

Supplementary materials

Exposure to secondhand smoke and physical disabilities in non-smokers: a national cross-sectional study with cotinine measurement

Jiahui He^{1,2}, Zhounan Wu^{1,2}, Yuhang Liang^{1,2}, Jinshen He, MD^{1,*}

¹ Department of Orthopaedic Surgery, Third Xiangya Hospital of Central South University, Changsha, Hunan, China, 410013

² Xiangya School of Medicine, Central South University, Changsha, China, 410013

* Corresponding author

Jinshen He, MD

Institutional address: Department of Orthopaedic Surgery, Third Xiangya Hospital of Central South University, Changsha, Hunan 410013, China

Email: Jinshen.he@hotmail.com

Tables legends:

Supplementary Table 1. Some other characteristics of participants, Weighted.

Supplementary Table 2. Variance Inflation Factor (VIF) test for each confounding factors.

Supplementary Table 3. Association between cotinine, hydroxycotinine and adverse health outcomes, Weighted.

Supplementary Table 4-1. Association between serum cotinine level, cotinine, hydroxycotinine and adverse health outcomes, stratified by gender, Weighted.

Supplementary Table 4-2. Association between serum cotinine level, cotinine, hydroxycotinine and adverse health outcomes, stratified by age, Weighted.

Supplementary Table 4-3. Association between serum cotinine level, cotinine, hydroxycotinine and adverse health outcomes, stratified by race/ethnicity, Weighted.

Supplementary Table 1. Some other characteristics of participants, Weighted.

		Total*	Total	Quartiles (ng/mL Serum cotinine level)				P
				Q1	Q2	Q3	Q4	
Education level								<0.001
	Less than high school	20.32%	13.26%	10.43%	12.33%	14.29%	16.49%	
	High school	24.74%	25.95%	18.66%	29.23%	24.32%	32.73%	
	More than high school	54.93%	60.79%	70.91%	58.44%	61.39%	50.78%	
Data release cycle								0.897
	2013-2014	35.94%	33.75%	34.84%	32.43%	33.81%	33.78%	
	2015-2016	32.76%	32.89%	33.64%	34.55%	29.86%	33.35%	
	2017-2018	31.29%	33.36%	31.52%	33.02%	36.34%	32.87%	
Diabetes		14.33%	10.24%	12.36%	7.85%	9.57%	10.89%	0.164
Hypertension		34.61%	30.43%	34.18%	30.86%	29.63%	26.43%	0.178
Cancer		6.36%	7.19%	7.97%	8.92%	5.81%	5.90%	0.366
Cardiovascular vascular disease		8.80%	7.26%	10.47%	4.87%	5.66%	7.54%	0.005

* , the unweighted data;

, variables with missing date as another category, the cumulation percent was not 100%;

Mean±95%CI for continuous variables, **P** value was calculated by weighted linear regression model;

% for categorical variables, **P** value was calculated by weighted chi-square test.

Supplementary Table 2. Variance Inflation Factor (VIF) test for each confounding factors.*

Confounding factors	VIF
Race/Ethnicity	1.127
Gender	1.033
Age	1.587
Education level	1.106
Marital status	1.031
Income to poverty ratio	1.020
Hypertension	1.407
Body Mass Index	1.066
Diabetes	1.219
Cardiovascular Diseases	1.175

Cancer	1.083
Data Release Cycle	1.021
Alcohol use	1.157

*: The variance expansion coefficient (VIF) is less than 5, indicating that there is no collinearity relationship between confounding factors.

Supplementary Table 3. Association between cotinine, hydroxycotinine and adverse health outcomes, Weighted.

Variables		Model 1		Model 2		Model 3	
		OR (95% CI)	<i>P</i>	OR (95% CI)	<i>P</i>	OR (95% CI)	<i>P</i>
Cotinine							
	Hearing difficulty	0.640 (0.452, 0.905)	0.015	0.862 (0.660, 1.127)	0.283	0.884 (0.672, 1.162)	0.385
	Vision impairment	0.917 (0.755, 1.114)	0.388	1.020 (0.856, 1.216)	0.823	0.915 (0.731, 1.145)	0.446
	Attention deficit hyperactivity disorder	0.942 (0.829, 1.071)	0.370	0.997 (0.884, 1.124)	0.961	0.934 (0.821, 1.063)	0.310
	Walking difficulty	0.913 (0.798, 1.044)	0.189	1.167 (1.029, 1.325)	0.021	1.135 (0.972, 1.325)	0.121
	Difficulty dressing or bathing independently	0.878 (0.710, 1.088)	0.241	1.072 (0.880, 1.306)	0.491	1.031 (0.836, 1.272)	0.776
	Difficulty running errands alone	0.955 (0.844, 1.081)	0.473	1.106 (0.956, 1.278)	0.182	1.018 (0.886, 1.170)	0.802
Cotinine(Quartile)							
Hearing difficulty	Q1	Reference		Reference		Reference	
	Q2	0.269 (0.154, 0.472)	<0.001	0.340 (0.174, 0.664)	0.003	0.297 (0.146, 0.604)	0.003
	Q3	0.325 (0.149, 0.708)	0.007	0.447 (0.194, 1.029)	0.066	0.459 (0.190, 1.111)	0.098
	Q4	0.331 (0.189, 0.581)	<0.001	0.685 (0.362, 1.296)	0.251	0.617 (0.355, 1.072)	0.100
	<i>P</i> for trend	0.001		0.121		0.084	
Vision impairment	Q1	Reference		Reference		Reference	
	Q2	0.797 (0.400, 1.588)	0.523	0.947 (0.464, 1.933)	0.882	0.877 (0.448, 1.715)	0.705
	Q3	1.333 (0.652, 2.725)	0.436	1.665 (0.790, 3.507)	0.188	1.527 (0.736, 3.170)	0.267
	Q4	0.915 (0.482, 1.738)	0.787	1.343 (0.685, 2.635)	0.396	0.857 (0.417, 1.760)	0.678
	<i>P</i> for trend	0.795		0.169		0.883	
Attention deficit hyperactivity disorder	Q1	Reference		Reference		Reference	
	Q2	0.990 (0.587, 1.672)	0.972	1.098 (0.634, 1.902)	0.741	1.094 (0.620, 1.931)	0.758
	Q3	1.326 (0.742, 2.369)	0.346	1.513 (0.822, 2.785)	0.191	1.478 (0.779, 2.803)	0.244
	Q4	1.352 (0.830, 2.202)	0.232	1.699 (0.998, 2.893)	0.058	1.307 (0.720, 2.373)	0.388

	<i>P</i> for trend	0.129		0.027		0.244	
Walking difficulty	Q1	Reference		Reference		Reference	
	Q2	0.741 (0.464, 1.184)	0.217	1.053 (0.599, 1.849)	0.859	1.060 (0.570, 1.974)	0.855
	Q3	1.028 (0.580, 1.823)	0.924	1.651 (0.910, 2.993)	0.107	1.670 (0.883, 3.157)	0.128
	Q4	0.928 (0.587, 1.468)	0.752	2.136 (1.394, 3.274)	0.001	1.681 (0.984, 2.872)	0.070
	<i>P</i> for trend	0.960		0.001		0.036	
Difficulty dressing or bathing independently	Q1	Reference		Reference		Reference	
	Q2	0.818 (0.330, 2.026)	0.666	1.095 (0.439, 2.729)	0.847	0.973 (0.376, 2.516)	0.955
	Q3	0.897 (0.354, 2.274)	0.820	1.277 (0.529, 3.083)	0.589	1.203 (0.487, 2.968)	0.693
	Q4	0.724 (0.381, 1.375)	0.329	1.367 (0.788, 2.371)	0.273	1.066 (0.585, 1.943)	0.836
	<i>P</i> for trend	0.413		0.220		0.667	
Difficulty running errands alone	Q1	Reference		Reference		Reference	
	Q2	0.798 (0.459, 1.385)	0.426	1.014 (0.573, 1.795)	0.961	0.902 (0.493, 1.649)	0.740
	Q3	1.164 (0.612, 2.214)	0.647	1.580 (0.845, 2.953)	0.160	1.406 (0.682, 2.898)	0.366
	Q4	1.404 (0.882, 2.234)	0.160	2.434 (1.577, 3.758)	<0.001	1.702 (1.010, 2.867)	0.058
	<i>P</i> for trend	0.083		<0.001		0.030	
Hydroxycotinine							
Hearing difficulty		0.701 (0.380, 1.292)	0.261	0.882 (0.555, 1.401)	0.597	0.841 (0.515, 1.372)	0.494
Vision impairment		0.879 (0.596, 1.298)	0.521	1.009 (0.689, 1.477)	0.963	0.810 (0.485, 1.353)	0.428
Attention deficit disorder	hyperactivity	0.935 (0.676, 1.295)	0.689	1.034 (0.739, 1.445)	0.847	0.875 (0.608, 1.260)	0.479
Walking difficulty		1.087 (0.843, 1.401)	0.524	1.550 (1.189, 2.021)	0.003	1.485 (1.059, 2.081)	0.030
Difficulty dressing or bathing independently		0.900 (0.575, 1.406)	0.645	1.126 (0.703, 1.803)	0.625	1.063 (0.619, 1.826)	0.826
Difficulty running errands alone		1.117 (0.821, 1.520)	0.485	1.372 (0.925, 2.035)	0.123	1.191 (0.781, 1.816)	0.426
Hydroxycotinine (Quartile)							
Hearing difficulty	Q1	Reference		Reference		Reference	
	Q2	1.136 (0.647, 1.994)	0.660	0.982 (0.525, 1.836)	0.954	1.064 (0.574, 1.972)	0.846
	Q3	0.741 (0.448, 1.226)	0.250	0.689 (0.386, 1.229)	0.214	0.666 (0.370, 1.197)	0.187
	Q4	0.817 (0.451, 1.478)	0.507	0.976 (0.520, 1.829)	0.939	0.971 (0.519, 1.817)	0.927
	<i>P</i> for trend	0.284		0.637		0.542	
Vision impairment	Q1	Reference		Reference		Reference	
	Q2	1.025 (0.541, 1.941)	0.941	0.964 (0.519, 1.791)	0.908	0.990 (0.517, 1.896)	0.977

	Q3	1.262 (0.706, 2.256)	0.437	1.300 (0.708, 2.388)	0.403	1.224 (0.684, 2.189)	0.503
	Q4	1.148 (0.637, 2.068)	0.648	1.288 (0.689, 2.409)	0.433	0.907 (0.452, 1.821)	0.786
	P for trend	0.528		0.314		0.952	
Attention deficit hyperactivity disorder	Q1	Reference		Reference		Reference	
	Q2	1.321 (0.789, 2.212)	0.296	1.283 (0.765, 2.151)	0.350	1.259 (0.706, 2.245)	0.444
	Q3	1.626 (0.913, 2.898)	0.106	1.662 (0.935, 2.955)	0.091	1.455 (0.811, 2.610)	0.221
	Q4	1.492 (0.953, 2.336)	0.088	1.599 (1.037, 2.467)	0.04	1.199 (0.739, 1.944)	0.469
	P for trend	0.055		0.021		0.379	
Walking difficulty	Q1	Reference		Reference		Reference	
	Q2	1.295 (0.765, 2.193)	0.342	1.162 (0.716, 1.888)	0.547	1.249 (0.797, 1.958)	0.342
	Q3	1.538 (0.932, 2.537)	0.099	1.687 (1.013, 2.809)	0.051	1.634 (0.969, 2.755)	0.078
	Q4	1.699 (1.028, 2.807)	0.045	2.250 (1.417, 3.572)	0.001	1.991 (1.237, 3.206)	0.009
	P for trend	0.026		<0.001		0.007	
Difficulty dressing or bathing independently	Q1	Reference		Reference		Reference	
	Q2	1.263 (0.623, 2.559)	0.521	1.140 (0.542, 2.399)	0.731	1.067 (0.462, 2.466)	0.881
	Q3	1.312 (0.564, 3.052)	0.532	1.348 (0.576, 3.155)	0.496	1.194 (0.480, 2.971)	0.707
	Q4	0.904 (0.506, 1.614)	0.735	1.051 (0.573, 1.931)	0.872	0.873 (0.417, 1.831)	0.723
	P for trend	0.839		0.696		0.867	
Difficulty running errands alone	Q1	Reference		Reference		Reference	
	Q2	1.786 (1.033, 3.086)	0.044	1.665 (0.962, 2.885)	0.076	1.628 (0.937, 2.828)	0.097
	Q3	1.825 (0.918, 3.626)	0.093	1.909 (0.957, 3.809)	0.074	1.609 (0.763, 3.395)	0.224
	Q4	2.347 (1.349, 4.083)	0.004	2.765 (1.600, 4.778)	<0.001	2.092 (1.128, 3.880)	0.028
	P for trend	0.007		<0.001		0.036	

Model 1: no covariates were adjusted.

Model 2: age and gender were adjusted.

Model 3: age, gender, body mass index, race/ethnicity, data release cycle, education level, marital status, income to poverty ratio, alcohol use, hypertension, diabetes, cancer, and cardiovascular diseases were adjusted.

Supplementary Table 4-1. Association between serum cotinine level, cotinine, hydroxycotinine and adverse health outcomes, stratified by gender, Weighted.

