Global incidence of surgical-site infection after appendectomy: a systematic review and meta-analysis

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APPENDIX

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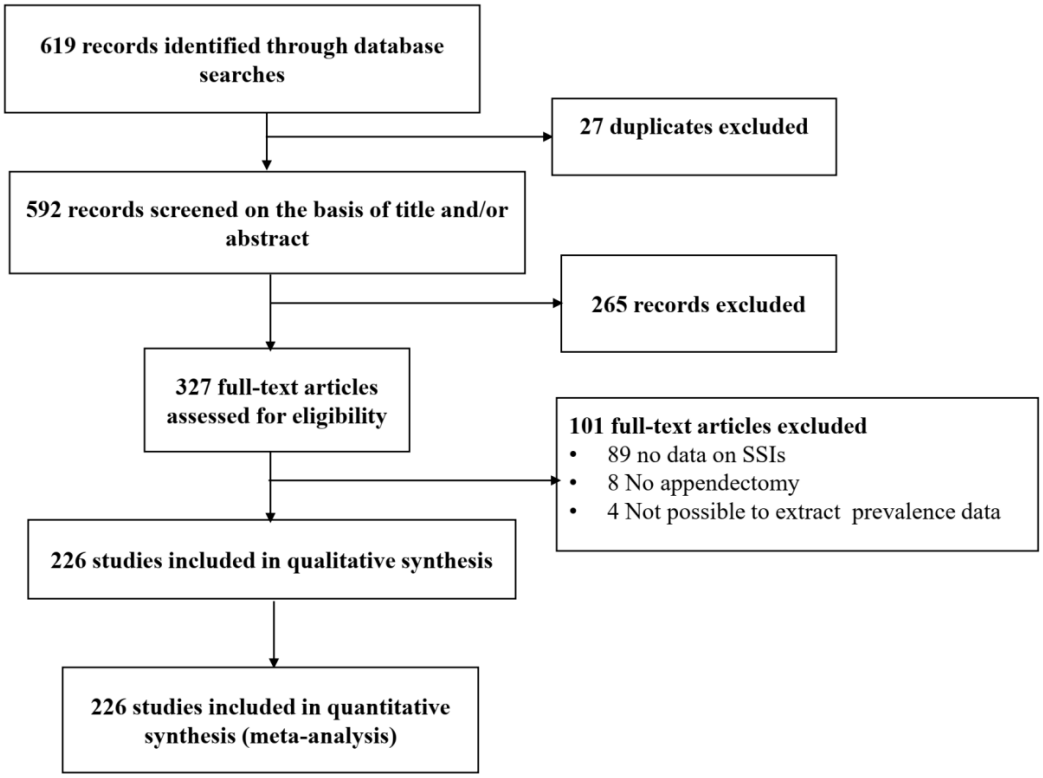
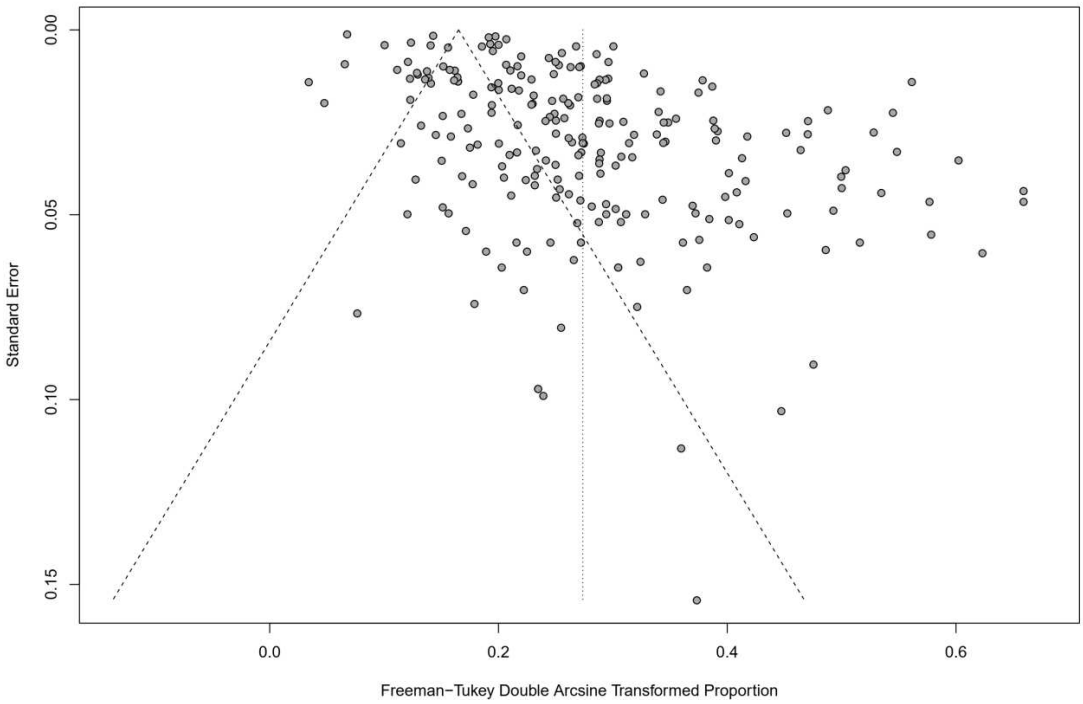
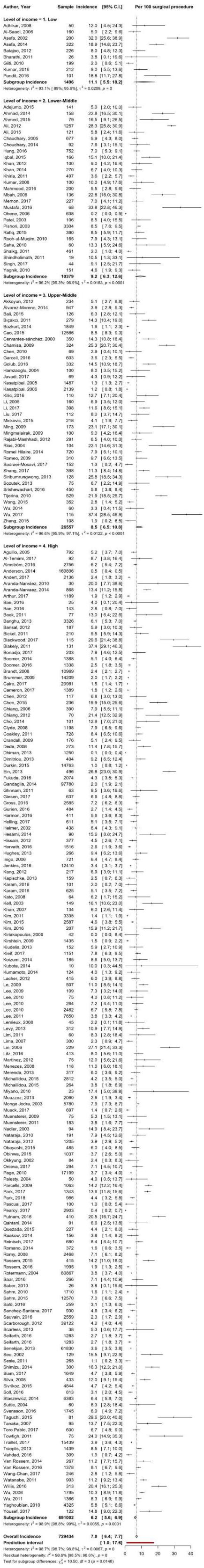


Supplementary Figure 1. Study flow

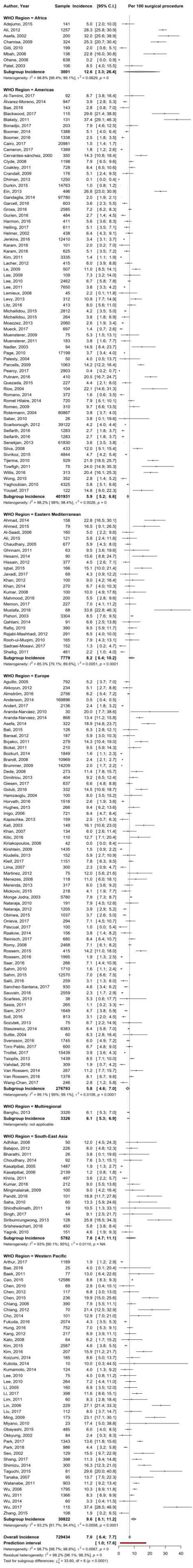


Supplementary Figure 2. Funnel plot for publication bias

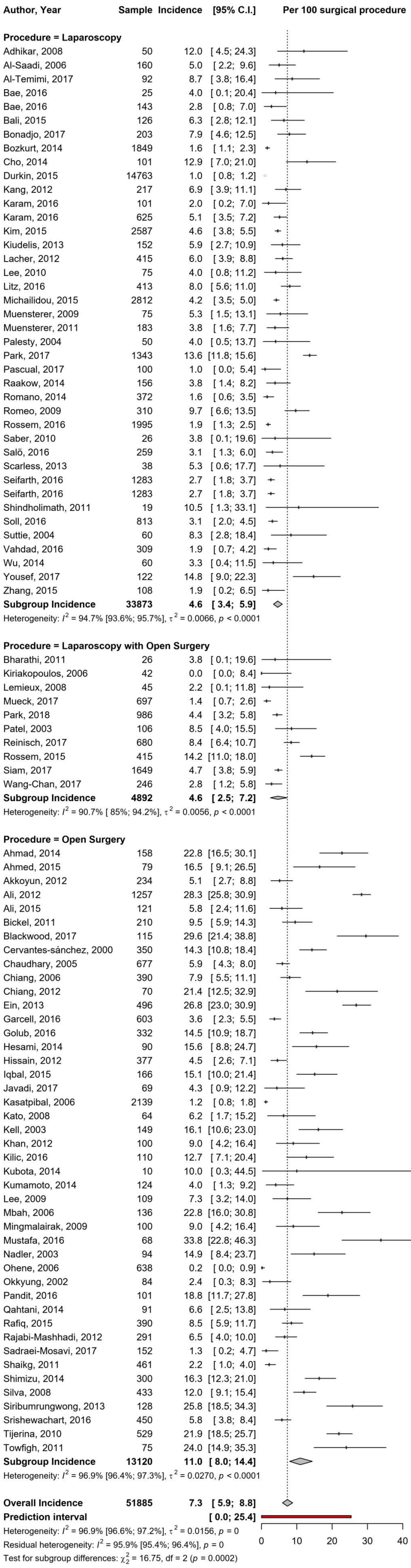
Supplementary Figure 3. Global Incidence of surgical site infection after appendectomy, by country level of income



Supplementary Figure 4. Global Incidence of surgical site infection after appendectomy, by WHO regions



Supplementary Figure 5. Global Incidence of surgical site infection after appendectomy, by surgical procedure



