European Commission

JRC TECHNICAL REPORTS

A proposal on cancer data quality checks:

one common procedure for European cancer registries

European Network of Cancer Registries

Carmen Martos,
Emanuele Crocetti (Coordinator),
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2014

Version 1.0 • November 2014

Report EUR 27008 EN

Joint Research Centre

European Commission
Joint Research Centre
Institute for Health and Consumer Protection (IHCP)

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https://ec.europa.eu/jrc/en/institutes/ihcp
https://ec.europa.eu/jrc/

JRC93456

EUR 27008 EN

ISBN 978-92-79-44675-7 (pdf)
ISBN 978-92-79-44676-4 (print)

ISSN 1831-9424 (online)
ISSN 1018-5593 (print)

doi:10.2788/182378

Luxembourg: Publications Office of the European Union, 2014

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1. Introduction

The aim of population-based cancer registries (CRs) is: *a*) to obtain information from all new cases in a well-defined geographic area to assess the magnitude of the cancer burden and its evolution, and *b*) to provide a basis for research on cancer causes and outcome (incidence, prevalence and survival). Therefore, CRs contribute to monitoring the impact and effectiveness of policy implementation through monitoring outcomes such as incidence, prevalence or survival. The reliability and utility of the information provided by CRs depends on the quality of the data collected.

Three aspects are usually regarded when evaluating the quality of the data in CRs: comparability, completeness and validity. An additional quality indicator – the timeliness of registry procedures – is also considered.

A variety of methods and tools have been used to check the data validity of CRs. Therefore, the European Network of Cancer Registries (ENCR) in cooperation with the Joint Research Centre (JRC) has been working to establish a comprehensive and standardised list of data quality checks to be adopted by European CRs and European projects that would address the current fragmented and sometimes conflicting situation regarding validation of data collected for different purposes.

The adoption of a common list of variables, formats and standard data quality checks will improve the harmonisation of European cancer data and the adherence to standardised data quality procedures will give CRs the opportunity to participate easily in different international projects.

Three workshops on data quality checks took place in JRC-Ispra, on 2 July and 15 October 2013 and 4 June 2014 (http://www.encr.eu/). The outcome of the first two meetings was the creation of a comprehensive list of the existing data quality checks currently in place for various European projects, collected and summarised by the JRC. At the conclusion of the second workshop, agreements were reached for drafting a preliminary list of mandatory and basic variables and their formats.

Furthermore, and in view of the third workshop, the Working Group drafted a document 'A proposal on cancer data quality checks: one common procedure for European cancer registries' taking into account the case definition, the list of variables and their format agreed upon during the second workshop, as well as the existing edits and the expertise of cancer registry experts. This report was disseminated among the European CRs for consultation.

The report was the object of discussion and final revision at the third workshop, and final agreements were reached concerning case definition, variables and their format and data quality control list.

This document is the result of a collaborative project between the ENCR, the JRC, the Working Group on Cancer Data Quality Checks and European cancer registries. The final outcome of the project was an ENCR-endorsed recommendations document, to be issued and presented at the 2014 ENCR Scientific Meeting and General Assembly, 12-14 November 2014, at JRC-Ispra.

The document is a first version (1.0) covering cancer data quality checks developed in accordance with current ENCR recommendations and international rules and taking into account existing edits. Future versions will include updated ENRC recommendations and new international rules based on new knowledge.

This report focuses on *case definitions* and *variable format* quality checks and *internal consistency* within and between collected variables. The proposed quality checklist allows the identification of: impossible codes or code combinations, unlikely codes or code combinations and possible but very rare code or code combinations.

Finally, the list of drugs used for chemotherapy, hormonal therapy, targeted therapy, immunotherapy and other therapies used in cancer treatment was revised and included in the *Appendices*: the list of drugs contains the Anatomical Therapeutic Chemical (ATC) code as well as the generic and trade names.

2. Case definition and variable format quality checks

The cancer data quality check list included in this report is based on the following case definition for CRs and European projects.

2.1. Case definition

- All primary malignant tumours (behaviour = 3), including basal cell and squamous cell carcinomas of skin.
- Benign tumours of the central nervous system (CNS).
- Uncertain behaviour tumours of CNS and urinary bladder.
- In situ tumours: breast, cervix, colon, rectum, urinary bladder and melanoma of the skin.

An extent of this case definition could be considered according to the European CRs needs in the future.

2.2. Variables and their format quality checks

During the second workshop on quality checks agreements were reached for the mandatory and basic variable list and their format. A revision of the list of variables and formats was made during the third workshop. *Table 1* shows the list of the variables: description, format, mandatory or non-mandatory status, missing/unknown values and the allowed values on which quality checks are based.

Table 1. *Quality checks for the variables and their formats.*

Variable description	Format	Mandatory	Missing/unknown values	Allowed values
(Check flag) The ENCR-JRC QC list	F1	Yes	Not allowed	Allowed values: 0, 1 0 → Not checked 1 → Checked
Patient identification number	A20	Yes (according to registry coding)	Not allowed	Not allowed to have duplicate combination of the two variables: Patient identification number +Tumour sequence number in the same dataset
Tumour sequence number	F2	Yes (according to registry coding)	99	
Day of birth	A2 DD	Y	99	Range of allowed values: from 01 to 31 and 99
Month of birth	A2 MM	Y	99	Range of allowed values: from 01 to 12 and 99 **Warning for value = 99**
Year of birth	F4 YYYY	Y	9999	Range of allowed values: >1842 and ≤ the current year **Warning for value = 9999**

F: Numeric variable A: Alphanumeric variable Y=yes N=not

Table 1. *(cont.)*

Variable description	Format	Mandatory	Missing/unknown values	Allowed values
Sex	F1	Y	9	Allowed values: 1, 2, 3, 9 1 → Male 2 → Female 3 → Other 9 → Unknown **Warning for value = 9**
Day: date of incidence	A2 DD	Y	99	Range of allowed values: from 01 to 31 and 99
Month: date of incidence	A2 MM	Y	99	Range of allowed values: from 01 to 12 and 99 **Warning for value = 99**
Year: date of incidence ENCR recommendation for incidence date http://www.encr.eu/images/docs/recommendations/incideng.pdf	F4 YYYY	Y	Not allowed	Range of allowed values: > 1941 and ≤ the current year
Day of case registration	A2 DD	N	99	Range of allowed values: from 01 to 31 and 99
Month of case registration	A2 MM	N	99	Range of allowed values: from 01 to 12 and 99
Year of case registration	F4 YYYY	N	9999	Range of allowed values: > 1941 and ≤ the current year
Age at diagnosis in years	F3	Y*	999	Range of allowed values: ≥ 0 and < 121 **Warning for value = 999** if completed dates are not available
Basis of diagnosis (BoD) ENCR recommendations http://www.encr.eu/images/docs/recommendations/basisd.pdf	F1	Y	9	Allowed values: 0, 1, 2, 4, 5, 6, 7, 9 0 → Death certificate only (DCO) 1 → Clinical 2 → Clinical investigation 4 → Specific tumour markers 5 → Cytology 6 → Histology of a metastasis 7 → Histology of a primary tumour 9 → Unknown **Warning for value = 9**
ICD-O-3 topography (topography of the metastasis is not admitted)	A4	Y	Not allowed	Valid code in ICD-O-3. **Warning for undefined topography when BoD is 5 or 7** C809; C76 (C760, C761, C762, C763, C764, C765, C767 and C768); C14 (C140, C148); C26 (C260, C268, C269); C39 (C390, C398, C399); C559; C579; C639; C689; C729; C759

F: Numeric variable A: Alphanumeric variable Y=yes N=not

* If complete date of birth and/or date of incidence are missing or unknown.

