8 Supplementary Figures

				Effect Size (beta)	
/ariable	Method	# SNP	Beta (95% CI)		P-value
PhenoAge					
Oily Fish Inktake	MR Egger	59	-3.34(-6.96 to 0.27)	•	7.53e-02
Oily Fish Inktake	Weighted median	59	-1.00(-2.22 to 0.23)		1.10e-0
Oily Fish Inktake	IVW	59	-1.16(-2.02 to -0.29)	-	8.68e-0
Oily Fish Inktake	Simple mode	59	-0.90(-3.75 to 1.96)	•	-5.41e-0
Oily Fish Inktake	Weighted mode	59	-0.90(-3.59 to 1.79)	•	- 5.16e-0
				-6 -4 -2 0	_

Fig. 1S All 5 MR Methods for Oily Fish Intake vs PhenoAge Forest plot showing additional MR methods of simple mode, weighted mode, and weighted median for this statistically significant exposure outcome pair.

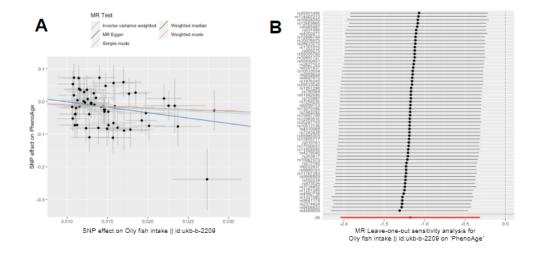


Fig. 2S Sensitivity Analysis of Oily Fish Intake on PhenoAge. Scatter plot of IV effects on 5 MR methods (A) and LOO analysis (B) used to assess the robustness of the causal estimate of oily fish intake on PhenoAge.

				Effect Size (beta)
iable	Method	# SNP	Beta (95% CI)	
imAge				
Fish Oil Supplement	: MR Egger	4	-1.51(-32.85 to 29.82)	
Fish Oil Supplement	Weighted median	4	-4.51(-10.15 to 1.13)	-
Fish Oil Supplement	IVW	4	-5.21(-10.13 to -0.30)	-
Fish Oil Supplement	Simple mode	4	-3.88(-11.58 to 3.82)	-
Fish Oil Supplement	Weighted mode	4	-3.80(-11.38 to 3.78)	-

Fig. 3S All 5 MR Methods for Fish Oil vs GrimAge Forest plot showing additional MR methods of simple mode, weighted mode, and weighted median for this statistically significant exposure outcome pair.

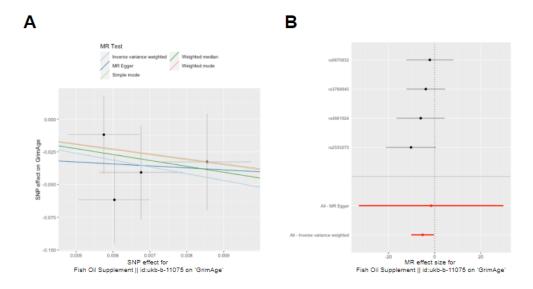


Fig. 4S Sensitivity Analysis of Fish Oil Intake on GrimAge. Scatter plot of IV effects on 5 MR methods (A) and LOO analysis (B) used to evaluate the robustness of the causal estimate of fish oil intake on GrimAge

					Effect Size (beta)	
Variable	Method	# SNP	Beta (95% CI)			P-value
Tryglycerides						
Fish Oil Supplement	MR Egger	4	-0.09(-5.16 to 4.99)	-		- 9.76e-01
Fish Oil Supplement	Weighted median	4	-0.93(-1.85 to -0.01)		-	4.85e-02*
Fish Oil Supplement	IVW	4	-1.15(-1.93 to -0.37)		-	4.00e-03*
Fish Oil Supplement	Simple mode	4	-0.88(-2.19 to 0.44)		-	2.82e-01
Fish Oil Supplement	Weighted mode	4	-0.82(-2.05 to 0.41)	- 1	0 -2.5 0.0 2.5	2.83e-01

Fig. 5S All 5 MR Methods for Fish Oil vs Triglycerides Forest plot showing additional MR methods of simple mode, weighted mode, and weighted median for this statistically significant exposure outcome pair.

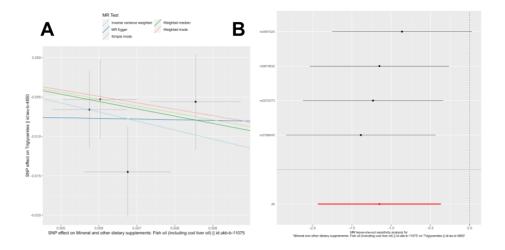


Fig. 6S Fish Oil Triglycerides Sensitivity Scatter plot of IV effects on 5 MR methods (A) and LOO analysis (B) used to assess the robustness of the causal estimate of fish oil supplementation on triglycerides.

