The association of grip strength with health outcomes does not differ if grip strength is used in absolute or relative terms: a prospective cohort study

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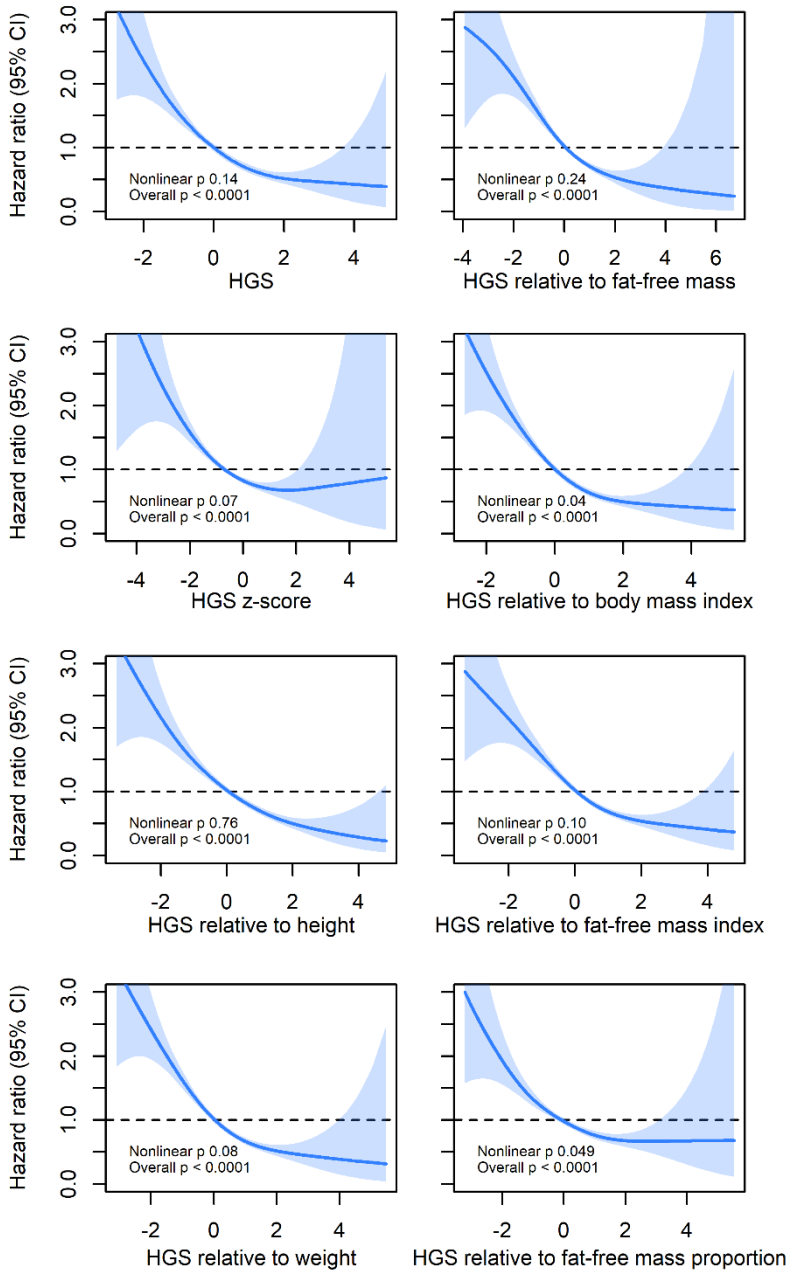
Appendix 1. C-indices of grip strength indicators

