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## Genetic variants related to longer telomere length are associated with increased risk of renal cell carcinoma

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## Supplementary Tables

**Supplementary Table 1.** Minimac R<sup>2</sup> (IARC) or IMPUTE2 info scores (MDA, NCI1, NCI2, UK) for imputed variants.

	<b>rs11125529</b>	<b>rs6772228</b>	<b>rs10936599</b>	<b>rs7675998</b>	<b>rs2736100</b>	<b>rs9420907</b>	<b>rs3027234</b>	<b>rs8105767</b>	<b>rs755017</b>
<b>IARC</b>	1.00	0.70	Genotyped	0.99	Genotyped	Genotyped	0.99	0.95	1.00
<b>MDA</b>	1.00	0.84	Genotyped	1.00	Genotyped	Genotyped	1.00	1.00	1.00
<b>NCI1</b>	1.00	0.83	Genotyped	1.00	Genotyped	Genotyped	1.00	1.00	1.00
<b>NCI2</b>	1.00	0.81	Genotyped	1.00	Genotyped	1.00	1.00	1.00	Genotyped
<b>UK</b>	1.00	0.85	Genotyped	1.00	Genotyped	0.99	1.00	1.00	Genotyped

Variants that were directly genotyped are denoted as “Genotyped”. Differences in which variants were imputed and genotyped across studies reflects differences in array coverage for commercially available Illumina genotyping platforms used by the studies.

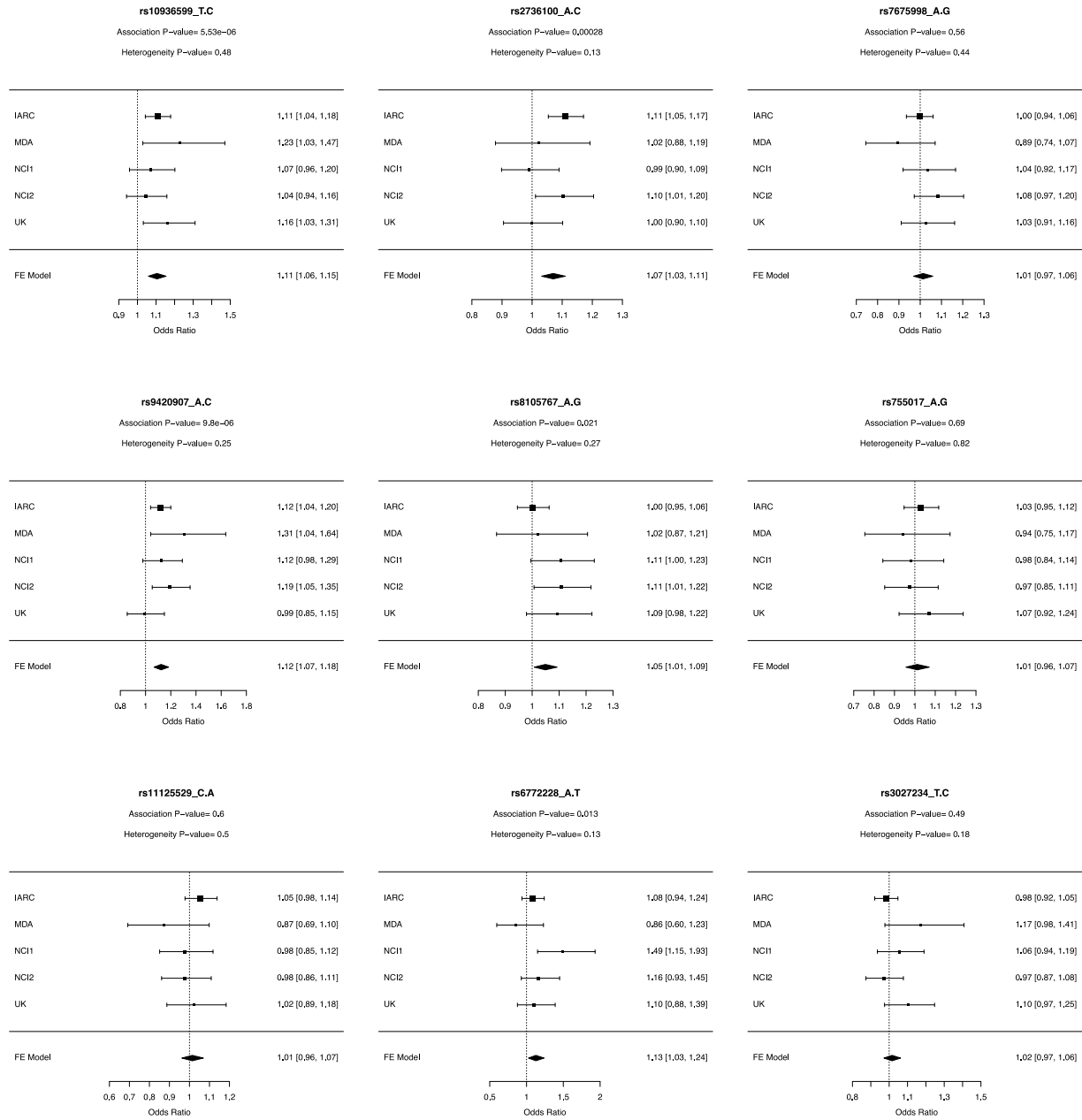
**Supplementary Table 2.** Telomere length associated variant associations with each major RCC subtype and RCC overall.

