Ali MU, Fitzpatrick-Lewis D, Raina P, Warren R, Kenny M, Raina P. Screening for abdominal aortic aneurysm: Updated GRADE tables. http://canadiantaskforce.ca/guidelines/published-guidelines/abdominal-aortic-aneurysm/. Updated April 2017.

Screening for Abdominal Aortic Aneurysm (AAA) in Asymptomatic Men 65 Years of age and Older Evidence Synthesis

Population:	The population of interest was asymptomatic adults aged 50 years and older
Option:	Interventions of interest were general or targeted screening for AAA with ultrasound.
Comparison:	Varied
Main outcomes:	▪ AAA-related mortality ▪ All-cause mortality ▪ AAA rupture rate ▪ Procedures to repair an AAA ▪ 30-day mortality following procedures to repair an AAA
Setting:	Primary care settings

Background: A systematic review on screening for AAA was produced for the Canadian Task Force on Preventive Health Care by the Evidence Review and Synthesis Centre at McMaster University in 2015.[1,2]

The aim of this systematic review was to examine the evidence on benefits and harms of screening for abdominal aortic aneurysm by ultrasound in asymptomatic adults aged 50 years and older to inform a task force guideline on this topic.

The systematic review was updated to January 2017 prior to guideline publication. Through the updated search, one additional randomized controlled trial (RCT)[1] was identified for inclusion.

Purpose: This report was produced by the Evidence Review and Synthesis Centre Team at McMaster University to provide updated evidence profiles on screening for AAA that include findings from the recently published RCT.

Evidence Set (ES) 1. Benefits of One-Time Screening

- ES Table 1.1 GRADE Evidence Profile: Benefits of one-time screening
- ES Forest Plots Figure 1.1-1.3

Evidence Set (ES) 2. Harms of One-Time Screening

- ES Table 2.1 GRADE Evidence Profile: Harms of one-time screening
- ES Forest Plots 2.1-2.6

ES Table 1.1 GRADE Evidence Profile: Benefits of one-time screening (updated-2017)

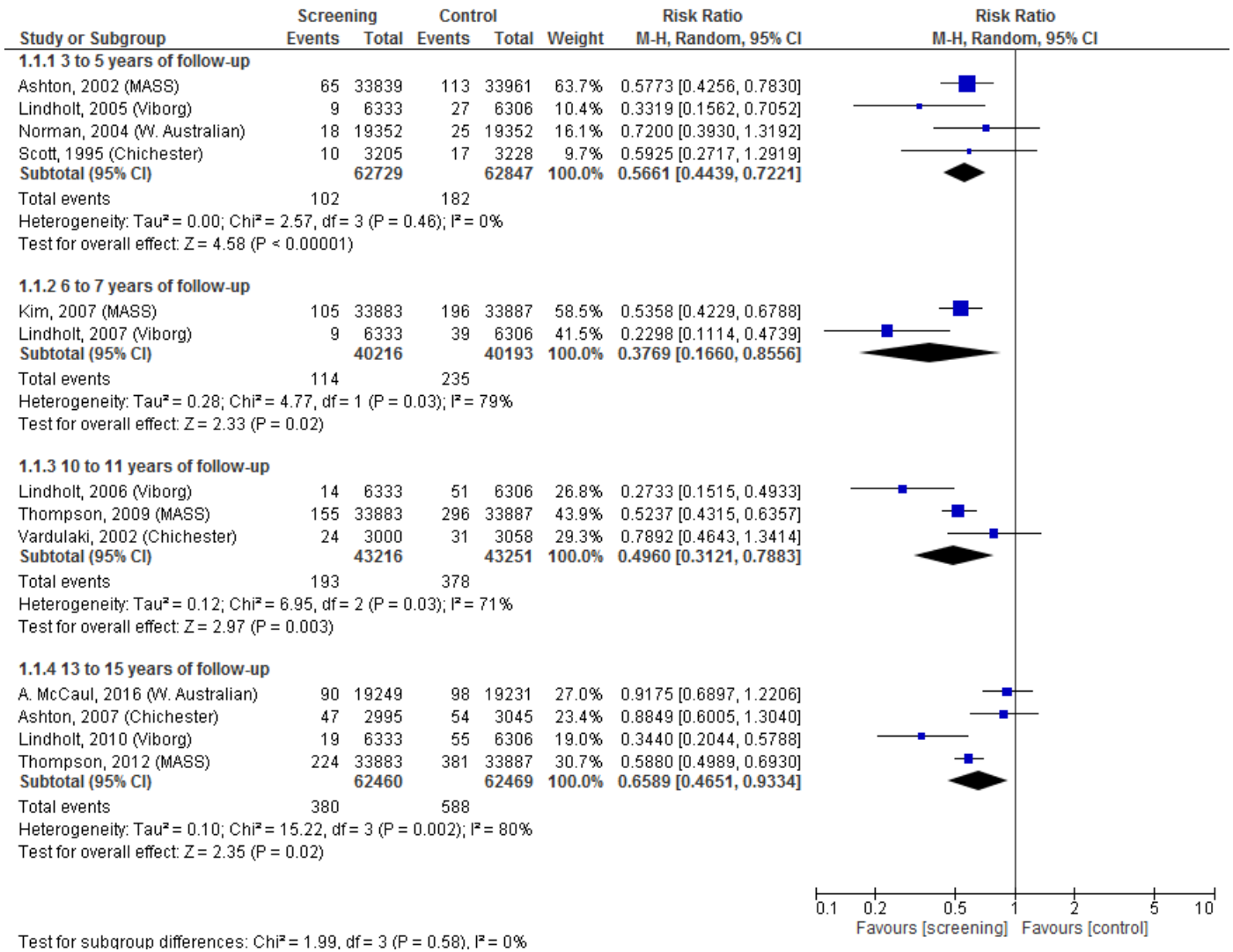
Quality assessment							No of patients		Effect				Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Benefits of one-time screening	Control	Relative (95% CI)	Absolute per million	ARR	NNS (95% CI)		
AAA Mortality - By length of Follow-up - 3 to 5 years of follow-up (follow-up 3.6 to 5.0 years; assessed with: Objectively)														
4[3-6]	randomised trials	serious[2]	no serious inconsistency[3]	no serious indirectness[4]	no serious imprecision[5]	none[6]	102/62,729 (0.16%)	182/62,847 (0.29%)	RR 0.5661 (0.4439 to 0.7221)	1,257 fewer (from 805 fewer to 1,610 fewer)	0.13%	796 (621 to 1,242)	⊕⊕⊕O MODERATE	CRITICAL
AAA Mortality - By length of Follow-up - 6 to 7 years of follow-up (follow-up 5.9 to 7 years; assessed with: Objectively)														
2[7,8]	randomised trials	serious[8]	no serious inconsistency[9]	no serious indirectness[10]	no serious imprecision[11]	none[6]	114/40,216 (0.28%)	235/40,193 (0.58%)	RR 0.3769 (0.166 to 0.8556)	3,643 fewer (from 844 fewer to 4,876 fewer)	0.36%	274 (205 to 1,185)	⊕⊕⊕O MODERATE	CRITICAL
AAA Mortality - By length of Follow-up - 10 to 11 years of follow-up (follow-up mean 10 years; assessed with: Objectively)														
3[9-11]	randomised trials	serious[13]	no serious inconsistency[14]	no serious indirectness[15]	no serious imprecision[16]	none[6]	193/43,216 (0.45%)	378/43,251 (0.87%)	RR 0.4960 (0.3121 to 0.7883)	4,405 fewer (from 1,850 fewer to 6,012 fewer)	0.44%	227 (166 to 541)	⊕⊕⊕O MODERATE	CRITICAL
AAA Mortality - By length of Follow-up - 13 to 15 years of follow-up (follow-up 12.8 to 15 years; assessed with: Objectively)**														
4[12-15]	randomised trials	serious[18]	no serious inconsistency[19]	no serious indirectness[20]	no serious imprecision[21]	none[6]	380/62460 (0.61%)	588/62469 (0.94%)	RR 0.6589 (0.4651 to 0.9334)	3211 fewer (from 627 fewer to 5035 fewer)	0.32%	311 (199 to 1595)	⊕⊕⊕O MODERATE	CRITICAL
All-cause Mortality - By length of Follow-up - 3 to 5 years of follow-up (follow-up 3.6 to 5.0 years; assessed with: Objectively)														
4[3-6]	randomised trials	serious[23]	no serious inconsistency[24]	no serious indirectness[25]	serious[26]	none[6]	7,453/62,729 (11.9%)	7,953/62,847 (12.7%)	RR 0.9449 (0.8758 to 1.0195)	6,973 fewer (from 15,717 fewer to 2,468 more)	NS	-	⊕⊕⊕O LOW	CRITICAL
All-cause Mortality - By length of Follow-up - 6 to 7 years of follow-up (follow-up 5.9 to 7 years; assessed with: Objectively)														
2[7,8]	randomised trials	serious[28]	no serious inconsistency[29]	no serious indirectness[30]	no serious imprecision[31]	none[6]	8,258/40,216 (20.5%)	8,571/40,193 (21.3%)	RR 0.9628 (0.9373 to 0.989)	7,933 fewer (from 2,346 fewer to 13,371 fewer)	0.79%	126 (75 to 426)	⊕⊕⊕O MODERATE	CRITICAL
All-cause Mortality - By length of Follow-up - 10 to 11 years of follow-up (follow-up mean 10 years; assessed with: Objectively)														
2[9,10]	randomised trials	serious[32]	no serious inconsistency[33]	no serious indirectness[34]	no serious imprecision[35]	none[6]	12,458/ 40,216 (31%)	12,715/ 40,193 (31.6%)	RR 0.9791 (0.9593 to 0.9993)	6,612 fewer (from 221 fewer to 12,875 fewer)	0.66%	151 (78 to 4,525)	⊕⊕⊕O MODERATE	CRITICAL
All-cause Mortality - By length of Follow-up - 13 to 15 years of follow-up (follow-up 12.8 to 15 years; assessed with: Objectively))**														
4[12-15]	randomised trials	serious[37]	no serious inconsistency[38]	no serious indirectness[39]	no serious imprecision[40]	none[6]	28474/62460 (45.6%)	28899/62469 (46.3%)	RR 0.9868 (0.9753 to 0.9985)	6106 fewer (from 694 fewer to 11427 fewer)	0.61%	164 (88 to 1,441)	⊕⊕⊕O MODERATE	CRITICAL
AAA Rupture - By length of Follow-up - 3 to 5 years of follow-up (follow-up 3.6 to 5.0 years; assessed with: Objectively)														
4[3,5,6,16]	randomised	serious[42]	no serious	no serious	no serious	none[6]	117/62,729	218/62,847	RR 0.5247	1,649 fewer (from	0.16%	606 (442	⊕⊕⊕O	CRITICAL