Supplementary Table 1. Search strategy in EMBASE

	Search terms
#1	'appendectomy'/exp OR appendectomy OR 'appendicectomy'/exp OR appendicectomy OR appendices OR 'appendix epiploica' OR 'omental appendix' OR 'appendicitis'/exp OR appendicitis
#2	'surgical site infection'/exp OR 'surgical site infection' OR 'surgical wound infection'/exp OR 'surgical wound infection' OR 'surgical wound infections'/exp OR 'surgical wound infections' OR 'surgical site infections' OR 'operative site infections' OR 'postoperative wound infections'/exp OR 'postoperative wound infections' OR 'postoperative wound infection'/exp OR 'postoperative wound infection'
#3	[2000-2018]/py
#4	#1 AND #2 AND #3

Supplementary Table 2 : Characteristics of included studies

Characteristics	N = 226
Year of publication, range	2000-2018
%Male, range	0-100 (n = 195)
Mean/median age, range	7-74 (n = 186)
%HIV	0-13.1 (n = 2)
%Diabetes	0-95.7 (n = 34)
%Obesity	0-7.4 (n = 18)
Design, n	
- Cross sectional	120
- Cohort study	99
- Case control	7
WHO regions, n	
- Africa	8
- Americas	67
- Eastern Mediterranean	23
- Europe	68
- Multiregional	1
- South-East Asia	16
- Western Pacific	43
Level of income, n	
- Low	9
- Lower-middle	27
- Upper-middle	36
- High	154
Timing of data collection	
- Retrospective	123
- Prospective	101
- Unclear	2
Sampling	
- Consecutive	131
- Systematic	37
- Random	32
- Exhaustive	11
- Unclear	15
Number of sites	
- Multisite	51
- One site	170
- Unclear	5
Pattern of appendicitis, range	
- %Catarrhal	0-100 (n = 84)
- %Perforated	0-100 (n = 110)
- %Suppurated	0-100 (n = 70)
- %Gangrenous	0-46.7 (n = 89)
%With administered antibiotics	24.1-100 (n = 109)
%With administered analgesics	64.5-100 (n = 20)
%With diet > 6 or 8 hours	50-100 (n = 3)
Type of surgery	
- %Open surgery	0-100 (n = 134)

- %Laparoscopy	0-100 (n = 187)
Mean/median time to complete the intervention (in hours), range	0.1-2.2 (n = 106)
Type of anesthesia, n	
- General	118
- Spinal and general	2
- Unclear	106
SSI definition, n	
- CDC-NNIS criteria	50
- Other criteria	25
- Not reported/Unclear	151

Supplementary Table 3. *Individual characteristics of included studies*

Author	Year	Risk of bias	Design	Country	Timing	Sampling method	Sites	Period	Population	%Male	Mean or median age	%Obesity	Pattern of appendicitis	%Catarrhal	%Perforated	%Suppurated	%Gangrenous	% with antibiotic therapy	Type of surgery	Time to complete the surgery intervention (in hours)	Type of anesthesia	SSI Definition	Sample
Adejumo	2015	Moderate	Cohort	Nigeria	Retrospective	Consecutive	One site	2007-2014	Adults	39	26	NR	Catarrhal, Perforated, Suppurated, Gangrenous	48.9	NR	NR	NR	100	NR	NR	NR	NR	141
Adhikar	2008	Moderate	Cohort	Nepal	Prospective	Consecutive	One site	2005-2006	Children, Adolescents, Adults, Elderly	NR	NR	NR	Unclear	NR	NR	NR	NR	100	Laparoscopy	0.5	General	NR	50
Aguillo	2005	Moderate	Cohort	Spain	Prospective	Consecutive	Unclear	NR	Children, Adolescents, Adults, Elderly	63.1	NR	NR	Unclear	NR	NR	NR	NR	100	NR	NR	NR	NR	792
Ahmad	2014	Moderate	Clinical trial	Pakistan	Prospective	Consecutive	One site	2012	Adults	35.4	27.4	NR	Perforated	0	100	0	0	100	Open Surgery	NR	General	NR	158
Ahmed	2015	Moderate	Cross sectional	Pakistan	Retrospective	Consecutive	One site	2009-2010	Children, Adolescents	51.89	10.1	NR	Unclear	NR	NR	NR	NR	100	Open Surgery	NR	NR	NR	79
Akkoyun	2012	Moderate	Case control	Turkey	Retrospective	Consecutive	One site	1998-2011	Children	64.5	8.9	NR	Perforated	0	100	0	0	100	Open Surgery	0.6	General	NR	234
Ali	2015	Moderate	Cross sectional	Pakistan	Prospective	Consecutive	One site	2014	Adults	46.3	27.4	NR	Unclear	NR	NR	NR	NR	100	Open Surgery	NR	General	NR	121
Ali	2012	Moderate	Cohort	Nigeria	Prospective	Consecutive	One site	2002-2009	Children, Adolescents, Adults, Elderly	33.9	32	NR	Catarrhal, Perforated, Suppurated, Gangrenous	NR	23.47	NR	NR		Open Surgery	NR	NR	NR	1257
Almström	2016	Moderate	Cohort	Sweden	Retrospective	Systematic	One site	2006-2013	Children, Adolescents	59.5	NR	NR	Perforated, Non Perforated 76%	NR	24	NR	NR		Laparoscopy or Open Surgery	0.8	NR	NR	2756
Al-Saadi	2006	Moderate	Cohort	Yemen	Retrospective	Consecutive	One site	2003-2005	Children, Adolescents, Adults	75	NR	NR	Catarrhal, Perforated, Suppurated, Gangrenous	NR	60	NR	13	100	Laparoscopy	NR	NR	NR	160
Al-Temimi	2017	Low	Cohort	USA	Prospective	Systematic	One site	2016	Children, Adolescents, Adults, Elderly	40.2	30	NR	Catarrhal, Perforated, Suppurated, Gangrenous, Normal	73	17.4	3.3	3.3		Laparoscopy	0.6	NR	NR	92
Álvarez-Moreno	2014	Low	Cohort	Colombia	Prospective	Systematic	Multisite	2008-2010	Children, Adolescents, Adults, Elderly	NR	NR	NR	Unclear	NR	NR	NR	NR		NR	NR	NR	According to CDC-NNIS diagnostic criteria	947
Anderson	2014	Moderate	Cohort	Sweden	Retrospective	Exhaustive	Multisite	1992-2008	Adults	54	NR	NR	Perforated, Not perforated	NR	19.4	0	0		Laparoscopy or Open Surgery	NR	NR	NR	169896
Andert	2017	Moderate	Cohort	Germany	Retrospective	Consecutive	One site	2003-2014	Adults	48.6	30.5	NR	Catarrhal, Perforated, Suppurated, Gangrenous	NR	NR	NR	NR	100	Laparoscopy or Open Surgery	NR	NR	Local signs of inflammation	2136
Aranda-Narvaez	2014	Moderate	Cohort	Spain	Not reported/Unclear	Not clear	One site	2007-2010	Adults	57	29	NR	Catarrhal, Perforated, Suppurated, Gangrenous	65.8	NR	NR	NR	62.00	Laparoscopy or Open Surgery	0.92	NR	According to CDC-NNIS diagnostic Criteria	868
Aranda-Narváez	2010	Low	Cohort	Spain	Retrospective	Random	One site	1997-2009	Children, Adolescents, Adults, Elderly	63.3	35	NR	Suppurated, Gangrenous	0	0	53.3	46.7	100	Laparoscopy or Open Surgery	NR	General	According to CDC-NNIS diagnostic Criteria	30

Author	Year	Risk of bias	Design	Country	Timing	Sampling method	Sites	Period	Population	%Male	Mean or median age	%Obesity	Pattern of appendicitis	%Catarrhal	%Perforated	%Suppurated	%Gangrenous	% with antibiotic therapy	Type of surgery	Time to complete the surgery intervention (in hours)	Type of anesthesia	SSI Definition	Sample
Arthur	2017	Low	Cross sectional	Australia	Prospective	Systematic	Multisite	2016	Children, Adolescents, Adults, Elderly	49.5	31.4	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	1	NR	NR	1189
Asefa	2014	Moderate	Cross sectional	Ethopia	Retrospective	Consecutive	One site	2006-2010	Children	62.1	10	NR	Catarrhal, Perforated, Suppurated, Gangrenous	32.3	59.6	6.2	1.9		NR	NR	NR	NR	322
Asefa	2002	High	Cross sectional	Ethopia	Retrospective	Consecutive	One site	1997-1999	Adults	79.5	25.6	NR	Catarrhal, Perforated	45.4	44	0	0		NR	NR	NR	NR	200
Bae	2016	Low	Cross sectional	Korea	Prospective	Systematic	One site	2014-2016	Adults	52	62	NR	Perforated, Suppurated, Gangrenous	NR	4	72	24	100	Laparoscopy	1.2	General	According to CDC-NNIS diagnostic criteria	25
Bae	2016	Moderate	Cross sectional	USA	Retrospective	Systematic	One site	2010-2013	Children, Adolescents, Adults	NR	32	NR	Unclear	NR	NR	NR	NR	36.4	Laparoscopy	NR	NR	According to CDC-NNIS diagnostic criteria	143
Baek	2011	Moderate	Cross sectional	Korea	Retrospective	Exhaustive	One site	2007-2009	Elderly	45.5	68.2	NR	Catarrhal, Perforated, Suppurated, Gangrenous	22.1	29.9	32.5	15.6	100	Laparoscopy or Open Surgery	1.05	General	NR	77
Bali	2015	Moderate	Cohort	Turkey	Prospective	Consecutive	One site	2009-2013	Adults	35.7	32.33	NR	Unclear	NR	NR	NR	NR		Laparoscopy	1	NR	NR	126
Banghu	2013	Low	Cohort	UK, Spain, Japan, Hong Kong, Australia, New Zealand	Prospective	Consecutive	Multisite	2012	Children, Adolescents, Adults, Elderly	51.1	NR	NR	Unclear	NR	NR	NR	NR	96.9	Laparoscopy or Open Surgery	NR	NR	According to CDC-NNIS diagnostic criteria	3326
Bansal	2012	Low	Cohort	Switzerland	Prospective	Consecutive	One site	NR	Children	62	9.8	NR	Catarrhal, Perforated	74.3	25.7	NR	NR	49.2	Laparoscopy or Open Surgery	1.0	NR	According to CDC-NNIS diagnostic Criteria	187
Batajoo	2012	Moderate	Cross sectional	Nepal	Retrospective	Consecutive	One site	2009-2012	Children, Adolescents, Adults, Elderly	45.6	29.6	NR	Unclear	NR	NR	NR	NR	100	Laparoscopy or Open Surgery	0.8	NR	NR	226
Bharathi	2011	Moderate	Cohort	Nepal	Prospective	Consecutive	One site	2008-2009	Children, Adolescents, Adults, Elderly	50	22.9	NR	Catarrhal, Perforated, Suppurated, Gangrenous	80	NR	NR	NR	100	Laparoscopy with Open Surgery	0.5	NR	NR	26
Bıçakcı	2011	High	Cross sectional	Turkey	Retrospective	Systematic	Unclear	2006-2009	Children, Adolescents	64.5	10	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	NR	NR	279
Bickel	2011	Moderate	Clinical trial	Israel	Prospective	Random	One site	2006-2009	Adults	73	28	NR	Catarrhal, Gangrenous, Phlegmonous 58.6 , Normal 4.3%	17	NR	NR	20.5	100	Open Surgery	0.5	General	NR	210
Blackwood	2017	Moderate	Cross sectional	USA	Retrospective	Random	One site	2010-2015	Children	55.6	10.4	29.6	Unclear	NR	NR	NR	NR		Open Surgery	2	General	According to CDC-NNIS diagnostic Criteria	115
Blakely	2011	Low	Clinical trial	USA	Prospective	Random	One site	2006-2009	Children, Adolescents	55.7	10.2	NR	Perforated	0	100	0	0	100	Laparoscopy or Open Surgery	1.9	NR	NR	131

