Appendix 2 (as supplied by the authors): Further details on characteristics of studies included in the meta-analysis

Author	Alfageme 2006[1]
Approximate year of trial start	2003
Study population	Spanish COPD patients, excluding those with specified co-morbidities. 95% male. Mean 68.5 years old, range 61-73 years
Maximum follow up time	2.7 years
Interventions	23-valent PPV. No intervention in control group other than follow up checks, as in vaccine group
Quality	Described as randomised. Generation of allocation sequence described and adequate but concealment of allocation not described Not described as double-blind but outcome assessors are blinded
Outcomes	Presumptive pneumococcal pneumonia (radiographic and bacteriologic) All-cause pneumonia (radiographic) All-cause mortality Mortality due to pneumonia (method of assessment of this outcome not clearly explained)

Author	Austrian 1976[2]
Approximate year of trial start	1972
Study population	Young gold-miners in South Africa 100% male. Age not well defined
Maximum follow up time	Not reported
Interventions	13 valent PPV. 2 control groups : saline placebo and Meningococcal A vaccine
Quality	Described as randomised. Generation of allocation sequence described and adequate but concealment of allocation not described Not reported as double-blind and no description of who, if anyone, was blinded
Outcomes	Presumptive pneumococcal pneumonia (radiographic and is suggestive that culture performed but not explicitly stated) All-cause pneumonia (radiographic)

Author	Austrian 1980[3]
Approximate year of trial start	1973
Study population	a) US psychiatric hospital patients (resident for over 3m) b) clients (>45yo) of a health insurance plan Sex and age distribution not well defined for either trial
Maximum follow up time	a) 3.0 years b) 2.8 years
Interventions	12v PPV with saline placebo in controls
Quality	a) Not described as randomised. Neither generation of allocation sequence nor concealment of allocation described. Described as double-blind but not possible to determine who is truly blinded b) Described as randomised. Generation of allocation sequence and concealment of allocation described and adequate Not described as double-blind. Some trial staff blinded but unclear regarding outcome assessors
Outcomes	a) All-cause pneumonia (radiographic) All-cause mortality Mortality due to pneumonia (method of assessment of this outcome not clearly explained) Bacteraemia/septicaemia b) All-cause pneumonia (radiographic) All-cause bronchitis All-cause mortality Mortality due to pneumonia (from death certificates) Mortality due to pneumococcal infection (“death associated with the isolation from respiratory secretions of a pneumococcal type in the vaccine”)

continued

Author	Davis 1987[4]
Approximate year of trial start	1978
Study population	US COPD patients Mean age 62.5 years. Sex distribution not defined
Maximum follow up time	Not reported
Interventions	14-valent PPV. Control group given saline placebo
Quality	Described as randomized. Generation of allocation sequence described and adequate but concealment of allocation not described Described as double-blind. Participants are blinded. Outcome assessors are blinded.
Outcomes	Definitive pneumococcal pneumonia (radiographic and bacteriologic) Presumptive pneumococcal pneumonia (radiographic and bacteriologic) All-cause pneumonia (radiographic) All-cause mortality Mortality due to pneumonia (method of assessment of this outcome not clearly explained)

Author	French 2000[5]
Approximate year of trial start	1995
Study population	Ugandan HIV+ 15-55yo, not pregnant, not on rifampicin, not stage 4, no acute febrile illnesses 29% male. Mean age 31 years. Minimum age 15 years.
Maximum follow up time	2.7 years
Interventions	23-valent PPV. Controls received sodium phosphate carrier (placebo)
Quality	Described as randomised but neither generation of allocation sequence nor allocation concealment described. Described as double-blind. Participants are blinded. Some trial staff blinded but unclear if outcome assessors are blinded.
Outcomes	All-cause pneumonia (radiographic) All-cause mortality Invasive pneumococcal disease

Author	Gaillat 1985[6]
Approximate year of trial start	1980
Study population	French elderly in hospitals or nursing homes 34% male. Mean age 74 years
Maximum follow up time	2.0 years
Interventions	14-valent PPV. No intervention in control group
Quality	Described as randomized. Generation of allocation sequence not described. Concealment of randomization described but not adequate. Not apparently blinded
Outcomes	All-cause pneumonia (appears not all cases had radiographic confirmation but percentage unclear) All-cause mortality