Table 1. *(cont.)*

Variable description	Format	Mandatory	Missing/unknown values	Allowed values	
ICD-O-3 morphology	F4	Y	Not allowed	Valid code in ICD-O-3 and updated in 2011	Valid code in ICD-O-3 and updated in 2011 **Warning for undefined morphology taking into account BoD** (See *Figure 2*, p. 30)
ICD-O-3 behaviour	F1	Y	Not allowed	Accepted value: 0-3	
Incidental finding of cancer at the autopsy	F1	Y	9	Allowed values: 0, 1, 9 0 → No 1 → Yes 9 → Unknown **Warning for value = 9**	
ICD-O-3 grade	F1	Y	9	Allowed values: 1-9 1 → Well differentiated, 2 → Moderately differentiated 3 → Poorly differentiated 4 → Undifferentiated, anaplastic 5 → T-cell; T-precursor 6 → B-Cell; Pre-B; B-precursor 7 → Null cell; Non T-non B 8 → NK cell (natural killer cell) 9 → Unknown	
Laterality of paired organs	F1	N	9	Allowed values: 0-4, 9 0 → Not applicable 1 → Right 2 → Left 3 → Unilateral NOS 4 → Bilateral 9 → Unknown	
Vital status at last contact	F1	Y	9	Allowed values: 1, 2, 9 1 → Alive 2 → Dead 9 → Unknown **Warning for value = 9**	
Day of the last known vital status	A2 DD	Y	99	Range of allowed values: from 01 to 31 and 99	
Month of the last known vital status	A2 MM	Y	99	Range of allowed values: from 01 to 12 and 99 **Warning for value = 99**	
Year of the last known vital status	F4 YYYY	Y	9999	Range of allowed values: > 1941 and ≤ the current year **Warning for value = 9999**	
Age at the last known vital status in years	F3	Y**	999	Range of allowed values: ≥ 0 and < 121 **Warning for value = 999**	

F: Numeric variable A: Alphanumeric variable Y=yes N=not

** If complete date of birth, data of incidence and/or date of end of follow-up are missing or unknown.

Table 1. *(cont.)*

Variable description	Format	Mandatory	Missing/unknown values	Allowed values
Duration of survival in days	F5	Y***	99999	≥ 0 **Warning for value = 99999**
Official underlying cause of death (ICD)	A5	N	99999	Valid code in ICD according to ICD edition
ICD edition used for coding cause of death	F2	N	99	Range of allowed values: ≥ 7 and ≤ 10 It has to be periodically updated
TNM stage, pathological primary site (pT)	A6	N	999999	Prefix modifiers will be considered: **y**: stage assessed after neo-adjuvant therapy; **a**: stage determined at autopsy (See *Table 2*)
TNM stage, pathological lymph nodes (pN)	A4	N	9999	(See *Table 2*)
TNM stage, pathological metastases (pM)	A4	N	9999	(See *Table 2*)
TNM stage, clinical primary site (cT)	A5	N	99999	(See *Table 2*)
TNM stage, clinical lymph nodes (cN)	A3	N	999	(See *Table 2*)
TNM stage, clinical metastases (cM)	A3	N	999	(See *Table 2*)
TNM stage grouping	A4	N	9999	Based on pathological TNM if it is available or clinical TNM when pathological TNM is not available (See *Table 2*)
TNM edition	F2	N	99	Allowed values: 6, 7, 99 It has to be periodically updated
Condensed TNM, T ENCR recommendations http://www.encr.eu/images/docs/recommendations/extentofdisease.pdf	A2	N	99	Allowed values: TL, TA, TX, 99 TL → Localised TA → Advanced TX → Unknown
Condensed TNM, N ENCR recommendations http://www.encr.eu/images/docs/recommendations/extentofdisease.pdf	A2	N	99	Allowed values: N0, N1, NX, 99 N0 → No regional nodes N1 → Regional nodes NX → Unknown
Condensed TNM, M ENCR recommendations http://www.encr.eu/images/docs/recommendations/extentofdisease.pdf	A2	N	99	Allowed values: M0, M1, MX, 99 M0 → No distant metastasis M1 → Distant metastasis MX → Unknown

F: Numeric variable A: Alphanumeric variable Y=yes N=not

*** If complete date of incidence and/or date of end of follow-up are missing or unknown.

Table 1. *(cont.)*

Variable description	Format	Mandatory	Missing/unknown values	Allowed values
Dukes' stage	A1	N	9	Allowed values: A, B, C, D, 9 A → Dukes' stage A, B → Dukes' stage B, C → Dukes' stage C, D → Dukes' stage D, 9 → Dukes' stage unknown
FIGO stage	A3	N	999	Allowed values: 0, I, II, III, IVA, IVB, 999 0 → FIGO stage 0, I → FIGO stage I, II → FIGO stage II, III → FIGO stage III, IVA → FIGO stage IVA, IVB → FIGO stage IVB, 9 → FIGO stage unknown
Summary extent of disease (EOD)	F1	N	9	Allowed values: 1, 2, 3, 4, 5, 9 1 → Confined 2 → Adjacent tissues, and/or regional lymph-nodes 3 → Distant organs 4 → Not confined but not specified whether code 2 or 3 applies 5 → Not distant metastasis but not specified whether code 1 or 2 applies 9 → Unknown
Tumour size in mm with decimal	F5	N	999.9	>0 or 999.9
Number examined nodes	F2	N	99	From 0 to 99
Number metastatic nodes	F2	N	99	Number metastasis nodes ≤ Number examined nodes
Sentinel nodes	F1	N	9	Allowed values: 1, 2, 9 1 → Done 2 → Not done, 9 → Unknown
Metastatic in sentinel nodes	F1	N	9	Allowed values: 1, 2, 9 1 → Yes 2 → No, 9 → Unknown

F: Numeric variable A: Alphanumeric variable Y=yes N=not

Table 1. *(cont.)*

Variable description	Format	Mandatory	Missing/unknown values	Allowed values
C factor ENCR recommendations http://www.encr.eu/images/docs/recommendations/extentofdisease.pdf	F1	N	9	Allowed values: 1, 2, 3, 4, 5, 9 1 → C1 Evidence from standard diagnostic methods only 2 → C2 Evidence obtained by special diagnostic means 3 → C3 Evidence from surgical exploration, including biopsy and cytology 4 → C4 Evidence following definitive surgery and pathological examination of the resected specimen 5 → C5 Evidence from autopsy 9 → unknown
Surgery	F1	N	9	Allowed values: 1, 2, 9 1 → Yes 2 → No 9 → Unknown
Chemotherapy	F1	N	9	Allowed values: 1, 2, 9 1 → Yes 2 → No 9 → Unknown
Systemic therapy, other than chemotherapy	F1	N	9	Allowed values: 1, 2, 9 1 → Yes 2 → No 9 → Unknown
Radiotherapy	F1	N	9	Allowed values: 1, 2, 9 1 → Yes 2 → No 9 → Unknown
Hormone therapy	F1	N	9	Allowed values: 1, 2, 9 1 → Yes 2 → No 9 → Unknown
Bone marrow transplantation	F1	N	9	Allowed values: 1, 2, 9 1 → Yes 2 → No 9 → Unknown

F: Numeric variable A: Alphanumeric variable Y=yes N=not

3. List of quality checks: internal consistency

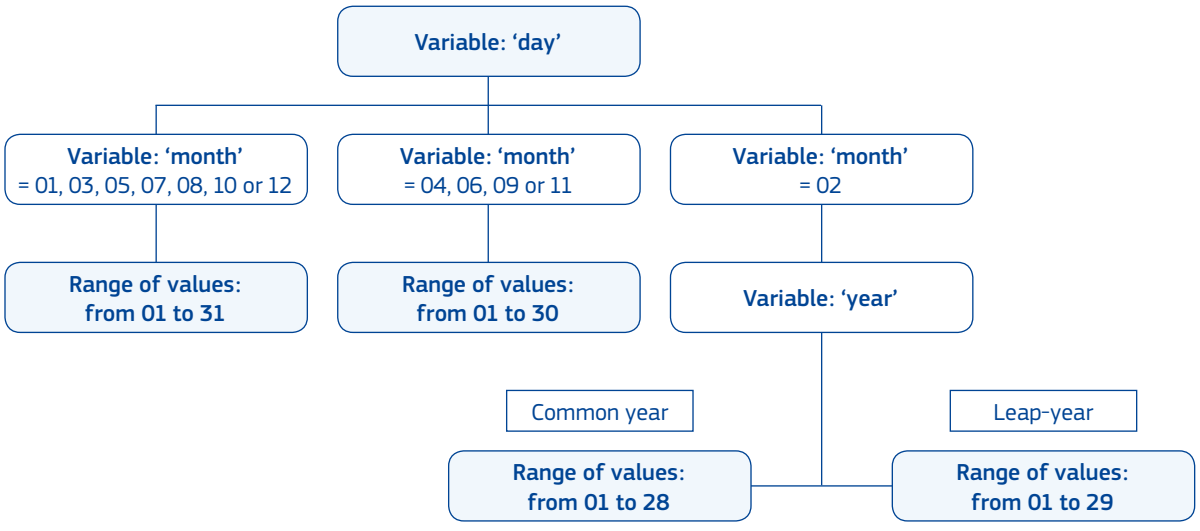
3.1. Consistency within variables

Most of the quality control checks for single variables concern its format and allowed values, detailed in *Table 1*. Nevertheless, other specific quality checks detailed below are required for dates and TNM/stage.

