Supplemental Material

We searched PubMed and EMBASE with terms and Boolean operators as follows:

DNA damage: “Oxidative DNA damage” OR “oxidatively damaged DNA” OR “8-oxodG” OR “8-OHdG” OR “8-oxoGua” OR “8-hydroxyguanine” OR “8-hydroxy-2'-deoxyguanine” OR” 8-hydroxy-2'-deoxyguanosine” OR “8-oxo-7,8-dihydro-2'-deoxyguanosine” OR” FPG” OR “formamidopyrimidine” OR “ENDOIII” OR “endonuclease III” OR “comet assay”.

Lipid peroxidation products: “Lipid peroxidation” OR “thiobarbituric acid reactive substances” OR “TBARS” OR “malondialdehyde” OR ”MDA” OR “isoprostane” OR “hydroperoxide”.

Exposure: “Air pollution” OR “diesel exhaust” OR “wood smoke” OR “biomass”.

The latest publication date was October 1st 2009. Figure 1 depicts a flow diagram illustrating the identification of publications. Research results from “DNA damage” and “Lipid peroxidation products” were combined with ”Exposure”. We reviewed the abstracts for relevant inclusion criteria, including that the publication should report original data of environmental/urban exposure to air pollution. Further searches were conducted in the Web of Science database on publications that had cited those publications, which we had identified in the PubMed and EMBASE databases. We also assessed the reference lists of the publications. Publications from studies on occupational exposure to air pollution were only included if they contained biomarker/exposure data from subjects that had been exposed outdoor to ambient air pollution from exhaust or residential biomass combustion. We have judged two articles to be parallel publications from the same study written in English (Chung et al. 2003) and Chinese (Chuang et al. 2002). Only the publication written in English has been included in the study. We have not identified other publications written in non-English language in our search that reported results from studies on air pollution exposure and oxidatively damaged DNA or lipids in humans.

