

Biomonitoring

Cotinine

Table B4: Cotinine in nonsmoking children ages 3 to 17 years: Median and 95th percentile concentrations in blood serum, 1988-2016

Concentration of cotinine in serum (ng/mL)									
	1988-1991	1991-1994	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012
Median	0.25	0.21	0.11	0.06*	0.10	0.05	0.05	0.03	0.03
95th percentile	3.2	3.2	3.1	3.2	3.2	2.3	2.6	2.1	1.9
	2013-2014	2015-2016							
Median	0.02	0.03							
95th percentile	2.2	1.6							

DATA: Centers for Disease Control and Prevention, National Center for Health Statistics and National Center for Environmental Health, National Health and Nutrition Examination Survey

NOTE: Based on children ages 3 to 17 years with serum cotinine ≤ 10 ng/mL (ages 4 to 17 years for 1988-1991 and 1991-1994).

*The estimate should be interpreted with caution because the standard error of the estimate is relatively large: the relative standard error, RSE, is at least 30% but is less than 40% (RSE = standard error divided by the estimate), or the RSE may be underestimated.

Table B4a. Cotinine in nonsmoking children ages 3 to 17 years: Median concentrations in blood serum, by race/ethnicity and family income, 2013-2016

Median concentration of cotinine in serum (ng/mL)			
Race / Ethnicity	All Incomes‡ (n=4,568)	< Poverty Level (n=1,416)	≥ Poverty Level (n=2,811)
All Races/Ethnicities (n=4,568)	0.02	0.07	0.02
White non-Hispanic (n=1,170)	0.02	NA**	0.02
Black non-Hispanic (n=1,058)	0.12	0.50	0.05
Mexican-American (n=1,107)	0.02	0.02	0.01
All Other Races/Ethnicities† (n=1,233)	0.02	0.04	0.02

DATA: Centers for Disease Control and Prevention, National Center for Health Statistics and National Center for Environmental Health, National Health and Nutrition Examination Survey

NOTE: Based on children ages 3 to 17 years with serum cotinine ≤ 10 ng/mL.

† The “All Other Races/Ethnicities” category includes all other races or ethnicities not specified, together with those individuals who report more than one race.

‡ Includes sampled individuals for whom income information is missing.

** Not available. The estimate is not reported because it has large uncertainty: the relative standard error, RSE, is 40% or greater (RSE = standard error divided by the estimate), or the RSE cannot be reliably estimated.

Table B4b. Cotinine in nonsmoking children ages 3 to 17 years: 95th percentile concentrations in blood serum, by race/ethnicity and family income, 2013-2016

Race / Ethnicity	95 th percentile concentration of cotinine in serum (ng/mL)		
	All Incomes‡ (n=4,568)	< Poverty Level (n=1,416)	≥ Poverty Level (n=2,811)
All Races/Ethnicities (n=4,568)	2.0	3.8	1.1
White non-Hispanic (n=1,170)	1.9	4.8	1.1
Black non-Hispanic (n=1,058)	3.5	4.9	2.2
Mexican-American (n=1,107)	0.6*	NA**	NA**
All Other Races/Ethnicities† (n=1,233)	1.5	3.3	0.8*

DATA: Centers for Disease Control and Prevention, National Center for Health Statistics and National Center for Environmental Health, National Health and Nutrition Examination Survey

NOTE: Based on children ages 3 to 17 years with serum cotinine ≤ 10 ng/mL.

† The “All Other Races/Ethnicities” category includes all other races or ethnicities not specified, together with those individuals who report more than one race.

‡ Includes sampled individuals for whom income information is missing.

*The estimate should be interpreted with caution because the standard error of the estimate is relatively large: the relative standard error, RSE, is at least 30% but is less than 40% (RSE = standard error divided by the estimate), or the RSE may be underestimated.

** Not available. The estimate is not reported because it has large uncertainty: the relative standard error, RSE, is 40% or greater (RSE = standard error divided by the estimate), or the RSE cannot be reliably estimated.

Table B4c: Cotinine in nonsmoking children ages 3 to 17 years: Median and 95th percentile concentrations in blood serum, by age group, 2013-2016

	Concentration of cotinine in serum (ng/mL)				
	All ages	Ages 3 to 5 years	Ages 6 to 10 years	Ages 11 to 15 years	Ages 16 to 17 years
Median	0.02	0.03	0.02	0.02	0.02
95th percentile	2.0	2.5	1.6	2.0	2.4

DATA: Centers for Disease Control and Prevention, National Center for Health Statistics and National Center for Environmental Health, National Health and Nutrition Examination Survey

NOTE: Based on children ages 3 to 17 years with serum cotinine ≤ 10 ng/mL.

