered as low risk of bias if Q1=a/b, Q2=a/b, Q3=a/b, Q4=a, Q5=a/b, Q6=a. Studies that failed to fulfill these criteria would be classified as high risk of bias.
2. This checklist is modified from Wells GA, Shea B, O'connell D, et al. The Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomized studies in meta-analyses. Available from: http://www.ohri.ca/programs/clinical_epidemiology/oxford.asp. Accessed August 7, 2017.

Appendix VII. Risk of bias assessment checklist for case-control study

Selection

1) Is the case definition adequate?
   a) Yes, with independent validation
   b) Yes, e.g. record linkage or based on self-reports
   c) No description

2) Appropriate representativeness of the cases?
   a) Consecutive or obviously representative series of cases
   b) Potential for selection biases or not stated

3) Appropriate selection of controls?
   a) Community controls
   b) Hospital controls
   c) No description

Comparability

4) CA-MRSA controlled between cases and controls?
   a) Study controls for CA-MRSA
   b) No description

Exposure

5) Appropriate ascertainment of exposure?
   a) Secure record (e.g. surgical records)
   b) Structured interview where blind to case/control status
   c) Interview not blinded to case/control status
   d) Written self-report or medical record only
   e) No description

6) Same response rate in case group and control group?
   a) Same rate for both groups
   b) Non respondents described
   c) Rate different and no designation

Overall risk of bias: Low/ High

Remarks:

1. A study was considered as low risk of if Q1=a/b, Q2=a, Q3=a, Q4=a, Q5=a, Q6=a. Studies that failed to fulfill the criteria would be classified as high risk of bias.
2. This checklist is modified from Wells GA, Shea B, O'connell D, et al. The Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomized studies in meta-analyses. Available from: http://www.ohri.ca/programs/clinical_epidemiology/oxford.asp. Accessed August 7, 2017.

Appendix VIII. Details of 152 included studies (132 articles)

The article numbers (i.e the second column) correspond to the order of article list in Appendix IX.

Study No.	Article No.	Author	Year of publication	Setting	Start Date	End Date	Country	Study design	Population	Isolation site	Location	Definition of CA-MRSA	Sample Size	Number of individuals with		
														CA-MRSA	MRSA	SA
1	1	Ansari et al.	2016	Community	Mar 2014	Mar 2014	Nepal	Cross-sectional	Medical students who were studying in their first year of medical education and were not exposed to their clinical posting	Nose	A medical college	Not defined	200	8	8	30
*2	2	Batabyal et al.	2012	Community	Mar 2011	May 2012	India	Cross-sectional	Oral-suffering patients	Oral cavity	Various departments of a dental hospital	Not defined	223	6	6	109
*3	3	Bennett et al.	2014	NA[a]	Apr 2006	Sep 2006	Australia	Cross-sectional	Patients with community-onset *S. aureus* infection not admitted to major hospitals	General; Blood; Urine; Respiratory Specimens	Community doctors and community hospitals	Epidemiological	2094	49	49	2094
*4	4	Bhat et al.	2016	Community	Feb 2013	Jul 2013	India	Cross-sectional	Patients with primary pyodermas aged from 3-65 years old	Pus or exudates from lesions	Outpatient department of Dermatology of a hospital	Not defined	110	54	54	89
*5	5	Bounchiat et al.	2015	Hospital	Nov 2011	Feb 2012	India	Cross-sectional	Patients with *S. aureus* infections	Infection sites (blood, urine, respiratory, bone and joint, skin)	A hospital	Epidemiological	92	29	48	92
6	6	Brennan et al.	2013	Hospital	Nov 2009	Dec 2009	Australia	Cross-sectional	Patients within 48 hours of hospital admission	Nose; Throat; Skin lesions	General medical, general surgical, and orthopedic wards of a hospital	Molecular	225	2	5	69
7	6	Brennan et al.	2013	Hospital	Feb 2010	Mar 2010	Australia	Cross-sectional	Patients who had stayed as hospital inpatients for five or more days	Nose; throat; skin lesions	General medical, general surgical, and orthopedic wards of a hospital	Molecular	201	21	38	70
*8	7	Britton and Andresen	2013	Hospital	2008	2008	Australia	Cohort (Retrospective)	Pediatric patients with community-associated *S. aureus*	Wound; pus; blood; urine	A pediatric hospital (wards not specified)	Epidemiological	431	83	83	431
*9	8	Buntaran et al.	2013	Hospital	2012	2012	Indonesia	Cross-sectional	Patients with *S. aureus* isolates	Urine; Sputum; Pus; Throat; Blood; Bronchial discharge	Two hospitals (wards not specified)	Not defined	11	1	4	11
10	9	Chang et al.	2015	Hospital	Jun 2014	Aug 2014	Taiwan	Cross-sectional	Janitors working in two hospitals	Nose	Two hospitals (wards not specified)	Not defined	111	4	4	17
11	9	Chang et al.	2015	Community	Jun 2014	Aug 2014	Taiwan	Cross-sectional	Janitors working in non-medical institutions	Nose	Nine universities and three department stores	Not defined	75	1	1	10
*12	10	Changchien et al.	2011	Hospital	Dec 2004	Nov 2008	Taiwan	Cross-sectional	Patients with necrotizing fasciitis	Wound; Blood	A hospital (wards not specified)	Epidemiological	247	25	49	91
*13	11	Changchien et al.	2016	Hospital	Jan 2008	Nov 2008	Taiwan	Cross-sectional	Patients with S.aureus skin and soft tissue infections (SSTIs)	Blood; and others	A hospital (wards not specified)	Epidemiological	307	68	177	307

Study No.	Article No.	Author	Year of publication	Setting	Start Date	End Date	Country	Study design	Population	Isolation site	Location	Definition of CA-MRSA	Sample Size	Number of individuals with		
														CA-MRSA	MRSA	SA
14	12	Chatterjee et al.	2009	Community	Jan 2005	Jun 2005	India	Cross-sectional	School children aged 5-15 years old	Nose	Two districts (rural, urban, and peri-urban slum)	Not defined	489	16	19	256
*15	13	Chen et al.	2005	Hospital	Jul 2000	Jun 2001	Taiwan	Cross-sectional	Hospitalized children with *S. aureus* infections aged 2 weeks-17 years old	Any body sites	A children hospital	Epidemiological	191	54	NA[b]	191
*16	14	Chen et al.	2010	Community	Jan 2001	Dec 2007	Taiwan	Cross-sectional	Adults with *S. aureus* bacteremia	Blood	Emergency department of a hospital	Epidemiological; Molecular	819	34	290	819
17	15	Chen et al.	2010	Hospital	Jun 2008	Jul 2008	Taiwan	Cross-sectional	Hospitalized adult patients in an intensive units (ICUs)	Nose	Medical ICUs and Surgical ICUs of a university-affiliated hospital	Not defined	177	6 [am]	57	74
18	16	Chen et al.	2011	Community	Jul 2005	Jun 2008	Taiwan	Cross-sectional	Healthy children who visited general checkup clinics aged 2-60 months	Nose; Nasopharyngeal	Three hospitals (general checkup clinics) located in suburban area and metropolitan areas	Not defined	6057	473	473	1404
*19	17	Chen et al.	2012	Community	Jan 2001	Dec 2010	Taiwan	Cross-sectional	Adults with community-onset *S. aureus* bacteremia	Blood	Emergency department of a university-affiliated hospital	Epidemiological	1166	54	380	1166
*20	18	Chen et al.	2014	NA[a]	May 2011	June 2012	China	Cross-sectional	Patients with *S. aureus* isolates	Respiratory tract; Wound; Skin and soft tissue; Blood; Body fluid; Drainage; Urine; Others (Pus; Cerebral spinal fluid; Catheter; etc)	Hospitals in 7 cities (outpatient/emergency departments, intensive care units, other inpatient departments)	Epidemiological	322	27 [am]	151	322
21	19[h]	Chen et al.	2015	Community	Oct 2013	Mar 2014	China	Cross-sectional	Community residents	Nose	Campuses of a university	Not defined	297	1	1	75
*22	20	Chou et al.	2015	Community	Jan 2012	Dec 2013	Taiwan	Case-control[e]	Cases: Patients of new-onset SSTIs due to MRSA; Controls: Patients of new-onset SSTIs not due to MRSA	Nose; wound	Hospital-affiliated outpatient clinics	Not defined	100	29	29	39
*23	21	Chung et al.	2008	Community	Jun 2004	Apr 2005	South Korea	Cross-sectional	Children with atopic dermatitis	Skin lesions	Pediatric allergy clinic of a hospital	Not defined	115	16	16	87
24	22	Coombs et al.	2013	Hospital	Jul 2011	Nov 2011	Australia	Cross-sectional	Hospital inpatients admitted for ≥ 48 hours and with S.aureus isolates	Skin and soft tissue; respiratory; blood; urine; sterile body cavity; cerebrospinal fluid	Hospitals (wards not specified)	Molecular	2357	275 [am]	713	2357
25	23	Deng et al.	2012	Community	Sep 2005	Dec 2010	China	Cross-sectional[f]	Healthy children aged 2-18 years old	Nose	Secondary and primary schools; Kindergartens	Not defined	2373	27	27	430
26	24	Dey et al.	2013	Community	Jan 2008	Apr 2010	India	Cross-sectional	Children attending *anganwaries* (pre-schools) aged 1-6 years old	Nose	100 *anganwaries* (preschools)	Not defined	1002	102	102	351

Study No.	Article No.	Author	Year of publication	Setting	Start Date	End Date	Country	Study design	Population	Isolation site	Location	Definition of CA-MRSA	Sample Size	Number of individuals with		
														CA-MRSA	MRSA	SA
*27	25	Douglas et al.	2004	Hospital	Jan 2000	Dec 2000	Australia	Cross-sectional	Inpatients with bloodstream infections	Blood	A teaching hospital (wards not specified)	Epidemiological	257	3	19	73
*28	26	Eshwara et al.	2013	Hospital	Aug 2010	Jul 2011	India	Cohort (Prospective)	Inpatients with *S. aureus* bacteremia	Blood	Various specialties of a tertiary care hospital (wards not specified)	Clinical;Epidemiological	70	27	38	70
29	27	Fan et al.	2011	Community	Sep 2005	Dec 2005	China	Cross-sectional	Healthy children aged 2-7 years old	Nose	Five kindergartens	Not defined	801	9	9	147
30	28	George et al.	2016	Hospital	Apr 2012	May 2013	India	Cross-sectional	Patients within 24 hours of admission	Nose	Surgical, orthopedics, and subspecialty wards of a hospital	Clinical	683	16	16	16
*31	29	Ghanznavi-Rad et al.	2010	Hospital	Oct 2007	Sep 2008	Malaysia	Cross-sectional	Hospitalized patients aged 4 days-88 years old with MRSA isolates	Pus; cellulitis; abscess; respiratory specimen; blood; medical devices; cerebrospinal fluid; conjunctiva; body fluids; urine; bone marrow	Wards (General medicine, Pediatrics, General surgery, Urology/nephrology, Neurosurgery, Orthopedic surgery, Maternity, ICU) of a hospital	Not defined	389	28	389	389
32	30 [h]	Goud et al.	2011	Community	Apr 2003	Dec 2007	India	Cross-sectional	Community residents from upper, middle and lower economic class	Nose; forearm; dorsum; palm	A city and the adjacent district	Not defined	738	122	122	167
33	31	Govindan et al.	2015	Community	Jul 2009	Dec 2010	India	Cross-sectional	School children aged 5-16 years old	Nose	Schools in a district	Molecular	1503	7	17	441
34	32	Gowrishankar et al.	2013	Community	2009	2010	India	Cross-sectional	Pharyngitis patients aged 14-65 years old	Throat	Thoracic Science Department (Outpatient) of a hospital	Epidemiological	265	63	63	165
35	33	Hart et al.	2015	Community	Sep 2010	Sep 2011	Australia	Cross-sectional [g]	Patients with Type 1 or Type 2 diabetes drawn from an urban population	Nose; axillae; blood [l]	Assessment center (explicit location not mentioned)	Not defined	660	8	8	258
36	34 [i]	Hayashi et al.	2012	Hospital	May 2009	Sep 2009	Australia	Cross-sectional	Patients with laboratory-confirmed 2009 pandemic influenza A(H1N1) within 2 days of admission [i]	Respiratory tract; blood; urine	Public hospitals	Molecular [m]	4491	2 [am]	2	13
*37	35	Hennam et al.	2012	Hospital	Dec 2009	Jan 2011	Australia	Cross-sectional	Women undergoing caesarean section	Wounds; Tissue; Aspirates	Hospital (emergency and outpatient settings excluded)	Not defined	583	8 [am]	8	18
*38	36	Heo et al.	2007	Community	Jan 2000	Aug 2005	South Korea	Case-control [e]	Patients with S. aureus bacteremia	Blood	Emergency department of a hospital	Not defined	231	63	63	231
39	37	Hirakata et al.	2005	Community	Dec 2001	Apr 2002	Japan	Cross-sectional	Adult outpatients with acute respiratory tract infection	Nasopharyngeal; Throat	29 clinics and 16 hospitals (outpatient)	Not defined	930	22	22	242
40	38	Hisata et al.	2005	Community	Jul 2001 [n]	Mar 2002 [n]	Japan	Cross-sectional [g]	Healthy children	Nose	5 day care centres and 2 kindergartens	Not defined	818	35	35	231
41	39	Ho et al.	2007	Community	Jan 2004	Dec 2005	Hong Kong	Cross-sectional	Household members of CA-MRSA patients	Nose; axillary skin; cutaneous wound lesions	Home visit; in-charge doctors' office	Epidemiological	46	6	6	6

