# Evaluation of Romanian microbiology laboratories for the identification and antibiotic susceptibility of microbiological agents. Survey results of the 2013 EQA scheme

Mariana Carmen Chifiriuc
University of Bucharest, Faculty of Biology, Microbiology Department
CALILAB

# Proposed schemes, periodicity, requirements

- **EQA scheme provider**: CALILAB (since 2006)

- **Proposed schemes**:
  - General bacteriology
  - Urine cultures
  - Stool cultures
  - Throat swabs
  - Secretions (ear, conjunctival, nasal, wound, purulent, urethral, vaginal)

- **Periodicity**:
  - 4 times / year

- **No. of participants**:
  - May 2013 – 179, September 2013 – 184

**Distributed strains:**

*Streptococcus agalactiae*
*Streptococcus equisimilis*
*Streptococcus pyogenes*
*Staphylococcus aureus*
*Proteus mirabilis*
*Escherichia coli*
*Salmonella* spp.
*Candida albicans*

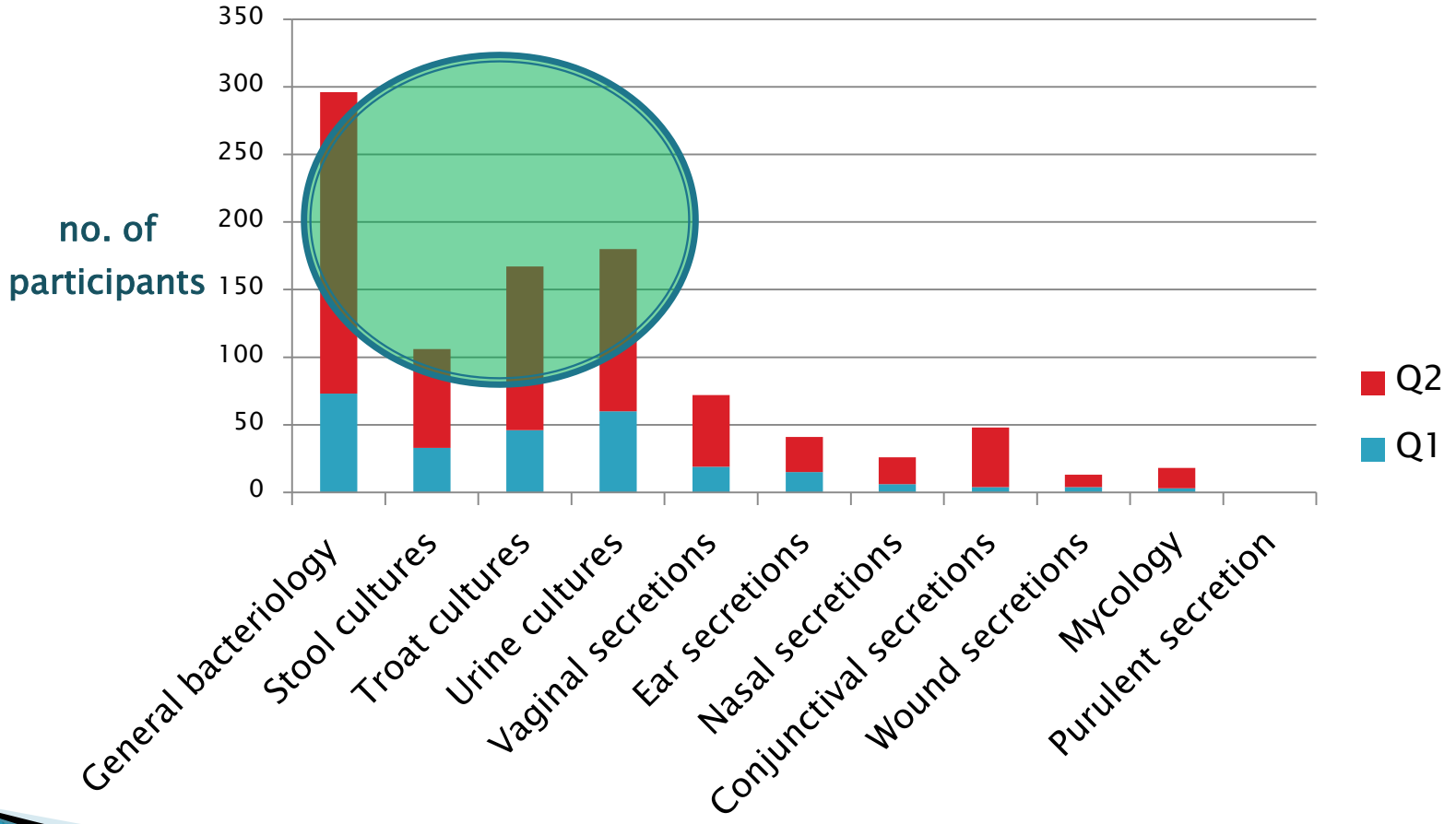
**Requirements:**

- Microbial strains identification
- Antibiotic susceptibility testing results

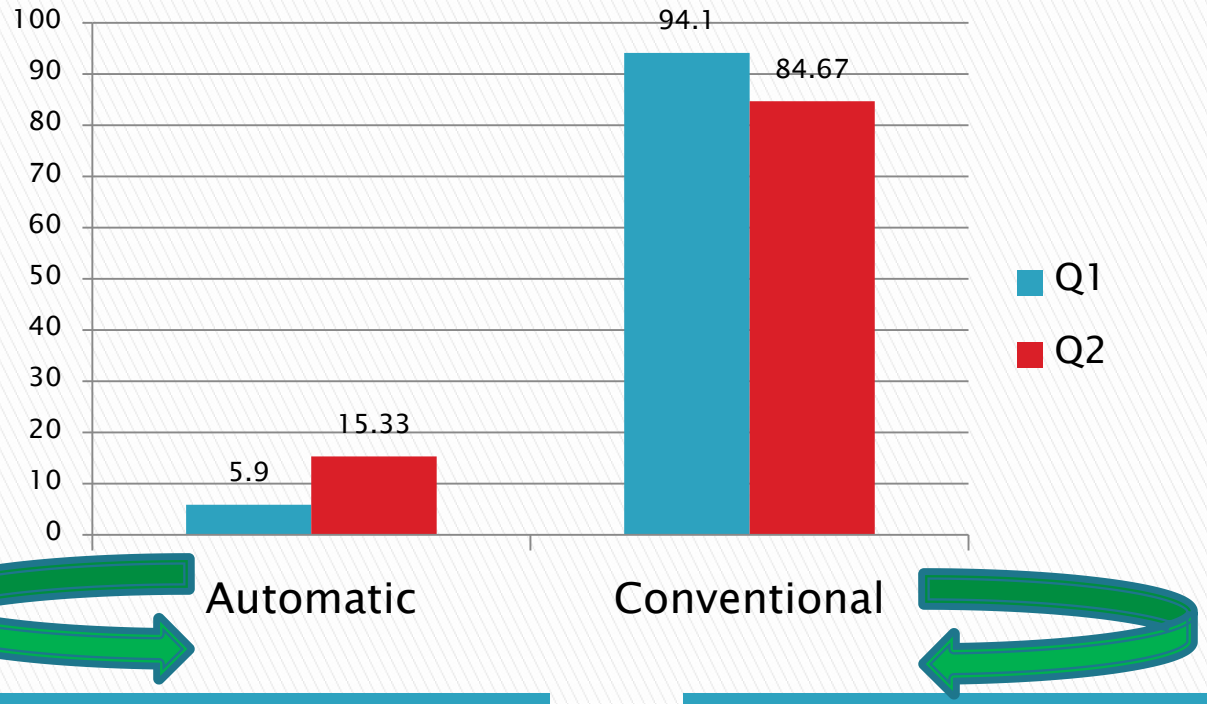
**Evaluation of the obtained results**:

- Comparison with the assigned value/identity
- Establishing the percentage of participants reporting the correct result

