Supplemental file contents:

Supplemental file abbreviations: TAP = Topical antibiotic prophylaxis; PPAP = Protocolized parenteral antibiotic prophylaxis; EAP = enteral antibiotic prophylaxis;

Table S1: *Pseudomonas* and *Acinetobacter* data: observational studies (Benchmark groups) [a]

author	Year	Ref	Notes	MV%	LOS	Patients	VAP		Bacteremia	
					d	n	v_ps_n	v_ac_n	b_ps_n	b_ac_n
A'court	1993	1	T	100	12	150	17	0	6	
Alvarez-Lerma	1996	2		93	9	6494	174	56		
Antonelli	1994	3		70	17	124	5	6		
Apostolopoulou	2003	4		100	16	175	17	6		
Baraibar	1997	5		100	8	707		12		
Beck-Sague	1996	6		100	5	145	5	0		
Bekaert	2011	7		100	8	4479	155	24		
Bercault_IHT	2005	8		100	9	118	9	2		
Bercault_all	2005	8		100	10	236	12	5		
Berrouane_all	1998	9		83	13	565	40			
Bochicchio	2004	10	T	100	13	678	22	10		
Bonten'94	1994	11		100	25	64	6	0		
Boots'06_All	2006	12		100	13	381	14	14		
Boots	2008	13		100	13	412	15	14		
Bornstain	2004	14		100	12	747	23	1		
Braun	1986	15		100	6	66	0			
Bregeon	1997	16		100	10	660	33	10		
Bronchard	2004	17	T	100	23	109	0			
Cade	1993	18		98	16	98	4	0	1	0
Cavalcanti	2006	19		100	5	190	9	1		
Cenderero	1999	20		100	7	123	4	2		
Chaari	2015	21		100	8	175	20	12		
Chastre	1998	22		100	19	243	36	13		
Chevret	1993	23		100	5	255	21	5		
Cook_non-trauma	2010	24		100	6	2080	7	1		
Cook_trauma	2010	24	T	100	7	511	16	8		
Craven-medical	1988	25		100	6	277	9	0	1	
Craven-surgical	1988	25		100	6	521	17	0	6	
Daschner	1988	26		100	6	116	9	1		
de_Latorre	1995	27		100	15	80	7	0		
El-Masri	2004	28		NS	11	361			1	3
Ensminger	2006	29	C	100	7	92	2	1		
Esteve	2007	30		80	16	395			8	1
Esteve	2007	30		78	17	404			4	6
Evans	2010	31		100	8	416	18			
Ewig	1999	32		100	10	48	4	0		
Fabian_all	1993	33		100	11	278	10	15		
Fagon'89	1989	34		100	13	567	16	8		

Table S1 (continued): *Pseudomonas* VAP data: observational studies (Benchmark groups)

author	Year	Ref	Notes	MV%	LOS	Patients	VAP		Bacteremia	
					d	n	v_ps_n	v_ac_n	b_ps_n	b_ac_n
Gacouin	2009	35		100	11	361	21	4		
Garrouste-Orgeas	1997	36		100	11	86	9	11		
Garrouste-Orgeas	2006	37		75	11	3247			19	1
George	1998	38		100	6	223	6	1		
Georges	2000	39		100	18	135	19	8		
Giamarellos-Bourboulis	2009	40	T	100	12	72	5	17	1	2
Giard	2008	41		100	8	7236	168			
Gruson-97-98	2000	42	I	100	12	1029	47	7		
Gruson-95-96	2000	42		100	12	1004	62	20		
Gruson-99-01	2003	43		100	12	823	41	15		
Guérin	1997	44		100	19	260	14	1		
Heyland	1999	45		100	16	1014	38	6		
Holzapfel_93	1993	46		100	10	300	0	1	0	
Hortal	2009	47	C	100	9	231	40	4		
Huang_1SC	2013	48		NS	3	23480			14	7
Huang_1pre	2013	48		NS	3	15816			5	9
Hugonnet	2007	49		100	6	936	31	8		
Hyllienmark	2007	50		100	4	221	0	1		
Ibáñez	2000	51		100	8	30	1	1		
Ibrahim'00	2000	52		69	11	4913			22	8
Ibrahim'00	2000	52		100	5	1882	130	16		
Jaillette	2011	53		100	15	439	59	22		
Jimenez	1989	54		100	6	77	7	6		
Kallel	2005	55		100	14	241	34	31		
Ko	2013	56		100	23	1453			21	11
Kollef' 93	1993	57		100	7	277	4	1		
Kollef '95	1995	58		100	15	300	23	6		
Kollef '97	1997	59		100	8	521	15	2		
Kollef'14_Europe	2014	60		100	11	495	24			
Kollef'14_USA	2014	60		100	11	502	17			
Koss– N	2001	61		100	10	87	4	2		
Koss– P	2001	61	I	100	8	66	9	2		
Kunac	2014	62		100	5	716	23	13	2	1
Laggner	1989	63		100	11	32	0	0		
Lambert	2011	64		NS	5	119699			389	143
Laupland	2002	65		NS	5	1017			2	0
Laupland	2004	66		84	5	4473			11	4

Table S1 (continued): *Pseudomonas* VAP data: observational studies (Benchmark groups)

author	Year	Ref	Notes	MV%	LOS	Patients	VAP		Bacteremia	
					d	n	v_ps_n	v_ac_n	b_ps_n	b_ac_n
Lepelletier	2010	67	T	100	13	161	10			
Luyt	2005	68		100	35	290	11	3		
Magnason	2008	69		100	8	280	5	0	0	0
Magret_trauma	2010	70	T	100	5	354	17	30		
Magret_non-trauma	2010	70		100	5	2082	64	42		
Mahul	1992	71		100	17	145	8	3		
Makris	2011	72	I	100	22	152	7			
Markowicz	2000	73		100	12	744	58	13		
Moine	2002	74		80	14	764	27	1		
Montecalvo_G	1992	75		100	10	19			0	
Myny	2005	76		100	6	385	28	13		
Nguile-Makao	2010	77		100	7	2873	130			
Nielsen	1992	78		100	5	242	3	0		
Nseir	2005	79		100	24	1241	32	20		
Osmon	2003	80		72	8	893			9	
Papazian	1996	81		100	16	586	26	5		
Potgieter	1987	82		78	9	250	26	32		
Rello'91	1991	83		100	8	264	14	2		
Rello'92	1992	84		67	9	161	4			
Rello'94	1994	85		72	7				16	5
Rello'94	1994	86		100	13	568	18			
Rello'96	1996	87		100	8	83	4			
Rello'02	2002	88		100	8	9080	119			
Rello'03	2003	89		100	7	99	8	2		
Reusser	1989	90		100	7	40	2	1	0	0
Rincón-Ferrari	2004	91		100	10	310	6	27		
Rodriguez	1991	92	T	100	14	294	31	11		
Ruiz-Santana	1987	93		100	7	1005	56	0		
Salata	1987	94		100	14	51	7	0		
Shahin	2013	95		100	6	267	4			
Sligl	2006	96		NS	6	6544			10	1
Sofianou	2000	97		100	36	198	19	35		
Stéphan	2006	98	T	100	16	175	14	8		
Tejada-Artigas	2001	99		100	12	103	5	10		
Thompson	2008	100		NS	6	4270			13	1
Timsit	1996	101		100	19	387	11	8		
Torres	1990	102		100	4	322	5	9		

Table S1 (continued): *Pseudomonas* VAP data: observational studies (Benchmark groups)

author	Year	Ref	Notes	MV%	LOS	Patients	**VAP**		**Bacteremia**	
					d	n	v_ps_n	v_ac_n	b_ps_n	b_ac_n
Trouillet	1998	103		100	17	498	39	22		
Urli	2002	104		95	21	178	27		3	
Valles	2007	105		100	22	60	15	0		
Vanhems	2011	106		100	6	3387	24			
Verhamme	2007	107		84	8	4000	54	3		
Violan	1998	108		100	16	314	25	1		
Warren	2001	109		28	4	3163			3	0
Woske	2001	110		100	15	103	8	1		
Zahar	2009	111		100	9	1233	62			

Table S1 footnotes

T – Data originating from a study for which the majority of ICU admission were for trauma

I – Infection control intervention to entire ICU

NS – Not stated; LOS is mean or median length of ICU stay

v_ps_n is the count of *Pseudomonas* VAP and v_ac_n is the count of *Acinetobacter* VAP

b_ps_n is the count of *Pseudomonas* bacteremia and b_ac_n is the count of *Acinetobacter* bacteremia

Several (n = 43) of these studies were cited in the following source systematic reviews.

- Melsen WG, Rovers MM, Bonten MJM: Ventilator-associated pneumonia and mortality: A systematic review of observational studies. *Crit Care Med* 2009, 37:2709–2718.
- Safdar N, Dezfulian C, Collard HR, Saint S: Clinical and economic consequences of ventilator-associated pneumonia: a systematic review. *Crit Care Med* 2005, 33:2184–93.
- Agrafiotis M, Siempos II, Ntaidou TK, Falagas ME. Attributable mortality of ventilator-associated pneumonia: a meta-analysis. *Intern J Tub Lung Dis.* 2011;15(9):1154-1163.

Table S2: *Pseudomonas* and *Acinetobacter* data: Groups of non decontamination studies [a]

author	Year	Ref	Notes	MV%	LOS	Patients	VAP		Bacteremia	
					d	n	v_ps_n	v_ac_n	b_ps_n	b_ac_n
Acosta-escribano	2010	112	T	100	18	54	4	0		
Acosta-escribano	2010	112	T	100	16	50	3	0		
Bonten '95	1995	113		100	17	67	11	0		
Bonten '95	1995	113		100	19	74	7	1		
Combes	2000	114	T	100	16	50	0			
Combes	2000	114	T	100	20	54	0			
Cook	1998	115		100	9	596	20			
Cook	1998	115		100	9	604	21			
Dreyfuss	1991	116		100	13	35	3	3		
Dreyfuss	1991	116		100	10	28	1	2		
Daumal	1999	117		100	7	174	11			
Daumal	1999	117		100	7	187	12			
Drakulovic	1999	118		100	10	47	3	1		
Drakulovic	1999	118		100	9	39	1	0		
Dreyfuss	1995	119		100	13	70	1	2		
Dreyfuss	1995	119		100	10	61	0	3		
Driks	1987	120		100	14	69	5			
Driks	1987	120		100	11	61	1			
Forestier	2008	121		100	13	106	8			
Forestier	2008	121		100	13	102	3			
Heyland	1999	122		100	12	46	0			
Heyland	1999	122		100	13	49	0			
Holzapfel_C_99	1999	123		100	15	200	6	3	0	0
Holzapfel_I_99	1999	123		100	17	199	10	4	2	1
Kirschenbaum	2002	124		100	12	20	5			
Kirschenbaum	2002	124		100	12	17	1			
Kirton	1997	125		100	16	140	6			
Kirton	1997	125		100	20	140	6			
Knight	2009	126		100	7	129	1	1		
Knight	2009	126		100	6	130	0	3		
Kollef '97_pre	1997	127		90	3	353	7	2	2	1
Kollef '97_post	1997	127		90	2	327	3	1	1	0
Kollef	2008	128		100	4	743	11	5		
Kollef_silverETT	2008	128		100	4	766	8	1		
Kortbeek	1999	129	T	100	7	43	0	1		
Kortbeek	1999	129	T	100	10	37	0	1		

Table S2 (continued): *Pseudomonas* and *Acinetobacter* data: Groups of non decontamination studies [a]

author	Year	Ref	Notes	MV%	LOS	Patients	VAP		Bacteremia	
					d	n	v_ps_n	v_ac_n	b_ps_n	b_ac_n
Lacherade '05	2005	130		100	25	184	14	0		
Lacherade '05	2005	130		100	21	185	9	2		
Lacherade '10	2010	131		100	11	164	16	2		
Lacherade '10	2010	131		100	11	169	9	2		
Laueny	2014	132		100	10	91	0	0		
Laueny	2014	132		100	15	98	0	1		
Lorente '03	2003	133		100	18	116	10	1		
Lorente '03	2003	133		100	16	114	9	0		
Lorente '04	2004	134		100	16	143	8	1		
Lorente '04	2004	134		100	20	161	9	3		
Lorente'05	2006	135		100	13	233	12	2		
Lorente'05	2006	135		100	13	210	12	1		
Lorente'06a	2005	136		100	10	221	7	1		
Lorente'06a	2005	136		100	10	236	9	1		
Lorente'06b	2006	137		100	21	51	5			
Lorente'06b	2006	137		100	20	53	2			
Lorente'07	2007	138		100	16	140	4	1		
Lorente'07	2007	138		100	14	140	4	3		
Lorente'14	2014	139		100	16	150	6	1		
Lorente'14	2014	139		100	15	134	3	0		
Manzano	2008	140		100	12	63	0	4		
Manzano	2008	140		100	9	64	0	2		
Martin	1993	141		100	4	66	2	0		
Martin	1993	141		100	4	65	0	1		
Morrow	2010	142		100	15	73	6	2		
Morrow	2010	142		100	15	73	0	3		
Nseir	2011	143		100	10	61	2	2		
Nseir	2011	143		100	12	61	0	1		
Pickworth	1993	144	T	100	7	44	1			
Pneumatikos	2006	145		100	15	40	1	1		
Pneumatikos	2006	145		100	16	39	0	1		
Prod'hom_A	1994	146		100	6	81	4	0		
Prod'hom_R	1994	146		100	6	80	1	1		
Prod'hom_S	1994	146		100	5	83	1	0		
Reigneir	2013	147		100	7	222	9			
Reigneir	2013	147		100	7	227	12			
Ryan_C	1993	148		100	5	56	2	1		
Ryan_S	1993	148		100	6	58	1	0		

Table S2 (continued): *Pseudomonas* and *Acinetobacter* data: Groups of non decontamination studies [a]

author	Year	Ref	Notes	MV%	LOS	Patients	VAP		Bacteremia	
					d	n	v_ps_n	v_ac_n	b_ps_n	b_ac_n
Smulders	2002	149		100	14	75	3			
Smulders	2002	149		100	12	75	1			
Staudinger	2010	150		100	14	75	5			
Staudinger	2010	150		100	8	75	3			
Thomachot	1998	151		100	12	66	3	1		
Thomachot	1998	151		100	12	70	2	1		
Thomachot	1999	152		100	11	77	1	0		
Thomachot	1999	152		100	12	63	2	0		
Thomachot	2002	153		100	10	84	2	0		
Thomachot	2002	153		100	9	71	0	1		
Valencia	2007	154		100	13	69	1	0		
Valencia	2007	154		100	13	73	3	1		
Valles	1995	155		100	6	77	12			
Valles	1995	155		100	12	76	12			
Walaszek	2017	156		100	5	804	5	39		
Walaszek	2017	156		100	5	1003	10	22		

Table S2 footnotes

T – Data originating from a study for which the majority of ICU admission were for trauma

NS – Not stated; LOS is mean or median length of ICU stay

v_ps_n is the count of *Pseudomonas* VAP and v_ac_n is the count of *Acinetobacter* VAP

b_ps_n is the count of *Pseudomonas* bacteremia and b_ac_n is the count of *Acinetobacter* bacteremia

Several (n = 47) of these studies were cited in the following source systematic reviews.