Study No.	Article No.	Author	Year of publication	Setting	Start Date	End Date	Country	Study design	Population	Isolation site	Location	Definition of CA-MRSA	Sample Size	Number of individuals with		
														CA-MRSA	MRSA	SA
*42	40	Ho et al.	2008	Community	Nov 2006	Feb 2007	Hong Kong	Cross-sectional	Outpatients with purulent SSTIs of less than 7 days duration	Wound	Emergency departments in 6 regional hospitals	Epidemiological	298	13	19	126
43	41	Ho et al.	2012	Community	Sep 2009	Apr 2010	Hong Kong	Cross-sectional	Children aged 2-5 years old	Nose; Nasopharyngeal	Day care centres and kindergartens	Molecular	2211	12	28	610
44	42	Huang and Chen	2015	Community [o]	Sep 2009	Nov 2011	Taiwan	Cross-sectional [g]	Children aged from newborn (within 3 days of life) to 2 years old with ≥ 9 samples	Nose; Umbilicus (for newborn only)	Newborn: nursery in a hospital Others: not explicitly stated	Not defined	273 [p]	110 [p]	110 [p]	243 [p]
45	42	Huang and Chen	2015	Community [o]	Sep 2009	Nov 2011	Taiwan	Cross-sectional	Mothers of children aged 2 years old	Nose	Not explicitly stated	Not defined	262	21	21	21
46	43	Huang and Hung	2006	Community	Oct 2000	Mar 2003	Taiwan	Cross-sectional	Outpatients with acute rhinosinusitis	The side of nasal cavity with more purulent discharge	A hospital (outpatient)	Epidemiological	601	16	16	NA [b]
47	44	Huang et al.	2007	Community [q]	Jul 2005	Oct 2006	Taiwan	Cross-sectional	Children presented for a well-child health care visit aged 2 months-5 years old	Nose	Three medical centers (well-child health visit)	Not defined	3046	221	221	713
48	45	Huang et al.	2007	Community	Aug 2004	May 2005	Taiwan	Cross-sectional	Household members of CA-MRSA children patients	Nose	Households recruited at a children's hospital	Not defined [r]	121	30	30	30
49	46 [h]	Huang et al.	2013	Community	Apr 2010	Apr 2010	Taiwan	Cross-sectional	Pediatricians affiliated to clinics	Nose	During a conference	Not defined	94	8	8	8
50	47	Hwang et al.	2002	Community	Aug 2000	Feb 2002	Taiwan	Cross-sectional	Outpatients presenting with otorrhea aged 1-85 years old	External auditory canal (near the tympanic membrane)	Outpatient settings	Not defined	221	27	27	98
51	48	Hwang et al.	2002	Community	Aug 2000	Jun 2001	Taiwan	Cross-sectional	Outpatients presenting with otorrhea aged 1-85 years old	External auditory canal (near the tympanic membrane)	A local teaching hospital (Outpatient)	Not defined	161	22	22	NA [b]
52	49 [h]	Indian Network for Surveillance of Antimicrobial Resistance (INSAR) group	2013	Community	Jan 2008	Dec 2009	India	Cross-sectional	Outpatients with S.aureus isolates	Pus; Blood; Respiratory samples; Urine; Sterile body fluids; Tissue; Others (ear, nose, Skin, body fluids)	15 Indian tertiary care centres (outpatients)	Not defined	3358 [c] (isolate)	936 [c] (isolate)	936 [c] (isolate)	3358 [c] (isolate)
53	50	Ishida et al.	2015	Hospital	Oct 2010	Sep 2013	Japan	Cross-sectional	Patients (bedridden & non-bedridden) with community-acquired pneumonia	Blood; sputum (if available); pharyngeal (if available)	A hospital	Epidemiological	531	4	4	17
54	51	Ito et al.	2015	Hospital	2005	2012	Japan	Cross-sectional	Patients with MRSA isolates	Not reported	A tertiary care hospital (excluding emergency department)	Not defined	2178	210	2178	2178

Study No.	Article No.	Author	Year of publication	Setting	Start Date	End Date	Country	Study design	Population	Isolation site	Location	Definition of CA-MRSA	Sample Size	Number of individuals with		
														CA-MRSA	MRSA	SA
55	51	Ito et al.	2015	Community	2005	2012	Japan	Cross-sectional	Patients with MRSA isolates	Not reported	A tertiary care hospital (Emergency department)	Not defined	161	161	161	161
56	52 [h]	Jain et al.	2014	Community	Oct 2006	Nov 2007	India	Cross-sectional	Apparent healthy individuals accompanying patients attending outdoor services for the first time	Nose; Axilla; Throat	Outdoor service of a tertiary care hospital [s]	Epidemiological	200	47	47	116
57	53	Jamaluddin et al.	2008	Community	Jul 2001	May 2003	Japan	Cross-sectional [g]	Healthy children	Nose	5 day-care centres and 2 kindergartens	Not defined	1285 [al]	49	49	49
*58	54 [h]	Jenney et al.	2014	Community	2006	2006	Fiji	Cohort (Prospective)	School children with impetigo	Infected skin lesion	Three primary schools	Molecular	455	14 [am]	14	14
*59	54 [h]	Jenney et al.	2014	Hospital	Sep 2006	May 2007	Fiji	Cross-sectional	Hospitalized patients with MRSA isolates from clinical specimens	Sterile and non-sterile site; Blood	A hospital (wards not specified)	Molecular	36 [c] (isolates)	22 [c] (isolates)	36 [c] (isolates)	36 [c] (isolates)
60	55	Joo et al.	2012	Hospital	Jan 2007	Dec 2009	South Korea	Cohort (Retrospective)	Hospitalized patients with infections caused by ST72-MRSA-IV	Blood; Pus; Sputum; Body fluids	A hospital (wards not specified)	Epidemiological	124	23	124	124
*61	56	Joo et al.	2012	Hospital	Jan 2007 [t]	Dec 2009 [t]	South Korea	Case-control	Cases: Hospitalized patients with community-onset infections caused by ST72-MRSA-IV strains; Controls: Hospitalized patients with community-onset methicillin-susceptible S. aureus infections [u]	Blood; Pus; Sputum; Body fluids	A hospital (wards not specified)	Epidemiological	NA [d]	NA [d]	NA [d]	NA [d]
62	57	Joshi et al.	2017	Hospital	Oct 2014	Apr 2015	Nepal	Cross-sectional	Healthcare workers (nurses, ward attendants, doctors, laboratory workers) and patients	Nose	Patients: Intensive care unit and hospital wards Healthcare workers: different departments of a hospital	Not defined	536	4	29	135
63	58	Jung et al.	2013	Hospital	Jan 2008	Dec 2011	South Korea	Cross-sectional	Hospitalized patients with pneumonia	Respiratory (Broncho-alveolar lavage fluid; Pleural effusion; Lung abscess or Sputum); Blood	A hospital (wards not specified)	Epidemiological	943	21	78	129
64	59	Kang et al.	2012	Community	Jan 2011	Jun 2011	Taiwan	Cross-sectional [g]	Patients undergoing hemodialysis	Nose	Outpatient hemodialysis clinics	Not defined	284 [g]	11 [g]	11 [g]	45 [g]
65	60	Kawaguchiya et al.	2011	Community	Jan 2009	Jul 2009	Japan	Cross-sectional	Outpatients with S.aureus isolates	Urine; Pus; Sputum; Otorrhea; Nasal discharge; Eye discharge; Skin	Outpatient settings	Epidemiological	1015 [c] (isolates)	189 [c] (isolates)	189 [c] (isolates)	1015 [c] (isolates)
66	61	Kim et al.	2007	NA [a]	Jan 2005	Jun 2005	South Korea	Cross-sectional	Patients with non-duplicate S.aureus clinical isolates	Various body sites	Outpatient clinics, emergency rooms and other wards of 7 hospitals	Epidemiological	3251	112	1900	3251

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														CA-MRSA	MRSA	SA
*67	62	Kim et al.	2014	Hospital	May 2012	Dec 2012	South Korea	Cross-sectional	Patients with invasive S.aureus infection	Sterile body fluid (Blood; Abscesses in internal body sites; Bone and organ tissue; Joint fluid; Ear discharge; Pleural fluid; Ascites; Cerebrospinal fluid; Pericardial fluid)	16 hospitals (wards not specified)	Epidemiological	1627	102	355	1627
68	63	Kitti et al.	2011	Community	Oct 2009	Sep 2010	Thailand	Cross-sectional	Healthy third-year students and graduates aged 19-25 years old	Nose	A university	Not defined	200	2	2	30
69	64	Ko et al.	2008	Community	Dec 2005	Feb 2006	South Korea	Cross-sectional	Children aged 1-11 years old	Nose	An outpatient of a tertiary care hospital	Epidemiological	296	14	18	95
*70	65	Krishna et al.	2004	NA [a]	Jun 2001	Dec 2001	India	Cross-sectional	Outpatients and inpatients with S.aureus isolates and with no contact with healthcare facilities in the past two years	Abscesses; Boils; Wound Discharge; Ear Discharge; Pus	A facility (inpatients and outpatients)	Epidemiological	116	6	21	116
71	66	Kuo et al.	2013	Hospital	Oct 2011	Dec 2011	Taiwan	Cross-sectional	Hospitalized infants	Nose; umbilicus	Neonatal intensive care units of 7 medical centers	Not defined	251	11	11	33
72	67	Kwon et al.	2011	Hospital	Oct 2008	May 2009	South Korea	Cross-sectional	Patients with MRSA bacteremia or MRSA nasal carriage	Blood; Nose	10 intensive-care units	Molecular; Epidemiological	258	37 [k]	258	258
73	68 [v]	Lee et al.	2011	Community	Sep 2008	Oct 2008	South Korea	Cross-sectional	Apparently healthy pre-school children	Nose	7 day care centres	Not defined	428	40	40	164
*74	69	Lee et al.	2014	Hospital	Jan 2004	Sep 2012	South Korea	Cohort (Prospective)	Adult patients with community-acquired *S. aureus* bacteremia	Blood	A hospital (ward not specified)	Epidemiological	169	31	31	169
*75	70	Lee et al.	2015	Hospital	Jan 2013	Dec 2013	Taiwan	Cohort (Retrospective)	Hospitalized adults with (purulent and non-purulent) cellulitis	Blood; Pus; Skin biopsy	A hospital (ward not specified)	Epidemiological	465	22	32	64
*76	71	Leung et al.	2012	Hospital	Feb 2009	Dec 2010	Hong Kong	Matched Case-control	Cases: Hospitalized persons with CA-MRSA infection; Controls: Hospitalized persons without any MRSA infection	Not reported	14 acute public hospitals (wards not specified)	Clinical; Epidemiological; Molecular	NA [d]	NA [d]	NA [d]	NA [d]
*77	72	Li et al.	2013	Hospital	Jun 2005	Dec 2011	China	Cross-sectional	Hospitalized children with CC59 MRSA infection	Sputum; Pus; Pharyngeal; Sterile body sites (Blood; Bones and joints; Cerebrospinal fluid; Lung; Pleural cavity; Peritoneal cavity ; Deep seated soft tissue)	8 hospitals (wards not specified)	Epidemiological	110	90	110	110
*78	73	Liao et al.	2005	Community	Jun 2001	May 2002	Taiwan	Cross-sectional	Patients with S. aureus bacteremia identified within 48 hours of arrival	Blood	Emergency department of a hospital	Epidemiological	101	1	NA [b]	101

