

Supplemental Table D: Excluded citations and rationale for exclusion

Citations	Rationale for Exclusion from Critical Appraisal and Meta-Analysis
Blair A. 1980. Mortality among workers in the metal polishing and plating industry, 1951--1969. <i>J Occup Med</i> 2, 158-62.	PMR study
Garabrant DH, Wegman DH. 1984. Cancer mortality among shoe and leather workers in Massachusetts. <i>Am J Ind Med</i> 5, 303-14.	PMR study
N Maizlish, J Beaumont, J Singleton. 1988. Mortality among California highway workers. <i>Am J Ind Med</i> 13, 363-79.	PMR study
Robinson C, Stern F, Halperin W, Venable H, Petersen M, Frazier T, Burnett C, Lulich N, Salg J, Sestito J. 1995. Assessment of mortality in the construction industry in the United States, 1984-1986. <i>Am J Ind Med</i> 28, 49-70.	PMR study, stomach cancer numbers are not provided. Not included in Supplemental Table B
Rosenman KD, Stanbury M. 1996. Risk of lung cancer among former chromium smelter workers. <i>Am J Ind Med</i> 29, 491-500.	PMR/PCMR study
Salg J, Alterman T. 2005. A proportionate mortality study of bricklayers and allied craftworkers. <i>Am J Ind Med</i> 47, 10-9.	PMR study
Silverstein M, Mirer F, Kotelchuck D, Silverstein B, Bennett M. 1981. Mortality among workers in a die-casting and electroplating plant. <i>Scand J Work Environ Health</i> 7 Suppl 4, 156-65.	PMR study
Stern F, Lehman E, Ruder A. 2001. Mortality among unionized construction plasterers and cement masons. <i>Am J Ind Med</i> 39, 373-88.	PMR study
Walrath J, Decoufle P, Thomas TL. 1987. Mortality among workers in a shoe manufacturing company. <i>Am J Ind Med</i> 12, 615-623.	PMR study
Cole P, Rodu B. 2005. Epidemiologic studies of chrome and cancer mortality: a series of meta-analyses. <i>Reg Tox Pharm</i> 43, 225-31.	Meta-analysis
Gatto NM, Kelsh MA, HaMai D, Suh M, Proctor DM. 2010. Occupational exposure to hexavalent chromium and cancers of the gastrointestinal tract: a meta-analysis. <i>Cancer epidemiology</i> 34, 388-99.	Meta-analysis
Welling R, Beaumont JJ, Petersen SJ, Alexeeff GV, Steinmaus C. 2015. Chromium VI and stomach cancer: a meta-analysis of the current epidemiological evidence. <i>Occup Environ Med</i> 72, 151-9.	Meta-analysis
Marini F, Ferré MP, Gross H, Mantout B, Huvinen M, Beaufils D, Cunat PJ, Bozec C. 1995. Does welding stainless steel cause cancer? <i>Scand J Work Environ Health</i> 21, 65-8.	Letter to the editor
Nurminen M. 2004. On the carcinogenicity risk assessment of chromium compounds. <i>Am J Ind Med</i> 45, 308-9; author reply 310.	Letter to the editor
Nakagawa K, Tsuchiya E, Hirano T. 1989. [Lung cancer in chromium-exposed workers--high prevalence of lung cancer and multiple primary cancers]. <i>Gan no rinsho. Japan journal of cancer clinics</i>	Case reports on pathology of disease
Yang Y, Liu H, Xiang XH, Liu FY. 2013. Outline of occupational chromium poisoning in China. <i>Bull Environ Contam Toxicol</i> . 90, 742-749.	The study analyzed the feature of occupational chromium poisoning in China since the 1980s. Used surveys from various locations of chromium poisonings
[No authors listed]. 1981. Role of metals in carcinogenesis. Problems of epidemiological evidence. <i>Environ Health Perspect</i> 40, 11-20.	Review
Becker N, Chang-Claude J, Frentzel-Beyme R. 1991. Risk of cancer for arc welders in the Federal Republic of Germany: results of a second follow up (1983-8). <i>Br J Ind Med</i> . 48, 675-683.	Updated information is available from Becker (1999) (which was included)
Boice JD, Marano DE, Fryzek JP, Sadler CJ, McLaughlin JK. 1999. Mortality among aircraft manufacturing workers. <i>Occup Environ Med</i> 56, 581-597.	Updated information is available from Lipworth et al. (2011) (which was included)
Costantini AS, Paci E, Miligi L, Buiatti E, Martelli C, Lenzi S. 1989. Cancer mortality among workers in the Tuscan tanning industry. <i>Br J Ind Med</i> . 46, 384-388.	Updated information is available from Iaia et al. (2006) (which was included)
Gibb HJ, Lees PS, Pinsky PF, Rooney BC. 2000. Lung cancer among workers in chromium chemical production. <i>Am J Ind Med</i> 38, 115-26.	Updated information is available from Gibb et al. (2015) (which was included)
Huvinen M, Pukkala E. 2016. Cause-specific mortality in Finnish ferrochromium and stainless steel production workers. <i>Occup Med (Lond)</i> . 66, 241-246.	Information overlaps with Huvinen and Pukkala (2013). In that study, cancer incidence information is provided regarding a larger cohort. Hence, the prior study was included.
