

QUALITY ASSESSMENT AND IMPACT FACTORS OF TISSUE AND BIOFLUID SAMPLES IN VIET NAM CREDCA NETWORK

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Background

Maintaining the stability and integrity of DNA, RNA is a major problem in tissue banking. The impact of ex-vivo ischemic time, fixative time on DNA, RNA, and protein expression involved in hypoxia, stress, apoptosis and autophagy remains exclusive.

Objectives

The present study aimed to systematically evaluate the impact of ischemic/or fixative time and storage time on tumor quality based on DNA and RNA levels.

Methods

52,865 collected tumor samples from all sites of CREDCA network in Vietnam range from 2009 to 2018 (up to 9 national hospitals).

The study protocol was approved by the IRB of Hanoi Medical University. The day before, when patient's operation was performed, the consent was signed by patient.

Samples were included in cancer tissue (FFPE and fresh) and peripheral blood (Plasma and serum). The crude samples were exported to Asterand company, US for sample treatment and assessment of quality, such as insufficient Tumor Nuclei (ITN) or RNA integrity number (RIN)

Figure 1: Procedure of sample collection

Results and Discussion

There were 52,865 samples from types of different carcinomas, such as breast cancer, lung cancer, gastric cancer, large intestinal cancer, lymphoma, liver cancer, ovary cancer, kidney cancer, etc, which were collected from the CREDCA network. Quality check was done. Pass rate ranged from 33 to 100% depending on the different sites.

