

# Newer trends in EQAS

## Continuous peer-group monitoring of laboratory data

Adam Uldall Lecture  
EQALM Symposium Bucharest 2013



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**STT**

Consulting

# Introduction

## MASTER COMPARISONS

EQA with panels of fresh frozen single donation (commutable) sera

## EDUCATION

Conceptual and statistical education about analytical quality in the medical laboratory



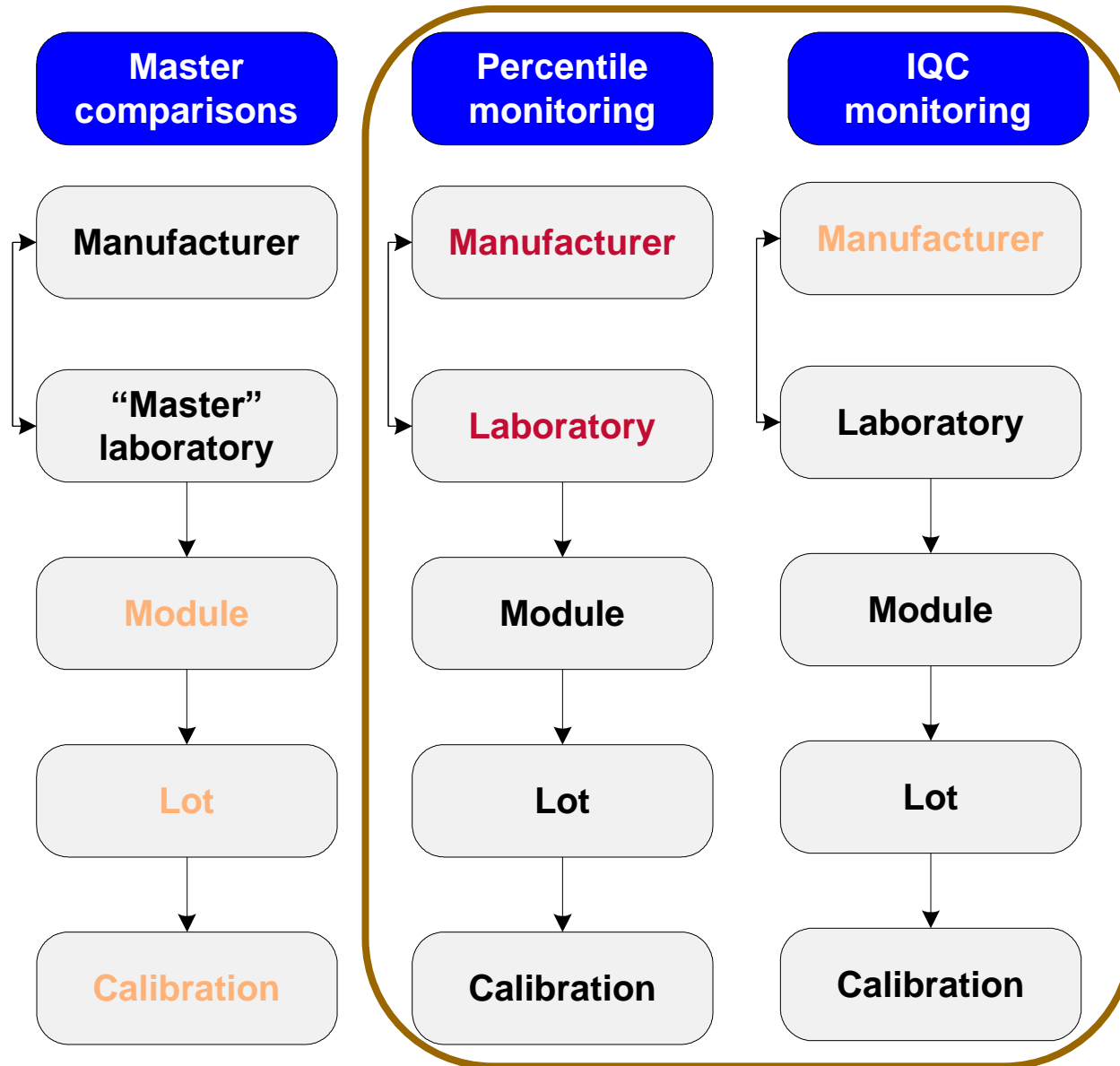
## VIRTUAL EQA-1 (Percentiles)

