APPENDICES

Determinants of MRSA prevalence in the Asia Pacific Region: a systematic review and meta-analysis

Appendix 1. Supplementary information about materials and methods

1. Search terms

PubMed

#1
(((((((Methicillin-resistant Staphylococcus aureus) OR Meticillin resistant Staphylococcus aureus)) OR (((((Staphylococcus aureus) OR S. aureus) OR S aureus) OR "S. aureus") OR "S aureus")) OR (((((meticillin) OR methicillin)) AND ((resistant) OR resistance)) AND (((((Staphylococcus aureus) OR S. aureus) OR S aureus) OR "S. aureus") OR "S aureus"))))

AND

#2
(((((((Drug resistance, Microbial) OR antimicrobial resistance) OR antibiotic resistance) OR bacterial resistance) OR methicillin resistance) OR meticillin resistance)) OR (((((((drug) OR antimicrobial) OR antibiotic) OR bacterial) OR methicillin) OR meticillin)) AND ((resistant) OR resistance))))

AND

#3
((American Samoa OR Australia OR Brunei Darussalam OR Cambodia OR China OR Cook Islands OR Fiji OR French Polynesia OR Guam OR Hong Kong OR Japan OR Kiribati OR Lao People's Democratic Republic OR Laos OR Macao OR Macau OR Malaysia OR Marshall Islands OR Micronesia, Federated States of OR Micronesia OR Mongolia OR Nauru OR New Caledonia OR New Zealand OR Niue OR Northern Mariana Islands, Commonwealth of the OR Palau OR Papua New Guinea OR Philippines OR Pitcairn Islands OR Republic of Korea OR South Korea OR Korea OR Samoa OR Singapore OR Solomon Islands OR Tokelau OR Tonga OR Tuvalu OR Vanuatu OR Viet Nam OR Wallis and Futuna OR Indonesia OR Myanmar OR Burma OR Taiwan OR Thailand OR Timor-Leste OR Asia OR Western Pacific OR Western Pacific Region))

Search term: #1 AND #2 AND #3; Filter: Humans

Embase (Embase Classic + Embase 1947 – 2017 February 15)

1. Methicillin-resistant Staphylococcus aureus.mp. or exp methicillin resistant Staphylococcus aureus/
2. Meticillin-resistant Staphylococcus aureus.mp.
3. Methicillin.mp. or exp meticillin/
4. Meticillin.mp. or exp meticillin/
5. resistant.mp.
6. resistance.mp.

7. Staphylococcus aureus.mp. or exp Staphylococcus aureus/
8. "S aureus".mp.
9. methicillin resistant Staphylococcus aureus infection.mp. or exp methicillin resistant Staphylococcus aureus infection/
10. meticillin resistant Staphylococcus aureus infection.mp.
11. 3 or 4
12. 5 or 6
13. 7 or 8
14. 11 and 12 and 13
15. 1 or 2 or 9 or 10 or 13 or 14
16. Drug resistance.mp. or exp drug resistance/
17. antimicrobial resistance.mp.
18. antibiotic resistance.mp. or exp antibiotic resistance/
19. bacterial resistance.mp.
20. methicillin resistance.mp.
21. meticillin resistance.mp.
22. 16 or 17 or 18 or 19 or 20 or 21
23. drug.mp. or exp drug/
24. antimicrobial.mp. or exp antiinfective agent/
25. antibiotic.mp. or exp antibiotic agent/
26. bacterial.mp.
27. methicillin.mp.
28. meticillin.mp. or exp meticillin/
29. 23 or 24 or 25 or 26 or 27 or 28
30. 12 and 29
31. 22 or 30
32. exp American Samoa/ or exp Australia/ or exp Brunei Darussalam/ or exp Cambodia/ or exp China/ or exp Cook Islands/ or exp Fiji/ or exp French Polynesia/ or exp Guam/ or exp Hong Kong/ or exp Japan/ or exp Kiribati/ or exp Lao People's Democratic/ or exp Laos/ or exp Macao/ or exp Macau/ or exp Malaysia/ or exp Marshall Islands/ or exp Micronesia/ or exp Micronesia, federated states/ or exp Mongolia/ or exp Nauru/ or exp New Caledonia/ or exp New Zealand/ or exp Niue/ or exp Northern Mariana Islands, Commonwealth of the/ or exp Palau/ or exp Papua New Guinea/ or exp Philippines/ or exp Pitcairn Islands/ or exp Republic of Korea/ or exp South Korea/ or exp Korea/ or exp Samoa/ or exp Singapore/ or exp Solomon Islands/ or exp Tonga/ or exp Tuvalu/ or exp Vanuatu/ or exp Viet Nam/ or exp "Wallis and Futuna"/ or exp Indonesia/ or exp Myanmar/ or exp Burma/ or exp Taiwan/ or exp Thailand/ or exp Timor-Leste/ or exp Asia/ or exp Western Pacific/ or exp Western Pacific Region/
33. 15 and 31 and 32
34. limit 33 to human

2. Data extraction

Two reviewers will extract the following data from each included study using Google Forms: author and year of publication, country, type of study, study period, study population, subject age range, setting, source of infection, sample type (sampling site), sample size, laboratory method, laboratory standard for antimicrobial susceptibility testing, and proportion of resistant *S. aureus* against methicillin, cefoxitin, oxacillin, or flucloxacillin.

Descriptions for specific study types, settings, source of infection, study populations, and laboratory methods will be summarized for clarity and consistency. Studies that assess resistance proportions and MRSA prevalence through descriptive methods such as national/regional surveillance, surveys, and retrospective analysis of hospital or laboratory records will be categorized as prevalence studies. Studies that assess resistance proportions and MRSA prevalence as part of investigations into associations between antimicrobial resistance and pathogen, host, or environmental risk factors will be classified according to their study design. Hospitals, clinics, and other facilities that provide clinical care will be classified as healthcare settings, while training facilities and daycare centers are classified as community settings.

For studies that do not report source of infections, we infer the likely source by their study population and inclusion criteria. For example, studies that include specimens from inpatients without criteria to separate community and hospital-associated infections would likely capture infections from both sources, while studies that include specimens from outpatients would likely consist of infections that are community-associated. Likewise, studies that

include clinical specimens from hospitals or clinics would likely comprise both community and hospital-associated infections. Studies that include specimens from patients admitted before and after a time cut-off of 48 or 72 hours will be considered community-associated and hospital-associated respectively. For studies that do not clearly state its study population, inferences are drawn based on type of infections and medical conditions studied. For instance, severe infections such as bacteremia and pneumonia will be more likely found in inpatients.

In this study, resistance proportion is defined as the proportion of MRSA isolates among *S. aureus* isolates that are tested for antibiotic susceptibility. Prevalence is defined as the proportion of MRSA among the total number of patients sampled or cases/isolates collected in the study, without pre-selection of *S. aureus* infection or isolates. For studies that report overall resistance proportions as well as the breakdown of resistance proportions from different sources of infection or patient populations, we recorded only the resistance proportions that are specifically linked to each source of infection or patient population.

Articles that report resistance proportions and prevalence for different years, populations, or source of infections will have individual entries recorded for each year, population, and source of infection.

3. Data analysis

The overall search results (i.e. resistance proportions and prevalence of MRSA) for all countries with available data will presented by country and data categories (i.e. source of infection and population type). A meta-analysis will be conducted on extracted MRSA

prevalences and resistance proportions that are Freeman-Tukey (double arcsine) transformed and combined using a DerSimonian-Laird random-effects model. Statistical heterogeneity for MRSA prevalence and resistance proportion will be assessed by the I^2 statistic, which values correspond to the degree of variability in estimates attributable to between-study heterogeneity. As a high degree of variation is expected due to different study locations, study periods, study population, and source of infection, we will conduct meta-regression analyses for MRSA prevalence and resistance proportion separately using multivariable mixed effect models. Covariates of interest include country gross national income (GNI), study year, study population, source of infection, and sampling site. To simplify our analysis, we will group studies that were done in mixed populations (e.g. inpatients, outpatients, and healthy participants) as a "mixed" group. Studies that include samples collected from a combination of the three major sites of interest (blood, respiratory tract, and skin) will be grouped with studies that include samples from other sites, such as ocular and faecal samples; and studies that did not report specific sample collection sites were also included in the "mixed group". Laboratory methods are grouped into six groups based on the principles underlying the specific antibiotic susceptibility testing method (diffusion methods, dilution methods, screening agar, molecular methods, automated systems, and mixed methods) [REF: CLSI, AMA]. We will assess source of infection and population group as covariates in separate mixed effect models as they are likely to be correlated. All data will be visualized and analyzed in R version 3.4.1 (R Development Core Team, Vienna, Austria) and the *metafor* package.[1]

Appendix 2: List of included studies

References can be found in Supplementary 1 References

References	Country	Study period	Type of study	Setting	Source of infection[1]	Study population[2]	Antibiotic tested[3]	Resistance proportion (%, 95% CI)[4]		Prevalence (%, 95% CI)[5]	
Abu 2016 [2]	Malaysia	2001 – 2011	Prevalence	1 tertiary hospital	CA	Children admitted to hospital with community-acquired bacteraemia	CEF, OXA	7.90	[-0.68, 16.48]	1.35#	[-0.17, 2.87]
Alesana-Slater 2011 [3]	Samoa	2007 – 2008	Cross-sectional	Hospitals and 1 clinic	Mixed	Persons with SSTI	OXA	17.35	[12.05, 22.65]	8.00^	[5.41, 10.59]
Al-Talib 2010 [4]	Malaysia	2002 – 2007	Cross-sectional	1 tertiary hospital	HA	Patients admitted to different wards	CEF	24.13	[23.20, 25.06]	1.01#	[0.97, 1.05]
Anderson 2014 [5]	Laos	2000 – 2011	Cross-sectional	1 government hospital	≤ 72 hours of hospitalisation	Hospitalised infants	OXA	0	NA	0^	NA
Apisarnthanarak 2011 [6]	Thailand	2010	Prevalence	1 university hospital	Carriage	Hospitalised patients	OXA	NA	NA	3.60^	[1.29, 5.91]
Asa 2012 [7]	Papua New Guinea	2008 – 2009	Cross-sectional	1 referral hospital	CA and HA	Surgical patients with BSI	OXA	75.00	[32.57, 117.43]	2.61^	[-0.30, 5.52]
Aung 2011 [8]	Myanmar	2007 – 2008	Prevalence	1 general hospital	Mixed	Clinical specimens	OXA	4.35	[-3.99, 12.68]	NA	NA
Aung 2012 [9]	Australia	2001	Cross-sectional	1 tertiary hospital	CA and HA	BSI isolates from inpatients	FLU	46.00	[36.23, 55.77]	11.86#	[8.64, 15.07]
	Australia	2002	Cross-sectional	1 tertiary hospital	CA and HA	BSI isolates from inpatients	FLU	44.20	[35.91, 52.49]	14.88#	[11.43, 18.32]
	Australia	2003	Cross-sectional	1 tertiary hospital	CA and HA	BSI isolates from inpatients	FLU	61.90	[52.61, 71.19]	15.44#	[11.99, 18.89]
	Australia	2004	Cross-sectional	1 tertiary hospital	CA and HA	BSI isolates from inpatients	FLU	57.10	[46.52, 67.68]	13.15#	[9.68, 16.62]
	Australia	2005	Cross-sectional	1 tertiary hospital	CA and HA	BSI isolates from inpatients	FLU	47.30	[35.90, 58.68]	10.70#	[7.35, 14.05]
	Australia	2006	Cross-sectional	1 tertiary hospital	CA and HA	BSI isolates from inpatients	FLU	56.90	[45.46, 68.34]	13.85#	[9.92, 17.79]
	Australia	2007	Cross-sectional	1 tertiary hospital	CA and HA	BSI isolates from inpatients	FLU	76.30	[65.06, 87.54]	13.95#	[10.04, 17.87]
	Australia	2008	Cross-sectional	1 tertiary hospital	CA and HA	BSI isolates from	FLU	82.50	[70.72, 94.27]	11.22#	[7.62, 14.83]

