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Supplemental Material

Variability of Metal Levels in Spot, First Morning, and 24-Hour Urine Samples over a 3-Month Period in Healthy Adult Chinese Men

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Table S1. Basic characteristics of the 11 men during the sampling days.

Characteristics	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
Age (years)	28	25	24	23	24	23	24	24	21	21	23
Height (m)	169	178	170	168	177	173	173	175	173	178	177
Wight (kg)	54	72	55	67	58	70	65	68	75	70	66
BMI (kg/m^2)	18.9	22.7	19.0	23.7	18.5	23.4	21.7	22.2	25.1	22.1	21.1
Profession	PhD candidate	PhD candidate	Graduate	Graduate	Graduate	Graduate	Graduate	Graduate	Undergraduate	Undergraduate	Graduate
Smoking	No	No	No	No	No	No	No	No	No	No	No
Dietary supplements	No	No	No	No	No	No	No	No	No	No	No
Seafood consumption[a]	No	No	No	No	No	No	No	No	No	No	No
Fish consumption	No	Once	No	No	No	No	No	Once	No	Once	No
Average volume of voids (mL)	164.1	212.3	230.9	117.0	249.2	295.6	159.9	178.7	198.3	220.9	219.8
Average frequency of voids (times/day)[b]	6.9	3.0	5.8	9.1	4.5	4.1	6.4	6.1	7.0	5.3	8.0

Graduate: Graduate student. [a]Seafood does not include fish. [b]A total of 529 spot urine samples were finally collected (6 missing spot samples), including 88 first morning urine samples.

Table S2. Uncorrected (μg/L), creatinine-corrected (μg/g creatinine) and urinary excretion rate (UER) (μg/h) of metals in spot, first morning and 24-h urine samples collected from 11 men.

Exposure variables	**Spot sample (*n*=529)**			**First morning sample (*n*=88)**			**24-h collection (*n*=88)**		
	Mean	Median	Interquartile	Mean	Median	Interquartile	Mean	Median	Interquartile
Uncorrected									
As	25.71	19.86	11.11-34.63	41.95	36.69	22.00-48.90	26.13	20.38	17.25-25.32
Cd	0.53	0.42	0.27-0.68	0.82	0.70	0.40-1.05	0.51	0.43	0.32-0.67
Co	0.21	0.16	0.10-0.24	0.30	0.23	0.15-0.35	0.20	0.17	0.12-0.22
Cu	11.36	8.54	5.98-12.58	14.96	12.09	9.00-17.93	11.78	9.53	7.05-13.56
Pb	3.49	2.75	1.92-3.50	3.30	3.16	2.42-3.57	3.42	2.85	2.33-3.80
Mo	98.46	80.02	44.23-132.63	122.77	106.86	71.45-149.00	92.24	81.41	59.8-109.98
Ni	2.34	1.67	0.83-2.70	3.23	2.24	1.48-3.54	2.27	1.76	1.14-2.50
Creatinine-corrected									
As	21.72	20.57	16.05-24.38	24.02	22.52	18.18-26.14	22.87	21.23	18.18-24.53
Cd	0.49	0.43	0.31-0.61	0.48	0.42	0.32-0.61	0.48	0.44	0.31-0.61
Co	0.20	0.16	0.13-0.22	0.18	0.14	0.11-0.19	0.19	0.16	0.13-0.21
Cu	11.80	8.59	6.47-11.98	9.70	7.89	6.22-10.51	11.21	9.68	7.50-12.54
Pb	3.96	2.64	1.85-3.90	2.14	1.81	1.41-2.33	3.26	2.83	2.17-3.63
Mo	89.42	80.62	54.77-112.01	74.26	72.61	49.85-97.95	85.98	87.40	59.75-105.49
Ni	2.36	1.51	0.93-2.46	2.01	1.44	0.90-2.09	2.16	1.61	1.20-2.46
UER									
As	1.16	1.05	0.76-1.31	1.14	1.00	0.79-1.28	1.14	0.99	0.82-1.26
Cd	0.03	0.02	0.02-0.03	0.02	0.02	0.02-0.03	0.02	0.02	0.02-0.03
Co	0.01	0.01	0.006-0.01	0.01	0.01	0.005-0.01	0.01	0.01	0.006-0.01
Cu	0.63	0.45	0.32-0.61	0.44	0.35	0.28-0.49	0.54	0.45	0.37-0.59
Pb	0.21	0.13	0.09-0.21	0.10	0.08	0.06-0.11	0.16	0.13	0.10-0.18
Mo	4.73	3.97	2.63-6.10	3.45	3.26	2.31-4.41	4.21	3.99	3.22-5.25
Ni	0.12	0.08	0.04-0.13	0.10	0.07	0.04-0.10	0.11	0.08	0.06-0.11

Table S3. The variance apportionment of $\log_{10}$-transformed creatinine concentrations in the three sample types collected from 11 adults.

Type of sample	Total samples (*n*=529)	Days apart (*n*=326)	Months apart (*n*=265)
Spot sample			
ICC	0.12	0.09	0.15
Between persons σ^2 (%)[a]	0.008 (12%)	0.005 (9%)	0.011 (15%)
Within person, between day σ^2 (%)[b]	0.001 (2%)	0.001 (2%)	0.001 (1%)
Within person, within day σ^2 (%)[c]	0.058 (86%)	0.052 (89%)	0.063 (84%)
First morning sample[d]			
ICC	0.55	0.49	0.62
Between person σ^2 (%)[a]	0.021 (55%)	0.020 (49%)	0.027 (62%)
Within person σ^2 (%)[b]	0.017 (45%)	0.019 (51%)	0.015 (38%)
24-h collection[d]			
ICC	0.53	0.54	0.61
Between person σ^2 (%)[a]	0.009 (53%)	0.007 (54%)	0.014 (61%)
Within person σ^2 (%)[b]	0.008 (47%)	0.006 (46%)	0.009 (39%)

Days apart: days 0, 1, 2, 3, and 4; months apart: days 0, 30, 60, and 90. σ^2= variance. [a]The proportion of between-person variance to the total variance. [b]The proportion of within-person between-day variance to the total variance. [c]The proportion of within-person within-day variance to the total variance. [d]For first morning and 24-h urine collections, the distinction between within-day vs. between-day variability is not applicable with only one measurement per day.