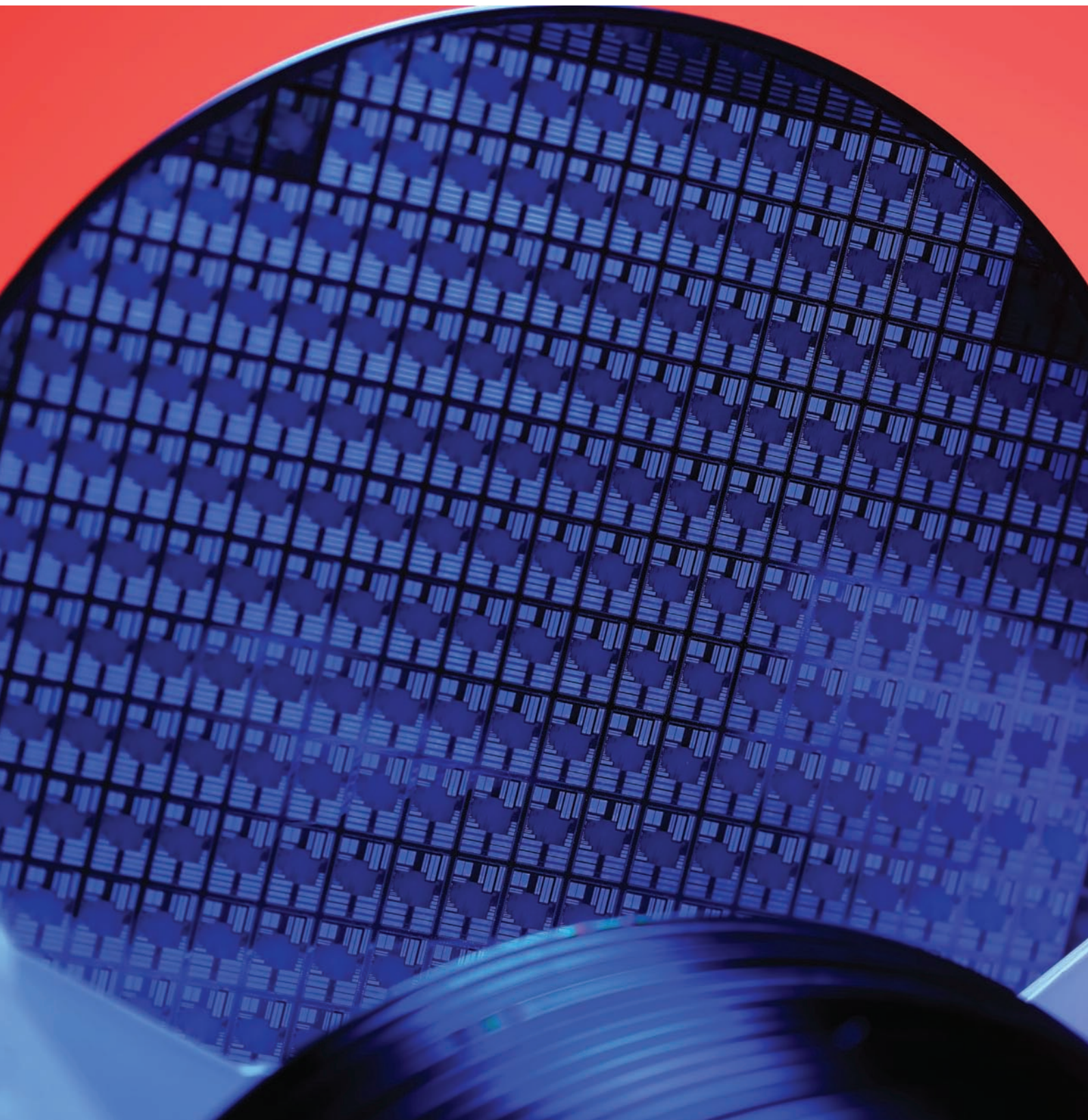


# **A further study of cancer among the current and former employees of National Semiconductor (UK) Ltd., Greenock**



# **A further study of cancer among the current and former employees of National Semiconductor (UK) Ltd., Greenock**

Health and Safety Executive  
and  
Institute of Occupational Medicine  
United Kingdom