Quantity of the collected sample type in 10 years

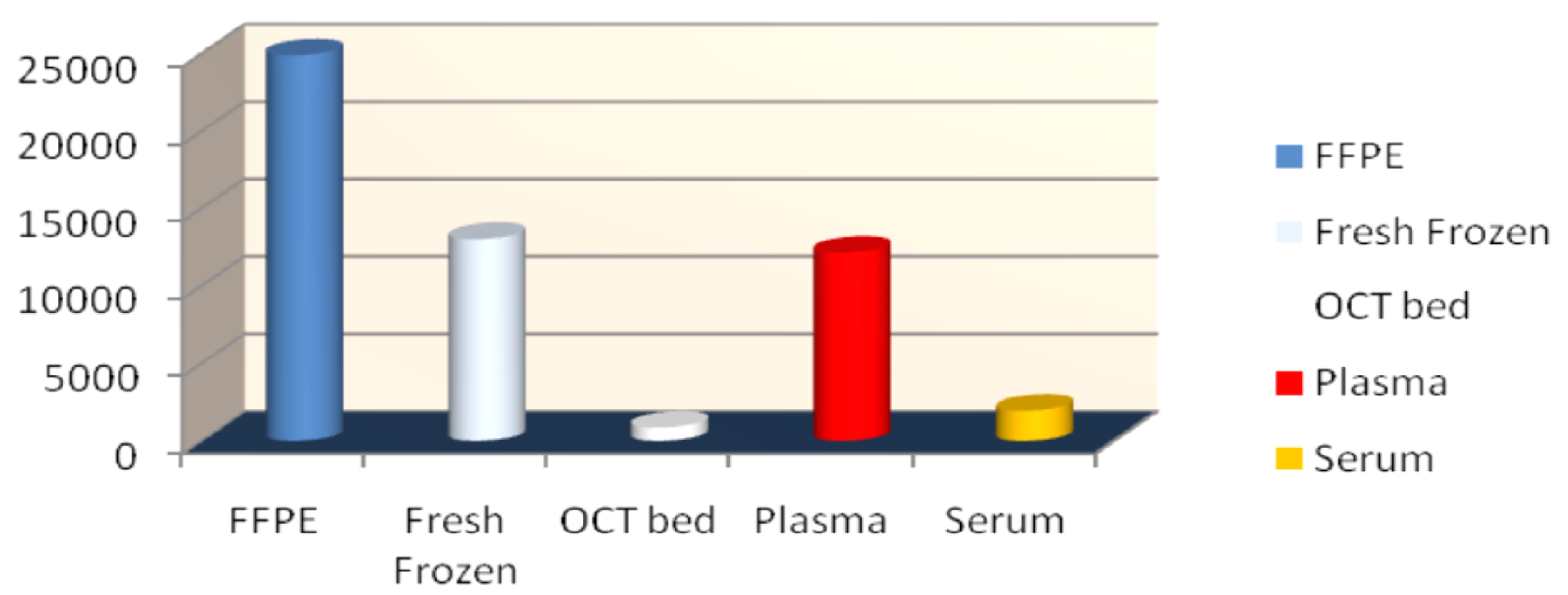


Figure 2: Distribution of the collected specimen types in total of 52,865 samples