Mid- to long-term monitoring of patient percentiles across laboratories and manufacturers

## VIRTUAL EQA-2 (IQC monitoring)

Mid- to long-term monitoring of IQC data across laboratories and manufacturers

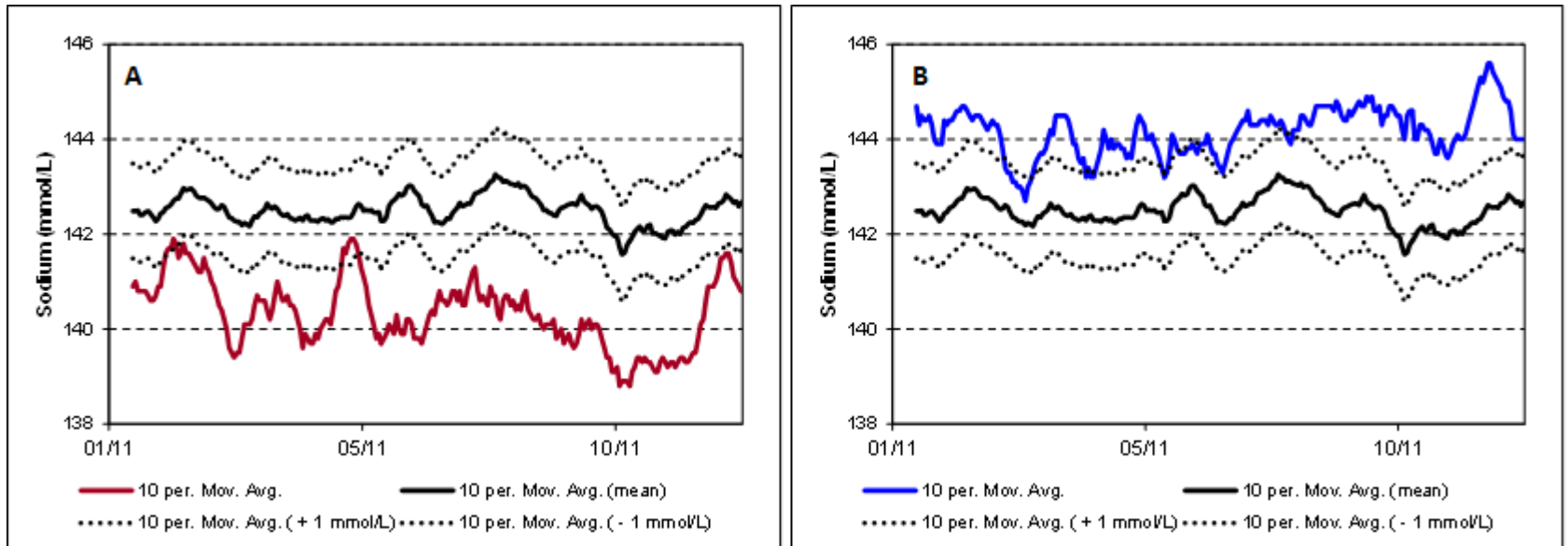
# Assessment of quality components



# IQC-monitoring

## Peer group comparisons

### Sodium (limit 1 mmol/L)



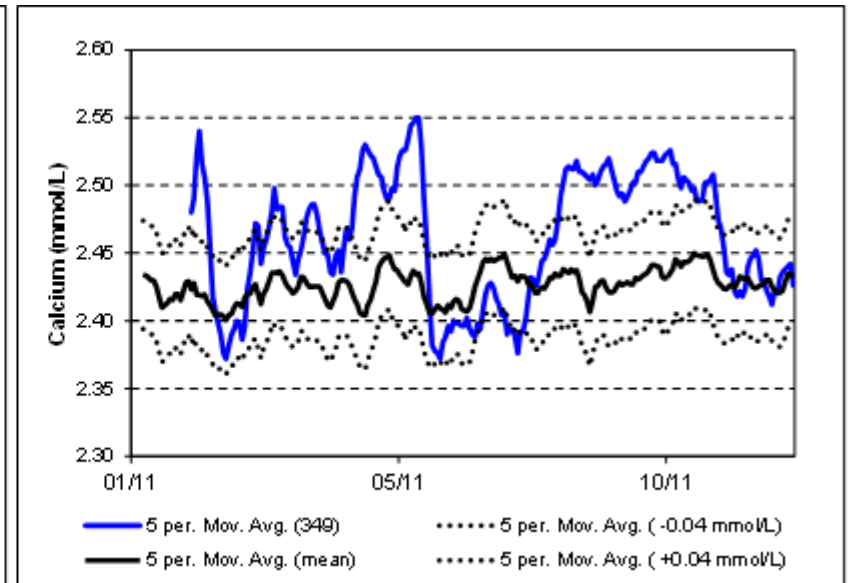
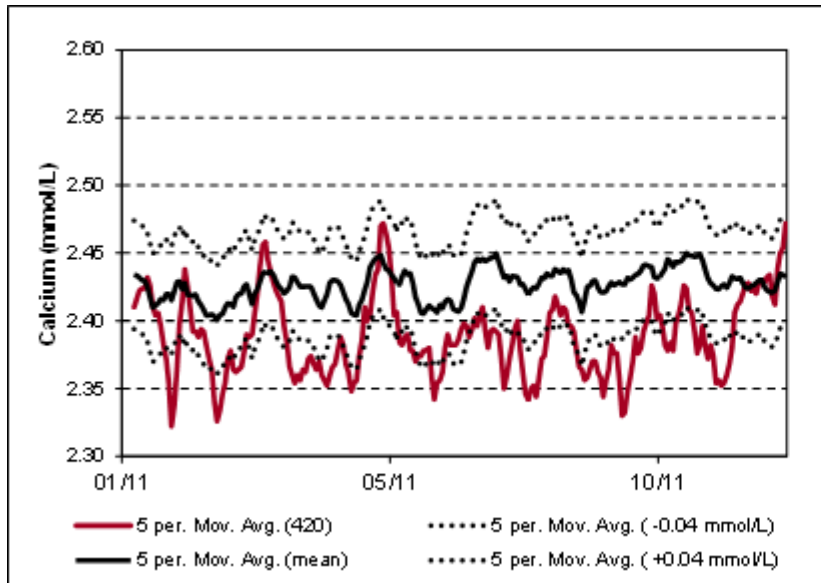
> **Several laboratories with long-term bias**

(courtesy Labquality)