	trials		inconsistency[43]	indirectness[44]	imprecision[45]		(0.19%)	(0.35%)	(0.3475 to 0.7922)	721 fewer to 2,263 fewer)		to 1,387)	MODERATE	
AAA Rupture - By length of Follow-up - 6 to 7 years of follow-up (follow-up mean 7 years; assessed with: Objectively)														
1[7]	randomised trials	no serious risk of bias[47]	no serious inconsistency[48]	no serious indirectness[49]	no serious imprecision[50]	none[6]	135/33,883 (0.4%)	257/33,887 (0.76%)	RR 0.5254 (0.4268 to 0.6467)	3,599 fewer (from 2,679 fewer to 4,347 fewer)	0.36%	278 (230 to 373)	⊕⊕⊕⊕ HIGH	CRITICAL
AAA Rupture - By length of Follow-up - 10 to 11 years of follow-up (follow-up mean 10 years; assessed with: Objectively)														
2[9,10]	randomised trials	serious[52]	no serious inconsistency[53]	no serious indirectness[54]	no serious imprecision[55]	none[6]	207/40,216 (0.51%)	405/40,193 (1%)	RR 0.4663 (0.307 to 0.7083)	5,378 fewer (from 2,939 fewer to 6,983 fewer)	0.54%	186 (143 to 340)	⊕⊕⊕O MODERATE	CRITICAL
AAA Rupture - By length of Follow-up - 13 to 15 years of follow-up (follow-up 12.8 to 15 years; assessed with: Objectively))**														
4[12-15]	randomised trials	serious[57]	no serious inconsistency[58]	no serious indirectness[59]	no serious imprecision[60]	none[6]	415/62460 (0.66%)	674/62469 (1.1%)	RR 0.6496 (0.5147 to 0.8199)	3781 fewer (from 1943 fewer to 5236 fewer)	0.38%	264 (191 to 515)	⊕⊕⊕O MODERATE	CRITICAL

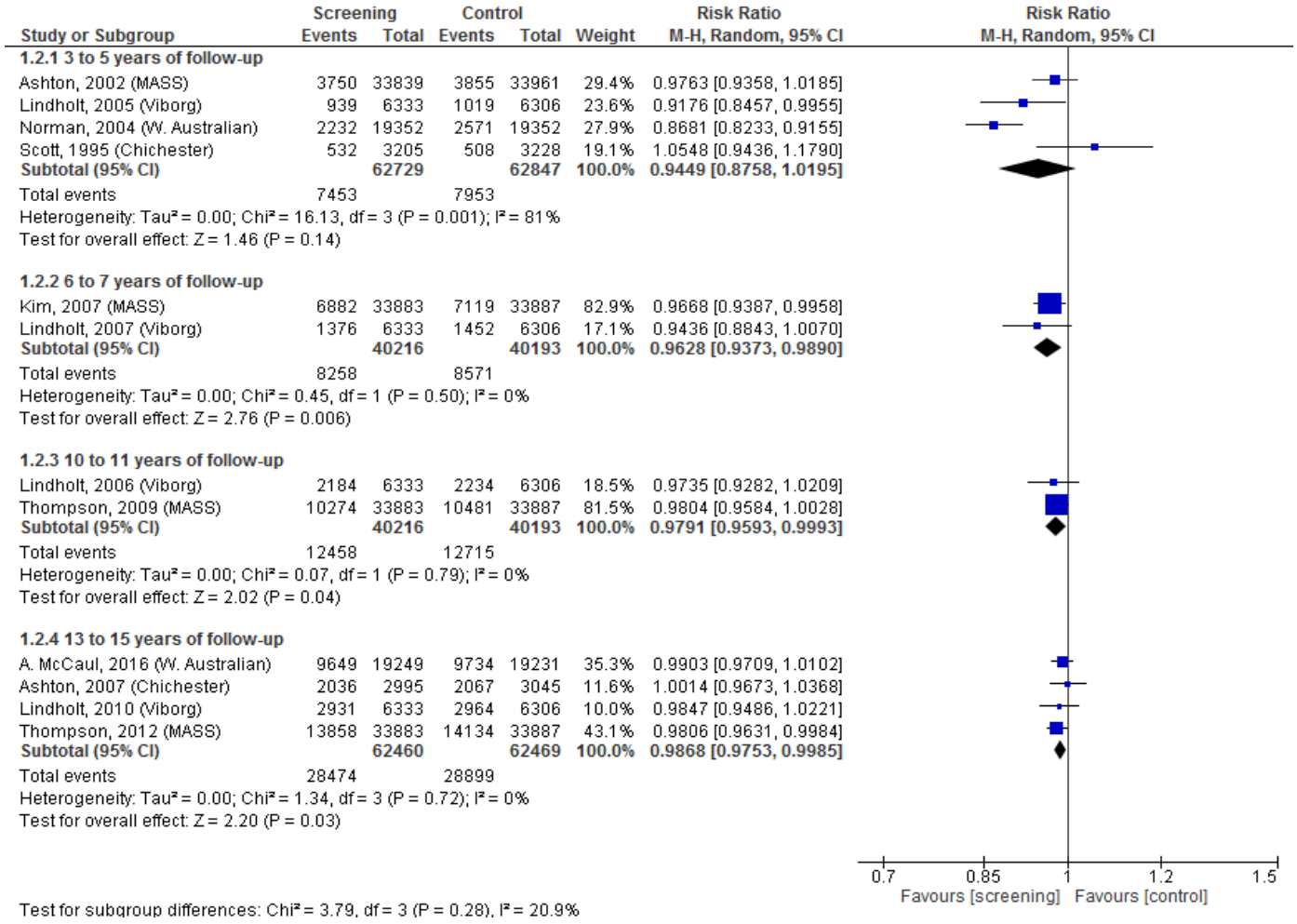
NOTE: NNH were calculated from Absolute numbers presented in GRADE tables. The GRADE tables estimate the absolute numbers per million using control group event rate and risk ratio with 95 % CI obtained from meta-analysis. NS = non-significant. The NNH were not calculated for 30-day mortality AAA operations, 30 day Mortality Elective AAA operations, 30 day Mortality Emergency AAA operations, emergency operations and emergent repairs for ruptures because either the effect was non-significant or showed a risk reduction in screening arm as compared to control arm.

