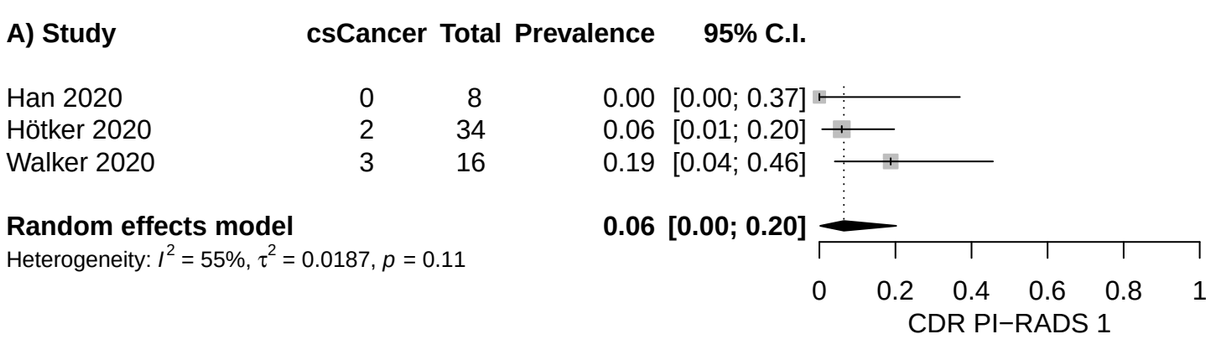
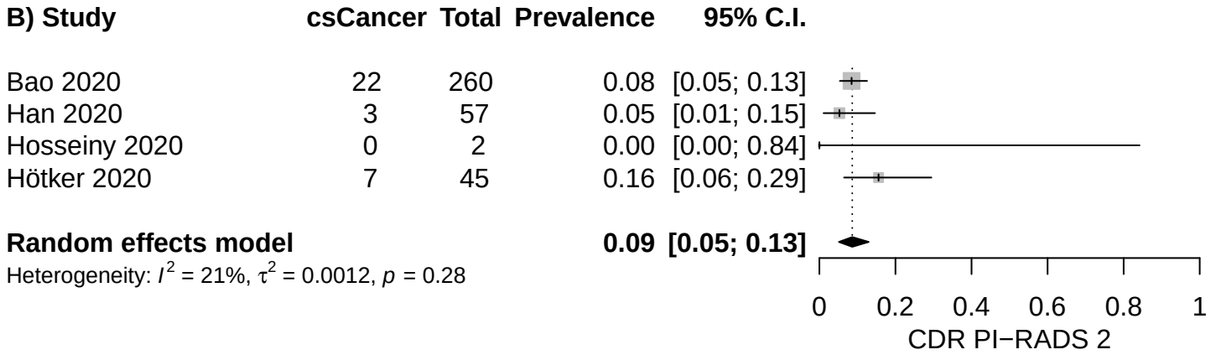
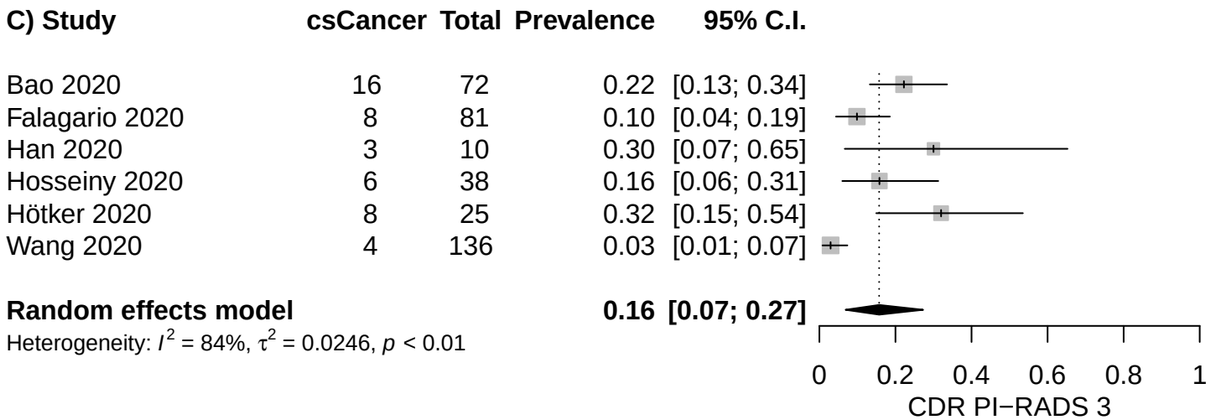
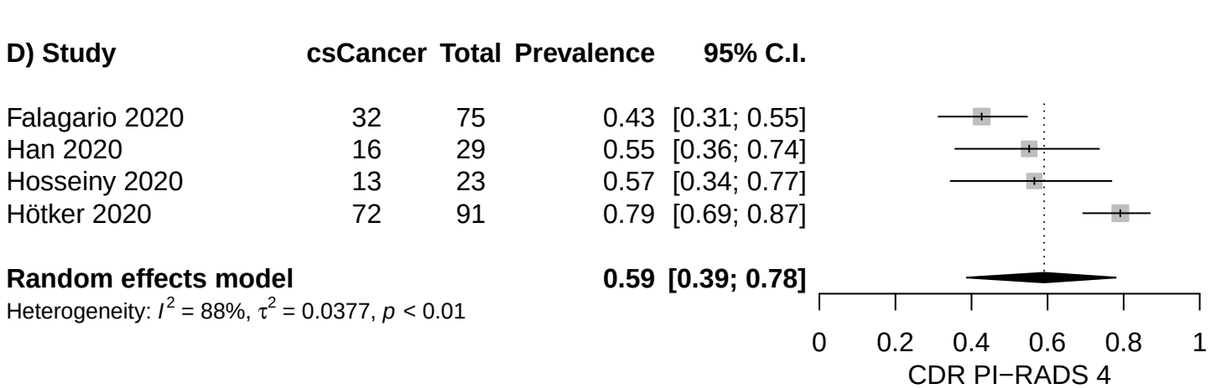
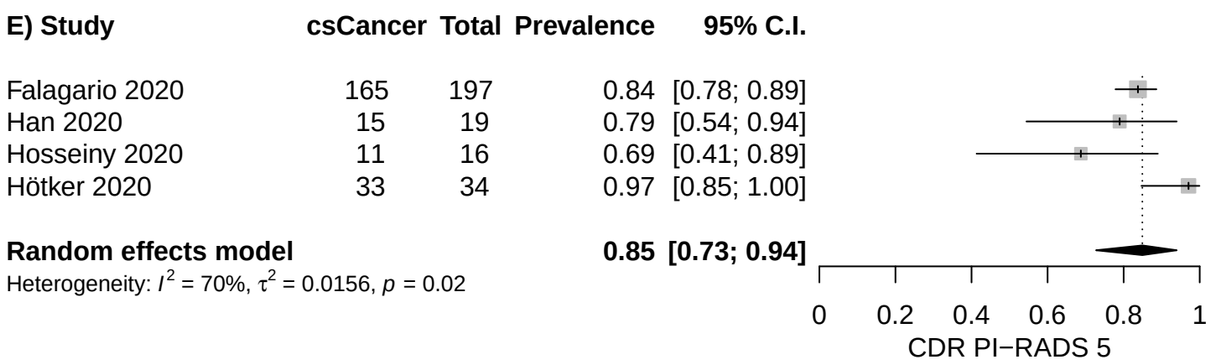
Supplementary figure 1 (patient level, outcome: cs cancer)







