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A Focus for Analytical Chemistry in Europe

9th PT/EQA Workshop - Portoroz 2017

Report from WG 6

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Use and treatment of measurement uncertainty in PT/EQA schemes

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Contributions to 9th Workshop

- Uncertainty a topic in
  - At least 20 (57) posters
  - At least 7 oral contributions

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WG composition?

- 66 participants
- 56 PT providers
  - Majority runs schemes for routine testing
- 6 PT participants only
- 1 Accreditation bodies
- 2 Regulatory authorities
- 1 Academia
- Others

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WG members self-assessment…

- …concerning knowledge of uncertainty
  - 6 Very knowledgeable
  - 35 Knowledgeable
  - 13 Some or little

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Question 1

What are the common practices in use in PT/EQA schemes…

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Question 1 What are the common practices in use in PT/EQA schemes…

- 1a) Asking for the uncertainty of the participant result?
- 1b) How is the reported uncertainty evaluated?
- 1c) How is the uncertainty reported used for the assessment of the result?

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1a) Asking for the uncertainty of the participant result?

- 27 YES
- 25 NO
- Some ask for uncertainty only in some schemes
- Some schemes are new and providers less experienced and do not yet ask for uncertainty

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1b) How is the reported uncertainty evaluated?

- No evaluation
- E_n-scores
- zeta-scores
- Graphical presentation
- Calculates %relative uncertainty
- Visual inspection
- Comparison with uncertainty of the assigned value or with SDPA

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1c) How is the uncertainty reported used for the assessment of the result?

- Not used
- In E_n and zeta scores
- Those without u-statement are penalised (participant's uncertainty set to zero)
- Used only as additional information for the participants

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Question 2

How do participants respond to the requested uncertainty of their result?

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Question 2-3

- 2) How do participants respond to the requested uncertainty of their result?
- 3) Should participants be encouraged to report the uncertainty of their result…
  - A) If so, how can this be achieved?
  - B) Who can/should drive this?

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2) How do participants respond to the requested uncertainty of their result?

- Cases where participants ask PT provider if they can report uncertainty or insist to do so even if the provider does not ask for it
- Some try to avoid giving uncertainty
- Over the years discussions on uncertainty less “scary”
- Culture problem
- Not mandatory in some countries. Small labs have problems but large labs report
- Participants often report “some kind of uncertainty information”

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2) How do participants respond to the requested uncertainty of their result?

- Suspects that many reported uncertainties are overestimated or taken from legislation (maximum allowed uncertainties)
- 15, 30, 50 % to near all participants report uncertinty
  - 0 reports in some scheme
    - “Alien concept” for test kit producers
  - Depends on type of scheme
  - Problem in small schemes if some do not report uncertainty

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Question 3

Should participants be encouraged to report the uncertainty of their result…

YES

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3a) If so, how can this be achieved?

- PT provider and experts should help and encourage
- Comes with accreditation
- Harmonised values are used so no meaning to make individual evaluations
- PT provider should use uncertainty statements if received
- Use more simple approaches like Nordtest approach and Fishbone diagram

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3a) If so, how can this be achieved?

- Accreditation bodies ask for uncertainty info more and more
- Provider should tell in advance and penalise those who don't report uncertainty
- MU statements have become more realistic
- Workshops and training courses organised by PT provider
- Laboratory managers must learn

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3a) If so, how can this be achieved?

- Continuous education
- Customer or PT provider can request
  - Essential in some industrial sectors
- Collect information on how uncertainty is evaluated
- Problem is that many still do not have sufficient knowledge
- Use for education and training purposes and not for performance assessment initially

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3b) Who can/should drive this?

- Metrology institute
- Eurachem
- Experts
- Accreditation bodies
- Lab managers
- Standardisation bodies

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Question 4

Is the reporting of uncertainty on their results by the participant, and their evaluation by the PT/EQA provider, **beneficial for the participant?**

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4) Is the reporting of uncertainty…?

- Good check for participants, tool for improving measurement quality
- Help in comparing statements with those of other labs
- Only useful if provider helps on best practice in uncertainty estimation
- “Pleasing and educating customer” at the same time
- Educational
- Tool for finding problems
- Need good guidance and training to obtain realistic uncertainty statements

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Looking back…

WG discussions on measurement uncertainty at the 3rd workshop (2000)

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About uncertainty at 3rd workshop WG discussions

- "**Requirement in ISO/IEC 17025:1999** will lead to PT providers receiving uncertainty statements with the test results"
- "Some fields might already use allowances for uncertainty in the **acceptance criteria**, perhaps by having wider intervals than purely **fitness for purpose**. Z-score limits of ±3 are often quite wide relative to desired goal for accuracy"
- "Schemes in the testing area are likely to follow those in calibration, where coordinators are **obliged to gather information about uncertainty**"

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About uncertainty at 3rd workshop WG discussions

- "Uncertainty is currently **poorly understood** by labs. Although many labs have evaluated uncertainty for years, most do not know how to report it, or report it differently from recommended procedures"
- "There would be a necessary **learning period** before participants' uncertainty statements can be properly assessed and used by PT providers to evaluate laboratory performance. There was **concern** that requesting this information now would generate much confusion and compromise the utility of current programs"