**Supplemental Data Table 1**. Readable formats are an e-mail embedded table, Excel-files, and text-files.

**e-mail embedded table**

From: ***

Sent: Saturday, 28 september 2013 06:31

To: percentile@stt-consulting.com

Content: Empower Percentile Project

Time produced : 27-09-2013 00:00 - 27-09-2013 23:59

ABCDEF;27/09/2013;C16000-5;POL;NA;mmol/L;140.9

ABCDEF;27/09/2013;C16000-6;POL;NA;mmol/L;139.4

ABCDEF;27/09/2013;C16000-5;POL;K;mmol/L;4.61

**EXCEL attachment to e-mail**

From: ***

Sent: Wednesday, 13 november 2013 06:18

To: percentile@stt-consulting.com

Content: Empower Percentile Project

Time produced : 12-11-2013 00:00 - 12-11-2013 23:59

Filename: Empower Percentile.xlsx (or xls)

| | | | | | | |
|---|---|---|---|---|---|---|
| ABCDEF | 12/11/2013 | VITROS5.1FS | E | Alb | g/L | 42.2 |
| ABCDEF | 12/11/2013 | VITROS5.1FS | E | APase | U/L | 91.5 |
| ABCDEF | 12/11/2013 | VITROS5.1FS | E | Ca | mmol/L | 2.355 |

**Text attachment to e-mail**

From: ***

Sent: Saturday, 28 september 2013 06:31

To: percentile@stt-consulting.com

Content: Empower Percentile Project

Time produced : 27-09-2013 00:00 - 27-09-2013 23:59

Filename: Empower Percentile.txt

ABCDEF;27/09/2013;80_AU5822;POL;ALB;g/dl;3.0

ABCDEF;27/09/2013;80_AU5822;POL;CA;mmol/l;2.125

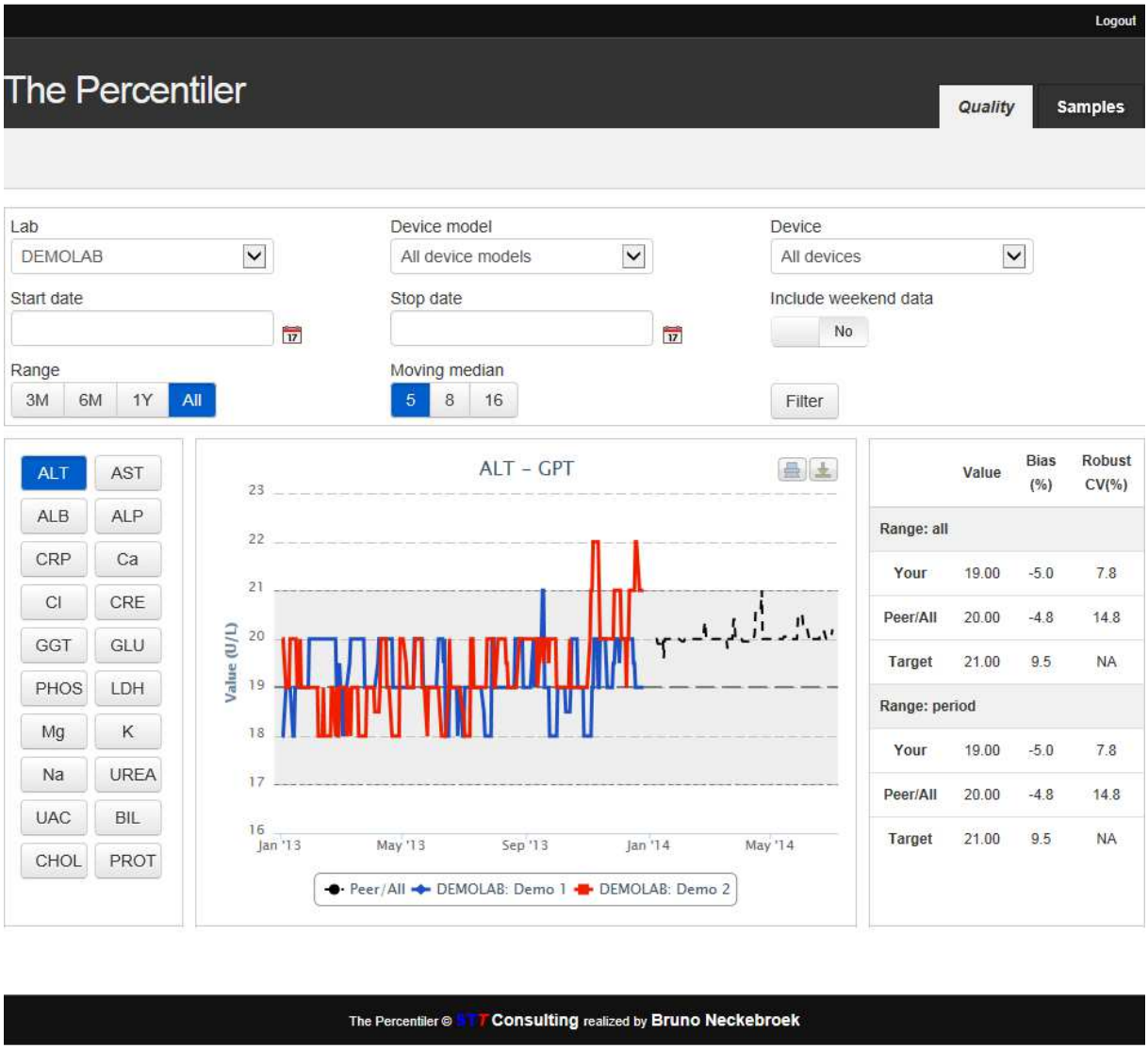
ABCDEF;27/09/2013;80_AU5822;POL;NA;mmol/l;140.1

