

**Supplemental Method 1.** Gut microbiota sequencing protocol, *Milieu Intérieur* study, France, 2012.

### ***DNA extraction***

DNA was extracted from stool samples using a Repeated Bead Beating Plus Column (RBB+C) method, as previously published (O'Cuiv et al. 2011; Yu et al. 2004). Briefly, cells lysis was achieved by bead beating in the presence of 4% (w/v) sodium dodecyl sulfate (SDS), 500mM NaCl, and 50mM EDTA. After bead beating, precipitation with ammonium acetate was achieved to remove most of the impurities as well as the SDS; and the nucleic acids were recovered by precipitation with isopropanol. During the last step, RNA and proteins were removed using sequential digestions with RNase and proteinase K respectively, and genomic DNA was purified using QIAamp columns (Qiagen). Finally, DNA quality and quantity were checked using NanoDrop and Qubit together with Broad Range assay.

### ***Barcoding Polymerase Chain Reaction (PCR)***

Barcoding PCR was carried out using indexed primers targeting the V3-V5 of the 16S rRNA gene as described by Kozich et al (Kozich et al. 2013) (forward primer: CCTACGGRAGGCAGCAG; reverse primer: GGACTACHVGGGTWTCTAAT). AccuPrime™ Pfx SuperMix (Invitrogen - 12344-040) was used to perform the PCR. PCR mix was made up of 18µL of AccuPrime™ Pfx SuperMix, 0.5µL of both V3-340F and V5-926R primers (0.2µM) and 1µL of DNA (10ng). PCR was carried out as follows: 95°C for 2min; 30 cycles of 95°C for 20sec; 55°C for 15sec; 72°C for 5min; and 72°C for 10min. PCR reaction was quantified using Qubit BR DNA assay kit. Equal amounts of each PCR reaction were pooled and thoroughly mixed. The amplicon pool was then loaded on an agarose gel (1.5%) and electrophoresis was run for 45min at 100V. The band corresponding to the 16S rDNA V3-V5 amplicon was extracted and purified using Qiaquick gel extraction kit (Qiagen-28704). The amplicon quantity and integrity were checked on agarose gel electrophoresis and Qubit BR DNA assay kit. Amplicon was stored at -20°C until use.

### **Sequencing**

16S rDNA amplicon library was sequenced at Institut Curie NGS platform on a MiSeq machine using the 2\*300 bp V3 kit.

### **Bioinformatics pipeline**

Reads were trimmed using sicle (Joshi et al. 2011) then error corrected using SPAdes (Bankevich et al. 2012), and merged using PEAR (Zhang et al. 2014). Reads were clustered at 97% of identity using vsearch pipeline (Rognes et al. 2016) to define Operational Taxonomic Units (OTU). Chimeric OTUs were identified using UCHIME (Edgar et al. 2011) and discarded from downstream analysis. Taxonomy of representative OTU sequences was determined using RDP SeqMatch and reference database RDP Release 11.3. OTU sequences were aligned using ssu-align (Nawrocki 2009). The phylogenetic tree was inferred from the OTUs multiple alignments using Fattree2 (Price et al. 2010).

### **Computation of microbial diversity indexes (Marcon 2016)**

Alpha-diversity indexes – which measure diversity in each sample – and Bray-Curtis dissimilarity matrix – which assesses how samples differ from each other ( $\beta$ -diversity) – were computed from the unrarefied OTU count table. Inferred  $\alpha$ -diversity indexes were observed richness (number of distinct species observed in each sample), Chao1 richness estimate (which estimates the number of unobserved species), and Simpson's diversity index (which corresponds to the probability that two randomly picked sequences belong to the same species).

### **Literature Cited**

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**Supplemental Table 1.** Associations between consumption of total, soluble and insoluble dietary fibers, and the risk of breast and prostate cancers

from multi-adjusted Cox proportional hazard models, NutriNet-Santé cohort, France, 2009-2019

	Total dietary fibers				Soluble fibers				Insoluble fibers				
	Tertile <sup>a</sup>	N (of which cases)	HR (95%CI) <sup>d</sup>	p-trend <sup>d</sup>	Tertile <sup>b</sup>	N (of which cases)	HR (95%CI) <sup>d</sup>	p-trend <sup>d</sup>	Tertile <sup>c</sup>	N (of which cases)	HR (95%CI) <sup>d</sup>	p-trend <sup>d</sup>	
<b>Model 1<sup>e</sup></b>	<b>Breast cancer<sup>j</sup></b>	T1	26,580 (171)	1.00		T1	26,580 (167)	1.00		T1	26,580 (186)	1.00	
		T2	26,581 (295)	1.13 (0.93–1.37)	0.9	T2	26,581 (279)	1.02 (0.84–1.25)	0.9	T2	26,581 (304)	1.15 (0.95–1.39)	0.5
		T3	26,581 (317)	1.01 (0.81–1.25)		T3	26,581 (337)	1.01 (0.82–1.24)		T3	26,581 (293)	0.96 (0.77–1.18)	
	<b>Prostate cancer<sup>k</sup></b>	T1	7179 (64)	1.00		T1	7179 (61)	1.00		T1	7179 (73)	1.00	
		T2	7179 (128)	1.17 (0.86–1.60)	0.8	T2	7179 (120)	0.98 (0.72–1.35)	0.8	T2	7179 (129)	1.23 (0.91–1.65)	0.7
		T3	7179 (131)	1.01 (0.71–1.43)		T3	7179 (142)	0.96 (0.69–1.33)		T3	7179 (121)	0.98 (0.70–1.37)	
<b>Model 2<sup>f</sup></b>	<b>Breast cancer<sup>j</sup></b>	T1	26,580 (171)	1.00		T1	26,580 (167)	1.00		T1	26,580 (186)	1.00	
		T2	26,581 (295)	1.13 (0.93–1.38)	0.9	T2	26,581 (279)	1.02 (0.84–1.24)	0.9	T2	26,581 (304)	1.16 (0.96–1.40)	0.5
		T3	26,581 (317)	1.01 (0.81–1.25)		T3	26,581 (337)	1.01 (0.82–1.24)		T3	26,581 (293)	0.96 (0.78–1.18)	
	<b>Prostate cancer<sup>k</sup></b>	T1	7179 (64)	1.00		T1	7179 (61)	1.00		T1	7179 (73)	1.00	
		T2	7179 (128)	1.18 (0.86–1.61)	0.9	T2	7179 (120)	0.99 (0.72–1.35)	0.8	T2	7179 (129)	1.23 (0.91–1.66)	0.7
		T3	7179 (131)	1.01 (0.71–1.44)		T3	7179 (142)	0.96 (0.69–1.34)		T3	7179 (121)	0.98 (0.70–1.37)	
<b>Model 3<sup>g</sup></b>	<b>Breast cancer<sup>j</sup></b>	T1	26,580 (171)	1.00		T1	26,580 (167)	1.00		T1	26,580 (186)	1.00	
		T2	26,581 (295)	1.16 (0.95–1.41)	0.6	T2	26,581 (279)	1.06 (0.87–1.29)	0.4	T2	26,581 (304)	1.17 (0.96–1.42)	0.8
		T3	26,581 (317)	1.08 (0.85–1.36)		T3	26,581 (337)	1.10 (0.88–1.38)		T3	26,581 (293)	0.99 (0.79–1.24)	
	<b>Prostate cancer<sup>k</sup></b>	T1	7179 (64)	1.00		T1	7179 (61)	1.00		T1	7179 (73)	1.00	
		T2	7179 (128)	1.14 (0.83–1.56)	0.6	T2	7179 (120)	0.96 (0.70–1.32)	0.5	T2	7179 (129)	1.20 (0.89–1.62)	0.5
		T3	7179 (131)	0.93 (0.63–1.36)		T3	7179 (142)	0.90 (0.63–1.29)		T3	7179 (121)	0.91 (0.64–1.31)	
<b>Model 4<sup>h</sup></b>	<b>Breast</b>	T1	26,580 (171)	1.00	0.5	T1	26,580 (167)	1.00	0.6	T1	26,580 (186)	1.00	0.3

