



Evaluation of the performance of medical laboratories in bacteriology during the last decade

**Christophe
GARCIE**

EQALM Symposium 2014
October 23-24, Hôtel Palladia, Toulouse, France

Introduction

- CTCB: Toulouse center for quality control in clinical biology



Centre Toulousain pour le Contrôle
de qualité en Biologie clinique

- CTCB Bacteriology Quality Control (Bact-QC):
 - external quality assessment program created in 1979
 - intended for private and public medical laboratories
 - 2 strains sent to laboratories 4 times per year
 - experts: Dr. Danièle Clavé & Dr. Catherine Delmas, bacteriologists

Diapositive 2

1

LOGO COFRAC COMPARAISON INTER-LABORATOIRES ???

Christophe Garcie; 22.10.2014

CTCB Bact-QC functioning

3

- Sending of 2 freeze-dried strains to laboratories quarterly:

1. Frequently encountered bacteria in human infectious disease

- “ identification + antimicrobial susceptibility testing (AST)
- “ external quality assessment

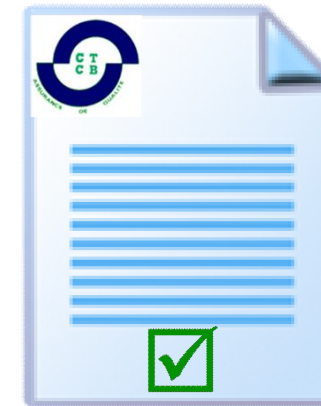


2. Unusual or 'difficult to grow' or 'complex to identify' bacteria

- “ identification only
- “ continuing professional development

- Statistical analyses of laboratories answers by the CTCB

- Transmission of individual results, synthesis report and technical sheets to participants