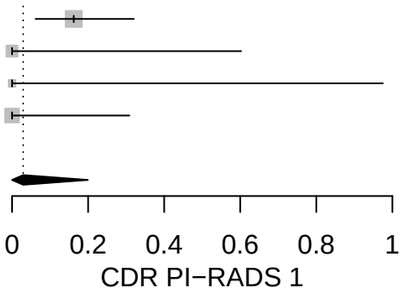




Supplementary figure 2 (lesion level, outcome: any cancer)

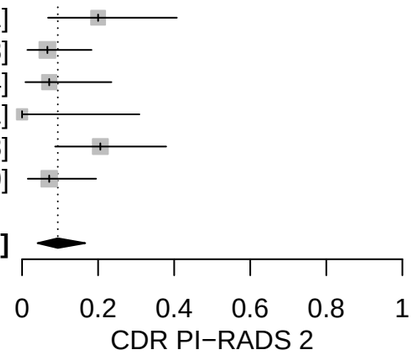
A) Study	any Cancer	Total	Prevalence	95% C.I.
Byun 2020	6	37	0.16	[0.06; 0.32]
Lim 2020	0	4	0.00	[0.00; 0.60]
Walker 2020	0	1	0.00	[0.00; 0.98]
Xu 2020	0	10	0.00	[0.00; 0.31]
Random effects model			**0.03**	**[0.00; 0.20]**

Heterogeneity: I^2 = 59%, τ^2 = 0.0463, p = 0.06



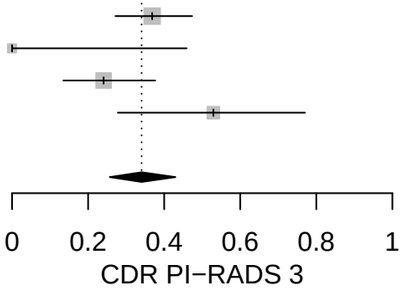
B) Study	any Cancer	Total	Prevalence	95% C.I.
Brancato 2020	5	25	0.20	[0.07; 0.41]
Byun 2020	3	45	0.07	[0.01; 0.18]
HosseinyB 2020	2	28	0.07	[0.01; 0.24]
Lim 2020	0	10	0.00	[0.00; 0.31]
Walker 2020	7	34	0.21	[0.09; 0.38]
Xu 2020	3	42	0.07	[0.01; 0.19]
Random effects model			**0.09**	**[0.04; 0.17]**

Heterogeneity: I^2 = 53%, τ^2 = 0.0093, p = 0.06



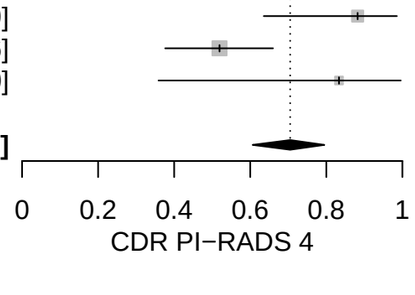
C) Study	any Cancer	Total	Prevalence	95% C.I.
Brancato 2020	9	17	0.53	[0.28; 0.77]
Byun 2020	27	69	0.39	[0.28; 0.52]
Costa 2020	24	110	0.22	[0.15; 0.31]
Gorin 2020	16	44	0.36	[0.22; 0.52]
HosseinyB 2020	51	117	0.44	[0.34; 0.53]
Lim 2020	35	95	0.37	[0.27; 0.47]
Vilanova 2020	0	6	0.00	[0.00; 0.46]
Walker 2020	13	54	0.24	[0.13; 0.38]
Xu 2020	9	17	0.53	[0.28; 0.77]
Random effects model			**0.34**	**[0.26; 0.43]**

