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The Belgian Virtual Tumourbank (BVT) project: Additional data quality control on kidney cancer samples registered in BVT

E. Van der Stock[1], K. Vande Loock[1], A. Debucquoy[1], K. Emmerechts[1], L. Van Eycken[1], E. Marbaix[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)

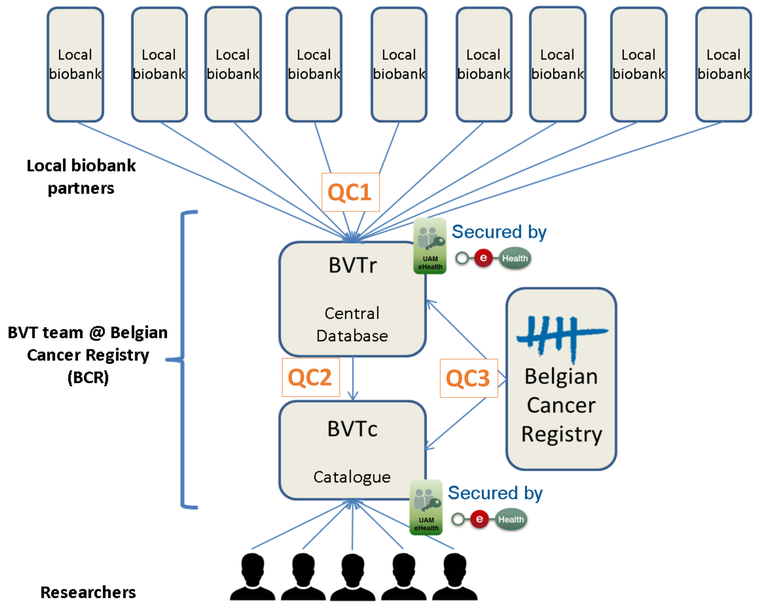
(2) Service d'Anatomie Pathologique, Université Catholique de Louvain, St-Luc University Hospital, 10 Ave Hippocrate, 1200 Brussels (Belgium)

THE BELGIAN VIRTUAL TUMOURBANK

Belgian Cancer Registry

INTRODUCTION

The Belgian Virtual Tumourbank (BVT) network encompasses the tumour biobanks from **11** Belgian university hospitals that collect and store **residual human tumour samples**. In order to facilitate the search for tumour samples scattered among different institutions, data collected at sample level is made available for researchers via the online **BVT catalogue (BVTc).**



High quality of the data is guaranteed by automatic and manual controls:

1. QC1: automatic check for format and content by the BVT application.
2. QC2: manual check for inconsistencies between different fields by BVT data analysts.

After these initial controls, the data is published in the BVT catalogue and made available for researchers in a coded form.

3. QC3: only performed for a specific data quality control study or upon request from a researcher on data of specific samples selected for his/her study.

AIM

Investigate and improve the data quality of kidney cancer samples from sample years 2017 and 2018 stored in the catalogue of the Belgian Virtual Tumourbank by performing an additional data quality control step (QC3).

METHODS

The BVT sample data of all kidney cancer cases from 2017-2018 were compared to the data available at the BCR cancer registry database.

- Linkage based on the social security identification number (SSIN)
- 12 overlapping variables
- Mismatch between the two databases → pathological report was read to determine the correct value
- Three non-mandatory variables in BVT → value empty or "unknown" is not considered as an error
- Errors will be corrected in the BVT database

RESULTS

In September 2020, a total of **107,657** registrations were available in the BVTc of which 664 registrations from primary kidney cancer samples from the years 2017-2018. The latter originate from 263 kidney cancer cases sampled in 10 out of 11 biobanks of the BVT network.

Out of the 12 variables that were taken into account for this study, three are not mandatory in the BVT: laterality, differentiation grade and pT. Nevertheless these variables are provided for 93.5%, 56.7% and 89.7% respectively by the local biobanks.

In total 43 errors were identified in the BVT database for the 263 kidney cancer cases. BVT-data of 33 (12.5%) kidney cancer cases contained one (n=26), two (n=5), three (n=1) or four (n=1) errors. Most errors were found for the variable histology (5.7%) followed by differentiation grade (3.4%) and pathological T-stage (pT) (3.0%). For one patient the registered renal tumour turned out to be non-invasive (behaviour "2").

In addition, analyses of the investigated kidney cancer cases in the BCR database showed that:

- samples from five cases were derived from recurrent tumours
- two patients received neoadjuvant therapy prior to sampling

Therefore, the pTNM prefixes "r" and "y" should be added in the BVT.

Variables	Cancer cases registered in BVT n (%)	Corrections needed in BVT n (%)
SSIN	263 (100)	0
Birth date	263 (100)	0
Gender	263 (100)	0
Sample date	263 (100)	7 (2.7)
Biopsy number	263 (100)	0
Sample type	263 (100)	0
Sample localisation	263 (100)	5 (1.9)
Histology	263 (100)	15 (5.7)
Behaviour	263 (100)	1 (0.4)
Laterality	246 (93.5)	3 (1.2)
Differentiation grade	149 (56.7)	5 (3.4)
pT	236 (89.7)	7 (3.0)
Additional information		**pTNM prefixes to be added in the BVT n (%)**
Recurrent tumours (rpTNM)		5 (1.9)
Tumour resection after neoadjuvant therapy (ypTNM)		2 (0.8)

CONCLUSIONS

The BVT database was found to have a good quality of data. During this study important additional information on recurrent kidney tumours and neoadjuvant therapy prior to resection of the kidney tumour has been found. This study shows the relevance of a joint evaluation of biobank and cancer registry information to guarantee a high quality of associated data from biospecimens used in translational cancer research.

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CONTACT INFORMATION

www.virtualtumourbank.be
Belgian Virtual Tumourbank - Belgian Cancer Registry
Koningsstraat 215 bus 7
1210 Brussels
biobank@kankerregister.org