- Messori A, Trippoli S, Vaiani M, Gorini M, Corrado A: Bleeding and pneumonia in intensive care patients given ranitidine and sucralfate for prevention of stress ulcer: meta-analysis of randomised controlled trials. *BMJ* 2000, 321:1103–1106.
- Huang J, Cao Y, Liao C, Wu L, Gao F: Effect of histamine-2-receptor antagonists versus sucralfate on stress ulcer prophylaxis in mechanically ventilated patients: a meta-analysis of 10 randomized controlled trials. *Crit Care* 2010, 14:R194.
- Alhazzani W, Almasoud A, Jaeschke R, Lo BW, Sindi A, Altayyar S, Fox-Robichaud A: Small bowel feeding and risk of pneumonia in adult critically ill patients: a systematic review and meta-analysis of randomized trials. *Crit Care* 2013, 17:R127.
- Melsen WG, Rovers MM, Bonten MJM: Ventilator-associated pneumonia and mortality: A systematic review of observational studies. *Crit Care Med* 2009, 37:2709–2718.
- Safdar N, Dezfulian C, Collard HR, Saint S: Clinical and economic consequences of ventilator-associated pneumonia: a systematic review. *Crit Care Med* 2005, 33:2184–93.
- Han J, Liu Y. Effect of ventilator circuit changes on ventilator-associated pneumonia: a systematic review and meta-analysis. *Respiratory care*, 2010; 55: 467-474.

- Subirana M, Solà I, Benito S: Closed tracheal suction systems versus open tracheal suction systems for mechanically ventilated adult patients. *Cochrane Database Syst Rev* 2007, 4: CD004581;
- Siempos II, Vardakas KZ, Kopterides P, Falagas ME. Impact of passive humidification on clinical outcomes of mechanically ventilated patients: A meta-analysis of randomized controlled trials. *Crit Care Med* 2007; 35: 2843-51;
- Muscedere J, Rewa O, McKechnie K, Jiang X, Laporta D, Heyland DK. Subglottic secretion drainage for the prevention of ventilator-associated pneumonia: a systematic review and meta-analysis. *Crit Care Med* 2011; 39:1985–1991.
- Delaney A, Gray H, Laupland KB, Zuege DJ. Kinetic bed therapy to prevent nosocomial pneumonia in mechanically ventilated patients: a systematic review and meta-analysis. *Crit Care* 2006; 10:R70;
- Sud S, Friedrich JO, Taccone P, Polli F, Adhikari NK, Latini R, Gattinoni L. Prone ventilation reduces mortality in patients with acute respiratory failure and severe hypoxemia: systematic review and meta-analysis. *Inten Care Med* 2010; 36(4); 585-599.
- Siempos II, Vardakas KZ, Falagas ME. Closed tracheal suction systems for prevention of ventilator-associated pneumonia. *Brit J Anaesthesia*, 2008; 100(3): 299-306.

Table S3: *Pseudomonas* and *Acinetobacter* data: Groups of anti-septic studies [a]

author	Year	Ref	Notes	MV%	LOS	Patients	VAP		Bacteremia	
					d	n	v_ps_n	v_ac_n	b_ps_n	b_ac_n
Cabov	2010	157		57	6	30	4	0	0	0
Cabov Chlx	2010	157		77	6	30	0	0	0	0
Climo_NC	2013	158		NS	6	1398			2	2
Climo	2013	158		NS	6	1410			4	1
Fourrier'00	2000	159		100	24	30	4	2	0	0
Fourrier'00 Chlx	2000	159		100	18	30	1	2	0	1
Fourrier'05	2005	160		100	13	114	5	0	0	0
Fourrier'05 Chlx	2005	160		100	14	114	6	1	1	0
Huang_2pre	2013	48		NS	3	15218			8	5
Huang_3pre	2013	48		NS	3	17356			11	10
Huang_3UD	2013	48		NS	3	26024			14	3
Huang_2TD	2013	48		NS	3	24752			13	2
Koeman	2006	161		100	13	130	4			
Koeman-Ch	2006	161		100	14	127	0			
Koeman ChC	2006	161		100	13	128	2			
Kollef	2006	162		100	14	347	9	2		
Kollef Iseganan	2006	162		100	14	362	8	2		
Lorente	2012	163		100	9	219	5	0		
Lorente Chlx	2012	163		100	10	217	5	2		
Noto_pre	2015	164		NS	3	4852			2	0
Noto_Chlx BW	2015	164		NS	3	4488			4	0
Seguin – CC	2006	165		100	19	31	0			
Seguin – SC	2006	165	T	100	14	31	1			
Seguin-PVI	2006	165	T	100	15	36	0			
Seguin	2014	166	T	100						
Seguin-PVI	2014	166	T	100						
Swan	2016	167		100	7	70	1	0	0	0
Swan Chlx BW	2016	167		100	7	63	1	1	0	0
Wittekamp	2018	168		100	10	2251			21	
Wittekamp Chlx	2018	168		100	10	2108			16	

Table S3: Footnotes

T – Data originating from a study for which the majority of ICU admission were for trauma

NS – Not stated; LOS is mean or median length of ICU stay

v_ps_n is the count of *Pseudomonas* VAP and v_ac_n is the count of *Acinetobacter* VAP

b_ps_n is the count of *Pseudomonas* bacteremia and b_ac_n is the count of *Acinetobacter* bacteremia

Several (n = 5) of these studies were cited in the following source meta-analyses.

- Chan EY, Ruest A, Meade MO, Cook DJ: Oral decontamination for prevention of pneumonia in mechanically ventilated adults: systematic review and meta-analysis. *BMJ* 2007, 334:889–900.
- Labeau SO, Van de Vyver K, Brusselaers N, Vogelaers D, Blot SI: Prevention of ventilator-associated pneumonia with oral antiseptics: a systematic review and meta-analysis. *Lancet Infect Dis* 2011, 11:845-854.
- Pileggi C, Bianco A, Flotta D, *et al*. Prevention of ventilator-associated pneumonia, mortality and all intensive care unit acquired infections by topically applied antimicrobial or antiseptic agents: a meta-analysis of randomized controlled trials in intensive care units. *Crit Care.* 2011; **15**: R155.
- Price R, MacLennan G, Glen J. Selective digestive or oropharyngeal decontamination and topical oropharyngeal chlorhexidine for prevention of death in general intensive care: systematic review and network meta-analysis. *BMJ*. 2014; **348**: g2197.
- Klompas M, Speck K, Howell MD, *et al*. Reappraisal of routine oral care with chlorhexidine gluconate for patients receiving mechanical ventilation: systematic review and meta-analysis. *JAMA Intern Med.* 2014; **174**: 751-61.

Intervention regimens abbreviations

Chlx = chlorhexidine; Chlx BW = chlorhexidine body wash; ChC = chlorhexidine and colisitn; TD = targetted decolonization; UD = universal decolonization; PVI = povidone iodine; CC = concurrent control; SC = saline control; iseganan, is a synthetic variant of a porcine protegrin, which is a natural antibiotic peptide released by neutrophils in response to invasion by microbes [Kollef 2006, 162].

Table S4: *Pseudomonas* and *Acinetobacter* data: Groups of studies of topical antibiotics [a]

author	PPAP	Year	Ref	Notes	MV%	LOS	Patients	VAP		Bacteremia	
						d	n	v_ps_n	v_ac_n	b_ps_n	b_ac_n
groups with NCC											
Wittekamp PTNy		2018	168		100	10	2224			15	
Wittekamp PTNy		2018	168		100	11	2082			9	
Bergmans NC		2001	169		100	12	61	5			
Bergmans_PGV		2001	169		100	15	78	8			
Bergmans		2001	169		100	13	87	3			
Bonten NC		1994	170		91	16	54	4			
Bonten CC		1994	170		86	9	21	0			
Bonten_PTA		1994	170		100	13	22	0			
Camus		2014	171		28	4	925			0	1
Camus_PTA		2014	171		28	4	1022			3	0
de Smet		2009	172		88	9	1990			36*	
de Smet_PTA		2009	172		94	9	1904			17*	
de Smet_PTA-Ctx	+	2009	172		93	9	2045			16*	
Godard		1990	173		80	13	84	5			
Godard_PT		1990	173		81	11	97	0			
Hartenauer_Ctx	+	1991	174		100	12	40	7	1	1	
Hartenauer_Ctx	+	1991	174		100	13	61	13	3	0	
Hartenauer_PTA-Ctx	+	1991	174		100	17	50	0	0	0	
Hartenauer_PTA-Ctx	+	1991	174		100	13	49	0	0	1	1
Oostdijk		2011	175		88	9	1945			25*	
Oostdijk_PTA		2011	175		94	9	2166			16*	
Oostdijk_PTA-Ctx	+	2011	175		93	9	2667			14*	
Stoutenbeek'84 NC		1984	176		100	14	59	5	1	1	0
Stoutenbeek_PTA-Ctx	+	1984	176		100	11	63	3	1	0	0
Stoutenbeek'87 NC		1987	177		100	14	59	5	1		0
Stoutenbeek_PTA	+	1987	177		100	18	42	1	2	1	2
Winter NC		1992	178		92	7	84	2	0		

Table S4(continued): ***Pseudomonas*** **and** ***Acinetobacter*** **data: Groups of studies of topical antibiotics** [a]

author	PPAP	Year	Ref	Notes	MV%	LOS	Patients	**VAP**		**Bacteremia**	
						d	n	v_ps_n	v_ac_n	b_ps_n	b_ac_n
groups with CC											
Winter CC		1992	178		92	8	92	8	2		
Winter_PTA-Cz	+	1992	178		92	6	91	3	0		
Abele-Horn		1997	179	T	100	22	30	3	0		
Abele-Horn_PTA-Ctx	+	1997	179	T	100	18	58	2	0		
Acquarolo		2005	180		100	13	19	2	0	0	
Acquarolo_AmpSul	+	2005	180		100	13	19	2	0	0	
Aerdts		1991	181		100	28	39	10	3		
Aerdts_PNoA-Ctx	+	1991	181		100	23	17	0	0		
Bion_-Ctx	+	1991	182		50	2	31	3	0	0	0
Bion_PTA-Ctx	+	1991	182		50	2	21	0	0	2	0
Blair		1991	183		93	8	130	9		3	
Blair_PTA-Ctx	+	1991	183		93	8	126	1		1	
Cockerill		1992	184		85	12	75	4			
Cockerill_PGNy-Ctx	+	1992	184		85	10	75	1			
de la Cal		2005	185	T	80	34	54	7	5	7	3
de la Cal_PTA-Ctx	+	2005	185	T	74	31	53	2	6	9	6
Ferrer_Ctx	+	1994	186		100	14	41	4	0	0	0
Ferrer_PTA-Ctx	+	1994	186		100	15	39	1	0	1	0
Georges		1994	187		100	16	33		0		
Georges_PNeA		1994	187		100	16	31		1		
Hammond_Ctx	+	1993	188		100	21	20		1		
Hammond_PTA-Ctx	+	1993	188		100	30	13		0		
Hammond_Ctx	+	1994	189		100	6	33	0	0		
Hammond_PTA-Ctx	+	1994	189		100	7	39	0	1		
Jacobs		1992	190		100	10	43	0	0	0	0
Jacobs_PTA-Ctx	+	1992	190		100	9	36	0	0	0	1
Karvouniaris		2015	191		100	13	84		11		
Karvouniaris_P		2015	191		100	16	84		2		
Korinek		1993	192		100	27	60	3	1		
Korinek_PTA-V		1993	192		100	25	63	0	1		
Laggner		1994	193		100	20	34	1		1	0
Laggner_GA		1994	193		100	16	33	0		0	0
Palomar		1997	194		100	6	42	6	0		
Palomar Ctx	+	1997	194		100	8	46	1	2		
Palomar_PTA-Ctx	+	1997	194		100	11	41	1	0		
Pneumatikos		2002	195	T	100	23	30	1	1		
Pneumatikos_PTA		2002	195	T	100	16	31	0	1		

Table S4(continued): *Pseudomonas* and *Acinetobacter* data: Groups of studies of topical antibiotics

author	PPAP	Year	Ref	Notes	MV%	LOS	Patients	VAP		Bacteremia	
						d	n	v_ps_n	v_ac_n	b_ps_n	b_ac_n
groups with CC											
Quinio		1995	196	T	100	16	72	12		0	0
Quinio_PGA		1995	196	T	100	16	76	5		0	0
Rocha		1992	197	T	100	18	54	8	4	1	3
Rocha__PTA-Ctx	+	1992	197	T	100	19	47	1	1	0	0
Rodríguez-Roldán		1990	198		100	10	15	5	2		
Rodríguez-Roldán__PTNeA		1990	198		100	10	13	0	0		
Rolando_CtxFlux		1996	199		73	7	61	2	0	0	0
Rolando_PTA_CtxFlux	+	1996	199		73	7	47	1	0	0	0
Rolando '93	+	1993	200		75	8	31	2	0		
Rolando__PTAM-Cfu	+	1993	200		75	8	28	1	0		
Sirvent		1997	201		100	16	50	1	2		
Sirvent_Cef	+	1997	201		100	13	50	3	1		
Smith_CtxAmp	+	1993	202		100	8	18	1			
Smith__PTA_CtxAmp	+	1993	202		100	7	18	0			
Stoutenbeek		2007	203	T	100	12	200	28	23	2	3
Stoutenbeek_PTA-Ctx	+	2007	203	T	100	13	201	11	15	3	0
Unertl		1987	204		100	23	20	2			
Unertl_PGA		1987	204		100	18	19	0			
Verwaest		1997	205		100	19	185	7	4	1	2
Verwaest OA_O	+	1997	205		100	17	193	2	4	2	2
Verwaest_PTA-Ctx	+	1997	205		100	22	200	10	4	6	2
Wiener		1995	206		100	11	31	0	0		
Wiener_PGNy		1995	206		100	11	30	2	1		
Studies without control groups											
Frencken_PTA-Ctx	+	2014	207		100	7	1874			15	
Garbino_PNeV		2002	208		100	9	204	4			
Leone_PTA-Cef	+	2002	209		100	6	324	3	5		
Nardi_ PTA		2001	210	T	100	12	104	4	1		
Nardi_PTAM		2001	210	T	100	11	119	3	0		
Oostdijk_PTA		2014	211		52	6	5508			23	3
Oostdijk_PTA-Ctx	+	2014	211		51	6	5483			20	1
Rouby_P		1994	212		100	12	347	12			
Rouby E		1994	212		100	18	251	26			
Silvestri_PTA-Ctx	+	1999	213		100	9	117	2		0	
Steffen_PTNy-Ctx	+	1994	214		100	14	127			1	0

Table S4: Footnotes

T – Data originating from a study for which the majority of ICU admission were for trauma

NS – Not stated; LOS is mean or median length of ICU stay; PPAP is use of protocolized parenteral antibiotic prophylaxis

v_ps_n is the count of *Pseudomonas* VAP and v_ac_n is the count of *Acinetobacter* VAP

b_ps_n is the count of *Pseudomonas* bacteremia and b_ac_n is the count of *Acinetobacter* bacteremia

* De Smet 2009 [172] The *Pseudomonas* and *Acinetobacter* counts in this study are available only as a combined category count for gram negative non-fermentative GNB and are provided here for reference but are not used in the analysis. The Pseudomonas counts in the study of Oostdijk [175] includes counts from the study by De Smet 2009 [172]. The Pseudomonas counts in the study of Oostdijk [175] are taken as given in Table 2 of Oostdijk [175] even though this Table appears to be mislabelled in comparison to the text and table 1 of Oostdijk [175] and in relation to the data in De Smet 2009 [172].

