



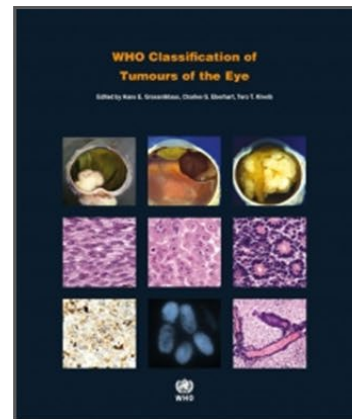
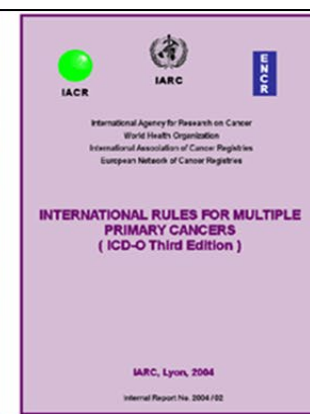
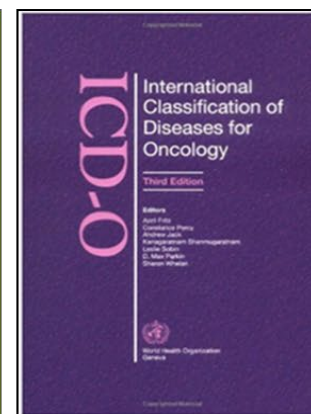
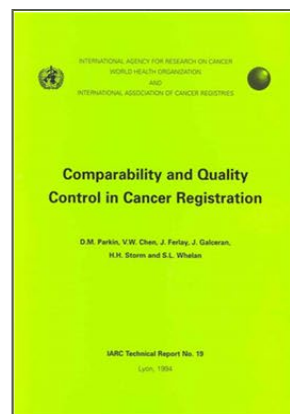
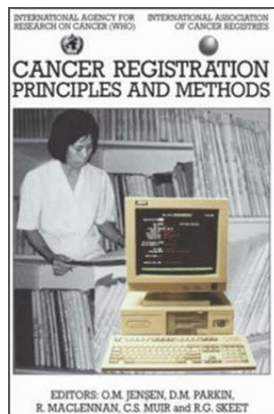
Asedat Software for Hospital-based cancer registries

ENCR Workshop on Software, Applications and IT
Tools for Data Collection and Quality Assurance in
Cancer Registries

Jordi Gálvez

18/10/2024

International standards for population-based cancer registries



Hospital-based cancer registries

Characteristics	Objectives	Use
<p>Patients diagnosed/treated in a hospital</p> <p><i>Subset of the total number of population cancer patients</i></p>	<p>Case identification exhaustivity</p> <p>Information collection regulations</p> <p>Validate cases from primary information sources (prevalent, multiple)</p> <p>Hospital administrative goals:</p> <ul style="list-style-type: none">✓ Clinical evaluation✓ Clinical follow up✓ Definition of hospital needs <p>Clinical and epidemiological projects</p>	<p>NOT SUITABLE for population health planning</p> <p>Biased sample (reference center, experience on certain cancer types, sanitary circuits, access of the population to enter a center, ...)</p>

ICO-ICS Hospital-based cancer registry

MULTICENTRIC (6 centers):

Badalona: H. Germans Trias i Pujol / ICO Badalona; **Girona:** H. Dr. Josep Trueta / ICO Girona; **L'Hospitalet de Llobregat:** H. Bellvitge/ ICO L'Hospitalet

INCLUSION CRITERIA:

1. **PRIMARY** tumors that contact for the first time in an RTH ICO-ICS center.
2. The contact of the primary tumor in the RTH ICO-ICS centers has been to make the diagnosis or administer oncological treatments.

