

## Reference values (RV<sub>95</sub>)

for antimony (Sb), arsenic (As), and metals (Pb, Cd, Hg, Ni, Tl, U, Pt,) in urine or blood

Parameter and Matrix	Population group / period of life	Year of study	RV <sub>95</sub> *
<b>Antimony in urine</b> [2009]	Children (3 to 14 years) <sup>1</sup>	2003-2006	<b>0.3 µg/l</b>
<b>Arsenic in urine</b> [2003, 2009]	Children (3 to 14 years) without fish consumption 48 hours before sample collection <sup>1</sup>  Adults (18 to 69 years) without fish consumption 48 hours before sample collection <sup>2</sup>	2003-2006  1997-1999	<b>15.0 µg/l</b>
<b>Lead in blood</b> [1996, 2003, 2009]	Children (3 to 14 years) <sup>1</sup>  Females (18 to 69 years) <sup>2</sup>  Males (18 to 69 years) <sup>2</sup>	2003-2006  1997-1999  1997-1999	<b>35 µg/l</b>  70 µg/l **  90 µg/l **
<b>Cadmium in urine</b> [1998, 2003, 2009]	Non-smoking children (3 to 14 years) <sup>1</sup>  Non-smoking adults (18 to 69 years) <sup>2</sup>	2003-2006  1997-1999	<b>0.2 µg/l</b>  <b>0.8 µg/l</b>
<b>Cadmium in blood</b> [1998, 2003, 2009]	Non-smoking children (3 to 14 years) <sup>1</sup>  Non-smoking adults (18 to 69 years) <sup>2</sup>	2003-2006  1997-1999	<0.3 µg/l <sup>a</sup>  <b>1.0 µg/l</b>
<b>Mercury in urine</b> [1999, 2003, 2009]	Children (3 to 14 years) without amalgam fillings <sup>1</sup>  Adults (18 to 69 years) without amalgam fillings <sup>2</sup>	2003-2006  1997-1999	<b>0.4 µg/l</b>  <b>1.0 µg/l</b>
<b>Mercury in blood</b> [1999, 2003, 2009]	Children (3 to 14 years), fish consumption ≤ 3 times per month <sup>1</sup>  Adults (18 to 69 years) fish consumption ≤ 3 times per month <sup>2</sup>	2003-2006  1997-1999	<b>0.8 µg/l</b>  <b>2.0 µg/l</b>
<b>Nickel in urine</b> [2001, 2009]	Children (3 to 14 years) <sup>1</sup>  Adults (but not a strictly representative reference sample) <sup>3</sup>	2003-2006	<b>4,5 µg/l</b>  <b>3 µg/l</b>
<b>Platinum in urine</b> [2003]	Adults (18 to 69 years) without teeth with dental inlays, crowns, bridge elements of precious metal <sup>2</sup>	1997-1999	<b>10 ng/l</b>
<b>Thallium in urine</b> [2009, 2011]	Children (3 to 14 years) <sup>1</sup>  Adults (20 to 29 years) <sup>4</sup>	2003-2006  2000-2008	<b>0.6 µg/l</b>  <b>0.5 µg/l</b>
<b>Uranium in urine</b> [2005, 2009]	Children (3 to 14 years) <sup>1</sup>  Adults (but not a strictly representative reference sample) <sup>3</sup>	2003-2006  2001-2003	<b>40 ng/l</b>  30-60 ng/l <sup>b</sup>

[xy] bibliographical data [publication](#):

when applying RV<sub>95</sub> the analytical uncertainty must be taken into account

<sup>1</sup> Source: German Environmental Survey on Children 2003-2006 (GerES IV); <sup>2</sup> Source: German Environmental Survey 1998 (GerES III);

<sup>3</sup> Source: based on published data; <sup>4</sup> Source: Environmental specimen bank for human tissues; <sup>a</sup> no RV<sub>95</sub>, but should there be analytically reliable and confirmed concentrations of Cd in whole blood above the level of 0.3 µg/l, a special exposure must be expected such as active smoking, i.e., <sup>b</sup> background exposure level for orientation purposes for as long as no data are available from representative population sample.

\*\* The HBM Commission has collated the data sets on blood lead levels which are available in Germany from the German states and evaluated them in descriptive terms. Based on this, the Commission drew the following conclusions at its October 2011 session:

A) The RV<sub>95</sub> for lead in blood cannot be updated. Reason: The available data are not population-representative because in some cases select population groups were investigated. Due to the low case numbers, stratification by gender is hardly possible.

B) The available data show that population background exposure to lead has likely declined significantly compared to the reference values of 1998 and that an updated RV<sub>95</sub> for lead in blood can be expected to be below 50 µg/l for both men and women.

C) The HBM Commission maintains that appropriate studies need to be performed to generate a suitable data base for updating the RV<sub>95</sub> for lead in blood.

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