# IQC-monitoring

## Peer group comparisons

### Calcium (limit 0.04 mmol/L)



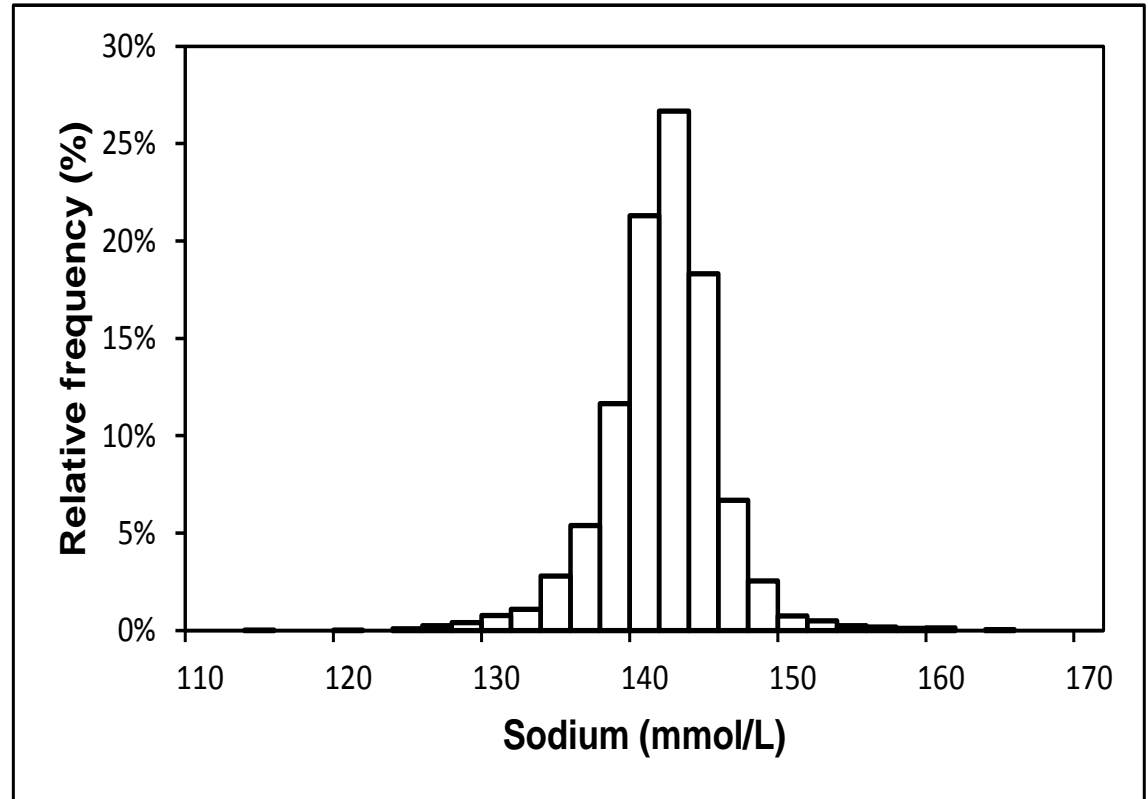
**> Several laboratories with high variation**

(courtesy Labquality)

# Percentile monitoring

**Stratification**

**Applications**