The control group in one study by Stoutenbeek [176] appears also as the control group in another study by this author [177] and is used only once in the analysis here.

Several (n = 24) of these studies were cited in the following source systematic reviews.

- Liberati A, D'Amico R, Pifferi S, Torri V, Brazzi L, Parmelli E: Antibiotic prophylaxis to reduce respiratory tract infections and mortality in adults receiving intensive care. *Cochrane Database Syst Rev* 2009, 4.
- Pileggi C, Bianco A, Flotta D, Nobile CG, Pavia M. Prevention of ventilator-associated pneumonia, mortality and all intensive care unit acquired infections by topically applied antimicrobial or antiseptic agents: a meta-analysis of randomized controlled trials in intensive care units. *Crit Care* 2011; 15:R155.
- Silvestri L, Van Saene HK, Milanese M, Gregori D. Impact of selective decontamination of the digestive tract on fungal carriage and infection: systematic review of randomized controlled trials. *Intensive Care Med* 2005, 31:898-910.
- Chan EY, Ruest A, Meade MO, Cook DJ. Oral decontamination for prevention of pneumonia in mechanically ventilated adults: systematic review and meta-analysis. *BMJ.* 2007; 334:889–900.

TAP intervention regimens abbrevations; PTA (=P, topical polymyxin; T, topical tobramycin; A, topical amphotericin); PTA-Ctx (=P, topical polymyxin; T, topical tobramycin; A, topical amphotericin; Ctx, parenteral cephalosporin); P (P = polymyxin either aerosolized or topical); PNeV (P = polymyxin; Ne = Neomycin; V = Vancomycin); PGA-Ctx (=P, topical polymyxin; G, topical gentamicin; A, topical amphotericin; Ctx, parenteral cephalosporin); PTAM (=P, topical polymyxin; T, topical tobramycin; A, topical amphotericin; topical mupirocin); E (=E, topical erythromycin); PNoA-Ctx (=P, topical polymyxin; No, topical norfloxacin; A, topical amphotericin; Ctx, parenteral cephalsporin); PGV (=P, topical polymyxin; G, topical gentamicin; V, topical vancomycin); PGNy-Ctx (=P, topical polymyxin; G, topical gentamicin; Ny, topical nystatin; Ctx, parenteral cephalsporin); P-Ctx (=P, topical polymyxin; Ctx, parenteral cephalosporin); PTAV (=P, topical polymyxin; T, topical tobramycin; A, topical amphotericin; V, topical vancomycin); PGA (=P, topical polymyxin; G, topical gentamicin; A, topical amphotericin); PTNeA (=P, topical polymyxin; T, topical tobramycin; Ne, topical Neomycin; A, topical amphotericin); PGNy (=P, topical polymyxin; G, topical gentamicin; Ny, topical nystatin); PTA-Cz (=P, topical polymyxin; T, topical tobramycin; A, topical amphotericin; Cz, parenteral Ceftazidime).

Table S5: Development of GSEM model [a]

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 7	Model 6	
	Fig S8	Fig S9	Fig S10	Fig S11	Fig S12	Fig S12	Fig S13	95%CI
Factor [b-j]								
b_Ps_n								
Pseudomonas	1	1	1	1	1	1	1	(constrained)
ppap			1.11**	0.97**	0.97**	1.00**	0.95**	0.27 to 1.61
_cons	-5.18***	-5.19***	-5.38***	-6.00***	-6.00***	-6.05***	-6.05***	-6.6 to -5.4
b_Ac_n								
Acinetobacter	1	1	1	1	1	1	1	(constrained)
ppap			0.6	0.46	0.48	0.44	0.47	-0.51 to 4639
_cons	-6.74***	-6.74***	-6.83***	-7.38***	-7.44***	-7.47***	-7.47***	-8.0 to -7.0
v_Ps_n								
Pseudomonas	0.67***	0.67***	0.71***	0.80***	0.80***	0.81***	0.81***	0.51 to 1.09
mvp90	0.55*	0.54*	0.49*	0.43	0.43	0.48*	0.49*	0.03 to 0.92
non_D	-0.37*	-0.58***	-0.61***	-0.60***	-0.60***	-0.54***	-0.54***	-0.79 to -0.31
_cons	-3.63***	-3.63***	-3.56***	-4.17***	-4.17***	-4.24***	-4.25***	-4.7 to -3.7
v_Ac_n								
Acinetobacter	0.73***	0.73***	0.74***	0.83***	0.83***	0.83***	0.83***	+0.66 to 1.01
mvp90	0.79*	0.79*	0.73	0.71	0.69	0.71	0.7	-0.12 to 1.55
non_D	-0.35	-0.31	-0.33	-0.27	-0.21	-0.17	-0.17	-0.56 to 0.23
_cons	-5.13***	-5.13***	-5.06***	-5.79***	-5.85***	-5.88***	-5.87***	-6.8 to -4.9
Pseudomonas								
TAP	-0.65**	-0.65**	-0.67***	-0.68***	-0.68***	-0.47*	-0.57***	-0.91 to -0.29
a_S	-1.34***	-1.33***	-1.20***	-1.01***	-1.00***	-0.94***	-0.93***	-1.46 to -0.46
eap						-0.21		
ppap	0.27	0.27						
non_D	-0.33							
los7				1.03***	1.03***	0.96***	0.97***	0.53 to 1.45
trauma50					0.04	0.03	0.02	-0.33 to 0.36
CC						0.56**	0.56**	0.08 to 1.10

Table S5: Development of GSEM model (continued) [a]

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 7	Model 6	
	Fig S8	Fig S9	Fig S10	Fig S11	Fig S12	Fig S12	Fig S13	95%CI
Factor [b-j]								
Acinetobacter								
TAP	-0.25	-0.25	-0.27	-0.27	-0.5	-0.58	-0.43	-1.04 to 0.15
a_S	-1.26*	-1.27*	-1.21*	-1.04*	-0.85	-0.8	-0.82	-1.83 to 0.19
eap						0.25		
ppap	0.1	0.1						
non_D	0.06							
los7				1.15***	1.01***	0.99***	0.98***	0.41 to 1.54
trauma50					1.09***	1.04***	1.04***	0.47 to 1.62
CC						0.42	0.42	-0.22 to 1.22
Error terms								
var(e.Ps_GO)	1.32*	1.32*	1.17**	0.76**	0.76**	0.71**	0.72**	0.36 to 1.47
var(e.Ac_GO)	2.66***	2.66***	2.56***	1.92***	1.62***	1.60***	1.60***	1.01 to 2.48
Model fit [k]								
AIC	3345.94	3344.15	3329.29	3274.57	3261.55	3259.1	3255.53	
N	22	20	20	22	24	28	26	
Groups (n)	334	334	334	334	334	334	334	
Clusters (n)	213	213	213	213	213	213	213	

Footnotes

a. Legend: * p<0.05; ** p<0.01; *** p<0.001

b. v_ps_n is the count of *Pseudomonas* VAP; v_ac_n is the count of *Acinetobacter* VAP; b_ps_n is the count of *Pseudomonas* bacteremia and b_ac_n is the count of *Acinetobacter* bacteremia

c. PPAP is the group wide use of protocolized parenteral antibiotic prophylaxis; tap is topical antibiotic prophylaxis; eap is enteral antibiotic prophylaxis

d. Acinetobacter GO is the Acinteobacter gut overgrowth latent variable

e. Pseudomonas GO is the Pseudomonas gut overgrowth latent variable

f. MVP90 is use of mechanical ventilation by more than 90% of the group

g. LOS7 is a mean or median length of ICU stay for the group of 7 days or greater

h. Trauma ICU arbitrarily defined as an ICU for which >50% of admissions were for trauma

i. CC is concurrency of control groups with an intervention group receiving TAP

j. Less than 90% of the group receiving prolonged mechanical ventilation.

k. Model fit; AIC is Akaike's information criteria. This indicates model fit taking into account the statistical goodness of fit and the number of parameters in the model. Lower values of AIC indicate a better model fit. N is the number of parameters in the model.

Table S6: VAP count data [a]

	Observational studies	Infection prevention studies		
	(no intervention)	Non-dec	Anti-septic	TAP ±PPAP
Excluding groups with LOS<7 days				
Acinetobacter				
CC or observational groups	586/37026 [b, c] 1.6% (67)	30/2620 [b] 1.1% (25)	4/780 [b] 0.5% (5)	67/1521 [b] 4.4% (25)
Intervention groups		34/2429 [c] 1.4% (24)	8/786 [c] 1.0% (5)	41/1721 [c] 2.4% (26)
Pseudomonas				
CC or observational groups	2217/60131 [d, e] 3.7% (81)	200/4288 [d] 4.7% (38)	27/914 [d] 3.0% (8)	179/2161 [d] 8.3% (34)
Intervention groups		167/4169 [e] 4.0% (37)	24/1027 [e] 2.3% (8)	106/3193 [e] 3.3% (37)

Footnotes to table S6

a. Non-dec = Non-decontamination studies; TAP = Topical antibiotic prophylaxis; PPAP = Protocolized parenteral antibiotic prophylaxis.
b. The counts of *Acinetobacter* VAP among the three categories of control groups and the category of observation groups among studies after excluding those with length of stay <7 days differed significantly ($p < 0.001$; Fisher’s exact test)
c. The counts of *Acinetobacter* VAP among the three categories of intervention groups and the category of observation groups among studies after excluding those with length of stay <7 days differed significantly ($p = 0.038$; Fisher’s exact test)
d. The counts of *Pseudomonas* VAP among the three categories of control groups and the category of observation groups among studies after excluding those with length of stay <7 days differed significantly ($p < 0.001$; Fisher’s exact test)
e. The counts of *Pseudomonas* VAP among the three categories of intervention groups and the category of observation groups among studies after excluding those with length of stay <7 days was differed marginally ($p = 0.05$; Fisher’s exact test)

Table S7: Bacteremia count data [a]

	Observational studies	Infection prevention studies		
	(no intervention)	Non-dec	Anti-septic	TAP ±PPAP
All groups				
Acinetobacter				
CC or observational groups	203/189338 0.11% (20)	1/553 0.18% (2)	17/39162 0.04% (8)	15/1860 0.8% (13)
Intervention groups		1/526 0.19% (2)	7/57009 0.01% (8)	15/13290 [b] 0.11% (18)
Pseudomonas				
CC or observational groups	567/192203 0.30% (27)	2/553 0.36% (2)	23/39162 0.06% (8)	63/5280 1.2% (16)
Intervention groups		3/526 0.57% (2)	52/59117 0.09% (9)	139/23543 0.59% (25)
Excluding groups with LOS<7 days				
Acinetobacter				
CC or observational groups	37/12913 [c, d] 0.29% (11)	0/200 [c] 0% (1)	0/308 [c] 0% (3)	14/904 [c] 1.5% (11)
Intervention groups		1/199 [d] 0.5% (1)	1/305 [d] 0.33% (3)	11/1256 [d] 0.88% (14)
Pseudomonas				
CC or observational groups	111/14453 [e, f] 0.77% (16)	0/200 [e] 0% (1)	0/308 [e] 0.0% (3)	63/5249 [e] 1.2% (15)
Intervention groups		2/199 [f] 1.0% (1)	17/2413 [f] 0.7% (4)	94/12531 [f, g] 0.75% (22)

Footnotes to table S7

a. Non-dec = Non-decontamination studies; TAP = Topical antibiotic prophylaxis; PPAP = Protocolized parenteral antibiotic prophylaxis.

b. Among intervention groups of TAP based prevention studies, the count of *Acinetobacter* bacteremias was 12/6609 (0.18%; 13 studies) versus 3/6681 (0.04%; 4 studies) for those using versus not including PPAP in the intervention (p = 0.02, Fisher's exact test)

c. The counts of *Acinetobacter* bacteremias among the three categories of control groups and the category of observation groups among studies after excluding those with length of stay <7 days differed significantly ($p < 0.001$; Fisher's exact test)

d. The counts of *Acinetobacter* bacteremias among the three categories of intervention groups and the category of observation groups among studies after excluding those with length of stay <7 days differed significantly ($p = 0.012$; Fisher's exact test)

e. The counts of *Pseudomonas* bacteremias among the three categories of control groups and the category of observation groups among studies after excluding those with length of stay <7 days differed significantly ($p = 0.010$; Fisher's exact test)

f. The counts of *Pseudomonas* bacteremias among the three categories of intervention groups and the category of observation groups among studies after excluding those with length of stay <7 days was not significantly different ($p = 0.90$; Fisher's exact test)

g. Among intervention groups of TAP based prevention studies excluding those with a LOS less than 7 days, the count of *Pseudomonas* bacteremias was 53/5908 (0.9%; 16 studies) versus 41/6623 (0.62%; 6 studies) for those using versus not including PPAP in the intervention ($p = 0.07$, Fisher's exact test)

Details of methods used in additional analyses

Benchmarking: visual

Caterpillar plots were generated to facilitate a visual benchmark of the *Pseudomonas* bacteremia and *Acinetobacter* bacteremia incidence proportion and these were generated as follows. The data for each bacteremia incidence proportion were logit transformed to generate caterpillar plots using the 'metan' command in STATA (release 12.0, STATA Corp., College Station, TX, USA). For *Pseudomonas* bacteremia this transformation proceeds as follows; with the number of mechanically ventilated patients as the denominator (D), the number of patients with *Pseudomonas* bacteremia as the numerator (N), and R being the *Pseudomonas* bacteremia proportion (N/D), the logit(*Pseudomonas* bacteremia) is log(N/(D-N)) and its variance is 1/(D*R*(1-R)). Note that for any group with a zero event rate (N=0), the addition of the continuity correction (i.e. N+0·5) is required to avoid indeterminate transformations of the logit proportion and its variance. The visual benchmarks are the summary incidences for each of the *Pseudomonas* bacteremia and *Acinetobacter* bacteremia as derived using the observational studies. These visual benchmarks were then used in the respective caterpillar plots of the component groups from the VAP prevention studies as a reference line.

