

Supplemental Table 1.

Standardized incidence ratios (SIR) of selected cancers among World Trade Center Health

Program (WTCHP) responders, 2003-2013; effect of selection bias threshold on SIRs

Site	Criteria	Observed	Expected	SIR	95% CI
All sites combined	Unrestricted	1850	1432.4	1.29	1.23 - 1.35
	Restricted 6 months	1072	984.4	1.09	1.02 - 1.16
	Restricted 12 months	1000	932.8	1.07	1.01 - 1.14
	Restricted 24 months	876	826.2	1.06	0.99 - 1.13
Smoking-related	Unrestricted	505	436.6	1.16	1.06 - 1.26
	Restricted 6 months	300	304.9	0.98	0.88 - 1.10
	Restricted 12 months	285	289.3	0.99	0.87 - 1.11
	Restricted 24 months	257	257.0	1.00	0.88 - 1.13
Oral cavity and pharynx	Unrestricted	66	51.3	1.29	0.99 - 1.64
	Restricted 6 months	34	35.3	0.96	0.67 - 1.34
	Restricted 12 months	32	33.5	0.96	0.65 - 1.35
	Restricted 24 months	29	29.7	0.98	0.65 - 1.40
Digestive system	Unrestricted	271	260.2	1.04	0.92 - 1.17
	Restricted 6 months	163	180.2	0.90	0.77 - 1.05
	Restricted 12 months	153	170.8	0.90	0.76 - 1.05
	Restricted 24 months	136	151.4	0.90	0.75 - 1.06
Esophagus	Unrestricted	26	18.7	1.39	0.91 - 2.04
	Restricted 6 months	19	13.0	1.46	0.88 - 2.28
	Restricted 12 months	17	12.3	1.38	0.80 - 2.21
	Restricted 24 months	17	10.9	1.56	0.91 - 2.49
Stomach	Unrestricted	31	26.0	1.19	0.81 - 1.69
	Restricted 6 months	19	17.8	1.07	0.64 - 1.67
	Restricted 12 months	19	16.8	1.13	0.68 - 1.76
	Restricted 24 months	15	14.9	1.00	0.56 - 1.66
Colon and rectum	Unrestricted	130	123.3	1.05	0.88 - 1.25
	Restricted 6 months	68	84.0	0.81	0.63 - 1.03
	Restricted 12 months	61	79.4	0.77	0.59 - 0.99
	Restricted 24 months	55	70.0	0.79	0.59 - 1.02
Liver and intrahepatic bile duct	Unrestricted	29	35.3	0.82	0.55 - 1.18
	Restricted 6 months	24	25.2	0.95	0.61 - 1.42
	Restricted 12 months	24	24.0	1.00	0.64 - 1.49
	Restricted 24 months	19	21.4	0.89	0.53 - 1.39
Pancreas	Unrestricted	26	31.9	0.81	0.53 - 1.19
	Restricted 6 months	18	23.0	0.78	0.46 - 1.24

	Restricted 12 months	18	21.9	0.82	0.49 - 1.30
	Restricted 24 months	17	19.6	0.87	0.51 - 1.39
Nose, nasal cavity and middle ear	Unrestricted	5	2.7	1.85	0.60 - 4.32
	Restricted 6 months	<5		1.14	
	Restricted 12 months	<5		1.21	
	Restricted 24 months	<5		1.38	
Larynx	Unrestricted	21	17.6	1.19	0.74 - 1.82
	Restricted 6 months	10	12.0	0.83	0.40 - 1.53
	Restricted 12 months	9	11.3	0.79	0.36 - 1.51
	Restricted 24 months	9	10.0	0.90	0.41 - 1.72
Lung and bronchus	Unrestricted	131	138.2	0.95	0.79 - 1.12
	Restricted 6 months	80	96.2	0.83	0.66 - 1.04
	Restricted 12 months	76	91.2	0.83	0.66 - 1.04
	Restricted 24 months	71	81.0	0.88	0.68 - 1.11
Soft tissue including heart	Unrestricted	16	12.5	1.28	0.73 - 2.08
	Restricted 6 months	7	7.9	0.88	0.35 - 1.82
	Restricted 12 months	7	7.5	0.94	0.38 - 1.93
	Restricted 24 months	6	6.5	0.92	0.34 - 2.01
Melanoma of the skin	Unrestricted	82	64.6	1.27	1.01 - 1.58
	Restricted 6 months	50	43.3	1.15	0.86 - 1.52
	Restricted 12 months	49	41.0	1.20	0.88 - 1.58
	Restricted 24 months	42	36.1	1.16	0.84 - 1.57
Breast	Unrestricted	88	76.1	1.16	0.93 - 1.42
	Restricted 6 months	47	50.3	0.94	0.69 - 1.24
	Restricted 12 months	44	47.4	0.93	0.67 - 1.25
	Restricted 24 months	36	41.4	0.87	0.61 - 1.20
Corpus uteri	Unrestricted	15	13.9	1.08	0.60 - 1.78
	Restricted 6 months	8	9.8	0.82	0.35 - 1.61
	Restricted 12 months	8	9.3	0.86	0.37 - 1.70
	Restricted 24 months	7	8.2	0.85	0.34 - 1.76
Prostate	Unrestricted	442	328.0	1.35	1.23 - 1.48
	Restricted 6 months	298	238.7	1.25	1.11 - 1.40
	Restricted 12 months	279	227.5	1.23	1.09 - 1.38
	Restricted 24 months	246	204.0	1.21	1.06 - 1.37
Testis	Unrestricted	31	27.7	1.12	0.76 - 1.59
	Restricted 6 months	10	14.5	0.69	0.33 - 1.27
	Restricted 12 months	8	13.3	0.60	0.26 - 1.18
	Restricted 24 months	7	11.2	0.63	0.25 - 1.29
Urinary bladder	Unrestricted	81	63.0	1.29	1.02 - 1.60
	Restricted 6 months	48	44.2	1.09	0.80 - 1.44
	Restricted 12 months	48	41.9	1.14	0.84 - 1.52
	Restricted 24 months	39	37.3	1.05	0.74 - 1.43
Kidney and renal pelvis	Unrestricted	105	66.6	1.58	1.29 - 1.91
	Restricted 6 months	54	46.7	1.16	0.87 - 1.51

