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"

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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 (KOK, JMR). 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 153 included studies (134 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 2016	Mar 2016	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	Outpatients suffering from *S. aureus* oral infection	Oral cavity	Various departments of a dental hospital	Not defined	223	6	6	109
*3	3	Bennett et al.	2014	Community	Apr 2006	Sep 2006	Australia	Cross-sectional	Patients with community-onset *S. aureus* infection aged from 1-93 years old	Blood; Urine; Respiratory Specimens	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	Not reported	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	Nov 2009	Dec 2009	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	Jan 2008	Dec 2008	Australia	Cohort (Retrospective)	Patients with community-associated *S. aureus* aged 0.6-8.4 years old	Wound; pus; blood; urine	A children hospital	Epidemiological	431	83	83	431
*9	8	Buntaran et al.	2013	Hospital	Jan 2012	Dec 2012	Indonesia	Cross-sectional	Hospitalized patients with *S. aureus* infections	Urine; Sputum; Pus; Throat	Two hospitals	Epidemiological	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	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 (NF)	Infection sites	A hospital	Epidemiological	247	25	49	91
*13	11	Changchien et al.	2016	Hospital	Jan 2008	Nov 2008	Taiwan	Cross-sectional	Patients with skin and soft tissue infections (SSTIs)	Not reported	A hospital	Epidemiological	307	68	177	307
14	12	Chatterjee et al.	2009	Community	Jan 2005	Jun 2005	India	Cross-sectional	School children from rural, urban, and peri-urban slum aged 5-15 years old	Nose	Two districts in India	Not defined	489	16	16	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	Not reported	A children hospital	Epidemiological	198	54	106	198
*16	14	Chen et al.	2010	Community	Jul 2004	Dec 2007	Taiwan	Cross-sectional	Adults with *S. aureus* infection aged 32-72years	Blood	Emergency department (ED) of a hospital	Epidemiological	819	34	290	819

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
17	15	Chen et al.	2010	Hospital	Jun 2008	Jul 2008	Taiwan	Cross-sectional	Hospitalized adult patients in an intensive unit (ICU) aged 44-81 years old	Not reported	Medical ICU and Surgical ICU of a university-affiliated hospital	Not defined	177	6	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 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	Not reported	Emergency department (ED) of a university-affiliated hospital	Epidemiological	1166	54	380	1166
*20	18	Chen et al.	2014	Hospital	May 2011	May 2011	China	Cross-sectional	Patients with *S. aureus* from tertiary care hospitals	Respiratory tract; Wound; Skin and soft tissue; Blood; Body fluid; Drainage; Urine; Pus; Cerebral spinal fluid; Catheter	Hospitals located in 7 districts of China	Epidemiological	322	24	151	322
21	19	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	Cases: Patients of SSTIs with MRSA; Controls: Patients of SSTIs without 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 (AD) aged 3.1-12.3 years old	Skin lesions; yellow colonies	Pediatric allergy clinic	Not defined	115	16	16	87
24	22	Coombs et al.	2013	Hospital	Jul 2011	Nov 2011	Australia	Cross-sectional	Hospital inpatients stayed more than or equal to 48 hours aged 0-101 years old	Skin and soft tissue; respiratory specimens; blood; urine; sterile body cavity; cerebrospinal fluid	Laboratories from six states	Molecular	2357	275	713	2357
25	23	Deng et al.	2012	Community	Jan 2005	Dec 2010	China	Cross-sectional	Healthy children aged 2-18 years old	Nose	Primary schools and 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-school) aged 1-6 years old	Nose	100 *anganwaries* (preschools) of a city	Not defined	1002	102	102	351
*27	25	Douglas et al.	2004	Hospital	Jan 2000	Dec 2000	Australia	Cross-sectional	Inpatients aged 0-90 years old	Blood	A teaching hospital	Epidemiological	257	3	16	21
*28	26	Eshwara et al.	2013	Hospital	Aug 2010	Jul 2011	India	Cohort (Prospective)	Inpatients with *S. aureus* bacteremia	Blood	Specialties of a tertiary care hospital	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	Department of Microbiology of a medical college	Clinical	683	16	16	16

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
*31	29	Ghanznavi-Rad et al.	2010	Hospital	Oct 2007	Sep 2008	Malaysia	Cross-sectional	Hospitalized patients aged 4 days-88 years old	Pus; cellulitis; abscess; respiratory specimen; blood; medical devices; cerebrospinal fluid; conjunctiva; body fluids; urine; bone marrow	Wards (General medicine, Pediatrics, General surgery, Urology, Neurosurgery, Orthopedic surgery, Maternity, ICU) of a hospital	Not defined	389	28	389	389
32	30	Goud et al.	2011	Community	Apr 2003	Dec 2007	India	Cross-sectional	Community residents	Nose; forearm; dorsum; palm	A city and the adjacent district	Not defined	738 (Upper +middle +Low economic class)	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	Jan 2009	Dec 2010	India	Cross-sectional	Pharyngitis patients aged 14-65 years old	Throat	Thoracic Science Department of a hospital	Epidemiological	265	63	63	165
35	33	Hart et al.	2015	Community	Sep 2010	Sep 2011	Australia	Cross-sectional	Patients with Type 1 or Type 2 community-based diabetes aged 10-90 years old	Nose; axillae	Urban area of Western Australia	Not defined	660	8	8	258
36	34	Hayashi et al.	2012	Hospital	May 2009	Sep 2009	Australia	Cross-sectional	Patients with 2009 pandemic influenza A (H1N1)	Respiratory tract specimen; blood; urine	Public hospitals	Molecular	4491	2	2	13
*37	35	Hennam et al.	2012	Hospital	Dec 2009	Jan 2011	Australia	Cross-sectional	Women	Infected wounds; Tissue; Aspirates	A tertiary referral centre	Not defined	583	8	8	18
*38	36	Heo et al.	2007	Community	Jan 2000	Aug 2005	South Korea	Case-control	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 patients	Nasopharyngeal; Throat	29 clinics and 16 hospitals	Not defined	930	22	22	242
40	38	Hisata et al.	2005	Community	Jul 2001	Mar 2002	Japan	Cross-sectional	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 aged 1-30 years old	Nose; axillary skin; wound lesions	Home visit; in-charge doctor's office	Epidemiological	46	6	6	6
*42	40	Ho et al.	2008	Community	Nov 2006	Feb 2007	Hong Kong	Cross-sectional	Outpatients with SSTIs	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 attended day care centres and kindergartens aged 2-6 years old	Nose; Nasopharyngeal	Day care centres and kindergartens	Molecular	2211	12	28	610
44	42	Huang and Chen	2015	Community	Sep 2009	Nov 2011	Taiwan	Cross-sectional	Children from newborn to 2 years old	Nose	A hospital	Not defined	273	110	110	243
45	42	Huang and Chen	2015	Community	Sep 2009	Nov 2011	Taiwan	Cross-sectional	Mothers of infants	Nose	A hospital	Not defined	262	21	21	21
46	43	Huang and Hung	2006	Community	Oct 2000	Mar 2003	Taiwan	Cross-sectional	Outpatients with acute rhinosinusitis	Nasal purulence	A hospital	Epidemiological	601	16	16	53
47	44	Huang et al.	2007	Community	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 in Taiwan	Not defined	3046	221	221	713

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		
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48	45	Huang et al.	2007	Community	Aug 2004	May 2005	Taiwan	Cross-sectional	Household members of CA-MRSA patients	Nose	A children's hospital	Epidemiological	121	30	30	30
49	46	Huang et al.	2013	Community	Apr 2010	Apr 2010	Taiwan	Cross-sectional	Pediatricians aged 31-60 years old	Nose	During a conference	Not defined	220	15	15	15
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	Outpatient clinics	Not defined	221	27	27	108
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	A local teaching hospital	Not defined	177	22	22	76
52	49	Indian Network for Surveillance of Antimicrobial Resistance (INSAR) group	2013	Community	Jan 2008	Dec 2009	India	Cross-sectional	Outpatients	Pus; Blood; Respiratory samples; Urine; Sterile body fluids; Tissue; Ear; Nose; Skin; Body fluids; throat swab; genital specimens	15 Indian tertiary care centres	Not defined	26310	936	4778	26310
53	50	Ishida et al.	2015	Hospital	Oct 2010	Sep 2013	Japan	Cross-sectional	Patients with community-acquired pneumonia aged 58.9-92 years old	Blood	A hospital	Epidemiological	531	4	4	17
54	51	Ito et al.	2015	Hospital	Jan 2005	Dec 2012	Japan	Cross-sectional	Hospitalized patients	Not reported	A tertiary care hospital	Molecular	2339	227	2339	2339
55	52	Jain et al.	2014	Community	Oct 2006	Nov 2007	India	Cross-sectional	Apparent healthy community residents accompanying patients attending outpatient services	Nose; Axillary; Throat	A tertiary care hospital	Epidemiological	200	47	47	116
56	53	Jamaluddin et al.	2008	Community	Jan 2001	Dec 2003	Japan	Cross-sectional	Healthy children	Nose	5 day-care centres and 2 kindergartens in three districts	Epidemiological	1285	49	49	49
*57	54	Jenney et al.	2014	Community	Jan 2006	Dec 2006	Fiji	Cohort (Prospective)	School children with impetigo	Skin lesion	Three schools	Molecular	455	14	14	14
*58	54	Jenney et al.	2014	Hospital	Sep 2006	May 2007	Fiji	Cross-sectional	Hospitalized patients	Sterile and non-sterile site	Diagnostic microbiology laboratory	Molecular	36	22	36	36
59	55	Joo et al.	2012	Hospital	Jan 2007	Dec 2009	South Korea	Cohort (Retrospective)	Hospitalized patients aged 1-97 years old	Blood; Pus; Sputum; Body fluids	A tertiary care university hospital	Epidemiological	124	23	124	124
*60	56	Joo et al.	2012	Hospital	Jan 2007	Dec 2009	South Korea	Case-control	Cases: Patients with community-onset infections caused by ST72-MRSA-IV strains in Korea aged 1-97 years old; Controls: Patients with community-onset methicillin-susceptible *S. aureus* infections aged 1-97 years old	Blood; Pus; Sputum; Body fluids	A tertiary care university hospital	Epidemiological	168	84	84	84