Author	Honkanen 1999[7]
Approximate year of trial start	1992
Study population	Finnish older than 65yo Mean age 73.5 years
Maximum follow up time	3.2yrs
Interventions	23-valent PPV and influenza vaccine in pneumococcal vaccine group. Influenza vaccine in control group.
Quality	Not described as randomized. Method of allocation by odd or even year of birth. Not described as double-blind. Unclear if outcome assessors blind
Outcomes	Presumptive pneumococcal pneumonia (radiographic and presence of circulating pneumolysin specific immune complexes) All-cause pneumonia (radiographic) Bacteraemia/septicaemia

continued

Author	Kaufman 1947[8]
Approximate year of trial start	1937
Study population	Elderly in New York City Home Mean 67 years. Sex distribution not defined
Maximum follow up time	1.5 years
Interventions	3-valent PPV. No intervention in control group
Quality	Described as randomised. Randomization not adequate. Not described as double-blind and no further description of any blinding in paper
Outcomes	All-cause pneumonia (unclear diagnostic criteria) All-cause mortality
Notes	Results from Kaufman 1941[9] are summarized in Kaufman 1947 – only these data were extracted. A randomization process is reported starting in the trial's second year (alternation; volunteers taken in first year), results were extracted from second year on.

Author	Klastersky 1986[10]
Approximate year of trial start	1987
Study population	Belgian bronchogenic carcinoma patients, most with no radiotherapy or chemotherapy prior to vaccination 96% male. Mean age 61 years, range 42-78 years
Maximum follow up time	Not reported
Interventions	17v PPV. Saline placebo in control group
Quality	Described as randomized. No description of generation of allocation sequence but concealment described and adequate Not reported as double-blind but participants blind and at least some trial staff. Unclear if outcome assessors blind
Outcomes	Presumptive pneumococcal pneumonia (radiographic and bacteriologic) Mortality due to pneumococcal infection (deaths from pneumococcal septicaemias) Bacteraemia/septicaemia

Author	Koivula 1997[11]
Approximate year of trial start	1982
Study population	Finnish elderly (over 60yo)
Maximum follow up time	3.0 years
Interventions	14-valent PPV and influenza vaccine in intervention group. Influenza vaccine in control group 37% male.
Quality	Described as randomized. Generation of allocation sequence described and adequate. Concealment described and but difficult to determine if adequate. Not reported as double-blind but outcome assessors blinded.
Outcomes	Presumptive pneumococcal pneumonia (radiographic and two-fold rise of pneumolysin antibodies) All-cause pneumonia (radiographic) All-cause mortality Mortality due to pneumonia (from death certificates)
Notes	Database of elderly residents randomised prior to recruitment. Outcomes also reported for non-responders

Author	Leech 1987[12]
Approximate year of trial start	1981
Study population	Canadian COPD patients 71% male. Mean age 67 years, range 40-89 years
Maximum follow up time	2.2 years
Interventions	14-valent PPV. Saline placebo in control group. Both groups given influenza vaccine at 0, 1 and 2 years
Quality	Described as randomised but neither generation of allocation sequence nor allocation concealment described. Described as double-blind. At least some trial staff blinded but unclear if outcome assessors blind
Outcomes	All-cause mortality Bacteraemia/septicaemia

continued

Author	MacLeod 1945[13]
Approximate year of trial start	1944
Study population	US trainees at the Army Airforce Technical School
Maximum follow up time	Not reported
Interventions	4V PPV. Saline placebo in control group 100% male. Mean age 23.3 years. Minimum age 18 years
Quality	Described as randomised. Both generation of allocation sequence and allocation concealment described but neither are adequate. Not described as double-blind and no further description of any blinding in paper
Outcomes	Presumptive pneumococcal pneumonia (clinical and bacteriologic)