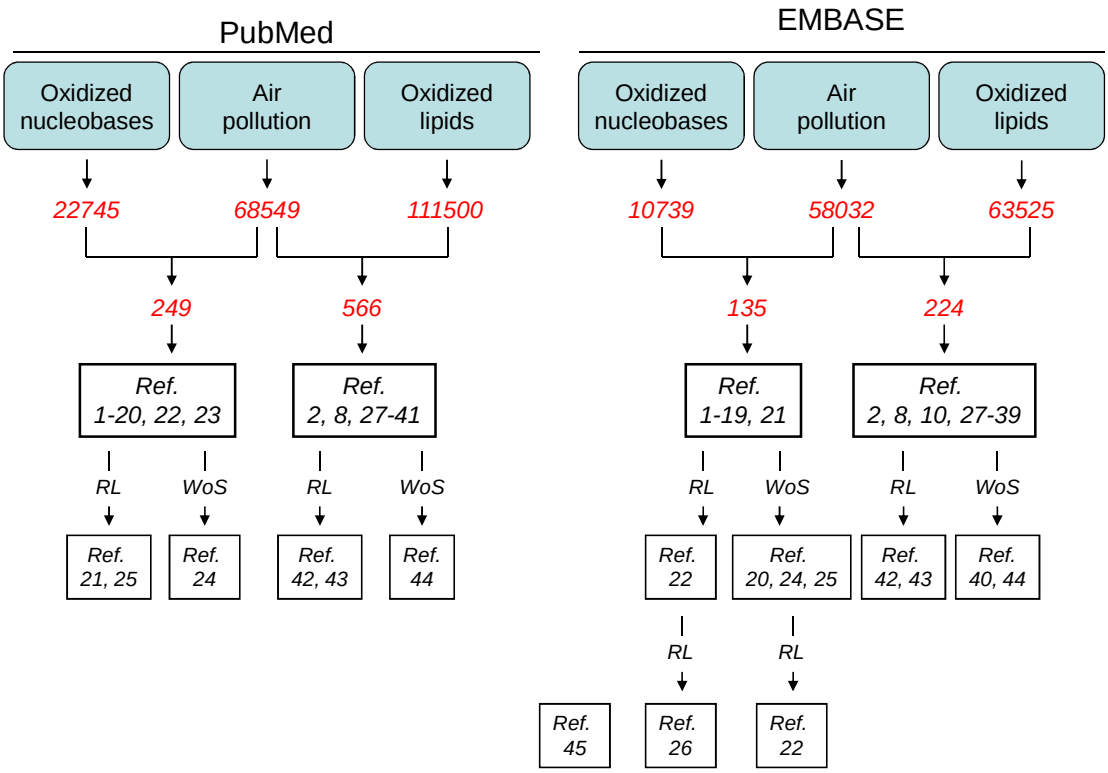

Figure 1. Flow diagram of primary searches in PubMed and EMBASE, with subsequent identification of publications via Web of Science (WoS) or reference lists (RL). Red text indicates the number of retrieved publications in the PubMed and EMBASE databases. One publication (reference no 45) was not identified by this search. The reference numbers are Loft et al. 1999 (1), Autrup et al. 1999 (2), Sørensen et al. 2003a (3), Fanou et al. 2006 (4), Avogbe et al. 2005 (5), Vinzents et al. 2005 (6), Bräuner et al. 2007 (7), Rossner et al. 2007 (8), Danielsen et al. 2008 (9), Singh et al. 2007 (10), Buthbumrung et al. 2008 (11), Novotna et al. 2007 (12), Svecova et al. 2009 (13), Rossner et al. 2008a (14), Chuang et al. 2007 (15), Palli et al. 2009 (16), Cavallo et al. 2006 (17), Calderon-Garciduenas et al. 1999 (18), Suzuki et al. 1995 (19), Wei et al. 2009 (20), Sørensen et al. 2003c (21), Lai et al. 2005 (22), Chuang et al. 2003 (23), Kelishadi et al. 2009 (24) , Staessen et al. 2001 (25), De Coster et al. 2008 (26), Mills et al. 2008 (27), Isik et al. 2005 (28), Barregard et al. 2006 (29), Bonina et al. 2008 (30), Rossner et al. 2008b (31), Sørensen et al. 2003b (32), Liu et al. 2007 (33), Barregard et al. 2008 (34), Romieu et al. 2008 (35), Liu et al. 2009 (36), Medina-Navarro et al. 1997 (37), Allen et al. 2009 (38), Liu et al. 2009b (39), Chen et al. 2007 (40), Vujovic et al. 2009 (41), Bräuner et al. 2008 (42), Hicks et al. 1996 (43), Sanchez-Rodriguez et al. 2005 (44) and Rundell et al. 2008 (45).

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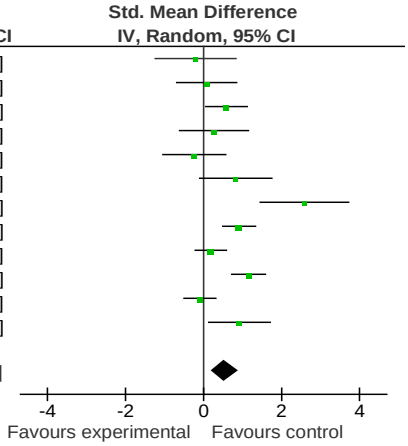
No potential of measurement error

Study or Subgroup	Experimental Mean	Experimental SD	Experimental Total	Control Mean	Control SD	Control Total	Weight	Std. Mean Difference IV, Random, 95% CI
Allen 2009 (1)	0	0.234	9	0.05	0.234	6	6.0%	-0.20 [-1.24, 0.84]
Barregaard 2008	0.0053	0.0865	13	0	0.022	13	7.8%	0.08 [-0.69, 0.85]
Braüner 2007	0.53	0.28	29	0.38	0.22	29	9.7%	0.59 [0.06, 1.11]
Danielsen 2008 (2)	0.81	0.35	10	0.73	0.19	10	7.0%	0.27 [-0.61, 1.15]
Danielsen 2008 (3)	0.225	0.13	12	0.255	0.119	12	7.6%	-0.23 [-1.04, 0.57]
Danielsen 2008 (4)	8.43	6.48	10	4.24	2.31	10	6.7%	0.82 [-0.10, 1.75]
Rundell 2008	27.2	6.9	12	12.2	3.9	12	5.5%	2.58 [1.45, 3.72]
Sørensen 2003a (5)	0.23	0.14	49	0.122	0.09	49	10.5%	0.91 [0.49, 1.33]
Sørensen 2003a (6)	1.51	6.8	49	0.5	3.5	49	10.6%	0.19 [-0.21, 0.58]
Sørensen 2003a (7)	0.58	0.33	49	0.27	0.18	49	10.4%	1.16 [0.73, 1.59]
Sørensen 2003b	35.9	7.4	47	36.6	8	47	10.6%	-0.09 [-0.49, 0.31]
Vinzents 2005	0.08	0.08	14	0.02	0.04	14	7.7%	0.92 [0.14, 1.71]
Total (95% CI)			**303**			**300**	**100.0%**	**0.55 [0.19, 0.90]**

