

P2: GERMAN BIOBANKING ALLIANCE TISSUE PROFICIENCY TEST – A SUSTAINABLE WAY TO ASSURE HIGH QUALITY STANDARDS IN BIOBANKING



German Biobank Node
bbmri.de

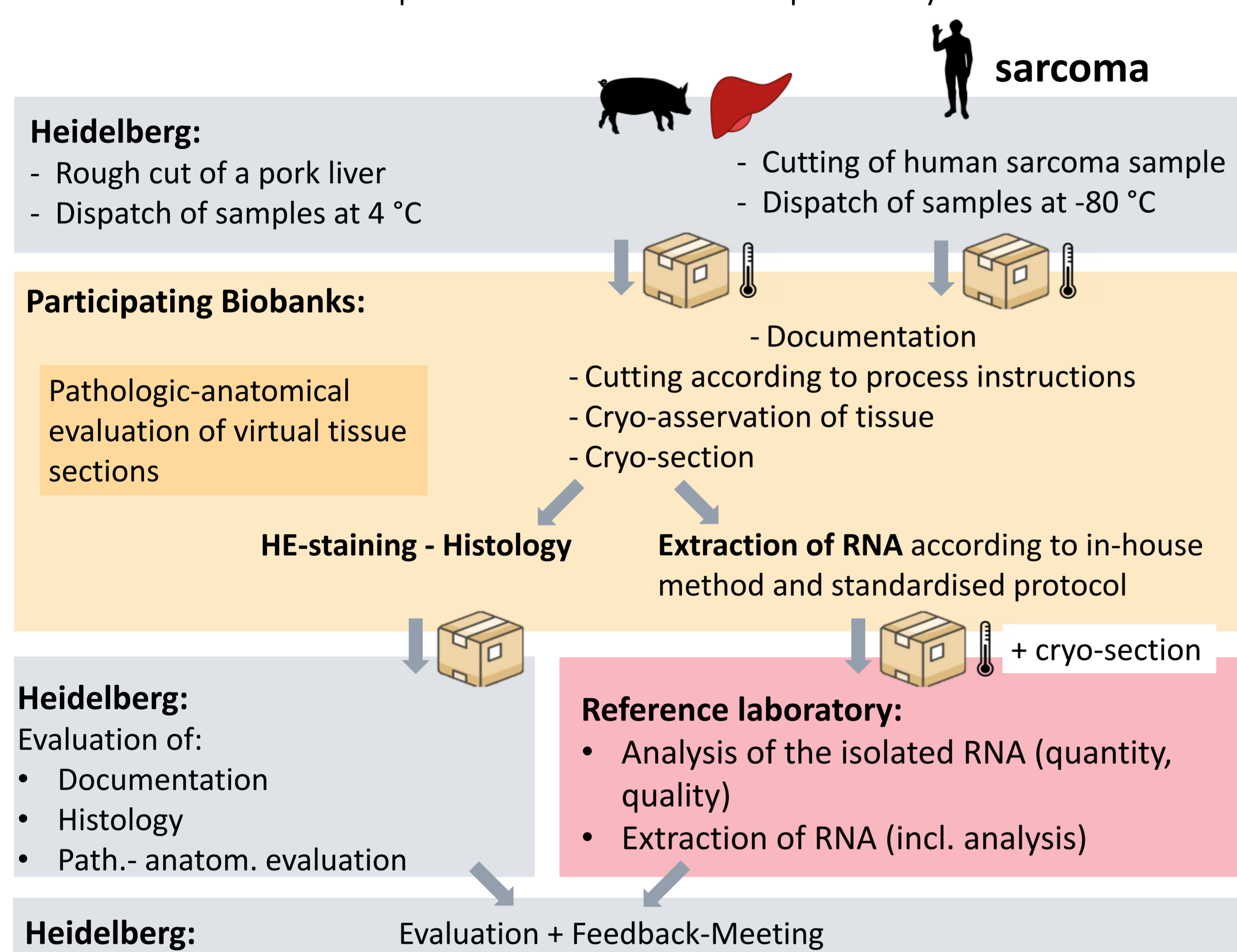
BACKGROUND:

For tissue biobanking, it is essential to check the identity and properties of the tissue provided for research prior to release using histotechnological procedures and tissue analyses. Therefore, maintenance of the tissue samples from the time of collection, via pre-analytical procedures, e.g., transport, processing, and storage till shipping to customer are critical. Changes in the histopathological morphology or at the molecular level must be avoided.