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61	57	Joshi et al.	2017	Hospital	Oct 2014	Apr 2015	Nepal	Cross-sectional	Healthcare workers and patients	Nose	Intensive care unit (ICU) and wards from different departments of a tertiary care hospital	Not defined	536	4	29	135
62	58	Jung et al.	2013	Hospital	Jan 2008	Dec 2011	South Korea	Cross-sectional	Hospitalized patients with pneumonia aged 51.2-80.8 years old	Broncho-alveolar lavage fluid; Pleural effusion Lung abscess; Sputum	A hospital	Epidemiological	943	21	78	129
63	59	Kang et al.	2012	Hospital	Jan 2011	Jun 2011	Taiwan	Cross-sectional	Patients undergoing hemodialysis aged 19-60 years old	Nose	Hemodialysis clinics of 2 hospitals	Not defined	296	19	19	84
64	60	Kawaguchiya et al.	2011	Community	Jan 2009	Jul 2009	Japan	Cross-sectional	Outpatients	Urine; Pus; Sputum; Otorrhea; Nasal discharge; Eye discharge; Skin	Hospitals and clinics	Epidemiological	1015	189	189	1015
65	61	Kim et al.	2007	Community	Jan 2005	Jun 2005	South Korea	Cross-sectional	Community residents in outpatient clinics, emergency rooms or within 72 hours of hospital admission	Various body sites	4 community-based and 3 tertiary care hospitals	Epidemiological	3251	112	1900	3251
*66	62	Kim et al.	2014	Hospital	May 2012	Dec 2012	South Korea	Cross-sectional	Patients with *S. aureus* infection aged 0-100 years old	Blood; Abscesses in internal body sites; Bone and organ tissue; Joint fluid; Ear discharge; Pleural fluid; Cerebrospinal fluid; Pericardial fluid	16 teaching hospitals	Epidemiological	1627	102	355	1627
67	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
68	64	Ko et al.	2008	Community	Dec 2005	Feb 2006	South Korea	Cross-sectional	Children aged 1-11 years old	Nose	Outpatient clinic of a tertiary care hospital	Epidemiological	296	14	18	95
*69	65	Krishna et al.	2004	Hospital	Jun 2001	Dec 2001	India	Cross-sectional	Outpatients and inpatients that had no contact with healthcare facilities in the preceding two years	Abscesses; Boils; Wound Discharge; Ear Discharge	A tertiary care teaching facility	Epidemiological	116	6	21	116
70	66	Kuo et al.	2013	Hospital	Oct 2011	Dec 2011	Taiwan	Cross-sectional	Hospitalized infants in neonatal intensive care units (NICUs)	Nose; umbilicus	7 medical centers	Not defined	251	11	11	33
71	67	Kwon et al.	2011	Hospital	Oct 2008	May 2009	South Korea	Cross-sectional	Patients with MRSA infection or colonization aged 17-98 years old	Blood; Nose	10 university-affiliated hospital ICUs	Molecular; Epidemiological	72	36	72	72
72	68	Lee et al.	2011	Community	Sep 2008	Oct 2008	South Korea	Cross-sectional	Preschool healthy children aged 12months -6.8 years old	Nose	7 day care centres	Not defined	428	40	40	164
*73	69	Lee et al.	2014	Hospital	Jan 2004	Sep 2012	South Korea	Cohort (Prospective)	Adult patients with community-acquired *S. aureus* bacteremia	Infection site	A general hospital provided primary and tertiary care	Epidemiological	169	31	31	169

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*74	70	Lee et al.	2015	Hospital	Jan 2013	Dec 2013	Taiwan	Cohort (Retrospective)	Hospitalized adults with cellulitis aged 20-96 years old	Blood; Pus; Skin biopsy	A general hospital provided primary and tertiary care	Epidemiological	465	22	32	64
*75	71	Leung et al.	2012	Hospital	Feb 2009	Dec 2010	Hong Kong	Case-control	Cases: Persons with CA-MRSA; Controls: persons without CA-MRSA	Not reported	14 acute public hospitals	Clinical; Epidemiological; Molecular	127	127	127	127
*76	72	Li et al.	2013	Hospital	Jun 2005	Dec 2011	China	Cross-sectional	Hospitalized children	Sputum; Pus; Pharyngeal; Blood; Bones and joints; Cerebrospinal fluid; Lung; Pleural cavity; Peritoneal cavity ; Deep seated soft tissue	8 hospitals	Epidemiological	110	90	110	110
*77	73	Liao et al.	2005	Community	Jun 2001	May 2002	Taiwan	Cross-sectional	Patients with community-onset *S. aureus* bacteremia aged 15-95 years old	Blood	Emergency department of a hospital	Epidemiological	102	1	32	102
*78	74	Lim et al.	2014	Community	Jan 2002	Dec 2011	Australia	Case-control	Cases: Adults with community-onset bloodstream infection (COBSI) due to a multidrug (MDR) organism; Controls: Adults with (COBSI) due to a non-multidrug (MDR) organism	Blood	A tertiary referral hospital	Not defined	360	72	72	206
*79	75	Lin et al.	2011	Hospital	Nov 2003	Jul 2007	Taiwan	Cross-sectional	Inpatients with SSTIs aged 1-90 years old	Wound	Dermatology department of a hospital	Epidemiological	130	31	41	73
*80	75	Lin et al.	2011	Community	Nov 2003	Jul 2007	Taiwan	Cross-sectional	Outpatients with SSTIs aged 1-88 years old	Wound	Dermatology department of a hospital	Epidemiological	313	84	84	163
*81	76	Lin et al.	2015	Hospital	Jan 2008	Dec 2011	Taiwan	Cross-sectional	Inpatients with *S. aureus* septic arthritis	Not reported	A referral medical center and a regional hospital	Not defined	93	31	38	93
82	77	Lin et al.	2017	Community	Apr 2014	May 2015	China	Cross-sectional	Diabetic outpatients aged 57-76 years old	Nose	11 districts	Not defined	529	22	22	46
83	77	Lin et al.	2017	Community	Apr 2014	May 2015	China	Cross-sectional	Non-diabetic population aged 55-74 years old	Nose	11 districts	Not defined	427	12	12	25
*84	78	Liu et al.	2012	Hospital	Jan 2005	Dec 2009	China	Cross-sectional	Hospitalized children from newborn to 16 years old	Blood; Pus; Pharyngeal; Respiratory tract	9 children hospitals in 7 cities	Not defined	134	60	134	134
*85	79	Liu et al.	2016	Community	Jan 2011	Dec 2013	China	Cross-sectional	Outpatients with SSTIs aged 1-91 years old	Infection site	Surgical clinic and dermatological clinic in three general hospitals	Epidemiological	1400	21	21	203
86	80	Lo et al.	2008	Community	Jan 2004	Dec 2006	Taiwan	Cross-sectional	Children with no acute medical problem aged 1month-12 years old	Nose	Health maintenance clinic and kindergartens	Epidemiological	1615	131	131	454
87	81	Lu et al.	2005	Community	Apr 2001	Oct 2001	Taiwan	Cross-sectional	Community residents aged 1-90 years old	Nose	Two villages and four sites in a city	Epidemiological	1838	64	64	463
88	82	Ma and Luo	2011	Community	Jan 2009	Dec 2009	China	Cross-sectional	Medical university students aged 19-22 years old	Nose	A medical university	Not defined	1634	41	41	239

