

Supplementary Table 1. Prevalence (%) of main lifestyle-related risk factors for cancer by age group across cohort studies and external prevalence data sources

RISK FACTORS	AGE	MEN									WOMEN								
		COHORT DATA						PREVALENCE DATA			COHORT DATA						PREVALENCE DATA		
		MCCS	BMES	AusDiab	NWAHS	CHAMP	45&Up	NHS1	NHS2	NHS3	MCCS	BMES	ALSWH	AusDiab	NWAHS	45&Up	NHS1	NHS2	NHS3
		1990-94	1992-93	1999-01	1999-03	2005-07	2005-08	2001	2004	2014-15	1990-94	1992-93	1996	1999-01	1999-03	2005-08	2001	2004	2014-15
Smoking																			
Former regular	< 35	-	-	17	16	-	-	13	14	17	-	-	15	18	26	-	17	17	15
	35-44	33	-	26	33	-	-	27	23	27	26	-	-	27	36	-	25	23	26
	45-54	39	38	32	38	-	33	33	33	32	22	27	28	22	30	31	24	25	28
	55-64	48	47	44	45	-	42	45	42	44	20	24	-	22	34	29	25	28	31
	65-74	58	61	51	58	55	50	57	56	50	22	26	30	27	30	28	24	26	33
	≥ 75	-	57	56	66	58	52	62	66	56	-	26	30	20	24	22	25	25	29
Current regular	< 35	-	-	20	28	-	-	32	30	19	-	-	21	18	22	-	25	23	13
	35-44	18	-	23	31	-	-	30	29	20	12	-	-	16	24	-	24	23	13
	45-54	16	21	18	24	-	12	23	25	20	11	20	15	14	17	11	19	20	16
	55-64	14	22	13	15	-	9	21	19	17	8	17	-	9	13	7	14	13	12
	65-74	10	12	9	11	8	5	12	11	11	6	11	6	6	7	4	9	8	7
	≥ 75	-	7	6	5	5	2	7	6	3	-	8	4	3	4	2	4	4	4
Alcohol consumption																			
> 2 drinks/day	< 35	-	-	24	17	-	-	30	33	23	-	-	6	6	3	-	8	12	7
	35-44	26	-	27	15	-	-	29	34	28	10	-	-	8	4	-	10	13	10
	45-54	29	30	28	20	-	25	33	36	28	10	7	5	8	4	8	10	13	11
	55-64	30	22	31	21	-	27	27	35	31	7	5	-	10	4	7	9	14	10
	65-74	29	17	30	17	18	24	24	29	27	8	5	3	5	2	5	7	9	11
	≥ 75	-	14	16	11	12	16	21	17	15	-	3	2	1	3	3	5	6	8
Body fatness (BMI; kg/m ²) ¹																			
25.0-29.9	< 35	-	-	42	31	-	-	35	37	36	-	-	15	24	21	-	18	22	22
	35-44	49	-	48	47	-	-	43	47	47	28	-	-	26	27	-	23	26	28
	45-54	53	49	51	51	-	47	46	46	47	35	37	29	33	31	30	28	30	29
	55-64	55	48	49	49	-	48	49	48	45	40	33	-	38	37	34	35	34	33
	65-74	55	47	53	52	48	49	47	43	42	40	38	33	39	42	36	34	35	36
	≥ 75	-	37	53	50	49	43	39	40	45	-	29	31	42	42	33	29	30	40
≥ 30.0	< 35	-	-	19	18	-	-	11	14	20	-	-	6	15	19	-	12	12	17
	35-44	14	-	19	30	-	-	19	23	27	15	-	-	21	29	-	16	17	31
	45-54	18	19	22	31	-	24	20	25	33	21	19	19	25	38	23	21	20	33
	55-64	22	14	26	33	-	25	19	24	37	26	25	-	29	38	26	24	24	35
	65-74	19	15	21	31	32	22	15	17	38	22	19	14	29	34	24	21	22	33
	≥ 75	-	9	12	14	24	12	10	11	28	-	12	12	17	28	16	13	13	26

