SUPPLEMENTAL MATERIAL

Adherence to the 2018 World Cancer Research Fund/American Institute for Cancer Research cancer prevention recommendations and pancreatic cancer incidence and mortality: a prospective cohort study

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Supplemental Table 1. The 2018 WCRF/AICR recommendations for cancer prevention and adherence score construction in the Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial

WCRF/AICR recommendations	Baseline data	Operationalization	Score	Number of
				participants (%)
Be a healthy weight	BMI (kg/m^2)	18.5–24.9	1	32350 (33.7)
		25.0–29.9	0.5	40977 (42.7)
		<18.5 or ≥30.0	0	22635 (23.6)
Be physically active	Moderate to vigorous physical	≥150	1	31539 (32.9)
	activity (min/week)	75 to <150	0.5	20916 (21.8)
		<75	0	43507 (45.3)
Eat a diet rich in whole grains,	Fruits and vegetables (g/day)	≥400	1	62265 (64.9)
vegetables, fruit, and beans		200 to <400	0.5	26657 (27.8)
		<200	0	7040 (7.3)
	Dietary fiber (g/day)	≥30	1	8209 (8.6)
		15 to <30	0.5	48168 (50.2)
		<15	0	39585 (41.3)
Limit consumption of "fast foods"	Ultra-processed foods (g/day)	Tertile 1: ≤142.9	1	31991 (33.4)
and other processed		Tertile 2: 143.0–233.9	0.5	31985 (33.3)
foods high in fat, starches or sugars		Tertile 3: ≥234.0	0	31986 (34.8)
Limit consumption of red and	Red meat and processed meat	Red meat <500 and processed meat <21	1	69636 (72.6)
processed meat	(g/week)	Red meat <500 and processed meat 21 to <100	0.5	25667 (26.7)
		Red meat \geq 500 or processed meat \geq 100	0	659 (0.7)
Limit consumption of	Fruit or vegetable drinks and soft	0	1	11713 (12.2)
sugar-sweetened drinks	drinks (g/day)	>0 to ≤250	0.5	64780 (67.5)
		>250	0	19469 (20.3)

Limit alcohol consumption	Alcohol intake (g/day)	0	1	24171 (25.2)
		>0 to \leq 28 for males and \leq 14 for females	0.5	59666 (62.2)
		>28 for males and >14 for females	0	12125 (12.6)
For mothers: breastfeed your baby,	Cumulative	≥6	1	15515 (16.2)
if you can	duration of exclusive breastfeeding (<6	0.5	13399 (14.0)
	months)	0	0	67048 (69.9)

Supplemental Table 2. Hazard ratios of the association between WCRF/AICR score and pancreatic cancer incidence in 77557 participants with complete data

Tertiles of WCRF/AICR score	Number of	Person-years	Incidence/10000	Hazard ratio (95% confidence interval)		
(range)	cases		person-years	Unadjusted	Model 1 ^a	Model 2 ^b
Overall WCRF/AICR score						
Tertile 1 (0.50–3.75)	91	167562.2	5.43	1.00 (reference)	1.00 (reference)	1.00 (reference)
Tertile 2 (4.00–4.75)	103	246089.1	4.19	0.77 (0.58, 1.02)	0.76 (0.57, 1.02)	0.76 (0.57, 1.02)
Tertile 3 (5.00–8.00)	83	277480.1	2.99	0.55 (0.41, 0.74)	0.56 (0.40, 0.78)	0.56 (0.40, 0.77)
$P_{ m trend}$				< 0.0001	0.0005	0.0005
Continuous (1-ponit increment)	277	691131.4	4.01	0.81 (0.72, 0.91)	0.81 (0.71, 0.93)	0.81 (0.71, 0.93)
Dietary WCRF/AICR score						
Tertile 1 (0.50–2.75)	86	196342.0	4.38	1.00 (reference)	1.00 (reference)	1.00 (reference)
Tertile 2 (3.00–3.25)	82	189702.3	4.32	0.99 (0.73, 1.33)	0.95 (0.70, 1.30)	0.96 (0.70, 1.31)
Tertile 3 (3.50–5.00)	109	305087.1	3.57	0.82 (0.61, 1.08)	0.77 (0.56, 1.05)	0.78 (0.57, 1.06)
$P_{ m trend}$				0.1245	0.0800	0.0906
Continuous (1-ponit increment)	277	691131.4	4.01	0.86 (0.72, 1.03)	0.82 (0.68, 1.00)	0.83 (0.68, 1.01)