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89	83	Ma et al.	2011	Community	May 2008	Oct 2009	China	Cross-sectional	Healthy third year preclinical medical students aged 19-23 years old	Nose	A medical university	Not defined	2103	22	22	234
*90	84	McMullan et al.	2016	Hospital	Jan 2007	Dec 2012	Australia	Cohort (Prospective)	Children with *S. aureus* bacteremia from birth to less than 18 years old	Blood	Pediatric and general hospitals	Epidemiological	1073	69	142	1073
*91	85	Mekviwattanawong et al.	2006	Hospital	Jan 2015	May 2015	Thailand	Cross-sectional	Hospitalized patients with *S. aureus carriage* from 1-95 years old	Blood; Joint fluid; Peritoneal fluid; Pus; Sputum; Bronchial fluid; Urine	A tertiary care hospital	Epidemiological	446	2	186	446
*92	86	Mine et al.	2013	Community	Jun 2008	Nov 2010	Japan	Cross-sectional	Outpatient presenting with SSTI aged from 1 month to 91 years old	Skin lesions	Clinics and hospitals	Not defined	497	98	98	274
*93	87	Moon et al.	2010	Hospital	Jan 2003	Dec 2005	South Korea	Cross-sectional	Patients with MRSA bacteremia	Blood	A tertiary referral center	Epidemiological	241	2	78	241
94	88	Munckhof et al.	2009	Community	Jul 2005	Mar 2006	Australia	Cross-sectional	Volunteer adult populations aged 18-96	Nose	General medical practices and community	Epidemiological	699	2	5	202
95	89	Nickerson et al.	2011	Community	Sep 2008	Oct 2008	Cambodia	Cohort (Prospective)	Outpatient children	Nose	Outpatient department of a hospital	Epidemiological	2485	28	87	87
96	89	Nickerson et al.	2011	Hospital	Sep 2008	Oct 2008	Cambodia	Cohort (Prospective)	Inpatient children	Nose	Outpatient department of a hospital	Epidemiological	145	2	6	6
*97	90	Nimmo et al.	2013	Hospital	Jan 2000	Dec 2012	Australia	Cross-sectional	Inpatients with *S. aureus* carriage	Blood; Pus; Tissue; Sterile fluid	Public health care facilities	Epidemiological	114980	486	486	114980
*98	90	Nimmo et al.	2013	Community	Jan 2000	Dec 2012	Australia	Cross-sectional	Outpatients with *S. aureus* carriage	Blood; Pus; Tissue; Sterile fluid	Public health care facilities	Epidemiological	142726	296	296	142726
99	91	Nozaki et al.	2015	Community	Jan 2013	Dec 2013	South Korea	Cross-sectional	Students	Nose; Hands	A university	Molecular	100	3	3	3
100	91	Nozaki et al.	2015	Community	Jan 2013	Dec 2013	Japan	Cross-sectional	Students	Nose; Ear	A university	Molecular	94	3	3	3
101	91	Nozaki et al.	2015	Community	Jan 2013	Dec 2013	The Philippines	Cross-sectional	Students	Nose; Palms	A university	Molecular	200	24	24	24
102	92	Ozaki et al.	2009	Community	Jan 2006	Dec 2008	Japan	Cross-sectional	Pediatric outpatients with upper respiratory tract infections aged 0.5-14 years old	Nose	Hospitals	Epidemiological	426	3	3	125
103	92	Ozaki et al.	2009	Community	Jan 2006	Dec 2008	Japan	Cross-sectional	Healthy children in the community aged 0.2-14 years old	Nose	Eight prefectures	Epidemiological	136	5	5	55
*104	93	Park et al.	2009	Hospital	Jul 2007	Nov 2007	South Korea	Cross-sectional	Patients with bloodstream infection aged 0-81 years old	Blood	3 community-based hospitals and 1 tertiary care hospital	Epidemiological	76	4	4	4
*105	94	Park et al.	2015	Hospital	Mar 2014	Jun 2014	South Korea	Cross-sectional	Pediatric patients with skin infections from 0-16 years old	Infected lesion	A hospital	Epidemiological	69	28	28	69
106	95	Park et al.	2016	Hospital	Jan 2007	Dec 2014	South Korea	Cross-sectional	Newly admitted patients	Nose	A university-affiliated tertiary care hospital	Not defined	24977	318	637	637
107	96	Pathak et al.	2010	Community	Nov 2007	Feb 2009	India	Cross-sectional	Pediatric outpatients aged 1 month -59 months	Nose	Pediatric outpatient clinics of two hospitals	Not defined	1562	16	16	98
*108	97	Patil et al.	2006	Community	Feb 2004	Jul 2004	India	Cross-sectional	Patients with community-acquired primary pyodermas aged 5-80 years old	Infected lesion	Dermatology outpatient clinic in a tertiary care hospital	Not defined	86	1	1	84
109	98	Qiao et al.	2013	Hospital	Jan 2006	Dec 2011	China	Cross-sectional	Hospitalized patients ≤ 14 years old	Sterile body site	A children hospital	Epidemiological	235767	29	161	161

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*110	99	Qiao et al.	2014	Hospital	Dec 2011	Feb 2013	China	Cross-sectional	Patients with invasive community-acquired *S. aureus* infections ≤ 14 years old	Sterile body site	Three regional children's hospitals	Epidemiological	163	71	71	163
*111	100	Ravishankar et al.	2014	Community	Feb 2013	Aug 2013	India	Cross-sectional	Patients with community-acquired SSTIs from 10-69 years old	Pus	Outpatient department of a surgical unit in a tertiary teaching hospital	Epidemiological	73	11	11	45
112	101	Rijal et al.	2008	Community	Jul 2007	Nov 2007	Nepal	Cross-sectional	School children aged 1-15 years old	Nose	School in a city	Not defined	184	32	32	57
113	102	Ro et al.	2012	Community	Jan 2007	Dec 2008	South Korea	Cross-sectional	Patients visited a tertiary teaching hospital emergency department aged 18-63 years old	Blood; Sputum; Urine; Body fluid; Rectal samples	A tertiary teaching hospital emergency department	Not defined	89206	939	939	939
*114	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
*115	104	Shetty et al.	2014	Community	Jul 2010	Sep 2010	India	Cross-sectional	Children attending well-child clinic and a local public school aged 1month to 17 years old	Nose	An academic tertiary care	Epidemiological	500	4	4	126
*116	105	Sit et al.	2017	Hospital	Jan 2011	Dec 2012	Malaysia	Cross-sectional	Adult inpatients from 16-92 years old	Cerebrospinal fluid; Synovial fluid; Tissue; Bone; Pus; Blood	University Medical Centre	Epidemiological	209	65	209	209
*117	106	Song et al.	2011	Hospital	Sep 2004	Aug 2006	South Korea	Cross-sectional	Patients with *S. aureus* infection aged 1 month-104 years old	Not reported	Tertiary or secondary-care teaching hospitals in urban areas	Epidemiological	852	23	570	852
*118	106	Song et al.	2011	Hospital	Sep 2004	Aug 2006	Taiwan	Cross-sectional	Patients with *S. aureus* infection aged 1 month-104 years old	Not reported	Tertiary or secondary-care teaching hospitals in urban areas	Epidemiological	844	94	467	844
*119	106	Song et al.	2011	Hospital	Sep 2004	Aug 2006	Hong Kong	Cross-sectional	Patients with *S. aureus* infection aged 1 month-104 years old	Not reported	Tertiary or secondary-care teaching hospitals in urban areas	Epidemiological	427	7	203	427
*120	106	Song et al.	2011	Hospital	Sep 2004	Aug 2006	The Philippines	Cross-sectional	Patients with *S. aureus* infection aged 1 month-104 years old	Not reported	Tertiary or secondary-care teaching hospitals in urban areas	Epidemiological	190	28	65	190
*121	106	Song et al.	2011	Hospital	Sep 2004	Aug 2006	Thailand	Cross-sectional	Patients with *S. aureus* infection aged 1 month-104 years old	Not reported	Tertiary or secondary-care teaching hospitals in urban areas	Epidemiological	438	3	183	438
*122	106	Song et al.	2011	Hospital	Sep 2004	Aug 2006	Vietnam	Cross-sectional	Patients with *S. aureus* infection aged 1 month-104 years old	Not reported	Tertiary or secondary-care teaching hospitals in urban areas	Epidemiological	801	197	306	801
*123	106	Song et al.	2011	Hospital	Sep 2004	Aug 2006	India	Cross-sectional	Patients with *S. aureus* infection aged 1 month-104 years old	Not reported	Tertiary or secondary-care teaching hospitals in urban areas	Epidemiological	139	2	23	139

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*124	106	Song et al.	2011	Hospital	Sep 2004	Aug 2006	Sri Lanka	Cross-sectional	Patients with *S. aureus* infection aged 1 month-104 years old	Not reported	Tertiary or secondary-care teaching hospitals in urban areas	Epidemiological	426	19	345	426
*125	107	Sun et al.	2013	Hospital	Jan 2008	Oct 2008	China	Cross-sectional	Patients with *S. aureus* carriage	Sputum, Pus, Blood, Urine, Prostatic fluid, Catheter tips, Drainage fluids, Ascites	Different departments of a tertiary care center	Epidemiological	202	22	129	202
126	108	Tangchisuriya et al.	2014	Community	Jan 2010	Dec 2011	Thailand	Cross-sectional	Healthy children aged 3-12 years old	Nose	3 primary schools in 3 different districts of a province	Not defined	217	5	5	78
*127	109	Tong et al.	2009	Hospital	Apr 2006	Apr 2007	Australia	Cross-sectional	Patients with *S. aureus* carriage	Not reported	A tertiary referral center	Molecular	807	291	329	807
*128	110	Tong et al.	2010	Hospital	Apr 2006	Apr 2007	Australia	Case-control	Inpatients with *S. aureus* carriage	Not reported	A tertiary referral center	Molecular	1693	291	428	1693
*129	111	Tsao et al.	2014	Hospital	Jan 2006	Dec 2010	Taiwan	Cross-sectional	Patients with invasive diseases	Blood; Pleural effusion; Ascites; Biopsied tissues; Synovial fluid; Lymph node aspiration; Broncho-alveolar lavage; Cerebrospinal fluid	20 medical centers and regional hospitals	Molecular	670	240	670	670
*130	112	Nagaraju et al.	2004	Community	Jan 2000	Jul 2001	India	Cross-sectional	Patients with community-acquired pyoderma	Pus; Nose	Outreach camp	Not defined	250	22	22	202
131	113	Van Nguyuen et al.	2014	Community	Feb 2012	Jun 2012	Vietnam	Cross-sectional	Children and adults	Nose; Throat	Two districts	Not defined	1016	80	80	303
132	114	Verwer et al.	2012	Hospital	Dec 2007	Apr 2008	Australia	Cross-sectional	Health care workers aged 17-75 years old	Nose	An adult tertiary hospital	Molecular	1542	43	53	53
133	115	Vlack et al.	2006	Community	Oct 2004	Oct 2004	Australia	Cross-sectional	Primary school children living in an indigenous community aged 5-13 years old	Nose; Throat; Skin	A local primary school	Not defined	92	8	14	27
134	116	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	117	Wang et al.	2008	Hospital	Jan 2001	Dec 2006	Taiwan	Cross-sectional	Patients with community-acquired *S. aureus* infection aged 36-77 years old	Blood	A tertiary care center in Taiwan	Epidemiological	580	30	30	215
136	118	Wang et al.	2009	Community	Oct 2007	Dec 2007	Taiwan	Cross-sectional	Adults who attended mandatory health examinations	Nose	Three medical centres	Not defined	3098	119	119	686
137	118	Wang et al.	2009	Community	Oct 2007	Dec 2007	Taiwan	Cross-sectional	Household members of index people	Nose	Three medical centres	Not defined	242	64	64	64
*138	119	Wang et al.	2010	Hospital	Jan 2006	Dec 2006	Taiwan	Cross-sectional	Adults with MRSA bacteremia	Blood	A university hospital	Epidemiological	159	7	159	159
*139	120	Wang et al.	2010	Hospital	Jan 2006	Dec 2008	China	Cross-sectional	Hospitalized adults with nosocomial MRSA Bloodstream infection	Blood	A teaching hospital	Molecular	253	47	253	253

