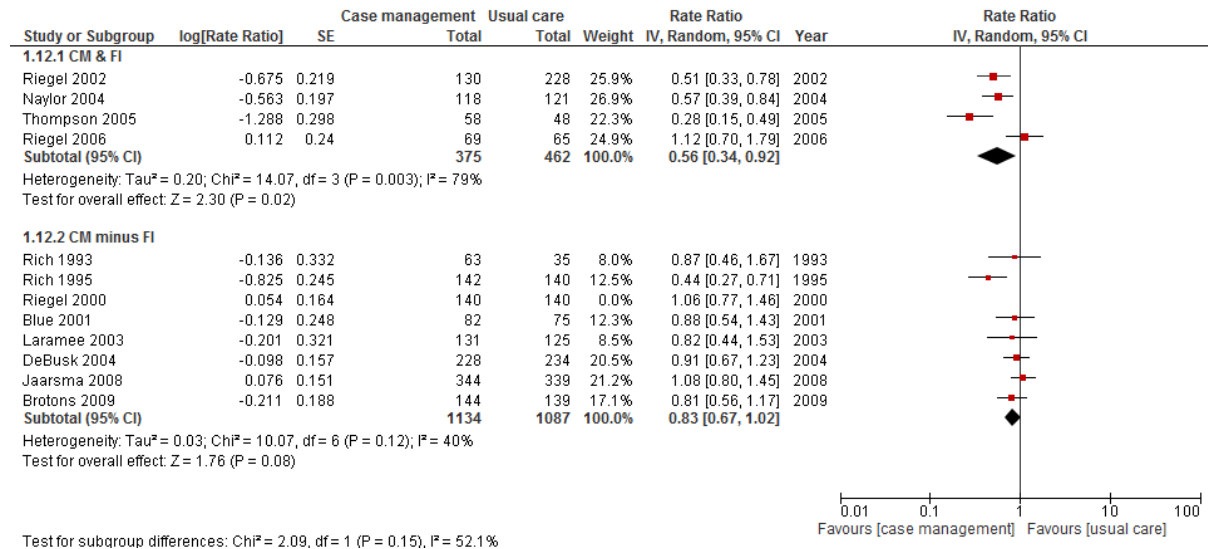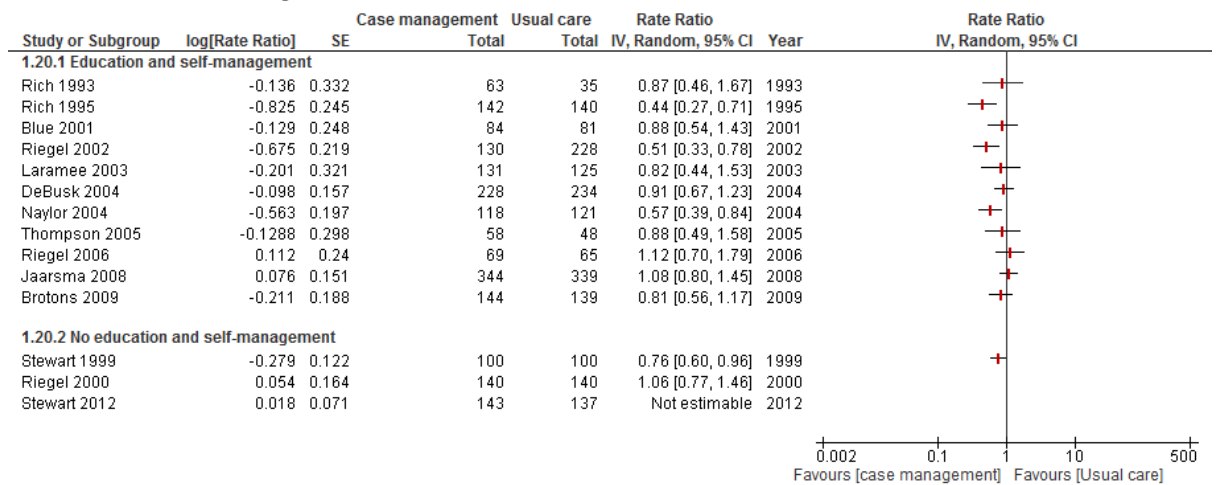# Appendix 2: Subgroup-analysis of unplanned readmission data by intervention component- hospital initiated studies

a) Family involvement

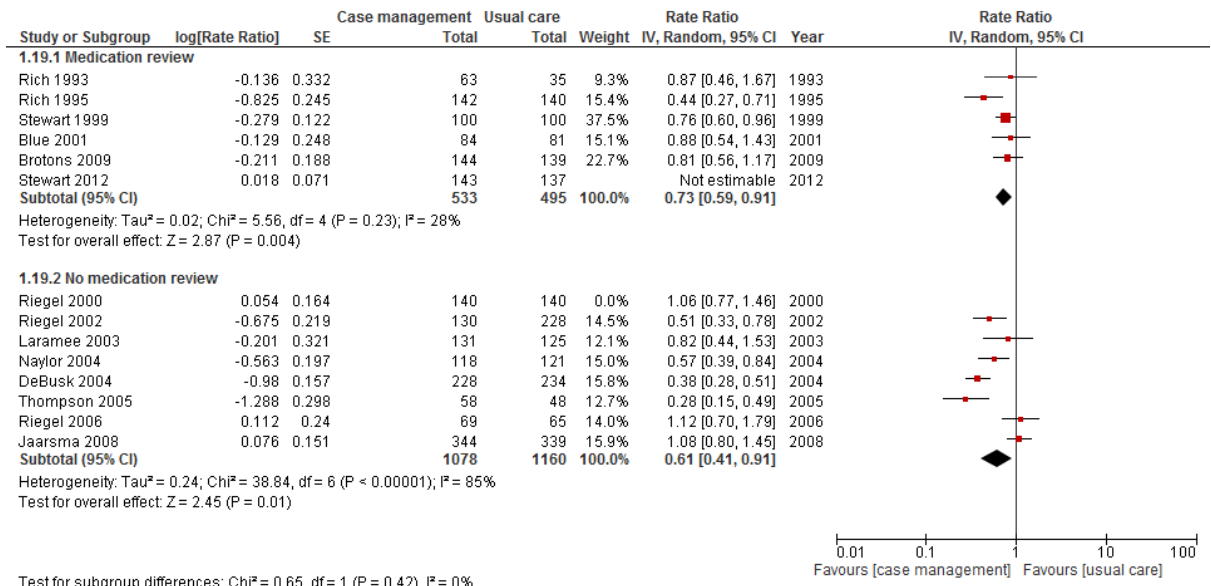| Study or Subgroup	log[Rate Ratio]	SE	Case management Total	Usual care Total	Weight	Rate Ratio IV, Random, 95% CI	Year	Rate Ratio IV, Random, 95% CI
1.12.1 CM & FI								
Riegel 2002	-0.675	0.219	130	228	25.9%	0.51 [0.33, 0.78]	2002	
Naylor 2004	-0.563	0.197	118	121	26.9%	0.57 [0.39, 0.84]	2004	
Thompson 2005	-1.288	0.298	58	48	22.3%	0.28 [0.15, 0.49]	2005	
Riegel 2006	0.112	0.24	69	65	24.9%	1.12 [0.70, 1.79]	2006	
Subtotal (95% CI)			375	462	100.0%	0.56 [0.34, 0.92]		
Heterogeneity: Tau² = 0.20; Chi² = 14.07, df = 3 (P = 0.003); I² = 79%								
Test for overall effect: Z = 2.30 (P = 0.02)								
1.12.2 CM minus FI								
Rich 1993	-0.136	0.332	63	35	8.0%	0.87 [0.46, 1.67]	1993	
Rich 1995	-0.825	0.245	142	140	12.5%	0.44 [0.27, 0.71]	1995	
Riegel 2000	0.054	0.164	140	140	0.0%	1.06 [0.77, 1.46]	2000	