Study No.	Article No.	Author	Year of publication	Setting	Start Date	End Date	Country	Study design	Population	Isolation site	Location	Definition of CA-MRSA	Sample Size	Number of individuals with		
														CA-MRSA	MRSA	SA
*79	74	Lim et al.	2014	Community	Jan 2002	Dec 2011	Australia	Matched Case-control	Cases: Adults with community-onset bloodstream infection (COBSI) due to a multidrug-resistant (MDR) organism; Controls: Adults with COBSI due to non-MDR organisms	Blood	Emergency departments of a hospital	Not defined	360	NA [d]	NA [d]	NA [j]
*80	75	Lin et al.	2011	Hospital	Nov 2003	Jul 2007	Taiwan	Cross-sectional	Inpatients with SSTIs	Wound	A hospital (dermatological outpatients)	Epidemiological	130	31	41	73
*81	75	Lin et al.	2011	Community	Nov 2003	Jul 2007	Taiwan	Cross-sectional	Outpatients with SSTIs	Wound	A hospital (dermatological outpatients)	Epidemiological	313 [c] (isolate)	84 [c] (isolate)	84 [c] (isolate)	163 [c] (isolate)
*82	76	Lin et al.	2015	Hospital	Jan 2008	Dec 2011	Taiwan	Cross-sectional	Patients with septic arthritis	Not reported	Two hospitals (wards nor specified)	Not defined [w]	194	31	38	93
83	77	Lin et al.	2017	Community	Apr 2014	May 2015	China	Cross-sectional	Diabetic population	Nose	Community settings (not explicitly stated)	Not defined	529	22	22	46
84	77	Lin et al.	2017	Community	Apr 2014	May 2015	China	Cross-sectional	Non-diabetic population	Nose	Community settings (not explicitly stated)	Not defined	427	12	12	25
*85	78	Liu et al.	2012	Hospital	2005	2009	China	Cross-sectional	Children patients with MRSA isolates	Blood; Pus; Nasopharyngeal; Respiratory tract; Wound; Puncture; Secretion	9 children hospitals (wards not specified)	Not defined	134 [c] (isolate)	99 [c] (isolate)	134 [c] (isolate)	134 [c] (isolate)
*86	79	Liu et al.	2016	Community	2011	2013	China	Cross-sectional	Outpatients with SSTIs	Infection site	Outpatient clinics (surgical and dermatological) in 3 hospitals	Epidemiological	1400	21	21	203
87	80	Lo et al.	2008	Community	2004	2006	Taiwan	Cross-sectional	Children with no acute medical problem	Nose	Health maintenance clinic or kindergartens	Not defined	1615	131	131	454
88	81 [h]	Lu et al.	2005	Community	Apr 2001	Oct 2001	Taiwan	Cross-sectional	Community residents and students	Nose	Four villages and four schools (kindergarten, elementary school, junior high school, senior high school)	Not defined	1838	64	64	463
89	82	Ma and Luo	2011	Community	2009	2010	China	Cross-sectional	Medical university students	Nose	A medical university	Not defined	1634	41	41	239
90	83	Ma et al.	2011	Community	May 2008	Oct 2009	China	Cross-sectional	Healthy third year preclinical medical students	Nose	A medical university	Not defined	2103	22	22	234
*91	84	McMullan et al.	2016	Hospital	Jan 2007	Dec 2012	Australia and New Zealand	Cohort (Prospective)	Children with *S. aureus* bacteremia	Blood	33 pediatric, general and adult hospitals (wards not specified)	Epidemiological	1073	69	142	1073
*92	85	Mekviwattanawong et al.	2006	Hospital	Jan 2005	May 2005	Thailand	Cross-sectional	Hospitalized patients with *S. aureus* infection	Blood; Joint fluid; Pleural fluid; Peritoneal fluid; Pus; Sputum; Bronchial fluid; Urine; Tissue; Others	A tertiary care hospital (Wards not specified)	Epidemiological	448	2	186	448

Study No.	Article No.	Author	Year of publication	Setting	Start Date	End Date	Country	Study design	Population	Isolation site	Location	Definition of CA-MRSA	Sample Size	Number of individuals with		
														CA-MRSA	MRSA	SA
*93	86	Mine et al.	2013	Community	Jun 2008	Nov 2010	Japan	Cross-sectional	Outpatient with SSTIs	Purulent skin lesions	Outpatient settings	Not defined	497	99	99	274
*94	87	Moon et al.	2010	Hospital	Jan 2003	Dec 2005	South Korea	Cross-sectional	Patients with S.aureus bacteremia	Blood (Not explicitly stated)	A hospital (ward not specified)	Epidemiological	241	2 [am]	129	241
95	88	Munckhof et al.	2009	Community	Jul 2005	Mar 2006	Australia	Cross-sectional	Volunteer adult populations (≥18 years old)	Nose	A general medical practice and a electoral roll	Epidemiological	699	2	5	202 [x]
96	89	Nickerson et al.	2011	Community	Sep 2008	Oct 2008	Cambodia	Cohort (Prospective)	Outpatient children	Nose	Outpatient department of a children hospital	Epidemiological	2485	28	87	87
97	89	Nickerson et al.	2011	Hospital	Sep 2008	Oct 2008	Cambodia	Cohort (Prospective)	Inpatient children	Nose; axillae; throat; (if ventilated) tracheal sunction	A hospital (wards not specified)	Epidemiological	145	2	6	6
*98	90	Nimmo et al.	2013	Hospital	2000	2012	Australia	Cross-sectional	Inpatients with *S. aureus* carriage	Blood; Pus; Tissue; Sterile fluid	Public hospitals	Molecular	114980	NA [j]	NA [j]	114980
*99	90	Nimmo et al.	2013	Community	2000	2012	Australia	Cross-sectional	Outpatients with *S. aureus* carriage	Blood; Pus; Tissue; Sterile fluid	Public health care facilities	Molecular	142726	NA [j]	NA [j]	142726
100	91	Nozaki et al.	2015	Community	NA [j]	NA [j]	South Korea	Cross-sectional	College students	Nose; Hands	A college	Not defined	100	NA [b]	NA [b]	NA [b]
101	91	Nozaki et al.	2015	Community	NA [j]	NA [j]	Japan	Cross-sectional	University students	Nasal vestibule; Back of ear auricle	A university	Molecular	94	0	3	3
102	91	Nozaki et al.	2015	Community	Sep 2013	Nov 2013	The Philippines	Cross-sectional	University students	Nose; Palms	A university	Molecular	100 [y]	NA [b]	NA [b]	NA [b]
103	92 [h]	Ozaki et al.	2009	Community	2006	2007	Japan	Cross-sectional	Pediatric outpatients with upper respiratory tract infections	Nose	Outpatient sections of hospitals	Epidemiological	426	3	3	125
104	92 [h]	Ozaki et al.	2009	Community	2007	2008	Japan	Cross-sectional	Healthy children in the community living with their families	Nose	Not explicitly stated	Epidemiological	136	5	5	55
*105	93	Park et al.	2009	Hospital	Oct 2004	Nov 2007	South Korea	Cross-sectional	Patients with MRSA bloodstream infection	Blood (Not explicitly stated)	4 hospitals (wards not specified)	Epidemiological; Molecular	76	2 [k]	76	76
*106	94	Park et al.	2015	NA [a]	Mar 2014	Jun 2014	South Korea	Cross-sectional	Pediatric patients with community-associated S.aureus skin infections	Infected lesion (Not explicitly stated)	A hospital (inpatient and outpatient; wards not specified)	Epidemiological	69	28	28	69
107	95	Park et al.	2016	Hospital	2007	Mar 2014	South Korea	Cross-sectional	Newly admitted patients	Nose	A hospital (wards not specified)	Not defined	24977	637 [z]	637	637
108	96	Pathak et al.	2010	Community	Nov 2007	Feb 2009	India	Cross-sectional	Pediatric outpatients without suspected infections (upper respiratory tract / skin infection) or need for hospital admission / emergency care	Nose	Pediatric outpatient clinics of two hospitals	Not defined	1562	16	16	98
*109	97	Patil et al.	2006	Community	Feb 2004	Jul 2004	India	Cross-sectional	Patients with community-acquired primary pyodermas	Infected lesion (exudate / pus)	Dermatology outpatient clinic in a hospital	Not defined	86	1	1	70
110	98	Qiao et al.	2013	Hospital	2006	2011	China	Cross-sectional	Hospitalized patients ≤ 14 years old	Sterile body site; Lung aspirate; Empyema; Others (not explicitly stated)	A hospital (wards not specified)	Epidemiological	235767	29	161	161

Study No.	Article No.	Author	Year of publication	Setting	Start Date	End Date	Country	Study design	Population	Isolation site	Location	Definition of CA-MRSA	Sample Size	Number of individuals with		
														CA-MRSA	MRSA	SA
*111	99	Qiao et al.	2014	Hospital	Dec 2011	Feb 2013	China	Cross-sectional	Patients with invasive community-acquired S. aureus infections	Sterile body site; other (not explicitly stated)	Three regional children's hospitals (wards not specified)	Epidemiological	163	71	71	163
*112	100	Ravishankar et al.	2014	Community	Feb 2013	Aug 2013	India	Cross-sectional	Patients with community-acquired SSTIs	Purulent materials	Outpatient department / Emergency of a surgical unit in a hospital	Epidemiological	73	11	11	45
113	101	Rijal et al.	2008	Community	Jul 2007	Nov 2007	Nepal	Cross-sectional	School children aged 1-15 years old	Nose	School (not explicitly stated)	Not defined	184	32	32	57
114	102	Ro et al.	2012	Community	Jan 2007	Dec 2008	South Korea	Cross-sectional	All patients visiting the emergency department	Blood; Sputum; Urine; Body fluid; Rectal	A hospital (emergency department)	Not defined	89206	939	939	939
*115	103	Sahoo et al.	2014	Community	Jul 2009	Dec 2010	India	Cross-sectional	Patients with SSTIs	Pus	Outpatient clinic of a hospital	Not defined	590	251	251	387
*116	104	Shetty et al.	2014	Community	Jul 2010	Sep 2010	India	Cross-sectional	Children attending well-child visits or a school	Nose	A well-child clinic of a hospital / a school	Not defined	500	4	4	126
*117	105	Sit et al.	2017	Hospital	Jan 2011	Dec 2012	Malaysia	Cross-sectional	Adult inpatients (>16 years old) with MRSA infection	Sterile sites (Cerebrospinal fluid; Synovial fluid; Tissue; Bone; Pus; Blood)	A hospital (ward not specified)	Epidemiological	209	65	209	209
*118	106	Song et al.	2011	Hospital	Sep 2004	Aug 2006	South Korea	Cross-sectional	Patients with *S. aureus* infection	Sputum; Blood; Pus; Urine	Tertiary- or secondary-care teaching hospitals in urban areas (wards not specified)	Epidemiological	852 [c]	23 [c]	570 [c]	852 [c]
*119	106	Song et al.	2011	Hospital	Sep 2004	Aug 2006	Taiwan	Cross-sectional	Patients with *S. aureus* infection	Sputum; Blood; Pus; Urine	Tertiary- or secondary-care teaching hospitals in urban areas (wards not specified)	Epidemiological	844 [c]	94 [c]	467 [c]	844 [c]
*120	106	Song et al.	2011	Hospital	Sep 2004	Aug 2006	Hong Kong	Cross-sectional	Patients with *S. aureus* infection	Sputum; Blood; Pus; Urine	Tertiary- or secondary-care teaching hospitals in urban areas (wards not specified)	Epidemiological	427 [c]	7 [c]	203 [c]	427 [c]
*121	106	Song et al.	2011	Hospital	Sep 2004	Aug 2006	The Philippines	Cross-sectional	Patients with *S. aureus* infection	Sputum; Blood; Pus; Urine	Tertiary- or secondary-care teaching hospitals in urban areas (wards not specified)	Epidemiological	190 [c]	28 [c]	65 [c]	190 [c]

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														CA-MRSA	MRSA	SA
*122	106	Song et al.	2011	Hospital	Sep 2004	Aug 2006	Thailand	Cross-sectional	Patients with *S. aureus* infection	Sputum; Blood; Pus; Urine	Tertiary- or secondary-care teaching hospitals in urban areas (wards not specified)	Epidemiological	438 [c]	3 [c]	183 [c]	438 [c]
*123	106	Song et al.	2011	Hospital	Sep 2004	Aug 2006	Vietnam	Cross-sectional	Patients with *S. aureus* infection	Sputum; Blood; Pus; Urine	Tertiary- or secondary-care teaching hospitals in urban areas (wards not specified)	Epidemiological	801 [c]	197 [c]	306 [c]	801 [c]
*124	106	Song et al.	2011	Hospital	Sep 2004	Aug 2006	India	Cross-sectional	Patients with *S. aureus* infection	Sputum; Blood; Pus; Urine	Tertiary- or secondary-care teaching hospitals in urban areas (wards not specified)	Epidemiological	139 [c]	2 [c]	23 [c]	139 [c]
*125	106	Song et al.	2011	Hospital	Sep 2004	Aug 2006	Sri Lanka	Cross-sectional	Patients with *S. aureus* infection	Sputum; Blood; Pus; Urine	Tertiary- or secondary-care teaching hospitals in urban areas (wards not specified)	Epidemiological	426 [c]	19 [c]	345 [c]	426 [c]
126	107	Tangchaisuriya et al.	2014	Community	2010	2011	Thailand	Cross-sectional	Healthy children	Nose	3 primary schools	Not defined	217	5	5	78
*127	108	Tong et al.	2009	Hospital	Apr 2006	Apr 2007	Australia	Case-control [e]	Patients with *S. aureus* clinical isolates	Various sites (Not explicitly stated)	Three top end hospitals (wards not explicitly stated) [aa]	Molecular	1499[ab]	226 [ab]	333 [ab]	1499 [ab]
*128 [ac]	109	Tong et al.	2010	Hospital	Apr 2006	Apr 2007	Australia	Case-control [e]	Patients with *S. aureus* clinical isolates	Various sites (Not explicitly stated)	A top end hospitals (emergency department excluded)	Molecular	965 [ad]	174 [ad]	282 [ad]	965 [ad]
*129	110	Tsao et al.	2014	Hospital	Jan 2006	Dec 2010	Taiwan	Cross-sectional	Patients with MRSA isolates causing invasive infections	Sterile sites (Blood; Pleural effusion; Ascites; Biopsied tissues; Synovial fluid; Lymph node aspiration; Broncho-alveolar lavage; Cerebrospinal fluid)	20 medical centers and regional hospitals (wards not specified)	Molecular	670	240	670	670
*130	111	Umashankar Nagaraju et al.	2004	Community	Jan 2000	Jul 2001	India	Cross-sectional	Patients with community-acquired pyoderma attending outreach camp	Skin lesions; Nose	Outreach camp	Not defined	250	22	22	202
131	112	Van Nguyen et al.	2014	Community	Feb 2012	Jun 2012	Vietnam	Cross-sectional	Children and adults	Nose; Throat	Two districts (urban and rural)	Not defined	1016	80	80	303