Heterogeneity: I^2 = 74%, τ^2 = 0.0129, p < 0.01



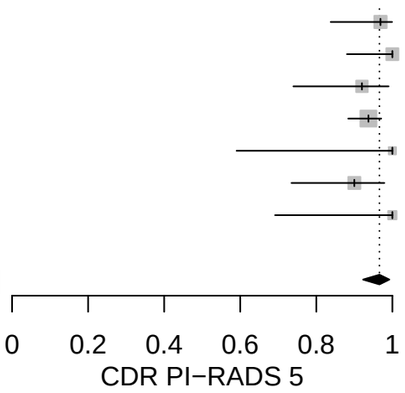
D) Study	any Cancer	Total	Prevalence	95% C.I.
Brancato 2020	33	43	0.77	[0.61; 0.88]
Byun 2020	18	21	0.86	[0.64; 0.97]
Gorin 2020	34	55	0.62	[0.48; 0.75]
HosseinyB 2020	118	187	0.63	[0.56; 0.70]
Vilanova 2020	15	17	0.88	[0.64; 0.99]
Walker 2020	27	52	0.52	[0.38; 0.66]
Xu 2020	5	6	0.83	[0.36; 1.00]
Random effects model			**0.70**	**[0.61; 0.79]**

Heterogeneity: I^2 = 68%, τ^2 = 0.0117, p < 0.01



E) Study	any Cancer	Total	Prevalence	95% C.I.
Brancato 2020	31	32	0.97	[0.84; 1.00]
Byun 2020	29	29	1.00	[0.88; 1.00]
Gorin 2020	23	25	0.92	[0.74; 0.99]
HosseinyB 2020	134	143	0.94	[0.88; 0.97]
Vilanova 2020	7	7	1.00	[0.59; 1.00]
Walker 2020	27	30	0.90	[0.73; 0.98]
Xu 2020	10	10	1.00	[0.69; 1.00]
Random effects model			**0.97**	**[0.92; 0.99]**

Heterogeneity: I^2 = 47%, τ^2 = 0.0072, p = 0.08

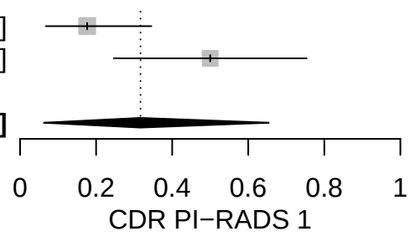


Supplementary figure 3 (patient level, outcome: any cancer)

A)

Study	any Cancer	Total	Prevalence	95% C.I.
Hötker 2020	6	34	0.18	[0.07; 0.35]
Walker 2020	8	16	0.50	[0.25; 0.75]
Random effects model			**0.32**	**[0.06; 0.65]**

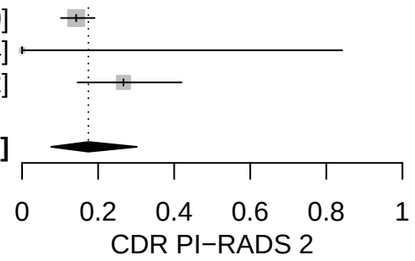
Heterogeneity: I^2 = 81%, τ^2 = 0.0504, p = 0.02



B)

Study	any Cancer	Total	Prevalence	95% C.I.
Bao 2020	37	260	0.14	[0.10; 0.19]
Hosseiny 2020	0	2	0.00	[0.00; 0.84]
Hötker 2020	12	45	0.27	[0.15; 0.42]
Random effects model			**0.17**	**[0.08; 0.30]**

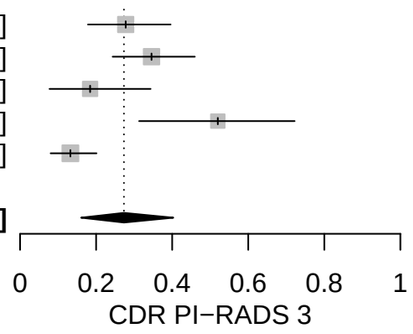
Heterogeneity: I^2 = 60%, τ^2 = 0.0095, p = 0.08



C)

Study	any Cancer	Total	Prevalence	95% C.I.
Bao 2020	20	72	0.28	[0.18; 0.40]
Falagario 2020	28	81	0.35	[0.24; 0.46]
Hosseiny 2020	7	38	0.18	[0.08; 0.34]
Hötker 2020	13	25	0.52	[0.31; 0.72]
Wang 2020	18	136	0.13	[0.08; 0.20]
Random effects model			**0.27**	**[0.16; 0.40]**

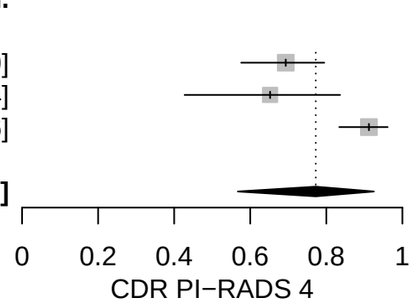
Heterogeneity: I^2 = 84%, τ^2 = 0.0200, p < 0.01