Blue 2001	-0.129	0.248	82	75	12.3%	0.88 [0.54, 1.43]	2001	
Laramee 2003	-0.201	0.321	131	125	8.5%	0.82 [0.44, 1.53]	2003	
DeBusk 2004	-0.098	0.157	228	234	20.5%	0.91 [0.67, 1.23]	2004	
Jaarsma 2008	0.076	0.151	344	339	21.2%	1.08 [0.80, 1.45]	2008	
Brotons 2009	-0.211	0.188	144	139	17.1%	0.81 [0.56, 1.17]	2009	
Subtotal (95% CI)			1134	1087	100.0%	0.83 [0.67, 1.02]		
Heterogeneity: Tau² = 0.03; Chi² = 10.07, df = 6 (P = 0.12); I² = 40%								
Test for overall effect: Z = 1.76 (P = 0.08)								

```
          0.01      0.1       1       10      100
     Favours [case management]  Favours [usual care]
```

Test for subgroup differences: Chi² = 2.09, df = 1 (P = 0.15), I² = 52.1%

Sensitivity analysis (removing Riegel 2002) Test for subgroup differences Chi² 0.98 df=1 (p=0.32) I²-0%

b) education & self-management

Study or Subgroup	log[Rate Ratio]	SE	Case management Total	Usual care Total	Rate Ratio IV, Random, 95% CI	Year	Rate Ratio IV, Random, 95% CI
1.20.1 Education and self-management							
Rich 1993	-0.136	0.332	63	35	0.87 [0.46, 1.67]	1993	
