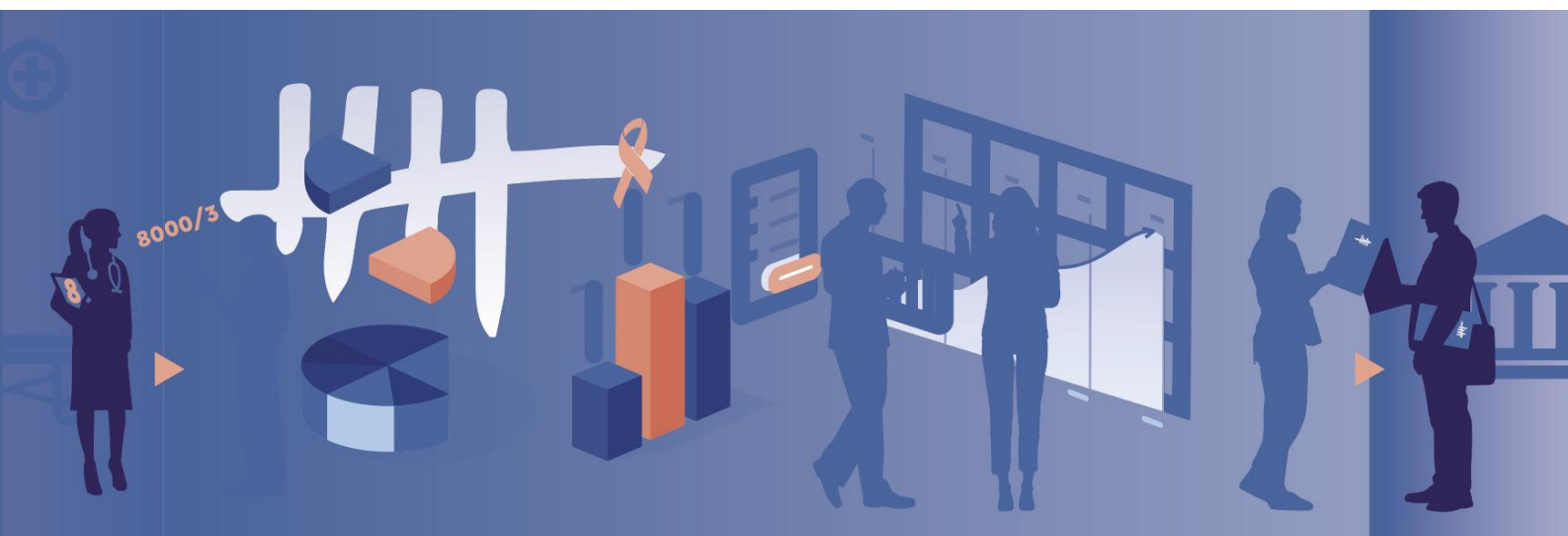


Cancer Incidence Estimates

METHODOLOGY



Cancer Incidence Estimates

METHODOLOGY

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.

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).

For each cancer type, the estimation method of the cancer incidence estimates is selected based on historical correction factors of the preceding 5 years. Cancer types with an error percentage larger than 5% are carefully reviewed and may be excluded if no underlying explanation can be identified. All cancer types are reviewed annually to assess whether their inclusion in the drawing module remains appropriate.

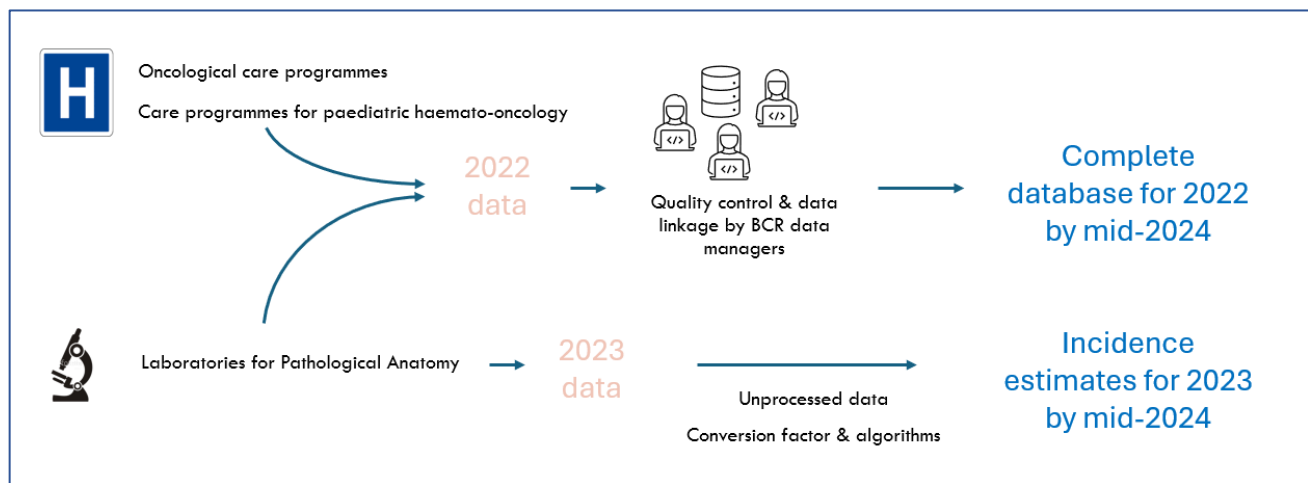


Figure 1 Standard Belgian Cancer Registry dataflow and cancer incidence estimates dataflow (in this example for data available mid-2024)

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. Tambuyzer, T., De Schutter, H., Leloup, A., Henau, K., Clinckaert, C., Van Gool, B., & Van Eycken, L. (2025). Early cancer incidence estimates improve timeliness of cancer incidence reporting by one year. *First Joint Conference of GRELL & ENCR 2025 Scientific Meeting, Porto, Portugal, 27-30 May 2025*.