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# WHO Global Foodborne Infections Network external quality assurance system (EQAS) for antimicrobial susceptibility testing of *Salmonella* isolates

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## Background

The WHO Global Foodborne Infections Network (GFN) is led by 11 steering committee partners (Figure 1) and builds global capacity to conduct integrated, laboratory-based surveillance, detection and response to outbreaks of foodborne and other infectious enteric diseases through a number of components.

One such component is the global External Quality Assurance System (EQAS) for antimicrobial susceptibility testing (AST) of *Salmonella* species which was initiated by GFN in 2000.

EQAS enhances the capacity of national reference laboratories to obtain reliable data for monitoring and surveillance purposes worldwide.



Figure 1: The GFN steering committee partners

## Methods

Nine EQAS iterations were conducted between 2000 and 2009. In each iteration, participants received eight test strains and new participants were provided with the *E. coli* ATCC 25922 quality control (QC) strain.

The test strains were selected to cover a variety of antimicrobial resistance profiles, especially emerging phenotypes like plasmid-mediated quinolone resistance and extended-spectrum beta lactamase-producers (ESBL).

In each iteration, participating laboratories submitted AST results for eight *Salmonella* isolates through a secured website and received an instant report with suggestions for corrective actions if needed.

## Results

A total of 323 laboratories in 119 countries participated in the AST iteration conducted between 2001-2009. (Figure 3)

Cumulatively, 92% of the uploaded AST results on the test isolates were in agreement with expected results.

The percentage of laboratories uploading data for the QC strain ranged by iteration from 72% to 99% with 41% to 56% of the laboratories having all values within accepted limits (Figure 3).

Data from 2001 to 2007 are summarized and published<sup>1</sup>.



Figure 3: Marked with color are the countries from which one or more laboratories have participated in the WHO GFN EQAS in any of the iterations from 2001 to 2009 (the 2000-data are not included as they were not uploaded to the database)

## Conclusions

The results from the GFN EQAS, one of the largest of its kind in the world, show that most laboratories worldwide are capable of correctly performing AST of the *Salmonella* isolates included in the test panel.

However, this study also indicates a continuing need for improvement. Future training efforts should be aimed at enhancing the quality control of the assay stressing the importance of the QC strain, the true indicator of the quality of AST performance, and at enhancing the ability to detect emerging resistance phenotypes, e.g. plasmid mediated quinolone resistance and ESBL.

## Reference

<sup>1</sup> Results of Use of WHO Global Salm-Surv External Quality Assurance System for Antimicrobial Susceptibility Testing of *Salmonella* Isolates from 2000 to 2007. Hendriksen RS, Seyfarth AMS, Jensen AB, Whichard J, Karlsmose S, Joyce K, Mikoleit M, DeLong SM, Weill FX, Aidara-Kane A, Lo Fo Wong DM, Angulo FJ, Wegener HC, Aarestrup FM. J Clin Microbiol, 2009 Jan; 47:79–85

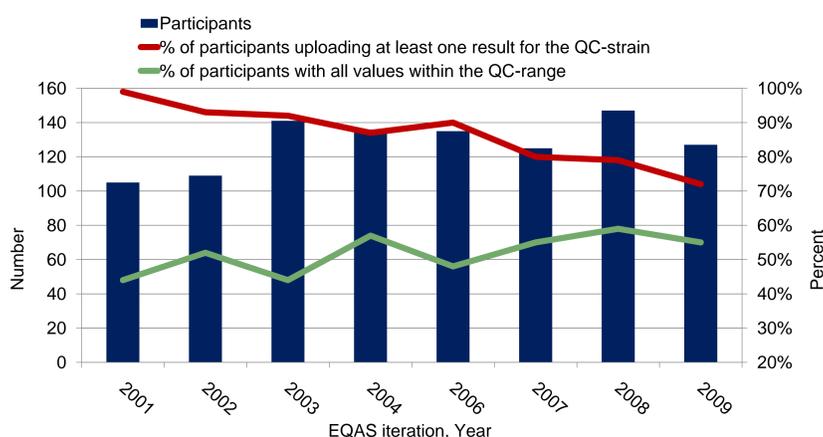


Figure 2: Participating laboratories testing the QC-reference strain (*E. coli* ATCC 25922)