Rich 1995	-0.825	0.245	142	140	0.44 [0.27, 0.71]	1995	
Blue 2001	-0.129	0.248	84	81	0.88 [0.54, 1.43]	2001	
Riegel 2002	-0.675	0.219	130	228	0.51 [0.33, 0.78]	2002	
Laramee 2003	-0.201	0.321	131	125	0.82 [0.44, 1.53]	2003	
DeBusk 2004	-0.098	0.157	228	234	0.91 [0.67, 1.23]	2004	
Naylor 2004	-0.563	0.197	118	121	0.57 [0.39, 0.84]	2004	
Thompson 2005	-0.1288	0.298	58	48	0.88 [0.49, 1.58]	2005	
Riegel 2006	0.112	0.24	69	65	1.12 [0.70, 1.79]	2006	
Jaarsma 2008	0.076	0.151	344	339	1.08 [0.80, 1.45]	2008	
Brotons 2009	-0.211	0.188	144	139	0.81 [0.56, 1.17]	2009	
1.20.2 No education and self-management							
Stewart 1999	-0.279	0.122	100	100	0.76 [0.60, 0.96]	1999	
Riegel 2000	0.054	0.164	140	140	1.06 [0.77, 1.46]	2000	
Stewart 2012	0.018	0.071	143	137	Not estimable	2012	

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          0.002      0.1       1       10      500
     Favours [case management]  Favours [Usual care]
```
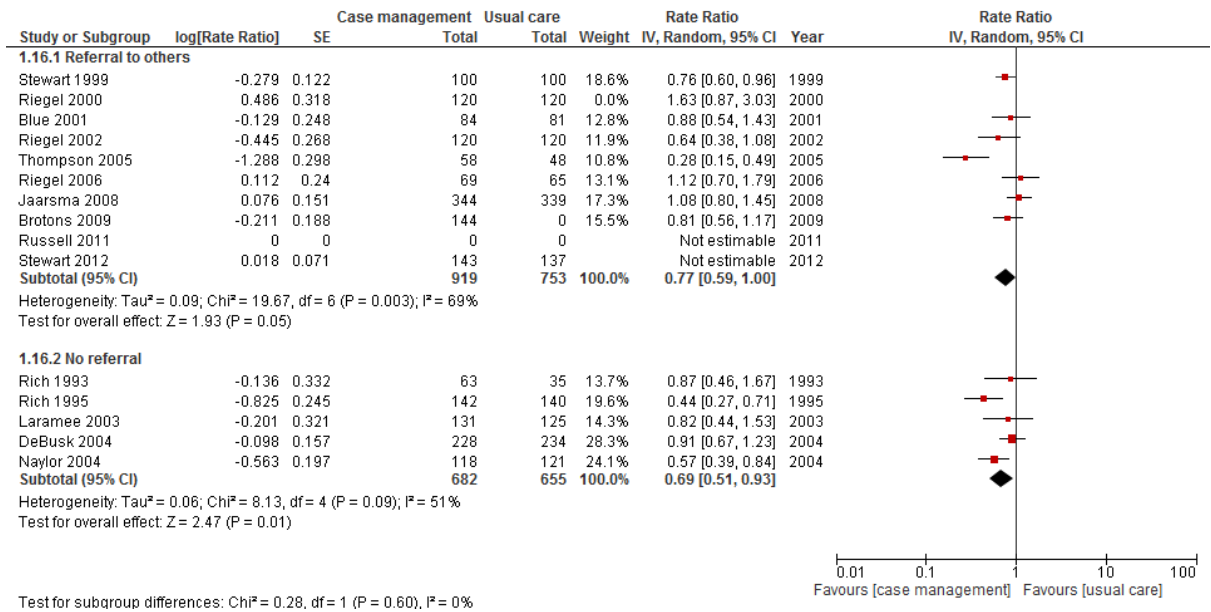
There were inadequate data in the no education/self-management group to perform a comparison.