# Stratification

## Points of care

- **Module-specific**
- **Outpatients**
- **Weekends/Holidays**
- **Referral pattern (PTH)**

## Limitations

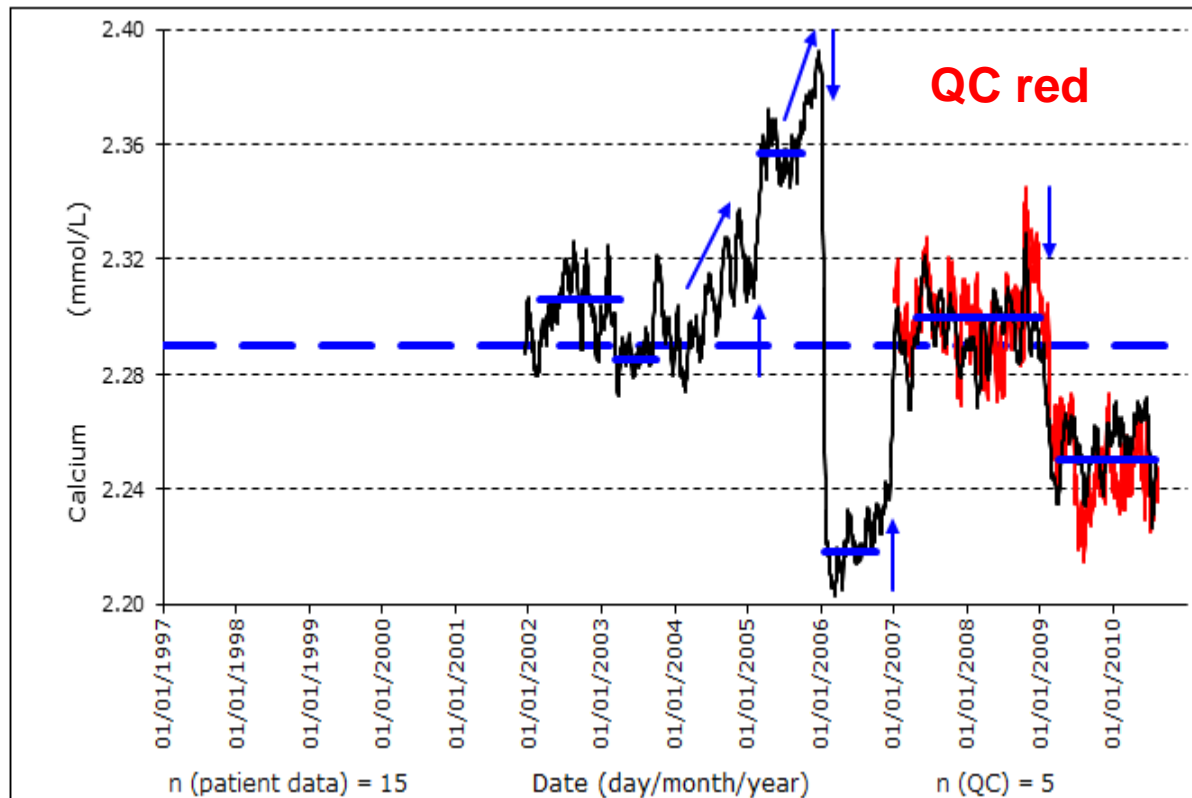
- **Low volume analytes**
- **Seasonal variation (25OHD)**