Model 1

Model 2

Model 3

	Men (n=796)	Women (n=1,374)	<i>P</i> - interact ion	Men (n=796)	Women (n=1,374)	<i>P</i> - interact ion	Men (n=796)	Women (n=1,374)	<i>P</i> - interact ion
Hearing difficulty	OR (95%CI) <i>P</i>-value	OR (95%CI) <i>P</i>-value		OR (95%CI) <i>P</i>-value	OR (95%CI) <i>P</i>-value		OR (95%CI) <i>P</i>-value	OR (95%CI) <i>P</i>-value	
Serum cotinine level	0.833 (0.663, 1.047) 0.124	0.643 (0.393, 1.053) 0.087	0.354	0.960 (0.793, 1.163) 0.680	0.818 (0.524, 1.275) 0.380	0.517	0.969 (0.792, 1.186) 0.763	0.813 (0.512, 1.290) 0.388	0.497
Vision impairment	OR (95%CI) <i>P</i>-value	OR (95%CI) <i>P</i>-value		OR (95%CI) <i>P</i>-value	OR (95%CI) <i>P</i>-value		OR (95%CI) <i>P</i>-value	OR (95%CI) <i>P</i>-value	
Serum cotinine level	0.952 (0.766, 1.182) 0.657	0.948 (0.783, 1.147) 0.584	0.977	0.999 (0.811, 1.231) 0.996	1.026 (0.864, 1.218) 0.769	0.857	0.946 (0.754, 1.186) 0.632	0.922 (0.716, 1.186) 0.531	0.886
Attention deficit hyperactivity disorder	OR (95%CI) <i>P</i>-value	OR (95%CI) <i>P</i>-value		OR (95%CI) <i>P</i>-value	OR (95%CI) <i>P</i>-value		OR (95%CI) <i>P</i>-value	OR (95%CI) <i>P</i>-value	
Serum cotinine level	0.925 (0.791, 1.081) 0.332	1.023 (0.905, 1.155) 0.722	0.321	0.942 (0.803, 1.105) 0.469	1.053 (0.942, 1.176) 0.372	0.261	0.895 (0.742, 1.078) 0.254	0.997 (0.873, 1.140) 0.970	0.393
Walking difficulty	OR (95%CI) <i>P</i>-value	OR (95%CI) <i>P</i>-value		OR (95%CI) <i>P</i>-value	OR (95%CI) <i>P</i>-value		OR (95%CI) <i>P</i>-value	OR (95%CI) <i>P</i>-value	
Serum cotinine level	0.912 (0.786, 1.060) 0.238	1.041 (0.917, 1.181) 0.540	0.224	1.016 (0.878, 1.176) 0.830	1.241 (1.105, 1.395) 0.001	0.041	1.036 (0.898, 1.196) 0.631	1.176 (1.005, 1.378) 0.055	0.226
Difficulty dressing or bathing independently	OR (95%CI) <i>P</i>-value	OR (95%CI) <i>P</i>-value		OR (95%CI) <i>P</i>-value	OR (95%CI) <i>P</i>-value		OR (95%CI) <i>P</i>-value	OR (95%CI) <i>P</i>-value	
Serum cotinine level	0.958 (0.780, 1.177) 0.685	0.897 (0.713, 1.127) 0.355	0.668	1.054 (0.853, 1.303) 0.629	1.045 (0.860, 1.270) 0.662	0.950	1.057 (0.847, 1.319) 0.626	0.979 (0.791, 1.211) 0.844	0.596
Difficulty running errands alone	OR (95%CI) <i>P</i>-value	OR (95%CI) <i>P</i>-value		OR (95%CI) <i>P</i>-value	OR (95%CI) <i>P</i>-value		OR (95%CI) <i>P</i>-value	OR (95%CI) <i>P</i>-value	

Serum cotinine level	0.979 (0.832, 1.152) 0.799	1.030 (0.908, 1.168) 0.649	0.633	1.045 (0.871, 1.252) 0.640	1.140 (1.010, 1.288) 0.041	0.401	1.007 (0.814, 1.246) 0.947	1.051 (0.916, 1.207) 0.483	0.762
Hearing difficulty	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	
Serum cotinine level (Quartile)			0.877			0.878			0.714
Q1	Reference	Reference		Reference	Reference		Reference	Reference	
Q2	0.368 (0.117, 1.157) 0.095	0.461 (0.218, 0.972) 0.049		0.458 (0.138, 1.512) 0.208	0.559 (0.244, 1.282) 0.178		0.422 (0.128, 1.388) 0.171	0.539 (0.219, 1.331) 0.195	
Q3	0.462 (0.145, 1.475) 0.200	0.360 (0.140, 0.926) 0.040		0.630 (0.181, 2.188) 0.472	0.451 (0.158, 1.292) 0.147		0.685 (0.204, 2.300) 0.547	0.394 (0.139, 1.118) 0.095	
Q4	0.388 (0.145, 1.037) 0.067	0.452 (0.203, 1.007) 0.059		0.854 (0.308, 2.367) 0.763	0.698 (0.277, 1.761) 0.451		0.865 (0.329, 2.272) 0.771	0.612 (0.249, 1.503) 0.297	
Vision impairment	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	
Serum cotinine level (Quartile)			0.020			0.018			0.004
Q1	Reference	Reference		Reference	Reference		Reference	Reference	
Q2	0.512 (0.148, 1.774) 0.298	1.587 (0.708, 3.559) 0.269		0.566 (0.156, 2.055) 0.393	1.787 (0.766, 4.166) 0.187		0.405 (0.120, 1.364) 0.160	2.127 (0.992, 4.563) 0.069	
Q3	0.350 (0.110, 1.112) 0.083	2.759 (1.250, 6.089) 0.016		0.401 (0.127, 1.267) 0.128	3.283 (1.461, 7.379) 0.007		0.336 (0.115, 0.980) 0.060	3.150 (1.456, 6.814) 0.009	
Q4	0.504 (0.174, 1.458) 0.214	1.891 (0.845, 4.235) 0.130		0.698 (0.238, 2.049) 0.517	2.440 (1.069, 5.570) 0.041		0.432 (0.154, 1.213) 0.127	1.685 (0.700, 4.059) 0.258	
Attention deficit hyperactivity disorder	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	
Serum cotinine level (Quartile)			0.147			0.169			0.190

Walking difficulty	Q1	Reference	Reference	Reference	Reference	Reference	Reference	
	Q2	1.347 (0.582, 3.118)	0.740 (0.382, 1.433)	1.407 (0.590, 3.355)	0.776 (0.402, 1.500)	1.208 (0.494, 2.958)	0.811 (0.438, 1.500)	
	Q3	1.394 (0.486, 3.998)	1.431 (0.774, 2.647)	1.482 (0.503, 4.369)	1.541 (0.818, 2.902)	1.407 (0.464, 4.266)	1.439 (0.782, 2.650)	
	Q4	0.971 (0.416, 2.270)	1.638 (0.933, 2.874)	1.117 (0.448, 2.785)	1.837 (1.056, 3.194)	0.704 (0.267, 1.859)	1.578 (0.862, 2.889)	
Walking difficulty Serum cotinine level (Quartile)	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	
			0.042		0.079		0.076	
Difficulty dressing or bathing independently	Q1	Reference	Reference	Reference	Reference	Reference	Reference	
	Q2	2.044 (0.872, 4.795)	0.782 (0.478, 1.277)	2.776 (1.049, 7.347)	0.961 (0.550, 1.679)	2.952 (1.117, 7.804)	1.071 (0.609, 1.882)	
	Q3	2.526 (1.111, 5.744)	0.906 (0.496, 1.653)	3.752 (1.504, 9.358)	1.227 (0.634, 2.375)	4.360 (1.701, 11.176)	1.091 (0.543, 2.194)	
	Q4	1.316 (0.633, 2.734)	1.380 (0.769, 2.476)	2.708 (1.283, 5.713)	2.452 (1.397, 4.304)	2.811 (1.384, 5.711)	1.901 (1.029, 3.513)	
Difficulty dressing or bathing independently Serum cotinine level (Quartile)	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	
			0.620		0.678		0.801	
Walking difficulty	Q1	Reference	Reference	Reference	Reference	Reference	Reference	
	Q2	1.478 (0.365, 5.986)	0.525 (0.190, 1.450)	1.858 (0.410, 8.407)	0.625 (0.225, 1.742)	1.509 (0.316, 7.200)	0.626 (0.203, 1.932)	
	Q3	1.512 (0.288, 7.947)	0.726 (0.308, 1.708)	2.005 (0.341, 11.792)	0.925 (0.393, 2.176)	1.908 (0.294, 12.362)	0.808 (0.338, 1.932)	
			0.628	0.467	0.446	0.858	0.506	0.637

	Q4	0.844 (0.244, 2.916) 0.790	0.700 (0.350, 1.403) 0.322		1.527 (0.402, 5.799) 0.538	1.027 (0.550, 1.916) 0.935		1.331 (0.278, 6.379) 0.724	0.817 (0.399, 1.672) 0.586	
Difficulty running errands alone		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	
Serum cotinine level (Quartile)				0.948			0.938			0.993
	Q1	Reference	Reference		Reference	Reference		Reference	Reference	
	Q2	0.870 (0.289, 2.625) 0.807	0.586 (0.311, 1.105) 0.107		1.013 (0.304, 3.371) 0.984	0.672 (0.354, 1.277) 0.233		0.802 (0.237, 2.717) 0.727	0.649 (0.323, 1.306) 0.240	
	Q3	1.395 (0.306, 6.352) 0.670	1.185 (0.614, 2.287) 0.615		1.713 (0.347, 8.468) 0.513	1.464 (0.769, 2.789) 0.254		1.441 (0.277, 7.502) 0.669	1.215 (0.617, 2.394) 0.579	
	Q4	1.815 (0.563, 5.848) 0.324	1.425 (0.817, 2.484) 0.220		2.880 (0.853, 9.717) 0.097	1.995 (1.194, 3.332) 0.012		1.903 (0.478, 7.578) 0.372	1.510 (0.806, 2.831) 0.213	
Hearing difficulty		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	
Cotinine		0.713 (0.501, 1.016) 0.068	0.468 (0.203, 1.078) 0.082	0.370	0.914 (0.686, 1.218) 0.542	0.743 (0.386, 1.432) 0.380	0.569	0.947 (0.698, 1.285) 0.731	0.747 (0.388, 1.440) 0.392	0.519
Vision impairment		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	
Cotinine		0.934 (0.685, 1.275) 0.671	0.915 (0.696, 1.202) 0.526	0.924	1.008 (0.752, 1.350) 0.959	1.035 (0.820, 1.306) 0.776	0.898	0.933 (0.682, 1.277) 0.668	0.894 (0.629, 1.271) 0.538	0.865
Attention deficit hyperactivity disorder		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	
Cotinine		0.888 (0.713, 1.106) 0.294	1.016 (0.857, 1.204) 0.857	0.371	0.914 (0.730, 1.143) 0.434	1.061 (0.915, 1.230) 0.441	0.300	0.857 (0.651, 1.129) 0.284	0.989 (0.825, 1.184) 0.903	0.449
Walking difficulty		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	

Cotinine	0.827 (0.672, 1.018) 0.080	1.004 (0.841, 1.198) 0.966	0.186	0.986 (0.812, 1.196) 0.884	1.302 (1.112, 1.524) 0.002	0.030	1.026 (0.850, 1.238) 0.792	1.207 (0.981, 1.485) 0.088	0.229
Difficulty dressing or bathing independently	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	
Cotinine	0.939 (0.716, 1.230) 0.648	0.818 (0.593, 1.128) 0.228	0.507	1.090 (0.837, 1.421) 0.526	1.048 (0.816, 1.345) 0.717	0.817	1.099 (0.850, 1.420) 0.479	0.946 (0.703, 1.273) 0.717	0.414
Difficulty running errands alone	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	
Cotinine	0.938 (0.771, 1.141) 0.524	1.001 (0.836, 1.198) 0.991	0.638	1.038 (0.839, 1.283) 0.736	1.167 (0.983, 1.384) 0.085	0.372	0.988 (0.772, 1.263) 0.924	1.044 (0.858, 1.271) 0.672	0.753
Hearing difficulty	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	
Cotinine (Quartile)			0.946			0.956			0.715
Q1	Reference	Reference		Reference	Reference		Reference	Reference	
Q2	0.232 (0.099, 0.546) 0.002	0.284 (0.125, 0.644) 0.005		0.306 (0.117, 0.798) 0.020	0.372 (0.155, 0.892) 0.033		0.246 (0.091, 0.664) 0.012	0.350 (0.143, 0.859) 0.033	
Q3	0.306 (0.097, 0.966) 0.051	0.313 (0.135, 0.724) 0.010		0.474 (0.138, 1.636) 0.245	0.423 (0.173, 1.036) 0.068		0.540 (0.163, 1.786) 0.324	0.401 (0.153, 1.050) 0.078	
Q4	0.267 (0.112, 0.634) 0.005	0.358 (0.168, 0.764) 0.012		0.682 (0.271, 1.716) 0.421	0.686 (0.293, 1.604) 0.390		0.656 (0.270, 1.594) 0.363	0.582 (0.258, 1.311) 0.206	
Vision impairment	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	
Cotinine (Quartile)			0.023			0.023			0.003
Q1	Reference	Reference		Reference	Reference		Reference	Reference	
Q2	0.330 (0.097, 1.120) 0.083	1.338 (0.623, 2.872) 0.460		0.387 (0.113, 1.324) 0.139	1.571 (0.716, 3.450) 0.267		0.275 (0.081, 0.936) 0.052	1.706 (0.835, 3.486) 0.158	