** Updated results based on the recently published Western Australia trial

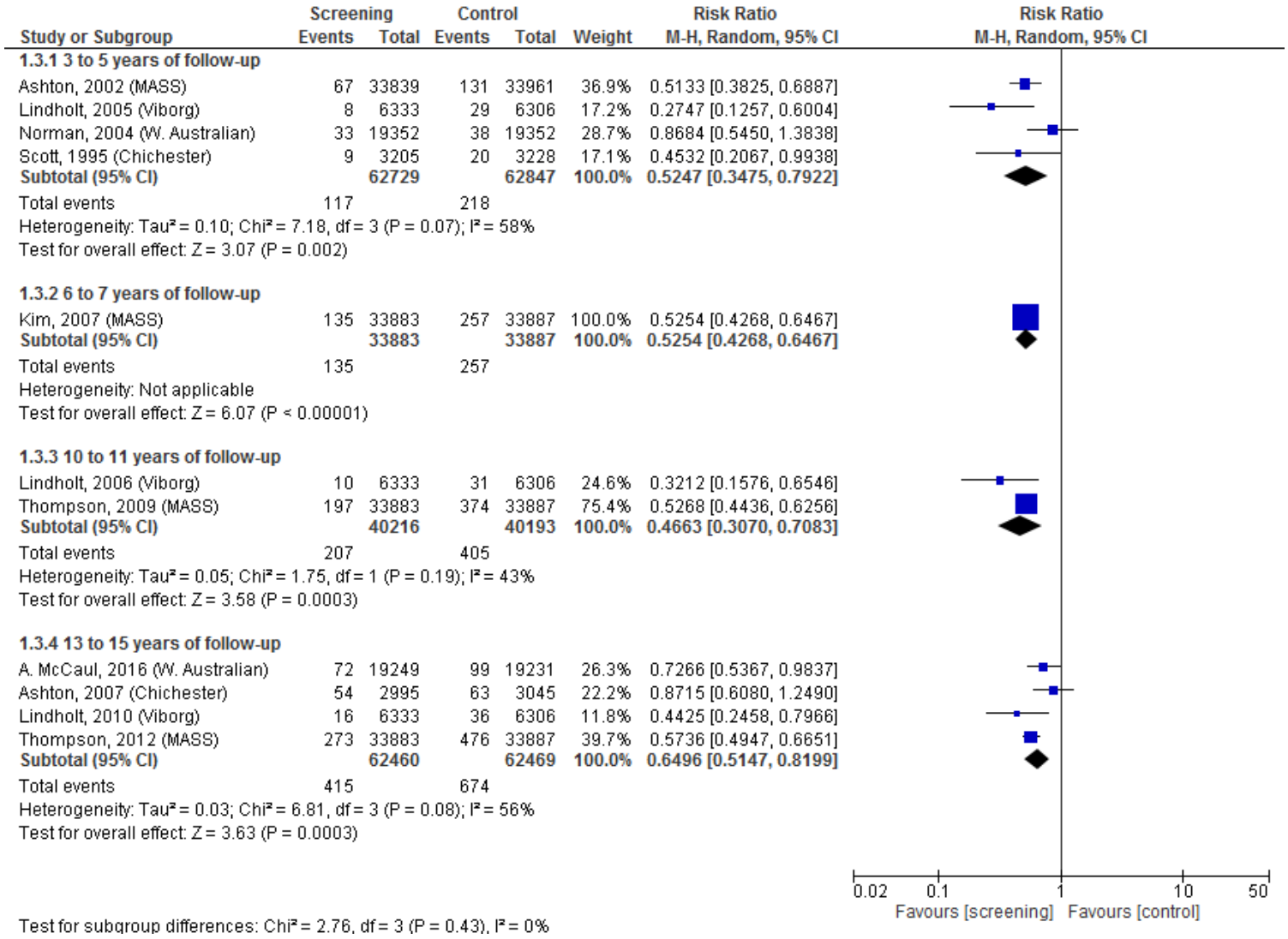
ES Forest Plot 1.1 Benefits of one-time AAA screening on AAA Mortality by Length of Follow-up



ES Forest Plot 1.2 Benefits of one-time AAA screening on All-Cause Mortality by Length of Follow-up



ES Forest Plot 1.3 Benefits of one-time AAA screening on AAA Rupture by Length of Follow-up



ES Table 2.1 GRADE Evidence Profile: Harms of one-time screening for AAA (updated -2017)

Quality assessment							No of patients		Effect				Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Harms of	Control	Relative (95% CI)	Absolute per million	ARI	NNH (95% CI)		
30 day Mortality, AAA operations - By length of Follow-up - 3 to 5 years of follow-up (follow-up 3.6 to 5 years; assessed with: Objectively)														
3[3,5,6]	randomised trials	serious[2]	no serious inconsistency[3]	no serious indirectness[4]	no serious imprecision[5]	none[6]	29/501 (5.8%)	41/221 (18.6%)	RR 0.3086 (0.1967 to 0.4841)	128,269 fewer (from 95,710 fewer to 149,029 fewer)	–	–	⊕⊕⊕O MODERATE	CRITICAL
30 day Mortality, AAA operations - By length of Follow-up - 6 to 7 years of follow-up (follow-up mean 7 years; assessed with: Objectively)														
1[7]	randomised trials	no serious risk of bias[8]	no serious inconsistency[9]	no serious indirectness[10]	no serious imprecision[11]	none[6]	31/495 (6.3%)	53/267 (19.9%)	RR 0.3155 (0.2078 to 0.4789)	135,875 fewer (from 103,439 fewer to 157,253 fewer)	–	–	⊕⊕⊕⊕ HIGH	CRITICAL
30 day Mortality, AAA operations - By length of Follow-up - 10 to 11 years of follow-up (follow-up mean 10 years; assessed with: Objectively)														
2[9,10]	randomised trials	serious[13]	no serious inconsistency[14]	no serious indirectness[15]	no serious imprecision[16]	none[6]	48/703 (6.8%)	86/436 (19.7%)	RR 0.3539 (0.2537 to 0.4937)	127,442 fewer (from 99,867 fewer to 147,206 fewer)	–	–	⊕⊕⊕O MODERATE	CRITICAL
30 day Mortality, AAA operations - By length of Follow-up - 13 to 15 years of follow-up (follow-up 12.8 to 15 years; assessed with: Objectively) **														
3[13-15]	randomised trials	serious[18]	no serious inconsistency[19]	no serious indirectness[20]	no serious imprecision[21]	none[6]	92/1299 (7.1%)	119/941 (12.6%)	RR 0.5546 (0.3856 to 0.7977)	56,326 fewer (from 25,583 fewer to 77,698 fewer)	–	–	⊕⊕⊕O MODERATE	CRITICAL
30 day Mortality, Elective AAA operations - By length of Follow-up - 3 to 5 years of follow-up (follow-up 3.6 to 5 years; assessed with: Objectively)														
4[3-6]	randomised trials	serious[23]	no serious inconsistency[24]	no serious indirectness[25]	no serious imprecision[26]	none[6]	21/505 (4.2%)	13/162 (8%)	RR 0.5102 (0.2618 to 0.9944)	39,305 fewer (from 449 fewer to 59,238 fewer)	–	–	⊕⊕⊕O MODERATE	CRITICAL
30 day Mortality, Elective AAA operations - By length of Follow-up - 6 to 7 years of follow-up (follow-up mean 7 years; assessed with: Objectively)														
1[7]	randomised trials	no serious risk of bias[28]	no serious inconsistency[9]	no serious indirectness[29]	serious[30]	none[6]	18/450 (4%)	12/156 (7.7%)	RR 0.5200 (0.2563 to 1.0549)	36,923 fewer (from 57,208 fewer to 4,223 more)	–	–	⊕⊕⊕O MODERATE	CRITICAL
30 day Mortality, Elective AAA operations - By length of Follow-up - 10 to 11 years of follow-up (follow-up mean 10 years; assessed with: Objectively)														
3[9-11]	randomised trials	serious[32]	no serious inconsistency[33]	no serious indirectness[34]	serious[35]	none[6]	24/664 (3.6%)	14/272 (5.1%)	RR 0.6927 (0.3634 to 1.3204)	15,817 fewer (from 32,766 fewer to 16,491 more)	–	–	⊕⊕OO LOW	CRITICAL
30 day Mortality, Elective AAA operations - By length of Follow-up - 13 to 15 years of follow-up (follow-up 12.8 to 15 years; assessed with: Objectively) **														