Proficiency tests are a useful tool to control biobanking processes. In 2017, the German Biobanking Node (GBN) started with a national tissue-related biobanking proficiency test programme, performed by the BioMaterialBank Heidelberg (BMBH) in close cooperation with the GBN. Five rounds have successfully been carried out to date, with participation of 18 biobanks. Here we present a cross-round evaluation of selected results.

PROCEDURE:

Schematic illustration of the procedure of the GBN tissue proficiency test:



CONTENT OF PREVIOUS ROUNDS:

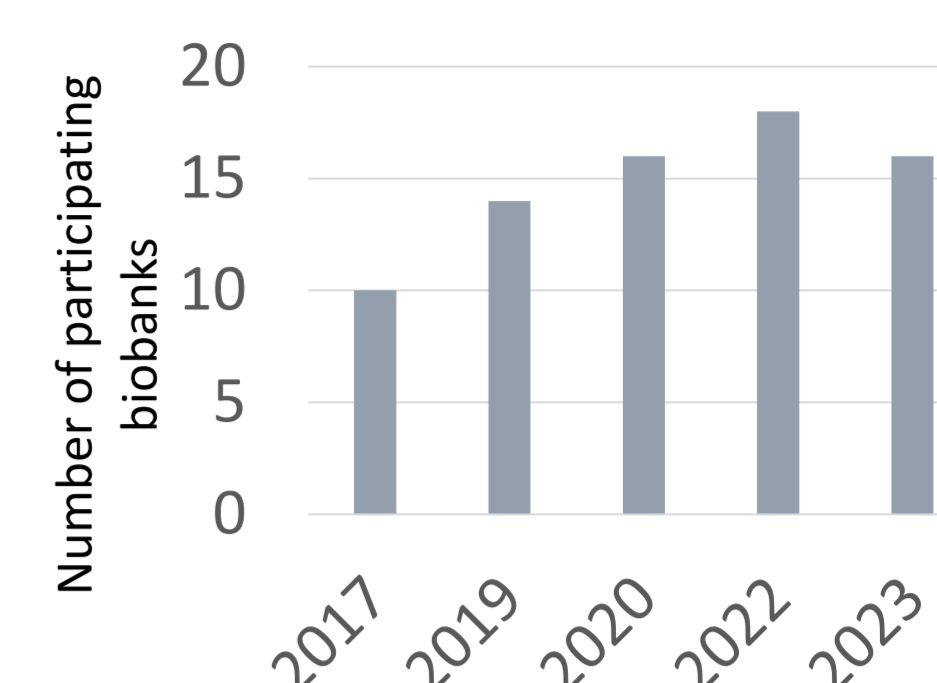
Constant parts:

- Asservation and analysis of pork liver
- Cryo-section and HE-staining
- Pathologic-anatomical evaluation

→ = Quality assurance

Continuous change and improvement based on results of previous rounds:

