

INTRODUCTION

The National Collection of Type Cultures (NCTC) curates over 6,000 reference bacterial strains of medical and veterinary importance, preserved and supplied as freeze-dried ampoules. The freeze-drying process requires a highly knowledgeable and skilled workforce; whereby high-titre liquid cultures are manually dispensed into glass ampoules and flame-sealed for long-term preservation. Therefore, a suitable and sufficient training programme is essential to deliver and instil the skills, knowledge, and experience required to perform tasks safely and effectively¹.

Laboratory training programmes are a requirement by the Health and Safety Executive (HSE), ISO15189:2012 in clinical, or ISO17025:2017 in testing laboratories. The standards are not prescriptive, allowing for individual interpretation and potential omission of safety-critical tasks.

In addition to performing testing and day-to-day tasks, laboratory staff must develop the skills to train others in the processes. Most learn these skills on the job and often, multiple approaches to training are used within a laboratory. The purpose of this project was to assess how safety is conveyed during the competency assessment process in NCTC, and to identify good practice and areas for improvement.

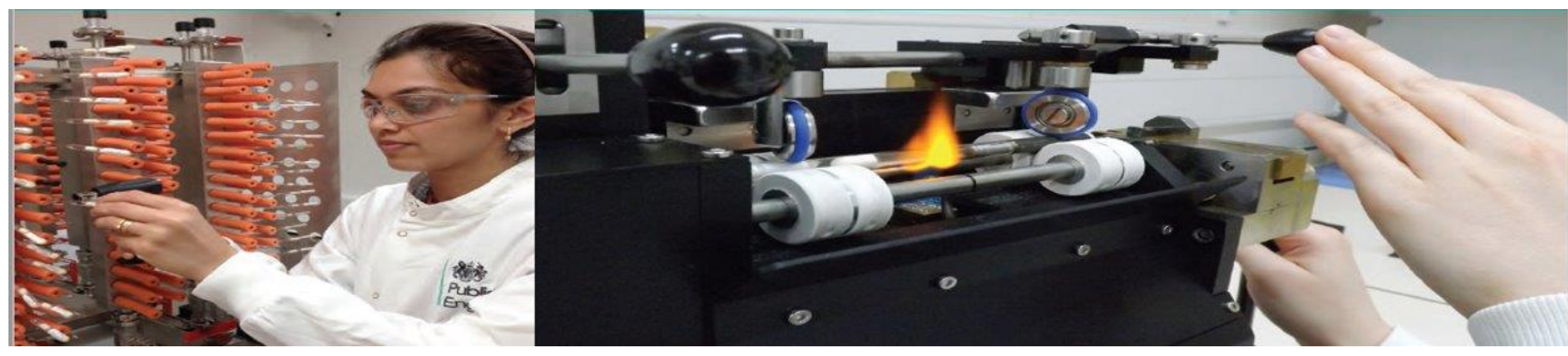





Figure 1: Removal of NCTC ampoules from the freeze-dryer and the constriction process

AIMS

-  To review what information is captured in the competency process
-  To determine if training provided is consistent across time, trainers, and grades of staff
-  To evaluate how well the training follows training policies, manuals, and guidance

METHODS

120 competency records from 15 individuals related to the freeze-drying process in NCTC were reviewed, consisting of Supervisors (2), Microbiologists (9), Technologists (4), Support workers (2). Competency records are comprised of documents that demonstrate the operator can perform a task correctly and safely. They are stored in the individual's training record.

The following information was extracted:

- Type of training (practical assessment, witness statements, self-assessment etc)
- Method of risk awareness training
- Nature of comments on form

The competency records were compared against a checklist to determine compliance to:-

- The departmental training manual
- HSE competence assessment guidance²
- Organisational Health and Safety policies for training
- The training statement in the standard operating procedure (SOP)

The nature of ongoing assessment was assessed and recorded.

RESULTS

- The average time for a trainee to be signed off as competent is 35 days. No correlation between length of training and grade of staff as observed.
- The majority (34% 41/120) of records employ two training methods. The most common combination being competence assessment with observation, accounting for 30 (25%) records.
- Risk awareness was primarily assessed through self-declaration of understanding (59%) and questioning (54%).
- Ongoing competency is in place for all trainees who had been in post for over one year. The most common reasons for ongoing competency training were returning to the laboratory after a period of absence (40%), followed by a new version of the SOP being issued (27%).
- The training statements in SOPs were inconsistent with five early versions of SOPs not containing a training statement. Two SOPs stated "all NCTC staff must be trained and be competent in this procedure" without describing what method the training should take.
- Figure 2 shows the nature of comments on the records. Figure 3 details the compliance to training policies and guidance.