**Supplemental Data Table 2.** Preliminary mid- to long-term bias limits used in “The Percentiler”.

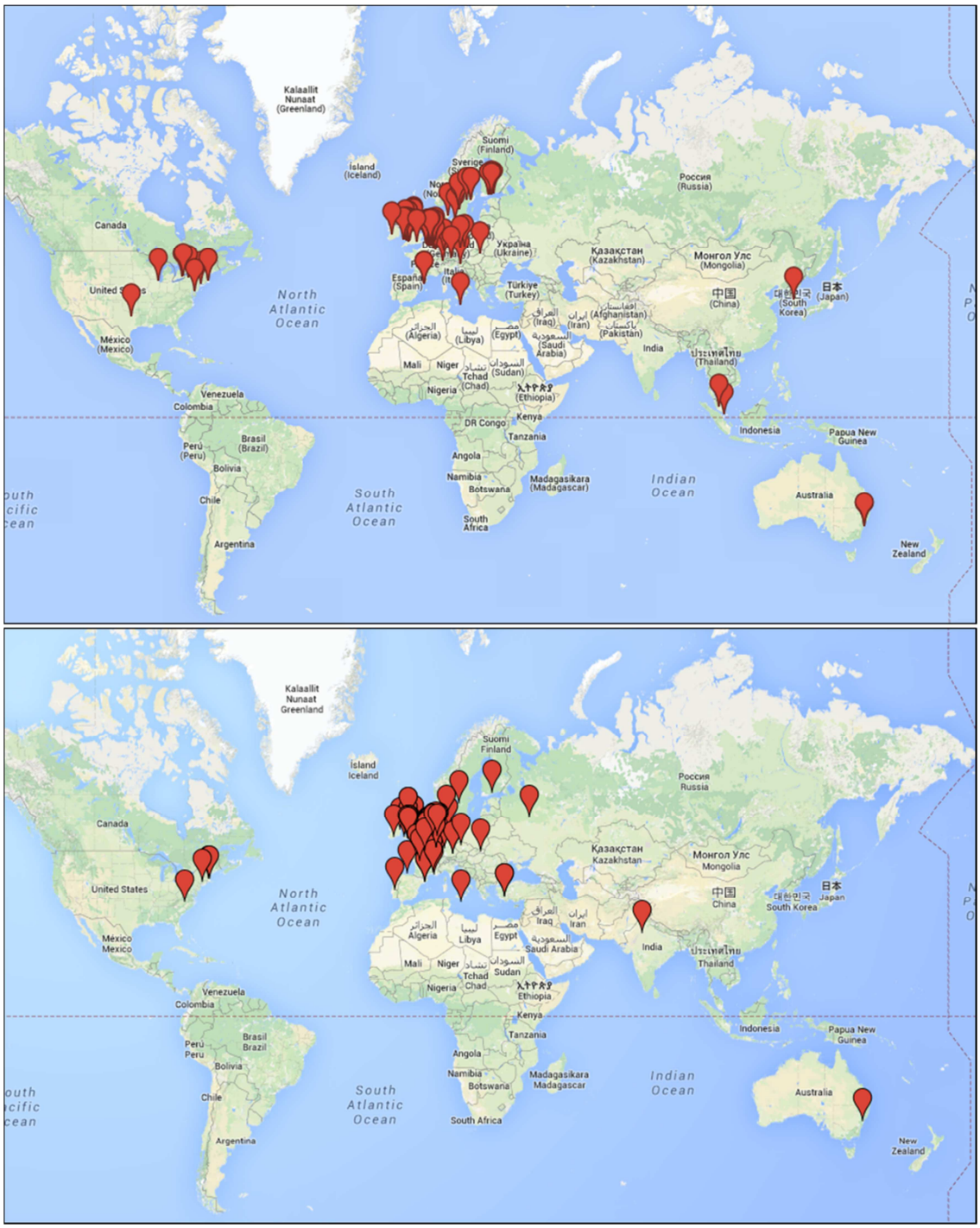
| Analyte | Limit | Unit |
|---|---|---|
| Albumin | 1 | g/L |
| Alkaline phosphatase | 5 | U/L |
| Alanine aminotransferase | 2 | U/L |
| Aspartate aminotransferase | 1 | U/L |
| Calcium | 0.05 | mmol/L |
| Chloride | 1 | mmol/L |
| Creatinine | 3 | µmol/L |
| C-reactive protein | 0.2 | mg/L |
| Gamma-glutamyl transferase | 2 | U/L |
| Glucose | 0.2 | mmol/L |
| Inorganic phosphor | 0.04 | mmol/L |
| Lactate dehydrogenase | 10 | U/L |
| Magnesium | 0.03 | mmol/L |
| Potassium | 0.15 | mmol/L |
| Sodium | 1 | mmol/L |
| Total-bilirubin | 1 | µmol/L |
| Total-cholesterol | 0.2 | mmol/L |
| Total-protein | 1 | g/L |
| Urea | 0.3 | mmol/L |
| Uric acid (urate) | 15 | µmol/L |

