Validity Assessment of Primary Breast Tumour Registrations in the Belgian Virtual Tumourbank Catalogue (BVTc) by Linkage to the Belgian Cancer Registry (BCR) Database

Araceli Diez-Fraile[1], Eva Van der Stock[1], Mia Slabbaert[1], Karen Vos[1], Katia Emmerechts[1], Liesbet Van Eycken[1], Vincent Grégoire[2] on behalf of the Steering Committee of the Belgian Virtual Tumourbank

(1) Belgian Virtual Tumourbank - Belgian Cancer Registry (BVT-BCR), Koningsstraat 215 bus 7 - Rue Royale 215 boîte 7, 1210 Brussels (Belgium).
(2) Radiation Oncology Dept & Center for Molecular Imaging and Radiotherapy and Oncology (MIRO), Institut de Recherche Expérimentale et Clinique, Université Catholique de Louvain, St-Luc University Hospital, 10 Ave Hippocrate, 1200 Brussels (Belgium).

Introduction

The BVT is a web application for tumour biospecimen annotation and traceability among eleven Belgian university hospitals. Data quality control (QC) of the BVT includes control measures at every stage of the data process (Fig. 1) guaranteeing a high quality of the data on the biospecimens requested by scientists working in translational research in oncology. It has been previously emphasised that linkages of cancer and biobank registry data optimise their value in cancer research [1]. However, to our knowledge, only one pilot study has been earlier performed by linking information from biological samples to population-based cancer registries [2].

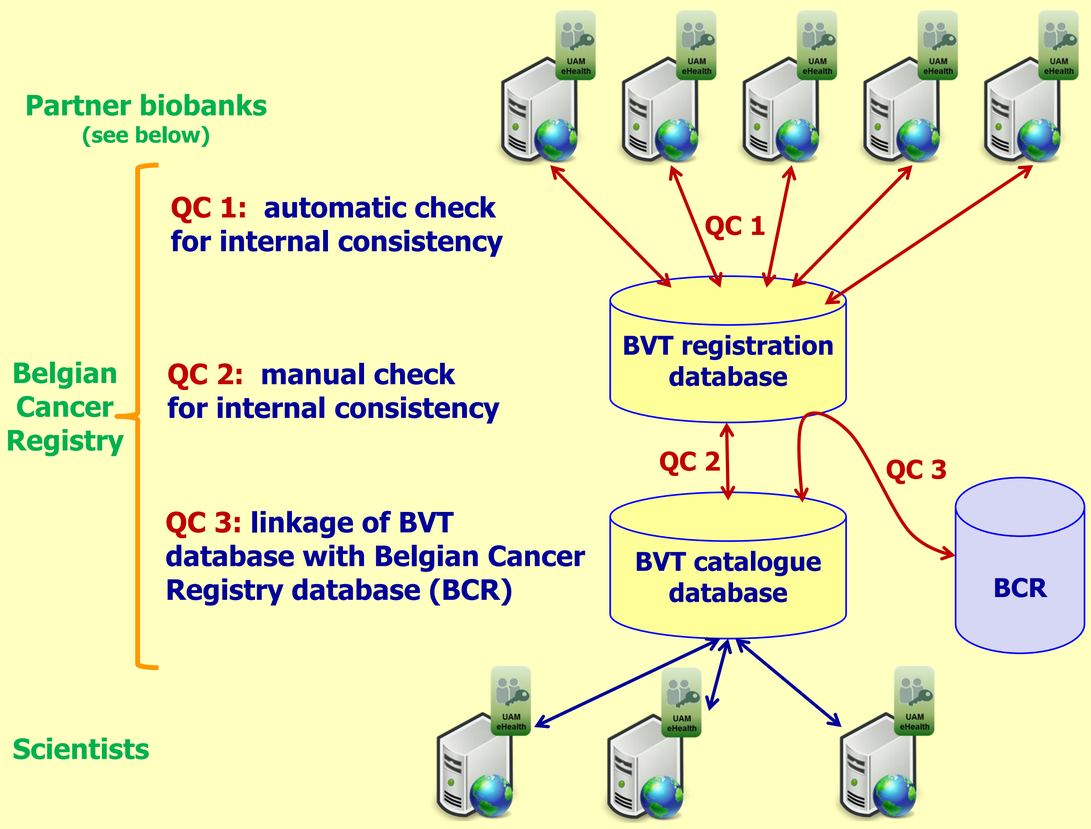

Figure 1. Organisational scheme and steps of data quality analysis of the BVT system with decentralised input by authorised local biobanks, the BVT central databank with two modules (registration and catalogue) and authentication service providing authorised users access to the data. The BVT catalogue database is the interface that allows queries based on patient, technical and oncological variables.

Aim

To perform a validity assessment of the BVT data requested by a researcher for a breast cancer study.

Methods

Upon request from a scientist a validity assessment of the BVT catalogue data on the biopsy samples of interest (see QC 3 Fig. 1) was performed following the methodology summarised in Figure 2. Validity measures within this study include the proportions of overlapping variables applicable for breast tumours (Table 1).