c) medication review

Study or Subgroup	log[Rate Ratio]	SE	Case management Total	Usual care Total	Weight	Rate Ratio IV, Random, 95% CI	Year	Rate Ratio IV, Random, 95% CI
1.19.1 Medication review								
Rich 1993	-0.136	0.332	63	35	9.3%	0.87 [0.46, 1.67]	1993	
Rich 1995	-0.825	0.245	142	140	15.4%	0.44 [0.27, 0.71]	1995	
Stewart 1999	-0.279	0.122	100	100	37.5%	0.76 [0.60, 0.96]	1999	
Blue 2001	-0.129	0.248	84	81	15.1%	0.88 [0.54, 1.43]	2001	
Brotons 2009	-0.211	0.188	144	139	22.7%	0.81 [0.56, 1.17]	2009	
Stewart 2012	0.018	0.071	143	137		Not estimable	2012	
Subtotal (95% CI)			533	495	100.0%	0.73 [0.59, 0.91]		
Heterogeneity: Tau² = 0.02; Chi² = 5.56, df = 4 (P = 0.23); I² = 28%								
Test for overall effect: Z = 2.87 (P = 0.004)								
1.19.2 No medication review								
Riegel 2000	0.054	0.164	140	140	0.0%	1.06 [0.77, 1.46]	2000	
Riegel 2002	-0.675	0.219	130	228	14.5%	0.51 [0.33, 0.78]	2002	
Laramee 2003	-0.201	0.321	131	125	12.1%	0.82 [0.44, 1.53]	2003	
Naylor 2004	-0.563	0.197	118	121	15.0%	0.57 [0.39, 0.84]	2004	
DeBusk 2004	-0.98	0.157	228	234	15.8%	0.38 [0.28, 0.51]	2004	
Thompson 2005	-1.288	0.298	58	48	12.7%	0.28 [0.15, 0.49]	2005	
Riegel 2006	0.112	0.24	69	65	14.0%	1.12 [0.70, 1.79]	2006	
Jaarsma 2008	0.076	0.151	344	339	15.9%	1.08 [0.80, 1.45]	2008	
Subtotal (95% CI)			1078	1160	100.0%	0.61 [0.41, 0.91]		
Heterogeneity: Tau² = 0.24; Chi² = 38.84, df = 6 (P < 0.00001); I² = 85%								
Test for overall effect: Z = 2.45 (P = 0.01)								

0.01   0.1   1   10   100
Favours [case management]   Favours [usual care]

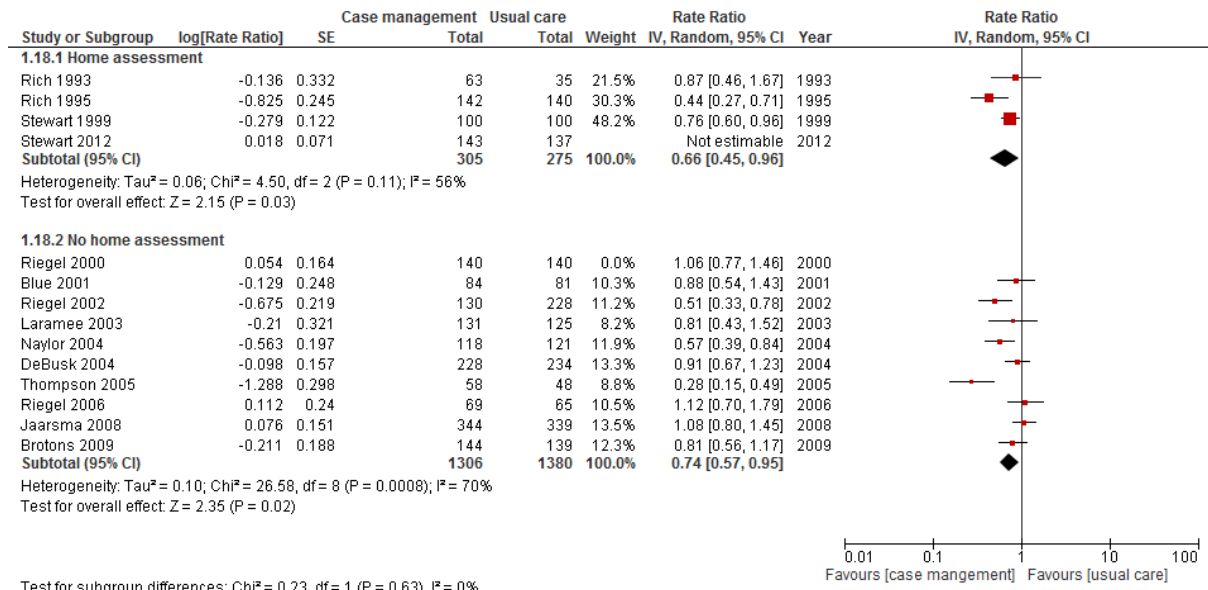Test for subgroup differences: Chi² = 0.65, df = 1 (P = 0.42), I² = 0%

Sensitivity analysis (removing Riegel 2002) Test for subgroup differences Chi^2 0.36 df=1 (p=0.55) I^2-0%