Morphology:

3. Any invasive cancer regardless of topography
4. Any tumor of the central nervous system regardless of tumor behavior (benign, uncertain, malignant)

Hospital registry data sources (1)

Source	Data availability	Structured?	Variables
Hospital discharge	Diagnoses and procedures	ICD-10	Oncological surgery, elective/emergency surgery, hospital mortality, average hospital stay, comorbidity
Pathology records	Morphology, histology, behaviour, pTN, ypTN, hormone receptors, biomarkers	Snomed-CT terminology	Morphology, diagnostic method, first pathological diagnosis date
Outpatients records	Diagnoses	ICD-10	Tumour site, number of hospital visits
Clinical trials	Diagnoses	Unstructured (mapping to ICD-O-3.2)	Tumour and treatment related variables

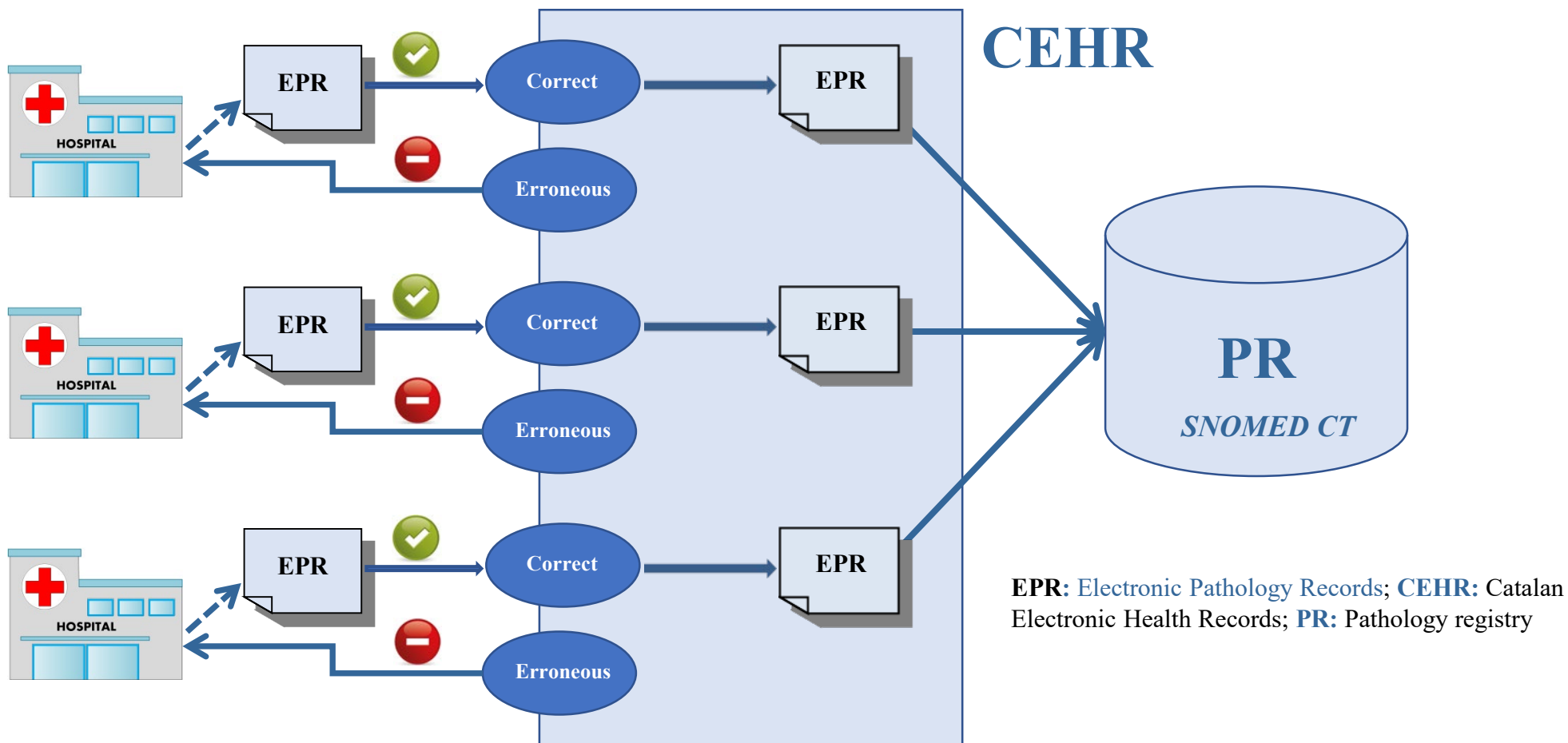
Hospital registry data sources (2)

