



Department of Health
Wadsworth Center

New York State Biomonitoring Program for Trace Elements

Event #1, 2026

Trace Elements in Whole Blood, Urine, and Serum

April, 2026

Wadsworth Center
NEW YORK STATE DEPARTMENT OF HEALTH
Trace Elements Laboratory



**Event #1, 2026:
Trace Elements in Whole Blood, Urine, and Serum**

4/27/2026

Dear Laboratory Director,

This report summarizes performance for the first biomonitoring proficiency test (PT) event of 2026 for Trace Elements in Whole Blood, Urine, and Serum. One of the key goals of this PT program is to achieve harmonization of biomonitoring data for trace elements.

Target Value Assignment and Performance Evaluation:

For these PT materials, target values have been assigned for a limited number of trace elements that are gradable under criteria set by the NYS DOH Biomonitoring PT program. See assay-specific narratives for details. Data for additional trace elements are reported and are included here in order to characterize the PT materials more completely. Participant data and descriptive statistics are provided for educational purposes. No target value or acceptable range is implied.

Where the data permit, robust statistics were used to assign target values based on Algorithm A as defined by ISO 13528:2005E *Statistical methods for use in proficiency testing by inter-laboratory comparisons* [1]. Acceptable ranges for the graded elements are based on consensus criteria and/or those set by the NYS DOH's PT program. For example, some are fixed based on US regulatory guidelines (Pb, Cd) while for other elements the criteria are based on a consensus of the Network of PT scheme organizers for trace elements in occupational and environmental laboratory medicine [2]. Quality specifications are element and matrix specific; full details are provided under each element specific narrative.

A confidential, three-digit code number assigned by PT program staff identifies all laboratory participants.

Samples for the next PT event (Event #2, 2026) will be shipped May 20, 2026. Comments about this report may be directed to trel@health.ny.gov.

Sincerely,

A handwritten signature in blue ink that reads "Patrick J. Parsons".

Patrick J. Parsons, PhD
Chief, Inorganic and Nuclear Chemistry,
Division of Environmental Sciences
Wadsworth Center

A handwritten signature in blue ink that reads "Kayla Mehigan".

Kayla Mehigan
Coordinator, Biomonitoring PT Program,
Division of Environmental Sciences
Wadsworth Center



Department of Health
Wadsworth Center

Event #1, 2026

**Trace Elements in
Whole Blood**

Wadsworth Center
NEW YORK STATE DEPARTMENT OF HEALTH
Trace Elements Laboratory



**Event #1, 2026:
Trace Elements in Whole Blood**

PT Materials

Human whole blood was purchased from BioIVT and preserved with K₂EDTA. The company certifies that this material was "non-reactive" for HBsAg, HBV DNA, HIV-1,2 Ab, HIV-1 RNA, HCV Ab, HCV RNA, and STS. Units of whole blood were filtered into polypropylene containers through cheesecloth to remove particulates and supplemented with arsenic (As), cadmium (Cd), cobalt (Co), chromium (Cr), mercury (Hg), manganese (Mn), lead (Pb), barium (Ba), beryllium (Be), copper (Cu), molybdenum (Mo), nickel (Ni), platinum (Pt), antimony (Sb), selenium (Se), tin (Sn), titanium (Ti), thallium (Tl), uranium (U), vanadium (V), tungsten (W), and zinc (Zn). Whole blood samples were homogenized overnight prior to aliquoting 2-mL into polypropylene vials. PT samples were stored at -80°C until the week of the PT event, when they were thawed at 4°C prior to circulation to laboratories for analysis.

Graded Elements

Seven elements in whole blood are formally graded: As, Cd, Co, Cr, Hg, Mn, and Pb. Target values for the graded elements are assigned to these pools based on (a) the robust mean calculated from data reported by all laboratories, or (b) if a robust mean is not possible, the arithmetic mean after outlier deletion.

Additional Elements

An additional 23 elements were reported by at least one participant: Ag, Al, Ba, Be, Bi, Cs, Cu, I, Li, Mo, Ni, Pt, Sb, Se, Sn, Sr, Te, Th, Tl, U, V, W, and Zn. These data are included here to provide a more complete characterization of the PT materials. All results reported by participant laboratories are tabulated and organized by lab code. The PT data are graphed for visual comparison purposes for all elements where at least five laboratories reported a value greater than the LOD. A statistical summary table is provided for samples where at least two comparable values were reported as above the LOD.

The summary statistics for the additional elements are provided for educational purposes only, i.e., no acceptable response is implied. However, it is expected that each laboratory would wish to investigate a potential source of bias if warranted by these data. Future events might result in additional elements becoming graded if a consensus can be reached regarding desired quality specifications.



Results for Event #1, 2026: Summary Statistics

Whole Blood As ($\mu\text{g/L}$)					
	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
Target (Arithmetic Mean (\bar{x}))	0.65	35.1	11.5	16.7	4.18
Upper Limit	6.65	42.1	17.5	22.7	10.18
Lower Limit	0.00	28.1	5.5	10.7	0.00
Arithmetic SD (s)	0.10	2.1	0.3	0.8	0.20
Arithmetic RSD (%)	15	6.0	2.6	4.8	4.8
Number of Sample Measurements (N)	6	6	5	6	6

The acceptable range is based on quality specifications: $\pm 6 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 6 \mu\text{g/L}$ at concentrations less than or equal to $30 \mu\text{g/L}$. These quality specifications were established by New York State Department of Health's Wadsworth Center, the PT Program organizer.



Results for Event #1, 2026: Performance of Participating Laboratories

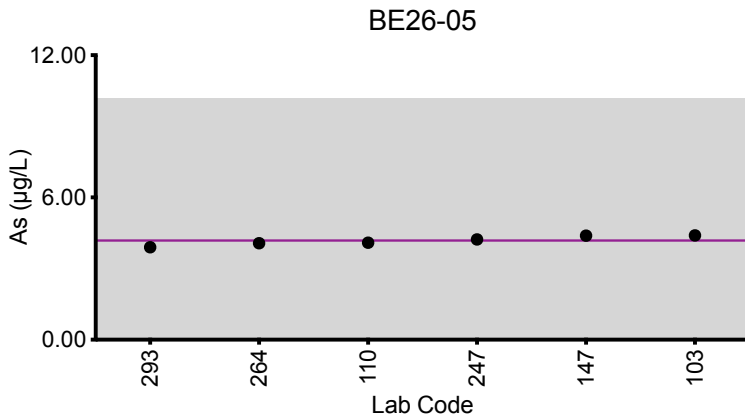
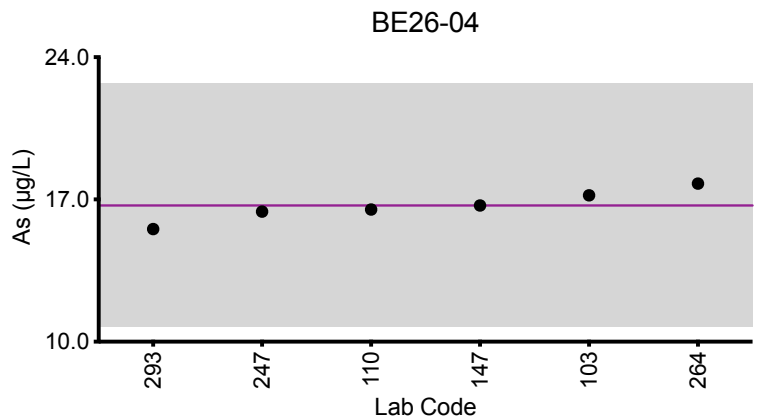
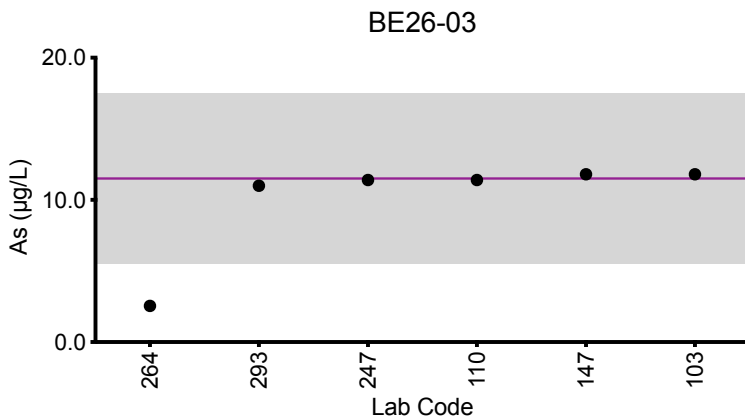
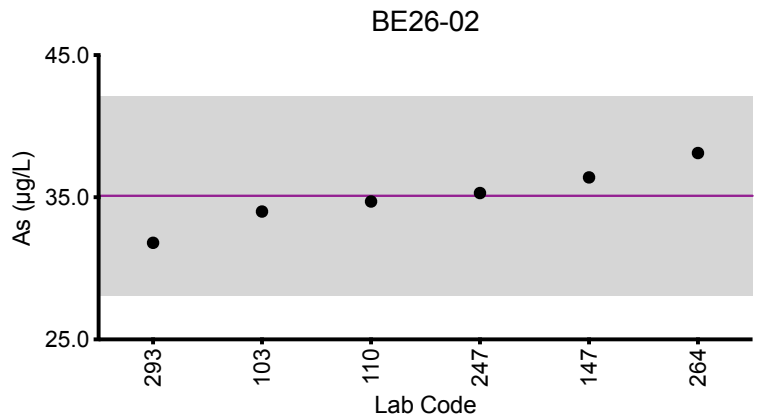
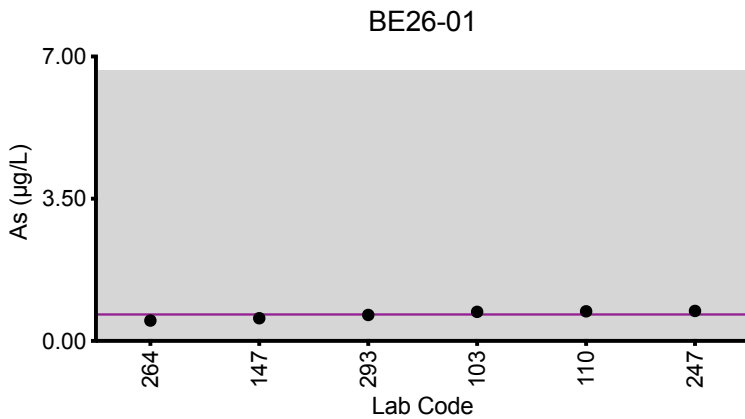
Whole Blood As ($\mu\text{g/L}$)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
	Target	0.65	35.1	11.5	16.7	4.18
103	ICP-MS/MS	0.717	34.0	11.8	17.2	4.40
110	ICP-MS/MS	0.73	34.7	11.4	16.5	4.09
147	ICP-MS	0.558	36.4	11.8	16.7	4.39
247	ICP-MS/MS	0.740	35.3	11.4	16.4	4.23
264	ICP-MS	0.50	38.11	*2.54 ↓	17.78	4.07
293	DRC/CC-ICP-MS	0.64	31.8	10.99	15.54	3.9

Based on the grading criteria for As in Whole Blood, 97% of results were satisfactory, with 0 of the 6 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Whole Blood As



Legend:

● Labs

Horizontal purple line = assigned target value based on the arithmetic mean of all laboratories.
Gray area = acceptable range based on quality specifications:

$\pm 6 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 6 \mu\text{g/L}$ at concentrations less than or equal to $30 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

Whole Blood Cd ($\mu\text{g/L}$)					
	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
Target (Robust Mean (x^*))	0.28	4.13	0.99	2.17	0.98
Upper Limit	1.28	5.13	1.99	3.17	1.98
Lower Limit	0.00	3.13	0.00	1.17	0.00
Robust SD (s^*)	0.03	0.22	0.04	0.09	0.05
Robust RSD (%)	8.9	5.3	4.1	4.1	5.1
Number of Sample Measurements (N)	7	11	10	11	10
Standard Uncertainty (u)	NA	0.08	0.02	0.03	0.02

The acceptable range is based on quality specifications: $\pm 1 \mu\text{g/L}$ or $\pm 15\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 1 \mu\text{g/L}$ at concentrations less than or equal to $6.7 \mu\text{g/L}$. These quality specifications are based on those used by US OSHA for occupational exposure.

An arithmetic mean, SD, RSD and n are provided for sample BE26-01.



Results for Event #1, 2026: Performance of Participating Laboratories

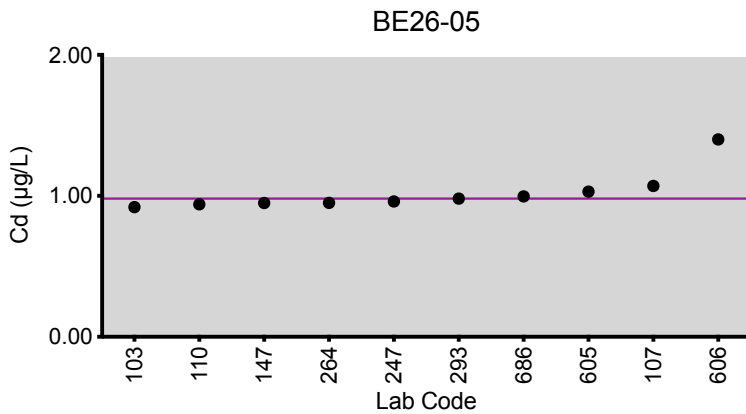
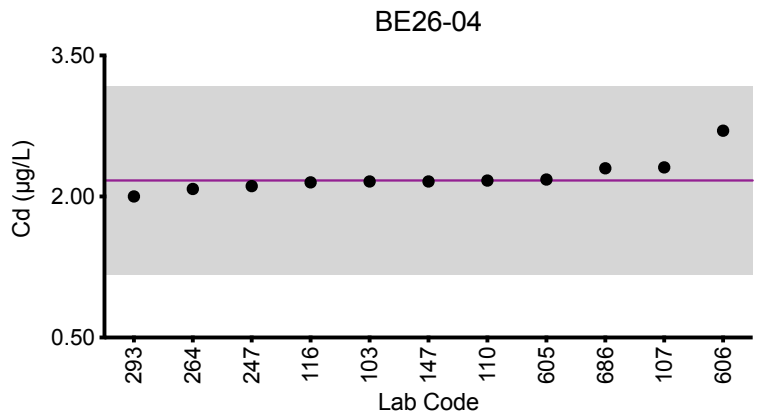
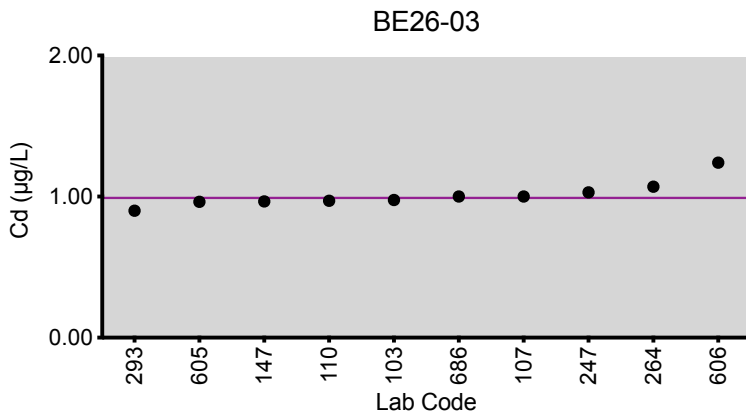
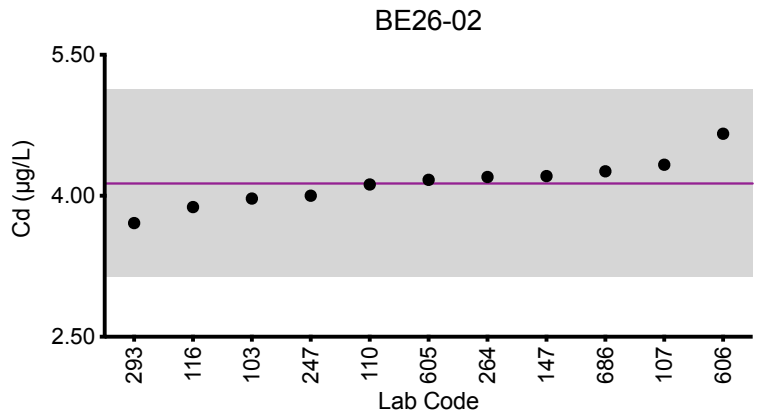
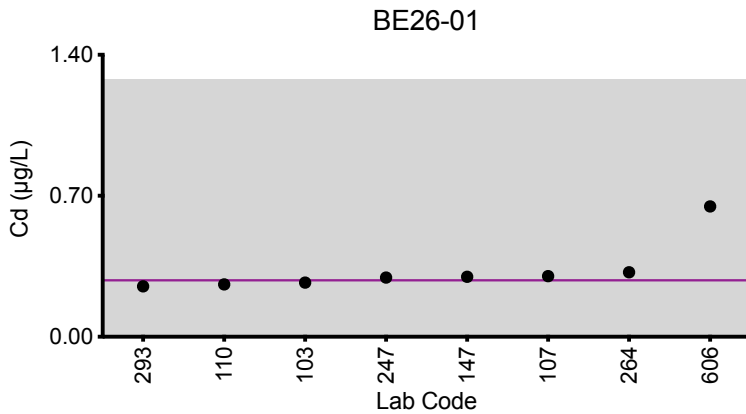
Whole Blood Cd ($\mu\text{g/L}$)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
	Target	0.28	4.13	0.99	2.17	0.98
103	ICP-MS/MS	0.269	3.97	0.976	2.16	0.920
107	ICP-MS/MS	0.301	4.33	1.00	2.31	1.07
110	ICP-MS/MS	0.26	4.12	0.97	2.17	0.94
116	ICP-MS/MS	<1.50	3.88	<1.50	2.15	<1.50
147	ICP-MS	0.298	4.21	0.966	2.16	0.949
247	ICP-MS/MS	0.294	4.00	1.03	2.11	0.960
264	ICP-MS	0.32	4.20	1.07	2.08	0.95
293	DRC/CC-ICP-MS	0.25	3.71	0.900	2.0	0.98
605	ICP-MS	<0.500	4.17	0.963	2.18	1.03
606	ICP-MS/MS	*0.647	4.66	1.24	2.70	1.40
686	ICP-MS	<0.500	4.26	1.00	2.30	0.996

Based on the grading criteria for Cd in Whole Blood, 100% of results were satisfactory, with 0 of the 11 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Whole Blood Cd



Legend:

● Labs

Horizontal purple line = assigned target value based on the robust mean of all laboratories.

Gray area = acceptable range based on quality specifications:

$\pm 1 \mu\text{g/L}$ or $\pm 15\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 1 \mu\text{g/L}$ at concentrations less than or equal to $6.7 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

Whole Blood Co (µg/L)					
	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
Target (Arithmetic Mean (\bar{x}))	12.7	7.7	0.88	1.26	15.9
Upper Limit	15.2	9.2	2.38	2.76	19.1
Lower Limit	10.2	6.2	0.00	0.00	12.7
Arithmetic SD (s)	0.5	0.5	0.06	0.10	0.3
Arithmetic RSD (%)	3.9	6.5	6.8	7.9	2.1
Number of Sample Measurements (N)	6	6	6	6	6

The acceptable range is based on quality specifications: ± 1.5 µg/L or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at ± 1.5 µg/L at concentrations less than or equal to 7.5 µg/L. These quality specifications were established based on discussions with the US FDA, and represent a consensus from a network of Trace Element PT program organizers.



Results for Event #1, 2026: Performance of Participating Laboratories

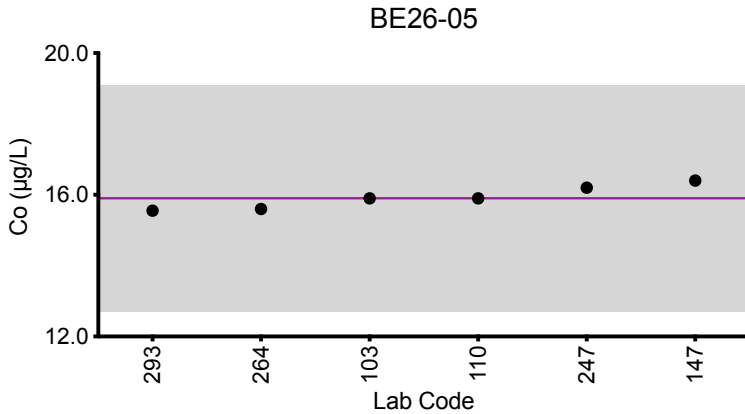
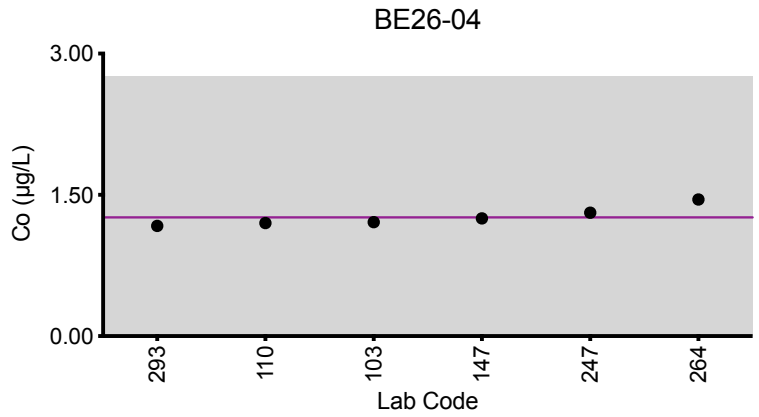
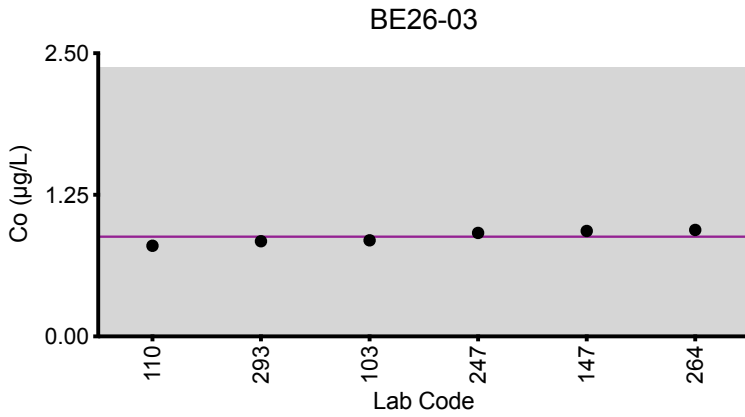
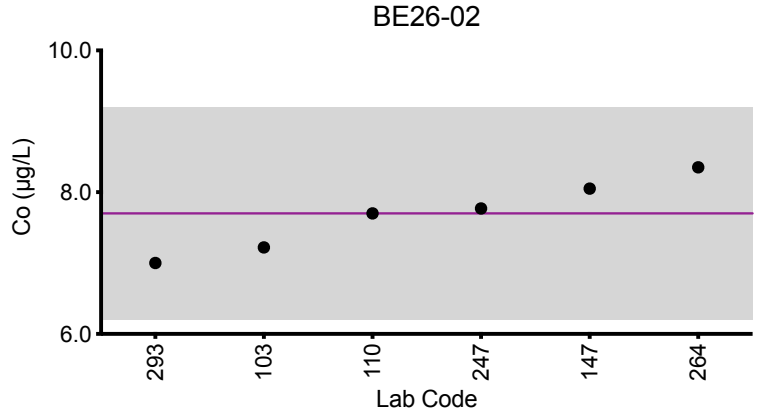
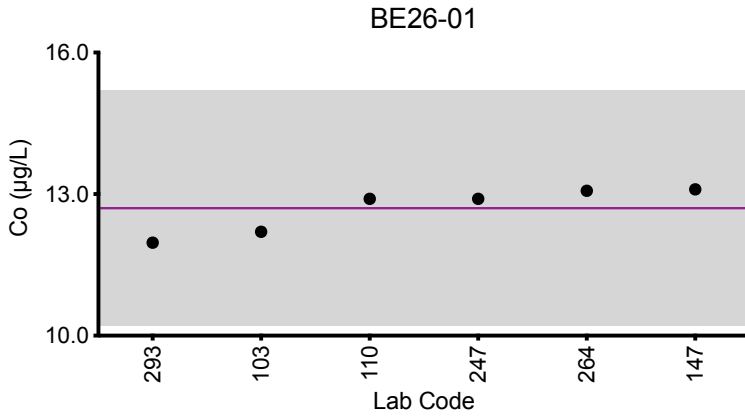
Whole Blood Co (µg/L)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
	Target	12.7	7.7	0.88	1.26	15.9
103	ICP-MS/MS	12.2	7.22	0.848	1.21	15.9
110	ICP-MS/MS	12.9	7.7	0.8	1.2	15.9
147	ICP-MS	13.1	8.05	0.931	1.25	16.4
247	ICP-MS/MS	12.9	7.77	0.914	1.31	16.2
264	ICP-MS	13.07	8.35	0.94	1.45	15.60
293	DRC/CC-ICP-MS	11.97	7.00	0.84	1.17	15.55

Based on the grading criteria for Co in Whole Blood, 100% of results were satisfactory, with 0 of the 6 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Whole Blood Co



Legend:

- Labs
- Horizontal purple line = assigned target value based on the arithmetic mean of all laboratories.
- Gray area = acceptable range based on quality specifications: $\pm 1.5 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 1.5 \mu\text{g/L}$ at concentrations less than or equal to $7.5 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

Whole Blood Cr ($\mu\text{g/L}$)					
	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
Target (Arithmetic Mean (\bar{x}))	3.34	0.53	1.91	0.76	4.83
Upper Limit	5.34	2.53	3.91	2.76	6.83
Lower Limit	1.34	0.00	0.00	0.00	2.83
Arithmetic SD (s)	0.07	0.13	0.07	0.08	0.20
Arithmetic RSD (%)	2.1	25	3.7	11	4.1
Number of Sample Measurements (N)	5	5	6	4	6

The acceptable range is based on quality specifications:

$\pm 2 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 2 \mu\text{g/L}$ at concentrations less than or equal to $10 \mu\text{g/L}$. These quality specifications were established based on discussions with the US FDA, and represent a consensus from a network of Trace Element PT program organizers.



Results for Event #1, 2026: Performance of Participating Laboratories

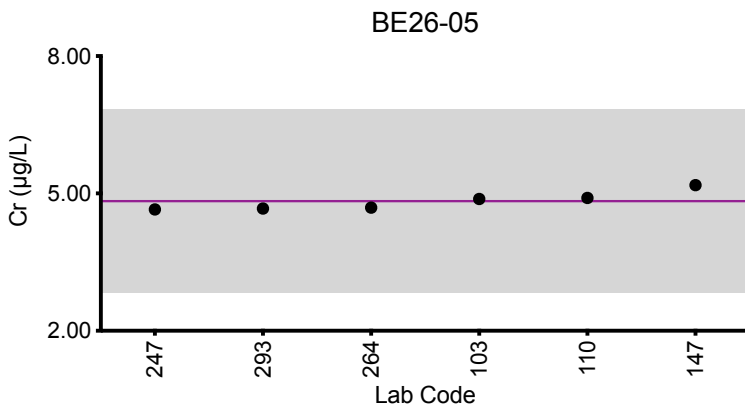
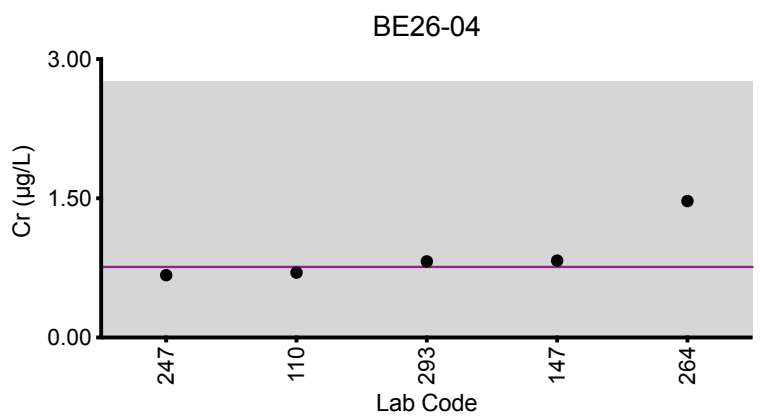
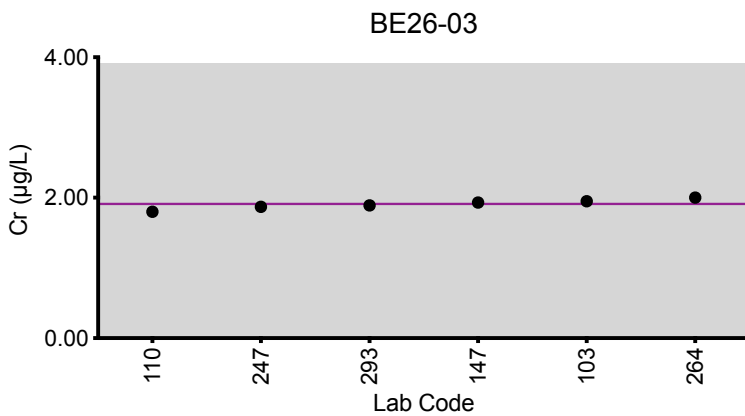
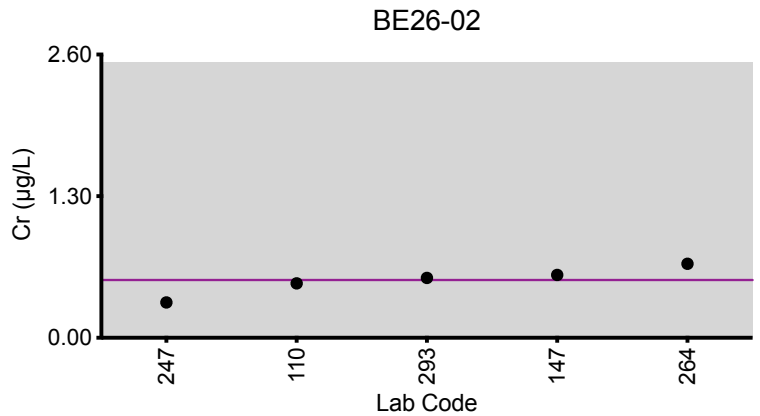
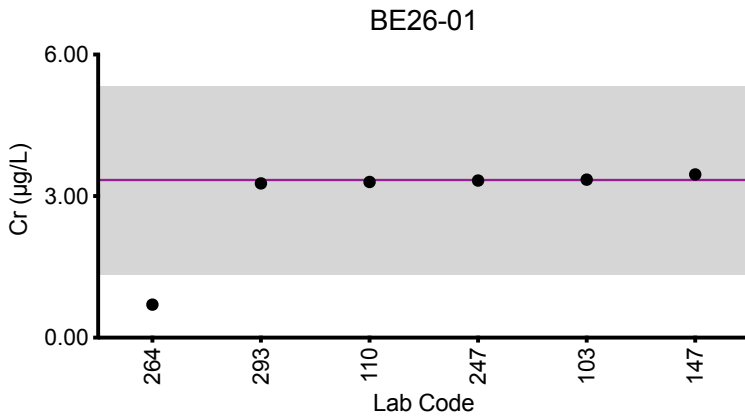
Whole Blood Cr ($\mu\text{g/L}$)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
	Target	3.34	0.53	1.91	0.76	4.83
103	ICP-MS/MS	3.35	<1.50	1.95	<1.50	4.88
110	ICP-MS/MS	3.3	0.5	1.8	0.7	4.9
147	DRC/CC-ICP-MS	3.46	0.577	1.93	0.829	5.18
247	ICP-MS/MS	3.33	0.325	1.87	0.672	4.65
264	ICP-MS	*0.70 ↓	0.68	2.00	*1.47	4.69
293	DRC/CC-ICP-MS	3.27	0.55	1.89	0.82	4.67

Based on the grading criteria for Cr in Whole Blood, 97% of results were satisfactory, with 0 of the 6 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Whole Blood Cr



Legend:

● Labs

Horizontal purple line = assigned target value based on the arithmetic mean of all laboratories.
Gray area = acceptable range based on quality specifications:

$\pm 2 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 2 \mu\text{g/L}$ at concentrations less than or equal to $10 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

	Whole Blood Hg ($\mu\text{g/L}$)				
	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
Target (Robust Mean (x^*))	4.5	2.16	17.9	11.3	0.55
Upper Limit	7.5	5.16	23.3	14.7	3.55
Lower Limit	1.5	0.00	12.5	7.9	0.00
Robust SD (s^*)	0.4	0.14	1.1	0.9	0.07
Robust RSD (%)	8.9	6.5	6.1	8.0	13
Number of Sample Measurements (N)	11	11	11	11	10
Standard Uncertainty (u)	0.2	0.05	0.4	0.3	0.03

The acceptable range is based on quality specifications: $\pm 3 \mu\text{g/L}$ or $\pm 30\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 3 \mu\text{g/L}$ at concentrations less than or equal to $10 \mu\text{g/L}$. These quality specifications were established by New York State Department of Health's Wadsworth Center, the PT Program organizer.



Results for Event #1, 2026: Performance of Participating Laboratories

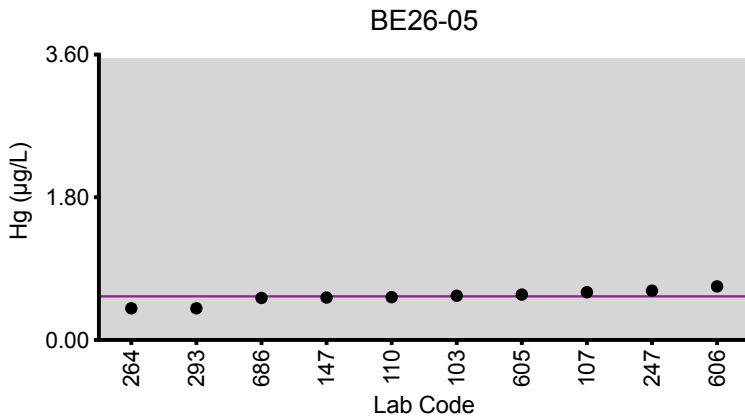
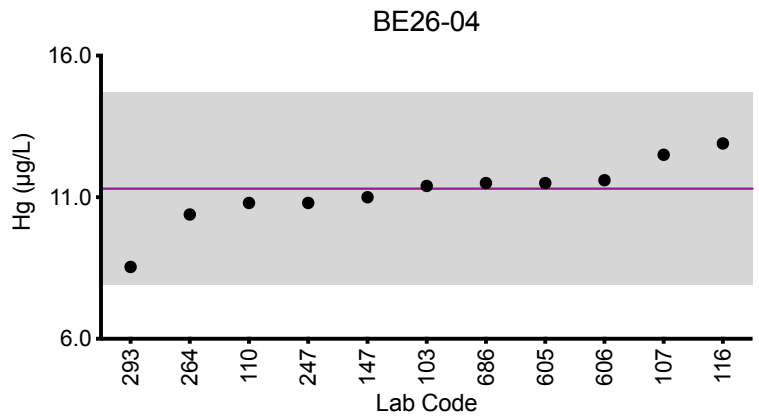
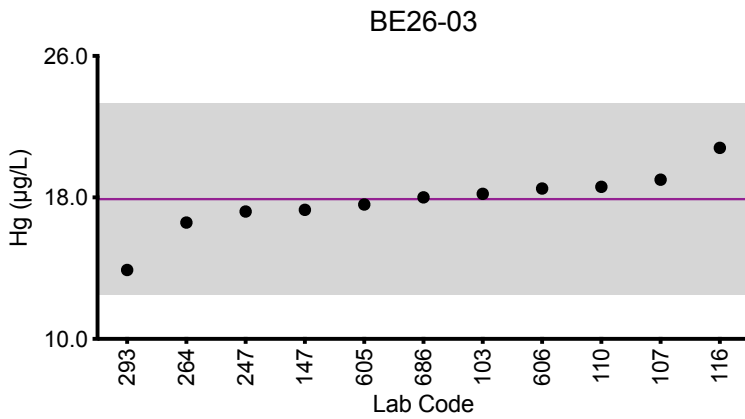
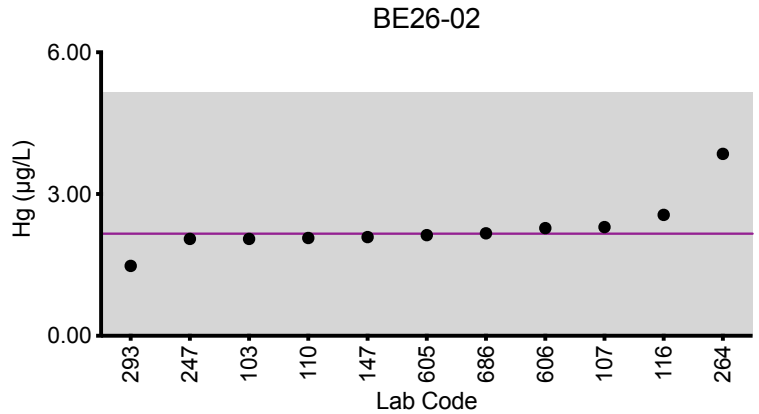
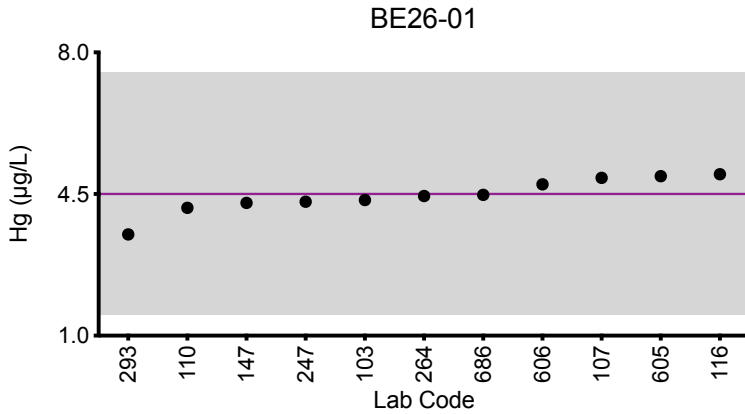
Whole Blood Hg ($\mu\text{g/L}$)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
	Target	4.5	2.16	17.9	11.3	0.55
103	ICP-MS/MS	4.35	2.05	18.2	11.4	0.559
107	ICP-MS/MS	4.90	2.30	19.0	12.5	0.602
110	ICP-MS/MS	4.16	2.07	18.6	10.8	0.54
116	ICP-MS/MS	4.99	2.56	20.8	12.9	<1.50
147	ICP-MS	4.28	2.09	17.3	11.0	0.536
247	ICP-MS/MS	4.31	2.05	17.2	10.8	0.623
264	ICP-MS	4.45	3.85	16.58	10.39	0.40
293	DRC/CC-ICP-MS	3.5	1.48	13.9	8.54	0.40
605	ICP-MS	4.94	2.13	17.6	11.5	0.574
606	ICP-MS/MS	4.74	2.28	18.5	11.6	0.677
686	ICP-MS	4.48	2.17	18.0	11.5	0.530

Based on the grading criteria for Hg in Whole Blood, 100% of results were satisfactory, with 0 of the 11 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Whole Blood Hg



Legend:

● Labs

Horizontal purple line = assigned target value based on the robust mean of all laboratories.