d) Referral to other services

Study or Subgroup	log[Rate Ratio]	SE	Case management Total	Usual care Total	Weight	Rate Ratio IV, Random, 95% CI	Year	Rate Ratio IV, Random, 95% CI
1.16.1 Referral to others								
Stewart 1999	-0.279	0.122	100	100	18.6%	0.76 [0.60, 0.96]	1999	
Riegel 2000	0.486	0.318	120	120	0.0%	1.63 [0.87, 3.03]	2000	
Blue 2001	-0.129	0.248	84	81	12.8%	0.88 [0.54, 1.43]	2001	
Riegel 2002	-0.445	0.268	120	120	11.9%	0.64 [0.38, 1.08]	2002	
Thompson 2005	-1.288	0.298	58	48	10.8%	0.28 [0.15, 0.49]	2005	
Riegel 2006	0.112	0.24	69	65	13.1%	1.12 [0.70, 1.79]	2006	
Jaarsma 2008	0.076	0.151	344	339	17.3%	1.08 [0.80, 1.45]	2008	
Brotons 2009	-0.211	0.188	144	0	15.5%	0.81 [0.56, 1.17]	2009	
Russell 2011	0	0	0	0		Not estimable	2011	
Stewart 2012	0.018	0.071	143	137		Not estimable	2012	
Subtotal (95% CI)			919	753	100.0%	0.77 [0.59, 1.00]		
Heterogeneity: Tau² = 0.09; Chi² = 19.67, df = 6 (P = 0.003); I² = 69%								
Test for overall effect: Z = 1.93 (P = 0.05)								
1.16.2 No referral								
Rich 1993	-0.136	0.332	63	35	13.7%	0.87 [0.46, 1.67]	1993	
Rich 1995	-0.825	0.245	142	140	19.6%	0.44 [0.27, 0.71]	1995	
Laramee 2003	-0.201	0.321	131	125	14.3%	0.82 [0.44, 1.53]	2003	
DeBusk 2004	-0.098	0.157	228	234	28.3%	0.91 [0.67, 1.23]	2004	
Naylor 2004	-0.563	0.197	118	121	24.1%	0.57 [0.39, 0.84]	2004	
Subtotal (95% CI)			682	655	100.0%	0.69 [0.51, 0.93]		
Heterogeneity: Tau² = 0.06; Chi² = 8.13, df = 4 (P = 0.09); I² = 51%								
Test for overall effect: Z = 2.47 (P = 0.01)								

0.01   0.1   1   10   100
Favours [case management]   Favours [usual care]

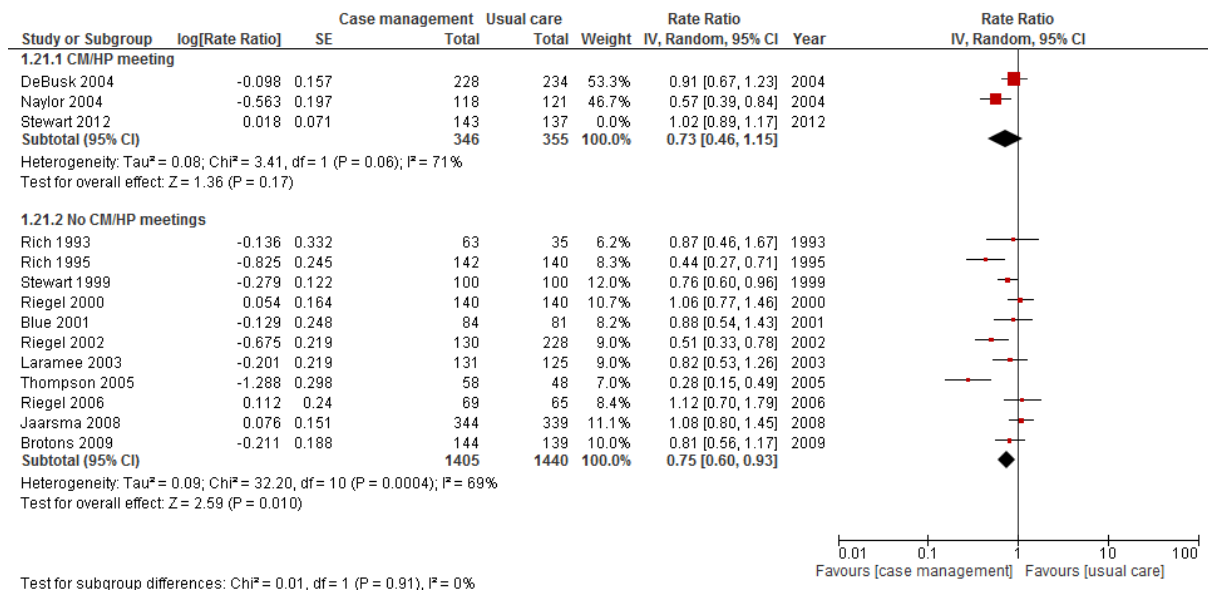Test for subgroup differences: Chi² = 0.28, df = 1 (P = 0.60), I² = 0%