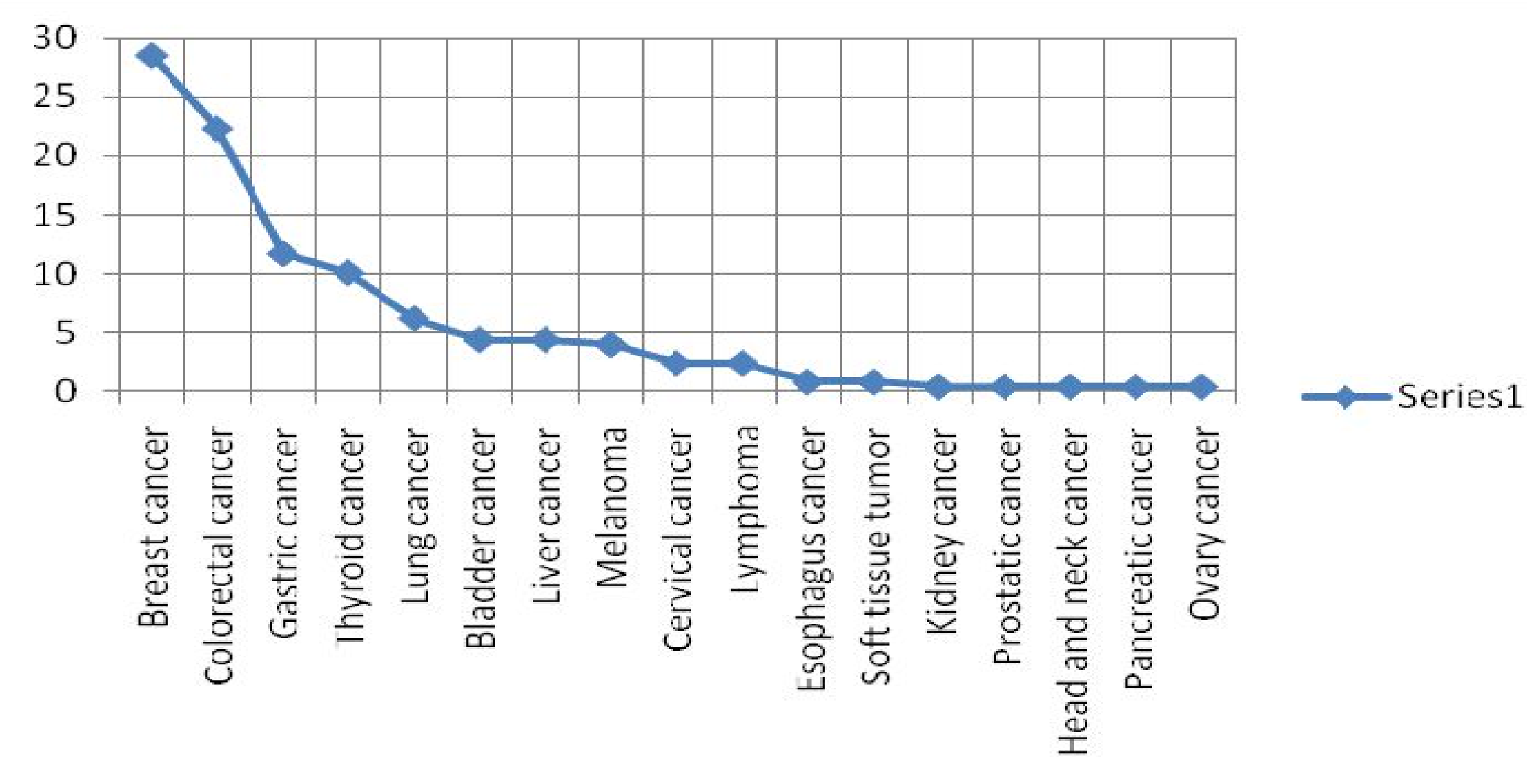


Figure 3: Cancer types are collected

Quarantine according to the collected sample type in 10 years (%)