Gray area = acceptable range based on quality specifications:

$\pm 3 \mu\text{g/L}$ or $\pm 30\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 3 \mu\text{g/L}$ at concentrations less than or equal to $10 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

Whole Blood Mn ($\mu\text{g/L}$)					
	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
Target (Arithmetic Mean (\bar{x}))	7.6	35.4	21.8	9.7	15.4
Upper Limit	10.6	41.4	25.5	12.7	18.4
Lower Limit	4.6	29.4	18.1	6.7	12.4
Arithmetic SD (s)	1.2	2.1	1.5	0.9	1.9
Arithmetic RSD (%)	16	5.9	6.9	9.3	12
Number of Sample Measurements (N)	8	8	8	8	8

The acceptable range is based on quality specifications:

$\pm 3 \mu\text{g/L}$ or $\pm 17\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 3 \mu\text{g/L}$ at concentrations less than or equal to $17.7 \mu\text{g/L}$. These quality specifications were recently proposed by a network of Trace Element PT program organizers. (Praamsma M, et al. An assessment of clinical laboratory performance for the determination of manganese in blood and urine. Clinical Chemistry Laboratory Medicine 2016; 54(12): 1921-1928)



Results for Event #1, 2026: Performance of Participating Laboratories

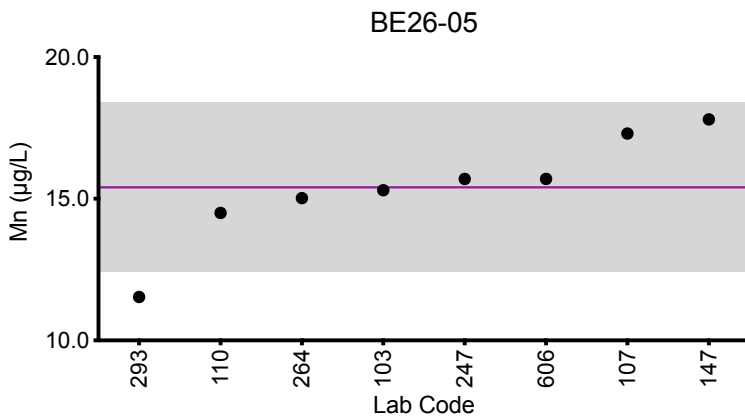
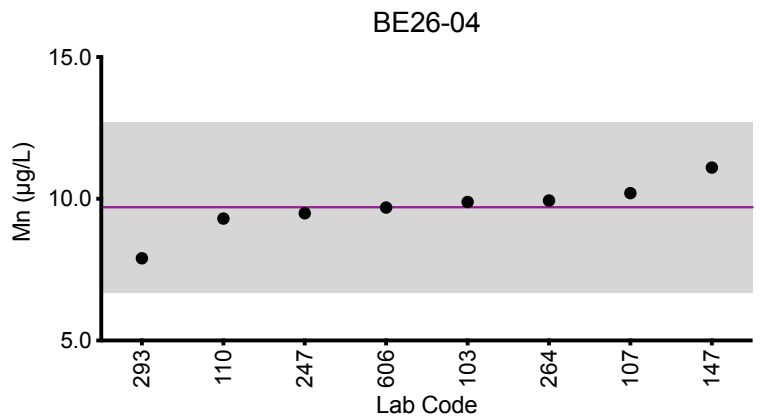
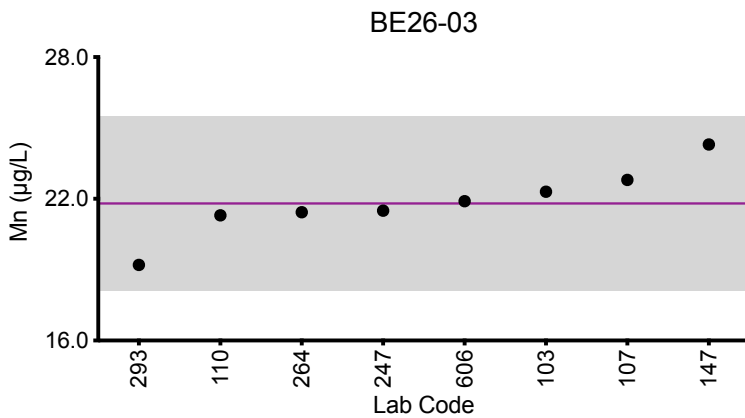
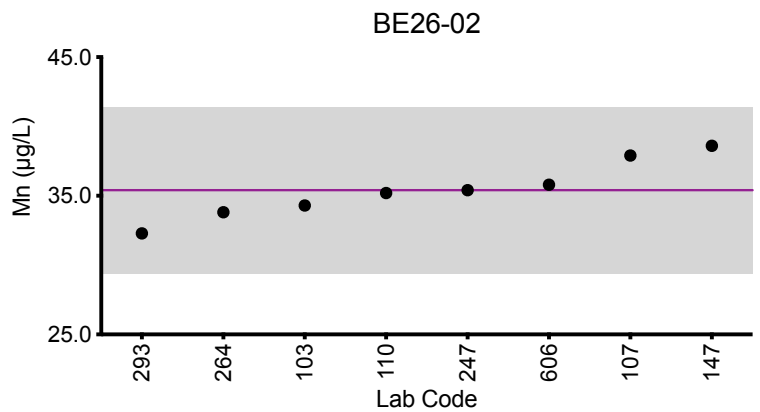
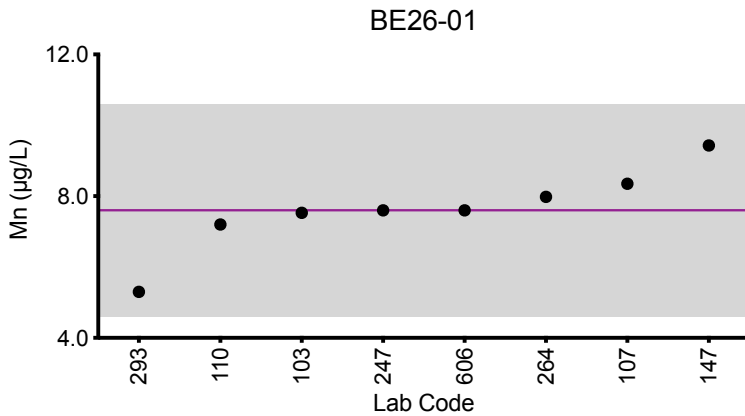
Whole Blood Mn ($\mu\text{g/L}$)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
	Target	7.6	35.4	21.8	9.7	15.4
103	ICP-MS/MS	7.53	34.3	22.3	9.89	15.3
107	ICP-MS/MS	8.35	37.9	22.8	10.2	17.3
110	ICP-MS/MS	7.2	35.2	21.3	9.3	14.5
147	ICP-MS	9.43	38.6	24.3	11.1	17.8
247	ICP-MS/MS	7.60	35.4	21.5	9.49	15.7
264	ICP-MS	7.98	33.81	21.43	9.94	15.02
293	DRC/CC-ICP-MS	5.3	32.29	19.2	7.9	11.53 ↓
606	ICP-MS/MS	7.60	35.8	21.9	9.69	15.7

Based on the grading criteria for Mn in Whole Blood, 98% of results were satisfactory, with 0 of the 8 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Whole Blood Mn



Legend:

● Labs

Horizontal purple line = assigned target value based on the arithmetic mean of all laboratories.

Gray area = acceptable range based on quality specifications:

$\pm 3 \mu\text{g/L}$ or $\pm 17\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 3 \mu\text{g/L}$ at concentrations less than or equal to $17.7 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

	Whole Blood Pb ($\mu\text{g}/\text{dL}$)				
	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
Target (Robust Mean (x^*))	3.96	19.0	8.7	14.8	2.65
Upper Limit	5.96	21.0	10.7	16.8	4.65
Lower Limit	1.96	17.0	6.7	12.8	0.65
Robust SD (s^*)	0.20	0.7	0.3	0.6	0.14
Robust RSD (%)	5.1	3.7	3.9	4.1	5.3
Number of Sample Measurements (N)	13	13	13	13	11
Standard Uncertainty (u)	0.07	0.3	0.1	0.2	0.05

The acceptable range is based on quality specifications: $\pm 2 \mu\text{g}/\text{dL}$ or $\pm 10\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 2 \mu\text{g}/\text{dL}$ at concentrations less than or equal to $20 \mu\text{g}/\text{dL}$. These quality specifications are recommended by the Clinical Laboratory Standards Institute (CLSI, C40-A2) and have been proposed for use in proficiency testing programs approved under CLIA by the Centers for Medicare and Medicaid Services (CMS) in the USA. (<https://clsi.org/standards/products/clinical-chemistry-and-toxicology/documents/c40/>)



Results for Event #1, 2026: Performance of Participating Laboratories

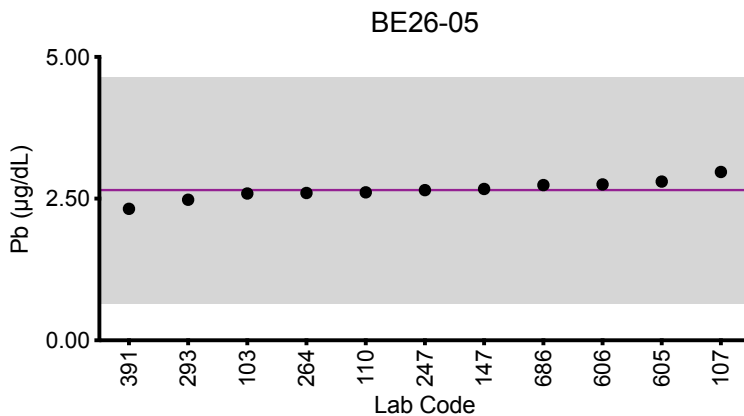
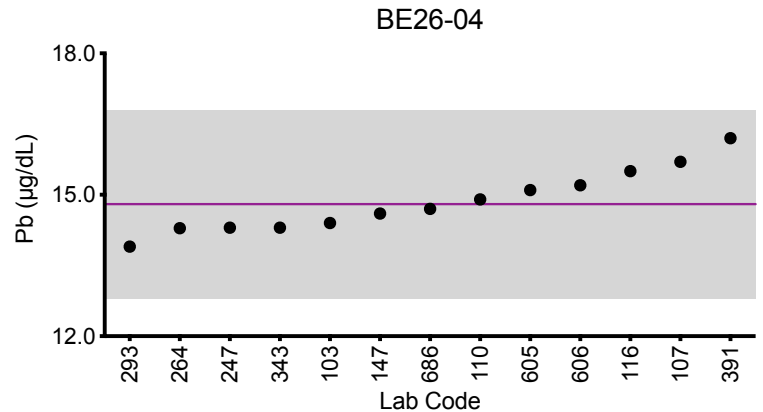
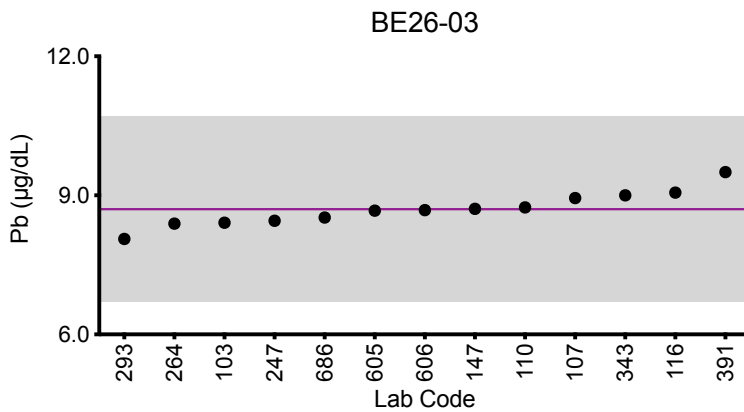
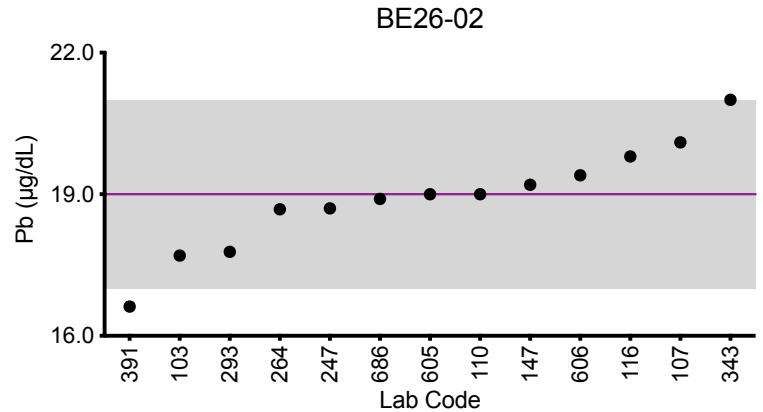
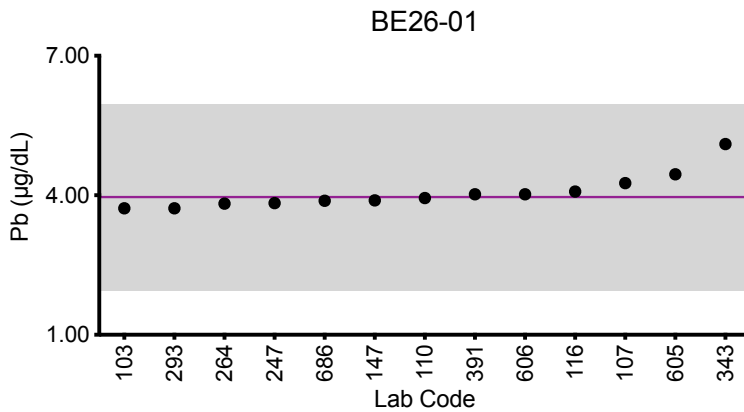
Whole Blood Pb ($\mu\text{g/dL}$)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
	Target	3.96	19.0	8.7	14.8	2.65
103	ICP-MS/MS	3.72	17.7	8.41	14.4	2.59
107	ICP-MS/MS	4.26	20.1	8.94	15.7	2.97
110	ICP-MS/MS	3.94	19.0	8.74	14.9	2.61
116	ICP-MS/MS	4.08	19.8	9.06	15.5	<3.00
147	ICP-MS	3.89	19.2	8.71	14.6	2.67
247	ICP-MS/MS	3.83	18.7	8.45	14.3	2.65
264	ICP-MS	3.82	18.68	8.39	14.29	2.60
293	DRC/CC-ICP-MS	3.72	17.78	8.06	13.9	2.48
343	ASV-LeadCare	5.1	21.0	9.0	14.3	<3.3
391	ETAAS-Z	4.02	16.62 ↓	9.50	16.2	2.32
605	ICP-MS	4.45	19.0	8.67	15.1	2.80
606	ICP-MS/MS	4.02	19.4	8.68	15.2	2.75
686	ICP-MS	3.88	18.9	8.52	14.7	2.74

Based on the grading criteria for Pb in Whole Blood, 98% of results were satisfactory, with 0 of the 13 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Whole Blood Pb



Legend:

● Labs

Horizontal purple line = assigned target value based on the robust mean of all laboratories.

Gray area = acceptable range based on quality specifications:

$\pm 2 \mu\text{g/dL}$ or $\pm 10\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 2 \mu\text{g/dL}$ at concentrations less than or equal to $20 \mu\text{g/dL}$.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

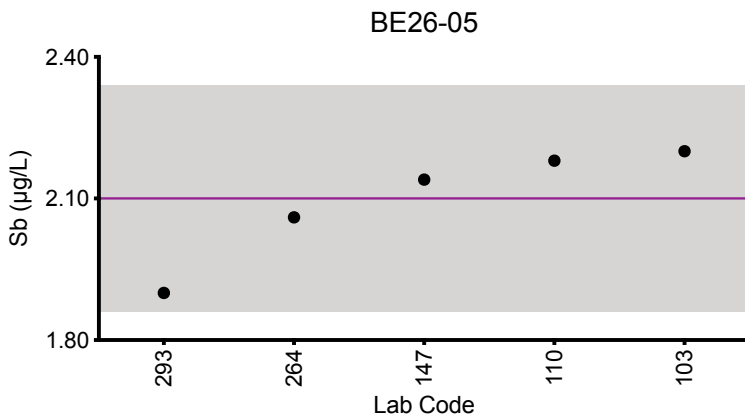
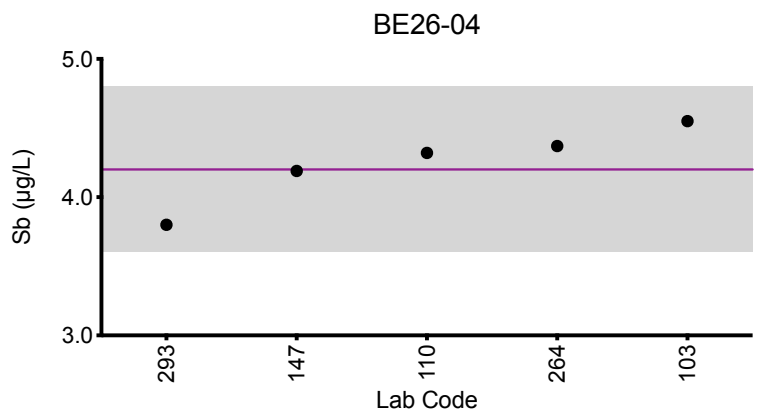
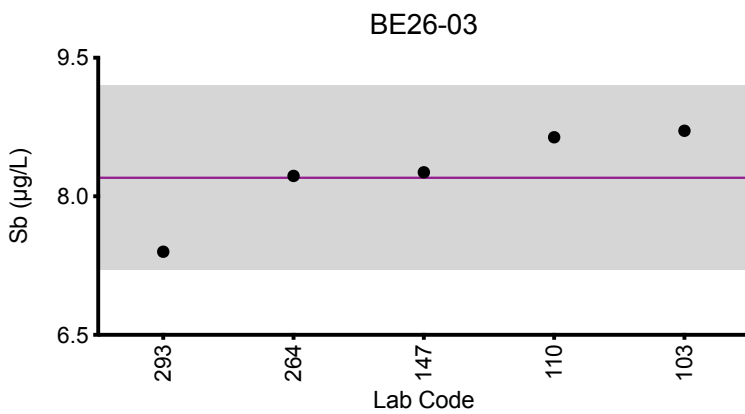
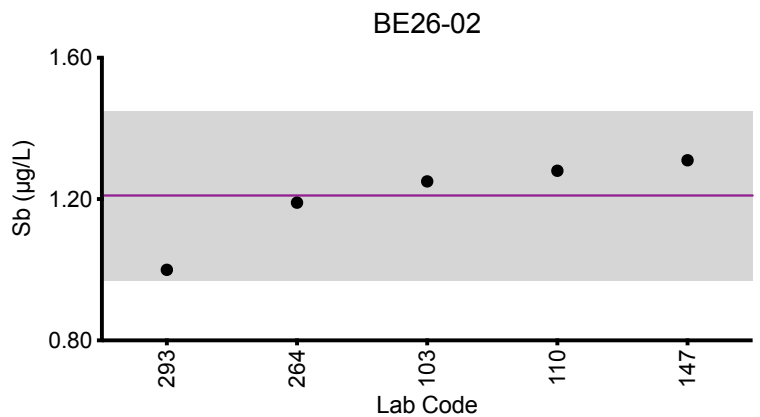
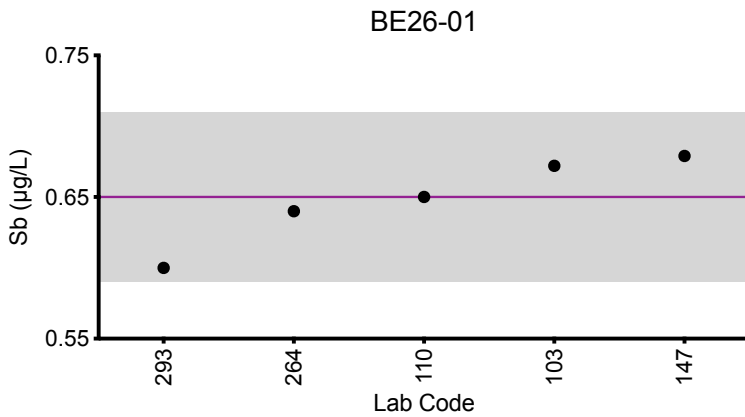
Whole Blood Sb ($\mu\text{g/L}$)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
103	ICP-MS/MS	0.672	1.25	8.71	4.55	2.20
110	ICP-MS/MS	0.65	1.28	8.64	4.32	2.18
147	ICP-MS	0.679	1.31	8.26	4.19	2.14
264	ICP-MS	0.64	1.19	8.22	4.37	2.06
293	DRC/CC-ICP-MS	0.6	1.0	7.4	3.8	1.9
Summary Statistics						
		BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
Arithmetic Mean (\bar{x})		0.65	1.21	8.2	4.2	2.10
Arithmetic SD (s)		0.03	0.12	0.5	0.3	0.12
Arithmetic RSD (%)		4.8	9.9	6.1	6.6	5.7
Number of Sample Measurements (N)		5	5	5	5	5

*Denotes a statistical Outlier.



Results for Event #1, 2026: Summary Figures

Whole Blood Sb



Legend:

● Labs

Horizontal purple line = arithmetic mean of all laboratories.

Gray area = $\pm 2SD$ of the mean.

The mean and $\pm 2SD$ of all laboratories are not intended to be quality specifications and are included for informational purposes only.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

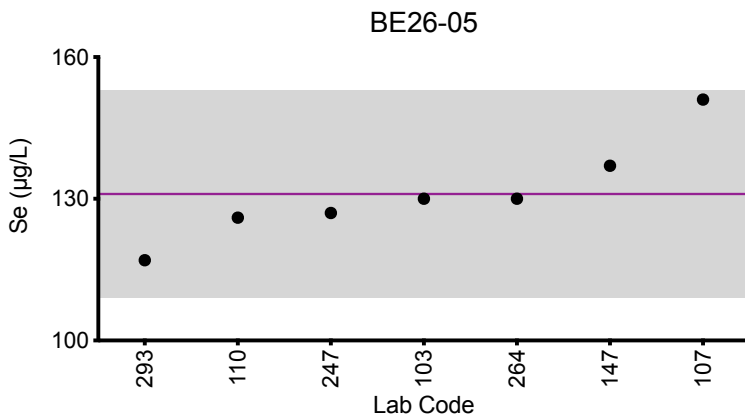
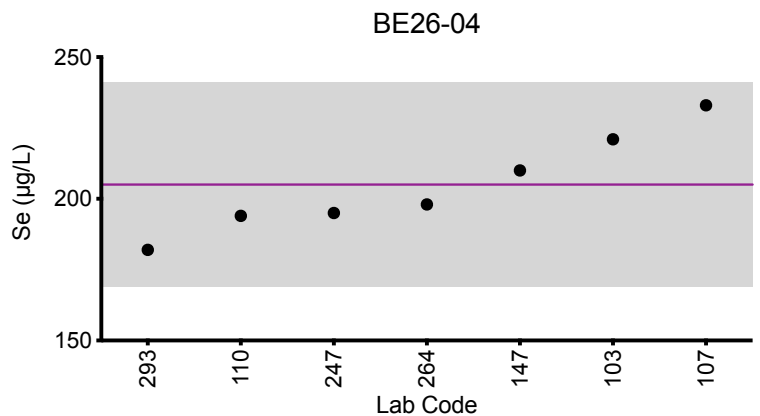
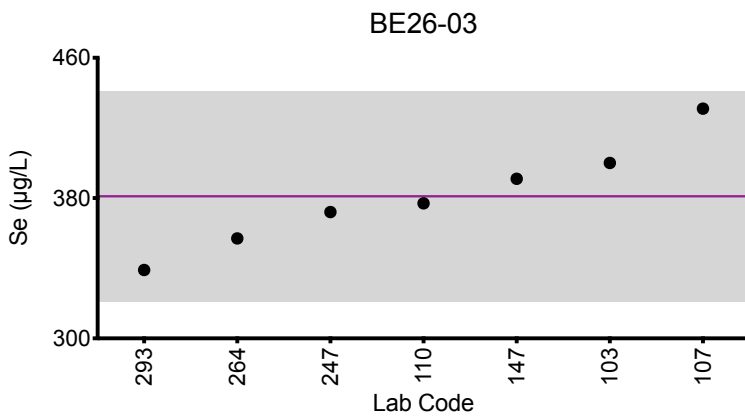
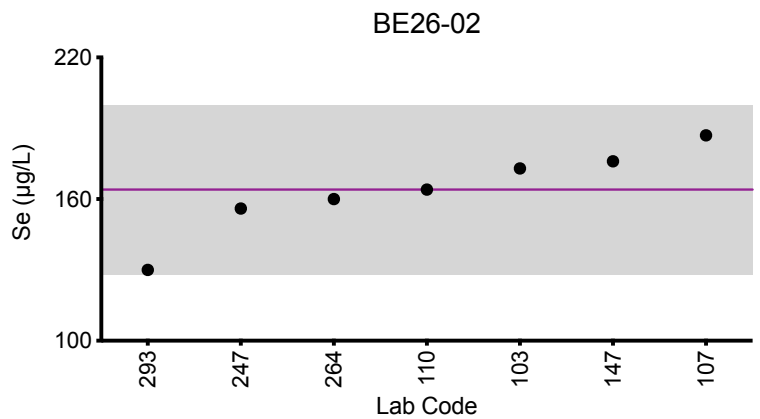
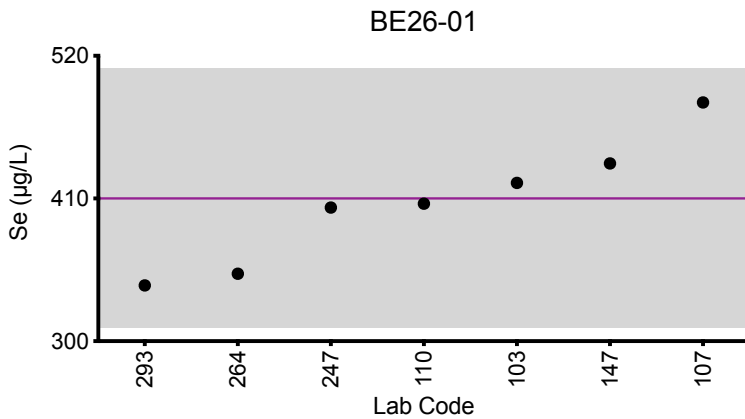
Whole Blood Se (µg/L)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
103	ICP-MS/MS	422	173	400	221	130
107	ICP-MS/MS	484	187	431	233	151
110	ICP-MS/MS	406	164	377	194	126
147	ICP-MS	437	176	391	210	137
247	ICP-MS/MS	403	156	372	195	127
264	ICP-MS	352	160	357	198	130
293	DRC/CC-ICP-MS	343	130	339	182	117
Summary Statistics						
		BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
Arithmetic Mean (\bar{x})		410	164	381	205	131
Arithmetic SD (s)		50	18	30	18	11
Arithmetic RSD (%)		12	11	7.9	8.8	8.4
Number of Sample Measurements (N)		7	7	7	7	7

*Denotes a statistical Outlier.



Results for Event #1, 2026: Summary Figures

Whole Blood Se



Legend:

● Labs

Horizontal purple line = arithmetic mean of all laboratories.

Gray area = $\pm 2SD$ of the mean.

The mean and $\pm 2SD$ of all laboratories are not intended to be quality specifications and are included for informational purposes only.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

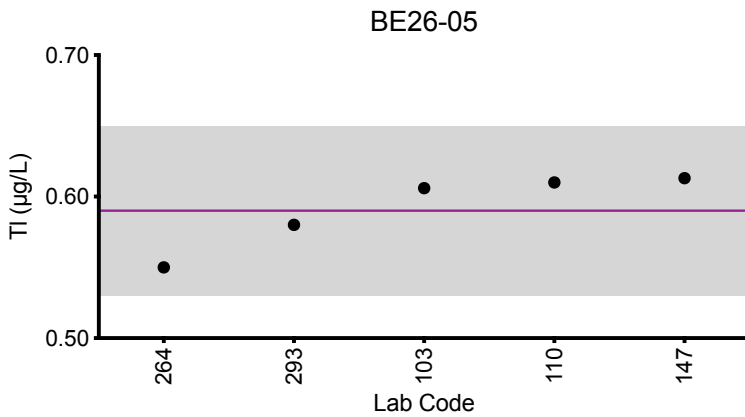
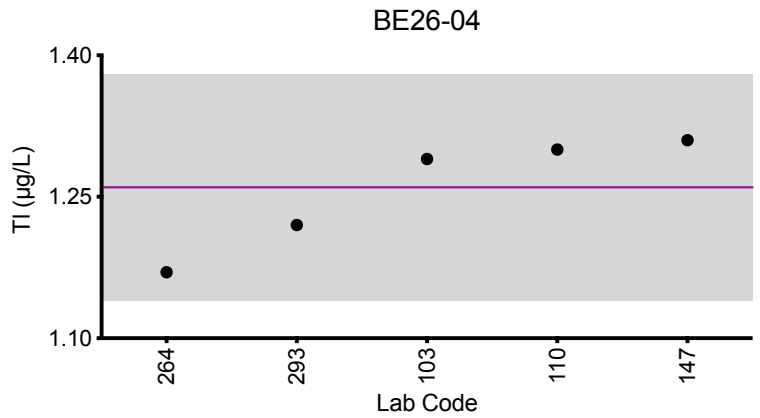
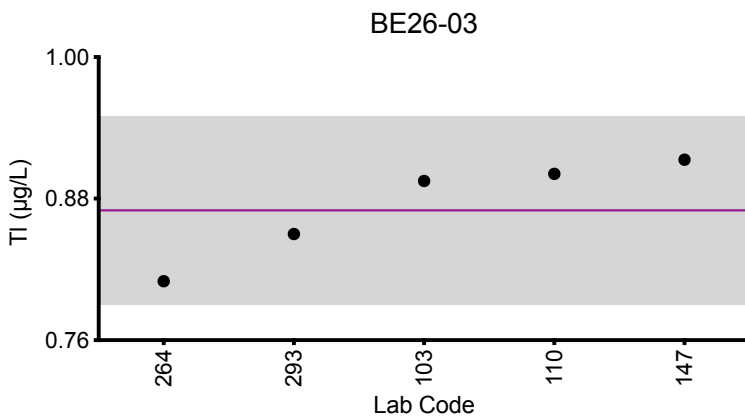
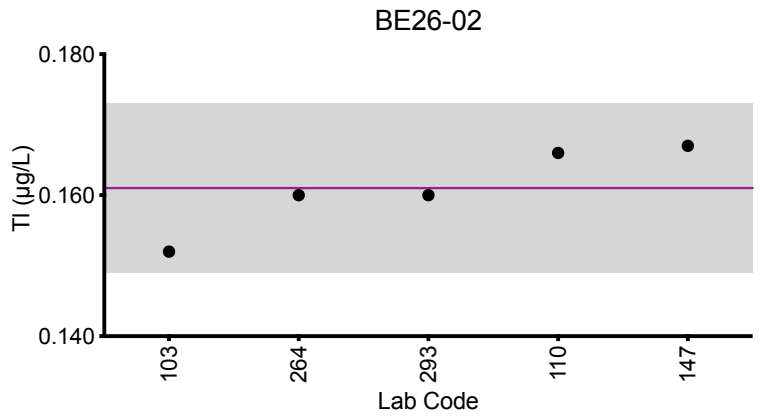
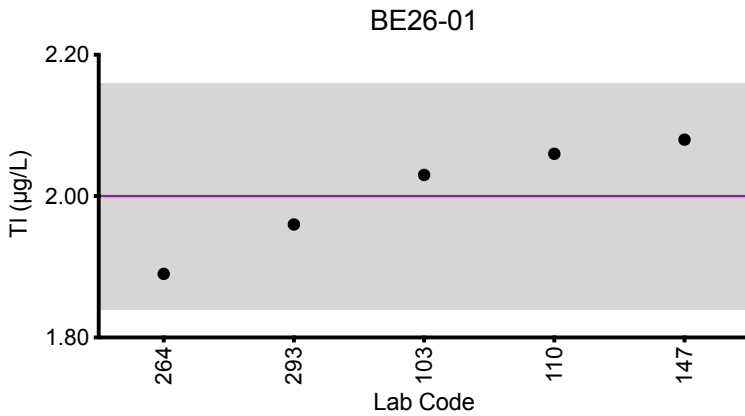
Whole Blood TI ($\mu\text{g/L}$)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
103	ICP-MS/MS	2.03	0.152	0.895	1.29	0.606
110	ICP-MS/MS	2.06	0.166	0.901	1.30	0.610
147	ICP-MS	2.08	0.167	0.913	1.31	0.613
264	ICP-MS	1.89	0.16	0.81	1.17	0.55
293	DRC/CC-ICP-MS	1.96	0.16	0.850	1.22	0.58
Summary Statistics						
		BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
Arithmetic Mean (\bar{x})		2.00	0.161	0.87	1.26	0.59
Arithmetic SD (s)		0.08	0.006	0.04	0.06	0.03
Arithmetic RSD (%)		4.0	3.7	4.6	4.8	4.6
Number of Sample Measurements (N)		5	5	5	5	5

*Denotes a statistical Outlier.



Results for Event #1, 2026: Summary Figures

Whole Blood TI



Legend:

● Labs

Horizontal purple line = arithmetic mean of all laboratories.

Gray area = $\pm 2SD$ of the mean.