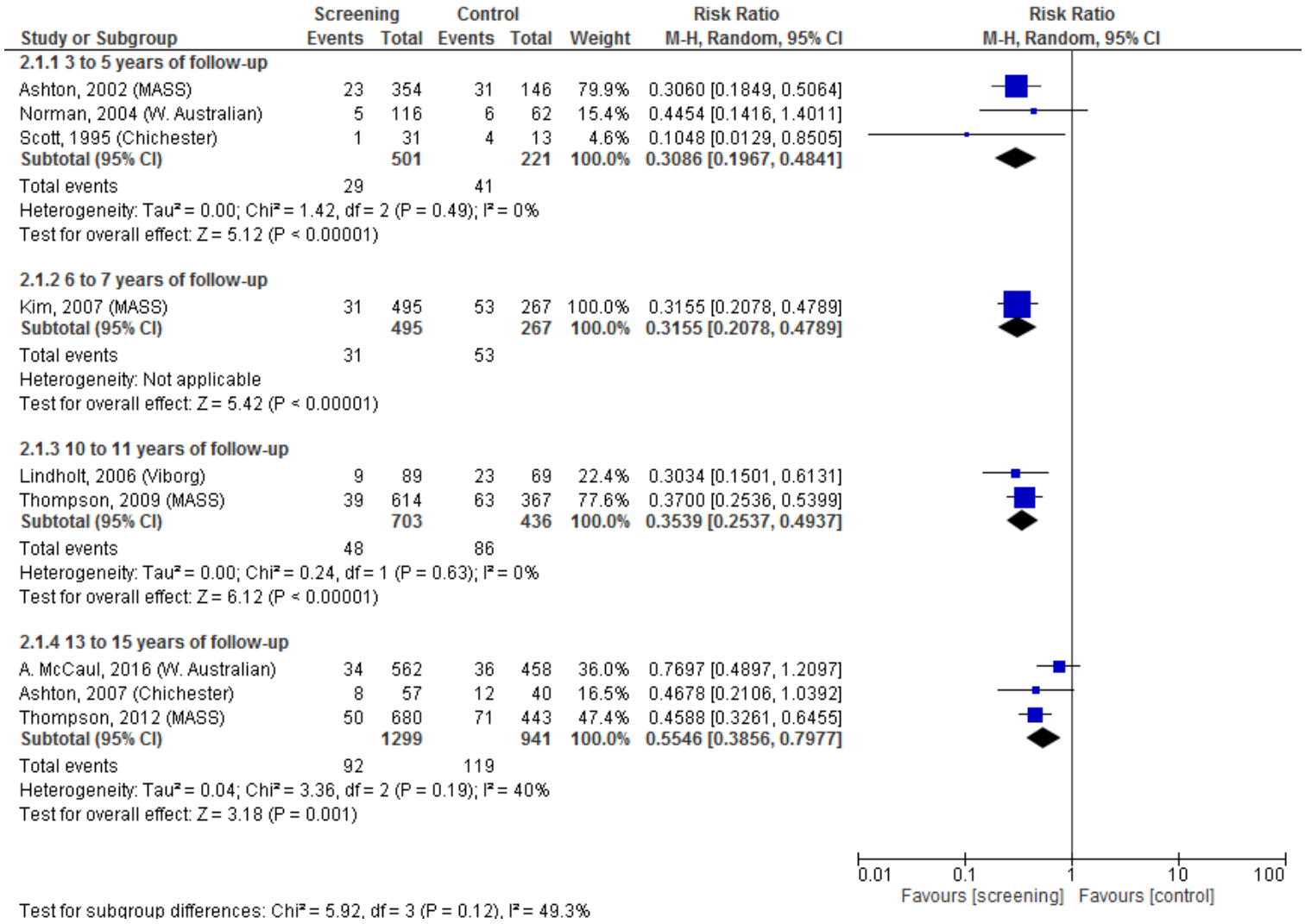
3[10,14,15]	randomised trials	serious[37]	no serious inconsistency[38]	no serious indirectness[39]	serious[40]	none[6]	44/1212 (3.6%)	32/720 (4.4%)	RR 0.7997 (0.5100 to 1.2540)	8,902 fewer (from 21,778 fewer to 11,289 more)	–	–	⊕⊕OO LOW	CRITICAL
30 day Mortality, Emergency AAA operations - By length of Follow-up - 3 to 5 years of follow-up (follow-up 3.6 to 5 years; assessed with: Objectively)														
3[3,5,6]	randomised trials	serious[42]	no serious inconsistency[43]	no serious indirectness[44]	serious[45]	none[6]	10/39 (25.6%)	29/70 (41.4%)	RR 0.6678 (0.3686 to 1.2098)	137,626 fewer (from 261,580 fewer to 86,917 more)	–	–	⊕⊕OO LOW	CRITICAL
30 day Mortality, Emergency AAA operations - By length of Follow-up - 6 to 7 years of follow-up (follow-up mean 7 years; assessed with: Objectively)														
1[7]	randomised trials	no serious risk of bias[47]	no serious inconsistency[9]	no serious indirectness[48]	serious[49]	none[6]	13/45 (28.9%)	41/111 (36.9%)	RR 0.7821 (0.4655 to 1.314)	80,486 fewer (from 197,428 fewer to 115,982 more)	–	–	⊕⊕⊕O MODERATE	CRITICAL
30 day Mortality, Emergency AAA operations - By length of Follow-up - 10 to 11 years of follow-up (follow-up mean 10 years; assessed with: Objectively)														
2[9,10]	randomised trials	serious[51]	no serious inconsistency[52]	no serious indirectness[53]	serious[54]	none[6]	24/75 (32%)	72/181 (39.8%)	RR 0.8252 (0.5705 to 1.1938)	69,534 fewer (from 170,851 fewer to 77,092 more)	–	–	⊕⊕OO LOW	CRITICAL
30 day Mortality, Emergency AAA operations - By length of Follow-up - 13 to 15 years of follow-up (follow-up 12.8 to 15 years; assessed with: Objectively) **														
3[13-15]	randomised trials	serious[56]	no serious inconsistency[57]	no serious indirectness[58]	serious[59]	none[6]	51/122 (41.8%)	88/231 (38.1%)	RR 1.0878 (0.8288 to 1.4278)	33,448 more (from 65,219 fewer to 162,971 more)	–	–	⊕⊕OO LOW	CRITICAL
AAA operations - By length of Follow-up - 3 to 5 years of follow-up (follow-up 3.6 to 5 years; assessed with: Objectively)														
4[3-6]	randomised trials	serious[61]	no serious inconsistency[62]	no serious indirectness[63]	no serious imprecision[64]	none[6]	554/62,729 (0.88%)	252/62,847 (0.4%)	RR 2.1600 (1.8179 to 2.5663)	4,651 more (from 3,280 more to 6,280 more)	0.47%	215 (159 to 305)	⊕⊕⊕O MODERATE	CRITICAL
AAA operations - By length of Follow-up - 6 to 7 years of follow-up (follow-up mean 7 years; assessed with: Objectively)														
1[7]	randomised trials	no serious risk of bias[66]	no serious inconsistency[9]	no serious indirectness[67]	no serious imprecision[68]	none[6]	495/33,883 (1.5%)	267/33,887 (0.79%)	RR 1.8542 (1.5990 to 2.1500)	6,730 more (from 4,720 more to 9,061 more)	0.67%	149 (110 to 212)	⊕⊕⊕⊕ HIGH	CRITICAL
AAA operations - By length of Follow-up - 10 to 11 years of follow-up (follow-up mean 10 years; assessed with: Objectively)														
3[9-11]	randomised trials	serious[70]	no serious inconsistency[71]	no serious indirectness[72]	no serious imprecision[73]	none[6]	752/43,216 (1.7%)	469/43,251 (1.1%)	RR 1.5700 (1.3502 to 1.8255)	6,181 more (from 3,797 more to 8,951 more)	0.62%	162 (112 to 263)	⊕⊕⊕O MODERATE	CRITICAL
AAA operations - By length of Follow-up - 13 to 15 years of follow-up (follow-up 12.8 to 15 years; assessed with: Objectively) **														
4[12-15]	randomised trials	serious[75]	no serious inconsistency[76]	no serious indirectness[77]	no serious imprecision[78]	none[6]	1408/62460 (2.3%)	1029/62469 (1.6%)	RR 1.3549 (1.1696 to 1.5695)	5,846 more (from 2,794 more to 9,381 more)	0.58%	171 (107 to 358)	⊕⊕⊕O MODERATE	CRITICAL