	Restricted 12 months	50	44.3	1.13	0.84 - 1.49
	Restricted 24 months	47	39.3	1.20	0.88 - 1.59
Brain and other nervous system	Unrestricted	30	25.1	1.19	0.81 - 1.71
	Restricted 6 months	21	15.6	1.34	0.83 - 2.05
	Restricted 12 months	19	14.7	1.30	0.78 - 2.02
	Restricted 24 months	15	12.7	1.18	0.66 - 1.95
Thyroid	Unrestricted	128	49.0	2.61	2.18 - 3.11
	Restricted 6 months	73	33.4	2.19	1.71 - 2.75
	Restricted 12 months	69	31.6	2.18	1.70 - 2.76
	Restricted 24 months	59	27.9	2.11	1.61 - 2.72
Hematological	Unrestricted	245	152.6	1.61	1.41 - 1.82
	Restricted 6 months	106	100.6	1.05	0.86 - 1.27
	Restricted 12 months	97	94.9	1.02	0.83 - 1.25
	Restricted 24 months	79	83.5	0.95	0.75 - 1.18
Hodgkin's lymphoma	Unrestricted	19	15.2	1.25	0.75 - 1.95
	Restricted 6 months	7	8.4	0.83	0.34 - 1.72
	Restricted 12 months	7	7.8	0.90	0.36 - 1.85
	Restricted 24 months	5	6.6	0.76	0.25 - 1.77
Non-Hodgkin's lymphoma	Unrestricted	104	74.9	1.39	1.13 - 1.68
	Restricted 6 months	47	48.8	0.96	0.71 - 1.28
	Restricted 12 months	43	46.0	0.93	0.68 - 1.26
	Restricted 24 months	36	40.3	0.89	0.63 - 1.24
Myeloma	Unrestricted	42	20.8	2.02	1.45 - 2.73
	Restricted 6 months	12	15.0	0.80	0.41 - 1.40
	Restricted 12 months	11	14.3	0.77	0.39 - 1.38
	Restricted 24 months	10	12.7	0.78	0.38 - 1.44
Leukemia	Unrestricted	80	41.6	1.92	1.53 - 2.39
	Restricted 6 months	40	28.4	1.41	1.01 - 1.92
	Restricted 12 months	36	26.9	1.34	0.94 - 1.85
	Restricted 24 months	28	23.8	1.18	0.78 - 1.70
CLL	Unrestricted	30	15.4	1.95	1.32 - 2.79
	Restricted 6 months	12	11.1	1.08	0.56 - 1.89
	Restricted 12 months	10	10.5	0.95	0.45 - 1.74
	Restricted 24 months	8	9.4	0.85	0.37 - 1.67
AML	Unrestricted	17	11.4	1.49	0.87 - 2.39
	Restricted 6 months	12	7.6	1.58	0.82 - 2.76
	Restricted 12 months	10	7.2	1.39	0.67 - 2.56
	Restricted 24 months	8	6.4	1.26	0.54 - 2.48
Mesothelioma	Unrestricted	<5		1.74	
	Restricted 6 months	<5		1.25	
	Restricted 12 months	<5		1.31	
	Restricted 24 months	<5		1.48	

Supplemental Table 2.

