

COMPARISON OF DIFFERENT APPROACHES IN INTERPRETATION AND PRESENTATION OF PT RESULTS

Aida Jotanovic¹, Sema Suljagic²

^{1,2} Institute of Metrology of Bosnia and Herzegovina

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

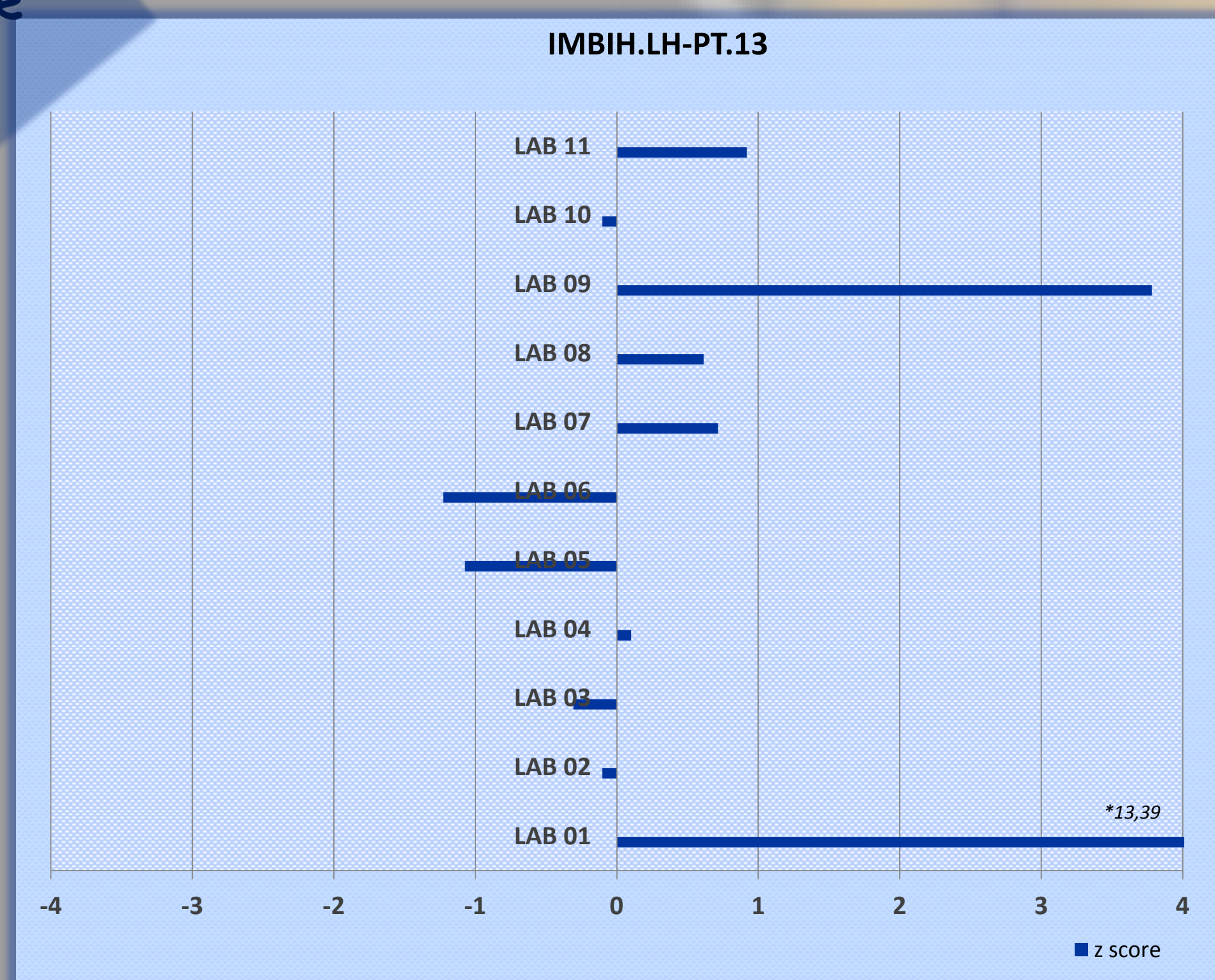
Graph 2: PT.14
Assigned value traceable to NIST SRM 685-R predetermined by IMBIH