Author	Year	Risk of bias	Design	Country	Timing	Sampling method	Sites	Period	Population	%Male	Mean or median age	%Obesity	Pattern of appendicitis	%Catarrhal	%Perforated	%Suppurated	%Gangrenous	% with antibiotic therapy	Type of surgery	Time to complete the surgery intervention (in hours)	Type of anesthesia	SSI Definition	Sample
Bonadjo	2017	Moderate	Cross sectional	USA	Retrospective	Consecutive	One site	2008-2015	Children, Adolescents	56.2	8.4	NR	Perforated	0	100	0	0	100	Laparoscopy	NR	General	NR	203
Boomer	2016	Low	Cross sectional	USA	Retrospective	Systematic	Multisite	2010-2012	Children, Adolescents	60.3	11.0	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	NR	According to CDC-NNIS diagnostic criteria	1338
Boomer	2014	Low	Cohort	USA	Retrospective	Consecutive	One site	2010-2012	Children, Adolescents	61.1	10.9	NR	Catarrhal, Perforated, Gangrenous	66.2	NR	NR	NR	97.8	Laparoscopy or Open Surgery	NR	General	Wound infection or abdominal/pelvic abscess	1388
Bozkurt	2014	Moderate	Case control	Turkey	Retrospective	Consecutive	One site	2008-2012	Children, Adolescents, Adults, Elderly	54	30.4	NR	Catarrhal	100	0	0	0		Laparoscopy	0.8	General	NR	1849
Brandt	2008	Moderate	Cross sectional	Germany	Retrospective	Systematic	Multisite	2000-2004	Children, Adolescents, Adults, Elderly	NR	NR	NR	NR	NR	NR	NR	NR		NR	NR	NR	According to CDC-NNIS diagnostic criteria	10969
Brummer	2009	Moderate	Cohort	Germany	Retrospective	Consecutive	Multisite	2004-2007	Children, Adolescents, Adults, Elderly	NR	NR	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	NR	According to CDC-NNIS diagnostic Criteria	14209
Cairo	2017	Moderate	Cohort	USA	Retrospective	Consecutive	Multisite	2012-2015	Children, Adolescents	61.3	11.0	29.9	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	General	NR	20981
Cameron	2017	Low	Cohort	USA	Retrospective	Systematic	Multisite	2012-2015	Children, Adolescents	60.4	11	11.7	Unclear	NR	NR	NR	NR	100	Laparoscopy or Open Surgery	NR	NR	According to CDC-NNIS diagnostic criteria	1389
Cao	2015	Moderate	Cohort	China	Retrospective	Consecutive	Multisite	2011-2013	Adults	54.2	37.3	12.4	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	0.8	General	NR	12586
Cervantes-sánchez	2000	Low	Clinical trial	Mexico	Prospective	Random	One site	1994-1995	Children, Adults	53.4	28	NR	Unclear	NR	NR	NR	NR		Open Surgery	NR	General	Pus or a positive bacteriologic culture from a wound discharge	350
Chamisa	2009	High	Cross sectional	South Africa	Retrospective	Exhaustive	One site	2002-2004	Children, Adolescents, Adults, Elderly	78.4	NR	NR	Catarrhal, Perforated, Gangrenous, Normal	53	30.5	NR	10.2		Laparoscopy or Open Surgery	NR	NR	NR	324
Chaudhary	2005	Moderate	Clinical trial	Pakistan	Prospective	Random	One site	1999-2003	Children, Adolescents, Adults, Elderly	45.4	NR	NR	Catarrhal	NR	0	0	0		Open Surgery	NR	NR	NR	677
Chen	2015	Moderate	Cohort	Taiwan	Retrospective	Consecutive	One site	2010-2012	Adults	43.6	42.5	NR	Catarrhal, Perforated	87.3	12.7	0	0		Laparoscopy or Open Surgery	NR	NR	NR	236
Chen	2012	High	Cross sectional	Taiwan	Prospective	Consecutive	One site	2010	Adults	60	38	NR	Unclear	NR	NR	NR	NR	73	Laparoscopy or Open Surgery	NR	General	NR	117
Chen	2010	High	Cross sectional	China	Prospective	Systematic	One site	2008-2009	Adults	NR	NR	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	0.8	Spinal and General	NR	69
Chiang	2006	Moderate	Cross sectional	Taiwan	Retrospective	Exhaustive	One site	2002-2004	Adults	59.7	35	NR	Catarrhal, Perforated	68	17	0	0	100	Open Surgery	1.1	General	NR	390

Author	Year	Risk of bias	Design	Country	Timing	Sampling method	Sites	Period	Population	%Male	Mean or median age	%Obesity	Pattern of appendicitis	%Catarrhal	%Perforated	%Suppurated	%Gangrenous	% with antibiotic therapy	Type of surgery	Time to complete the surgery intervention (in hours)	Type of anesthesia	SSI Definition	Sample
Chiang	2012	Moderate	Cohort	Taiwan	Prospective	Consecutive	One site	2008-2009	Adults	58.6	37.8	10	Unclear	NR	NR	NR	NR	100	Open Surgery	NR	General	Presence of gross or purulent discharge at the incision site with or without a positive bacterial culture	70
Cho	2014	Low	Cross sectional	Korea	Prospective	Consecutive	One site	2011-2012	Adults	53	38.7	18.8	Unclear	NR	NR	NR	NR		Laparoscopy	NR	General	According to CDC-NNIS diagnostic Criteria	101
Choudhary	2014	Moderate	Cross sectional	India	Prospective	Random	One site	2010-2013	Adults	67	NR	NR	Appendicular mass	0	0	0	0		NR	NR	NR	NR	92
Clyde	2008	High	Cross sectional	USA	Retrospective	Systematic	One site	2002-2007	Children, Adolescents, Adults, Elderly	52	35	NR	Catarrhal, Perforated, Unclear	77	14	0	0		Laparoscopy or Open Surgery	NR	NR	NR	1198
Coakley	2011	Low	Cohort	USA	Retrospective	Exhaustive	One site	2005-2010	Adults	47.3	28.7	NR	Catarrhal, Perforated, Suppurated, Gangrenous	38.3	1.2	47.1	9.8	100	Laparoscopy or Open Surgery	1.0	NR	According to CDC-NNIS diagnostic Criteria	728
Crandall	2009	High	Cross sectional	USA	Retrospective	Not clear	One site	2004-2005	Adults	54	32.5	NR	NR	NR	74	NR	NR		Laparoscopy or Open Surgery	0.9	General	NR	176
Dede	2008	Moderate	Cohort	Hungary	Prospective	Consecutive	One site	2005-2007	Children, Adolescents, Adults, Elderly	NR	NR	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	NR	NR	273
Dhiman	2013	High	Cross sectional	USA	Retrospective	Not clear	Multisite	2003-2009	Adults	58	30.1	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	General	NR	1250
Dimitriou	2013	Moderate	Cohort	Germany	Retrospective	Consecutive	One site	2007-2010	Children, Adolescents, Adults, Elderly	53.5	34.9	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	1	NR	NR	404
Durkin	2015	Moderate	Cohort	USA	Retrospective	Consecutive	Multisite	2007-2012	Adults	NR	NR	NR	Unclear	NR	NR	NR	NR		Laparoscopy	NR	NR	NR	14763
Ein	2013	Moderate	Cross sectional	Canada	Retrospective	Consecutive	One site	1969-2003	Children	70	7	NR	Perforated	0	100	0	0	78.8	Open Surgery	NR	General	1.Wound infection=pus draining from between the stitches or staples 2.Intra-abdominal abscess=presence of fever, abdominal pain and or gastrointestinal dysfunction and confirmed by radiologic evidence of intra-abdominal fluid collection	496