Author	Örtqvist 1998[14]
Approximate year of trial start	1991
Study population	Swedish non-immunocompromised middle aged and elderly (50yo and over) who had previously been hospitalised for community acquired pneumonia 48% male. Mean age 69.2 years, range 50-85 years
Maximum follow up time	Not reported
Interventions	23-valent PPV. Control group received saline placebo
Quality	Described as randomised and both generation of allocation sequence and allocation concealment are adequate. Described as double-blind and both participants and outcome assessors are blinded
Outcomes	Definitive pneumococcal pneumonia Presumptive pneumococcal pneumonia (radiographic and bacteriologic/two-fold rise of pneumolysin antibodies) All-cause pneumonia (radiographic) All-cause mortality Mortality due to pneumonia (method of assessment of this outcome not clearly explained) Bacteraemia/septicaemia

Author	Riley 1977[15]
Approximate year of trial start	1974
Study population	Highlanders over 10 yo in Papua New Guinea Sex distribution not defined
Maximum follow up time	Not reported
Interventions	14-valent PPV. Control received placebo
Quality	Described as randomized. Generation of allocation sequence not described. Concealment of allocation described and adequate Described as double-blind. Participants are blinded. Outcome assessors are blinded.
Outcomes	All-cause pneumonia (radiographic where possible, percentage unclear) All-cause mortality Mortality due to pneumonia (from questioning relatives) Acute lower respiratory tract infections
Notes	540 records were lost.

continued

Author	Simberkoff 1986[16]
Approximate year of trial start	1981
Study population	US "high-risk" patients i.e. those 55yo or older, or with chronic disease
Maximum follow up time	Not reported
Interventions	14-valent PPV. Saline placebo in control group
Quality	Described as randomized. No description of generation of allocation sequence but concealment described and adequate Described as double-blind but no description of who is blinded
Outcomes	Presumptive pneumococcal pneumonia (radiographic and bacteriologic) All-cause pneumonia (radiographic) All-cause bronchitis All-cause mortality Mortality due to pneumonia (deaths following radiographically positive pneumonia) Mortality due to pneumococcal infection (appears to be from death certificates, "listed as primary or contributory cause of death") Bacteraemia/septicaemia

Author	Smit 1977[17]
Approximate year of trial start	a) 1973 b) 1974
Study population	Young gold-miners in South Africa 100% male. Age distribution not well defined
Maximum follow up time	a) 2.3 years b) 1.6 years
Interventions	a) 6v PPV. Two control groups: saline placebo and Meningococcal A and C vaccine b) 12v PPV. Two control groups: saline placebo and Meningococcal A and C vaccine
Quality	a) and b) Described as randomized but neither generation of allocation sequence nor allocation concealment described. Not described as double-blind but outcome assessors appear to be blinded
Outcomes	a) and b) Presumptive pneumococcal pneumonia (radiographic and bacteriologic) All-cause pneumonia (radiographic), results only available for both control groups combined All-cause bronchitis, results only available for both control groups combined

Author	Steentoft 2006[18]
Approximate year of trial start	2005
Study population	Danish COPD patients 55% male. Age range 47-86 years
Maximum follow up time	Not reported
Interventions	23-valent PPV and combinations of steroid treatments in vaccine groups (3). Control group only has the steroid combinations
Quality	Described as randomized. No description of generation of allocation sequence but concealment described and adequate No blinding reported
Outcomes	All-cause pneumonia (radiographic)
Notes	Three vaccine groups combined as this reflects the steroid treatment patterns in the control group

Author	Zhogolev 2003[19]
Approximate year of trial start	2001
Study population	Russian soldiers in a) North-west Russia, b) Central Russia, c) East Russia 100% male. Age range not defined
Maximum follow up time	Not reported
Interventions	23-valent polysaccharide, control group received no intervention
Quality	No description of generation of allocation sequence, concealment of allocation or blinding
Outcomes	a, b and c) All cause pneumonia (diagnostic criteria unclear)
Notes	4 trials are reported in three Russian regions with differing risk settings. Incidence of pneumonia in controls was much higher in the "central" region, compared to the others. One trial not included due to confounding.

continued

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