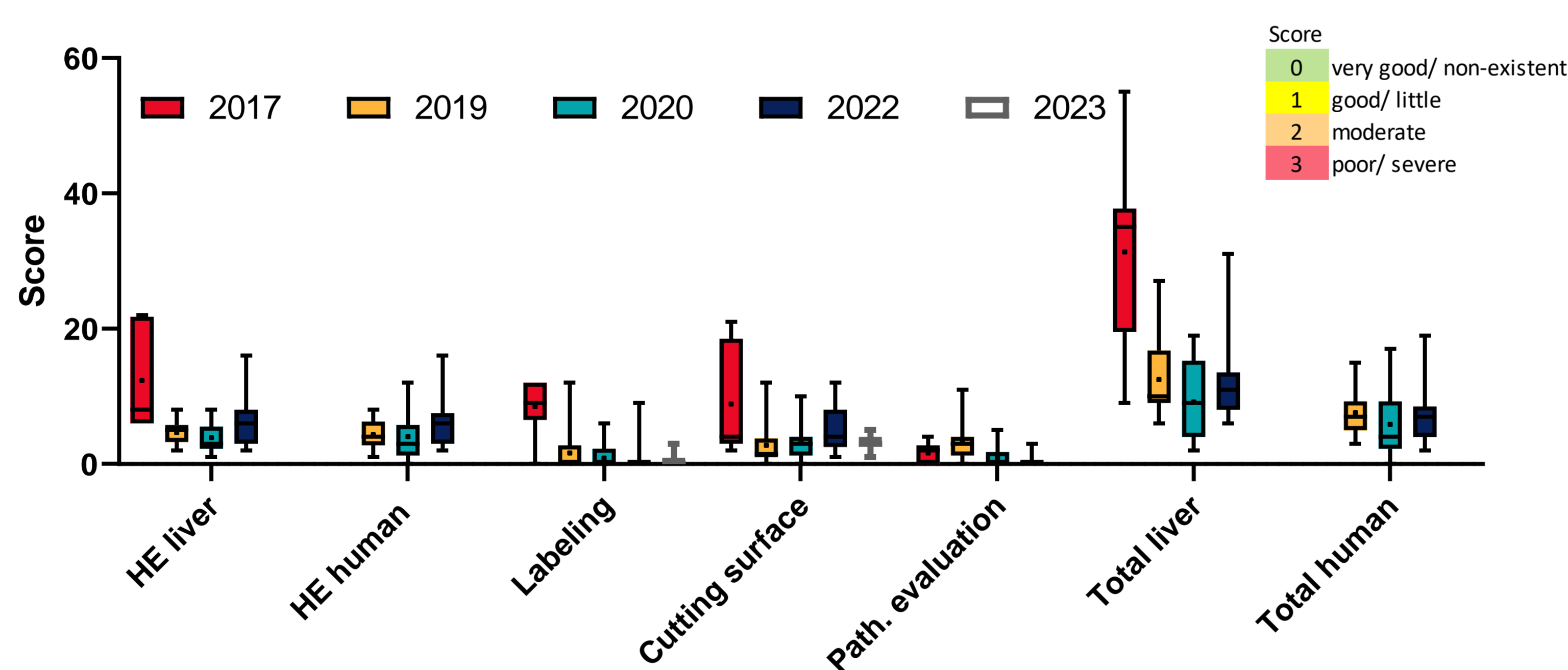
Round	Extraction nucleic acid	Human tissue	Path.-anatom. evaluation
1 (2017)	DNA, RNA	-	-
2 (2019)	RNA, standardized protocol (Kit)	Colon	✓
3 (2020)	RNA, homogenizing methode	Colon	✓
4 (2022)	RNA, ± DNase-digestion	Kidney	✓
5 (2023)	RNA in-house vs. RNAeasy Kit	Sarcoma	✓



HISTOLOGY

Technical and pathological aspects were assessed using a scoring system.