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														CA-MRSA	MRSA	SA
132	113	Verwer et al.	2012	Hospital	Dec 2007	Apr 2008	Australia	Cross-sectional	Health care workers (nurse, doctor, allied health, patient care assistant, others)	Nose	An adult tertiary hospital (wards not specified)	Molecular	1542	43 [b]	52	52
133	114	Vlack et al.	2006	Community	Oct 2004	Oct 2004	Australia	Cross-sectional	Primary school children living in an indigenous community	Nose; Throat; Skin lesions	A local primary school	Not defined	92	14	14	27
134	115	Wan et al.	2012	Community	Jul 2008	Nov 2009	Taiwan	Cross-sectional	Pet owners	Nose	A university veterinary hospital, and several private veterinary clinics	Not defined	787	22	22	94
*135	116	Wang et al.	2008	Community	Jan 2001	Dec 2006	Taiwan	Cross-sectional	Patients with community-onset *S. aureus* bacteremia [ae]	Blood	A hospital (emergency department)	Epidemiological	580	30	30	580
136	117	Wang et al.	2009	Community	Oct 2007	Dec 2007	Taiwan	Cross-sectional	Adults who attended mandatory health examinations	Nose	Three medical centres (mandatory health checkup)	Not defined	3098	119	119	686
137	117	Wang et al.	2009	Community	Oct 2007	Dec 2007	Taiwan	Cross-sectional	Household members of CA-MRSA carriers	Nose	Households	Not defined	242	64	64	64
*138	118	Wang et al.	2010	Hospital	Jan 2006	Dec 2006	Taiwan	Cross-sectional	Hospitalized adults (>16 years) with MRSA bacteremia	Blood	A university hospital (wards not specified)	Epidemiological	159	7	159	159
*139	119	Wang et al.	2010	Hospital	Jan 2006	Dec 2008	Taiwan	Cross-sectional	Hospitalized adults (>18 years) with MRSA bloodstream infection	Blood	A hospital (wards not specified)	Molecular	308	47 [am]	308	308
140	120	Wang et al.	2010	Hospital	Jan 2004	Dec 2006	China	Case-control [e]	Hospitalized patients with Type 2 diabetes with foot ulcers	Ulcer sites	A hospital (Diabetic foot care center)	Epidemiological	118	7	21	NA [b]
141	121	Wang et al.	2010	Hospital	Sep 2008	Sep 2009	Taiwan	Cross-sectional	Hospitalized patients	Nostril; Throat/ Sputum; Axillae; Inguinal area	A hospital (intensive care unit)	Molecular	1703 [af]	31	81	81
*142	122	Wang et al.	2015	Hospital	Jan 2011	Dec 2013	Taiwan	Cohort (Retrospective)	Hospitalized adults (>18 years) with S. aureus bacteremia	Blood	Two hospitals (wards not specified)	Molecular	353	59	160	353
143	123	Warren	2012	NA[a]	Jan 2011	Feb 2011	Australia	Cross-sectional	Clinical staff, nonclinical staff, patients, carers and family members	Nose	A general practice	Not defined	100	3	3	26
144	124	Williamson et al.	2013	Community	2005	2011	New Zealand	Cross-sectional [f]	The entire population	Not reported	The entire population	Epidemiological	100000 [ag]	9.3 [ag, ah]	18 [ag, ah]	18 [ag, ah]
*145	125	Wu et al.	2010	Community	Aug 2008	Jul 2009	China	Cross-sectional	Children with SSTIs	Skin and soft tissue (not explicitly stated)	A hospital (outpatient)	Not defined	1104 [ai]	14	14	351 [aj]
146	126	Wu et al.	2011	Hospital	Jul 2004	Jul 2009	Taiwan	Cross-sectional	Hospitalized adults (≥18 years) with infective endocarditis	Blood	A hospital (wards not specified)	Epidemiological	192 [b]	NA [b]	NA [b]	NA [b]
147	127	Wu et al.	2013	Hospital	2007	2007	Taiwan	Cross-sectional	Patients with pneumonia	Sputum; Tracheal aspirates; Broncho-alveolar lavage fluid; Pleural effusions; Blood; Urine	Six hospitals (wards not specified)	Epidemiological	1646	19	49	84
*148	128	Wu et al.	2013	Hospital	Jan 2004	Dec 2008	Taiwan	Cross-sectional	Patients with community-onset MRSA bacteremia and end-stage renal disease	Blood; vascular catheter tip	A hospital (wards not specified)	Molecular	57	10	57	57
149	129	Wu et al.	2017	Community	Oct 2009	Feb 2010	Taiwan	Cross-sectional	HIV-infected outpatients	Nose [ak]	Three hospitals (outpatients)	Not defined	714 [ak]	28 [ak]	28 [ak]	228 [ak]

Study No.	Article No.	Author	Year of publication	Setting	Start Date	End Date	Country	Study design	Population	Isolation site	Location	Definition of CA-MRSA	Sample Size	Number of individuals with		
														CA-MRSA	MRSA	SA
150	130	Xie et al.	2016	Hospital	Jan 2006	Dec 2011	China	Cross-sectional	Hospitalized patients with S.aueus infection	Skin lesion; Pus; Sputa; Bone	A hospital (wards not specified)	Epidemiological	587	23 [am]	67	587
*151	131	Yao et al.	2010	Hospital	Dec 2002	Jun 2008	China	Cross-sectional	Hospitalized patients with purulent SSTIs	Pus from infected lesion	A hospital (wards not specified)	Epidemiological	111	24	60	111
*152	132	Zhao et al.	2012	Community	Jan 2009	Aug 2010	China	Cross-sectional	Outpatients with SSTIs	Infected sites	Four hospitals (surgical/dermatological outpatient clinic)	Epidemiological	501	5	5	164

Notes: *Studies reporting CA-MRSA carriage prevalence among *S.* aureus/MRSA/Bloodstream infected patients.

[a] No clear classification between community and hospital settings in this study population.

[b] Numbers only available in number of episodes / isolates/ strains (not individual):
- Study 15: 106 episodes
- Study 46: 53 episodes
- Study 51: 77 isolates
- Study 78: 32 episodes (i.e. 32 or 31 individuals)
- Study 100: 100 subjects / 3 strains / 3 strains / 3 strains
- Study 102: 100 subjects / 5 strains / 5 strains / 5 strains
- Study 132: 43 isolates (i.e. 42/43 subjects) (values leading to higher prevalence was assumed)
- Study 140: 41 isolates
- Study 146: 192 subjects giving 200 episodes / 14 episodes / 44 episodes / 109 episodes

[c] These four numbers were all "numbers of isolates" and the corresponding number of individuals were not provided.

[d] Inappropriate study design to infer CA-MRSA prevalence
- Study 61: case-control; 168 / 84 / 84 / 84
- Study 76: matched case-control ; 254 / 27 / 27 / 27
- Study 79: matched case-control ; 360 / 134 / 134 / not provided

[e] The analysis approach is case-control, but the recruitment regime is "cross-sectional"

[f] Cross-sectional more than once
- Study 25: Twice (Sept 2005 – Dec 2007 , Jul 2008 – Dec 2010)
- Study 144: annual

[g] The study design was partly longitudinal, but the longitudinal data was not used in this review or in the original article.
- Study 35: Patients found to be colonized with S.aureus in the cross-sectional study were asked to return for follow-up swabs to measure the persistence of carriage.
- Study 40: 236 children attended study twice in Miyagi. But the article uses cross-sectional approach to analyze data
- Study 44: This study was longitudinal in nature, but the way we extracted our data was "cross-sectional": number of individuals with at least one specimen positive for MRSA/SA is regarded as "number of individuals carrying SA/MRSA".
- Study 57: And longitudinal as well
- Study 64: The study was longitudinal in nature, but the way we extracted our data was cross-sectional.
  For Round I, # of individual = 245, # of SA = 30 + 9 = 39, # of MRSA = 9, MRSA / Total = 3.7%
  For Round II, # of individual = 284, # of SA = 34 + 11 = 45, # of MRSA = 11, MRSA / Total = 3.9%
  Data of the study round with higher MRSA prevalence is taken.

[h] The article contains additional studies which are not included in this review. These additional studies were not included as the article did not define explicitly for CA-MRSA nor the conditions list in Appendix 3 were not fulfilled.
- Study 21: It contains another study about isolating MRSA (without defining HA- and CA-) in hospitals among HCWs (doctor/nursing staff/…/cleaners)
- Study 32: Doctors, nurses and inpatients were not included in this appendix because they were affiliated to hospitals and information from the article is not sufficient to distinguish CA-MRSA
- Study 49: Only pediatricians affiliated to clinics are considered. For those affiliated to hospitals, CA-MRSA was not defined in the article, nor the conditions in Appendix 3 Item 4(ii)(iii) were fulfilled.
- Study 52: Only outpatients were included (but not ICU / wards) because CA-MRSA was not defined in the article, nor the conditions in Appendix 3 Item 4(ii)(iii) were fulfilled.
- Study 55: Another study was described by this article: 100 randomly selected indoor patients from a surgical ward were asked to provide one nasal swab. The nasal swabs was collected at the time of admission. 26/100 patients were shown to carry S. aureus, and no work was further done to isolate MRSA from these 26 patients. On the other hand, among 74/100 patients NOT carrying S.aureus at the time of admission, 28 were shown to carry HA-MRSA later (after 72 hours of admission). Since no data is related to CA-MRSA, this study was not extracted in this Appendix.
- Study 58, 59: A third study was documented by this article to investigate the incidence of S.aureus bacteremia in hospital settings. The unit used in reporting is "number of isolates" (not individuals). There were 128 episodes of S.aureus bacteremia (i.e. 128 S.aureus isolates). Three out of 128 isolates were MRSA. However, because not further information was given to distinguish CA-MRSA, this study was not extracted in this Appendix.
- Study 88: This article also documented another study consisting of 393 individuals from health-care facility-related setting. Since there is no way to define CA-MRSA from this study, it is not included in this Appendix.
- Study 103, 104: This article also documents family analysis for 4 families with one MRSA-positive healthy children. Since (i) results were only mentioned for 3 families in the article, (ii) the epidemiological assessment for whether family members fulfill CA-MRSA definition are not mentioned, we therefore do not include this family-member study in this Appendix.

[i] There was another group of study population: Patients with laboratory-confirmed 2009 pandemic influenza A(H1N1) > 2 days of admission. But the data was not used.

[j] Not provided

[k] Stricter definition (both molecular and epidemiological were fulfilled) were adopted to extract this number of CA-MRSA cases

[l] Serum was for measuring 25OH(D).

[m] The article uses non-multi resistant MRSA (nmMRSA) to define CA-MRSA. But when the article really reports, they use "MRSA" but not "nmMRSA".