The mean and $\pm 2SD$ of all laboratories are not intended to be quality specifications and are included for informational purposes only.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Whole Blood Ba (µg/L)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
110	ICP-MS/MS	1.45	2.29	4.11	1.73	5.81
147	ICP-MS	0.943	2.18	3.82	1.57	5.20

Summary Statistics						
	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05	
Arithmetic Mean (\bar{x})	1.2	2.23	4.0	1.65	5.5	
Arithmetic SD (s)	0.4	0.08	0.2	0.11	0.4	
Arithmetic RSD (%)	33	3.6	5.3	6.7	7.3	
Number of Sample Measurements (N)	2	2	2	2	2	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Whole Blood Be (µg/L)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
110	ICP-MS/MS	1.43	0.48	3.21	1.07	0.78
147	ICP-MS	1.37	<0.991	3.18	1.01	<0.991

Summary Statistics						
	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05	
Arithmetic Mean (\bar{x})	1.40	NA	3.20	1.04	NA	
Arithmetic SD (s)	0.04	NA	0.02	0.04	NA	
Arithmetic RSD (%)	2.9	NA	0.66	3.8	NA	
Number of Sample Measurements (N)	2	NA	2	2	NA	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Whole Blood Cs ($\mu\text{g/L}$)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
110	ICP-MS/MS	2.19	2.17	1.82	1.77	1.91
147	ICP-MS	2.15	2.12	1.73	1.66	1.81

Summary Statistics						
	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05	
Arithmetic Mean (\bar{x})	2.17	2.15	1.77	1.72	1.86	
Arithmetic SD (s)	0.03	0.04	0.06	0.08	0.07	
Arithmetic RSD (%)	1.4	1.9	3.4	4.7	3.8	
Number of Sample Measurements (N)	2	2	2	2	2	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Whole Blood Cu ($\mu\text{g/L}$)

Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
110	ICP-MS/MS	716	1880	1360	855	1630
147	ICP-MS	746	1936	1385	865	1676
247	ICP-MS/MS	741	1876	1371	899	1682

Summary Statistics

	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
Arithmetic Mean (\bar{x})	734	1900	1372	873	1660
Arithmetic SD (s)	16	30	13	23	30
Arithmetic RSD (%)	2.2	1.6	0.95	2.6	1.8
Number of Sample Measurements (N)	3	3	3	3	3

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Whole Blood Mo ($\mu\text{g/L}$)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
103	ICP-MS/MS	5.55	<0.500	10.7	4.38	2.44
110	ICP-MS/MS	5.00	0.37	9.58	4.01	2.32
147	ICP-MS	5.12	0.439	9.60	3.88	2.26
264	ICP-MS	3.75	*1.17	7.40	3.40	1.90

Summary Statistics						
	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05	
Arithmetic Mean (\bar{x})	4.9	0.4	9.3	3.9	2.2	
Arithmetic SD (s)	0.8	0.1	1.4	0.4	0.2	
Arithmetic RSD (%)	16	12	15	10	10	
Number of Sample Measurements (N)	4	2	4	4	4	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Whole Blood Ni ($\mu\text{g/L}$)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
103	ICP-MS/MS	5.61	9.54	1.25	4.06	4.07
110	ICP-MS/MS	5.67	9.78	1.38	3.63	3.37
147	ICP-MS	5.44	9.66	1.15	3.36	3.23
Summary Statistics						
		BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
Arithmetic Mean (\bar{x})		5.57	9.66	1.26	3.7	3.6
Arithmetic SD (s)		0.12	0.12	0.12	0.4	0.5
Arithmetic RSD (%)		2.2	1.2	9.5	11	14
Number of Sample Measurements (N)		3	3	3	3	3

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Whole Blood Pt ($\mu\text{g/L}$)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
110	ICP-MS/MS	0.151	3.98	0.337	1.28	0.820
293	DRC/CC-ICP-MS	0.12	3.22	0.28	1.08	0.66

Summary Statistics						
	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05	
Arithmetic Mean (\bar{x})	0.14	3.6	0.31	1.2	0.74	
Arithmetic SD (s)	0.02	0.5	0.04	0.1	0.11	
Arithmetic RSD (%)	14	14	13	12	15	
Number of Sample Measurements (N)	2	2	2	2	2	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Whole Blood Sn ($\mu\text{g/L}$)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
110	ICP-MS/MS	1.01	1.23	3.98	0.64	2.97
147	ICP-MS	0.762	1.17	3.67	0.564	2.67

Summary Statistics						
	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05	
Arithmetic Mean (\bar{x})	0.9	1.20	3.8	0.60	2.8	
Arithmetic SD (s)	0.2	0.04	0.2	0.05	0.2	
Arithmetic RSD (%)	20	3.3	5.3	8.3	7.1	
Number of Sample Measurements (N)	2	2	2	2	2	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Whole Blood Sr ($\mu\text{g/L}$)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
103	ICP-MS/MS	12.5	12.2	14.8	14.6	14.3
110	ICP-MS/MS	13.4	13.2	15.4	15.1	15.9
147	ICP-MS	12.5	13.0	14.4	14.0	14.5
Summary Statistics						
		BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
Arithmetic Mean (\bar{x})		12.8	12.8	14.9	14.6	14.9
Arithmetic SD (s)		0.5	0.5	0.5	0.6	0.9
Arithmetic RSD (%)		3.9	3.9	3.4	4.1	6.0
Number of Sample Measurements (N)		3	3	3	3	3

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Whole Blood U ($\mu\text{g/L}$)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
103	ICP-MS/MS	<0.0250	0.0721	0.338	0.0563	0.137
110	ICP-MS/MS	0.0236	0.0733	0.308	0.0490	0.133
147	ICP-MS	0.0238	0.0740	0.320	0.0507	0.134
Summary Statistics						
		BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
Arithmetic Mean (\bar{x})		0.0237	0.0731	0.322	0.052	0.135
Arithmetic SD (s)		0.0001	0.0010	0.015	0.004	0.002
Arithmetic RSD (%)		0.59	1.4	4.7	7.7	1.6
Number of Sample Measurements (N)		2	3	3	3	3

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Whole Blood V ($\mu\text{g/L}$)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
110	ICP-MS/MS	3.50	2.16	0.26	5.07	0.85
147	DRC/CC-ICP-MS	3.65	2.30	0.247	5.25	0.860

Summary Statistics						
	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05	
Arithmetic Mean (\bar{x})	3.58	2.23	0.254	5.16	0.855	
Arithmetic SD (s)	0.11	0.10	0.009	0.13	0.007	
Arithmetic RSD (%)	3.1	4.5	3.5	2.5	0.82	
Number of Sample Measurements (N)	2	2	2	2	2	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Whole Blood W ($\mu\text{g/L}$)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
110	ICP-MS/MS	2.03	0.56	0.29	0.75	1.25
200	ICP-MS	2.4	0.6	0.4	0.9	1.4

Summary Statistics						
	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05	
Arithmetic Mean (\bar{x})	2.2	0.58	0.34	0.82	1.33	
Arithmetic SD (s)	0.3	0.03	0.08	0.11	0.11	
Arithmetic RSD (%)	14	5.2	24	13	8.3	
Number of Sample Measurements (N)	2	2	2	2	2	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Whole Blood Zn ($\mu\text{g/L}$)						
Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
110	ICP-MS/MS	4640	8200	5450	5670	6440
147	ICP-MS	4908	8485	5639	5767	6723
247	ICP-MS/MS	4288	7625	4870	5061	5803
Summary Statistics						
		BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
Arithmetic Mean (\bar{x})		4600	8100	5300	5500	6300
Arithmetic SD (s)		300	400	400	400	500
Arithmetic RSD (%)		6.5	4.9	7.5	7.3	7.9
Number of Sample Measurements (N)		3	3	3	3	3

*Denotes a statistical Outlier.



Results for Event #1, 2026:
Additional Elements in Whole Blood

Whole Blood Ag (µg/L)

Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
147	ICP-MS	<0.129	<0.129	0.148	0.168	<0.129

Whole Blood Al (µg/L)

Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
147	ICP-MS	<5.13	5.48	<5.13	<5.13	<5.13

Whole Blood Bi (µg/L)

Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
147	ICP-MS	0.224	0.231	<0.0376	<0.0376	<0.0376

Whole Blood I (µg/L)

Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
147	ICP-MS	27.3	26.5	31.1	31.0	17.3

Whole Blood Li (µg/L)

Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
147	ICP-MS	0.423	0.418	0.370	0.368	0.603

Whole Blood Te (µg/L)

Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
110	ICP-MS/MS	0.02	0.03	<0.02	0.02	0.04
147	ICP-MS	<0.0740	<0.0740	<0.0740	<0.0740	<0.0740

Whole Blood Th (µg/L)

Lab Code	Method	BE26-01	BE26-02	BE26-03	BE26-04	BE26-05
147	ICP-MS	<0.0255	<0.0255	<0.0255	<0.0255	<0.0255



Department of Health
Wadsworth Center

Event #1, 2026

**Trace Elements in
Urine**

Wadsworth Center
NEW YORK STATE DEPARTMENT OF HEALTH
Trace Elements Laboratory



Event #1, 2026: Trace Elements in Urine

PT Materials

Urine was collected from volunteer donors into polyethylene containers and stored at 4°C. Following collection, urine was acidified to 1% (v/v) with nitric acid and mixed with a sulfamic acid solution (stock solution contained 200 mg/mL sulfamic acid and 10% (v/v) Triton-X 100) to a final concentration of 1% (v/v) to stabilize Hg. Urine was stored frozen at -80°C pending further preparation. The urine was thawed at room temperature and precipitated salts removed by centrifugation. Urine supernatants were combined into five separate pools. Each urine pool was supplemented with arsenic (As), barium (Ba), beryllium (Be), cadmium (Cd), cobalt (Co), chromium (Cr), mercury (Hg), manganese (Mn), lead (Pb), thallium (Tl), uranium (U), aluminum (Al), cesium (Cs), copper (Cu), lithium (Li), molybdenum (Mo), nickel (Ni), platinum (Pt), antimony (Sb), selenium (Se), tin (Sn), strontium (Sr), tellurium (Te), titanium (Ti), vanadium (V), tungsten (W), and zinc (Zn). Urine samples were homogenized overnight prior to aliquoting 10-mL into polypropylene vials. PT samples were stored at -80°C until the week of the PT event, when they were thawed at 4°C prior to circulation to laboratories for analysis.

Graded Elements

Eleven elements in urine are formally graded: As, Ba, Be, Cd, Co, Cr, Hg, Mn, Pb, Tl, and U. Target values for the graded elements are assigned to these pools based on (a) the robust mean calculated from data reported by all laboratories, or (b) if a robust mean is not possible, the arithmetic mean after outlier deletion.

Additional Elements

An additional 21 elements were reported by at least one participant: Ag, Al, B, Bi, Cs, Cu, Fe, I, Li, Mo, Ni, Pt, Sb, Se, Sn, Sr, Te, Th, V, W, and Zn. These data are included here to provide a more complete characterization of the PT materials. All results reported by participant laboratories are tabulated and organized by lab code. The PT data are graphed for visual comparison purposes for all elements where at least five laboratories reported a value greater than the LOD. A statistical summary table is provided for samples where at least two comparable values were reported as above the LOD.

The summary statistics for the additional elements are provided for educational purposes only, i.e., no acceptable response is implied. However, it is expected that each laboratory would wish to investigate a potential source of bias if warranted by these data. Future events might result in additional elements becoming graded if a consensus can be reached regarding desired quality specifications.



Results for Event #1, 2026: Summary Statistics

	Urine As ($\mu\text{g/L}$)				
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
Target (Robust Mean (x^*))	22.2	4.2	15.5	58	35.1
Upper Limit	28.2	10.2	21.5	70	42.1
Lower Limit	16.2	0.0	9.5	46	28.1
Robust SD (s^*)	0.7	0.2	0.6	3	1.6
Robust RSD (%)	3.2	5.6	3.9	4.6	4.6
Number of Sample Measurements (N)	10	8	10	10	10
Standard Uncertainty (u)	0.3	NA	0.2	1	0.6

The acceptable range is based on quality specifications: $\pm 6 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 6 \mu\text{g/L}$ at concentrations less than or equal to $30 \mu\text{g/L}$. These quality specifications are based on the same criteria used by the US Centers for Disease Control Prevention (CDC) for public health labs participating in the Laboratory Response Network (LRN) PT program for Toxic Metals.

An arithmetic mean, SD, RSD and n are provided for sample UE26-02.



Results for Event #1, 2026: Performance of Participating Laboratories

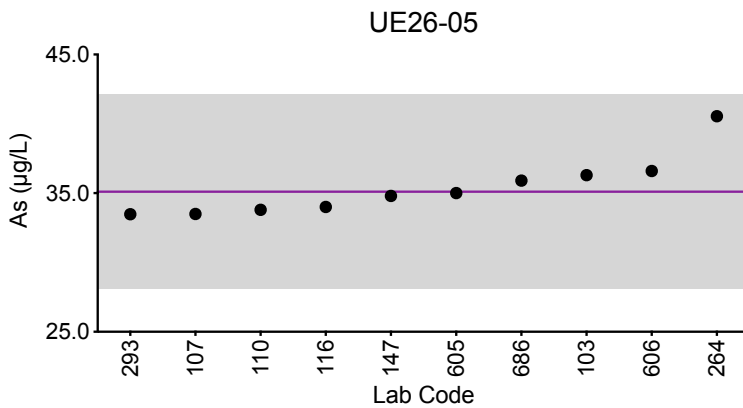
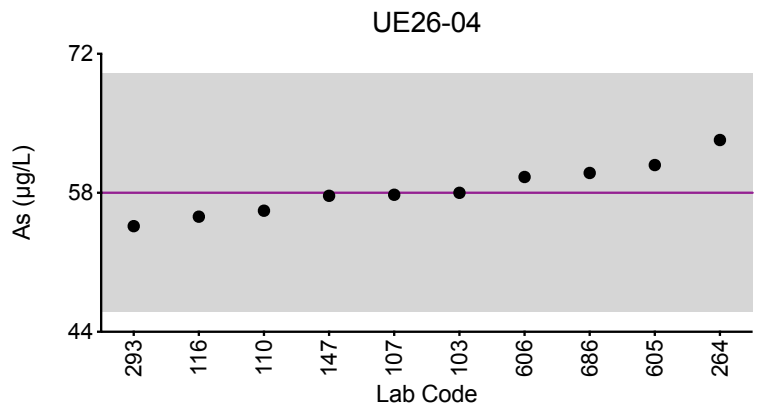
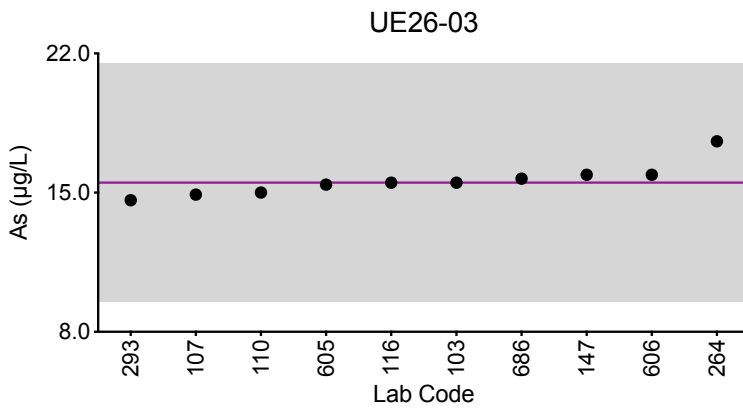
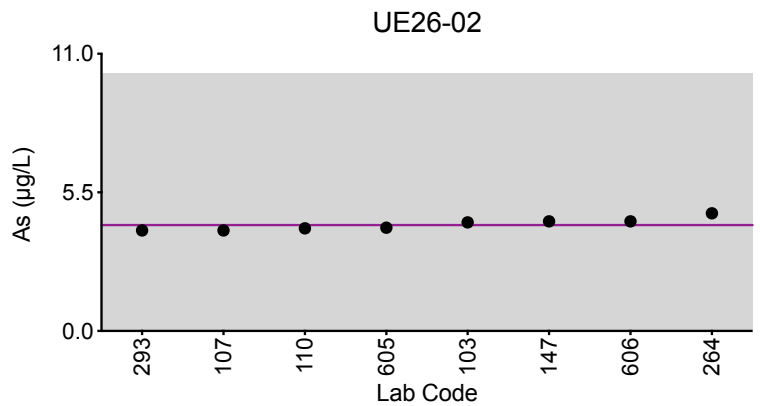
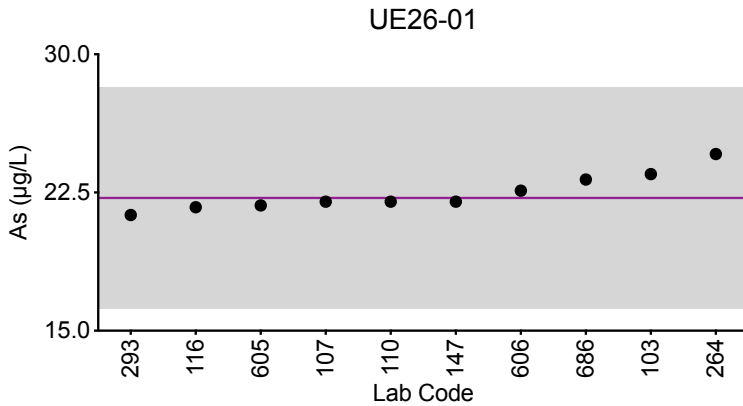
		Urine As ($\mu\text{g/L}$)				
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
Target		22.2	4.2	15.5	58	35.1
103	ICP-MS/MS	23.5	4.31	15.5	58.0	36.3
107	DRC/CC-ICP-MS	22.0	3.99	14.9	57.8	33.5
110	ICP-MS/MS	22.0	4.07	15.0	56.2	33.8
116	ICP-MS/MS	21.7	<6.0	15.5	55.6	34.0
147	ICP-MS	22.0	4.35	15.9	57.7	34.8
264	ICP-MS	24.59	4.67	17.58	63.32	40.55
293	DRC/CC-ICP-MS	21.28	3.99	14.62	54.64	33.48
605	ICP-MS	21.8	4.10	15.4	60.8	35.0
606	ICP-MS/MS	22.6	4.35	15.9	59.6	36.6
686	ICP-MS/MS	23.2	<6.00	15.7	60.0	35.9

Based on the grading criteria for As in Urine, 100% of results were satisfactory, with 0 of the 10 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Urine As



Legend:

● Labs

Horizontal purple line = assigned target value based on the robust mean of all laboratories.

Gray area = acceptable range based on quality specifications:

$\pm 6 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 6 \mu\text{g/L}$ at concentrations less than or equal to $30 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

	Urine Ba (µg/L)				
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
Target (Arithmetic Mean (\bar{x}))	8.8	2.10	0.587	6.4	4.30
Upper Limit	10.6	3.10	1.587	7.7	5.30
Lower Limit	7.0	1.10	0.000	5.1	3.30
Arithmetic SD (s)	0.4	0.12	0.008	0.3	0.20
Arithmetic RSD (%)	4.0	5.7	1.4	3.9	4.7
Number of Sample Measurements (N)	7	7	5	7	7

The acceptable range is based on quality specifications: ± 1 µg/L or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at ± 1 µg/L at concentrations less than or equal to 5 µg/L. These quality specifications are based on the same criteria used by the US Centers for Disease Control Prevention (CDC) for public health labs participating in the Laboratory Response Network (LRN) PT program for Toxic Metals.



Results for Event #1, 2026: Performance of Participating Laboratories

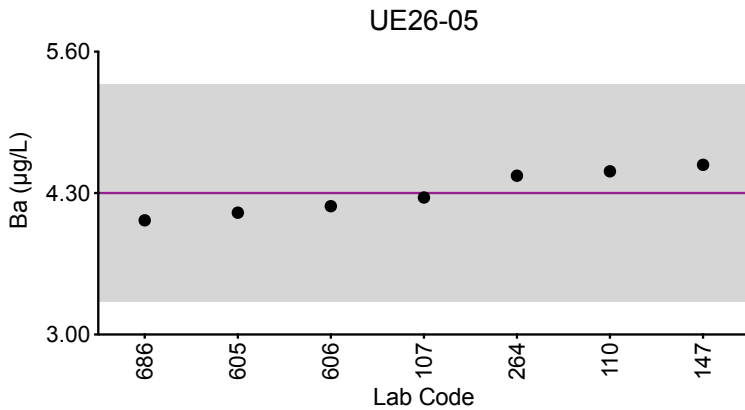
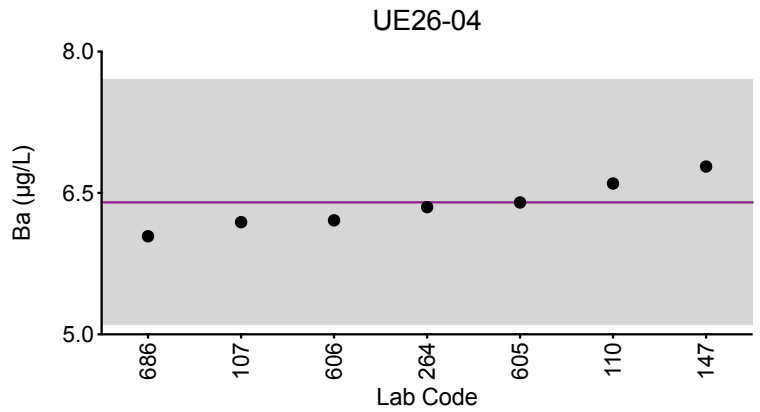
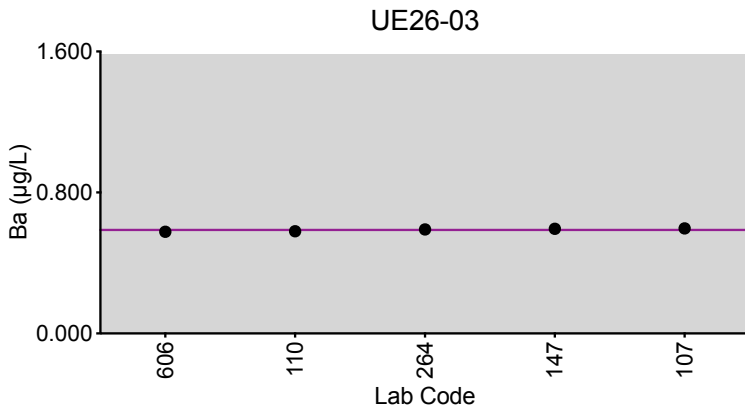
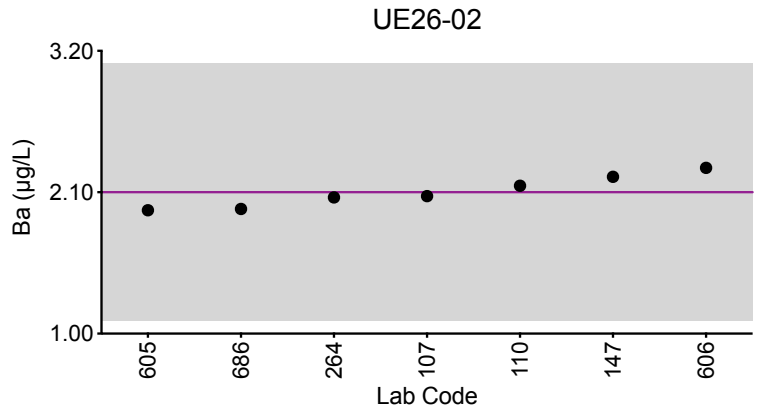
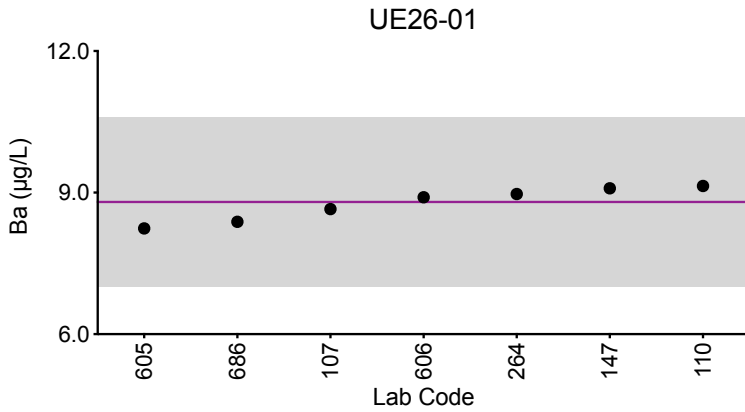
		Urine Ba (µg/L)				
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
	Target	8.8	2.10	0.587	6.4	4.30
107	ICP-MS	8.65	2.07	0.596	6.19	4.26
110	ICP-MS/MS	9.14	2.15	0.58	6.60	4.50
147	ICP-MS	9.09	2.22	0.594	6.78	4.56
264	ICP-MS	8.97	2.06	0.59	6.35	4.46
605	ICP-MS	8.24	1.96	<0.600	6.40	4.12
606	ICP-MS/MS	8.90	2.29	0.577	6.21	4.18
686	ICP-MS/MS	8.38	1.97	<0.600	6.04	4.05

Based on the grading criteria for Ba in Urine, 100% of results were satisfactory, with 0 of the 7 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Urine Ba



Legend:

● Labs

Horizontal purple line = assigned target value based on the arithmetic mean of all laboratories.
Gray area = acceptable range based on quality specifications:

$\pm 1 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 1 \mu\text{g/L}$ at concentrations less than or equal to $5 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

	Urine Be ($\mu\text{g/L}$)				
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
Target (Arithmetic Mean (\bar{x}))	1.08	0.50	0.77	0.25	3.06
Upper Limit	2.08	1.50	1.77	1.25	4.06
Lower Limit	0.08	0.00	0.00	0.00	2.06
Arithmetic SD (s)	0.11	0.07	0.07	0.03	0.16
Arithmetic RSD (%)	10	14	9.1	10	5.2
Number of Sample Measurements (N)	8	8	8	6	7

The acceptable range is based on quality specifications: $\pm 1 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 1 \mu\text{g/L}$ at concentrations less than or equal to $5 \mu\text{g/L}$. These quality specifications are based on the same criteria used by the US Centers for Disease Control Prevention (CDC) for public health labs participating in the Laboratory Response Network (LRN) PT program for Toxic Metals.



Results for Event #1, 2026: Performance of Participating Laboratories

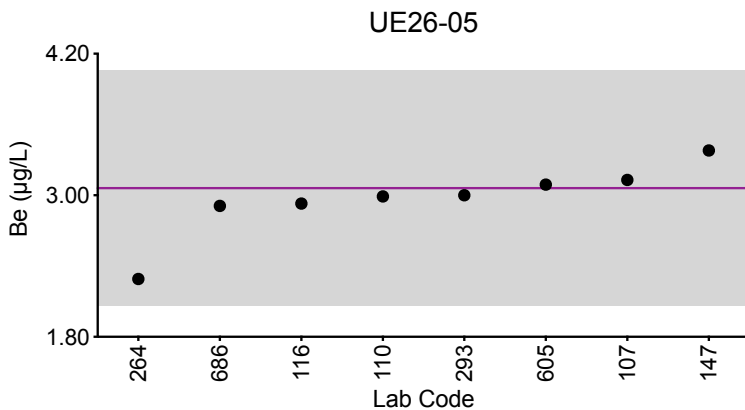
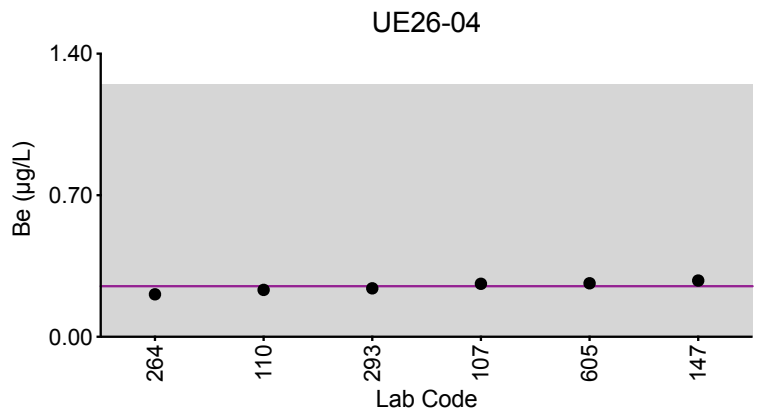
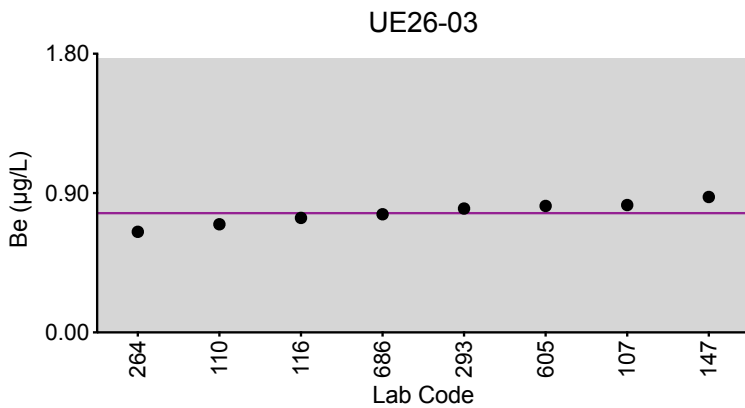
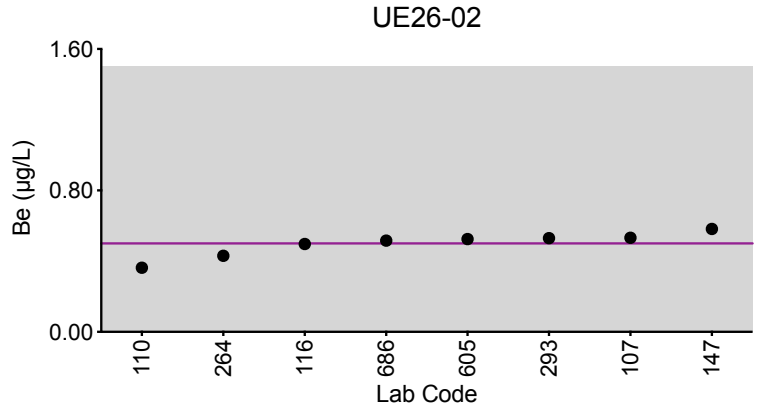
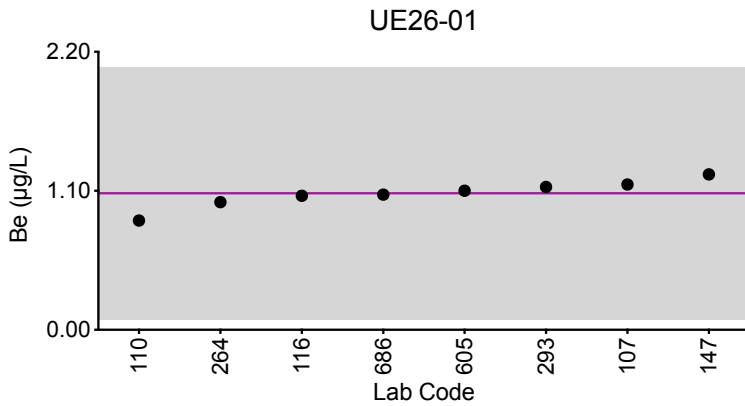
Urine Be ($\mu\text{g/L}$)						
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
	Target	1.08	0.50	0.77	0.25	3.06
107	ICP-MS	1.15	0.532	0.823	0.262	3.13
110	ICP-MS/MS	0.865	0.363	0.699	0.232	2.99
116	ICP-MS/MS	1.06	0.497	0.740	<0.3	2.93
147	ICP-MS	1.23	0.582	0.875	0.278	3.38
264	ICP-MS	1.01	0.43	0.65	0.21	*2.29
293	ICP-MS	1.13	0.53	0.8	0.24	3
605	ICP-MS	1.10	0.525	0.817	0.265	3.09
686	ICP-MS/MS	1.07	0.516	0.763	<0.300	2.91

Based on the grading criteria for Be in Urine, 100% of results were satisfactory, with 0 of the 8 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Urine Be



Legend:

● Labs

Horizontal purple line = assigned target value based on the arithmetic mean of all laboratories.
Gray area = acceptable range based on quality specifications:

$\pm 1 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 1 \mu\text{g/L}$ at concentrations less than or equal to $5 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

	Urine Cd ($\mu\text{g/L}$)				
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
Target (Robust Mean (x^*))	4.80	0.12	2.92	0.696	1.70
Upper Limit	5.80	1.12	3.92	1.696	2.70
Lower Limit	3.80	0.00	1.92	0.000	0.70
Robust SD (s^*)	0.23	0.02	0.11	0.022	0.08
Robust RSD (%)	4.8	13	3.8	3.2	4.7
Number of Sample Measurements (N)	11	7	11	10	11
Standard Uncertainty (u)	0.09	NA	0.04	0.009	0.03

The acceptable range is based on quality specifications: $\pm 1 \mu\text{g/L}$ or $\pm 15\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 1 \mu\text{g/L}$ at concentrations less than or equal to $6.6 \mu\text{g/L}$. These quality specifications are based on the same criteria used by the US Centers for Disease Control Prevention (CDC) for public health labs participating in the Laboratory Response Network (LRN) PT program for Toxic Metals.

An arithmetic mean, SD, RSD and n are provided for sample UE26-02.



Results for Event #1, 2026: Performance of Participating Laboratories

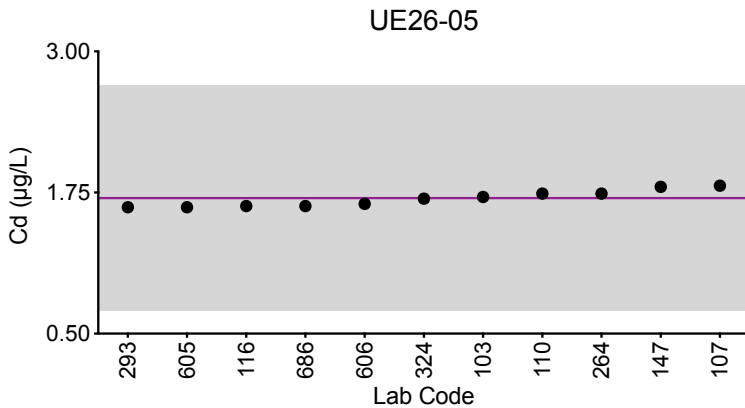
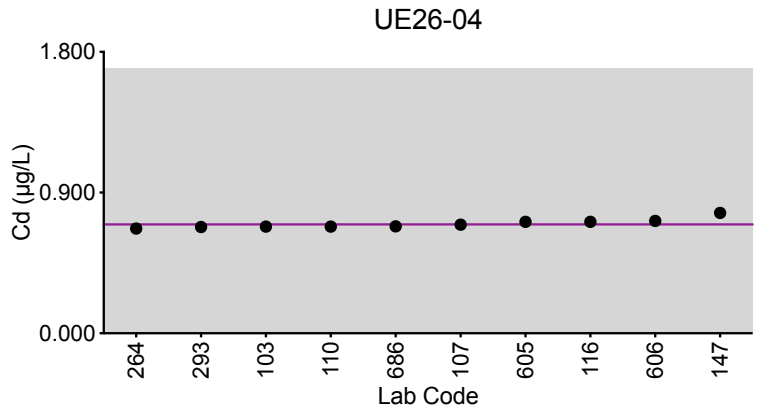
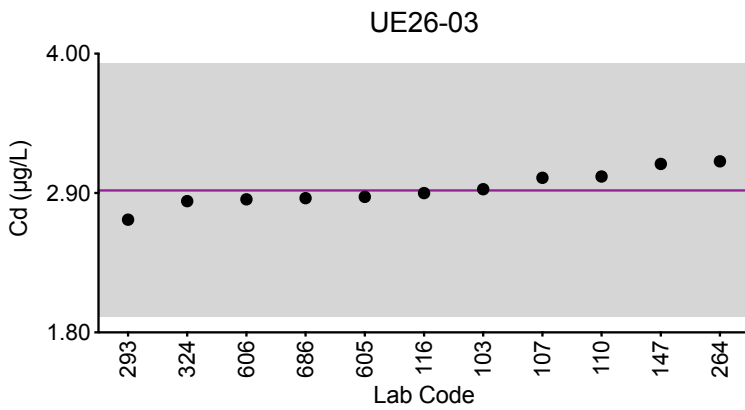
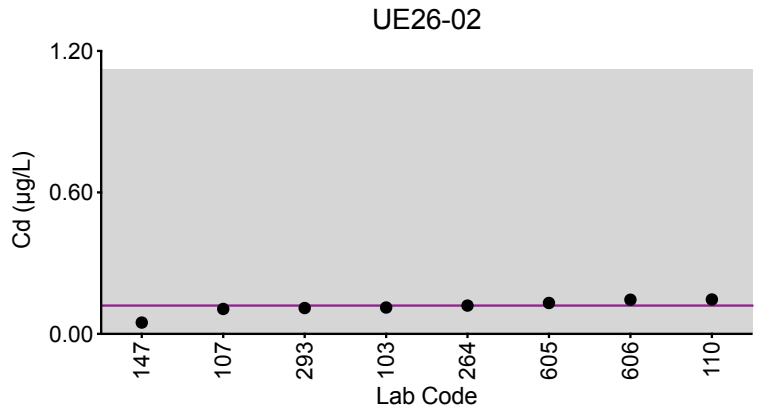
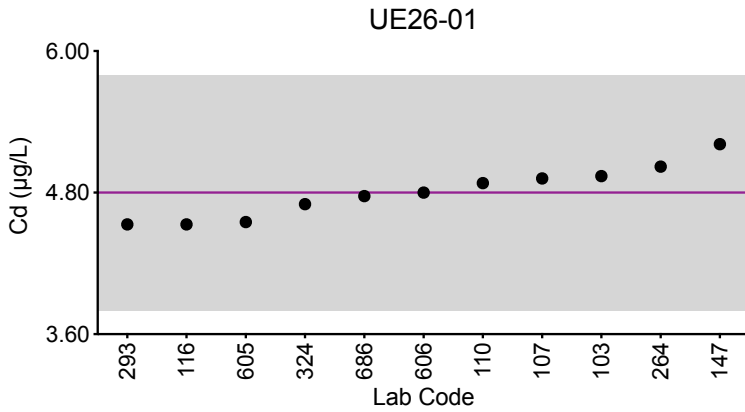
		Urine Cd (µg/L)				
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
	Target	4.80	0.12	2.92	0.696	1.70
103	ICP-MS/MS	4.94	0.112	2.93	0.682	1.71
107	DRC/CC-ICP-MS	4.92	0.106	3.02	0.695	1.81
110	ICP-MS/MS	4.88	0.146	3.03	0.682	1.74
116	ICP-MS/MS	4.53	<0.24	2.90	0.713	1.63
147	ICP-MS	5.21	*0.0481	3.13	0.770	1.80
264	ICP-MS	5.02	0.12	3.15	0.67	1.74
293	DRC/CC-ICP-MS	4.53	0.11	2.69	0.68	1.62
324	ICP-MS	4.702	<1	2.836	<1	1.695
605	ICP-MS	4.55	0.131	2.87	0.713	1.62
606	ICP-MS/MS	4.80	0.145	2.85	0.719	1.65
686	ICP-MS/MS	4.77	<0.240	2.86	0.684	1.63

Based on the grading criteria for Cd in Urine, 100% of results were satisfactory, with 0 of the 11 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Urine Cd



Legend:

● Labs

Horizontal purple line = assigned target value based on the robust mean of all laboratories.

