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healthy all life long

EQALM CENTRAL DATA BASE PROJECT

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EQALM symposium, October 13 2021

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Some history

Zagreb, 2018

- EQALM symposium Zagreb, 2018

  Greg Miller, Graham Beastall mentioned the need for a central data base of EQA results for monitoring harmonization and traceability of laboratory measurements

- 2018-2019: Feasibility study for Creatinine

  Presented by Sverre Sandberg and Eline van der Hagen on EQALM symposium in Ljubljana in 2019

Ljubljana, 2019

- 2019: EQALM Scientific committee discusses EQALM central data base

- 2020: Article from Tony Badrick and Anne Stavelin

  Harmonising EQA schemes the next frontier: challenging the status quo

  2020: HALMA

The air, 2021

- 2021: EQALM central data base pilot

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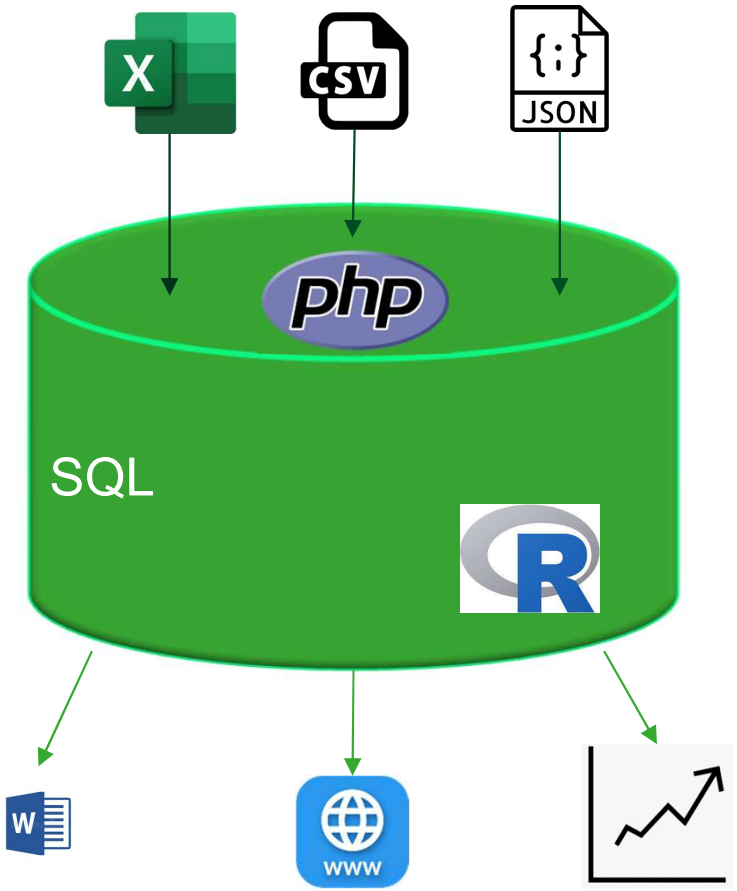
EQALM central data base

The EQALM central data base is a data base where EQA results of multiple EQA providers are put in together to help answering specific questions that are hard to answer with the data from a single EQA provider



- Multiple EQA providers
- Permanent feed
- Individual laboratory results
- Quantitative and qualitative results

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Is EQALM able to do this ?

- Frequency working group
  - Joining quantitative data from various EQA providers to compare EQA performance among EQA providers with different frequencies
- International immunohaematology study
  - Joining qualitative data from various EQA providers to look for drivers of quality in the laboratory
- EQA-Covid study
  - Joining quantitative and qualitative data from various EQA providers to see how laboratories and EQA providers dealt with the Covid-19 crisis

Initial aims

- Evaluation of harmonization between methods
  - Impetus of working around centralized data base
  - Multiple EQA providers: reagents from over the world
- Post-market vigilance
  - Change in reagent lot can be faster detected by a central data base than by individual EQA providers

Initial aims

- Service to EQA providers
  - Benchmarking of local performance with respect to others
  - Comparing own data processing techniques with others
  - Estimation of EQA variability
  - Evaluation of data quality

Terms of use

- EQA providers remain the only owner of the data
  - EQA providers can choose to for which project the data will be used
  - EQA providers can withdraw their collaboration and data at any moment at their own decision
  - EQALM provides only platform for EQA central data base and analysis routines
- EQALM appoints a supervisor to manage and maintain the data base. This supervisor reports to the EQALM board.
- No content will be provided to any third party without the permission of the EQA organization.
- Contribution of data is free of charge
- Laboratory results are anonymous. The EQA provider owns the anonymisation key.

Pilot project: haematology

Aim:

Test technical solutions

Investigate willingness and ability of EQA providers to contribute data

Pilot project: haematology

- Realization:
  - 13th of August: request for participation sent to 10 EQA providers
  - With terms of use
  - With template for putting data in
  - Asked about commutability of samples

- Parameters:
  - White blood cells
  - Hematocrite
  - Haemoglobin concentration
  - Red blood cells
  - Reticulocytes
  - Thrombocytes
  - Mean Corpuscular Volume

Pilot project: haematology

Challenges (that we thought at the beginning):

1. **How many EQA providers are willing to contribute ?**

2. **Will returned files be of a format that can be easily read in ?**

3. **Will samples be commutable ?**

4. **Will diversity in naming methods allow to make conclusions ?**

Pilot project: haematology

Challenges (that we thought at the beginning):

1. How many EQA providers are willing to contribute ?

10 EQA providers asked, 9 answered positively, 7+1 returned data

2. Will returned files be of a format that can be easily read in ?

From the 8 EQA providers, 7 returned data in the right format

3. Will samples be commutable ?

178 from 270 samples were reported as commutable

4. Will diversity in naming methods allow to make conclusions ?

Returned data

CTBC - France (Stéphanie Albarède, Erick Sanchez)

Biologie-Prospective - France (Jean-Pascal Siest)

Oequasta - Austra (Christoph Buchta)

CROQALM - Croatia (Ivana Celap)

PNAEQ - Portugal (Ana Paula Faria)

IEQAS - Ireland (Anne Kane)

DEKS - Denmark (Karin Lindholm Heidemann)

Sciensano - Belgium (Lobna Bouacida)

Overview of data

	RBC	Hematocrite
	Number of samples (Number of EQA providers)	
Level 3		
Sysmex XN 1000	18 (2)	18 (2)
Sysmex XN 550	19 (2)	17 (2)
Sysmex XN 3000	19 (2)	19 (2)
Comparison XN 1000-XN 550	18 (2)	16 (2)
Comparison XN 1000 - XN 3000	18 (2)	18 (2)
Level 2		
Sysmex XN	54 (6)	59 (6)
Siemens XS	24 (2)	24 (2)
Siemens Advia	48 (5)	38 (4)
Comparison Sysmex XN - Sysmex XS	19 (2)	24 (2)
Comparison System XN - Siemens Advia	42 (5)	37 (4)