# Distribution of participant laboratories in different schemes



# Microbial identification methods



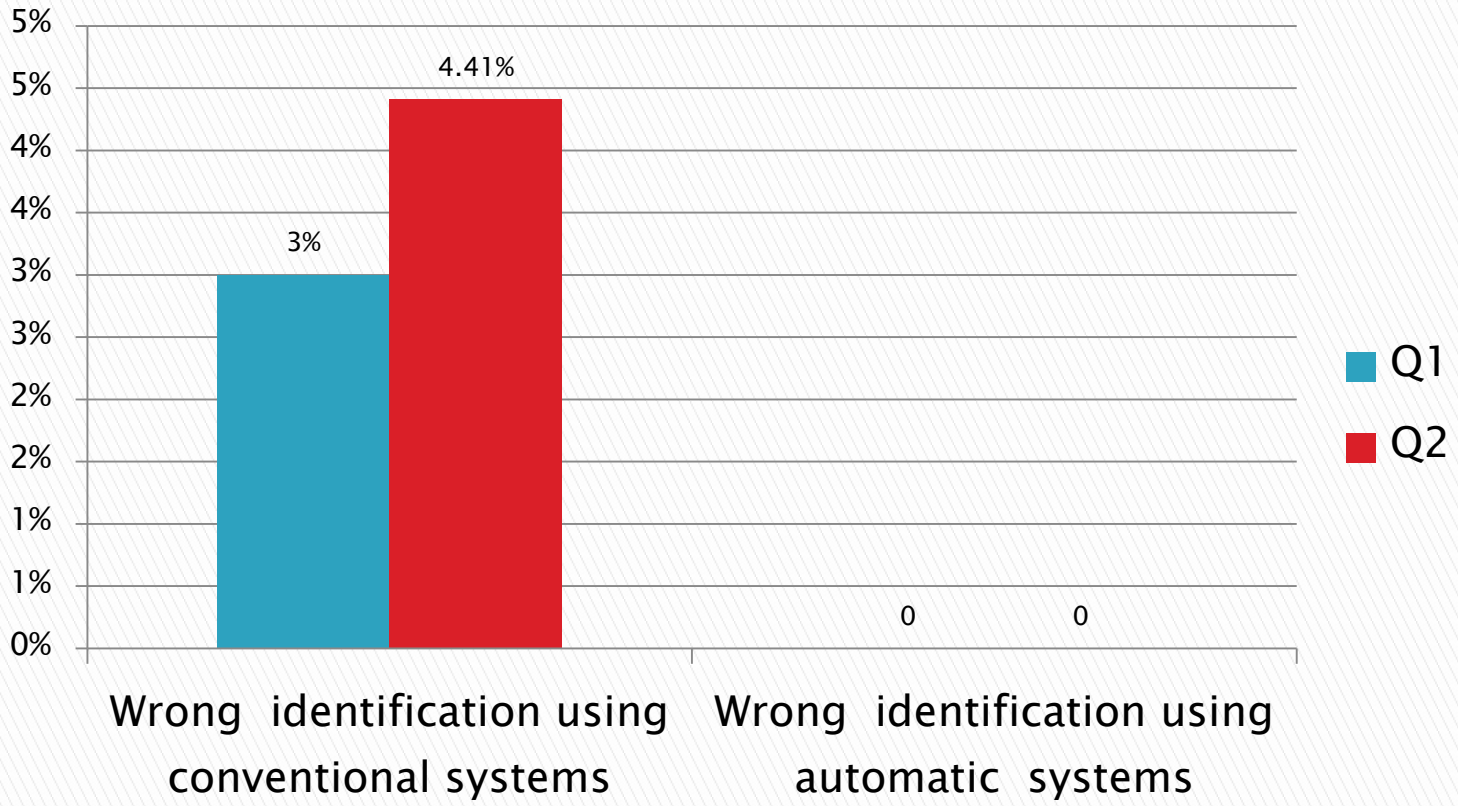

## Automatic systems

- Vitek II
- Microscan

## Conventional methods

- Microscopy
- Serotyping- agglutination
- Cultivation on selective media
- Biochemical tests