RISK FACTORS	AGE	MEN									WOMEN								
		COHORT DATA						PREVALENCE DATA			COHORT DATA						PREVALENCE DATA		
		MCCS 1990-93	BMES 1992-93	AusDiab 1999-01	NWAHS 1999-03	CHAMP 2005-07	45&Up 2005-08	NHS1 2001	NHS2 2004	NHS3 2014-15	MCCS 1990-93	BMES 1992-93	ALSWH 1996	AusDiab 1999-01	NWAHS 1999-03	45&Up 2005-08	NHS1 2001	NHS2 2004	NHS3 2014-15
Physical activity < 150 min/week ²	< 35	~	-	40	53	~	-	41	41	56	~	-	~	57	79	-	58	56	71
	35-44	~	-	47	70	~	-	49	57	69	~	-	~	59	81	-	64	63	77
	45-54	~	56	51	73	~	35	51	64	70	~	64	~	65	85	33	62	68	79
	55-64	~	52	54	75	~	35	47	69	77	~	56	~	62	84	30	54	70	84
	65-74	~	50	51	74	~	33	51	68	83	~	54	~	65	82	29	58	73	86
	≥ 75	~	51	56	75	~	43	43	80	89	~	60	~	71	87	45	51	83	95
Fruit consumption < 2 serves/day	< 35	-	-	72	-	-	-	61	61	61	-	-	-	65	-	-	50	48	50
	35-44	23	-	67	-	-	-	57	57	57	15	-	-	59	-	-	47	44	51
	45-54	20	62	60	-	-	53	53	50	59	12	61	-	47	-	42	39	39	44
	55-64	19	67	56	-	-	50	47	44	53	11	58	-	39	-	34	30	30	40
	65-74	19	61	51	-	-	48	39	38	48	10	59	-	34	-	30	31	32	31
	≥ 75	-	64	48	-	-	45	38	38	42	-	65	-	30	-	32	32	30	38
Vegetable consumption < 5 serves/day	< 35	-	-	94	-	-	-	79	92	93	-	-	-	88	-	-	75	88	91
	35-44	55	-	93	-	-	-	75	88	93	37	-	-	84	-	-	67	85	91
	45-54	54	43	92	-	-	81	70	87	93	35	42	-	82	-	66	63	81	89
	55-64	52	47	90	-	-	77	68	83	90	38	38	-	82	-	59	57	77	89
	65-74	52	37	90	-	-	72	66	81	89	39	37	-	83	-	55	60	79	85
	≥ 75	-	36	90	-	-	73	64	83	88	-	39	-	87	-	61	61	86	91

~ (not comparable); - (not available)

45&Up (45 and Up Study); ALSWH (Australian Longitudinal Study on Women's Health); AusDiab (Australian Diabetes, Obesity and Lifestyle Study); BMES (Blue Mountains Eye Study); BMI (Body Mass Index); CHAMP (Concord Health and Ageing in Men Project); MCCS (Melbourne Collaborative Cohort Study); NHS (National Health Survey); NWAHS (North West Adelaide Health Study)

¹ Measured weight and height (MCCS, AusDiab, NWAHS, CHAMP, NHS3); self-reported weight and height (BMES, ALSWH, 45&Up, NHS1, NHS2, LADY)

² ≥ 150 min/week of moderate activity or ≥ 75 min/week of vigorous activity or combination of the two

Supplementary Table 2. Total number of incident cancers and deaths, and the 20 most common cancer sites, by sex over entire follow-up period to 31 December 2012

CANCER SITE	MEN	WOMEN
Prostate (C61)	6,651	-
Breast (C50)	30	4,886
Colorectal (C18-C20)	2,199	2,550
Melanoma (C43)	2,044	1,811
Lung (C33-C34)	1,389	1,273
Non-Hodgkin lymphoma (C82-C86, C91.1)	866	919
Pancreas (C25)	377	464
Uterus (C54-C55)	-	795
Cancer of unknown primary (C76-C80)	333	426
Kidney (C64)	404	312
Bladder (C67)	525	185
Stomach (C16)	367	264
Leukemia (C91-C95, excluding C91.1)	303	264
Multiple myeloma (C90)	273	245
Ovary (C56)	-	484
Brain (C71)	247	224
Thyroid (C73)	93	339
Myelodysplastic syndromes (D46)	232	170
Oesophagus (C15)	207	152
Liver (C22)	210	111
ALL CANCERS	18,369	17,491
DEATHS	15,011	17,096

Supplementary Table 3. Numbers of incident cancers causally related to body fatness or both tobacco and alcohol consumption according to the International Agency for Research on Cancer during 10-years follow-up of 365,173 participants