PT PERFORMANCE SCORES

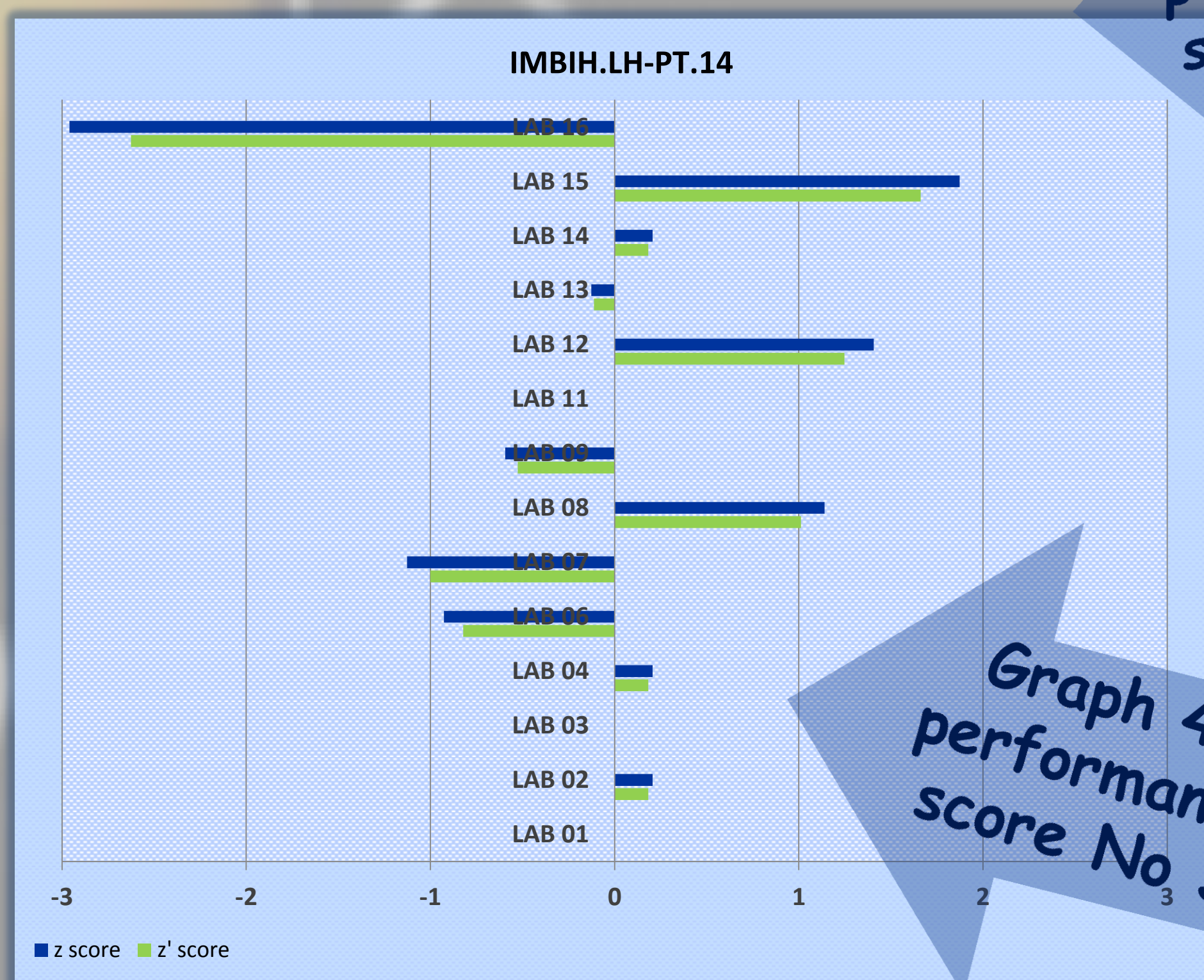
Graph 3: performance score No 1

z-score values calculated using the assigned value (x) and standard deviation (σ_R) by applying Algorithm A and Algorithm S as defined in the ISO 13528



Graph 4: performance score No 2

z-score values calculated using the assigned value (x) and standard deviation for PT (σ_p), set by ISO 11426