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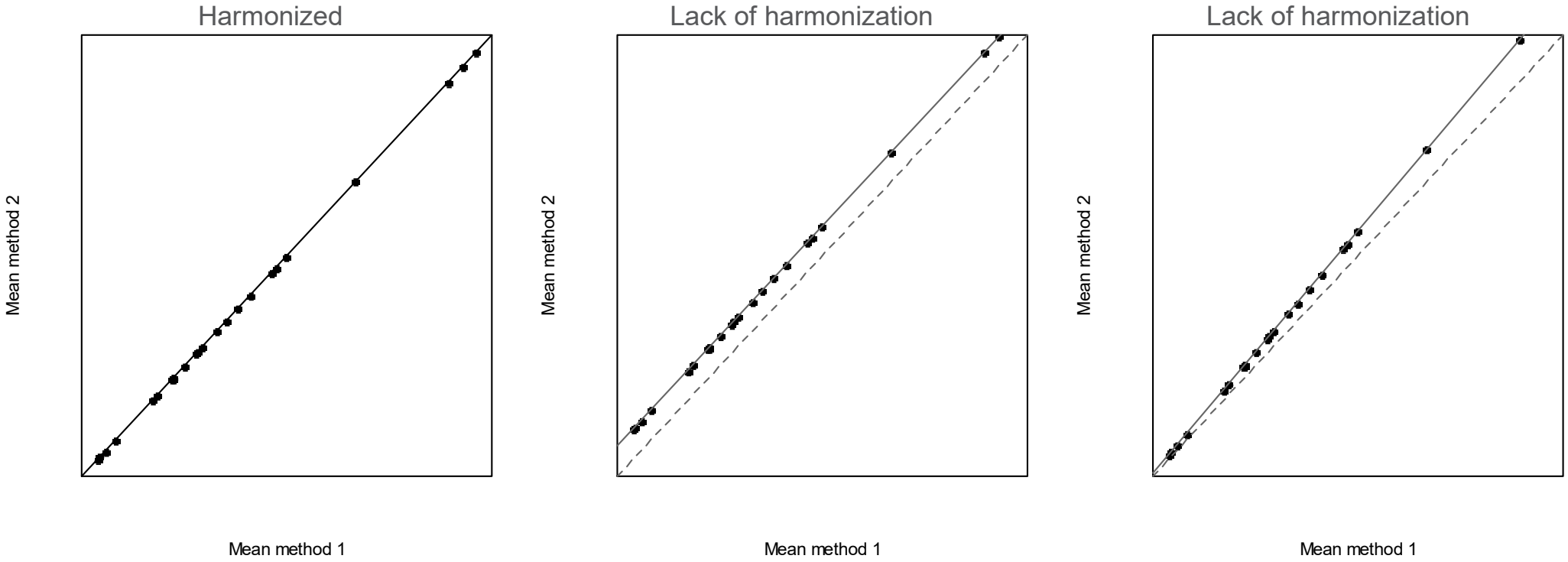
Assessing harmonization

If two methods are harmonized, there mean values should be the same

Plotting mean values of two methods with respect to each other should give a straight line that is equal to 45°-line:



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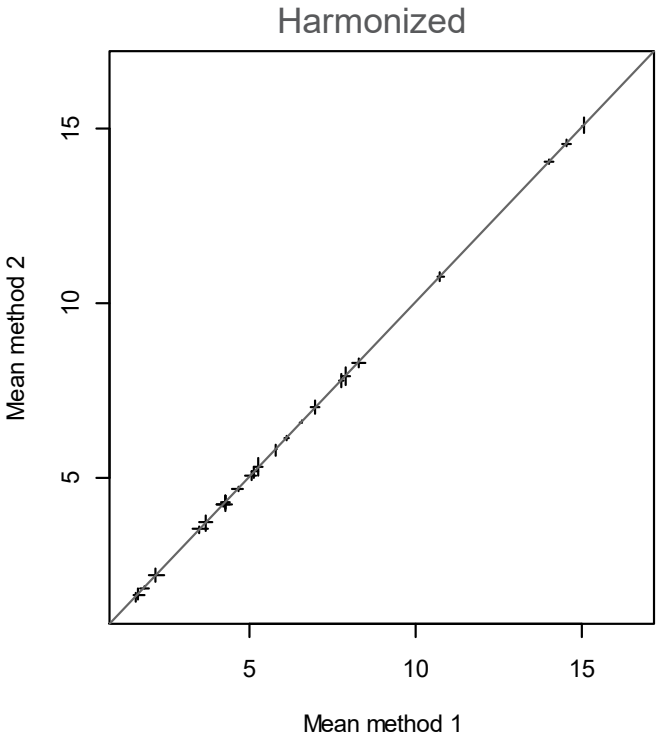
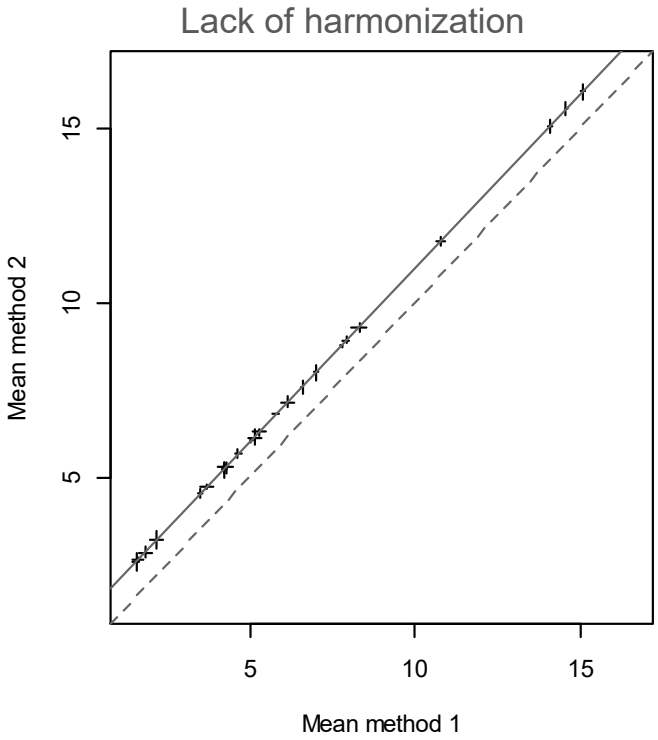
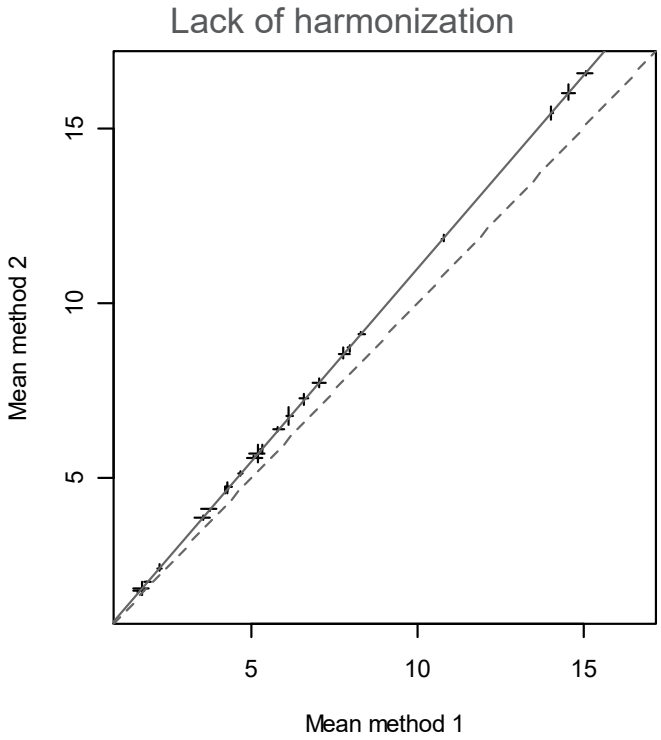
Assessing harmonization