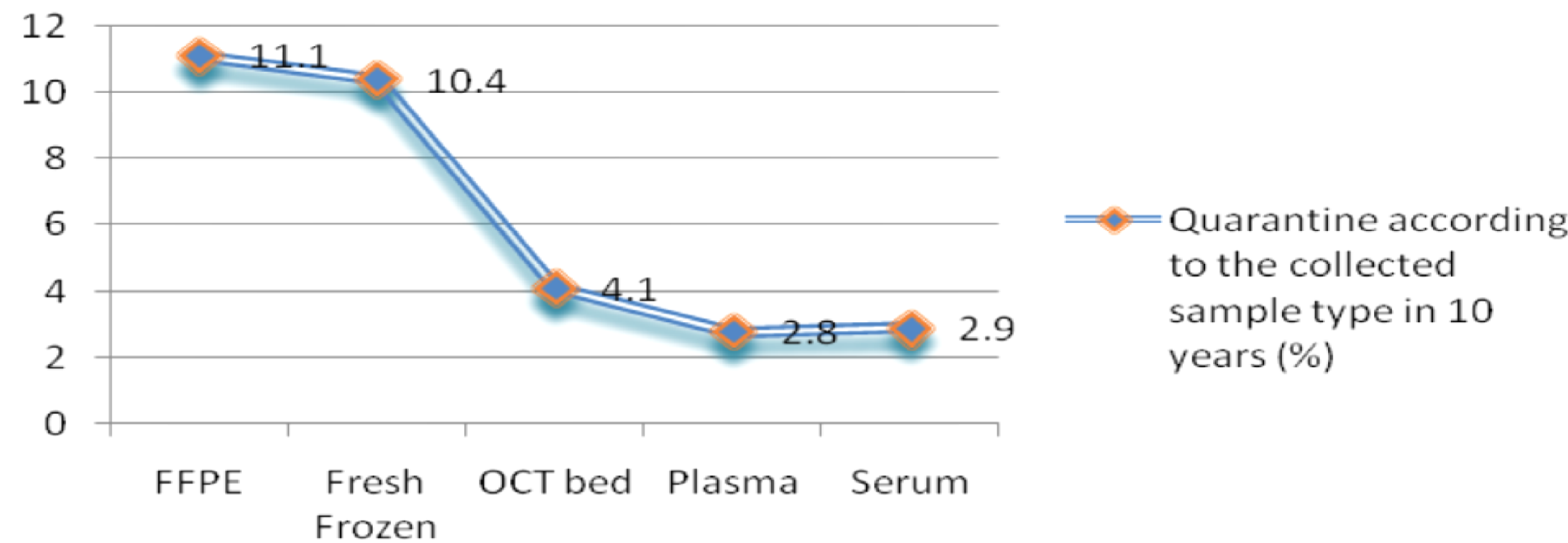


Figure 4: Sample evaluation by the quarantined specimen

% of total samples Quarantined: Reason

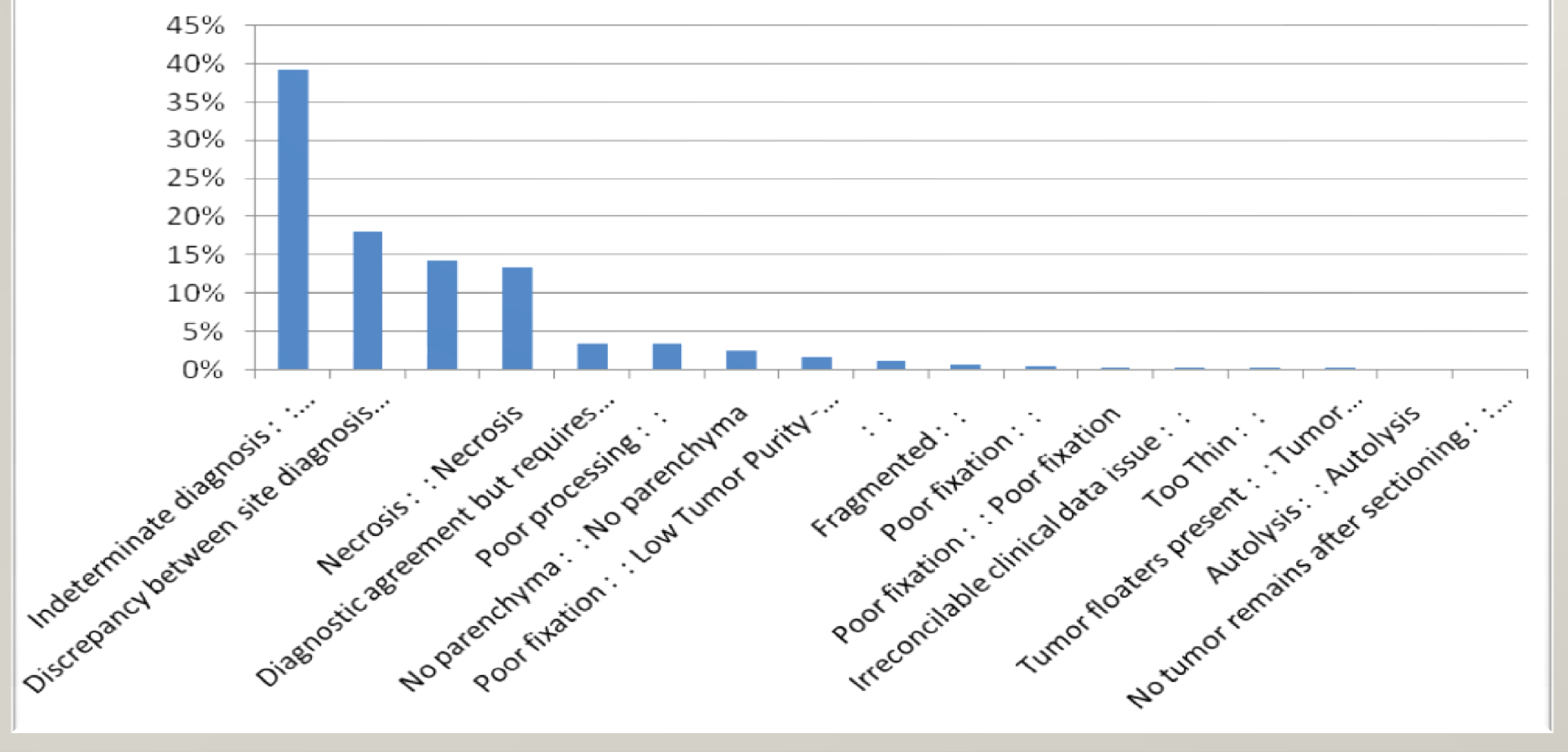


Figure 5: Reasons for the quarantined specimens (in 2013)