	Training data			Testing data				
	C-index	95% CI		C-index	95% CI		$P_{baseline}$	$P_{absolute}$
All-cause mortality								
Office-based risk model (baseline)	0.7220	0.7170	0.7269	0.7220	0.7170	0.7269	Ref	-
Absolute grip strength	0.7353	0.7304	0.7402	0.7351	0.7302	0.7400	0.0002	Ref
Age- and sex-specific z-score	0.7348	0.7299	0.7397	0.7347	0.7298	0.7396	0.0004	-
Scaled for height	0.7371	0.7322	0.7420	0.7368	0.7319	0.7417	0.0000	0.48
Scaled for weight	0.7358	0.7308	0.7407	0.7354	0.7305	0.7403	0.0002	0.89
Scaled for fat-free mass	0.7361	0.7312	0.7410	0.7360	0.7311	0.7409	0.0001	0.72
Scaled for BMI	0.7343	0.7294	0.7392	0.7339	0.7290	0.7388	0.0008	-
Scaled for fat-free mass index	0.7346	0.7297	0.7395	0.7344	0.7295	0.7393	0.0005	-
Scaled for fat-free mass proportion	0.7346	0.7297	0.7396	0.7345	0.7296	0.7394	0.0004	-
CVD mortality								
Office-based risk model (baseline)	0.7872	0.7825	0.7918	0.7870	0.7824	0.7916	Ref	-
Absolute grip strength	0.8007	0.7962	0.8053	0.8000	0.7955	0.8046	0.0001	Ref
Age- and sex-specific z-score	0.7997	0.7952	0.8043	0.7996	0.7950	0.8041	0.0002	-
Scaled for height	0.8011	0.7966	0.8056	0.8007	0.7962	0.8052	0.0000	0.84
Scaled for weight	0.7999	0.7954	0.8045	0.7995	0.7949	0.8040	0.0002	-
Scaled for fat-free mass	0.8003	0.7958	0.8049	0.8000	0.7955	0.8045	0.0001	-
Scaled for BMI	0.7995	0.7950	0.8041	0.7991	0.7945	0.8036	0.0003	-
Scaled for fat-free mass index	0.8000	0.7954	0.8045	0.7995	0.7950	0.8041	0.0002	-
Scaled for fat-free mass proportion	0.7996	0.7951	0.8042	0.7995	0.7950	0.8041	0.0002	-
Respiratory disease mortality								
Office-based risk model (baseline)	0.7981	0.7936	0.8027	0.7976	0.7931	0.8022	Ref	-
Absolute grip strength	0.8186	0.8142	0.8230	0.8178	0.8134	0.8222	< 0.0001	-
Age- and sex-specific z-score	0.8180	0.8136	0.8224	0.8174	0.8130	0.8218	< 0.0001	-
Scaled for height	0.8170	0.8126	0.8214	0.8162	0.8118	0.8206	< 0.0001	-
Scaled for weight	0.8140	0.8096	0.8184	0.8133	0.8089	0.8177	< 0.0001	-
Scaled for fat-free mass	0.8140	0.8096	0.8185	0.8134	0.8090	0.8179	< 0.0001	-
Scaled for BMI	0.8153	0.8109	0.8197	0.8145	0.8101	0.8190	< 0.0001	-
Scaled for fat-free mass index	0.8152	0.8108	0.8196	0.8148	0.8104	0.8193	< 0.0001	-
Scaled for fat-free mass proportion	0.8165	0.8121	0.8209	0.8160	0.8116	0.8204	< 0.0001	-

Cancer mortality								
Office-based risk model (baseline)	0.7120	0.7070	0.7170	0.7119	0.7069	0.7169	Ref	-
Absolute grip strength	0.7191	0.7141	0.7240	0.7187	0.7138	0.7237	0.06	Ref
Age- and sex-specific z-score	0.7188	0.7139	0.7238	0.7186	0.7136	0.7236	0.06	-
Scaled for height	0.7215	0.7166	0.7265	0.7210	0.7160	0.7259	0.01	0.53
Scaled for weight	0.7206	0.7156	0.7256	0.7203	0.7153	0.7252	0.02	0.67
Scaled for fat-free mass	0.7206	0.7157	0.7256	0.7202	0.7153	0.7252	0.02	0.67
Scaled for BMI	0.7184	0.7134	0.7233	0.7182	0.7132	0.7232	0.08	-
Scaled for fat-free mass index	0.7181	0.7131	0.7231	0.7181	0.7131	0.7231	0.08	-
Scaled for fat-free mass proportion	0.7183	0.7133	0.7233	0.7181	0.7132	0.7231	0.08	-