Author	Year	Risk of bias	Design	Country	Timing	Sampling method	Sites	Period	Population	%Male	Mean or median age	%Obesity	Pattern of appendicitis	%Catarrhal	%Perforated	%Suppurated	%Gangrenous	% with antibiotic therapy	Type of surgery	Time to complete the surgery intervention (in hours)	Type of anesthesia	SSI Definition	Sample
Fukuda	2016	Moderate	Cohort	Japan	Retrospective	Consecutive	Multisite	2007-2011	Children, Adolescents, Adults	54.4	64.5	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	1.3	General	NR	2074
Gandaglia	2014	Low	Cohort	USA	Prospective	Consecutive	Multisite	2005-2011	Adolescents, Adults, Elderly	NR	NR	NR	Unclear	NR	NR	NR	NR	100	Laparoscopy or Open Surgery	NR	General	According to CDC-NNIS diagnostic Criteria	97780
Garcell	2016	Low	Cohort	Cuba	Prospective	Consecutive	One site	2013-2015	Children, Adolescents, Adults, Elderly	95.3	30.7	2.1	Unclear	NR	NR	NR	NR		Open Surgery	NR	NR	According to CDC-NNIS diagnostic Criteria	603
Ghnnam	2011	Moderate	Cross sectional	Saudi Arabia	Retrospective	Not clear	One site	2007-2010	Adults	63.4	49.0	NR	Perforated, Unclear	NR	38.1	NR	NR		NR	NR	NR	NR	63
Giesen	2017	Moderate	Cohort	Netherlands	Retrospective	Consecutive	Multisite	2014-2015	Children, Adults	54.3	31	NR	Catarrhal, Perforated, Suppurated, Gangrenous	48.2	17.3	23.2	11.3	100	Laparoscopy or Open Surgery	0.52	NR	According to CDC-NNIS diagnostic criteria	637
Giiti	2010	Moderate	Cross sectional	Tanzania	Prospective	Systematic	One site	2008-2009	Children, Adolescents, Adults, Elderly	44.7	27	NR	Catarrhal, Perforated, Suppurated, Mass	87.4	7.0	1.5	0		NR	NR	NR	NR	199
Golub	2016	Moderate	Cohort	Russia	Retrospective	Consecutive	Multisite	2012	Adolescents, Adults	NR	34.8	NR	Unclear	NR	NR	NR	NR	100	Open Surgery	NR	General	NR	332
Gross	2016	Moderate	Cross sectional	USA	Retrospective	Consecutive	Multisite	2012-2013	Children, Adolescents	60.1	NR	17.8	Perforated	0	100	0	0		Laparoscopy or Open Surgery	NT	General	NR	2585
Gurien	2016	Moderate	Cohort	USA	Retrospective	Consecutive	One site	2009-2012	Children, Adolescents	62	10.5	NR	Unclear	NR	NR	NR	NR	100	Laparoscopy or Open Surgery	NR	General	Wound infections or intra abdominal abscesses	484
Hamzaoglu	2004	Low	Cross sectional	Turkey	Prospective	Consecutive	One site	1999-2001	Adults	57	46.7	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	General	NR	100
Harmon	2016	Low	Cohort	USA	Retrospective	Systematic	One site	2007-2012	Children, Adolescents, Adults, Elderly	47.4	39.7	NR	Non perforated	0	0	0	0		Laparoscopy or Open Surgery	NR	NR	According to CDC-NNIS diagnostic criteria	411
Helling	2017	Low	Cross sectional	USA	Retrospective	Systematic	One site	2009-2014	Adults	64.3	34.4	NR	Unclear	NR	NR	NR	NR	100	Laparoscopy or Open Surgery	NR	NR	According to CDC-NNIS diagnostic criteria	611
Helmer	2002	Low	Cross sectional	USA	Retrospective	Systematic	One site	1998-1999	Children, Adolescents, Adults, Elderly	NR	NR	NR	Perforated, Non perforated	NR	19.4	NR	NR	100	NR	NR	NR	A surgical wound infection was defined as purulent drainage from the wound, cellulitis requiring antibiotics, or the opening of a closed wound. An intra-abdominal abscess was defined as an intraabdominal fluid collection that contained purulent material.	438
Hesami	2014	Low	Clinical trial	Iran	Prospective	Random	Unclear	2010-2011	Children, Adolescents, Adults	58.9	27	NR	Unclear	NR	NR	NR	NR	100	Open Surgery	NR	NR	1..wound unfection=Purulent discharge, redness, inflammation, and the need to reooen	90

Author	Year	Risk of bias	Design	Country	Timing	Sampling method	Sites	Period	Population	%Male	Mean or median age	%Obesity	Pattern of appendicitis	%Catarrhal	%Perforated	%Suppurated	%Gangrenous	% with antibiotic therapy	Type of surgery	Time to complete the surgery intervention (in hours)	Type of anesthesia	SSI Definition	Sample
																						the wound 2...intra-abdominal abscess=abdominal pain, fullness, fever and confirmed by ecography	
Hissain	2012	Moderate	Clinical trial	Saudi Arabia	Prospective	Consecutive	One site	2010-2011	Adults	NR	32.2	NR	Catarrhal	100	0	0	0	100	Open Surgery	NR	NR	1..SSI=Pus discharge from wound needing its opening and drainage 2..Intra-abdominal collection=fluid collection inside the peritoneal cavity confirmed by ultrasound or CT scan that required drainage	377
Horvath	2016	Moderate	Cross sectional	Germany	Retrospective	Consecutive	One site	2005-2013	Adults	47	28.6	NR	Perforated, phelgmonous	NR	52	NR	NR		Laparoscopy or Open Surgery	1.0	General	According to CDC-NNIS diagnostic Criteria	1516
Hughes	2013	Moderate	Cross sectional	United Kingdom	Retrospective	Systematic	One site	2009-2010	Adults	55.6	30	NR	Unclear, simple and complicated	NR	NR	NR	NR	100	Laparoscopy or Open Surgery	NR	General	NR	266
Hung	2016	Moderate	Cross sectional	Vietnam	Prospective	Systematic	Multisite	2008-2010	Adults	45	41.6	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	1	General	NR	752
Inigo	2006	Low	Cohort	Spain	Prospective	Consecutive	One site	1998-2002	Adults	NR	NR	NR	Unclear	NR	NR	NR	NR		NR	0.7	NR	According to CDC-NNIS diagnostic Criteria	721
Iqbal	2015	Low	Clinical trial	Pakistan	Prospective	Random	One site	2011	Adolescents, Adults, Elderly	66.3	26	NR	Catarrhal	100	0	0	0	100	Open Surgery	NR	General	According to Southampton criteria. Southampton grade 2 and above was considered as surgical site infection.	166
Javadi	2017	Moderate	Clinical trial	Iran	Prospective	Random	One site	2016	Children, Adolescents, Adults	65	19.3	NR	Catarrhal, Suppurated, Gangrenous	NR	0	NR	NR		Open Surgery	0.5	General	NR	69
Jenkins	2016	Low	Cohort	USA	Prospective	Systematic	Multisite	2006-2011	Children, Adolescents, Adults, Elderly	51.3	40.1	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	NR	According to CDC-NNIS diagnostic criteria	12410
Kang	2012	Moderate	Case control	Korea	Retrospective	Random	One site	2010-2012	Adults	54.4	31.7	NR	Catarrhal, Perforated, Suppurated, Gangrenous	NR	5.1	NR	NR	100	Laparoscopy	1.1	General	NR	217
Kapischke	2013	Low	Case control	Germany	Retrospective	Consecutive	One site	1999-2001	Children, Adolescents	47.8	11.5	NR	Catarrhal, Perforated	NR	NR	NR	NR	100	Laparoscopy or Open Surgery	0.6	General	According to CDC-NNIS diagnostic criteria	159
Karam	2016	Moderate	Cross sectional	USA	Retrospective	Not clear	One site	2010-2015	Children	62	12	NR	Perforated, Gangrenous	NR	20.6	NR	6.2		Laparoscopy	NR	General	NR	625
Karam	2016	Moderate	Cross sectional	USA	Retrospective	Consecutive	One site	2010-2015	Children, Adolescents	63	NR	NR	Unclear	NR	NR	NR	NR	100	Laparoscopy	1	General	NR	101
Kasatpibal	2005	Low	Cross sectional	Thailand	Prospective	Systematic	Multisite	2003-2004	Children, Adolescents, Adults, Elderly	26.6	37.2	NR	Unclear	NR	NR	NR	NR	24.1	NR	0.8	NR	According to CDC-NNIS diagnostic criteria	1487
Kasatpibal	2006	Moderate	Cohort	Thailand	Prospective	Not clear	Multisite	2003-2004	Children, Adolescents, Adults, Elderly	46.9	26	NR	Catarrhal	100	NR	NR	NR	92.2	Open Surgery	0.97	NR	According to CDC-NNIS diagnostic criteria	2139