Variant	Alleles		Clear Cell RCC			Chromophobe RCC			Papillary RCC			RCC Overall		
	Short	Long	OR	LCL	UCL	OR	LCL	UCL	OR	LCL	UCL	OR	LCL	UCL
rs10936599	T	C	1.126	1.063	1.192	1.055	0.830	1.341	1.015	0.878	1.172	1.105	1.059	1.154
rs2736100	A	C	1.091	1.040	1.144	1.040	0.848	1.274	1.161	1.025	1.315	1.070	1.032	1.110
rs7675998	A	G	0.976	0.921	1.033	1.163	0.908	1.489	0.976	0.843	1.131	1.013	0.969	1.059
rs9420907	A	C	1.148	1.074	1.227	1.154	0.879	1.517	1.242	1.053	1.465	1.124	1.067	1.183
rs8105767	A	G	1.002	0.951	1.057	0.982	0.785	1.228	1.013	0.884	1.160	1.049	1.007	1.092
rs755017	A	G	1.030	0.956	1.109	1.290	0.967	1.720	1.080	0.898	1.298	1.012	0.956	1.071
rs11125529	C	A	1.041	0.971	1.116	1.071	0.799	1.436	0.953	0.794	1.145	1.014	0.962	1.070
rs6772228	A	T	1.062	0.938	1.202	0.801	0.485	1.324	1.159	0.836	1.608	1.127	1.026	1.239
rs3027234	T	C	0.975	0.920	1.034	1.000	0.780	1.281	0.899	0.776	1.042	1.016	0.972	1.063

OR=odds ratio; LCL=lower 95% confidence interval; UCL=upper 95% confidence interval