Elective operations - By length of Follow-up - 3 to 5 years of follow-up (follow-up 3.6 to 5 years; assessed with: Objectively)													
4[3-6]	randomised trials	serious[80]	no serious inconsistency[81]	no serious indirectness[82]	no serious imprecision[83]	none[6]	505/62,729 (0.81%)	162/62,847 (0.26%)	RR 3.2535 (2.1341 to 4.9603)	5,809 more (from 2,923 more to 10,208 more)	0.58%	172 (98 to 342)	⊕⊕⊕O MODERATE	CRITICAL
Elective operations - By length of Follow-up - 6 to 7 years of follow-up (follow-up mean 7 years; assessed with: Objectively)													
1[7]	randomised trials	no serious risk of bias[85]	no serious inconsistency[9]	no serious indirectness[86]	no serious imprecision[87]	none[6]	450/33,883 (1.3%)	156/33,887 (0.46%)	RR 2.8850 (2.4062 to 3.4590)	8,678 more (from 6,473 more to 11,320 more)	0.87%	115 (88 to 154)	⊕⊕⊕⊕ HIGH	CRITICAL
Elective operations - By length of Follow-up - 10 to 11 years of follow-up (follow-up mean 10 years; assessed with: Objectively)													
3[9-11]	randomised trials	serious[89]	no serious inconsistency[90]	no serious indirectness[91]	no serious imprecision[92]	none[6]	664/43,216 (1.5%)	272/43,251 (0.63%)	RR 2.4422 (2.1221 to 2.8106)	9,070 more (from 7,057 more to 11,387 more)	0.91%	110 (88 to 142)	⊕⊕⊕O MODERATE	CRITICAL
Elective operations - By length of Follow-up - 13 to 15 years of follow-up (follow-up 12.8 to 15 years; assessed with: Objectively) **													
4[12-15]	randomised trials	serious[94]	no serious inconsistency[95]	no serious indirectness[96]	no serious imprecision[97]	none[6]	1266/62460 (2%)	754/62469 (1.2%)	RR 1.8314 (1.2946 to 2.5909)	10,035 more (from 3,556 more to 19,202 more)	1.00%	100 (52 to 281)	⊕⊕⊕O MODERATE	CRITICAL
Emergency operations - By length of Follow-up - 3 to 5 years of follow-up (follow-up 3.6 to 5 years; assessed with: Objectively)													
4[3-6]	randomised trials	serious[99]	no serious inconsistency[100]	no serious indirectness[101]	no serious imprecision[102]	none[6]	44/62,729 (0.07%)	90/62,847 (0.14%)	RR 0.4971 (0.2875 to 0.8595)	720 fewer (from 201 fewer to 1,020 fewer)	–	–	⊕⊕⊕O MODERATE	CRITICAL
Emergency operations - By length of Follow-up - 6 to 7 years of follow-up (follow-up mean 7 years; assessed with: Objectively)													
1[7]	randomised trials	no serious risk of bias[104]	no serious inconsistency[9]	no serious indirectness[105]	no serious imprecision[106]	none[6]	45/33,883 (0.13%)	111/33,887 (0.33%)	RR 0.4055 (0.2869 to 0.5731)	1,947 fewer (from 1,398 fewer to 2,336 fewer)	–	–	⊕⊕⊕⊕ HIGH	CRITICAL
Emergency operations - By length of Follow-up - 10 to 11 years of follow-up (follow-up mean 10 years; assessed with: Objectively)													
3[9-11]	randomised trials	serious[107]	no serious inconsistency[108]	no serious indirectness[109]	no serious imprecision[110]	none[6]	81/43,216 (0.19%)	194/43,251 (0.45%)	RR 0.4192 (0.3234 to 0.5433)	2,605 fewer (from 2,049 fewer to 3,035 fewer)	–	–	⊕⊕⊕O MODERATE	CRITICAL
Emergency operations - By length of Follow-up – 13 to 15 years of follow-up (follow-up 12.8 to 15 years; assessed with: Objectively) **													
4[12-15]	randomised trials	serious[112]	no serious inconsistency[113]	no serious indirectness[114]	no serious imprecision[115]	none[6]	142/62460 (0.23%)	275/62469 (0.44%)	RR 0.5183 (0.4232 to 0.6348)	2,121 fewer (from 1,608 fewer to 2,539 fewer)	–	–	⊕⊕⊕O MODERATE	CRITICAL