If two methods are harmonized, there mean values should be the same

Taking into account of variability of mean values:







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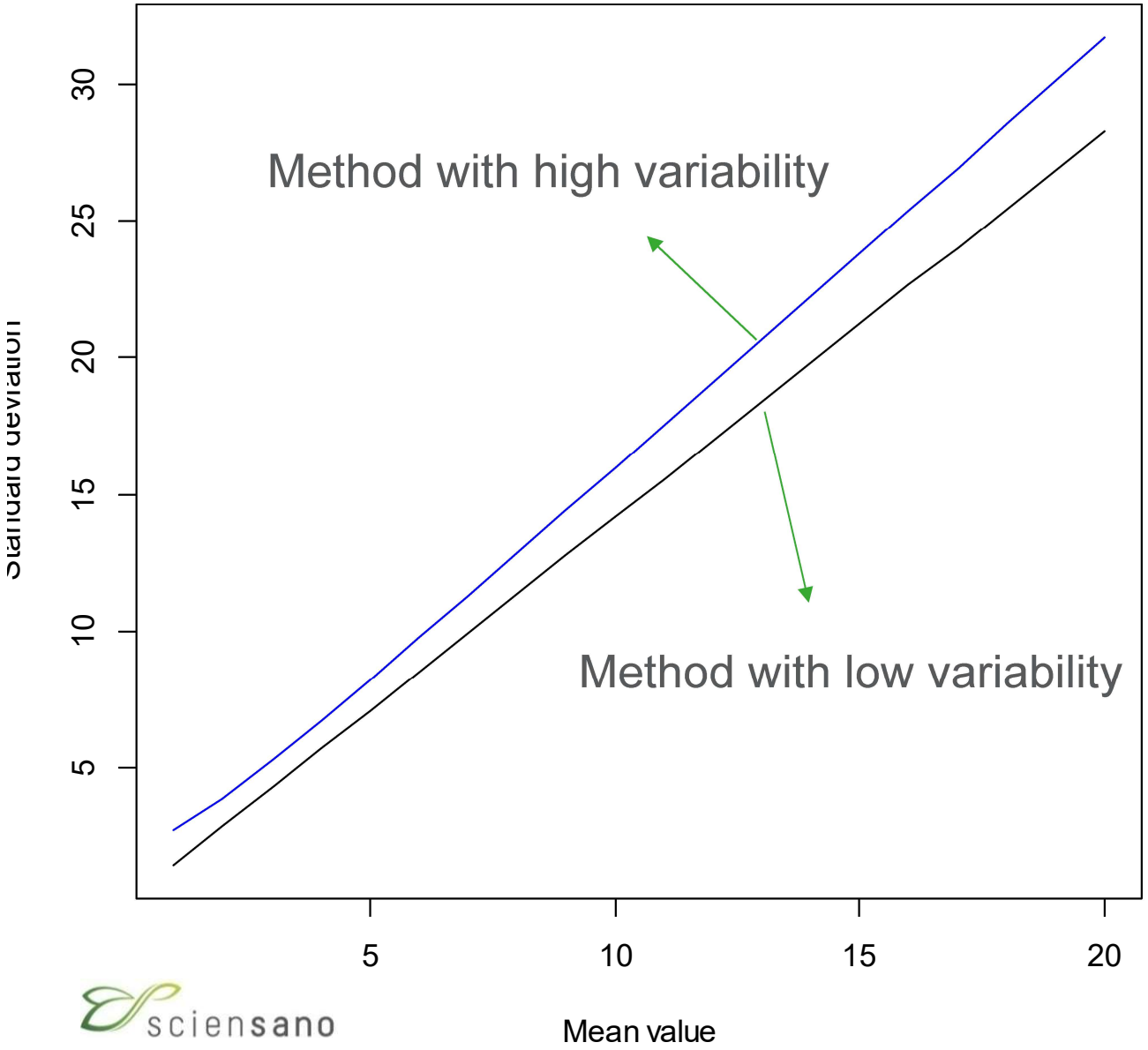
Comparing variability



Characteristic function:

$$SD=\sqrt{a+b*AV^2}$$

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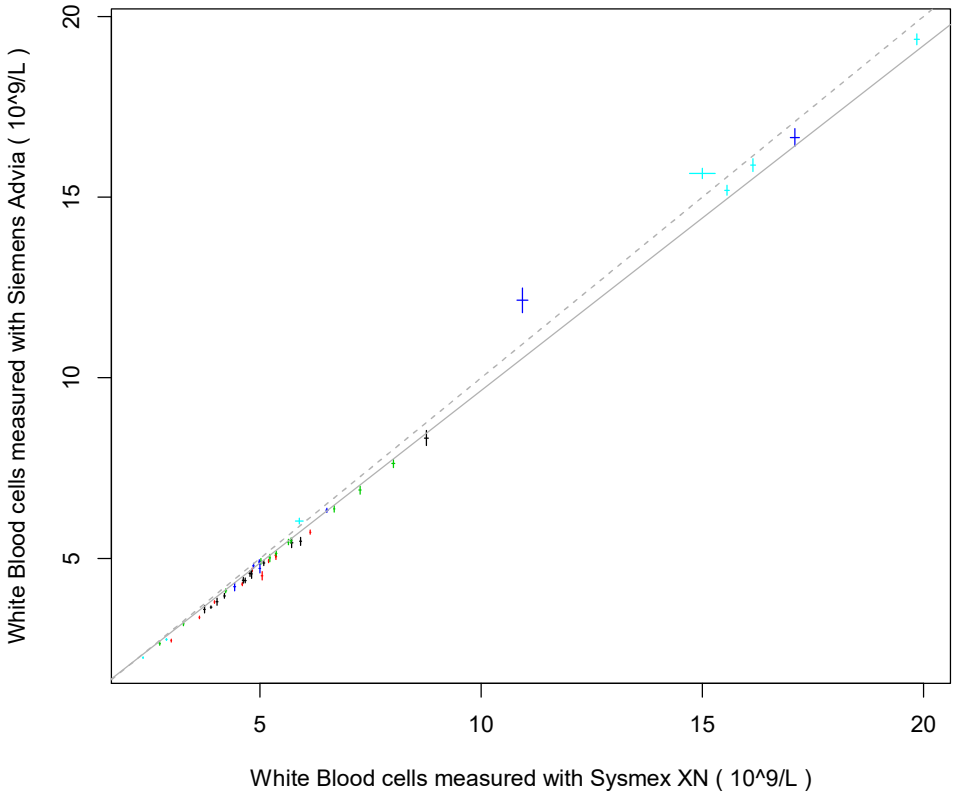
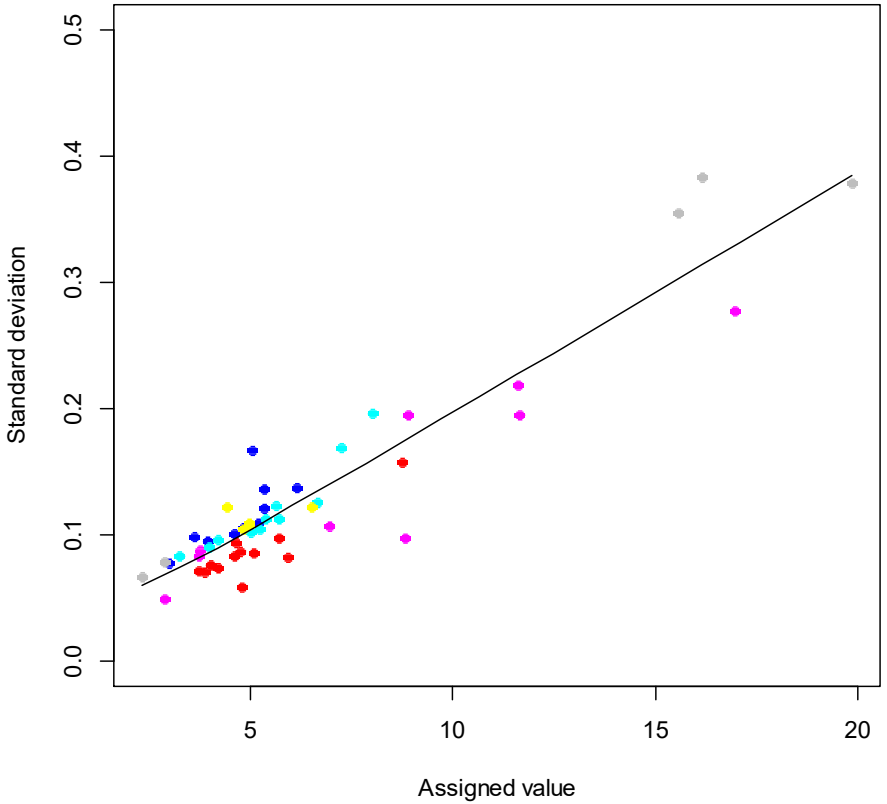
Can data be joined ?

Sysmex XN - Siemens Advia bias



Sysmex XN variability



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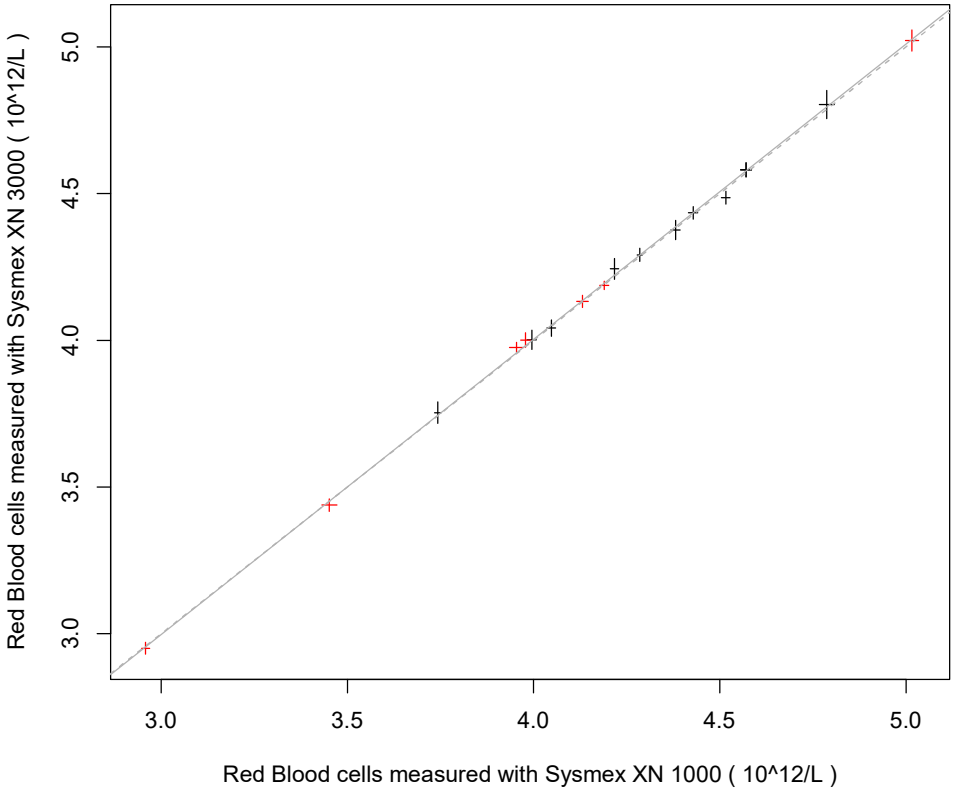
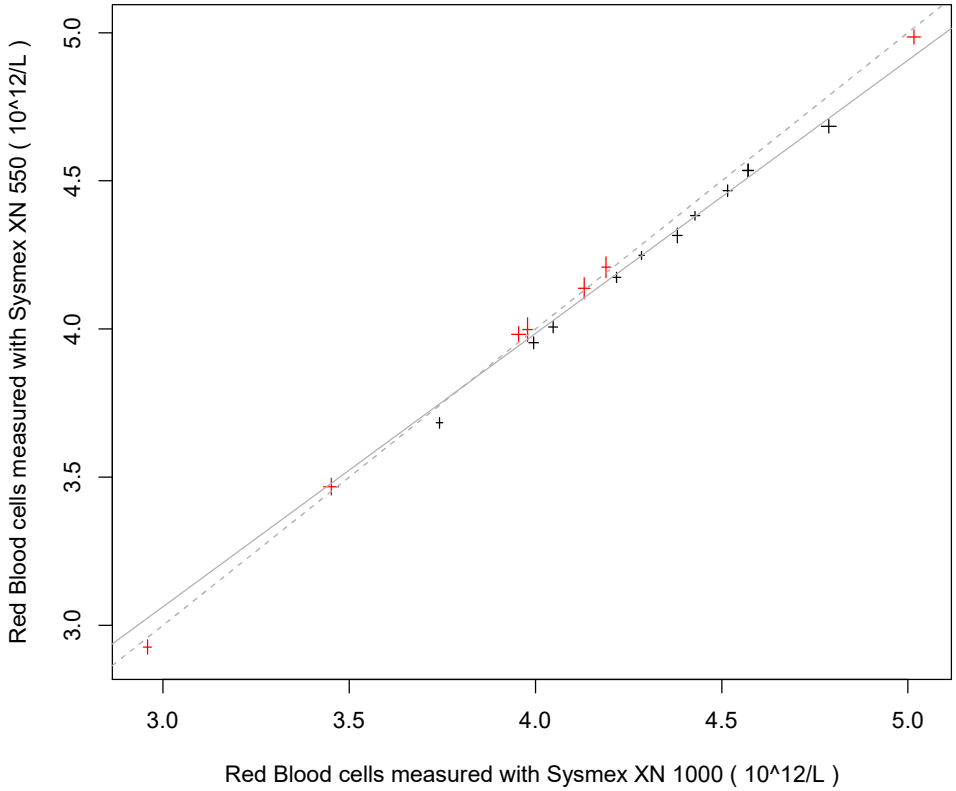
Red Blood cells: bias between methods

