

## Overview

This standard is about applying basic statistics within life sciences and related industries. You will be expected to use statistics to both plan/design the study and to handle the data from the activity. The activity will include a sampling plan, collection and analysis of the data followed by a report which includes a statistical analysis of the results

Reliable data is essential in any organisation. Simply collecting the data is not enough, applying a statistical approach will ensure that results can be reported with a higher degree of confidence in their reliability.

You will be expected to determine the scope/parameters of the work and to carry it out within them, recording all results. You will then be expected to use the data gathered to produce a statistical analysis, which is likely to include, mean, standard deviation, standard error and confidence intervals (or similar measurements). The results will be presented in a graphical form and any improvements or actions necessary will be reported ready for implementation.

Your responsibilities will require you to comply with organisational policy and procedures for the statistical activities undertaken and to report any problems you cannot personally resolve. You will be expected to work with a minimum of supervision, taking personal responsibility for your own actions and for the quality and accuracy of the work that you and your team carry out.

Your underpinning knowledge will provide a good understanding of design of experiments/activities and enable you to adopt an informed approach to applying basic statistics. You will have an understanding of data analysis and its application.

Who is this standard for

This standard is for senior technicians who have assumed some line management responsibility.

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**Performance  
criteria**

- You must be able to:
- P1 ensure that the work is carried out in accordance with workplace procedures to protect yourself and others
  - P2 select the experiment/process that is to be the subject of statistical study
  - P3 determine the scope/parameters of the study
  - P4 estimate the resources and the expected benefits for the study
  - P5 carry out a pilot study and ensure good experimental management
  - P6 implement any improvements suggested from the pilot study, before carrying out the full study
  - P7 record the results in the appropriate format
  - P8 analyse the data gathered using the appropriate statistical method
  - P9 produce the results of the statistical analysis in the appropriate format interpret the statistical data collected and produce a report of the results
  - P10 communicate the required information about the work done, to authorised people, in accordance with departmental and organisational procedures

## Knowledge and understanding

### You need to know and understand:

- K1 the health and safety requirements of the area in which the activities are being carried out the activities
- K2 the legal and regulatory frameworks within which you are working and the implications of failing to comply with either
- K3 the lines of communication and responsibilities in your department, and their links with the rest of the organisation
- K4 the limits of your own authority and to whom you should report if you have problems that you cannot resolve
- K5 how to determine the scope of an experiment
- K6 the advantages of good experimental design
- K7 how to use a sampling plan and experimental method to reduce systematic errors
- K8 the advantages of using basic statistics in data analysis
- K9 the meaning of and how to use basic statistical terms such as 'population' and 'sample'
- K10 the types of distribution curves and their properties
- K11 how to calculate mean, median, mode, standard deviation, range, inter-quartile range and variance
- K12 how to create and use tables charts and graph e.g. histograms, box plots, time series charts, pareto diagrams, stem and leaf diagrams etc.
- K13 how to construct confidence intervals
- K14 how to assess the significance of the results of the study
- K15 how to present the data in a suitable form in a report

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