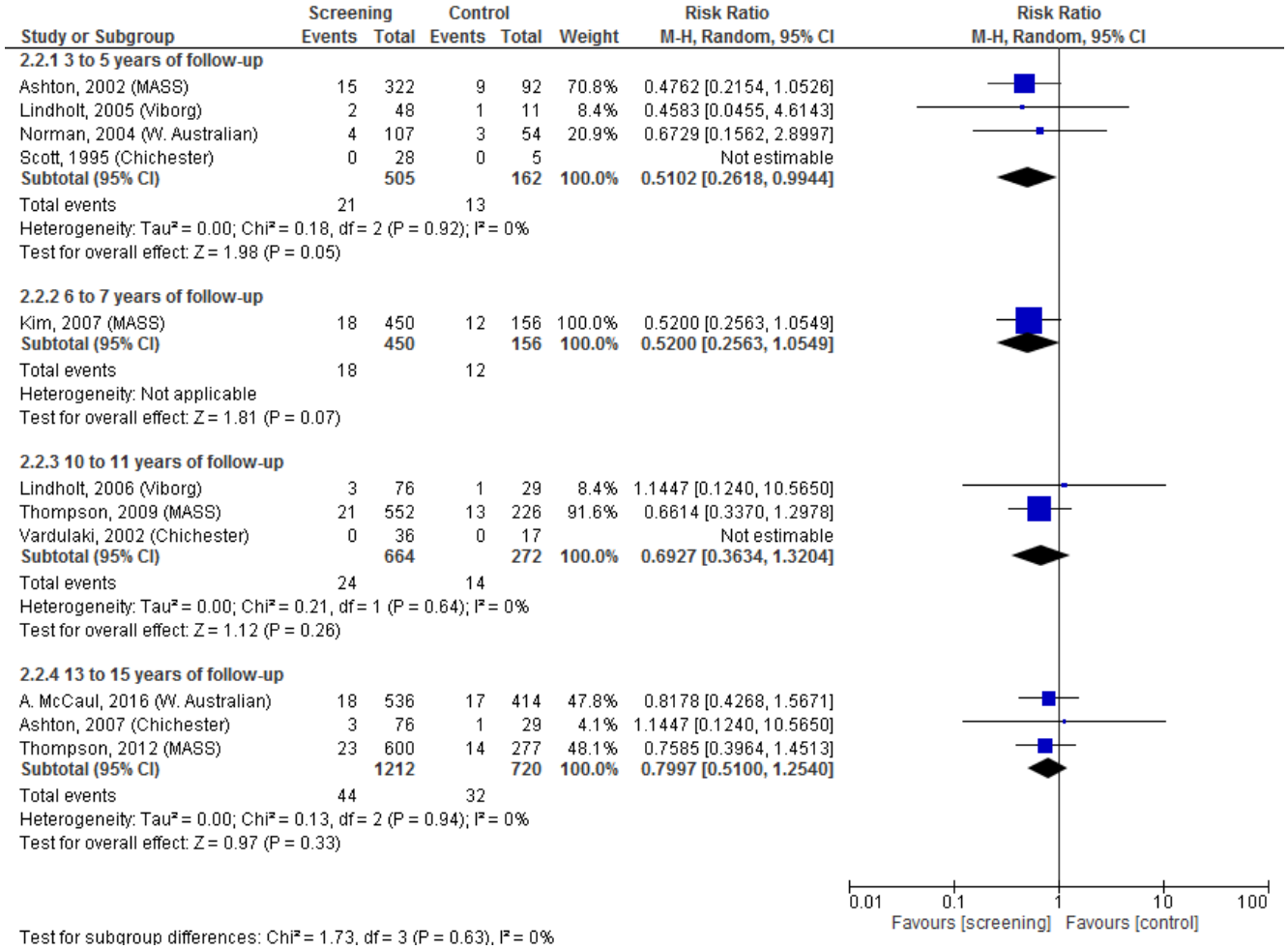
NOTE: NNH were calculated from Absolute numbers presented in GRADE tables. The GRADE tables estimate the absolute numbers per million using control group event rate and risk ratio with 95 % CI obtained from meta-analysis. NS = non-significant. The NNH were not calculated for 30-day mortality AAA operations, 30 day Mortality Elective AAA operations, 30 day Mortality Emergency AAA operations, emergency operations and emergent repairs for ruptures because either the effect was non-significant or showed a risk reduction in screening arm as compared to control arm.

** Updated results based on the recently published Western Australia trial

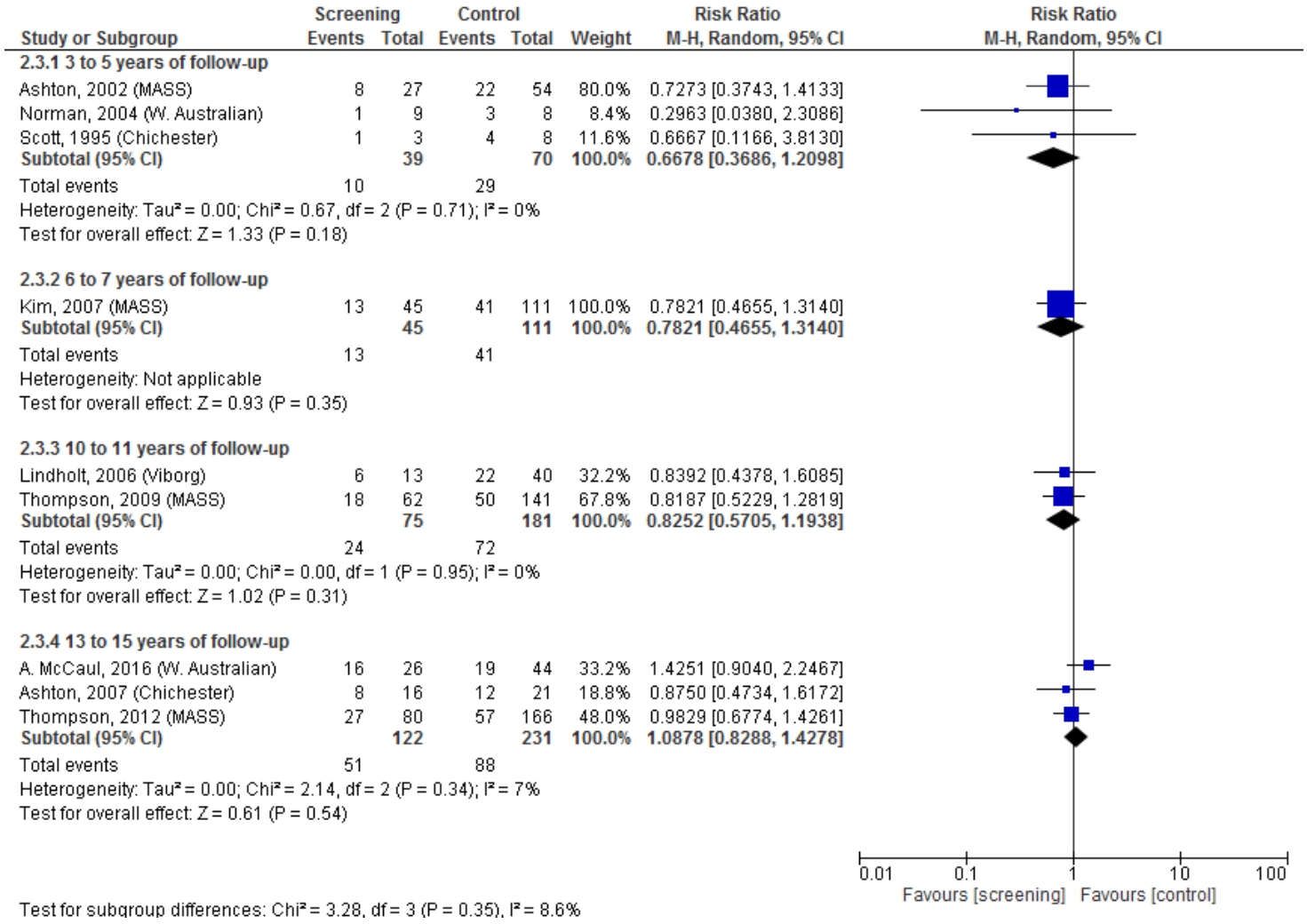
ES Forest Plot 2.1: Harms of one-time AAA screening: 30 day Mortality, AAA operations – By length of follow-up