Gray area = acceptable range based on quality specifications:

$\pm 1 \mu\text{g/L}$ or $\pm 15\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 1 \mu\text{g/L}$ at concentrations less than or equal to $6.6 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

	Urine Co ($\mu\text{g/L}$)				
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
Target (Arithmetic Mean (\bar{x}))	1.62	5.33	3.31	1.11	2.15
Upper Limit	3.12	6.83	4.81	2.61	3.65
Lower Limit	0.12	3.83	1.81	0.00	0.65
Arithmetic SD (s)	0.17	0.04	0.11	0.05	0.07
Arithmetic RSD (%)	10	0.75	3.3	4.5	3.3
Number of Sample Measurements (N)	9	8	9	9	9

The acceptable range is based on quality specifications: $\pm 1.5 \mu\text{g/L}$ or $\pm 15\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 1.5 \mu\text{g/L}$ at concentrations less than or equal to $10 \mu\text{g/L}$. These quality specifications were established based on discussions with the US FDA, and represent a consensus from a network of Trace Element PT program organizers.



Results for Event #1, 2026: Performance of Participating Laboratories

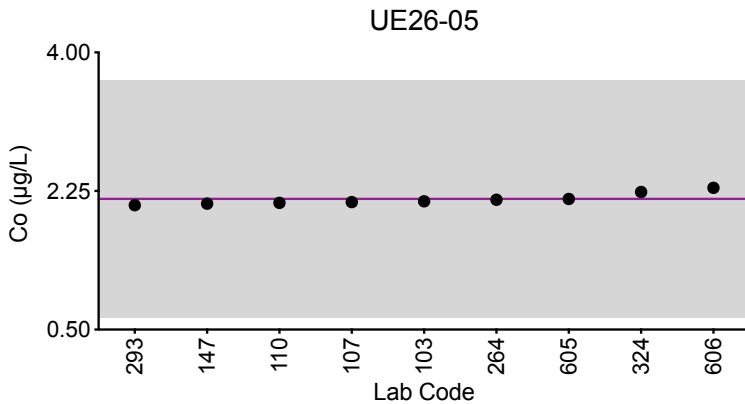
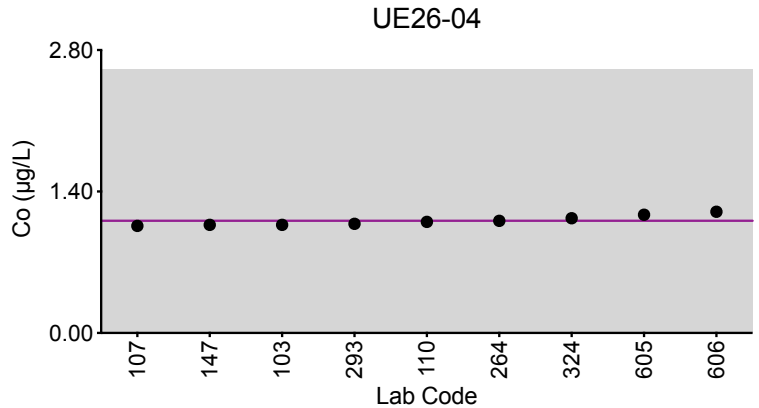
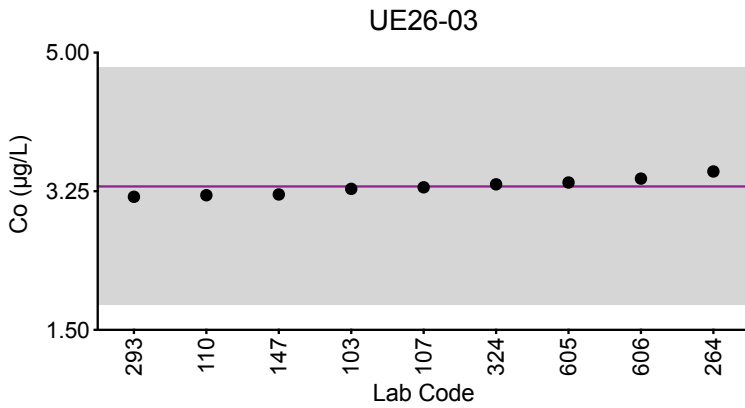
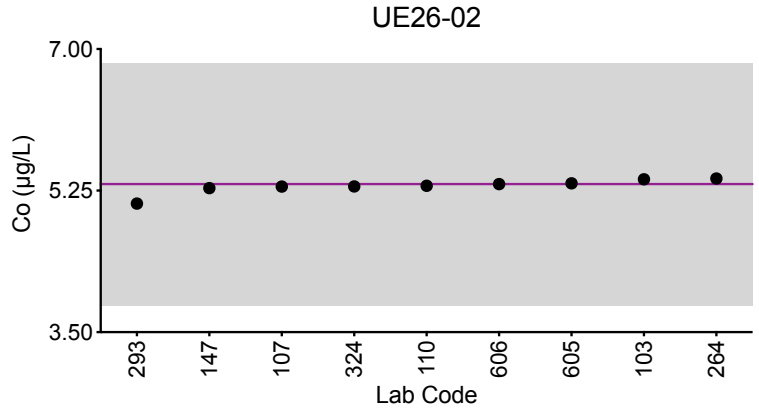
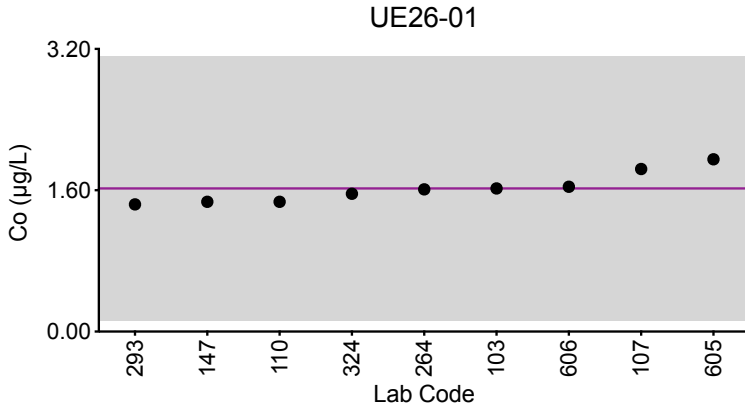
		Urine Co (µg/L)				
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
	Target	1.62	5.33	3.31	1.11	2.15
103	ICP-MS/MS	1.62	5.39	3.28	1.07	2.12
107	DRC/CC-ICP-MS	1.84	5.30	3.30	1.06	2.11
110	ICP-MS/MS	1.47	5.31	3.20	1.10	2.10
147	ICP-MS	1.47	5.28	3.21	1.07	2.09
264	ICP-MS	1.61	5.40	3.50	1.11	2.14
293	DRC/CC-ICP-MS	1.44	*5.09	3.18	1.08	2.07
324	ICP-MS	1.560	5.301	3.338	1.135	2.238
605	ICP-MS	1.95	5.34	3.36	1.17	2.15
606	ICP-MS/MS	1.64	5.33	3.41	1.20	2.29

Based on the grading criteria for Co in Urine, 100% of results were satisfactory, with 0 of the 9 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Urine Co



Legend:

● Labs

Horizontal purple line = assigned target value based on the arithmetic mean of all laboratories.
Gray area = acceptable range based on quality specifications:

$\pm 1.5 \mu\text{g/L}$ or $\pm 15\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 1.5 \mu\text{g/L}$ at concentrations less than or equal to $10 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

	Urine Cr ($\mu\text{g/L}$)				
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
Target (Arithmetic Mean (\bar{x}))	9.24	4.33	0.69	2.40	1.04
Upper Limit	12.24	7.33	3.69	5.40	4.04
Lower Limit	6.24	1.33	0.00	0.00	0.00
Arithmetic SD (s)	0.24	0.17	0.11	0.07	0.04
Arithmetic RSD (%)	2.6	3.9	16	2.9	3.6
Number of Sample Measurements (N)	8	9	7	8	8

The acceptable range is based on quality specifications:

$\pm 3 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 3 \mu\text{g/L}$ at concentrations less than or equal to $15 \mu\text{g/L}$. These quality specifications were established based on discussions with the US FDA, and represent a consensus from a network of Trace Element PT program organizers.



Results for Event #1, 2026: Performance of Participating Laboratories

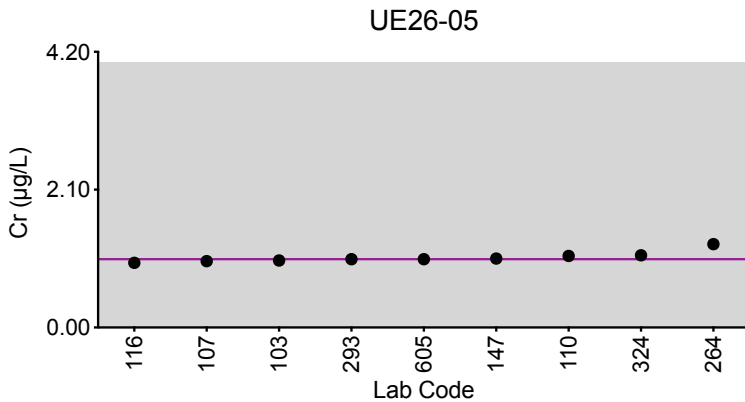
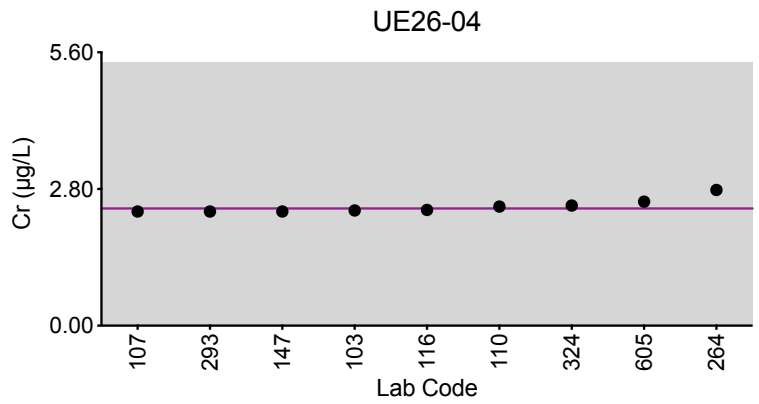
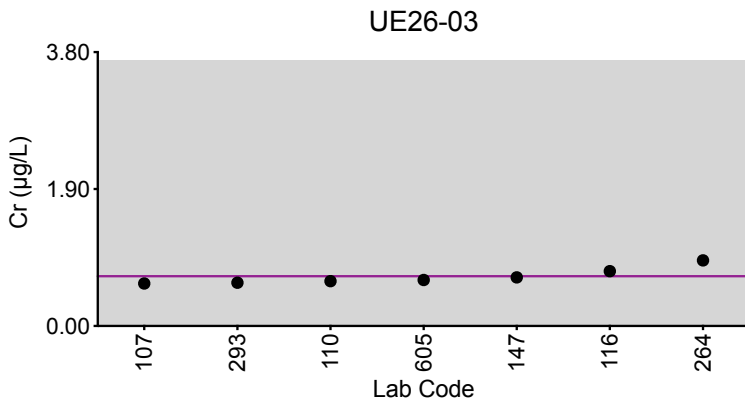
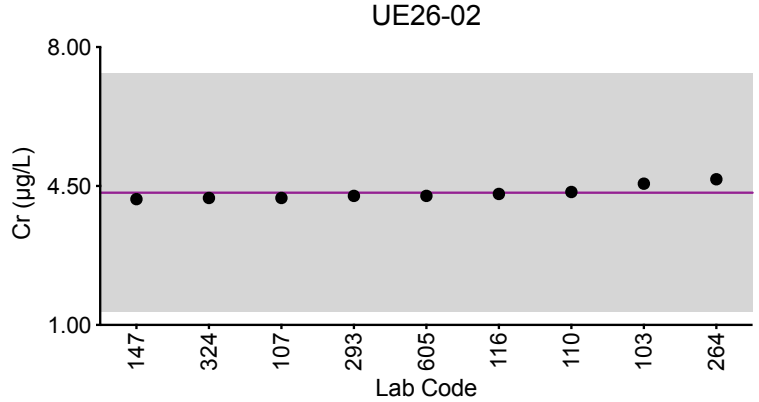
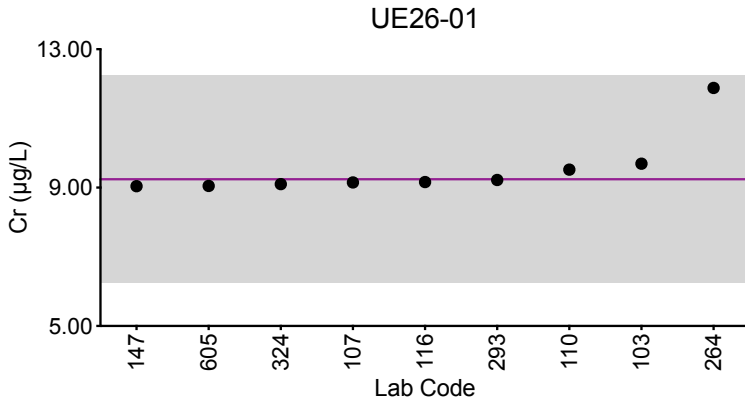
Lab Code	Method	Urine Cr ($\mu\text{g/L}$)				
		UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
	Target	9.24	4.33	0.69	2.40	1.04
103	ICP-MS/MS	9.69	4.56	<0.600	2.36	1.02
107	DRC/CC-ICP-MS	9.15	4.20	0.589	2.34	1.01
110	ICP-MS/MS	9.52	4.35	0.623	2.44	1.09
116	ICP-MS/MS	9.16	4.30	0.761	2.37	0.986
147	DRC/CC-ICP-MS	9.04	4.17	0.675	2.34	1.05
264	ICP-MS	*11.88	4.67	0.91	*2.78	*1.27
293	DRC/CC-ICP-MS	9.22	4.25	0.6	2.34	1.04
324	ICP-MS	9.102	4.198	<1	2.462	1.099
605	ICP-MS	9.05	4.25	0.638	2.54	1.04

Based on the grading criteria for Cr in Urine, 100% of results were satisfactory, with 0 of the 9 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Urine Cr



Legend:

● Labs

Horizontal purple line = assigned target value based on the arithmetic mean of all laboratories.
Gray area = acceptable range based on quality specifications:

$\pm 3 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 3 \mu\text{g/L}$ at concentrations less than or equal to $15 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

	Urine Hg ($\mu\text{g/L}$)				
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
Target (Robust Mean (x^*))	17.8	1.97	0.83	4.3	24.8
Upper Limit	23.1	4.97	3.83	7.3	32.2
Lower Limit	12.5	0.00	0.00	1.3	17.4
Robust SD (s^*)	1.5	0.15	0.08	0.6	2.1
Robust RSD (%)	8.4	7.6	9.4	14	8.5
Number of Sample Measurements (N)	10	10	7	10	10
Standard Uncertainty (u)	0.6	0.06	NA	0.2	0.8

The acceptable range is based on quality specifications: $\pm 3 \mu\text{g/L}$ or $\pm 30\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 3 \mu\text{g/L}$ at concentrations less than or equal to $10 \mu\text{g/L}$. These quality specifications were established by New York State Department of Health's Wadsworth Center, the PT Program organizer.

An arithmetic mean, SD, RSD and n are provided for sample UE26-03.



Results for Event #1, 2026: Performance of Participating Laboratories

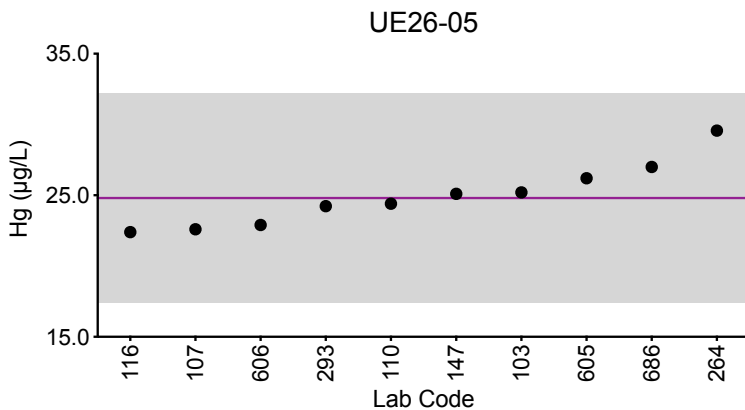
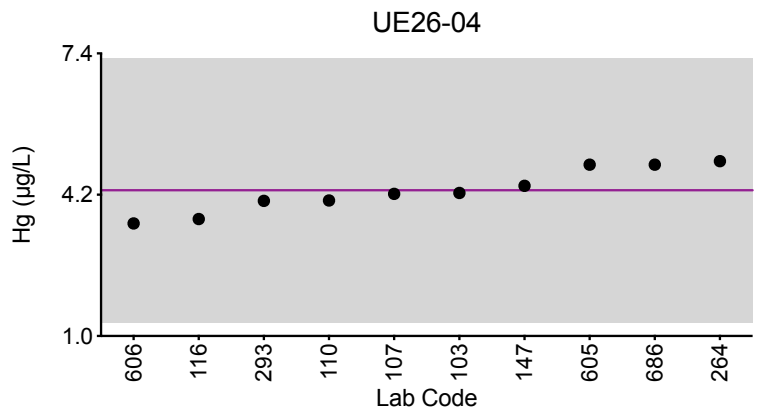
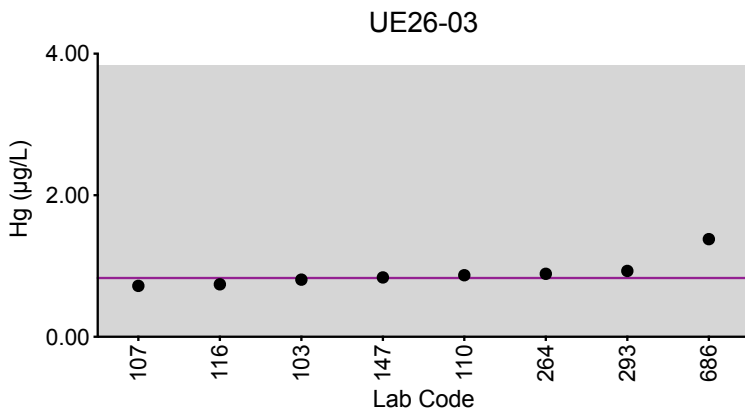
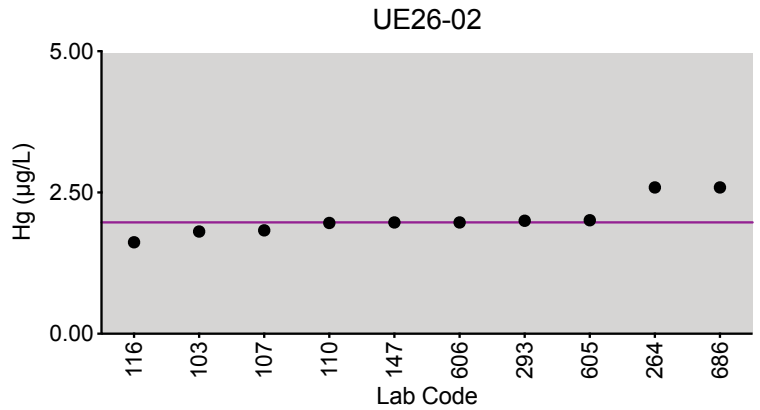
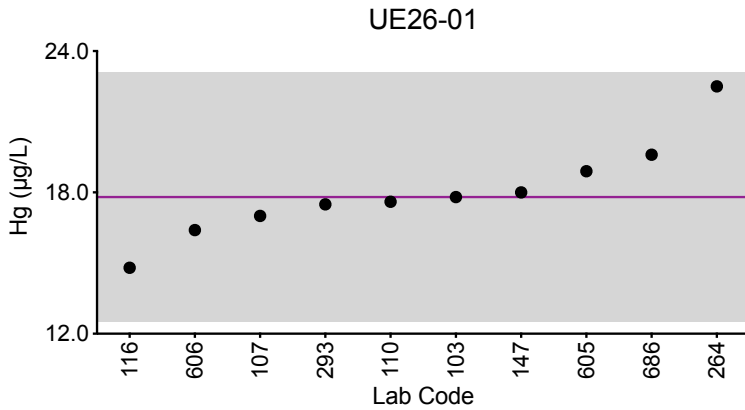
Lab Code	Method	Urine Hg ($\mu\text{g/L}$)				
		UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
	Target	17.8	1.97	0.83	4.3	24.8
103	ICP-MS/MS	17.8	1.81	0.808	4.24	25.2
107	DRC/CC-ICP-MS	17.0	1.83	0.719	4.22	22.6
110	ICP-MS	17.6	1.96	0.87	4.07	24.4
116	ICP-MS/MS	14.8	1.62	0.741	3.65	22.4
147	ICP-MS	18.0	1.97	0.839	4.40	25.1
264	ICP-MS	22.50	2.59	0.89	4.96	29.57
293	DRC/CC-ICP-MS	17.49	2	0.93	4.06	24.23
605	ICP-MS	18.9	2.01	<1.00	4.88	26.2
606	ICP-MS/MS	16.4	1.97	<1.00	3.55	22.9
686	ICP-MS	19.6	2.59	*1.38	4.88	27.0

Based on the grading criteria for Hg in Urine, 100% of results were satisfactory, with 0 of the 10 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Urine Hg



Legend:

● Labs

Horizontal purple line = assigned target value based on the robust mean of all laboratories.

Gray area = acceptable range based on quality specifications:

$\pm 3 \mu\text{g/L}$ or $\pm 30\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 3 \mu\text{g/L}$ at concentrations less than or equal to $10 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

	Urine Mn ($\mu\text{g/L}$)				
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
Target (Robust Mean (x^*))	9.0	2.72	1.48	0.45	5.1
Upper Limit	11.3	3.40	2.03	1.00	6.4
Lower Limit	6.8	2.04	0.93	0.00	3.8
Robust SD (s^*)	0.4	0.20	0.08	0.10	0.2
Robust RSD (%)	4.4	7.4	5.4	22	4.7
Number of Sample Measurements (N)	10	10	10	9	10
Standard Uncertainty (u)	0.2	0.08	0.03	NA	0.1

The acceptable range is based on quality specifications: $\pm 0.55 \mu\text{g/L}$ or $\pm 25\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 0.55 \mu\text{g/L}$ at concentrations less than or equal to $2.2 \mu\text{g/L}$. Quality specifications for Mn are consistent with those used by other External Quality Assessment Schemes for trace elements. (Praamsma M, et al. An assessment of clinical laboratory performance for the determination of manganese in blood and urine. Clinical Chemistry and Laboratory Medicine. 2016; 54(12): 1921-1928)

An arithmetic mean, SD, RSD and n are provided for sample UE26-04.



Results for Event #1, 2026: Performance of Participating Laboratories

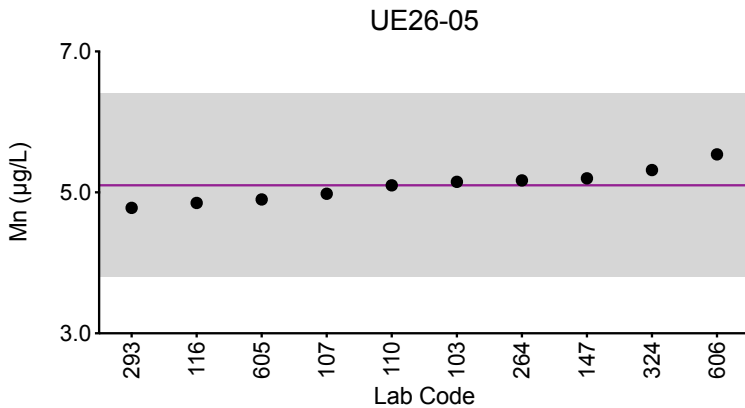
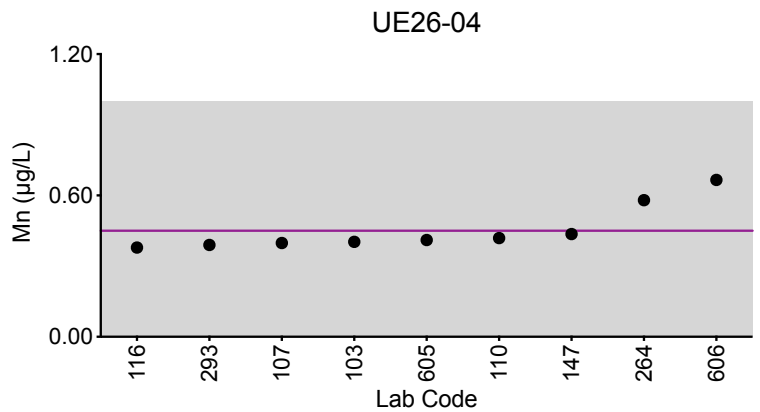
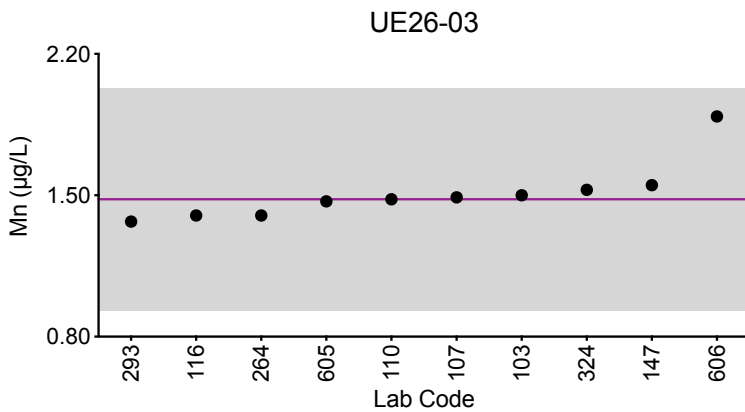
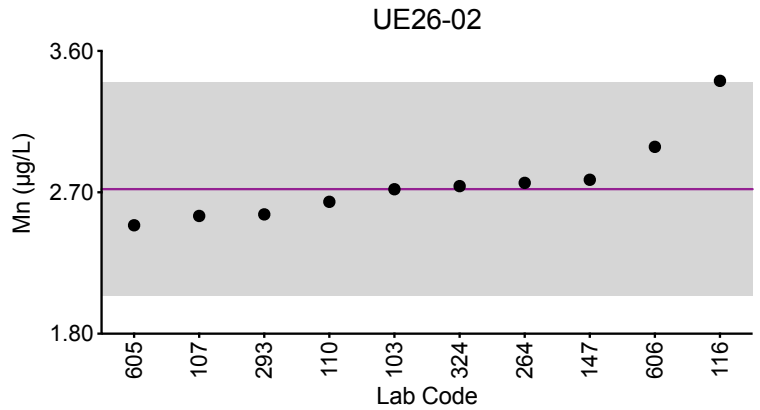
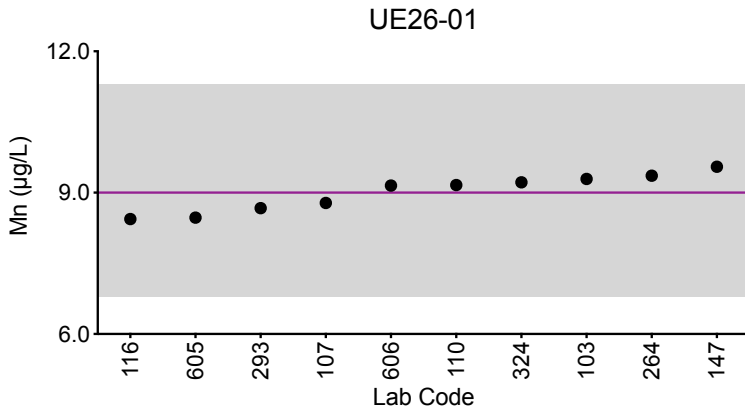
		Urine Mn ($\mu\text{g/L}$)				
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
Target		9.0	2.72	1.48	0.45	5.1
103	ICP-MS/MS	9.29	2.72	1.50	0.403	5.15
107	DRC/CC-ICP-MS	8.78	2.55	1.49	0.398	4.98
110	ICP-MS/MS	9.16	2.64	1.48	0.419	5.10
116	ICP-MS/MS	8.44	3.41 ↑	1.40	0.379	4.85
147	DRC/CC-ICP-MS	9.55	2.78	1.55	0.436	5.20
264	ICP-MS	9.36	2.76	1.40	0.58	5.17
293	DRC/CC-ICP-MS	8.67	2.56	1.37	0.39	4.78
324	ICP-MS	9.220	2.740	1.527	<1	5.318
605	ICP-MS	8.47	2.49	1.47	0.411	4.90
606	ICP-MS/MS	9.15	2.99	1.89	0.666	5.54

Based on the grading criteria for Mn in Urine, 98% of results were satisfactory, with 0 of the 10 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Urine Mn



Legend:

● Labs

Horizontal purple line = assigned target value based on the robust mean of all laboratories.

Gray area = acceptable range based on quality specifications:

$\pm 0.55 \mu\text{g/L}$ or $\pm 25\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 0.55 \mu\text{g/L}$ at concentrations less than or equal to $2.2 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

	Urine Pb ($\mu\text{g/L}$)				
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
Target (Robust Mean (x^*))	0.29	14.2	1.35	2.73	9.1
Upper Limit	1.29	17.0	2.35	3.73	10.9
Lower Limit	0.00	11.4	0.35	1.73	7.3
Robust SD (s^*)	0.04	0.6	0.07	0.12	0.3
Robust RSD (%)	13	4.2	5.2	4.4	3.4
Number of Sample Measurements (N)	8	11	11	11	11
Standard Uncertainty (u)	NA	0.2	0.03	0.05	0.1

The acceptable range is based on quality specifications: $\pm 1 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 1 \mu\text{g/L}$ at concentrations less than or equal to $5 \mu\text{g/L}$. These quality specifications are based on the same criteria used by the US Centers for Disease Control Prevention (CDC) for public health labs participating in the Laboratory Response Network (LRN) PT program for Toxic Metals.

An arithmetic mean, SD, RSD and n are provided for sample UE26-01.



Results for Event #1, 2026: Performance of Participating Laboratories

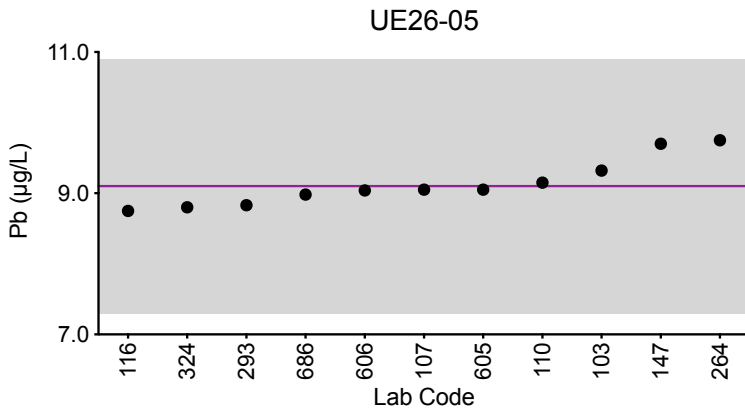
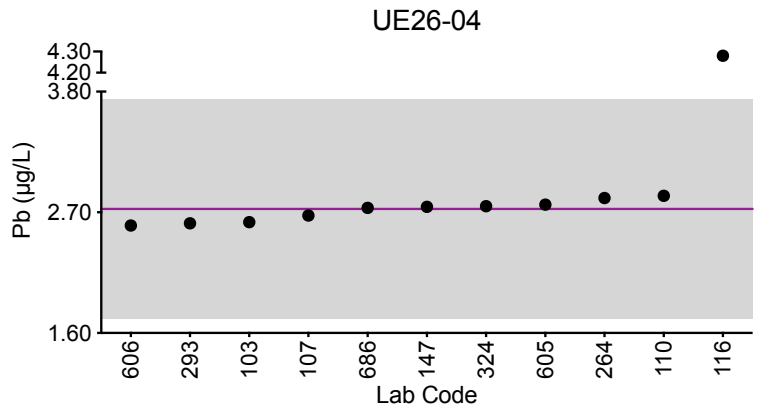
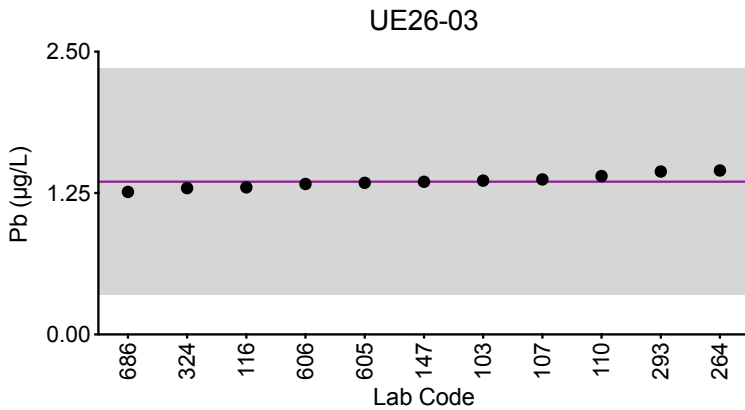
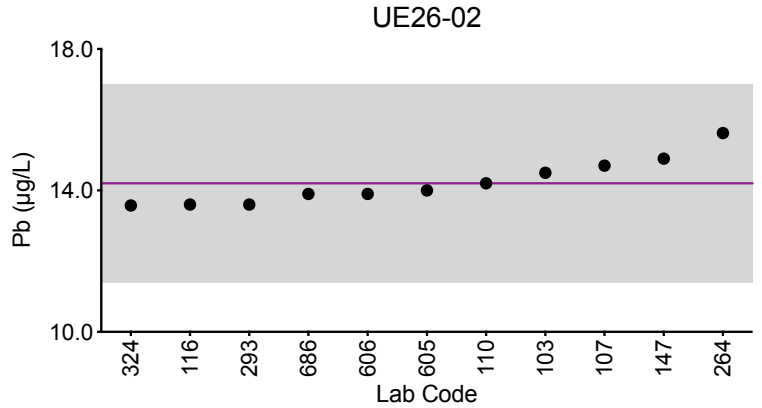
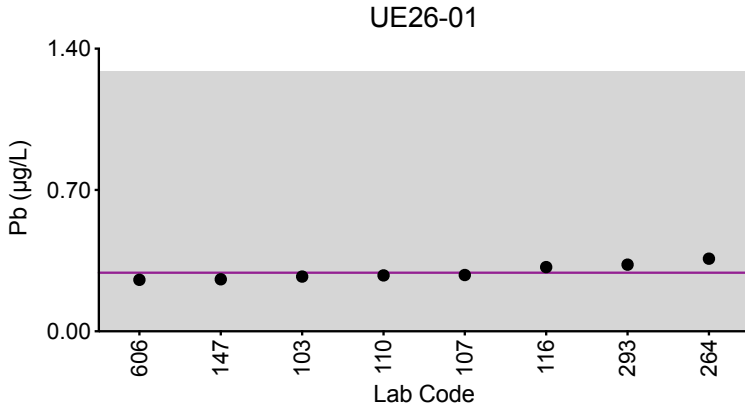
Urine Pb ($\mu\text{g/L}$)						
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
	Target	0.29	14.2	1.35	2.73	9.1
103	ICP-MS/MS	0.271	14.5	1.36	2.61	9.32
107	ICP-MS	0.279	14.7	1.37	2.67	9.05
110	ICP-MS/MS	0.277	14.2	1.40	2.85	9.15
116	ICP-MS/MS	0.318	13.6	1.30	4.28 ↑	8.75
147	ICP-MS	0.258	14.9	1.35	2.75	9.70
264	ICP-MS	0.36	15.62	1.45	2.83	9.75
293	DRC/CC-ICP-MS	0.33	13.6	1.44	2.6	8.83
324	ICP-MS	<1	13.574	1.294	2.755	8.801
605	ICP-MS	<0.300	14.0	1.34	2.77	9.05
606	ICP-MS/MS	0.255	13.9	1.33	2.58	9.04
686	ICP-MS/MS	<0.300	13.9	1.26	2.74	8.98

Based on the grading criteria for Pb in Urine, 98% of results were satisfactory, with 0 of the 11 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Urine Pb



Legend:

● Labs

Horizontal purple line = assigned target value based on the robust mean of all laboratories.