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Aung 2012 [9]	Australia	2009	Cross-sectional	1 tertiary hospital	CA and HA	BSI isolates from inpatients	FLU	72.50	[58.66, 86.34]	11.65#	[7.66, 15.63]
Baek 2016 [10]	Republic of Korea	2010 – 2013	Prevalence	1 university hospital	Mixed	Clinical specimens from inpatients	OXA	61.58	[56.84, 66.31]	NA	NA
	Republic of Korea	2010 – 2013	Prevalence	1 university hospital	Mixed	Clinical specimens from outpatients	OXA	37.03	[33.03, 41.03]	NA	NA
Bamra 2009 [11]	Australia	2007	Prevalence	1 hospital emergency department	Mixed	Patients who presented to the emergency department	Not applicable (CRA)	10.96	[3.79, 18.13]	3.90^	[1.24, 6.56]
Bennett 2013 [12]	Australia	2006	Cross-sectional	1 community-based pathology service	CA	Clinical specimens submitted to a community-based pathology service	MET	11.70	[10.32, 13.08]	NA	NA
Bowen 2014 [13]	Australia	2009 – 2012	Cross-sectional	12 remote communities	Mixed	Indigenous children with untreated impetigo	CEF	14.94	[11.59, 18.29]	12.80^	[9.89, 15.70]
Brennan 2013 [14]	Australia	2009	Cross-sectional	1 tertiary referral hospital	CA and HA	Patients ≤ 48 hours of hospital admission	OXA	7.25	[1.13, 13.37]	2.20^	[0.28, 4.12]
	Australia	2010	Cross-sectional	1 tertiary referral hospital	CA and HA	Inpatients who stayed for ≥ 5 days	OXA	54.29	[42.62, 65.96]	18.90^	[13.49, 24.31]
Britton 2013 [15]	Australia	2008	Retrospective cohort	1 children's hospital microbiology database	CA	*S. aureus* isolates with antimicrobial susceptibility data	CEF	19.30	[15.57, 23.03]	NA	NA
Cen 2015 [16]	China	2011	Prevalence	1 tertiary hospital	CA and HA	Hospitalised burn patients	OXA	76.00	[67.46, 84.54]	NA	NA
	China	2012	Prevalence	1 tertiary hospital	CA and HA	Hospitalised burn patients	OXA	81.20	[72.94, 89.46]	NA	NA
	China	2013	Prevalence	1 tertiary hospital	CA and HA	Hospitalised burn patients	OXA	86.00	[78.99, 93.01]	NA	NA
Chan 2009 [17]	Singapore	2007	Prevalence (hospital surveillance)	1 general hospital	Carriage	Healthcare workers	CEF	NA	NA	20.20^	[11.86, 28.54]
Chan 2015 [18]	Hong Kong	2008	Prospective cohort	1 surgical unit	Carriage	Hospitalised nursing home residents	Not applicable (CRA)	NA	NA	39.06^	[32.16, 45.96]
Chanchaithong 2014 [19]	Thailand	2010 – 2012	Prevalence	1 veterinary teaching hospital	Mixed	Small animal veterinarians	OXA	12.50	[-0.73, 25.73]	1.50^	[-0.18, 3.18]
	Thailand	2010 – 2012	Prevalence	1 veterinary teaching hospital	Mixed	Dog owners	OXA	0	NA	0^	NA

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Chang 2015 [20]	Taiwan	2014	Prevalence	2 hospitals	Carriage	Janitors	CEF	18.52	[3.87, 33.17]	2.69^	[0.36, 5.01]
Changchien 2011 [21]	Taiwan	2004 – 2008	Cross-sectional	1 hospital	CA	Inpatients with necrotising fasciitis	OXA	27.47	[18.3, 36.64]	10.12^	[6.36, 13.88]
	Taiwan	2004 – 2008	Cross-sectional	1 hospital	HA	Inpatients with necrotising fasciitis	OXA	26.37	[17.32, 35.43]	9.72^	[6.02, 13.41]
Changchien 2016 [22]	Taiwan	2008	Cross-sectional	1 hospital	CA	Cases of *S. aureus*-associated SSTI	OXA	22.15	[17.50, 26.80]	NA	NA
	Taiwan	2008	Cross-sectional	1 hospital	HA	Cases of *S. aureus*-associated SSTI	OXA	35.50	[30.15, 40.86]	NA	NA
Chen 2005 [23]	Taiwan	2000 – 2001	Cross-sectional	1 hospital	CA	Children admitted with a positive culture for *S. aureus*	OXA	47.37	[38.20, 56.53]	NA	NA
	Taiwan	2000 – 2001	Cross-sectional	1 hospital	HA	Children admitted with a positive culture for *S. aureus*	OXA	61.90	[51.52, 72.29]	NA	NA
Chen 2010 [24]	Taiwan	2008	Cross-sectional	1 hospital	Carriage	Adult ICU patients	OXA	77.03	[67.44, 86.61]	32.20^	[25.32, 39.09]
Chen 2011 [25]	Taiwan	2005 – 2008	Cross-sectional	General health clinics in 3 hospitals	Carriage	Healthy children who visited general health check-up clinics	OXA	33.69	[31.22, 36.16]	7.81^	[7.13, 8.48]
Chen 2012 [26]	Taiwan	2007 – 2009	Cross-sectional	1 university	Carriage	Medical students	CEF	11.29	[3.41, 19.17]	2.17^	[0.58, 3.77]
Chen 2012b [27]	China	2009	Prevalence	4 burn centres	Mixed	Isolates from burn wounds	CEF, OXA	NA	NA	55.30^	[44.73, 65.87]
Chen 2013 [28]	China	2009 – 2011	Cross-sectional	3 tertiary hospitals and 1 children's hospital	CA and HA	Patients with *S. aureus* BSI	CEF, OXA	57.40	[48.07, 66.73]	NA	NA
Chen 2014 [29]	China	2008	Cross-sectional	1 general hospital surgical ICU	Carriage	ICU inpatients	CEF	NA	NA	10.50^	[8.69, 12.31]
	China	2009	Cross-sectional	1 general hospital surgical ICU	Carriage	ICU inpatients	CEF	NA	NA	1.90#	[1.64, 2.16]
Chen 2015 [30]	China	2013 – 2014	Cross-sectional	2 university campuses and 1 teaching hospital	Carriage	Volunteers from university campuses and HCW from a hospital	CEF	2.90	[0.10, 5.70]	0.70^	[0.03, 1.37]

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Chen 2017 [31]	Taiwan	2008 - 2013	Cross-sectional	1 hospital haematological ward	Mixed	Patients with haematological malignancy	OXA	42.11	[29.29, 54.92]	1.15#	[0.69, 1.61]
Chen 2017b [32]	China	2014 - 2015	Cross-sectional	1 university campus	Carriage	Volunteers residing on a medical campus	CEF	1.4	[-1.30, 4.04]	0.34^	[0.32, 1.00]
Chen 2017c [33]	China	2008	Prevalence	1 general tertiary-care regional teaching hospital	HA	Inpatients	OXA	69.5	[63.27, 75.73]	NA	NA
	China	2009	Prevalence	1 general tertiary-care regional teaching hospital	HA	Inpatients	OXA	58.3	[52.30, 64.30]	NA	NA
	China	2010	Prevalence	1 general tertiary-care regional teaching hospital	HA	Inpatients	OXA	50.2	[44.09, 56.31]	NA	NA
	China	2011	Prevalence	1 general tertiary-care regional teaching hospital	HA	Inpatients	OXA	67.4	[61.84, 72.96]	NA	NA
	China	2012	Prevalence	1 general tertiary-care regional teaching hospital	HA	Inpatients	OXA	49.6	[44.69, 54.51]	NA	NA
	China	2013	Prevalence	1 general tertiary-care regional teaching hospital	HA	Inpatients	OXA	48.3	[43.88, 52.72]	NA	NA
	China	2014	Prevalence	1 general tertiary-care regional teaching hospital	HA	Inpatients	OXA	42.1	[38.26, 45.94]	NA	NA
Cheng 2011 [34]	Hong Kong	2008	Prospective cohort	1 tertiary referral hospital surgical unit	CA and HA	Inpatients	CEF	NA	NA	9.00^	[7.83, 10.17]
Cheng 2013 [35]	Hong Kong	2011	Prospective cohort	57 long-term care facilities (LCTF)	Carriage	LCTF residents	CEF, OXA	NA	NA	21.6^	[19.81, 23.39]
	Hong Kong	2011	Prospective cohort	1 tertiary referral hospital, three extended-care hospitals and a paediatric hospital	Carriage	LCTF residents who are admitted to the five hospitals.	CEF, OXA	NA	NA	15.80^	[13.81, 17.79]
Chi 2004 [36]	Taiwan	2000	Cross-sectional	1 hospital	CA	Patients admitted with *S. aureus* BSI	OXA	1.61	[0.62, 2.60]	NA	NA

