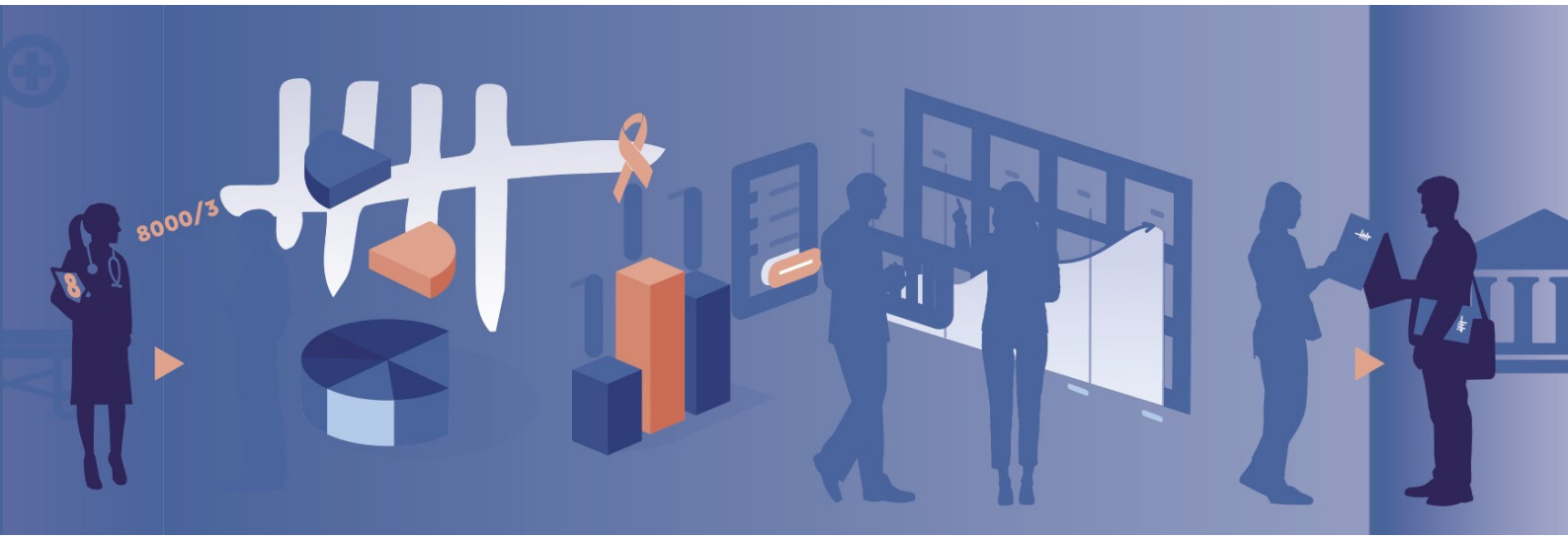
Belgian Cancer Registry

Cancer Incidence Estimates 2023

METHODOLOGY



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Context:

The method of the Belgian Cancer Registry (BCR) to calculate cancer incidence estimates was originally developed in the context of the COVID-19 crisis during which fast reporting of changes in cancer incidence was of high value to inform the broader audience, patients, partners, researchers, policy makers, etc.[1] The response of and interactions with the stakeholders revealed the need for a sustainable approach, also, in the post-COVID-19 era, to determine early "Cancer Incidence Estimates" on a yearly basis for a range of tumour types. The complete estimation approach was evaluated and refined in 2023-2024 based on retrospective analyses to create a reliable and sustainable procedure for early determination of cancer incidence estimates in this post-COVID-19 era. This document is intended to be a guide for the correct interpretation of the cancer incidence estimates of 2023.

Cancer registration data and calculation of cancer incidence estimates:

In the standard cancer registration procedure of BCR, data of both oncological care programs and laboratories for pathological anatomy go through a thorough process of data quality control and data linkage to obtain a complete database per incidence year. The incidence estimates method only uses data of the laboratories for pathological anatomy (cytological puncture, biopsy, surgery, lymph nodes, etc.). This approach has the advantage that annual estimates are available at only 6 months after incidence date enabling assessment of incidence (trends) approximately 1 year earlier than the final BCR dataset for the same incidence year.[2]

Since the cancer incidence estimates are solely based on unprocessed pathology data, all obtained results are multiplied with a conversion factor (based on previous incidence years) to account for missing registrations from oncological care programs and the lack of the thorough process of data quality control and data linkage.

These conversion factors are calculated based on the ratios of cancer incidence data (Number of new diagnoses - N or Revised European Standardized Rate - ESR2013) as extracted with the complete BCR database (for available preceding incidence years) divided by the incidence values (N or ESR2013) solely based on pathology data (for the same incidence years).