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														CA-MRSA	MRSA	SA
140	121	Wang et al.	2010	Hospital	Jan 2004	Dec 2006	China	Cross-sectional	Patients with Type 2 diabetes with foot ulcers	Ulcer site	Diabetic foot care center at a hospital	Epidemiological	118	7	21	41
141	122	Wang et al.	2010	Hospital	Sep 2008	Feb 2009	Taiwan	Cross-sectional	Patients admitted to the medical intensive care unit (MICU) and coronary care unit (CCU)	Nostril; Throat; Axillae; Inguinal area	A teaching hospital	Molecular	1703	31	81	81
*142	123	Wang et al.	2015	Hospital	Jan 2011	Dec 2013	Taiwan	Cohort (Retrospective)	Adults hospitalized patients with nosocomial *S. aureus* bacteremia	Blood	Two tertiary teaching hospitals	Molecular	353	59	160	353
143	124	Warren	2012	Hospital	Jan 2011	Feb 2011	Australia	Cross-sectional	Patients aged over 18 years old and clinical staff	Nose	A medical practice clinical treatment room	Not defined	100	3	3	26
144	125	Williamson et al.	2013	Hospital	Jan 2005	Dec 2011	New Zealand	Cross-sectional	Hospitalized patients	Not reported	Community and hospital laboratories	Epidemiological	100000	9	18	18
*145	126	Wu et al.	2010	Community	Aug 2008	Jul 2009	China	Cross-sectional	Children with community-acquired *S. aureus* SSTIs aged 11 days -14 years old	Not reported	Outpatient surgery department of a children's hospital	Not defined	1104	14	14	351
146	127	Wu et al.	2011	Hospital	Jul 2004	Jul 2009	Taiwan	Cross-sectional	Patients with infective endocarditis (IE) aged 19-92 years old	Blood	A teaching hospital	Epidemiological	200	14	44	109
147	128	Wu et al.	2013	Hospital	Jan 2007	Dec 2007	Taiwan	Cross-sectional	Patients with community-acquired pneumonia	Sputum; Tracheal aspirates; Broncho-alveolar lavage fluid; Pleural effusions; Blood; Urine	6 medical centres	Epidemiological	1645	19	49	84
*148	129	Wu et al.	2013	Hospital	Jan 2004	Dec 2008	Taiwan	Cross-sectional	Patients with community-onset MRSA bacteremia and end-stage renal disease	Endovascular lesions; Deep-seated infections	A tertiary medical centre	Molecular	57	10	57	57
149	130	Wu et al.	2017	Community	Oct 2009	Feb 2010	Taiwan	Cross-sectional	HIV-infected outpatients	Nose	Three hospitals	Not defined	714	20	20	145
150	131	Xiao et al.	2013	Hospital	Jan 2011	Jun 2011	China	Cross-sectional	Voluntaries from hospitals	Not reported	69 hospitals in 45 large cities located in 27 provinces	Not defined	1141	116	1141	1141
151	132	Xie et al.	2016	Hospital	Jan 2006	Dec 2011	China	Cross-sectional	Inpatients	Not reported	A university-affiliated hospital	Epidemiological	587	23	67	67
*152	133	Yao et al.	2010	Hospital	Dec 2002	Jun 2008	China	Cross-sectional	Patients with SSTIs aged 4 days-80 years old	Pus from infected lesion	A teaching hospital	Epidemiological	111	24	60	111
*153	134	Zhao et al.	2012	Community	Jan 2009	Aug 2010	China	Cross-sectional	Outpatients with SSTIs aged 10-92 years old	Infected sites	Surgical clinic and dermatological clinic in two teaching hospitals	Epidemiological	501	5	5	164

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

Appendix IX. Reference list for the 134 included articles

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

1. Ansari S, Gautam R, Shrestha S, Ansari SR, Subedi SN, Chhetri MR. Risk factors assessment for nasal colonization of Staphylococcus aureus and its methicillin resistant strains among pre-clinical medical students of Nepal. *BMC Res Notes*. 2016;9(1):214.

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Appendix X. Characteristics of the 153 included studies

	Community settings (N = 78)		Hospital settings (N = 75)		Both settings (N = 153)	
	n	%	n	%	n	%
Study design						
Cross-sectional	73	94	63	84	136	89
Cohort (Prospective)	2	3	4	5	6	4
Cohort (Retrospective)	0	0	4	5	4	3
Case control	3	4	4	5	7	5
Country						
Australia	6	8	12	16	18	12
Cambodia	1	1	1	1	2	1
China	10	13	11	15	21	14
Fiji	1	1	1	1	2	1
Hong Kong	3	4	2	3	5	3
India	15	19	4	5	19	12
Indonesia	0	0	1	1	1	1
Japan	8	10	2	3	10	7
Malaysia	0	0	2	3	2	1
Nepal	2	3	1	1	3	2
New Zealand	0	0	2	3	2	1
South Korea	7	9	11	15	18	12
Sri Lanka	0	0	1	1	1	1
Taiwan	21	27	20	27	41	27
Thailand	2	3	2	3	4	3
The Philippines	1	1	1	1	2	1
Vietnam	1	1	1	1	2	1
Study start year						
2000-2004	21	27	22	29	43	28
2005-2009	37	47	33	44	70	46
2010-2016	20	26	20	27	40	26
Language						
Chinese	3	4	1	1	4	3
English	75	96	74	99	149	97
Isolation site						
Multiple body site	31	40	39	52	70	46
Nose only	37	47	8	11	45	29
Blood only	6	8	11	15	17	11
Throat only	1	1	0	0	1	1
Oral cavity only	1	1	0	0	1	1
Not reported	2	3	17	23	19	12

Appendix XI. CA-MRSA definitions employed by the 153 included studies

Definitions	Community settings		Hospital settings	
	No. of study	Study Numbers	No. of study	Study Numbers
Epidemiological				
MRSA identified in the community + absence of healthcare risk factors	1	55		-
MRSA identified in the community	3	56,64,87		-
MRSA identified with absence of healthcare risk factors	6	3,16,65,85,86,94	6	9, 62, 75[a,b], 105,138,147
MRSA identified in outpatient setting + absence of healthcare risk factors	6	34,42,68,95,102,103		-
MRSA identified in outpatients or inpatients within 48 hours of hospital admission		-	1	20
MRSA identified in outpatients or inpatients within 48 hours of hospital admission + absence of healthcare risk factors	9	19,41,46,77,80,98,111,115,153	37	5,8,12,13,15,27,28[a],53,59,60[b],73,74,76,79,90,93, 96,97,104,109,110,116,117,118,119,120,121,122 ,123,124,125,135,140,144,146,151,152
MRSA identified in outpatients or inpatients within 72 hours of hospital admission	1	48	1	71[a]
MRSA identified in outpatients or inpatients within 72 hours of hospital admission + absence of healthcare risk factors		-	3	66,69,91
Molecular				
SCCmec IV or V	5	33,43,99,100,101	4	24, 54, 75[a,b], 142
Non-multidrug-resistant MRSA	1	57	2	36,58
Resistant to <3 non-beta-lactam antimicrobial classes, and with a genotype corresponding to a known CA-MRSA Complex Clone (CC)		-	2	6,7
Resistant to <3 non-beta-lactam antibiotic classes		-	2	127,128
ST59 with SCCmec IV or V		-	3	139, 141, 148
SCCmec IV, V, or VT		-	1	129
ST72-Iva		-	1	71[a]
ST1-IV, ST78-IV, ST5-IV		-	1	132
Clinical				
MRSA identified in nose		-	1	30
SSTIs		-	1	75[a,b]
Consistent with an invasive S. aureus infections		-	1	28[a]
No definition	46	1,2,4,11,14,18,21,22,23,25,26,29,32,35, 38,39,40,44,45,47,49,50,51,52,67,72,78, 82,83,88,89,92,107,108,112,113,114,12 6,130,131,133,134,136,137,145,149	12	10,17,31,37,61,63,70,81,84, 106,143,150

[a] Combination of two definitions in a single study as the selection criteria of CA-MRSA carriage cases

[b] Studies reported CA-MRSA significant risk factors and protective factors only