	Taiwan	2001	Cross-sectional	1 hospital	CA	Patients admitted with *S. aureus* BSI	OXA	1.62	[0.51, 2.73]	NA	NA
Chi 2006 [37]	Taiwan	2001 - 2004	Cross-sectional	1 hospital	CA	Hospitalised children with *S. aureus* toxic shock and scalded skin syndromes	OXA	68.75	[46.04, 91.46]	NA	NA
Cho 2008 [38]	Republic of Korea	2004 – 2006	Prevalence (national surveillance)	17 public health institutes	CA	Acute diarrheal patients	OXA	43.00	[40.60, 45.40]	8.98#	[8.34, 9.61]
Choi 2009 [39]	Republic of Korea	2004 – 2005	Prevalence	A military training facility	CA	Korean military recruits	OXA	37.50	[20.73, 54.27]	6.60^	[2.98, 10.22]
Chou 2015 [40]	Taiwan	2012 – 2013	Case-control	2 hospitals	CA	Patients registered at dermatology clinics	OXA	34.52	[24.36, 44.69]	29.00^	[20.11, 37.89]
Chow 2012 [41]	Singapore	2009 – 2010	Cross-sectional	1 tertiary hospital	CA	Dermatology patients, patients with HIV infection, and other infectious diseases	Not applicable (CRA)	NA	NA	11.80^	[10.46, 13.14]
Chu 2015 [42]	China	2002 – 2014	Cross-sectional	2 hospitals	Mixed	Renal transplant patients with acute respiratory distress syndrome and pneumonia caused by selected pathogens	MET	94.11	[82.93, 105.30]	18.18#	[10.12, 26.24]
Chung 2009 [43]	Republic of Korea	2005 – 2006	Prevalence	1 eye clinic	Carriage	Patients scheduled for refractive surgery	CEF	0	NA	0^	NA
Chung 2011 [44]	Republic of Korea	2008 – 2009	Prevalence (regional surveillance)	Tertiary or secondary care Hospitals	HA	Patients with hospital-acquired pneumonia and ventilator-acquired pneumonia	OXA	80.00	[70.95, 89.05]	NA	NA
	China	2008 – 2009	Prevalence (regional surveillance)	Tertiary or secondary care Hospitals	HA	Patients with hospital-acquired pneumonia and ventilator-acquired pneumonia	OXA	82.40	[75.01, 89.79]	NA	NA
	Hong Kong	2008 – 2009	Prevalence (regional surveillance)	Tertiary or secondary care Hospitals	HA	Patients with hospital-acquired pneumonia and ventilator-acquired pneumonia	OXA	84.80	[72.55, 97.05]	NA	NA
	Philippines	2008 – 2009	Prevalence (regional surveillance)	Tertiary or secondary care Hospitals	HA	Patients with hospital-acquired pneumonia and ventilator-acquired pneumonia	OXA	80.00	[44.94, 115.06]	NA	NA
	Malaysia	2008 – 2009	Prevalence (regional surveillance)	Tertiary or secondary care Hospitals	HA	Patients with hospital-acquired pneumonia and ventilator-acquired pneumonia	OXA	60.00	[29.64, 90.36]	NA	NA

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Chung 2011 [44]	Singapore	2008 – 2009	Prevalence (regional surveillance)	Tertiary or secondary care Hospitals	HA	Patients with hospital-acquired pneumonia and ventilator-acquired pneumonia	OXA	70.00	[41.60, 98.40]	NA	NA
	Taiwan	2008 – 2009	Prevalence (Regional surveillance)	Tertiary or secondary care Hospitals	HA	Patients with hospital-acquired pneumonia and ventilator-acquired pneumonia	OXA	50.00	[1.00, 99.00]	NA	NA
	Thailand	2008 – 2009	Prevalence (Regional surveillance)	Tertiary or secondary care Hospitals	HA	Patients with hospital-acquired pneumonia and ventilator-acquired pneumonia	OXA	71.4	[60.24, 82.56]	NA	NA
Coombs 2009 [45]	Australia	2006	Prevalence (national surveillance)	30 laboratories	Mixed	Clinical isolates from patients attending clinics, emergency departments or other outpatient settings, or residing in long-term care facilities	CEF, OXA	16.00	[14.70, 17.30]	NA	NA
Coombs 2013 [46]	Australia	2011	Prevalence (national surveillance)	29 laboratories	Mixed	*S. aureus* isolates from hospital inpatients	Not applicable (AUTO)	30.30	[28.40, 32.10]	NA	NA
Coombs 2014 [47]	Australia	2012	Prevalence (national surveillance)	29 laboratories	Mixed	*S. aureus* isolates from hospital outpatients	Not applicable (AUTO)	17.93	[16.52, 19.34]	NA	NA
Coombs 2014b [48]	Australia	2013	Prevalence (national surveillance)	26 laboratories	Mixed	*S. aureus* isolated from blood cultures	CEF	19.10	[17.38, 20.82]	NA	NA
Coombs 2016 [49]	Australia	2014	Prevalence (national surveillance)	27 laboratories	CA and HA	*S. aureus* isolated from blood cultures	Not applicable (AUTO)	18.77	[17.14, 20.40]	NA	NA
Dat 2017 [50]	Vietnam	2011 - 2013	Retrospective cohort	1 tertiary teaching hospital	CA	Inpatients with bacterial BSI	Not applicable (AUTO)	38.7	[21.56, 55.86]	3.00^	[1.33, 4.67]
	Vietnam	2011 - 2013	Retrospective cohort	1 tertiary teaching hospital	HA	Inpatients with bacterial BSI	Not applicable (AUTO)	0	0	0	0
Deng 2013 [51]	China	2011	Prospective cohort	5 university teaching hospitals	> 48 hours of hospitalisation	Patients > age 18 years admitted to ICUs	CEF, MET, OXA	NA	NA	12.90*	[10.38, 15.41]
Deng 2014 [52]	China	2008	Prevalence	3 primary schools	Carriage	Healthy Tibetan children	CEF	0	NA	0^	NA

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Deng 2015 [53]	China	2001 – 2010	Prevalence	1 teaching hospital	Mixed	Clinical *S. aureus* isolates	CEF	4.20	[3.03, 5.37]	NA	NA
Eun 2006 [54]	Republic of Korea	2002	Cross-sectional	8 provincial geriatric hospitals	Carriage	Inpatients	OXA	71.92	[66.97, 76.87]	36.10^	[32.36, 39.84]
Fang 2014 [55]	Taiwan	2012	Prevalence	22 pig farms and 2 pig auction markets	Carriage	Pig farm workers, auction market employees, and regular visitors	CEF	NA	NA	13.00^	[6.41, 19.59]
Feng 2013 [56]	China	2009 – 2011	Cross-sectional	1 teaching hospital	Mixed	Patients with diabetic foot infections	CEF, OXA	28.90	[22.57, 35.23]	13.29#	[10.08, 16.50]
Ghasemzadeh-Moghaddam 2014 [57]	Malaysia	2011	Prevalence	1 general hospital	≤ first week of admission	*S. aureus* isolates from hospitalised patients	Not applicable (AUTO)	36.68	[30.81, 42.55]	NA	NA
Gong 2014 [58]	China	2011 – 2012	Cross-sectional	1 hospital	Mixed	Burn patients in the burn ICU and common burn ward	CEF, OXA	98.40	[96.98, 99.82]	12.40#	[11.08, 13.72]
Gong 2017 [59]	China	2012	Cross sectional	Primary schools	Carriage	Healthy Tibetan children	CEF	18.75	[-0.38, 37.88]	0.96^	[-0.12, 2.03]
Gu 2015 [60]	China	2011 – 2012	Cross-sectional	1 trauma medical centre	CA and HA	*S. aureus* isolates from orthopaedic patients with SSI	CEF, OXA	43.90	[33.16, 54.64]	5.55#	[3.79, 7.31]
Gu 2015b [61]	China	2011 – 2013	Cross-sectional	3 hospitals	CA and HA	SA isolates of patients with SSTI	CEF	18.80	[11.72, 25.88]	NA	NA
Gu 2016 [62]	China	2016	Cross-sectional	7 nursing homes	Carriage	Residents in nursing homes	CEF	45.45	[35.65, 55.26]	10.16^	[7.34, 12.97]
Gu 2016b [63]	China	2014 – 2015	Prevalence	2 hospitals	Mixed	Patients with SSTI	CEF	25.81	[14.91, 36.70]	25.81^	[14.91, 36.70]
Hare 2013 [64]	Australia	2004-2008	Prospective cohort	1 hospital clinic	Carriage	Children diagnosed with non-cystic fibrosis bronchiectasis	MET	50.00	[9.99, 90.01]	3.80^	[-0.42, 8.02]
	Australia	2010	Prospective cohort	1 hospital clinic	Carriage	Children diagnosed with non-cystic fibrosis bronchiectasis	MET	9.09	[-7.90, 26.08]	1.32^	[-1.25, 3.89]
Hart 2015 [65]	Australia	2010 – 2011	Cross-sectional	First biennial assessment of a cohort study	Carriage	Patients with type 2 diabetes	Not applicable (CRA)	3.10	[0.99, 5.22]	1.21^	[0.38, 2.05]
He 2013 [66]	China	2010 – 2011	Cross-sectional	16 teaching hospitals	HA	Inpatients with *S. aureus* BSI	CEF, OXA	47.50	[41.13, 53.87]	NA	NA