Sensitivity analysis (removing Riegel 2002) Test for subgroup differences Chi^2 0.36 df=1 (p=0.55) I^2=0%

e) Assessment of home environment

Study or Subgroup	log[Rate Ratio]	SE	Case management Total	Usual care Total	Weight	Rate Ratio IV, Random, 95% CI	Year	Rate Ratio IV, Random, 95% CI
1.18.1 Home assessment								
Rich 1993	-0.136	0.332	63	35	21.5%	0.87 [0.46, 1.67]	1993	
Rich 1995	-0.825	0.245	142	140	30.3%	0.44 [0.27, 0.71]	1995	
Stewart 1999	-0.279	0.122	100	100	48.2%	0.76 [0.60, 0.96]	1999	
Stewart 2012	0.018	0.071	143	137		Not estimable	2012	
Subtotal (95% CI)			**305**	**275**	**100.0%**	**0.66 [0.45, 0.96]**		
Heterogeneity: Tau² = 0.06; Chi² = 4.50, df = 2 (P = 0.11); I² = 56%								
Test for overall effect: Z = 2.15 (P = 0.03)								
1.18.2 No home assessment								
Riegel 2000	0.054	0.164	140	140	0.0%	1.06 [0.77, 1.46]	2000	
Blue 2001	-0.129	0.248	84	81	10.3%	0.88 [0.54, 1.43]	2001	
Riegel 2002	-0.675	0.219	130	228	11.2%	0.51 [0.33, 0.78]	2002	
Laramee 2003	-0.21	0.321	131	125	8.2%	0.81 [0.43, 1.52]	2003	
Naylor 2004	-0.563	0.197	118	121	11.9%	0.57 [0.39, 0.84]	2004	
DeBusk 2004	-0.098	0.157	228	234	13.3%	0.91 [0.67, 1.23]	2004	
Thompson 2005	-1.288	0.298	58	48	8.8%	0.28 [0.15, 0.49]	2005	
Riegel 2006	0.112	0.24	69	65	10.5%	1.12 [0.70, 1.79]	2006	
Jaarsma 2008	0.076	0.151	344	339	13.5%	1.08 [0.80, 1.45]	2008	
Brotons 2009	-0.211	0.188	144	139	12.3%	0.81 [0.56, 1.17]	2009	
Subtotal (95% CI)			**1306**	**1380**	**100.0%**	**0.74 [0.57, 0.95]**		
Heterogeneity: Tau² = 0.10; Chi² = 26.58, df = 8 (P = 0.0008); I² = 70%								
Test for overall effect: Z = 2.35 (P = 0.02)								

0.01 0.1 1 10 100
Favours [case management]   Favours [usual care]

Test for subgroup differences: Chi² = 0.23, df = 1 (P = 0.63), I² = 0%
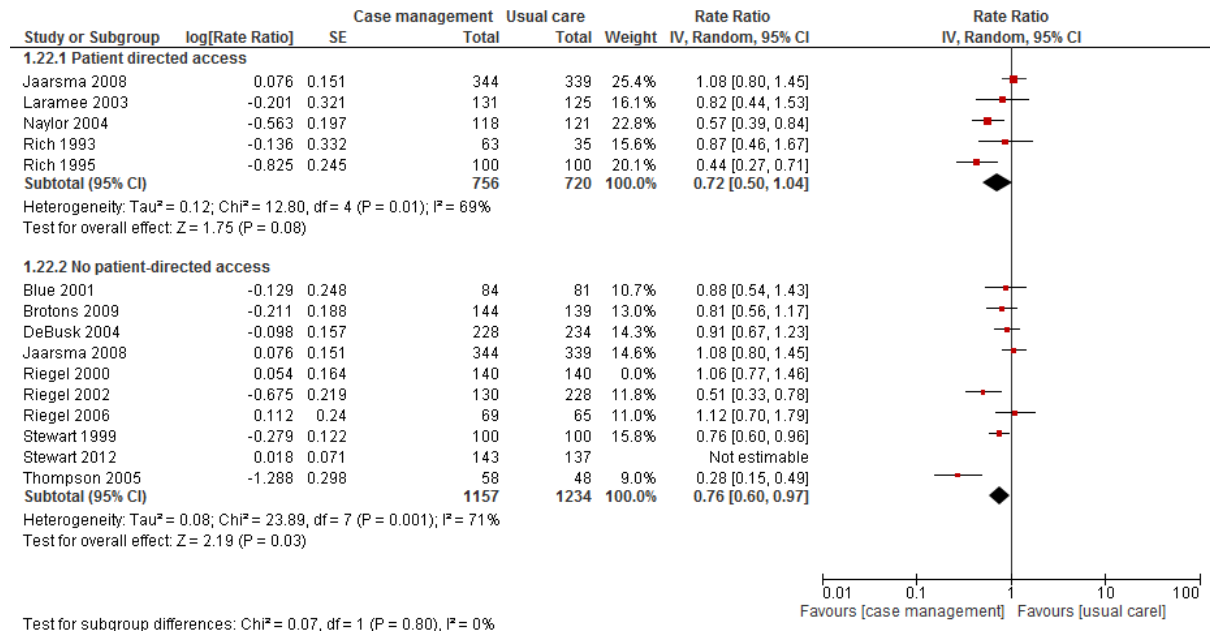