Gray area = acceptable range based on quality specifications:

$\pm 1 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 1 \mu\text{g/L}$ at concentrations less than or equal to $5 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

	Urine TI ($\mu\text{g/L}$)				
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
Target (Arithmetic Mean (\bar{x}))	0.149	1.22	0.469	3.56	0.89
Upper Limit	0.349	1.46	0.669	4.27	1.09
Lower Limit	0.000	0.98	0.269	2.85	0.69
Arithmetic SD (s)	0.012	0.03	0.016	0.15	0.03
Arithmetic RSD (%)	8.1	2.8	3.4	4.2	3.8
Number of Sample Measurements (N)	9	9	9	9	9

The acceptable range is based on quality specifications: $\pm 0.2 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 0.2 \mu\text{g/L}$ at concentrations less than or equal to $1 \mu\text{g/L}$. These quality specifications are based on the same criteria used by the US Centers for Disease Control Prevention (CDC) for public health labs participating in the Laboratory Response Network (LRN) PT program for Toxic Metals.



Results for Event #1, 2026: Performance of Participating Laboratories

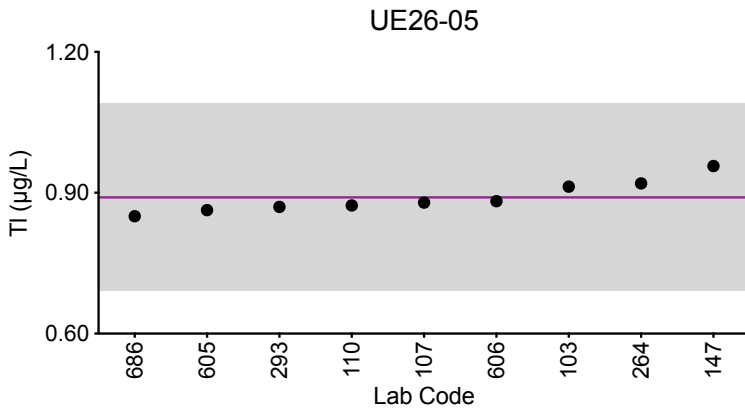
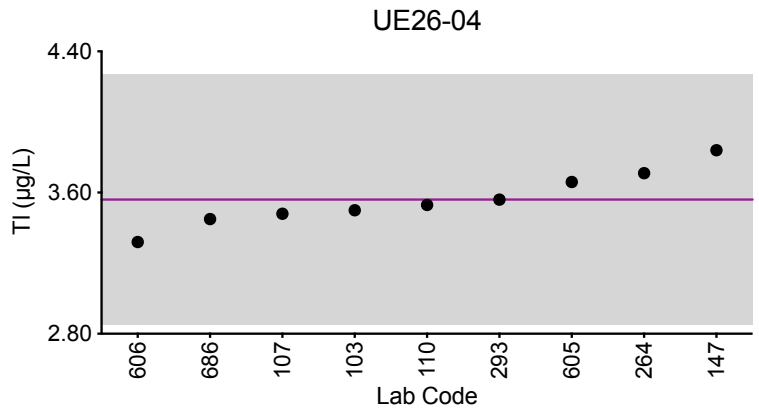
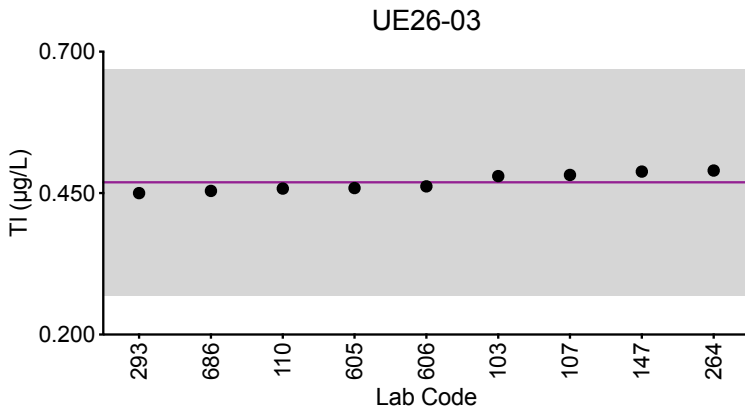
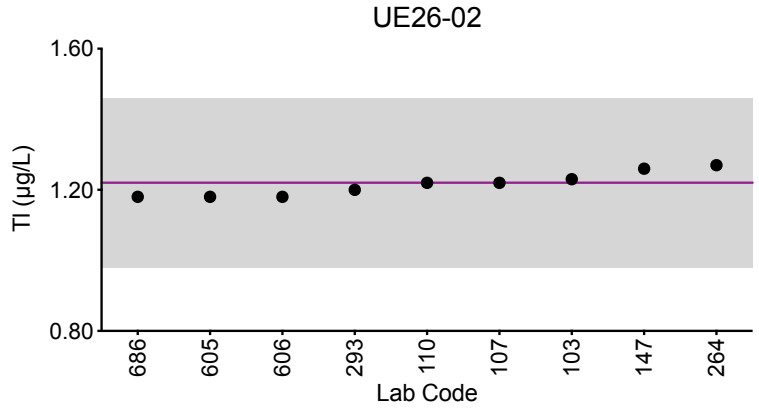
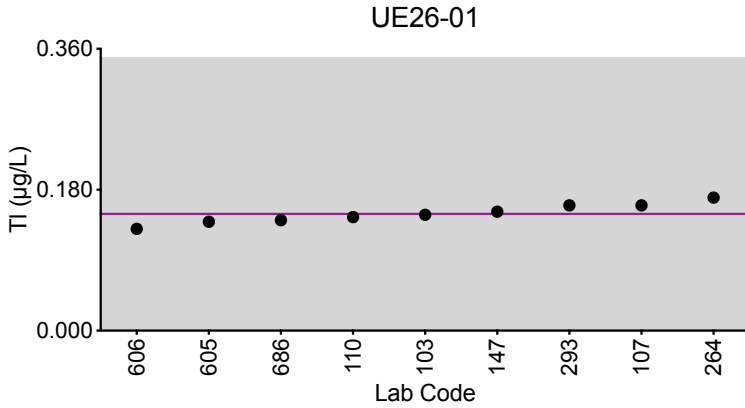
		Urine TI ($\mu\text{g/L}$)				
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
	Target	0.149	1.22	0.469	3.56	0.89
103	ICP-MS/MS	0.148	1.23	0.480	3.50	0.913
107	ICP-MS	0.160	1.22	0.482	3.48	0.879
110	ICP-MS/MS	0.145	1.22	0.458	3.53	0.873
147	ICP-MS	0.152	1.26	0.488	3.84	0.957
264	ICP-MS	0.17	1.27	0.49	3.71	0.92
293	DRC/CC-ICP-MS	0.16	1.2	0.45	3.56	0.87
605	ICP-MS	0.139	1.18	0.459	3.66	0.863
606	ICP-MS/MS	0.130	1.18	0.462	3.32	0.882
686	ICP-MS/MS	0.141	1.18	0.454	3.45	0.850

Based on the grading criteria for TI in Urine, 100% of results were satisfactory, with 0 of the 9 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Urine TI



Legend:

● Labs

Horizontal purple line = assigned target value based on the arithmetic mean of all laboratories.
Gray area = acceptable range based on quality specifications:

$\pm 0.2 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 0.2 \mu\text{g/L}$ at concentrations less than or equal to $1 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

	Urine U (µg/L)				
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
Target (Robust Mean (x*))	0.239	0.115	0.009	0.007	0.052
Upper Limit	0.287	0.145	0.039	0.037	0.082
Lower Limit	0.191	0.085	0.000	0.000	0.022
Robust SD (s*)	0.010	0.005	0.002	0.002	0.004
Robust RSD (%)	4.2	4.3	18	23	6.9
Number of Sample Measurements (N)	10	10	6	6	10
Standard Uncertainty (u)	0.004	0.002	NA	NA	0.001

The acceptable range is based on quality specifications: $\pm 0.03 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 0.03 \mu\text{g/L}$ at concentrations less than or equal to $0.15 \mu\text{g/L}$. These quality specifications are based on the same criteria used by the US Centers for Disease Control Prevention (CDC) for public health labs participating in the Laboratory Response Network (LRN) PT program for Toxic Metals.

An arithmetic mean, SD, RSD and n are provided for samples UE26-03 and UE26-04.



Results for Event #1, 2026: Performance of Participating Laboratories

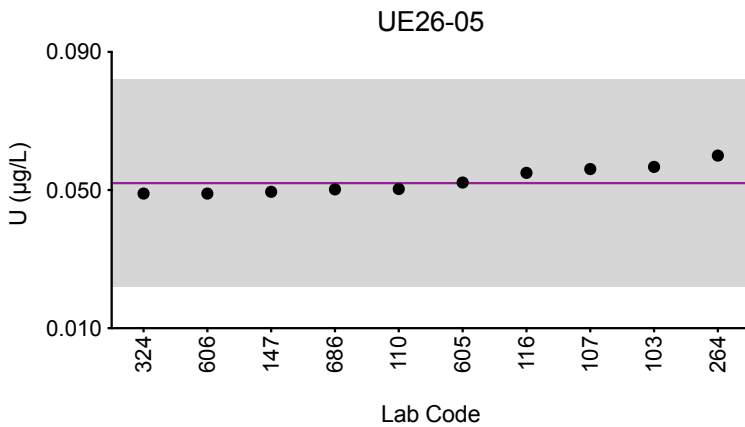
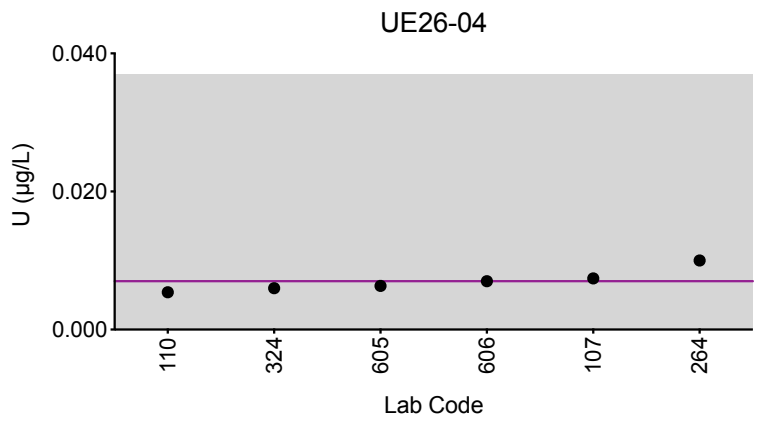
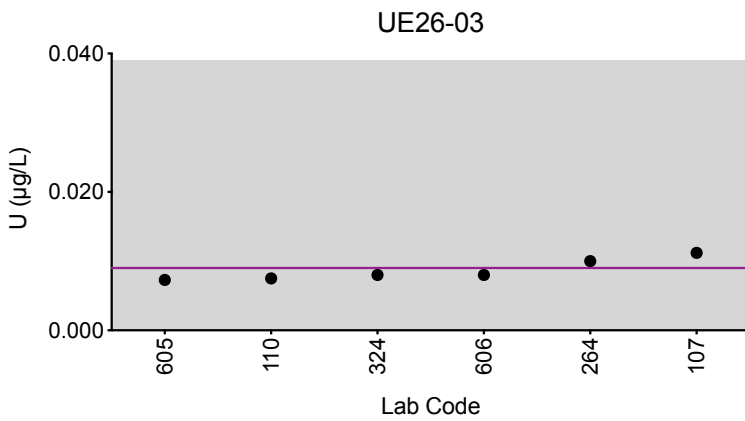
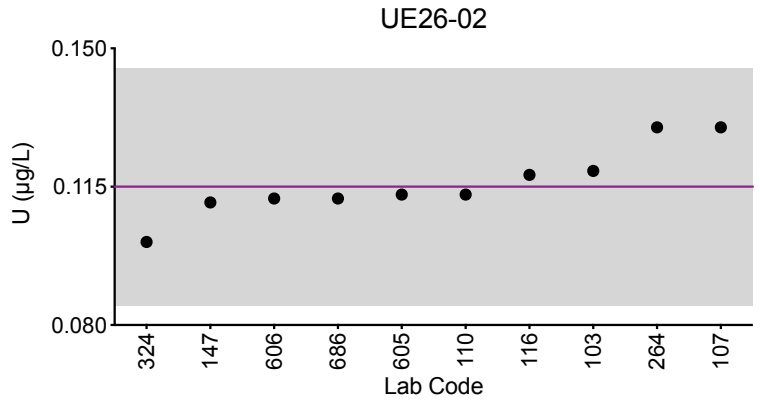
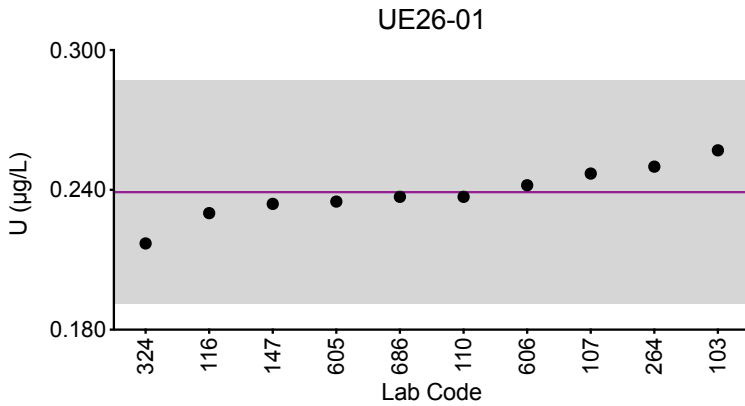
		Urine U (µg/L)				
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
Target		0.239	0.115	0.009	0.007	0.052
103	ICP-MS/MS	0.257	0.119	<0.0100	<0.0100	0.0567
107	ICP-MS	0.247	0.130	0.0112	0.00740	0.0561
110	ICP-MS/MS	0.237	0.113	0.0075	0.0054	0.0503
116	ICP-MS/MS	0.230	0.118	<0.015	<0.015	0.055
147	ICP-MS	0.234	0.111	<0.00738	<0.00738	0.0495
264	ICP-MS	0.25	0.13	0.01	0.01	0.06
324	ICP-MS	0.217	0.101	0.008	0.006	0.049
605	ICP-MS	0.235	0.113	0.00729	0.00633	0.0522
606	ICP-MS/MS	0.242	0.112	0.008	0.007	0.049
686	ICP-MS/MS	0.237	0.112	<0.0150	<0.0150	0.0502

Based on the grading criteria for U in Urine, 100% of results were satisfactory, with 0 of the 10 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Urine U



Legend:

● Labs

Horizontal purple line = assigned target value based on the robust mean of all laboratories.

Gray area = acceptable range based on quality specifications:

$\pm 0.03 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 0.03 \mu\text{g/L}$ at concentrations less than or equal to $0.15 \mu\text{g/L}$.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Urine Cs ($\mu\text{g/L}$)						
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
107	ICP-MS	1.56	11.0	3.32	1.71	6.38
110	ICP-MS/MS	1.63	11.4	3.43	1.79	6.58
147	ICP-MS	1.53	10.8	3.19	1.73	6.22
264	ICP-MS	1.59	10.64	3.34	1.72	6.44
605	ICP-MS	1.47	10.3	3.11	1.73	6.03
606	ICP-MS/MS	1.56	11.0	3.35	1.78	6.26

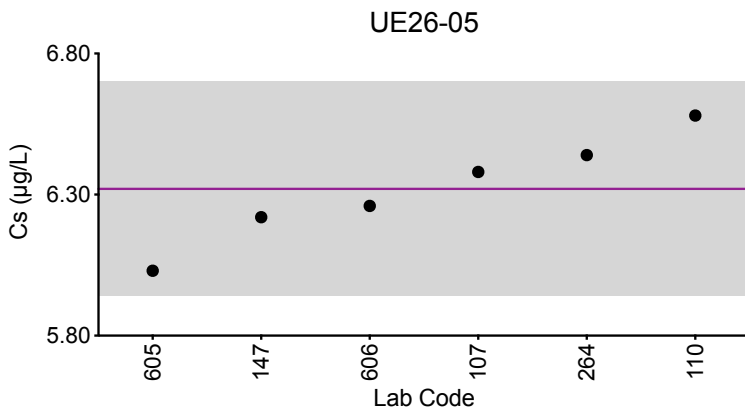
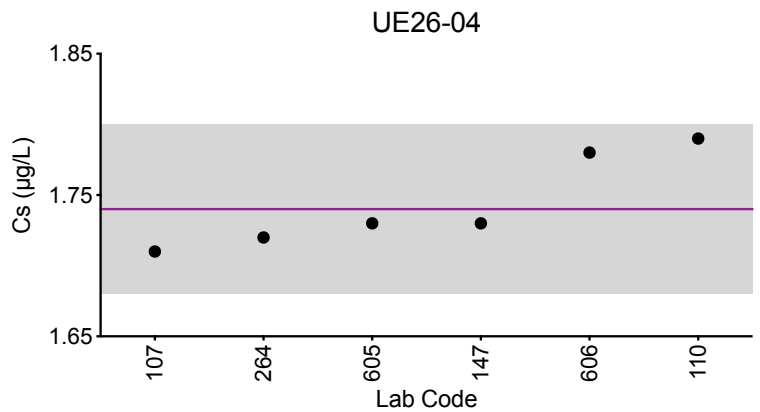
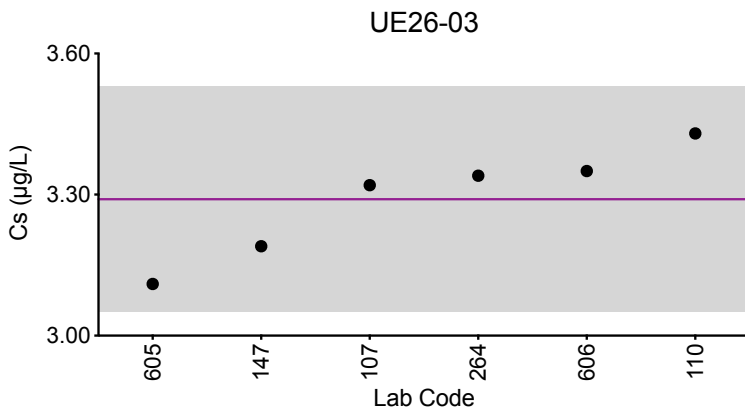
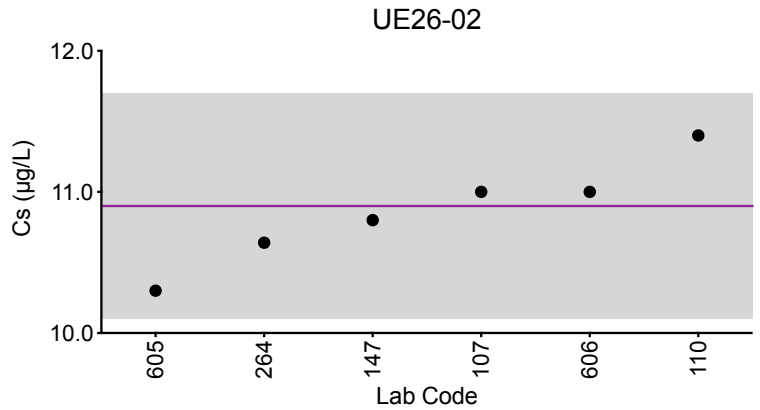
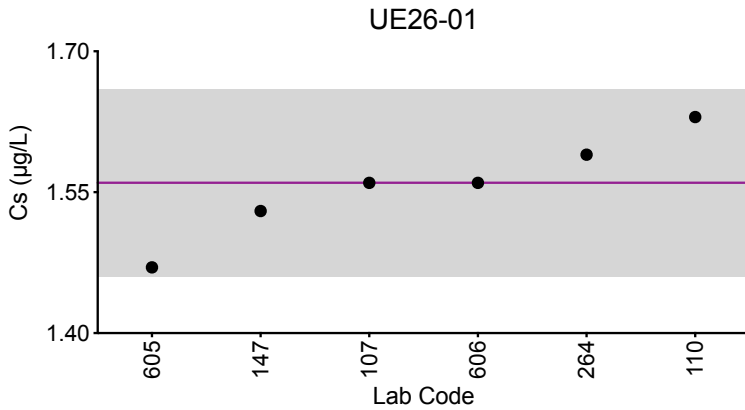
Summary Statistics					
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
Arithmetic Mean (\bar{x})	1.56	10.9	3.29	1.74	6.32
Arithmetic SD (s)	0.05	0.4	0.12	0.03	0.19
Arithmetic RSD (%)	3.2	3.7	3.6	1.9	3.0
Number of Sample Measurements (N)	6	6	6	6	6

*Denotes a statistical Outlier.



Results for Event #1, 2026: Summary Figures

Urine Cs



Legend:

● Labs

Horizontal purple line = arithmetic mean of all laboratories.

Gray area = $\pm 2SD$ of the mean.

The mean and $\pm 2SD$ of all laboratories are not intended to be quality specifications and are included for informational purposes only.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

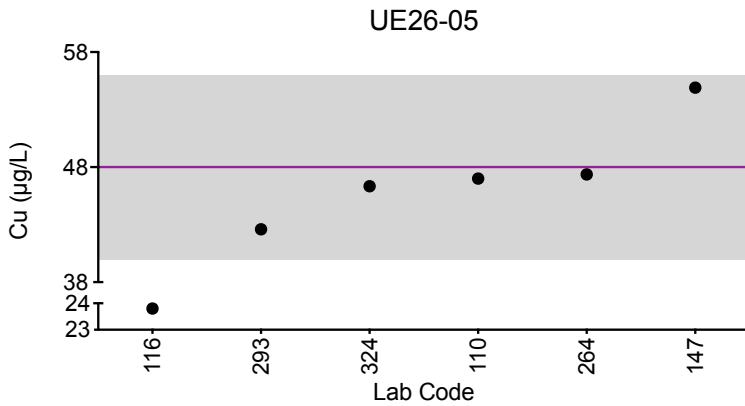
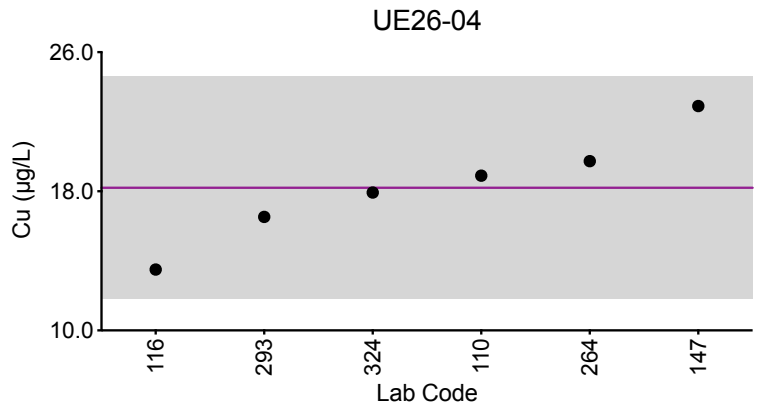
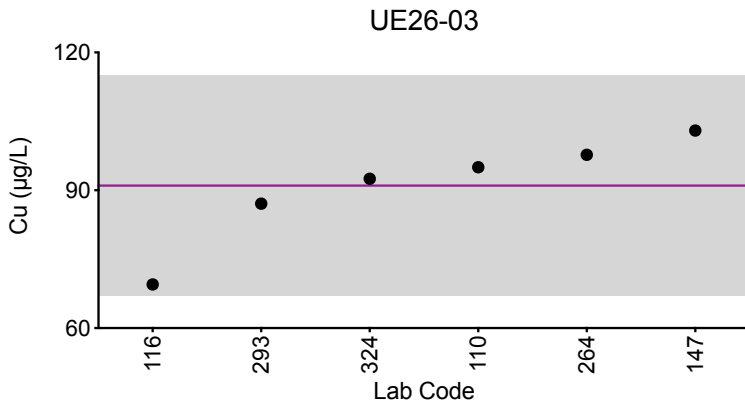
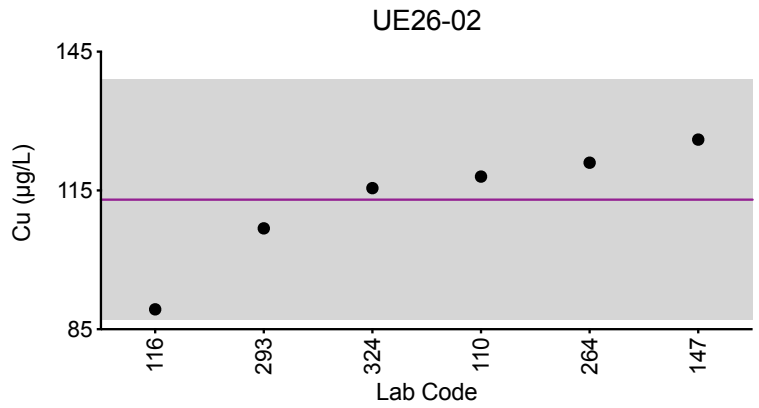
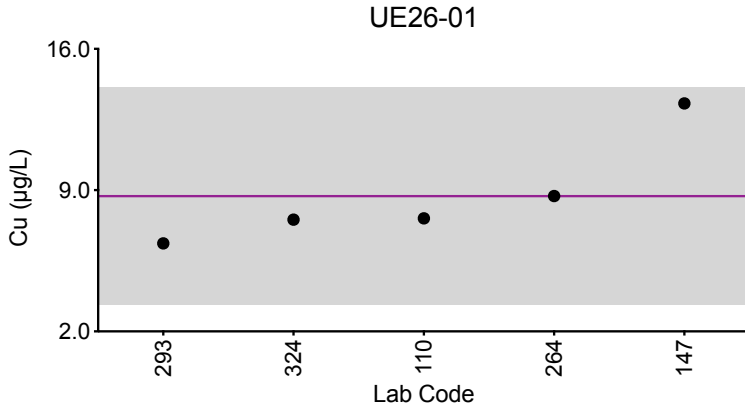
Urine Cu ($\mu\text{g/L}$)						
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
110	ICP-MS/MS	7.60	118	95.0	18.9	47.0
116	ICP-MS/MS	<6.0	89.3	69.5	13.5	*23.8
147	ICP-MS	13.3	126	103	22.9	54.9
264	ICP-MS	8.71	121	97.71	19.73	47.36
293	DRC/CC-ICP-MS	6.36	106.8	87.09	16.53	42.59
324	ICP-MS	7.539	115.501	92.491	17.929	46.337
Summary Statistics						
		UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
Arithmetic Mean (\bar{x})		8.7	113	91	18.2	48
Arithmetic SD (s)		2.7	13	12	3.2	4
Arithmetic RSD (%)		31	12	13	18	8.3
Number of Sample Measurements (N)		5	6	6	6	5

*Denotes a statistical Outlier.



Results for Event #1, 2026: Summary Figures

Urine Cu



Legend:

● Labs

Horizontal purple line = arithmetic mean of all laboratories.

Gray area = $\pm 2SD$ of the mean.

The mean and $\pm 2SD$ of all laboratories are not intended to be quality specifications and are included for informational purposes only.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

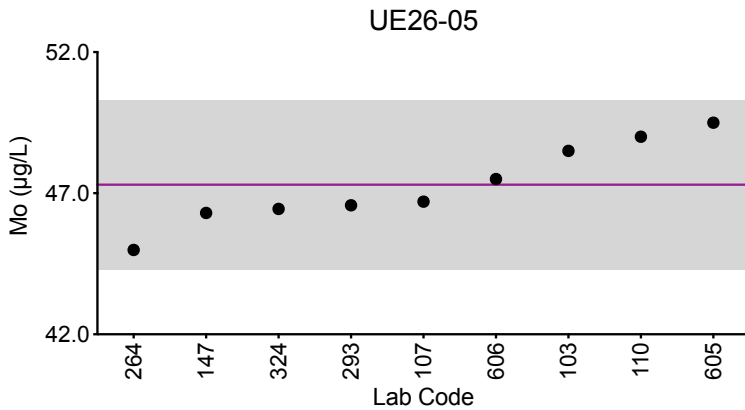
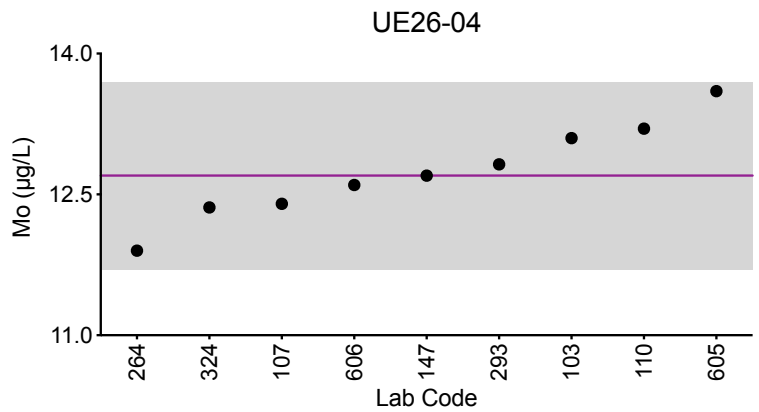
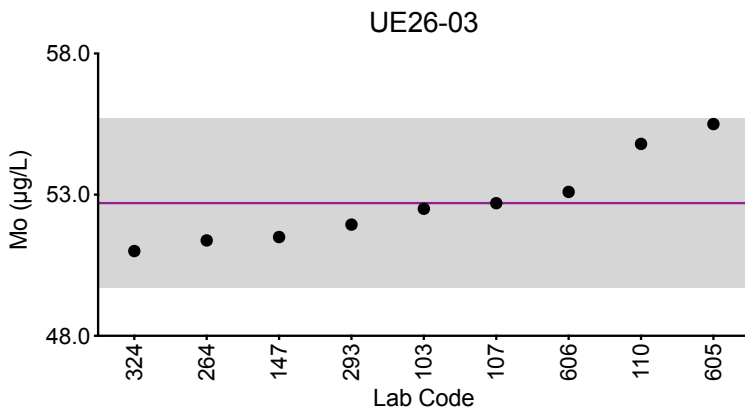
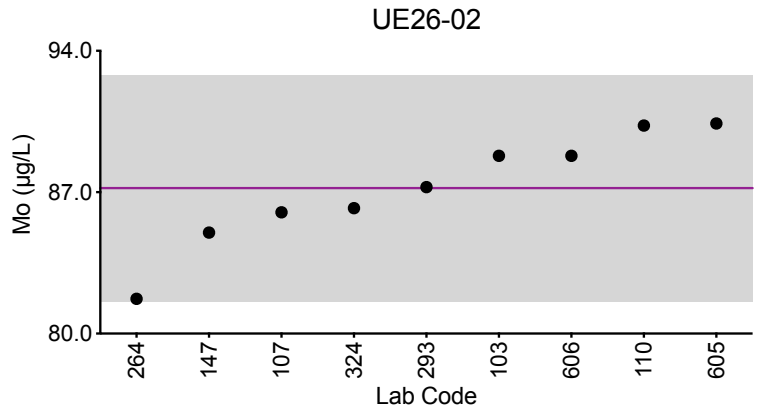
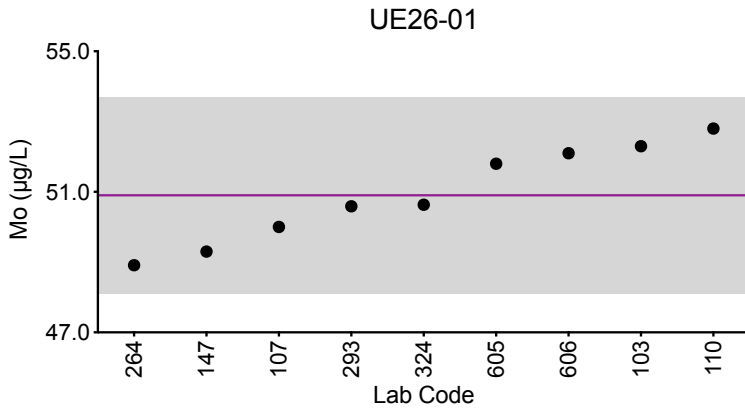
Urine Mo ($\mu\text{g/L}$)						
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
103	ICP-MS/MS	52.3	88.8	52.5	13.1	48.5
107	ICP-MS	50.0	86.0	52.7	12.4	46.7
110	ICP-MS/MS	52.8	90.3	54.8	13.2	49.0
147	ICP-MS	49.3	85.0	51.5	12.7	46.3
264	ICP-MS	48.91	81.72	51.38	11.90	44.99
293	DRC/CC-ICP-MS	50.59	87.25	51.94	12.82	46.57
324	ICP-MS	50.633	86.212	51.002	12.361	46.445
605	ICP-MS	51.8	90.4	55.5	13.6	49.5
606	ICP-MS/MS	52.1	88.8	53.1	12.6	47.5
Summary Statistics						
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05	
Arithmetic Mean (\bar{x})	50.9	87.2	52.7	12.7	47.3	
Arithmetic SD (s)	1.4	2.8	1.5	0.5	1.5	
Arithmetic RSD (%)	2.8	3.2	2.8	3.9	3.2	
Number of Sample Measurements (N)	9	9	9	9	9	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Summary Figures

Urine Mo



Legend:

● Labs

Horizontal purple line = arithmetic mean of all laboratories.

Gray area = $\pm 2SD$ of the mean.