	Q3	0.430 (0.134, 1.377) 0.163	2.458 (1.172, 5.155) 0.022	0.536 (0.167, 1.726) 0.303	3.010 (1.410, 6.428) 0.007	0.421 (0.140, 1.269) 0.140	3.065 (1.454, 6.462) 0.008
	Q4	0.428 (0.143, 1.279) 0.137	1.522 (0.684, 3.384) 0.310	0.640 (0.213, 1.925) 0.432	2.115 (0.941, 4.755) 0.078	0.380 (0.124, 1.161) 0.105	1.372 (0.560, 3.365) 0.497
Attention deficit hyperactivity disorder		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value
Cotinine (Quartile)			0.194		0.211		0.242
	Q1	Reference	Reference	Reference	Reference	Reference	Reference
	Q2	1.821 (0.685, 4.844) 0.237	0.748 (0.379, 1.478) 0.408	1.973 (0.708, 5.498) 0.202	0.802 (0.400, 1.608) 0.538	1.629 (0.554, 4.789) 0.386	0.848 (0.430, 1.669) 0.638
	Q3	1.246 (0.387, 4.009) 0.715	1.439 (0.745, 2.782) 0.285	1.385 (0.416, 4.616) 0.599	1.577 (0.790, 3.148) 0.205	1.188 (0.324, 4.352) 0.798	1.602 (0.802, 3.199) 0.197
	Q4	1.180 (0.459, 3.033) 0.733	1.605 (0.938, 2.747) 0.093	1.422 (0.511, 3.961) 0.504	1.870 (1.070, 3.267) 0.034	0.884 (0.285, 2.739) 0.833	1.578 (0.830, 3.001) 0.179
Walking difficulty		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value
Cotinine (Quartile)			0.024		0.050		0.027
	Q1	Reference	Reference	Reference	Reference	Reference	Reference
	Q2	2.010 (0.860, 4.701) 0.115	0.551 (0.316, 0.962) 0.043	3.041 (1.099, 8.415) 0.039	0.720 (0.383, 1.353) 0.314	3.121 (1.177, 8.275) 0.033	0.719 (0.349, 1.481) 0.382
	Q3	2.018 (0.828, 4.920) 0.131	0.914 (0.479, 1.745) 0.786	3.462 (1.323, 9.059) 0.016	1.338 (0.675, 2.651) 0.409	4.014 (1.518, 10.617) 0.011	1.273 (0.620, 2.613) 0.519
	Q4	1.173 (0.555, 2.480) 0.679	1.038 (0.590, 1.828) 0.897	2.842 (1.310, 6.163) 0.012	2.113 (1.246, 3.583) 0.009	2.920 (1.430, 5.965) 0.008	1.493 (0.757, 2.945) 0.261
Difficulty dressing or bathing independentl		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value
y							

Cotinine (Quartile)			0.097		0.106		0.121		
Q1	Reference	Reference		Reference	Reference	Reference	Reference		
Q2	3.510 (0.875, 14.088) 0.085	0.413 (0.142, 1.198) 0.112		4.968 (1.149, 21.471) 0.038	0.533 (0.175, 1.619) 0.274	4.193 (1.043, 16.853) 0.057	0.483 (0.141, 1.657) 0.261		
Q3	2.557 (0.478, 13.677) 0.279	0.668 (0.298, 1.497) 0.333		3.952 (0.737, 21.192) 0.117	0.903 (0.404, 2.018) 0.805	3.764 (0.678, 20.906) 0.145	0.834 (0.373, 1.867) 0.664		
Q4	1.459 (0.420, 5.064) 0.556	0.675 (0.333, 1.368) 0.282		3.118 (0.925, 10.515) 0.075	1.164 (0.622, 2.177) 0.638	2.763 (0.802, 9.521) 0.123	0.843 (0.402, 1.769) 0.657		
Difficulty running errands alone	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		
Cotinine (Quartile)			0.123		0.139		0.160		
Q1	Reference	Reference		Reference	Reference	Reference	Reference		
Q2	2.620 (0.738, 9.302) 0.145	0.516 (0.279, 0.954) 0.041		3.375 (0.876, 13.008) 0.085	0.630 (0.331, 1.197) 0.167	2.725 (0.743, 9.998) 0.146	0.569 (0.289, 1.119) 0.118		
Q3	1.666 (0.265, 10.460) 0.589	1.168 (0.632, 2.157) 0.623		2.303 (0.352, 15.070) 0.390	1.516 (0.827, 2.779) 0.187	1.851 (0.260, 13.192) 0.546	1.387 (0.709, 2.714) 0.350		
Q4	3.083 (0.854, 11.135) 0.094	1.218 (0.735, 2.019) 0.449		5.580 (1.514, 20.559) 0.014	1.913 (1.166, 3.140) 0.014	3.706 (0.988, 13.900) 0.066	1.348 (0.745, 2.441) 0.336		
Hearing difficulty	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		
Hydroxycotinine	0.773 (0.406, 1.473) 0.438	0.450 (0.139, 1.457) 0.190	0.433	0.992 (0.603, 1.631) 0.974	0.597 (0.168, 2.119) 0.430	0.481	0.946 (0.561, 1.594) 0.835	0.563 (0.138, 2.298) 0.432	0.507
Vision impairment	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	
Hydroxycotinine	0.874 (0.473, 1.617) 0.671	0.937 (0.543, 1.617) 0.817	0.877	0.963 (0.533, 1.743) 0.902	1.085 (0.637, 1.849) 0.765	0.784	0.830 (0.409, 1.685) 0.611	0.783 (0.362, 1.692) 0.539	0.914
Attention deficit	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	

hyperactivity disorder

Hydroxycotinine	0.846 (0.476, 1.506) 0.573	1.169 (0.796, 1.717) 0.429	0.332	0.879 (0.495, 1.563) 0.663	1.238 (0.849, 1.805) 0.274	0.302	0.735 (0.376, 1.435) 0.376	1.040 (0.659, 1.641) 0.866	0.408
Walking difficulty	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	
Hydroxycotinine	0.953 (0.605, 1.499) 0.835	1.487 (0.991, 2.230) 0.062	0.192	1.167 (0.768, 1.772) 0.473	2.161 (1.457, 3.203) <0.001	0.048	1.178 (0.775, 1.791) 0.450	1.901 (1.115, 3.239) 0.027	0.168
Difficulty dressing or bathing independently	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	
Hydroxycotinine	0.908 (0.478, 1.724) 0.769	0.930 (0.447, 1.936) 0.848	0.962	1.082 (0.560, 2.089) 0.816	1.207 (0.606, 2.407) 0.595	0.826	1.064 (0.499, 2.269) 0.874	1.062 (0.538, 2.095) 0.864	0.997
Difficulty running errands alone	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	
Hydroxycotinine	1.066 (0.605, 1.879) 0.826	1.352 (0.931, 1.964) 0.121	0.479	1.208 (0.652, 2.236) 0.551	1.645 (1.138, 2.376) 0.011	0.363	1.102 (0.518, 2.342) 0.803	1.315 (0.867, 1.996) 0.210	0.703
Hearing difficulty	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	
Hydroxycotinine (Quartile)			0.285			0.283			0.418
Q1	Reference	Reference		Reference	Reference		Reference	Reference	
Q2	2.025 (0.860, 4.768) 0.114	0.751 (0.349, 1.618) 0.470		1.900 (0.772, 4.676) 0.171	0.609 (0.276, 1.342) 0.226		1.828 (0.776, 4.306) 0.183	0.714 (0.309, 1.650) 0.440	
Q3	1.088 (0.449, 2.633) 0.853	0.571 (0.277, 1.174) 0.136		0.992 (0.393, 2.504) 0.987	0.551 (0.233, 1.302) 0.182		0.982 (0.411, 2.343) 0.967	0.519 (0.214, 1.262) 0.163	
Q4	0.990 (0.392, 2.499) 0.983	0.724 (0.338, 1.551) 0.412		1.624 (0.666, 3.956) 0.293	0.701 (0.304, 1.617) 0.410		1.632 (0.650, 4.096) 0.310	0.686 (0.289, 1.628) 0.403	

	Q2	2.973 (1.192, 7.413) 0.025	1.019 (0.593, 1.753) 0.945	2.736 (1.056, 7.093) 0.045	0.913 (0.536, 1.554) 0.739	2.677 (1.010, 7.099) 0.062	1.004 (0.613, 1.647) 0.986
	Q3	4.321 (1.731, 10.786) 0.003	1.111 (0.681, 1.813) 0.676	4.531 (1.761, 11.655) 0.003	1.213 (0.726, 2.025) 0.466	4.814 (1.847, 12.546) 0.004	1.113 (0.660, 1.877) 0.693
	Q4	2.275 (1.008, 5.137) 0.055	1.717 (0.973, 3.028) 0.070	3.377 (1.451, 7.863) 0.008	2.084 (1.225, 3.547) 0.010	3.228 (1.364, 7.640) 0.015	1.775 (0.991, 3.179) 0.068
Difficulty dressing or bathing independently		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value
Hydroxycotinine (Quartile)			0.092		0.076		0.037
	Q1	Reference	Reference	Reference	Reference	Reference	Reference
	Q2	0.362 (0.085, 1.545) 0.178	1.781 (0.832, 3.814) 0.145	0.316 (0.071, 1.396) 0.137	1.651 (0.725, 3.760) 0.240	0.275 (0.059, 1.278) 0.115	1.616 (0.616, 4.242) 0.341
	Q3	1.855 (0.460, 7.476) 0.390	0.989 (0.560, 1.745) 0.969	1.807 (0.414, 7.896) 0.436	1.043 (0.572, 1.900) 0.892	1.683 (0.374, 7.581) 0.505	0.883 (0.454, 1.716) 0.717
	Q4	0.780 (0.250, 2.434) 0.672	0.993 (0.529, 1.865) 0.982	1.050 (0.312, 3.529) 0.938	1.054 (0.542, 2.052) 0.877	0.891 (0.219, 3.627) 0.873	0.856 (0.393, 1.865) 0.699
Difficulty running errands alone		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value
Hydroxycotinine (Quartile)			0.930		0.833		0.822
	Q1	Reference	Reference	Reference	Reference	Reference	Reference
	Q2	1.376 (0.408, 4.640) 0.610	1.946 (1.178, 3.214) 0.013	1.249 (0.365, 4.278) 0.725	1.855 (1.107, 3.106) 0.024	1.124 (0.325, 3.889) 0.855	1.885 (1.116, 3.183) 0.028
	Q3	1.586 (0.326, 7.707) 0.571	1.942 (1.084, 3.478) 0.032	1.550 (0.297, 8.080) 0.606	2.087 (1.164, 3.744) 0.018	1.321 (0.245, 7.106) 0.749	1.753 (0.955, 3.216) 0.085

	1.113)	1.293)	1.201)		1.128)	1.334)	1.211)		1.098)	1.277)	1.108)	
	0.594	0.540	0.876		0.713	0.374	0.943		0.485	0.953	0.319	
Walking difficulty	OR	OR	OR		OR	OR	OR		OR	OR	OR	
	(95%CI) P-	(95%CI) P-	(95%CI) P-		(95%CI) P-	(95%CI) P-	(95%CI) P-		(95%CI) P-	(95%CI) P-	(95%CI) P-	
	value	value	value		value	value	value		value	value	value	
	1.025	0.994	1.557		1.044	1.033	1.594		1.038	0.946	1.581	
Serum cotinine level	(0.857, 1.226)	(0.818, 1.207)	(1.194, 2.030)	0.014	(0.870, 1.253)	(0.850, 1.255)	(1.240, 2.049)	0.011	(0.847, 1.273)	(0.710, 1.259)	(1.235, 2.024)	0.016
	0.785	0.948	0.002		0.649	0.746	<0.001		0.719	0.706	0.002	
Difficulty dressing or bathing independently	OR	OR	OR		OR	OR	OR		OR	OR	OR	
	(95%CI) P-	(95%CI) P-	(95%CI) P-		(95%CI) P-	(95%CI) P-	(95%CI) P-		(95%CI) P-	(95%CI) P-	(95%CI) P-	
	value	value	value		value	value	value		value	value	value	
	1.053	0.936	1.148		1.054	0.938	1.149		1.056	0.892	1.098	
Serum cotinine level	(0.822, 1.349)	(0.737, 1.189)	(0.889, 1.483)	0.556	(0.820, 1.355)	(0.734, 1.198)	(0.890, 1.485)	0.565	(0.810, 1.376)	(0.670, 1.188)	(0.872, 1.383)	0.539
	0.686	0.591	0.296		0.683	0.612	0.294		0.692	0.443	0.433	
Difficulty running errands alone	OR	OR	OR		OR	OR	OR		OR	OR	OR	
	(95%CI) P-	(95%CI) P-	(95%CI) P-		(95%CI) P-	(95%CI) P-	(95%CI) P-		(95%CI) P-	(95%CI) P-	(95%CI) P-	
	value	value	value		value	value	value		value	value	value	
	1.010	1.144	1.140		1.020	1.171	1.150		0.992	1.077	1.060	
Serum cotinine level	(0.858, 1.188)	(0.965, 1.357)	(0.864, 1.505)	0.560	(0.859, 1.210)	(0.979, 1.399)	(0.875, 1.511)	0.496	(0.830, 1.187)	(0.885, 1.310)	(0.794, 1.414)	0.833
	0.907	0.130	0.359		0.824	0.091	0.322		0.934	0.466	0.696	
Hearing difficulty	OR	OR	OR		OR	OR	OR		OR	OR	OR	
	(95%CI) P-	(95%CI) P-	(95%CI) P-		(95%CI) P-	(95%CI) P-	(95%CI) P-		(95%CI) P-	(95%CI) P-	(95%CI) P-	
	value	value	value		value	value	value		value	value	value	
Serum cotinine level (Quartile)				0.206				0.190				0.368
Q1	Reference	Reference	Reference		Reference	Reference	Reference		Reference	Reference	Reference	