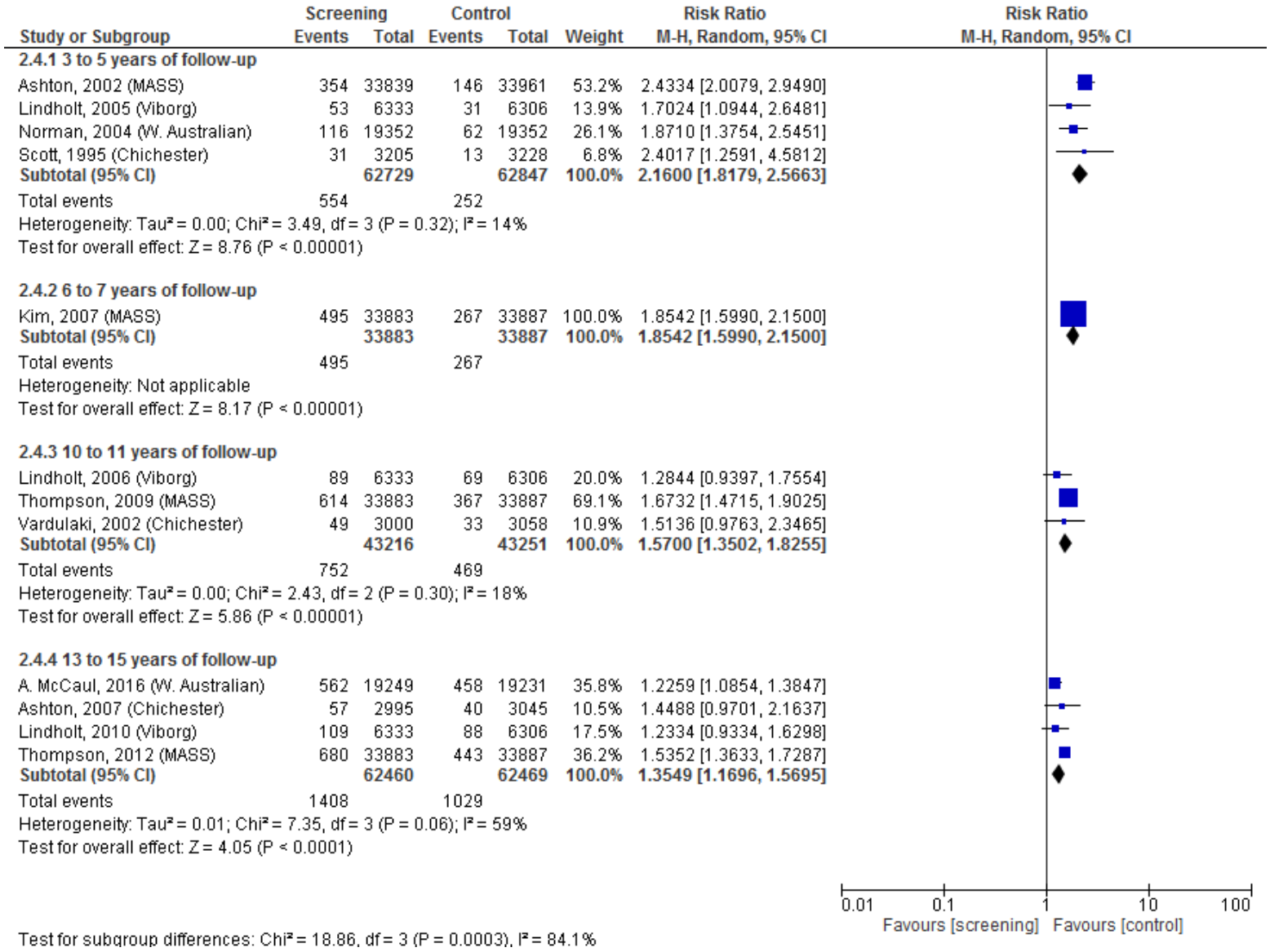
ES Forest Plot 2.2: Harms of one-time AAA screening: 30 day Mortality, elective AAA operations – By length of follow-up



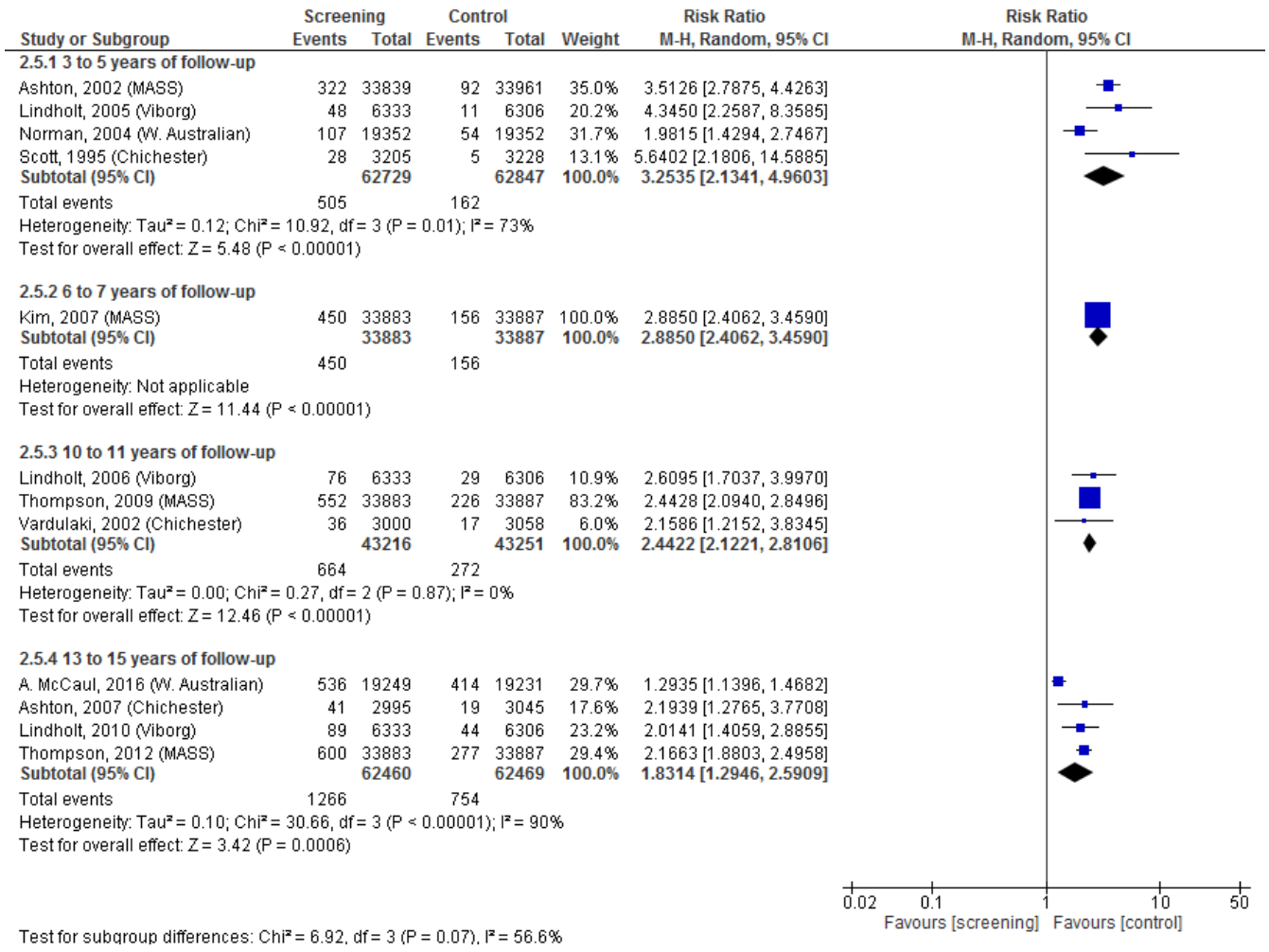
ES Forest Plot 2.3: Harms of one-time AAA screening: 30 day Mortality, emergency AAA operations – By length of follow-up