D)

Study	any Cancer	Total	Prevalence	95% C.I.
Falagario 2020	52	75	0.69	[0.58; 0.79]
Hosseiny 2020	15	23	0.65	[0.43; 0.84]
Hötker 2020	83	91	0.91	[0.83; 0.96]
Random effects model			**0.77**	**[0.57; 0.93]**

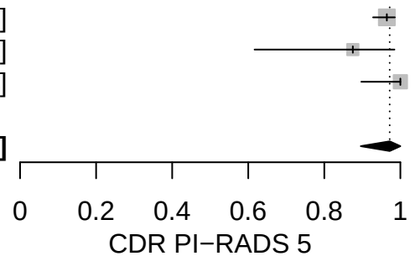
Heterogeneity: I^2 = 88%, τ^2 = 0.0326, p < 0.01



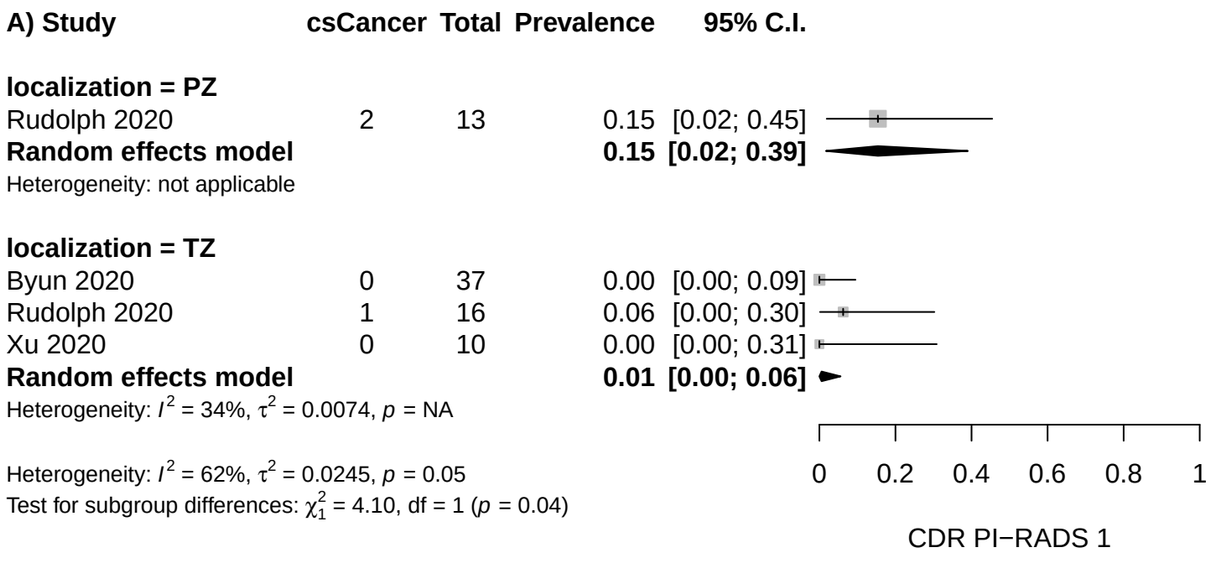
E)

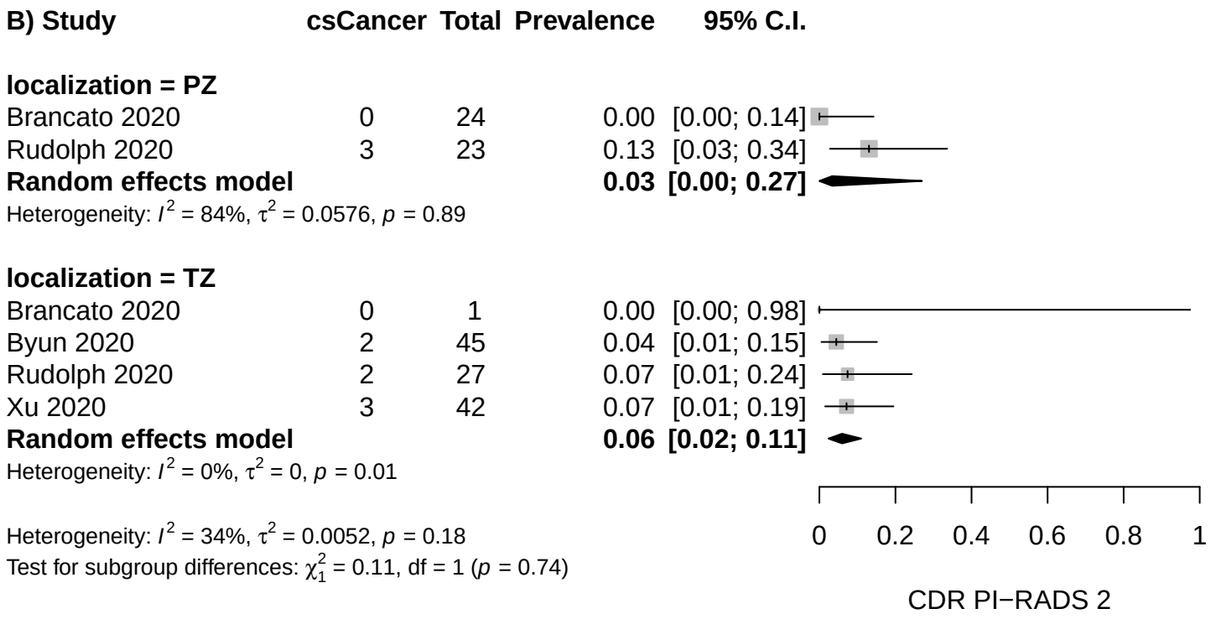
Study	any Cancer	Total	Prevalence	95% C.I.
Falagario 2020	190	197	0.96	[0.93; 0.99]
Hosseiny 2020	14	16	0.88	[0.62; 0.98]
Hötker 2020	34	34	1.00	[0.90; 1.00]
Random effects model			**0.97**	**[0.90; 1.00]**