<b>Model 5<sup>i</sup></b>	<b>cancer<sup>j</sup></b>	T2	26,581 (295)	1.10 (0.90–1.34)		T2	26,581 (279)	0.99 (0.82–1.21)		T2	26,581 (304)	1.13 (0.93–1.36)	
		T3	26,581 (317)	0.95 (0.76–1.19)		T3	26,581 (337)	0.95 (0.77–1.17)		T3	26,581 (293)	0.91 (0.73–1.13)	
	<b>Prostate cancer<sup>k</sup></b>	T1	7179 (64)	1.00		T1	7179 (61)	1.00		T1	7179 (73)	1.00	
		T2	7179 (128)	1.17 (0.85–1.60)	0.8	T2	7179 (120)	0.99 (0.72–1.36)	0.8	T2	7179 (129)	1.21 (0.90–1.64)	0.6
		T3	7179 (131)	0.98 (0.67–1.42)		T3	7179 (142)	0.95 (0.67–1.35)		T3	7179 (121)	0.94 (0.66–1.35)	
	<b>Breast cancer<sup>j</sup></b>	T1	26,580 (171)	1.00		T1	26,580 (167)	1.00		T1	26,580 (186)	1.00	
T2		26,581 (295)	1.03 (0.81–1.31)	0.2	T2	26,581 (279)	0.93 (0.73–1.18)	0.5	T2	26,581 (304)	1.03 (0.82–1.30)	0.09	
T3		26,581 (317)	0.88 (0.68–1.14)		T3	26,581 (337)	0.92 (0.72–1.17)		T3	26,581 (293)	0.82 (0.64–1.06)		
<b>Prostate cancer<sup>k</sup></b>	T1	7179 (64)	1.00		T1	7179 (61)	1.00		T1	7179 (73)	1.00		
	T2	7179 (128)	1.18 (0.80–1.75)	0.8	T2	7179 (120)	1.02 (0.69–1.53)	0.7	T2	7179 (129)	1.22 (0.84–1.77)	0.8	
	T3	7179 (131)	1.08 (0.70–1.67)		T3	7179 (142)	1.09 (0.72–1.64)		T3	7179 (121)	1.09 (0.72–1.65)		

CI, confidence interval; HR, hazard ratio

<sup>a</sup>Cut-offs for tertiles of TDF consumption were 18.2g.d<sup>-1</sup> and 24.2g.d<sup>-1</sup> for men (prostate cancer model) and 15.5g.d<sup>-1</sup> and 20.5g.d<sup>-1</sup> for women (breast cancer model).

<sup>b</sup>Cut-offs for tertiles of SF consumption were 5.0g.d<sup>-1</sup> and 7.4g.d<sup>-1</sup> for men (prostate cancer model) and 4.2g.d<sup>-1</sup> and 6.1g.d<sup>-1</sup> for women (breast cancer model).

<sup>c</sup>Cut-offs for tertiles of IF consumption were 12.8g.d<sup>-1</sup> and 17.1g.d<sup>-1</sup> for men (prostate cancer model) and 11.0g.d<sup>-1</sup> and 14.5g.d<sup>-1</sup> for women (breast cancer model).

<sup>d</sup>HR (95%CI) and p-value were computed for Cox proportional hazard model.

<sup>e</sup>Model 1 was adjusted for (timescale), sex, body-mass index, height, physical activity, smoking status, alcohol intake, energy intake, number of 24-hour dietary records, educational level, and family history of the chronic pathology of interest.

<sup>f</sup>Model 2 = Model 1 further adjusted for dyslipidemia and associated medical treatment, hypertriglyceridemia and associated medical treatment, hypertension and associated medical treatment. CVD and cancer models were also adjusted for T2D and T2D medical treatment.

<sup>g</sup>Model 3 = Model 1 further adjusted for saturated fat, sodium, and added sugar intakes.

<sup>h</sup>Model 4 = Model 1 further adjusted for vitamin C, vitamin E, zinc, selenium intakes.

<sup>i</sup>Model 5 = Model 1, carried out by excluding participants whose conditions were diagnosed or whose death occurred within 2 years after inclusion. Cancer models were also adjusted for height.

<sup>j</sup>Mean follow-up time for breast cancer was 5.8 years, with 435,186 person-years.

<sup>k</sup>Mean follow-up time for prostate cancer was 6.0y, with 120,200 person-years.

**Supplemental Table 2.** Associations between consumption of dietary fibers from different sources, and the risk of breast and prostate cancers from multi-adjusted Cox proportional hazard models, NutriNet-Santé cohort, France, 2009-2019

	Total dietary fibers from fruits			Total dietary fibers from vegetables			Total dietary fibers from whole grains			Total dietary fibers from legumes			Total dietary fibers from potatoes & tubers						
	Tertile <sup>a</sup>	N (of which cases)	HR (95%CI) <sup>f</sup>	p-trend <sup>f</sup>	Tertile <sup>b</sup>	N (of which cases)	HR (95%CI) <sup>f</sup>	p-trend <sup>f</sup>	Tertile <sup>c</sup>	N (of which cases)	HR (95%CI) <sup>f</sup>	p-trend <sup>f</sup>	Tertile <sup>d</sup>	N (of which cases)	HR (95%CI) <sup>f</sup>	p-trend <sup>f</sup>			
<b>Breast cancer<sup>g</sup></b>		26,580	1.00			26,580	1.00			26,667	1.00			44,634	1.00				
	T1	(172)			T1	(178)			T1	(219)			T1	(378)			T1	(223)	
	T2	(261)	0.92 (0.76–1.12)	0.8	T2	(290)	1.01 (0.84–1.23)	0.6	T2	(283)	0.93 (0.77–1.11)	0.06	T2	(96)	0.99 (0.79–1.25)	0.9	T2	(297)	1.02 (0.86–1.22)
<b>Prostate cancer<sup>h</sup></b>	T3	(350)	0.95 (0.78–1.16)		T3	(315)	0.96 (0.79–1.16)		T3	(281)	0.84 (0.70–1.01)		T3	(309)	1.01 (0.86–1.18)		T3	(263)	0.94 (0.78–1.13)
	T1	(48)	1.00		T1	(65)	1.00		T1	(75)	1.00		T1	(132)	1.00		T1	(76)	1.00
	T2	(115)	1.15 (0.81–1.61)	0.6	T2	(127)	1.14 (0.81–1.60)	0.9	T2	(120)	1.23 (0.92–1.65)	0.3	T2	(65)	1.25 (0.92–1.71)	0.9	T2	(129)	1.13 (0.85–1.51)
	T3	(160)	1.14 (0.81–1.60)		T3	(131)	1.11 (0.82–1.50)		T3	(128)	1.21 (0.90–1.61)		T3	(126)	1.02 (0.79–1.31)		T3	(118)	1.00 (0.75–1.35)

CI, confidence interval; HR, hazard ratio

<sup>a</sup>Cut-offs for sex-specific tertiles of TDF from fruits consumption were 2.1g.d<sup>-1</sup> and 4.6g.d<sup>-1</sup> for men and 2.0g.d<sup>-1</sup> and 4.1g.d<sup>-1</sup> for women.

<sup>b</sup>Cut-offs for sex-specific tertiles of TDF from vegetables consumption were 3.6g.d<sup>-1</sup> and 5.9g.d<sup>-1</sup> for men and 3.5g.d<sup>-1</sup> and 5.6g.d<sup>-1</sup> for women.

<sup>c</sup>Cut-offs for sex-specific tertiles of TDF from whole grains consumption were 0g.d<sup>-1</sup> and 2.3g.d<sup>-1</sup> for men and 0.3g.d<sup>-1</sup> and 2.1g.d<sup>-1</sup> for women.

<sup>d</sup>Cut-offs for sex-specific tertiles of TDF from legumes consumption were 0g.d<sup>-1</sup> and 0.6g.d<sup>-1</sup> for men and 0g.d<sup>-1</sup> 0.4g.d<sup>-1</sup> for women.

<sup>e</sup>Cut-offs for sex-specific tertiles of TDF from potatoes and tubers consumption were 0.5g.d<sup>-1</sup> and 1.2g.d<sup>-1</sup> for men and 0.4g.d<sup>-1</sup> 1.0g.d<sup>-1</sup> for women.

<sup>f</sup>HR (95%CI) and p-value were computed for Cox proportional hazard model, adjusted for age (timescale), sex, body-mass index, height, physical activity, smoking status, alcohol intake, energy intake, number of 24-hour dietary records, educational level, and family history cancer.

<sup>g</sup>Mean follow-up time for breast cancer was 5.8 years, with 435,186 person-years.