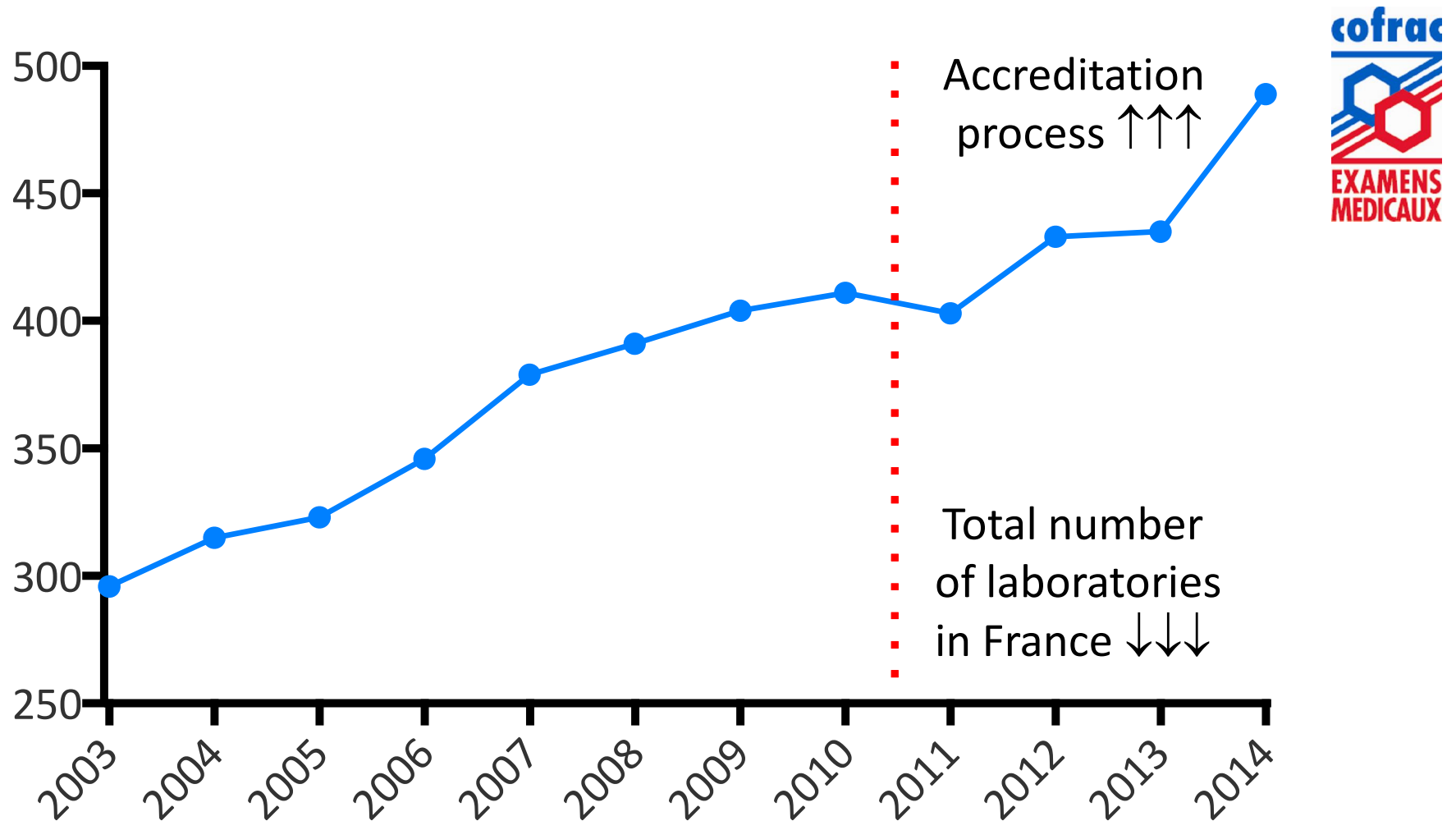
Bacterial diversity

4

	External Quality Assessment	Continuing Professional Development
Gram +	<i>Staphylococci</i> <i>Streptococci</i> <i>Enterococci</i> <i>Listeria</i> <i>Clostridium</i>	<i>Abiotrophia</i> <i>Alloïococcus</i> <i>Leifsonia</i> <i>Nocardia</i> <i>Turicella</i>
Gram -	<i>Neisseria</i> <i>Enterobacteria</i> <i>Haemophilus</i> <i>Pseudomonas</i> <i>Pasteurella</i>	<i>Chryseobacterium</i> <i>Leptotrichia</i> <i>Raoultella</i> ...

Evolution of the participants number

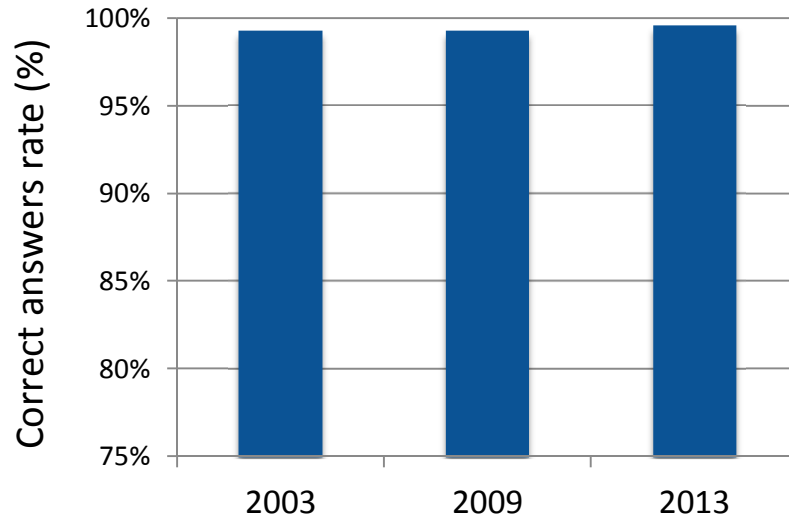
5



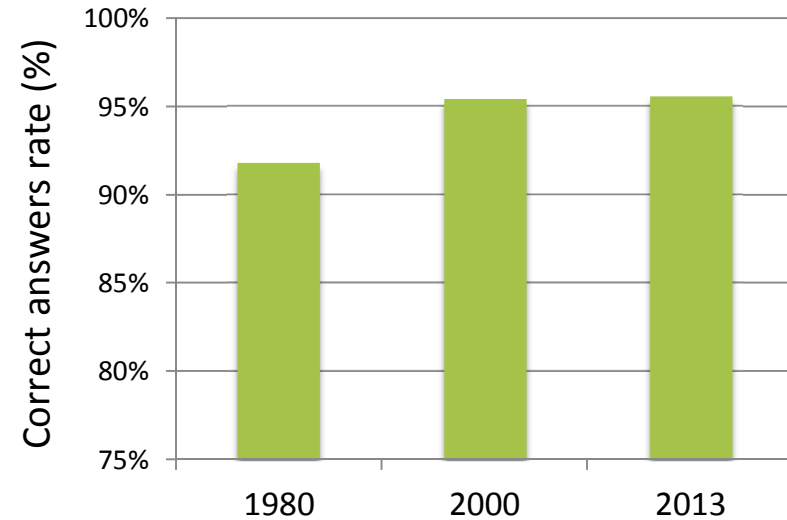
Global performance of medical laboratories