[n] Survey time for Kyoto and Saga are not explicitly stated.
[o] "Nursery" and this "not-explicitly-stated" locations were assumed to be community settings.
[p] These numbers are derived from longitudinal samples with meaning that: (for example) There are 110 subjects EVER positive for MRSA among the 243 subjects EVER positive for SA.
[q] Well-child health visit should be part of the outpatient setting in a hospital
[r] Epidemiological definition for CA-MRSA infection ("MRSA infection documented within 72 hours of admission") was only available for the index case children.
[s] "Outdoor services" was interpreted as outpatient settings as "indoor patients" was used to describe inpatients in a surgical ward.
[t] Exact month is extracted from Study 60
[u] ST72-MRSA-IV is assumed to be one of the CA-MRSA representative strain.
[v] This study is described in the method section of Article 68. For full details of Study 73, please refer to this article: "Nasal carriage of Staphylococcus aureus from Healthy children Attending Day Care Center" which is excluded in the current review because the full text is in Korean.
[w] They use the term "community-acquired". But this term is not defined explicitly in the article. The article only explicitly define "healthcare-associated"
[x] It was reported in the abstract that the MSSA carriage was 202/699, but in the main text (Table 1) it was reported that the S.aureus carriage was 202/699. We take it that: S.aureus = 202/699. On the other hand, it is also possible that the 5 specimens can co-host MRSA and MSSA.
[y] After reading the main text, the sample size being 200 for Philippines should be a typo. It was mentioned "100 college students" and "200 samples (nose / palm)" in the main text.
[z] The term "community-associated" is implicitly used among "newly admitted patients", and the way to define "newly admitted patients" is in lack. This number is extracted based on the assumption that "newly admitted patients" fulfilled the conditions list in Appendix III Item 4 Point (ii).
[aa] Three Top End Hospitals include Royal Darwin Hospital (RDH)
[ab] Based on overall recruited samples from the 3 Top End Hospitals minus the data from emergency department of RDF.
[ac] Data already included in Study 127.
[ad] Data from emergency department (as identified from Study 127 / Article 108) were excluded.
[ae] "community-onset" was not defined.
[af] Excluding 203 patients who had already carried MRSA before being admitted to ICU.
[ag] This number was after adjusting the "3323 MRSA isolates identified from 2005-2011 throughout New Zealand" to the population data
[ah] The largest yearly prevalence was selected from 2005 to 2011
[ai] It is not explicitly stated whether these 1104 children were S.aureus SSTI or simply SSTI, But it was taken to mean that they were simply SSTI.
[aj] According to the article, the 351 cases are S.aureus SSTI fulfilling inclusion criteria of the study (which we interpret as the criteria for "community-acquired"), i.e. 351 CA-MRSA cases. Since the number of HA-MRSA was not reported, this number (i.e. 351) represents the conservative number of individuals with SA in this sample.
[ak] To detect S.aureus and MRSA colonization, 714 patients ("all-patient group") gave nasal specimens among whom 457 patients ("457-patient subgroup") additionally gave oral specimens. To allow comparisons, only results from "all-patient group" were extracted.
[al] These 1285 subjects consists of 103 Kyoto subjects who joined the survey twice.
[am] The number of CA-MRSA cases here represent a conservative estimate out of the sample size because not all related samples were test.
Study 17: Only 38 (out of 57) MRSA isolates were used to identify the 6 CA-MRSA cases
Study 20: Only 127 (out of 151) MRSA isolates were used to identify the 27 CA-MRSA cases
Study 24: Only 703 (out of 713) MRSA isolates were used to identify the 275 CA-MRSA cases
Study 36: Among 57 (out of 4491) subjects with positive respiratory tract culture, 7 were excluded (due to chronic suppurative lung disease) and only 50 of them were tested for S.aureus and MRSA.
Study 37: Among 40 (out of 583) subjects with surgical site infection, only 28 (out of 40) were tested for S.aureus and MRSA.
Study 58: 455 subjects provided 563 samples, and 323 samples (out of 563) were S.aureus. Only 299 (out of 323) samples were used to identify 20 CA-MRSA samples (from 14 subjects).
Study 94: Only 78 (out of 129) MRSA isolates were available from laboratory to classify CA-MRSA
Study 139: Only 253 (out of 308) non-duplicated MRSA isolates were eligible for microbiological analysis
Study 150: Only 62 (out of 67) were used to identify CA-MRSA because there were 5 samples from which strains could not be recovered.

Appendix IX. Reference list for the 132 included articles

The order of articles in this reference list corresponds to the article number (i.e the second column) in Appendix VIII.

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Appendix X. Characteristics of the 152 included studies

	Community settings (N =81)		Hospital settings (N =66)		Ambiguous (N =5)		Overall (N =152)	
	n	%	n	%	n	%	n	%
Study design								
Cross-sectional	76	94	53	80	5	100	134	88
Cohort	2	2	8	12	0	0	10	7
Case-control	3	4	5	8	0	0	8	5
Country								
Australia	6	7	12 *	18	1	20	19 *	13
Cambodia	1	1	1	2	0	0	2	1
China	10	12	7	11	1	20	18	12
Fiji	1	1	1	2	0	0	2	1
Hong Kong	3	4	2	3	0	0	5	3
India	15	19	4	6	1	20	20	13
Indonesia	0	0	1	2	0	0	1	1
Japan	9	11	2	3	0	0	11	7
Malaysia	0	0	2	3	0	0	2	1
Nepal	2	2	1	2	0	0	3	2
New Zealand	1	1	1 *	2	0	0	2 *	1
South Korea	6	7	10	15	2	40	18	12
Sri Lanka	0	0	1	2	0	0	1	1
Taiwan	23	28	18	27	0	0	41	27
Thailand	2	2	2	3	0	0	4	3
The Philippines	1	1	1	2	0	0	2	1
Vietnam	1	1	1	2	0	0	2	1
Study start year								
2000-2004	23	28	20	30	1	20	44	29
2005-2009	38	47	31	47	2	40	71	47
2010-2016	18	22	15	23	2	40	35	23
Not reported	2	2	0	0	0	0	2	1
Language								
Chinese	3	4	1	2	0	-	4	3
English	78	96	65	98	0	-	148	97
Isolation site								
Multiple body site	31	38	46	70	5	100	82	54
Nose only	38	47	6	9	0	0	44	29
Blood only	6	7	11	17	0	0	17	11
Throat only	1	1	0	0	0	0	1	1
Oral cavity only	1	1	0	0	0	0	1	1
Throat only	2	2	0	0	0	0	2	1
Not reported	2	2	3	5	0	0	5	3

* One study conducted in New Zealand and Australia

Appendix XI. Types of CA-MRSA definition employed by the 152 included studies

Definition Types	Community settings		Hospital settings		Unclassified	
	No. of study	Study Numbers	No. of study	Study Numbers	No. of study	Study Numbers
Epidemiological	20	16[a],19,34,41,42,46,56,65,69,78,81,86, 95,96,103,104,112,135,144,152	40	5,8,12,13,15,27,28[b],53,60,61,63,67, 72[a],74,75,76[c],77,80,91,92,94,97,105[a], 110,111,117,118,119,120,121,122, 123,124,125,138,140,146,147,150, 151	5	3,20,66,70,106
Molecular	7	16[a],33,43,58,99,101,102	17	6,7,24,36,59, 72[a], 76[c], 98, 105[a], 127,128,129,132,139,141,142,148	0	-
Clinical	0	-	3	28[b],30, 76[c]	0	-
Not defined	54	1,2,4,11,14,18,21,22,23,25,26,29,32,35, 38,39,40,44,45,47,48,49,50,51,52,55, 57,64,68,73,79,83,84,87,88,89,90,93,10 0,108,109,113,114,115,116,126,130,13 1,133,134,136,137,145,149	12	9,10,17,31,37,54,62,71,82,85,107, 143	0	-

[a] Both epidemiological and molecular definitions were adopted

[b] Both epidemiological and clinical definitions were adopted

[c] All epidemiological, molecular and clinical definitions were adopted

Appendix XII. The 119 studies included for meta-analysis. Studies with low risk of bias are underlined.

	Community settings		Hospital settings		Both settings	
	No. of studies (low risk)	**Study number**	**No. of studies (low risk)**	**Study number**	**No. of studies (low risk)**	**Study number**
General						
General members	9 (2)	21,32,56,88,95,114,131,136,144	9 (4)	6,7,10,17,30,62,107,132,141	18 (6)	6,7,10,17,21,30,32,56,62,88,95,107,114,131,132,136,141,144
Subgroups without specific health conditions						
Children ≤ 6 years old	10 (3)	18,26,43,44,47,69,104*,108,113,131	1 (0)	71	11 (3)	18,26,43,44,47,69,71,104*,108,113,131
Children aged 7-18 years old	3 (2)	69, 104*,113	-	-	-	-
Adults > 18 years old	5 (1)	68,89,90,95,131	-	-	-	-
University students	5 (0)	1, 68, 89, 90, 101	-	-	-	-
Household members of CA-MRSA carriers	3 (0)	41,48,137	-	-	-	-
Pediatricians	1 (0)	49	-	-	-	-
Mothers of children aged 2 years	1 (0)	45	-	-	-	-
Janitors	1 (0)	11	1 (0)	10	2	10,11
Pet owners	1 (0)	134	-	-	-	-
Population without diabetes	1 (0)	84	-	-	-	-
Subgroups with these specific health conditions						
S. aureus carriage	63 (13)	1,2,4,11,14,16,18,19,21,22,23,25,26,29,32,33,34,35,38,39,40,42,43,44,47,50,52,56,65,68,69,73,78,81,83,84,86,87,88,89,90,93,95,101,103,104,108,109,112,113,115,116,126,130,131,133,134,135,136,144,145,149,152	42 (4)	5,6,7,8,9,10,12,13,15,17,24,27,28,36,37,53,62,63,64,67,71,74,75,80,82,91,92,94,111,118,119,120,121,122,123,124,125,127,142,147,150,151	105 (17)	1,2,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,21,22,23,24,25,26,27,28,29,32,33,34,35,36,37,38,39,40,42,43,44,47,50,52,53,56,62,63,64,65,67,68,69,71,73,74,75,78,80,81,82,83,84,86,87,88,89,90,91,92,93,94,95,101,103,104,108,109,111,112,113,115,116,118,119,120,121,122,123,124,125,126,127,130,131,133,134,135,136,142,144,145,147,149,150,151,152
Skin and soft tissue infections (SSTIs)	14 (3)	4,22,23,42,58,81,86,93,109,112,115,130,145,152	4 (0)	12,75,80,151	18 (3)	4,12,22,23,42,58,75,80,81,86,93,109,112,115,130,145,151,152
S.aureus SSTIs	-	-	1(0)	13	-	-
Oral related conditions	1 (0)	2	-	-	-	-
Respiratory system related Conditions	2 (1)	39, 103	4 (0)	36,53,63,147	6 (1)	36,39,53,63,103,147
Bacteremia	-	-	1 (1)	27	-	-
S.aureus bacteremia	5 (2)	16,19,38,78,135	5 (0)	28,74,91,94,142	10 (2)	16,19,28,38,74,78,91,94,135,142
Septic arthritis	-	-	1 (0)	82	-	-
Ear, Nose and Throat (ENT) related conditions	4 (1)	34,46,50,51	-	-	-	-
Diabetes Mellitus (DM)	3 (0)	35,83,140	-	-	-	-
Human immunodeficiency virus (HIV) carriage	1 (0)	149	-	-	-	-
Renal system related conditions	-	-	1 (0)	64	-	-
Caesarean section	-	-	1 (0)	37	-	-

*Extracted numbers embedded Study 102

Appendix XIII. Risk factors for CA-MRSA carriage

Settings	Target population	Risk factor	Study number
Community	**General members**	Gastrointestinal diseases	88
		Recent hospital admission	88
		Age <5 years old	131
		Age 6-12 years old	131
		Age 20-29 years old	131
		Wealth index >3	131
		Presence of household members under aged 7	136
		Using antibiotics within the past year	136
	Subgroups without specific health conditions		
	Children under 18	Living in mud-thatch houses	14
		Number of children in the family	18
		Residing in northern Taiwan	18
		Age 2-6 months	18
		Children attending pre-school	108
		Children attending school	108
		Family size > 10 members	108
		Antibiotic use in past 12 months	87
	University students	Co-morbidities with upper respiratory tract infections (URTIs)	1
		Contact with pet (dog)	1
		Recent visit to public amusement places	1
	Subgroups with these specific health conditions		
	SSTI patients	Filipino ethnicity	42
		Previous exposure to an individual who had surgery within last year	22
		MRSA nasal carriage	22
		Recent antibiotics treatment for SSTIs in the year before infection	22
	HIV carriage	Incarceration	149
Hospital	**General members**	Aboriginal Australian	7
		Presence of a nasogastric tube	123
		Prior usage of antipseudomonal penciling	123
		Prior usage of antifungals	123
		Being female	61
		Prior hospitalization with previous year	61
		Severe sepsis or septic shock	61
		Surgical site infection	61
		Sharing of personal items with other persons	76
	Subgroups with these specific health conditions		
	S.aureus carriage	Abscess formation	8
		Completed at least 48 hours of anti-MSSA antibiotics at infection presentation	8
		Age greater than 1 year	8
		Family history of staphylococcal infection of SSTIs	8
		Infection presentation in spring	8
		Aboriginal ethnicity	8
		Being female	127
		Remote residence	127
		Bone and joint infection	74
		Cutaneous abscess	135
		Necrotizing pneumonia or empyema	135

Appendix XIV. Protective factors for CA-MRSA carriage

Settings	Target population	Protective factor	Study number
Community	**General members**	Smoking habits	136
	Subgroups without specific health conditions		
	Children under 18 years old	Breast feeding	108
		Colonization with Streptococcus pneumonia	108
Hospital	**General members**	Hand washing frequency of 10-19 times per day	76
		History of acne	76
		Prior usage of carbapenems	123

Appendix XV. Pooled country-specific prevalence of CA-MRSA among general members

Country	Community settings						Hospital settings						Both settings					
	Study No.	No. of studies	Pooled population	Prevalence (95% CI)[a]	Range	I^2	Study No.	No. of studies	Pooled population	Prevalence (95% CI)[a]	Range	I^2	Study No.	No. of studies	Pooled population	Prevalence (95% CI)[a]	Range	I^2
China	21	1	297	0.3 (0.0, 1.4)	-	-							21	1	297	0.3 (0.0, 1.4)		
India	32,56	2	938	19.5 (13.1, 26.7)	16.5-23.5	79.7	30	1	683	2.3 (1.3, 3.6)	-	-	30,32,56	3	1621	12.3 (2.2, 28.9)	2.3-23.5	98.5
Taiwan	88,136	2	4936	3.7 (3.2, 4.3)	3.5-3.8	0	10,17,141	3	1991	2.3 (1.1, 3.9)	1.8-3.6	43.0	10,17,88, 136,141	5	6927	3.0 (2.0, 4.1)	1.8-3.8	77.3
Australia	95	1	699	0.3 (0, 0.9)	-	-	6,7,132	3	1968	3.8 (0.7, 8.9)	0.9-10.4	87.8	6,7,95,132	4	2667	2.6 (0.6,5.8)	0.3-10.4	92.6
South Korea	114	1	89206	1.1 (1.0, 1.1)	-	-	107	1	24977	2.6 (2.4, 2.8)	-	-	107,114	2	114183	1.7 (0.6, 3.5)	1.1-2.6	99.6
Nepal	-	-	-	-	-	-	62	1	536	0.7 (0.2, 1.7)	-	-	62	1	536	0.7 (0.2, 1.7)		-
New Zealand	144	1	100000	0.0	-	-					-	-	144	1	100000	0.0*		-
Vietnam	131	1	1016	7.9 (6.3, 9.6)	-	-	-	-	-	-	-	-	131	1	1016	7.9 (6.3, 9.6)		-
Overall	21, 32, 56, 88, 95, 114, 131, 136,144	9	197092	3.9 (2.0, 6.3)	0.0 – 23.5	99.7	6, 7, 10, 17, 30, 62, 107, 132, 141, 143	9	30155	2.5 (1.7, 3.3)	0.7-10.4	81.2	6,7,10,17,21,30,32,56,62,88,95,107, 114,131, 132,136, 141, 144	18	227247	3.3 (2.0, 4.8)	0.0-23.5	99.6