Source	Data availability	Structured?	Variables
Chemotherapy records	Diagnoses, chemotherapy, immunotherapy	Unstructured (mapping to ICD-O-3.2)	Tumour and chemotherapy related, biomarkers
Radiotherapy records	Diagnoses, radiotherapy scheme	ICD-9 (mapping to ICD-O-3.2)	Tumour and radiotherapy related
Haematological laboratory	Cytogenetics and molecular biology records	Unstructured (mapping to ICD-O-3.2)	Specification of haematological tumours
Tumour committees	Diagnoses	Unstructured (mapping to ICD-O-3.2)	Tumour site, stage

Hospital registry data sources (3)

Source	Data availability	Structured?	Variables
Hospital admissions	Personal information	Local codification	Sex, birth date, residence
Mortality records	Vital status	ICD-10	Date and cause of death
Hospital registry	Historical data	ICD-O-3, ...	Prevalent tumours, multiple tumours

Catalan Pathology Registry structure



From SNOMED CT to ICD-O-3.2

Journal of Biomedical Informatics 78 (2018) 167–176

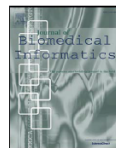


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Journal of Biomedical Informatics

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Definition of a SNOMED CT pathology subset and microglossary, based on 1.17 million biological samples from the Catalan Pathology Registry



Xavier Sanz^a, Laura Pareja^a, Ariadna Rius^b, Pepi Rodenas^c, Núria Abdón^b, Jordi Gálvez^a, Laura Esteban^a, Josep Maria Escribà^{a,d}, Josep Maria Borràs^{a,d}, Josepa Ribes^{a,d,*}

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^d Department of Clinical Sciences, University of Barcelona (UB), Carrer de la Feixa Llarga, s/n, 08907 L'Hospitalet de Llobregat, Barcelona, Spain

International Journal of Medical Informatics 141 (2020) 104167



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How cancer registries can detect neoplasms in pathology laboratories that code with SNOMED CT terminology? An actual, simple and flexible solution



Xavier Sanz^a, Laura Pareja^a, Ariadna Rius^b, Jordi Gálvez^a, Josep Maria Escribà^a, Laura Esteban^a, Josep M. Borràs^a, Josepa Ribes^{a,c,*}

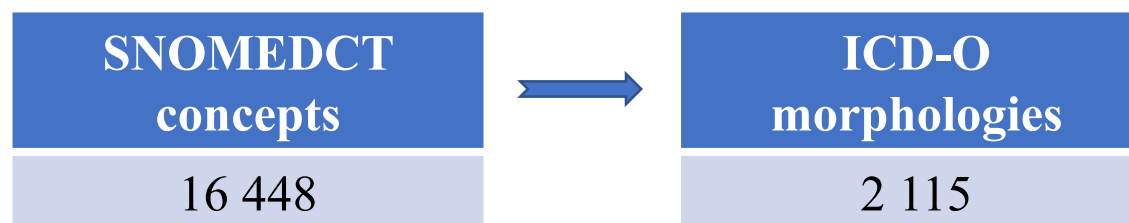
^a Catalan Cancer Plan, Department of Health of Catalonia, Avd. Gran Via de l'Hospitalet, 199-203, 08908, Hospitalet del Llobregat, Barcelona, Spain

^b Office of Standards and Interoperability of TicSalut Social Foundation, Department of Health, Av. Ernest Lluch, 32, 6a Planta, 08302, Mataró, Barcelona, Spain

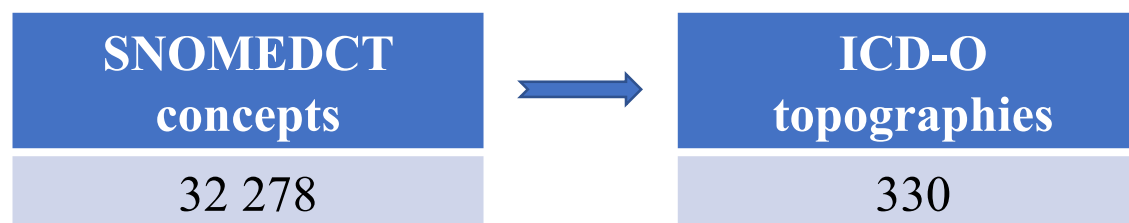
^c Department of Clinical Sciences, University of Barcelona (UB), Carrer de la Feixa Llarga, s/n, 08907 L'Hospitalet de Llobregat, Barcelona, Spain