6

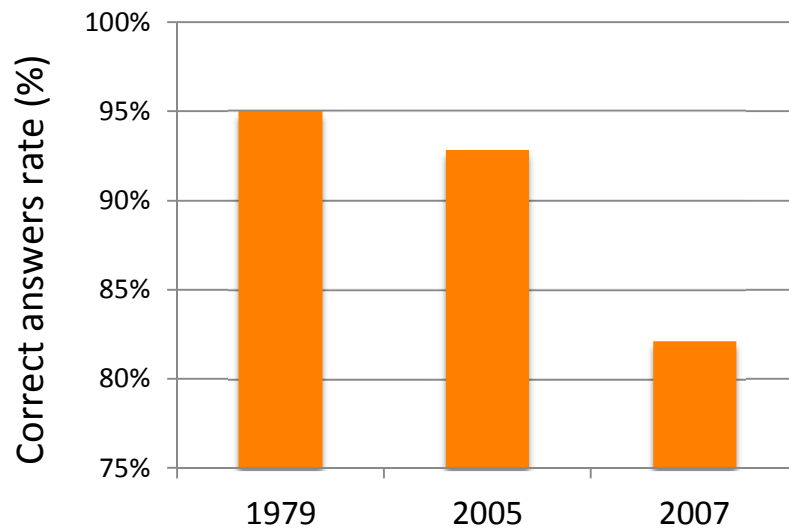
Staphylococcus aureus



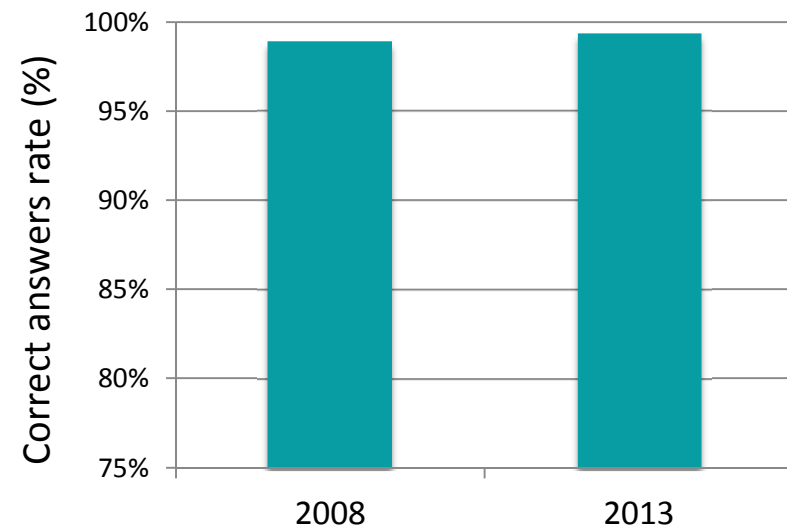
Listeria monocytogenes



Enterococcus faecalis