^a Adjusted for variables determined by change-in-estimate strategy, namely age (years), sex (male, female), smoking status (current, former, never), history of diabetes (yes, no), and total energy intake (kcal/day).

^b Adjusted for age (years), sex (male, female), race (non-Hispanic white, non-Hispanic black, Hispanic, others), educational degree (college below, college graduate, postgraduate), smoking status (current, former, never), aspirin use (yes, no), history of diabetes (yes, no), family history of pancreatic cancer (yes, no), and total energy intake (kcal/day). For the association of dietary WCRF/AICR score with pancreatic cancer incidence, model 2 was further adjusted for body mass index (kg/m²) and moderate to vigorous activity (min/week).

Supplemental Table 3. Sensitivity analyses on the association between WCRF/AICR score and pancreatic cancer incidence

Tertiles of WCRF/AICR score	Hazard ratio (95% confidence interval) ^a		
(range)	Excluding cases occurring	Excluding subjects with	
	within the first two years	extreme values of energy	
	of follow-up (n=58)	intake (n=2684) ^b	
Overall WCRF/AICR score			
Tertile 1	1.00 (reference)	1.00 (reference)	
Tertile 2	0.96 (0.72, 1.28)	0.90 (0.69, 1.16)	
Tertile 3	0.72 (0.51, 1.00)	0.67 (0.49, 0.91)	
$P_{ m trend}$	0.0626	0.0125	
Continuous (1-ponit increment)	0.90 (0.80, 1.03)	0.87 (0.78, 0.98)	
Dietary WCRF/AICR score			
Tertile 1	1.00 (reference)	1.00 (reference)	
Tertile 2	1.14 (0.84, 1.55)	1.04 (0.78, 1.38)	
Tertile 3	0.86 (0.63, 1.19)	0.84 (0.62, 1.12)	
$P_{ m trend}$	0.2228	0.1641	
Continuous (1-ponit increment)	0.87 (0.71, 1.06)	0.85 (0.71, 1.02)	

^a Adjusted for age (years), sex (male, female), race (non-Hispanic white, non-Hispanic black, Hispanic, others), educational level (college below, college graduate, postgraduate), smoking status (current, former, never), aspirin use (yes, no), history of diabetes (yes, no), family history of pancreatic cancer (yes, no), and total energy intake (kcal/day). For the association of dietary WCRF/AICR score with pancreatic cancer incidence, model 2 was further adjusted for body mass index (kg/m²) and moderate to vigorous activity (min/week).

^b Extreme values of energy intake are defined as <800 or >4000 kcal/d for men and <500 or >3500 kcal/d for women.

Supplemental Table 4. Associations of adherence to individual WCRF/AICR cancer prevention recommendations with pancreatic cancer incidence