Appendix XII. The 134 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	8 (3)	21,32,55,87,94,113,131,136	13 (5)	6,7,10,17,27,30,61,106,132,141,143,144,151	21 (8)	6,7,10,17,21,27,30,32,55,61,87,94,106,113,131,132,136,141,143,144,151
Subgroups without specific health conditions						
Children ≤ 6 years old	11 (4)	18,32,43,44,47,68,102*, 103*,107,112,131	1 (0)	70	12 (4)	18,32,43,44,47,68,70,102*,103*,107,112,131
Children aged 7-18 years old	5 (3)	21,68,102*,103*,112	-	-	-	-
Adults > 18 years old	9 (1)	1,67,88,89,94,99,100,101,131	-	-	-	-
Household members of CA-MRSA Carriers	3 (0)	41,48,137	-	-	-	-
Pediatricians	1 (0)	49	-	-	-	-
Mothers of infants	1 (0)	45	-	-	-	-
Janitors work in non-medical institutions	1 (0)	11	-	-	-	-
Pet owners	1 (0)	134	-	-	-	-
Population without diabetes	1 (0)	83	-	-	-	-
Subgroups with these specific health conditions						
S. aureus carriage	66 (25)	1,2,3,4,11,14,16,18,19,21,22,23,25,26,29,32,33,34,35,38,39,40,42,43,44,46,47,50,51,52,55,64,65,67,68,72,77,78,80,82,83,85,86,87,88,89,92,94,98,102,103,107,108,111,112,114,115,126,130,131,133,134,136,145,149,153	51 (20)	5,6,7,8,9,10,12,13,15,17,20,24,27,28,36,37,53,61,62,63,66,69,70,73,74,79,81,90,91,93,97,105,110,117,118,119,120,121,122,123,124,125,127,128,135,140,142,143,146,147,152	117 (45)	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,32,33,34,35,36,37,38,39,40,42,43,44,46,47,50,51,52,53,55,61,62,63,64,65,66,67,68,69,70,72,73,74,77,78,79,80,81,82,83,85,86,87,88,89,90,91,92,93,94,97,98,102,103,105,107,108,110,111,112,114,115,117,118,119,120,121,122,123,124,125,126,127,128,130,131,133,134,135,136,140,142,143,145,146,147,149,152,153
Skin and soft tissue infections (SSTIs)	14 (7)	4,22,23,42,57,80,85,92,108,111,114,130,145,153	3 (2)	12,74,79	17 (9)	4,12,22,23,42,57,74,79,80,85,92,108,111,114,130,145,153
Respiratory system related Conditions	2 (1)	39, 102	3 (1)	53,62,147	5 (2)	39,53,62,102,147
Bloodstream infection (BSI)	1 (1)	78	1(0)	104	2 (1)	78,104
Ear, Nose and Throat (ENT) related conditions	4 (2)	34,46,50,51	-	-	-	-
Type 2 Diabetes Mellitus (DM)	2 (0)	35,82	-	-	-	-
Human immunodeficiency virus (HIV) carriage	1 (0)	149	-	-	-	-
Infective Endocarditis (IE)	-	-	1 (0)	146	-	-
Renal system related conditions	-	-	1 (0)	63	-	-
H1N1 infections	-	-	1 (0)	36	-	-

*Studies providing combined data on prevalence.

Appendix XIII. Risk factors for CA-MRSA carriage

Settings	Target population	Risk factor	aOR (95% CI)	P-value	Study number
Community	**General members**	Gastrointestinal diseases	2.74 (1.35,5.70)	0.011	87
		Recent hospital admission	1.55 (1.53,19.03)	0.026	87
		Age <5 years old	4.84 (1.47,15.97)	0.01	131
		Age 6-12 years old	10.21 (3.59,29.50)	< 0.001	131
		Age 20-29 years old	4.01 (1.09,14.77)	0.037	131
		Wealth index >3	1.63 (1.01,2.62)	0.046	131
		Presence of household members under aged 7	2.24 (1.53,3.29)	< 0.0001	136
		Using antibiotics within the past year	2.05 (1.35,3.11)	0.0007	136
	Subgroups without specific health conditions				
	Children under 18	Living in mud-thatch houses	Not reported	0.035	14
		Number of children in the family	1.11 (1.00,1.24)	0.0463	18
		Residing in northern Taiwan	1.45 (1.19,1.76)	0.0003	18
		Age 2-6 months	2.24 (1.73,2.90)	< 0.0001	18
		Children attending pre-school	4.26 (2.25,8.03)	0.007	107
		Children attending school	3.02 (1.27,7.18)	< 0.001	107
		Family size > 10 members	2.76 (1.06,7.15)	0.03	107
		Antibiotic use in past 12 months	29.37 (10.72,80.30)	< 0.001	86
	University students	Co-morbidities with upper respiratory tract infections (URTIs)	N/A	0.009	1
		Contact with pet (dog)	N/A	0.0005	1
		Recent visit to public amusement places	N/A	0.018	1
	Subgroups with these specific health conditions				
	SSTI patients	Filipino ethnicity	14.8 (3.30,70.00)	< 0.001	42
		Previous exposure to an individual who had surgery within last year	3.63 (1.05,12.60)	0.04	22
		MRSA nasal carriage	4.46 (1.25,15.89)	0.02	22
		Recent antibiotics treatment for SSTIs in the year before infection	6.02 (1.28,28.83)	0.02	22
	HIV carriage	Incarceration	8.11 (2.10,30.31)	0.002	149
Hospital	**General members**	Aboriginal Australian	6.0 (1.4,25.7)	< 0.01	7
		Presence of a nasogastric tube	3.53 (2.26,10.75)	0.0282	122
		Prior usage of antipseudomonal penciling	3.09 (1.45,6.58)	0.0035	122
		Prior usage of antifungals	3.45 (1.11,10.74)	0.033	122
		Being female	2.55 (1.30,5.04)	0.0007	60
		Prior hospitalization with previous year	2.18 (1.10,4.32)	0.026	60
		Severe sepsis or septic shock	3.05 (1.09,8.35)	0.034	60
		Surgical site infection	4.63 (1.38,15.59)	0.013	60
		Sharing of personal items with other persons	4.71 (1.43,15.59)	0.01	75
	Subgroups with these specific health conditions				
	S.aureus carriage	Abscess formation	5.7	< 0.001	8
		Completed at least 48 hours of anti-MSSA antibiotics at infection presentation	2.8	0.001	8
		Age greater than 1 year	3	0.003	8
		Family history of staphylococcal infection of SSTIs	6.4	< 0.001	8
		Infection presentation in spring	2	0.033	8
		Aboriginal ethnicity	3.8	0.011	8
		Being female	1.50 (1.10,20.00)	N/A	127
		Remote residence	1.80 (1.20,2.50)	N/A	127
		Bone and joint infection	2.61 (1.09,6.21)	N/A	73
		Cutaneous abscess	5.46 (1.66,17.94)	< 0.01	135
		Necrotizing pneumonia or empyema	24.81 (2.63,234.03)	< 0.01	135

Appendix XIV. Protective factors for CA-MRSA carriage

Settings	Target population	Protective factor	aOR (95% CI)	P-value	Study number
Community	**General members**	Smoking habits	0.44 (0.24-0.82)	0.0096	136
	Subgroups without specific health conditions				
	Children under 18 years old	Breast feeding	0.65 (0.53-0.79)	< 0.0001	107
		Colonization with Streptococcus pneumonia	0.70 (0.53-0.79)	0.017	107
Hospital	**General members**	Hand washing frequency of 10-19 times per day	0.21 (0.06-0.72)	0.01	75
		History of acne	0.12 (0.02-0.74)	0.02	75
		Prior usage of carbapenems	0.08 (0.01-0.72)	0.024	122

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

Country	Community settings						Hospital settings						Both settings					
	Study Number	No. of studies	Pooled population	Prevalence (95% CI)[a]	Range	I^2	Study Number	No. of studies	Pooled population	Prevalence (95% CI)[a]	Range	I^2	Study Number	No. of studies	Pooled population	Prevalence (95% CI)[a]	Range	I^2
China	21	1	297	0.3 (0.0, 1.4)	-	-	151	1	587	3.9 (2.5, 5.7)	-	-	21, 151	2	884	1.8 (0, 6.8)	0.3-3.9	92.7
India	32,55	2	938	19.5 (13.1, 26.7)	16.5-23.5	79.7	30	1	683	2.3 (1.3, 3.6)	-	-	30,32,55	3	1621	12.3 (2.2, 28.9)	2.3-23.5	98.5
Taiwan	87,136	2	1838	3.7 (3.2, 4.2)	3.5-3.8	0	10,17,141	3	1991	2.3 (1.1, 3.9)	1.8-3.6	43.0	10,17,87, 136,141	5	6927	3.1 (2.0, 4.2)	1.8-3.8	80.6
Australia	94	1	699	0.3 (0, 0.9)	-	-	6,7,27,132,143	5	2325	3.0 (1.0, 5.8)	0.9-10.4	85.8	6,7,27,94 ,132,143	6	3024	2.3 (0.6, 4.8)	0.3-10.4	90.9
South Korea	113	1	89206	1.1 (1.0, 1.1)	-	-	106	1	24977	1.3 (1.1, 1.4)	-	-	106,113	2	114183	1.2 (0.9, 1.4)	1.1-1.3	88.1
Nepal	-	-	-	-	-	-	61	1	536	0.7 (0.2, 1.7)	-	-	61	1	536	0.7 (0.2, 1.7)		-
New Zealand	-	-	-	-	-	-	144	1	100000	0	-	-	144	1	100000	0*		-
Vietnam	131	1	1016	7.9 (6.3, 9.6)	-	-	-	-	-	-	-	-	131	1	1016	7.9 (6.3, 9.6)		-
Overall	21, 32, 55, 87, 94, 113, 131, 136	8	97092	5.0 (2.2, 8.8)	0.3 – 23.5	99.0	6, 7, 10, 17, 27, 30, 61, 106, 132, 141, 143, 144 151	13	131099	2.1 (0.9, 3.7)	0.0-10.4	99.1	6,7,10,17 ,21,27,30 ,32,55,61 ,87,94,10 6,113,13 1,132,13 6,141,14 3,144, 151	21	228191	3.1 (2.0, 4.4)	0.01-23.5	99.4