Final subsets

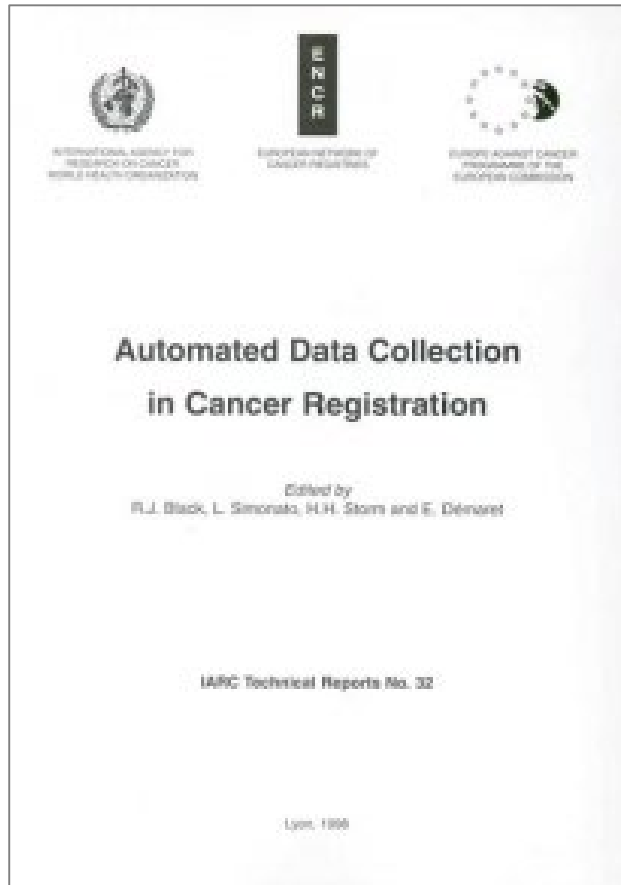
- Neoplastic subset



- Topographic subset



Software for hospital-based tumour registries (ASEDAT)



British Journal of Cancer (1996) 73, 1436-1439
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A computerised cancer registration network in the Veneto region, North-east of Italy: a pilot study

L Simonato¹, P Zambon¹, S Rodella², R Giordano³, S Guzzinati¹, C Stocco¹, S Tognazzo¹ and R Winkelmann⁴

¹Venetian Tumour Registry, University of Padua, Via Giustiniani, 7 - 35100 Padua, Italy; ²Pathology Department, Policlinico Borgo Roma, Via delle Grazie, 8 - 37134 Verona, Italy; ³Pathology Department, General Hospital of Dolo, Via S. Pio X, 8 - 30031 Dolo, Italy; ⁴Unit of Analytical Epidemiology, International Agency for Research on Cancer, Cours Albert-Thomas, 150 - 69372 Lyon, France.

Summary A cancer registration network based on computerised coded diagnoses has been tested in the Veneto region, north-east Italy, with the goal of estimating cancer incidence during 1987-89. The results of the pilot study based on a population of 1 449 513 (33.1% of the total population of the region) indicate that the computer-assisted system successfully ascertained 61.3% of the cases. The quality indices appear to be close to those from other cancer registries in Europe. The increasing availability of computerised coded information from hospitals, pathology departments and death certificates can provide an important contribution to cancer registration, thus reducing the amount of manual work and consequently allowing cancer registration on larger populations at reduced costs.

Keywords: cancer registration; computer-assisted diagnosis; public health

GACETA SANITARIA
SOCIEDAD ESPAÑOLA DE SALUD PÚBLICA Y ADMINISTRACIÓN SANITARIA

Software ASEDAT

ORIGINALES

Automatización de un registro hospitalario de tumores

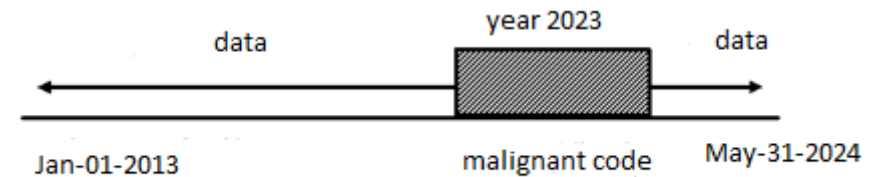
Josepa Ribes^a / Jordi Gálvez^a / Àngels Melià^a / Ramon Clèries^a / Xavier Messeguer^b / Francesc Xavier Bosch^a
^aServei d'Epidemiologia i Registre del Càncer. Institut Català d'Oncologia. L'Hospitalet de Llobregat. Barcelona. España.
^bDepartament de Llenguatges i Sistemes Informàtics. Universitat Politècnica de Catalunya. Barcelona. España.