## Supplementary Figures

### Supplementary Figure 1. Forest plots for associations of each telomere length associated variant with RCC risk.

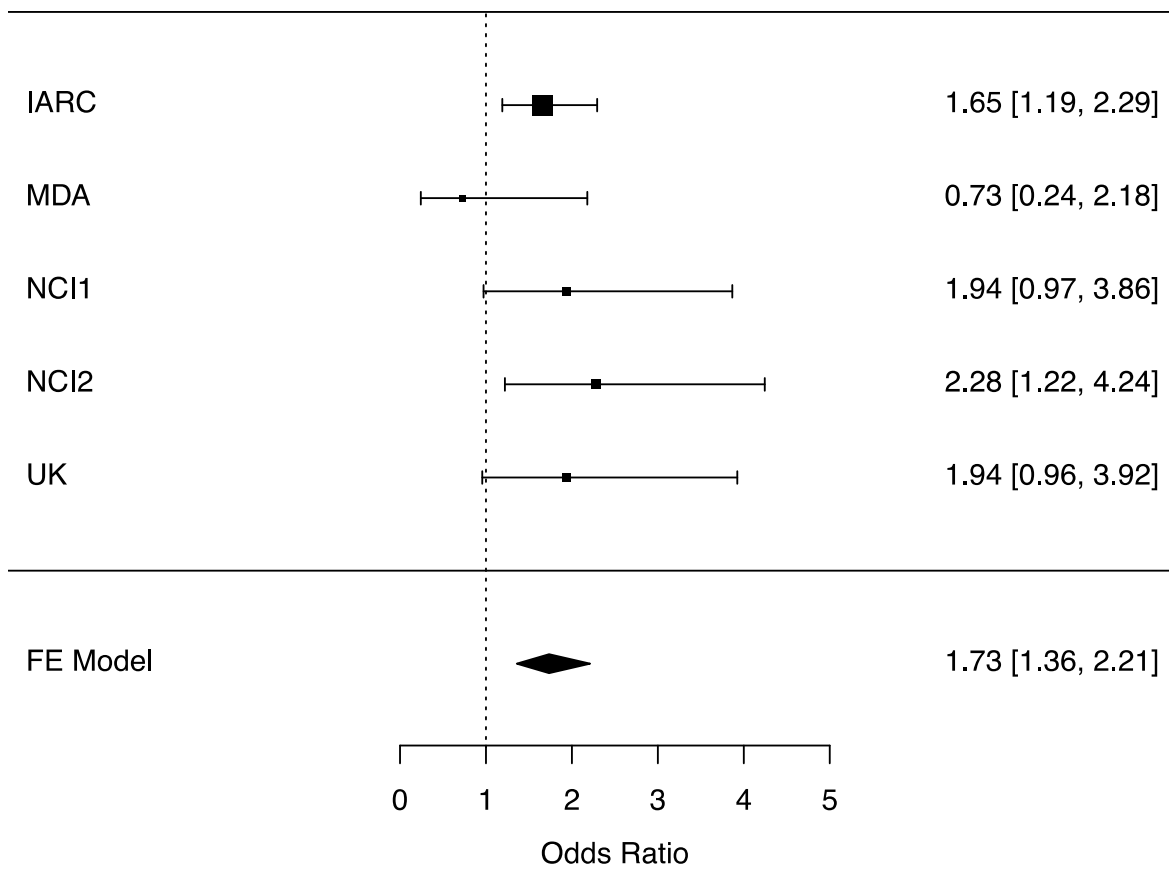


**Supplementary Figure 2.** Forest plot for RCC association of the telomere length associated GRS that removes rs10936599—TERC and rs9420907—OBFC1 GWAS variants.

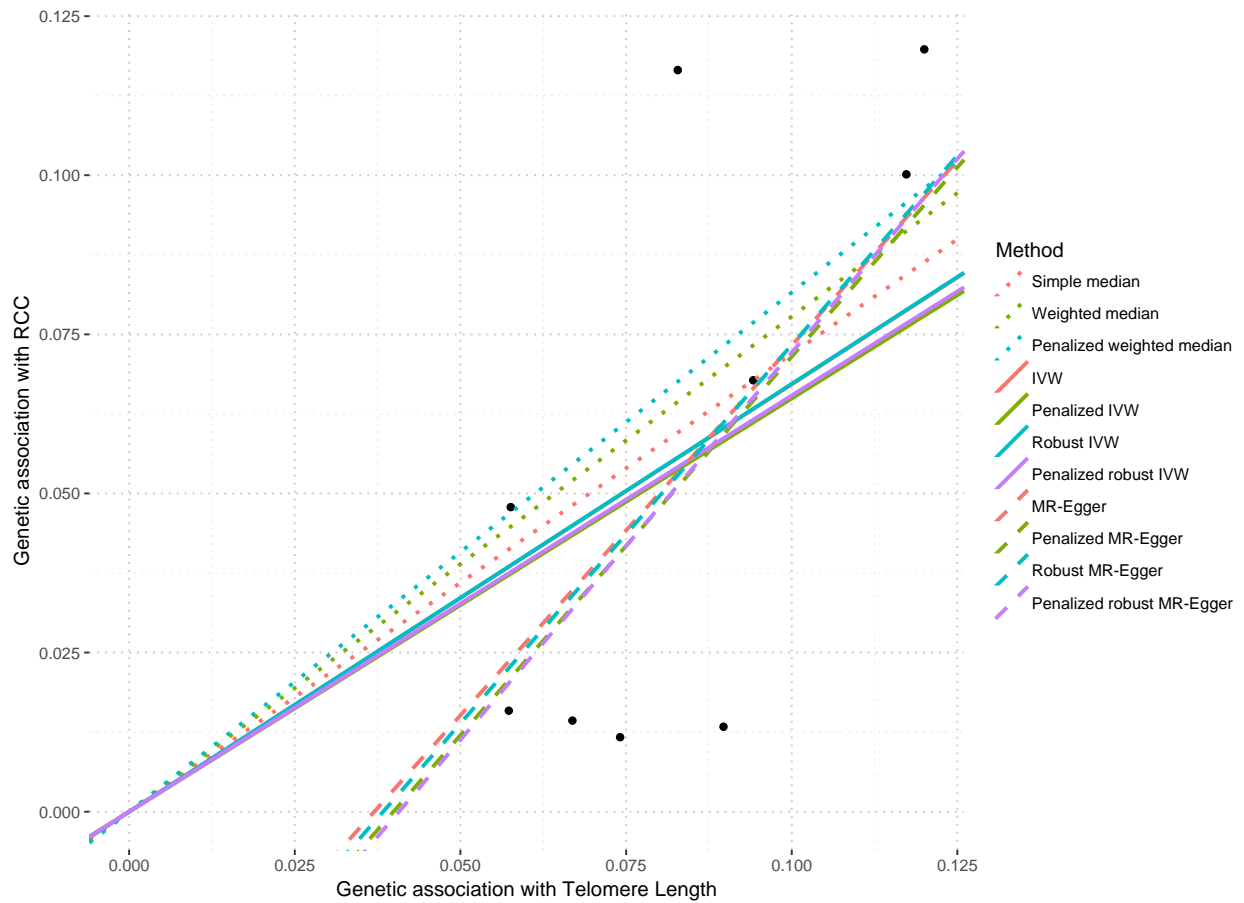
### Telomere Length GRS without TERC and OBFC1