Andrew Darnton<sup>1</sup>, Sam Wilkinson<sup>1</sup>, Brian Miller<sup>2</sup>,  
Laura MacCalman<sup>2</sup>, Karen Galea<sup>2</sup>, Amy Shafrir<sup>2</sup>,  
John Cherrie<sup>2</sup>, Damien McElvenny<sup>3</sup>, John Osman<sup>1</sup>

<sup>1</sup>Health and Safety Executive  
Epidemiology Unit  
Redgrave Court  
Merton Road  
Bootle  
Merseyside L20 7HS

<sup>2</sup>Institute of Occupational Medicine  
Research Avenue North  
Riccarton  
Edinburgh EH14 4AP

<sup>3</sup>University of Central Lancashire  
School of Public Health and Clinical Sciences  
Preston  
Lancashire PR1 2HE





















































**Table 2.10** Female cancer registrations by disease group and time since first employment: numbers of cases and SRRs with adjustment for deprivation

<i>Disease group</i>	<i>&lt;10 years since first employment</i>			<i>≥10 years since first employment</i>		
	<i>Observed registrations</i>	<i>Adjusted SRR</i>	<i>(95% CI)</i>	<i>Observed registrations</i>	<i>Adjusted SRR</i>	<i>(95% CI)</i>
All malignant neoplasms	39	110	(78.4, 151)	83	98.8	(78.7, 123)
All malignant neoplasms, excluding non-melanoma skin cancer	37	117	(82.5, 162)	68	94.3	(73.2, 120)
Malignant neoplasms of the lip, oral cavity and pharynx	0	..		3	208	(42.9, 608)
Malignant neoplasms of digestive organs and peritoneum	5	170	(55, 396)	10	106	(50.7, 195)
Malignant neoplasms of the stomach	3	701	(145, 2050)	2	171	(20.6, 616)
Malignant neoplasms of respiratory and intrathoracic organs	7	277	(111, 570)	9	93.9	(42.9, 178)
Malignant neoplasms of trachea, bronchus and lung	7	309	(124, 637)	9	102	(46.5, 193)
Malignant neoplasm of the pleura	0	..		0	..	
Malignant neoplasms of other genitourinary organs	5	69.7	(22.6, 163)	6	54.7	(20.1, 119)
Malignant melanoma of the skin	1	47.5	(1.2, 265)	4	137	(37.3, 351)
Other malignant neoplasm of the skin	2	52.3	(6.3, 189)	15	127	(70.9, 209)
Malignant neoplasm of the female breast	17	156	(91, 250)	29	109	(72.8, 156)
Malignant neoplasm of the uterus	0	..		2	72	(8.7, 260)
Malignant neoplasm of the ovary	2	112	(13.6, 405)	2	54	(6.5, 195)
Malignant neoplasm of the thyroid gland	0	..		0	..	
Malignant neoplasms of the lymphatic and haematopoietic tissue	1	46.7	(1.2, 260)	3	77.6	(16, 227)
Multiple myeloma	0	..		0	..	
Leukaemia	0	..		1	..	
Leukaemia, except chronic lymphatic leukaemia	0	..		1	..	
Malignant neoplasm of the brain and central nervous system	0	..		0	..	
Malignant neoplasm of the brain	0	..		0	..	
In situ neoplasms	47	85.2	(62.6, 113)	28	75.2	(50, 109)

.. SRRs not calculated where both the observed and expected registrations <2





**Table 2.15** Female breast cancer registrations: numbers and SRRs by time since first employment for selected subgroups