# Example

## Calcium 50<sup>th</sup> percentile

Reflects analytical stability very well; strong shifts

(Stepman et al. Poster AACC 2012)

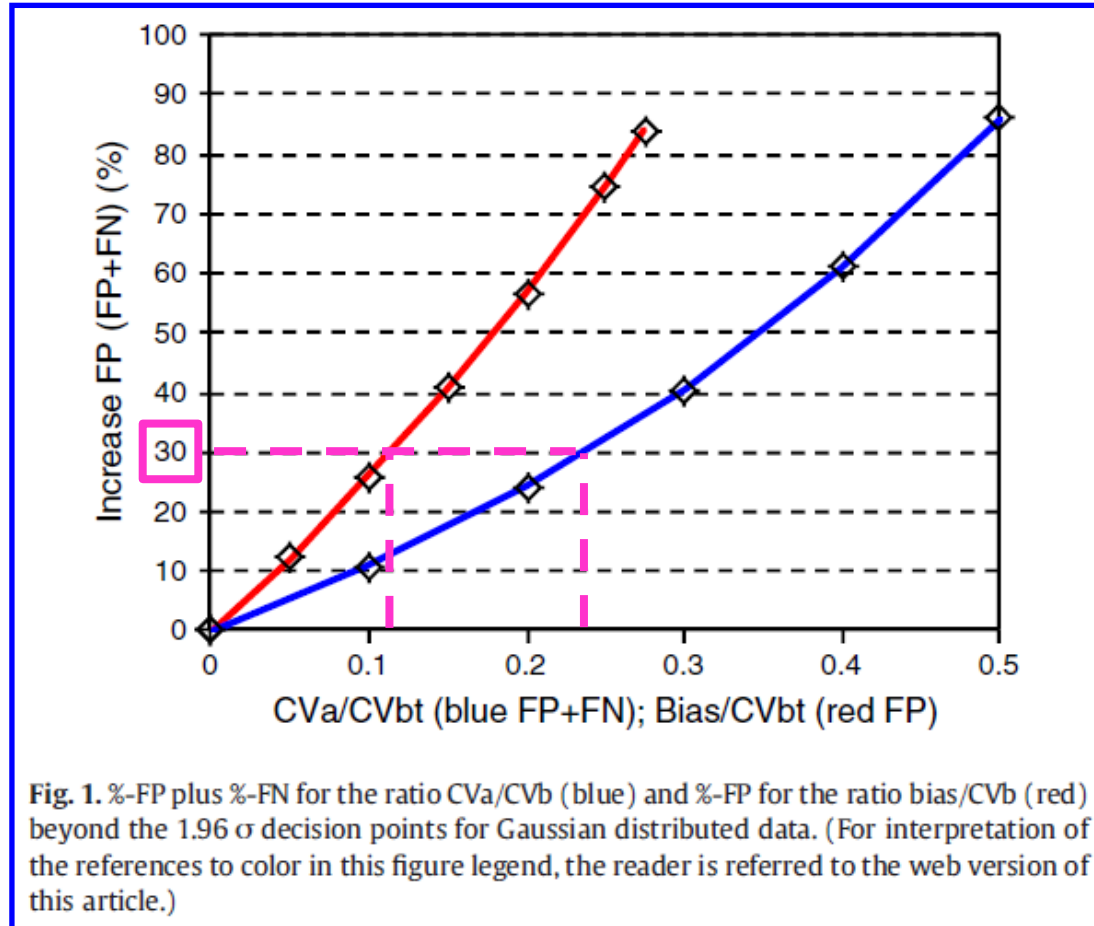




# Application concept

## Concept

### Effect of assay instability on surrogate medical decisions



A fresh look at analytical performance specifications from biological variation.  
Stepman HC, Stöckl D, Twomey PJ, Thienpont LM. Clin Chim Acta 2013;421:191-2.