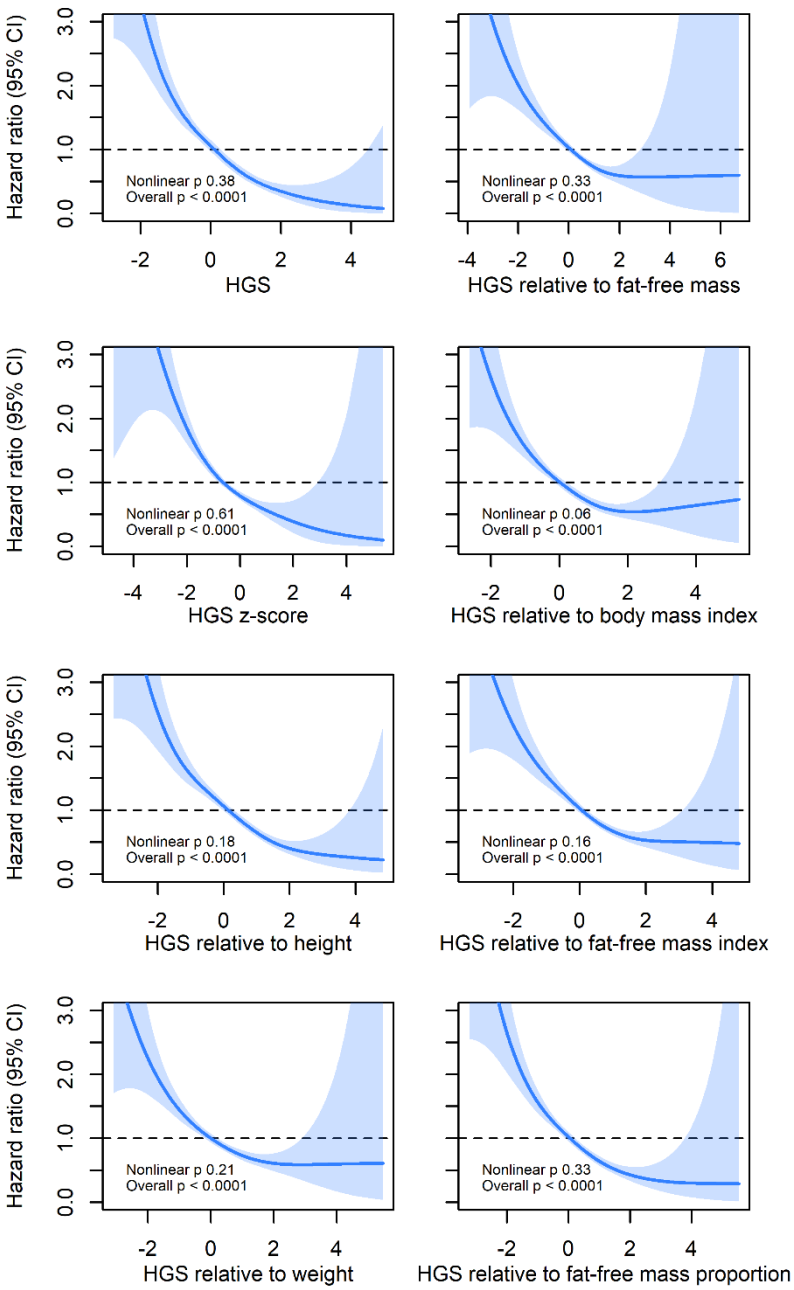
1 C-index, the probability of concordance between observed and predicted responses, is an indicator of risk prediction, with 0.5 being equivalent to a random guess and
2 1.0 equivalent to perfect prediction.

Appendix 2. Association between CVD mortality and handgrip strength expressed in absolute and relative terms in fully adjusted models.



Data is presented as hazard ratio and its 95%CI. Absolute and relative markers of handgrip strength were standarised against their mean and SD to allow comparison across diferent markers of handgrip strength. Analyses were conducted using a 2-year landmark analyses and participants with major comorbidities were excluded from the analyses (n=129,100). All analyses were adjusted for age, sex, ethnicity, Townsend deprivation index and month of recruitment); smoking status, systolic blood pressure, medications for CVD, self-reported physical activity time and dietary intake of red meat, processed meat, fruit and vegetables, and oily fish. HGS: handgrip strength.

Appendix 3. Association between respiratory diseases mortality and handgrip strength expressed in absolute and relative terms in fully adjusted models.