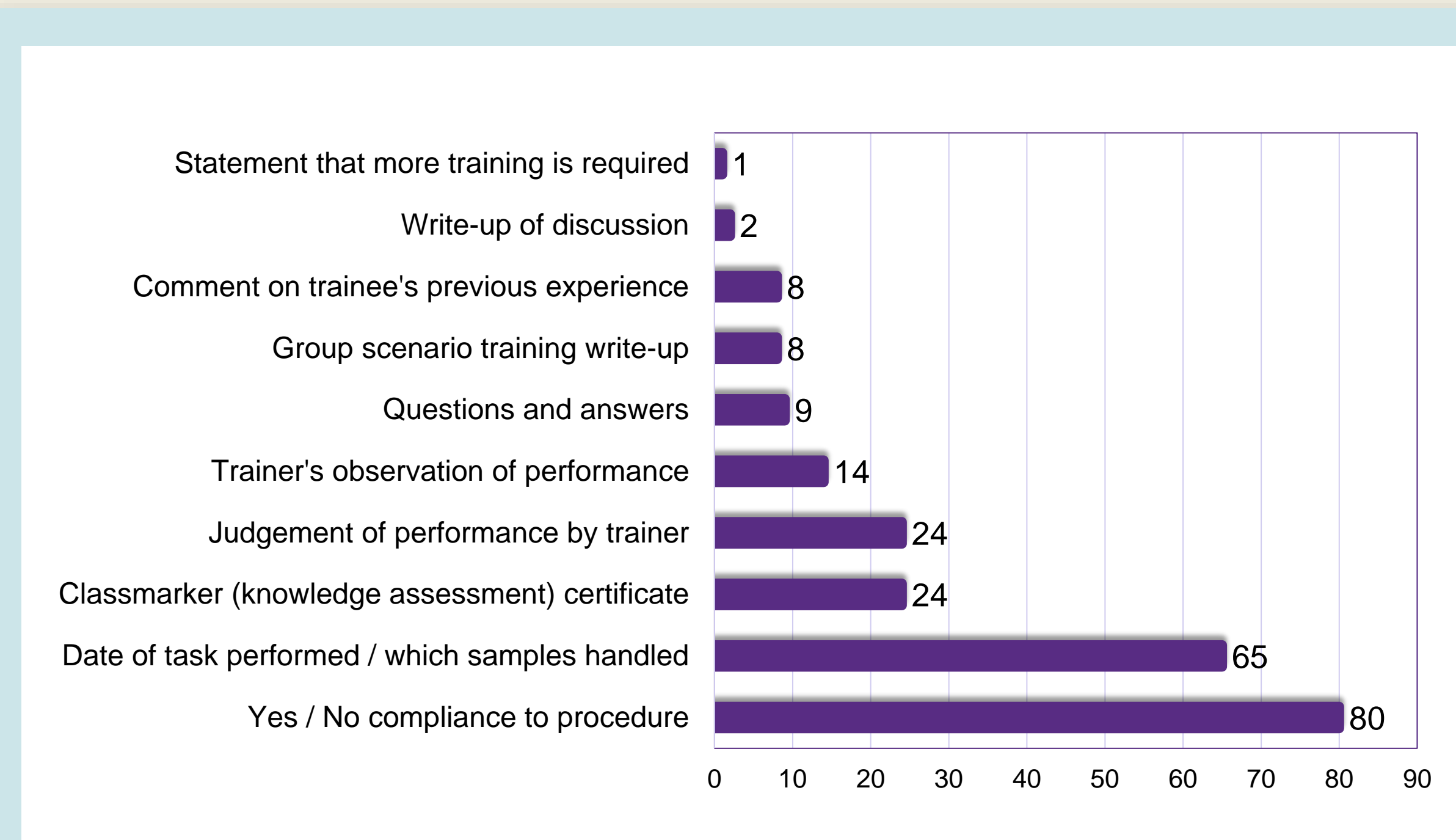


Figure 2. Nature of comments on competency records. The most common methods are statement of compliance to procedure and record of task performed.