Note: The actually chosen numbers for the bias limits are “tailored” to the used SI-units; e.g., for albumin 1 g/L. This allows us to show the limits in the user interface as so-called stability limits that should not be exceeded by longer than 1 week (see, for example, Figure 2A for ALT in the main text). To appreciate how these absolute limits compare with the bias limits inferred from biological variation, the 1 g/L for albumin can be expressed relatively (in %) to our project’s typical median concentration of 43 g/L), i.e. 2.3% versus 1.3% for the limit derived from biological variation. This 2.3% is what we call a “state-of-the-art” limit mirrored to the biological variation limit.

**Supplemental Data Figure 1.** A screenshot of “The Percentiler”.



**Supplemental Data Figure 2.** Global distribution of the participants in the 2014 survey of the master comparisons (top) and patient percentile monitoring (bottom).



**Supplemental Data Table 3.** Number of laboratories participating in the 2014 survey of the master comparisons and number of instruments represented in the patient percentile monitoring part of the Empower project.

| Manufacturer | Device Type | 2014 master comparisons | Patient percentile monitoring |
|---|---|---|---|
| Abbott | Architect | 21 | 19 |
| Beckman Coulter | AU | 19 | 12 |
| | Synchron | 11 | 12 |
| Ortho | Vitros | 19 | 22 |
| Roche | Cobas | 26 | 91 |
| | Integra | - | 3 |
| | Modular | 9 | 11 |
| Siemens | Advia | 12 | 7 |
| | Vista | 8 | 5 |
| **Total** (laboratories/instruments) | | **125** | **182** |

**Supplemental Data Figure 3.** Patient percentile monitoring: (A) example of stable performance with low patient population variation and good concordance between different instruments in one laboratory mainly working with primary care practitioners (samples almost exclusively from outpatients); note, the profile is similar for nearly all other analytes; (B) example of a laboratory with higher performance variation due to a higher patient population variation (moving median from n = 5 daily medians), however, with a moving median tailored to n = 16 (C) the effect of population variation can partly be suppressed.