Method definitions up to level 3





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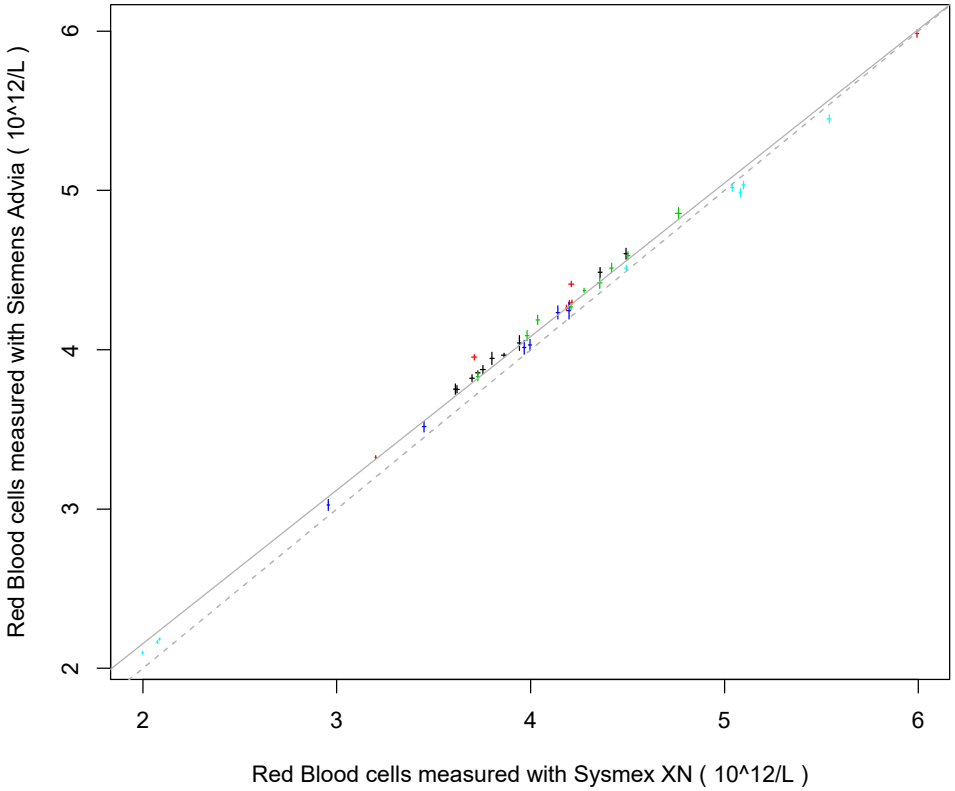
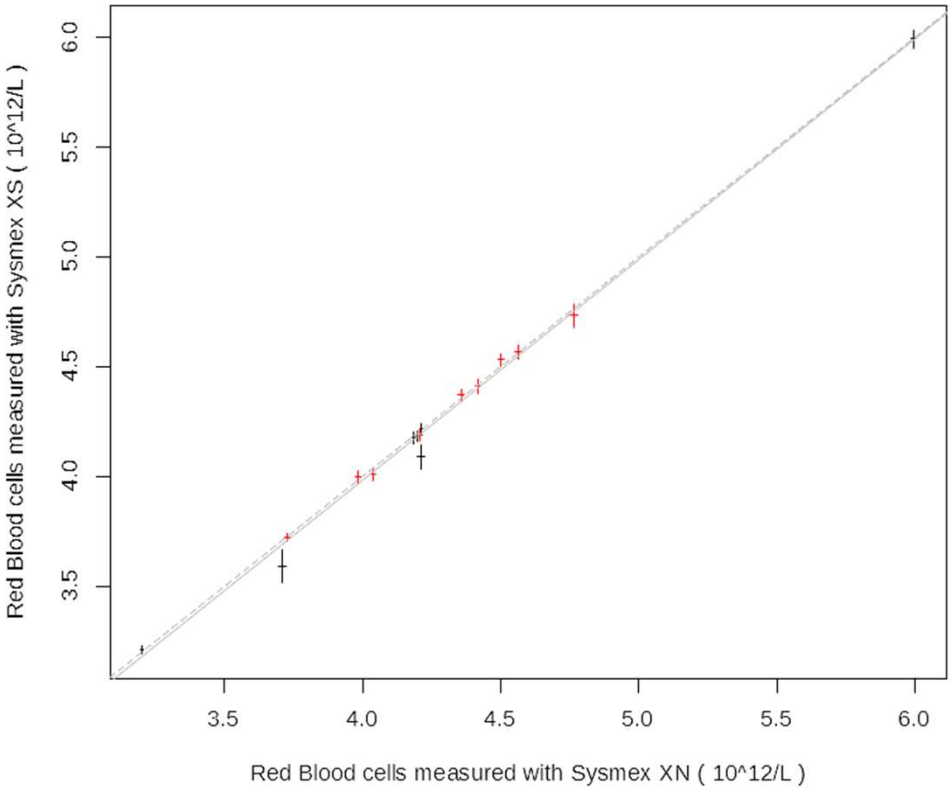
Red Blood cells: Bias between methods