Sensitivity analysis (removing Riegel 2002) Test for subgroup differences Chi² 0.46 df=1 (p=0.50) I² =0%

f) Case management/health professional meetings

Study or Subgroup	log[Rate Ratio]	SE	Case management Total	Usual care Total	Weight	Rate Ratio IV, Random, 95% CI	Year	Rate Ratio IV, Random, 95% CI
1.21.1 CM/HP meeting								
DeBusk 2004	-0.098	0.157	228	234	53.3%	0.91 [0.67, 1.23]	2004	
Naylor 2004	-0.563	0.197	118	121	46.7%	0.57 [0.39, 0.84]	2004	
Stewart 2012	0.018	0.071	143	137	0.0%	1.02 [0.89, 1.17]	2012	
Subtotal (95% CI)			**346**	**355**	**100.0%**	**0.73 [0.46, 1.15]**		
Heterogeneity: Tau² = 0.08; Chi² = 3.41, df = 1 (P = 0.06); I² = 71%								
Test for overall effect: Z = 1.36 (P = 0.17)								
1.21.2 No CM/HP meetings								
Rich 1993	-0.136	0.332	63	35	6.2%	0.87 [0.46, 1.67]	1993	
Rich 1995	-0.825	0.245	142	140	8.3%	0.44 [0.27, 0.71]	1995	
Stewart 1999	-0.279	0.122	100	100	12.0%	0.76 [0.60, 0.96]	1999	
Riegel 2000	0.054	0.164	140	140	10.7%	1.06 [0.77, 1.46]	2000	
Blue 2001	-0.129	0.248	84	81	8.2%	0.88 [0.54, 1.43]	2001	
Riegel 2002	-0.675	0.219	130	228	9.0%	0.51 [0.33, 0.78]	2002	
Laramee 2003	-0.201	0.219	131	125	9.0%	0.82 [0.53, 1.26]	2003	
Thompson 2005	-1.288	0.298	58	48	7.0%	0.28 [0.15, 0.49]	2005	
Riegel 2006	0.112	0.24	69	65	8.4%	1.12 [0.70, 1.79]	2006	
Jaarsma 2008	0.076	0.151	344	339	11.1%	1.08 [0.80, 1.45]	2008	
Brotons 2009	-0.211	0.188	144	139	10.0%	0.81 [0.56, 1.17]	2009	
Subtotal (95% CI)			**1405**	**1440**	**100.0%**	**0.75 [0.60, 0.93]**		
Heterogeneity: Tau² = 0.09; Chi² = 32.20, df = 10 (P = 0.0004); I² = 69%								
Test for overall effect: Z = 2.59 (P = 0.010)								

0.01 0.1 1 10 100
Favours [case management]   Favours [usual care]

Test for subgroup differences: Chi² = 0.01, df = 1 (P = 0.91), I² = 0%