Dot plots were used to provide an 'at a glance' summary of the entire evidence base. These were derived as above for caterpillar plots but without the confidence limits. In dot plots, any group with a zero event rate (N=0) was arbitrarily assigned a low finite value (either 0.1%, 0.02% or 0.01%, depending on the spread of values). In the dot plots, a benchmark derived from the caterpillar plot as described above is used.

Meta-analysis: Effect sizes

The study specific and overall summary effect sizes and associated 95% confidence interval for each of the antibiotic, antiseptic and non-decontamination based interventions against either VAP overall or bacteremia overall were calculated using the Der Simonian-Laird random-effect methods of meta-analysis using the 'metan' command in Stata 14.2 (Stata Corp., College Station, TX, USA).

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Fig S1. (p 36) Search method, screening criteria and resulting classification of eligible studies and subsequent decant of component groups. The four numbered arrows are as follows;

(1) An electronic search for systematic reviews or meta-analysis (SR/MA) containing potentially eligible studies using search terms; "ventilator associated pneumonia", "mechanical ventilation", "intensive care unit", each combined with either "meta-analysis" or "systematic review" up to December 2018;

(2) The systematic reviews were then searched for studies of patient populations requiring prolonged (> 24 hours) ICU admission

(3) The studies were triaged from the systematic reviews into one of four categories; studies in which there was no intervention (observational studies), studies of various non-decontamination methods such as methods delivered either via the gastric route, the airway route or via the oral care route, studies of anti-septic methods and studies with a TAP (in any formulation) based intervention.

(4) All studies were reviewed for potentially eligible studies and screened against inclusion and exclusion criteria. Any duplicate or ineligible studies were removed and

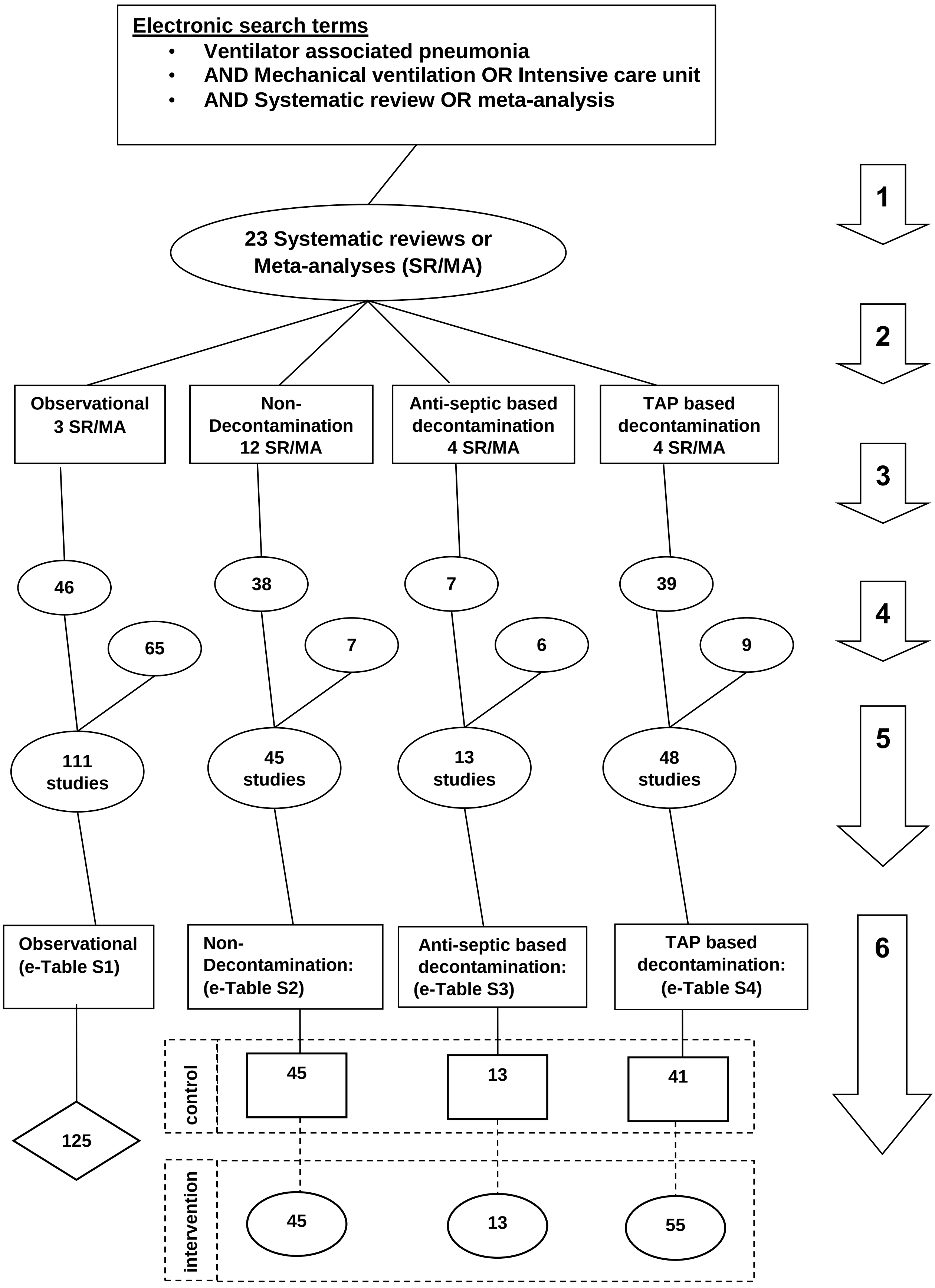
(5) Studies identified outside of systematic reviews were included;

(6) The component groups were decanted from each study being control (rectangles), intervention (ovals) and observation (diamond) groups.

Note; the total numbers do not tally as some systematic reviews provided studies in more than one category and some studies provided groups in more than one category and some studies have unequal numbers of control and interventions groups.

TAP = Topical antibiotic prophylaxis

Figure 1: Flow chart of literature search and study and group decant



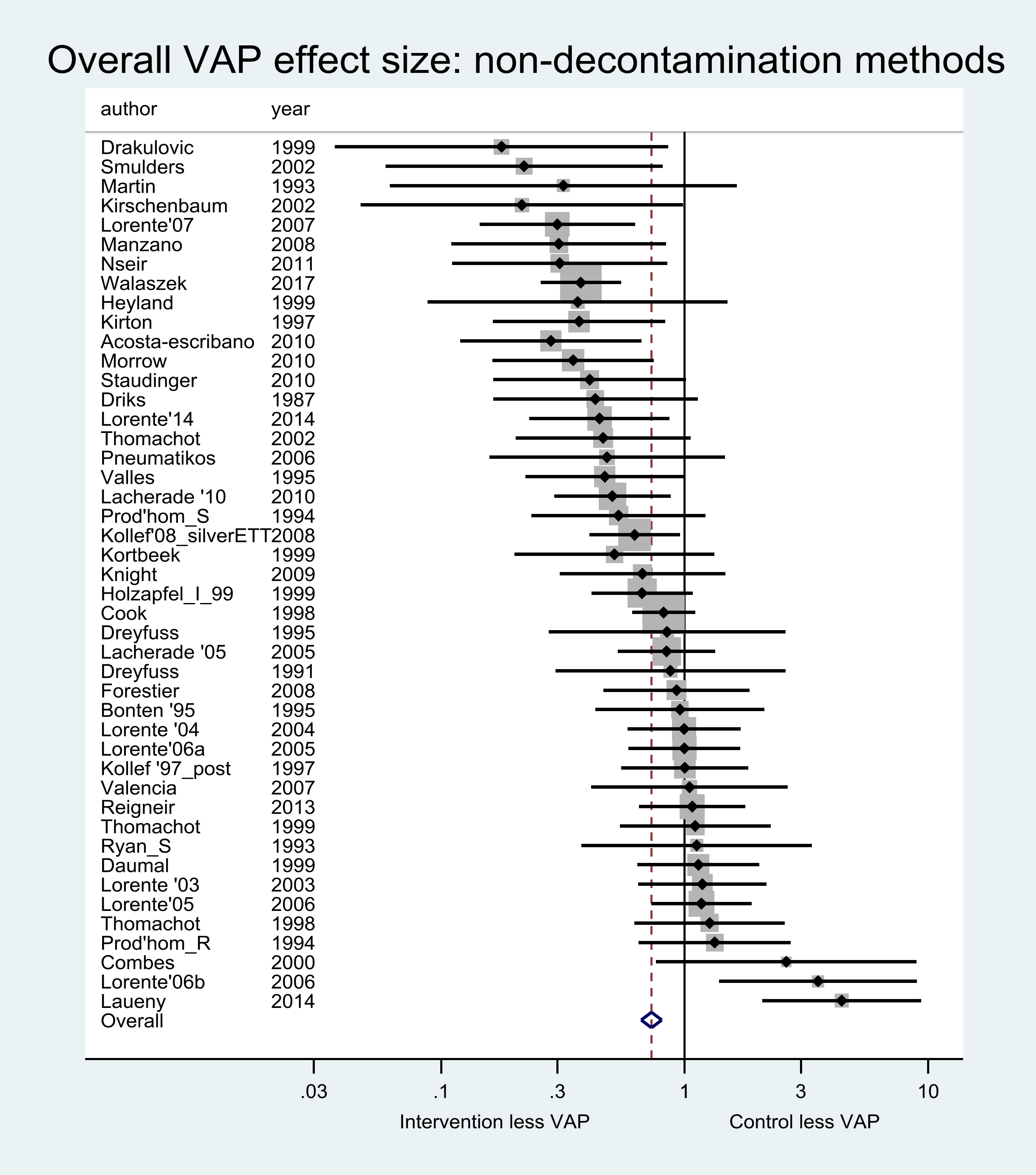


Fig S2

Caterpillar plots of the group specific (small squares) and summary (large open diamond, broken vertical line) effect size on the overall VAP incidence and 95 % CI among studies of non-decontamination methods of VAP prevention. Studies are listed in Table S2.

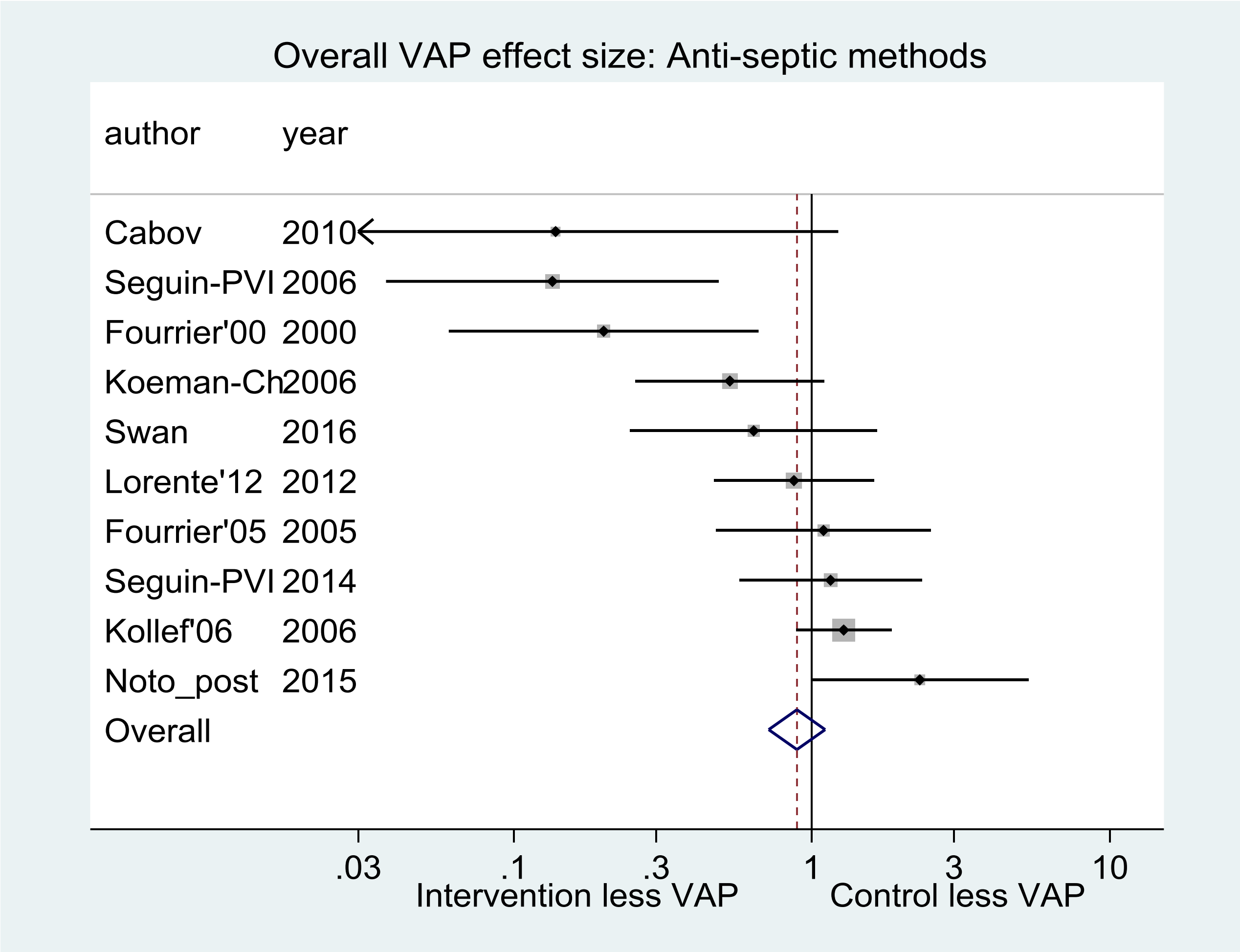


Fig S3

Caterpillar plots of the group specific (small squares) and summary (large open diamond, broken vertical line) effect size on the overall VAP incidence and 95 % CI among studies of anti-septic based methods of VAP prevention. Studies are listed in Table S3.