<sup>h</sup>Mean follow-up times for prostate cancer was 6.0y, with 120,200 person-years.

**Supplemental Table 3.** Sensitivity analyses for the associations between consumption of total, soluble and insoluble dietary fibers, and the risk of overall mortality, mortality attributed to chronic diseases, overall CVD, coronary heart diseases, cerebrovascular diseases, overall cancers, colorectal cancer, and type 2 diabetes from multi-adjusted Cox proportional hazard models, NutriNet-Santé cohort, France, 2009-2019.

		Total dietary fibers				Soluble fibers				Insoluble fibers				
		Tertile <sup>a</sup>	N (of which cases)	HR (95%CI) <sup>d</sup>	p-trend <sup>d</sup>	Tertile <sup>b</sup>	N (of which cases)	HR (95%CI) <sup>d</sup>	p-trend <sup>d</sup>	Tertile <sup>c</sup>	N (of which cases)	HR (95%CI) <sup>d</sup>	p-trend <sup>d</sup>	
<b>Model 2<sup>e</sup></b>	Mortality from chronic diseases <sup>i</sup>	T1	35,791 (194)	1.00	0.003	T1	35,791 (174)	1.00	0.003	T1	35,791 (216)	1.00	0.0004	
		T2	35,793 (195)	0.79 (0.64–0.98)		T2	35,793 (204)	0.83 (0.67–1.02)		T2	35,793 (186)	0.76 (0.62–0.93)		
		T3	35,793 (191)	0.70 (0.55–0.88)		T3	35,793 (202)	0.71 (0.57–0.89)		T3	35,793 (178)	0.66 (0.52–0.83)		
	Overall cardiovascular diseases <sup>j</sup>	T1	34,934 (479)	1.00	0.1	T1	34,934 (463)	1.00	0.01	T1	34,934 (512)	1.00	1.0	
		T2	34,936 (740)	1.04 (0.92–1.18)		T2	34,936 (727)	0.97 (0.86–1.09)		T2	34,936 (710)	1.05 (0.93–1.18)		
		T3	34,935 (733)	0.91 (0.80–1.05)		T3	34,935 (762)	0.86 (0.75–0.98)		T3	34,935 (730)	1.00 (0.88–1.14)		
	Coronary heart diseases <sup>j</sup>	T1	34,934 (302)	1.00	0.5	T1	34,934 (296)	1.00	0.007	T1	34,934 (314)	1.00	0.5	
		T2	34,936 (455)	1.05 (0.90–1.22)		T2	34,936 (468)	0.98 (0.84–1.14)		T2	34,936 (449)	1.12 (0.96–1.30)		
		T3	34,935 (462)	0.96 (0.81–1.14)		T3	34,935 (455)	0.81 (0.69–0.96)		T3	34,935 (456)	1.07 (0.91–1.27)		
	Cerebrovascular diseases <sup>j</sup>	T1	34,934 (209)	1.00	0.1	T1	34,934 (197)	1.00	0.8	T1	34,934 (235)	1.00	0.3	
		T2	34,936 (341)	1.04 (0.87–1.25)		T2	34,936 (304)	0.93 (0.77–1.12)		T2	34,936 (315)	0.96 (0.8–1.14)		
		T3	34,935 (328)	0.86 (0.70–1.06)		T3	34,935 (377)	0.96 (0.80–1.17)		T3	34,935 (328)	0.90 (0.74–1.10)		
	Overall cancers <sup>k</sup>	T1	33,759 (591)	1.00	1.0	T1	33,759 (571)	1.00	0.6	T1	33,759 (643)	1.00	0.8	
		T2	33,760 (914)	1.06 (0.95–1.18)		T2	33,760 (883)	0.97 (0.87–1.08)		T2	33,760 (916)	1.08 (0.97–1.19)		
		T3	33,760 (998)	1.01 (0.90–1.14)		T3	33,760 (1049)	0.97 (0.86–1.08)		T3	33,760 (944)	0.99 (0.89–1.12)		
	Colorectal cancer <sup>k</sup>	T1	33,759 (44)	1.00	0.1	T1	33,759 (45)	1.00	0.04	T1	33,759 (52)	1.00	0.1	
		T2	33,760 (77)	1.12 (0.76–1.65)		T2	33,760 (70)	0.86 (0.59–1.27)		T2	33,760 (72)	1.01 (0.69–1.46)		
		T3	33,760 (61)	0.74 (0.47–1.16)		T3	33,760 (67)	0.66 (0.44–1.00)		T3	33,760 (58)	0.71 (0.46–1.08)		
	Type 2–diabetes <sup>l</sup>	T1	34,901 (226)	1.00	0.02	T1	34,901 (210)	1.00	0.003	T1	34,901 (258)	1.00	0.004	
		T2	34,903 (292)	0.86 (0.72–1.03)		T2	34,903 (305)	0.87 (0.73–1.05)		T2	34,903 (273)	0.79 (0.66–0.94)		
		T3	34,903 (303)	0.79 (0.64–0.96)		T3	34,903 (306)	0.75 (0.61–0.91)		T3	34,903 (290)	0.74 (0.61–0.91)		
	<b>Model 3<sup>f</sup></b>	Chronic–disease related mortality <sup>i</sup>	T1	35,791 (194)	1.00	0.04	T1	35,791 (174)	1.00	0.04	T1	35,791 (216)	1.00	0.004
			T2	35,793 (195)	0.80 (0.64–1.00)		T2	35,793 (204)	0.86 (0.69–1.06)		T2	35,793 (186)	0.76 (0.61–0.94)	
			T3	35,793 (191)	0.73 (0.55–0.98)		T3	35,793 (202)	0.77 (0.59–0.99)		T3	35,793 (178)	0.66 (0.50–0.88)	