Be a healthy weight 0 82 196471.8 1.00 (reference) 0.8146 0.5 143 364285.5 0.91 (0.69, 1.20) 1 112 289973.4 0.96 (0.71, 1.29) Be physically active 0 179 382252.5 1.00 (reference) 0.0377 0.5 71 186319.3 0.91 (0.69, 1.20) 1 87 282158.9 0.75 (0.58, 0.98) Eat a diet rich in whole grains, vegetables, fruit, and beans 0 27 56980.9 1.00 (reference) 0.6664 0.25 70 180441.1 0.88 (0.56, 1.38) 0.5 65 169194.1 0.90 (0.56, 1.42) 0.75 150 372377.8 1.01 (0.64, 1.58) 1 25 71736.8 0.95 (0.49, 1.83) Limit consumption of ultra-processed foods 0 120 284464.0 1.00 (reference) 0.7891 0.5 102 284794.4 0.84 (0.62, 1.14) 1 115 281472.3 0.94 (0.66, 1.34) Limit consumption of red and processed meat 0 6 5700.4 1.00 (reference) 0.2827 0.5 96 225612.9 0.39 (0.17, 0.90) 1 235 619417.4 0.37 (0.16, 0.86) Limit consumption of sugar-sweetened drinks 0 76 171716.6 1.00 (reference) 0.0854 0.5 227 575246.4 0.88 (0.67, 1.15) 1 34 103767.7 0.69 (0.45, 1.05) Limit alcohol consumption 0 46 107670.0 1.00 (reference) 0.4144 0.5 205 530430.7 0.85 (0.61, 1.19) 1 86 212630.0 0.83 (0.56, 1.22) For mothers: breastfeed your baby, if you can 0 57 181897.0 1.00 (reference) 0.7975	WCRF/AICR	Number of	Person-years	Hazard ratio (95%	$P_{ m trend}$
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Limit consumption of red and processed meat 0 6 5700.4 1.00 (reference) 0.2827 0.5 96 225612.9 0.39 (0.17, 0.90) 1 235 619417.4 0.37 (0.16, 0.86) Limit consumption of sugar-sweetened drinks 0 76 171716.6 1.00 (reference) 0.0854 0.5 227 575246.4 0.88 (0.67, 1.15) 1 34 103767.7 0.69 (0.45, 1.05) Limit alcohol consumption 0 46 107670.0 1.00 (reference) 0.4144 0.5 205 530430.7 0.85 (0.61, 1.19) 1 86 212630.0 0.83 (0.56, 1.22) For mothers: breastfeed your baby, if you can 0 57 181897.0 1.00 (reference) 0.7975	0.5	102	284794.4	0.84 (0.62, 1.14)	
0 6 5700.4 1.00 (reference) 0.2827 0.5 96 225612.9 0.39 (0.17, 0.90) 1 235 619417.4 0.37 (0.16, 0.86) Limit consumption of sugar-sweetened drinks 0 76 171716.6 1.00 (reference) 0.0854 0.5 227 575246.4 0.88 (0.67, 1.15) 0.69 (0.45, 1.05) Limit alcohol consumption 0 46 107670.0 1.00 (reference) 0.4144 0.5 205 530430.7 0.85 (0.61, 1.19) 0.4144 1 86 212630.0 0.83 (0.56, 1.22) For mothers: breastfeed your baby, if you can 0 57 181897.0 1.00 (reference) 0.7975	1	115	281472.3	0.94 (0.66, 1.34)	
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Limit consumption of sugar-sweetened drinks 0 76 171716.6 1.00 (reference) 0.0854 0.5 227 575246.4 0.88 (0.67, 1.15) 1 34 103767.7 0.69 (0.45, 1.05) Limit alcohol consumption 0 46 107670.0 1.00 (reference) 0.4144 0.5 205 530430.7 0.85 (0.61, 1.19) 1 86 212630.0 0.83 (0.56, 1.22) For mothers: breastfeed your baby, if you can 0 57 181897.0 1.00 (reference) 0.7975	0.5	96	225612.9	0.39 (0.17, 0.90)	
0 76 171716.6 1.00 (reference) 0.0854 0.5 227 575246.4 0.88 (0.67, 1.15) 1 34 103767.7 0.69 (0.45, 1.05) Limit alcohol consumption 0 46 107670.0 1.00 (reference) 0.4144 0.5 205 530430.7 0.85 (0.61, 1.19) 1 86 212630.0 0.83 (0.56, 1.22) For mothers: breastfeed your baby, if you can 0 57 181897.0 1.00 (reference) 0.7975	1	235	619417.4	0.37 (0.16, 0.86)	
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Limit alcohol consumption 0 46 107670.0 1.00 (reference) 0.4144 0.5 205 530430.7 0.85 (0.61, 1.19) 1 86 212630.0 0.83 (0.56, 1.22) For mothers: breastfeed your baby, if you can 0 57 181897.0 1.00 (reference) 0.7975	0.5	227	575246.4	0.88 (0.67, 1.15)	
0 46 107670.0 1.00 (reference) 0.4144 0.5 205 530430.7 0.85 (0.61, 1.19) 1 86 212630.0 0.83 (0.56, 1.22) For mothers: breastfeed your baby, if you can 0 57 181897.0 1.00 (reference) 0.7975	1	34	103767.7	0.69 (0.45, 1.05)	
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1 86 212630.0 0.83 (0.56, 1.22) For mothers: breastfeed your baby, if you can 0 57 181897.0 1.00 (reference) 0.7975	0	46	107670.0	1.00 (reference)	0.4144
For mothers: breastfeed your baby, if you can 0 57 181897.0 1.00 (reference) 0.7975	0.5	205	530430.7	0.85 (0.61, 1.19)	
0 57 181897.0 1.00 (reference) 0.7975	1	86	212630.0	0.83 (0.56, 1.22)	
` '	For mothers: bro	eastfeed your baby	y, if you can		
0.5 47 120323.0 1.18 (0.80, 1.74)	0	57	181897.0	1.00 (reference)	0.7975
120323.0 1.10 (0.00, 1.7 7)	0.5	47	120323.0	1.18 (0.80, 1.74)	
1 41 138539.5 0.93 (0.62, 1.40)	1	41	138539.5	0.93 (0.62, 1.40)	