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Hill 2011 [67]	New Zealand	2007 – 2008	Cross-sectional	1 tertiary hospital dermatology clinic	CA	Children aged <18 years with a diagnosis of atopic dermatitis	CEF	2.94	[-1.08, 6.96]	2.00^	[-0.74, 4.74]
Ho 2008 [68]	Hong Kong	2006 – 2007	Cross-sectional	6 regional hospitals	CA	Patients with purulent SSTI of less than 7 days' duration	CEF, OXA	15.08	[8.83, 21.33]	6.38^	[3.61, 9.15]
Ho 2008b [69]	Hong Kong	2005	Prevalence	487 residential care homes for elderly (RCHE)	Carriage	RCHE residents	CEF, OXA	NA	NA	5.10^	[4.01, 6.19]
Ho 2009 [70]	Hong Kong	2000	Cross-sectional	1 acute care hospital and 4 convalescence care hospitals	Mixed	SA isolates from a hospital-based clinical microbiology laboratory	CEF, OXA	36.00	[33.76, 38.24]	NA	NA
	Hong Kong	2001	Cross-sectional	1 acute care hospital and 4 convalescence care hospitals	Mixed	SA isolates from a hospital-based clinical microbiology laboratory	CEF, OXA	34.00	[31.91, 36.09]	NA	NA
	Hong Kong	2002	Cross-sectional	1 acute care hospital and 4 convalescence care hospitals	Mixed	SA isolates from a hospital-based clinical microbiology laboratory	CEF, OXA	32.40	[30.30, 34.50]	NA	NA
	Hong Kong	2003	Cross-sectional	1 acute care hospital and 4 convalescence care hospitals	Mixed	SA isolates from a hospital-based clinical microbiology laboratory	CEF, OXA	35.60	[33.38, 37.82]	NA	NA
	Hong Kong	2004	Cross-sectional	1 acute care hospital and 4 convalescence care hospitals	Mixed	SA isolates from a hospital-based clinical microbiology laboratory	CEF, OXA	31.00	[28.87, 33.13]	NA	NA
	Hong Kong	2005	Cross-sectional	1 acute care hospital and 4 convalescence care hospitals	Mixed	SA isolates from a hospital-based clinical microbiology laboratory	CEF, OXA	31.50	[29.36, 33.64]	NA	NA
Ho 2012 [71]	Hong Kong	2009 – 2010	Cross-sectional	79 day care centres and 113 kindergartens	CA	Children aged between 2 and 5 years	CEF	4.59	[2.93, 6.25]	1.27^	[0.80, 1.74]
Ho 2015 [72]	Hong Kong	2006 – 2013	Prevalence	1 university	Carriage	Year 1 medical students	CEF	1.12	[0.23, 2.01]	0.52^	[0.10, 0.94]
Hsiao 2016 [73]	Taiwan	2003 – 2007	Prevalence	Microbiology database of 1 hospital	Mixed	All corneal scrapings undertaken for cultures	OXA	58.14	[43.39, 72.89]	5.45#	[3.37, 7.52]
	Taiwan	2008 – 2012	Prevalence	Microbiology database of 1 hospital	Mixed	All corneal scrapings undertaken for cultures	OXA	59.09	[44.56, 73.62]	4.48#	[2.80, 6.17]

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Hsueh 2001 [74]	Taiwan	2000	Prevalence (national surveillance)	5 teaching hospitals	Mixed	Clinical specimens of intensive care unit patients	OXA	65.83	[59.23, 72.42]	10.28#	[8.61, 11.95]
Hu 2016 [75]	China	2005	Prevalence (national surveillance)	8 hospitals	Mixed	Clinical isolates from inpatients and outpatients	OXA	69.94	[67.96, 71.92]	6.30^	[6.01, 6.64]
	China	2006	Prevalence (national surveillance)	9 hospitals	Mixed	Clinical isolates from inpatients and outpatients	OXA	58.19	[56.44, 59.94]	5.24^	[5.00, 5.48]
	China	2007	Prevalence (national surveillance)	12 hospitals	Mixed	Clinical isolates from inpatients and outpatients	OXA	58.31	[56.65, 59.98]	5.45^	[5.22, 5.69]
	China	2008	Prevalence (national surveillance)	12 hospitals	Mixed	Clinical isolates from inpatients and outpatients	OXA	56.37	[54.73, 58.00]	5.49^	[5.25, 5.72]
	China	2009	Prevalence (national surveillance)	14 hospitals	Mixed	Clinical isolates from inpatients and outpatients	OXA	55.25	[53.70, 56.80]	4.96^	[4.76, 5.17]
	China	2010	Prevalence (national surveillance)	14 hospitals	Mixed	Clinical isolates from inpatients and outpatients	OXA	51.71	[50.24, 53.17]	4.81^	[4.62, 5.00]
	China	2011	Prevalence (national surveillance)	15 hospitals	Mixed	Clinical isolates from inpatients and outpatients	OXA	50.66	[49.39, 51.93]	5.12^	[4.94, 5.29]
	China	2012	Prevalence (national surveillance)	15 hospitals	Mixed	Clinical isolates from inpatients and outpatients	OXA	48.84	[47.69, 50.00]	4.86^	[4.70, 5.02]
	China	2013	Prevalence (national surveillance)	16 hospitals	Mixed	Clinical isolates from inpatients and outpatients	OXA	44.28	[43.21, 45.35]	4.34^	[4.20, 4.48]
	China	2014	Prevalence (national surveillance)	17 hospitals	Mixed	Clinical isolates from inpatients and outpatients	OXA	44.09	[42.94, 45.23]	4.02^	[3.88, 4.15]
Huang 2005 [76]	Taiwan	2001 – 2002	Cross-sectional	1 child-care centre and 2 schools	Carriage	School children	OXA	5.26	[0.77, 9.75]	1.91^	[0.25, 3.57]
	Taiwan	2001 – 2002	Cross-sectional	1 tertiary children's hospital	Carriage	School children	OXA	47.37	[31.49, 63.24]	13.14^	[7.48, 18.8]
Huang 2009 [77]	Taiwan	2005 – 2006	Cross-sectional	Delivery rooms of 2 hospitals	Carriage	Parturient mothers visiting delivery rooms	OXA	17.91	[11.42, 24.40]	4.81^	[2.93, 6.69]

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Huang 2009 [77]	Taiwan	2005 – 2006	Cross-sectional	Delivery rooms of 2 hospitals	Carriage	Babies born to parturient mothers visiting delivery rooms	OXA	6.98	[-0.64, 14.59]	0.60^	[-0.08, 1.27]
Huang 2011 [78]	Taiwan	2003 – 2005	Prevalence	1 hospital	CA and HA	Bacteraemic isolates from adults with cancer	OXA	55.8	[40.96, 70.64]	4.08#	[2.48, 5.68]
Huang 2013 [79]	Taiwan	2010	Prevalence	1 conference	Carriage	Paediatricians attending a conference	Not applicable (PCR)	NA	NA	6.82^	[3.49, 10.15]
Indrawattana 2013 [80]	Thailand	2007, 2010	Cross-sectional	3 hospitals	Mixed	Clinical specimens of *S. aureus*	OXA, CEF	60.87	[50.9, 70.84]	NA	NA
Ishihara 2014 [81]	Japan	2008	Prevalence	71 private veterinary clinics	Carriage	Veterinarians and veterinary technicians	OXA	NA	NA	17.47#	[11.69, 23.25]
Issler-Fisher 2016 [82]	Australia	2004 – 2014	Retrospective case-control	1 general intensive care unit	HA	Inpatients with burns	Not applicable (PCR)	NA	NA	10.1#	[8.42, 11.78]
Jia 2015 [83]	China	2012 – 2013	Prevalence	1 hospital	Mixed	Clinical specimens	CEF	29.17	[26.9, 31.45]	4.24#	[3.85, 4.62]
Jiang 2016 [84]	China	2008 – 2012	Prevalence	1 hospital	Mixed	Hospitalised neonates with sepsis	CEF	12.50	[-10.42, 35.42]	0.75^	[-0.71, 2.22]
Jones 2013 [85]	China	2011	Prevalence (surveillance)	12 medical centres	Mixed	Isolates from bacteraemias, RTI, and skin/SSTIs	OXA	45.80	[40.50, 51.07]	6.89#	[5.85, 7.93]
Jordan 2011 [86]	Australia	2009	Cross-sectional	4 veterinary conferences	Carriage	Veterinarians	CEF	NA	NA	5.84^	[4.18, 7.50]
Kang 2012 [87]	Taiwan	2011	Prospective cohort	2 hospital outpatient haemodialysis clinics	Carriage	Patients receiving haemodialysis	OXA	NA	NA	3.78#	[2.16, 5.41]
Kang 2015 [88]	Taiwan	2010 – 2011	Prevalence	1 hospital microbiology laboratory	CA and HA	Patients with *S. aureus* ocular infections	CEF	57.63	[45.02, 70.24]	NA	NA
Kang 2016 [89]	Republic of Korea	2001 – 2008	Prevalence (national surveillance)	Hospitals that are part of the National Antimicrobial Surveillance Project	Mixed	*S. aureus* isolates of clinical patients	OXA	81.44	[79.01, 83.87]	NA	NA
Kang 2017 [90]	Republic of Korea	2014 – 2015	Cross-sectional	1 children's hospital	Carriage	Inpatients	Not applicable (CRA)	55.8	[42.27, 69.27]	25.66	[17.61, 33.72]
Kawaguchiya 2011 [91]	Japan	2009	Prevalence	Hospitals and clinics in Hokkaido, Japan	CA	*S. aureus* isolates from outpatients	CEF	NA	NA	18.62#	[16.23, 21.02]

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Kim 2006 [92]	Republic of Korea	2002 – 2004	Prevalence	1 teaching hospital department	Mixed	Patients diagnosed with chronic sinusitis with nasal polyps endoscopic sinus surgery	OXA	14.00	[-0.18, 28.18]	2.47^	[-0.91, 5.85]
Kim 2007 [93]	Republic of Korea	2005	Prevalence	Laboratories of 7 community-based or tertiary hospitals	CA and HA	Cultures of patient specimens obtained from outpatient clinics, emergency rooms, or within 72 hours of admission	OXA	58.40	[56.70, 60.10]	NA	NA
Kim 2014 [94]	Republic of Korea	2012	Cross-sectional	16 hospitals	CA	Hospitalised cases of SA infections	Not applicable (AUTO)	31.68	[26.60, 36.76]	NA	NA
	Republic of Korea	2012	Cross-sectional	16 hospitals	HA	Hospitalised cases of SA infections	Not applicable (AUTO)	54.50	[49.97, 59.03]	NA	NA
Kim 2015 [95]	Republic of Korea	2008 – 2010	Prospective cohort	1 hospital	Carriage	Liver transplant recipients	Not applicable (CRA)	NA	NA	8.45^	[3.88, 13.03]
Kitti 2011 [96]	Thailand	2009 – 2010	Prevalence	1 university	Carriage	Undergraduate and graduate microbiology students	OXA	6.67	[-2.26, 15.59]	1.00^	[-0.38, 2.38]
Ko 2005 [97]	Taiwan	2004	Prevalence	1 skin clinic	Mixed	Patients attending skin clinic diagnosed with furuncle and carbuncle	OXA	31.11	[17.58, 44.64]	17.07^	[8.93, 25.21]
Ko 2008 [98]	Republic of Korea	2005 – 2006	Prevalence	1 tertiary care hospital's outpatient clinic	Carriage	Children attending outpatient clinic	OXA	18.90	[11.03, 26.77]	6.08^	[3.36, 8.80]
Ko 2009 [99]	Republic of Korea	2006	Cross-sectional	1 tertiary care hospital	Mixed	SA blood isolates from the emergency department and other wards	OXA	53.70	[44.82, 62.58]	NA	NA
Kok 2011 [100]	Australia	2008 – 2010	Cross-sectional	1 tertiary care hospital	CA and HA	Patients with SA bacteraemia episodes	MET	40.10	[33.08, 47.12]	NA	NA
Kunishima 2010 [101]	Japan	2004	Prevalence	1 regional acute care hospital	Mixed	Inpatients	OXA	45.8	[39.12, 52.48]	0.82^	[0.66, 0.98]
	Japan	2005	Prevalence	1 regional acute care hospital	Mixed	Inpatients	OXA	47.6	[41.35, 53.84]	0.93^	[0.76, 1.10]
	Japan	2006	Prevalence	1 regional acute care hospital	Mixed	Inpatients	OXA	43.5	[37.74, 49.26]	0.93^	[0.77, 1.09]