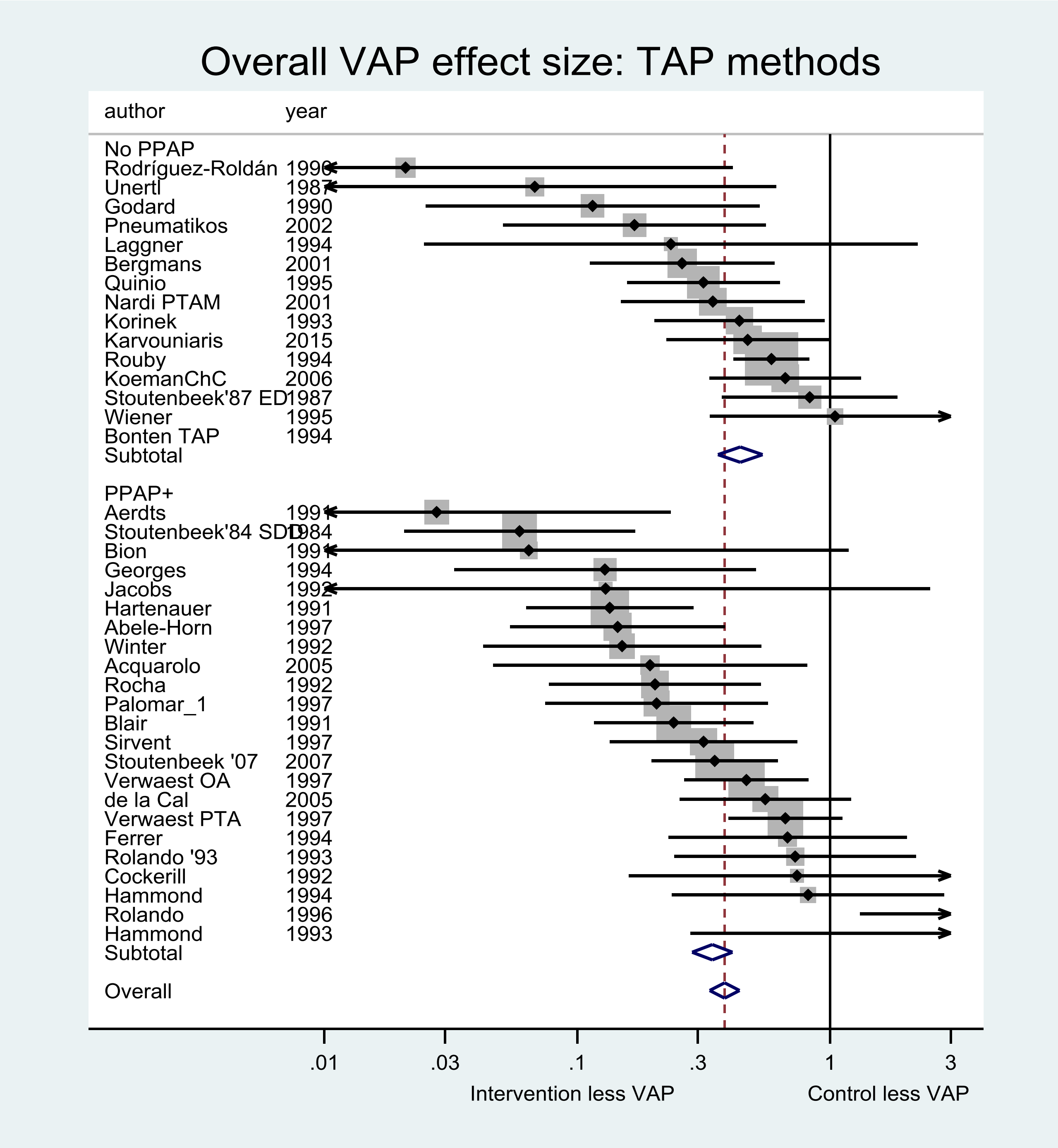


Fig S4

Caterpillar plots of the group specific (small squares) and summary (large open diamond, broken vertical line) effect size on the overall VAP incidence and 95 % CI among studies of TAP ±PPAP based methods of VAP prevention. TAP = Topical antibiotic prophylaxis. Studies are listed in Table S4.

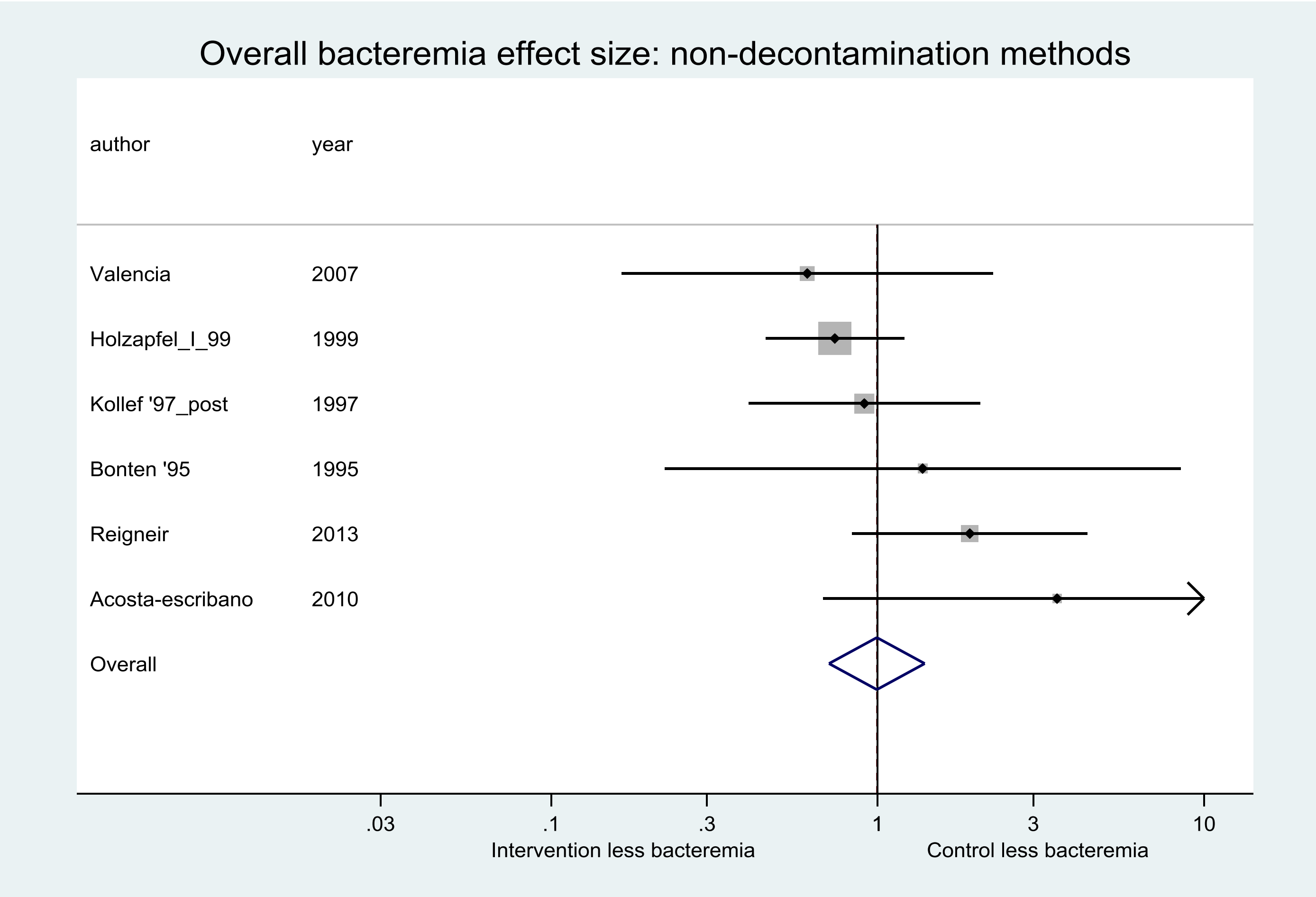


Fig S5

Caterpillar plots of the group specific (small squares) and summary (large open diamond, broken vertical line) effect size on the overall bacteremia incidence and 95 % CI among studies of non-decontamination methods of VAP prevention. Studies are listed in Table S2.

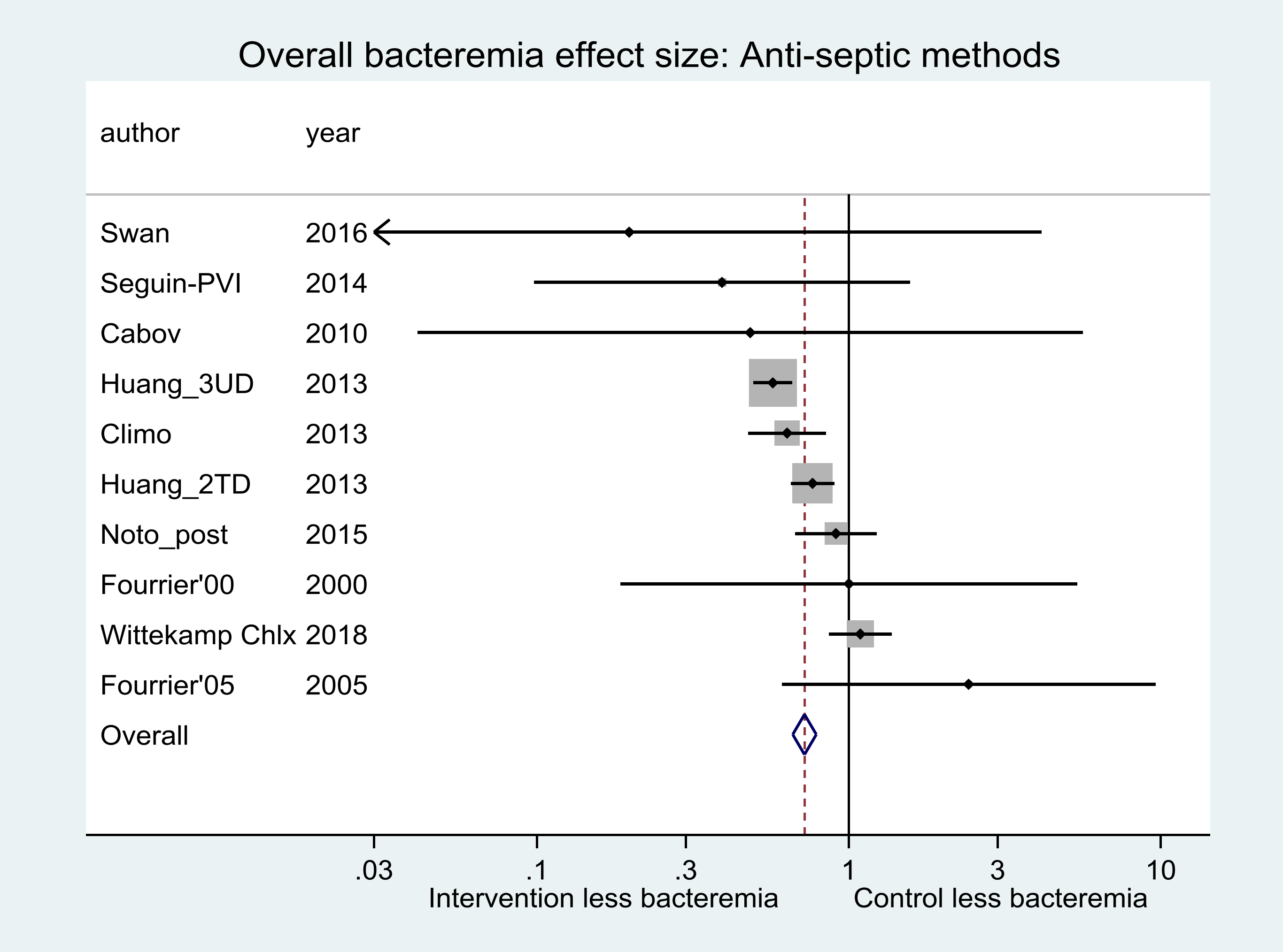


Fig S6

Caterpillar plots of the group specific (small squares) and summary (large open diamond, broken vertical line) effect size on the overall bacteremia incidence and 95 % CI among studies of anti-septic based methods of VAP prevention. Studies are listed in Table S3.

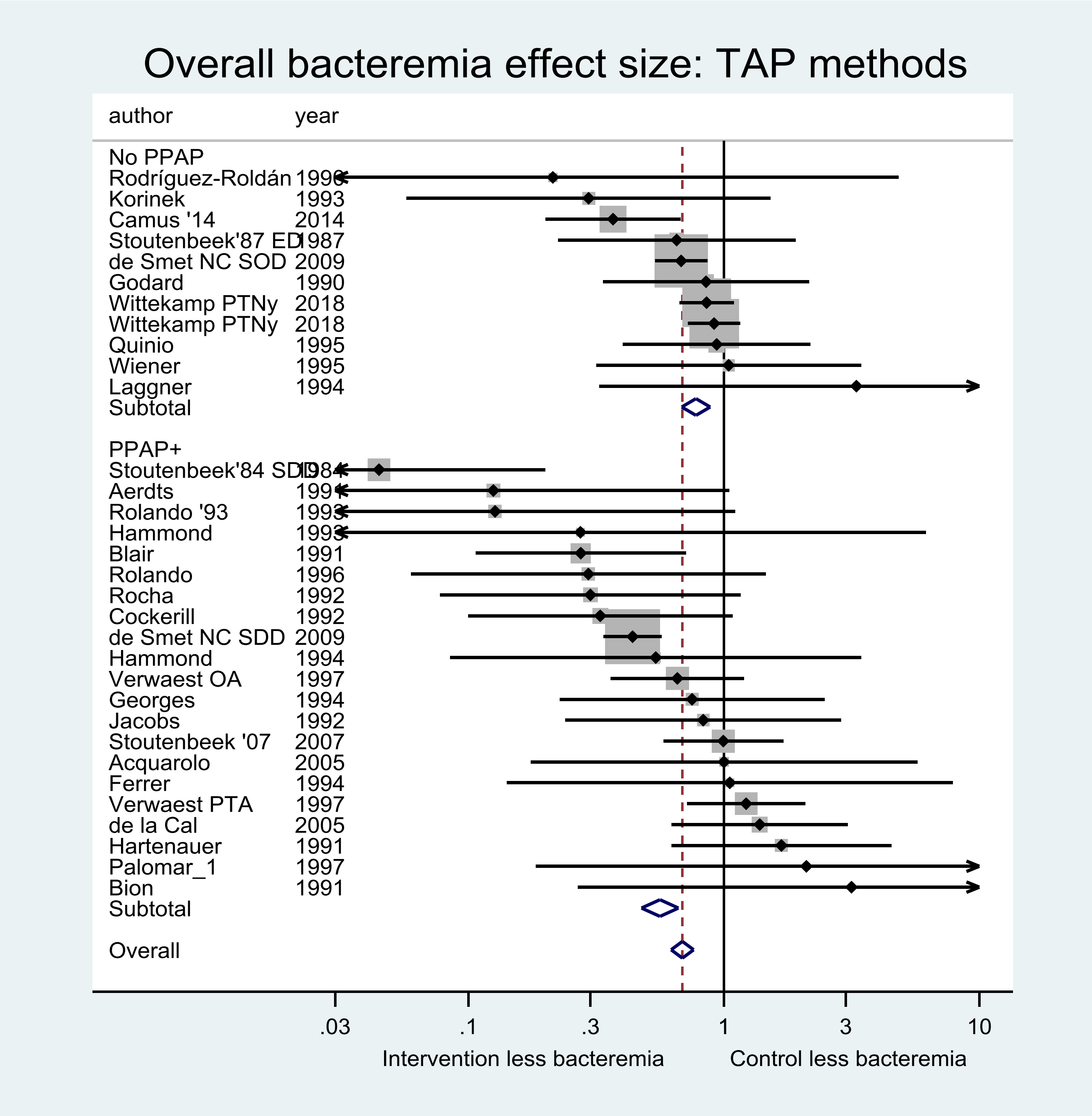


Fig S7

Caterpillar plots of the group specific (small squares) and summary (large open diamond, broken vertical line) effect size on the overall bacteremia incidence and 95 % CI among studies of TAP ±PPAP based methods of VAP prevention. TAP = Topical antibiotic prophylaxis. Studies are listed in Table S4.