Vision impairment	Q2	0.111	0.180	0.741	0.113	0.165	0.752	0.126	0.198	0.633
		(0.009, 1.367)	(0.058, 0.557)	(0.320, 1.718)	(0.009, 1.401)	(0.053, 0.520)	(0.326, 1.735)	(0.010, 1.628)	(0.062, 0.634)	(0.256, 1.570)
		0.095	0.005	0.490	0.099	0.004	0.509	0.132	0.015	0.339
	Q3	0.605	0.553	0.549	0.611	0.493	0.568	0.688	0.627	0.483
		(0.047, 7.860)	(0.193, 1.587)	(0.246, 1.229)	(0.047, 7.999)	(0.163, 1.489)	(0.257, 1.256)	(0.051, 9.349)	(0.205, 1.918)	(0.209, 1.117)
		0.703	0.278	0.154	0.710	0.219	0.172	0.782	0.426	0.108
	Q4	0.552	0.675	0.870	0.520	0.615	0.908	0.565	0.660	0.732
		(0.086, 3.556)	(0.227, 2.009)	(0.375, 2.018)	(0.081, 3.359)	(0.203, 1.861)	(0.388, 2.127)	(0.080, 3.977)	(0.245, 1.780)	(0.283, 1.893)
		0.536	0.485	0.747	0.497	0.396	0.826	0.575	0.424	0.530
		OR	OR	OR	OR	OR	OR	OR	OR	OR
		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value
	Serum cotinine level (Quartile)			0.968			0.971			0.936
Q1	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	
	0.730	1.229	1.136	0.727	1.252	1.132	0.699	1.295	1.140	
	(0.108, 4.947)	(0.406, 3.727)	(0.374, 3.453)	(0.106, 4.966)	(0.407, 3.846)	(0.372, 3.439)	(0.104, 4.700)	(0.375, 4.469)	(0.352, 3.691)	
Q2	0.749	0.717	0.823	0.747	0.698	0.829	0.718	0.688	0.830	
	1.770	1.282	1.761	1.765	1.315	1.745	1.591	1.134	1.661	
	(0.430, 7.289)	(0.397, 4.139)	(0.560, 5.534)	(0.428, 7.275)	(0.393, 4.398)	(0.557, 5.467)	(0.402, 6.289)	(0.357, 3.606)	(0.469, 5.877)	
Q3	0.435	0.680	0.340	0.437	0.660	0.346	0.518	0.834	0.443	
	1.361	1.121	1.885	1.380	1.144	1.867	1.104	0.717	1.100	
	(0.344, 5.395)	(0.319, 3.932)	(0.711, 4.999)	(0.351, 5.428)	(0.324, 4.041)	(0.707, 4.929)	(0.284, 4.293)	(0.197, 2.611)	(0.317, 3.819)	
Q4	0.663	0.860	0.211	0.648	0.836	0.216	0.888	0.621	0.882	

Serum cotinine level (Quartile)				0.504				0.416			0.257	
Q1	Reference	Reference	Reference		Reference	Reference	Reference		Reference	Reference	Reference	
	0.566	1.164	0.760		0.561	1.217	0.751		0.579	1.219	0.630	
Q2	(0.161, 1.999)	(0.309, 4.389)	(0.339, 1.703)		(0.157, 1.999)	(0.315, 4.702)	(0.336, 1.680)		(0.165, 2.030)	(0.360, 4.131)	(0.262, 1.514)	
	0.383	0.824	0.510		0.379	0.777	0.491		0.406	0.755	0.317	
	1.415	3.786	1.075		1.406	4.041	1.051		1.261	3.796	0.749	
Q3	(0.312, 6.419)	(1.504, 9.531)	(0.469, 2.467)		(0.310, 6.385)	(1.610, 10.143)	(0.456, 2.420)		(0.277, 5.743)	(1.308, 11.017)	(0.312, 1.803)	
	0.655	0.008	0.865		0.662	0.005	0.908		0.768	0.026	0.529	
	2.161	3.835	1.682		2.240	4.045	1.643		1.765	2.966	1.177	
Q4	(0.575, 8.124)	(1.353, 10.872)	(0.760, 3.723)		(0.588, 8.538)	(1.405, 11.641)	(0.740, 3.647)		(0.426, 7.316)	(1.198, 7.345)	(0.506, 2.738)	
	0.262	0.016	0.208		0.246	0.014	0.231		0.445	0.032	0.710	
	OR	OR	OR		OR	OR	OR		OR	OR	OR	
Hearing difficulty	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	
	0.770	0.820	0.968		0.755	0.782	0.953		0.782	0.761	0.984	
Cotinine	(0.461, 1.288)	(0.502, 1.339)	(0.678, 1.381)	0.740	(0.451, 1.263)	(0.478, 1.278)	(0.676, 1.342)	0.698	(0.471, 1.296)	(0.416, 1.395)	(0.704, 1.375)	0.723
	0.326	0.432	0.857		0.290	0.332	0.783		0.350	0.387	0.927	
	OR	OR	OR		OR	OR	OR		OR	OR	OR	
Vision impairment	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	
	1.032	0.974	1.005		1.037	0.986	1.008		0.992	0.799	0.835	
Cotinine	(0.780, 1.365)	(0.704, 1.347)	(0.744, 1.356)	0.970	(0.786, 1.368)	(0.709, 1.371)	(0.745, 1.364)	0.978	(0.733, 1.341)	(0.533, 1.199)	(0.519, 1.343)	0.710
	0.826	0.873	0.976		0.799	0.933	0.959		0.957	0.290	0.465	
	OR	OR	OR		OR	OR	OR		OR	OR	OR	
Attention deficit	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	

hyperactivity disorder

	0.940	1.117	0.927		0.954	1.165	0.937		0.922	1.051	0.817	
Cotinine	(0.775, 1.140)	(0.853, 1.462)	(0.680, 1.264)	0.614	(0.787, 1.157)	(0.891, 1.523)	(0.690, 1.272)	0.512	(0.762, 1.115)	(0.762, 1.451)	(0.573, 1.165)	0.673
	0.535	0.426	0.635		0.633	0.272	0.677		0.411	0.764	0.277	
Walking difficulty	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	
	1.026	0.983	1.727		1.046	1.039	1.777		1.036	0.919	1.796	
Cotinine	(0.808, 1.302)	(0.765, 1.263)	(1.118, 2.668)	0.076	(0.822, 1.332)	(0.812, 1.330)	(1.166, 2.706)	0.072	(0.790, 1.359)	(0.626, 1.347)	(1.207, 2.670)	0.046
	0.836	0.894	0.018		0.717	0.762	0.011		0.799	0.668	0.008	
Difficulty dressing or bathing independently	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	
	1.046	0.960	1.193		1.047	0.964	1.194		1.042	0.901	1.147	
Cotinine	(0.754, 1.450)	(0.707, 1.303)	(0.844, 1.687)	0.685	(0.753, 1.456)	(0.708, 1.312)	(0.844, 1.690)	0.692	(0.738, 1.471)	(0.629, 1.292)	(0.830, 1.584)	0.638
	0.791	0.796	0.324		0.787	0.815	0.322		0.817	0.578	0.416	
Difficulty running errands alone	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	
	0.960	1.246	1.178		0.971	1.287	1.188		0.928	1.152	1.083	
Cotinine	(0.793, 1.162)	(0.999, 1.554)	(0.789, 1.758)	0.241	(0.796, 1.185)	(1.024, 1.617)	(0.800, 1.762)	0.178	(0.752, 1.144)	(0.890, 1.492)	(0.702, 1.673)	0.466
	0.679	0.058	0.428		0.772	0.036	0.398		0.491	0.294	0.721	
Hearing difficulty	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	

Cotinine (Quartile)				0.936				0.946			0.964
Q1	Reference	Reference	Reference		Reference	Reference	Reference		Reference	Reference	Reference
	0.106	0.380	0.397		0.102	0.354	0.387		0.108	0.368	0.301
Q2	(0.008, 1.344)	(0.111, 1.305)	(0.175, 0.900)		(0.008, 1.308)	(0.102, 1.231)	(0.166, 0.904)		(0.008, 1.385)	(0.108, 1.257)	(0.119, 0.756)
	0.092	0.133	0.034		0.089	0.112	0.035		0.107	0.130	0.021
	0.550	0.607	0.427		0.531	0.534	0.440		0.598	0.665	0.416
Q3	(0.042, 7.172)	(0.191, 1.928)	(0.187, 0.975)		(0.040, 7.008)	(0.158, 1.806)	(0.193, 1.001)		(0.043, 8.265)	(0.194, 2.279)	(0.161, 1.077)
	0.651	0.403	0.051		0.634	0.320	0.059		0.706	0.526	0.090
	0.510	0.728	0.738		0.462	0.663	0.746		0.491	0.677	0.574
Q4	(0.077, 3.389)	(0.225, 2.359)	(0.377, 1.445)		(0.069, 3.100)	(0.199, 2.203)	(0.374, 1.485)		(0.065, 3.680)	(0.232, 1.975)	(0.275, 1.197)
	0.490	0.600	0.382		0.432	0.507	0.410		0.499	0.486	0.158
Vision impairment	OR (95%CI) P- value	OR (95%CI) P- value	OR (95%CI) P- value		OR (95%CI) P- value	OR (95%CI) P- value	OR (95%CI) P- value		OR (95%CI) P- value	OR (95%CI) P- value	OR (95%CI) P- value
Cotinine (Quartile)				0.553				0.582			0.758
Q1	Reference	Reference	Reference		Reference	Reference	Reference		Reference	Reference	Reference
	0.682	1.257	0.716		0.688	1.276	0.718		0.643	1.254	0.614
Q2	(0.141, 3.308)	(0.389, 4.066)	(0.266, 1.924)		(0.141, 3.347)	(0.391, 4.165)	(0.266, 1.936)		(0.139, 2.973)	(0.350, 4.498)	(0.228, 1.652)
	0.638	0.705	0.512		0.646	0.689	0.517		0.580	0.733	0.348
	2.365	1.434	1.349		2.383	1.476	1.337		2.113	1.205	1.396
Q3	(0.478, 11.695)	(0.419, 4.902)	(0.481, 3.783)		(0.481, 11.797)	(0.414, 5.255)	(0.476, 3.756)		(0.429, 10.416)	(0.346, 4.201)	(0.413, 4.726)
	0.299	0.569	0.573		0.295	0.552	0.585		0.372	0.773	0.599
	1.207	1.119	1.855		1.234	1.142	1.850		0.952	0.694	0.992
Q4	(0.266, 5.475)	(0.309, 4.052)	(0.716, 4.808)		(0.274, 5.558)	(0.313, 4.174)	(0.712, 4.803)		(0.213, 4.250)	(0.181, 2.657)	(0.288, 3.415)
	0.809	0.865	0.212		0.786	0.842	0.215		0.950	0.601	0.990

Attention deficit hyperactivity disorder	OR	OR	OR	OR	OR	OR	OR	OR	OR		
	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		
Cotinine (Quartile)				0.633				0.662		0.686	
Q1	Reference 0.961	Reference 0.900	Reference 1.301		Reference 0.986	Reference 0.941	Reference 1.313		Reference 0.910	Reference 0.914	Reference 1.372
Q2	(0.378, 2.446)	(0.339, 2.390)	(0.604, 2.799)		(0.385, 2.527)	(0.347, 2.557)	(0.610, 2.827)		(0.326, 2.544)	(0.338, 2.472)	(0.645, 2.919)
Q3	0.934 1.084 (0.388, 3.025)	0.834 1.606 (0.684, 3.767)	0.506 1.728 (0.715, 4.178)		0.977 1.110 (0.398, 3.094)	0.906 1.757 (0.742, 4.162)	0.491 1.686 (0.689, 4.122)		0.860 1.040 (0.381, 2.839)	0.861 1.583 (0.578, 4.338)	0.423 1.783 (0.689, 4.612)
Q4	0.878 1.057 (0.511, 2.190)	0.284 1.688 (0.616, 4.627)	0.233 2.932 (1.274, 6.744)		0.844 1.134 (0.547, 2.350)	0.209 1.802 (0.659, 4.926)	0.260 2.919 (1.288, 6.616)		0.941 0.863 (0.407, 1.830)	0.385 1.442 (0.471, 4.422)	0.251 2.206 (0.973, 5.004)
Q4	0.881	0.316	0.016		0.738	0.259	0.015		0.705	0.531	0.076
Walking difficulty	OR	OR	OR	OR	OR	OR	OR	OR	OR		
	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		
Cotinine (Quartile)				0.043				0.03		0.045	
Q1	Reference 3.143	Reference 0.643	Reference 0.900		Reference 3.262	Reference 0.681	Reference 0.909		Reference 3.817	Reference 0.690	Reference 0.839
Q2	(0.704, 14.020)	(0.232, 1.777)	(0.353, 2.296)		(0.733, 14.515)	(0.245, 1.895)	(0.356, 2.319)		(0.845, 17.237)	(0.263, 1.809)	(0.316, 2.225)
Q3	0.143 1.535 (0.330, 7.152)	0.400 2.408 (0.925, 6.270)	0.826 1.166 (0.638, 2.131)		0.130 1.584 (0.338, 7.420)	0.467 2.742 (1.065, 7.055)	0.843 1.125 (0.609, 2.078)		0.101 1.590 (0.339, 7.461)	0.461 2.766 (0.993, 7.701)	0.729 1.165 (0.605, 2.243)
Q3	0.589	0.081	0.621		0.563	0.044	0.710		0.565	0.069	0.654