Regarding '*dates*', some simple rules are necessary when they are collected as three independent variables reporting 'day', 'month' and 'year' (*Figure 1*):

- if the variable 'month' is equal to January (01), March (03), May (05), July (07), August (08), October (10) or December (12) the range of values for the variable day is from 01 to 31;
- if the variable 'month' is April (04), June (06), September (09) or November (11) the range of values for the variable 'day' is from 01 to 30;
- if the variable 'month' is February (02) the range of values for the variable 'day' is from 01 to 28, except for leap-years in which the range of values for the 'day' is from 01 to 29. The algorithm to define a leap-year is the following:
  - it is a year divisible by 4 (*i.e.* 2004, 2008, etc.). This rule does not apply to centennial years (those exactly divisible by 100 (*i.e.* 1900, 2100, etc.);
  - it is a centennial year (exactly divisible by 100) and it is also exactly divisible by 400 (like 2000, 2400).

Figure 1. *Range of values for the variable 'day' according to variables 'month' and 'year'.*



Age at diagnosis: measured as the age in years at the patient's last birthday. Age could be calculated if both incidence and birth dates are registered (or at least the incidence year and birth year). It is recommended using algorithms to impute the dates before calculating the age, when possible. The range of values must be between 0 and 120.

This variable is optional if at least both incidence and birth year are available, while it is mandatory when at least one of them is missing:

- If only year of diagnosis and birth are available, then age at diagnosis is computed as a difference:

Age at diagnosis = year of incidence - year of birth

- If the month and year of both dates are known, then age at diagnosis is computed as:

Age at diagnosis = [(year of incidence * 12 + month of incidence) - (year of birth * 12 + month of birth)] / 12

→ Integer

- If the month of diagnosis and birth are known and equal, and the day of diagnosis is earlier than the day of birth, then 1 is subtracted from the calculated age.

Once computed, the age at diagnosis should be compared with what was provided by the CRs, and be consistent according to the following rule:

Age at diagnosis computed
= registered age at diagnosis ± 1

TNM and stage grouping values depend on the cancer topography and the edition of the TNM classification. The TNM system includes both clinical (pre-treatment) and pathological (post-surgical histopathological) classifications. The clinical classification is designated as cTNM, and the pathological as pTNM.

Table 2 includes the valid values for T (extent of primary tumour), N (absence/presence and extent of regional lymph node metastasis) and M (absence/presence of distant metastasis) as well as the corresponding stage by topography and revision of TNM classification (6 and 7), according to the case definitions described in section 2.1 of this report.

T, N and M values are similar for clinical and pathological classifications with very few exceptions. Therefore, unless clearly specified, the T, N and M values included in *Table 2* are valid for both cTNM and pTNM classifications.

In addition, *Appendices II* and *III* contain detailed stage grouping as well as the corresponding T, N, M values for the TNM 6 and TNM 7 editions, respectively.

Table 2. *Valid values for T, N, M and stage by cancer topography and TNM edition.*[§]

Topography	TNM edition	T	N	M	Stage grouping
Lip and oral cavity C00, C02-C06 (except C051 and C052)	6	TX, T1, T2, T3, T4a, T4b	NX, N0, N1, N2, N2a, N2b, N2c, N3	MX, M0, M1	I, II, III, IVA, IVB, IVC
	7	TX, T1, T2, T3, T4a, T4b	NX, N0, N1, N2, N2a, N2b, N2c, N3	M0, M1	I, II, III, IVA, IVB, IVC
Oropharynx C01, C051, C052, C090, C091, C099, C100, C102, C103	6	TX, T1, T2, T3, T4a, T4b	NX, N0, N1, N2, N2a, N2b, N2c, N3	MX, M0, M1	I, II, III, IVA, IVB, IVC
Nasopharynx C11		TX, T1, T2, T2a, T2b, T3, T4	NX, N0, N1, N2, N3, N3a, N3b		I, IIA, IIB, III, IVA, IVB, IVC
Hypopharynx C12, C13		TX, T1, T2, T3, T4a, T4b	NX, N0, N1, N2, N2a, N2b, N2c, N3		I, II, III, IVA, IVB, IVC
Oropharynx C01, C051, C052, C090, C091, C099, C100, C102, C103	7	TX, T1, T2, T3, T4a, T4b	NX, N0, N1, N2, N2a, N2b, N2c, N3	M0, M1	I, II, III, IVA, IVB, IVC
Nasopharynx C11		TX, T1, T2, T3, T4	NX, N0, N1, N2, N3, N3a, N3b		
Hypopharynx C12, C13		TX, T1, T2, T3, T4a, T4b	NX, N0, N1, N2, N2a, N2b, N2c, N3		
Major salivary glands C07, C08	6	TX, T1, T2, T3, T4a, T4b	NX, N0, N1, N2, N2a, N2b, N2c, N3	MX, M0, M1	I, II, III, IVA, IVB, IVC
	7	TX, T1, T2, T3, T4a, T4b	NX, N0, N1, N2, N2a, N2b, N2c, N3	M0, M1	I, II, III, IVA, IVB, IVC
Oesophagus C15	6	TX, T1, T2, T3, T4	NX, N0, N1	MX, M0, M1, M1a (for C153 and C155), M1b (for C153, C154 and C155)	I, IIA, IIB, III, IV, IVA, IVB
Oesophagus C15, C160	7	TX, T1, T2, T3, T4, T4a, T4b	NX, N0, N1, N2, N3	M0, M1	IA, IB, IIA, IIB, IIIA, IIIB, IIIC, IV
Stomach C16	6	TX, T1, T2, T2a, T2b, T3, T4	NX, N0, N1, N2, N3	MX, M0, M1	IA, IB, II, IIIA, IIIB, IV
Stomach C161-C164	7	TX, T1, T1a, T1b, T2, T3, T4, T4a, T4b	NX, N0, N1, N2, N3, N3a, N3b	M0, M1	IA, IB, IIA, IIB, IIIA, IIIB, IIIC, IV
Small intestine C17	6	TX, T1, T2, T3, T4	NX, N0, N1	MX, M0, M1	I, II, III, IV
	7	TX, T1, T1a, T1b, T2, T3, T4	NX, N0, N1, N2	M0, M1	I, IIA, IIB, IIIA, IIIB, IV
Appendix carcinoma C181	7	TX, Tis, T1, T2, T3, T4, T4a, T4b	NX, N0, N1, N2	M0, M1, M1a, M1b	0, I, IIA, IIB, IIC, IIIA, IIIB, IIIC, IVA, IVB, IVC

§ In general, the classification applies to carcinomas, except for some topographies with specific morphologies that use separate classifications (*i.e.* appendix-carcinoid). There should be histological confirmation of the disease.

