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## COMPARISON OF DIFFERENT APPROACHES IN INTERPRETATION AND PRESENTATION OF PT RESULTS Aida Jotanovic<sup>1</sup>, Semsa Suljagic<sup>2</sup>

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### ABSTRACT

Technical specifications for the quality of precious metals articles and market control are defined under national legislations of the majority of European countries, therefore making the continuous confirmation of the testing capabilities of the responsible laboratories very important. The Laboratory for precious metals within the Institute of Metrology of Bosnia and Herzegovina (IMBIH-LH) acts as a state reference laboratory in this field and disseminates the reference values through the organisation of PT schemes. Two separate PTs for the determination of gold content in typical jewellery alloy (Au=585 mg/g) were conducted in 2013 and in 2014. Participating laboratories applied ISO method for the determination of gold content (ISO 11426:1997) having the same designated codes for PT.13 and PT.14. Different approaches in the evaluation of the results were used with the purpose of determining the most adequate way for the interpretation of the PT.



#### **PT RESULTS**

Graph 1: PT.13 Assigned value derived from the participants' results applying robust statistics

Graph 2: PT.14 Assigned value traceable to NIST SRM 685-R predetermined by IMBIH





calculated using the assigned value (x) and standard deviation (σ<sub>R</sub>) by applying Algorithm A and Algorithm S as defined in the ISO 13528





# Graph 5: performance score No 4

-4

Q score used to express the relative error of the paticipants' results



CONCLUSION

From the results shown in Graph 4, it can be concluded that  $u_x$  of the pilot LAB does not effect the overall successfulness of the participants, thus confirming its capability in assigning the reference value. Therefore, z score will be used as sole indicator in future PT schemes calculated using the assigned value (x) and standard deviation for PT (σ<sub>p</sub>), set by ISO 11426 z'-score values

calculated using the assigned value (x), standard deviation for PT ( $\sigma_p$ ) and uncertainty of the assigned value ( $u_x$ )

CONCLUSION 2 Participating labs were divided into two groups in accordance with their z and Q scores: a) Group 1: "Reference labs" with z<1 and Q<0,05% future partners in PTs used for the purpose of ref. value assignement b) Group 2: "Control labs" with z<2 and Q>0,05% -PT participants



#### **REFERENCES:**

- **ISO 11426:1999** Determination of gold in gold jewelry alloys Cupellation method (fire assay)
- ISO 13528:2005 Statistical method for use in proficiency testing by interlaboratory comparisons
- IUPAC Technical Report The International Harmonized Protocol for the Proficiency Testing of Analytical Chemistry Laboratories
- ISO 21748:2010 Guidance for the use of repeatability, reproducibility and trueness estimates in measurement uncertainty estimation
- EUROLAB Technical report No.1/2007 Alternative approaches to uncertainty evaluation