# Application

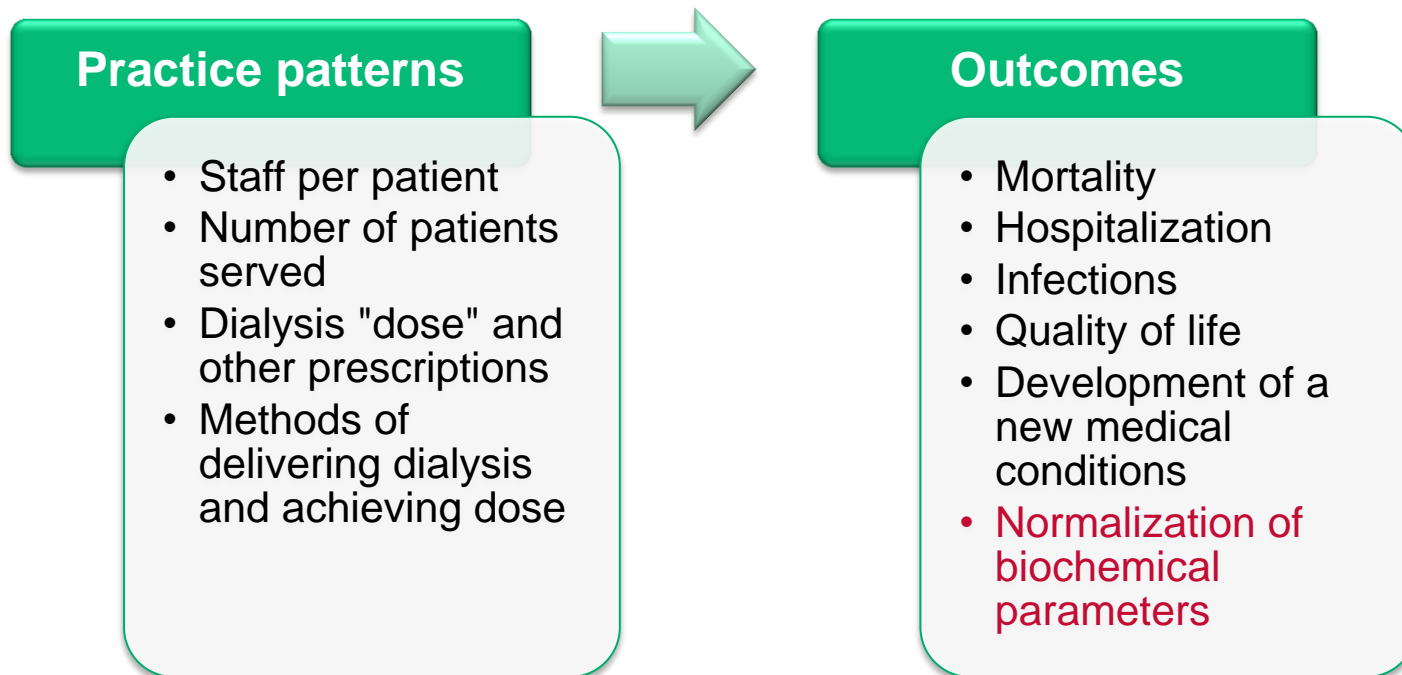
## Surrogate medical outcome (laboratory population)

	Long-term mean	CV for stable periods (%)	Maximum neg. and pos. bias (%)	Percentage hypo in a biased period	Ratio hypo	Percentage hyper in a biased period	Ratio hyper	Bias specific. (diagnosis) (%)
<b>Calcium</b>								
<b>Brussels</b>	2.23	1.0	-3.1 3.7	40 22	1.8	5.0 12	2.4	0.8
<b>Ghent</b>	2.29	1.0	-3.5 3.9	35 19	1.8	1.0 5.1	5.1	