→ Continuous improvement of all participating biobanks



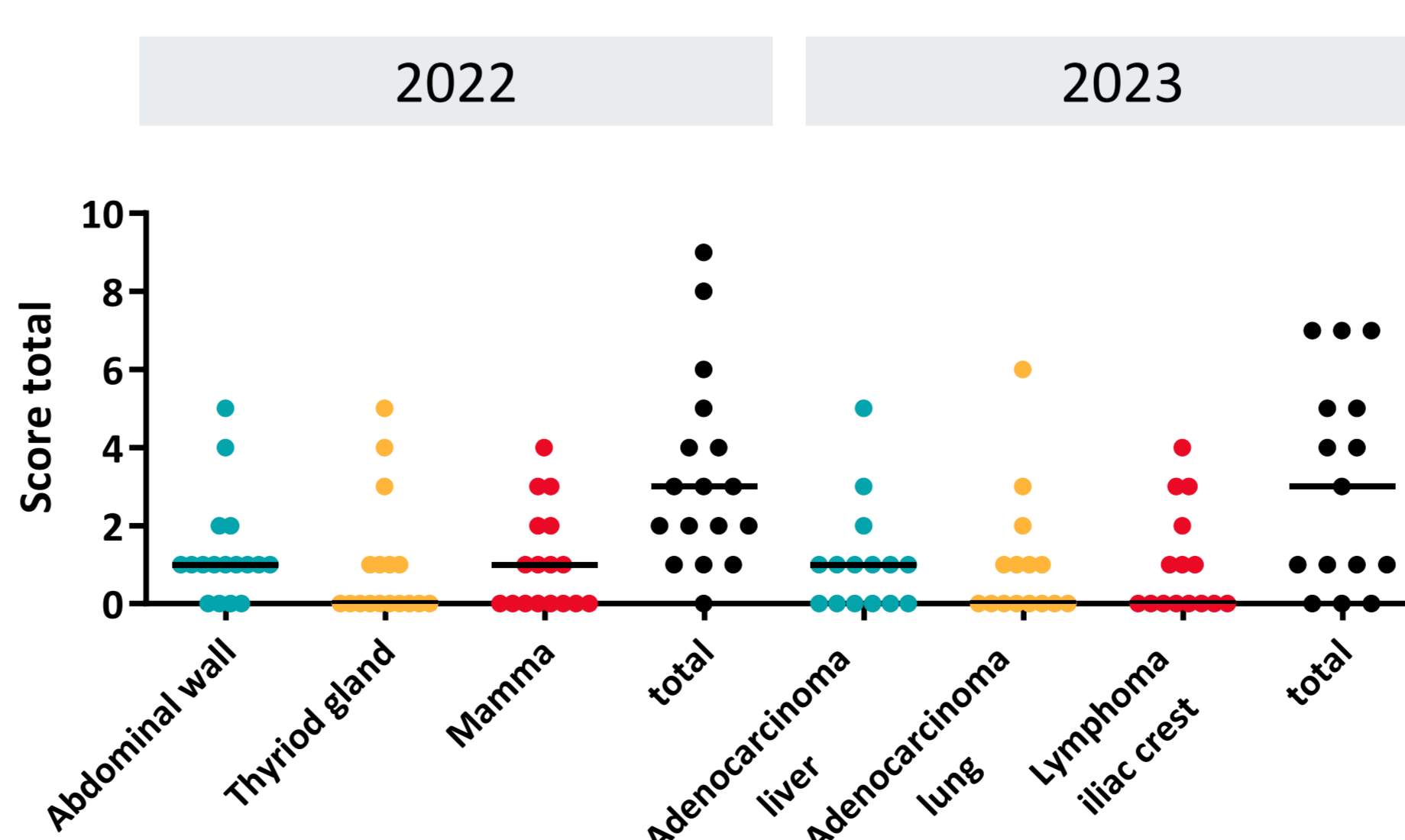
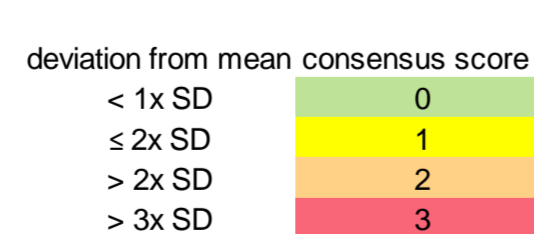
PATHOLOGICAL-ANATOMICAL EVALUATION

of virtual tissue material

The evaluation was based on a scoring system.