Fig S8

GSEM model 1

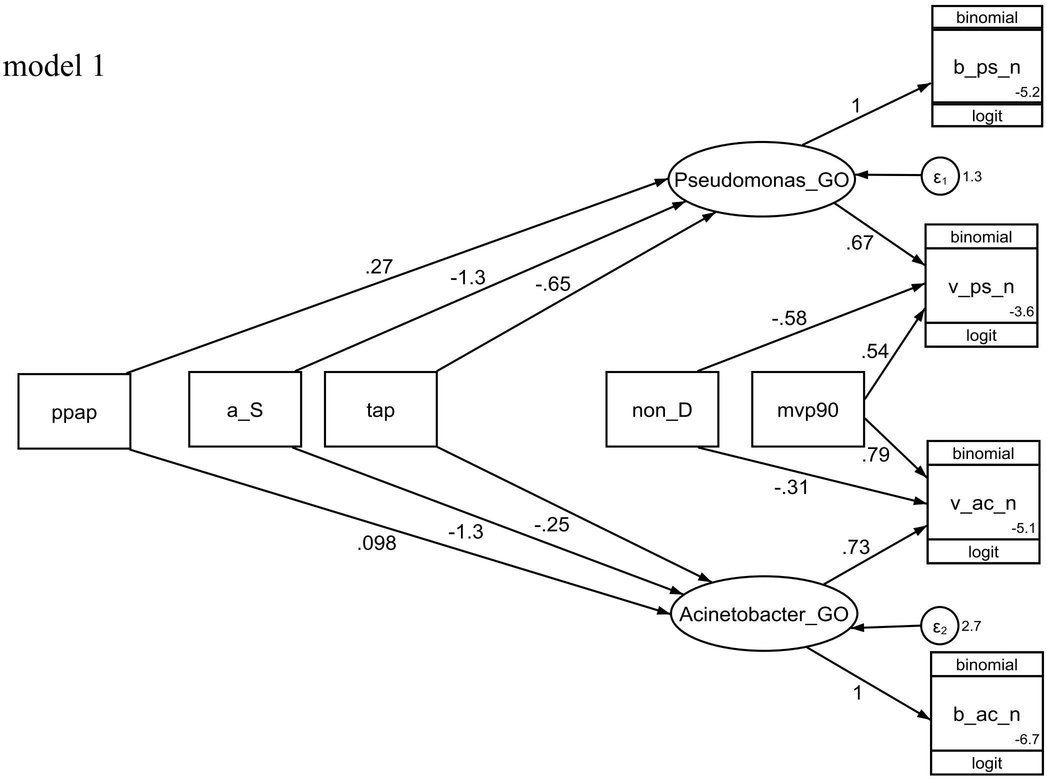


Fig S9

GSEM model 2

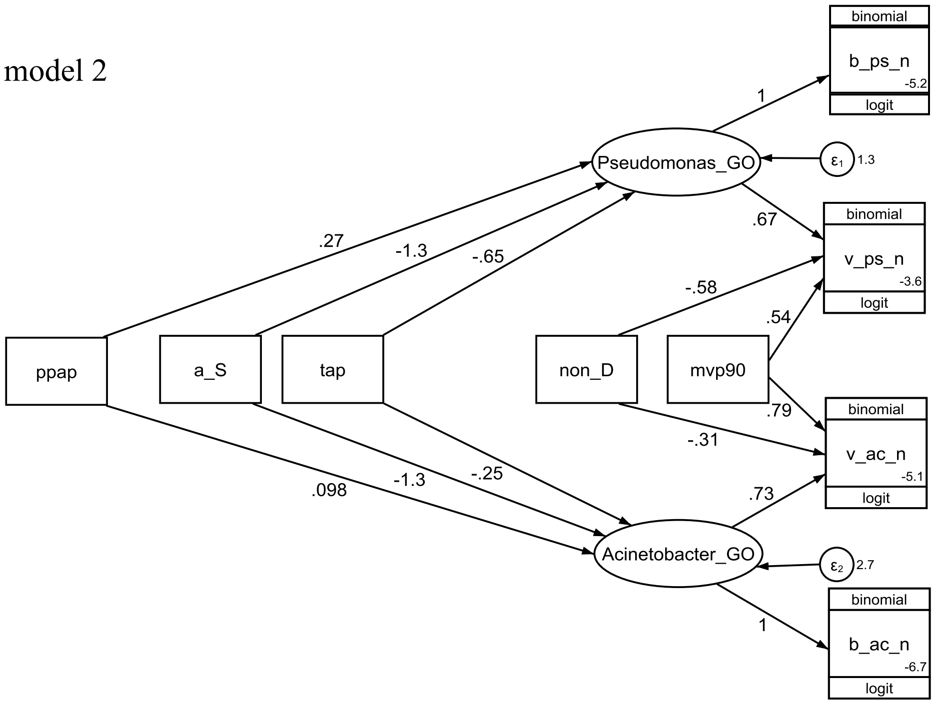


Fig S10

GSEM model 3

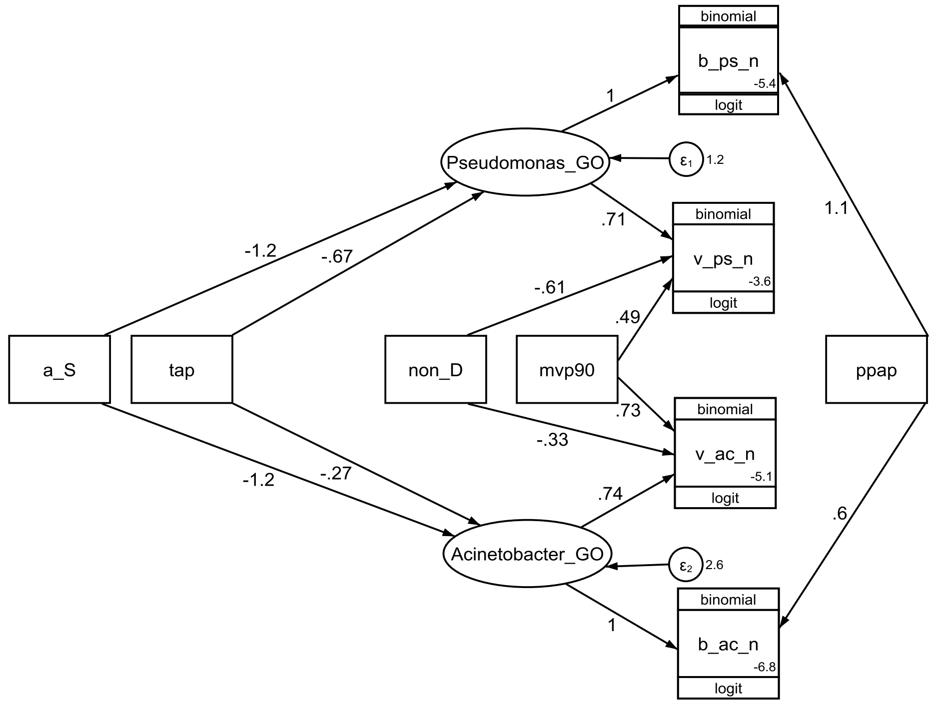


Fig S811

GSEM model 4

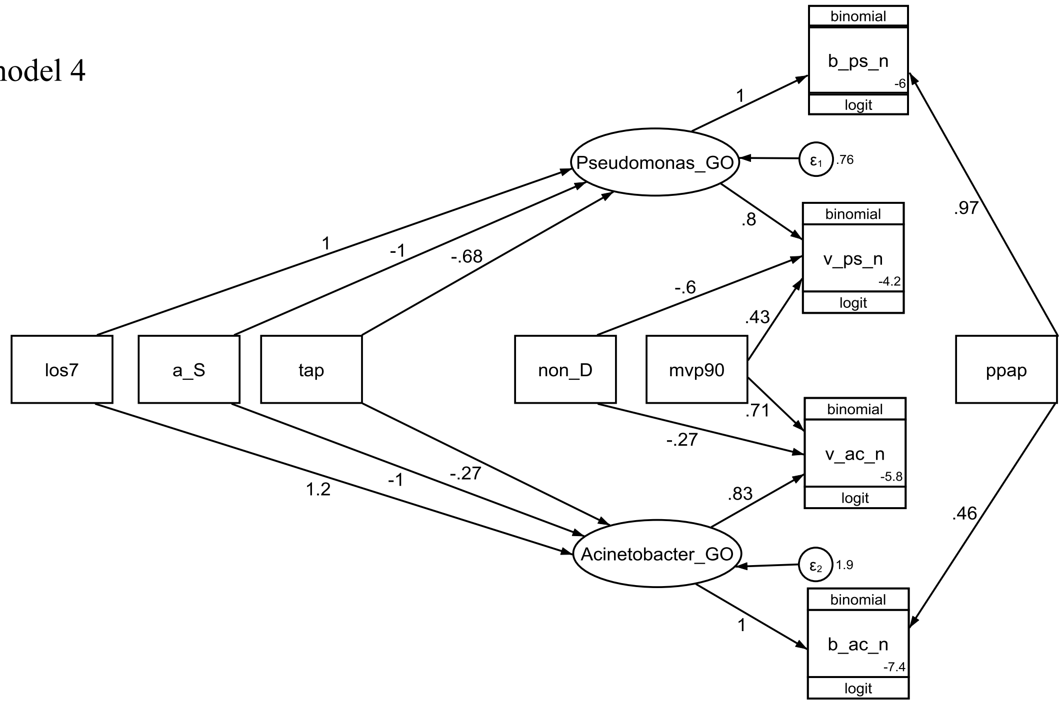


Fig S12

GSEM model 5

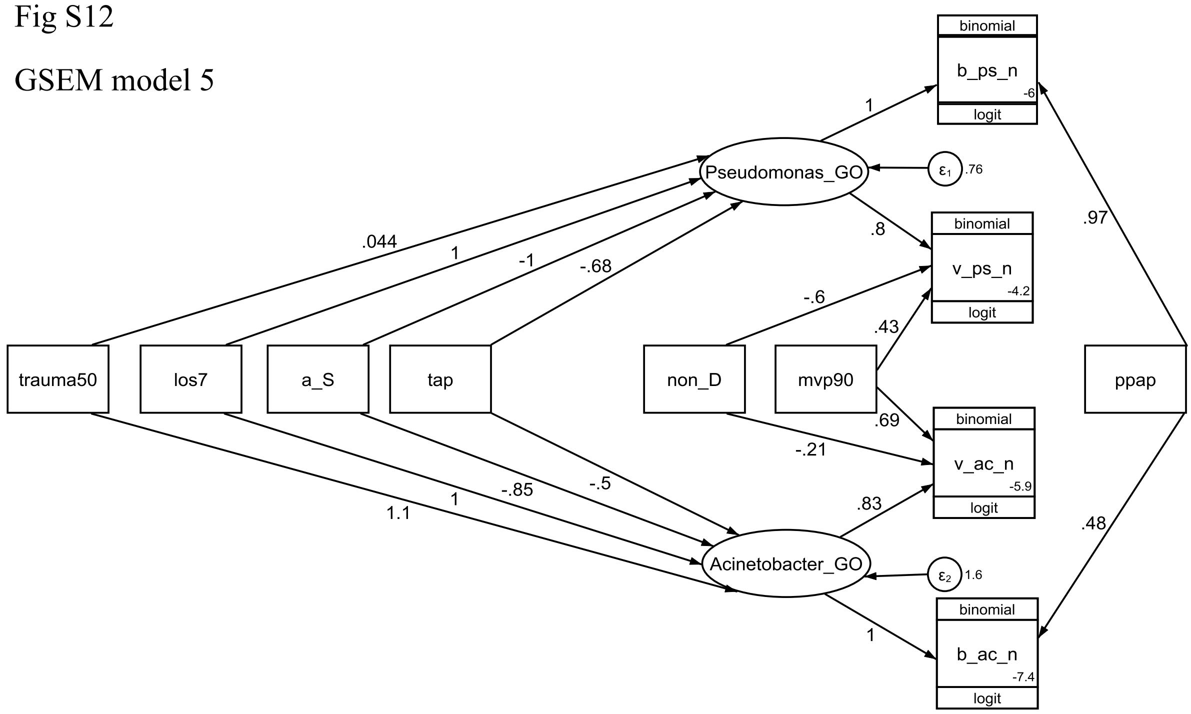


Fig S13

GSEM model 6

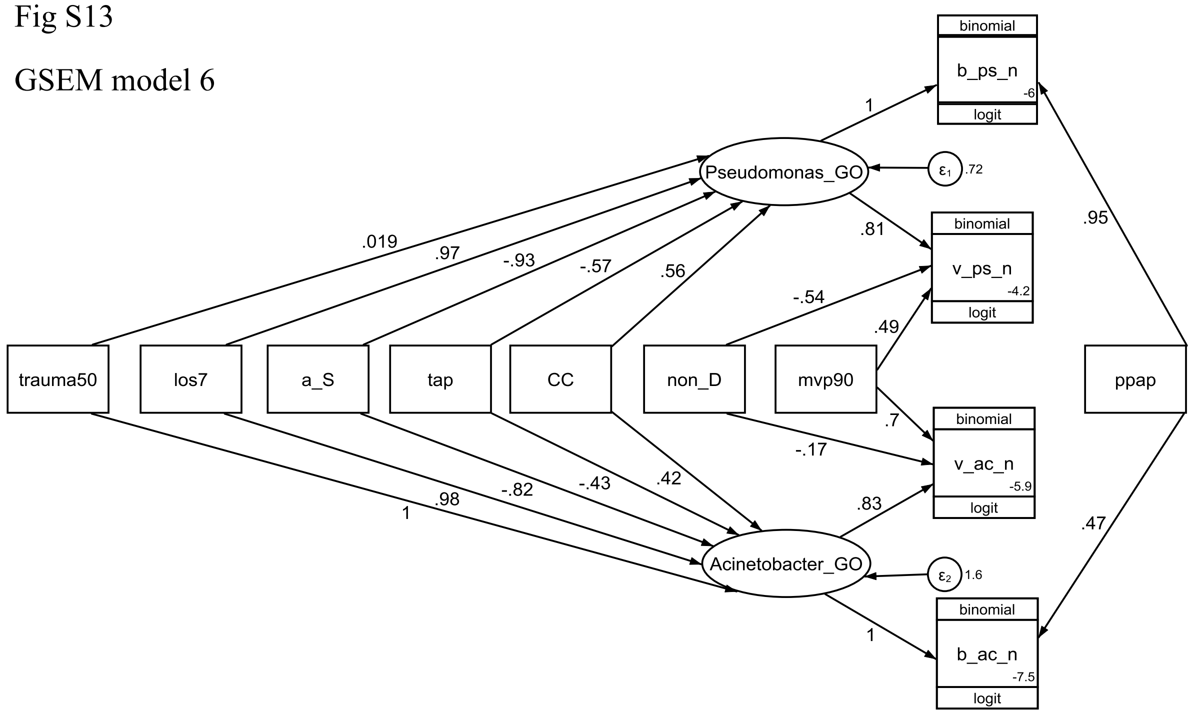
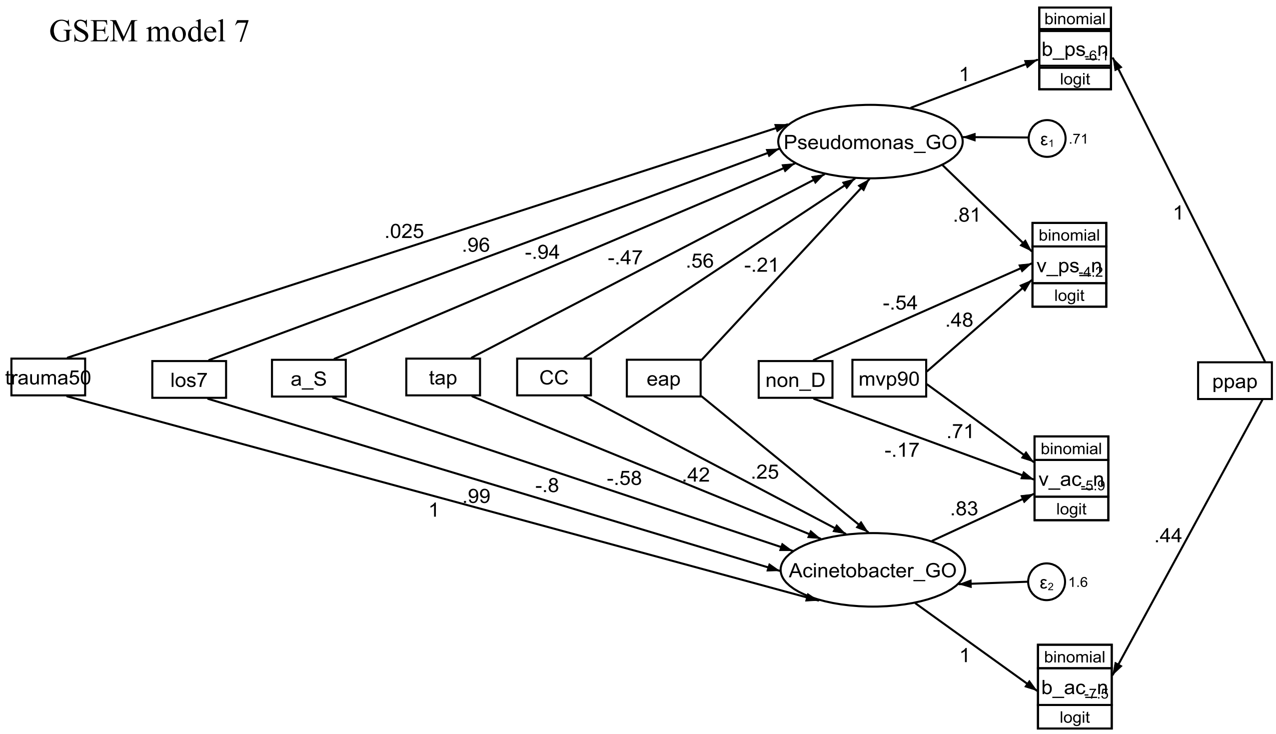


Fig S14

GSEM model 7



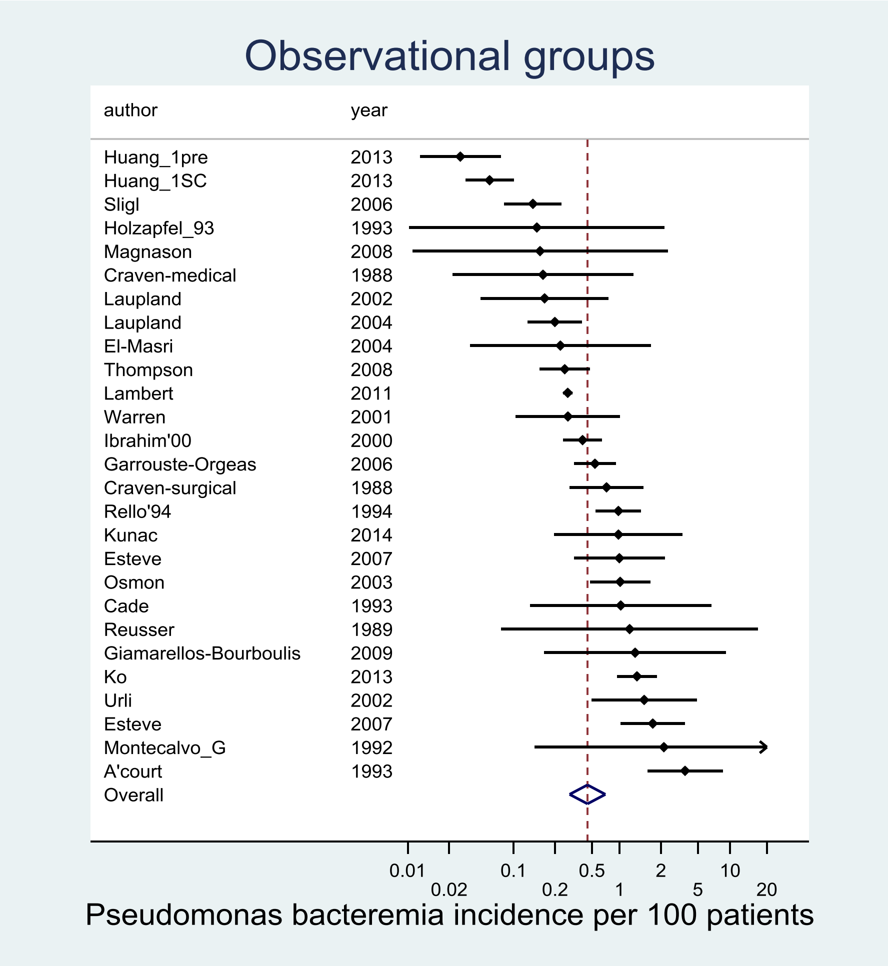


Fig S15

Pseudomonas bacteremia incidence among observational studies. Caterpillar plots of the group specific (small squares) and summary (large open diamonds) *Pseudomonas* bacteremia incidence proportion and 95 % CI. Groups are listed in Table S1. Note that the x axis is a logit scale and that groups with a zero event have a continuity correction (N+0.5) to enable them to appear in the plot. These zero count groups contribute < 1.5% in weight each towards the summary estimate. The central solid line is the *Pseudomonas* bacteremia benchmark.

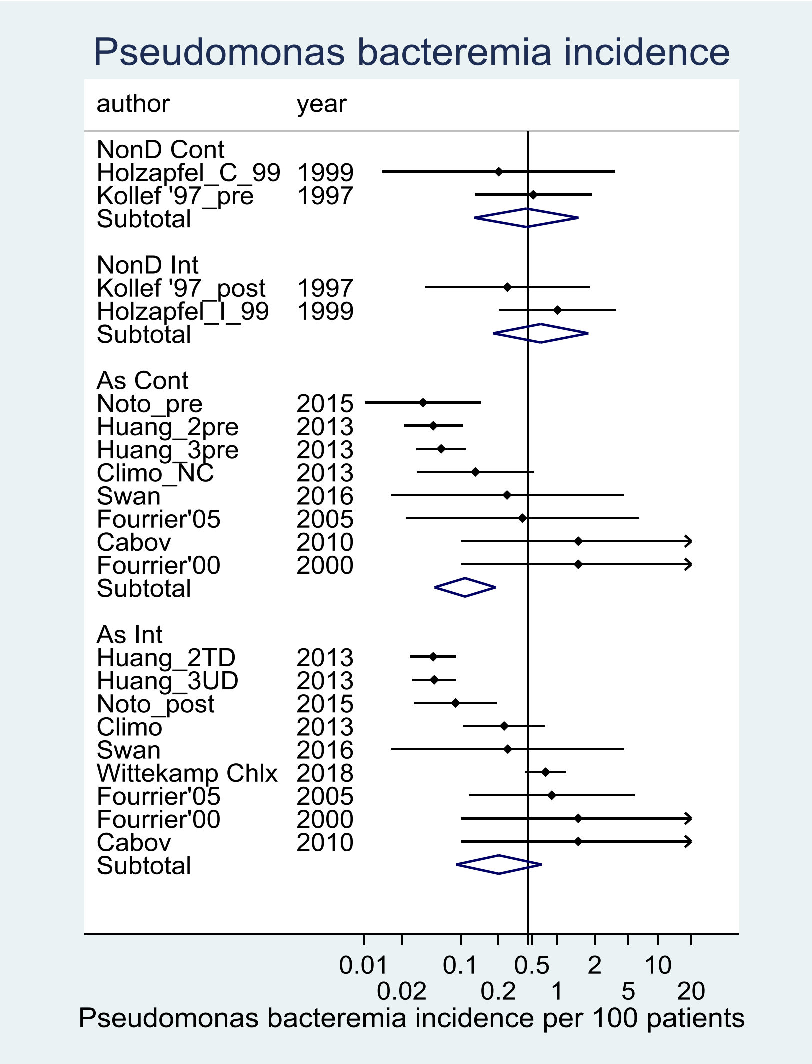


Fig S16