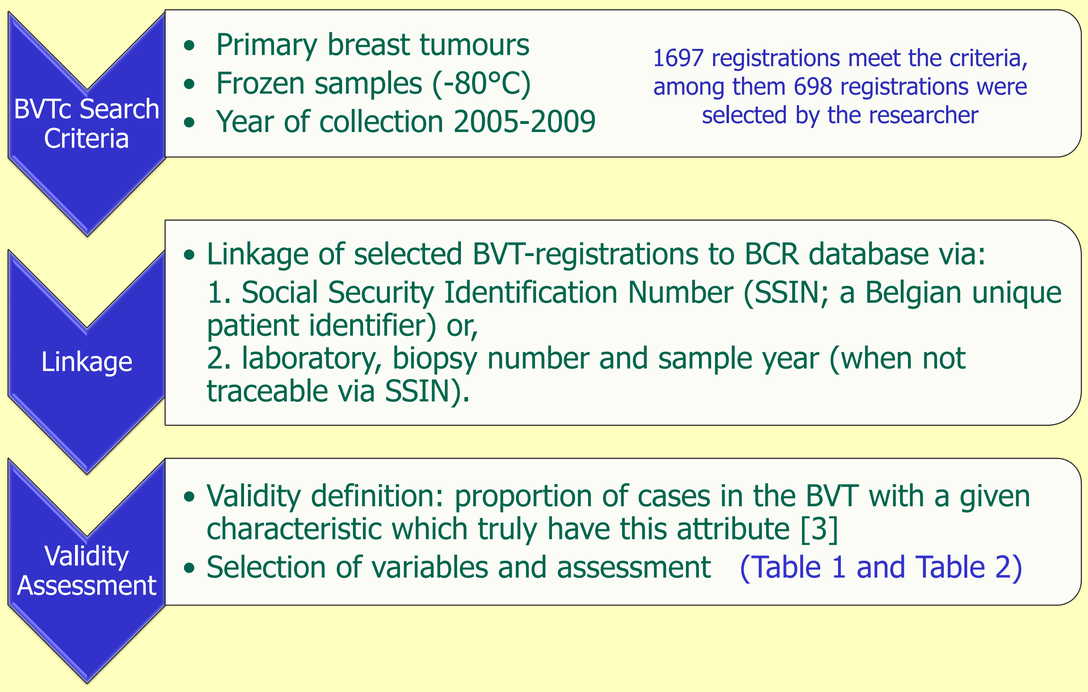

Figure 2. Methodology followed to assess the validity of the registrations of primary breast tumours.

Table 1. Overlapping information between the BVT and BCR dataset that apply for the current study.

Patient variables	Technical variables	Oncological variables
SSIN	Sample date	Sample type
Gender	Biopsy number	Sample localisation
Birth date		Morphology (histology and behaviour)
		pT *

*post-surgical histo-pathological classification of the primary tumour according to the TNM-classification (non-mandatory field for the BVT and BCR databases).

Results

BVTc Search Criteria: A total of 698 registrations corresponding to 695 biopsy samples (695 patients) were selected by the researcher (Fig. 2) in the BVTc in July 2014. Associated normal tissue from the same patient was available for 40.4% of the cases (n=281).

Linkage: BVT-data of 693 biopsy samples could be linked to the BCR-database as described in Figure 2. Data of two biopsy samples were not found in the BCR database and were, therefore, validated by comparison to the pathological report and information from medical files provided by the corresponding local biobanks.

Results of the Validity Assessment: BVT-data of 55 (7.9%) biopsy samples contained 1 (n=47), 2 (n=6) or 3 (n=2) errors (Table 2).

Table 2. Results of the data validity assessment.

Variables	Registered in BVT n (%)	Corrections needed in BVT n (%)
SSIN	695 (100)	16 (2.3)
Birth date	695 (100)	2 (0.3)
Gender	695 (100)	0
Sample date	695 (100)	2 (0.3)
Biopsy number	695 (100)	0
Sample type	695 (100)	2 (0.3)
Sample localisation	695 (100)	3 (0.4)
Histology	695 (100)	12 (1.7)
Behaviour	695 (100)	4 (0.6)
pT	620 (89.2)	24 (3.9)
Deviations between sample date in the BVT and incidence date in the BCR allowed the identification of		**n (%)**
Recurrent tumours		11 (1.6)
Tumour resection after neoadjuvant therapy		60 (8.6)

Conclusions

- BVT data quality was found to be good.
- The validity assessment allows scientists to determine more clearly the value and usability of breast cancer biospecimens. It helps distinguish between samples of primary and recurrent breast cancer and adds information about prior neoadjuvant breast cancer treatment.
- This report reinforces the relevance for a joint evaluation of biobank and cancer registry information in order to guarantee a high quality of associated data from biospecimens used in translational cancer research.

References

[1] Langseth et al. (2010) Acta Oncologica, 49:368-377
[2] Diez-Fraile et al. (2013) ESBB Meeting; poster abstract proceedings p. 38
[3] Bray and Parkin (2009) European Journal of Cancer, 45:747-755

Acknowledgements

The BVT project is financed by the Belgian Ministry of Public Health as part of the Belgian Cancer Plan.

Partner Biobanks