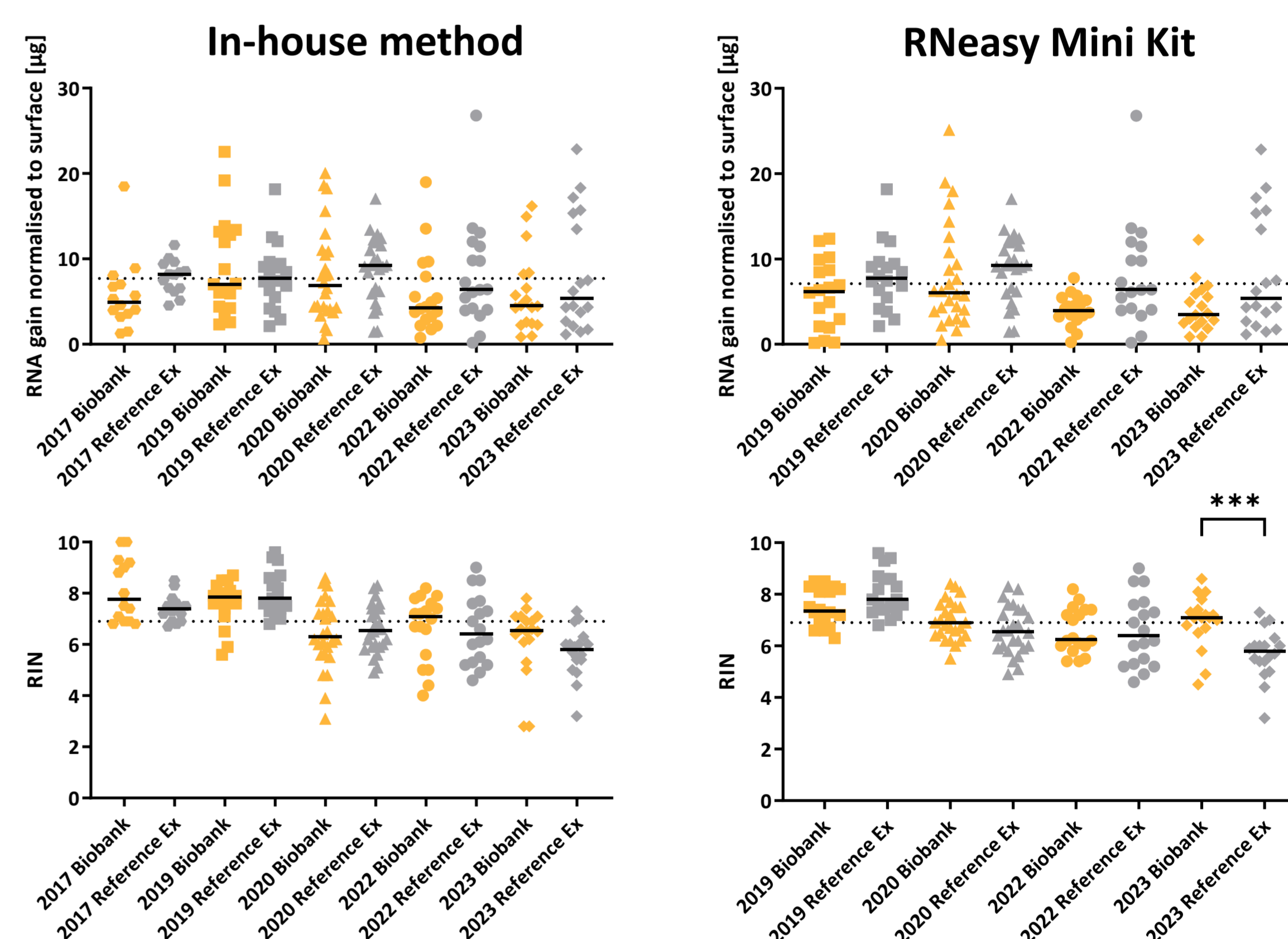
Evaluated parameters: Tumor in total tissue [%], vital [%], avital [%], stroma [%]

→ The overall evaluation is on a stable level compared to the previous round.



RNA-EXTRACTION

Comparison of RNA quantity and quality using the in-house method or RNeasy Mini Kit after extraction from identical liver samples.



→ Decreasing RNA quality in dispatched cryo-sections.

SUMMARY:

The overall results of the five tissue proficiency tests from GBN and the BMBH displayed an improvement of the services of the participating biobanks. Evaluation of H&E stained cryo-sections for multiple parameters as well as the quality of pathological-anatomical evaluation of virtual tissue material displayed an amelioration over time. Results from RNA quantity and quality measurement showed overall stable results. However, fluctuation in RNA quality in reference extractions should be tracked and potentially dispatch procedures improved.

CONCLUSION:

Proficiency tests are a key instrument to survey and improve existing processes. The data collected and conclusions derived here provide the basis for harmonising and refining tissue-related processes nationwide to ensure consistently high and comparable sample quality across many different biobanks and, therefore improve research output.