<b>Model 4<sup>e</sup></b>	Overall cardiovascular diseases <sup>j</sup>	T1	34,934 (479)	1.00	0.4	T1	34,934 (463)	1.00	0.06	T1	34,934 (512)	1.00	0.6
		T2	34,936 (740)	1.05 (0.93–1.19)		T2	34,936 (727)	0.98 (0.87–1.11)		T2	34,936 (710)	1.06 (0.94–1.20)	
		T3	34,935 (733)	0.94 (0.81–1.09)		T3	34,935 (762)	0.88 (0.76–1.01)		T3	34,935 (730)	1.05 (0.91–1.20)	
	Coronary heart diseases <sup>j</sup>	T1	34,934 (302)	1.00	1.0	T1	34,934 (296)	1.00	0.02	T1	34,934 (314)	1.00	0.2
		T2	34,936 (455)	1.06 (0.91–1.24)		T2	34,936 (468)	1.00 (0.85–1.16)		T2	34,936 (449)	1.13 (0.97–1.32)	
		T3	34,935 (462)	1.01 (0.83–1.21)		T3	34,935 (455)	0.82 (0.69–0.99)		T3	34,935 (456)	1.13 (0.95–1.35)	
	Cerebrovascular diseases <sup>j</sup>	T1	34,934 (209)	1.00	0.2	T1	34,934 (197)	1.00	0.7	T1	34,934 (235)	1.00	0.5
		T2	34,936 (341)	1.05 (0.87–1.26)		T2	34,936 (304)	0.96 (0.79–1.15)		T2	34,936 (315)	0.97 (0.81–1.16)	
		T3	34,935 (328)	0.89 (0.71–1.11)		T3	34,935 (377)	1.03 (0.84–1.28)		T3	34,935 (328)	0.94 (0.76–1.15)	
	Overall cancers <sup>k</sup>	T1	33,759 (591)	1.00	0.9	T1	33,759 (571)	1.00	0.7	T1	33,759 (643)	1.00	0.7
		T2	33,760 (914)	1.06 (0.95–1.18)		T2	33,760 (883)	0.97 (0.87–1.08)		T2	33,760 (916)	1.07 (0.96–1.19)	
		T3	33,760 (998)	1.00 (0.88–1.14)		T3	33,760 (1049)	0.97 (0.86–1.10)		T3	33,760 (944)	0.98 (0.87–1.11)	
	Colorectal cancer <sup>k</sup>	T1	33,759 (44)	1.00	0.2	T1	33,759 (45)	1.00	0.07	T1	33,759 (52)	1.00	0.2
		T2	33,760 (77)	1.13 (0.76–1.68)		T2	33,760 (70)	0.86 (0.58–1.28)		T2	33,760 (72)	1.02 (0.70–1.49)	
		T3	33,760 (61)	0.76 (0.46–1.24)		T3	33,760 (67)	0.66 (0.42–1.05)		T3	33,760 (58)	0.73 (0.46–1.16)	
	Type 2–diabetes <sup>l</sup>	T1	34,901 (226)	1.00	0.001	T1	34,901 (210)	1.00	<0.0001	T1	34,901 (258)	1.00	0.0003
		T2	34,903 (292)	0.81 (0.67–0.98)		T2	34,903 (305)	0.83 (0.69–1.00)		T2	34,903 (273)	0.76 (0.63–0.90)	
		T3	34,903 (303)	0.69 (0.55–0.86)		T3	34,903 (306)	0.64 (0.52–0.80)		T3	34,903 (290)	0.67 (0.55–0.83)	
	Chronic–disease related mortality <sup>i</sup>	T1	35,791 (194)	1.00	0.0002	T1	35,791 (174)	1.00	0.0003	T1	35,791 (216)	1.00	<0.0001
		T2	35,793 (195)	0.76 (0.61–0.93)		T2	35,793 (204)	0.81 (0.65–0.995)		T2	35,793 (186)	0.72 (0.59–0.89)	
		T3	35,793 (191)	0.62 (0.49–0.80)		T3	35,793 (202)	0.65 (0.51–0.82)		T3	35,793 (178)	0.59 (0.46–0.75)	
	Overall cardiovascular diseases <sup>j</sup>	T1	34,934 (479)	1.00	0.1	T1	34,934 (463)	1.00	0.02	T1	34,934 (512)	1.00	1.0
		T2	34,936 (740)	1.04 (0.92–1.17)		T2	34,936 (727)	0.97 (0.86–1.10)		T2	34,936 (710)	1.05 (0.93–1.18)	
		T3	34,935 (733)	0.90 (0.78–1.05)		T3	34,935 (762)	0.85 (0.74–0.98)		T3	34,935 (730)	1.00 (0.87–1.15)	
	Coronary heart diseases <sup>j</sup>	T1	34,934 (302)	1.00	0.3	T1	34,934 (296)	1.00	0.003	T1	34,934 (314)	1.00	0.8
		T2	34,936 (455)	1.03 (0.88–1.20)		T2	34,936 (468)	0.92 (0.76–1.10)		T2	34,936 (449)	1.10 (0.95–1.28)	
		T3	34,935 (462)	0.92 (0.76–1.10)		T3	34,935 (455)	0.98 (0.84–1.14)		T3	34,935 (456)	1.04 (0.87–1.24)	
Cerebrovascular diseases <sup>j</sup>	T1	34,934 (209)	1.00	0.3	T1	34,934 (197)	1.00	0.7	T1	34,934 (235)	1.00	0.6	
	T2	34,936 (341)	1.05 (0.88–1.27)		T2	34,936 (304)	0.95 (0.79–1.15)		T2	34,936 (315)	0.97 (0.81–1.16)		
	T3	34,935 (328)	0.90 (0.72–1.12)		T3	34,935 (377)	1.03 (0.83–1.26)		T3	34,935 (328)	0.95 (0.77–1.16)		
Overall cancers <sup>k</sup>	T1	33,759 (591)	1.00	0.5	T1	33,759 (571)	1.00	0.3	T1	33,759 (643)	1.00	0.4	
	T2	33,760 (914)	1.04 (0.93–1.16)		T2	33,760 (883)	0.96 (0.86–1.07)		T2	33,760 (916)	1.06 (0.95–1.17)		
	T3	33,760 (998)	0.97 (0.86–1.10)		T3	33,760 (1049)	0.93 (0.83–1.05)		T3	33,760 (944)	0.96 (0.85–1.09)		

<b>Model 5<sup>h</sup></b>	Colorectal cancer <sup>k</sup>	T1	33,759 (44)	1.00	0.3	T1	33,759 (45)	1.00	0.09	T1	33,759 (52)	1.00	0.2
		T2	33,760 (77)	1.15 (0.77–1.70)		T2	33,760 (70)	0.88 (0.60–1.31)		T2	33,760 (72)	1.03 (0.70–1.50)	
		T3	33,760 (61)	0.78 (0.48–1.27)		T3	33,760 (67)	0.69 (0.44–1.08)		T3	33,760 (58)	0.74 (0.47–1.17)	
	Type 2–diabetes <sup>l</sup>	T1	34,901 (226)	1.00	0.002	T1	34,901 (210)	1.00	0.0009	T1	34,901 (258)	1.00	0.0001
		T2	34,903 (292)	0.82 (0.68–0.99)		T2	34,903 (305)	0.88 (0.73–1.05)		T2	34,903 (273)	0.75 (0.62–0.89)	
		T3	34,903 (303)	0.71 (0.57–0.88)		T3	34,903 (306)	0.71 (0.57–0.87)		T3	34,903 (290)	0.66 (0.54–0.81)	
	Chronic–disease related mortality <sup>i</sup>	T1	35,791 (194)	1.00	0.01	T1	35,791 (174)	1.00	0.09	T1	35,791 (216)	1.00	0.0006
		T2	35,793 (195)	0.71 (0.55–0.91)		T2	35,793 (204)	0.89 (0.69–1.15)		T2	35,793 (186)	0.74 (0.58–0.95)	
		T3	35,793 (191)	0.69 (0.52–0.91)		T3	35,793 (202)	0.79 (0.60–1.04)		T3	35,793 (178)	0.62 (0.47–0.81)	
	Overall cardiovascular diseases <sup>j</sup>	T1	34,934 (479)	1.00	0.04	T1	34,934 (463)	1.00	0.002	T1	34,934 (512)	1.00	0.6
		T2	34,936 (740)	1.04 (0.90–1.19)		T2	34,936 (727)	0.91 (0.79–1.04)		T2	34,936 (710)	1.04 (0.91–1.18)	
		T3	34,935 (733)	0.87 (0.75–1.01)		T3	34,935 (762)	0.80 (0.69–0.92)		T3	34,935 (730)	0.97 (0.84–1.13)	
	Coronary heart diseases <sup>j</sup>	T1	34,934 (302)	1.00	0.3	T1	34,934 (296)	1.00	0.0007	T1	34,934 (314)	1.00	0.6
		T2	34,936 (455)	1.08 (0.91–1.29)		T2	34,936 (468)	0.89 (0.75–1.06)		T2	34,936 (449)	1.14 (0.96–1.35)	
		T3	34,935 (462)	0.92 (0.75–1.11)		T3	34,935 (455)	0.73 (0.61–0.88)		T3	34,935 (456)	1.07 (0.88–1.29)	
	Cerebrovascular diseases <sup>j</sup>	T1	34,934 (209)	1.00	0.09	T1	34,934 (197)	1.00	0.6	T1	34,934 (235)	1.00	0.2
		T2	34,936 (341)	1.02 (0.84–1.24)		T2	34,936 (304)	0.91 (0.74–1.11)		T2	34,936 (315)	0.96 (0.79–1.16)	
		T3	34,935 (328)	0.84 (0.68–1.05)		T3	34,935 (377)	0.94 (0.76–1.15)		T3	34,935 (328)	0.88 (0.71–1.09)	
	Overall cancers <sup>l</sup>	T1	33,759 (591)	1.00	0.5	T1	33,759 (571)	1.00	0.7	T1	33,759 (643)	1.00	0.4
		T2	33,760 (914)	1.03 (0.90–1.18)		T2	33,760 (883)	0.98 (0.86–1.12)		T2	33,760 (916)	1.02 (0.90–1.16)	
		T3	33,760 (998)	0.97 (0.84–1.11)		T3	33,760 (1049)	0.97 (0.84–1.11)		T3	33,760 (944)	0.95 (0.83–1.10)	
	Colorectal cancer <sup>l</sup>	T1	33,759 (44)	1.00	0.06	T1	33,759 (45)	1.00	0.01	T1	33,759 (52)	1.00	0.1
		T2	33,760 (77)	0.95 (0.60–1.51)		T2	33,760 (70)	0.76 (0.48–1.19)		T2	33,760 (72)	0.86 (0.55–1.35)	
		T3	33,760 (61)	0.62 (0.36–1.05)		T3	33,760 (67)	0.55 (0.33–0.90)		T3	33,760 (58)	0.66 (0.40–1.10)	
	Type 2–diabetes <sup>l</sup>	T1	34,901 (226)	1.00	0.0004	T1	34,901 (210)	1.00	<0.0001	T1	34,901 (258)	1.00	<0.0001
		T2	34,903 (292)	0.85 (0.68–1.06)		T2	34,903 (305)	0.83 (0.67–1.04)		T2	34,903 (273)	0.77 (0.62–0.96)	
		T3	34,903 (303)	0.64 (0.50–0.82)		T3	34,903 (306)	0.61 (0.48–0.78)		T3	34,903 (290)	0.58 (0.46–0.75)	

CI, confidence interval; HR, hazard ratio

<sup>a</sup>Cut-offs for sex-specific tertiles of TDF consumption were 18.2g.d<sup>-1</sup> and 24.2g.d<sup>-1</sup> for men and 15.5g.d<sup>-1</sup> 20.5g.d<sup>-1</sup> for women.