^a Adjusted for age (years), sex (male, female) (except the component "for mothers: breastfeed your baby, if you can"), race (non-Hispanic white, non-Hispanic black, Hispanic, others), educational degree (college below, college graduate, postgraduate), smoking status (current, former, never), aspirin use (yes, no), history of diabetes (yes, no), family history of pancreatic cancer (yes, no), and total energy intake (kcal/day). All individual components were mutually adjusted.

Supplemental Table 5. Subdistribution hazard ratios of the association of WCRF/AICR score with pancreatic cancer mortality in 77557 participants with complete data.

Tertiles of WCRF/AICR score	Number of	Person-years	Mortality/10000	Subdistribution hazard ratio (95% confidence interval)		ce interval)
(range)	deaths		person-years	Unadjusted	Model 1 ^a	Model 2 ^b
Overall WCRF/AICR score						
Tertile 1 (0.50–3.75)	80	249068.2	3.21	1.00 (reference)	1.00 (reference)	1.00 (reference)
Tertile 2 (4.00–4.75)	97	369617.8	2.62	0.82 (0.61, 1.11)	0.81 (0.60, 1.10)	0.81 (0.60, 1.10)
Tertile 3 (5.00–8.00)	75	421666.4	1.78	0.56 (0.41, 0.77)	0.56 (0.39, 0.80)	0.56 (0.39, 0.80)
$P_{ m trend}$				0.0003	0.0011	0.0011
Continuous (1-ponit increment)	252	1040352.3	2.42	0.83 (0.73, 0.93)	0.83 (0.72, 0.95)	0.83 (0.72, 0.95)
Dietary WCRF/AICR score						
Tertile 1 (0.50–2.75)	75	295609.4	2.54	1.00 (reference)	1.00 (reference)	1.00 (reference)
Tertile 2 (3.00–3.25)	75	285784.8	2.62	1.04 (0.75, 1.43)	1.00 (0.72, 1.39)	1.01 (0.72, 1.40)
Tertile 3 (3.50–5.00)	102	458958.2	2.22	0.87 (0.65, 1.18)	0.82 (0.59, 1.14)	0.82 (0.59, 1.15)
$P_{ m trend}$				0.3018	0.1887	0.1916
Continuous (1-ponit increment)	252	1040352.3	2.42	0.89 (0.74, 1.07)	0.85 (0.69, 1.04)	0.84 (0.69, 1.04)

^a Adjusted for variables determined by change-in-estimate strategy, namely age (years), sex (male, female), smoking status (current, former, never), history of diabetes (yes, no), and total energy intake (kcal/day).