Appendix XVI. Pooled CA-MRSA carriage prevalence among different population groups stratified based on settings

	Community settings					Hospital settings					Both settings				
	No. of studies	Pooled population	Prevalence (95%CI)[a]	I^2 (%)	Range	No. of studies	Pooled population	Prevalence (95%CI)[a]	I^2 (%)	Range	No. of studies	Pooled population	Prevalence (95%CI)[a]	I^2 (%)	Range
General members															
General members	9	197092	3.9(2.0, 6.3)	99.7	0.0-23.5	9	30155	2.3 (1.5, 3.4)	87.4	0.7-10.4	18	227247	3.1 (2.0, 4.5)	99.4	0.0-23.5
Subgroups without specific health conditions															
Children ≤ 6 years old	10	14697	8.0(4.1,13.0)	98.7	0.5-40.3	1	251	4.4 (1.9, 6.9)	-	-	11	14948	7.6 (4.0,12.2)	98.6	0.5-40.3
Children aged 7-18 years old	3	218	3.2 (0.7, 6.5)	31.8	1.4-6.5	-	-	-	-	-	-	-	-	-	
Adults > 18 years old	5	5106	1.6 (0.7, 3.0)	88.8	0.4-4.2	-	-	-	-	-	-	-	-	-	-
University students	5	4231	1.7 (0.7, 2.9)	76.7	0.0-4.0	-	-	-	-	-	-	-	-	-	-
Household members of CA-MRSA carriers	3	409	23.0 (16.8, 29.8)	50.5	13.0-26.4	-	-	-	-	-	-	-	-	-	
Pediatricians	1	94	8.5 (3.7, 16.1)	-	-	-	-	-	-	-	-	-	-	-	
Mothers of children aged 2	1	262	8.0 (5.0, 11.6)	-	-	-	-	-	-	-	-	-	-	-	
Janitors	1	75	1.3 (0, 5.6)	-	-	1	111	3.6 (1.0, 9.0)	-	-	2	186	2.6 (0.6, 5.5)	0	1.3-3.6
Pet owners	1	787	2.8 (1.7, 4.1)	-	-	-	-	-	-	-	-	-	-	-	
Population without diabetes	1	427	2.8 (1.4, 4.6)	-	-	-	-	-	-	-	-	-	-	-	
Subgroups with these specific health conditions															
S. aureus carriage	63	19416	18.3 (14.3, 22.6)	98.1	0.0-74.4	42	14945	14.4 (11.2, 18.0)	96.6	0.0-43.6	105	34361	16.8 (14.0, 19.7)	97.8	0.0-74.4
SSTIs	14	5892	12.1 (5.3, 21.2)	98.8	1.0-49.1	4	953	13.7 (5.6, 24.6)	94.0	4.7-23.8	18	6845	12.5 (6.5, 19.9)	98.5	1.0-49.1
S. aureus SSTIs	-	-	-	-	-	1	307	22.1 (17.6, 27.2)	-	-	-	-	-	-	-
Oral-related conditions	1	223	2.7 (1.0, 5.8)	-	-	-	-	-	-	-	-	-	-	-	-
Respiratory system-related conditions	2	1356	1.5 (0.3, 3.5)	80.2	0.7-2.4	4	7611	0.8 (0, 2.4)	95.9	0.0-2.2	6	8967	1.0 (0.2, 2.3)	95.1	0.0-2.4
Bacteremia	-	-	-	-	-	1	257	1.2 (0.2, 3.4)	-	-					
S. aureus bacteremia	5	2897	6.8 (2.6,12.6)	96.1	1.0-27.3	5	1906	3.1 (5.1, 24.0)	96.7	0.8-38.6	10	4803	9.5 (5.5, 14.6)	96.2	0.8-38.6
Septic arthritis	-	-	-	-	-	1	194	15.9 (11.1, 21.9)	-	-	-	-	-	-	-
ENT-related conditions	4	1248	11.8 (3.3, 24.6)	96.9	2.7-23.8	-	-	-	-	-	-	-	-	-	
Diabetes Mellitus (DM)	3	1307	3.2 (0.9, 6.7)	86.2	1.2-5.9	-	-	-	-	-	-	-	-	-	
HIV carriage	1	714	3.9 (2.6, 5.6)	-	-	-	-	-	-	-	-	-	-	-	
Renal system related conditions	-	-	-	-	-	1	284	3.9 (1.9, 6.8)	-	-	-	-	-	-	
Caesarean section	-	-	-	-	-	1	583	1.4 (0.6, 2.7)	-	-	-	-	-	-	

[a] Freeman-Tukey transformed proportion.

[b] Two studies provided one combined data (Appendix XII, Appendix XXV)

Note: i) Combined estimates were generated using a DerSimonian-Laird random-effects model.

ii) Pooled estimates of studies should be interpreted in caution due to the high heterogeneity (I^2) reported in general.

Abbreviations: BSI, blood stream infection; CA-MRSA, community associated methicillin-resistant *Staphylococcus aureus*; CI, confidence interval; DM, diabetes mellitus; ENT, ear, nose and throat; HIV, human immunodeficiency virus; No., number; *S. aureus*, *Staphylococcus aureus*; SSTIs, skin and soft tissue infections

Appendix XVII. Pooled prevalence of CA-MRSA antibiotic resistance among general members stratified based on settings

Antibiotics	Community settings					Hospital settings					Both settings				
	No. of studies	No. of isolates	Pooled prevalence (95%CI)[a]	I^2 (%)	Range	No. of studies	No. of isolates	Pooled prevalence (95%CI)[a]	I^2 (%)	Range	No. of studies	No. of isolates	Pooled prevalence (95%CI)[a]	I^2 (%)	Range
Macrolide															
Erythromycin	4[b]	295	80.4 (54.0, 98.5)	90.0	46.8-100.0	4	30	91.2 (71.0, 100.0)	33.2	50.0-100.0	8[b]	325	84.7 (67.5, 97.1)	80.6	46.8-100.0
Tetracycline															
Tetracycline	1	64	95.3 (86.9, 99.0)	-	-	-	-	-	-	-	-	-	-	-	-
Minocycline	1[b]	183	1.1 (0.1, 3.9)	-	-	-	-	-	-	-	-	-	-	-	-
Fluoroquinolones															
Ofloxacin	1	64	12.5 (5.6, 23.2)	-	-	-	-	-	-	-	-	-	-	-	-
Ciprofloxacin	2[b]	230	7.9 (0.0, 42.3)	96.3	0.5-23.4	2	8	50.0 (6.0, 94.0)	37.7	25.0-75.0	4[b]	238	19.2 (0.0, 57.1)	92.3	0.5-75.0
Moxifloxacin	1	64	1.6 (0.0, 8.4)	-	-	-	-	-	-	-	-	-	-	-	-
Cephalosporin															
Cephalexcin	-	-	-	-	-	1	16	100.0 (79.4, 100.0)	-	-	-	-	-	-	-
Cefoxitin	-	-	-	-	-	1	16	100.0 (79.4, 100.0)	-	-	-	-	-	-	-
Aminoglycosides															
Gentamicin	3[b]	294	35.5 (12.2, 63.2)	94.7	21.9-64.1	1	16	100.0 (79.4, 100.0)	-	-	4[b]	310	51.8 (21.1, 81.8)	96.0	21.9-100.0
Co-trimoxazole	2[b]	247	12.3 (0.0, 62.4)	98.3	0.5-35.9	2	20	72.2 (0.8, 100.0)	88.1	25.0-100.0	4[b]	267	36.4 (0.0, 88.2)	97.9	0.5-100.0
Miscellaneous															
Clindamycin	4[b]	295	69.8 (32.0, 98.0)	94.9	25.5-100.0	1	4	100.0 (39.8, 100.0)	-	-	5[b]	299	73.7 (40.1, 98.0)	93.2	25.5-100.0
Mupirocin	-	-	-	-	-	1	4	25.0 (0.6, 80.6)	-	-	-	-	-	-	-
Rifampin	1	64	3.1 (0.4 10.8)	-	-	-	-	-	-	-	-	-	-	-	-

[a] Freeman-Tukey transformed proportion
[b] Two study provided one combined data on antibiotic resistance (Appendix XVIII, Appendix XXVI)

Note: Pooled estimates of studies should be interpreted in caution due to the high heterogeneity (I^2) among studies.
Abbreviations: No., number

Appendix XVIII. Included studies for meta-analysis of antibiotics resistance among general members

Antibiotic	Community settings		Hospital settings		Both settings	
	No. of studies	Study Number	No. of studies	Study number	No. of studies	Study number
Macrolide						
Erythromycin	4	21,56,88,136*	4	10,17,30, 62	8	10,17,21,30,56,62,88,136*
Tetracycline						
Tetracycline	1	88	-	-	-	-
Minocycline	1	136*	-	-	-	-
Fluoroquinolones						
Ofloxacin	1	88	-	-	-	-
Ciprofloxacin	2	56,136*	2	10,62	4	10,56,62,136*
Moxifloxacin	1	88	-	-	-	-
Cephalosporin						
Cephalexcin	-	-	1	30	-	-
Cefoxitin	-	-	1	30	-	-
Aminoglycosides						
Gentamicin	3	56,88,136*	1	30	4	30, 56,88,136*
Co-trimoxazole	2	88,136*	2	30, 62	4	30,88,127,136*
Miscellaneous						
Clindamycin	4	21,56,88,136*	1	10	5	10,21,56,88,136*
Mupirocin	-	-	1	62	-	-
Rifampin	1	88	-	-	-	-

* Extracted data embedded Study 137

Appendix XIX. Included studies for evaluating sources of heterogeneity of CA-MRSA carriage prevalence among general members

Sources of heterogeneity	Community settings					Hospital settings				
	No. of studies	Study number	Pooled Prevalence	95% CI	Sample Size	No. of studies	Study number	Pooled Prevalence	95% CI	Sample Size
Gender										
Female	3	21,114,136	1.6%	(0.1, 4.6)	43176	2	7,141	5.5%	(0.0, 20.8)	1222
Male	3	21,114,136	1.7%	(0.4, 3.9)	49404	2	7,141	4.8%	(0.2, 13.9)	682
Settings										
Outpatient or emergency visits	3	56,114,136	6.5%	(2.1, 13.1)	92504	-	-	-	-	-
Others[a]	6	21,32,88,95,131,144	2.9%	(0.1, 9.1)	104588	-	-	-	-	-
Isolation sites										
Single	4	21,88,95,136	1.7%	(0.4, 3.7)	5932	5	10,30,62,107,132	2.2%	(1.6, 2.9)	27849
Multiple	4	32,55,114,131	10.2%	(1.9, 24.1)	91160	3	6,7,141	3.4%	(0.4, 8.8)	2129
Study year (Start year)										
2000-2004	2	32,88	8.9%	(0.5, 25.5)	2576	0		-	-	-
2005-2009	5	56,95,114,136,144	2.6%	(0.9, 5.0)	193203	6	6,7,17,107,132,141	2.8%	(1.9,3.9)	28825
2010-2016	2	21,131	3.1%	(0.0, 14.4)	1313	3	10,30,62	1.8%	(0.5, 3.7)	1330
Study year (Mid-year)										
2000-2004	1	88	3.5%	(2.7, 4.4)	1838	0		-	-	-
2005-2009	6	32,56,95,114,136,144	4.2%	(2.0, 7.1)	193941	5	6,7,17,132,141	3.1%	(1.5,5.2)	3848
2010-2016	2	21,131	3.1%	(0.0, 14.4)	1313	4	10,30,62,107	2.0%	(1.1, 3.1)	26307
Study year (End year)										
2000-2004	1	88	3.5%	(2.7, 4.4)	1838	0				
2005-2009	5	32,56,95,114,136	6.2%	(2.1, 12.4)	93941	5	6,7,17,132,141	3.1%	(1.5, 5.2)	3848
2010-2016	3	21,131,144	1.4%	(0.0, 9.7)	101313	4	10,30,62,107	2.0%	(1.1, 3.1)	26307
Publication year										
2000-2008	1	88	3.5%	(2.7, 4.4)	1838	0				
2009-2014	7	32,56,95,114,131,136,144	4.7%	(2.4, 7.6)	194957	5	6,7,17,132,141	3.1%	(1.6,5.2)	3848
2015-2016	1	21	0.3%	(0.0, 1.4)	297	4	10,30,62,107,	2.0%	(1.1,3.1)	26307
Definition of CA-MRSA										
Presence	3	56,95,144	3.4%	(0.0, 13.7)	100899	5	6,7,30,132,141	2.9%	(1.5,4.7)	4354
Absence	6	21,32,88,114,131,136	4.3%	(1.6,8.4)	96193	4	10,17,62,107	2.1%	(1.0,3.6)	25801
Countries' status										
High-mortality developing	2	32,56	19.5%	(13.1, 26.7)	938	2	30,62	1.5%	(0.3, 3.4)	1219
Low-mortality developing	5	21,88,114,131,136	2.8%	(1.0, 5.6)	95455	4	10,17,107,141	2.2%	(1.7,2.9)	26968
Developed	2	95,144	0.1%	(0.0, 0.6)	100699	3	6,7,132	3.8%	(0.7,8.9)	1968
Laboratory procedures										
CLSI guidelines	7	21,32,56,88,95,131,136	5.8%	(2.4, 10.5)	7886	7	6, 7,10,17,30,62,141	2.6%	(1.3, 4.4)	3636
No specific guideline	2	114,144	0.3%	(0.0, 2.2)	189206	2	107,132	2.6%	(2.4,2.7)	26519

[a] Others include: urban and rural areas of communities, schools and day care centers.