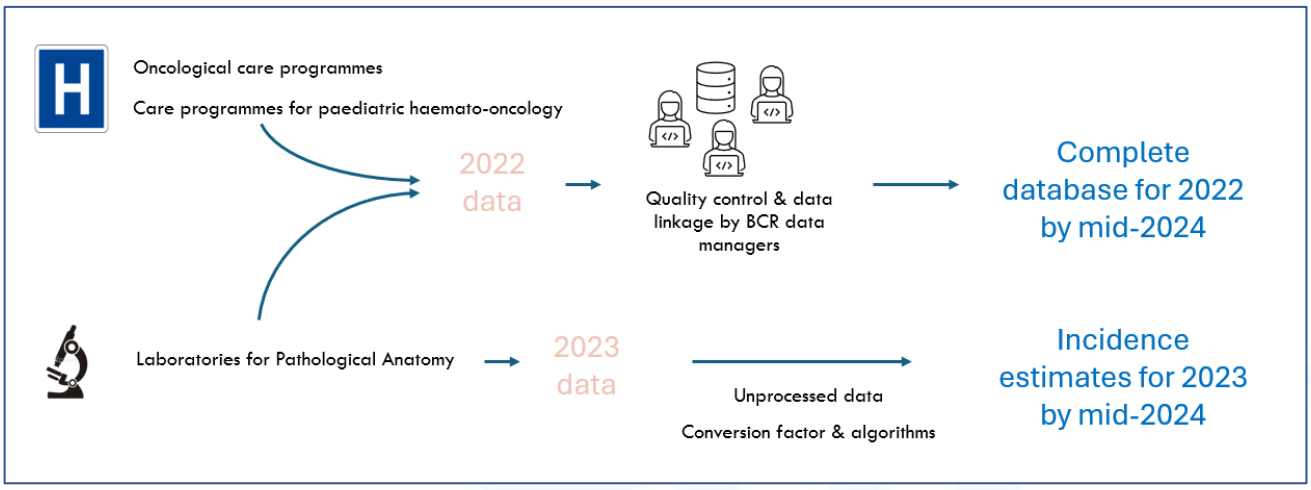

Figure 1 Standard Belgian Cancer Registry dataflow and cancer incidence estimates dataflow

Innovations of the estimation approach:

A concise overview of the implemented innovations for the calculation of the 2023 incidence estimates can be found below:

- Improved accuracy based on retrospective analyses for 2017-2022.
- In addition to the number of new diagnoses, also the age-standardised incidence (ESR2013) is included.
- More cancer types are considered for inclusion compared to previous years (e.g., testis).
- For the first time, all cancer incidence estimates of 2023 are included in the drawing module of BCR (*https://kankerregister.org/nl/tekenmodule*).
- For each cancer type, the expected accuracy of the cancer incidence estimates was assessed based on simulations for the period 2018-2022. The calculated error percentage based on the previous years can be used as a guide for correct interpretation of the results per cancer type for 2023.

Guidelines for correct interpretation of cancer incidence estimates for 2023:

The table below gives an overview of the available cancer incidence estimates including the error percentage based on previous years. This table should be taken into account when interpreting the cancer incidence estimates of 2023.

Expected error percentage of cancer incidence estimates based on incidence year 2022	
<1,5%	Colorectum, haematological malignancies, prostate, breast, all cancers (excl non-melanoma skin)
<3%	Melanoma, non-melanoma skin, kidney, testis, head and neck, thyroid, uterus, lung
<5%	Oesophagus, pancreas, stomach, bladder
>5%	Cervix, central nervous system, ovary

The first row shows the cancer types for which the estimates are expected to be most reliable (Error <1.5%). The last row shows cancer types for which no results are implemented in the drawing module of the BCR website for incidence year 2023, since the error was larger than 5% in 2022. These cancer types will be reassessed for inclusion during the next years.

Below, some additional guidelines for correct interpretation of the estimates are listed:

- Compared to other age groups, there are proportionally more diagnoses in the age group 70+ that are registered solely via the oncological care programmes and not through the laboratories for pathological anatomy. Thus, shifts in age-specific incidence can lead to small over- or underestimations in the incidence estimate dataset.
- Since the estimates data are only based on pathology reports, new advances in diagnostic procedures can affect the results (e.g. more diagnoses performed by medical imaging).
- Estimates for cancer types with small numbers are more prone to fluctuations on a year-by-year level. Therefore, the number of implemented cancer types is limited and it is not possible to show results by gender for all included cancer types.
- Other factors that might influence the results are new data registration rules, additional trainings provided by BCR to people involved in cancer registration, additional project-specific data cleaning, early mortality, patients with multiple tumours, divergent tumour registrations pathways, etc.

References

1. Peacock [*], H. M., Tambuyzer [*], T., Verdoodt, F., Calay, F., Poirel, H. A., De Schutter, H., ... & Van Eycken, L. (2021). Decline and incomplete recovery in cancer diagnoses during the COVID-19 pandemic in Belgium: a year-long, population-level analysis. ESMO open, 6(4), 100197. [*]Shared first authors

2. van Walle, L. (2024) Population-based cancer registries: a treasure of data to guide cancer control. KU Leuven