Table 2. *(cont.)* [§]

Topography	TNM edition	T	N	M	Stage grouping
Appendix carcinoid C181 (well differentiated neuroendocrine tumour)	7	TX, T1, T1a, T1b, T2, T3, T4	NX, N0, N1	M0, M1	I, II, III, IV
Colon and rectum C18, C19, C20	6	TX, Tis, T1, T2, T3, T4	NX, N0, N1, N2	MX, M0, M1	0, I, IIA, IIB, IIIA, IIIB, IIIC, IV
Colon and rectum C18 (excluded C181), C19, C20	7	TX, Tis, T1, T2, T3, T4, T4a, T4b	NX, N0, N1, N1a, N1b, N1c, N2, N2a, N2b	M0, M1, M1a, M1b	0, I, II, IIA, IIB, IIC, III, IIIA, IIIB, IIIC, IVA, IVB
Anal canal C211	6	TX, T1, T2, T3, T4	NX, N0, N1, N2, N3	MX, M0, M1	I, II, IIIA, IIIB, IV
	7	TX, T1, T2, T3, T4	NX, N0, N1, N2, N3	M0, M1	I, II, IIIA, IIIB, IV
Gastrointestinal stromal tumour (GIST) C15, C16, C170, C171, C172, C18, C20, C481 (Omentum, mesentery)	7	TX, T1, T2, T3, T4	NX, N0, N1	M0, M1	**C16, C481 (omental GIST)** IA, IB, II, IIIA, IIIB, IV **C17, C15, C18, C20, C481 (mesentery)** I, II, IIIA, IIIB, IV
Gastric, small and large Intestinal carcinoid tumours (appendix excluded)*	7	Stomach TX, T1, T2, T3, T4	NX, N0, N1	M0, M1	I, IIA, IIB, IIIA, IIIB, IV
		Duodenum, ampulla, jejunum, ileum TX, T1, T2, T3, T4			
		Large intestine TX, T1, T1a, T1b, T2, T3, T4			
Liver and intrahepatic bile ducts C220, C221	6	TX, T1, T2, T3, T4	NX, N0, N1	MX, M0, M1	I, II, IIIA, IIIB, IIIC, IV
Liver–hepatocellular carcinoma C220	7	TX, T1, T2, T3, T3a, T3b, T4	NX, N0, N1	M0, M1	I, II, IIIA, IIIB, IIIC, IVA, IVB
Liver–intrahepatic bile ducts C221		TX, T1, T2a, T2b, T3, T4			I, II, III, IVA, IVB
Gallbladder C23	6	TX, T1, T1a, T1b, T2, T3, T4	NX, N0, N1	MX, M0, M1	IA, IB, IIA, IIB, III, IV
	7	TX, T1, T1a, T1b, T2, T3, T4	NX, N0, N1	M0, M1	I, II, IIIA, IIIB, IVA, IVB

§ In general, the classification applies to carcinomas, except for some topographies with specific morphologies that use separate classifications (*i.e.* appendix-carcinoid). There should be histological confirmation of the disease.

* Well-differentiated neuroendocrine tumours and Well-differentiated neuroendocrine carcinomas.

Table 2. *(cont.)* [§]

Topography	TNM edition	T	N	M	Stage grouping
Exthrahepatic bile ducts C240	6	TX, T1, T2, T3, T4	NX, N0, N1	MX, M0, M1	IA, IB, IIA, IIB, III, IV
	7	C240–Perihilar TX, T1, T2a, T2b, T3, T4 C240–Distal TX, T1, T2, T3, T4	NX, N0, N1	M0, M1	C240–Perihilar I, II, IIIA, IIIB, IVA, IVB C240–Distal IA, IB, IIA, IIB, III, IV
Ampulla of vater C241	6	TX, T1, T2, T3, T4	NX, N0, N1	MX, M0, M1	IA, IB, IIA, IIB, III, IV
	7	TX, T1, T2, T3, T4	NX, N0, N1	M0, M1	IA, IB, IIA, IIB, III, IV
Pancreas C25	6	TX, T1, T2, T3, T4	NX, N0, N1	MX, M0, M1	IA, IB, IIA, IIB, III, IV
	7	TX, T1, T2, T3, T4	NX, N0, N1	M0, M1	IA, IB, IIA, IIB, III, IV
Supraglottis C321, C101	6	TX, T1, T2, T3, T4a, T4b	NX, N0, N1, N2, N2a, N2b, N2c, N3	MX, M0, M1	I, II, III, IVA, IVB, IVC
Glottis C320		TX, T1, T1a, T1b, T2, T3, T4a, T4b			
Subglottis C322		TX, T1, T2, T3, T4a, T4b			
Supraglottis C321, C101	7	TX, T1, T2, T3, T4a, T4b	NX, N0, N1, N2, N2a, N2b, N2c, N3	M0, M1	I, II, III, IVA, IVB, IVC
Glottis C320		TX, T1, T1a, T1b, T2, T3, T4a, T4b			
Subglottis C322		TX, T1, T2, T3, T4a, T4b			
Nasal cavity and paranasal sinuses C300, C310, C311	6	TX, T1, T2, T3, T4a, T4b	NX, N0, N1, N2, N2a, N2b, N2c, N3	MX, M0, M1	I, II, III, IVA, IVB, IVC
	7	TX, T1, T2, T3, T4a, T4b	NX, N0, N1, N2, N2a, N2b, N2c, N3	M0, M1	I, II, III, IVA, IVB, IVC
Malignant melanoma of aerodigestive tract (C00-C06, C10-C14, C30-C32)	7	TX, T3, T4a, T4b	NX, N0, N1	M0, M1	III, IVA, IVB, IVC
Lung C34	6	TX, T1, T2, T3, T4	NX, N0, N1, N2, N3	MX, M0, M1	IA, IB, IIA, IIB, IIIA, IIIB, IV
	7	TX, T1, T1a, T1b, T2, T2a, T2b, T3, T4	NX, N0, N1, N2, N3	M0, M1, M1a, M1b	IA, IB, IIA, IIB, IIIA, IIIB, IV
Pleural mesothelioma C384	6	TX, T1, T1a, T1b, T2, T3, T4	NX, N0, N1, N2, N3	MX, M0, M1	IA, IB, II, III, IV
	7	TX, T1, T1a, T1b, T2, T3, T4	NX, N0, N1, N2, N3	M0, M1	IA, IB, II, III, IV

[§] In general, the classification applies to carcinomas, except for some topographies with specific morphologies that use separate classifications (*i.e.* appendix-carcinoid). There should be histological confirmation of the disease.

Table 2. *(cont.)* §

Topography	TNM edition	T	N	M	Stage grouping
Bone C40, C41	6	TX, T1, T2, T3	NX, N0, N1	MX, M0, M1, M1a, M1b	IA, IB, IIA, IIB, III, IVA, IVB
	7	TX, T1, T2, T3	NX, N0, N1	M0, M1, M1a, M1b	IA, IB, II, III, IVA, IVB
Soft tissues C381, C382, C383, C47, C480, C49, 9581/3, 8804/3, 9220/3, 9180/3, 9260/3, 9473/3, 8810/3, 8890/3, 8850/3, 8830/3, 9150/3, 8990/3, 9540/3, 8900/3, 9040/3, 8800/3	6**	TX, T1, T1a, T1b, T2, T2a, T2b	NX, N0, N1	MX, M0, M1	IA, IB, IIA, IIB, III, IV
	7***	TX, T1, T1a, T1b, T2, T2a, T2b	NX, N0, N1	M0, M1	I, IIA, IIB, III, IV
Carcinoma of eyelid C441	6	TX, T1, T2, T3, T4	NX, N0, N1	MX, M0, M1	No stage grouping recommended
	7	TX, T1, T2a, T2b, T3a, T3b, T4	NX, N0, N1	M0, M1	IA, IB, IC, II, IIIA, IIIB, IIIC, IV
Carcinoma of conjunctiva C690	6	TX, T1, T2, T3, T4, T4a, T4b, T4c, T4d	NX, N0, N1	MX, M0, M1	No stage grouping recommended
	7	TX, T1, T2, T3, T4, T4a, T4b, T4c, T4d	NX, N0, N1	M0, M1	No stage grouping recommended
Malignant melanoma of conjunctiva C690	6	TX, T1, T2, T3, T4	NX, N0, N1	MX, M0, M1	No stage grouping recommended
	7	TX, T1, T1a, T1b, T1c, T1d, T2, T2a, T2b, T2c, T2d, T3, T3a, T3b, T3c, T3d, T4	NX, N0, N1	M0, M1	No stage grouping recommended
Malignant melanoma of uvea C693, C694	6	TX, T1, T1a, T1b, T1c, T2, T2a, T2b, T2c, T3, T3a, T4	NX, N0, N1	MX, M0, M1	I, II, III, IV
	7	TX, T1, T1a, T1b, T1c, T1d, T2, T2a, T2b, T2c, T2d, T3, T3a, T3b, T3c, T3d, T4, T4a, T4b, T4c, T4d, T4e	NX, N0, N1	M0, M1	I, IIA, IIB, IIIA, IIIB, IIIC, IV

§ In general, the classification applies to carcinomas, except for some topographies with specific morphologies that use separate classifications (*i.e.* appendix-carcinoid). There should be histological confirmation of the disease.