Pseudomonas bacteremia incidence among control and intervention groups of studies of non-decontamination methods & studies of anti-septic methods of infection prevention. Caterpillar plots of the group specific (small squares) and summary (large open diamonds) *Pseudomonas* bacteremia incidence proportion and 95 % CI. Groups are listed in Tables S2 & S3. Note that the x axis is a logit scale and that groups with a zero event have a continuity correction (N+0.5) to enable them to appear in the plot. These zero count groups contribute < 6% in weight each towards the summary estimate. The central solid line is the *Pseudomonas* bacteremia benchmark derived from Fig S15.

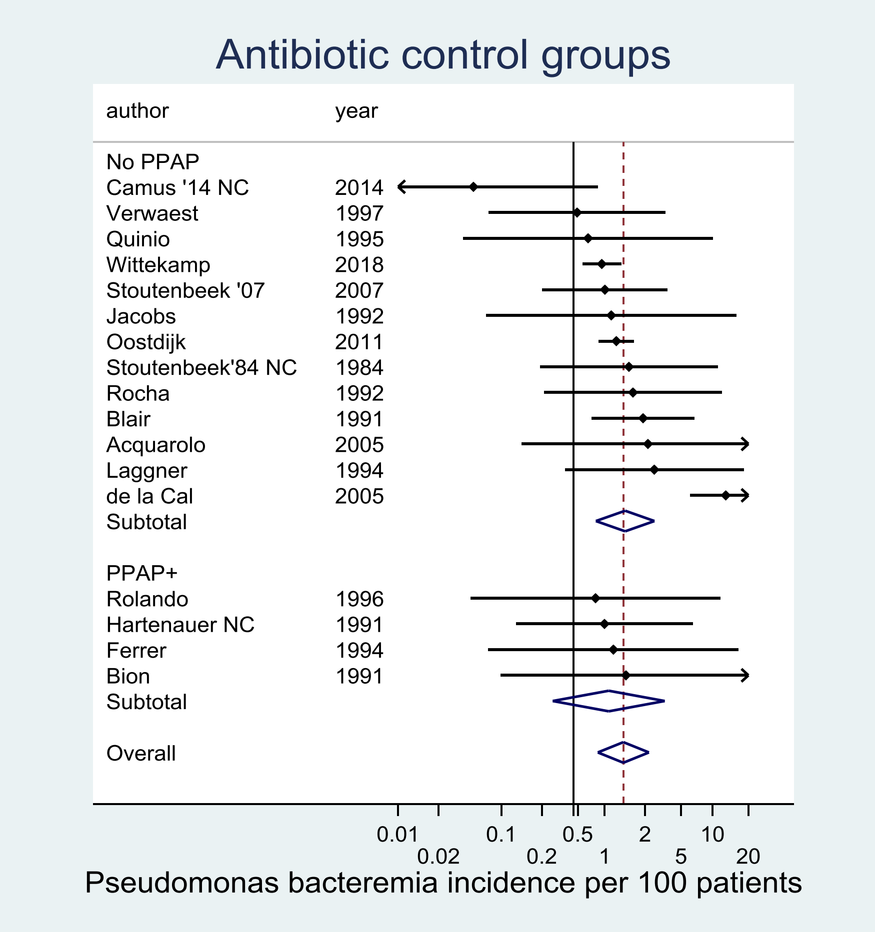


Fig S17

Pseudomonas bacteremia incidence among control groups of studies of TAP methods of infection prevention stratified by use of PPAP or not. Caterpillar plots of the group specific (small squares) and summary (large open diamonds) *Pseudomonas* bacteremia incidence proportion and 95 % CI. Groups are listed in Tables S4. Note that the x axis is a logit scale and that groups with a zero event have a continuity correction (N+0.5) to enable them to appear in the plot. These zero count groups contribute < 4% in weight each towards the summary estimate. The central solid line is the *Pseudomonas* bacteremia benchmark derived from Fig S15.