Abbreviations: CA-MRSA, community-associated methicillin-resistant *Staphylococcus aureus*; CI, confidence interval; CLSI, Clinical and Laboratory Standards Institute

Appendix XX. Results of bias assessment of 134 cross-sectional studies

Study Number	Article Number	Study (Year)	Q1. True or close representation of targeted population?	Q2. Data collected directly from the subjects?	Q3. Acceptable CA-MRSA definition used in the study?	Q4. Study instrument used to measure the parameter of interest shown to have validity and reliability?	Q5. Same mode of data collection used for all subjects?	Q6. Appropriate numerator(s) and denominator (s) for the parameter of interest?	Overall risk of bias
1	1	Ansari et al. 2016	Yes	Yes	No	Yes	Yes	Yes	High
2	2	Batabyal et al. 2012	Yes	Yes	No	Yes	Yes	Yes	High
3	3	Bennett et al. 2014	Yes	Yes	Yes	Yes	Unknown	Yes	High
4	4	Bhat et al. 2016	Yes	Yes	No	Yes	Yes	Yes	High
5	5	Bounchiat et al. 2015	Yes	Yes	Yes	Yes	Unknown	Yes	High
6,7	6	Brennan et al. 2013	Yes	Yes	Yes	Yes	Yes	Yes	Low
9	8	Buntaran et al. 2013	Yes	Yes	No	Yes	No	Yes	High
10,11	9	Chang et al. 2015	Yes	Yes	No	Yes	Yes	Yes	High
12	10	Changchien et al. 2011	Yes	Yes	Yes	Yes	No	Yes	High
13	11	Changchien et al. 2016	Yes	Yes	Yes	Yes	Unknown	Yes	High
14	12	Chatterjee et al. 2009	Yes	Yes	No	Yes	Yes	Yes	High
15	13	Chen et al. 2005	Yes	Yes	Yes	Yes	Unknown	No	High
16	14	Chen et al. 2010	Yes	Yes	Yes	Yes	Yes	Yes	Low
17	15	Chen et al. 2010	Yes	Yes	No	Yes	Yes	No	High
18	16	Chen et al. 2011	Yes	Yes	No	Yes	Yes	Yes	High
19	17	Chen et al. 2012	Yes	Yes	Yes	No	Yes	Yes	High
20	18	Chen et al. 2014	Yes	Partial	Yes	Yes	Unknown	No	High
21	19	Chen et al. 2015	Yes	Yes	No	Yes	Yes	Yes	High
23	21	Chung et al. 2008	Yes	Yes	No	Yes	Yes	Yes	High
24	22	Coombs et al. 2013	Yes	Yes	Yes	Yes	Unknown	No	High
25	23	Deng et al. 2012	Yes	Yes	No	Yes	Yes	Yes	High
26	24	Dey et al. 2013	Yes	Yes	No	Yes	Yes	Yes	High
27	25	Douglas et al. 2004	Yes	Yes	Yes	Yes	Yes	Yes	Low
29	27	Fan et al. 2011	Yes	Yes	No	Yes	Yes	Yes	High
30	28	George et al. 2016	Yes	Yes	Yes	Yes	Yes	Yes	Low
31	29	Ghanznavi-Rad et al. 2010	Yes	Yes	No	Yes	Unknown	Yes	High
32	30	Goud et al. 2011	Yes	Yes	No	Yes	Yes	Yes	High
33	31	Govindan et al. 2015	Yes	Yes	Yes	Yes	Yes	Yes	Low

Study Number	Article Number	Study (Year)	Q1. True or close representation of targeted population?	Q2. Data collected directly from the subjects?	Q3. Acceptable CA-MRSA definition used in the study?	Q4. Study instrument used to measure the parameter of interest shown to have validity and reliability?	Q5. Same mode of data collection used for all subjects?	Q6. Appropriate numerator(s) and denominator (s) for the parameter of interest?	Overall risk of bias
34	32	Gowrishankar et al. 2013	Yes	Yes	Yes	Yes	Yes	Yes	Low
35	33	Hart et al. 2015	Yes	Yes	No	Yes	Yes	Yes	High
36	34	Hayashi et al. 2012	Yes	Yes	Yes	No	No	Yes	High
37	35	Henman et al. 2012	Yes	Yes	No	No	Yes	No	High
39	37	Hirakata et al. 2005	Yes	Yes	No	Yes	Unknown	Yes	High
40	38	Hisata et al. 2005	Yes	Yes	No	Yes	Yes	Yes	High
41	39	Ho et al. 2007	Yes	Yes	Yes	Yes	Yes	Yes	Low
42	40	Ho et al. 2008	Yes	Yes	Yes	Yes	Yes	Yes	Low
43	41	Ho et al. 2012	Yes	Yes	Yes	Yes	Yes	Yes	Low
44, 45	42	Huang and Chen 2015	Yes	Yes	No	Yes	Yes	Yes	High
46	43	Huang and Hung 2006	Yes	Yes	Yes	Yes	Yes	No	High
47	44	Huang et al. 2007	Yes	Yes	No	Yes	Yes	Yes	High
48	45	Huang et al. 2007	Yes	Yes	No	Yes	Yes	Yes	High
49	46	Huang et al. 2013	Yes	Yes	No	Yes	Yes	No	High
50	47	Hwang et al. 2002	Yes	Yes	No	No	Yes	Yes	High
51	48	Hwang et al. 2002	Yes	Yes	No	No	Yes	No	High
52	49	INSAR 2013	Yes	Yes	No	Yes	Unknown	Yes	High
53	50	Ishida et al. 2015	Yes	Yes	Yes	No	Partial	Yes	High
54,55	51	Ito et al. 2015	Yes	Yes	No	Yes	Unknown	No	High
56	52	Jain et al. 2014	Yes	Yes	Yes	Yes	Yes	Yes	Low
57	53	Jamaluddin et al. 2008	Yes	Yes	No	Yes	Yes	Yes	High
59	54	Jenney et al. 2014	Yes	Yes	Yes	Yes	Unknown	No	High
62	57	Joshi et al. 2017	Yes	Yes	No	Yes	Yes	Yes	High
63	58	Jung et al. 2013	Yes	Yes	Yes	No	Unknown	Yes	High
64	59	Kang et al. 2012	Yes	Yes	No	Yes	Yes	Yes	High
65	60	Kawaguchiya et al. 2011	Yes	Yes	Yes	Yes	Unknown	Yes	High
66	61	Kim et al. 2007	Yes	Yes	Yes	Yes	Unknown	Yes	High
67	62	Kim et al. 2014	Yes	Yes	Yes	No	Unknown	Yes	High
68	63	Kitti et al. 2011	Yes	Yes	No	Yes	Yes	Yes	High
69	64	Ko et al. 2008	Yes	Yes	Yes	Yes	Yes	Yes	Low

Study Number	Article Number	Study (Year)	Q1. True or close representation of targeted population?	Q2. Data collected directly from the subjects?	Q3. Acceptable CA-MRSA definition used in the study?	Q4. Study instrument used to measure the parameter of interest shown to have validity and reliability?	Q5. Same mode of data collection used for all subjects?	Q6. Appropriate numerator(s) and denominator (s) for the parameter of interest?	Overall risk of bias
70	65	Krishna et al. 2004	Yes	Yes	Yes	Yes	Unknown	Yes	High
71	66	Kuo et al. 2013	Yes	Yes	No	Yes	Yes	Yes	High
72	67	Kwon et al. 2011	Yes	Yes	Yes	Yes	No	No	High
73	68	Lee et al. 2011	Yes	Yes	No	Yes	Yes	Yes	High
77	72	Li et al. 2013	Yes	Yes	Yes	Yes	Unknown	Yes	High
78	73	Liao et al. 2005	Yes	Yes	Yes	Yes	Yes	Yes	Low
80, 81	75	Lin et al. 2011	Yes	Yes	Yes	Yes	Unknown	Yes	High
82	76	Lin et al. 2015	Yes	Yes	No	Yes	Unknown	Yes	High
83, 84	77	Lin et al. 2016	Yes	Yes	No	Yes	Yes	Yes	High
85	78	Liu et al. 2012	Yes	Yes	No	No	Unknown	No	High
86	79	Liu et al. 2016	Yes	Yes	Yes	Yes	Yes	Yes	Low
87	80	Lo et al. 2008	Yes	Yes	No	Yes	Yes	Yes	High
88	81	Lu et al. 2005	Yes	Yes	No	Yes	Yes	Yes	High
89	82	Ma and Luo 2011	Yes	Yes	No	Yes	Yes	Yes	High
90	83	Ma et al. 2011	Yes	Yes	No	Yes	Yes	Yes	High
92	85	Mekviwattanawong et al. 2006	Yes	Yes	Yes	No	Unknown	Yes	High
93	86	Mine et al. 2013	Yes	Yes	No	Yes	Yes	Yes	High
94	87	Moon et al. 2010	Yes	Yes	Yes	Yes	Yes	No	High
95	88	Munckof et al. 2008	Yes	Yes	Yes	Yes	Yes	Yes	Low
98, 99	90	Nimmo et al. 2013	Yes	Yes	Yes	Yes	Unknown	No	High
100, 101, 102	91	Nozaki et al. 2015	Yes	Yes	Partial	Yes	Unknown	Yes	High
103, 104	92	Ozaki et al. 2009	Yes	Yes	Yes	Yes	Yes	Yes	Low
105	93	Park et al. 2009	Yes	Yes	Yes	No	Yes	Yes	High
106	94	Park et al. 2015	Yes	Yes	Yes	No	Unknown	Yes	High
107	95	Park et al. 2016	Yes	Yes	No	No	Unknown	Yes	High
108	96	Pathak et al. 2010	Yes	Yes	No	Yes	Yes	Yes	High
109	97	Patil et al. 2006	Yes	Yes	No	Yes	Yes	No	High
110	98	Qiao et al. 2013	Yes	Yes	Yes	Yes	Unknown	Yes	High

Study Number	Article Number	Study (Year)	Q1. True or close representation of targeted population?	Q2. Data collected directly from the subjects?	Q3. Acceptable CA-MRSA definition used in the study?	Q4. Study instrument used to measure the parameter of interest shown to have validity and reliability?	Q5. Same mode of data collection used for all subjects?	Q6. Appropriate numerator(s) and denominator (s) for the parameter of interest?	Overall risk of bias
111	99	Qiao et al. 2014	Yes	Yes	Yes	No	Unknown	Yes	High
112	100	Ravishankar et al. 2014	Yes	Yes	Yes	Yes	Yes	Yes	Low
113	101	Rijal et al. 2008	Yes	Yes	No	Yes	Yes	Yes	High
114	102	Ro et al. 2012	Yes	Yes	No	No	Unknown	Yes	High
115	103	Sahoo et al. 2014	Yes	Yes	No	Yes	Yes	Yes	High
116	104	Shetty et al. 2014	Yes	Yes	No	Yes	Yes	Yes	Low
117	105	Sit et al. 2017	Yes	Yes	Yes	Yes	Unknown	Yes	Low
118,119, 120,121, 122,123, 124,125	106	Song et al. 2011	Yes	Yes	Yes	Yes	Unknown	Yes	High
126	107	Tangchaisuriya et al. 2014	Yes	Yes	No	Yes	Yes	Yes	High
129	110	Tsao et al. 2014	Yes	Yes	Yes	Yes	Unknown	No	High
130	111	Umashankar Nagaraju et al. 2004	Yes	Yes	No	Yes	Yes	Yes	High
131	112	Van Nguyen et al. 2014	Yes	Yes	No	Yes	Yes	Yes	High
132	113	Verwer et al. 2011	Yes	Yes	Yes	Yes	Yes	No	High
133	114	Vlack et al. 2006	Yes	Yes	No	No	Yes	Yes	High
134	115	Wan et al. 2011	Yes	Yes	No	Yes	Yes	Yes	High
135	116	Wang et al. 2008	Yes	Yes	Yes	Yes	Unknown	Yes	High
136, 137	117	Wang et al. 2009	Yes	Yes	No	Yes	Yes	Yes	High
138	118	Wang et al. 2010	Yes	Yes	Yes	Yes	Unknown	Yes	High
139	119	Wang et al. 2010	Yes	Yes	Yes	Yes	Yes	No	High
141	121	Wang et al. 2010	Yes	Yes	Yes	Yes	Yes	Yes	Low
143	123	Warren 2012	Yes	Yes	No	No	Yes	Yes	High
144	124	Williamson et al. 2013	Yes	Yes	Yes	No	Unknown	No	High
145	125	Wu et al. 2010	Yes	Yes	No	Yes	Unknown	Yes	High
146	126	Wu et al. 2011	Yes	Yes	Yes	No	Unknown	No	High
147	127	Wu et al. 2013	Yes	Yes	Yes	Yes	Unknown	Yes	High
148	128	Wu et al. 2013	Yes	Yes	Yes	Yes	Unknown	Yes	High