Cox proportional hazards models of selected cancers among World Trade Center Health Program (WTCHP) responders, 2003-2013; effect of selection bias threshold on hazard ratios

	All Cancer Sites Combined						Prostate Cancer					
	Restricted 6 months		Restricted 12 months		Restricted 24 months		Restricted 6 months		Restricted 12 months		Restricted 24 months	
	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI
Sex												
Male	1.21	0.97-1.52	1.24	0.98-1.56	1.27	0.98-1.63						
Female	1.0	reference	1.0	reference	1.0	reference						
Age on 9/11												
Per year	1.09	1.08-1.10	1.09	1.08-1.10	1.09	1.08-1.10	1.13	1.12-1.14	1.13	1.11-1.14	1.13	1.11-1.14
Occupation												
Construction	1.12	0.92-1.36	1.13	0.93-1.38	1.15	0.93-1.43	1.22	0.90-1.66	1.22	0.88-1.67	1.26	0.90-1.77
Protective	1.03	0.84-1.26	1.07	0.87-1.31	1.11	0.89-1.39	1.09	0.77-1.56	1.06	0.74-1.53	1.14	0.77-1.68
CM&IRG	0.96	0.74-1.24	1.01	0.78-1.31	1.05	0.80-1.38	1.15	0.76-1.74	1.23	0.81-1.86	1.29	0.82-2.02
All other	1.00	reference	1.00	reference	1.00	reference	1.00	reference	1.00	reference	1.00	reference
Smoking												
Current smoker	1.29	1.07-1.57	1.32	1.09-1.61	1.34	1.09-1.65	0.74	0.50-1.10	0.74	0.50-1.11	0.72	0.47-1.10
Former smoker	1.00	0.85-1.17	1.03	0.87-1.21	1.05	0.88-1.25	0.94	0.73-1.21	0.90	0.69-1.17	0.88	0.66-1.16
Never smoked	1.00	reference	1.00	reference	1.00	reference	1.00	reference	1.00	reference	1.00	reference
SSN												
SSN sent to registry	0.95	0.81-1.11	0.93	0.79-1.09	0.93	0.78-1.11	1.08	0.84-1.40	1.10	0.84-1.43	1.14	0.86-1.51
No SSN sent	1.00	reference	1.00	reference	1.00	reference	1.00	reference	1.00	reference	1.00	reference
Derived exposure level												
Low	1.00	reference	1.00	reference	1.00	reference	1.00	reference	1.00	reference	1.00	reference
Medium	0.91	0.75-1.11	0.92	0.75-1.12	0.92	0.74-1.15	0.82	0.60-1.12	0.80	0.59-1.10	0.78	0.56-1.09
High	0.99	0.78-1.26	0.96	0.75-1.23	0.95	0.73-1.24	0.93	0.64-1.36	0.87	0.58-1.28	0.87	0.58-1.32
Very high	0.67	0.40-1.12	0.57	0.33-1.01	0.60	0.33-1.09	0.48	0.17-1.33	0.49	0.18-1.38	0.55	0.20-1.54

	All Cancer Sites Combined						Prostate Cancer					
	Restricted 6 months		Restricted 12 months		Restricted 24 months		Restricted 6 months		Restricted 12 months		Restricted 24 months	
	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI
Dust exposure												
/arrival time												
Direct	1.07	0.86-1.33	1.05	0.84-1.32	1.04	0.82-1.32	1.18	0.82-1.69	1.13	0.77-1.64	1.20	0.80-1.80
Significant	1.16	0.93-1.46	1.24	0.98-1.55	1.26	0.99-1.61	1.43	0.99-2.06	1.46	1.01-2.12	1.56	1.05-2.31
Some	0.86	0.62-1.20	0.91	0.65-1.27	0.97	0.68-1.38	0.93	0.52-1.66	0.91	0.50-1.67	1.02	0.54-1.91
None/arrival 9/11- 9/14	1.06	0.88-1.29	1.08	0.89-1.32	1.06	0.86-1.32	1.11	0.80-1.54	1.12	0.80-1.56	1.12	0.78-1.61
None/arrival after 9/14	1.00	reference	1.00	reference	1.00	reference	1.00	reference	1.00	reference	1.00	reference
Duration on site												
1st quartile	1.00	reference	1.00	reference	1.00	reference	1.00	reference	1.00	reference	1.00	reference
2nd quartile	1.08	0.88-1.32	1.09	0.88-1.34	1.07	0.85-1.33	1.13	0.82-1.55	1.08	0.78-1.50	0.98	0.69-1.39
3rd quartile	0.99	0.80-1.21	0.98	0.79-1.21	0.99	0.79-1.24	0.83	0.59-1.16	0.80	0.56-1.14	0.72	0.49-1.05
4th quartile	1.04	0.85-1.26	1.03	0.84-1.26	1.09	0.88-1.35	0.82	0.60-1.14	0.82	0.59-1.14	0.79	0.56-1.12
Worked on Pile												
Yes	1.02	0.88-1.19	1.00	0.85-1.17	1.00	0.84-1.18	0.95	0.74-1.22	0.96	0.74-1.25	0.98	0.74-1.29
No	1.00	reference	1.00	reference	1.00	reference	1.00	reference	1.00	reference	1.00	reference