# Applications

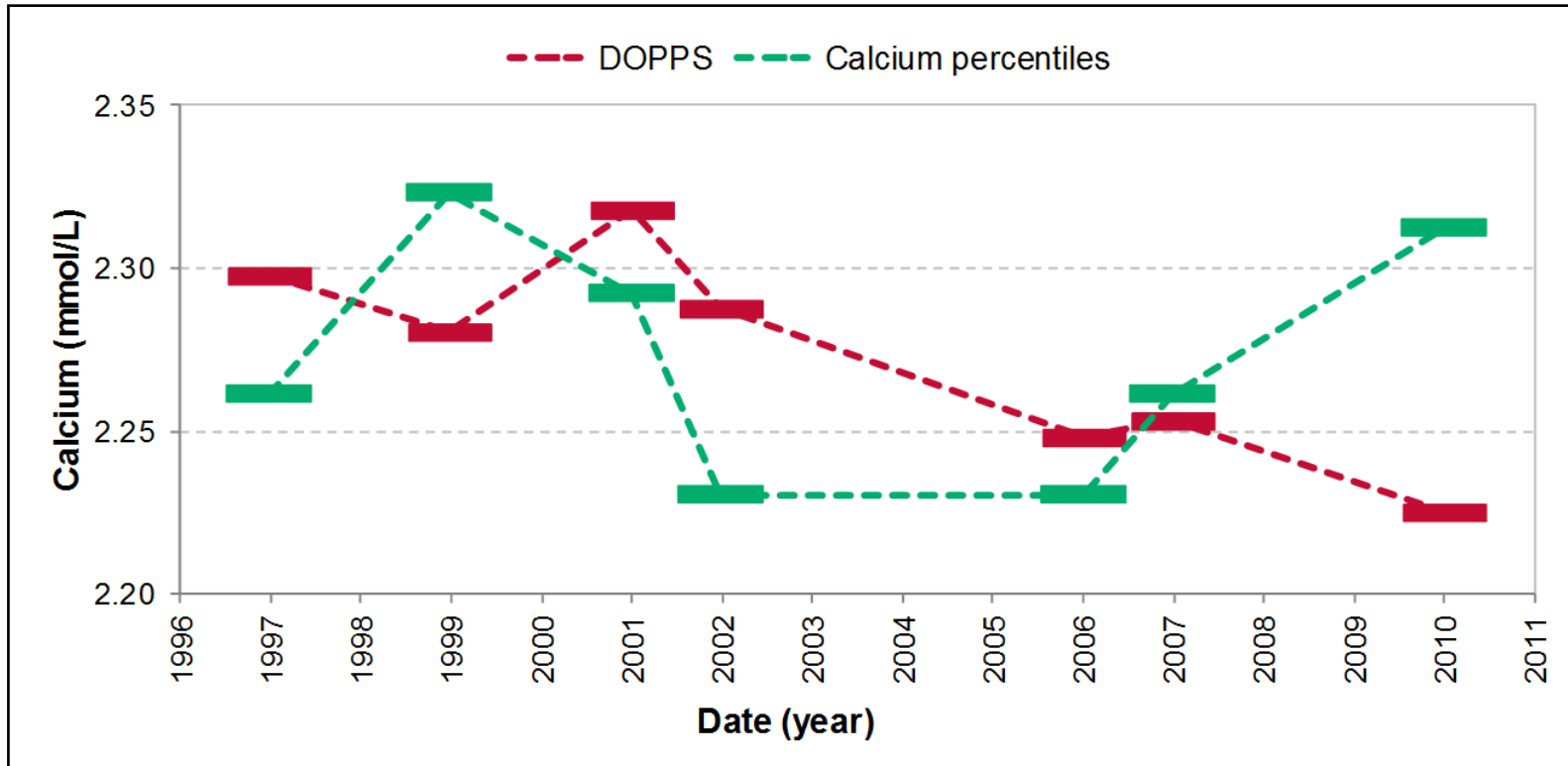
**DOPPS** = Dialysis Outcomes and Practice Pattern Study

Hypothesis: measurable differences in dialysis facility practices influence patient life expectancy, morbidity and health-related quality of life



# Applications

Trends by practice patterns or analytical instability?