^b Adjusted for age (years), sex (male, female), race (non-Hispanic white, non-Hispanic black, Hispanic, others), educational level (college below, college graduate, postgraduate), smoking status (current, former, never), aspirin use (yes, no), history of diabetes (yes, no), family history of pancreatic cancer (yes, no), and total energy intake (kcal/day). For the association of dietary WCRF/AICR score with pancreatic cancer mortality, model 2 was further adjusted for body mass index (kg/m²) and moderate to vigorous activity (min/week).

Supplemental Table 6. Sensitivity analyses on the association between WCRF/AICR score and pancreatic cancer mortality

Tertiles of WCRF/AICR score

Subdistribution hazard ratio (95% confidence interval) a

Tertiles of WCRF/AICR score	Subdistribution hazard ratio (95% confidence interval) ^a			
(range)	Excluding deaths occurring within the first two years of	Excluding subjects with extreme values of energy		
	follow-up (n=38)	intake (n=2684) ^b		
Overall WCRF/AICR score				
Tertile 1	1.00 (reference)	1.00 (reference)		
Tertile 2	1.01 (0.76, 1.34)	0.94 (0.72, 1.24)		
Tertile 3	0.66 (0.47, 0.94)	0.65 (0.47, 0.90)		
$P_{ m trend}$	0.0308	0.0134		
Continuous (1-ponit increment)	0.89 (0.78, 1.01)	0.87 (0.77, 0.99)		
Dietary WCRF/AICR score				
Tertile 1	1.00 (reference)	1.00 (reference)		
Tertile 2	1.14 (0.83, 1.56)	1.05 (0.78, 1.42)		
Tertile 3	0.84 (0.61, 1.17)	0.85 (0.62, 1.15)		
$P_{ m trend}$	0.2451	0.2027		
Continuous (1-ponit increment)	0.85 (0.69, 1.04)	0.84 (0.70, 1.02)		

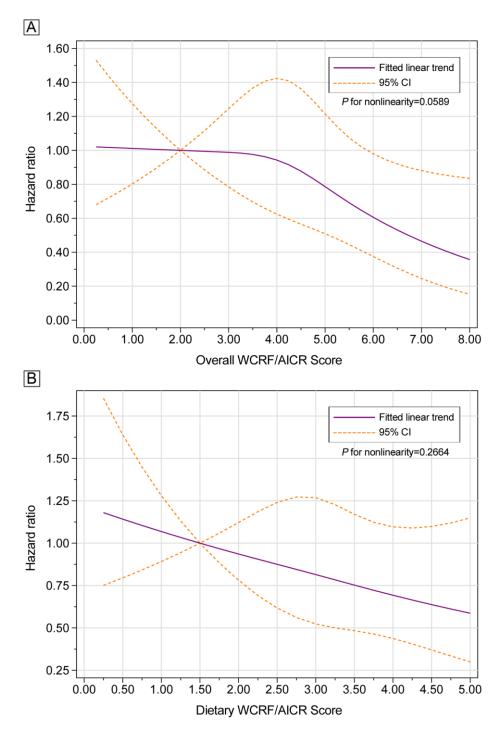
^a Adjusted for age (years), sex (male, female), race (non-Hispanic white, non-Hispanic black, Hispanic, others), educational level (college below, college graduate, postgraduate), smoking status (current, former, never), aspirin use (yes, no), history of diabetes (yes, no), family history of pancreatic cancer (yes, no), and total energy intake (kcal/day). For the association of dietary WCRF/AICR score with pancreatic cancer mortality, model 2 was further adjusted for body mass index (kg/m2) and moderate to vigorous activity (min/week).

^b Extreme values of energy intake are defined as <800 or >4000 kcal/d for men and <500 or >3500 kcal/d for women.