Table B5: Cotinine in nonsmoking women ages 16 to 49 years: Median and 95th percentile concentrations in blood serum, 1988-2016

	Concentration of cotinine in serum (ng/mL)								
	1988-1991	1991-1994	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012
Median	0.21	0.15	0.06	0.04	0.04	0.04	0.04	0.03	0.02
95th percentile	2.6	2.1	1.7	1.6	2.2	1.5	1.9	1.4	1.2*
	2013-2014	2015-2016							
Median	0.02	0.02							
95th percentile	2.6	1.4*							

DATA: Centers for Disease Control and Prevention, National Center for Health Statistics and National Center for Environmental Health, National Health and Nutrition Examination Survey

NOTES:

- Based on women ages 16 to 49 years with serum cotinine ≤ 10 ng/mL.
- To reflect exposures to women who are pregnant or may become pregnant, the estimates are adjusted for the probability (by age and race/ethnicity) that a woman gives birth. The intent of this adjustment is to approximate the distribution of exposure to pregnant women. Results will therefore differ from a characterization of exposure to adult women without consideration of birth rates.

*The estimate should be interpreted with caution because the standard error of the estimate is relatively large: the relative standard error, RSE, is at least 30% but is less than 40% (RSE = standard error divided by the estimate), or the RSE may be underestimated.

Table B5a. Cotinine in nonsmoking women ages 16 to 49 years: Median concentrations in blood serum, by race/ethnicity and family income, 2013-2016

Race / Ethnicity	Median concentration of cotinine in serum (ng/mL)		
	All Incomes† (n=2,768)	< Poverty Level (n=621)	≥ Poverty Level (n=1,924)
All Races/Ethnicities (n=2,768)	0.02	0.05	0.02
White non-Hispanic (n=784)	0.02	NA**	0.01
Black non-Hispanic (n=538)	0.09	0.29*	0.06
Mexican-American (n=597)	0.01	0.02	0.01
All Other Races/Ethnicities† (n=849)	0.02	0.03*	0.02

DATA: Centers for Disease Control and Prevention, National Center for Health Statistics and National Center for Environmental Health, National Health and Nutrition Examination Survey

NOTES:

- Based on women ages 16 to 49 years with serum cotinine ≤ 10 ng/mL.
- To reflect exposures to women who are pregnant or may become pregnant, the estimates are adjusted for the probability (by age and race/ethnicity) that a woman gives birth. The intent of this adjustment is to approximate the distribution of exposure to pregnant women. Results will therefore differ from a characterization of exposure to adult women without consideration of birth rates.

† The “All Other Races/Ethnicities” category includes all other races or ethnicities not specified, together with those individuals who report more than one race.

‡ Includes sampled individuals for whom income information is missing.

*The estimate should be interpreted with caution because the standard error of the estimate is relatively large: the relative standard error, RSE, is at least 30% but is less than 40% ($RSE = \text{standard error} / \text{estimate}$), or the RSE may be underestimated.

** Not available. The estimate is not reported because it has large uncertainty: the relative standard error, RSE, is 40% or greater ($RSE = \text{standard error} / \text{estimate}$), or the RSE cannot be reliably estimated.

Table B5b. Cotinine in nonsmoking women ages 16 to 49 years: 95th percentile concentrations in blood serum, by race/ethnicity and family income, 2013-2016

Race / Ethnicity	95 th percentile concentration of cotinine in serum (ng/mL)		
	All Incomes‡ (n=2,768)	< Poverty Level (n=621)	≥ Poverty Level (n=1,286)
All Races/Ethnicities (n=2,768)	2.0	4.1	1.3
White non-Hispanic (n=784)	1.8*	4.2	NA**
Black non-Hispanic (n=538)	4.1	5.6	3.0
Mexican-American (n=597)	0.2*	NA**	NA**
All Other Races/Ethnicities† (n=849)	1.6*	NA**	1.1*

DATA: Centers for Disease Control and Prevention, National Center for Health Statistics and National Center for Environmental Health, National Health and Nutrition Examination Survey

NOTES:

- Based on women ages 16 to 49 years with serum cotinine ≤ 10 ng/mL.
- To reflect exposures to women who are pregnant or may become pregnant, the estimates are adjusted for the probability (by age and race/ethnicity) that a woman gives birth. The intent of this adjustment is to approximate the distribution of exposure to pregnant women. Results will therefore differ from a characterization of exposure to adult women without consideration of birth rates.

† The “All Other Races/Ethnicities” category includes all other races or ethnicities not specified, together with those individuals who report more than one race.

‡ Includes sampled individuals for whom income information is missing.

*The estimate should be interpreted with caution because the standard error of the estimate is relatively large: the relative standard error, RSE, is at least 30% but is less than 40% (RSE = standard error divided by the estimate), or the RSE may be underestimated.

** Not available. The estimate is not reported because it has large uncertainty: the relative standard error, RSE, is 40% or greater (RSE = standard error divided by the estimate), or the RSE cannot be reliably estimated.