Itoh T, Takahashi K, Okubo T. 1996. Mortality of chromium plating workers in Japan - a 16-year follow-up study. <i>J UOEH</i> 18, 7-18.	Updated information is available from Hara et al. (2010) (which was included)
Langard S, Andersen A, Gylseth B. 1980. Incidence of cancer among ferrochromium and ferrosilicon workers. <i>Br J Ind Med</i> 37, 114-20.	Updated information is available from Langard (1990) (which was included)
Luippold RS, Mundt KA, Austin RP, Liebig E, Panko J, Crump C, Crump K, Proctor D. 2003. Lung cancer mortality among chromate production workers. <i>Occup Environ Med</i> 60, 451-457.	Updated information is available in Proctor et al. (2016) (which was included)

Citations	Rationale for Exclusion from Critical Appraisal and Meta-Analysis
Simonato L, Fletcher AC, Andersen A, Anderson K, Becker N, Chang-Claude J, Ferro G, Gerin M, Gray CN, Hansen KS et al. 1991. A historical prospective study of European stainless steel, mild steel, and shipyard welders. <i>Br J Ind Med</i> 48, 145-154.	Information overlaps with Moulin et al. (1993) publications (which was included)
Takahashi K, Okubo T. 1990. A prospective cohort study of chromium plating workers in Japan. <i>Arch Environ Health</i> 45, 107-111.	Updated information is available from Hara et al. (2010) (which was included)
Zhang J, Li S. 1997. Cancer mortality in a Chinese population exposed to hexavalent chromium in water. <i>J Occup Environ Med</i> 39, 315-319.	Retracted article. Newer studies exist on the study population (Beaumont et al. 2008, Kerger et al. 2009) and they were included.
Beaumont JJ, Weiss NS. 1980. Mortality of welders, shipfitters, and other metal trades workers in boilermakers Local No. 104, AFL-CIO. <i>Am J Epidemiol</i> 112, 775-86.	Relative risk is presented by combining all gastro cancers. Stomach cancer relative risk is not separately evaluated.
Armienta-Hernandez MA, Rodriguez-Castillo R. Environmental exposure to chromium compounds in the valley of Leon, Mexico. <i>Environ Health Perspect</i> 103(Suppl 1), 47-51.	No stomach cancer numbers or relative risk estimates are presented. Study evaluated exposures to Cr(VI) in water, soil, and urine.
Birk T, Mundt KA, Dell LD, Luippold RS, Miksche L, Steinmann-Steiner-Haldenstaett W, Mundt DJ. 2006. Lung cancer mortality in the German chromate industry, 1958 to 1998. <i>J Occup Environ Med</i> 48, 426-33.	No stomach cancer number or relative risk estimates are presented. Relative risk for stomach cancer could not be calculated.
Blot WJ, Fryzek JP, Henderson BE, Sadler CJ, McLaughlin JK. 2000. A cohort mortality study among gas generator utility workers. <i>J Occup Environ Med</i> 42, 194-9.	Evaluated lung cancer relative risk among gas generator utility workers. No stomach cancers evaluated
Boffetta P, Autier P, Boniol M, Boyle P, Hill C, Aurengo A, Masse R, Thé GD, Valleron AJ, Monier R, Tubiana M. 2010. An estimate of cancers attributable to occupational exposures in France. <i>J Occup Environ Med</i> 52, 399-406.	Does not evaluate stomach cancer in association with chromium exposure
Dalager NA, Mason TJ, Fraumeni JF, Hoover R, Payne WW. 1980. Cancer mortality among workers exposed to zinc chromate paints. <i>J Occup Med</i> 22, 25-29.	Presents results for digestive cancers combined only. No individual numbers or relative risk estimates for stomach cancer
Decoufle P. 1979. Cancer risks associated with employment in the leather and leather products industry. <i>Arch Environ Health</i> 34, 33-37.	No stomach cancer numbers or relative risk estimates are presented.