<sup>b</sup>Cut-offs for sex-specific tertiles of SF consumption were 5.0g.d<sup>-1</sup> and 7.4g.d<sup>-1</sup> for men and 4.2g.d<sup>-1</sup> 6.1g.d<sup>-1</sup> for women.

<sup>c</sup>Cut-offs for sex-specific tertiles of IF consumption were 12.8g.d<sup>-1</sup> and 17.1g.d<sup>-1</sup> for men and 11.0g.d<sup>-1</sup> 14.6g.d<sup>-1</sup> for women.

<sup>d</sup>HR (95%CI) and p-value were computed for Cox proportional hazard model.

<sup>e</sup>Model 2: adjusted for age (timescale), sex, body-mass index, physical activity, smoking status, alcohol intake, energy intake, number of 24-hour dietary records, educational level, and family history of the chronic pathology of interest (CVD, cancer, or T2D) for pathology models or family history of CVD and cancer for mortality models (model 1) + dyslipidemia and associated medical treatment, hypertriglyceridemia and associated medical treatment, hypertension and associated medical treatment. Mortality, CVD, and cancer models were also adjusted for T2D and T2D medical treatment. Cancer models were also adjusted for height.

<sup>f</sup>Model 3: model 1 + saturated fat, sodium, and added sugar intakes. Cancer models were also adjusted for height.

<sup>g</sup>Model 4: model 1 + intakes of vitamin C, vitamin E, selenium, and zinc. Cancer models were also adjusted for height.

<sup>h</sup>Model 5 was adjusted for model 1 + was carried out by excluding participants whose conditions were diagnosed or whose death occurred within 2 years after inclusion. Cancer models were also adjusted for height.

<sup>i</sup>Mean follow-up time for mortality was 6.3 years, with 616,427 person-years.

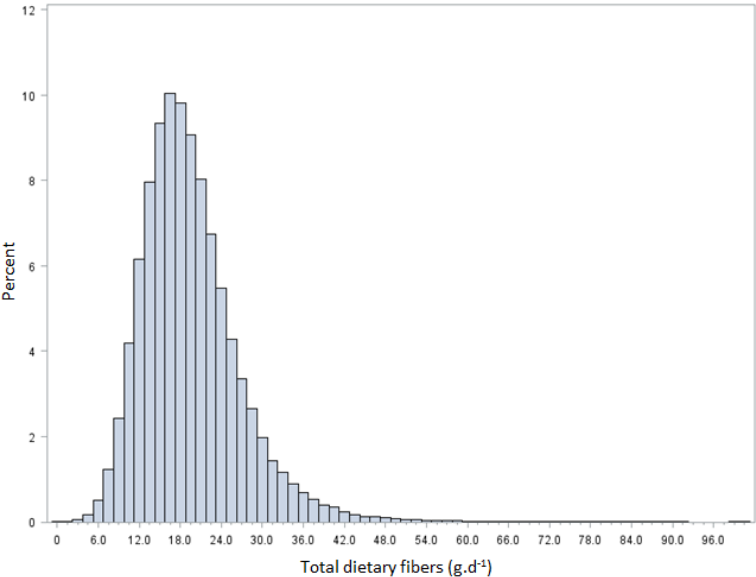
<sup>j</sup>Mean follow-up times for overall cardiovascular diseases, coronary heart diseases and cerebrovascular diseases were all equal to 6.0y. Person-years were 579,099, 581,374, and 582,790 respectively.

<sup>k</sup>Mean follow-up times for overall cancers and colorectal cancer was 6.0y. Person-years was 579,099.

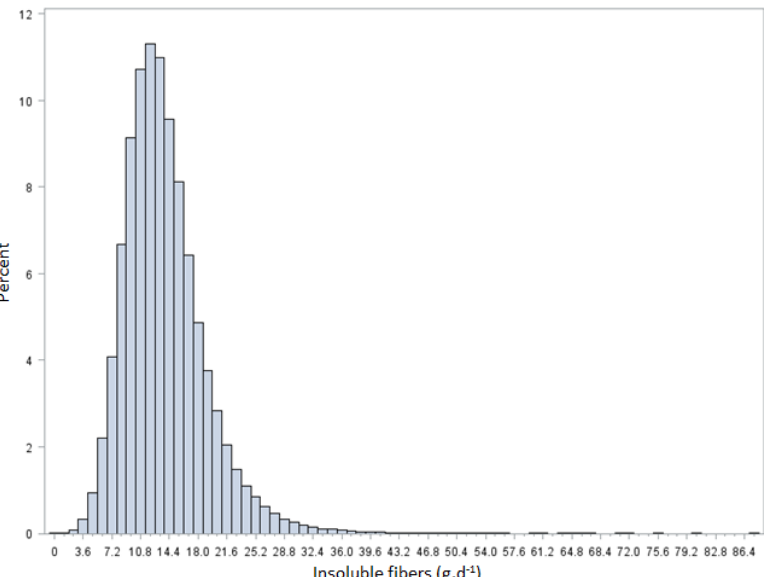
<sup>l</sup>Mean follow-up times for type 2-diabetes was 6.0y. Person-years was 582,237.

**Supplemental Figure 1.** Distributions of the consumption of total dietary fibers (A), insoluble fibers (B), and soluble fibers (C) in  $\text{g}\cdot\text{d}^{-1}$  in the study sample ( $N=107,377$ ), NutriNet-Santé cohort, France, 2009-2019.

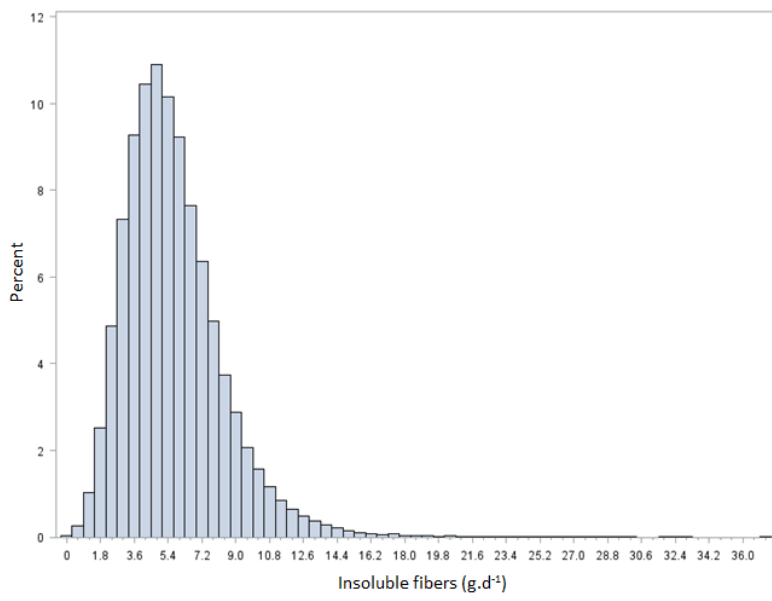
(A)



(B)