Method definitions up to level 2





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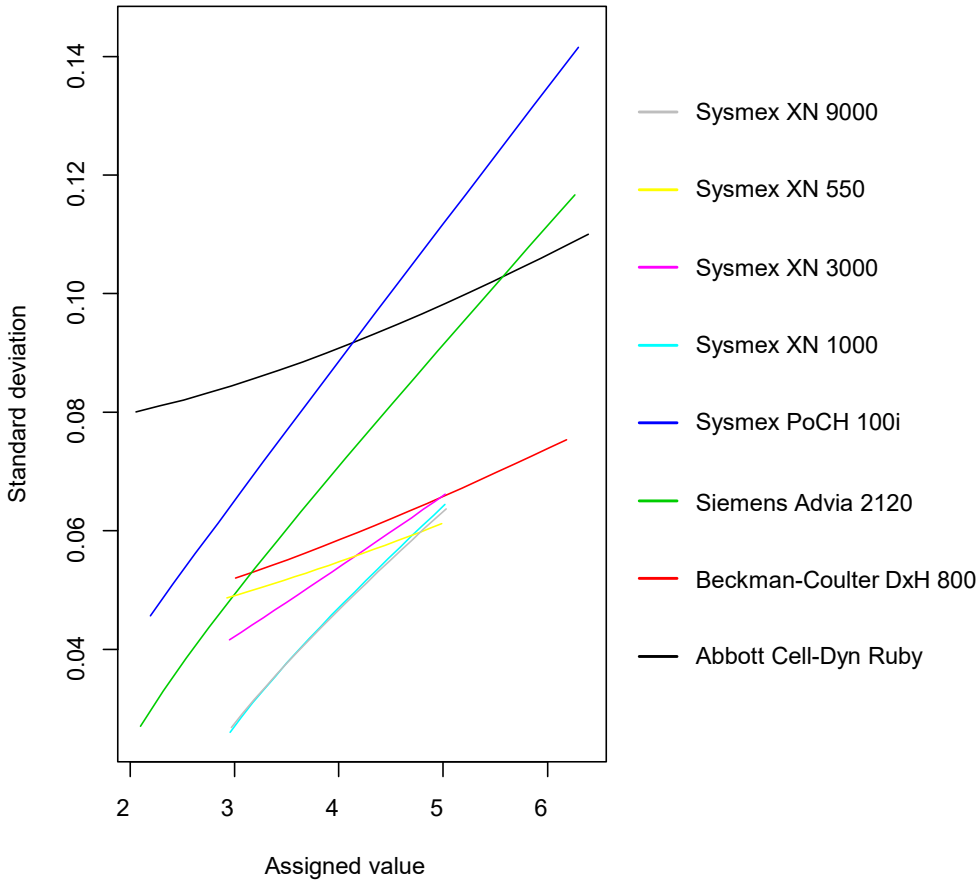
Red blood cells: variability of methods

Method definitions up to level 3



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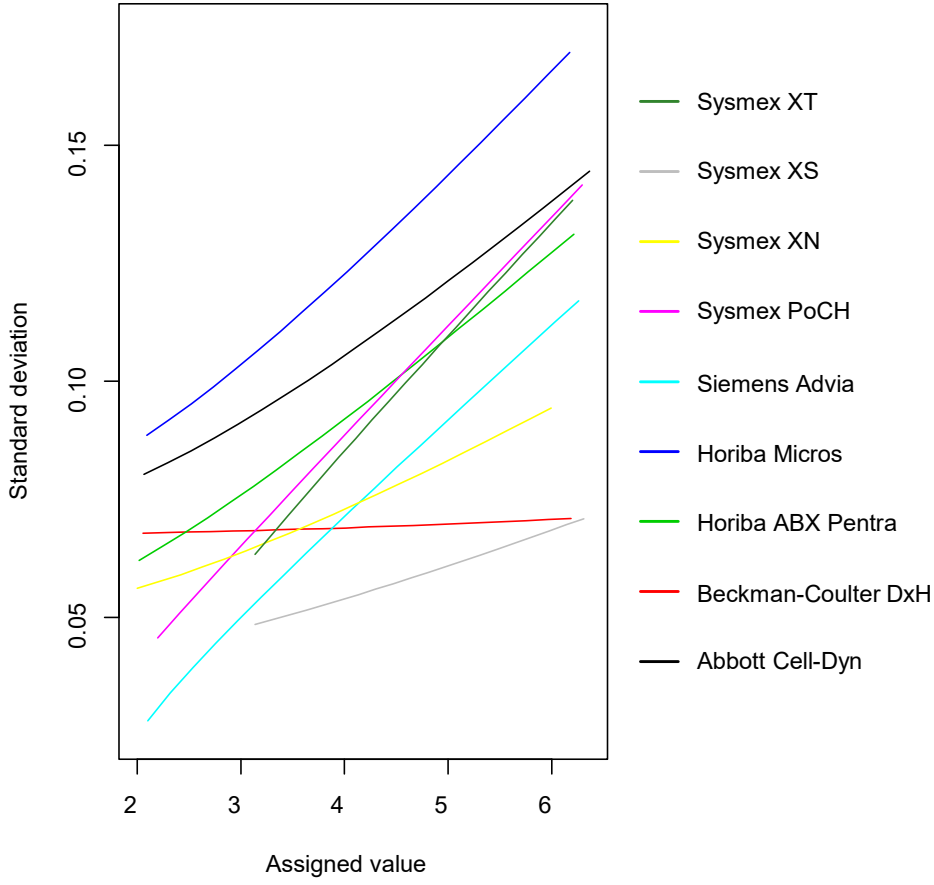