				Effect Size (beta)
e	Method	# SNP	Beta (95% CI)	
l Supplement				
nAge	MR Egger	4	-0.09(-0.18 to -0.01)	+
nAge	IVW	4	-0.00(-0.01 to 0.01)	
num	MR Egger	9	-0.01(-0.02 to 0.01)	
num	IVW	9	-0.00(-0.00 to 0.00)	
A	MR Egger	24	-0.00(-0.01 to 0.00)	
A	IVW	24	-0.00(-0.00 to 0.00)	
noAge	MR Egger	10	-0.00(-0.01 to 0.01)	
noAge	IVW	10	-0.00(-0.00 to 0.00)	

Fig. 7S Reverse MR of Epigenetic Age Measures vs Fish Oil Intake. Beta coefficients and p-values used to represent the potential impact of four epigenetic age measures on fish oil intake. No significant associations were observed.

				Effect Size (b	eta)	_
ariable	Method	# SNP	Beta (95% CI)			P-v
Oily Fish Inktake						
GrimAge	MR Egger	4	-0.09(-0.26 to 0.09)	•	<u> </u>	— 4.ž
GrimAge	IVW	4	-0.00(-0.02 to 0.01)		+	3.
Hannum	MR Egger	9	0.03(-0.03 to 0.09)		+	3.7
Hannum	IVW	9	0.00(-0.01 to 0.02)		+	8.5
IEAA	MR Egger	24	0.00(-0.01 to 0.01)		+	9.0
IEAA	IVW	24	0.00(-0.00 to 0.01)		•	7.6
PhenoAge	MR Egger	10	0.01(-0.00 to 0.03)		+	1.9
PhenoAge	IVW	10	0.00(-0.01 to 0.01)		+	8.8

Fig. 8S Reverse MR of Epigenetic Age Measures vs Oily Fish Intake. Beta coefficients and p-values used to depict the potential influence of four epigenetic age measures on oily fish intake. No significant associations were observed.

Variable	Method	# SNP	Beta (95% CI)		
Fish Oil Supplement					
C-Reactive Protein Level	MR Egger	53	0.00(-0.00 to 0.01)		
C-Reactive Protein Level	IVW	53	0.00(-0.00 to 0.01)		
C-Reactive Protein Level	MR Egger	28	0.01(-0.01 to 0.03)		
C-Reactive Protein Level	IVW	28	0.00(-0.01 to 0.01)		
HDL Cholesterol	MR Egger	32	-0.00(-0.01 to 0.01		
HDL Cholesterol	IVW	32	0.00(-0.01 to 0.01)		
LDL Cholesterol	MR Egger	41	0.01(-0.00 to 0.01)		
LDL Cholesterol	IVW	41	0.00(-0.00 to 0.01)		
Tryglycerides	MR Egger	37	0.00(-0.02 to 0.02)		
Tryglycerides	IVW	37	0.01(-0.00 to 0.02)		

Effect Size (beta)	
	P-value
-	2.86e-01
+	1.49e-01
•	2.77e-01
	8.54e-01
•	8.38e-01
-	7.51e-01
-	9.62e-02
-	1.27e-01
•	7.19e-01
+	2.87e-01
-0.01 0.00 0.01 0.02	

Fig. 9S Reverse MR of Blood Biomarkers vs Fish Oil Supplement. Beta coefficients and p-values illustrating the influence of blood biomarkers on fish oil supplementation. No significant associations found.

ole .	Method # SNP Beta (95% CI)	,
ish Inktake		
eactive Protein Level	rein Level MR Egger 53 -0.02(-0.06 1	0.01)
eactive Protein Level	rein Level IVW 53 -0.01(-0.03 1	0.02)
Cholesterol	MR Egger 32 0.01(-0.02 1	o 0.04)
Cholesterol	IVW 32 -0.00(-0.02 f	o 0.01)
lycerides	MR Egger 37 0.06(0.01 1	o 0.11)
Jlycerides	IVW 37 0.04(0.02 1	o 0.07)
Jlycerides	MR Egger 37 0.06(0.01 t	

Effect Size (beta)	
	P-value
•	1.41e-01
-	6.36e-01
	7.26e-01
-	6.46e-01
•	2.76e-02*
-	7.16e-04*
-0.04 0.00 0.04 0.08	

Fig. 10S Reverse MR of Blood Biomarkers vs Oily Fish Intake. Beta coefficients and p-values demonstrating the influence of blood biomarkers on oily fish intake. Significant reverse MR associations (p < 0.05) were found for LDL cholesterol and triglycerides on oily fish intake.