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Kunishima 2010 [101]	Japan	2007	Prevalence	1 regional acute care hospital	Mixed	Inpatients	OXA	44.2	[38.32, 50.08]	0.89^	[0.73, 1.05]
	Japan	2008	Prevalence	1 regional acute care hospital	Mixed	Inpatients	OXA	46.5	[41.24, 51.76]	1.18^	[1.00, 1.36]
Kuntaman 2016 [102]	Indonesia	2014	Prevalence	2 departments in 1 hospital	Carriage	Hospitalised patients at the time of admission	Not applicable (CRA)	NA	NA	9.33^	[7.08, 11.58]
Kuo 2014 [103]	Taiwan	2011	Cross-sectional	Neonatal ICUs in 7 medical centres	CA and non-CA	Patients admitted to neonatal ICUs	CEF	33.33	[17.25, 49.41]	4.38^	[1.85, 6.91]
Kuroda 2016 [104]	Japan	2011	Prevalence	2 racehorse training centers	Carriage	Healthy veterinarians	OXA	88.89	[74.37, 103.41]	30.2^	[17.83, 42.55]
Kyaw 2012 [105]	Singapore	2008	Cross-sectional	1 referral communicable disease centre	Carriage	HIV-positive patients who attended the specialist outpatient clinic	Not applicable (CRA)	NA	NA	5.10^	[2.59, 7.61]
Lai 2011 [106]	Taiwan	2007	Prospective cohort	1 hospital outpatient haemodialysis unit	Carriage	Outpatient haemodialysis patients	OXA	NA	NA	9.48^	[6.20, 12.76]
Lai 2013 [107]	Taiwan	2000 – 2010	Cross-sectional	1 hospital	HA	*S. aureus* bacteraemia isolates tested for oxacillin resistance	OXA	69.06	[67.15, 70.98]	7.29#	[6.94, 7.64]
Lai 2014 [108]	Taiwan	2000 – 2011	Prevalence	3 hospitals	HA	*S. aureus* bacteraemia isolates tested for oxacillin resistance	OXA	58.25	[56.95, 59.56]	5.61#	[5.42, 5.80]
Lauderdale 2010 [109]	Taiwan	2005 – 2006	Cross-sectional	2 hospitals	Carriage	Hospitalised patients in the ICU	CEF	NA	NA	23.12^	[19.95, 26.29]
Le 2006 [110]	Vietnam	2000	Cross-sectional	1 teaching hospital	HA	All surgical patients admitted to the orthopaedic and neurosurgical departments	MET	90.00	[70.00, 109.60]	1.14^	[0.36, 1.93]
Lee 2004 [111]	Republic of Korea	2001	Cross-sectional	1 tertiary-care teaching hospital	Mixed	Inpatients	OXA	70.20	[67.12, 73.28]	NA	NA
	Republic of Korea	2002	Cross-sectional	1 tertiary-care teaching hospital	Mixed	Inpatients	OXA	65.70	[62.79, 68.61]	NA	NA
	Republic of Korea	2003	Cross-sectional	1 tertiary-care teaching hospital	Mixed	Inpatients	OXA	64.10	[61.13, 67.07]	NA	NA

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Lee 2007 [112]	Taiwan	2001 – 2005	Prevalence	1 hospital	CA	Hospitalised patients with necrotizing fascitis	OXA	35.00	[14.10, 55.90]	13.21^	[4.09, 22.32]
	Taiwan	2001 – 2005	Prevalence	1 hospital	HA	Hospitalised patients with necrotizing fascitis	OXA	25.00	[6.02, 43.98]	9.43^	[1.56, 17.3]
Lee 2011 [113]	Republic of Korea	2008	Prevalence	7 day care centers	CA	Healthy preschool-aged children who attend day care centres	CEF, OXA	24.39	[17.82, 30.96]	24.39^	[17.82, 30.96]
Lee 2011b [114]	Republic of Korea	2009	Prevalence (national surveillance)	24 hospitals	Mixed	Bacteria isolates collected from participating hospitals	CEF, OXA	69.00	[68.40, 69.59]	11.45#	[11.28, 11.62]
	Republic of Korea	2009	Prevalence (national surveillance)	2 commercial laboratories	Mixed	Bacteria isolates collected from secondary-care hospitals and primary care clinics	CEF, OXA	74.00	[73.01, 74.99]	8.19#	[7.98, 8.40]
Lee 2015 [115]	Taiwan	2013	Retrospective cohort	1 hospital	CA and non-CA	Hospitalized adults with cellulitis	CEF	50.00	[37.75, 62.25]	6.88^	[4.58, 9.18]
Lestari 2008 [116]	Indonesia	2001 – 2002	Prevalence	2 university hospitals	Carriage	Inpatient	OXA	0	0	NA	NA
	Indonesia	2001 – 2002	Prevalence	2 university hospitals	Carriage	Outpatient	OXA	0	0	NA	NA
	Indonesia	2001 – 2002	Prevalence	2 university hospitals	Carriage	Healthy participants	OXA	0	0	NA	NA
Li 2013 [117]	China	2010	Cross-sectional	1 children's hospital and 1 teaching hospital	Mixed	SA isolates from children below 7 years old with BSI and SSTI	Not applicable (PCR)	22.50	[12.79, 32.21]	NA	NA
Li 2014 [118]	China	2011 – 2012	Cross-sectional	1 teaching hospital ICU	Carriage	Intensive-care unit patients	Not applicable (PCR)	NA	NA	8.86^	[5.88, 11.84]
Li 2015 [119]	China	2011 – 2013	Prevalence	1 hospital	CA and HA	Cirrhosis patients with spontaneous peritonitis	CEF	52.17	[31.76, 72.59]	5.15#	[2.31, 7.99]
Li 2016 [120]	China	2008 – 2013	Prevalence	4 hospitals	Mixed	Patients with complicated skin and soft tissue infections	MET	18.67	[9.85, 27.49]	2.66^	[1.28, 4.03]
Liao 2005 [121]	Taiwan	2001 – 2002	Cross-sectional	1 emergency department	CA	Patients with *S. aureus* bacteraemia ≤ 48 hours of arrival	OXA	97.30	[92.07, 102.52]	NA	NA

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Liao 2005 [121]	Taiwan	2001 – 2002	Cross-sectional	1 emergency department	HA	Patients with *S. aureus* bacteremia ≤ 48 hours of arrival	OXA	57.14	[44.18, 70.10]	NA	NA
Lim 2014 [122]	Australia	2011	Nested case-control	4 co-located long term care facilities	Carriage	Residents at long-term care facilities (LCTF) except those not present with recent admission or palliative care	Not applicable (CRA)	NA	NA	16.00#	[9.30, 22.70]
Lin 2007 [123]	Taiwan	2001	Prevalence	1 hospital	HA	Healthcare workers	OXA	39.02	[24.09, 53.96]	26.23^	[15.19, 37.27]
Lin 2011 [124]	Taiwan	2003 – 2007	Prevalence	1 hospital department	CA and HA	Patients with SSTI	OXA	52.97	[46.60, 59.33]	28.22#	[24.03, 32.41]
Lin 2012 [125]	Taiwan	2006 – 2008	Prevalence	1 hospital department	Carriage	Children with acute rhinosinusitis	OXA	68.75	[46.04, 91.46]	15.94^	[7.30, 24.58]
Lin 2012b [126]	Taiwan	2001 - 2010	Cross-sectional	1 university hospital	Mixed	Children with otitis media or obstructive sleep apnea undergoing adenoidectomy surgery	OXA	35.00	[22.93, 47.07]	7.4^	[4.37, 10.47]
Lin 2015 [127]	Taiwan	2008 – 2012	Prevalence	1 hospital database	Mixed	Patients with Fournier's gangrene	MET	57.14	[20.48, 93.80]	6.56#	[0.35, 12.77]
Lin 2015b [128]	Taiwan	2008 – 2011	Cross-sectional	1 hospital database	Mixed	Patients with septic arthritis	OXA	59.14	[49.15, 69.13]	28.35^	[22.01, 34.69]
Lin 2016 [129]	China	2014 – 2015	Cross-sectional	11 community settings	Carriage	People with clinically diagnosed diabetes	CEF	47.83	[33.39, 62.26]	4.16^	[2.46, 5.86]
Lin 2017 [130]	Taiwan	2015	Cross-sectional	1 burn intensive care unit	CA	Inpatients with burns	OXA	0	0	0	0
Ling 2003 [131]	Hong Kong	2000 – 2001	Prevalence	89 community doctors'/general practitioners' clinics	CA	Patients who visit participating doctors' clinics	MET	2.00	[-0.18, 4.18]	0.22#	[-0.03, 0.47]
Liu 2015 [132]	China	2011 – 2012	Cross-sectional	6 teaching hospitals	Mixed	*S. aureus* isolates from sterile body fluids	MET	41.85	[34.72, 48.98]	NA	NA
Liu 2016 [133]	China	2011 – 2013	Cross-sectional	Surgical and dermatological clinics in 3 hospitals	CA	Outpatients with SSTI	CEF	10.34	[6.16, 14.53]	1.50^	[0.86, 2.14]
Liu 2016b [134]	China	2009 – 2011	Prevalence (regional surveillance)	23 hospitals in 6 regions	CA	Children and adult patients with SSTI	OXA	2.62	[1.91, 3.33]	1.88#	[1.37, 2.39]
Lu 2005 [135]	Taiwan	2001	Cross-sectional	1 kindergarten, 3 schools, and healthcare facilities	Carriage	Community residents	OXA	16.91	[13.75, 20.08]	4.08^	[3.26, 4.90]