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	8	97092	5.0 (2.2, 8.8)	99.0	0.3-23.5	13	131099	2.1 (0.9, 3.7)	99.1	0-10.4	21	228191	3.1 (2.0, 4.4)	99.4	0-23.5
Subgroups without specific health conditions															
Children ≤ 6 years old	11[b]	13728	10.6 (5.7, 16.8)	98.8	0.5-63.6	1	251	4.4 (1.9, 6.9)	-	-	12[b]	13979	9.9 (5.4, 15.5)	98.7	0.5-63.6
Children aged 7-18 years old	5[b]	475	2.0 (0.0, 7.3)	77.3	0.3-6.7	-	-	-	-	-	-	-	-	-	
Adults > 18 years old	9	5700	2.8 (1.4, 4.6)	90.0	0.4-12.0	-	-	-	-	-	-	-	-	-	
Household members of CA-MRSA carriers	3	409	23.0 (16.8, 29.8)	50.5	13.0-26.4	-	-	-	-	-	-	-	-	-	
Pediatricians	1	220	6.8 (3.8, 10.6)	-	-	-	-	-	-	-	-	-	-	-	
Mothers of infants	1	262	8.0 (5.0, 11.6)	-	-	-	-	-	-	-	-	-	-	-	
Janitors work in non-medical institutions	1	75	1.3 (0, 5.6)	-	-	-	-	-	-	-	-	-	-	-	
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	66	190115	17.0 (13.5, 20.9)	99.5	0.2-74.4	51	131431	15.0 (10.7, 19.9)	99.2	0.4-44.4	117	321546	15.9 (13.9, 18.0)	99.4	0.2-74.4
SSTIs	14	5669	12.9 (5.5, 22.8)	98.9	1.0-49.1	3	842	11.6 (3.6, 21.1)	94.4	4.7-23.8	17	6511	12.7 (6.3, 20.9)	98.7	1.0-49.1
Respiratory system-related conditions	2	1356	1.5 (0.3, 3.5)	80.2	0.7-2.4	3	3119	1.3 (0.7, 2.2)	67.7	0.8-2.2	5	4475	1.4 (0.8, 2.1)	67.4	0.7-2.4
BSI	1	360	20.0 (16.0, 24.3)	-	-	1	76	5.3 (1.2, 11.6)	-	-	2	436	12.1 (1.7, 29.5)	91.9	5.1-20.0
ENT-related conditions	4	1264	11.5 (3.2, 24.0)	96.9	2.7-23.8	-	-	-	-	-	-	-	-	-	
Type 2 DM	2	1189	2.5 (0.4, 6.1)	90.4	1.2-4.2	-	-	-	-	-	-	-	-	-	
HIV carriage	1	714	2.8 (1.7, 4.2)	-	-	-	-	-	-	-	-	-	-	-	
IE	-	-	-	-	-	1	200	7.0 (3.8, 11.0)	-	-	-	-	-	-	
Renal system related conditions	-	-	-	-	-	1	296	6.4 (3.9, 9.5)	-	-	-	-	-	-	
H1N1 infections	-	-	-	-	-	1	4491	0.0 (0.0, 0.0)	-	-	-	-	-	-	

[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; IE, infective endocarditis; 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	5[b]	366	77.8 (61.9, 90.5)	90.0	46.8-90.6	2	29	80.5 (25.7, 100.0)	82.9	50.0-95.7	7[b]	395	79.7 (65.5, 91.1)	86.4	46.8-95.7
Tetracycline															
Tetracycline	2	136	81.7 (41.8, 100.0)	96.0	62.5-95.3	2	29	62.6 (43.1, 80.5)	0	50.0-65.2	4	136	73.2 (45.8, 94.0)	89.9	50.0-95.3
Minocycline	2[b]	183	0.5 (0, 2.3)	-	-	1	227	13.7 (9.5, 18.5)	-	-	3[b]	410	5.2 (0, 24.7)	97.1	0.5-13.7
Fluoroquinolones															
Ofloxacin	1	64	12.5 (5.4, 21.9)	-	-	-	-	-	-	-	-	-	-	-	-
Ciprofloxacin	4[b]	302	20.4 (0, 66.7)	98.3	0.5-54.2	2	29	34.0 (16.7, 53.4)	0	33.3-34.8	6[b]	331	24.8 (1.3, 60.7)	96.6	0.5-54.2
Moxifloxacin	1	64	1.6 (0,6.6)	-	-	1	23	17.4 (4.2, 36.0)	-	-	2	87	6.9 (0, 29.2)	83.5	1.6-17.4
Sitafloxacin	-	-	-	-	-	1	227	29.1 (23.3, 35.2)	-	-	-	-	-	-	-
Cephalosporin															
Cefotaxime	-	-	-	-	-	1	227	59.9 (53.4, 66.2)	-	-	-	-	-	-	-
Aminoglycosides															
Arbekacin	-	-	-	-	-	1	227	1.8 (0.1, 3.5)	-	-	-	-	-	-	-
Gentamicin	5[b]	366	41.5 (19.4, 65.4)	94.8	21.9-64.1	3	256	37.4 (5.5, 76.3)	91.2	16.7-67.0	8[b]	622	40.3 (21.7, 60.4)	95.1	16.7-67.0
Co-trimoxazole	4[b]	319	9.2 (0, 35.0)	96.6	0.5-35.9	1	6	83.3 (41.4, 100.0)	-	-	5[b]	325	19.0 (0.5, 50.3)	96.2	0.5-83.3
Miscellaneous															
Clarithromycin	-	-	-	-	-	1	227	58.1 (51.7, 64.5)	-	-	-	-	-	-	-
Chloramphenicol	1	72	11.1 (4.7, 19.6)	-	-	-	-	-	-	-	-	-	-	-	-
Clindamycin	5[b]	366	70.8 (46.2, 90.3)	95.2	25.5-90.6	1	23	95.7 (82.3, 100.0)	-	-	6[b]	389	76.3 (54.8, 92.6)	94.3	25.5-95.7
Levofloxacin	-	-	-	-	-	1	227	55.5 (49.0, 61.9)	-	-	-	-	-	-	-
Rifampin	2	136	6.7 (0.9, 16.3)	68.2	3.1-11.1	1	23	4.3 (0, 17.7)	-	-	3	159	6.1 (1.8, 12.3)	37.5	3.1-11.1

[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	5	55,65,87,136*,137*	2	69,151	7	55,65,69,87,136*,137*,151
Tetracycline						
Tetracycline	2	65,87	2	69,151	4	65,69,87,151
Minocycline	2	136*, 137*	1	54	3	54, 136*,137*
Fluoroquinolones						
Ofloxacin	1	87	-	-	-	-
Ciprofloxacin	4	55,65,136*,137*	2	69,151	6	55,65,69,136*,137*,151
Moxifloxacin	1	87	1	151	2	87,151
Sitafloxacin	-	-	1	54	-	-
Cephalosporin						
Cefotaxime	-	-	1	54	-	-
Aminoglycosides						
Arbekacin	-	-	1	54	-	-
Gentamicin	5	55,65,87,136*,137*	3	54,69,151	8	54,55,65,69,87,136*,137*,151
Co-trimoxazole	4	65,87,136*,137*	1	69	5	65,69,87,136*,137*
Miscellaneous						
Clarithromycin	-	-	1	54	-	-
Chloramphenicol	1	65	-	-	-	-
Clindamycin	5	55,65,87,136*,137*	1	151	6	55,65,87,136*,137*,151
Levofloxacin	-	-	1	54	-	-
Rifampin	2	65,87	1	151	3	65,87,151