Study Number	Article Number	Study (Year)	Q1. True or close representation of targeted population?	Q2. Data collected directly from the subjects?	Q3. Acceptable CA-MRSA definition used in the study?	Q4. Study instrument used to measure the parameter of interest shown to have validity and reliability?	Q5. Same mode of data collection used for all subjects?	Q6. Appropriate numerator(s) and denominator (s) for the parameter of interest?	Overall risk of bias
149	129	Wu et al. 2017	Yes	Yes	No	Yes	Yes	Yes	High
150	130	Xie et al. 2016	Yes	Yes	Yes	Yes	Unknown	No	High
151	131	Yao et al. 2010	Yes	Yes	Yes	No	Yes	Yes	High
152	132	Zhao et al. 2012	Yes	Yes	Yes	Yes	Unknown	Yes	High

Appendix XXI. Results of bias assessment of 8 case-control studies

Study Number	Article Number	Study (Year)	Q1: Adequate case definition?	Q2. Appropriate representativeness of the cases?	Q3. Appropriate selection of controls?	Q4. CA-MRSA controlled between cases and control?	Q5. Appropriate ascertainment of outcome?	Q6. Same response rate in case group and control group?	Overall risk of bias
22	20	Chou et al. 2015	No	Yes	Yes	Yes	Yes	Yes	High
38	36	Heo et al. 2007	No	Yes	Yes	Yes	Yes	Yes	High
61	56	Joo et al. 2012	Yes	Yes	Yes	Yes	Yes	Yes	Low
76	71	Leung et al. 2012	Yes	Yes	Yes	Yes	Yes	Yes	Low
79	74	Lim et al. 2014	No	Yes	Yes	Yes	Yes	Yes	High
127	108	Tong et al. 2009	Yes	Yes	Yes	Yes	Yes	Yes	Low
128	109	Tong et al. 2010	Yes	Yes	Yes	Yes	Yes	Yes	Low
140	120	Wang et al. 2010	Yes	Yes	Yes	No	Yes	Yes	High

Q1: "Yes" refers to case definition that has been independently validated or record linked or self-reported.
Q2: "Yes" refers to consecutive or obviously representative series of cases.
Q3: "Yes" refers to community/hospital controls.
Q4: "Yes" refers the control of CA-MRSA in the study among cases and controls.
Q5: "Yes" refers to secure record or method to ascertain the outcome of study.
Q6: "Yes" refers to same response rate in case group and control group.
A study is considered as low risk of bias if all answers are "Yes", otherwise the study will be considered as high risk of bias.

Appendix XXII. Results of bias assessment of 10 cohort studies

Study Number	Article Number	Study (Year)	Q1: Appropriate representation of the exposed cohort?	Q2. Appropriate selection of non-exposed group?	Q3. Appropriate ascertainment of exposure?	Q4. CA-MRSA being controlled?	Q5. Appropriate ascertainment of outcome ?	Q6. Adequate follow up for all subjects?	Overall risk of bias
8	7	Britton and Andresen 2013	Yes	No	Yes	Yes	Yes	Yes	High
28	26	Eshwara et al. 2013	Yes	No	Yes	Yes	Yes	Yes	High
58	54	Jenny et al. 2014	Yes	No	Yes	Yes	Yes	Yes	High
60	55	Joo et al. 2012	Yes	No	Yes	No	Yes	Yes	High
74	69	Lee et al. 2014	Yes	No	Yes	Yes	Yes	Yes	High
75	70	Lee et al. 2015	Yes	Yes	Yes	No	Yes	Yes	High
91	84	McMullan et al. 2016	Yes	No	Yes	Yes	Yes	Yes	High
96,97	89	Nickerson et al. 2011	Yes	Yes	Yes	No	Yes	Yes	High
142	122	Wang et al. 2015	Yes	No	Yes	Yes	Yes	Yes	High

Q1: "Yes" refers to a true or close representation of targeted population drawn in the community.
Q2: "Yes" refers to appropriate selection of non-exposed group from the same community as exposed group.
Q3: "Yes" refers to ascertainment of exposure by secure records.
Q4: "Yes" refers to the control of CA-MRSA in the control group.
Q5: "Yes" refers to ascertainment of outcomes by independent blind assessment or secure records.
Q6: "Yes" refers to complete follow up for all subjects in the study.
A study is considered as low risk of bias if all answers are "Yes", otherwise the study will be considered as high risk of bias.

Appendix XXIII. CA-MRSA carriage prevalence based only on low-risk studies

	Community settings					Hospital settings					Both settings				
	No. of studies	**Pooled population**	**Prevalence (95%CI) [a]**	**Range**	**I^2 (%)**	**No. of studies**	**Pooled population**	**Prevalence (95%CI) [a]**	**Range**	**I^2 (%)**	**No. of studies**	**Pooled population**	**Prevalence (95%CI) [a]**	**Range**	**I^2 (%)**
General members															
General members	2	899	7.6 (0, 43.6)	0.3-23.5	98.4	4	2812	3.0 (1.1, 5.9)	0.9-10.4	90.0	6	3711	4.3 (1.2, 9.2)	0.3-23.5	96.8
Subgroups without specific health conditions															
Children ≤ 6 years old	3	2632	1.2 (0, 3.4)	0.5-3.9	84.2	-	-	-	-	-	-	-	-	-	-
Children aged 7-18 years old	2	163	3.7(0.3, 10.0)	1.4-6.5	60.1	-	-	-	-	-	-	-	-	-	-
Adults > 18 years old	1	507	0.4 (0, 1.2)	-	-	-	-	-	-	-	-	-	-	-	-
University students	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Household members of CA-MRSA carriers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pediatricians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mothers of children aged 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Janitors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pet owners	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Population without diabetes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subgroups with these specific health conditions															
S. aureus carriage	13	3688	11.4 (3.9, 21.9)	1.0-40.5	98.5	4	1711	11.3 (3.9, 21.8)	2.9-30.0	90.3	17	5399	11.4 (5.6, 18.8)	1.0-40.5	98.0
SSTIs	3	1771	5.2 (1.0, 12.1)	1.5-15.1	92.8	-	-	-	-	-	-	-	-	-	-
S.aureus SSTIs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oral-related conditions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Respiratory system related Conditions	1	426	0.7 (0.1, 1.8)	-	-	-	-	-	-	-	-	-	-	-	-
Bacteremia	-	-	-	-	-	1	257	1.2 (0.2, 3.4)	-	-	-	-	-	-	-
S.aureus bacteremia	2	920	2.8 (0.6, 6.2)	1.0-4.2	63.2	-	-	-	-	-	-	-	-	-	-
Septic arthritis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ear, Nose and Throat (ENT) related conditions	1	265	23.8 (18.8, 29.4)	-	-	-	-	-	-	-	-	-	-	-	-
Diabetes Mellitus (DM)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Human immunodeficiency virus (HIV) carriage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renal system related conditions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caesarean section	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

[a] Freeman-Tukey transformed proportion. Combined estimates were generated by use of a DerSimonian-Laird random-effects model.

Appendix XXIV. Reasons for exclusion for studies excluded from meta-analysis.

Study Number	Reasons for exclusion
3	Ambiguous distinction between community and hospital settings
20	Ambiguous distinction between community and hospital settings
31	The denominator was number of MRSA cases.
54	The denominator was number of MRSA cases.
55	The denominator was number of MRSA cases.
57	Age group is not specified, nor information on S.aureus was given.
59	The denominator was number of MRSA cases.
60	The denominator was number of MRSA cases.
61	Inappropriate study design to estimate CA-MRSA prevalence
66	Ambiguous distinction between community and hospital settings
70	Ambiguous distinction between community and hospital settings
72	The denominator was number of MRSA cases.
76	Inappropriate study design to estimate CA-MRSA prevalence
77	The denominator was number of MRSA cases.
79	Inappropriate study design to estimate CA-MRSA prevalence
85	The denominator was number of MRSA cases.
96	Age group was not specified, nor information on S.aureus was given.
97	Age group was not specified, nor information on S.aureus was given.
98	The denominator was not reported aggregately.
99	The denominator was not reported aggregately.
100	Unmatched reporting units
102	Unmatched reporting units
105	The denominator was number of MRSA cases.
106	Ambiguous distinction between community and hospital settings
110	Age group was not specified, nor information on S.aureus was given.
117	The denominator was number of MRSA cases.
128	Duplicated data, as included in Study 127 already.
129	The denominator was number of MRSA cases.
138	The denominator was number of MRSA cases.
139	The denominator was number of MRSA cases.
143	Ambiguous distinction between community and hospital settings
146	Unmatched reporting units
148	The denominator was number of MRSA cases.

Appendix XXV. Included studies reporting CA-MRSA carriage prevalence among different age groups

Subgroups without specific health conditions	Study No.	Author	Year of publication	Settings	Sample size	CA-MRSA reported
Children ≤ 6 years old	18	Chen et al.	2011	Community	6057	473
	26	Dey et al.	2013	Community	1002	120
	43	Ho et al.	2012	Community	2211	12
	44	Hunag and Chen	2015	Community	273	110
	47	Huang et al.	2007	Community	3046	221
	69	Ko et al.	2008	Community	204	8
	71	Kuo et al.	2013	Hospital	251	11
	104*	Ozaki et al.	2009	Community	217	1
	108	Pathak et al.	2010	Community	1562	16
	113	Rijal et al.	2008	Community	40	13
	131	Van Nguyuen et al.	2014	Community	85	10
Children aged 7-18 years	69	Ko et al.	2008	Community	92	6
	104*	Ozaki et al.	2009	Community	71	1
	113	Rijal et al.	2008	Community	55	1
Adults > 18 years old	68	Kitti et al.	2011	Community	200	2
	89	Ma and Luo	2011	Community	1634	41
	90	Ma et al.	2011	Community	2103	22
	95	Munckhof et al.	2009	Community	507	2
	131	Van Nguyuen et al.	2014	Community	662	28

*Extracted data embedded Study 102

Appendix XXVI. Included studies reporting antibiotics resistance among general members

	Study No.	Author	Year of Publication	Settings	CA-MRSA sample size	Resistance reported
Macrolide group						
Erythromycin	21	Chen et al.	2015	Community	1	1
	56	Jain et al.	2014	Community	47	22
	88	Lu et al.	2005	Community	64	58
	136*	Wang et al.	2009	Community	183	152
	10	Chang et al.	2015	Hospital	4	4
	17	Chen et al.	2010	Hospital	6	6
	30	George et al.	2016	Hospital	16	16
	61	Joshi et al.	2017	Hospital	4	2
Tetracycline group						
Tetracycline	88	Lu et al.	2005	Community	64	61
Minocycline	136*	Wang et al.	2009	Community	183	2
Fluoroquinolones group						
Ofloxacin	88	Lu et al.	2005	Community	64	8
Ciprofloxacin	56	Jain et al.	2014	Community	47	11
	136*	Wang et al.	2009	Community	183	1
	10	Chang et al.	2015	Hospital	4	1
	62	Joshi et al.	2017	Hospital	4	3
Moxifloxacin	88	Lu et al.	2005	Community	64	1
Cephalosporin group						
Cephalexcin	30	George et al.	2016	Hospital	16	16
Cefoxitin	30	George et al.	2016	Hospital	16	16
Aminoglycosides group						
Gentamicin	56	Jain et al.	2014	Community	47	11
	88	Lu et al.	2005	Community	64	41
	136*	Wang et al.	2009	Community	183	40
	30	George et al.	2016	Hospital	16	16
Co-trimoxazole	88	Lu et al.	2005	Community	64	23
	136*	Wang et al.	2009	Community	183	1
	30	George et al.	2016	Hospital	16	16
	62	Joshi et al.	2017	Hospital	4	1
Miscellaneous						
Clindamycin	56	Jain et al.	2014	Community	47	12
	88	Lu et al.	2005	Community	64	58
	21	Chen et al.	2015	Community	1	1
	136*	Wang et al.	2009	Community	183	137
	10	Chang et al.	2015	Hospital	4	4
Rifampin	88	Lu et al.	2005	Community	64	2
Mupirocin	62	Joshi et al.	2017	Hospital	4	1

*Extracted data embedded Study 137