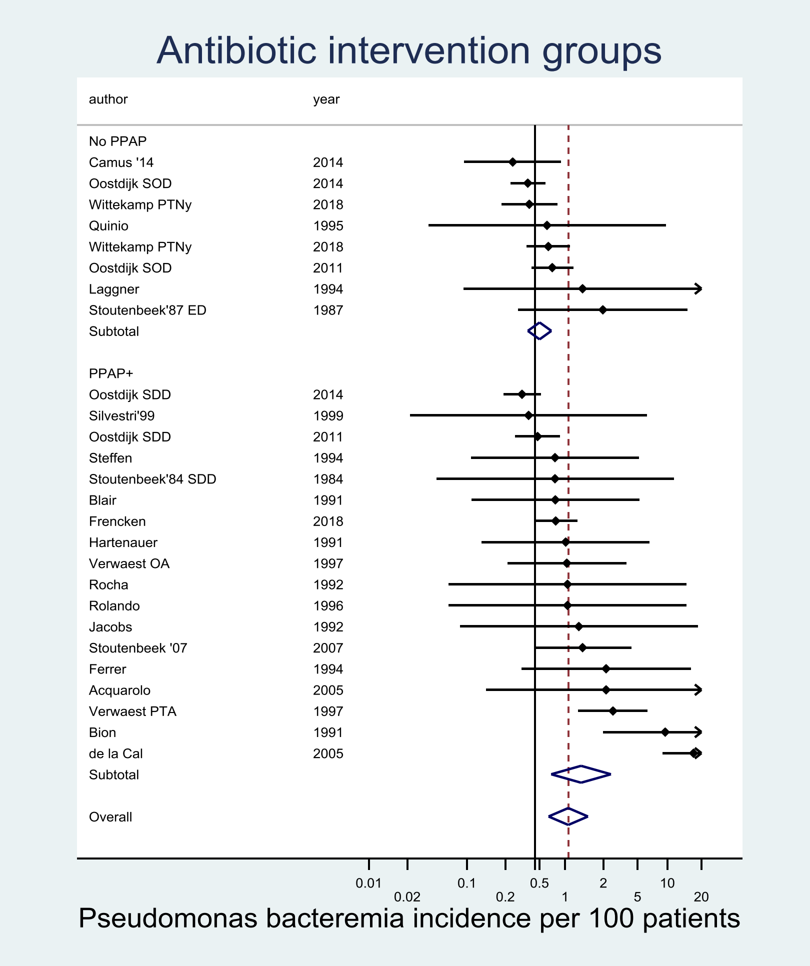


Fig S18

Pseudomonas bacteremia incidence among intervention groups of studies of topical antibiotic methods of infection prevention stratified by use of PPAP or not. Caterpillar plots of the group specific (small squares) and summary (large open diamonds) *Pseudomonas* bacteremia incidence proportion and 95 % CI. Groups are listed in Tables S4. Note that the x axis is a logit scale and that groups with a zero event have a continuity correction (N+0.5) to enable them to appear in the plot. These zero count groups contribute < 2% in weight each towards the summary estimate. The central solid line is the *Pseudomonas* bacteremia benchmark derived from Fig S15.

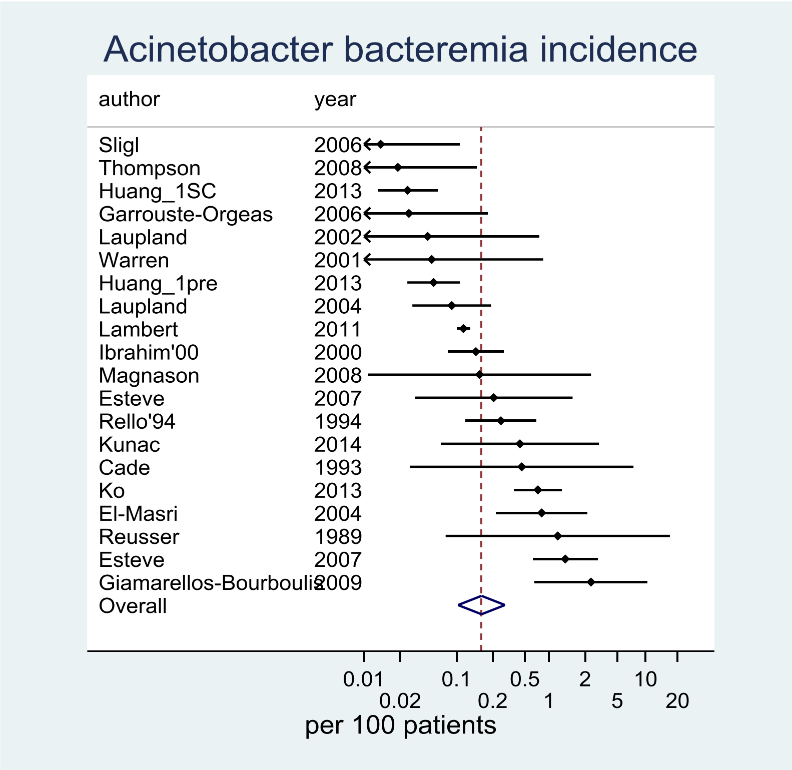


Fig S19

Acinetobacter bacteremia incidence among observational studies. Caterpillar plots of the group specific (small squares) and summary (large open diamonds) *Acinetobacter* bacteremia incidence proportion and 95 % CI. Groups are listed in Table S1. Note that the x axis is a logit scale and that groups with a zero event have a continuity correction (N+0.5) to enable them to appear in the plot. These zero count groups contribute < 3% in weight each towards the summary estimate. The central solid line is the *Acinetobacter* bacteremia benchmark.

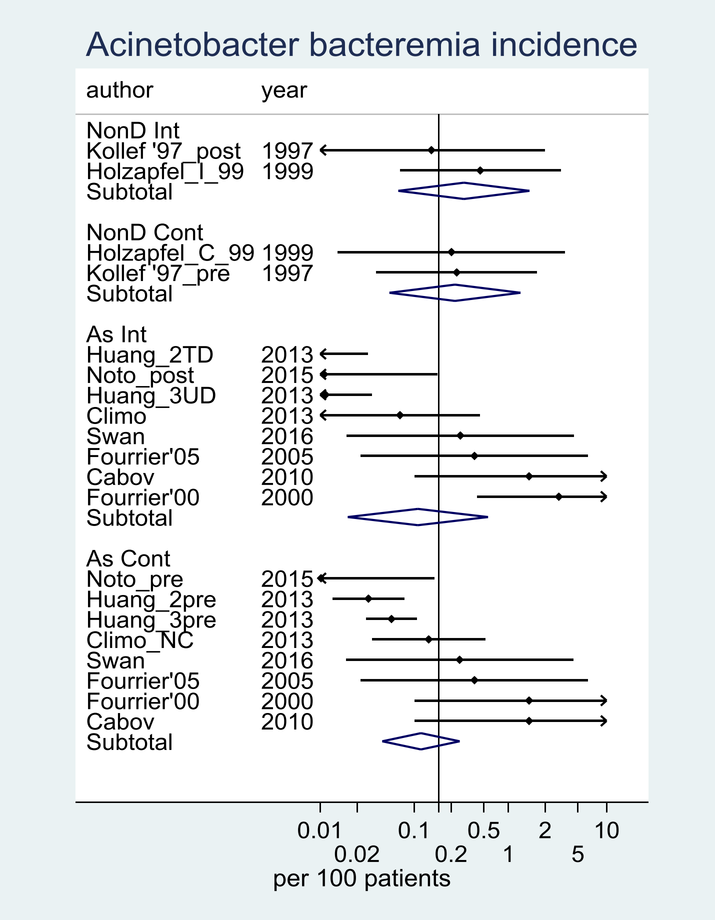


Fig S20

Acinetobacter bacteremia incidence among control and intervention groups of studies of non-decontamination methods & studies of anti-septic methods of infection prevention. Caterpillar plots of the group specific (small squares) and summary (large open diamonds) *Acinetobacter* bacteremia incidence proportion and 95 % CI. Groups are listed in Tables S2 & S3. Note that the x axis is a logit scale and that groups with a zero event have a continuity correction (N+0.5) to enable them to appear in the plot. These zero count groups contribute < 4% in weight each towards the summary estimate. The central solid line is the *Acinetobacter* bacteremia benchmark derived from Fig S19.

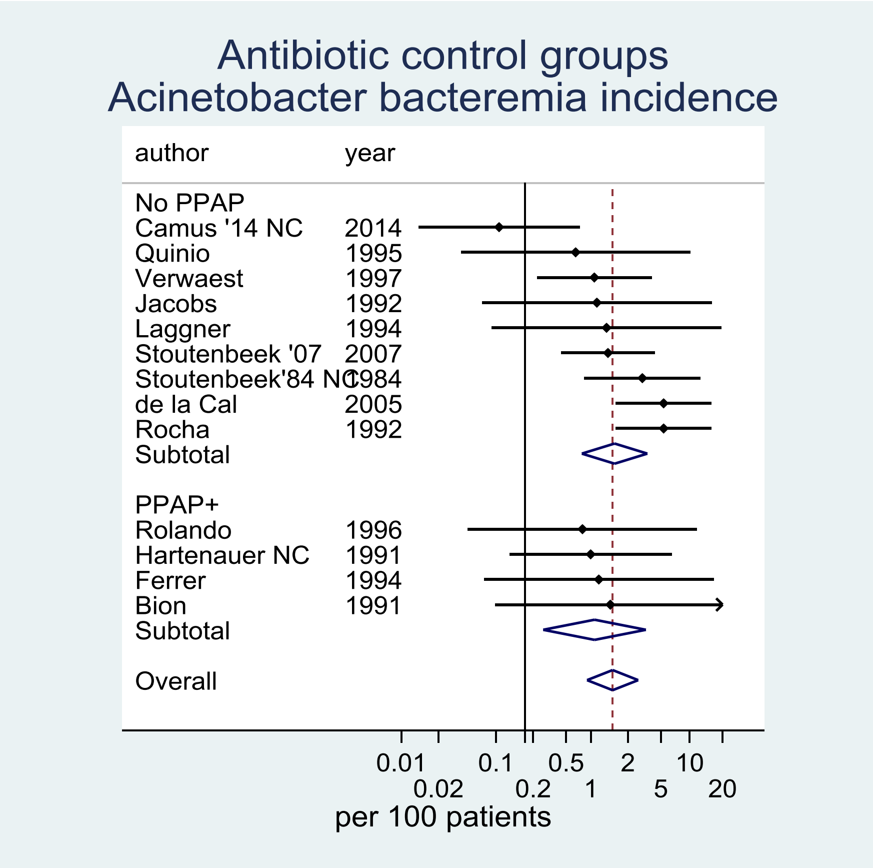


Fig S21

Acinetobacter bacteremia incidence among control groups of studies of topical antibiotic methods of infection prevention stratified by use of PPAP or not. Caterpillar plots of the group specific (small squares) and summary (large open diamonds) *Acinetobacter* bacteremia incidence proportion and 95 % CI. Groups are listed in Tables S4. Note that the x axis is a logit scale and that groups with a zero event have a continuity correction (N+0.5) to enable them to appear in the plot. These zero count groups contribute < 4.5% in weight each towards the summary estimate. The central solid line is the *Acinetobacter* bacteremia benchmark derived from Fig S19.

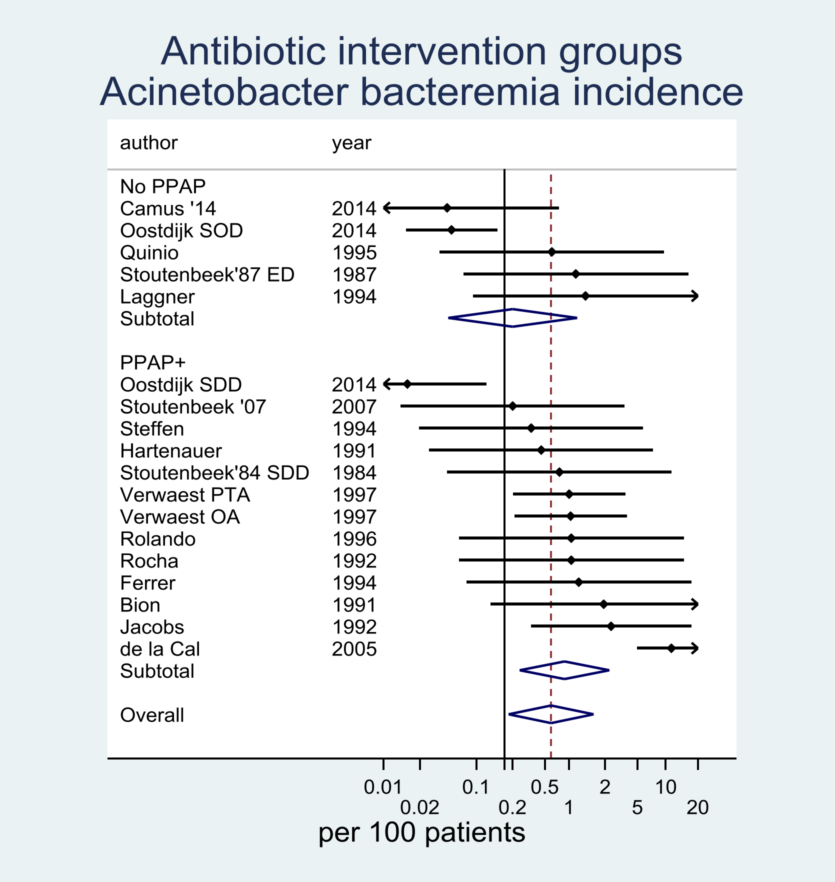


Fig S22

Acinetobacter bacteremia incidence among intervention groups of studies of topical antibiotic methods of infection prevention stratified by use of PPAP or not. Caterpillar plots of the group specific (small squares) and summary (large open diamonds) *Acinetobacter* bacteremia incidence proportion and 95 % CI. Groups are listed in Tables S4. Note that the x axis is a logit scale and that groups with a zero event have a continuity correction (N+0.5) to enable them to appear in the plot. These zero count groups contribute < 5% in weight each towards the summary estimate. The central solid line is the *Acinetobacter* bacteremia benchmark derived from Fig S18.