	<i>&lt;10 years since first employment</i>	<i>≥10 years since first employment</i>	<i>Total</i>
<b><i>Total</i></b>			
N	17	29	46
Unadjusted SRR	148 (86.4, 238)	103 (69.2, 148)	116 (85.2, 155)
Adjusted SRR	156 (91, 250)	109 (72.8, 156)	123 (89.7, 163)
<b><i>Employed 12 months or more</i></b>			
N	6	27	33
Unadjusted SRR	75.9 (27.8, 165)	107 (70.6, 156)	99.6 (68.6, 140)
Adjusted SRR	80 (29.4, 174)	113 (74.3, 164)	105 (72.2, 147)
<b><i>Aged &lt;50 years</i></b>			
N	10	10	20
Unadjusted SRR	113 (54.3, 208)	74.5 (35.7, 137)	89.9 (54.9, 139)
Adjusted SRR	119 (57.2, 219)	78.6 (37.7, 145)	94.8 (57.9, 146)
<b><i>Aged 50 years or more</i></b>			
N	7	19	26
Unadjusted SRR	267 (107, 550)	130 (78.1, 203)	151 (98.3, 221)
Adjusted SRR	280 (113, 578)	136 (81.9, 212)	158 (103, 231)
<b><i>First employed before 1982</i></b>			
N	1	10	11
Unadjusted SRR	33.8 (0.8, 188)	78.4 (37.6, 144)	70 (34.9, 125)
Adjusted SRR	35.4 (0.9, 198)	82.4 (39.5, 152)	73.5 (36.7, 132)
<b><i>First employed 1982 or later</i></b>			
N	16	19	35
Unadjusted SRR	188 (108, 306)	124 (74.7, 194)	147 (102, 204)
Adjusted SRR	199 (114, 322)	131 (78.6, 204)	155 (108, 215)
<b><i>Fab workers</i></b>			
N	13	26	39
Unadjusted SRR	146 (77.5, 249)	121 (78.9, 177)	128 (91, 175)
Adjusted SRR	153 (81.6, 262)	127 (83, 186)	135 (95.8, 184)
<b><i>Non-fab workers</i></b>			
N	4	3	7
Unadjusted SRR	158 (43.2, 406)	45.9 (9.5, 134)	77.3 (31.1, 159)
Adjusted SRR	167 (45.4, 427)	48.2 (10, 141)	81.2 (32.6, 167)

**Table 2.16** Female breast cancer registrations: numbers and SRRs by duration of employment

<b><i>Duration</i></b>	<b><i>n</i></b>	<b><i>SRR</i></b>	<b><i>95% CI</i></b>
<1 year	13	203	(108, 347)
1-4 years	8	85.7	(37, 169)
5-9 years	6	77.5	(28.4, 169)
10 or more years	19	118	(71.3, 185)































