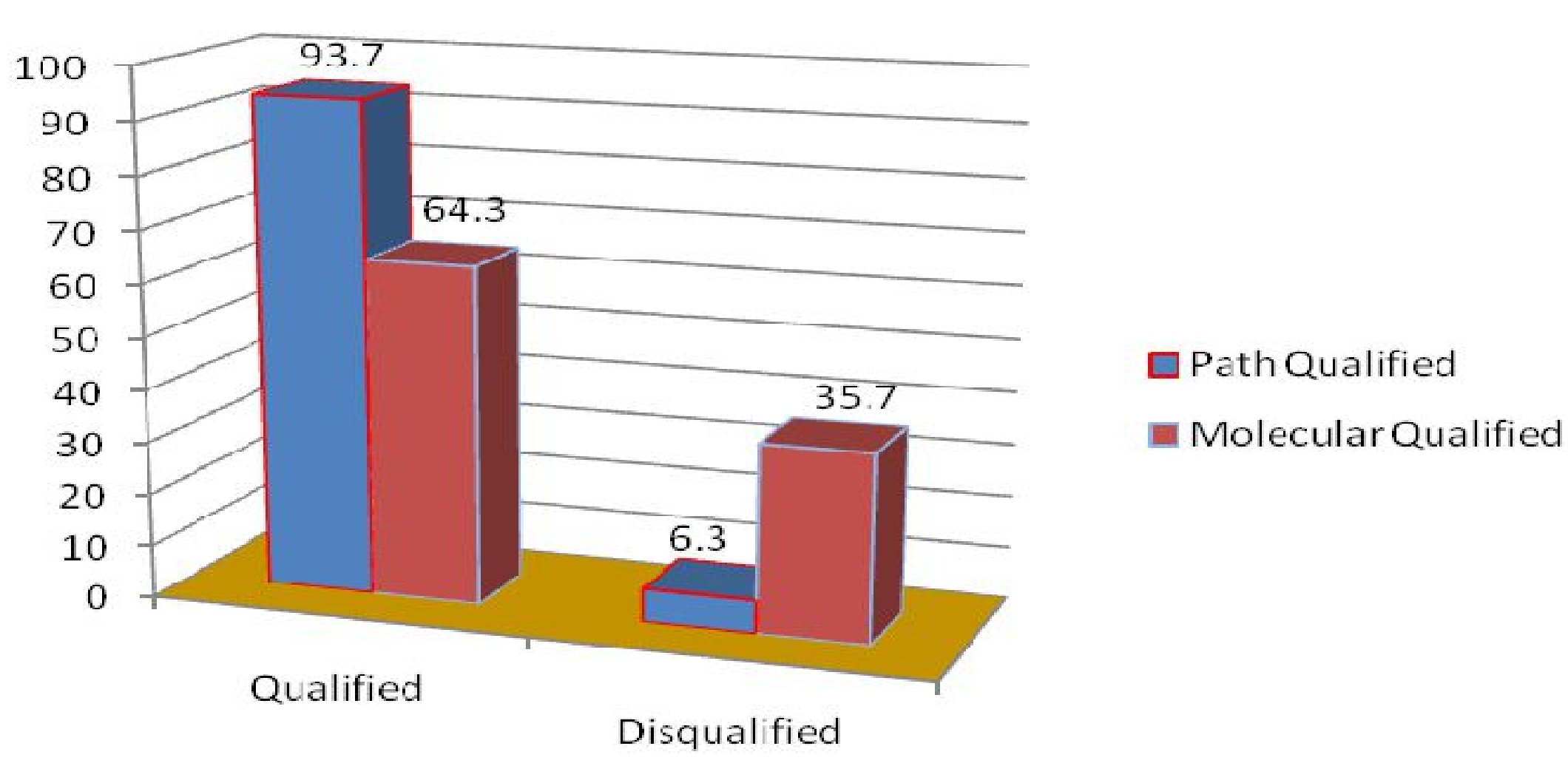


Figure 6: Sample quality is assessed by pathology and molecular level (in 2012)