Author	Year	Risk of bias	Design	Country	Timing	Sampling method	Sites	Period	Population	%Male	Mean or median age	%Obesity	Pattern of appendicitis	%Catarrhal	%Perforated	%Suppurated	%Gangrenous	% with antibiotic therapy	Type of surgery	Time to complete the surgery intervention (in hours)	Type of anesthesia	SSI Definition	Sample
Kato	2008	Low	Cohort	Japan	Prospective	Systematic	One site	2004-2006	Children	NR	9.4	NR	Perforated, Non perforated 75%	NR	25	NR	NR	100	Open Surgery	NR	NR	NR	64
Kell	2003	Moderate	Cohort	Ireland	Prospective	Consecutive	Unclear	NR	Children, Adolescents, Adults, Elderly	75.2	20.7	NR	Unclear	NR	NR	NR	NR	100	Open Surgery	NR	General	Defined based on clinical and microbiological criteria	149
Khan	2007	Low	Cohort	United Kingdom	Prospective	Consecutive	One site	2006	Children, Adolescents, Adults, Elderly	47.0	24	NR	Catarrhal, Perforated	63.4	20.1	0	0	100	Laparoscopy or Open Surgery	0.9	General	According to CDC-NNIS diagnostic Criteria	134
Khan	2012	Moderate	Clinical trial	Pakistan	Prospective	Random	Multisite	2006-2009	Adults	69	33.3	NR	Unclear	NR	NR	NR	NR	100	Open Surgery	0.6	General	NR	100
Khan	2014	Moderate	Clinical trial	Pakistan	Prospective	Random	Multisite	2013-2014	Children, Adolescents, Adults, Elderly	56.7	24	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	NR	Observation of pain, redness, tenderness and purulent discharge	270
Khiria	2011	Moderate	Cross sectional	India	Retrospective	Consecutive	One site	1999-2009	Adults	66	33.4	NR	Perforated, Gangrenous	NR	14.3	NR	5.2		Laparoscopy or Open Surgery	1.2	General	Any evidence of infection(erythema, purulent discharge, induration...) and requiring suture removal, antibiotic treatment, or evidence of dehiscence	497
Kilic	2016	Moderate	Cross sectional	Turkey	Retrospective	Consecutive	One site	2004-2010	Children	62.1	9.5	NR	Perforated	0	100	0	0	100	Open Surgery	NR	NR	According to CDC-NNIS diagnostic Criteria	110
Kim	2015	Low	Cross sectional	Korea	Retrospective	Systematic	One site	2008-2013	Children, Adolescents, Adults, Elderly	47.8	32.6	NR	Perforated, Suppurated, Gangrenous, Normal	6	13.8	64.5	7.1		Laparoscopy	0.7	NR	According to CDC-NNIS diagnostic criteria	2587
Kim	2011	Moderate	Cross sectional	USA	Prospective	Consecutive	One site	2005-2008	Elderly	48.1	73.4	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	General	According to CDC-NNIS diagnostic Criteria	3335
Kim	2016	Moderate	Cohort	Korea	Retrospective	Consecutive	One site	2005-2012	Adults	59	NR	NR	Perforated, Gangrenous	NR	NR	NR	NR	100	Laparoscopy or Open Surgery	1.9	General	NR	207
Kiriakopoulos	2006	Moderate	Cross sectional	Greece	Retrospective	Consecutive	One site	2000-2004	Adults	73.8	42.3	NR	Perforated, Suppurated, Generalized peritonitis	0	61.9	9.5	0	100	Laparoscopy with Open Surgery	1.1	General	NRR	42
Kirshtein	2009	Moderate	Cross sectional	Israel	Retrospective	Consecutive	One site	2000-2007	Adults	31.9	70.1	NR	Unclear	NR	NR	NR	NR	100	Laparoscopy or Open Surgery	0.7	General	NR	1435
Kiudelis	2013	Moderate	Cross sectional	Lithuania	Prospective	Consecutive	One site	2004-2009	Adults	46.3	32.3	NR	Unclear	NR	NR	NR	NR	100	Laparoscopy	1.1	General	NR	152
Kleif	2017	Moderate	Cross sectional	Denmark	Retrospective	Not clear	Multisite	2012-2014	Adults	53	47	NR	Suppurated, Gangrenous	NR	NR	NR	NR	98	Laparoscopy or Open Surgery	NR	General	NR	1151
Koizumi	2014	Moderate	Cross sectional	Japan	Prospective	Consecutive	One site	2010	Adults	57.9	39.8	NR	Catarrhal, Perforated, Gangrenous, phelmong	6.4	6.4	NR	25 4		Laparoscopy or Open Surgery	0.9	General	NR	185
Kubota	2014	Low	Clinical trial	Japan	Prospective	Random	One site	2008-2012	Children	63.6	NR	NR	Unclear	NR	NR	NR	NR	100	Open Surgery	NR	General	According to CDC-NNIS diagnostic Criteria	10

Author	Year	Risk of bias	Design	Country	Timing	Sampling method	Sites	Period	Population	%Male	Mean or median age	%Obesity	Pattern of appendicitis	%Catarrhal	%Perforated	%Suppurated	%Gangrenous	% with antibiotic therapy	Type of surgery	Time to complete the surgery intervention (in hours)	Type of anesthesia	SSI Definition	Sample
Kumamoto	2014	Low	Cohort	Japan	Prospective	Consecutive	One site	1997-2011	Adults	0	28	NR	Catarrhal, Gangrenous, Phlegmonous	21.8	NR	NR	33.4	100	Open Surgery	0.7	General	NR	124
Kumar	2016	Moderate	Cohort	Nepal	Prospective	Consecutive	One site	2015-2016	Adolescents, Adults	49	33.9	NR	Catarrhal, Perforated, Suppurated, Gangrenous, Normal	88.6	4.7	1.9	2.4		Laparoscopy or Open Surgery	0.7	General	According to CDC-NNIS diagnostic Criteria	212
Kumar	2008	Moderate	Cohort	Pakistan	Prospective	Consecutive	One site	1997-2000	Children, Adolescents, Adults, Elderly	NR	NR	NR	Unclear	NR	NR	NR	NR	50	Laparoscopy or Open Surgery	0.7	NR	NR	100
Lacher	2012	Moderate	Cohort	USA	Prospective	Consecutive	One site	2009-2011	Children, Adolescents	64.1	10.9	22.4	Catarrhal, Perforated	71.8	19	NR	NR	100	Laparoscopy	0.7	General	NR	415
Le	2009	Moderate	Cross sectional	USA	Retrospective	Systematic	One site	1997-2007	Children, Adolescents, Adults, Elderly	52.1	31.8	NR	Catarrhal, Perforated, Gangrenous, Normal Appendix	92.9	2	0	2.2	86	Laparoscopy or Open Surgery	0.9	NR	According to CDC-NNIS diagnostic criteria	507
Lee	2009	Low	Clinical trial	USA	Prospective	Random	One site	2006-2008	Children, Adolescents, Adults, Elderly	64.2	34.2	NR	Catarrhal, Perforated, Suppurated, Gangrenous	46.8	26.6	16.5	10.1	100	Open Surgery	NR	NR	Any significant subcutaneous SSI necessitating wound opening or treatment with antibiotics. This also included any subject who was prescribed a separate course of antibiotics after discharge from the hospital.	109
Lee	2010	Moderate	Cross sectional	Taiwan	Prospective	Consecutive	One site	2006-2008	Children	58	11.1	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	2	General	NR	264
Lee	2010	Moderate	Cross sectional	Korea	Retrospective	Consecutive	One site	2008-2009	Adults	49.3	26.7	NR	Perforated, Suppurated	0	26.7	73.3	0		Laparoscopy	1.0	General	NR	75
Lee	2010	Moderate	Cohort	USA	Retrospective	Consecutive	Multisite	1998-2007	Children, Adolescents	61.5	11	NR	Perforated, Non perforated	NR	25.7	NR	NR		Laparoscopy or Open Surgery	NR	General	NR	2462
Lee	2011	Moderate	Cohort	USA	Retrospective	Systematic	Multisite	1998-2007	Children, Adolescents	61	11.6	NR	Perforated, Non perforated 70.8%	NR	29.2	NR	NR		Laparoscopy or Open Surgery	NR	NR	NR	7650
Lemieux	2008	Moderate	Cohort	Canada	Retrospective	Consecutive	One site	1997-2007	Adults	0	28.8	NR	Perforated	NR	NR	NR	NR		Laparoscopy with Open Surgery	0.8	NR	NR	45
Levy	2013	Moderate	Cohort	USA	Retrospective	Consecutive	One site	2010-2011	Children	NR	NR	NR	Catarrhal, Perforated, Suppurated, Gangrenous	56.4	32.7	4.2	6.7		Laparoscopy or Open Surgery	NR	NR	NSQIP criteria	312

Author	Year	Risk of bias	Design	Country	Timing	Sampling method	Sites	Period	Population	%Male	Mean or median age	%Obesity	Pattern of appendicitis	%Catarrhal	%Perforated	%Suppurated	%Gangrenous	% with antibiotic therapy	Type of surgery	Time to complete the surgery intervention (in hours)	Type of anesthesia	SSI Definition	Sample
Li	2005	Moderate	Cohort	China	Prospective	Consecutive	One site	2002-2004	Children, Adolescents	71.3	7.9	NR	Catarrhal, Suppurated, Gangrenous	11.0	0	69.4	19.7	100	Laparoscopy or Open Surgery	0.65	General	NR	160
Li	2017	Moderate	Cohort	China	Retrospective	Consecutive	One site	2005-2016	Children	58.8	5.2	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	1	NR	Erythema, swelling and pus at the site of operation	398
Lim	2011	Low	Cohort	Korea	Retrospective	Consecutive	One site	2009-2011	Adults	47.8	50.8	NR	Perforated, Gangrenous	0	61.6	NR	18.3	100	Laparoscopy or Open Surgery	1.3	General	Any evidence of infection (e.g., erythema, purulent discharge, induration, etc) requiring suture removal, antibiotics or dehiscence.	60
Lima	2007	Moderate	Cross sectional	Spain	Retrospective	Consecutive	One site	2001-2006	Children, Adolescents, Adults, Elderly	NR	NR	NR	Catarrhal, Perforated, Suppurated, Gangrenous	53	2	26.3	9.7		NR	NR	NR	NR	300
Lin	2006	Moderate	Cross sectional	Taiwan	Retrospective	Consecutive	One site	2001-2003	Adults	57.6	37.5	NR	Perforated	NR	100	NR	NR	100	Laparoscopy or Open Surgery	1.4	Not described	NR	229
Litz	2016	Moderate	Cohort	USA	Retrospective	Consecutive	One site	2012-2015	Children, Adolescents	NR	11.4	17.7	Catarrhal, Perforated, Suppurated, Gangrenous, Interval, Normal	54	11.4	15.0	11.9		Laparoscopy	0.5	General	NR	413
Liu	2017	High	Cross sectional	China	Retrospective	Consecutive	Unclear	2015-2016	Children	53.6	6.6	NR	Catarrhal, Suppurated, Gangrenous	34.8	0	38.4	26.8		Laparoscopy or Open Surgery	1.0	General	NR	112
Mahmood	2016	Moderate	Clinical trial	Pakistan	Prospective	Random	One site	2012	Children, Adolescents, Adults	55.5	22.3	NR	Unclear	NR	NR	NR	NR	100	Laparoscopy or Open Surgery	NR	General	Based on Wound Asepsis Score	200
Martinez	2012	Moderate	Cross sectional	Spain	Retrospective	Random	One site	2011	Adults	60	35.8	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	General	NR	75
Mbah	2006	Moderate	Cohort	Nigeria	Prospective	Consecutive	One site	2005	Children, Adolescents, Adults, Elderly	70	25	NR	Unclear	NR	NR	NR	NR		Open Surgery	NR	General	NR	136
Memon	2017	Moderate	Clinical trial	Pakistan	Prospective	Random	One site	2014-2016	Adults	53.3	26	NR	Catarrhal	100	0	0	0	100	Laparoscopy or Open Surgery	NR	NR	NR	227
Menezes	2008	Moderate	Cross sectional	Ireland	Retrospective	Consecutive	One site	2000-2006	Children, Adolescents	62.7	10.5	NR	Perforated, Gangrenous	0	81.4	0	17.8		Laparoscopy or Open Surgery	NR	NR	NR	118
Merenda	2013	Moderate	Cross sectional	Poland	Retrospective	Consecutive	One site	2006-2012	Children, Adolescents, Adults, Elderly	NR	NR	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	NR	NR	317
Michailidou	2015	Low	Cross sectional	USA	Retrospective	Systematic	One site	2007-2013	Children, Adolescents	56.1	9.6	NR	Perforated, Negative appendectomy	NR	26.5	NR	NR		Laparoscopy or Open Surgery	1.3	NR	According to CDC-NNIS diagnostic criteria	264
Michailidou	2015	Moderate	Cross sectional	USA	Retrospective	Consecutive	Multisite	2012	Children, Adolescents	60.1	11.2	22.5	Catarrhal, Perforated, Suppurated, Gangrenous	NR	NR	NR	NR	100	Laparoscopy	0	General	NR	2812