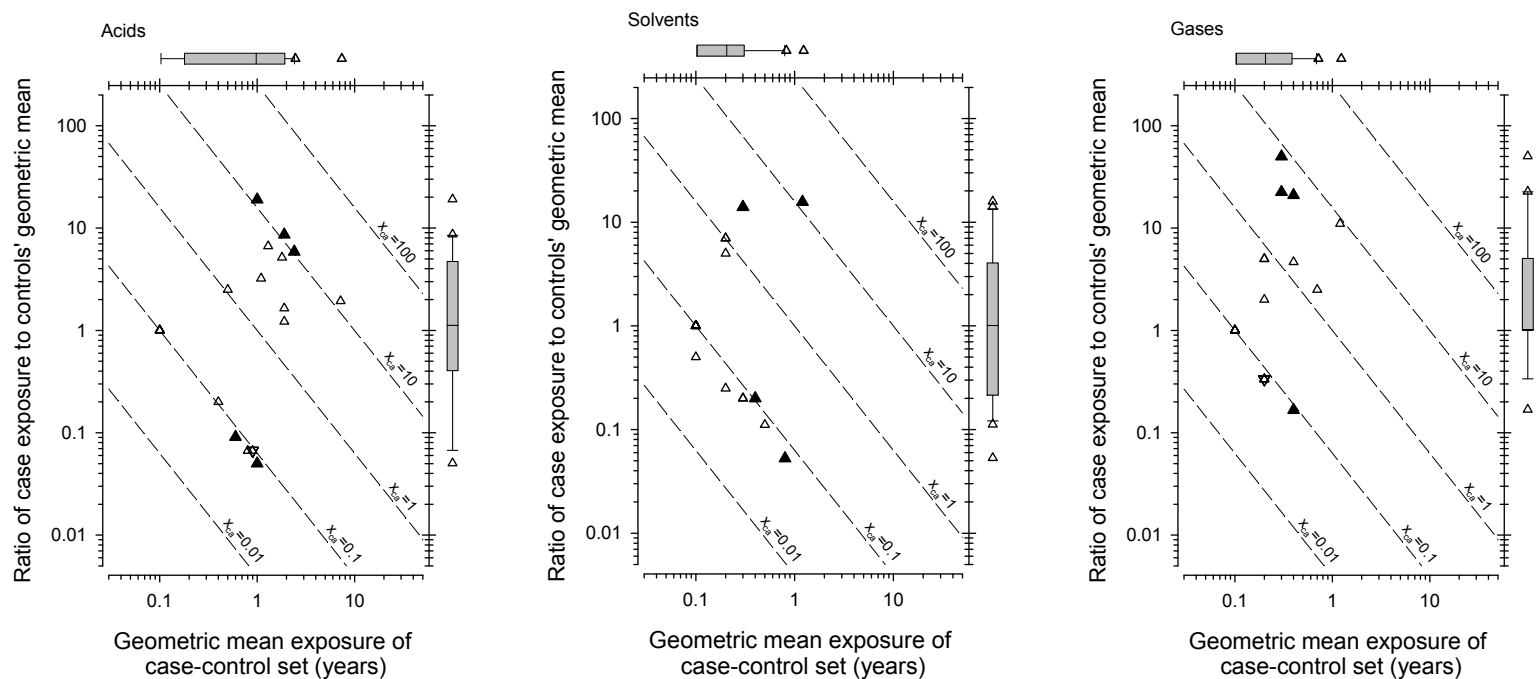




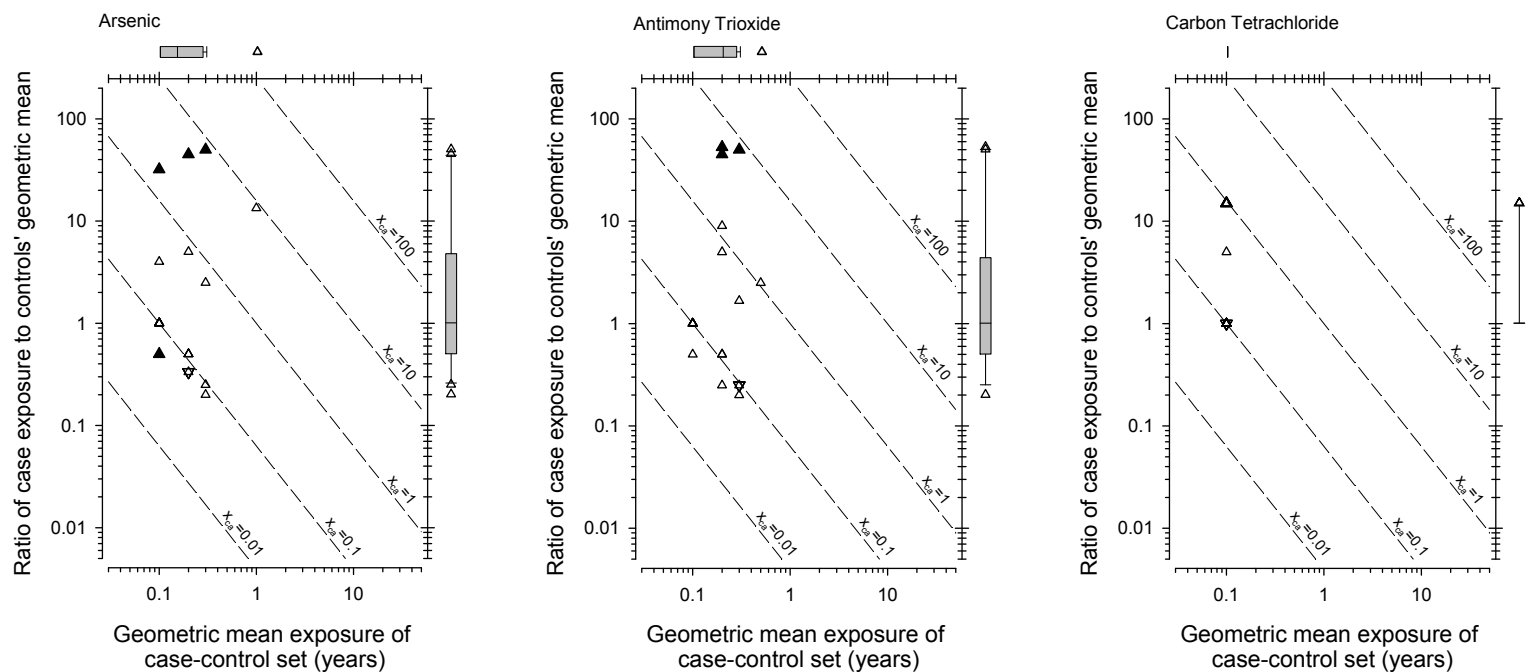




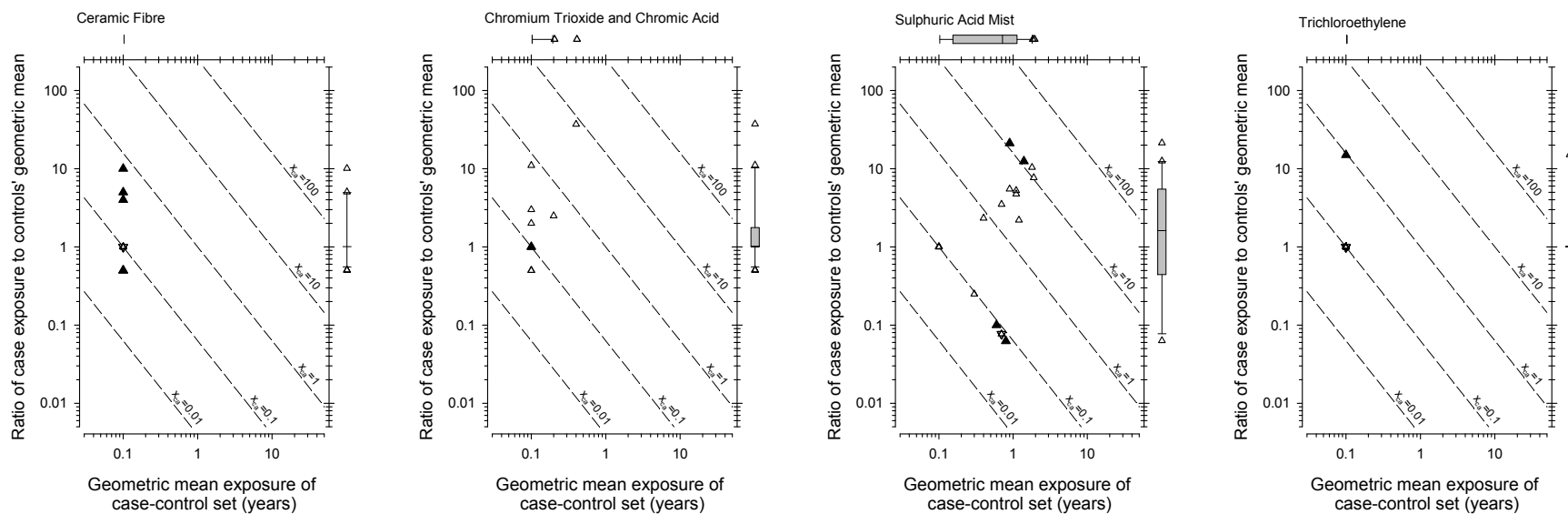
**Figure 4.2:** Plot of the geometric mean of the exposure of the case-control set (years) against the ratio of the exposure of the case to the geometric mean of the controls' exposures for: Acids (left); Solvents (centre); Gases (right). Durations are adjusted for a 10 year latency period. The solid upward pointing triangles ( $\blacktriangle$ ) are influential cases, while the solid downward pointing triangles ( $\blacktriangledown$ ) are influential cases where one of their controls is also influential