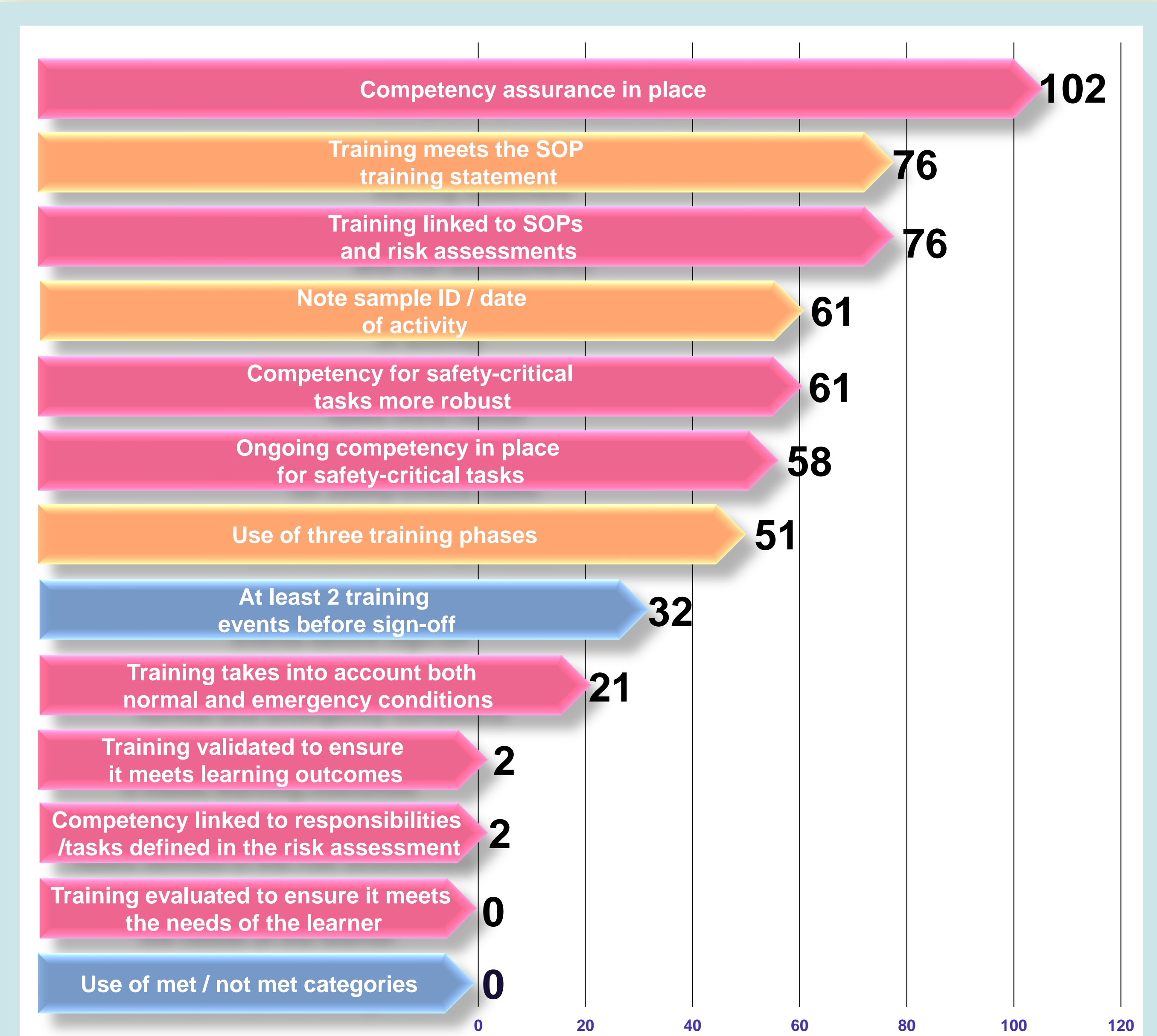


Figure 3. Number of records that comply to each statement found in training policies and guidance. Orange = departmental training manual; Pink = HSE guidance; Blue = organisational health and safety policies

DISCUSSION

The laboratory has kept thorough competency records. The nature of comments on the forms were factual rather than descriptive. An important part of the training cycle is assessment and evaluation, so both parties can improve. Recording feedback would highlight parts of procedures people struggle with and allow adaptation to meet the needs of the learners.

Training has improved over time. In 2019, NCTC introduced ClassMarker, an online knowledge assessment software. This has standardised questions asked during training and increased risk awareness in staff.

There is no differentiation between grades of staff. A supervisor would have more responsibility and would be expected to act in the event of a failure or non-conformance. This was not reflected in the information captured in the training records.

Bloom's taxonomy of learning³ could be used to set clear learning objectives for each grade of staff in the training statement for each SOP. This will give trainers a better understanding of what needs to be included and create consistency.

Training in NCTC is strongly aligned to the quality standards and guidance. Better incorporation of control measures identified in the risk assessment into the SOP will enable a clearer focus on training for safety.

Whilst the information is not always captured in the records, safety awareness may be conveyed through other methods such as informal conversations, previous experience or departmental meetings. Understanding what sources lab staff value, will enable better implementation and adherence to safety measures.

RECOMMENDATIONS

- NCTC are currently ensuring all risk assessments are task-based and clearly incorporated into the SOP. Tasks identified as safety-critical will be specifically assessed during training.
- Training statements for each SOP will include clear objectives using Bloom's taxonomy of learning for each staff group.
- ClassMarker Q&As will continue to be used to assess knowledge and be incorporated in the competence assessment.
- Competency assessment forms will digitised to allow flexibility in information captured without adding extra time-burden on staff.
- Feedback on training will be sought more often for continuing professional development of staff and improving the process.
- This study is part of a larger exploration of health and safety training. The next stage will be to interview staff to find out which sources of information they value the most.
- Other training models such as Wenger's Communities of Practice⁴ are being explored to ascertain how laboratory staff learn and make sense of safety information.



ACKNOWLEDGEMENTS

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