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Lu 2011 [136]	Taiwan	2009	Cross-sectional	1 emergency department	CA	Adult patients visiting an emergency department	OXA	21.84	[13.16, 30.52]	3.78^	[2.12, 5.45]
Luk 2014 [137]	Hong Kong	2011	Cross-sectional	15 acute hospitals	Carriage	Patients admitted to acute medical units	Not applicable (CRA)	NA	NA	14.30^	[13.50, 15.10]
Ma 2011 [138]	China	2008 – 2009	Cross-sectional	1 teaching hospital	Carriage	Third year students from a medical university	OXA	9.40	[5.66, 13.14]	1.05^	[0.61, 1.49]
MacMorran 2017 [139]	Australia	2014	Prevalence	1 teaching hospital	CA	Inpatients	OXA	60.00	[52.41, 67.59]	NA	NA
Marshall 2014 [140]	Australia	2008 – 2010	Cross-sectional	1 tertiary hospital and 1 affiliated hospital	Carriage	Patients with positive blood cultures for *S. aureus*	OXA	15.00	[7.13, 22.87]	12.00^	[5.63, 18.37]
Mat Azis 2017 [141]	Malaysia	2013	Cross-sectional	1 tertiary education institution	Carriage	Health science undergraduates	CEF	6.67	[0.35, 12.98]	2.1^	[0.06, 4.10]
McDonald 2004 [142]	Taiwan	2000	Prevalence (national surveillance)	21 hospitals	Mixed	Outpatients, paediatric inpatients, adult ICU patients	OXA	59.75	[54.94, 64.56]	27.31#	[24.36, 30.27]
Mendes 2013 [143]	Republic of Korea	2011	Prevalence (regional surveillance)	2 surveillance sites or hospital laboratories	Mixed	Isolates of specified Gram-positive and negative pathogens groups	OXA	NA	NA	73.00#	[68.95, 77.05]
	Philippines	2011	Prevalence (regional surveillance)	1 surveillance site or hospital laboratory	Mixed	Isolates of specified Gram-positive and negative pathogens groups	OXA	NA	NA	59.00#	[52.10, 65.90]
	Australia	2011	Prevalence (regional surveillance)	6 surveillance sites or hospital laboratories	Mixed	Isolates of specified Gram-positive and negative pathogens groups	OXA	NA	NA	26.00#	[23.45, 28.55]
	Hong Kong	2011	Prevalence (regional surveillance)	1 surveillance site or hospital laboratory	Mixed	Isolates of specified Gram-positive and negative pathogens groups	OXA	NA	NA	28.00#	[22.28, 33.72]
	Japan	2011	Prevalence (regional surveillance)	4 surveillance sites or hospital laboratories	Mixed	Isolates of specified Gram-positive and negative pathogens groups	OXA	NA	NA	41.00#	[36.17, 45.83]
	Malaysia	2011	Prevalence (regional surveillance)	1 surveillance site or hospital laboratory	Mixed	Isolates of specified Gram-positive and negative pathogens groups	OXA	NA	NA	32.00#	[26.09, 37.91]

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Mendes 2013 [143]	New Zealand	2011	Prevalence (regional surveillance)	2 surveillance sites or hospital laboratories	Mixed	Isolates of specified Gram-positive and negative pathogens groups	OXA	NA	NA	9.00#	[6.43, 11.57]
	Singapore	2011	Prevalence (regional surveillance)	1 surveillance site or hospital laboratory	Mixed	Isolates of specified Gram-positive and negative pathogens groups	OXA	NA	NA	52.00#	[45.82, 58.18]
	Thailand	2011	Prevalence (regional surveillance)	2 surveillance sites or hospital laboratories	Mixed	Isolates of specified Gram-positive and negative pathogens groups	OXA	NA	NA	53.00#	[48.29, 57.71]
Mine 2013 [144]	Japan	2008 – 2010	Prevalence	7 clinics and 14 hospitals	CA	Non-hospitalised patients presenting with skin and soft tissue infections	CEF	35.76	[30.85, 41.44]	19.64#	[16.15, 23.13]
Moon 2014 [145]	Republic of Korea	2010 – 2013	Cross-sectional	Laboratory and hospital databases at 1 hospital	CA	*S. aureus* isolates	Not applicable (AUTO)	33.00	[29.84, 36.16]	NA	NA
	Republic of Korea	2010 – 2013	Cross-sectional	Laboratory and hospital databases at 1 hospital	HA	*S. aureus* isolates	Not applicable (AUTO)	73.30	[71.26, 75.34]	NA	NA
Myat 2014 [146]	Myanmar	2005 – 2008	Prevalence	1 general hospital	Mixed	Outpatient or inpatient with suspected BSI or prolonged fever	OXA	38.73	[30.72, 46.74]	2.97#	[2.20, 3.75]
	Myanmar	2009 – 2013	Prevalence	1 general hospital	Mixed	Outpatient or inpatient with suspected BSI or prolonged fever	OXA	18.75	[-0.37, 37.88]	0.15#	[-0.02, 0.32]
Nair 2014 [147]	Mongolia	2007 – 2008, 2011	Prevalence	1 centre for communicable diseases	Mixed	Potentially confirmed *S. aureus* isolates	OXA	8.80	[2.59, 15.01]	NA	NA
van Nguyen 2014 [148]	Vietnam	2012	Cohort (district surveillance)	Demographic and health surveillance sites	Carriage	Healthy participants	CEF	NA	NA	7.90^	[6.24, 9.55]
Nickerson 2009 [149]	Thailand	2006 – 2007	Cross-sectional	1 hospital diagnostic microbiology laboratory	CA and HA	Patients of any age with at least one sample taken from a sterile site positive for *S. aureus*	OXA	15.56	[11.23, 19.88]	NA	NA

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Nickerson 2009b [150]	Thailand	2006 – 2007	Cross-sectional	1 hospital	CA and HA	Patients with at least 1 clinically significant blood culture positive for a pure growth of *S. aureus*	OXA	47.37	[34.41, 60.33]	25.47^	[17.18, 33.77]
Nickerson 2011 [151]	Cambodia	2008	Prevalence	1 children's hospital	Carriage	Children admitted in the hospital	CEF	NA	NA	4.10^	[0.87, 7.33]
	Cambodia	2008	Prevalence	1 children's hospital	Carriage	Children treated in the outpatient department	CEF	NA	NA	3.50^	[2.78, 4.22]
Niki 2008 [152]	Japan	2009	Prevalence (nationwide surveillance)	32 medical institutions	Mixed	Patients with RTI	OXA	63.40	[56.81, 69.99]	14.70#	[12.37, 17.03]
Niki 2009 [153]	Japan	2007	Prevalence (nationwide surveillance)	39 medical institutions	Mixed	Patients with RTI	OXA	59.70	[53.31, 66.09]	12.20#	[10.27, 14.13]
Niki 2011 [154]	Japan	2008	Prevalence (nationwide surveillance)	34 medical institutions	Mixed	Patients with RTI	OXA	59.80	[52.81, 66.79]	11.45#	[9.51, 13.49]
Nimmo 2007 [155]	Australia	2005	Prevalence	27 public and 5 private laboratories	> 48 hours after hospitalisation	Clinical isolates from patients who are admitted for > 48 hours	CEF, OXA	31.90	[29.84, 33.96]	NA	NA
Nimmo 2011 [156]	Australia	2009	Prevalence	26 hospital laboratories and 4 private laboratories	> 48 hours after hospitalisation	Patients who are admitted for > 48 hours	Not applicable (AUTO)	33.60	[31.80, 35.40]	NA	NA
Nimmo 2013 [157]	Australia	2000	Prevalence	1 state laboratory	CA and HA	Inpatients	OXA	25.00	[21.56, 28.44]	NA	NA
	Australia	2000	Prevalence	1 state laboratory	CA and HA	Outpatients	OXA	11.90	[7.77, 16.03]	NA	NA
	Australia	2001	Prevalence	1 state laboratory	CA and HA	Inpatients	OXA	24.20	[20.80, 27.60]	NA	NA
	Australia	2001	Prevalence	1 state laboratory	CA and HA	Outpatients	OXA	10.60	[7.00, 14.19]	NA	NA
	Australia	2002	Prevalence	1 state laboratory	CA and HA	Inpatients	OXA	27.60	[23.82, 31.38]	NA	NA
	Australia	2002	Prevalence	1 state laboratory	CA and HA	Outpatients	OXA	12.30	[8.52, 16.05]	NA	NA
	Australia	2003	Prevalence	1 state laboratory	CA and HA	Inpatients	OXA	17.40	[14.15, 20.65]	NA	NA

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Nimmo 2013 [157]	Australia	2003	Prevalence	1 state laboratory	CA and HA	Outpatients	OXA	9.71	[6.28, 13.14]	NA	NA
	Australia	2004	Prevalence	1 state laboratory	CA and HA	Inpatients	OXA	19.80	[16.58, 23.02]	NA	NA
	Australia	2004	Prevalence	1 state laboratory	CA and HA	Outpatients	OXA	13.40	[9.63, 17.17]	NA	NA
	Australia	2005	Prevalence	1 state laboratory	CA and HA	Inpatients	OXA	20.30	[16.93, 23.67]	NA	NA
	Australia	2005	Prevalence	1 state laboratory	CA and HA	Outpatients	OXA	13.80	[10.17, 17.42]	NA	NA
	Australia	2006	Prevalence	1 state laboratory	CA and HA	Inpatients	OXA	21.10	[17.57, 24.63]	NA	NA
	Australia	2006	Prevalence	1 state laboratory	CA and HA	Outpatients	OXA	12.60	[9.12, 16.08]	NA	NA
	Australia	2007	Prevalence	1 state laboratory	CA and HA	Inpatients	OXA	21.70	[18.21, 25.19]	NA	NA
	Australia	2007	Prevalence	1 state laboratory	CA and HA	Outpatients	OXA	14.00	[10.75, 17.25]	NA	NA
	Australia	2008	Prevalence	1 state laboratory	CA and HA	Inpatients	OXA	22.00	[18.65, 25.35]	NA	NA
	Australia	2008	Prevalence	1 state laboratory	CA and HA	Outpatients	OXA	15.60	[12.25, 18.95]	NA	NA
	Australia	2009	Prevalence	1 state laboratory	CA and HA	Inpatients	OXA	24.30	[20.78, 27.82]	NA	NA
	Australia	2009	Prevalence	1 state laboratory	CA and HA	Outpatients	OXA	14.40	[11.37, 17.43]	NA	NA
	Australia	2010	Prevalence	1 state laboratory	CA and HA	Inpatients	OXA	21.40	[17.80, 25.00]	NA	NA
	Australia	2010	Prevalence	1 state laboratory	CA and HA	Outpatients	OXA	18.20	[14.76, 21.64]	NA	NA
	Australia	2011	Prevalence	1 state laboratory	CA and HA	Inpatients	OXA	19.90	[16.41, 23.39]	NA	NA
	Australia	2011	Prevalence	1 state laboratory	CA and HA	Outpatients	OXA	16.80	[13.70, 19.90]	NA	NA
	Australia	2012	Prevalence	1 state laboratory	CA and HA	Inpatients	OXA	14.90	[11.98, 17.82]	NA	NA
	Australia	2012	Prevalence	1 state laboratory	CA and HA	Outpatients	OXA	15.10	[12.31, 17.88]	NA	NA
Nishikawa 2009 [158]	Japan	2003	Cross-sectional	1 national geriatric hospital	Carriage	Patients who are admitted due to acute geriatric illness	OXA	NA	NA	8.00^	[3.47, 12.53]