Eizaguirre-Garcia D, Rodriguez-Andres C, Watt GC et al. (1999) A study of leukaemia in Glasgow in connection with chromium-contaminated land. <i>J Public Health Med</i> 21, 435-438.	No stomach cancer numbers or relative risk estimates are presented. A study of leukemia
Eizaguirre-Garcia D, Rodriguez-Andres C, Watt GC. (2000) Congenital anomalies in Glasgow between 1982 and 1989 and chromium waste. <i>J Public Health Med</i> 22, 54-58.	No stomach cancer numbers or relative risk estimates are presented. A study of congenital abnormalities
Giordano F, Dell'orco V, Fantini F, Grippo F, Perretta V, Testa A, Figà-Talamanca I. 2012. Mortality in a cohort of cement workers in a plant of Central Italy. <i>Int Arch Occup Environ Health</i> 85, 373-9.	No stomach cancer numbers or relative risk estimates are presented.
Hansen KS, Lauritsen JM, Skytthe A. 1996. Cancer incidence among mild steel and stainless steel welders and other metal workers. <i>Am J Ind Med</i> 30, 373-82.	No stomach cancer numbers or relative risk estimates are presented.
Hara T. 2012. Evaluation of cancer death risk of chrome plating workers worldwide. <i>J OEH</i> 34, 309-313.	No stomach cancer numbers or relative risk estimates are presented.
Hayes RB, Lilienfeld AM, Snell LM. 1979. Mortality in chromium chemical production workers: a prospective study. <i>Int J Epidemiol</i> 8, 365-74.	Relative risk estimates are for digestive cancers combined. No stomach cancer relative risk estimates are presented.
Karagiannis D, Deliveliotis C, Papadimitriou E, Riza E, Lykou A, Petralias A, Papatsoris A, Linos A. 2015. Oral exposure to hexavalent chromium through drinking water and urologic morbidity in an industrial area of Greece. <i>J Public Health</i> 23, 249-255.	No stomach cancer numbers or relative risk estimates are presented. Study evaluated urologic effects from Cr(VI) exposure.
Luippold RS, Mundt KA, Dell LD, Birk T. 2005. Low-level hexavalent chromium exposure and rate of mortality among US chromate production employees. <i>J Occup Environ Med</i> 47, 381-5.	No stomach cancer numbers or relative risk estimates are presented.
Mikoczy Z, Schütz A, Strömberg U, Hagmar L. 1996. Cancer incidence and specific occupational exposures in the Swedish leather tanning industry: a cohort based case-control study. <i>Occup Environ Med</i> 53, 463-7.	No stomach cancer numbers are presented in the text. Authors state, "We could not find any noteworthy association between any of the chemical exposure indices and stomach, kidney, and bladder cancer."
Moulin JJ, Clavel T, Roy D, Dananché B, Marquis N, Févotte J, Fontana JM. 2000. Risk of lung cancer in workers producing stainless steel and metallic alloys. <i>Int Arch Occup Environ Health</i> 73, 171-180.	No stomach cancer numbers or relative risk estimates are presented.
Parent ME, Hua Y, Siemiatycki J. 2000. Occupational risk factors for renal cell carcinoma in Montreal. <i>Am J Ind Med</i> 38, 609-618.	No stomach cancer numbers or relative risk estimates are presented.
Pastides H, Austin R, Lemeshow L, Klar J, Mundt KA. 1994. A retrospective-cohort study of occupational exposure to hexavalent chromium. <i>Am J Ind Med</i> 25, 663-75.	No stomach cancer numbers or relative risk estimates are presented.
Royle H. 1975. Toxicity of chromic acid in the chromium plating industry (1). <i>Environ Research</i> 10, 39-53.	No stomach cancer numbers or relative risk estimates are presented.

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Yuan TH, Lian leB, Tsai KY, Chang TK, Chiang CT, Su CC, Hwang YH. 2011. Possible association between nickel and chromium and oral cancer: a case-control study in central Taiwan. <i>Sci Total Environ</i> 409, 1046-1052.	No stomach cancer numbers or relative risk estimates are presented. A study of oral cancer.
Andersen A, Barlow L, Engeland A, Kjaerheim K, Lynge E, Pukkala E. 1999. Work-related cancer in the Nordic countries. <i>Scand J Work Environ Health</i> 25, 1-116.	Occupations are listed as part of registry study. Specifications of Cr(VI) exposures are not indicated by the authors.