# Wrong identification



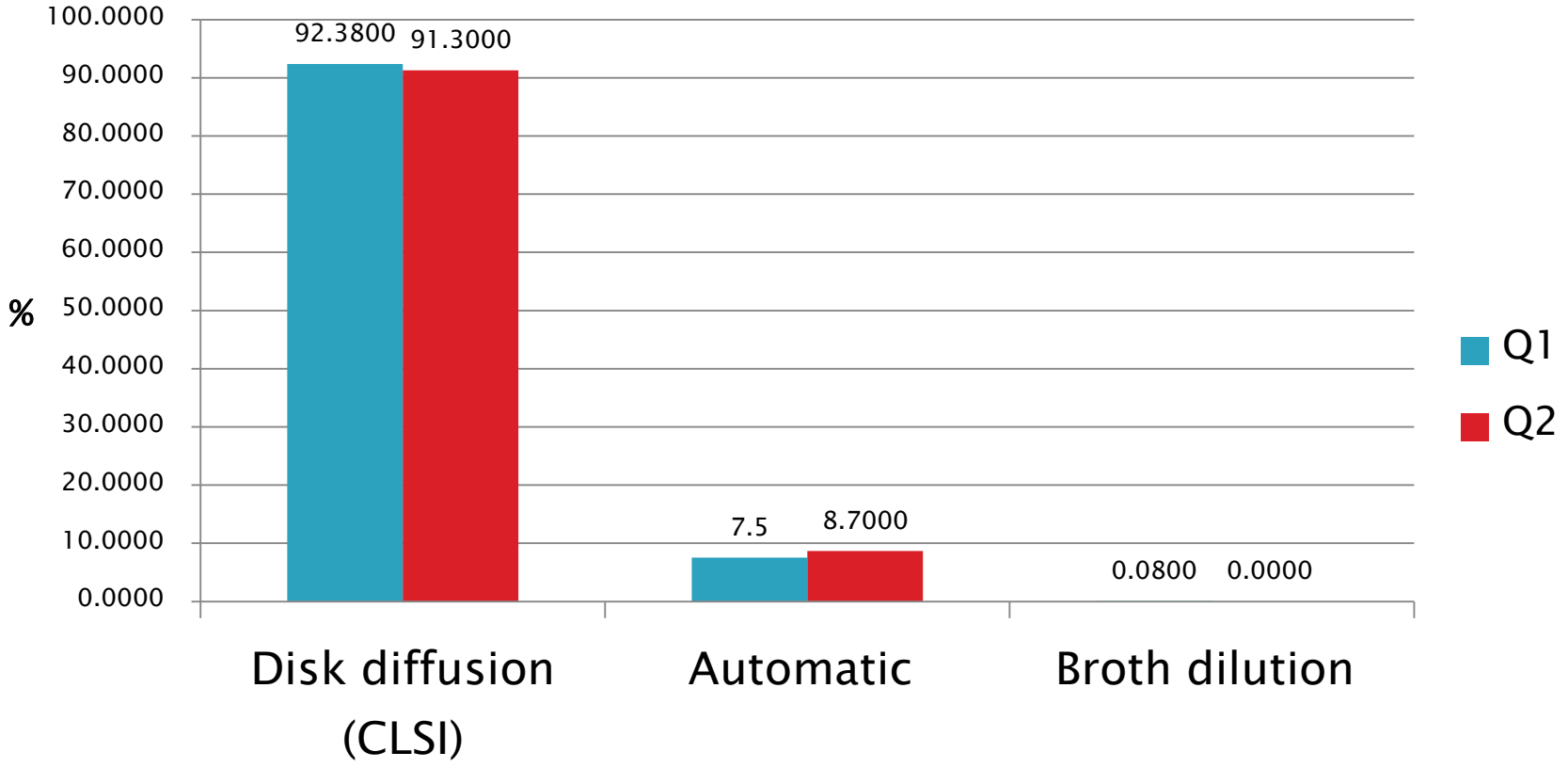

**Possible error sources**:

using only microscopy for species identification of Gram-positive cocci

poor quality and/or wrong interpretation of multitest biochemical tests used for the identification of Gram-negative bacilli

only 42.8% of participants used serology for the confirmation of *Salmonella* spp.

# Antibiotic susceptibility testing methods



# Antibiotic susceptibility results

- All distributed strains exhibited wild type susceptibility profiles (no aquired resistance to antibiotics)

- Discordant results per isolate:
  - ***E. coli***
    - 39% R AMP
    - 18% R AMC
    - 10% ESBL!!!
  - ***Salmonella vellore***
    - 12.33% R to AMP
  - ***Proteus mirabilis***
    - 12% R to AMP
    - 84 % S to NIT (intrinsec resistance, CLSI 2013, pp. 176)

# Discordant antibiotic susceptibility results

- *S. aureus*
  - 10% R FOX
  - 10% R TEC (EUCAST- *Disk diffusion is unreliable and cannot distinguish between wild type isolates and those with non-vanA-mediated resistance).*
  - 14% R ERY

- *Streptococcus agalactiae*
  - 10% R VAN (CLSI 2013, pp.112-*For some organism/antimicrobial agent combinations, the absence or rare occurrence of resistant strains precludes defining any results categories other than susceptible. For strains yielding results suggestive of a nonsusceptible category, organism identification and antimicrobial susceptibility test results should be confirmed*)

# Frequent errors

- Misidentification of microbial species or genera
- Incompliance to AST standard recommendations or use of previous standard versions (i.e. CLSI)
- Lack of knowledge on intrinsec resistance phenotypes
- Reporting resistance phenotypes without using confirmation methods

- **Prevention of such errors could be successfully accomplished by effective and continuing training**.
  - Knowledge of atypical results for different organism-agent combinations and of intrinsec resistance phenotypes may provide warning of possibly erroneous results, as well as an understanding of the limitations and sources of error in disk diffusion methods.