# IT surrounding

## “Direct reading from instrument”

“What used to take **four hours**,  
now takes **two minutes**.”

– Mark Shearer, MCLT, MT(ASCP)  
Director of Chemistry, CompuNet Clinical Laboratories



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**Available in 2013**

Automated Proficiency  
Testing Reporting

“e-LAB Solutions Connect™  
**streamlines** the process,  
**eliminates** the potential  
for **clerical errors**, and  
makes reporting proficiency  
testing a whole lot **easier**.”

– Lisa Berger, MT(ASCP)  
Site Director, CompuNet Clinical Laboratories

# The MIPS GLIMS IT solution

## Configuration time

**<1 hour**

## Data transfer

**“Hassle free” background calculation & sending**

## Price

**ZERO €**

# The MIPS GLIMS IT solution

## Output and email transfer

**e-mail to** dietmar@stt-consulting.com (SMTP server)

Production Statistics

Time period: 29/05/13 00:00 - 29/05/13 23:59 (produced)

Selection: no QC, no unassessed, no unsolicited, status 'Confirmed' until 'Validated', classification 'statPERCSTUDIE'

Contents: Median of numeric value, per statPERC\_STUDIE (rows)

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StatPERC\_STUDIE

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?

UZG;29/05/2013;COBAS8000C;POL;ALB;g/L;47.50

UZG;29/05/2013;COBAS8000C;POL;ALKFOS;U/L;61.70

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UZG;29/05/2013;COBAS8000C;POL;URINZ;mg/dL;5.64

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## Codes

Lab identifier;Date(DD/MM/JJJJ);Instrument ID;Outpatient code;Analyte;unit;median (or 50<sup>th</sup> percentile)

[future: serum/plasma?; calibrator lot; reagent lot].

## 20 Analytes (serum or plasma)

Albumin; Alkaline Phosphatase; Alanine aminotransferase (ALT); Aspartate aminotransferase (AST); total-Bilirubin; Calcium; total-Cholesterol; Chloride; C-reactive protein (CRP); Gamma-glutamyl transferase (GGT); Glucose; Potassium; Creatinine; Lactate dehydrogenase (LDH); Magnesium; Sodium; Inorganic phosphor (phosphate); total-Protein; Urea; Uric acid (urate)

# IT – MySQL database & Visualization

**E-mail reading**

**Graphical user interface**

**Bruno Neckebroek**



# Thanks for the IT solution!

Filip Migom (MIPS): [filip.migom@mips.be](mailto:filip.migom@mips.be)

Tom Fiers (UZ Gent): [tom.fiers@uzgent.be](mailto:tom.fiers@uzgent.be)

Bruno Neckebroek: [neckebroek.bruno@telenet.be](mailto:neckebroek.bruno@telenet.be)



# Benefits

## **Patient percentile monitoring** (“Virtual EQA”)

- **Evidence about mid- to long-term stability of assays**
- **Evidence about the reasons for assay variation: lot-to-lot-variation; laboratory/instrument variation (laboratories having significant, long-term bias to their own peer group).**
- **Establish realistic quality goals (effect of variation on “surrogate” medical decisions); tool for strengthening the physician/laboratory interface by more transparent communication of performance.**
- **Strengthens the laboratory/manufacture dialogue.**
- **Cross comparison between manufacturers allows insight into performance of competitors.**

# Benefits

## **IQC monitoring** (mid- to long-term)

- **Has to substitute percentile monitoring for low-volume assays and patient populations with a high heterogeneity (PTH, 25OHD); >similar information as patient percentiles.**
- **A conceptually strong IQC system is the backbone of the laboratory's analytical quality management system.**
- **Many manufacturers, indeed, have their own IQC/EQA monitoring system. Laboratories and manufacturers would profit from an open, independent look at these data and a cross comparison to other manufacturers.**



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# THE EMPOWER PROJECT

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