

Interpretation of performance

Performance is monitored over a rolling set number of distributions (the number of distributions included in the cumulative performance analysis is scheme dependant).

In the Cumulative score information box on page one of your report you will see the text:

Your cumulative score for the specimens/test combinations that you reported was X out of a possible Y
The mean score calculated from the reports returned by 'Your Country' laboratories testing the specimen/test combinations you examined was Z with a standard error of K.

K is the standard error of the mean score for that specimen/test combination and just shows how much variability there is with the scores obtained by the laboratories.

To see how well you are doing you need to look at your cumulative score X and the mean score Z

If X is greater than Z you are doing better than average for your country for that specimen/test combination.

Performance Rating (PR)

PR enables laboratories to quantify how much better or worse their performance is compared to other laboratories. This is a method of ranking. PR is the number of standard errors your score lies above or below the mean performance for the laboratories in your country examining the same specimens and is calculated using the formula

$$\frac{(\text{Cumulative score of lab} - \text{Mean cumulative score of all laboratories for the same specimens})}{\text{Standard error of mean cumulative score of all laboratories for the same specimens}}$$

Therefore you could have a record of very good performance and a high PR if the average score for laboratories is low, then in the following distribution if the average performance of laboratories is high and similar to your performance your PR may drop.

Calculation for each laboratory; sequence

The system checks to see if there are 10 or more laboratories in your country participating; if there are all the calculations are performed on data from laboratories in your country. If there are less than 10 laboratories participating then the calculations are based on all laboratories.

The system looks for

Scores for the specimens (that have been scored*) that your laboratory has received

The mean score for each specimen

Analyses each of the possible results for the specimen

*Specimens for which you have reported 'Not Examined' or Late are not scored and therefore excluded from the calculations.

The laboratory performance statistics can then be calculated using the following method:

A = for individual specimen, sum of scores/number of laboratories scored

B = average for series of specimens (the sum of A)

C = the sum of scores for the individual laboratory in that series

Calculate standard errors as follows

For each specimen

$$D = [(2 - \text{average score}) \times (2 - \text{average score})] \times \text{number of laboratories scoring 2}$$

$$E = [(1 - \text{average score}) \times (1 - \text{average score})] \times \text{number of laboratories scoring 1}$$
$$F = [(0 - \text{average score}) \times (0 - \text{average score})] \times \text{number of laboratories scoring 0}$$
$$G = [(-1 - \text{average score}) \times (-1 - \text{average score})] \times \text{number of laboratories scoring -1}$$
$$H = (D + E + F + G) / \text{number of laboratories scored}$$

I = sum of H for all specimens

J = square root of I

$$K = J + 0.5$$

The standard error of the mean score

(0.5 is a continuity correction applied because the data is discontinuous)

$$L = (C - B) / K$$

This is the number of standard errors the participant's score is above or below the mean

Round values (of L) to two decimal places to give the performance rating PR

For most schemes failure to return results for a set of specimens in a distribution is penalized with a score of zero for each specimen in the distribution (an exception is made to the multi-marker serology schemes). For the Antimicrobial susceptibility scheme participants not returning results for a set of specimens had been receiving a score of zero for each possible antimicrobial agent. Therefore they could have lost 40 points if the two specimens in the distribution were each tested against ten antimicrobial agents. These results had an effect on the performance rating resulting in laboratories returning results having an inflated performance rating and those failing to return results being excessively penalized; therefore the zero score for failure to return reports was removed. The change was applied retrospectively to April 2004 when the scheme was first introduced.

A comment should have been added to the report for distribution 1939 when the change was applied. Through December we shall be updating all individual participants' reports for the Antimicrobial Susceptibility scheme and placing them on the secure web site www.uknegas.org.uk (username and password required). Laboratories will be able to download their own reports.

Laboratories failing to return reports will be monitored separately and those UK laboratories failing to return results for any two distributions in a six month period will be considered potential poor performers.