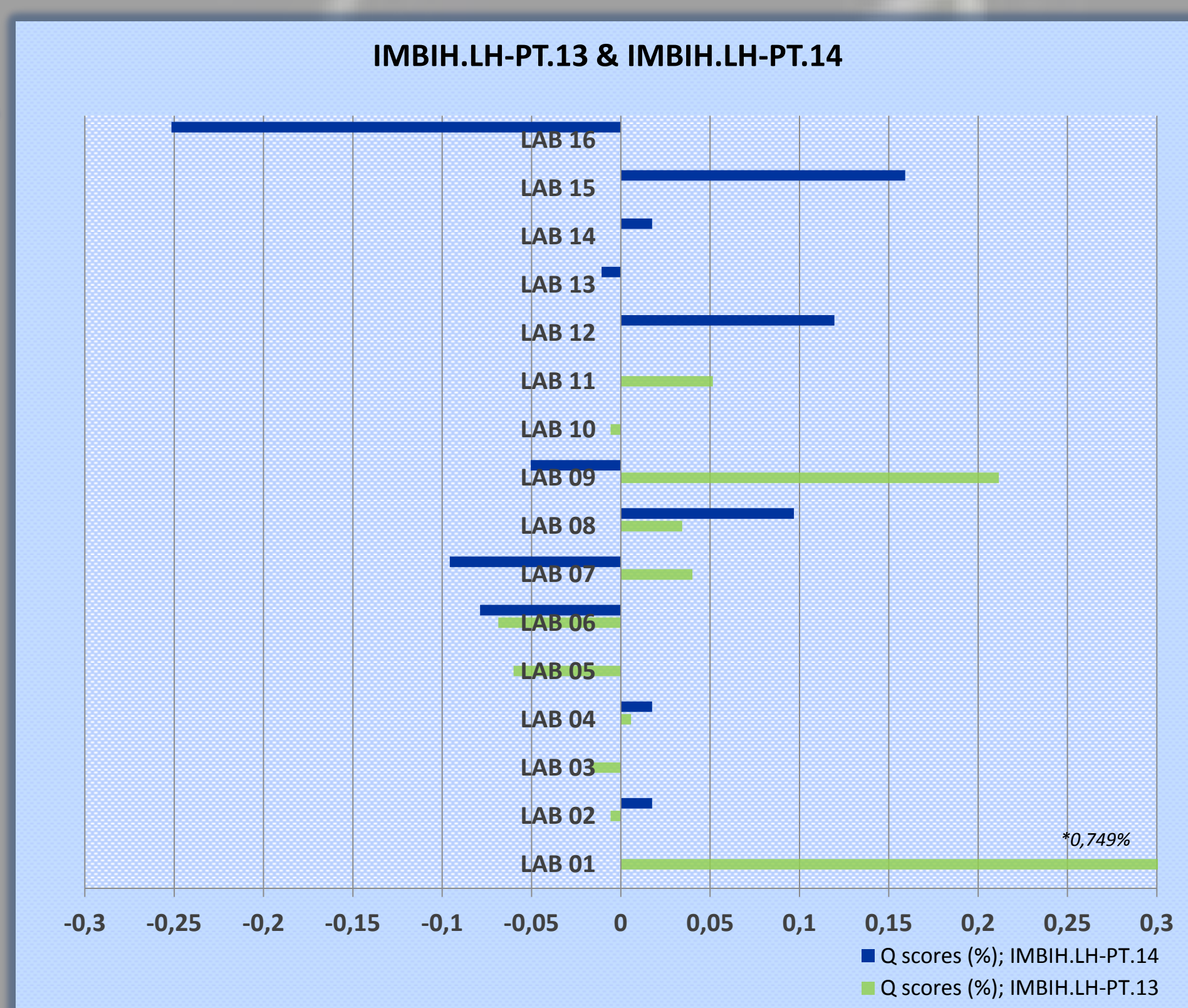
Graph 4: performance score No 3

z'-score values calculated using the assigned value (x), standard deviation for PT (σ_p) and uncertainty of the assigned value (u_x)

Graph 5: performance score No 4

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

$$Q = \frac{x_i - x_{ref}}{x_{ref}} * 100$$



CONCLUSION 1

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

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