** The following histological types are not included: Kaposi sarcoma, dermatofibrosarcoma (protuberans), fibromatosis (desmoid tumour), and sarcoma arising from the dura mater, brain, hollow viscera or parenchymatous organs (with the exception of breast sarcomas) and angiosarcoma.

*** The following histological types are not included: Kaposi sarcoma, dermatofibrosarcoma (protuberans), fibromatosis (desmoid tumour), sarcoma arising from the dura mater, brain, hollow viscera or parenchymatous organs (with the exception of breast sarcomas), angiosarcoma and gastrointestinal stromal tumours.

Table 2. *(cont.)* [§]

Topography	TNM edition	T	N	M	Stage grouping
Sarcoma of orbit C696	6	TX, T1, T2, T3, T4	NX, N0, N1	MX, M0, M1	No stage grouping recommended
	7	TX, T1, T2, T3, T4	NX, N0, N1	M0, M1	No stage grouping recommended
Carcinoma of lachrymal gland C695	6	TX, T1, T2, T3, T3a, T3b, T4	NX, N0, N1	MX, M0, M1	No stage grouping recommended
	7	TX, T1, T2, T3, T4, T4a, T4b, T4c	NX, N0, N1	M0, M1	No stage grouping recommended
Retinoblastoma C692	6	**Clinical T** TX, T1, T1a, T1b, T2, T2a, T2b, T2c, T3, T4 **Pathological T** pTX, pT0, pT1, pT2, pT2a, pT2b, pT2c, pT3, pT3a, pT3b, pT3c, pT4	NX, N0, N1	**Clinical M** MX, M0, M1 **Pathological M** pMX, pM0, pM1, pM1a, pM1b	No stage grouping recommended
	7	**Clinical T** TX, T1, T1a, T1b, T1c, T2, T2a, T2b, T3, T3a, T3b, T4, T4a, T4b, T4c, T4d **Pathological T** pTX, pT0, pT1, pT2, pT2a, pT2b, pT2c, pT3, pT3a, pT3b, pT3c, pT4	**Clinical N** NX, N0, N1 **Pathological N** pNX, pN0, pN1, pN2	**Clinical M** M0, M1 **Pathological M** pM0, pM1, pM1a, pM1b, pM1c, pM1d, pM1e	No stage grouping recommended
Carcinoma of skin C440, C442-C447, C632	6	TX, T1, T2, T3, T4	NX, N0, N1	MX, M0, M1	I, II, III, IV
	7	TX, T1, T2, T3, T4	NX, N0, N1, N2, N3	M0, M1	I, II, III, IV
Malignant melanoma of skin C44, C510, C609, C632	6	Extent of tumour is classified after excision: pTX, pTis, pT1, pT1a, pT1b, pT2, pT2a, pT2b, pT3, pT3a, pT3b, pT4, pT4a, pT4b	NX, N0, N1, N1a, N1b, N2, N2a, N2b, N2c, N3	MX, M0, M1, M1a, M1b, M1c	0, I, IA, IB, IIA, IIB, IIC, III, IIIA, IIIB, IIIC, IV
	7	Extent of tumour is classified after excision: pTX, pTis, pT1, pT1a, pT1b, pT2, pT2a, pT2b, pT3, pT3a, pT3b, pT4, pT4a, pT4b	NX, N0, N1, N1a, N1b, N2, N2a, N2b, N2c, N3	M0, M1, M1a, M1b, M1c	0, I, IA, IB, IIA, IIB, IIC, III, IIIA, IIIB, IIIC, IV

§ In general, the classification applies to carcinomas, except for some topographies with specific morphologies that use separate classifications (*i.e.* appendix-carcinoid). There should be histological confirmation of the disease.

Table 2. *(cont.)* §

Topography	TNM edition	T	N	M	Stage grouping
Merkel cell carcinoma of kin C44, C632	7	TX, T1, T2, T3, T4	NX, N0, N1, N1a, N1b, N2	M0, M1, M1a, M1b, M1c	I, IA, IB, IIA, IIB, IIC, IIIA, IIIB, IV
Vulva C51	6	TX, T1, T1a, T1b, T2, T3, T4	NX, N0, N1, N2	MX, M0, M1	I, IA, IB, II, III, IVA, IVB
	7	TX, T1, T1a, T1b, T2, T3	NX, N0, N1, N1a, N1b, N2, N2a, N2b, N2c, N3	M0, M1	I, IA, IB, II, IIIA, IIIB, IIIC, IVA, IVB
Vagina C52	6	TX, T1, T2, T3, T4	NX, N0, N1	MX, M0, M1	I, II, III, IVA, IVB
	7	TX, T1, T2, T3, T4	NX, N0, N1	M0, M1	I, II, III, IVA, IVB
Cervix uteri C53	6	TX, Tis, T1, T1a, T1a1, T1a2, T1b, T1b1, T1b2, T2, T2a, T2b, T3, T3a, T3b, T4	NX, N0, N1	MX, M0, M1	0, IA, IA1, IA2, IB, IB1, IB2, IIA, IIB, IIIA, IIIB, IVA, IVB
	7	TX, Tis, T1, T1a, T1a1, T1a2, T1b, T1b1, T1b2, T2, T2a, T2a1, T2a2, T2b, T3, T3a, T3b, T4	NX, N0, N1	M0, M1	0, I, IA, IA1, IA2, IB, IB1, IB2, II, IIA, IIA1, IIA2, IIB, III, IIIA, IIIB, IVA, IVB
Corpus uteri C541, C55	6	TX, T1, T1a, T1b, T1c, T2, T2a, T2b, T3, T3a, T3b, T4	NX, N0, N1	MX, M0, M1	IA, IB, IC, IIA, IIB, IIIA, IIIB, IIIC, IVA, IVB
	7	TX, T1, T1a, T1b, T2, T3, T3a, T3b, T4	NX, N0, N1	M0, M1	IA, IB, II, IIIA, IIIB, IIIC, IVA, IVB
Uterine sarcoma C53, C540, C543 (8890/3, 8930/3, 8933/3)	7	**8890/3, 8930/3** T1, T1a, T1b, T2, T2a, T2b, T3, T3a, T3b, T4 **8933/3** T1, T1a, T1b, T1c, T2, T2a, T2b, T3, T3a, T3b, T4	NX, N0, N1	M0, M1	I, IA, IB, IC (only for 8993/3), II, IIA, IIB, IIIA, IIIB, IIIC, IVA, IVB
Ovary C56	6	TX, T1, T1a, T1b, T1c, T2, T2a, T2b, T2c, T3, T3a, T3b	NX, N0, N1	MX, M0, M1	IA, IB, IC, IIA, IIB, IIC, IIIA, IIIB, IIIC, IV
	7	TX, T1, T1a, T1b, T1c, T2, T2a, T2b, T2c, T3, T3a, T3b, T3c	NX, N0, N1	M0, M1	IA, IB, IC, IIA, IIB, IIC, IIIA, IIIB, IIIC, IV

§ In general, the classification applies to carcinomas, except for some topographies with specific morphologies that use separate classifications (*i.e.* appendix-carcinoid). There should be histological confirmation of the disease.