		1.628	1.941	2.687	1.789	2.128	2.697	1.642	1.786	2.006
Q4		(0.509,	(0.760,	(1.471,	(0.560,	(0.864,	(1.518,	(0.505,	(0.705,	(0.995,
		5.213)	4.962)	4.910)	5.717)	5.241)	4.794)	5.344)	4.528)	4.044)
		0.417	0.175	0.003	0.334	0.110	0.002	0.422	0.239	0.070
Difficulty dressing or bathing independently		OR	OR	OR	OR	OR	OR	OR	OR	OR
independently		(95%CI) P-	(95%CI) P-	(95%CI) P-	(95%CI) P-	(95%CI) P-	(95%CI) P-	(95%CI) P-	(95%CI) P-	(95%CI) P-
		value	value	value	value	value	value	value	value	value
Cotinine (Quartile)				0.018			0.012			0.007
Q1	Reference	Reference	Reference		Reference	Reference	Reference	Reference	Reference	Reference
	16.995	0.613	0.891		17.110	0.620	0.893	18.521	0.518	0.720
Q2	(1.711,	(0.186,	(0.263,		(1.734,	(0.187,	(0.265,	(1.931,	(0.157,	(0.220,
	168.802)	2.024)	3.012)		168.819)	2.053)	3.007)	177.606)	1.710)	2.351)
	0.021	0.428	0.853		0.021	0.440	0.856	0.022	0.297	0.593
	4.156	3.754	0.521		4.181	3.839	0.518	3.776	3.425	0.476
Q3	(0.384,	(1.168,	(0.194,		(0.387,	(1.259,	(0.192,	(0.345,	(0.978,	(0.178,
	44.935)	12.070)	1.403)		45.160)	11.710)	1.397)	41.345)	11.998)	1.269)
	0.249	0.033	0.206		0.247	0.024	0.202	0.293	0.072	0.157
	6.753	1.761	1.308		6.873	1.789	1.305	6.006	1.341	0.985
Q4	(0.762,	(0.573,	(0.598,		(0.783,	(0.580,	(0.595,	(0.662,	(0.452,	(0.420,
	59.880)	5.412)	2.858)		60.342)	5.521)	2.860)	54.494)	3.976)	2.307)
	0.095	0.330	0.506		0.091	0.319	0.511	0.131	0.604	0.972
Difficulty running errands alone		OR	OR		OR	OR	OR	OR	OR	OR
alone		(95%CI) P-	(95%CI) P-		(95%CI) P-	(95%CI) P-	(95%CI) P-	(95%CI) P-	(95%CI) P-	(95%CI) P-
		value	value		value	value	value	value	value	value
Cotinine (Quartile)				0.360			0.241			0.297
Q1	Reference	Reference	Reference		Reference	Reference	Reference	Reference	Reference	Reference
	1.805	1.015	0.980		1.846	1.055	0.987	1.786	0.907	0.840
Q2	(0.471,	(0.307,	(0.452,		(0.479,	(0.314,	(0.455,	(0.475,	(0.315,	(0.367,

	6.912)	3.354)	2.125)		7.113)	3.539)	2.140)		6.721)	2.610)	1.923)	
	0.395	0.981	0.959		0.379	0.932	0.974		0.404	0.858	0.686	
	2.228	3.622	1.055		2.274	3.912	1.031		2.051	3.392	0.895	
	(0.511,	(1.608,	(0.504,		(0.523,	(1.766,	(0.494,		(0.471,	(1.176,	(0.404,	
	9.714)	8.156)	2.209)		9.889)	8.665)	2.151)		8.928)	9.784)	1.984)	
	0.294	0.004	0.888		0.281	0.002	0.936		0.353	0.038	0.788	
	3.874	3.457	1.675		4.117	3.655	1.664		3.161	2.512	1.113	
	(1.150,	(1.363,	(0.750,		(1.227,	(1.426,	(0.744,		(0.915,	(1.170,	(0.458,	
	13.049)	8.772)	3.739)		13.816)	9.368)	3.722)		10.917)	5.392)	2.705)	
	0.036	0.013	0.216		0.028	0.011	0.224		0.088	0.031	0.815	
	OR	OR	OR		OR	OR	OR		OR	OR	OR	
Hearing difficulty	(95%CI) P-	(95%CI) P-	(95%CI) P-		(95%CI) P-	(95%CI) P-	(95%CI) P-		(95%CI) P-	(95%CI) P-	(95%CI) P-	
	value	value	value		value	value	value		value	value	value	
	0.387	0.553	1.510		0.364	0.517	1.446		0.389	0.443	1.403	
Hydroxycotinine	(0.080,	(0.206,	(0.827,	0.129	(0.075,	(0.195,	(0.833,	0.098	(0.082,	(0.163,	(0.760,	0.152
	1.872)	1.487)	2.756)		1.760)	1.368)	2.511)		1.836)	1.206)	2.591)	
	0.245	0.248	0.187		0.216	0.192	0.198		0.246	0.125	0.291	
	OR	OR	OR		OR	OR	OR		OR	OR	OR	
Vision impairment	(95%CI) P-	(95%CI) P-	(95%CI) P-		(95%CI) P-	(95%CI) P-	(95%CI) P-		(95%CI) P-	(95%CI) P-	(95%CI) P-	
	value	value	value		value	value	value		value	value	value	
	1.050	0.742	1.306		1.066	0.756	1.322		1.014	0.467	1.002	
Hydroxycotinine	(0.572,	(0.286,	(0.800,	0.545	(0.580,	(0.291,	(0.805,	0.550	(0.504,	(0.137,	(0.579,	0.499
	1.928)	1.929)	2.133)		1.957)	1.967)	2.171)		2.039)	1.599)	1.734)	
	0.877	0.544	0.292		0.838	0.570	0.276		0.970	0.238	0.994	
	OR	OR	OR		OR	OR	OR		OR	OR	OR	
Attention deficit hyperactivity disorder	(95%CI) P-	(95%CI) P-	(95%CI) P-		(95%CI) P-	(95%CI) P-	(95%CI) P-		(95%CI) P-	(95%CI) P-	(95%CI) P-	
	value	value	value		value	value	value		value	value	value	
	0.927	1.066	1.115		0.972	1.142	1.154		0.910	0.862	0.824	
Hydroxycotinine	(0.549,	(0.574,	(0.656,	0.876	(0.570,	(0.610,	(0.674,	0.884	(0.522,	(0.401,	(0.471,	0.968
	1.565)	1.978)	1.898)		1.657)	2.139)	1.975)		1.587)	1.850)	1.441)	
	0.778	0.841	0.689		0.918	0.680	0.604		0.744	0.706	0.504	

	OR (95%CI) <i>P</i> - value	OR (95%CI) <i>P</i> - value	OR (95%CI) <i>P</i> - value		OR (95%CI) <i>P</i> - value	OR (95%CI) <i>P</i> - value	OR (95%CI) <i>P</i> - value		OR (95%CI) <i>P</i> - value	OR (95%CI) <i>P</i> - value	OR (95%CI) <i>P</i> - value	
Walking difficulty	1.116	1.012	4.660		1.201	1.118	4.898		1.205	0.882	4.568	
Hydroxycotinine	(0.641, 1.943)	(0.529, 1.939)	(1.927, 11.268)	0.009	(0.679, 2.121)	(0.582, 2.146)	(2.258, 10.627)	0.005	(0.645, 2.251)	(0.341, 2.285)	(1.916, 10.891)	0.025
	0.700	0.971	0.002		0.533	0.739	<0.001		0.565	0.799	0.003	
Difficulty dressing or bathing independently	1.279	0.641	1.482		1.285	0.644	1.488		1.351	0.551	1.237	
Hydroxycotinine	(0.653, 2.504)	(0.243, 1.686)	(0.733, 2.999)	0.396	(0.645, 2.561)	(0.239, 1.738)	(0.736, 3.011)	0.400	(0.628, 2.904)	(0.167, 1.821)	(0.657, 2.332)	0.39
	0.477	0.373	0.280		0.480	0.390	0.275		0.450	0.339	0.517	
Difficulty running errands alone	1.266	1.226	1.481		1.320	1.299	1.531		1.286	1.000	1.172	
Hydroxycotinine	(0.742, 2.160)	(0.686, 2.191)	(0.729, 3.008)	0.925	(0.741, 2.352)	(0.706, 2.391)	(0.761, 3.080)	0.939	(0.703, 2.354)	(0.518, 1.933)	(0.579, 2.375)	0.846
	0.391	0.495	0.284		0.352	0.406	0.240		0.423	0.999	0.664	
Hearing difficulty	OR (95%CI) <i>P</i> - value	OR (95%CI) <i>P</i> - value	OR (95%CI) <i>P</i> - value		OR (95%CI) <i>P</i> - value	OR (95%CI) <i>P</i> - value	OR (95%CI) <i>P</i> - value		OR (95%CI) <i>P</i> - value	OR (95%CI) <i>P</i> - value	OR (95%CI) <i>P</i> - value	
Hydroxycotinine (Quartile)				0.398				0.364				0.497
Q1	Reference	Reference	Reference		Reference	Reference	Reference		Reference	Reference	Reference	
Q2	2.449	0.341	1.152		2.609	0.321	1.164		2.863	0.358	1.327	
	(0.209,	(0.088,	(0.518,		(0.228,	(0.080,	(0.530,		(0.252,	(0.089,	(0.601,	

Hydroxycotinine (Quartile)										
	0.004			0.009			0.004			
	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	
Q1	1.881	1.106	0.884	1.814	1.143	0.879	1.864	0.943	0.989	
Q2	(0.823, 4.300)	(0.457, 2.676)	(0.405, 1.930)	(0.790, 4.166)	(0.467, 2.798)	(0.413, 1.872)	(0.796, 4.363)	(0.331, 2.688)	(0.477, 2.051)	
Q3	0.143	0.825	0.759	0.170	0.772	0.741	0.171	0.913	0.976	
	1.446	2.314	1.309	1.414	2.393	1.325	1.285	1.964	1.246	
	(0.567, 3.686)	(1.163, 4.605)	(0.478, 3.584)	(0.547, 3.659)	(1.174, 4.879)	(0.487, 3.605)	(0.481, 3.436)	(0.892, 4.323)	(0.518, 2.999)	
Q4	0.445	0.022	0.604	0.480	0.022	0.585	0.624	0.113	0.630	
	1.098	1.797	2.465	1.116	1.870	2.381	0.876	1.409	1.895	
	(0.422, 2.855)	(0.654, 4.939)	(1.041, 5.840)	(0.427, 2.916)	(0.684, 5.112)	(1.012, 5.598)	(0.363, 2.114)	(0.439, 4.520)	(0.797, 4.504)	
	0.849	0.264	0.048	0.824	0.231	0.055	0.772	0.572	0.167	
	OR	OR	OR	OR	OR	OR	OR	OR	OR	
Walking difficulty	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	
Hydroxycotinine (Quartile)										
	0.020			0.026			0.067			
	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	
Q1	2.542	1.105	0.843	2.421	1.156	0.836	2.358	1.157	1.004	
Q2	(0.826, 7.824)	(0.426, 2.868)	(0.467, 1.522)	(0.784, 7.475)	(0.449, 2.975)	(0.475, 1.472)	(0.787, 7.061)	(0.484, 2.768)	(0.589, 1.712)	
	0.113	0.838	0.575	0.134	0.766	0.539	0.145	0.747	0.988	
	1.119	2.631	2.631	1.085	2.761	1.247	1.020	2.929	1.242	
Q3	(0.309, 4.043)	(0.987, 7.016)	(0.987, 7.016)	(0.299, 3.939)	(1.026, 7.431)	(0.562, 2.768)	(0.286, 3.638)	(1.063, 8.070)	(0.580, 2.658)	
	0.865	0.062	0.062	0.902	0.053	0.591	0.976	0.054	0.584	
Q4	1.254	2.114	3.095	1.281	2.235	2.975	1.140	2.027	2.856	
	(0.453, 1.254)	(0.797, 2.114)	(1.552, 3.095)	(0.459, 1.281)	(0.865, 2.235)	(1.497, 2.975)	(0.402, 1.140)	(0.781, 2.027)	(1.465, 2.856)	