* Provided combined data on antibiotic resistance

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	21,113,136	1.6%	(0.1, 4.6)	43176	2	7,141	5.5%	(0.0, 20.8)	1222
Male	3	21,113,136	1.7%	(0.4, 3.9)	49404	2	7,141	4.8%	(0.2, 13.9)	682
Settings										
Outpatient or emergency visits	3	55,113,136	6.5%	(2.1, 13.1)	92504	-	-	-	-	-
Others[a]	5	21,32,87,94,131	4.1%	(0.7, 10.0)	4588	-	-	-	-	-
Isolation sites										
Single	4	21,87,94,136	1.7%	(0.4, 3.7)	5932	7	10,27,30,61,106,132,143	1.7%	(1.0, 2.6)	28206
Multiple	4	32,55,113,131	10.2%	(1.9, 24.1)	91160	3	6,7,141	3.4%	(0.6, 8.8)	2129
Study year (Start year)										
2000-2004	2	32,87	8.9%	(0.5, 25.5)	2576	1	27	1.2%	(0.1, 2.9)	257
2005-2009	4	55,94,113,136	4.2%	(1.3, 8.5)	93203	8	6,7,17,106,132,141,144,151	2.2%	(0.8, 4.3)	129412
2010-2016	2	21,131	3.1%	(0.0, 14.4)	1313	4	10,30,61,143	1.9%	(0.7, 3.6)	1430
Study year (Mid-year)										
2000-2004	1	87	3.5%	(2.7, 4.4)	1838	1	27	1.2%	(0,1, 2.9)	257
2005-2009	5	32,55,94,113,136	6.2%	(2.1, 12.4)	93941	7	6,7,17,132,141,144,151	2.5%	(0.5, 5.9)	104435
2010-2016	2	21,131	3.1%	(0.0, 14.4)	1313	5	10,30,61,106,143	1.5%	(0.8, 2.4)	26407
Study year (End year)										
2000-2004	1	87	3.5%	(2.7, 4.4)	1838	1	27	1.2%	(0.1, 2.9)	257
2005-2009	5	32,55,94,113,136	6.2%	(2.1, 12.4)	93941	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	7	10,30,61,106,143,144,151	1.6%	(0.4, 3.4)	126994
Publication year										
2000-2008	1	87	3.5%	(2.7, 4.4)	1838	1	27	1.2%	(0.1, 2.9)	257
2009-2014	6	32,55,94,113,131,136	6.5%	(2.5, 12.2)	94957	7	6,7,17,132,141,143,144	2.3%	(0.4, 5.6)	103948
2015-2016	1	21	0.3%	(0.0, 1.4)	297	5	10,30,61,106,151	2.0%	(1.0, 3.3)	26894
Definition of CA-MRSA										
Presence	3	55,87,94	6.0%	(0.4, 1.7)	2737	8	6,7,27,30,132,141,144,151	2.2%	(0.4, 5.1)	105198
Absence	5	21,32,113,131,136	4.5%	(1.2, 9.7)	94355	5	10,17,61,106,143	1.6%	(0.8, 2.8)	25901
Countries' status										
High-mortality developing	2	32,55	19.5%	(13.1, 26.7)	938	2	30,61	1.5%	(0.3, 3.4)	1219
Low-mortality developing	5	21,87,113,131,136	2.8%	(1.0, 5.6)	95455	5	10,17,106,141,151	2.3%	(1.3, 3.6)	27555
Developed	1	94	0.3%	(0.0, 0.9)	699	6	6,7,27,132,143,144	2.1%	(0.1, 5.9)	102325
Laboratory procedures										
CLSI guidelines	7	21,32,55,87,94,131,136	5.8%	(2.4, 10.5)	7886	9	6, 7,10,17,27,30,61,141,151	2.6%	(1.4, 4.0)	4480
No specific guideline	1	113	1.1%	(1.0, 1.1)	89206	4	106,132,143,144	1.2%	(0.0, 3.5)	126619

[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 136 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	Yes	Yes	Low
4	4	Bhat et al. 2016	Yes	Yes	No	Yes	Yes	Yes	High
5	5	Bounchiat et al. 2015	Yes	Yes	Yes	Yes	Yes	Yes	Low
6,7	6	Brennan et al. 2013	Yes	Yes	Yes	Yes	Yes	Yes	Low
9	8	Buntaran et al. 2013	Yes	Yes	Yes	Yes	Yes	Yes	Low
10,11	9	Chang et al. 2015	Yes	Yes	No	Yes	Yes	Yes	High
12	10	Changchien et al. 2011	Yes	Yes	Yes	Yes	Yes	Yes	Low
13	11	Changchien et al. 2016	Yes	Yes	Yes	Yes	Yes	Yes	Low
14	12	Chatterjee et al. 2009	Yes	Yes	No	Yes	Yes	Yes	High
15	13	Chen et al. 2005	Yes	Yes	Yes	Yes	Yes	Yes	Low
16	14	Chen et al. 2010	Yes	Yes	Yes	Yes	Yes	Yes	Low
17	15	Chen et al. 2010	Yes	Yes	No	Yes	Yes	Yes	High
18	16	Chen et al. 2011	Yes	Yes	No	Yes	Yes	Yes	High
19	17	Chen et al. 2012	Yes	Yes	Yes	Yes	Yes	Yes	Low
20	18	Chen et al. 2014	Yes	Yes	Yes	Yes	Yes	Yes	Low
21	19	Chen et al. 2015	Yes	Yes	No	Yes	Yes	Yes	High
23	21	Chung et al. 2008	No	Yes	No	Yes	Yes	Yes	High
24	22	Coombs et al. 2013	Yes	Yes	Yes	Yes	Yes	Yes	Low
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	Yes	No	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	No	No	Yes	Yes	High
37	35	Henman et al. 2012	Yes	Yes	No	No	Yes	Yes	High
39	37	Hirakata et al. 2005	Yes	Yes	No	Yes	Yes	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	No	Yes	High
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	Yes	Low
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	Yes	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	Yes	High
52	49	INSAR 2013	Yes	Yes	No	Yes	Yes	Yes	High
53	50	Ishida et al. 2015	Yes	Yes	No	No	Yes	Yes	High
54	51	Ito et al. 2015	Yes	Yes	No	Yes	Yes	No	High
55	52	Jain et al. 2014	Yes	Yes	Yes	Yes	Yes	Yes	Low
56	53	Jamaluddin et al. 2008	Yes	Yes	No	Yes	Yes	Yes	High
58	54	Jenney et al. 2014	Yes	Yes	No	Yes	Yes	No	High
61	57	Joshi et al. 2017	Yes	Yes	No	Yes	Yes	Yes	High
62	58	Jung et al. 2013	Yes	Yes	Yes	No	Yes	Yes	High
63	59	Kang et al. 2012	Yes	Yes	No	Yes	Yes	Yes	High
64	60	Kawaguchiya et al. 2011	Yes	Yes	Yes	Yes	No	Yes	High
65	61	Kim et al. 2007	Yes	Yes	Yes	Yes	Yes	Yes	Low
66	62	Kim et al. 2014	Yes	Yes	Yes	Yes	Yes	Yes	Low
67	63	Kitti et al. 2011	Yes	Yes	No	Yes	Yes	Yes	High
68	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
69	65	Krishna et al. 2004	Yes	Yes	Yes	Yes	Yes	Yes	Low
70	66	Kuo et al. 2013	Yes	Yes	No	Yes	Yes	Yes	High
71	67	Kwon et al. 2011	Yes	Yes	Yes	Yes	Yes	No	High
72	68	Lee et al. 2011	Yes	Yes	No	Yes	Yes	Yes	High
76	72	Li et al. 2013	Yes	Yes	Yes	Yes	Yes	Yes	Low
77	73	Liao et al. 2005	Yes	Yes	Yes	Yes	Yes	Yes	Low
79, 80	75	Lin et al. 2011	Yes	Yes	Yes	Yes	Yes	Yes	Low
81	76	Lin et al. 2015	Yes	Yes	No	Yes	Yes	Yes	High
82, 83	77	Lin et al. 2016	Yes	Yes	No	Yes	Yes	Yes	High
84	78	Liu et al. 2012	Yes	Yes	No	No	Yes	No	High
85	79	Liu et al. 2016	Yes	Yes	Yes	Yes	Yes	Yes	Low
86	80	Lo et al. 2008	Yes	Yes	Yes	Yes	Yes	Yes	Low
87	81	Lu et al. 2005	Yes	Yes	Yes	Yes	Yes	Yes	Low
88	82	Ma and Luo 2011	Yes	Yes	No	Yes	Yes	Yes	High
89	83	Ma et al. 2011	Yes	Yes	No	Yes	Yes	Yes	High
91	85	Mekviwattanawong et al. 2006	Yes	Yes	Yes	No	Yes	Yes	High
92	86	Mine et al. 2013	Yes	Yes	No	Yes	Yes	Yes	High
93	87	Moon et al. 2010	Yes	Yes	Yes	Yes	Yes	Yes	Low
94	88	Munckof et al. 2008	Yes	Yes	Yes	Yes	Yes	Yes	Low
97, 98	90	Nimmo et al. 2013	Yes	Yes	Yes	Yes	Yes	Yes	Low
99, 100, 101	91	Nozaki et al. 2015	Yes	Yes	Yes	Yes	No	Yes	High
102, 103	92	Ozaki et al. 2009	Yes	Yes	Yes	Yes	Yes	Yes	Low
104	93	Park et al. 2009	Yes	Yes	Yes	No	Yes	Yes	High
105	94	Park et al. 2015	Yes	Yes	Yes	No	Yes	Yes	High
106	95	Park et al. 2016	Yes	Yes	No	No	Yes	Yes	High
107	96	Pathak et al. 2010	Yes	Yes	No	Yes	Yes	Yes	High
108	97	Patil et al. 2006	Yes	Yes	No	Yes	Yes	Yes	High
109	98	Qiao et al. 2013	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
110	99	Qiao et al. 2014	Yes	Yes	Yes	No	Yes	Yes	High
111	100	Ravishankar et al. 2014	Yes	Yes	Yes	Yes	Yes	Yes	Low
112	101	Rijal et al. 2008	Yes	Yes	No	Yes	Yes	Yes	High
113	102	Ro et al. 2012	Yes	Yes	No	No	Yes	Yes	High
114	103	Sahoo et al. 2014	Yes	Yes	No	Yes	Yes	Yes	High
115	104	Shetty et al. 2014	Yes	Yes	Yes	Yes	Yes	Yes	Low
116	105	Sit et al. 2017	Yes	Yes	Yes	Yes	Yes	Yes	Low
117,118, 119,120, 121,122, 123,124	106	Song et al. 2011	Yes	Yes	Yes	Yes	No	Yes	High
125	107	Sun et al. 2013	Yes	Yes	Yes	Yes	Yes	Yes	Low
126	108	Tangchaisuriya et al. 2014	Yes	Yes	No	Yes	Yes	Yes	High
127	109	Tong et al. 2009	Yes	Yes	Yes	Yes	Yes	Yes	Low
129	111	Tsao et al. 2014	Yes	Yes	Yes	Yes	Yes	No	High
130	112	Umashankar et al. 2004	Yes	Yes	No	Yes	Yes	Yes	High
131	113	Van Nguyuen et al. 2014	Yes	Yes	No	Yes	Yes	Yes	High
132	114	Verwer et al. 2011	Yes	Yes	Yes	Yes	Yes	Yes	Low
133	115	Vlack et al. 2006	Yes	Yes	No	Yes	No	Yes	High
134	116	Wan et al. 2011	Yes	Yes	No	Yes	Yes	Yes	High
135	117	Wang et al. 2008	Yes	Yes	Yes	No	Yes	Yes	High
136, 137	118	Wang et al. 2009	Yes	Yes	No	Yes	Yes	Yes	High
138	119	Wang et al. 2010	Yes	Yes	Yes	Yes	Yes	Yes	Low
139	120	Wang et al. 2010	Yes	Yes	Yes	Yes	Yes	No	High
141	122	Wang et al. 2010	Yes	Yes	Yes	Yes	Yes	Yes	Low
143	124	Warren 2012	Yes	Yes	No	No	Yes	Yes	High
144	125	Williamson et al. 2013	Yes	Yes	Yes	No	Yes	No	High
145	126	Wu et al. 2010	Yes	Yes	No	Yes	Yes	Yes	High
146	127	Wu et al. 2011	Yes	Yes	Yes	No	Yes	Yes	High
147	128	Wu et al. 2013	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
148	129	Wu et al. 2013	Yes	Yes	Yes	Yes	Yes	Yes	Low
149	130	Wu et al. 2017	Yes	Yes	No	Yes	Yes	Yes	High
150	131	Xiao et al. 2013	Yes	Yes	No	Yes	Yes	No	High
151	132	Xie et al. 2016	Yes	Yes	Yes	Yes	Yes	Yes	Low
152	133	Yao et al. 2010	Yes	Yes	Yes	No	Yes	Yes	High
153	134	Zhao et al. 2012	Yes	Yes	Yes	Yes	Yes	Yes	Low