Table 2. *(cont.)* [§]

Topography	TNM edition	T	N	M	Stage grouping
Fallopian tube C570	6	TX, T1, T1a, T1b, T1c, T2, T2a, T2b, T2c, T3, T3a, T3b, T3c	NX, N0, N1	MX, M0, M1	IA, IB, IC, IIA, IIB, IIC, IIIA, IIIB, IIIC, IV
	7	TX, T1, T1a, T1b, T1c, T2, T2a, T2b, T2c, T3, T3a, T3b, T3c	NX, N0, N1	M0, M1	IA, IB, IC, IIA, IIB, IIC, IIIA, IIIB, IIIC, IV
Gestational trophoblastic tumours C58	6	TX, T1, T2	–	MX, M0, M1, M1a, M1b	I, IA, IB, II, IIA, IIB, III, IIIA, IIIB, IV, IVA, IVB
	7	TX, T1, T2	–	M0, M1, M1a, M1b	I, IA, IB, II, IIA, IIB, III, IIIA, IIIB, IV, IVA, IVB
Breast C50	6	TX, Tis, T1, T1mic, T1a, T1b, T1c, T2, T3, T4, T4a, T4b, T4c, T4d	NX, N0, N1, N2, N2a, N2b, N3, N3a, N3b, N3c **Pathological N:** pNX, pN0, pN1, pN1mi, pN1a, pN1b, pN1c, pN2, pN2a, pN2b, pN3, pN3a, pN3b, pN3c	MX, M0, M1	0, I, IIA, IIB, IIIA, IIIB, IIIC, IV
	7	TX, Tis, T1, T1mi, T1a, T1b, T1c, T2, T3, T4, T4a, T4b, T4c, T4d	NX, N0, N1, N2, N2a, N2b, N3, N3a, N3b, N3c **Pathological N:** pNX, pN0, pN1, pN1mi, pN1a, pN1b, pN1c, pN2, pN2a, pN2b, pN3, pN3a, pN3b, pN3c	M0, M1	0, IA, IB, IIA, IIB, IIIA, IIIB, IIIC, IV
Penis C60	6	TX, T1, T2, T3, T4	NX, N0, N1, N2, N3	MX, M0, M1	I, II, III, IV
	7	TX, T1, T1a, T1b, T2, T3, T4	NX, N0, N1, N2, N3	M0, M1	I, II, IIIA, IIIB, IV
Prostate C61	6	TX, T1, T1a, T1b, T1c, T2, T2a, T2b, T2c, T3, T3a, T3b, T4	NX, N0, N1	MX, M0, M1, M1a, M1b, M1c	I, II, III, IV
	7	TX, T1, T1a, T1b, T1c, T2, T2a, T2b, T2c, T3, T3a, T3b, T4	NX, N0, N1	M0, M1, M1a, M1b, M1c	I, II, III, IV

§ In general, the classification applies to carcinomas, except for some topographies with specific morphologies that use separate classifications (*i.e.* appendix-carcinoid). There should be histological confirmation of the disease.

Table 2. *(cont.)* [§]

Topography	TNM edition	T	N	M	Stage grouping
Testis C62	6	Extent of tumour → after radical orchiectomy pTX, pT1, pT2, pT3, pT4	NX, N0, N1, N2, N3	MX, M0, M1, M1a, M1b	I, IA, IB, IS, II, IIA, IIB, IIC, III, IIIA, IIIB, IIIC
	7	Extent of tumour → after radical orchiectomy, except for T4 pTX, pT1, pT2, pT3, pT4	NX, N0, N1, N2, N3	M0, M1, M1a, M1b	I, IA, IB, IS, II, IIA, IIB, IIC, III, IIIA, IIIB, IIIC
Kidney C64	6	TX, T1, T1a, T1b, T2, T3, T3a, T3b, T3c, T4	NX, N0, N1, N2	MX, M0, M1	I, II, III, IV
	7	TX, T1, T1a, T1b, T2, T2a, T2b, T3, T3a, T3b, T3c, T4	NX, N0, N1	M0, M1	I, II, III, IV
Renal pelvis and ureter C65, C66	6	TX, T1, T2, T3, T4	NX, N0, N1, N2, N3	MX, M0, M1	I, II, III, IV
	7	TX, T1, T2, T3, T4	NX, N0, N1, N2, N3	M0, M1	I, II, III, IV
Urinary bladder C67	6	TX, Ta, Tis, T1, T2, T2a, T2b, T3, T3a, T3b, T4, T4a, T4b	NX, N0, N1, N2, N3	MX, M0, M1	0a, 0is, I, II, III, IV
	7	TX, Ta, Tis, T1, T2, T2a, T2b, T3, T3a, T3b, T4, T4a, T4b	NX, N0, N1, N2, N3	M0, M1	0a, 0is, I, II, III, IV
Urethra (C680) and transitional cell carcinomas of prostate (C619)	6	TX, T1, T2, T3, T4	NX, N0, N1, N2	MX, M0, M1	I, II, III, IV
	7	TX, T1, T2, T3, T4	NX, N0, N1, N2	M0, M1	I, II, III, IV

§ In general, the classification applies to carcinomas, except for some topographies with specific morphologies that use separate classifications (*i.e.* appendix-carcinoid). There should be histological confirmation of the disease.

Table 2. *(cont.)* [§]

Topography	TNM edition	T	N	M	Stage grouping
Thyroid gland C73	6	TX, T1, T2, T3, T4a, T4b	NX, N0, N1, N1a, N1b	MX, M0, M1	**Papillary/Follicular <45 years** I, II **Papillary/Follicular 45 years and older Medullary** I, II, III, IVA, IVB, IVC **Anaplastic/ Undifferentiated** IVA, IVB, IVC
	7	TX, T1, T1a, T1b, T2, T3, T4a, T4b	NX, N0, N1, N1a, N1b	M0, M1	**Papillary/Follicular <45 years** I, II **Papillary/Follicular 45 years and Medullary** I, II, III, IVA, IVB, IVC **Anaplastic/ Undifferentiated** IVA, IVB, IVC
Adrenal cortex tumours (C740)	7	TX, T1, T2, T3, T4	NX, N0, N1	M0, M1	I, II, III, IV

[§] In general, the classification applies to carcinomas, except for some topographies with specific morphologies that use separate classifications (*i.e.* appendix-carcinoid). There should be histological confirmation of the disease.

3.2. Consistency between variables

3.2.1. Coherence between dates

The following three dates are included in the list of agreed upon variables: *date of birth*, *date of incidence* and *date of the last known vital status*. The proposed rules below check for coherence between these dates:

- Date of birth ≤ Date of incidence.
  This rule is valid unless the case was diagnosed in utero if the diagnosis is in utero, the difference in months between dates should be no more than nine.
- Date of birth ≤ Date of the last known vital status.
- Date of incidence ≤ Date of the last known vital status.

For each comparison between dates, if years are known but month(s) is (are) unknown / missing, then the years are only compared. Similarly, if the day(s) is (are) unknown / missing, only the years and months are compared.

3.2.2. Consistency between tumour data and demographic information

- Consistency between age / topography / morphology.

  Some cancers occur almost exclusively in certain age groups such as retinoblastoma (tumour of young children) or prostate cancer in older men; therefore, some combinations age / topography / morphology are unlikely and should result in a warning.

  Nevertheless there are other age and tumour type combinations that are not unlikely *but* rare. A warning for these combinations improves the precision of these rare tumours. After the confirmation by CRs, a flag will show that the case has been checked. *Table 3* shows unlikely and rare combinations by age group and tumour type.

Table 3. *Unlikely and rare combinations of age and tumour type.*

Age group [years]	Morphology		Topography
0-2	Hodgkin lymphoma: 9650-9667		–
> 9	Neuroblastoma and ganglioneuroblastoma: 9490, 9500		–
> 5	Retinoblastoma: 9510-9514		–
> 8	Wilms' tumour, rhabdoid, and clear cell sarcoma	8960, 8964	–
		8963	C649
0-8	Renal carcinoma: 8010-8041, 8050-8075, 8082, 8120-8122, 8130-8141, 8143, 8155, 8190-8201, 8210, 8211, 8221-8231, 8240, 8241, 8244-8246, 8260-8263, 8290, 8310, 8320, 8323, 8401, 8430, 8440, 8480-8490, 8504, 8510, 8550, 8560-8573		C649
	8312		–