		3.469)	5.607)	6.174)		3.577)	5.771)	5.913)		3.234)	5.263)	5.566)
		0.666	0.142	0.003		0.640	0.106	0.004		0.809	0.166	0.007
Difficulty dressing or bathing independently		OR	OR	OR		OR	OR	OR		OR	OR	OR
(95%CI) P-value		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value
Hydroxycotinine (Quartile)				<0.001				<0.001				<0.001
Q1	Reference	Reference	Reference		Reference	Reference	Reference		Reference	Reference	Reference	
	0.476	1.978	1.131		0.473	1.990	1.130		0.478	1.744	1.175	
Q2	(0.132, 1.722)	(0.806, 4.852)	(0.434, 2.946)		(0.132, 1.693)	(0.807, 4.907)	(0.434, 2.943)		(0.131, 1.745)	(0.663, 4.588)	(0.423, 3.264)	
	0.266	0.146	0.803		0.258	0.145	0.804		0.280	0.276	0.761	
	0.000	3.569	1.423		0.000	3.589	1.426		0.000	3.233	1.370	
Q3	(0.000, 0.000)	(0.932, 13.672)	(0.589, 3.438)		(0.000, 0.000)	(0.959, 13.438)	(0.591, 3.442)		(0.000, 0.000)	(0.774, 13.499)	(0.603, 3.113)	
	<0.001	0.072	0.438		<0.001	0.067	0.435		<0.001	0.127	0.463	
	0.481	1.867	1.100		0.483	1.880	1.092		0.457	1.504	0.899	
Q4	(0.109, 2.120)	(0.590, 5.913)	(0.422, 2.866)		(0.109, 2.133)	(0.590, 5.993)	(0.412, 2.892)		(0.092, 2.265)	(0.468, 4.829)	(0.342, 2.363)	
	0.340	0.296	0.847		0.344	0.294	0.860		0.352	0.503	0.831	
Difficulty running errands alone		OR	OR	OR		OR	OR	OR		OR	OR	OR
Hydroxycotinine (Quartile)		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value
				0.644				0.615				0.494
Q1	Reference	Reference	Reference		Reference	Reference	Reference		Reference	Reference	Reference	
	0.822	1.791	1.861		0.797	1.840	1.856		0.813	1.602	2.076	
Q2	(0.207, 0.822)	(0.763, 1.791)	(0.902, 1.861)		(0.200, 0.797)	(0.775, 1.840)	(0.890, 1.856)		(0.198, 0.813)	(0.739, 1.602)	(0.989, 2.076)	

	3.270)	4.203)	3.838)	3.181)	4.370)	3.871)	3.343)	3.473)	4.355)
	0.783	0.189	0.102	0.750	0.176	0.109	0.778	0.250	0.071
	1.462	3.511	1.351	1.435	3.601	1.364	1.398	2.842	1.152
Q3	(0.330, 6.477)	(1.392, 8.857)	(0.578, 3.158)	(0.324, 6.355)	(1.429, 9.075)	(0.581, 3.204)	(0.292, 6.689)	(0.996, 8.109)	(0.464, 2.863)
	0.620	0.011	0.492	0.637	0.010	0.481	0.680	0.069	0.764
	2.186	3.115	2.598	2.216	3.213	2.524	1.829	2.276	1.938
Q4	(0.561, 8.515)	(1.188, 8.172)	(1.223, 5.517)	(0.564, 8.705)	(1.220, 8.465)	(1.178, 5.406)	(0.438, 7.633)	(0.970, 5.345)	(0.840, 4.468)
	0.268	0.027	0.018	0.263	0.024	0.023	0.420	0.077	0.140

Model 1: no covariates were adjusted.

Model 2: gender was adjusted.

Model 3: gender, body mass index, race/ethnicity, data release cycle, education level, marital status, income to poverty ratio, alcohol use, hypertension, diabetes, cancer, and cardiovascular diseases were adjusted.

Supplementary Table 4-3. Association between serum cotinine level, cotinine, hydroxycotinine and adverse health outcomes, stratified by race/ethnicity, Weighted.

	Model 1				Model 2				Model 3			
	Non-Hispanic White (n=693)	Non-Hispanic African American (n=650)	Others (n=827)	<i>P</i> -interaction	Non-Hispanic White (n=693)	Non-Hispanic African American (n=650)	Others (n=827)	<i>P</i> -interaction	Non-Hispanic White (n=693)	Non-Hispanic African American (n=650)	Others (n=827)	<i>P</i> -interaction
Hearing difficulty	OR (95%CI) <i>P</i> -value	OR (95%CI) <i>P</i> -value	OR (95%CI) <i>P</i> -value		OR (95%CI) <i>P</i> -value	OR (95%CI) <i>P</i> -value	OR (95%CI) <i>P</i> -value		OR (95%CI) <i>P</i> -value	OR (95%CI) <i>P</i> -value	OR (95%CI) <i>P</i> -value	
	0.836 (0.654, 1.067)	0.790 (0.569, 1.095)	0.702 (0.389, 1.269)		0.954 (0.787, 1.157)	0.927 (0.666, 1.291)	0.879 (0.591, 1.308)		0.937 (0.752, 1.167)	0.926 (0.653, 1.312)	0.860 (0.577, 1.281)	
Serum cotinine level	0.158	0.165	0.248	0.851	0.637	0.658	0.530	0.929	0.567	0.669	0.465	0.935
Vision impairment	OR (95%CI) <i>P</i> -value	OR (95%CI) <i>P</i> -value	OR (95%CI) <i>P</i> -value		OR (95%CI) <i>P</i> -value	OR (95%CI) <i>P</i> -value	OR (95%CI) <i>P</i> -value		OR (95%CI) <i>P</i> -value	OR (95%CI) <i>P</i> -value	OR (95%CI) <i>P</i> -value	

	0.861	0.952	0.990		0.930	1.019	1.060		0.785	1.005	1.054	
Serum cotinine level	(0.671, 1.104)	(0.778, 1.165)	(0.752, 1.303)	0.751	(0.740, 1.168)	(0.836, 1.242)	(0.821, 1.369)	0.758	(0.576, 1.068)	(0.786, 1.285)	(0.828, 1.342)	0.352
	0.244	0.635	0.942		0.538	0.852	0.656		0.137	0.969	0.673	
Attention deficit hyperactivity disorder	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	
	0.942	1.092	0.839		0.983	1.128	0.880		0.896	1.089	0.860 (0.670, 1.104)	0.146
Serum cotinine level	(0.855, 1.039)	(0.926, 1.288)	(0.656, 1.074)	0.179	(0.886, 1.090)	(0.963, 1.321)	(0.701, 1.104)	0.198	(0.789, 1.017)	(0.937, 1.265)	0.249	
	0.241	0.304	0.171		0.742	0.144	0.275		0.104	0.277		
Walking difficulty	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	
	1.025	0.926	0.814		1.213	1.079	0.975		1.170	1.085	0.986	
Serum cotinine level	(0.890, 1.181)	(0.805, 1.064)	(0.668, 0.993)	0.232	(1.060, 1.388)	(0.935, 1.245)	(0.838, 1.134)	0.137	(0.986, 1.389)	(0.922, 1.276)	(0.827, 1.176)	0.441
	0.729	0.283	0.049		0.008	0.305	0.741		0.086	0.338	0.877	
Difficulty dressing or bathing independently	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	
	0.922	0.936	0.934		1.040	1.059	1.062		0.993	1.038	1.070	
Serum cotinine level	(0.718, 1.185)	(0.715, 1.225)	(0.755, 1.155)	0.997	(0.821, 1.318)	(0.817, 1.373)	(0.878, 1.286)	0.990	(0.779, 1.266)	(0.776, 1.387)	(0.861, 1.329)	0.892
	0.531	0.631	0.532		0.746	0.666	0.538		0.958	0.804	0.548	
Difficulty running errands alone	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	

Serum cotinine level		1.057	0.965	0.811	0.223	1.166	1.058	0.912	0.174	1.079	1.009	0.886	0.400
		(0.938, 1.190)	(0.771, 1.207)	(0.612, 1.076)		(1.017, 1.337)	(0.826, 1.354)	(0.722, 1.153)		(0.950, 1.226)	(0.777, 1.311)	(0.682, 1.153)	
		0.370	0.755	0.155		0.034	0.660	0.447		0.255	0.945	0.377	
Hearing difficulty		OR	OR	OR		OR	OR	OR		OR	OR	OR	
		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	
Serum cotinine level (Quartile)					0.915				0.916				0.933
	Q1	Reference	Reference	Reference		Reference	Reference	Reference		Reference	Reference	Reference	
		0.507	0.512	0.273		0.601	0.755	0.296		0.532	0.795	0.304	
Q2		(0.216, 1.190)	(0.176, 1.494)	(0.101, 0.735)		(0.236, 1.529)	(0.242, 2.350)	(0.108, 0.809)		(0.202, 1.401)	(0.243, 2.598)	(0.111, 0.835)	
		0.128	0.229	0.015		0.293	0.630	0.024		0.219	0.708	0.034	
		0.531	0.393	0.314		0.587	0.640	0.468		0.547	0.506	0.418	
Q3		(0.236, 1.195)	(0.079, 1.954)	(0.110, 0.894)		(0.229, 1.499)	(0.125, 3.276)	(0.163, 1.345)		(0.204, 1.464)	(0.097, 2.647)	(0.148, 1.179)	
		0.135	0.262	0.037		0.274	0.596	0.168		0.246	0.431	0.118	
		0.584	0.516	0.270		0.953	1.032	0.529		0.777	0.956	0.448	
Q4		(0.267, 1.276)	(0.179, 1.491)	(0.062, 1.177)		(0.393, 2.316)	(0.297, 3.592)	(0.117, 2.395)		(0.347, 1.738)	(0.246, 3.720)	(0.098, 2.058)	
		0.186	0.230	0.090		0.917	0.960	0.414		0.547	0.949	0.316	
		OR	OR	OR		OR	OR	OR		OR	OR	OR	
Vision impairment		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	
Serum cotinine level (Quartile)					0.886				0.892				0.977
	Q1	Reference	Reference	Reference		Reference	Reference	Reference		Reference	Reference	Reference	
		0.820	1.067	1.120		0.917	1.382	1.197		0.923	1.459	1.245	
Q2	(0.285,	(0.315,	(0.370,		(0.309,	(0.400,	(0.386,		(0.302,	(0.403,	(0.385,		

Serum cotinine level (Quartile)										
	0.596			0.564			0.492			
Q1	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	
	1.110	0.501	0.939	1.404	0.822	1.056	1.549	0.767	1.228	
Q2	(0.581, 2.119)	(0.244, 1.029)	(0.488, 1.805)	(0.683, 2.887)	(0.366, 1.846)	(0.496, 2.248)	(0.778, 3.085)	(0.319, 1.841)	(0.569, 2.649)	
	0.754	0.069	0.850	0.363	0.638	0.889	0.230	0.560	0.608	
	1.311	0.774	0.971	1.713	1.407	1.373	1.676	1.245	1.300	
Q3	(0.623, 2.761)	(0.437, 1.370)	(0.488, 1.930)	(0.744, 3.943)	(0.724, 2.735)	(0.677, 2.781)	(0.692, 4.057)	(0.598, 2.593)	(0.633, 2.669)	
	0.480	0.385	0.934	0.215	0.321	0.386	0.268	0.566	0.485	
	1.530	0.598	1.176	2.966	1.235	2.329	2.396	0.972	2.221	
Q4	(0.757, 3.091)	(0.320, 1.116)	(0.533, 2.594)	(1.538 , 5.719)	(0.629, 2.424)	(1.070 , 5.067)	(1.211 , 4.741)	(0.472, 2.001)	(0.924, 5.339)	
	0.245	0.115	0.691	0.003	0.544	0.041	0.022	0.940	0.092	
Difficulty dressing or bathing independentl y Serum cotinine level (Quartile)										
	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	
Q1	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	
	0.756	0.807	0.702	0.902	1.211	0.787	0.836	1.188	0.747	
Q2	(0.239, 2.393)	(0.240, 2.719)	(0.253, 1.947)	(0.276, 2.951)	(0.363, 4.035)	(0.279, 2.217)	(0.250, 2.798)	(0.320, 4.417)	(0.274, 2.038)	
	0.637	0.732	0.501	0.866	0.758	0.653	0.775	0.800	0.576	
	0.908	1.273	0.693	1.063	2.073	0.959	1.036	1.812	0.774	
Q3	(0.213, 3.878)	(0.378, 4.285)	(0.259, 1.859)	(0.249, 4.538)	(0.635, 6.772)	(0.352, 2.610)	(0.233, 4.595)	(0.521, 6.301)	(0.281, 2.133)	
	0.897	0.699	0.472	0.934	0.236	0.935	0.964	0.363	0.626	
0.888										
0.712										
0.681										