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Ong 2013 [159]	Taiwan	2006 – 2010	Cross-sectional	1 hospital microbiology laboratory	Mixed	Inpatients and outpatients with *S. aureus* keratitis	CEF	44.07	[31.40, 56.74]	NA	NA
Otsuka 2012 [160]	Japan	2009 – 2012	Prevalence	2 hospitals	Carriage and/or CA	Paediatric outpatients aged 0 -15 years and healthy children aged 3 years and below	OXA	NA	NA	0.78#	[0.54, 1.02]
Ozaki 2009 [161]	Japan	2006 – 2007	Cross-sectional	Hospitals	CA	Paediatric outpatients < age 14 years with upper RTI	Not applicable (PCR)	NA	NA	0.70^	[-0.09, 1.49]
	Japan	2007 – 2008	Cross-sectional	Community	CA	Healthy children under age 14 years living with their families	Not applicable (PCR)	NA	NA	3.68^	[0.52, 6.84]
Patchanee 2014 [162]	Thailand	2012	Prevalence	Pig farms	LA	Farm workers	CEF	46.67	[21.42, 71.91]	2.54#	[0.68, 4.39]
Pei 2013 [163]	China	2012	Prevalence (regional surveillance)	1 tertiary-care hospital	Mixed	Outpatients and inpatients with urinary, respiratory, wound, bloodstream and other infections	OXA	47.00	[41.19, 52.81]	8.10#	[6.78, 9.42]
Phetsouvanh 2006 [164]	Laos	2000 – 2004	Cross-sectional	1 hospital	CA	Patients admitted with suspected community-acquired bacteremia	MET	0	NA	0#	NA
Qiao 2014 [165]	China	2011 – 2013	Cross-sectional	3 children's hospitals	CA	Patients below age 14 years with invasive CA-*S. aureus* infections	Not applicable (PCR)	43.60	[35.99, 51.21]	NA	NA
Qu 2010 [166]	China	2007	Cross-sectional	2 military camps	Carriage	Healthy military volunteers	CEF	0	NA	0^	NA
Rahman 2013 [167]	Malaysia	2001 – 2010	Cross-sectional	Diagnostic microbiology laboratory of a tertiary hospital	Mixed	Ocular surface specimen culture records	OXA	31.50	[25.14, 37.86]	7.40#	[5.96, 8.84]
Raja 2007 [168]	Malaysia	2004 – 2005	Prevalence	Microbiology laboratory of a teaching hospital	Mixed	Inpatients or outpatients with diabetic foot infections with an infected ulcer, wound, osteomyelitis or previous amputation	OXA	16.00	[6.48, 25.52]	3.14^	[1.12, 5.16]
Raymond 2006 [169]	New Zealand	2001	Prospective cohort (local surveillance)	Hospitals	CA and HA	All positive blood cultures	OXA	1.54	[-1.45, 4.53]	0.5#	[-0.48, 1.48]

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Reinprayoon 2015 [170]	Thailand	2005 – 2009	Prevalence	1 hospital	Mixed	Ocular specimens collected from inpatients diagnosed with vision threatening ocular infection	OXA	0	NA	0#	NA
Safari 2015 [171]	Indonesia	2011	Prevalence	1 hospital geriatric clinic	Carriage	Elderly adults attending routine visits at a geriatric clinic	OXA	21.43	[9.02, 33.84]	6.04^	[2.22, 9.87]
Santosaningsih 2014 [172]	Indonesia	2007 – 2009	Cross-sectional	3 academic hospitals	Carriage	Surgery patients	Not applicable (CRA)	18.07	[14.73, 21.42]	6.13^	[4.91, 7.34]
Schlebusch 2009 [173]	Australia	2003	Prevalence	1 hospital	Mixed	SA isolates collected as part of a national staphylococcal survey	Not applicable (PCR)	12.38	[6.10, 18.70]	NA	NA
Seki 2015 [174]	Japan	2012	Cross-sectional	1 emergency department of a hospital	CA	Patients admitted to an emergency department	OXA	NA	NA	6.30#	[1.41, 11.19]
Shin 2016 [175]	Republic of Korea	2006 – 2008	Prevalence	25 public health centres	Mixed	People suspected to be infected with food poisoning	OXA	10.59	[7.32, 13.86]	0.58#	[0.39, 0.77]
Song 2011 [176]	Republic of Korea	2004 – 2006	Prevalence (regional surveillance)	7 tertiary-care or secondary-care teaching hospitals	CA	All SA isolates from participating centres	OXA	15.60	[9.73, 21.47]	NA	NA
	Republic of Korea	2004 – 2006	Prevalence (regional surveillance)	7 tertiary-care or secondary-care teaching hospitals	HA	All SA isolates from participating centres	OXA	77.60	[74.52, 80.68]	NA	NA
	Hong Kong	2004 – 2006	Prevalence (regional surveillance)	1 tertiary-care or secondary-care teaching hospitals	CA	All SA isolates from participating centres	OXA	8.50	[2.46, 14.54]	NA	NA
	Hong Kong	2004 – 2006	Prevalence (regional surveillance)	1 tertiary-care or secondary-care teaching hospitals	HA	All SA isolates from participating centres	OXA	56.80	[51.57, 62.03]	NA	NA
	Philippines	2004 – 2006	Prevalence (regional surveillance)	1 tertiary-care or secondary-care teaching hospitals	CA	All SA isolates from participating centres	OXA	30.10	[20.78, 39.42]	NA	NA
	Philippines	2004 – 2006	Prevalence (regional surveillance)	1 tertiary-care or secondary-care teaching hospitals	HA	All SA isolates from participating centres	OXA	38.10	[28.44, 47.76]	NA	NA

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Song 2011 [176]	Vietnam	2004 – 2006	Prevalence (regional surveillance)	1 tertiary-care or secondary-care teaching hospitals	CA	All SA isolates from participating centres	OXA	30.10	[26.58, 33.62]	NA	NA
	Vietnam	2004 – 2006	Prevalence (regional surveillance)	1 tertiary-care or secondary-care teaching hospitals	HA	All SA isolates from participating centres	OXA	74.10	[67.02, 81.18]	NA	NA
	Taiwan	2004 – 2006	Prevalence (regional surveillance)	1 tertiary-care or secondary-care teaching hospitals	CA	All SA isolates from participating centres	OXA	34.81	[29.13, 40.50]	NA	NA
	Taiwan	2004 – 2006	Prevalence (regional surveillance)	1 tertiary-care or secondary-care teaching hospitals	HA	All SA isolates from participating centres	OXA	64.98	[61.08, 68.89]	NA	NA
	Thailand	2004 – 2006	Prevalence (regional surveillance)	1 tertiary-care or secondary-care teaching hospitals	CA	All SA isolates from participating centres	OXA	2.46	[-0.29, 5.21]	NA	NA
	Thailand	2004 – 2006	Prevalence (regional surveillance)	1 tertiary-care or secondary-care teaching hospitals	HA	All SA isolates from participating centres	OXA	56.96	[51.50, 62.42]	NA	NA
Song 2017 [177]	China	2014 – 2015	Prevalence	2 teaching children's hospitals	Mixed	Inpatients	CEF	45.80	[36.35, 55.23]	NA	NA
Strachan 2011 [178]	Australia	2007 – 2009	Prevalence (national surveillance)	13 major paediatric hospitals	Mixed	Children with childhood empyema	Not applicable (PCR)	53.85	[26.75, 80.95]	4.07^	[1.12, 7.02]
Sukhumungoon 2014 [179]	Thailand	2010 – 2012	Prevalence	Medical institutes associated with 1 hospital	HA	Healthy students	MET	1.31	[-0.49, 3.11]	1.31^	[-0.49, 3.11]
Sun 2006 [180]	China	2003	Prevalence	10 county hospitals and 1 teaching hospital	Mixed	Clinical bacteria isolates	MET	33.47	[27.60, 39.34]	NA	NA
Suzuki 2015 [181]	Japan	2011 – 2012	Prevalence (nationwide surveillance)	26 teaching hospitals	Mixed	Patients with acute otorhinolaryngological infections	OXA	25.89	[17.78, 34.00]	3.98#	[2.56, 5.40]
Syafinaz 2012 [182]	Malaysia	2011	Cross-sectional	1 medical school	Carriage	Medical students	OXA	0	NA	0^	NA
Taguchi 2012 [183]	Japan	2007	Prospective cohort	1 tertiary care centre of a teaching hospital	CA	Hospitalised patients	OXA	NA	NA	11.24#	[7.45, 15.03]

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Takadama 2017 [184]	Japan	2013 – 2014	Prevalence	23 medical facilities	CA	Outpatients with skin infections	Not applicable (PCR)	25.60	[22.72, 28.57]	18.94	[16.69, 21.2]
Takesue 2012 [185]	Japan	2010	Cross-sectional (nationwide surveillance)	27 medical centers	HA	Patients with surgical site infections	OXA	72.00	[64.64, 79.36]	14.67#	[12.05, 17.29]
Takesue 2017 [186]	Japan	2014 – 2015	Prevalence (nationwide surveillance)	27 medical centers	HA	Patients with surgical site infections	MET	53.80	[46.02, 61.48]	NA	NA
Tang 2011 [187]	Taiwan	2005 – 2008	Cross-sectional	1 clinical microbiology laboratory	Carriage	Healthy children with atopic dermatitis	OXA	36.73	[27.19, 46.28]	19.15^	[13.52, 24.77]
Thuy 2017 [188]	Vietnam	2016	Prevalence	1 intensive care unit of a tertiary hospital	Carriage	Inpatients	OXA	65.50	[56.57, 74.34]	8.59^	[6.69, 10.49]
Tong 2015 [189]	Australia	2008 – 2012	Prevalence	1 microbiology laboratory which serves community clinics in a region	CA	*S. aureus* isolates	FLU	24.00	[23.27, 24.73]	NA	NA
Treesirichod 2013 [190]	Thailand	2012	Cross-sectional	1 university	Carriage	Healthy, third-year, preclinical medical students	CEF	0	NA	0^	NA
Tsai 2017 [191]	Taiwan	2005 – 2010	Prevalence	1 well-child clinic in a tertiary medical center	Carriage	Healthy children	OXA	35.90	[32.81, 39.01]	10.2^	[9.18, 11.28]
Tsao 2015 [192]	Taiwan	2012	Cross-sectional	14 nursing homes	Carriage	Nursing home residents and staff	CEF	64.02	[56.68, 71.37]	20.08^	[16.64, 23.51]
Uehara 2013 [193]	Japan	2009	Prevalence	1 haemodialysis clinic	Carriage	Patients and healthcare workers	Not applicable (PCR)	34.48	[17.18, 51.78]	8.90^	[3.63, 14.17]
	Japan	2010	Prevalence	1 haemodialysis clinic	Carriage	Patients and healthcare workers	Not applicable (PCR)	14.81	[1.41, 28.21]	3.89^	[0.15, 7.61]
Valle 2016 [194]	Philippines	2013	Prevalence	1 hospital laboratory	Mixed	Clinical *S. aureus* isolates submitted for culture and sensitivity	OXA, CEF	45.76	[39.41, 52.12]	NA	NA
Verwer 2012 [195]	Australia	2007 – 2008	Cross-sectional	1 acute care hospital	Carriage	Healthcare workers	CEF	NA	NA	3.40^	[2.50, 4.30]