Supplemental Table 7. Associations of adherence to individual WCRF/AICR cancer prevention recommendations with pancreatic cancer mortality

WCRF/AICR	Number	Person-years	Subdistribution hazard ratio	P_{trend}
components	of deaths		(95% confidence interval) ^a	
Be a healthy weig	ght			
0	76	294707.7	1.00 (reference)	0.7576
0.5	130	547862.5	0.90 (0.68, 1.21)	
1	101	437178.3	0.94 (0.69, 1.29)	
Be physically act	ive			
0	162	565417.0	1.00 (reference)	0.0542
0.5	64	282481.4	0.91 (0.67, 1.21)	
1	81	431850.1	0.77 (0.58, 1.01)	
Eat a diet rich in	whole grains,	vegetables, frui	t, and beans	
0	25	85570.7	1.00 (reference)	0.5663
0.25	60	271174.9	0.82 (0.51, 1.32)	
0.5	61	253982.9	0.92 (0.57, 1.48)	
0.75	142	561065.9	1.04 (0.65, 1.66)	
1	19	107954.1	0.76 (0.37, 1.55)	
Limit consumption	on of ultra-pro	ocessed foods		
0	108	427847.6	1.00 (reference)	0.8350
0.5	90	428087.2	0.84 (0.61, 1.16)	
1	109	423813.6	1.02 (0.70, 1.48)	
Limit consumption	on of red and	processed meat		
0	6	8507.7	1.00 (reference)	0.1935
0.5	88	337777.7	0.36 (0.15, 0.84)	
1	213	933463.1	0.33 (0.14, 0.78)	
Limit consumption	on of sugar-sw	veetened drinks		
0	70	258937.7	1.00 (reference)	0.1010
0.5	205	865460.8	0.86 (0.64, 1.13)	
1	32	155350.0	0.70 (0.45, 1.08)	
Limit alcohol cor	sumption			
0	42	161990.0	1.00 (reference)	0.2955
0.5	189	803104.4	0.86 (0.60, 1.22)	
1	76	314654.1	0.80 (0.53, 1.20)	
For mothers: brea	istfeed your b	aby, if you can		
0	54	275890.6	1.00 (reference)	0.8152
0.5	42	181824.4	1.12 (0.74, 1.67)	
1	39	211517.7	0.94 (0.62, 1.43)	
a A division and fa		(1 C	vala) (except the component "fe	41

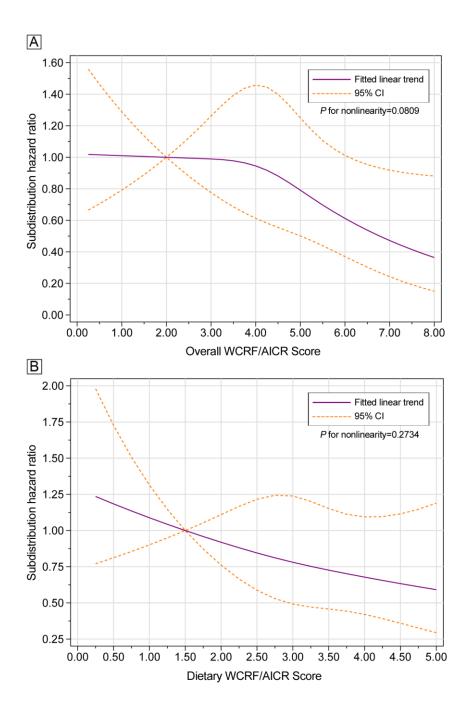
^a Adjustment for age (years), sex (male, female) (except the component "for mothers: breastfeed your baby, if you can"), race (non-Hispanic white, non-Hispanic black, Hispanic, others), educational level (college below, college graduate, postgraduate), smoking status (current, former, never), aspirin use (yes, no), history of diabetes (yes, no), family history of pancreatic cancer (yes, no), and energy intake from diet (kcal/day). All WCRF/AICR components were mutually adjusted.