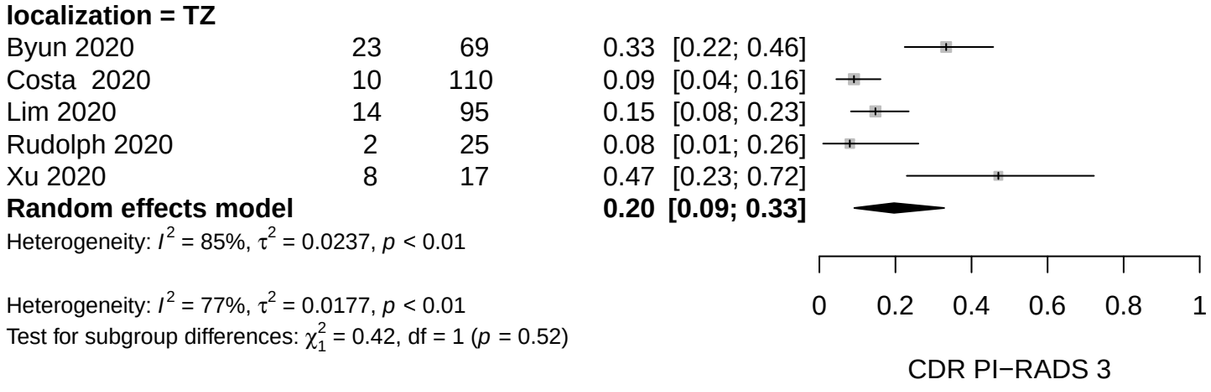
Heterogeneity: I^2 = 69%, τ^2 = 0.0135, p = 0.04

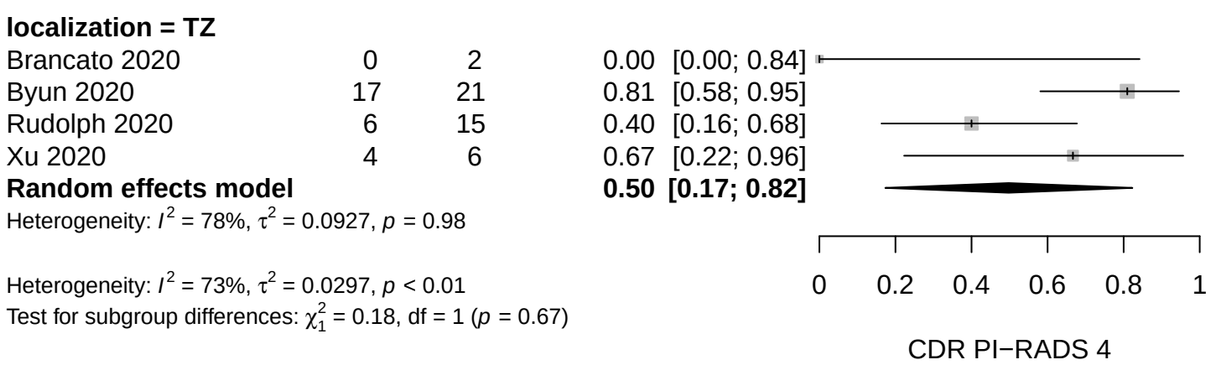


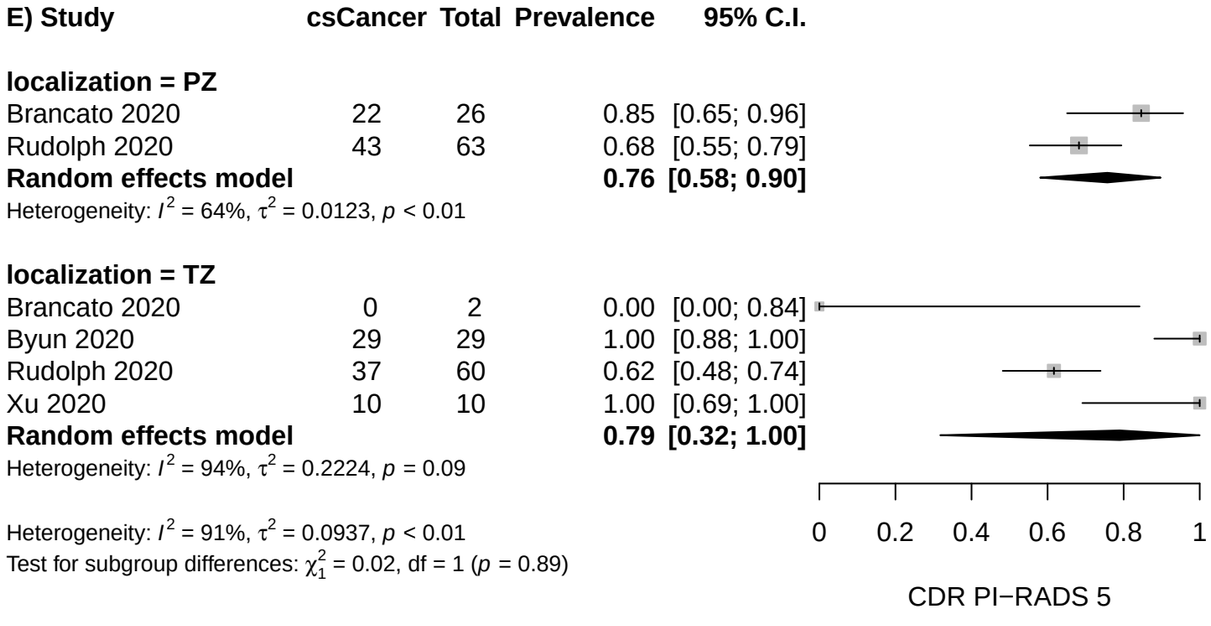
Supplementary figure 4 (lesion level, outcome: cs cancer)