The mean and $\pm 2SD$ of all laboratories are not intended to be quality specifications and are included for informational purposes only.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Urine Ni ($\mu\text{g/L}$)						
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
103	ICP-MS/MS	4.42	8.94	0.778	5.31	2.22
107	DRC/CC-ICP-MS	4.29	8.89	0.772	5.30	2.12
110	ICP-MS/MS	4.49	9.07	0.82	5.55	2.38
147	ICP-MS	4.41	8.95	<0.646	5.52	2.02
264	ICP-MS	*5.85	9.48	0.83	6.13	2.57
293	DRC/CC-ICP-MS	4.28	8.74	0.79	5.28	2.21
324	ICP-MS	4.715	9.152	*1.179	5.654	2.781
605	ICP-MS	4.28	8.67	0.696	5.79	2.14

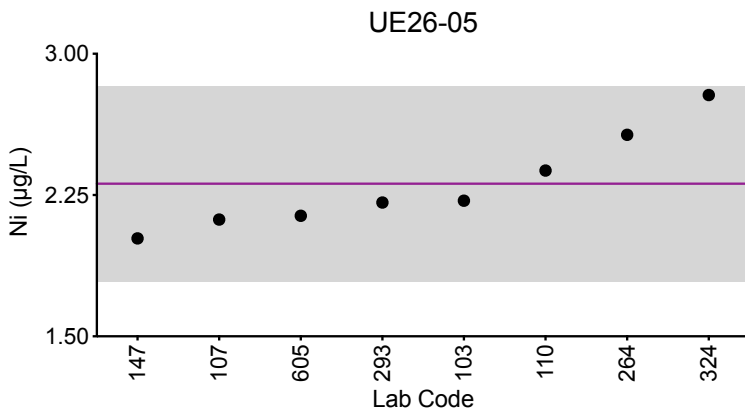
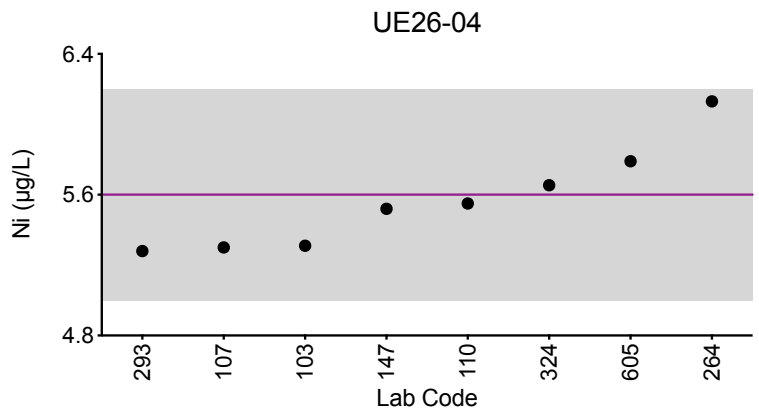
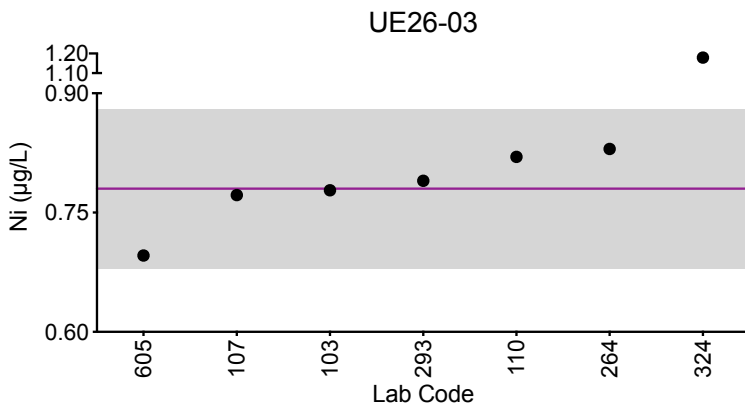
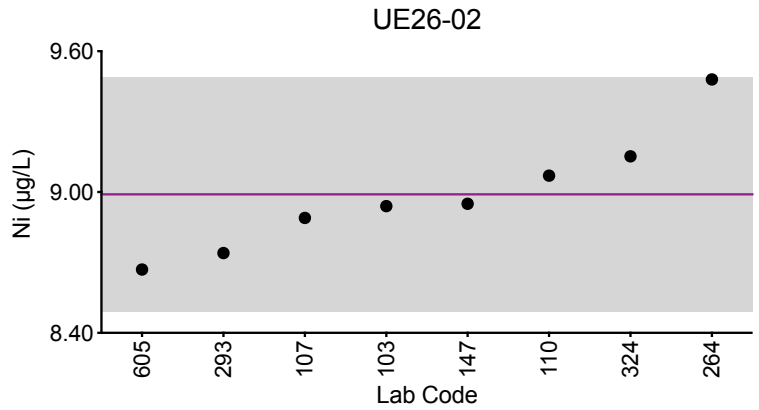
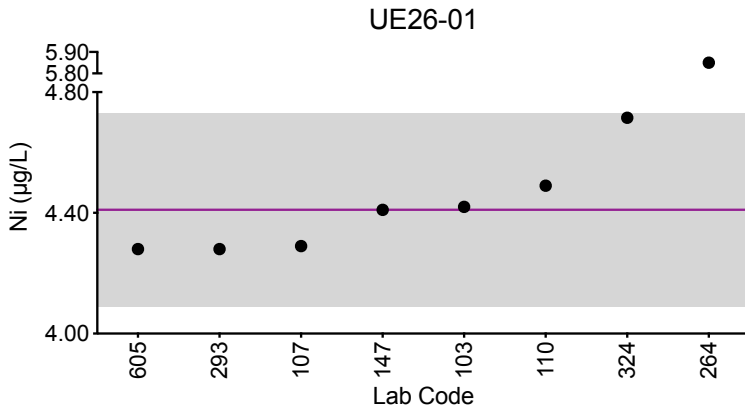
Summary Statistics						
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05	
Arithmetic Mean (\bar{x})	4.41	8.99	0.78	5.6	2.31	
Arithmetic SD (s)	0.16	0.25	0.05	0.3	0.26	
Arithmetic RSD (%)	3.6	2.8	6.4	5.2	11	
Number of Sample Measurements (N)	7	8	6	8	8	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Summary Figures

Urine Ni



Legend:

● Labs

Horizontal purple line = arithmetic mean of all laboratories.

Gray area = $\pm 2SD$ of the mean.

The mean and $\pm 2SD$ of all laboratories are not intended to be quality specifications and are included for informational purposes only.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

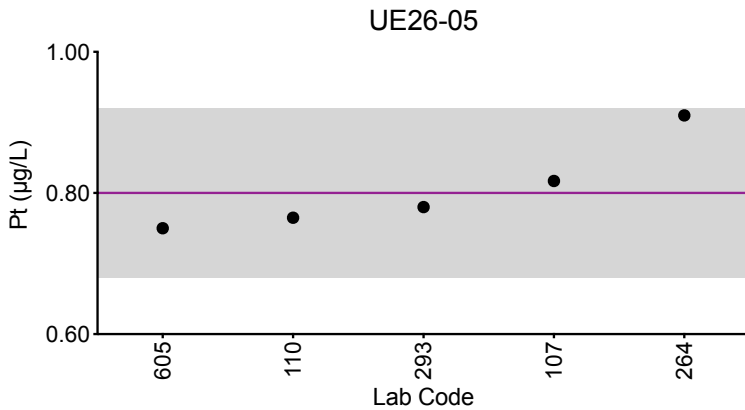
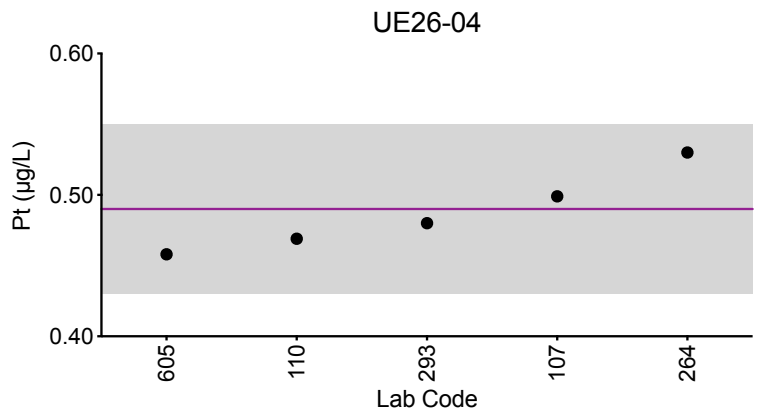
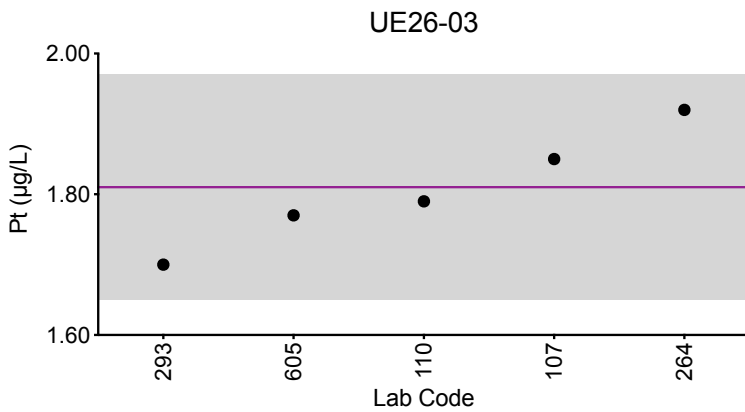
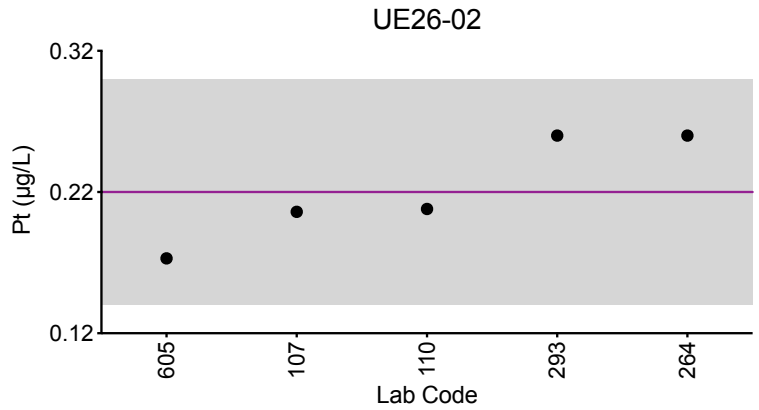
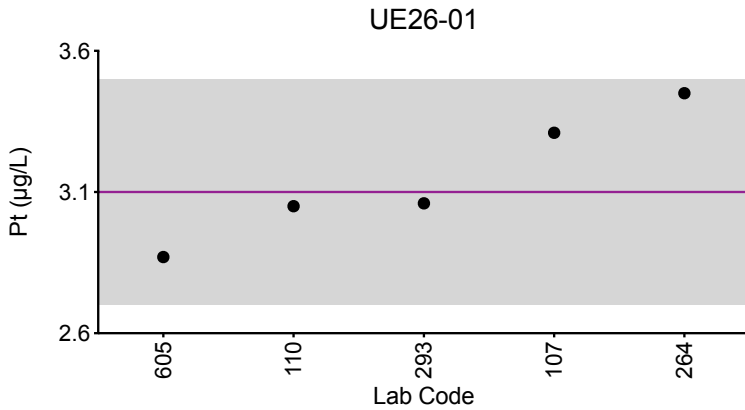
Urine Pt ($\mu\text{g/L}$)						
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
107	ICP-MS	3.31	0.206	1.85	0.499	0.817
110	ICP-MS/MS	3.05	0.208	1.79	0.469	0.765
264	ICP-MS	3.45	0.26	1.92	0.53	0.91
293	DRC/CC-ICP-MS	3.06	0.26	1.7	0.48	0.78
605	ICP-MS	2.87	0.173	1.77	0.458	0.750
Summary Statistics						
		UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
Arithmetic Mean (\bar{x})		3.1	0.22	1.81	0.49	0.80
Arithmetic SD (s)		0.2	0.04	0.08	0.03	0.06
Arithmetic RSD (%)		7.3	18	4.4	5.7	7.5
Number of Sample Measurements (N)		5	5	5	5	5

*Denotes a statistical Outlier.



Results for Event #1, 2026: Summary Figures

Urine Pt



Legend:

● Labs

Horizontal purple line = arithmetic mean of all laboratories.

Gray area = $\pm 2SD$ of the mean.

The mean and $\pm 2SD$ of all laboratories are not intended to be quality specifications and are included for informational purposes only.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

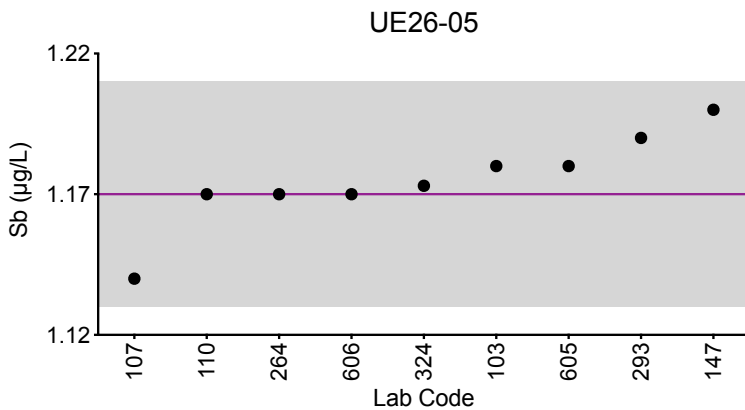
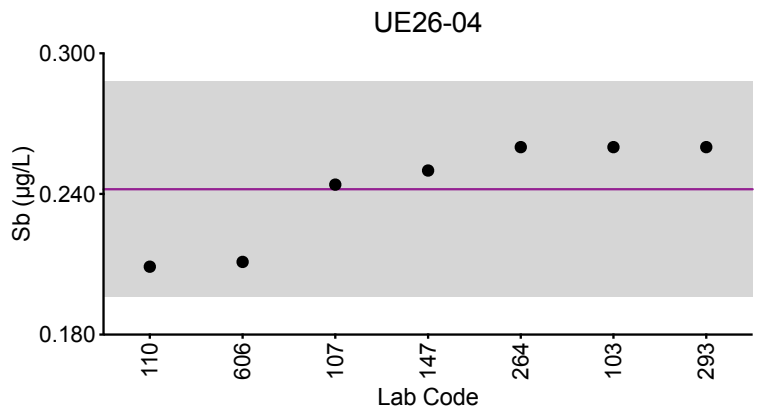
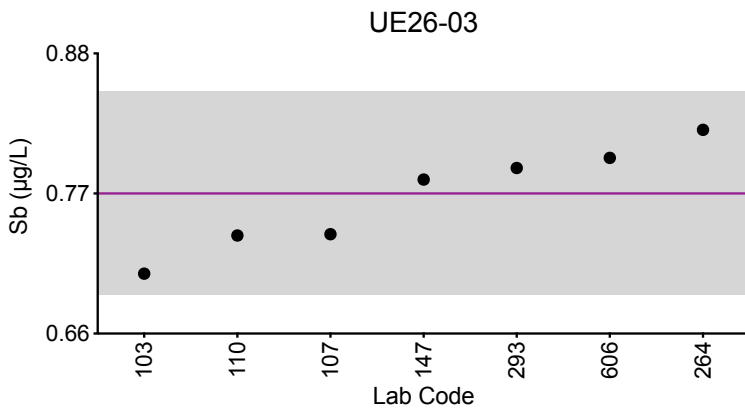
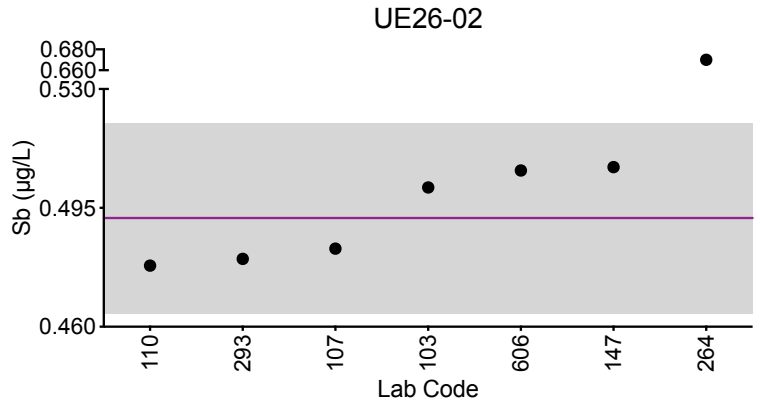
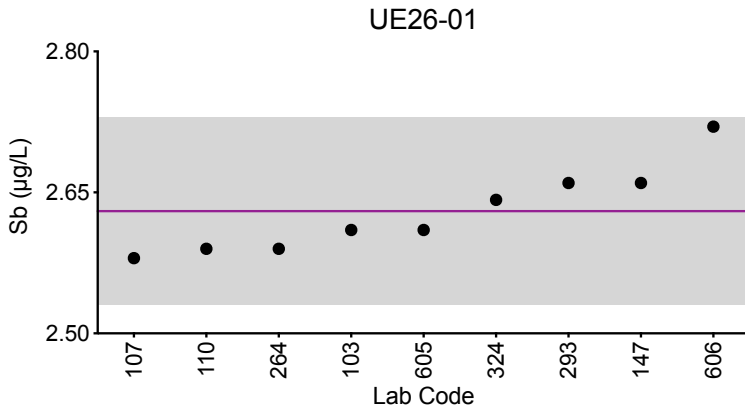
Urine Sb ($\mu\text{g/L}$)						
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
103	ICP-MS/MS	2.61	0.501	0.707	0.260	1.18
107	ICP-MS	2.58	0.483	0.738	0.244	1.14
110	ICP-MS/MS	2.59	0.478	0.737	0.209	1.17
147	ICP-MS	2.66	0.507	0.781	0.250	1.20
264	ICP-MS	2.59	*0.67	0.82	0.26	1.17
293	DRC/CC-ICP-MS	2.66	0.48	0.79	0.26	1.19
324	ICP-MS	2.642	<1	<1	<1	1.173
605	ICP-MS	2.61	<0.800	<0.800	<0.800	1.18
606	ICP-MS/MS	2.72	0.506	0.798	0.211	1.17
Summary Statistics						
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05	
Arithmetic Mean (\bar{x})	2.63	0.492	0.77	0.242	1.17	
Arithmetic SD (s)	0.05	0.014	0.04	0.023	0.02	
Arithmetic RSD (%)	1.9	2.8	5.2	9.5	1.4	
Number of Sample Measurements (N)	9	6	7	7	9	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Summary Figures

Urine Sb



Legend:

● Labs

Horizontal purple line = arithmetic mean of all laboratories.

Gray area = $\pm 2SD$ of the mean.

The mean and $\pm 2SD$ of all laboratories are not intended to be quality specifications and are included for informational purposes only.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

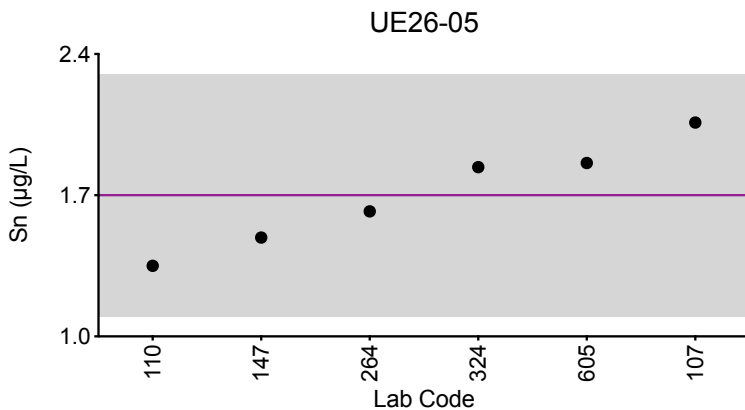
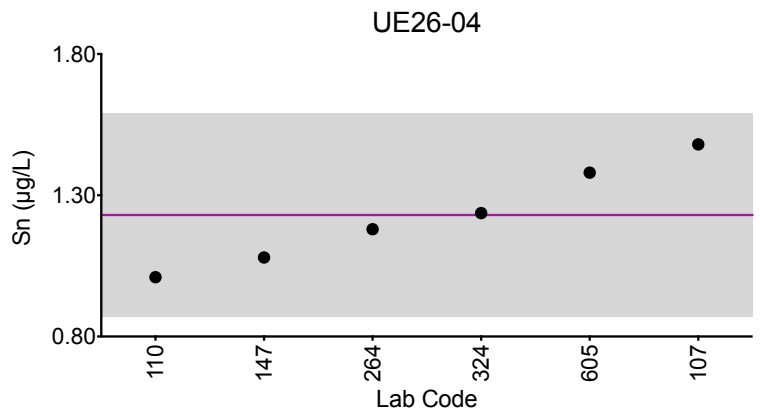
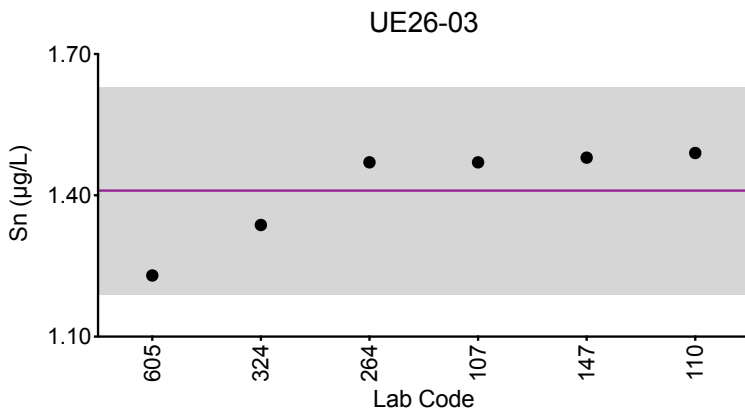
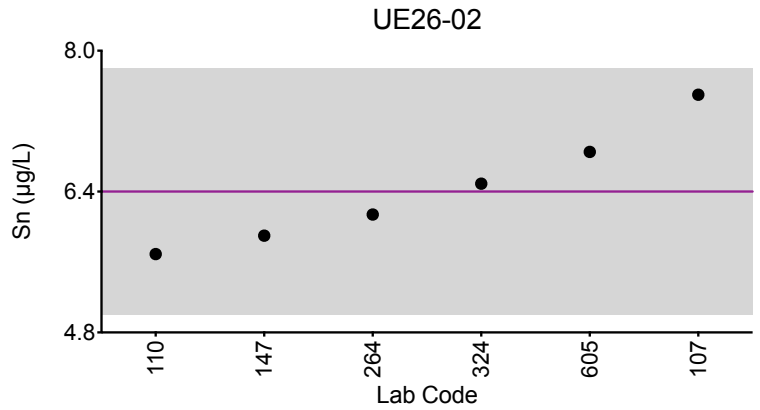
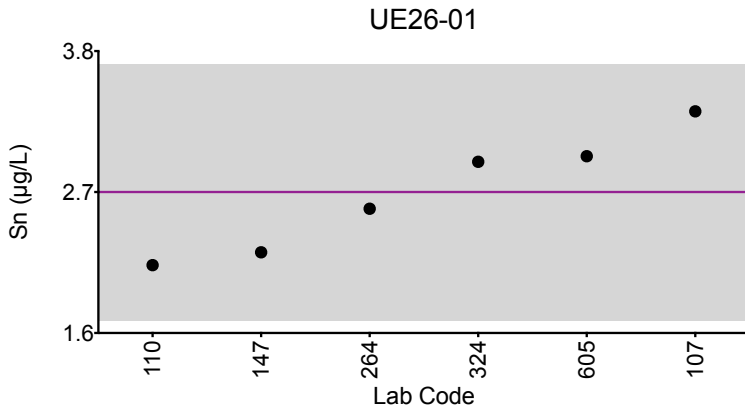
Urine Sn ($\mu\text{g/L}$)						
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
107	ICP-MS	3.33	7.50	1.47	1.48	2.06
110	ICP-MS/MS	2.13	5.69	1.49	1.01	1.35
147	ICP-MS	2.23	5.90	1.48	1.08	1.49
264	ICP-MS	2.57	6.14	1.47	1.18	1.62
324	ICP-MS	2.936	6.490	1.337	1.237	1.839
605	ICP-MS	2.98	6.85	1.23	1.38	1.86
Summary Statistics						
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05	
Arithmetic Mean (\bar{x})	2.7	6.4	1.41	1.23	1.7	
Arithmetic SD (s)	0.5	0.7	0.11	0.18	0.3	
Arithmetic RSD (%)	19	11	7.8	15	15	
Number of Sample Measurements (N)	6	6	6	6	6	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Summary Figures

Urine Sn



Legend:

● Labs

Horizontal purple line = arithmetic mean of all laboratories.

Gray area = $\pm 2SD$ of the mean.

The mean and $\pm 2SD$ of all laboratories are not intended to be quality specifications and are included for informational purposes only.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

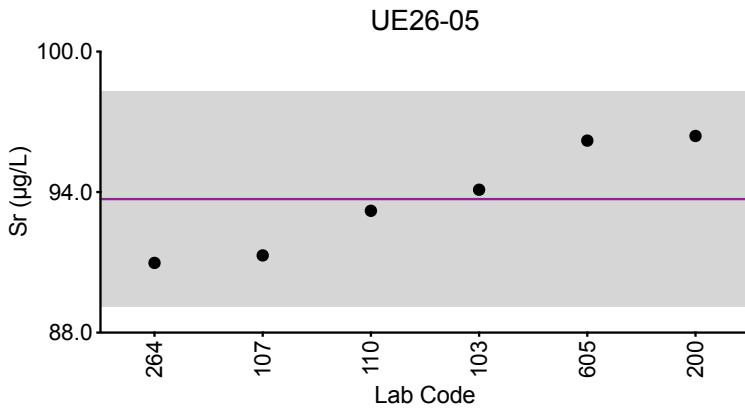
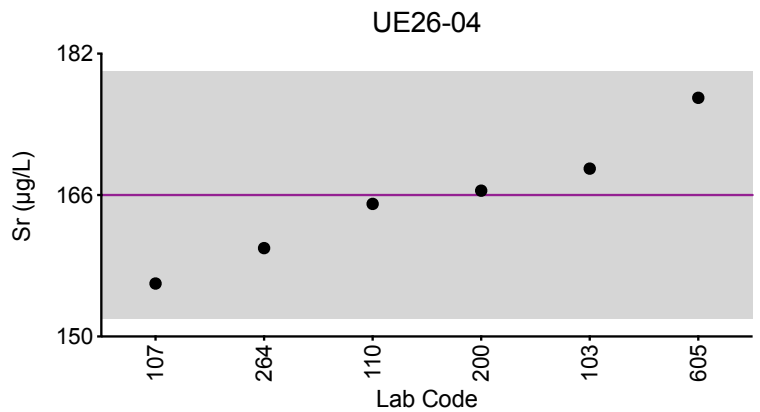
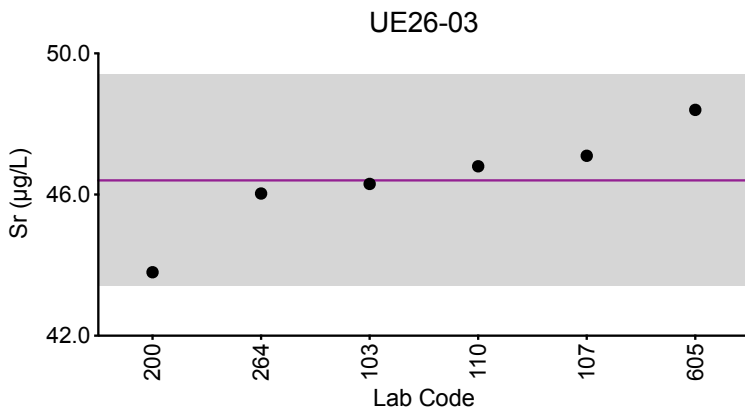
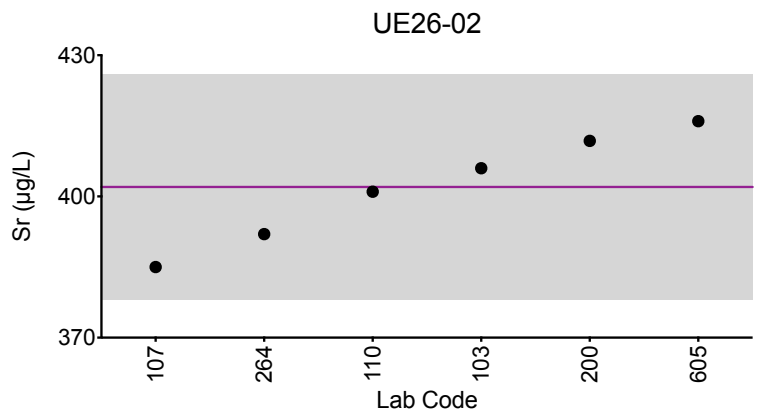
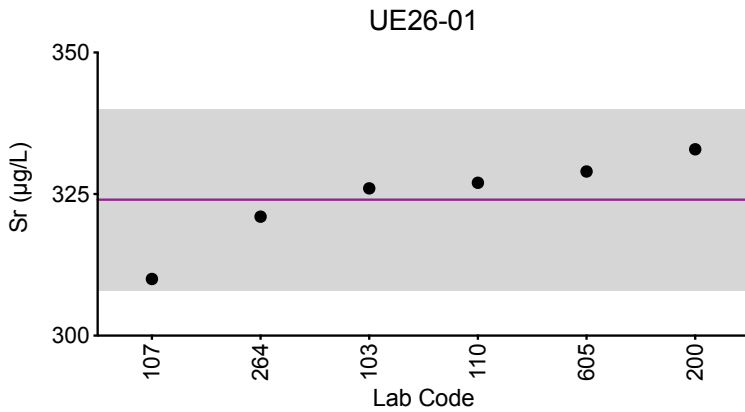
Urine Sr ($\mu\text{g/L}$)						
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
103	ICP-MS/MS	326	406	46.3	169	94.1
107	ICP-MS	310	385	47.1	156	91.3
110	ICP-MS/MS	327	401	46.8	165	93.2
200	ICP-MS	332.9	411.8	43.8	166.5	96.4
264	ICP-MS	321	392	46.03	160	90.98
605	ICP-MS	329	416	48.4	177	96.2
Summary Statistics						
		UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
Arithmetic Mean (\bar{x})		324	402	46.4	166	93.7
Arithmetic SD (s)		8	12	1.5	7	2.3
Arithmetic RSD (%)		2.5	3.0	3.2	4.2	2.5
Number of Sample Measurements (N)		6	6	6	6	6

*Denotes a statistical Outlier.



Results for Event #1, 2026: Summary Figures

Urine Sr



Legend:

● Labs

Horizontal purple line = arithmetic mean of all laboratories.

Gray area = $\pm 2SD$ of the mean.

The mean and $\pm 2SD$ of all laboratories are not intended to be quality specifications and are included for informational purposes only.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

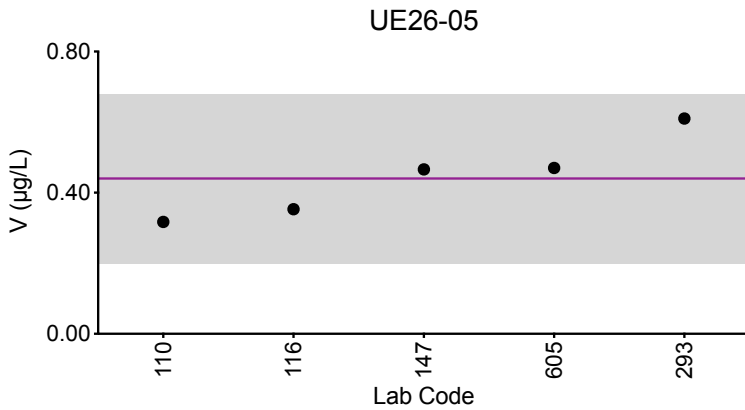
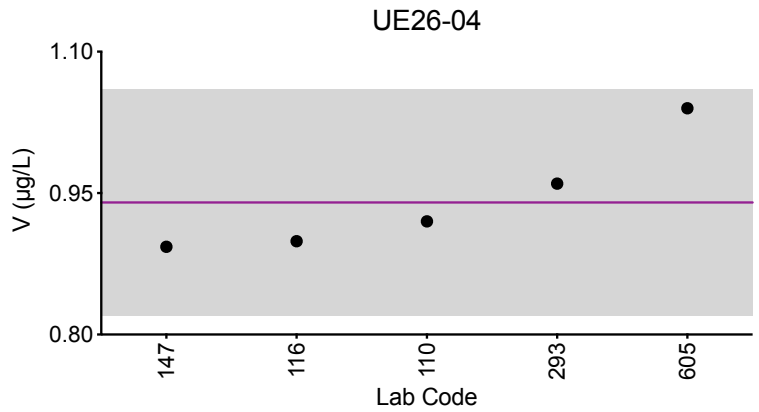
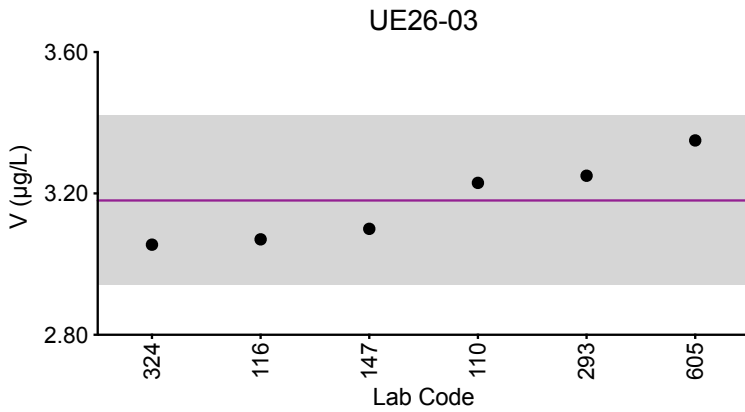
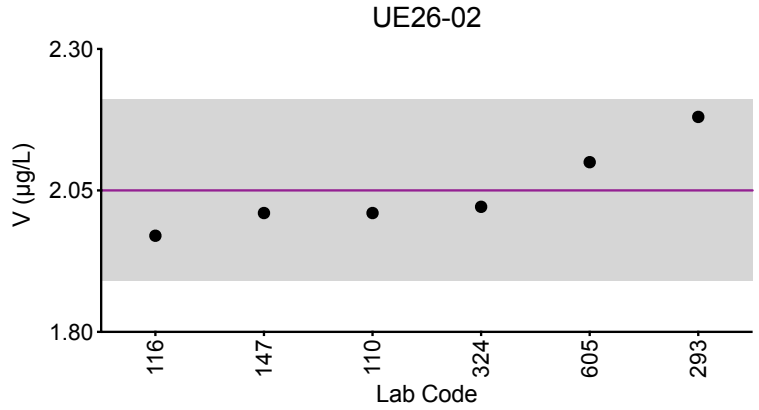
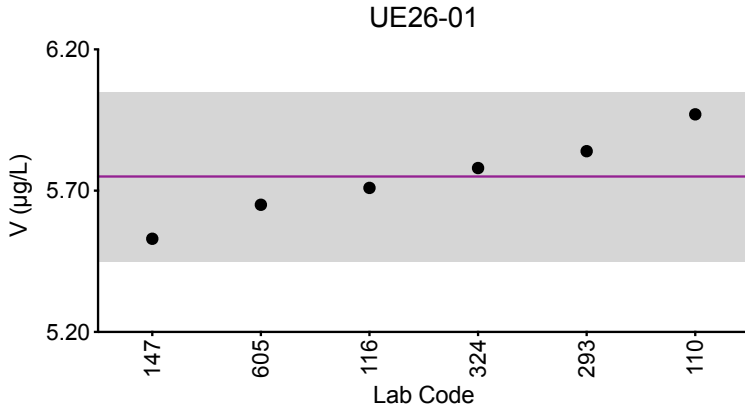
Urine V ($\mu\text{g/L}$)						
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
110	ICP-MS/MS	5.97	2.01	3.23	0.920	0.317
116	ICP-MS/MS	5.71	1.97	3.07	0.899	0.353
147	DRC/CC-ICP-MS	5.53	2.01	3.10	0.893	0.466
293	DRC/CC-ICP-MS	5.84	2.18	3.25	0.96	0.61
324	ICP-MS	5.780	2.021	3.055	<1	<1
605	ICP-MS	5.65	2.10	3.35	1.04	0.470
Summary Statistics						
		UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
Arithmetic Mean (\bar{x})		5.75	2.05	3.18	0.94	0.44
Arithmetic SD (s)		0.15	0.08	0.12	0.06	0.12
Arithmetic RSD (%)		2.6	3.9	3.8	6.4	27
Number of Sample Measurements (N)		6	6	6	5	5

*Denotes a statistical Outlier.



Results for Event #1, 2026: Summary Figures

Urine V



Legend:

● Labs

Horizontal purple line = arithmetic mean of all laboratories.

Gray area = $\pm 2SD$ of the mean.