Association P-value= 1.01e-05

Heterogeneity P-value= 0.49



**Supplementary Figure 3.** Comparison of Egger regression effect estimates (dashed lines) to standard (dotted lines) and IVW based estimation approaches. Egger regression estimated an intercept of -0.043 (95% CI=-0.133-0.047, P-value=0.352) and an estimated odds ratio of 3.20 (95% CI=1.10-9.27, P-value=0.03).

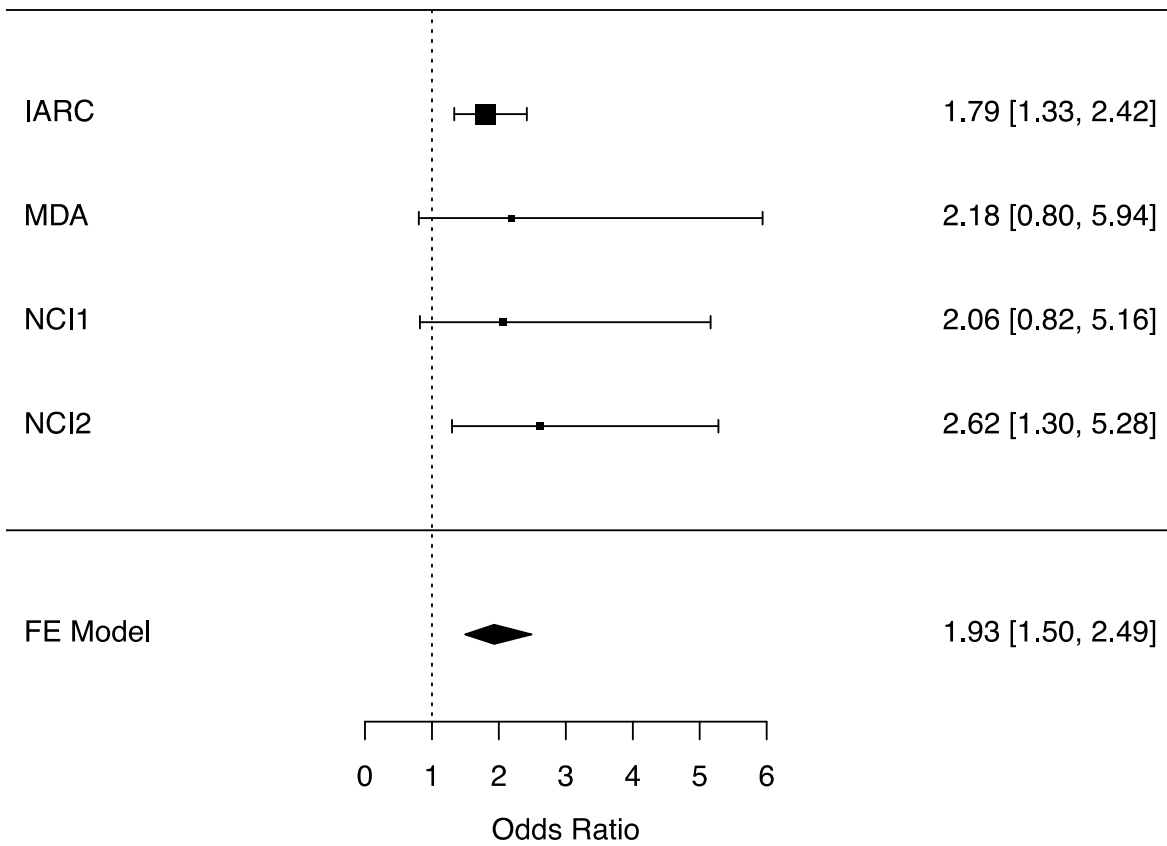


**Supplementary Figure 4.** Forest plot for associations of the telomere length associated GRS with clear cell RCC risk.