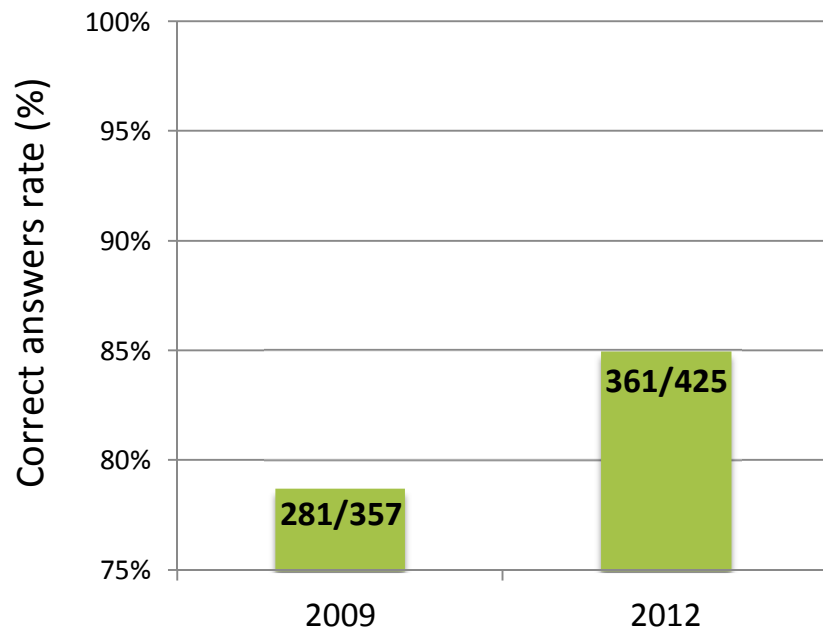
Klebsiella pneumoniae



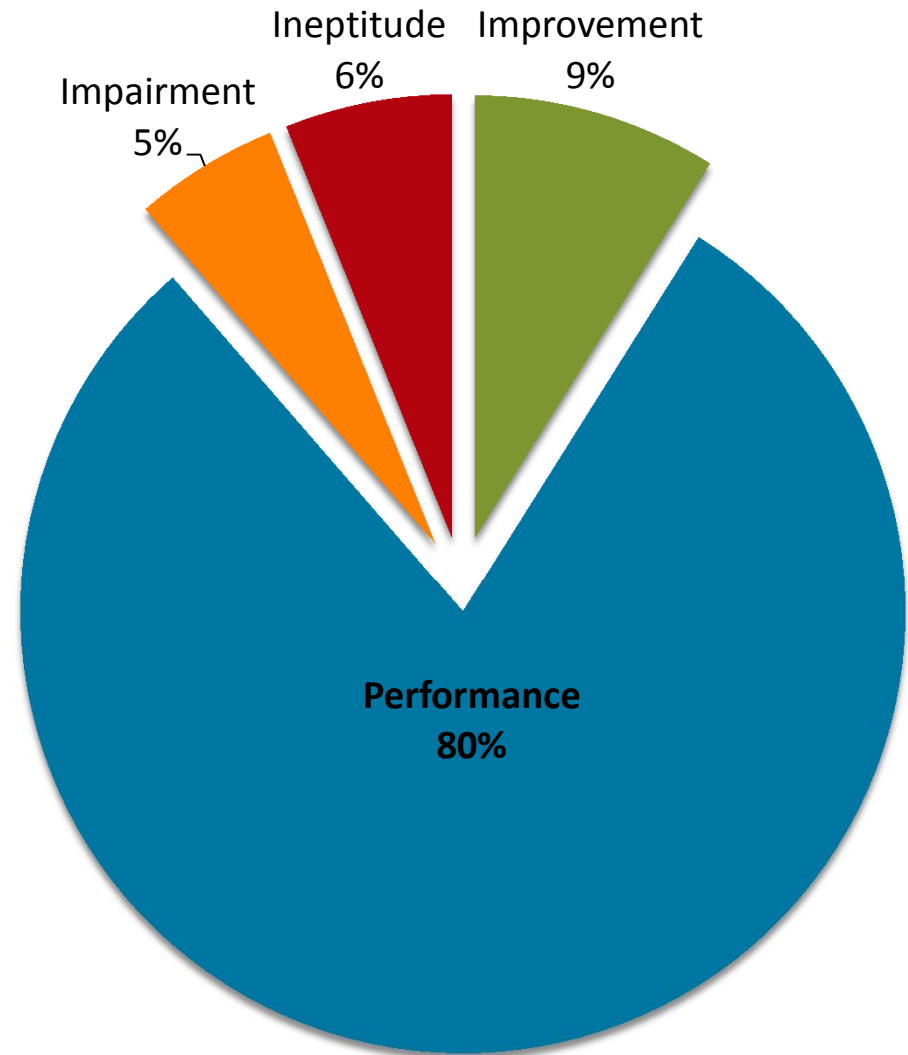
Evolution of the performance

□ *Staphylococcus caprae*:

- sent for identification twice

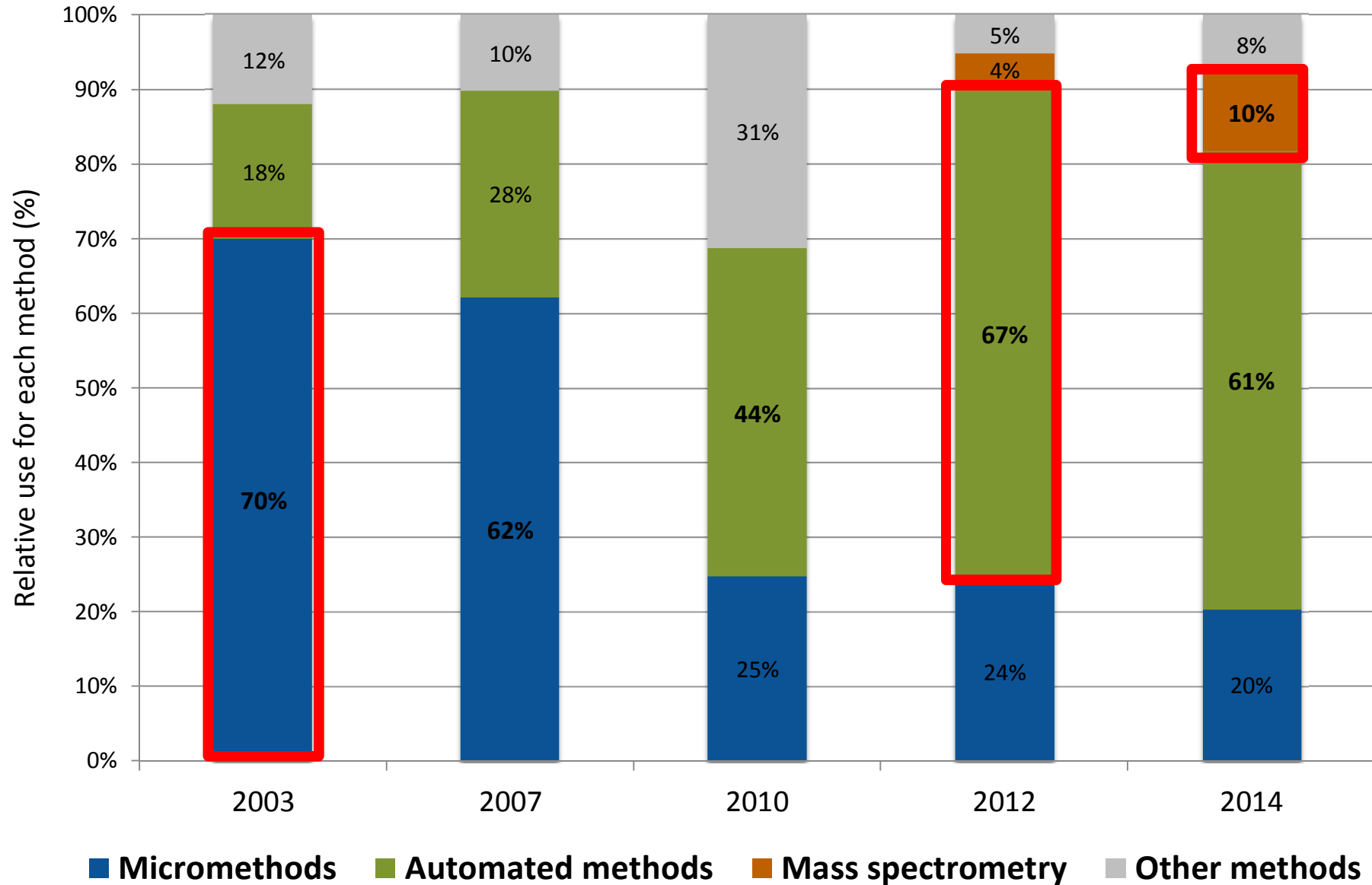


- 246 laboratories answered for both sendings of *S. caprae*
⇒ analysis of their evolution



Technical evolution

8



Identification of a technical misuse

9

- Example with the Vitek[®] 2 automated identification system
- In 2013, high number of '*Sphingomonas paucimobilis*' answers

Strains sent in 2013	Number of participants	Number of Vitek 2 users	Number of <i>Sphingomonas</i> answers	Number of <i>Sphingomonas</i> answers with Vitek 2
<i>Pasteurella multocida</i>	427	214	24	22
<i>Listeria monocytogenes</i>	449	226	4	4
<i>Leifsonia sp.</i>	432	198	59	52

- Analysis revealed a misuse of the Vitek[®] 2 system:
 - systematically control identification when Vitek result is '*Sphingomonas*'
 - information note from the CTCB experts to Biomérieux

Common errors

10

- Careless mistakes:
 - ▣ unobserved instructions for cultivation
 - ▣ switch between the two strains
 - ▣ input errors during the results submission

- Technical mistakes:
 - ▣ errors in Gram straining reading
 - ▣ absence of 'rapid orientation test'
 - ▣ wrong choice of the identification panel

Antimicrobial susceptibility testing evaluation

11

- Difficulties to analyse AST results from participants
- Transition period for AST recommendations:

CA-SFM (France)



- Ongoing thought to improve AST evaluation:
 - ▣ ability to correctly identify resistance mechanisms
 - ▣ respect of the recommended interpretation rules

Take home message

12

- EQA program required for accreditation process (ISO 15189):
 - ▣ increased number of participants these past four years
 - ▣ no laboratories performance improvement observed yet

- CTCB Bact-QC as a surveillance tool:
 - ▣ technical evolution of medical laboratories in bacteriology
 - ▣ medical diagnostic devices vigilance or misuse detection
 - ▣ global performance evaluation of methods used in bacteriology

- Improvement of AST evaluation needed:
 - ▣ harmonisation between european EQA programs?

Thank you for your attention !

Many thanks to:

Dr. Danièle Clavé

Dr. Catherine Delmas

CTCB members

EQALM Symposium staff

