

**Health information on the Six Metals in Drinking Water from
the World Health Organization (WHO) and International Agency for Research on Cancer (IARC)**

	WHO guideline value for drinking water (µg/L)	Key potential health effects*	Concerns on cancer risk
Antimony	20	Ingesting large amount of antimony salt may exert a strong irritating effect on the gut and trigger sustained vomiting, abdominal cramps and diarrhoea.	IARC concluded that antimony trioxide is possibly carcinogenic to humans (Group 2B) on the basis of inhalation study in rats, but that antimony trisulfide was not classifiable as to its carcinogenicity to humans (Group 3). Nevertheless, chronic oral uptake of antimony may not be associated with an additional carcinogenic risk.
Cadmium	3	Long term consumption of high level of cadmium may cause damage to the kidneys. Early symptom is protein in the urine. In addition, an even higher intake may increase the risk of bone fracture.	IARC has classified cadmium and cadmium compounds in Group 1 (carcinogenic to humans). However, there is no clear evidence of carcinogenicity by the oral route.
Chromium	50 (Provisional)	Chromium(III) is an essential nutrient in the human body. On the other hand, Chromium(VI) is an oxidizing agent overdose of which can be harmful and may lead to gastrointestinal discomfort.	Studies of occupational exposure to chromium(VI) (chromate production and chromium electroplating) showed increased risk of lung cancer. IARC has classified that chromium(VI) compounds are carcinogenic to humans (Group 1), but its carcinogenicity has not been well-established through oral route.
Copper	2000	Copper is an essential nutrient for human. Excessive intake of copper may cause acute gastrointestinal effects and very high level consumption may cause liver and kidney injury.	There is no adequate study for the carcinogenicity of copper. IARC has not made any classification for copper.
Lead	10 (Provisional)	Significant exposure to lead is associated with a wide range of effects, including neurodevelopmental effects, neurological impairment, anaemia, high blood pressure, gastrointestinal symptoms, impaired renal function, impaired fertility and adverse pregnancy outcomes.	There is some evidence that long-term occupational exposure to inorganic lead may contribute to the development of cancer. IARC classified inorganic lead compounds in Group 2A (i.e. probably carcinogenic to humans) and organic lead compounds in Group 3 (i.e., not classifiable as to its carcinogenicity to humans).
Nickel	70	The most common effect of nickel on the human body is allergic contact dermatitis caused by nickel-containing metal (e.g. earrings, watch straps) touching the skin. Acute ingestion of high level of nickel can cause nausea, vomiting and diarrhoea. For individuals sensitized to nickel, ingestion of excessive nickel could induce allergy.	Studies of occupational exposure to nickel (refinery and smelter workers) showed increased risks of lung and nasal cancers. IARC has classified that nickel compounds are carcinogenic to humans (Group 1). However, there is a lack of consistent evidence of a carcinogenic risk from ingestion of nickel.

* These metals may enter the human body mainly by mouth and breathing. Depending on the route, concentration and duration, exposure to these metals can be associated with a wide range of effects.