(Automatization of a hospital-based tumor registry)

Gac Sanit. 2005;19(3):221-8

Input source data

- First step: select patients with a malignant code within available data sources on the time lapse to be processed
- Second step: for selected patients, every data available (malign and benign, from every time lapse) through data sources are included in the input data tables to be processed with Asedat algorithm
- Patient matching: all data sources are linked through the unique patient hospital identifier



Tumour matching

- Based on technical report “Automated Data Collection on Cancer Registration” by IARC
- Equivalency groups for topography and morphology
- Groups must be coherent through data sources
 - Otherwise, manual revision is needed
- Multiple tumours can be automatically collected if enough data is available (coherent topography through data sources and morphology in Pathology Records) and tumours sites and morphologies are from different, non-related equivalency groups

Automatically collected tumour data

- Topography site
- Morphology
- First hospital incidence date
- Basis of diagnosis
- TNM and stage from pathology records
- Associated treatments

More data can be manually added

Treatments data collection (1)

Surgical and trasplants treatments collection

Hospital discharges have the surgical procedures coded using ICD-9 and ICD-10. Asedat tries to collect tumor treatments by examining these codes. Rules for associating a treatment to a tumor are defined as follow:

- The main diagnose of the discharge must be a neoplasm
- A dictionary is defined for treatment codes associated to a certain tumor location. At least one of the procedure codes of the discharge must appear in this dictionary associated to the neoplasm of the main diagnose
- Additional data can be collected from identified discharges: admittance date, discharge date, average stance, re-admitances,

The dictionary comprises more than 80.000 combinations of ICD tumor diagnoses (at 4 digits level) and ICD surgical procedure codes. Both ICD-9 and ICD-10 codes are included. This dictionary also includes trasplant codes

Treatments data collection (2)

Chemotherapy treatments collection

Chemotherapy treatments are collected from the ESPOQ software database. The main issue is that tumor site and morphology are not coded in this database, but a literal is constructed when ESPOQ users select the protocol to a treatment. These literals include tumor site and sometimes morphology, so a dictionary is constructed to codify them from the literal. Currently, up to 3400 literals have been converted to ICD-O-3 codes.

Because this issue only happens at ESPOQ databases, and Asedat is designed to be general purpose for any registry using any kind of chemotherapy database, the dictionary is not included in the Asedat package, so the conversion is made before Asedat is executed. Asedat expects the input chemotherapy database to have tumor site and morphology coded in ICD-O-3. Date of prescription and date of administration are also collected.

Work in progress: ATC codes, types of chemotherapy (immunotherapy, cytostatics ...)

Treatments data collection (3)

Radiotherapy treatments collection

- Radiotherapy treatments are collected from the ICO database. Here tumor site is available, coded in ICD-9 at three digits level and full ICD-10 codes since 2019, but no morphology code or descriptor is present, so unknown morphology is assumed (M-80003 code) until it can be collected from other sources. A simple conversion to ICD-O-3 site codes is performed, and treatment is collected including several variables (starting and ending dates, dose, number of sessions...)
- Brachytherapy and in-surgery radiotherapy can also be identified on hospital discharge records through ICD-10 codes

Manual data revision

[Cercador codis ICD-O-3 online](#) | [International Classification of Diseases for Oncology](#)