Author	Year	Risk of bias	Design	Country	Timing	Sampling method	Sites	Period	Population	%Male	Mean or median age	%Obesity	Pattern of appendicitis	%Catarrhal	%Perforated	%Suppurated	%Gangrenous	% with antibiotic therapy	Type of surgery	Time to complete the surgery intervention (in hours)	Type of anesthesia	SSI Definition	Sample
Mickovic	2015	Moderate	Cross sectional	Serbia	Retrospective	Not clear	One site	2010	Children	46.4	11.7	NR	Catarrhal, Perforated, Gangrenous	45.9	2.2	NR	19.5	100	Laparoscopy or Open Surgery	0.7	General	NR	218
Ming	2009	Moderate	Cross sectional	China	Retrospective	Consecutive	One site	2003-2005	Adults	57.2	48.8	NR	Perforated, Gangrenous, Appendicular abscess	NR	72.3	NR	38.2	100	Laparoscopy or Open Surgery	NR	General	NR	173
Mingmalairak	2009	Low	Clinical trial	Thailand	Prospective	Random	One site	2006-2007	Adults	61	29.5	0	Catarrhal, Perforated, Suppurated, Gangrenous	24	16	52	8.0	100	Open Surgery	43	General	NR	100
Miyano	2010	Low	Cohort	Japan	Prospective	Consecutive	One site	2004-2008	Children, Adolescents	56.5	7.7	NR	Peritonitis complicating appendicitis	0	100	0	0	100	Laparoscopy or Open Surgery	1.9	General	NR	23
Moazzez	2013	Low	Cohort	USA	Retrospective	Not clear	One site	2005-2009	Elderly	49.3	74	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	General	NR	2060
Monge Jodra	2003	Moderate	Cohort	Spain	Prospective	Consecutive	Multisite	1997-2000	Children, Adolescents, Adults, Elderly	NR	NR	NR	Unclear	NR	NR	NR	NR		NR	NR	NR	According to CDC-NNIS diagnostic Criteria	5780
Mueck	2017	Moderate	Cohort	USA	Prospective	Consecutive	One site	2012-2015	Children, Adolescents	62.5	11.0	NR	Catarrhal, Suppurated	NR	NR	NR	NR	95	Laparoscopy with Open Surgery	NR	General	NR	697
Muensterer	2011	Low	Cohort	USA	Prospective	Consecutive	One site	2009-2010	Children, Adolescents	NR	11.2	NR	Catarrhal, Perforated	78.1	10.4	0	0	100	Laparoscopy	0.6	General	Infected umbilicus requiring antibiotics, or incision and drainage	183
Muensterer	2009	Moderate	Cross sectional	USA	Prospective	Consecutive	One site	2009	Children	61.3	11	NR	Perforated	NR	21.4	NR	NR		Laparoscopy	0.73	General	NR	75
Mustafa	2016	Low	Clinical trial	Pakistan	Prospective	Random	One site	2015-2016	Adults	52.9	26.6	NR	Perforated	0	100	0	0	100	Open Surgery	NR	NR	Redness around the wound, serosangious discharge, fever > 100°F	68
Nadler	2003	High	Cross sectional	USA	Retrospective	Systematic	One site	1998-2001	Children	62.2	9.35	NR	Perforated	NR	100	NR	NR	100	Open Surgery	NR	General	NR	94
Nataraja	2010	Moderate	Cohort	United Kingdom	Retrospective	Consecutive	One site	2008-2010	Children, Adolescents	59.1	11	NR	Catarrhal, Perforated, Suppurated	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	General	NR	191
Nataraja	2012	Moderate	Case control	United Kingdom	Retrospective	Consecutive	Multisite	2003-2010	Children, Adolescents	58.2	11.3	NR	Catarrhal, Perforated, Suppurated, Gangrenous	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	General	Post op intra abdominal abcess	1205
Obayashi	2015	Moderate	Cross sectional	Japan	Retrospective	Consecutive	One site	2006-2014	Children, Adolescents	60	11	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	NR	NR	485
Obinwa	2015	Moderate	Cohort	Ireland	Retrospective	Consecutive	One site	1995-2008	Children	54.5	9.6	NR	Catarrhal, Perforated, Suppurated, Gangrenous	62.7	NR	NR	4.2	100	NR	NR	NR	NR	1037
Ohene	2006	Moderate	Cross sectional	Ghana	Prospective	Consecutive	One site	1998-2004	Adults	63.9	32.4	NR	Unclear	NR	NR	NR	NR	100	Open Surgery	NR	General	NR	638
Okkyung	2002	Moderate	Clinical trial	Korea	Prospective	Random	One site	2002	Children, Adolescents, Adults, Elderly	54.7	30.5	NR	Catarrhal, Suppurated, Gangrenous	NR	0	50	27.3	100	Open Surgery	NR	General	NR	84

Author	Year	Risk of bias	Design	Country	Timing	Sampling method	Sites	Period	Population	%Male	Mean or median age	%Obesity	Pattern of appendicitis	%Catarrhal	%Perforated	%Suppurated	%Gangrenous	% with antibiotic therapy	Type of surgery	Time to complete the surgery intervention (in hours)	Type of anesthesia	SSI Definition	Sample
Onieva	2017	Moderate	Cross sectional	Spain	Retrospective	Consecutive	One site	2012-2014	Children, Adolescents, Adults, Elderly	53.7	32	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	NR	NR	294
Page	2010	Moderate	Cross sectional	USA	Retrospective	Exhaustive	Multisite	2008	Adults	51.4	39.2	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	0.94	General	NR	17199
Palesty	2004	Moderate	Cross sectional	USA	Retrospective	Consecutive	One site	2000-2002	Adults	47	25.2	NR	Unclear	NR	NR	NR	NR	100	Laparoscopy	1.2	General	NR	50
Pandit	2016	High	Cohort	Nepal	Retrospective	Consecutive	Multisite	2009-2014	Children, Adolescents, Adults	51	24.3	NR	Perforated, Suppurated	NR	2.6	97.4	0		Open Surgery	0.6	Spinal and General	NR	101
Parcells	2009	Low	Cohort	USA	Retrospective	Systematic	One site	1997-2007	Adults	NR	39.3	NR	Perforated, Not perforated	NR	33.1	NR	NR		Laparoscopy or Open Surgery	NR	NR	According to CDC-NNIS diagnostic criteria	1063
Park	2017	Low	Cohort	Korea	Prospective	Systematic	One site	2012-2014	Adults	53.3	37.45	NR	Perforated, Gangrenous	NR	38.7	NR	45.9		Laparoscopy	1.1	General	According to CDC-NNIS diagnostic Criteria	1343
Park	2018	Moderate	Cohort	Korea	Retrospective	Consecutive	One site	2009-2013	Adults	53.7	34.2	NR	Perforated	NR	13.2	NR	NR		Laparoscopy with Open Surgery	1.1	General	NR	986
Pascual	2017	Moderate	Cohort	Spain	Prospective	Consecutive	One site	2013-2017	Adults	49	41	NR	Unclear	NR	NR	NR	NR		Laparoscopy	0.1	General	NR	100
Patel	2003	High	Cohort	Kenya	Retrospective	Consecutive	One site	1996-2002	Children, Adolescents, Adults	30.2	30.6	NR	Catarrhal, Suppurated, Gangrenous, Carcinoid tumor	94.3	0	0.9	2.8	100	Laparoscopy with Open Surgery	1.5	General	NR	106
Pearcy	2017	Moderate	Case control	USA	Retrospective	Random	Multisite	2010-2014	Adults	54	36	NR	Unclear	NR	NR	NR	NR		NR	1.1	NR	NR	2903
Pishori	2003	Low	Cross sectional	Pakistan	Prospective	Systematic	One site	1997-1999	Children, Adolescents, Adults, Elderly	NR	NR	NR	Unclear	NR	NR	NR	NR		NR	NR	NR	According to CDC-NNIS diagnostic criteria	3304
Putnam	2016	Moderate	Cross sectional	USA	Prospective	Consecutive	One site	2012-2015	Children, Adolescents	61	9.4	NR	Perforated, Suppurated, Gangrenous	0	100	0	0	100	Laparoscopy or Open Surgery	0.9	General	NR	410
Qahtani	2014	Moderate	Cohort	Saudi Arabia	Prospective	Random	One site	2012	Adolescents, Adults	68	23.6	NR	Catarrhal, Perforated, Gangrenous	9.6	19.9	NR	22.4	100	Open Surgery	1.5	General	NR	91
Quezada	2015	Moderate	Cohort	Chile	Retrospective	Consecutive	One site	2003-2013	Adults	43	39	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	2.2	NR	NR	227
Raakow	2014	High	Cohort	Germany	Prospective	Not clear	One site	2009-2013	Adolescents, Adults	28.8	27.2	NR	Catarrhal, Suppurated, Gangrenous	12.8	0	16	4		Laparoscopy	0.8	General	NR	156
Rafiq	2015	Low	Clinical trial	Pakistan	Prospective	Random	One site	2012-2014	Adolescents, Adults, Elderly	48.5	22.6	0	Unclear	NR	NR	NR	NR	100	Open Surgery	0.7	General	NR	390
Rajabi-Mashhadi	2012	Moderate	Clinical trial	Iran	Prospective	Random	One site	2006-2007	Adults	62.5	26.2	NR	Unclear, Non perforated	NR	NA	NR	NR	100	Open Surgery	NR	NR	NR	291