Heterogeneity: Tau² = 0.27; Chi² = 44.37, df = 11 (P < 0.00001); I² = 75%
Test for overall effect: Z = 2.99 (P = 0.003)

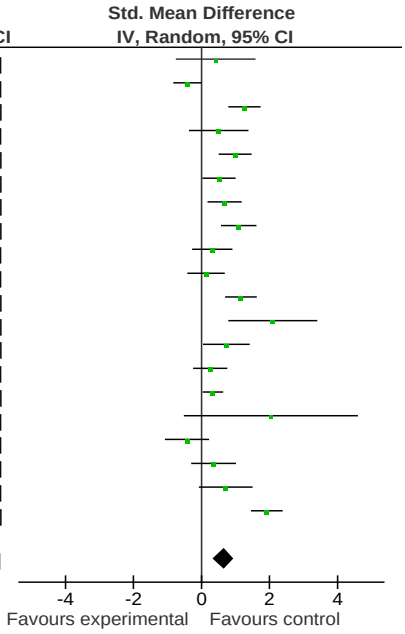


(1) LPO
(2) 8-oxodG (urine)
(3) FPG sites (blood cells)
(4) 8-oxoGua (urine)
(5) 8-oxodG (urine)
(6) ENDOIII/FPG (lymphocytes)
(7) 8-oxodG (lymphocytes)

Potential measurement error in either biomarker analysis or exposure assessment

Study or Subgroup	Experimental Mean	Experimental SD	Experimental Total	Control Mean	Control SD	Control Total	Weight	Std. Mean Difference IV, Random, 95% CI
Allen 2009 (1)	0.087	0.193	6	0	0.193	6	3.3%	0.42 [-0.73, 1.57]
Autrup 1999	0.87	0.19	55	0.96	0.25	45	5.9%	-0.41 [-0.81, -0.01]
Avogbe 2005	9.2	3.11	108	5.39	2.47	27	5.8%	1.26 [0.82, 1.71]
Barregaard 2006	0.036	0.051	11	0.016	0.017	11	4.3%	0.51 [-0.35, 1.36]
Bräuner 2008	0.5	0.1	41	0.4	0.1	41	5.7%	0.99 [0.53, 1.45]
Buthbumrung 2008 (2)	2.16	1.84	43	1.32	1.24	32	5.7%	0.52 [0.05, 0.98]
Buthbumrung 2008 (3)	0.25	0.13	40	0.08	0.34	32	5.7%	0.68 [0.20, 1.16]
Cavallo 2006	12.85	5.14	41	7.97	3.19	31	5.6%	1.09 [0.59, 1.60]
Liu 2007	0.572	0.572	24	0.411	0.411	24	5.3%	0.32 [-0.25, 0.89]
Liu 2009b	5.9	5.16	28	5.22	4.57	28	5.5%	0.14 [-0.39, 0.66]
Loft 1999	190	108	29	29	146	89	5.8%	1.16 [0.72, 1.61]
Mills 2008	16.6	7.6	8	4.5	1.3	8	2.9%	2.10 [0.81, 3.39]
Novotna 2007	2.52	1.73	54	1.29	1.21	11	5.0%	0.73 [0.07, 1.39]
Palli 2008	5	3.06	44	4.11	3.96	27	5.7%	0.26 [-0.22, 0.74]
Staessen 2001	0.52	0.27	100	0.44	0.2	100	6.3%	0.34 [0.06, 0.61]
Suzuki 1995	9.93	2.48	3	4.22	1.97	3	1.1%	2.04 [-0.50, 4.58]
Sørensen 2003c (4)	222.03	126.2	20	280.2	142.5	20	5.1%	-0.42 [-1.05, 0.20]
Sørensen 2003c (5)	9.76	17.5	20	5.01	5.2	19	5.1%	0.36 [-0.28, 0.99]
Sørensen 2003c (6)	1.03	1.07	14	0.376	0.66	14	4.6%	0.71 [-0.05, 1.48]
Wei 2009	6.91	3.67	58	1.83	0.52	58	5.8%	1.93 [1.48, 2.37]
Total (95% CI)			**747**			**626**	**100.0%**	**0.66 [0.37, 0.95]**