### Clear Cell Telomere Length GRS

Association P-value=  $3.86 \times 10^{-7}$

Heterogeneity P-value= 0.79



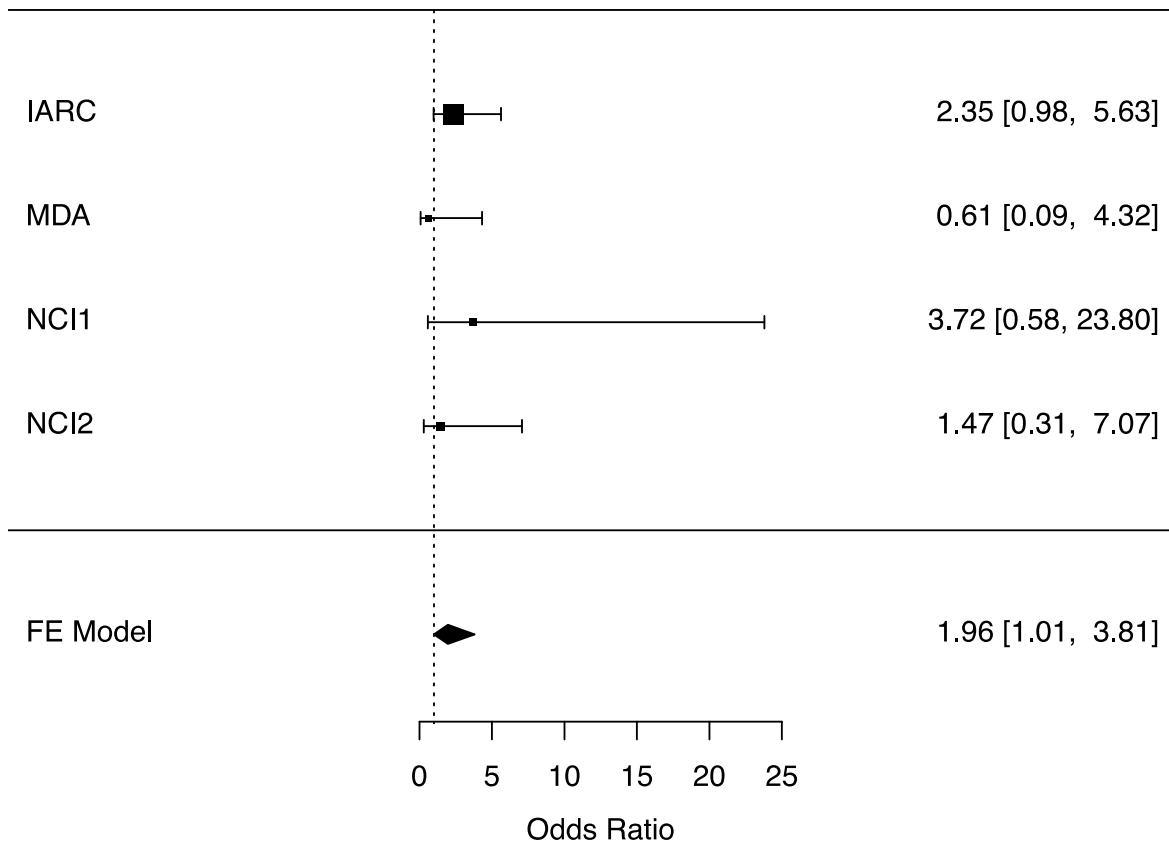


**Supplementary Figure 5.** Forest plot for associations of the telomere length associated GRS with papillary RCC risk.

### Papillary Telomere Length GRS

Association P-value= 0.046

Heterogeneity P-value= 0.55

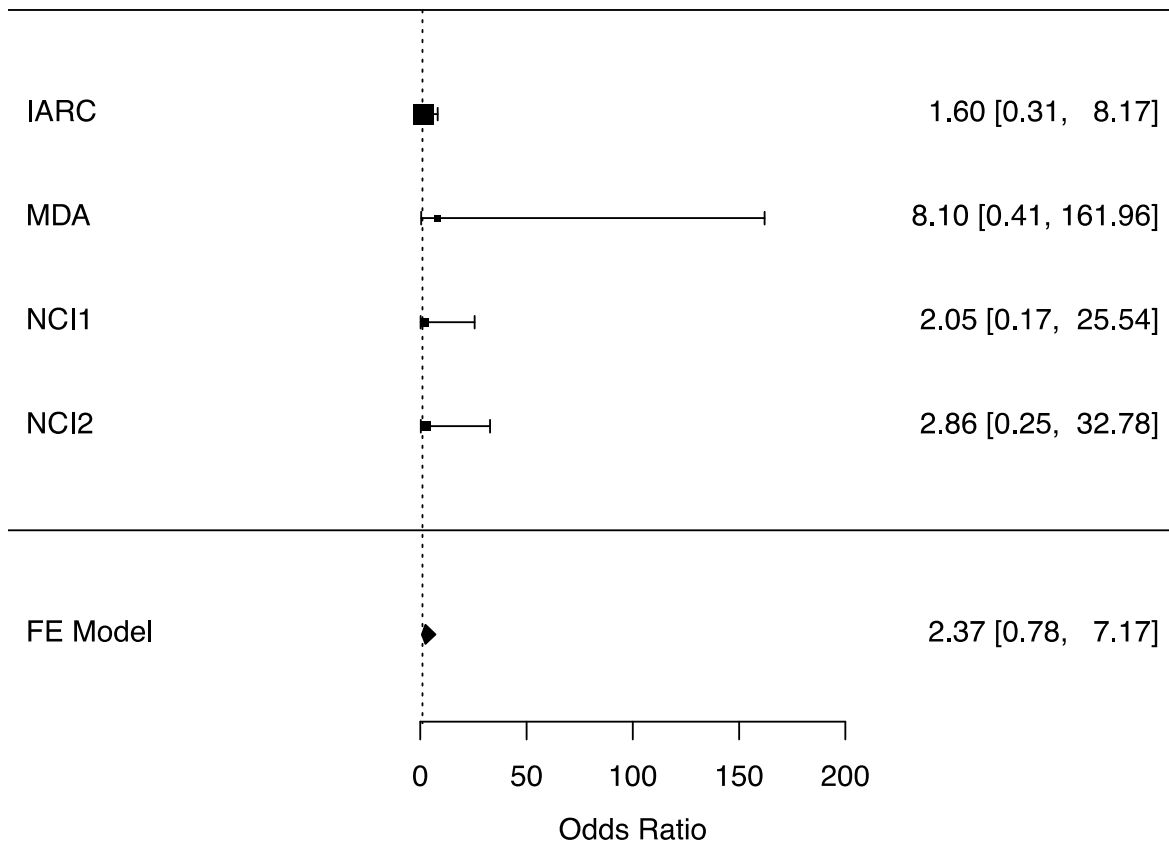


**Supplementary Figure 6.** Forest plot for associations of the telomere length associated GRS with chromophobe RCC risk.