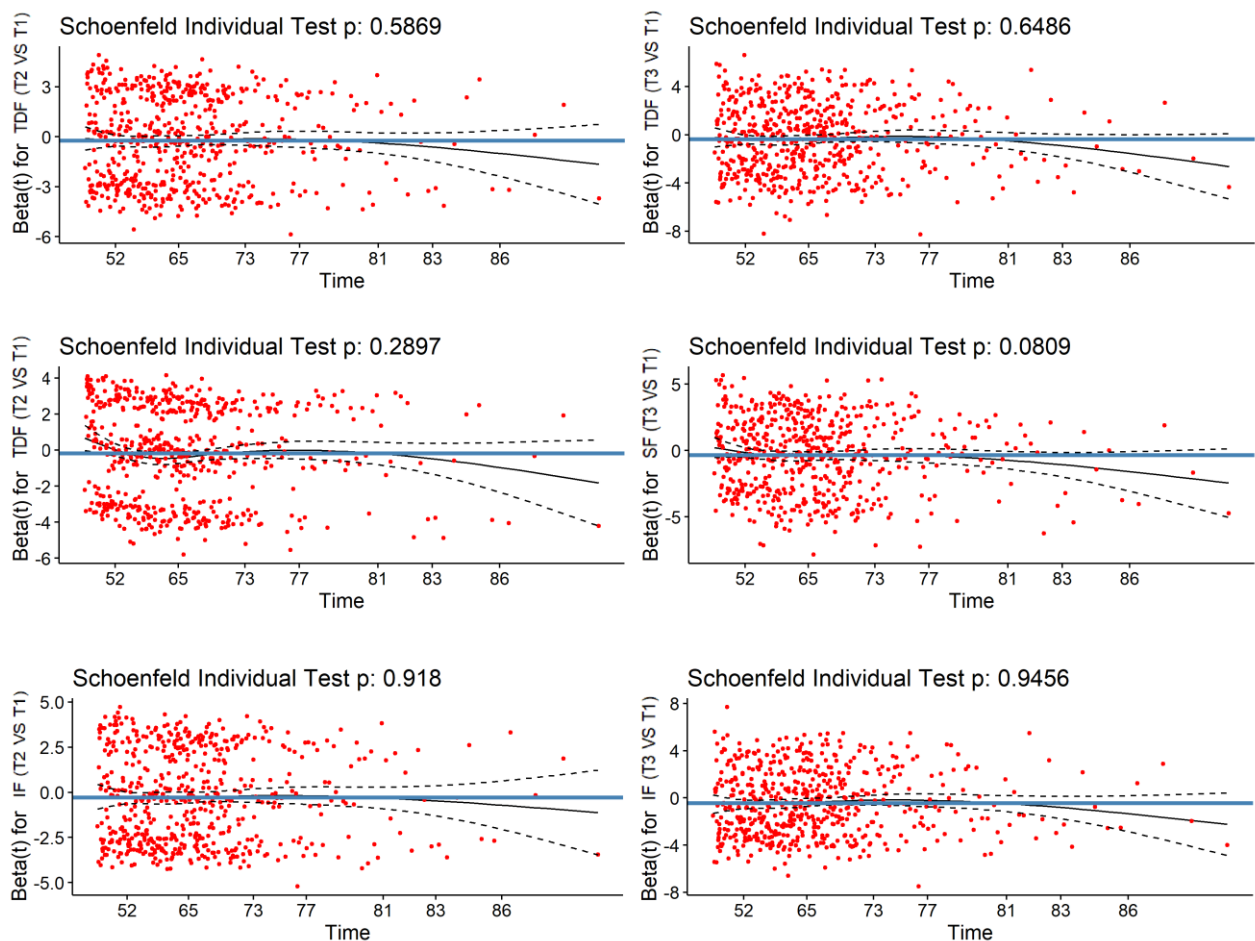
(C)



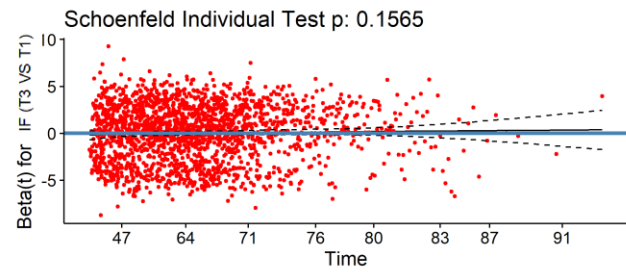
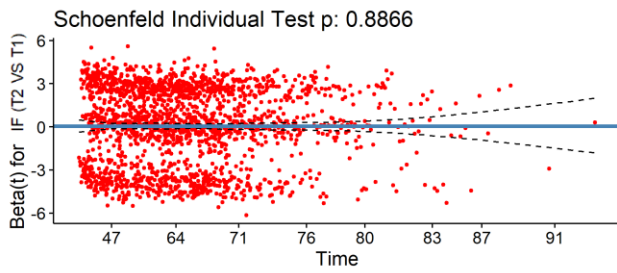
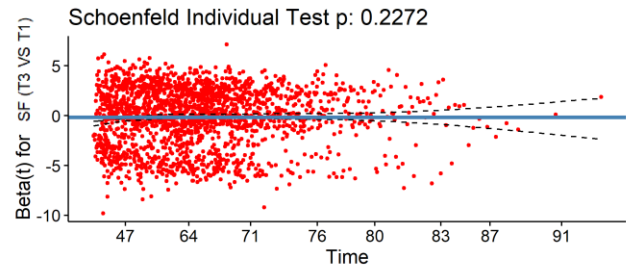
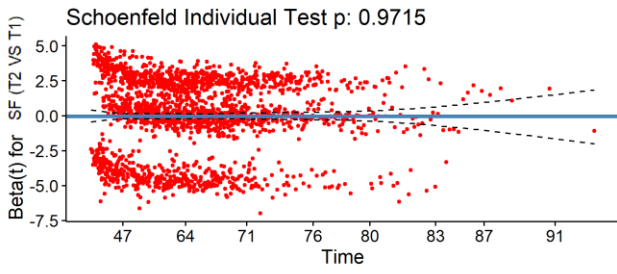
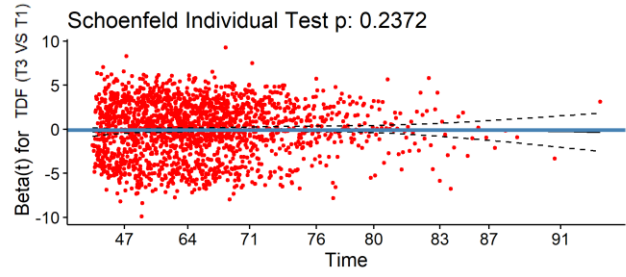
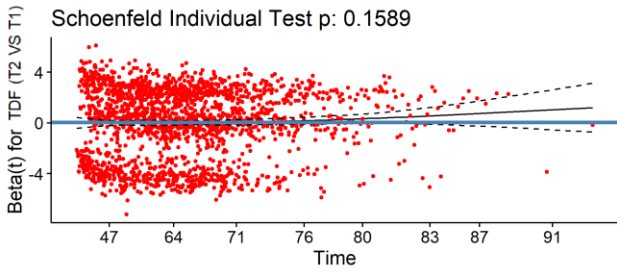
**Supplemental Figure 2.** Scaled Schoenfeld residuals for the DF variables in the (A) mortality, (B) cardiovascular disease, (C) coronary heart disease, (D) cerebrovascular disease, (E) global cancer, (F) colorectal cancer, (G) breast cancer, (H) prostate cancer models, NutriNet-Santé cohort, France, 2009-2019.

The solid black and the dashed black curves represent the smooth curve and its 95% confidence interval, respectively. For comparison purpose, the estimated coefficient is showed as a solid blue line.