The mean and $\pm 2SD$ of all laboratories are not intended to be quality specifications and are included for informational purposes only.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

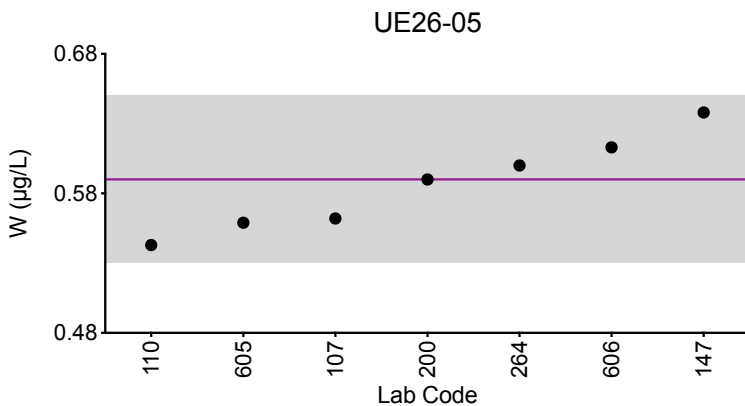
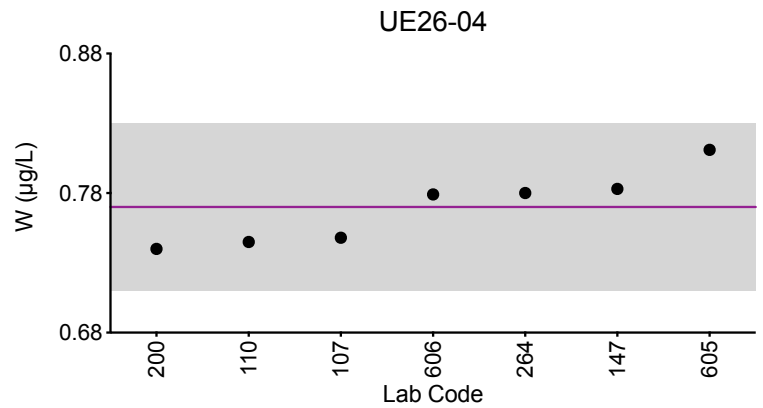
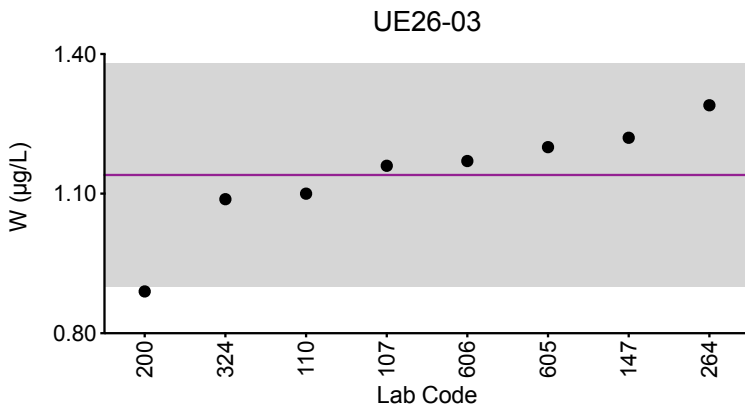
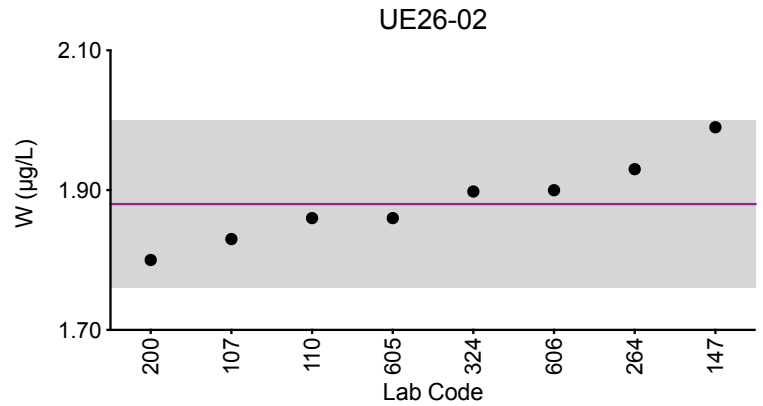
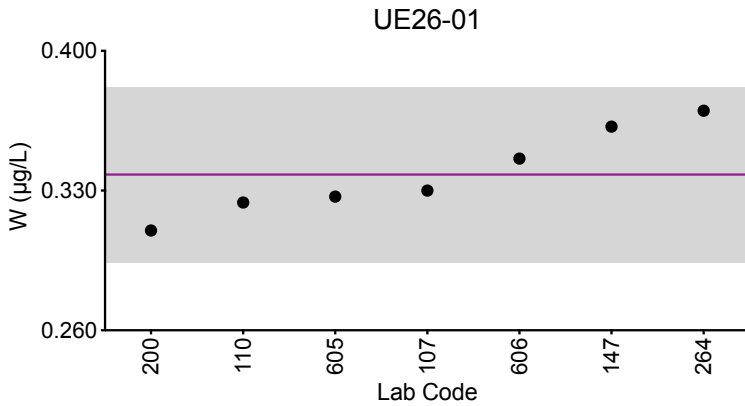
Urine W ($\mu\text{g/L}$)						
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
107	ICP-MS	0.330	1.83	1.16	0.748	0.562
110	ICP-MS/MS	0.324	1.86	1.10	0.745	0.543
147	ICP-MS	0.362	1.99	1.22	0.783	0.638
200	ICP-MS	0.31	1.8	0.89	0.74	0.59
264	ICP-MS	0.37	1.93	1.29	0.78	0.60
324	ICP-MS	<1	1.898	1.088	<1	<1
605	ICP-MS	0.327	1.86	1.20	0.811	0.559
606	ICP-MS/MS	0.346	1.90	1.17	0.779	0.613
Summary Statistics						
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05	
Arithmetic Mean (\bar{x})	0.338	1.88	1.14	0.77	0.59	
Arithmetic SD (s)	0.022	0.06	0.12	0.03	0.03	
Arithmetic RSD (%)	6.5	3.2	11	3.4	5.8	
Number of Sample Measurements (N)	7	8	8	7	7	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Summary Figures

Urine W



Legend:

● Labs

Horizontal purple line = arithmetic mean of all laboratories.

Gray area = $\pm 2SD$ of the mean.

The mean and $\pm 2SD$ of all laboratories are not intended to be quality specifications and are included for informational purposes only.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

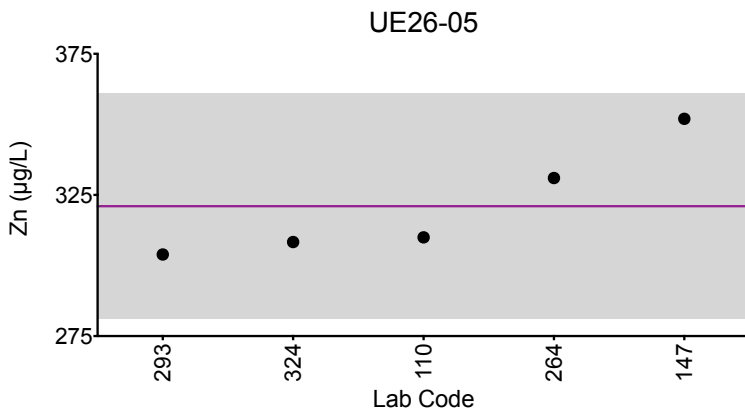
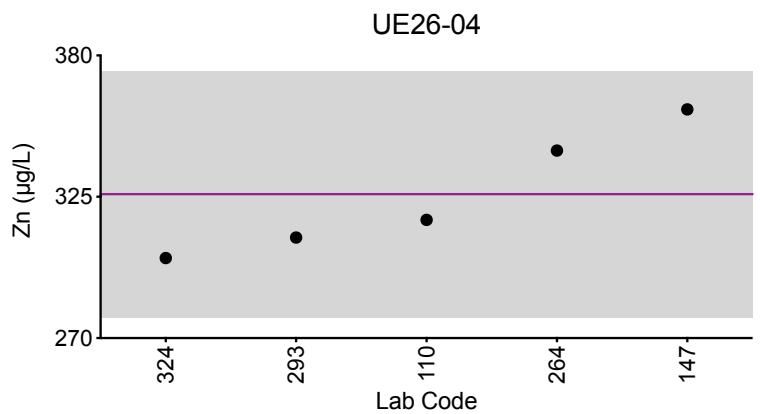
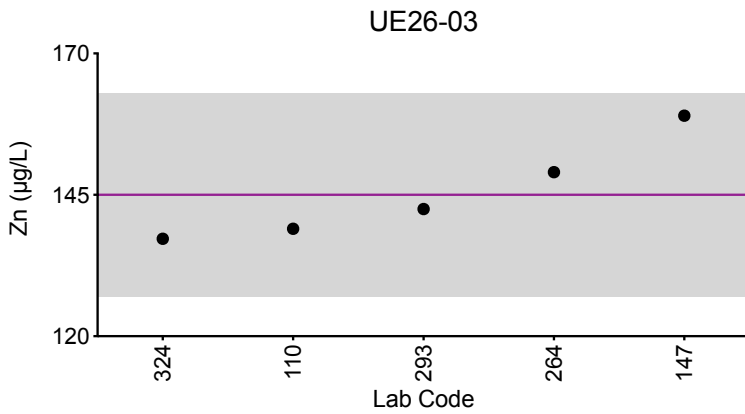
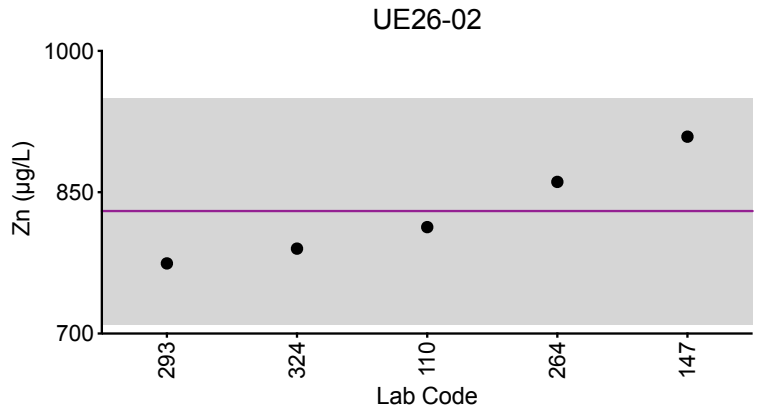
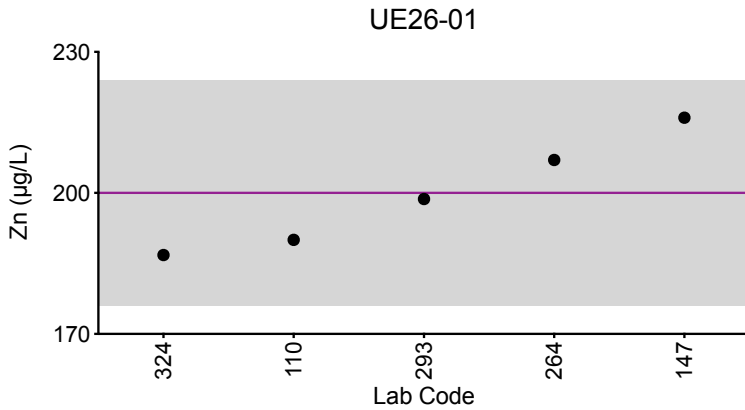
Urine Zn ($\mu\text{g/L}$)						
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
110	ICP-MS/MS	190	813	139	316	310
147	ICP-MS	216	909	159	359	352
264	ICP-MS	207	861	149	343	331
293	DRC/CC-ICP-MS	198.69	774.51	142.48	309.15	303.92
324	ICP-MS	186.780	790.110	137.221	301.166	308.319
Summary Statistics						
		UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
Arithmetic Mean (\bar{x})		200	830	145	326	321
Arithmetic SD (s)		12	60	9	24	20
Arithmetic RSD (%)		6.0	7.2	6.2	7.4	6.2
Number of Sample Measurements (N)		5	5	5	5	5

*Denotes a statistical Outlier.



Results for Event #1, 2026: Summary Figures

Urine Zn



Legend:

● Labs

Horizontal purple line = arithmetic mean of all laboratories.

Gray area = $\pm 2SD$ of the mean.

The mean and $\pm 2SD$ of all laboratories are not intended to be quality specifications and are included for informational purposes only.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Urine AI ($\mu\text{g/L}$)						
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
147	ICP-MS	35.9	<13.5	<13.5	21.2	17.7
264	ICP-MS	34.79	13.36	8.61	33.24	19.33
293	DRC/CC-ICP-MS	31.84	11.06	7.02	23.2	17.81
324	ICP-MS	27.555	11.145	6.414	19.227	16.293
Summary Statistics						
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05	
Arithmetic Mean (\bar{x})	33	11.9	7.3	24	17.8	
Arithmetic SD (s)	4	1.3	1.1	6	1.2	
Arithmetic RSD (%)	12	11	15	25	6.7	
Number of Sample Measurements (N)	4	3	3	4	4	

*Denotes a statistical Outlier.



Results for Event #1, 2026:
Laboratory Data and Summary Statistics

Urine Li (µg/L)						
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
110	ICP-MS/MS	19.5	15.1	8.0	27.3	27.3
147	ICP-MS	20.6	16.7	8.26	28.8	29.6

Summary Statistics						
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05	
Arithmetic Mean (\bar{x})	20.1	15.9	8.1	28.1	28.5	
Arithmetic SD (s)	0.8	1.1	0.2	1.1	1.6	
Arithmetic RSD (%)	4.0	6.9	2.2	3.9	5.6	
Number of Sample Measurements (N)	2	2	2	2	2	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Urine Se ($\mu\text{g/L}$)						
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
103	ICP-MS/MS	83.8	212	110	41.9	26.4
110	ICP-MS/MS	73.8	190	95.3	40.5	23.8
147	ICP-MS	83.1	213	112	48.0	29.1
293	DRC/CC-ICP-MS	76.62	191.94	100.32	41.07	24.49
Summary Statistics						
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05	
Arithmetic Mean (\bar{x})	79	202	104	43	25.9	
Arithmetic SD (s)	5	12	8	3	2.4	
Arithmetic RSD (%)	6.3	5.9	7.7	7.0	9.3	
Number of Sample Measurements (N)	4	4	4	4	4	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Urine Te ($\mu\text{g/L}$)						
Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
110	ICP-MS/MS	0.311	2.49	0.585	1.24	0.87
147	ICP-MS	0.322	2.70	0.665	1.49	0.875

Summary Statistics						
	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05	
Arithmetic Mean (\bar{x})	0.317	2.6	0.63	1.4	0.873	
Arithmetic SD (s)	0.008	0.2	0.06	0.2	0.004	
Arithmetic RSD (%)	2.5	5.8	9.5	13	0.46	
Number of Sample Measurements (N)	2	2	2	2	2	

*Denotes a statistical Outlier.



Results for Event #1, 2026:
Additional Elements in Urine

Urine Ag (µg/L)

Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
147	ICP-MS	<0.108	<0.108	<0.108	<0.108	<0.108

Urine B (µg/L)

Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
200	ICP-MS	545	626	741	400	872

Urine Bi (µg/L)

Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
147	ICP-MS	<0.0773	<0.0773	<0.0773	<0.0773	<0.0773
264	ICP-MS	1.55	0.38	0.11	0.05	0.08

Urine Fe (µg/L)

Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
324	ICP-MS	10.111	12.999	4.520	4.866	8.998

Urine I (µg/L)

Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
147	ICP-MS	78.2	87.9	75.2	55.1	102

Urine Th (µg/L)

Lab Code	Method	UE26-01	UE26-02	UE26-03	UE26-04	UE26-05
147	ICP-MS	<0.0951	<0.0951	<0.0951	<0.0951	<0.0951



Department of Health
Wadsworth Center

Event #1, 2026

**Trace Elements in
Serum**

Wadsworth Center
NEW YORK STATE DEPARTMENT OF HEALTH
Trace Elements Laboratory



**Event #1, 2026:
Trace Elements in Serum**

PT Materials

Test materials were prepared from human serum obtained from BioIVT. The company certifies that these materials were tested by FDA approved methods and found to be negative for HIV 1₂ and HIV-1 RNA, and non-reactive to HBsAg, HCV3 and STS. Units of serum were filtered into polypropylene containers through cheesecloth to remove particulates and supplemented with aluminum (Al), cobalt (Co), chromium (Cr), copper (Cu), selenium (Se), zinc, (Zn), arsenic (As), beryllium (Be), cadmium (Cd), mercury (Hg), manganese (Mn), molybdenum (Mo), nickel (Ni), lead (Pb), platinum (Pt), antimony (Sb), tin (Sn), strontium (Sr), titanium (Ti), thallium (Tl), uranium (U), vanadium (V) and tungsten (W). Serum samples were homogenized overnight prior to aliquoting 2-mL into polypropylene vials. PT samples were stored at -80°C until the week of the PT event, when they were thawed at 4°C prior to circulation to laboratories for analysis.

Graded Elements

Six elements in serum are formally graded: Al, Co, Cr, Cu, Se, and Zn. Target values for the graded elements are assigned to these pools based on (a) the robust mean calculated from data reported by all laboratories, or (b) if a robust mean is not possible, the arithmetic mean after outlier deletion.

Additional Elements

An additional 25 were reported by at least one participant: As, Ba, Be, Bi, Cd, Cs, Fe, Hg, I, Li, Mg, Mn, Mo, Ni, Pb, Pt, Sb, Sn, Sr, Te, Ti, Tl, U, V, and W. These data are included here to provide a more complete characterization of the PT materials. All results reported by participant laboratories are tabulated and organized by lab code. The PT data are graphed for visual comparison purposes for all elements where at least five laboratories reported a value greater than the LOD. A statistical summary table is provided for samples where at least two comparable values were reported as above the LOD.

The summary statistics for the additional elements are provided for educational purposes only, i.e., no acceptable response is implied. However, it is expected that each laboratory would wish to investigate a potential source of bias if warranted by these data. Future events might result in additional elements becoming graded if a consensus can be reached regarding desired quality specifications.



Results for Event #1, 2026: Summary Statistics

	Serum AI ($\mu\text{g/L}$)				
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
Target (Arithmetic Mean (\bar{x}))	24	70	48	94	40.6
Upper Limit	29	84	58	113	48.7
Lower Limit	19	56	38	75	32.5
Arithmetic SD (s)	3	6	4	6	1.7
Arithmetic RSD (%)	13	8.6	8.3	6.4	4.2
Number of Sample Measurements (N)	4	4	4	4	4

The acceptable range is based on quality specifications: $\pm 5 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 5 \mu\text{g/L}$ at concentrations less than or equal to $25 \mu\text{g/L}$. These quality specifications were established by New York State Department of Health's Wadsworth Center, the PT Program organizer.



Results for Event #1, 2026: Performance of Participating Laboratories

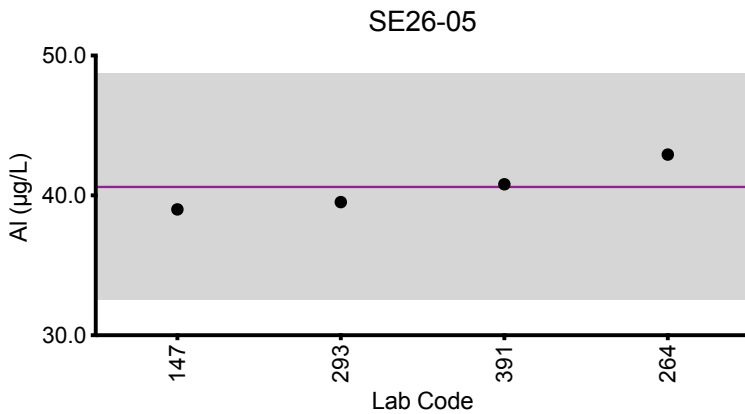
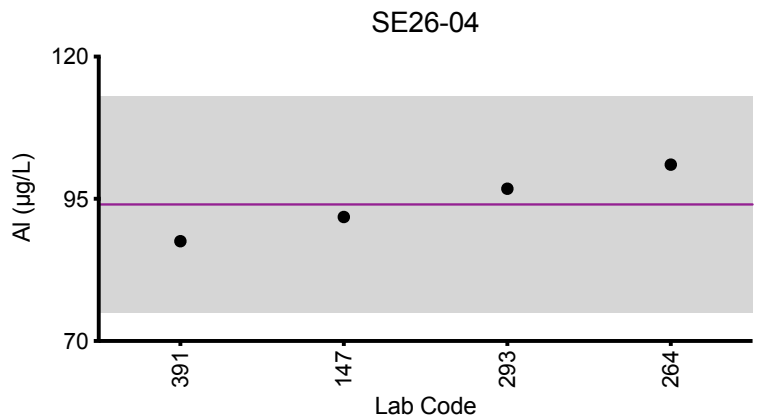
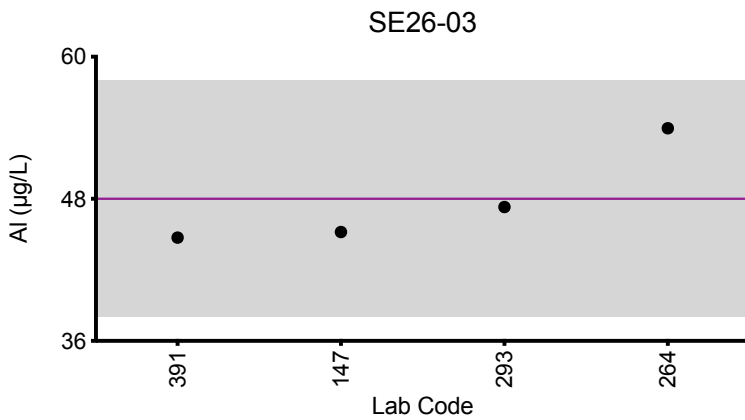
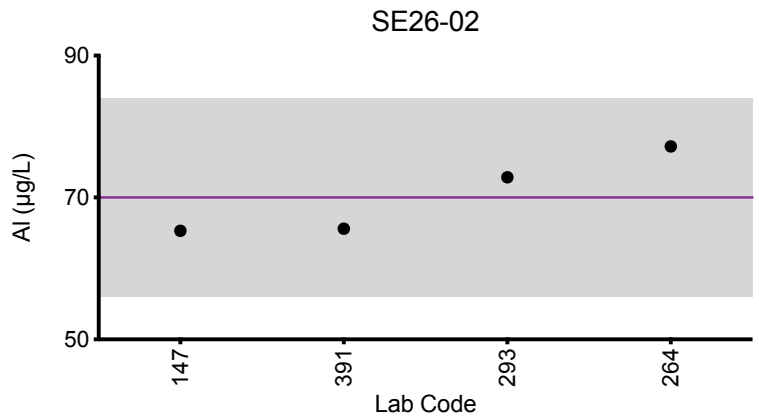
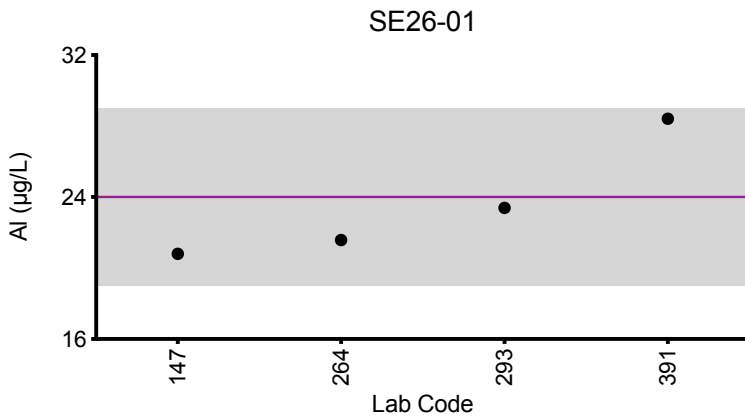
		Serum AI ($\mu\text{g/L}$)				
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
	Target	24	70	48	94	40.6
147	ETAAS-Z	20.8	65.3	45.2	91.8	39.0
264	ICP-MS	21.58	77.20	53.96	101	42.92
293	DRC/CC-ICP-MS	23.39	72.85	47.31	96.77	39.52
391	ETAAS-Z	28.41	65.59	44.72	87.55	40.8

Based on the grading criteria for AI in Serum, 100% of results were satisfactory, with 0 of the 4 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Serum AI



Legend:

● Labs

Horizontal purple line = assigned target value based on the arithmetic mean of all laboratories.
Gray area = acceptable range based on quality specifications:

$\pm 5 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 5 \mu\text{g/L}$ at concentrations less than or equal to $25 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

	Serum Co ($\mu\text{g/L}$)				
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
Target (Arithmetic Mean (\bar{x}))	9.36	0.966	3.8	5.5	0.61
Upper Limit	10.86	2.466	5.3	7.0	2.11
Lower Limit	7.86	0.000	2.3	4.0	0.00
Arithmetic SD (s)	0.17	0.012	0.3	0.3	0.04
Arithmetic RSD (%)	1.8	1.2	6.9	4.9	6.6
Number of Sample Measurements (N)	4	4	5	5	5

The acceptable range is based on quality specifications: $\pm 1.5 \mu\text{g/L}$ or $\pm 15\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 1.5 \mu\text{g/L}$ at concentrations less than or equal to $10 \mu\text{g/L}$. These quality specifications were established based on discussions with the US FDA, and represent a consensus from a network of Trace Element PT program organizers.



Results for Event #1, 2026: Performance of Participating Laboratories

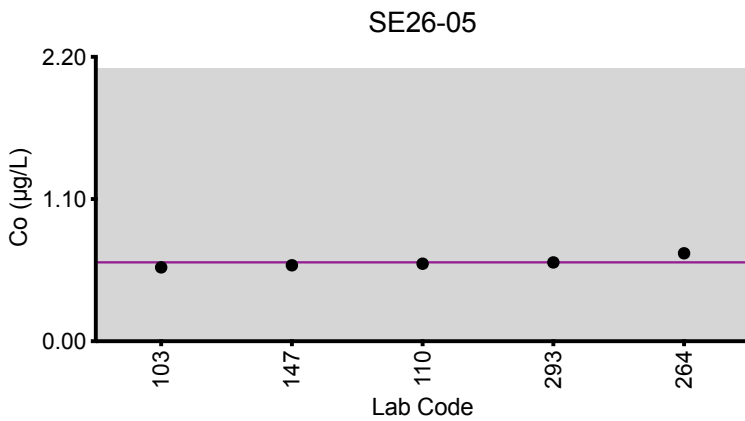
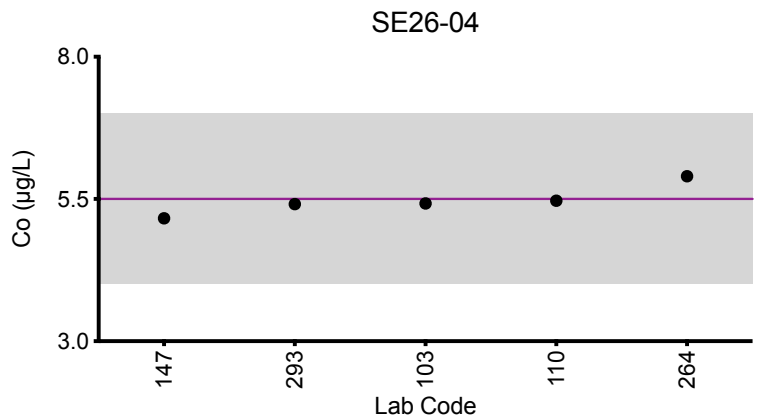
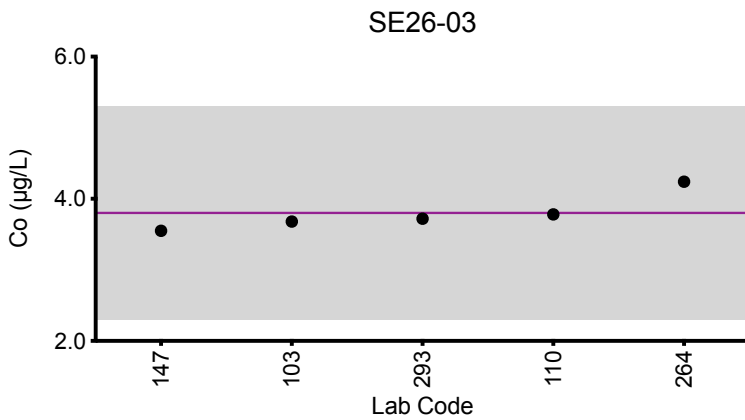
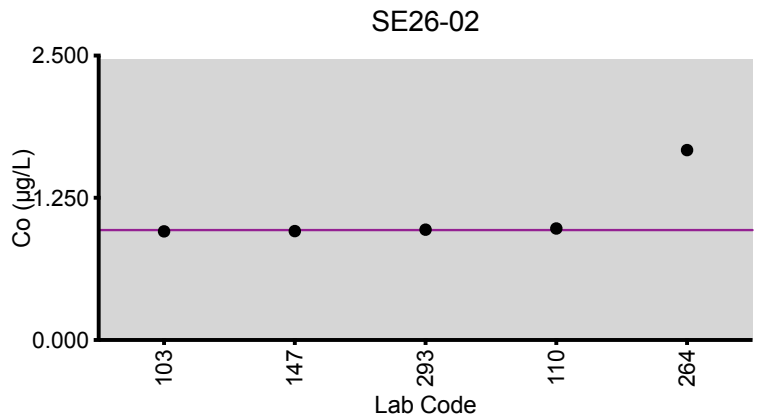
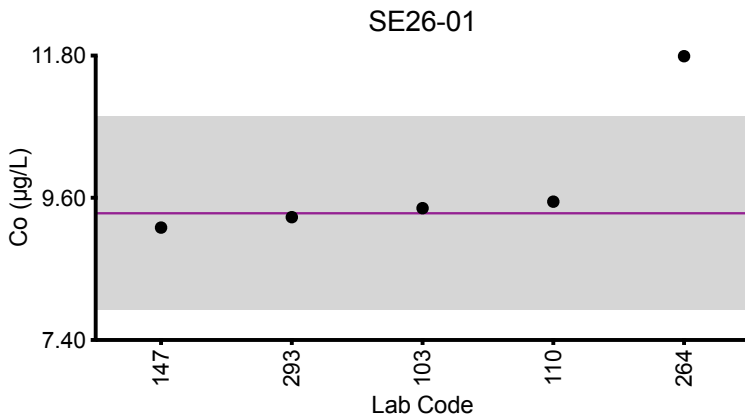
		Serum Co ($\mu\text{g/L}$)				
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
	Target	9.36	0.966	3.8	5.5	0.61
103	ICP-MS/MS	9.44	0.955	3.68	5.42	0.572
110	ICP-MS/MS	9.54	0.98	3.78	5.47	0.60
147	DRC/CC-ICP-MS	9.14	0.957	3.55	5.16	0.588
264	ICP-MS	*11.79 \uparrow	*1.67	4.24	5.90	0.68
293	DRC/CC-ICP-MS	9.3	0.97	3.72	5.41	0.61

Based on the grading criteria for Co in Serum, 96% of results were satisfactory, with 0 of the 5 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Serum Co



Legend:

● Labs

Horizontal purple line = assigned target value based on the arithmetic mean of all laboratories.
Gray area = acceptable range based on quality specifications:

$\pm 1.5 \mu\text{g/L}$ or $\pm 15\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 1.5 \mu\text{g/L}$ at concentrations less than or equal to $10 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

	Serum Cr ($\mu\text{g/L}$)				
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
Target (Arithmetic Mean (\bar{x}))	7.3	0.40	1.49	0.74	3.29
Upper Limit	9.3	2.40	3.49	2.74	5.29
Lower Limit	5.3	0.00	0.00	0.00	1.29
Arithmetic SD (s)	0.3	0.08	0.19	0.15	0.18
Arithmetic RSD (%)	3.8	20	13	20	5.5
Number of Sample Measurements (N)	5	4	5	5	5

The acceptable range is based on quality specifications: $\pm 2 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 2 \mu\text{g/L}$ at concentrations less than or equal to $10 \mu\text{g/L}$. These quality specifications were established based on discussions with the US FDA, and represent a consensus from a network of Trace Element PT program organizers.



Results for Event #1, 2026: Performance of Participating Laboratories

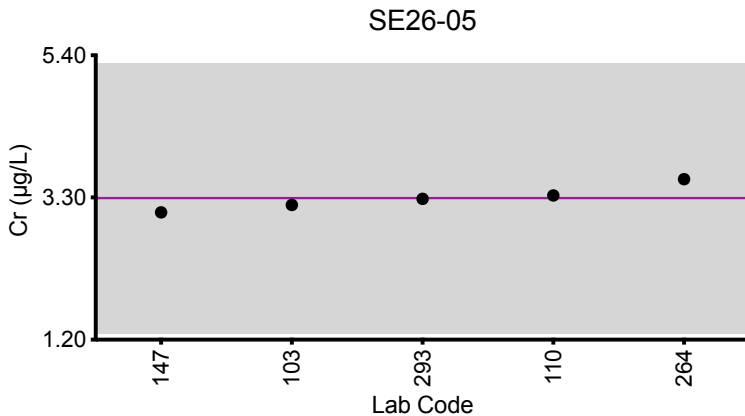
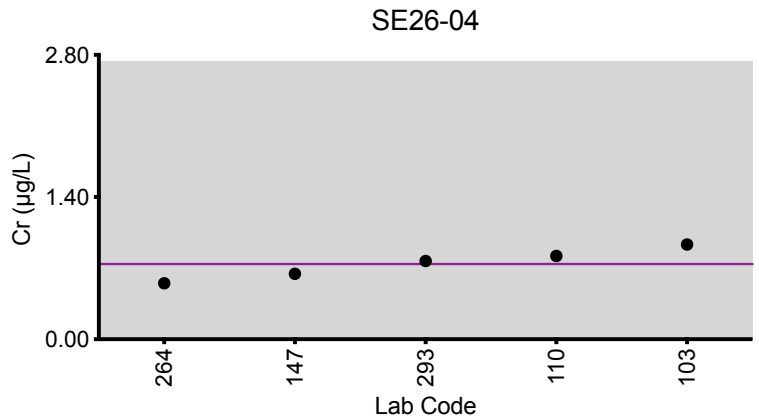
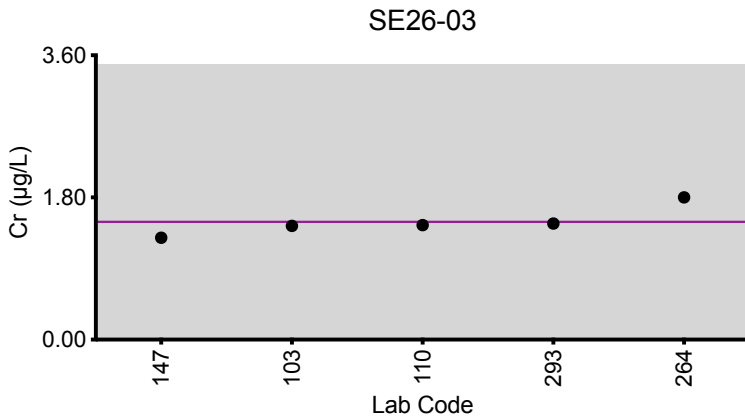
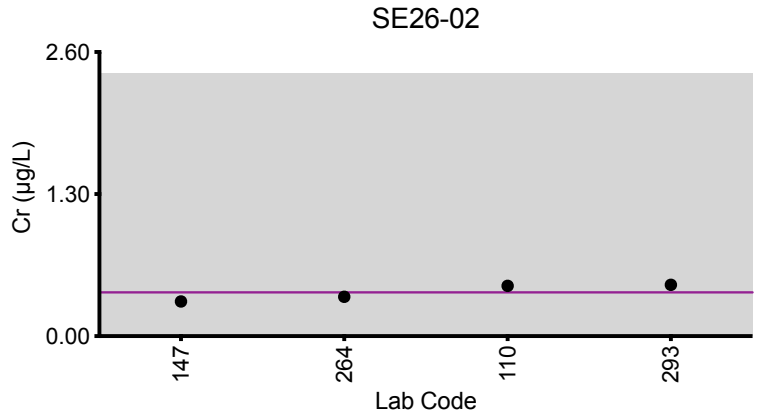
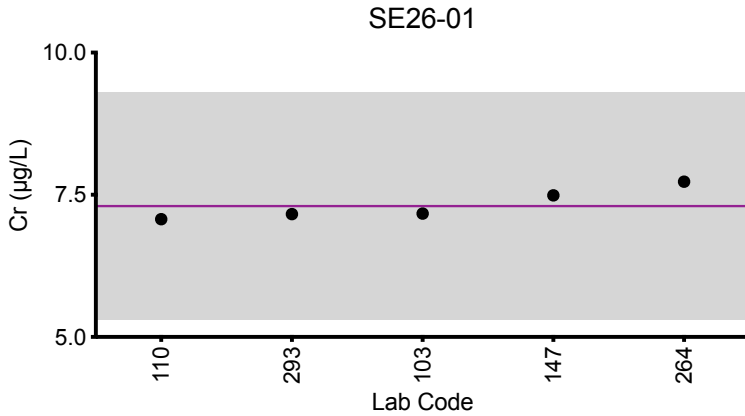
		Serum Cr ($\mu\text{g/L}$)				
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
	Target	7.3	0.40	1.49	0.74	3.29
103	ICP-MS/MS	7.17	<0.600	1.44	0.933	3.19
110	ICP-MS/MS	7.07	0.46	1.45	0.82	3.33
147	DRC/CC-ICP-MS	7.49	0.317	1.29	0.644	3.08
264	ICP-MS	7.73	0.36	1.80	0.55	3.57
293	DRC/CC-ICP-MS	7.16	0.47	1.47	0.77	3.28

Based on the grading criteria for Cr in Serum, 100% of results were satisfactory, with 0 of the 5 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Serum Cr



Legend:

● Labs

Horizontal purple line = assigned target value based on the arithmetic mean of all laboratories.
Gray area = acceptable range based on quality specifications:

$\pm 2 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 2 \mu\text{g/L}$ at concentrations less than or equal to $10 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

	Serum Cu ($\mu\text{g/L}$)				
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
Target (Arithmetic Mean (\bar{x}))	1180	1920	1640	700	870
Upper Limit	1360	2210	1890	805	1000
Lower Limit	1000	1630	1390	595	740
Arithmetic SD (s)	80	150	160	80	100
Arithmetic RSD (%)	6.8	7.8	9.8	11	11
Number of Sample Measurements (N)	5	5	5	5	5

The acceptable range is based on quality specifications: $\pm 95 \mu\text{g/L}$ or $\pm 15\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 95 \mu\text{g/L}$ at concentrations less than or equal to $635 \mu\text{g/L}$. These quality specifications were established by New York State Department of Health's Wadsworth Center, the PT Program organizer.