Supplemental Figure 1 Dose–response analyses on WCRF/AICR scores and pancreatic cancer incidence. The referents were set as 2.00 and 1.50 for overall and dietary WCRF/AICR scores, respectively. Hazard ratio was adjusted for age, sex, race, educational degree, smoking status, aspirin use, history of diabetes, family history of pancreatic cancer, and energy intake from diet. For the dose–response analysis on the dietary WCRF/AICR score, hazard ratio was further adjusted for body mass index and physical activity level. The purple solid line represents the fitted linear trend, and the orange short-dash line represents 95% CI. WCRF/AICR, World Cancer Research Fund/American Institute for Cancer Research; CI, confidence interval.

Components omitted in each turn	HR (95% CI)
Be a healthy weight	— 0.87 (0.78, 0.98)
Be physically active	0.90 (0.79, 1.03)
Eat a diet rich in whole grains	0.85 (0.74, 0.97)
Limit consumption of ultra-processed foods	0.87 (0.77, 0.98)
Limit consumption of red and processed meat	0.89 (0.79, 1.00)
Limit consumption of sugar-sweetened drinks	0.90 (0.79, 1.02)
Limit alcohol consumption	0.88 (0.78, 1.00)
For mothers: breastfeed your baby,if you can	0.87 (0.78, 0.98)
	1

Supplemental Figure 2 Explanatory analysis: ignoring a single component in turn to determine their relative importance in the overall WCRF/AICR score. The component shown on the left is the one left out in each turn. The square with dark blue color represents the HR after ignoring a single component, and the corresponding black line represents its 95% CI. HR represents risk estimate per 1-point increment in the overall WCRF/AICR score, and was adjusted for age, sex, race, educational degree, smoking status, aspirin use, history of diabetes, family history of pancreatic cancer, and energy intake from diet. All WCRF/AICR components were mutually adjusted. WCRF/AICR, World Cancer Research Fund/American Institute for Cancer Research; HR, hazard ratio; CI, confidence interval.



Supplemental Figure 3 Dose–response analyses on WCRF/AICR scores and pancreatic cancer mortality. The referents were set as 2.00 and 1.50 for overall and dietary WCRF/AICR scores, respectively. Subdistribution hazard ratio was adjusted for age, sex, race, educational degree, smoking status, aspirin use, history of diabetes, family history of pancreatic cancer, and energy intake from diet. For the dose–response analysis on the dietary WCRF/AICR score, subdistribution hazard ratio was further adjusted for body mass index and physical activity level. The purple solid line represents the fitted linear trend, and the orange short-dash line represents 95% CI. WCRF/AICR, World Cancer Research Fund/American Institute for Cancer Research; CI, confidence interval.

Components omitted in each turn		SHR (95% CI)
Be a healthy weight —	-	0.87 (0.76, 0.99)
Be physically active	-	O.90 (0.78, 1.03)
Eat a diet rich in whole grains		0.86 (0.75, 0.99)
Limit consumption of ultra-processed foods —	-	0.87 (0.77, 0.99)
Limit consumption of red and processed meat	-	0.89 (0.78, 1.01)
Limit consumption of sugar-sweetened drinks	-	- 0.90 (0.79, 1.03)
Limit alcohol consumption —	-	0.88 (0.77, 1.00)
For mothers: breastfeed your baby,if you can		0.88 (0.78, 0.99)
	1	

Supplemental Figure 4 Explanatory analysis: ignoring a single component in turn to determine their relative importance in the overall WCRF/AICR score. The component shown on the left is the one left out in each turn. The square with dark blue color represents the SHR after ignoring a single component, and the corresponding black line represents its 95% CI. SHR represents risk estimate per 1-point increment in the overall WCRF/AICR score, and was adjusted for age, sex, race, educational degree, smoking status, aspirin use, history of diabetes, family history of pancreatic cancer, and energy intake from diet. All WCRF/AICR components were mutually adjusted. WCRF/AICR, World Cancer Research Fund/American Institute for Cancer Research; SHR, subdistribution hazard ratio; CI, confidence interval.