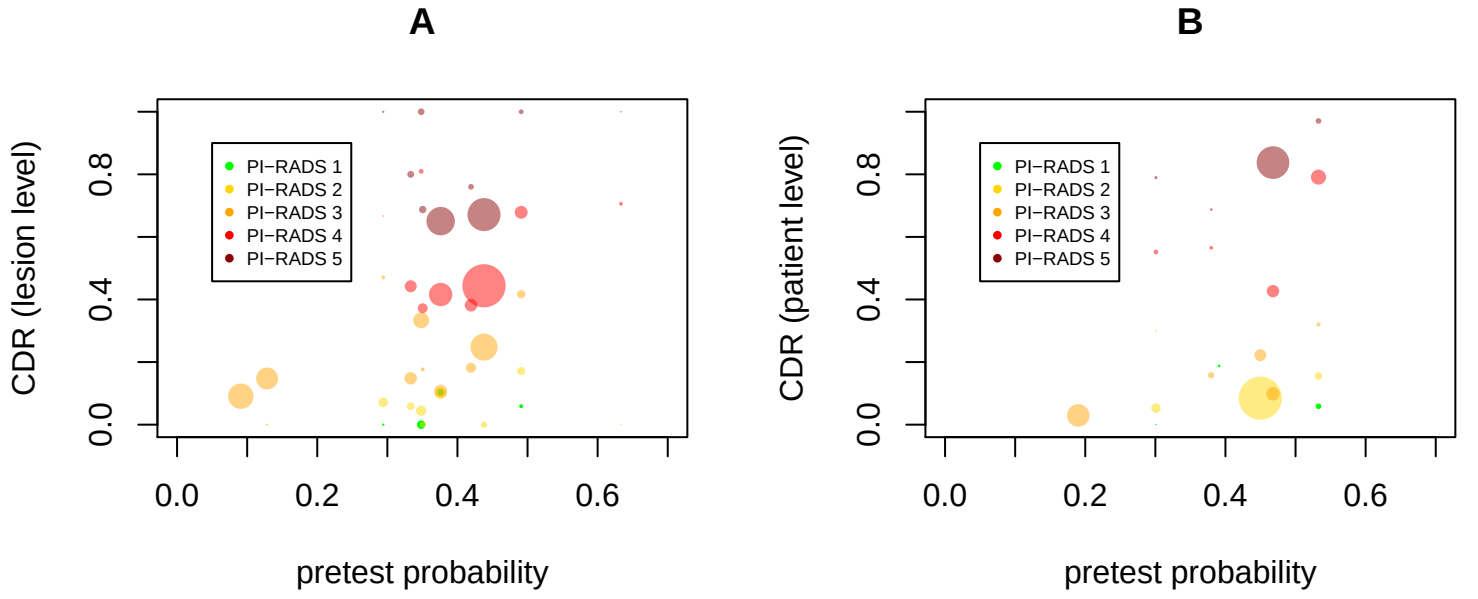




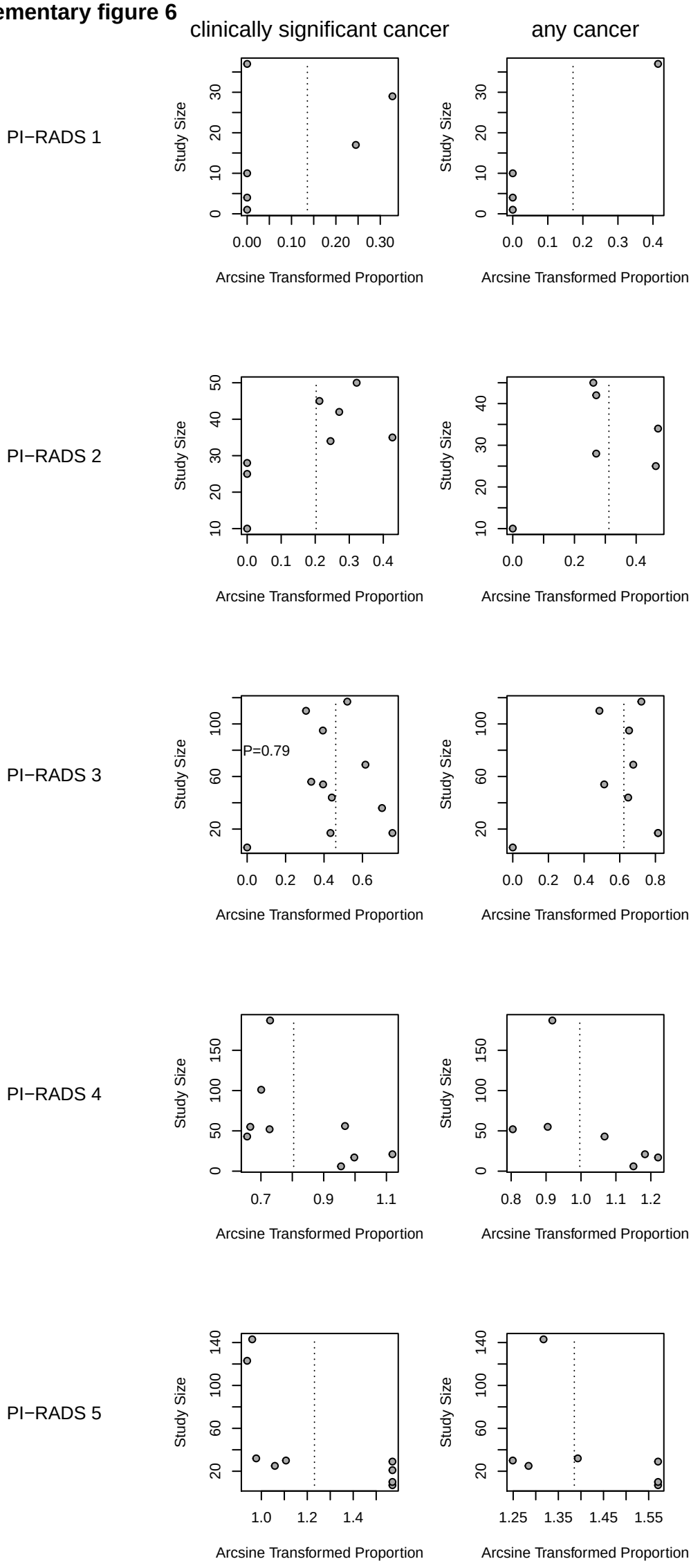




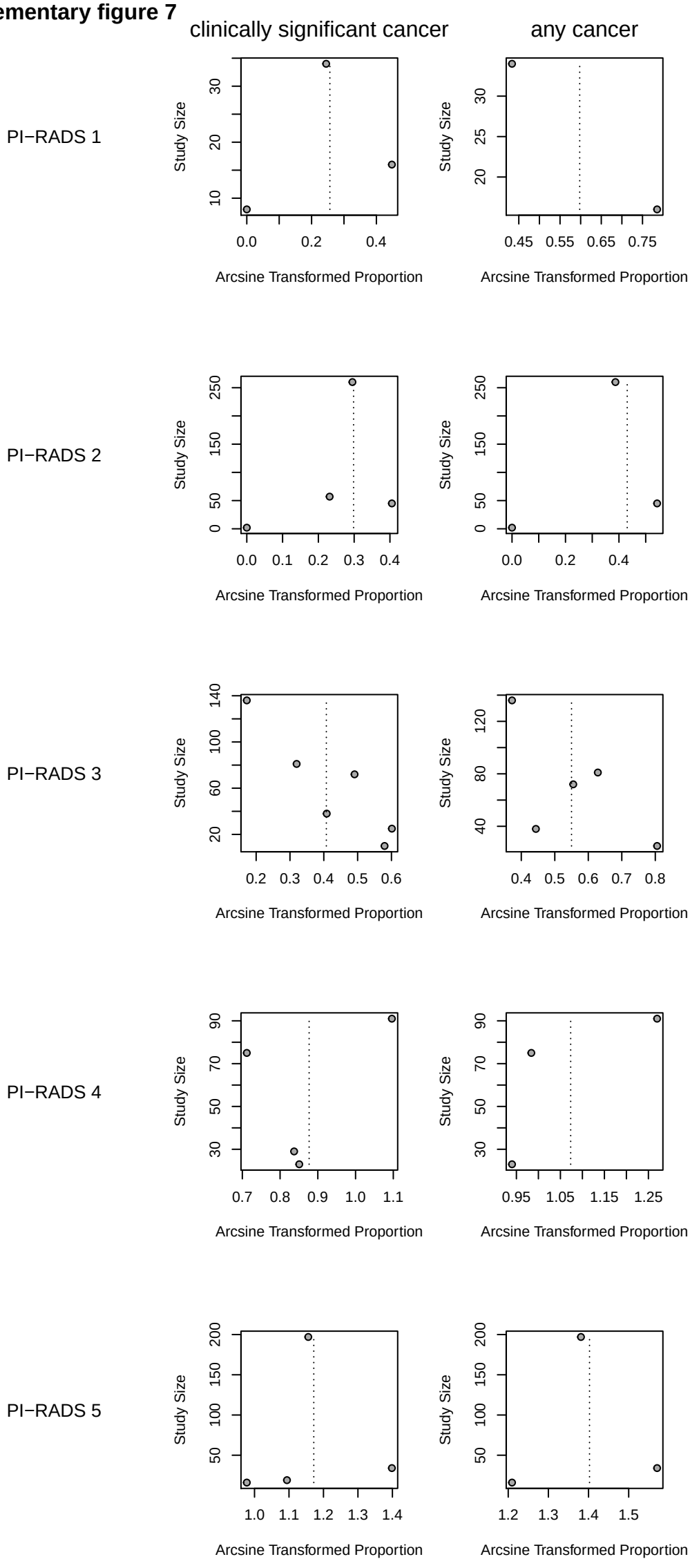
Supplementary figure 5



Supplementary figure 6



Supplementary figure 7



Supplementary Figure Captions

Supplementary figure 1: Forest plots of patient level analysis, cancer detection rates of PI-RADSv2.1 assessment categories for clinically significant cancer as outcome variable. **A**) PI-RADS 1, **B**) PI-RADS 2, **C**) PI-RADS 3, **D**) PI-RADS 4, **E**) PI-RADS 5.