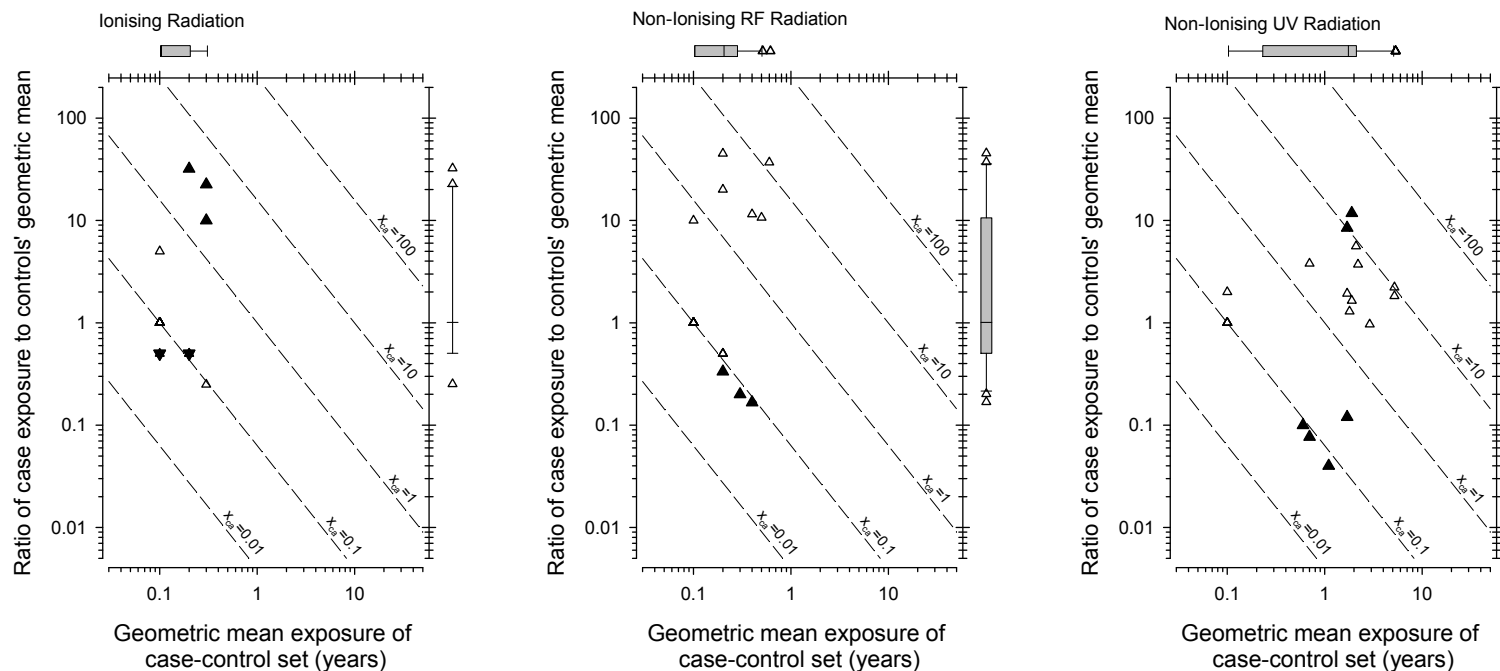
**Figure 4.3** Plot of the geometric mean of the exposure of the case-control set (years) against the ratio of the exposure of the case to the geometric mean of the controls' exposures for: Arsenic and its compounds (left); Antimony trioxide (centre); Carbon tetrachloride (right). Durations are adjusted for a 10 year latency period. The solid upward pointing triangles ( $\blacktriangle$ ) are influential cases, while the solid downward pointing triangles ( $\blacktriangledown$ ) are influential cases where one of their controls is also influential



**Figure 4.4** Plot of the geometric mean of the exposure of the case-control set (years) against the ratio of the exposure of the case to the geometric mean of the controls' exposures for: Ceramic fibre (left); Chromium Trioxide and Chromic Acid (centre-left); Sulphuric acid mist (centre-right); Trichloroethylene (right). Durations are adjusted for a 10 year latency period. The solid upward pointing triangles ( $\blacktriangle$ ) are influential cases, while the solid downward pointing triangles ( $\blacktriangledown$ ) are influential cases where one of their controls is also influential



**Figure 4.5** Plot of the geometric mean of the exposure of the case-control set (years) against the ratio of the exposure of the case to the geometric mean of the controls' exposures for: Ionising radiation (left); Non-ionising radiation Radio Frequency (centre); Non-ionising radiation Ultra-Violet (right). Durations are adjusted for a 10 year latency period. The solid upward pointing triangles ( $\blacktriangle$ ) are influential cases, while the solid downward pointing triangles ( $\blacktriangledown$ ) are influential cases where one of their controls is also influential





**Figure 4.6** Plot of the geometric mean of the exposure of the case-control set (years) against the ratio of the exposure of the case to the geometric mean of the controls' exposures for: Work in fab (left); Work in a building in which fab was situated (centre); Work in other semiconductor factory (right). Durations are adjusted for a 10 year latency period. The solid upward pointing triangles ( $\blacktriangle$ ) are influential cases, while the solid downward pointing triangles ( $\blacktriangledown$ ) are influential cases where one of their controls is also influential