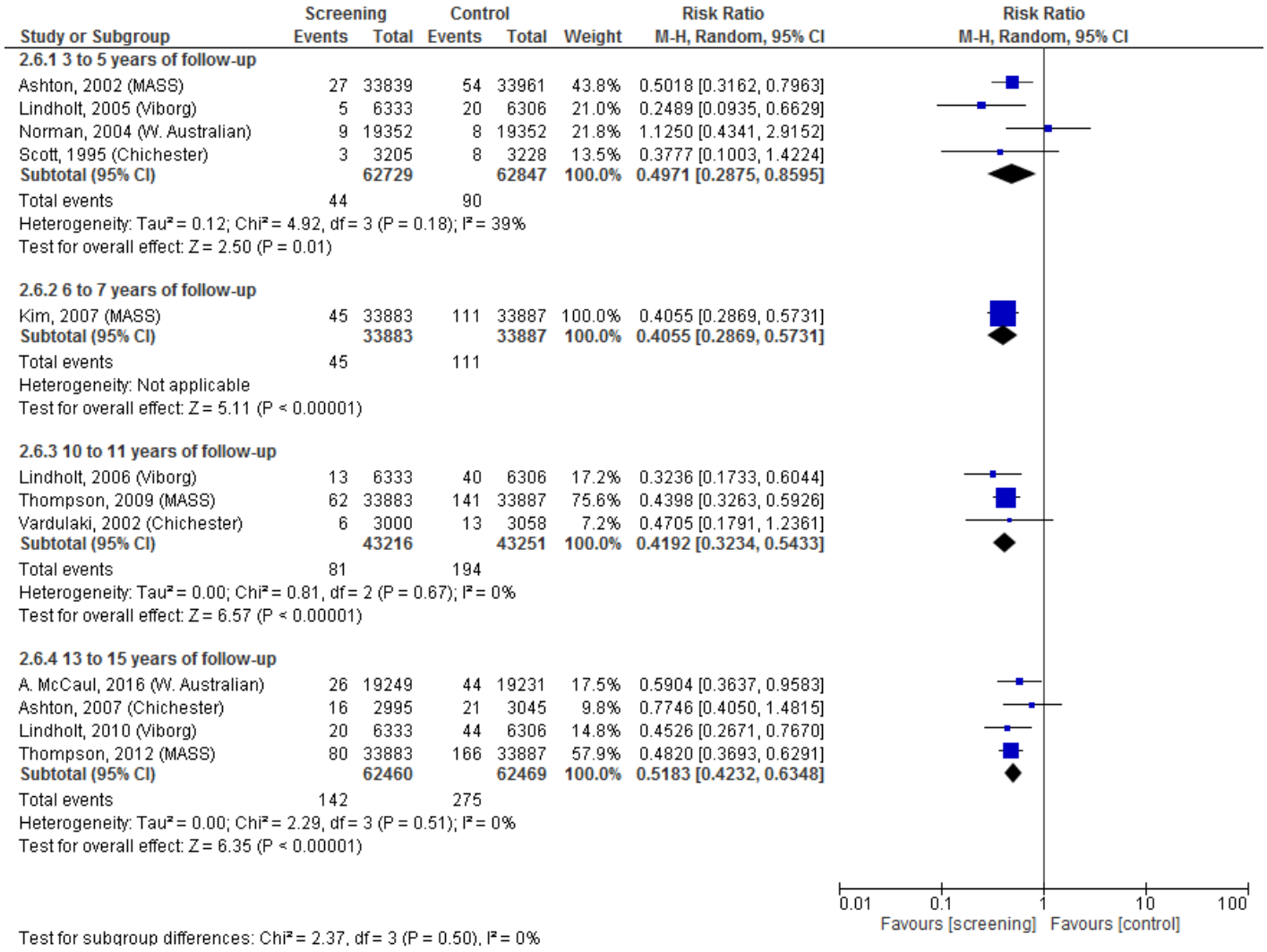
ES Forest Plot 2.4: Harms of one-time AAA screening: AAA operations – By length of follow-up



ES Forest Plot 2.5: Harms of one-time AAA screening: elective AAA operations – By length of follow-up



ES Forest Plot 2.6: Harms of one-time AAA screening: emergency AAA operations – By length of follow-up



References

1. Fitzpatrick-Lewis D, Warren R, Ali MU, et al. Screening for abdominal aortic aneurysm: Systematic review and meta-analysis. http://canadiantaskforce.ca/guidelines/published-guidelines/abdominal-aortic-aneurysm/. Updated 2017.

2. Ali MU, Fitzpatrick-Lewis D, Raina P, Warren R, Kenny M, Raina P. Screening for abdominal aortic aneurysm: Updated GRADE tables. http://canadiantaskforce.ca/guidelines/published-guidelines/abdominal-aortic-aneurysm/. Updated 2017.

3. McCaul KA, Lawrence-Brown M, Dickinson JA,Norman PA. Long-term outcomes of theWestern australian trial of screening for abdominal aortic aneurysms secondary analysis of a randomized clinical trial. *JAMA Intern Med*. 2016;176(12):1761-1767.

4. Ashton H, Buxton M, Day N, Kim LG, Marteau TM, Scott RA,et al. The multicentre aneurysm screening study (MASS) into the effect of abdominal aortic aneurysm screening on mortality in men: A randomised controlled trial. *Lancet*. 2002;360(9345):1531-1539.

5. Lindholt JS, Juul S, Fasting H,Henneberg EW. Screening for abdominal aortic aneurysms: Single centre randomised controlled trial. *BMJ*. 2005;330(7494):750.

6. Norman PE, Jamrozik K, Lawrence-Brown MM, Le MT, Spencer CA, Tuohy RJ, Parsons RW,Dickinson JA. Population based randomised controlled trial on impact of screening on mortality from abdominal aortic aneurysm. *BMJ*. 2004;329(7477):1259.

7. Scott RAP, Wilson NM, Ashton HA,Kay DN. Influence of screening on the incidence of ruptured abdominal aortic aneurysm: 5-year results of a randomized controlled study. *Br J Surg*. 1995;82(8):1066-1070.

8. Kim LG, Scott P, Alan, R, Ashton HA,Thompson SG. A sustained mortality benefit from screening for abdominal aortic aneurysm. *Annals of Internal Medicine*. 2007;146(10):699-706.

9. Lindholt JS, Juul S,Henneberg EW. High-risk and low-risk screening for abdominal aortic aneurysm both reduce aneurysm-related mortality. A stratified analysis from a single-centre randomised screening trial. *Eur J Vascular Surg*. 2007;34(1):53-58.

10. Lindholt JS, Juul S, Fasting H,Henneberg EW. Preliminary ten year results from a randomised single centre mass screening trial for abdominal aortic aneurysm. *Eur J Vascular Surg*. 2006;32(6):608-614.

11. Thompson SG, Ashton HA, Gao L, Scott RAP,on behalf of the Multicentre Aneurysm Screening Study (MASS) Group. Screening men for abdominal aortic aneurysm: 10 year mortality and cost effectiveness results from the randomised multicentre aneurysm screening study. *BMJ*. 2009;338:2307.

12. Vardulaki KA, Walker NM, Couto E, Day NE, Thompson SG, Ashton HA,Scott RA. Late results concerning feasibility and compliance from a randomized trial of ultrasonographic screening for abdominal aortic aneurysm. *Br J Surg*. 2002;89(7):861-864.

13. Lindholt JS, Sørensen J, Søgaard R,Henneberg EW. Long-term benefit and cost-effectiveness analysis of screening for abdominal aortic aneurysms from a randomized controlled trial. *Br J Surg*. 2010;97(6):826-834.

14. Thompson SG, Ashton HA, Gao L, Buxton MJ, Scott RAP,on behalf of the Multicentre Aneurysm Screening Study (MASS) Group. Final follow-up of the multicentre aneurysm screening study (MASS) randomized trial of abdominal aortic aneurysm screening. *Br J Surg*. 2012;99(12):1649-1656.

15. Ashton HA, Gao L, Kim LG, Druce PS, Thompson SG,Scott RAP. Fifteen-year follow-up of a randomized clinical trial of ultrasonographic screening for abdominal aortic aneurysms. *Br J Surg*. 2007;94(6):696-701.

16. Lindholt JS, Juul S, Fasting H,Henneberg EW. Hospital costs and benefits of screening for abdominal aortic aneurysms. results from a randomised population screening trial. *Eur J Vascular Surg*. 2002;23(1):55-60.