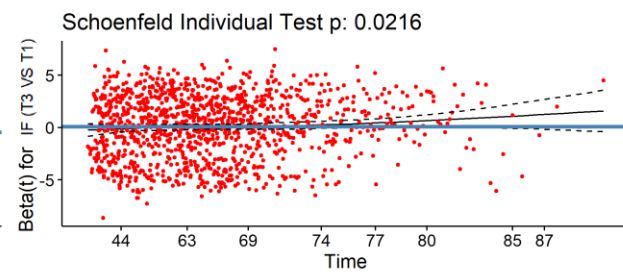
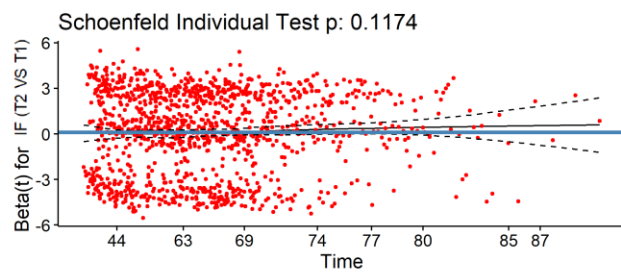
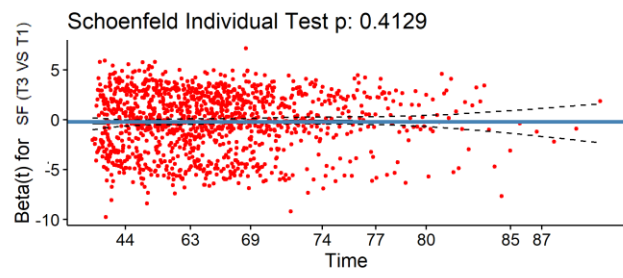
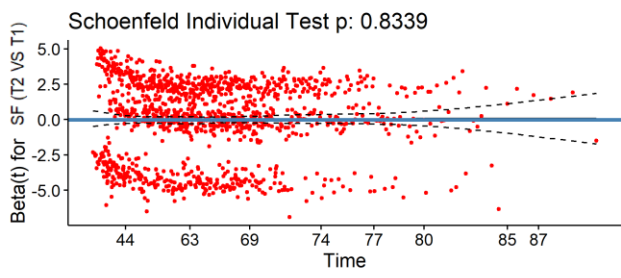
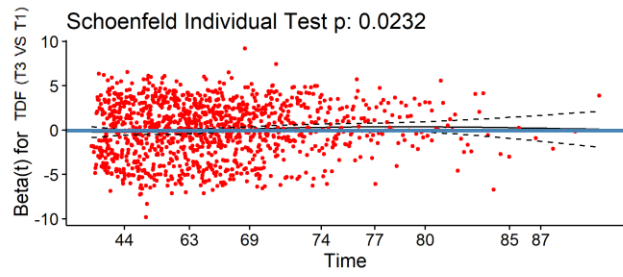
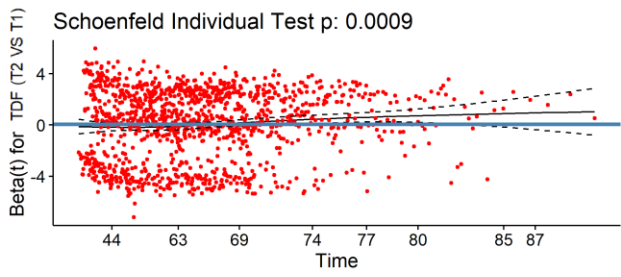
(A)



(B)

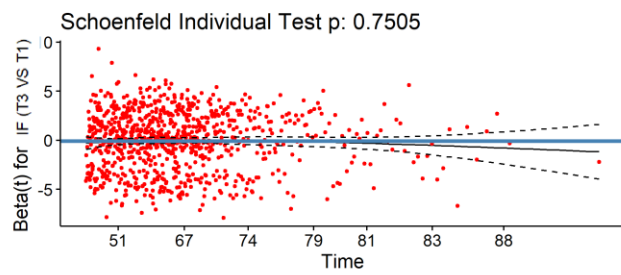
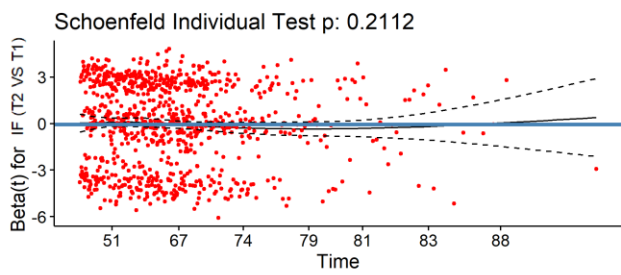
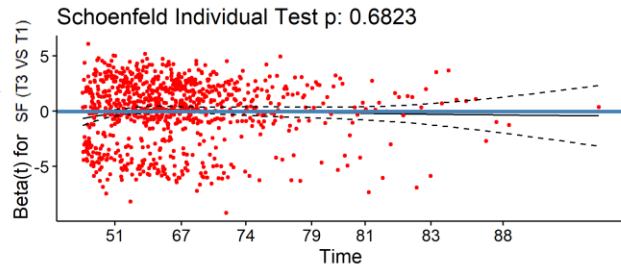
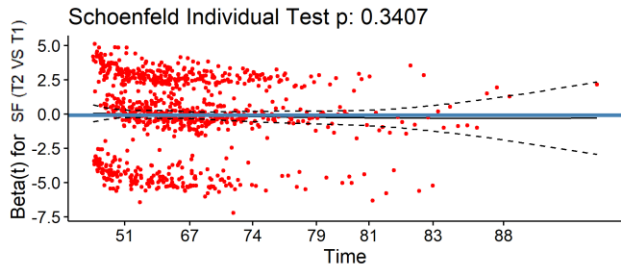
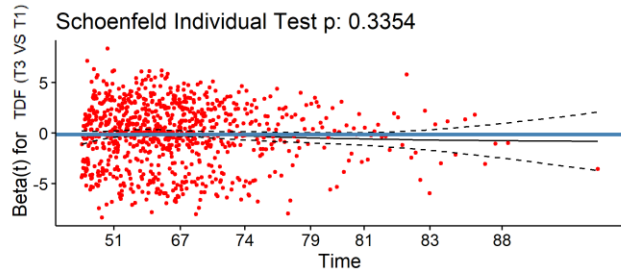
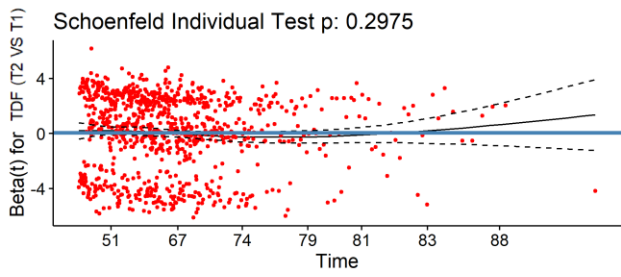


(C)

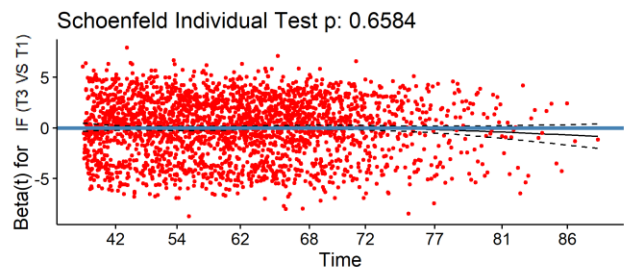
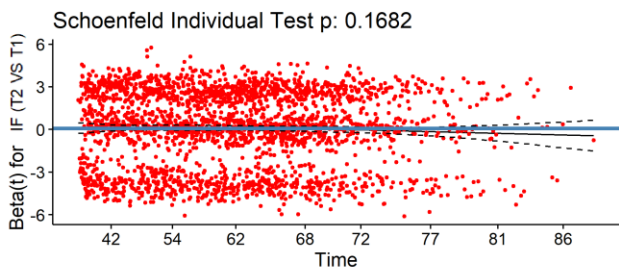
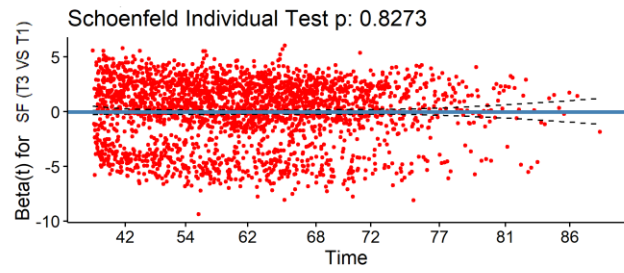
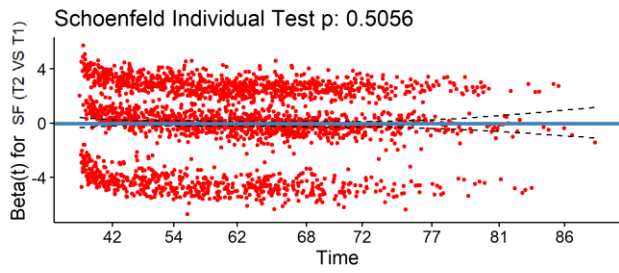
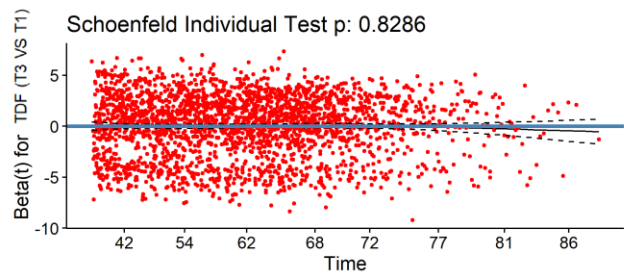
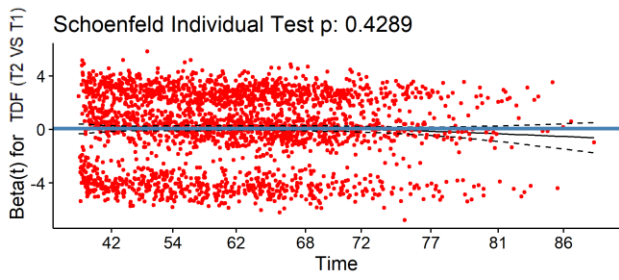