Appendix XXI. Results of bias assessment of 7 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	Yes	Yes	Yes	Yes	Yes	Yes	Low
38	36	Heo et al. 2007	No	Yes	No	No	Yes	No	High
60	56	Joo et al. 2012	Yes	Yes	Yes	Yes	Yes	Yes	Low
75	71	Leung et al. 2012	Yes	Yes	Yes	Yes	No	Yes	High
78	74	Lim et al. 2014	Yes	Yes	Yes	Yes	Yes	Yes	Low
128	110	Tong et al. 2010	Yes	Yes	Yes	Yes	Yes	Yes	Low
140	121	Wang et al. 2010	Yes	Yes	Yes	Yes	Yes	Yes	Low

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 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	No	Yes	Yes	High
28	26	Eshwara et al. 2013	Yes	No	Yes	No	Yes	Yes	High
57	54	Jenny et al. 2014	Yes	No	Yes	No	Yes	Yes	High
59	55	Joo et al. 2012	Yes	No	Yes	No	Yes	Yes	High
73	69	Lee et al. 2014	Yes	No	Yes	Yes	Yes	No	High
74	70	Lee et al. 2015	Yes	Yes	Yes	Yes	Yes	No	High
90	84	McMullan et al. 2016	Yes	No	Yes	No	Yes	Yes	High
95,96	89	Nickerson et al. 2011	Yes	No	Yes	No	Yes	Yes	High
142	123	Wang et al. 2015	Yes	No	Yes	No	Yes	No	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	3	2737	6.0 (0.4, 17.0)	0.3-23.5	98.4	5	4354	2.9 (1.5, 4.7)	0.9-10.4	88.0	8	7091	3.9 (1.6, 6.5)	0.3-23.5	95.7
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)	-	-	-	-	-	-	-	-	-	-	-	-
Household members of CA-MRSA carriers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pediatricians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mothers of infants	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Janitors work in non-medical institutions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pet owners	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Population without diabetes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subgroups with these specific health conditions															
S. aureus carriage	25	154009	12.0 (7.7, 17.1)	0.2-74.4	99.1	20	123427	14.3 (7.6,22.6)	0.4-42.5	99.5	45	277429	12.7 (10.5, 15.0)	0.2-74.4	99.4
Skin and soft tissue infections (SSTIs)	7	2800	10.4 (3.3, 20.8)	1.0-29.0	97.9	2	377	16.2 (5.2, 31.7)	10.1-23.8	91.6	9	3177	11.6 (4.8, 20.8)	1.0-29.0	97.6
Respiratory system related Conditions	1	426	0.7 (0.1, 1.8)	-	-	1	1645	1.2 (0.7, 1.7)	-	-	2	2071	1.0 (0.6, 1.5)	0.7-1.2	0
Bloodstream infection (BSI)	1	360	20.0 (16.0, 24.3)	-	-	-	-	-	-	-	-	-	-	-	-
Ear, Nose and Throat (ENT) related conditions	2	866	10.9 (0, 3.9)	2.7-23.8	98.9	-	-	-	-	-	-	-	-	-	-
Type 2 Diabetes Mellitus (DM)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Human immunodeficiency virus (HIV) carriage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Infective Endocarditis (IE)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renal system related conditions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H1N1 infections	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

[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	Reason for exclusion
31	The denominator is number of MRSA cases.
54	The denominator is number of MRSA cases.
56	Age group is not specified.
58	The denominator is number of MRSA cases.
59	The denominator is number of MRSA cases.
60	Only risk factors are reported.
71	The denominator is number of MRSA cases.
75	Only risk factors are reported.
76	The denominator is number of MRSA cases.
84	The denominator is number of MRSA cases.
95	Age group is not specified.
96	Age group is not specified.
109	Age group categorization does not match our meta-analysis. Number of S. aureus is not reported.
116	The denominator is number of MRSA cases.
129	The denominator is number of MRSA cases.
138	The denominator is number of MRSA cases.
139	The denominator is number of MRSA cases.
148	The denominator is number of MRSA cases.
150	The denominator is 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
	32	Goud et al.	2011	Community	33	21
	43	Ho et al.	2012	Community	2211	12
	44	Hunag and Chen	2015	Community	273	110
	47	Huang et al.	2007	Community	3046	221
	68	Ko et al.	2008	Community	204	8
	70	Kuo et al.	2013	Hospital	251	11
	102,103	Ozaki et al.	2009	Community	217	1
	107	Pathak et al.	2010	Community	1562	16
	112	Rijal et al.	2008	Community	40	13
	131	Van Nguyuen et al.	2014	Community	85	10
Children aged 7-18 years old	21	Chen et al.	2015	Community	297	1
	68	Ko et al.	2008	Community	92	6
	102,103	Ozaki et al.	2009	Community	71	1
	112	Rijal et al.	2008	Community	15	1
Adults > 18 years old	1	Ansari et al.	2016	Community	200	8
	67	Kitti et al.	2011	Community	200	2
	88	Ma and Luo	2011	Community	1634	41
	89	Ma et al.	2011	Community	2103	22
	94	Munckhof et al.	2009	Community	507	2
	99	Nozaki et al.	2015	Community	100	3
	100	Nozaki et al.	2015	Community	94	3
	101	Nozaki et al.	2015	Community	200	24
	131	Van Nguyuen et al.	2014	Community	662	28

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	55	Jain et al.	2014	Community	47	22
	65	Kim et al.	2007	Community	72	60
	87	Lu et al.	2005	Community	64	58
	136, 137	Wang et al.	2009	Community	183	151
	69	Krishna et al.	2004	Hospital	6	3
	151	Xie et al.	2016	Hospital	23	22
Tetracycline group						
Tetracycline	65	Kim et al.	2007	Community	72	45
	87	Lu et al.	2005	Community	64	61
	69	Krishna et al.	2004	Hospital	6	3
	151	Xie et al.	2016	Hospital	23	15
Minocycline	136, 137	Wang et al.	2009	Community	183	1
	54	Ito et al.	2015	Hospital	227	31
Fluoroquinolones group						
Ofloxacin	87	Lu et al.	2005	Community	64	8
Ciprofloxacin	55	Jain et al.	2014	Community	47	11
	65	Kim et al.	2007	Community	72	39
	136, 137	Wang et al.	2009	Community	183	1
	69	Krishna et al.	2004	Hospital	6	2
	151	Xie et al.	2016	Hospital	23	8
Moxifloxacin	87	Lu et al.	2005	Community	64	1
	151	Xie et al.	2016	Hospital	23	4
Sitafloxacin	54	Ito et al.	2015	Hospital	227	66
Cephalosporin group						
Cefotaxime	54	Ito et al.	2015	Hospital	227	136
Aminoglycosides group						
Arbekacin	54	Ito et al.	2015	Hospital	227	4
Gentamicin	55	Jain et al.	2014	Community	47	11
	65	Kim et al.	2007	Community	72	43
	87	Lu et al.	2005	Community	64	41
	136, 137	Wang et al.	2009	Community	183	40
	54	Ito et al.	2015	Hospital	227	152
	69	Krishna et al.	2004	Hospital	6	1
	151	Xie et al.	2016	Hospital	23	5
Co-trimoxazole	65	Kim et al.	2007	Community	72	3
	87	Lu et al.	2005	Community	64	23
	136, 137	Wang et al.	2009	Community	183	1
	69	Krishna et al.	2004	Hospital	6	5
Miscellaneous						
Clarithromycin	54	Ito et al.	2015	Hospital	227	132
Chloramphenicol	65	Kim et al.	2007	Community	72	8
Clindamycin	55	Jain et al.	2014	Community	47	12
	65	Kim et al.	2007	Community	72	60
	87	Lu et al.	2005	Community	64	58
	136, 137	Wang et al.	2009	Community	183	137
	151	Xie et al.	2016	Hopsital	23	22
Levofloxacin	54	Ito et al.	2015	Hospital	227	126
Rifampin	65	Kim et al.	2007	Community	72	8
	87	Lu et al.	2005	Community	64	2
	151	Xie et al.	2016	Hospital	23	1