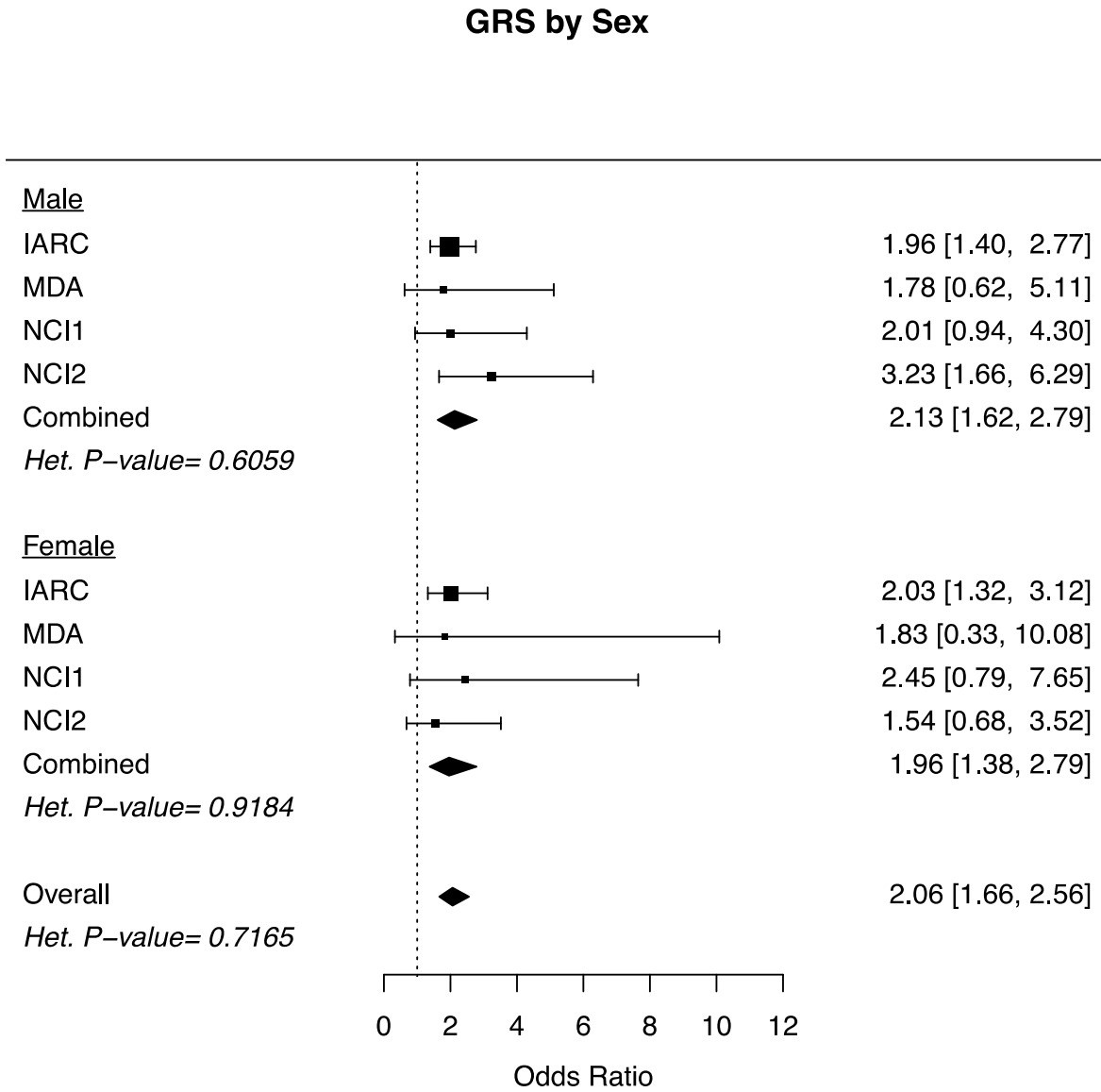
### Chromophobe Telomere Length GRS

Association P-value= 0.13

Heterogeneity P-value= 0.82

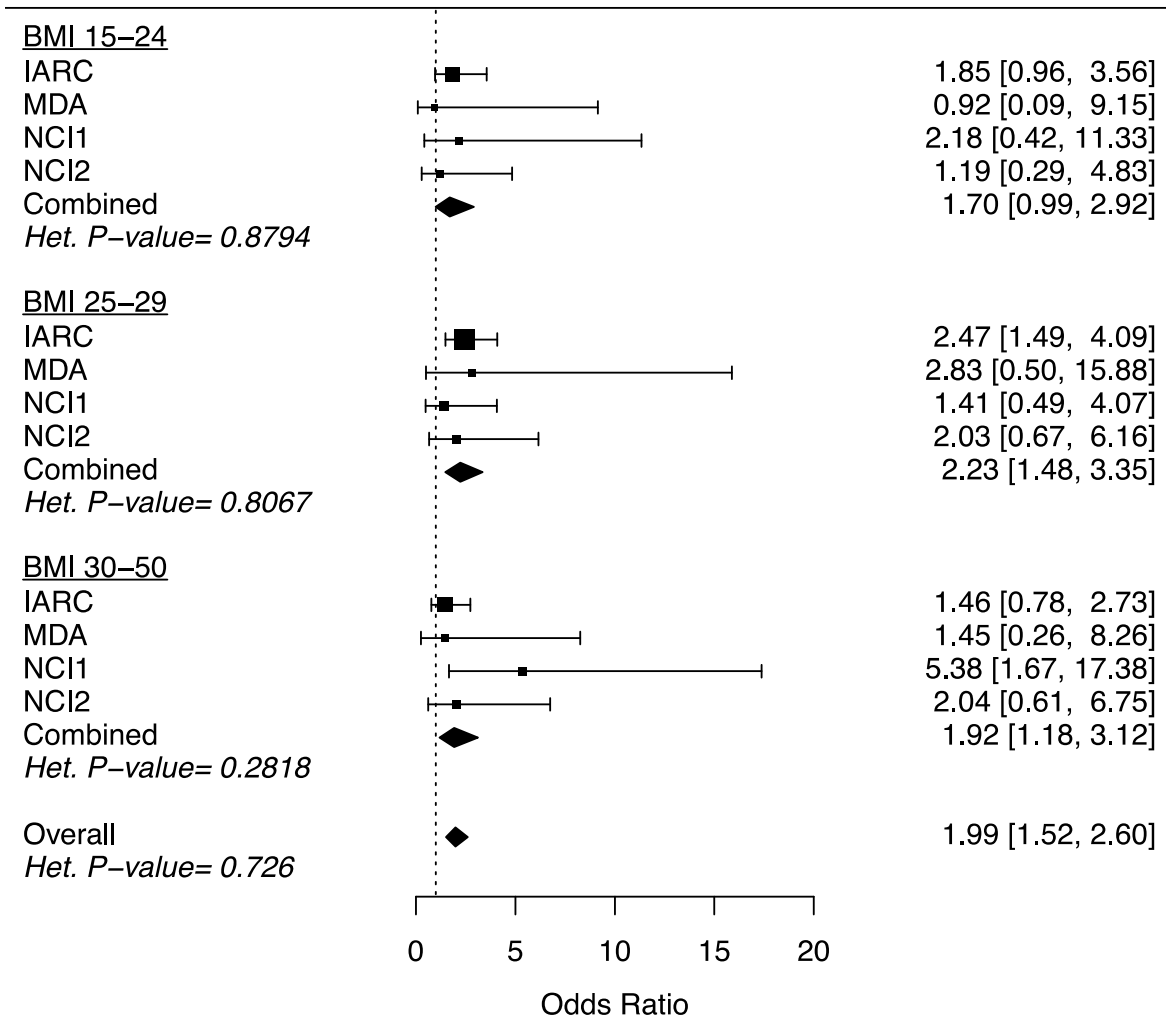


**Supplementary Figure 7.** Forest plot for associations of telomere length