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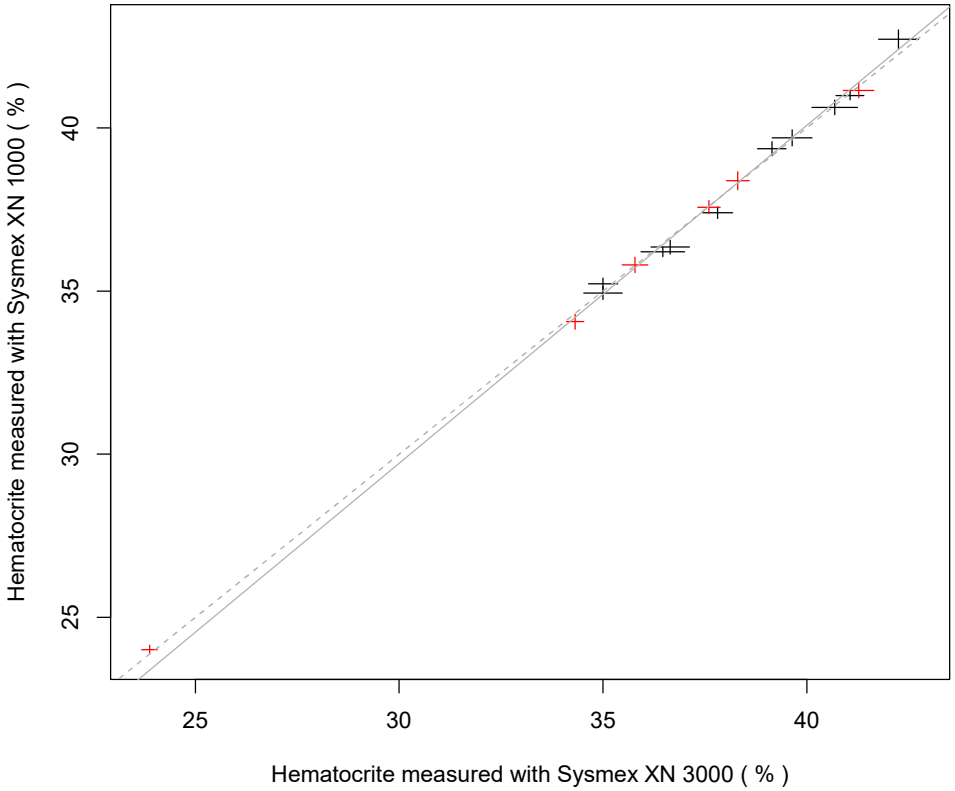
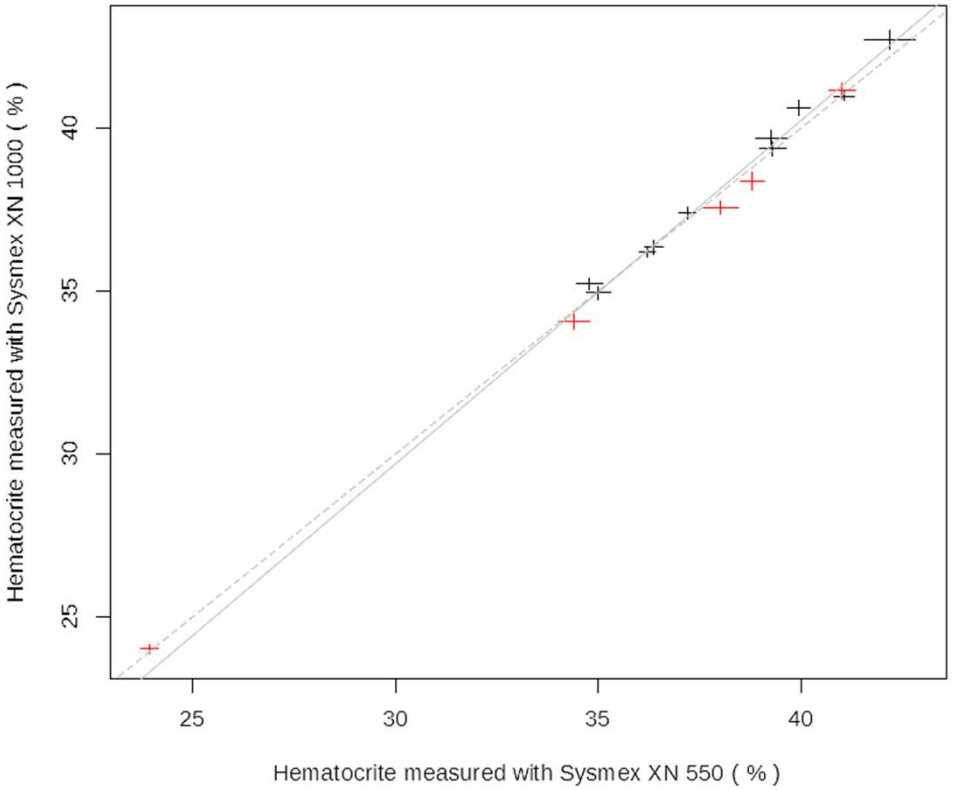
Hematocrite: Bias between methods

Method definitions up to level 3





Hematocrite: Bias between methods

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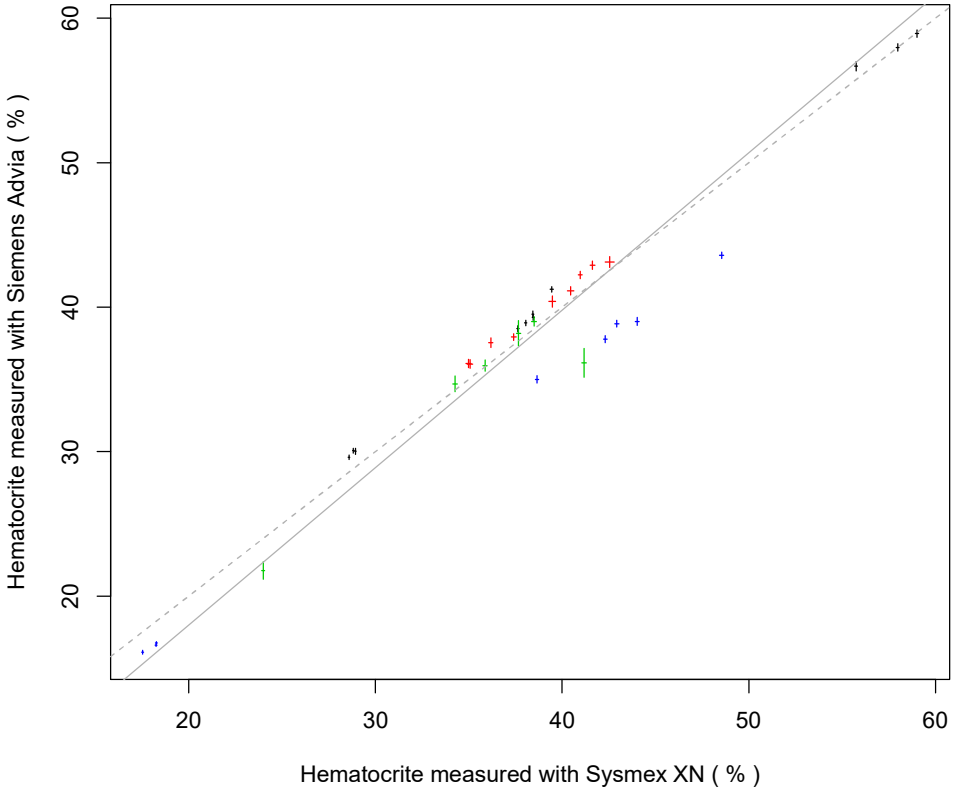