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Wang 2004 [196]	Taiwan	2001	Prospective cohort	1 teaching hospital	Carriage	Healthcare workers	OXA	NA	NA	8.38^	[4.32, 12.44]
Wang 2008 [197]	Taiwan	2004 – 2006	Cross-sectional	1 university hospital	CA	Patients aged > 16 years with positive *S. aureus* blood cultures ≤ 48 hours of arrival	OXA	13.95	[9.32, 18.59]	NA	NA
Wang 2009 [198]	Taiwan	2007	Prevalence	1 tertiary medical center	Carriage	Patients receiving long-term hemodialysis	OXA	NA	NA	5.92^	[3.93, 7.90]
Wang 2009b [199]	Taiwan	2007	Cross-sectional	3 medical centres	Carriage	Adults who attended mandatory health examinations	Not applicable (CRA)	17.35	[14.51, 20.18]	3.84^	[3.16, 4.52]
Wang 2010 [200]	Taiwan	2008 – 2009	Cross-sectional	2 ICUs in 1 hospital	CA and HA	Medical intensive care unit and coronary care unit patients	Not applicable (CRA)	NA	NA	10.65^	[9.27, 12.04]
Wang 2012 [201]	China	2008 – 2010	Cross-sectional	8 regional hospitals	CA	*S. aureus* isolates from hospitalised children < age 14 years	CEF	55.17	[50.50, 59.84]	NA	NA
Wang 2012b [202]	Taiwan	2007	Case-control	3 hospitals	Carriage	Outpatients undergoing long-term dialysis	OXA	26.45	[18.59, 34.30]	5.91#	[3.93, 7.90]
Wang 2015 [203]	Taiwan	2011 – 2013	Retrospective cohort	1 hospital	HA	Hospitalised adult patients aged >18 with nosocomial SA bacteraemia	Not applicable (CRA)	61.30	[55.39, 67.21]	26.14#	[22.66, 29.63]
Wang 2017 [204]	Taiwan	2013	Cross-sectional	2 universities	Carriage	Healthy students	Not applicable (PFGE)	6.90	[0.38, 13.42]	1.50^	[0.04, 3.05]
Wang 2017b [205]	China	2011 – 2014	Cross-sectional	1 hospital	HA	Patients with Cardiac Implantable Electronic Device infections	OXA	11.10	[-9.42, 31.62]	0.50^	[-0.44, 1.35]
Wang 2017c [206]	China	2013 - 2014	Cross-sectional	Slaughterhouses and factories	Carriage	Healthy workers	CEF	23.57	[16.54, 30.60]	2.80^	[1.84, 3.71]
Watanabe 2012 [207]	Japan	2009	Prevalence (nationwide surveillance)	46 medical institutions	Mixed	Patients with RTI	OXA	58.50	[50.03, 66.97]	11.97#	[9.45, 14.49]
Watanabe 2017 [208]	Japan	2013	Prevalence (nationwide surveillance)	30 dermatological departments	Mixed	Clinical specimens	OXA	24.35	[20.86, 27.85]	NA	NA
Williamson 2016 [209]	New Zealand	2013	Cross-sectional	5 schools	Carriage	Children attending 5 schools	OXA	14.62	[11.55, 17.70]	8.24^	[6.44, 10.04]
Win 2015 [210]	Singapore	2009 – 2010	Retrospective case-control	1 communicable disease centre	Carriage	Inpatients	Not applicable (CRA)	NA	NA	12.10^	[10.75, 13.45]

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Win 2015 [210]	Singapore	2009 – 2010	Retrospective case-control	1 communicable disease centre	HA	Inpatients	Not applicable (CRA)	NA	NA	4.80^	[3.66, 5.94]
Wu 2017 [211]	Taiwan	2009 – 2010	Cross-sectional	Infectious disease clinics at 1 hospital	Carriage	Outpatients with HIV	Not applicable (CRA)	13.4	[6.04, 20.79]	1.50^	[0.64, 2.44]
Xiao 2015 [212]	China	2010 – 2011	Prevalence	31 county hospitals	CA	Outpatients	OXA	15.34	[12.10, 18.58]	2.48#	[1.92, 3.04]
Xu 2017 [213]	China	2001 – 2005	Prevalence (surveillance)	1 hospital	HA	Patients infected by Staphylococci	OXA	54.40	[48.14, 60.66]	NA	NA
	China	2006 – 2010	Prevalence (surveillance)	1 hospital	HA	Patients infected by Staphylococci	OXA	71.90	[68.00, 75.80]	NA	NA
	China	2011 – 2015	Prevalence (surveillance)	1 hospital	HA	Patients infected by Staphylococci	OXA	70.10	[67.24, 72.96]	NA	NA
Yamaguchi 2005 [214]	Japan	2000	Prevalence	37 medical centres	Mixed	Clinical isolates of various bacterial species	Not applicable (AUTO)	51.55	[48.55, 54.55]	NA	NA
	Japan	2002	Prevalence	37 medical centres	Mixed	Clinical isolates of various bacterial species	Not applicable (AUTO)	49.78	[47.17, 52.39]	NA	NA
Yan 2015 [215]	China	2009 – 2011	Cross-sectional	Mandatory health screening service	Carriage	Food and public service industry workers and public health workers	Not applicable (PCR)	1.99	[0.63, 3.35]	0.33^	[0.10, 0.56]
Yanagihara 2015 [216]	Japan	2010	Prevalence (national surveillance)	34 medical institutions	Mixed	Patients with respiratory tract illness	OXA	50.49	[43.66, 57.31]	10.9#	[8.92, 12.88]
Ye 2015 [217]	China	2013 – 2014	Cross-sectional	Pig farms, abattoirs, and wet markets	Carriage	Workers in livestock-related venues	OXA, CEF	32.00	[25.54, 38.47]	3.40^	[2.58, 4.22]
Yeap 2017 [218]	Laos	2012 – 2014	Prevalence	1 hospital microbiology laboratory	Mixed	Inpatients and outpatients with *S. aureus* SSTI isolates	OXA	7.30	[2.09, 12.49]	NA	NA
Yeoh 2014 [219]	Singapore	2010 – 2011	Cross-sectional	1 acute care hospital	Carriage	Chronic haemodialysis patients who required admission	Not applicable (CRA)	NA	NA	15.10^	[9.85, 20.35]
Yong 2014 [220]	Republic of Korea	2011	Prevalence	32 hospitals	Mixed	Antimicrobial susceptibility test data from hospital patients	OXA	66.00	[65.43, 66.56]	NA	NA
	Republic of Korea	2011	Prevalence	2 commercial laboratories	Mixed	Antimicrobial susceptibility test data from secondary care hospitals and primary care clinics	OXA	66.00	[65.01, 66.98]	NA	NA

References	Country	Study period	Type of study	Setting	Source/time of infection	Study population	Antibiotic tested	Resistance proportion (%, 95% CI)		Prevalence (%, 95% CI)	
Young 2014 [221]	Singapore	2006 – 2007	Cross-sectional	Emergency department of a public tertiary hospital	Carriage	Patients > age 16 years planned for hospital admission	OXA	NA	NA	1.79^	[0.97, 2.61]
Yu 2015 [222]	China	2012 – 2013	Prevalence	1 hospital	Mixed	*S. aureus* isolates from hospitalised patients with SSTIs	OXA	44.53	[35.92, 53.14]	NA	NA
Zhang 2012 [223]	China	2008	Prevalence	1 hospital	Mixed	Trauma patients from the Wenchuan earthquake	Not applicable (AUTO)	58.30	[30.40, 86.19]	4.52#	[1.24, 7.76]
Zhang 2015 [224]	China	2014	Prevalence	7 nursing homes	CA	Residents from 7 nursing homes	CEF	62.39	[53.30, 71.48]	10.60^	[7.88, 13.32]
Zhang 2015b [225]	China	2006 – 2013	Cross-sectional	1 hospital	Mixed	Inpatients with gram positive cocci isolated	Not applicable (CRA)	19.57	[17.54, 21.59]	3.71#	[3.29, 4.13]
Zhao 2012 [226]	China	2005 – 2010	Prevalence (national surveillance)	12 teaching hospitals	CA	Clinical isolates of Gram-positive bacteria	OXA	46.80	[44.74, 48.86]	18.72#	[17.70, 19.74]
Zhao 2012b [227]	China	2009 – 2010	Prospective cohort	2 teaching hospitals and 2 community hospitals	CA	Adults with SSTI	OXA	3.05	[0.42, 5.68]	1.00#	[0.13, 1.87]
Zhou 2015 [228]	China	2001 – 2014	Prevalence	2 teaching hospitals	HA	Liver transplantation recipients who developed *S. aureus* bacteraemia	OXA	80.00	[62.47, 97.53]	5.82^	[3.05, 8.59]
Zhu 2016 [229]	China	2001 – 2014	Prevalence	1 hospital	HA	Inpatients with nosocomial infections	OXA	57.90	[42.20, 73.60]	6.23	[5.69, 6.78]
Zou 2012 [230]	China	2006 – 2008	Prevalence	11 public hospitals	Mixed	Clinical isolates of *S. aureus*	OXA	64.80	[59.33, 70.27]	NA	NA

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