		0.651	0.599	1.089	0.987	1.087	1.913	0.815	0.848	1.592			
		(0.264,	(0.148,	(0.410,	(0.432,	(0.274,	(0.675,	(0.352,	(0.213,	(0.566,			
		1.605)	2.426)	2.896)	2.259)	4.307)	5.423)	1.888)	3.370)	4.476)			
		0.358	0.477	0.865	0.976	0.906	0.231	0.640	0.817	0.390			
Difficulty running errands alone		OR	OR	OR	OR	OR	OR	OR	OR	OR			
		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		
Serum cotinine level (Quartile)		0.066			0.044						0.113		
Q1	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference			
	0.377	0.911	1.341	0.427	1.292	1.455	0.388	1.275	1.243				
Q2	(0.184,	(0.376,	(0.556,	(0.202,	(0.544,	(0.613,	(0.168,	(0.528,	(0.470,				
	0.773)	2.209)	3.232)	0.899)	3.069)	3.457)	0.893)	3.078)	3.286)				
Q3	0.012	0.839	0.518	0.032	0.566	0.401	0.040	0.596	0.666				
	1.354	0.978	1.152	1.585	1.453	1.450	1.384	1.223	1.069				
Q4	(0.555,	(0.316,	(0.517,	(0.631,	(0.476,	(0.680,	(0.510,	(0.400,	(0.501,				
	3.306)	3.026)	2.566)	3.983)	4.436)	3.093)	3.758)	3.741)	2.282)				
Q4	0.510	0.969	0.731	0.334	0.517	0.344	0.532	0.728	0.866				
	1.706	0.978	1.512	2.547	1.611	2.327	1.763	1.182	1.786				
Q4	(0.809,	(0.362,	(0.503,	(1.261,	(0.561,	(0.771,	(0.796,	(0.426,	(0.609,				
	3.594)	2.640)	4.547)	5.142)	4.626)	7.024)	3.904)	3.280)	5.239)				
Hearing difficulty	0.169	0.966	0.467	0.014	0.382	0.144	0.180	0.752	0.305				
	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR			
	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value			
Cotinine	0.687	0.747	0.604	0.906	0.949	0.843	0.884	0.958	0.822				
	(0.457,	(0.504,	(0.244,	0.886	(0.659,	(0.650,	(0.497,	0.932	(0.610,	(0.642,	(0.489,	0.888	
	1.034)	1.108)	1.491)		1.248)	1.385)	1.427)		1.281)	1.430)	1.381)		
	0.079	0.155	0.280		0.551	0.788	0.528		0.521	0.837	0.466		

	OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-		OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-		OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-	
Vision impairment	value	value	value		value	value	value		value	value	value	
	0.760	0.930	0.977		0.878	1.021	1.070		0.666	1.009	1.061	
Cotinine	(0.471, 1.228)	(0.713, 1.212)	(0.694, 1.374)	0.713	(0.577, 1.335)	(0.791, 1.319)	(0.786, 1.456)	0.775	(0.366, 1.213)	(0.743, 1.370)	(0.790, 1.425)	0.421
	0.269	0.594	0.893		0.546	0.872	0.671		0.197	0.956	0.700	
Attention deficit hyperactivity disorder	OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-		OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-		OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-	
	value	value	value		value	value	value		value	value	value	
	0.909	1.107	0.799		0.971	1.155	0.851		0.845	1.104	0.824	
Cotinine	(0.786, 1.051)	(0.885, 1.386)	(0.584, 1.091)	0.235	(0.831, 1.134)	(0.936, 1.424)	(0.642, 1.128)	0.258	(0.691, 1.032)	(0.907, 1.346)	(0.604, 1.124)	0.205
	0.204	0.378	0.166		0.712	0.186	0.269		0.113	0.334	0.233	
Walking difficulty	OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-		OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-		OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-	
	value	value	value		value	value	value		value	value	value	
	1.012	0.852	0.742		1.330	1.054	0.953		1.252	1.059	0.968	
Cotinine	(0.810, 1.265)	(0.717, 1.012)	(0.554, 0.995)	0.282	(1.084, 1.633)	(0.893, 1.244)	(0.778, 1.167)	0.068	(0.966, 1.622)	(0.881, 1.273)	(0.767, 1.221)	0.382
	0.918	0.076	0.053		0.010	0.540	0.644		0.103	0.548	0.784	
Difficulty dressing or bathing independently	OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-		OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-		OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-	
	value	value	value		value	value	value		value	value	value	
	0.874	0.871	0.907		1.088	1.040	1.075		1.016	1.006	1.081	
Cotinine	(0.599, 1.274)	(0.611, 1.243)	(0.676, 1.216)	0.974	(0.782, 1.513)	(0.754, 1.433)	(0.838, 1.379)	0.973	(0.721, 1.433)	(0.705, 1.434)	(0.820, 1.425)	0.909
	0.487	0.451	0.517		0.620	0.813	0.572		0.928	0.975	0.587	

Difficulty running errands alone	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	
	1.072	0.896	0.758		1.259	1.019	0.892		1.118	0.954	0.859	
Cotinine	(0.897, 1.282)	(0.708, 1.134)	(0.508, 1.132)	0.198	(1.036, 1.530)	(0.790, 1.313)	(0.654, 1.218)	0.094	(0.928, 1.348)	(0.730, 1.248)	(0.608, 1.214)	0.302
	0.447	0.365	0.183		0.026	0.887	0.477		0.253	0.735	0.399	
Hearing difficulty	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	
Cotinine (Quartile)				0.853				0.944				0.930
Q1	Reference	Reference	Reference		Reference	Reference	Reference		Reference	Reference	Reference	
	0.290	0.514	0.227		0.366	0.674	0.263		0.286	0.586	0.265	
Q2	(0.138, 0.610)	(0.181, 1.462)	(0.085, 0.606)		(0.149, 0.899)	(0.224, 2.026)	(0.095, 0.730)		(0.110, 0.740)	(0.178, 1.928)	(0.097, 0.720)	
	0.003	0.221	0.006		0.036	0.488	0.015		0.020	0.392	0.019	
	0.410	0.349	0.270		0.490	0.575	0.445		0.490	0.455	0.403	
Q3	(0.171, 0.985)	(0.068, 1.794)	(0.093, 0.781)		(0.185, 1.292)	(0.111, 2.968)	(0.158, 1.253)		(0.168, 1.428)	(0.083, 2.480)	(0.151, 1.076)	
	0.054	0.216	0.021		0.159	0.513	0.135		0.208	0.375	0.087	
	0.438	0.469	0.231		0.839	1.074	0.514		0.629	0.951	0.442	
Q4	(0.221, 0.866)	(0.162, 1.359)	(0.053, 1.008)		(0.381, 1.848)	(0.305, 3.784)	(0.118, 2.236)		(0.309, 1.278)	(0.244, 3.706)	(0.102, 1.914)	
	0.024	0.172	0.060		0.666	0.912	0.381		0.217	0.943	0.290	
Vision impairment	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	
Cotinine (Quartile)				0.504				0.665				0.308
Q1	Reference	Reference	Reference		Reference	Reference	Reference		Reference	Reference	Reference	

		0.579	0.942	1.010	0.706	1.119	1.119	0.693	1.152	1.111
	Q2	(0.188, 1.785)	(0.296, 3.002)	(0.413, 2.468)	(0.221, 2.259)	(0.345, 3.632)	(0.455, 2.754)	(0.216, 2.216)	(0.354, 3.748)	(0.442, 2.795)
		0.348	0.921	0.983	0.562	0.853	0.808	0.544	0.817	0.825
		1.416	0.979	1.189	1.678	1.359	1.531	1.768	1.456	1.334
	Q3	(0.545, 3.674)	(0.391, 2.449)	(0.322, 4.389)	(0.623, 4.521)	(0.533, 3.464)	(0.423, 5.540)	(0.649, 4.819)	(0.493, 4.296)	(0.354, 5.035)
		0.480	0.964	0.796	0.314	0.525	0.520	0.280	0.506	0.676
		0.742	0.642	1.315	1.093	0.974	1.958	0.581	0.797	1.981
	Q4	(0.254, 2.167)	(0.241, 1.715)	(0.412, 4.195)	(0.357, 3.347)	(0.363, 2.613)	(0.609, 6.293)	(0.158, 2.127)	(0.278, 2.289)	(0.621, 6.321)
		0.589	0.383	0.647	0.877	0.959	0.268	0.423	0.679	0.264
Attention deficit hyperactivity disorder		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value
Cotinine (Quartile)				0.485			0.648			0.449
	Q1	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
		0.864	0.907	1.558	0.984	1.003	1.579	0.971	1.015	1.433
	Q2	(0.400, 1.865)	(0.362, 2.271)	(0.704, 3.446)	(0.441, 2.194)	(0.414, 2.434)	(0.715, 3.487)	(0.438, 2.151)	(0.378, 2.723)	(0.630, 3.262)
		0.712	0.836	0.281	0.969	0.994	0.267	0.942	0.977	0.403
		1.519	0.585	1.862	1.694	0.707	2.066	1.678	0.637	1.736
	Q3	(0.670, 3.444)	(0.226, 1.513)	(0.859, 4.037)	(0.735, 3.904)	(0.270, 1.853)	(0.934, 4.574)	(0.697, 4.041)	(0.210, 1.934)	(0.780, 3.860)
		0.324	0.276	0.125	0.225	0.485	0.083	0.264	0.438	0.194
		1.395	1.147	1.669	1.758	1.433	2.061	1.145	1.120	1.695
	Q4	(0.736, 2.644)	(0.484, 2.720)	(0.664, 4.198)	(0.896, 3.449)	(0.605, 3.394)	(0.825, 5.148)	(0.550, 2.385)	(0.403, 3.116)	(0.636, 4.520)
		0.315	0.757	0.284	0.111	0.420	0.131	0.722	0.830	0.306

Walking difficulty	OR (95%CI) P- value	OR (95%CI) P- value	OR (95%CI) P- value	OR (95%CI) P- value	OR (95%CI) P- value	OR (95%CI) P- value	OR (95%CI) P- value	OR (95%CI) P- value	OR (95%CI) P- value	OR (95%CI) P- value	
Cotinine (Quartile)				0.284				0.280		0.490	
Q1	Reference 0.747	Reference 0.621	Reference 0.776		Reference 1.113	Reference 0.841	Reference 0.903		Reference 1.076	Reference 0.778	Reference 1.014
Q2	(0.366, 1.524)	(0.293, 1.315)	(0.412, 1.464)		(0.475, 2.612)	(0.377, 1.877)	(0.449, 1.817)		(0.445, 2.603)	(0.344, 1.761)	(0.502, 2.049)
	0.428	0.222	0.440		0.807	0.675	0.777		0.873	0.555	0.969
	1.387	0.546	0.661		2.043	1.007	1.029		2.159	0.945	0.940
Q3	(0.627, 3.068)	(0.313, 0.951)	(0.339, 1.289)		(0.869, 4.803)	(0.544, 1.866)	(0.522, 2.027)		(0.900, 5.182)	(0.480, 1.859)	(0.474, 1.861)
	0.425	0.040	0.233		0.111	0.982	0.935		0.103	0.872	0.860
	1.165	0.489	0.840		2.704	1.056	1.859		1.884	0.879	1.780
Q4	(0.598, 2.267)	(0.284, 0.840)	(0.369, 1.910)		(1.484, 4.925)	(0.571, 1.952)	(0.868, 3.984)		(0.909, 3.904)	(0.465, 1.662)	(0.746, 4.246)
	0.657	0.014	0.680		0.003	0.864	0.120		0.107	0.696	0.211
Difficulty dressing or bathing independentl y											
Cotinine (Quartile)				0.942				0.874		0.804	
Q1	Reference 0.952	Reference 0.582	Reference 0.640		Reference 1.322	Reference 0.756	Reference 0.760		Reference 1.165	Reference 0.711	Reference 0.724
Q2	(0.268, 3.382)	(0.138, 2.453)	(0.240, 1.708)		(0.363, 4.811)	(0.176, 3.241)	(0.280, 2.060)		(0.312, 4.353)	(0.148, 3.412)	(0.278, 1.889)
	0.940	0.466	0.379		0.675	0.709	0.593		0.823	0.675	0.518
Q3	1.003 (0.230,	0.796 (0.211,	0.653 (0.247,		1.286 (0.303,	1.339 (0.374,	0.999 (0.377,		1.344 (0.329,	1.234 (0.320,	0.805 (0.289,

