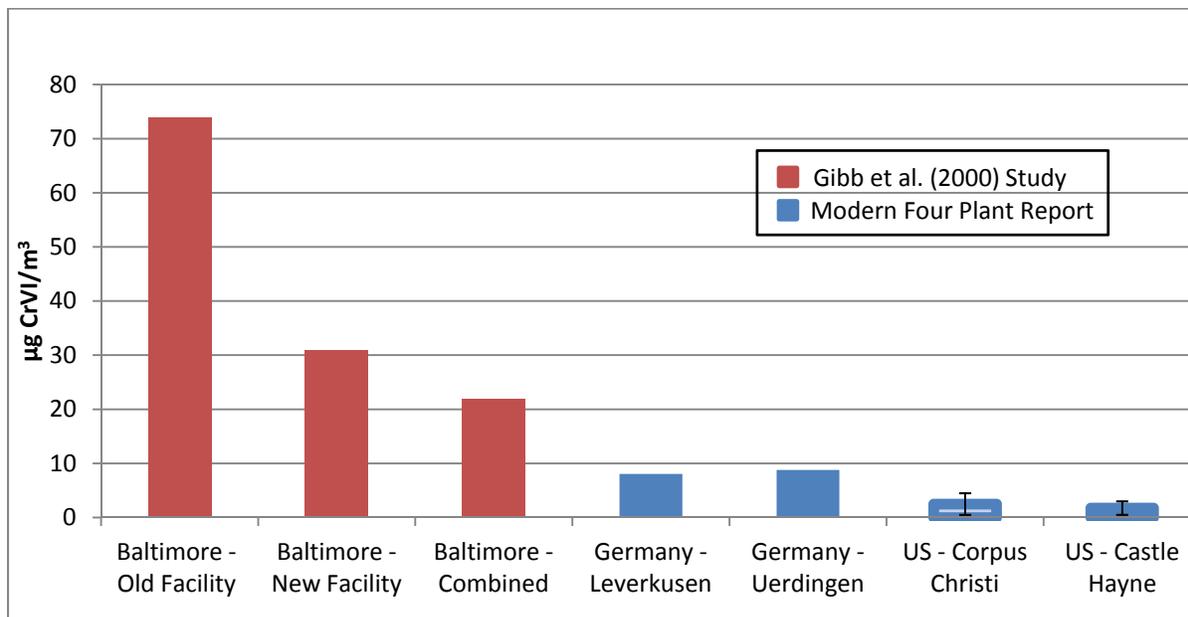


Average Hexavalent Chromium Concentrations in Air: Gibb and Modern Four Plant Report Studies

The Gibb et al. (2000) study (CX 62) evaluated lung cancer mortality risk from hexavalent chromium exposure to workers at the Baltimore, MD plant. The Baltimore plant workers were exposed to average hexavalent chromium (CrVI) concentrations in air 2 to 5 times higher than the concentrations in the German or the United States plants in the Modern Four Plant Report (CX 1). The Baltimore plant workers worked for a shorter duration (mean 3 years) than the Modern Four Plant Report workers (means of 8 to 12 years). Thus, one of the benefits of the Modern Four Plant Report is that it provides information about a key issue with respect to understanding risk to human health under different types of exposure scenarios (i.e., different combinations of average hexavalent chromium concentration and duration).

Average Hexavalent Chromium (CrVI) Concentrations in Air



Study	Location, Facility	Dates	CrVI Concentration	
			(µg CrVI/m ³)	(type of summary measure, n samples)
Gibb et al. (2000) Study	Baltimore Old Plant	1950-1959	74 ^a	(mean – 350 samples) ^a
	Baltimore New Plant	1950-1959	31 ^a	(mean – >219 samples) ^a
	Baltimore Combined		22 ^b	(mean)
Modern Four Plant Report ^c	Germany Leverkusen	1985-1998	8.04 ^d	(mean - 256 personal air samples) ^d
	Germany Uerdingen	1986-1994	8.8 ^d	(mean - 215 personal air samples) ^d
	United States Corpus Christi	1980-1998	~0.5, 4.5 ^e	(minimum, maximum of annual geometric mean - 1249 personal air samples) ^f
	United States Castle Hayne	1974-1988	~0.5, < 3 ^e	(minimum, maximum of annual geometric mean - 5461 personal air samples) ^f

^a CX 20 at 7 (Table III, footnotes c and d).

^b CX 62 at 6 (Table II). Combined hexavalent chromium concentration was derived from mean cumulative exposure (in units of µg CrVI/m³-yrs) divided by mean duration (i.e., 69 µg CrVI/m³-yrs/3.1 yrs = 22.2).

^c For Castle Hayne, anecdotal reports indicated that exposures from 1971 to 1973 might have been higher than in later years; for Corpus Christi, data were missing for some years (1983-1985, 1989) (CX 1 at 96-97).

^d CX 1 at 109 (Table 5).

^e CX 1 at 126-27 (Figures 3 and 4).

^f CX 1 at 106 (Table 2). Luippold et al. (2005) reported that the mean values were up to 10 µg/m³ in some specific work areas (CX 74 at 3).