Data Incidència Hospitalària


03/05/2010

Topografia  c509


C509 - MAMA, SAI

Lateralitat 

Grau Urològic 

Data Incidència Poblacional 


23/01/2019

Morfologia  m-85003

M-85003 - Carcinoma de mama

Comité de tumors

Sí


Grau SNC 

Data Mostra APA Hospital

23/01/2019

Mètode Dx

7 - Biòpsia de tumor principal

Grau diferenciació 

6: Cèl·lula B, Pre-B; precursor B

Grau Neuroendocrins

Tumors sòlids

Estadiatge al diagnòstic

T clínic

1a

pT

ypT

Estadi clínic

Clark

N clínic

1

pN

ypN

Estadi patològic

Breslow

M clínic

pM

ypM

Infecció H.Pylori

Hematologic transformation assistant

Data Incidència Hospitalària 03/05/2010	Data Incidència Poblacional ? 23/01/2019	Data Mostra APA Hospital 23/01/2019
Topografia ? C421 - MÈDULLA ÒSSIA	Morfologia ? M-97323 - Mieloma de cèl·lules	Mètode Dx 7 - Biòpsia de tumor principal
Lateralitat ?	Comité de tumors Sí	Grau diferenciació ? 6: Cèl·lula B, Pre-B; precursor B
Grau Urològic ?	Grau SNC ?	Grau Neuroendocrins

Tumors sòlids Tumors Hematològics Extres

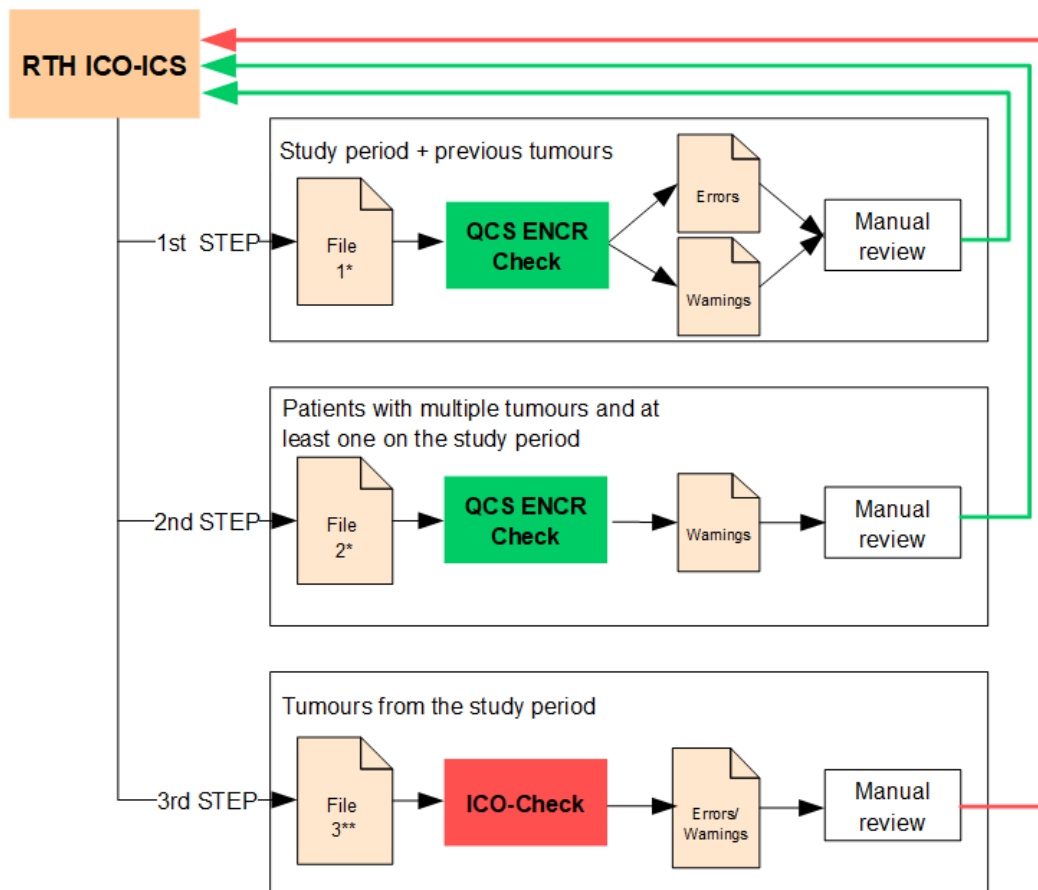
Transformació Hematològica

Segona Morfologia ? M-96653 - Limfoma de Hodgkin	Data Segona Morfologia	Topografia ?
Transformació hematològica ? Possible Múltiple		
Guardar		
Tornar a revisió		