Table 3. *(cont.)*

Age group [years]	Morphology		Topography
> 5	Hepatoblastoma: 8970		–
0-8	Hepatic carcinoma	8010-8041, 8050-8075, 8082, 8120-8122, 8140, 8141, 8143, 8155, 8190-8201, 8210, 8211, 8230, 8231, 8240, 8241, 8244-8246, 8260-8263, 8310, 8320, 8323, 8401, 8430, 8440, 8480-8490, 8504, 8510, 8550, 8560-8573	C220, C221
		8160-8180	–
0-5	Osteosarcomas: 9180-9187, 9192-9195		–
0-5	Chondrosarcoma	9220-9230	
		9240	C400-C419
0-3	Ewing sarcoma: 9260, 9364		–
> 7	Malignant extra-cranial and extra-gonadal germ cell: 9060-9065, 9070-972, 9080-9085, 9100-9105		C00-C55, C57-C61, C63-C69, C73-C7500, C754-C768, C80
0-14	Gonadal carcinoma	8010-8041, 8050-8075, 8082, 8120-8122, 8130-8141, 8143, 8190-8201, 8210, 8211, 8221-8241, 8244-8246, 8260-8263, 8290, 8310, 8320, 8323, 8380-8384, 8430, 8440, 8480-8490, 8504, 8510, 8550, 8560-8573, 9014, 9015	C56, C62
		8313, 8441, 8450, 8460-8471, 9000	–
0-5	Thyroid carcinoma	8010-8041, 8050-8075, 8082, 8120-8122, 8130-8141, 8155, 8190, 8200, 8201, 8211, 8230, 8231, 8244-8246, 8260-8263, 8290, 8310, 8320, 8323, 8430, 8440, 8480, 8481, 8510, 8560-8573	C73
		8330-8337, 8340-8347, 8350	–
0-5	Nasopharyngeal carcinoma: 8010-8041, 8050-8075, 8082, 8083, 8120-8122, 8130-8141, 8190, 8200, 8201, 8211, 8230, 8231, 8244-8246, 8260-8263, 8290, 8310, 8320, 8323, 8430, 8440, 8480, 8481, 8500-8576		C11
0-4	Skin carcinoma: 8010-8041, 8050-8075, 8078, 8082, 8090-8110, 8140, 8143, 8147, 8190, 8200, 8240, 8246, 8247, 8260, 8310, 8320, 8323, 8390-8420, 8430, 8480, 8542, 8560, 8570-8573, 8940, 8941		C44
0-4	Carcinoma, NOS: 8010-8084, 8120-8157, 8190-8264, 8290, 8310, 8314-8315, 8320-8325, 8380-8384, 8430-8440, 8452-8454, 8480-8586, 8588-8589, 8940-8941, 9000, 9010-9016, 9020, 9030		C00-C10, C12-C21, C23-C39, C48, C50-C55, C57-C61, C63, C65-C72, C75-C76, C80
0-14	Mesothelial neoplasms: 9050-9053		Any

Table 3. *(cont.)*

Age group [years]	Morphology	Topography
0-14	Any	C17, C25
0-14	Choriocarcinoma: 9100	Any
< 20	Any	C15, C19, C20, 21, C23, C24, C384, C50-C55
	Less than 9590 (Haematological malignancies)	C17
	Any other than carcinoid tumours (8240-8245)	C18, C33, C34
< 25	Multiple myeloma: 9732 and Chronic lymphocytic leukaemia: 9823	Any
< 30	Chronic myeloid leukaemia: 9876, 9945	Any
	Any	C60
< 40	Adenacarcinoma: 8140	C61
> 45	Choriocarcinoma: 9110	C58
> 14	8910, 8960, 8970, 8981, 8991, 9072, 9470, 951_, 9687	Any
	Juvenile myelomonocytic leukaemia: 9946	Any

- Consistency between sex/topography.

  Some sex/topography combinations are impossible. Invalid combinations are presented in *Table 4*.

Table 4. *Invalid sex and topography combinations.*

Sex = 1 (male)	Sex= 2 (female)
C51 Vulva	C60 Penis
C52 Vagina	C61 Prostate gland
C53 Cervix uteri	C62 Testis
C54 Corpus uteri	C63 Other and unspecified male genital organs
C55 Uterus, NOS	
C56 Ovary	
C57 Other and unspecified female genital organs	
C58 Placenta	

- Consistency between sex / morphology.

  Table 5 includes a list of unlikely sex / morphology combinations.

Table 5. *Unlikely sex and morphology combinations.*

Sex = 1 (male)		Sex= 2 (female)	
8313/3	Clear cell adenocarcinofibroma	9061/3	Seminoma, NOS
8380/3	Endometrioid adenocarcinoma, NOS	9062/3	Seminoma, anaplastic
8381/3	Endometrioid adenofibroma, malignant	9063/3	Spermatocytic seminoma
8382/3	Endometrioid adenocarcinoma, secretory variant		
8383/3	Endometrioid adenocarcinoma, ciliated cell variant		
8384/3	Adenocarcinoma, endocervical type		
8441/3	Serous cystadenocarcinoma, NOS		
8460/3	Papillary serous cystadenocarcinoma		
8471/3	Papillary mucinous cystadenocarcinoma		
8482/3	Mucinous adenocarcinoma, endocervical type		
8600/3	Thecoma, malignant		
8670/3	Steroid cell tumour, malignant		
8930/3	Endometrial stromal sarcoma, NOS		
8931/3	Endometrial stromal sarcoma, low grade		
8934/3	Carcinofibroma		
8950/3	Mullerian mixed tumour		
8951/3	Mesodermal mixed tumour		
9000/3	Brenner tumour, malignant		
9014/3	Serous adenocarcinofibroma		
9015/3	Mucinous adenocarcinofibroma		
9090/3	Struma ovary, malignant		

3.2.3. Consistency between tumour variables

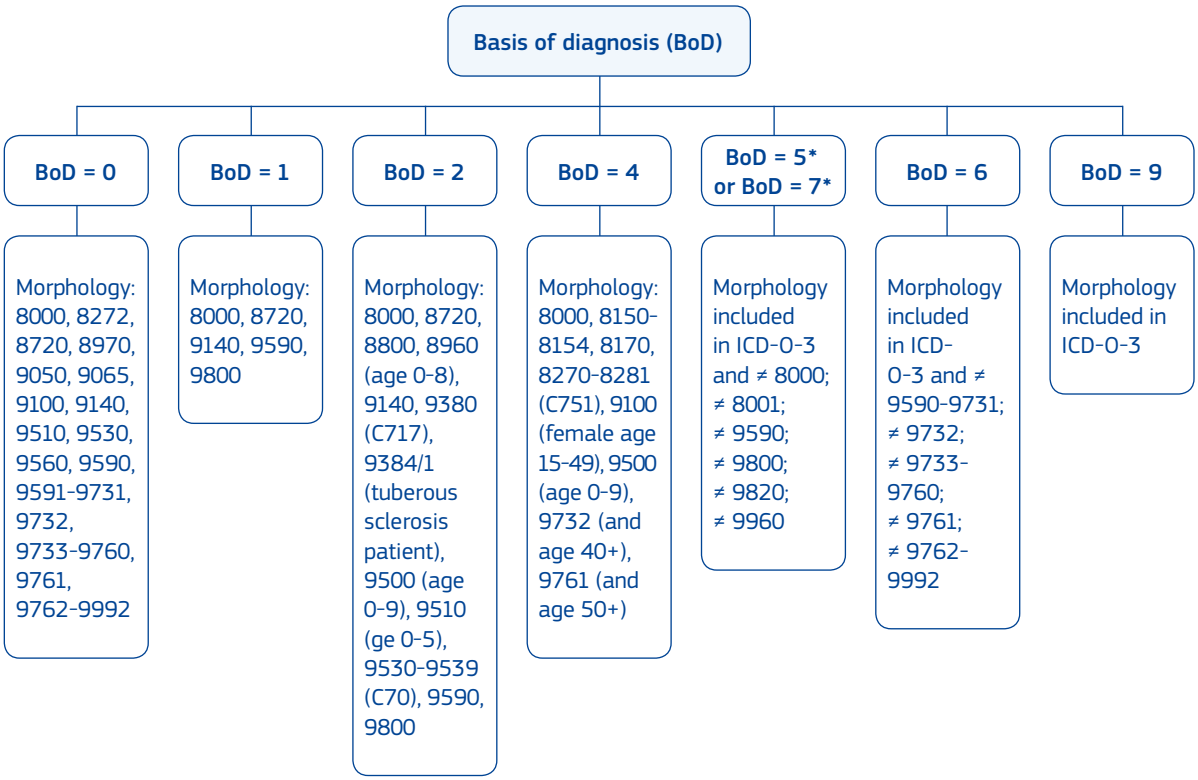
- Consistency between basis of diagnosis / morphology / behaviour.

  It is unlikely for specific morphologies not to have undergone a histological / cytological examination. Nevertheless, some combinations are considered as exceptions. ENCR recommendations have been followed for 'specific' morphology codes in absence of microscopic verification.

  Morphology codes for cases with 'death certificate only' (DCO) are allowed when they can be identified from the underlying cause of death code (International Classification of Diseases 10th Revision).

  Figure 2 shows the accepted combinations between basis of diagnosis (BoD) and morphology. Combinations not included in *Figure 2* need to be verified.