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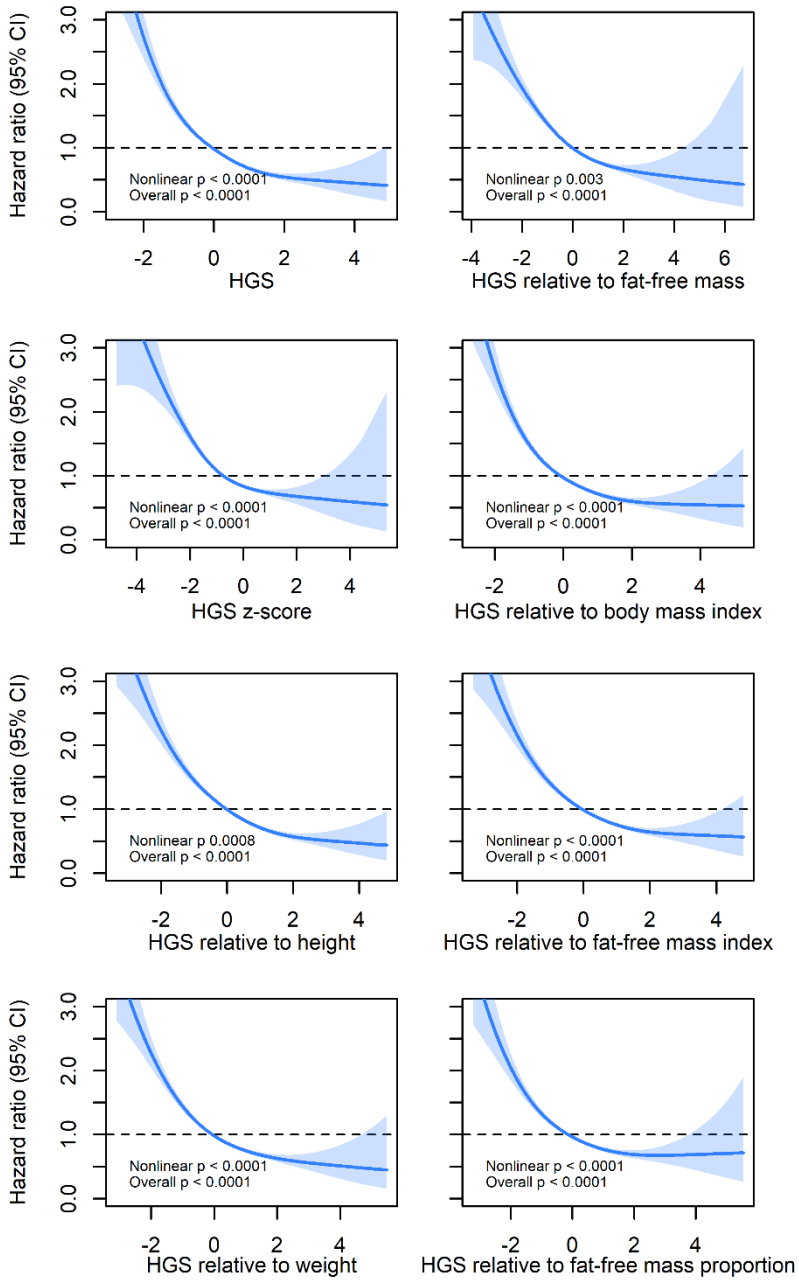
Appendix 4. Association between incident respiratory diseases and handgrip strength expressed in absolute and relative terms in fully adjusted models.



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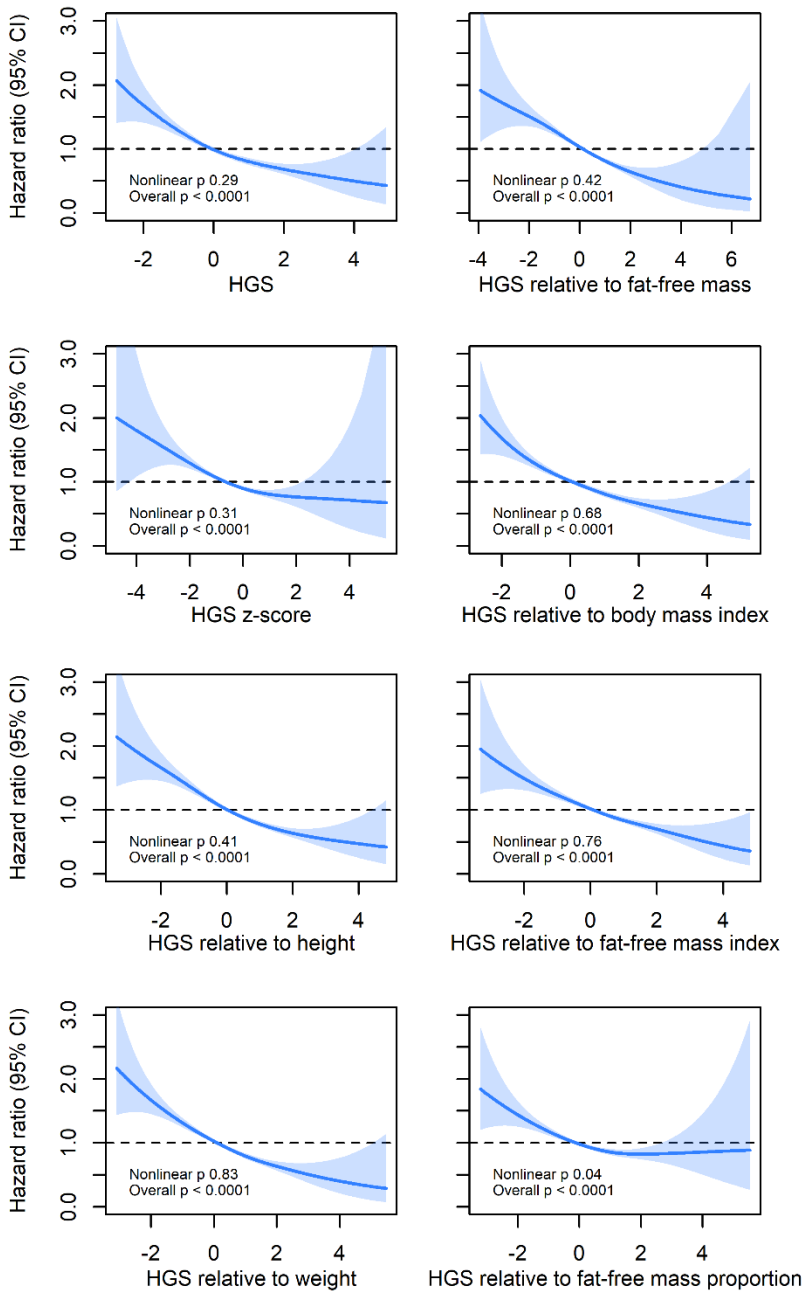
Appendix 5. Association between all-cause cancer mortality and handgrip strength expressed in absolute and relative terms in fully adjusted models.