References:

1. Gavin A, Rous B, Marcos-Gragera R, et al. Towards optimal clinical and epidemiological registration of haematological malignancies: Guidelines for recording progressions, transformations and multiple diagnoses. *Eur J Cancer*. 2015;51(9):1109-1122. <http://dx.doi.org/10.1016/j.ejca.2014.02.008>
- 2 Haemacare. Manual for Coding and Reporting Haematological Malignancies. In M. Sant, M.-L. Karjalainen-Lindsberg, M. Maynadié, M. Raphaël, S. Ferretti, A. Giacomini, C. Tereanu, P. Giraldo-Castellano, R. Marcos-Gragera, C. Martos-Jiménez, J.-M. Lutz, & O. Visser (Eds.), *Tumori*, 2010, Vol. 96, Issue 4.

Quality checks

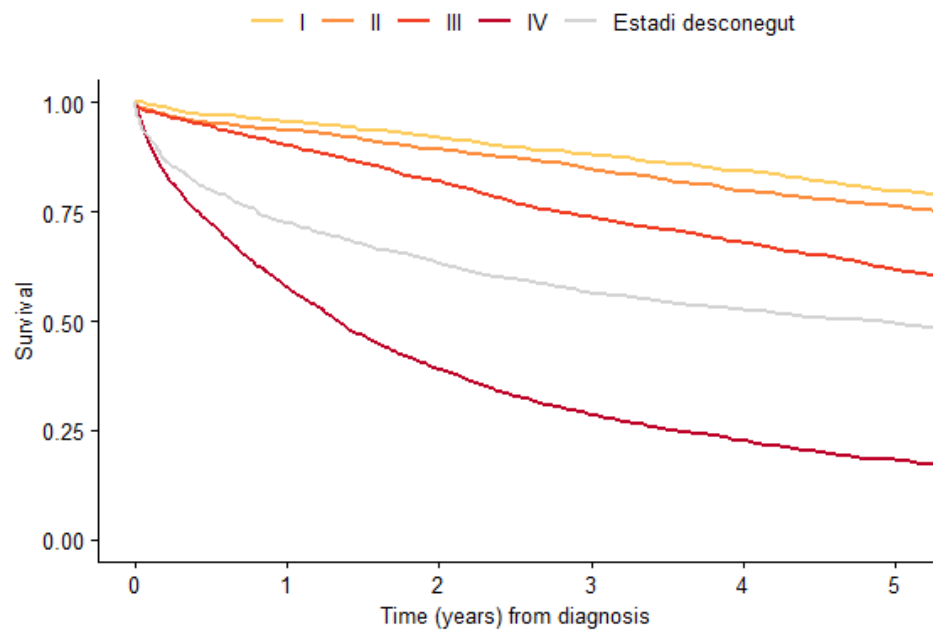


- Validates: Hospital incidence date, birth date, sex, topography, histology, behaviour, diagnostic method, degree of differentiation, TNM, pTNM, Stage, Gleason, Dukes, Figo Ann Arbor, Breslow, laterality, vital status and date of death. ** Validates: Date of diagnosis, treatment and death, taking into account the sequence of events.
- REF: JRC Technical Report: A common data quality check procedure for European cancer registries. Martos, Giusti, Van Eycken, Visser. 2024

Results (shiny portal)



Observed survival example



	0	1	2	3	4	5
I	931	889	856	754	655	531
II	1643	1539	1465	1283	1071	910
III	1667	1502	1364	1099	896	712
IV	1700	981	661	444	318	219
Estadi desconegut	1007	729	635	532	449	365

Observed survival (CI 95%)

	1 year	5 years	10 years
I	95.49 (94.16-96.83)	79.59 (76.91-82.37)	63.40 (58.96-68.17)
II	93.67 (92.50-94.85)	76.21 (74.08-78.40)	56.99 (53.63-60.56)
III	90.10 (88.68-91.55)	61.52 (59.09-64.06)	45.05 (41.79-48.57)
IV	57.71 (55.40-60.10)	18.17 (16.34-20.20)	10.32 (8.48-12.57)
Estadi desconegut	72.39 (69.68-75.21)	49.31 (46.24-52.58)	39.47 (35.99-43.28)

CI(95%): 95% confidence interval



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