Ji J, Hemminki K. 2006. Socio-economic and occupational risk factors for gastric cancer: a cohort study in Sweden. <i>Eur J Cancer Prev</i> 15, 391-397.	Registry study with general occupational listings. Specifications of Cr(VI) exposures are not indicated by the authors.
Minder CE, Beer-Porizek V. 1992. Cancer mortality of Swiss men by occupation, 1979–1982. <i>Scand J Work Environ Health</i> 18 Suppl 3, 1-27.	Occupations are listed as part of registry study. Specifications of Cr(VI) exposures are not indicated by the authors.
Pukkala E, Martinsen JJ, Lynge E, Gunnarsdottir HK, Sparén P, Tryggvadottir L, Weiderpass E, Kjaerheim K. 2009. Occupation and cancer - follow-up of 15 million people in five Nordic countries. <i>Acta Oncol</i> 48, 646-790.	A registry study with general occupational listings. No direct connections to Cr(VI) exposures are provided.
Pukkala E, Martinsen JJ, Weiderpass E, Kjaerheim K, Lynge E, Tryggvadottir L, Sparén P, Demers PA. 2014. Cancer incidence among firefighters: 45 years of follow-up in five Nordic countries. <i>Occup Environ Med</i> 71, 398-404.	A registry study of firefighters with multiple co-exposures to several chemicals.
Bednar CM, Kies C. 1991. Inorganic contaminants in drinking water correlated with disease occurrence in Nebraska. <i>Water Resources Bulletin</i> 27, 631-635.	Ecologic studies
Beaumont JJ, Sedman RM, Reynolds SD, Sherman CD, Li LH, Howd RA, Sandy MS, Zeise L, Alexeeff GV. 2008. Cancer mortality in a Chinese population exposed to hexavalent chromium in drinking water. <i>Epidemiology</i> 19, 12-23.	Ecologic studies
Fryzek JP, Mumma MT, McLaughlin JK, Henderson BE, Blot WJ. 2001. Cancer mortality in relation to environmental chromium exposure. <i>J Occup Environ Med</i> 43, 635-640.	Ecologic studies
Kerger BD, Butler WJ, Paustenbach DJ, Zhang J, Li S. 2009. Cancer mortality in chinese populations surrounding an alloy plant with chromium smelting operations. <i>Journal of toxicology and environmental health Part A</i> 72, 329-344.	Ecologic studies
Linou A, Petralias A, Christophi CA, Christoforidou E, Kouroutou P, Stolidis M, Veloudaki A, Tzala E, Makris KC, Karagas MR. 2011. Oral ingestion of hexavalent chromium through drinking water and cancer mortality in an industrial area of Greece--an ecological study [Research Support, Non-U.S. Gov't]. <i>Environ Health</i> 10, 50.	Ecologic studies
Cammarano G, Crosignani P, Berrino F, Berra G. 1984. Cancer mortality among workers in a thermoelectric power plant. <i>Scand J Work Environ Health</i> 10, 259-261.	Does not mention Cr(VI) exposure anywhere in the text. A study of thermoelectric power plant. Mentions exposures to PAHs, asbestos, PCBS, nickel, beryllium, and total chromium
González CA, Sanz M, Marcos G, Pita S, Brullet E, Vida F, Agudo A, Hsieh CC. 1991. Occupation and gastric cancer in Spain. <i>Scand J Work Environ Health</i> 17, 240-247.	General job categories without specifications of direct exposures to Cr(VI).
Jarvholm B, Thringer G, Axelsson O. 1982. Cancer morbidity among polishers. <i>Br J Ind Med</i> 39, 196-197.	Does not mention Cr(VI) exposure anywhere in the text. A study of metal polishers. Indicates total chromium and nickel content in the band polishing.
Kneller RW, Gao YT, McLaughlin JK, Gao RN, Blot WJ, Liu MH, Sheng JP, Fraumeni JF. 1990. Occupational risk factors for gastric cancer in Shanghai, China. <i>Am J Ind Med</i> 18, 69-78.	General job categories without specifications of direct exposures to Cr(VI). Author does not mention Cr(VI) anywhere in the text
Knutsson A, Damberg L, Jarvholm B. 2000. Cancers in concrete workers: results of a cohort study of 33,668 workers. <i>Occup Environ Med</i> 57, 264-267.	A study of concrete workers. General occupation codings are provided. Specifications of Cr(VI) exposures are not indicated by the authors.
Kusiak RA, Ritchie AC, Springer J, Muller J. 1993. Mortality from stomach cancer in Ontario miners. <i>Br J Ind Med</i> 50, 117-26.	Does not mention Cr(VI) exposure. A study of uranium miners. Discusses exposures to radon, silica dust.
