Question 2: Is it scientifically justified to conclude that mercury in dental amalgam could cause serious effects on human health due to mercury releases into the environment?

Mercury coming from dental amalgam as well as from many other sources, ubiquitously distributed in the environment, can be taken up by the general human population via food, water and air. Regarding the contribution of environmental mercury coming from dental amalgam use, it can be concluded that emissions of Hg to soil are not considered as a concern regarding human health. Regarding inhalation, amalgam use will also make only a limited contribution to the overall human inhalation exposure. The contribution of amalgam use to the concentrations of methyl mercury found in fish is not known and consequently no clear conclusion on possible health risks is possible. However SCHER estimated three scenarios in fish based on five hypothetical values for the methylation rate of mercury. SCHER also noted that all additional sources which add to the methyl mercury burden in humans may increase the number of people at risk, thus respecting the more conservative WFD threshold would contribute to the prevention of human health effects.

The SCHER report does not take into consideration a public health issue directly related to dental mercury: the poisoning of dentists and of their assistants. Autopsies revealed very high mercury levels in pituitary, occipital cortex and renal cortex of dental personnel [Nylander 1989]. High levels of mercury in dentists blood have been noted [Tezel 2001 Kasraei 2010] as well as in their urine - the latter being the best indicator of short-term exposure to inorganic mercury [Lehto 1989 , Steinberg 1995 Karahalil 2005 de Oliveira 2010]. Urinary mercury levels for dental assistants are even higher [Nilsson 1986]. Although the levels of urinary mercury remain relatively low for a majority of professionals, levels for some of this individuals are similar to those for which effects on kidneys and central nervous system have been reported [Skare 1990] . In addition, some studies have demonstrated symptoms due to mercury for these workers but not correlated with mercury levels measured in urine [Ritchie 2004].

Mercury levels in urine do not actually reflect the mercury accumulated in the body. A mobilization test with referenced chelator (ASD) is a much better indicator of the body burden of mercury as well as kidney and cognitive problems associated with it among dentists and their assistants [Gonzalez- Ramirez 1995]. This test reveals a urinary mercury concentration multiplied by 10 for dentists – while only multiplied by an average of 5.9 for dental wearers and 5.3 for controls without amalgams [Molin 1991]. Again, the increase in the urinary excretion of mercury is even greater among dental assistant [Zander 1992].
The risk of mercury absorption by professionals does not only correspond to the number of new amalgam based fillings , but also to the circumstances under which they work on the existing amalgam. Unfortunately a majority of professionals do not take sufficient measures to protect themselves [Colson , 2012, Warwick 2013] .

On the other hand , studies on dental professionals have shown that at comparable exposure, genetic factors may increase mercury effects on cognitive sphere, mood and behavior [Heyer 2008 , Echeverria 2006 , Echeverria 2005 , Heyer 2004 , Echeverria 1995]
Several studies have shown that dentists mercury exposure is associated with an increased prevalence of many symptoms [Neghab 2011 , Ritchie 2002].

In particular, many consistent studies find sensory, cognitive, neurological and psychosomatic disorders among dentists [Schach 2003, Ritchie 1995 Langworth 1997 Ngim 1992 Uzzell 1986, Shapiro 1982, Bittner 1998, Aydin 2003 Canto- Pereira 2005] and even more among dental assistants [Moen 2008, 2009 Hilt].

Publications observe an increased proportion of suicides among male dentists [Arnetz 1987, Meltzer 2008, Petersen 2008], others find increased kidney problems increased among dentists [Verschoor 1988 Samir 2011], and some increased cancer risks among dentists [Simning 2007], including brain cancers[2002 Navas Navas 2002 Ahlbom 1986], reproductive system cancers (breast or testicular) [Eriksson 1998 Rix 1996] and skin cancer [Linet 1995 Vågerö 1990].

Dental assistants and female dentists may suffer from reproductive disorders [Jones 2007, Rowland 1994 Lindbohm 2007] and we know that occupational exposure to mercury significantly increases the risk of hypertension in pregnant women and small weight birth malformation of child, neural tube defects and dead babies [Pan 2007 Figà - Talamanca 2006].

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