Sample quality assessment by RIN value in 2012

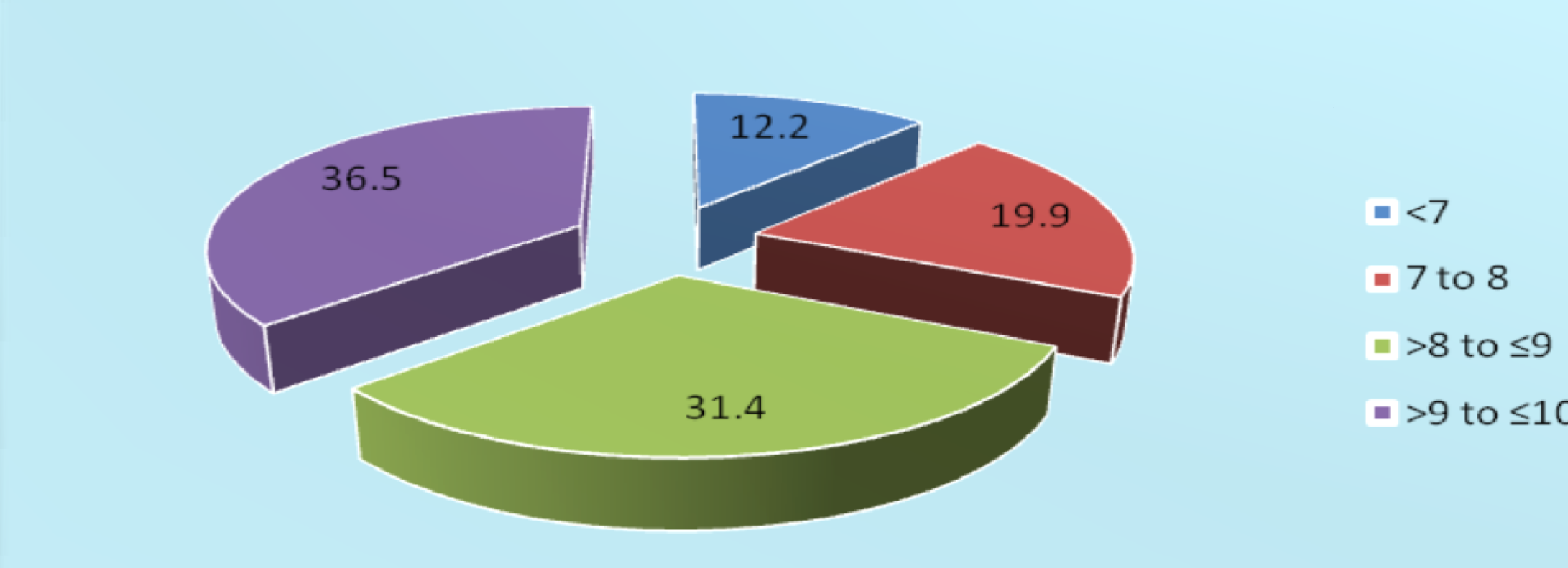


Figure 7: Category of RNA integrity number by evaluation of molecular level

Vietnam belongs to the tropical region with the humid climate (hot and damp). So the outside temperature affects the sample quality so much. It is very important to be sure about the minimum isthemia. Fixative solution is a problem. We should use 10% neutral formalin in ready to use for sample fixation. 10% neutral formalin is prepared by every lab, which doesn't get the standard concentration. Technicians or pathologists must be trained very well for resection of tumor sample

Conclusion

The most impact factor of sample quality was the cooperation of pathology and surgery department staff to be sure of the minimum isthemia, in Vietnam, which avoided sample destroy at protein or molecular level in room temperature and delay fixation.

References

- Amanda Rush, Kevin Spring, and Jennifer A. Byrne, A critical analysis of cancer biobank practices in relation to biospecimen quality, Biophys Rev (2015)7:369–378DOI:10.1007/s12551-015-0178-2.
- Caner A. Batscu, Quality assurance in cancer biobanking, Bioscience Biobank 2011 Jun;3(2):157-63. doi: 10.1089/bio.2010.0031.
- Jim Vaught, Akin Abayomi, Tim Peakman, Peter Watson, Lise Matzke, and Helen Moore, Critical Issues in International Biobanking, Clinical Chemistry (2014), 60:11, 1368–1374.

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