Author	Year	Risk of bias	Design	Country	Timing	Sampling method	Sites	Period	Population	%Male	Mean or median age	%Obesity	Pattern of appendicitis	%Catarrhal	%Perforated	%Suppurated	%Gangrenous	% with antibiotic therapy	Type of surgery	Time to complete the surgery intervention (in hours)	Type of anesthesia	SSI Definition	Sample
Reinisch	2017	Moderate	Cross sectional	Germany	Retrospective	Consecutive	One site	2008-2015	Adults	56	32	NR	Unclear	NR	NR	NR	NR	100	Laparoscopy with Open Surgery	NR	General	NR	680
Rios	2004	High	Cross sectional	Peru	Not reported/Unclear	Consecutive	One site	2001-2002	Children, Adolescents, Adults, Elderly	NR	30.6	NR	Catarrhal, Perforated, Suppurated, Gangrenous	15.38	16.35	44.23	24.04	100	NR	0.98	Unclear	NR	104
Romano	2014	Moderate	Cross sectional	USA	Retrospective	Systematic	One site	2010-2012	Adults	66	35.7	NR	Gangrenous	NR	NR	NR	9.7	86	Laparoscopy	NR	General	NR	372
Romel Hilaire	2014	Moderate	Cross sectional	Cuba	Retrospective	Consecutive	One site	2007-2009	Adults	100	NR	NR	Suppurated	0	0	100	0		Laparoscopy or Open Surgery	NR	NR	NR	720
Romeo	2009	Moderate	Cross sectional	Colombia	Retrospective	Consecutive	One site	1997	Children, Adolescents, Adults, Elderly	NR	NR	NR	Unclear	NR	NR	NR	NR		Laparoscopy	NR	NR	NR	310
Romy	2008	Low	Cross sectional	Switzerland	Prospective	Systematic	Multisite	1998-2004	Children, Adolescents, Adults, Elderly	53.9	32.7	NR	Unclear	NR	NR	NR	NR	59.5	Laparoscopy or Open Surgery	NR	NR	According to CDC-NNIS diagnostic criteria	2468
Rooh-ul-Muqim	2010	Moderate	Cohort	Pakistan	Prospective	Consecutive	One site	2008-2009	Adolescents, Adults, Elderly	48.5	24	NR	Catarrhal, Perforated, Suppurated, Gangrenous	NR	NR	NR	NR	100	Laparoscopy or Open Surgery	0.5	General	NR	165
Rossem	2015	Moderate	Cohort	Netherlands	Prospective	Consecutive	Multisite	2014	Adults	47.5	44	NR	Perforated, Gangrenous	NR	68	10.4	21.7	100	Laparoscopy with Open Surgery	0.9	General	NR	415
Rossem	2016	Low	Cohort	Netherlands	Prospective	Not clear	Multisite	2014	Children, Adolescents, Adults	46.2	28.0	NR	Unclear	NR	NR	NR	NR		Laparoscopy	0.8	General	Superficial surgical site infection: recorded when administration of antibiotics, opening of the incision or both was necessary. An intra-abdominal abscess was defined as a postoperative intra-abdominal fluid collection diagnosed by cross-sectional imaging for which administration of antibiotics or a radiological or surgical intervention was needed.	1995
Rotermann	2004	Moderate	Cohort	Canada	Retrospective	Consecutive	Multisite	1997-2000	Children, Adolescents, Adults, Elderly	55.2	NR	NR	Unclear	NR	NR	NR	NR		NR	NR	NR	According to CDC-NNIS diagnostic criteria	80867

Author	Year	Risk of bias	Design	Country	Timing	Sampling method	Sites	Period	Population	%Male	Mean or median age	%Obesity	Pattern of appendicitis	%Catarrhal	%Perforated	%Suppurated	%Gangrenous	% with antibiotic therapy	Type of surgery	Time to complete the surgery intervention (in hours)	Type of anesthesia	SSI Definition	Sample
Saar	2016	Low	Cross sectional	Estonia	Prospective	Consecutive	One site	2013-2014	Adults	48.9	35.4	NR	Perforated, Gangrenous	NR	15.4	NR	59.4	95.1	Laparoscopy or Open Surgery	0.7	General	According to CDC-NNIS diagnostic Criteria	266
Saber	2010	Moderate	Clinical trial	USA	Prospective	Consecutive	One site	2008-2009	Adults	42.3	33	NR	Catarrhal	100	0	0	0		Laparoscopy	0.8	NR	NR	26
Sadraei-Mosavi	2017	Moderate	Clinical trial	Iran	Prospective	Random	One site	2013-2014	Adults	NR	28.4	NR	Catarrhal	100	0	0	0	100	Open Surgery	NR	NR	SSI=pus discharge from wound, redness, tenderness, edema	152
Saha	2010	Moderate	Cohort	Bangladesh	Prospective	Consecutive	One site	2007-2008	Children	NR	NR	NR	Unclear	NR	NR	NR	NR	100	Laparoscopy or Open Surgery	NR	NR	NR	60
Sahm	2010	Moderate	Cross sectional	Germany	Prospective	Systematic	One site	1998-2006	Adults	54	39	NR	Catarrhal, Perforated, Gangrenous	50.7	17.0	NR	6.9	100	Laparoscopy or Open Surgery	1.0	General	NR	1710
Sahm	2015	Moderate	Cross sectional	Germany	Prospective	Exhaustive	Multisite	1988-2009	Children, Adolescents, Adults, Elderly	43	31	NR	Perforated, Non Perforated 91.5	NR	8.5	NR	NR		Laparoscopy or Open Surgery	NR	NR	NR	12570
Salö	2016	High	Cohort	Sweden	Retrospective	Consecutive	One site	2006-2014	Children	55.6	10.4	NR	Perforated, Gangrenous, Phlegmonous	NR	7.3	NR	11.6	100	Laparoscopy	0.94	NR	NR	259
Sanchez-Santana	2017	Low	Cohort	Spain	Prospective	Consecutive	One site	2007-2015	Adults	55.2	32.9	2.6	Unclear	NR	NR	NR	NR	71.3	Laparoscopy or Open Surgery	NR	NR	According to CDC-NNIS diagnostic criteria	930
Sauvain	2016	Moderate	Cohort	Switzerland	Retrospective	Consecutive	Multisite	2007-2011	Adults	53.2	34	NR	Catarrhal, Perforated, Suppurated, Gangrenous	NR	19	NR	NR		Laparoscopy or Open Surgery	NR	NR	NR	2559
Scarborough	2012	Low	Cross sectional	USA	Retrospective	Systematic	Multisite	2005-2009	Children, Adolescents, Adults, Elderly	52	38.9	NR	Perforated, Non rupture	NR	11.2	NR	NR		Laparoscopy or Open Surgery	0.9	NR	According to CDC-NNIS diagnostic criteria	39122
Scarless	2013	Moderate	Clinical trial	Scotland	Prospective	Random	One site	2011	Adults	53	32	NR	Unclear	NR	NR	NR	NR		Laparoscopy	1.4	General	NR	38
Seifarth	2016	Moderate	Cohort	USA	Retrospective	Consecutive	Multisite	2007-2012	Children, Adults	60	12	NR	Catarrhal	100	0	0	0		Laparoscopy	NR	General	NR	1283
Seifarth	2016	Low	Cohort	USA	Retrospective	Consecutive	Multisite	2007-2012	Children, Adolescents, Adults	60	12	NR	Perforated, Suppurated, Gangrenous	100	0	0	0		Laparoscopy	NR	NR	NR	1283
Senekjan	2013	Moderate	Cohort	USA	Retrospective	Consecutive	Multisite	2005-2009	Adolescents	56.5	40.3	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	0.9	NR	1) SSI (superficial and deep incisional)...infection within 30 days of operation and involved skin, subcutaneous tissue or deep soft tissue 2) Organ space infection (OSI)...infection within 30 days of operation when the infection appeared to be related to the operation and involved any part of the anatomy other than the incision	61830