Supplementary figure 2: Forest plots of lesion level analysis, cancer detection rates of PI-RADSv2.1 assessment categories for any cancer as outcome variable. **A**) PI-RADS 1, **B**) PI-RADS 2, **C**) PI-RADS 3, **D**) PI-RADS 4, **E**) PI-RADS 5.

Supplementary figure 3: Forest plots of patient level analysis, cancer detection rates of PI-RADSv2.1 assessment categories for any cancer as outcome variable. **A**) PI-RADS 1, **B**) PI-RADS 2, **C**) PI-RADS 3, **D**) PI-RADS 4, **E**) PI-RADS 5.

Supplementary figure 4: Forest plots of lesion level analysis, cancer detection rates of PI-RADSv2.1 assessment categories for clinically significant cancer as outcome variable, stratified by lesion localization (peripheral zone versus transition zone); given this information is provided. **A**) PI-RADS 1, **B**) PI-RADS 2, **C**) PI-RADS 3, **D**) PI-RADS 4, **E**) PI-RADS 5. From the study of Brancato et al. 7 lesions are excluded from this analysis because they are rated as central zone tumors.

Supplementary figure 5: Dependence of cancer detection rate (clinically significant cancer) on lesion level (**A**) and patient level (**B**) from pretest probability. Size of the data points is proportional to sample size.

Supplementary figure 6: Funnel plots of lesion level analysis. Rows are PI-RADS assessment categories, column 1 is the analysis for clinically significant cancer as outcome variable, column 2 is the analysis for any cancer as outcome variable.

Supplementary figure 7: Funnel plots of patient level analysis. Rows are PI-RADS assessment categories, column 1 is the analysis for clinically significant cancer as outcome variable, column 2 is the analysis for any cancer as outcome variable.

Supplementary Table 1: MRI examinations and case readings

Author (ref. No)	Field strength	One scanner / different scanners	Endorectal coil	Spasmolytic agent	N readers	Years experience prostate MRI*	Slice thickness / GAP T2	FOV T2	Slice thickness / GAP DWI	FOV DWI	high b-Value	Slice thickness / GAP DCE	FOV DCE
Bao [19]	3T	two scanners, same model	no	unclear	2	12	3.5/NR	20x20-25x25	3.5/NR	20x20	2000	3/NR	24x24
Brancato [20]	1.5T	one scanner	yes	unclear	3	10	3/NR	20x20	3/NR	25x25	1400	3.5/NR	20.8x41.7
Byun [21]	3T	different scanners	no	yes	3	>3	3/0	18x18	3/0	18x18	1500	6/0	18x18
Costa [22]	3T	one scanner	yes	unclear	11	20	3/0	18x18	3/0	16x16	2000	NR/NR	NR
Falagario [23]	1.5T and 3T	different scanners	no	unclear	NR	NR	NR/NR	NR	NR/NR	NR	NR	NR/NR	NR
Gorin [24]	NR	NR	NR	unclear	NR	NR	NR/NR	NR	NR/NR	NR	NR	NR/NR	NR
Han [25]	3T	one scanner	no	unclear	2	>5	4/NR	24x24-26x26	4/NR	26x26	1400 (1200 before 2015)	2/NR	26x26 or 36x36
Hosseiny [26]	3T	different scanners	no	yes	4	NR	1.5/NR	21x21	3.6/NR	21x26	1400	3.6/NR	26x26
HosseinyB [27]	3T	different scanners	no	yes	2	15	1.5/NR	21x21	3.6/NR	21x26	1400	3.6/NR	26x26
Hötker [28]	3T	two scanners, same model	mixed	unclear	2	>5	NR/NR	NR	NR/NR	NR	1400	NR/NR	NR
Lim [29]	3T	one scanner	no	unclear	3	7	3/0	22x22	4/0	22x22	1600-2000	4/0	22x22
Rudolph [30]	3T	two scanners, same model	unclear	unclear	3	>5	3/NR	18x18	3/NR	17x17	1400	3/NR	18.6x18.6
Tamada [31]	3T	different scanners	no	yes	3	22	3/0	20x20	3/0	30x30	2000	3.5 or -4/0	25x25 or 35x35
Vilanova [32]	1.5T, NR for second scanner	different scanners	no, outside MRI NR	unclear	2	24	NR/NR	NR	NR/NR	NR	NR	NR/NR	NR
Walker [33]	3T	one scanner	mixed	unclear	1	13	NR/NR	NR	NR/NR	NR	2000	NR/NR	NR
Wang [34]	3T	one scanner	no	unclear	2	10	3/NR	22x22	3/NR	26x26	1000	3/NR	22x22
Xu [35]	3T	one scanner	no	unclear	2	6	3/NR	27x27	3/NR	36x36	1500 or 2000	3/NR	40x40

*most experienced reader, NR: not reported