Cancer site	Number of body fatness–related incident cancers ¹	Number of tobacco- and alcohol–related incident cancers ²
Tongue (C01-C02)		117
Mouth (C03-C06)		95
Oropharynx (C10)		17
Hypopharynx (C12-C13)		17
Other sites in pharynx (C14)		12
Oesophagus (C15)		243
Adenocarcinoma ³	126	
Stomach (C16)	427	
Colorectal (C18-C20)	3,321	3,454
Liver (C22)	218	226
Gallbladder (C23)	65	
Pancreas (C25)	578	
Larynx (C32)		102
Breast (C50), postmenopausal	2,619	
Corpus uteri (C54)	448	
Ovary (C56)	311	
Kidney (C64), renal-cell carcinoma ⁴	478	
Meningioma (C70)	8	
Thyroid (C73)	299	
Multiple myeloma (C90)	361	
TOTAL	9,258	4,283

¹ Participants diagnosed with body fatness–related cancer (Lauby-Secretan et al. 2016) prior to baseline (n = 14,029) excluded

² Participants diagnosed with tobacco- and alcohol–related cancer (IARC 2012) prior to baseline (n = 5,367) excluded

³ Histology codes 8140-8576

⁴ Histology codes 8050, 8140, 8260, 8270, 8280-8312, 8316-8320, 8340-8344

SupplementaryTable 4. Cohort-specific hazard ratios for cancers causally related to body fatness or both tobacco and alcohol over 10-years follow-up

Risk factors	MCCS HR (95% CI)¹	BMES HR (95% CI)¹	ALSWH HR (95% CI)¹	AusDiab HR (95% CI)¹	NWAHS HR (95% CI)¹	CHAMP HR (95% CI)¹	45&Up HR (95% CI)¹	P²
Body fatness (BMI; kg/m ²) ³								
Healthy weight (18.5-24.9)	1	1	1	1	1	1	1	
Overweight (25.0-29.9)	1.16 (1.03, 1.31)	1.44 (1.03, 2.00)	1.09 (0.95, 1.26)	1.25 (0.95, 1.64)	1.64 (1.02, 2.62)	1.03 (0.57, 1.86)	1.09 (1.03, 1.17)	0.37
Obese (≥ 30.0)	1.39 (1.22, 1.60)	1.73 (1.17, 2.57)	1.50 (1.27, 1.77)	1.58 (1.18, 2.13)	2.10 (1.31, 3.36)	1.15 (0.61, 2.19)	1.28 (1.20, 1.38)	0.13
Smoking ⁴								
Never regular	1	1	1	1	1	1	1	
Former regular	1.27 (1.07, 1.50)	1.04 (0.51, 2.11)	0.94 (0.75, 1.17)	1.28 (0.90, 1.81)	1.47 (0.81, 2.69)	0.97 (0.56, 1.69)	1.35 (1.24, 1.46)	0.09
Current regular	1.60 (1.28, 2.01)	1.43 (0.90, 2.26)	1.27 (0.90, 1.78)	1.18 (0.70, 1.96)	1.50 (0.64, 3.49)	0.96 (0.29, 3.24)	1.86 (1.62, 2.14)	0.24
Alcohol consumption ⁴								
≤ 2 drinks/day	1	1	1	1	1	1	1	
> 2 drinks/day	1.37 (1.14, 1.64)	1.22 (0.65, 2.28)	1.59 (1.06, 2.38)	1.77 (1.15, 2.72)	1.60 (0.73, 3.48)	1.74 (0.91, 3.32)	1.35 (1.22, 1.49)	0.84

45&Up (45 and Up Study); ALSWH (Australian Longitudinal Study on Women's Health); AusDiab (Australian Diabetes, Obesity and Lifestyle Study); BMES (Blue Mountains Eye Study); CHAMP (Concord Health and Ageing in Men Project); MCCS (Melbourne Collaborative Cohort Study); NWAHS (North West Adelaide Health Study)

¹ Adjusted for age and sex

² P value for heterogeneity between the study-specific HRs tested using the asymptotic DerSimonian and Laird Q statistic

³ Cancers causally related to body fatness are oesophageal adenocarcinoma (C15, histology codes 8140-8576), cancers of stomach (C16), colon (C18), rectum (C19-20), liver (C22), gallbladder (C23), and pancreas (C25), postmenopausal breast cancer (C50), cancers of corpus uteri (C54) and ovary (C56), renal-cell carcinoma (C64, histology codes 8050, 8140, 8260, 8270, 8280-8312, 8316-8320, 8340-8344), meningioma (C70), thyroid cancer (C73) and multiple myeloma (C90)

⁴ Cancers causally related to both tobacco and alcohol are cancers of tongue (C01-02), mouth (C03-C06), oropharynx (C10), hypopharynx (C12-C13), other sites in pharynx (C14), oesophagus (C15), colon (C18-C19), rectum (C20), liver (C22) and larynx (C32)