Heterogeneity: Tau² = 0.33; Chi² = 107.19, df = 19 (P < 0.00001); I² = 82%
Test for overall effect: Z = 4.42 (P < 0.0001)

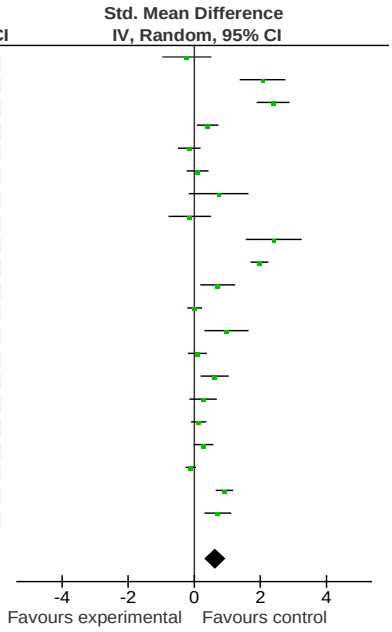


(1) 8-oxodG
(2) 8-oxodG (urine)
(3) 8-oxodG (leukocytes)
(4) 8-oxodG (urine)
(5) ENDOIII/FPG (lymphocytes)
(6) 8-oxodG (lymphocytes)

Potential measurement error in both biomarker analysis or exposure assessment

Study or Subgroup	Experimental Mean	Experimental SD	Experimental Total	Control Mean	Control SD	Control Total	Weight	Std. Mean Difference IV, Random, 95% CI
Bonina 2008	340.17	41.4	20	348.91	31.67	12	4.1%	-0.22 [-0.94, 0.49]
Calderon-Garciduenas 1999	602	195	87	210	122	12	4.3%	2.07 [1.40, 2.74]
Chen 2007	195.3	46	61	97.2	34.7	59	4.7%	2.39 [1.92, 2.86]
Chuang 2003	13.4	4.7	95	11.5	4.7	75	5.1%	0.40 [0.10, 0.71]
Chuang 2007	0.57	0.2	76	0.6	0.2	76	5.0%	-0.15 [-0.47, 0.17]
De Coster 2008	14.53	5.33	89	14	5.25	76	5.1%	0.10 [-0.21, 0.41]
Fanou 2006	2.02	1.25	35	1.11	0.82	6	3.7%	0.74 [-0.14, 1.62]
Hicks 1996	5.05	1.55	24	5.23	0.9	17	4.4%	-0.13 [-0.76, 0.49]
Isik 2005	3.28	0.79	28	1.47	0.63	15	3.9%	2.40 [1.58, 3.23]
Kelishadi 2009	1.52	0.17	187	1.22	0.13	187	5.1%	1.98 [1.73, 2.23]
Lai 2005	13.3	7.1	47	8.4	6.2	24	4.7%	0.71 [0.21, 1.22]
Liu 2009a	0.9	4.97	182	0.85	4.65	182	5.2%	0.01 [-0.20, 0.22]
Medina-Navarro 1997	5.68	1.2	21	4.47	1.22	21	4.3%	0.98 [0.34, 1.62]
Romieu 2008	14	16.3	107	12.4	16.3	107	5.1%	0.10 [-0.17, 0.37]
Rossner Jr 2008a	6.66	2.41	50	5.21	2.23	50	4.9%	0.62 [0.22, 1.02]
Rossner Jr 2008b	0.77	0.27	50	0.68	0.38	50	4.9%	0.27 [-0.12, 0.66]
Singh 2007 (1)	33	33.1	198	29.2	21.1	156	5.2%	0.13 [-0.08, 0.34]
Singh 2007 (2)	58.3	34.9	98	49.2	30.4	105	5.1%	0.28 [0.00, 0.55]
Svecova 2009	14.6	5.8	495	15.2	6.1	399	5.3%	-0.10 [-0.23, 0.03]
Sánches-Rodríguez 2005	0.38	0.19	167	0.23	0.12	125	5.1%	0.91 [0.67, 1.16]
Vujovic 2009	1.25	0.43	42	0.99	0.32	82	4.9%	0.72 [0.33, 1.10]
Total (95% CI)			**2159**			**1836**	**100.0%**	**0.65 [0.34, 0.96]**

Heterogeneity: Tau² = 0.47; Chi² = 398.36, df = 20 (P < 0.00001); I² = 95%
Test for overall effect: Z = 4.11 (P < 0.0001)



(1) M1dG
(2) 8-oxodG