associated GRS with RCC by strata of sex.



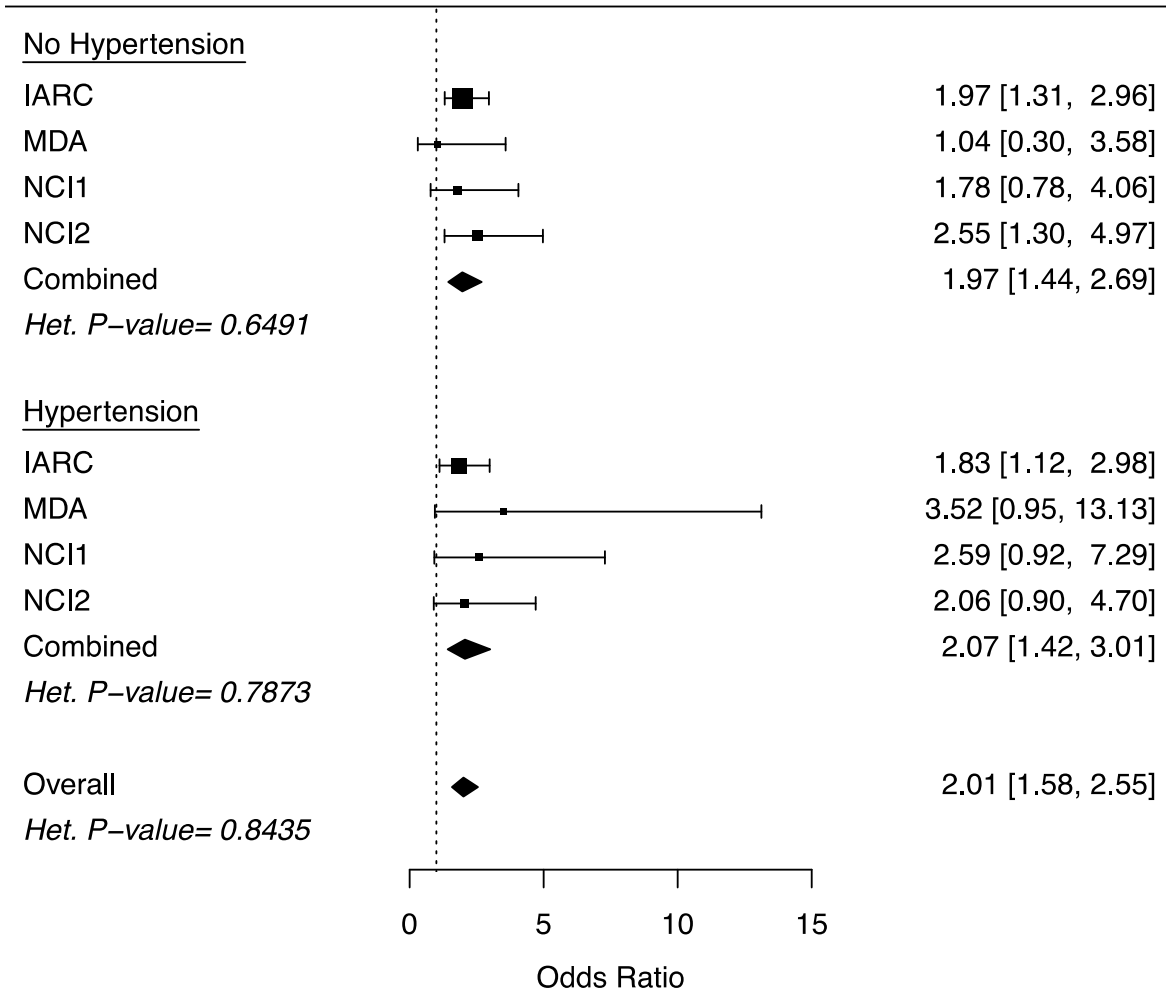
**Supplementary Figure 8.** Forest plot for associations of telomere length associated GRS with RCC by strata of BMI.

**GRS by Body Mass Index**



**Supplementary Figure 9.** Forest plot for associations of telomere length associated GRS with RCC by strata of hypertension.

**GRS by Hypertension**



**Supplementary Figure 10.** Forest plot for associations of telomere length associated GRS with RCC by strata of smoking.