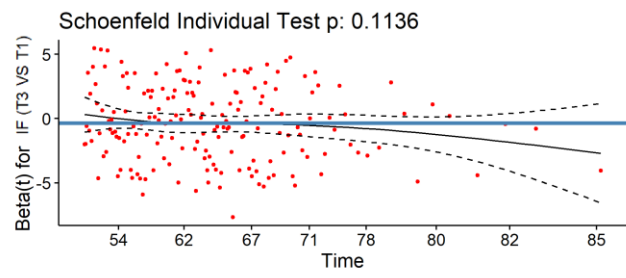
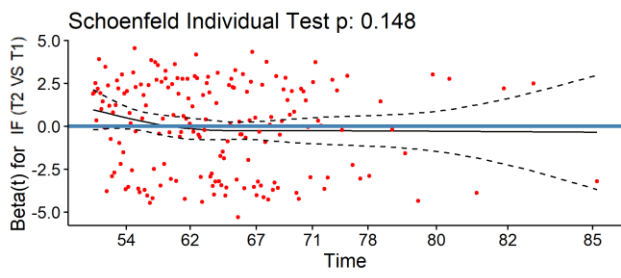
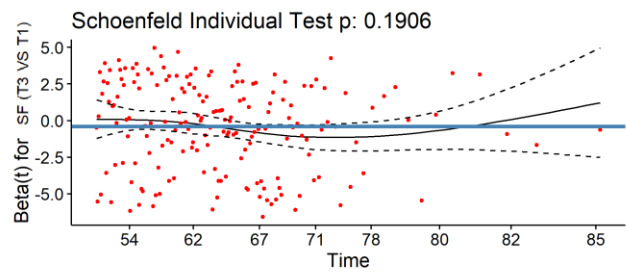
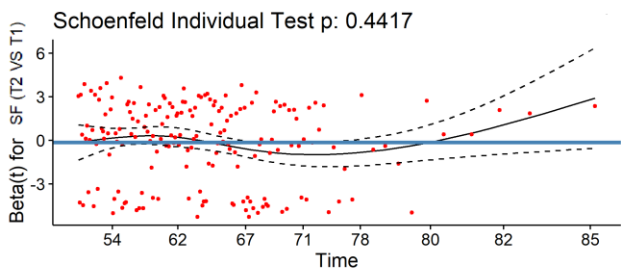
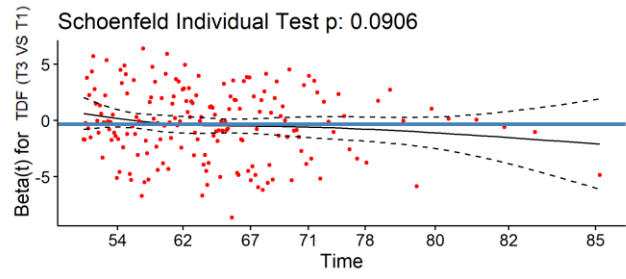
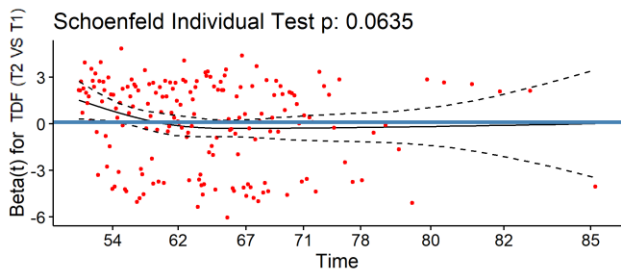
(D)



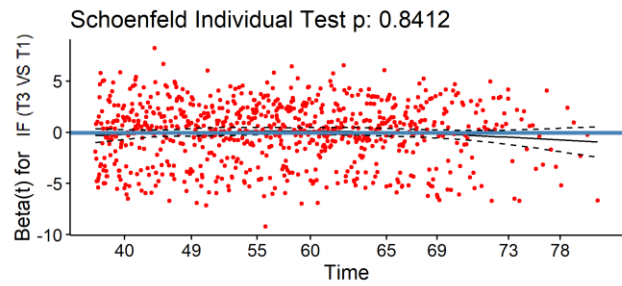
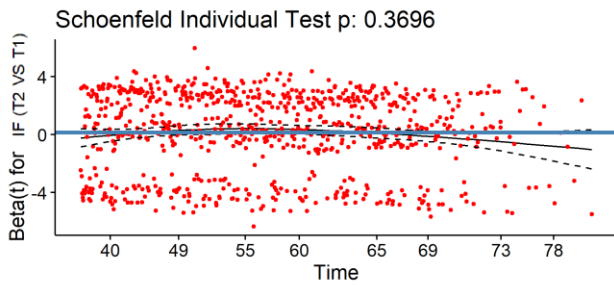
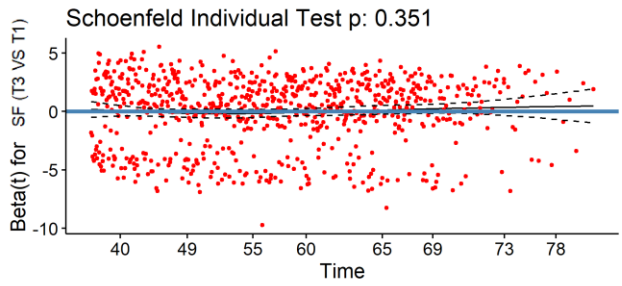
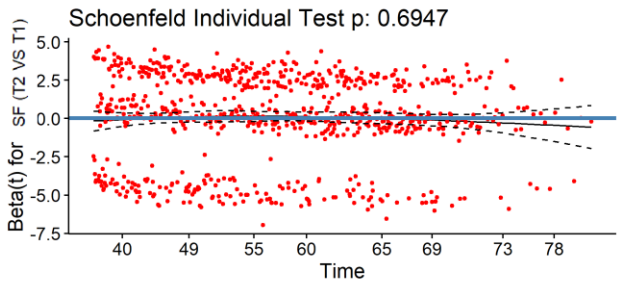
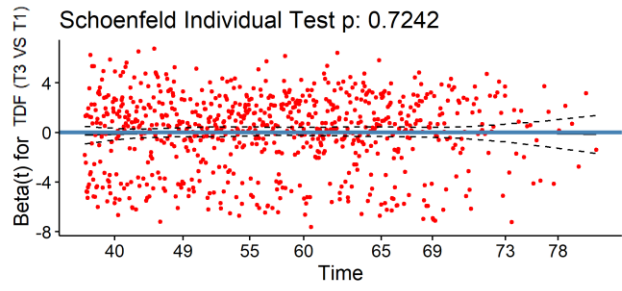
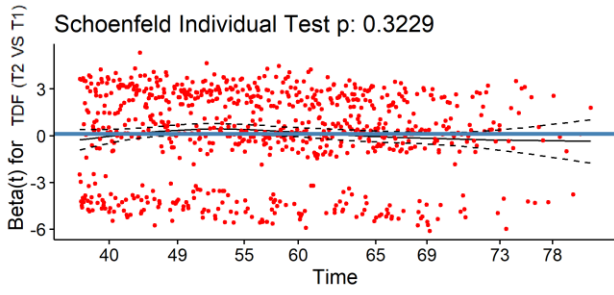
(E)



(F)



(G)



(H)