Mallin K, Rubin M, Joo E. 1989. Occupational cancer mortality in Illinois white and black males, 1979-1984, for seven cancer sites. <i>Am J Ind Med</i> 15, 699-717.	General job categories without specifications of direct exposures to Cr(VI).
Parent ME, Siemiatycki J, Fritschi L. 1998. Occupational exposures and gastric cancer. <i>Epidemiology</i> 9, 48-55.	General job categories without specifications of direct exposures to Cr(VI). Author does not mention Cr(VI) anywhere in the text
Ercolanelli M, Seniori Costantini A. 2002. Update of cancer mortality among workers in the Tuscan tanning industry. <i>European J Oncology</i> 2002, 7:57	For leather tanning, two bath process specified as not being used since WWII (Costani et al. 1989). Workers from 1980s and on were evaluated in this study.
Danielsen TE, Langård S, Andersen A, Knudsen O. 1993. Incidence of cancer among welders of mild steel and other shipyard workers. <i>Br J Ind Med</i> 50, 1097-1103.	Shipyard welders with high asbestos exposure.
Danielsen TE, Langård S, Andersen A. 2000. Incidence of cancer among welders and other shipyard workers with information on previous work history. <i>J Occup Environ Med</i> 42, 101-109.	Shipyard welders with high asbestos exposures.
Jansson C, Johansson AL, Bergdahl IA, Dickman PW, Plato N, Adami J, Boffetta P, Lagergren J. 2005. Occupational exposures and risk of esophageal and gastric cardia cancers among male Swedish construction workers. <i>Cancer Causes Control</i> 16, 755-64.	A study of construction workers with multiple co-exposures to other chemicals

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Krstev S, Stewart P, Rusiecki J, Blair A. 2007. Mortality among shipyard Coast Guard workers: a retrospective cohort study. <i>Occup Environ Med</i> 64, 651-658.	Exposed workers, as stated by the authors, were those who had ever been engaged in the typical shipbuilding or repair tasks. This non-descript exposure scenario includes high asbestos exposure among other carcinogens.
Mikoczy Z, Hagmar L. 2005. Cancer incidence in the Swedish leather tanning industry: updated findings 1958-99. <i>Occup Environ Med</i> 62, 461-464.	Describes chrome tanning but also processes using other chemicals; hard to separate data for co-exposures to other chemicals as currently presented.
Park RM. 2001. Medical insurance claims and surveillance for occupational disease: analysis of respiratory, cardiac, and cancer outcomes in auto industry tool grinding operations. <i>J Occup Environ Med</i> 43, 335-46.	The study evaluated medical claims associated auto industry tool grinding operations. Multiple co-exposures are likely.
Puntoni R, Vercelli M, Merlo F, Valerio F, Santi L. 1979. Mortality among shipyard workers in Genoa, Italy. <i>Ann N Y Acad Sci</i> 330, 353-77.	Authors stated that "asbestos exposure was wide-spread".
Santibañez M, Alguacil J, de la Hera MG, Navarrete-Muñoz EM, Llorca J, Aragonés N, Kauppinen T, Vioque J. 2012. Occupational exposures and risk of stomach cancer by histological type. <i>Occup Environ Med</i> . 69, 268-275.	Details on jobs are only codes (no other descriptions are provided); evaluated exposures to asbestos, wood dust, radiation.
Siemiatycki J, Dewar R, Lakhani R, Nadon L, Richardson L, Gérin M. 1989. Cancer risks associated with 10 inorganic dusts: results from a case-control study in Montreal. <i>Am J Ind Med</i> 16, 547-67.	Cement dust is only relevant exposure but not analyzed in regards to stomach cancer rates
Sjödahl K, Jansson C, Bergdahl IA, Adami J, Boffetta P, Lagergren J. 2007. Airborne exposures and risk of gastric cancer: a prospective cohort study. <i>Int J Cancer</i> 120, 2013-2018.	The cohort consists of construction industry workers with multiple co-exposures to other carcinogens.
Teta MJ, Ott MG. 1988. A mortality study of a research, engineering, and metal fabrication facility in western New York State. <i>Am J Epidemiol</i> 127, 540-551.	Various co-exposures are indicated including radiation and asbestos.
Weiderpass E, Vainio H, Kauppinen T, Vasama-Neuvonen K, Partanen T, Pukkala E. 2003. Occupational exposures and gastrointestinal cancers among Finnish women. <i>J Occup Environ Med</i> 45, 305-315.	Specifications are for chromium but occupations are not provided. It is unclear as to how job titles were converted to exposures to 31 occupational agents.