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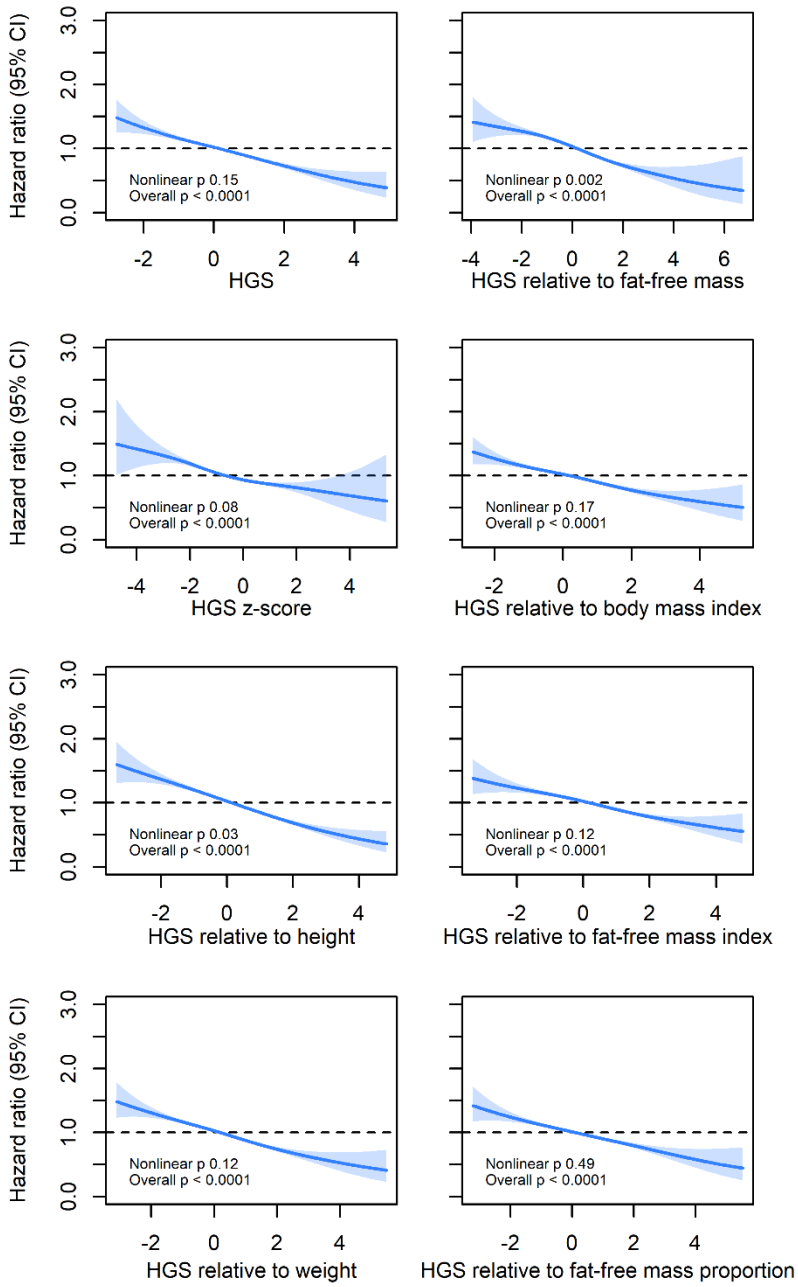
Appendix 6. Association between incident all-cause cancer and handgrip strength expressed in absolute and relative terms in fully adjusted models.



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