Results for Event #1, 2026: Performance of Participating Laboratories

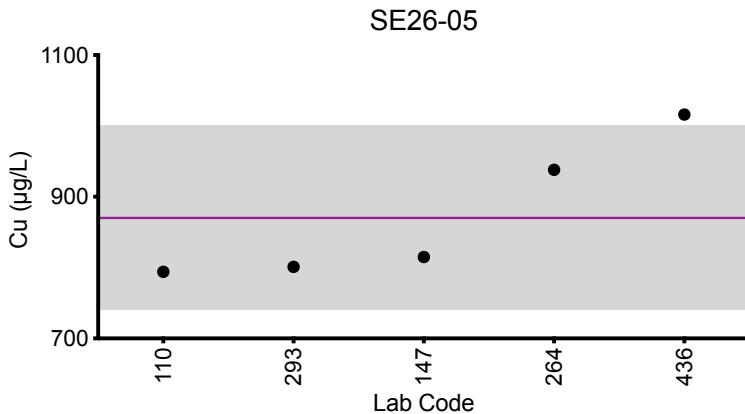
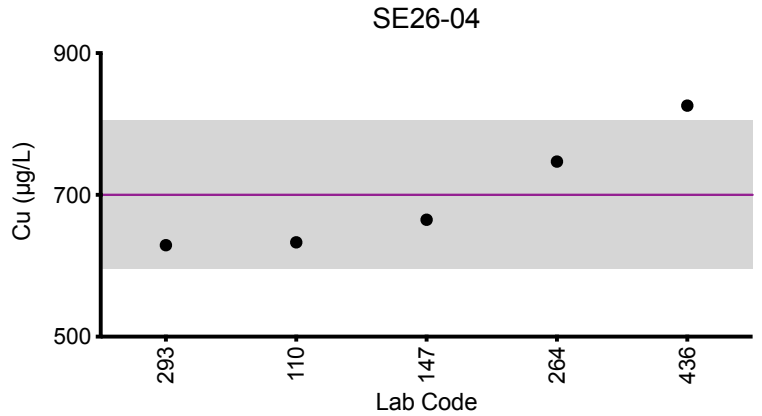
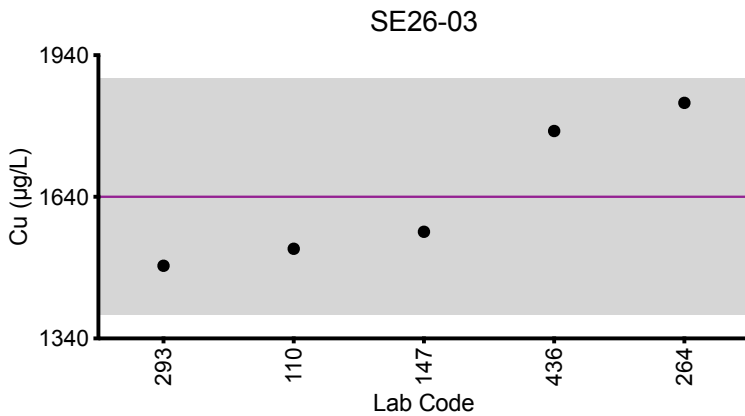
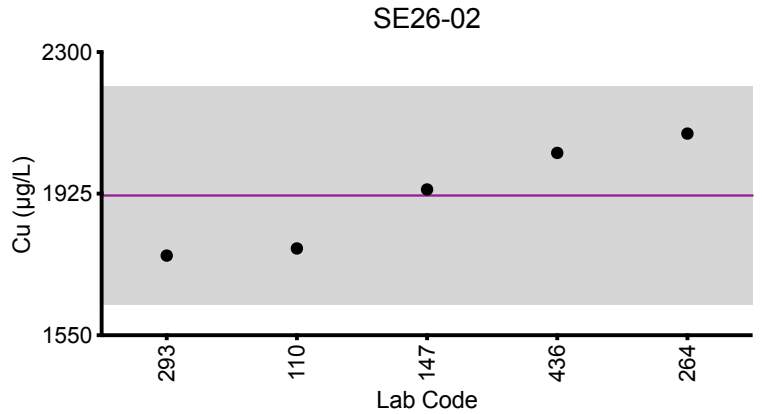
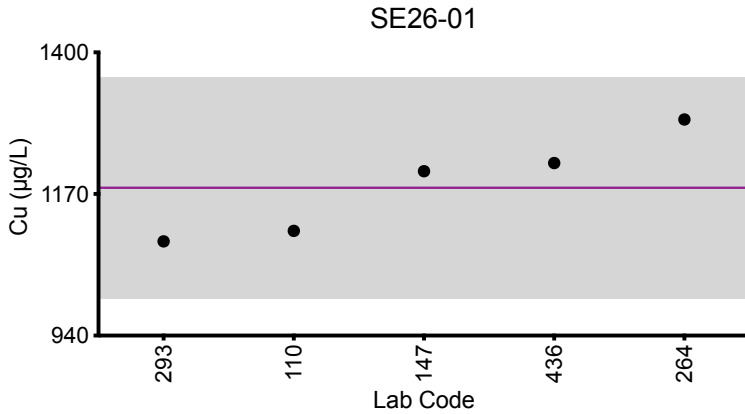
		Serum Cu ($\mu\text{g/L}$)				
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
	Target	1180	1920	1640	700	870
110	ICP-MS/MS	1110	1780	1530	633	794
147	DRC/CC-ICP-MS	1207	1936	1566	665	815
264	ICP-MS	1291	2084	1839	747	938
293	DRC/CC-ICP-MS	1093	1761	1494	629	801
436	FAAS	1220.225	2033	1779.4	826 ↑	1016 ↑

Based on the grading criteria for Cu in Serum, 92% of results were satisfactory, with 1 of the 5 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Serum Cu



Legend:

● Labs

Horizontal purple line = assigned target value based on the arithmetic mean of all laboratories.
Gray area = acceptable range based on quality specifications:

$\pm 95 \mu\text{g/L}$ or $\pm 15\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 95 \mu\text{g/L}$ at concentrations less than or equal to $635 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

	Serum Se ($\mu\text{g/L}$)				
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
Target (Arithmetic Mean (\bar{x}))	112	253	314	199	141
Upper Limit	134	304	377	239	169
Lower Limit	90	202	251	159	113
Arithmetic SD (s)	7	18	22	13	9
Arithmetic RSD (%)	6.3	7.1	7.0	6.5	6.4
Number of Sample Measurements (N)	6	6	6	6	6

The acceptable range is based on quality specifications: $\pm 2 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 2 \mu\text{g/L}$ at concentrations less than or equal to $10 \mu\text{g/L}$. These quality specifications were established by New York State Department of Health's Wadsworth Center, the PT Program organizer.



Results for Event #1, 2026: Performance of Participating Laboratories

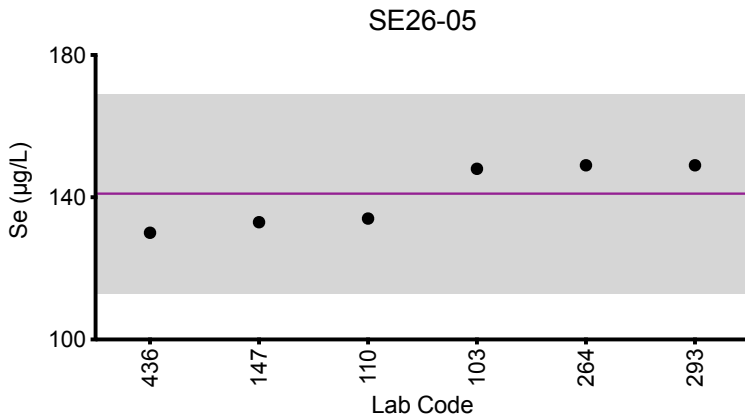
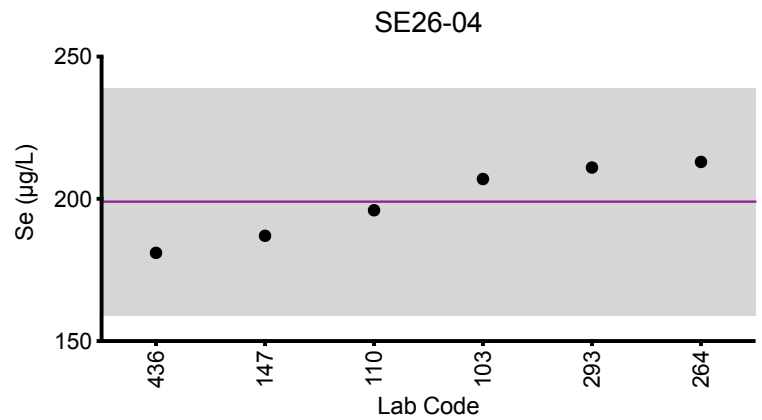
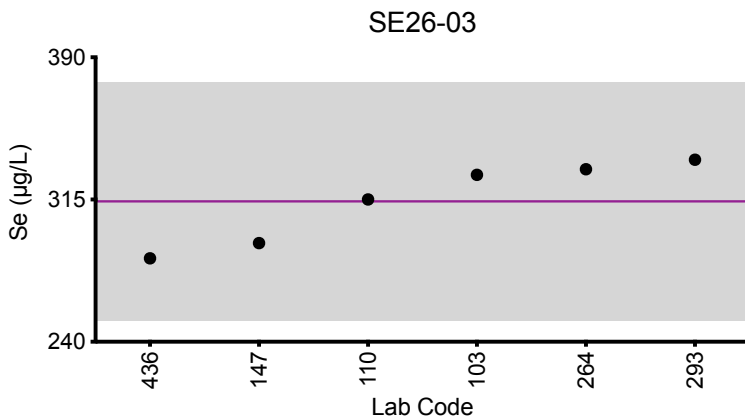
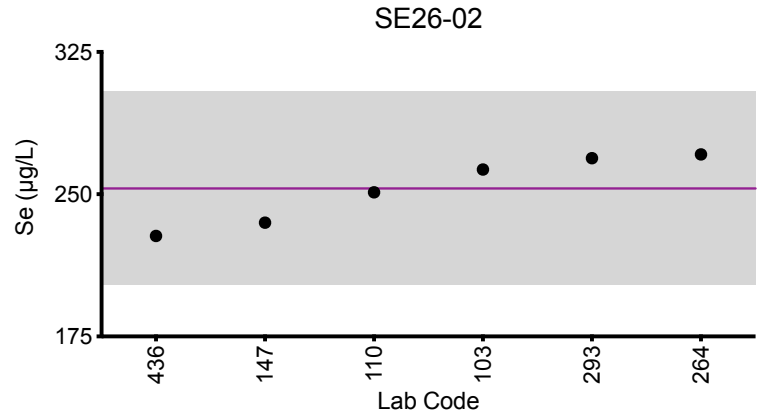
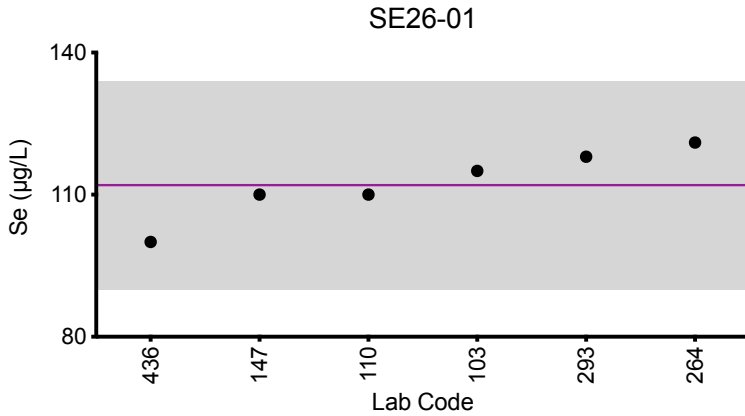
		Serum Se ($\mu\text{g/L}$)				
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
	Target	112	253	314	199	141
103	ICP-MS/MS	115	263	328	207	148
110	ICP-MS/MS	110	251	315	196	134
147	DRC/CC-ICP-MS	110	235	292	187	133
264	ICP-MS	121	271	331	213	149
293	DRC/CC-ICP-MS	118	269	336	211	149
436	ETAAS-Z	100	228	284	181	130

Based on the grading criteria for Se in Serum, 100% of results were satisfactory, with 0 of the 6 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Serum Se



Legend:

● Labs

Horizontal purple line = assigned target value based on the arithmetic mean of all laboratories.
Gray area = acceptable range based on quality specifications:

$\pm 2 \mu\text{g/L}$ or $\pm 20\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 2 \mu\text{g/L}$ at concentrations less than or equal to $10 \mu\text{g/L}$.



Results for Event #1, 2026: Summary Statistics

	Serum Zn ($\mu\text{g/L}$)				
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
Target (Arithmetic Mean (\bar{x}))	1820	1080	560	790	1490
Upper Limit	2090	1240	640	910	1710
Lower Limit	1550	920	480	670	1270
Arithmetic SD (s)	90	40	40	40	70
Arithmetic RSD (%)	4.9	3.7	7.1	5.1	4.7
Number of Sample Measurements (N)	4	4	4	4	4

The acceptable range is based on quality specifications: $\pm 15 \mu\text{g/L}$ or $\pm 15\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 15 \mu\text{g/L}$ at concentrations less than or equal to $100 \mu\text{g/L}$. These quality specifications were established by New York State Department of Health's Wadsworth Center, the PT Program organizer.



Results for Event #1, 2026: Performance of Participating Laboratories

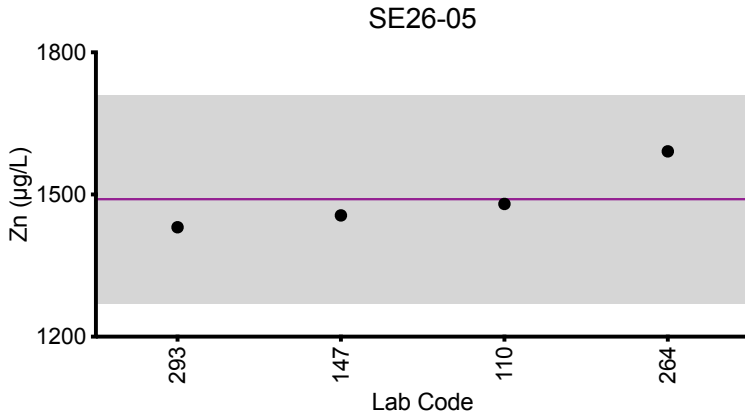
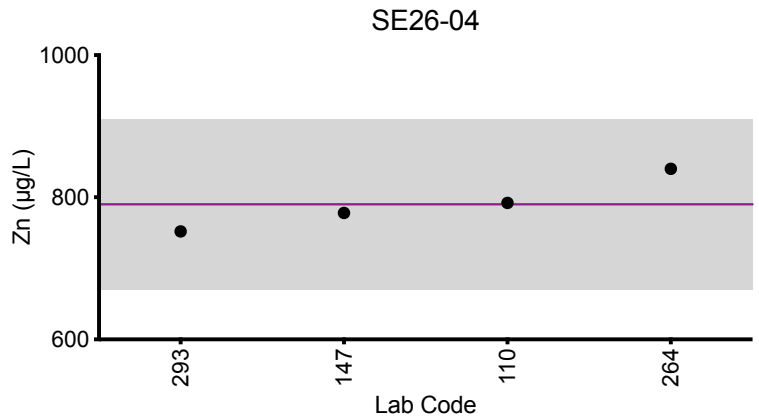
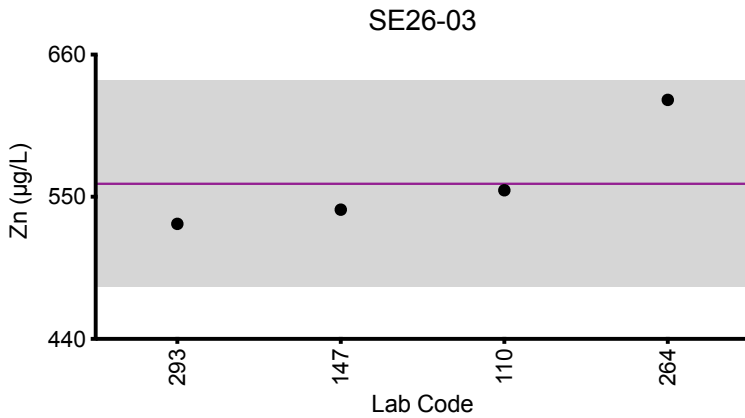
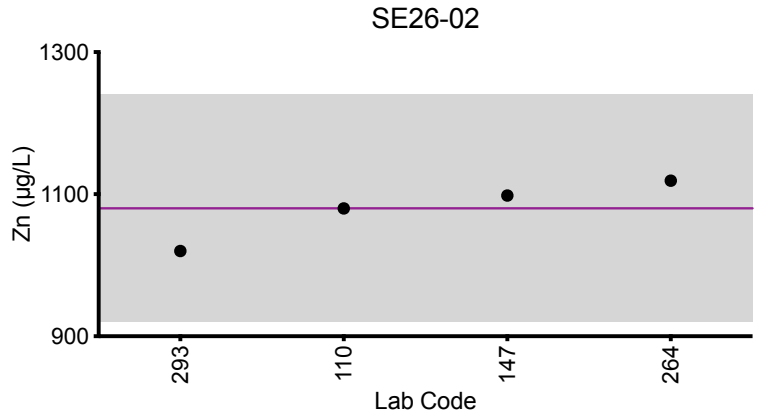
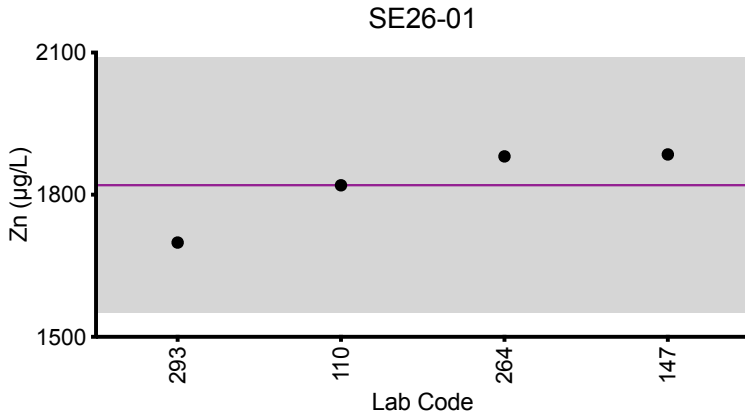
		Serum Zn ($\mu\text{g/L}$)				
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
	Target	1820	1080	560	790	1490
110	ICP-MS/MS	1820	1080	555	792	1480
147	DRC/CC-ICP-MS	1885	1098	540	778	1456
264	ICP-MS	1881	1119	625	840	1591
293	DRC/CC-ICP-MS	1699	1020	529	752	1431

Based on the grading criteria for Zn in Serum, 100% of results were satisfactory, with 0 of the 4 laboratories reporting 2 or more of the 5 results outside of the acceptable ranges.



Results for Event #1, 2026: Summary Figures

Serum Zn



Legend:

● Labs

Horizontal purple line = assigned target value based on the arithmetic mean of all laboratories. Gray area = acceptable range based on quality specifications:

$\pm 15 \mu\text{g/L}$ or $\pm 15\%$ around the target value, whichever is greater; thus, it is fixed at $\pm 15 \mu\text{g/L}$ at concentrations less than or equal to $100 \mu\text{g/L}$.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Serum Mn ($\mu\text{g/L}$)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
103	ICP-MS/MS	1.61	15.7	8.53	3.45	5.57
110	ICP-MS/MS	1.60	15.7	8.55	3.39	5.75
147	DRC/CC-ICP-MS	1.62	13.7	8.33	3.32	5.44
264	ICP-MS	*2.56	16.78	*9.57	3.54	6.00
293	DRC/CC-ICP-MS	1.640	15.11	8.25	3.39	5.500

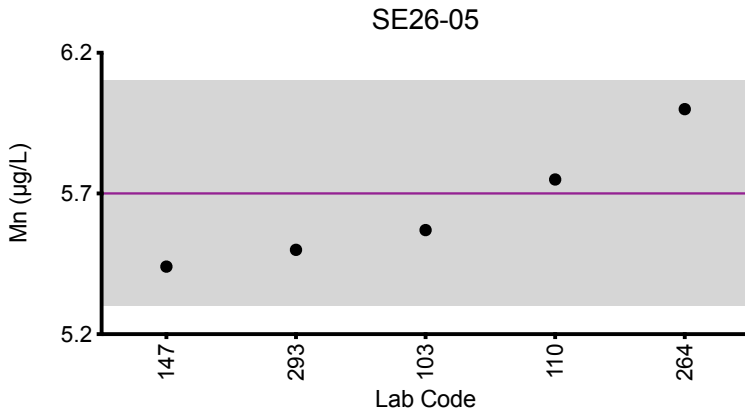
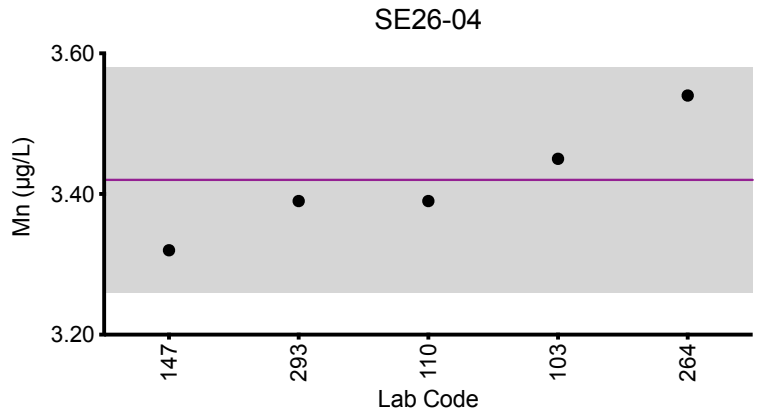
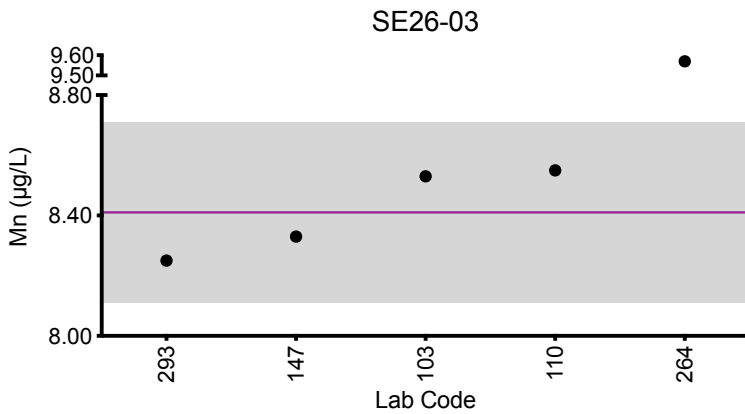
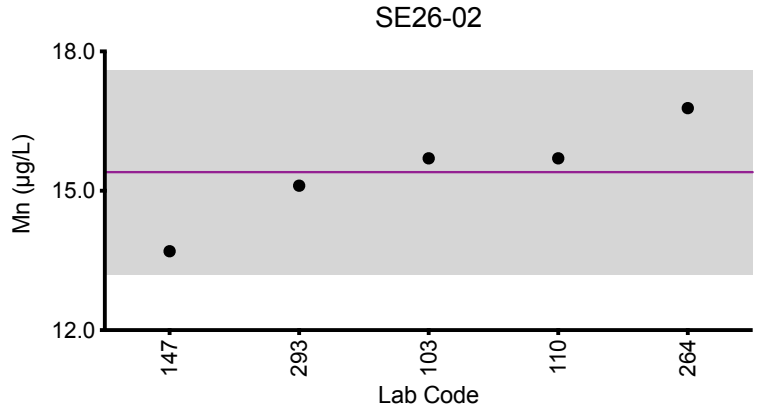
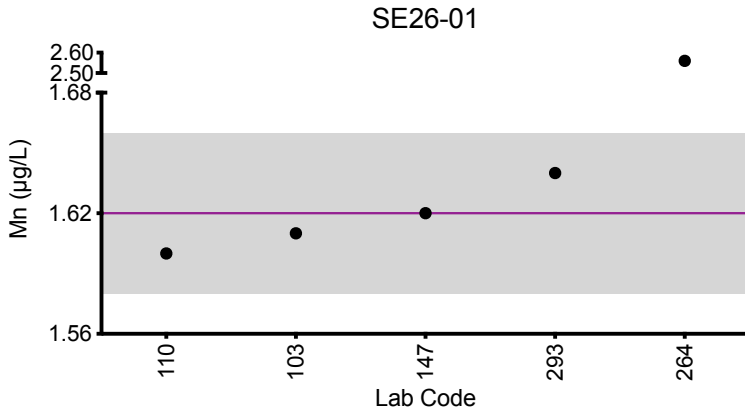
Summary Statistics					
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
Arithmetic Mean (\bar{x})	1.62	15.4	8.41	3.42	5.7
Arithmetic SD (s)	0.02	1.1	0.15	0.08	0.2
Arithmetic RSD (%)	1.1	7.1	1.8	2.3	4.1
Number of Sample Measurements (N)	4	5	4	5	5

*Denotes a statistical Outlier.



Results for Event #1, 2026: Summary Figures

Serum Mn



Legend:

● Labs

Horizontal purple line = arithmetic mean of all laboratories.

Gray area = $\pm 2SD$ of the mean.

The mean and $\pm 2SD$ of all laboratories are not intended to be quality specifications and are included for informational purposes only.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Serum As ($\mu\text{g/L}$)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
103	ICP-MS/MS	25.2	3.16	10.6	1.23	4.81
110	ICP-MS/MS	24.1	3.08	10.4	1.23	4.71
147	DRC/CC-ICP-MS	23.9	2.95	9.54	1.19	4.47
Summary Statistics						
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05	
Arithmetic Mean (\bar{x})	24.4	3.06	10.2	1.22	4.7	
Arithmetic SD (s)	0.7	0.11	0.6	0.02	0.2	
Arithmetic RSD (%)	2.9	3.6	5.9	1.9	3.6	
Number of Sample Measurements (N)	3	3	3	3	3	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Serum Ba ($\mu\text{g/L}$)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
110	ICP-MS/MS	0.69	1.10	0.88	0.98	0.69
147	ICP-MS	0.791	0.827	0.893	0.834	0.587

Summary Statistics						
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05	
Arithmetic Mean (\bar{x})	0.74	1.0	0.886	0.91	0.64	
Arithmetic SD (s)	0.07	0.2	0.009	0.10	0.07	
Arithmetic RSD (%)	9.5	20	1.0	11	11	
Number of Sample Measurements (N)	2	2	2	2	2	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Serum Be ($\mu\text{g/L}$)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
110	ICP-MS/MS	0.28	3.01	1.27	2.26	0.40
147	ICP-MS	0.365	2.80	1.24	2.30	0.607
293	ICP-MS	0.26	2.94	1.29	2.27	0.56

Summary Statistics						
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05	
Arithmetic Mean (\bar{x})	0.30	2.92	1.27	2.28	0.52	
Arithmetic SD (s)	0.06	0.11	0.03	0.02	0.11	
Arithmetic RSD (%)	20	3.8	2.0	0.92	21	
Number of Sample Measurements (N)	3	3	3	3	3	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Serum Cd ($\mu\text{g/L}$)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
103	ICP-MS/MS	0.236	3.55	1.15	2.37	0.790
110	ICP-MS/MS	0.24	3.75	1.21	2.47	0.82
147	ICP-MS	0.227	3.90	1.24	2.55	0.858
Summary Statistics						
		SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
Arithmetic Mean (\bar{x})		0.234	3.7	1.20	2.46	0.82
Arithmetic SD (s)		0.007	0.2	0.05	0.09	0.03
Arithmetic RSD (%)		3.0	4.8	4.2	3.7	3.7
Number of Sample Measurements (N)		3	3	3	3	3

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Serum Hg ($\mu\text{g/L}$)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
103	ICP-MS/MS	0.858	4.65	0.480	7.42	2.20
110	ICP-MS/MS	0.85	4.71	0.49	7.43	2.23

Summary Statistics						
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05	
Arithmetic Mean (\bar{x})	0.854	4.68	0.485	7.43	2.22	
Arithmetic SD (s)	0.006	0.04	0.007	0.01	0.02	
Arithmetic RSD (%)	0.70	0.85	1.4	0.095	0.95	
Number of Sample Measurements (N)	2	2	2	2	2	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Serum Mo ($\mu\text{g/L}$)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
103	ICP-MS/MS	7.29	1.28	0.751	4.10	2.51
110	ICP-MS/MS	7.28	1.35	0.83	3.96	2.52
147	DRC/CC-ICP-MS	6.87	1.33	0.848	3.74	2.35
293	DRC/CC-ICP-MS	7.140	1.250	0.760	3.840	2.410

Summary Statistics					
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
Arithmetic Mean (\bar{x})	7.1	1.30	0.80	3.91	2.45
Arithmetic SD (s)	0.2	0.05	0.05	0.16	0.08
Arithmetic RSD (%)	2.8	3.8	6.3	4.1	3.3
Number of Sample Measurements (N)	4	4	4	4	4

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Serum Ni ($\mu\text{g/L}$)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
103	ICP-MS/MS	2.39	9.58	0.373	4.64	6.52
110	ICP-MS/MS	2.14	9.47	0.34	4.76	6.79
147	DRC/CC-ICP-MS	2.19	9.25	0.331	4.62	6.40
293	DRC/CC-ICP-MS	2.24	9.51	0.47	4.60	6.75

Summary Statistics					
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
Arithmetic Mean (\bar{x})	2.24	9.45	0.38	4.66	6.62
Arithmetic SD (s)	0.11	0.14	0.06	0.07	0.19
Arithmetic RSD (%)	4.9	1.5	16	1.5	2.9
Number of Sample Measurements (N)	4	4	4	4	4

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Serum Pb ($\mu\text{g/L}$)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
103	ICP-MS/MS	9.58	0.445	2.94	<0.100	0.803
110	ICP-MS/MS	9.93	0.47	3.14	<0.02	0.89

Summary Statistics						
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05	
Arithmetic Mean (\bar{x})	9.8	0.46	3.0	NA	0.85	
Arithmetic SD (s)	0.2	0.02	0.1	NA	0.06	
Arithmetic RSD (%)	2.0	3.9	4.6	NA	7.1	
Number of Sample Measurements (N)	2	2	2	NA	2	

*Denotes a statistical Outlier.

Statistical data was not calculated for SE26-04 based on a lack of consensus among participating labs.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Serum Pt ($\mu\text{g/L}$)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
110	ICP-MS/MS	0.251	0.848	1.67	0.484	1.29
264	ICP-MS	0.37	1.00	1.95	0.58	1.50
293	DRC/CC-ICP-MS	0.24	0.84	1.69	0.48	1.32

Summary Statistics						
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05	
Arithmetic Mean (\bar{x})	0.29	0.90	1.77	0.51	1.37	
Arithmetic SD (s)	0.07	0.09	0.16	0.06	0.11	
Arithmetic RSD (%)	24	10	9.0	12	8.0	
Number of Sample Measurements (N)	3	3	3	3	3	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Serum Sb ($\mu\text{g/L}$)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
103	ICP-MS/MS	6.82	2.02	3.29	0.617	1.02
110	ICP-MS/MS	6.57	1.94	3.31	0.59	0.97
147	ICP-MS	7.24	2.01	3.32	0.611	0.984

Summary Statistics						
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05	
Arithmetic Mean (\bar{x})	6.9	1.99	3.31	0.606	0.99	
Arithmetic SD (s)	0.3	0.04	0.02	0.014	0.03	
Arithmetic RSD (%)	4.3	2.0	0.45	2.3	2.6	
Number of Sample Measurements (N)	3	3	3	3	3	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Serum Sr ($\mu\text{g/L}$)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
103	ICP-MS/MS	68.8	124	86.5	104	43.6
200	ICP-MS	70.10	131.40	96.40	105.10	43.80

Summary Statistics						
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05	
Arithmetic Mean (\bar{x})	69.5	128	91	105	43.7	
Arithmetic SD (s)	0.9	5	7	1	0.1	
Arithmetic RSD (%)	1.3	3.9	7.7	0.76	0.32	
Number of Sample Measurements (N)	2	2	2	2	2	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Serum TI ($\mu\text{g/L}$)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
103	ICP-MS/MS	0.800	0.327	2.67	1.03	0.140
110	ICP-MS/MS	0.824	0.328	2.71	1.05	0.147
147	ICP-MS	0.855	0.351	2.68	1.09	0.154
Summary Statistics						
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05	
Arithmetic Mean (\bar{x})	0.83	0.335	2.69	1.06	0.147	
Arithmetic SD (s)	0.03	0.014	0.02	0.03	0.007	
Arithmetic RSD (%)	3.6	4.2	0.78	2.8	4.8	
Number of Sample Measurements (N)	3	3	3	3	3	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Serum U ($\mu\text{g/L}$)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
103	ICP-MS/MS	0.0780	0.0812	0.143	0.0436	0.196
110	ICP-MS/MS	0.075	0.082	0.143	0.043	0.187

Summary Statistics						
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05	
Arithmetic Mean (\bar{x})	0.077	0.0816	0.143	0.0433	0.192	
Arithmetic SD (s)	0.002	0.0006	0.000	0.0004	0.006	
Arithmetic RSD (%)	2.7	0.74	0.0	0.92	3.1	
Number of Sample Measurements (N)	2	2	2	2	2	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Serum V ($\mu\text{g/L}$)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
110	ICP-MS/MS	3.94	0.35	2.38	0.68	1.07
147	DRC/CC-ICP-MS	4.04	0.325	2.28	0.579	1.01
293	DRC/CC-ICP-MS	4.07	0.55	2.48	0.81	1.3

Summary Statistics						
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05	
Arithmetic Mean (\bar{x})	4.02	0.41	2.38	0.69	1.13	
Arithmetic SD (s)	0.07	0.12	0.10	0.12	0.15	
Arithmetic RSD (%)	1.7	29	4.2	17	13	
Number of Sample Measurements (N)	3	3	3	3	3	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Laboratory Data and Summary Statistics

Serum W ($\mu\text{g/L}$)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
110	ICP-MS/MS	0.26	0.94	1.67	0.44	0.81
200	ICP-MS	0.270	1.060	1.800	0.440	0.890

Summary Statistics						
	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05	
Arithmetic Mean (\bar{x})	0.265	1.00	1.74	0.44	0.85	
Arithmetic SD (s)	0.007	0.08	0.09	0.00	0.06	
Arithmetic RSD (%)	2.6	8.0	5.2	0.0	7.1	
Number of Sample Measurements (N)	2	2	2	2	2	

*Denotes a statistical Outlier.



Results for Event #1, 2026: Additional Elements in Serum

Serum Bi (µg/L)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
147	ICP-MS	<0.0397	<0.0397	<0.0397	<0.0397	<0.0397

Serum Cs (µg/L)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
110	ICP-MS/MS	0.32	0.79	0.61	0.51	0.51

Serum Fe (µg/L)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
264	ICP-MS	3274.00	10218	11188.00	4425.00	4187.00

Serum I (µg/L)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
147	ICP-MS	55.0	55.3	40.9	50.8	49.5

Serum Li (µg/L)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
147	ICP-MS	0.772	0.748	1.07	0.818	0.917

Serum Mg (µg/L)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
264	ICP-MS	20635.00	21256	19452	20873	19537

Serum Sn (µg/L)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
110	ICP-MS/MS	7.98	4.95	0.91	2.45	1.31

Serum Te (µg/L)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
110	ICP-MS/MS	<0.01	<0.01	<0.01	<0.01	<0.01

Serum Ti (µg/L)						
Lab Code	Method	SE26-01	SE26-02	SE26-03	SE26-04	SE26-05
200	DRC/CC-ICP-MS	4.900	7.91	9.94	2.85	5.600



References

1. ISO/FDIS-13528 (2005) Statistical methods for use in proficiency testing by interlaboratory comparisons. International Organization for Standardization, Geneva.
2. Taylor A, Angerer J, Arnaud J, Claeys F, Jones RL, Mazarrasa O, Mairiaux E, Menditto A, Parsons PJ, Patriarca M, Pineau A, Valkonen S, Weber J-P, Weykamp C. Occupational and environmental laboratory medicine: A network of EQAS organisers. *Accreditation and Quality Assurance*. 2006;11(8-9):435-9. PubMed PMID: 086NJ-0011.