		4.376)	3.000)	1.727)		5.447)	4.790)	2.650)		5.496)	4.752)	2.240)
		0.997	0.738	0.397		0.735	0.657	0.999		0.686	0.764	0.683
		0.751	0.416	0.967		1.372	0.814	1.921		1.015	0.644	1.643
	Q4	(0.276, 2.042)	(0.102, 1.687)	(0.370, 2.527)		(0.581, 3.240)	(0.198, 3.346)	(0.678, 5.448)		(0.434, 2.374)	(0.151, 2.747)	(0.592, 4.562)
		0.578	0.228	0.946		0.476	0.778	0.228		0.973	0.560	0.354
Difficulty running errands alone		OR	OR	OR		OR	OR	OR		OR	OR	OR
Cotinine (Quartile)		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value
					0.452				0.676			0.745
	Q1	Reference	Reference	Reference		Reference	Reference	Reference		Reference	Reference	Reference
		0.672	0.796	1.015		0.879	0.998	1.140		0.792	0.929	0.916
	Q2	(0.282, 1.600)	(0.282, 2.253)	(0.475, 2.171)		(0.360, 2.145)	(0.361, 2.762)	(0.552, 2.353)		(0.313, 2.004)	(0.332, 2.599)	(0.410, 2.045)
		0.376	0.670	0.970		0.778	0.998	0.726		0.630	0.890	0.832
		1.451	0.550	1.082		1.824	0.841	1.486		1.733	0.715	1.107
	Q3	(0.574, 3.668)	(0.156, 1.930)	(0.546, 2.145)		(0.706, 4.716)	(0.257, 2.758)	(0.782, 2.825)		(0.620, 4.846)	(0.219, 2.337)	(0.568, 2.157)
		0.436	0.357	0.822		0.224	0.777	0.235		0.309	0.586	0.768
		1.870	0.795	0.958		3.235	1.375	1.609		2.092	1.025	1.160
	Q4	(0.894, 3.915)	(0.285, 2.215)	(0.305, 3.003)		(1.666, 6.282)	(0.463, 4.089)	(0.511, 5.068)		(0.989, 4.425)	(0.344, 3.052)	(0.380, 3.540)
		0.106	0.664	0.942		0.002	0.570	0.422		0.070	0.966	0.798
Hearing difficulty		OR	OR	OR		OR	OR	OR		OR	OR	OR
		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value
		0.800	0.372	0.356		0.944	0.507	0.704		0.895	0.457	0.632
Hydroxycotinine		(0.436, 1.470)	(0.064, 2.168)	(0.071, 1.794)	0.473	(0.594, 1.498)	(0.084, 3.058)	(0.203, 2.447)	0.72	(0.536, 1.493)	(0.073, 2.850)	(0.154, 2.600)
		0.477	0.278	0.218		0.807	0.463	0.584		0.674	0.410	0.531

	OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-		OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-		OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-	
Vision impairment	value	value	value		value	value	value		value	value	value	
	0.775	0.914	1.040		0.880	1.083	1.255		0.587	0.993	1.257	
Hydroxycotinine	(0.440, 1.364)	(0.481, 1.739)	(0.391, 2.764)	0.866	(0.505, 1.532)	(0.574, 2.044)	(0.525, 2.998)	0.787	(0.281, 1.224)	(0.398, 2.477)	(0.536, 2.951)	0.428
	0.382	0.786	0.938		0.653	0.806	0.613		0.169	0.988	0.604	
Attention deficit hyperactivity disorder	OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-		OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-		OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-	
	value	value	value		value	value	value		value	value	value	
	0.880	1.404	0.521		0.966	1.544	0.613		0.767	1.368	0.573	
Hydroxycotinine	(0.650, 1.192)	(0.791, 2.491)	(0.175, 1.552)	0.205	(0.701, 1.331)	(0.870, 2.742)	(0.223, 1.684)	0.218	(0.530, 1.111)	(0.764, 2.453)	(0.184, 1.786)	0.224
	0.414	0.253	0.249		0.834	0.146	0.348		0.174	0.303	0.347	
Walking difficulty	OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-		OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-		OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-	
	value	value	value		value	value	value		value	value	value	
	1.144	1.097	0.595		1.600	1.630	1.033		1.493	1.693	1.075	
Hydroxycotinine	(0.808, 1.619)	(0.694, 1.734)	(0.325, 1.090)	0.208	(1.151, 2.224)	(1.005, 2.646)	(0.673, 1.585)	0.268	(0.981, 2.272)	(0.936, 3.063)	(0.621, 1.858)	0.510
	0.454	0.693	0.101		0.008	0.055	0.884		0.074	0.095	0.799	
Difficulty dressing or bathing independently	OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-		OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-		OR (95%CI) P-	OR (95%CI) P-	OR (95%CI) P-	
	value	value	value		value	value	value		value	value	value	
	0.851	1.085	0.851		1.025	1.453	1.227		0.915	1.440	1.301	
Hydroxycotinine	(0.437, 1.660)	(0.471, 2.499)	(0.451, 1.608)	0.860	(0.523, 2.008)	(0.609, 3.468)	(0.731, 2.060)	0.826	(0.462, 1.813)	(0.499, 4.157)	(0.690, 2.453)	0.711
	0.639	0.848	0.622		0.942	0.405	0.444		0.802	0.507	0.425	

Difficulty running errands alone	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	
	1.181	1.247	0.485		1.435	1.570	0.710		1.204	1.417	0.633	
Hydroxycotinine	(0.857, 1.629)	(0.514, 3.025)	(0.187, 1.255)	0.214	(0.981, 2.099)	(0.596, 4.137)	(0.314, 1.604)	0.253	(0.838, 1.730)	(0.488, 4.116)	(0.232, 1.730)	0.451
	0.315	0.628	0.144		0.071	0.367	0.415		0.326	0.528	0.382	
Hearing difficulty	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	
Hydroxycotinine (Quartile)				0.854				0.941				0.974
Q1	Reference	Reference	Reference		Reference	Reference	Reference		Reference	Reference	Reference	
	1.087	1.097	1.462		0.952	1.144	1.085		1.016	1.092	1.221	
Q2	(0.510, 2.314)	(0.218, 5.518)	(0.500, 4.272)		(0.414, 2.190)	(0.206, 6.337)	(0.346, 3.396)		(0.456, 2.263)	(0.182, 6.569)	(0.404, 3.693)	
	0.831	0.911	0.492		0.909	0.879	0.890		0.969	0.925	0.728	
	0.787	1.059	0.504		0.711	1.138	0.505		0.672	0.966	0.501	
Q3	(0.421, 1.474)	(0.315, 3.562)	(0.169, 1.502)		(0.331, 1.525)	(0.307, 4.214)	(0.167, 1.527)		(0.311, 1.449)	(0.231, 4.045)	(0.176, 1.423)	
	0.460	0.927	0.227		0.388	0.848	0.235		0.324	0.963	0.212	
	0.922	0.809	0.869		1.073	1.056	1.080		0.991	0.940	0.937	
Q4	(0.437, 1.946)	(0.194, 3.379)	(0.293, 2.575)		(0.456, 2.520)	(0.239, 4.661)	(0.340, 3.432)		(0.428, 2.295)	(0.189, 4.669)	(0.290, 3.023)	
	0.832	0.774	0.801		0.873	0.943	0.896		0.984	0.941	0.914	
Vision impairment	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	
Hydroxycotinine (Quartile)				0.886				0.865				0.994

Attention deficit hyperactivity disorder Hydroxycortine (Quartile)	Q1	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
		1.117	1.279	0.760	1.054	1.292	0.670	1.091	1.065	0.807
	Q2	(0.333, 3.747)	(0.470, 3.479)	(0.322, 1.792)	(0.318, 3.493)	(0.471, 3.550)	(0.284, 1.578)	(0.342, 3.480)	(0.383, 2.965)	(0.321, 2.028)
		0.859	0.633	0.535	0.932	0.622	0.366	0.885	0.905	0.655
	Q3	(0.485, 4.001)	(0.429, 2.599)	(0.656, 2.244)	(0.483, 4.310)	(0.455, 2.769)	(0.676, 2.221)	(0.501, 4.059)	(0.383, 2.221)	(0.643, 2.110)
		0.541	0.907	0.541	0.516	0.803	0.507	0.515	0.859	0.620
	Q4	(0.525, 4.771)	(0.411, 2.484)	(0.180, 1.668)	(0.559, 5.684)	(0.483, 2.834)	(0.195, 1.903)	(0.316, 4.227)	(0.334, 1.848)	(0.183, 1.940)
		0.420	0.983	0.297	0.336	0.731	0.400	0.828	0.588	0.402
		OR	OR	OR	OR	OR	OR	OR	OR	OR
		(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value	(95%CI) P-value
					0.888			0.893		0.969
	Q1	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
		1.503	1.181	1.064	1.484	1.153	0.999	1.443	0.947	1.054
	Q2	(0.689, 3.277)	(0.372, 3.750)	(0.520, 2.180)	(0.687, 3.209)	(0.365, 3.647)	(0.487, 2.053)	(0.625, 3.331)	(0.275, 3.260)	(0.491, 2.261)
		0.313	0.779	0.866	0.323	0.810	0.999	0.402	0.932	0.894
	Q3	(0.794, 3.503)	(0.580, 5.169)	(0.706, 3.510)	(0.830, 3.624)	(0.600, 5.300)	(0.682, 3.480)	(0.735, 3.196)	(0.443, 4.527)	(0.565, 2.980)
	0.186	0.332	0.276	0.153	0.306	0.307	0.270	0.565	0.547	
	1.893	1.431	0.902	2.034	1.514	0.984	1.394	1.031	0.859	
Q4	(1.074, 3.337)	(0.452, 4.527)	(0.339, 2.396)	(1.178, 3.512)	(0.490, 4.676)	(0.382, 2.535)	(0.791, 2.456)	(0.308, 3.455)	(0.306, 2.407)	
	0.034	0.546	0.837	0.016	0.476	0.974	0.267	0.961	0.776	

Walking difficulty	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value
Hydroxycotinine (Quartile)				0.817			0.812		0.674
Q1	Reference 1.235	Reference 1.104	Reference 1.664	Reference 1.137	Reference 1.101	Reference 1.304	Reference 1.192	Reference 0.899	Reference 1.754
Q2	(0.602, 2.534)	(0.501, 2.433)	(0.767, 3.606)	(0.576, 2.246)	(0.503, 2.408)	(0.614, 2.773)	(0.608, 2.339)	(0.362, 2.233)	(0.770, 3.998)
Q3	0.568 1.370 (0.692, 2.714)	0.808 1.465 (0.656, 3.274)	0.206 2.182 (1.071, 4.442)	0.714 1.521 (0.745, 3.108)	0.812 1.687 (0.708, 4.020)	0.494 2.232 (1.126, 4.425)	0.615 1.477 (0.701, 3.110)	0.821 1.436 (0.575, 3.588)	0.199 2.272 (1.013, 5.097)
Q4	0.373 1.860 (0.971, 3.566)	0.358 1.153 (0.537, 2.474)	0.039 1.818 (0.764, 4.330)	0.258 2.493 (1.386, 4.486)	0.246 1.516 (0.712, 3.227)	0.028 2.342 (0.985, 5.567)	0.319 2.232 (1.195, 4.170)	0.449 1.135 (0.492, 2.618)	0.063 2.309 (0.867, 6.152)
Difficulty dressing or bathing independently				0.143			0.084		0.054
Hydroxycotinine (Quartile)									
Q1	Reference 1.390	Reference 1.189	Reference 1.058	Reference 1.278	Reference 1.207	Reference 0.838	Reference 1.130	Reference 1.025	Reference 0.945
Q2	(0.465, 4.156)	(0.334, 4.237)	(0.449, 2.493)	(0.399, 4.096)	(0.339, 4.295)	(0.362, 1.939)	(0.302, 4.230)	(0.284, 3.698)	(0.374, 2.386)
Q3	0.559	0.791	0.898	0.682	0.773	0.682	0.858	0.970	0.906

		1.487	1.806	0.665	1.532	1.997	0.659	1.402	1.632	0.541
	Q3	(0.452, 4.889)	(0.559, 5.834)	(0.227, 1.944)	(0.451, 5.208)	(0.586, 6.803)	(0.226, 1.919)	(0.401, 4.897)	(0.515, 5.177)	(0.177, 1.651)
		0.518	0.330	0.461	0.500	0.277	0.450	0.603	0.417	0.296
	Q4	(0.292, 1.878)	(0.209, 2.966)	(0.553, 4.412)	(0.326, 2.118)	(0.264, 3.613)	(0.646, 5.469)	(0.216, 2.089)	(0.203, 2.493)	(0.568, 5.011)
		0.531	0.727	0.406	0.701	0.971	0.256	0.501	0.601	0.360
Difficulty running errands alone		OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value	OR (95%CI) P-value
Hydroxycotinine (Quartile)				0.776			0.792			0.692
	Q1	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
		1.579	1.881	2.261	1.491	1.895	1.956	1.456	1.501	2.094
	Q2	(0.664, 3.754)	(0.785, 4.506)	(0.929, 5.505)	(0.612, 3.633)	(0.811, 4.424)	(0.817, 4.684)	(0.618, 3.430)	(0.594, 3.792)	(0.838, 5.231)
		0.309	0.166	0.081	0.386	0.150	0.142	0.402	0.403	0.132
		1.699	1.972	1.979	1.798	2.144	1.974	1.567	1.658	1.537
	Q3	(0.648, 4.454)	(0.742, 5.242)	(0.765, 5.114)	(0.667, 4.845)	(0.790, 5.819)	(0.760, 5.130)	(0.538, 4.563)	(0.617, 4.450)	(0.557, 4.241)
		0.289	0.182	0.168	0.254	0.144	0.172	0.422	0.330	0.418
		2.928	1.275	2.100	3.465	1.514	2.456	2.574	1.028	2.023
	Q4	(1.279, 6.704)	(0.434, 3.741)	(0.783, 5.634)	(1.511, 7.945)	(0.521, 4.398)	(0.915, 6.588)	(1.058, 6.263)	(0.359, 2.941)	(0.728, 5.621)
		0.016	0.661	0.150	0.006	0.451	0.084	0.053	0.960	0.194

Model 1: no covariates were adjusted.

Model 2: age and gender were adjusted.

Model 3: age, gender, body mass index, data release cycle, education level, marital status, income to poverty ratio, alcohol use, hypertension, diabetes, cancer, and cardiovascular diseases were adjusted.

© 2025 He J. et al.