Sensitivity analysis (removing Riegel 2002) Test for subgroup differences Chi² 0.07 df=1 (p=0.07) I² =0%

g) Patient-directed access

Study or Subgroup	log[Rate Ratio]	SE	Case management Total	Usual care Total	Weight	Rate Ratio IV, Random, 95% CI
1.22.1 Patient directed access						
Jaarsma 2008	0.076	0.151	344	339	25.4%	1.08 [0.80, 1.45]
Laramee 2003	-0.201	0.321	131	125	16.1%	0.82 [0.44, 1.53]
Naylor 2004	-0.563	0.197	118	121	22.8%	0.57 [0.39, 0.84]
Rich 1993	-0.136	0.332	63	35	15.6%	0.87 [0.46, 1.67]
Rich 1995	-0.825	0.245	100	100	20.1%	0.44 [0.27, 0.71]
Subtotal (95% CI)			**756**	**720**	**100.0%**	**0.72 [0.50, 1.04]**
Heterogeneity: Tau² = 0.12; Chi² = 12.80, df = 4 (P = 0.01); I² = 69%						
Test for overall effect: Z = 1.75 (P = 0.08)						
1.22.2 No patient-directed access						
Blue 2001	-0.129	0.248	84	81	10.7%	0.88 [0.54, 1.43]
Brotons 2009	-0.211	0.188	144	139	13.0%	0.81 [0.56, 1.17]
DeBusk 2004	-0.098	0.157	228	234	14.3%	0.91 [0.67, 1.23]
Jaarsma 2008	0.076	0.151	344	339	14.6%	1.08 [0.80, 1.45]
Riegel 2000	0.054	0.164	140	140	0.0%	1.06 [0.77, 1.46]
Riegel 2002	-0.675	0.219	130	228	11.8%	0.51 [0.33, 0.78]
Riegel 2006	0.112	0.24	69	65	11.0%	1.12 [0.70, 1.79]
Stewart 1999	-0.279	0.122	100	100	15.8%	0.76 [0.60, 0.96]
Stewart 2012	0.018	0.071	143	137		Not estimable
Thompson 2005	-1.288	0.298	58	48	9.0%	0.28 [0.15, 0.49]
Subtotal (95% CI)			**1157**	**1234**	**100.0%**	**0.76 [0.60, 0.97]**
Heterogeneity: Tau² = 0.08; Chi² = 23.89, df = 7 (P = 0.001); I² = 71%						
Test for overall effect: Z = 2.19 (P = 0.03)						

Test for subgroup differences: Chi² = 0.07, df = 1 (P = 0.80), I² = 0%

Sensitivity analysis (removing Riegel 2002) Test for subgroup differences Chi^2 0.25 df=1 (p=0.61) I^2=0%