Author	Year	Risk of bias	Design	Country	Timing	Sampling method	Sites	Period	Population	%Male	Mean or median age	%Obesity	Pattern of appendicitis	%Catarrhal	%Perforated	%Suppurated	%Gangrenous	% with antibiotic therapy	Type of surgery	Time to complete the surgery intervention (in hours)	Type of anesthesia	SSI Definition	Sample
Seo	2002	Moderate	Cross sectional	Korea	Retrospective	Systematic	One site	2000	Adults	0	NR	NR	Catarrhal, Perforated, Suppurated, Gangrenous	14.7	15.6	49.5	20.2		NR	NR	NR	NR	129
Sesia	2011	Moderate	Cohort	Germany	Prospective	Consecutive	One site	2006-2008	Children, Adolescents, Adults, Elderly	NR	NR	NR	Unclear	NR	NR	NR	NR	100	Laparoscopy or Open Surgery	1	NR	NR	265
Shaikg	2011	Moderate	Cross sectional	Pakistan	Prospective	Consecutive	One site	2007-2009	Adults	51.4	29	NR	Catarrhal, Perforated, Suppurated	82.86	8.67	1.51	0		Open Surgery	NR	General	NR	461
Shang	2017	Moderate	Cohort	China	Retrospective	Consecutive	One site	2013-2016	Adults	54.3	2.2	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	NR	Erythema, swelling and purulent discharge	398
Shimizu	2014	Low	Cross sectional	Japan	Retrospective	Not clear	One site	2000-2012	Adults	44	35	NR	Catarrhal, Gangrenous	19	NR	NR	37		Open Surgery	NR	General	According to CDC-NNIS diagnostic Criteria	300
Shindholimath	2011	Moderate	Cross sectional	India	Retrospective	Consecutive	One site	2007-2009	Adults	68.4	NR	NR	Perforated, Suppurated, Gangrenous, Appendicular abscess	0	36.8	5.3	26.3	100	Laparoscopy	1.6	General	NR	19
Siam	2017	Moderate	Cohort	Israel	Retrospective	Consecutive	One site	2008-2015	Adults	62.8	34.1	NR	Unclear	NR	NR	NR	NR	100	Laparoscopy with Open Surgery	0.7	General	NR	1649
Silva	2008	Moderate	Cohort	Chile	Prospective	Random	One site	2005-2006	Adults	58.9	NR	NR	Unclear	NR	NR	NR	NR		Open Surgery	NR	General	NR	433
Singh	2017	Moderate	Clinical trial	India	Prospective	Consecutive	One site	2014-2015	Adults	43.2	28.7	11.4	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	General	NR	44
Siribumrungwong	2013	Low	Cohort	Thailand	Retrospective	Systematic	One site	2006	Adults	65	37	NR	Perforated	NR	100	NR	NR	100	Open Surgery	1.2	NR	According to CDC-NNIS diagnostic criteria	128
Sivrikoz	2015	Moderate	Cohort	USA	Retrospective	Exhaustive	Multisite	2004-2010	Children, Adolescents, Adults, Elderly	52.1	48	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	0.9	NR	NR	4844
Soll	2016	Low	Cohort	Switzerland	Retrospective	Consecutive	One site	2009-2013	Children, Adolescents, Adults, Elderly	54.7	26.5	NR	Catarrhal, Perforated, Suppurated, Gangrenous	NR	46	NR	NR	100	Laparoscopy	1	NR	According to CDC-NNIS diagnostic Criteria	813
Sozutek	2013	Low	Clinical trial	Turkey	Retrospective	Consecutive	One site	2010-2011	Adults	44	30.9	NR	Catarrhal, Perforated	57	20	NR	NR		Laparoscopy or Open Surgery	0.5	General	NR	75
Srishewachart	2016	Moderate	Cross sectional	Thailand	Retrospective	Consecutive	One site	2012-2014	Children, Adolescents, Adults, Elderly	52	43.7	7.4	Unclear	NR	NR	NR	NR		Open Surgery	NR	General	NR	450
Staszewicz	2014	Moderate	Cohort	Switzerland	Prospective	Systematic	Multisite	1998-2011	Children, Adolescents, Adults, Elderly	54	34.2	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	1	NR	According to CDC-NNIS diagnostic Criteria	6383
Suttie	2004	High	Case control	Scotland	Retrospective	Not clear	One site	1997-2002	Children	50	10.8	NR	Perforated, Suppurated, Gangrenous	0	2	50	14		Laparoscopy	1	General	NR	60
Svensson	2016	Moderate	Cohort	Sweden	Prospective	Consecutive	One site	2006-2010	Children, Adolescents	60.2	11.3	NR	Catarrhal, Perforated, Suppurated, Gangrenous, not described	6.6	21.8	44.6	29.8	100	Laparoscopy or Open Surgery	0.7	General	NR	1745

Author	Year	Risk of bias	Design	Country	Timing	Sampling method	Sites	Period	Population	%Male	Mean or median age	%Obesity	Pattern of appendicitis	%Catarrhal	%Perforated	%Suppurated	%Gangrenous	% with antibiotic therapy	Type of surgery	Time to complete the surgery intervention (in hours)	Type of anesthesia	SSI Definition	Sample
Taguchi	2015	Moderate	Clinical trial	Japan	Prospective	Random	One site	2009-2014	Adults	65.43	47.5	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	1.2	General	According to CDC-NNIS diagnostic Criteria	81
Tanaka	2007	Moderate	Cohort	Japan	Retrospective	Consecutive	One site	2002-2005	Children	54.3	2.2	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	NR	NR	95
Tijerina	2010	Low	Clinical trial	Mexico	Prospective	Exhaustive	One site	2005-2007	Children, Adolescents, Adults, Elderly	46	NR	NR	Unclear	NR	NR	NR	NR	100	Open Surgery	NR	General	NR	529
Toro Pablo	2017	Moderate	Cohort	Spain	Retrospective	Consecutive	One site	2012-2016	Children, Adolescents, Adults	NR	26	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	NR	NR	600
Towfigh	2011	Low	Clinical trial	USA	Prospective	Random	One site	2007-2009	Adults	77.3	33	NR	Perforated	0	100	0	0		Open Surgery	NR	NR	NR	75
Troillet	2017	Low	Cohort	Switzerland	Prospective	Consecutive	Multisite	2011-2015	Children, Adolescents, Adults, Elderly	NR	NR	NR	Unclear	NR	NR	NR	NR	92.2	Laparoscopy or Open Surgery	NR	NR	According to CDC-NNIS diagnostic Criteria	15439
Tsioplis	2013	Moderate	Cross sectional	Germany	Retrospective	Consecutive	One site	1999-2008	Children, Adolescents, Adults, Elderly	51	23	9	Catarrhal, Perforated, Suppurated, Gangrenous	19	NR	50	25	75	Laparoscopy or Open Surgery	NR	Not reported	NR	1439
Vahdad	2016	Moderate	Cross sectional	Germany	Retrospective	Systematic	One site	2008-2012	Children, Adolescents	52.4	NR	NR	Catarrhal, Perforated, Phelgmonous in 43% of cases	48.2	8.7	NR	NR		Laparoscopy	1.1	NR	NR	309
Van Rossem	2016	High	Cohort	Netherlands	Prospective	Consecutive	Multisite	2014	Adults	49.7	39.0	NR	Catarrhal, Perforated, Gangrenous	73.7	11.0	NR	9.9	96.6	Laparoscopy or Open Surgery	0.72	NR	NR	1378
Van Rossem	2014	High	Cohort	Netherlands	Retrospective	Consecutive	Multisite	2004-2010	Adults	53.2	49	NR	Perforated	0	100	0	0	100	Laparoscopy or Open Surgery	0.85	NR	NR	267
Wang-Chan	2017	Low	Cross sectional	Switzerland	Retrospective	Consecutive	One site	2013-2014	Children, Adolescents, Adults, Elderly	55.3	47	13.8	Unclear	NR	NR	NR	NR		Laparoscopy with Open Surgery	NR	General	According to CDC-NNIS diagnostic Criteria	246
Watanabe	2011	Low	Cross sectional	Japan	Prospective	Consecutive	Multisite	2005-2006	Adults	59.4	63.8	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	General	According to CDC-NNIS diagnostic Criteria	903
Willis	2016	Moderate	Cohort	USA	Prospective	Consecutive	One site	2013-2014	Children, Adolescents	58.5	8.8	NR	Unclear	NR	NR	NR	NR	100	Laparoscopy or Open Surgery	NR	General	NR	313
Wong	2015	High	Cohort	Peru	Prospective	Not clear	Multisite	2005-2010	Adults	NR	NR	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	General	NR	352
Wu	2006	Low	Cross sectional	Taiwan	Retrospective	Not clear	One site	2001-2005	Adults	75	42	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	0.95	General	NR	1795

Author	Year	Risk of bias	Design	Country	Timing	Sampling method	Sites	Period	Population	%Male	Mean or median age	%Obesity	Pattern of appendicitis	%Catarrhal	%Perforated	%Suppurated	%Gangrenous	% with antibiotic therapy	Type of surgery	Time to complete the surgery intervention (in hours)	Type of anesthesia	SSI Definition	Sample
Wu	2011	Moderate	Cohort	Taiwan	Retrospective	Exhaustive	Multisite	2004-2009	Children, Adolescents, Adults, Elderly	58.1	36.4	NR	Unclear	NR	NR	NR	NR		Laparoscopy or Open Surgery	NR	General	NR	1366
Wu	2017	Moderate	Cross sectional	China	Retrospective	Consecutive	One site	2014-2016	Elderly	59	71	NR	Perforated, Suppurated, Gangrenous	0	61.7	10	28.7	100	Laparoscopy or Open Surgery	1	General	NR	115
Wu	2014	Moderate	Clinical trial	China	Prospective	Random	One site	2011-2013	Children, Adolescents	60	8.5	NR	Catarrhal	100	0	0	0		Laparoscopy	1	General	NR	60
Yaghoubian	2010	High	Cross sectional	USA	Retrospective	Exhaustive	Multisite	1998-2007	Children, Adolescents, Adults, Elderly	61.5	29.2	NR	Catarrhal, Perforated	73.4	26.6	0	0		Laparoscopy or Open Surgery	NR	NR	NR	4325
Yagnik	2010	Moderate	Cross sectional	India	Retrospective	Consecutive	One site	2007-2009	Children, Adolescents, Adults	32.5	23.41	NR	Catarrhal	100	0	0	0	100	Laparoscopy or Open Surgery	1	General	NR	151
Yousef	2017	Moderate	Cohort	Canada	Prospective	Consecutive	One site	2015-2016	Children, Adolescents	63.1	9.3	NR	Perforated	0	100	0	0	100	Laparoscopy	NR	General	NR	122
Zhang	2015	Moderate	Clinical trial	China	Prospective	Random	One site	2012-2013	Adults	47.2	30.8	NR	Unclear	10.2	7.4	54.6	9.3		Laparoscopy	0.9	General	NR	108

NR: not reported

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