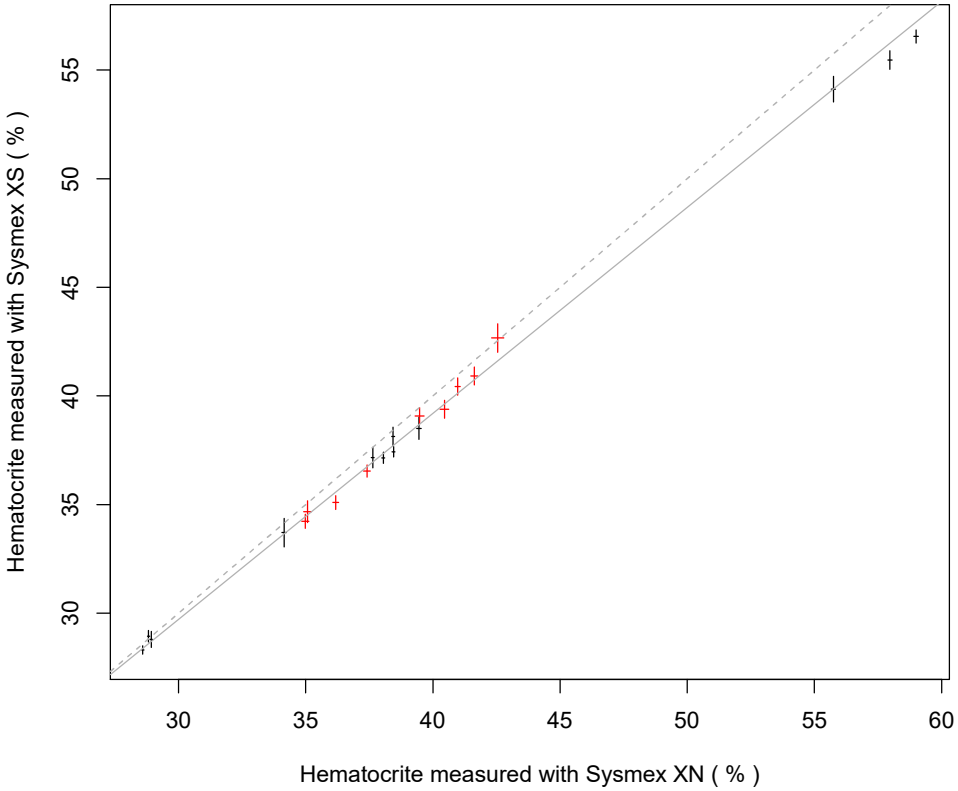

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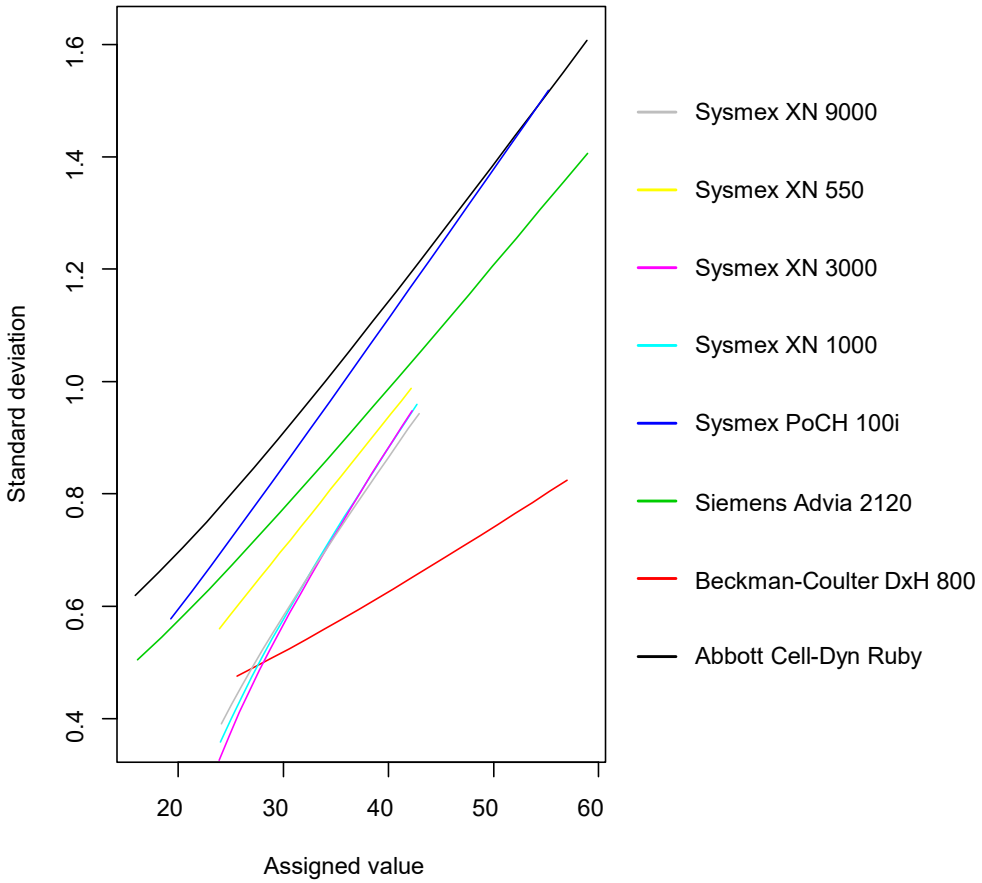

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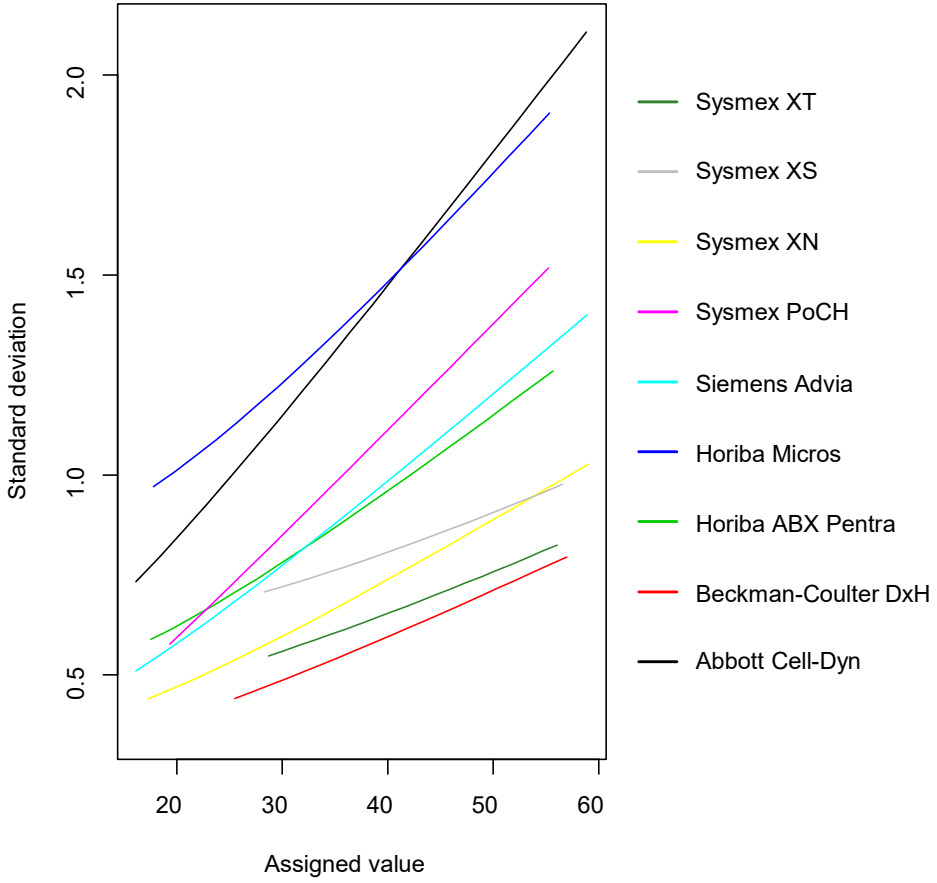

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Conclusions

EQALM is ready to play a leading role in having a centralized data base of EQA results

- More samples give more power
- Conclusions hold for larger concentration range
- Possiblity for international or even global covarge

The road ahead

- Extending data base
  - Permanent feed
  - Automatization of data feed and reports
  - New parameters
- Answering new questions
  - Ideal partitioning of peer groups
  - Assessing commutability
  - Algorithms for data validation