Figure 2. *Valid combinations for basis of diagnosis and morphology.*



* Since the determination that a neoplasm has not invaded surrounding tissue (in situ) is made via the microscope, cases coded in situ (**behaviour = 2**) should have a **basis of diagnosis = 7 or 5**.

- Consistency between behaviour / topography / morphology.

  Valid combinations for behaviour and site, according to case definition, are included in *Table 6*.

Table 6. *Valid combinations for behaviour and topography/morphology.*

Behaviour = 0		Behaviour = 1		Behaviour = 2	
Topography	**Morphology**	**Topography**	**Morphology**	**Topography**	**Morphology**
C70 Meninges	Any*	C70 Meninges	Any*	C44 Skin	8720 Melanoma in situ 8741 Precancerous melanosis, NOS 8742 Lentigo maligna
C71 Brain	Any*	C71 Brain	Any*	C50 Breast	Any*
C72 Spinal cord, cranial nerves, and other parts of central nervous system	Any*	C72 Spinal cord, cranial nerves, and other parts of central nervous system	Any*	C53 Cervix utero	Any*
		C67 Bladder	Any*	C18 Colon	Any*
				C19 Recto-sigmoid junction	Any*
				C20 Rectum	Any*
				C67 Bladder	Any*

* Morphology / behaviour combinations not included in ICD-O-3 are considered as errors, except some codes proposed by the ENCR Working Group for Recommendations for Coding Tumours of Brain and Central Nervous System. These codes are: 9443/3 (primitive polar spongioblastoma), 9505/0 (dysembryoplastic neuroepithelial tumour and demosplastic infantile ganglioglioma), 8726/1 (melanocytoma) and 9506/0 (central neurocytoma).

- Consistency between morphology / grade.

  Only malignant tumours (behaviour = 3) should be graded. The combination between a 'behaviour' code less than 3 and a 'grade' code less than 9 will be considered as an error.

  This edit is skipped if 'grade' is blank or missing.

  Grade values and the allowed corresponding morphology codes are shown in *Table 7*.

Table 7. *Valid combinations for morphology and grade.*

Grade →	5	6	8
Morphology	9700-9702, 9705, 9708, 9709, 9714, 9716, 9717, 9718, 9719, 9724, 9725, 9726, 9729, 9800, 9801, 9805-9807, 9809, 9820, 9827, 9831, 9834, 9837	9591, 9596, 9597, 9670, 9671, 9673, 9678-9680, 9684, 9687-9691, 9695, 9698, 9699, 9712, 9728, 9731, 9732, 9734, 9737, 9738, 9762, 9800, 9801, 9805-9808, 9811, 9812-9818, 9820, 9823, 9826, 9833, 9836, 9940	9719, 9727, 9831, 9948

The combination between grades 5-8 and morphology out of the range 9590-9992 is impossible. Some terms in ICD-O-3 carry an implied statement of grade; therefore an appropriate grade code needs to be associated. These combinations are specified in the following *Table 8*.

Table 8. *Morphology code and description, and correct associated grade for ICD-O-3 terms with implied statement of grade.*

Morphology code	Morphology description	Grade
8020/3	Carcinoma, undifferentiated, NOS	4
8021/3	Carcinoma, anaplastic, NOS	4
8240/3	Neuroendocrine carcinoma, well-differentiated	1
8249/3	Neuroendocrine carcinoma, moderately differentiated	2
8331/3	Follicular adenocarcinoma, well-differentiated	1
8332/3	Follicular adenocarcinoma, moderately differentiated	2
8585/3	Well-differentiated thymic carcinoma	1
8631/3	Sertoli-Leydig cell tumour, poorly differentiated	3
8634/3	Sertoli-Leydig cell tumour, poorly differentiated, with heterologous elements	3
8805/3	Undifferentiated sarcoma	4
8851/3	Liposarcoma, well-differentiated	1
9062/3	Seminoma, anaplastic	4
9082/3	Malignant teratoma, undifferentiated	4
9362/3	Pineal parenchymal tumour of intermediate differentiation	2, 3
9382/3	Anaplastic oligoastrocytoma	3
9390/3	Choroid plexus papilloma, anaplastic	3
9401/3	Astrocytoma, anaplastic	3

Table 8. *(cOnt.)*

Morphology code	Morphology description	Grade
9440/3	Glioblastoma	4
9451/3	Oligodendroglioma, anaplastic	3
9511/3	Retinoblastoma, differentiated	1
9512/3	Retinoblastoma, undifferentiated	4

- Consistency between topography/laterality.

  'Laterality' that means 'bilateral and separated topographies' should be coded for those paired organs for which such information may be relevant for clinical or epidemiological reasons. Therefore, laterality has a valid code from 1 to 4 for only the following topographies:

  List of paired organs for which it is suggested to collect laterality:

  - C07 Parotid gland
  - C09 Tonsil
  - C300 Nasal cavity
  - C340, C341, C343, C348, C349 Lung
  - C384 Pleura
  - C400 Long bones of upper limb and scapula
  - C401 Short bones of upper limb
  - C402 Long bones of lower limb
  - C403 Short bones of lower limb
  - C413 Rib and clavicle
  - C414 Pelvic bones (excluding sacrum, coccyx, and symphysis pubis)
  - C441 Skin of eyelid
  - C442 Skin of external ear
  - C446 Skin of arm and shoulder
  - C447 Skin of leg and hip
  - C50 Breast
  - C56 Ovary
  - C570 Fallopian tube
  - C62 Testis
  - C630 Epididymis
  - C649 Kidney
  - C659 Renal pelvis
  - C66 Ureter
  - C69 Eye
  - C74 Suprarenal gland

  Laterality is usually 1 for the topography C342, except for rare cases with situs inversus.

- Consistency between topography/morphology.

  The topography/morphology combinations include those morphologies commonly identified in specific primary topography (allowed topography codes) as well as the ones occurring only rarely or never in some specific primary topographies (not allowed topography codes). *Table 9* reports allowed/refused combinations.

Table 9. *Morphology codes and allowed/refused topography codes.*

Morphology codes	Allowed topography codes	Not allowed topography codes
8000-8005		C420, C421, C77
8010-8589		C38, C40-C42, C47, C480, C49, C70-C72, C77
8015	C53	
8077	C00-C15, C21, C30-C32, C44, C51-C53, C60	
8080	C51, C60	
8081	C00, C300, C44, C51, C60, C632, C690, C691	
8082	C00-C14, C16, C30-C34, C44, C53, C65-C68, C80	
8090-8095, 8097, 8100-8103, 8110	C300, C44, C51, C60, C632	
8098	C53	
8120, 8122, 8130, 8131	C56, C65-C68, C80	
8121	C300, C31, C65-C68	
8124	C212	
8142	C16	
8144	C15-C26, C30, C31, C52, C53, C56, C67, C80	
8145	C15-C20, C80	
8147	C00-C14, C30-C32, C50, C61	
8148	C15-C25, C61	
8150-8152, 8154, 8155	C25	
8153	C16, C170, C25, C80	
8156	C170, C25, C80	
8160, 8161	C221, C239, C240	
8162	C240	
8163	C22-C25	
8170-8175	C220	
8180	C221, C220	
8201	C15-C26, C50, C61, C80	
8210	C15-C26	

Table 9. *(cont.)*

Morphology codes	Allowed topography codes	Not allowed topography codes
8211	C15-C26, C50, C61, C80	
8213	C18	
8214	C16	
8215	C211	
8220, 8221	C18-C20	
8243	C18, C56, C80	
8247	C300, C44, C51, C60, C632, C80	
8250-8254	C34	
8261, 8262	C15-C26, C52-C57	
8263	C15-C26, C52-C57, C64	
8265	C18-C20	
8270-8272, 8280, 8281, 8300	C751	
8290	C07, C08, C64, C73, C740, C751, C80	
8312, 8316-8320	C64	
8313	C56	
8314, 8315	C50	
8322	C750	
8330-8332, 8335-8337, 8340-8347, 8350	C73	
8370	C740	
8380-8383	C481, C482, C52-C57, C80	
8384	C53	
8390, 8400, 8402-8410, 8413	C300, C44, C51, C60, C632	
8401	C300, C44, C50, C51, C60, C632	
8420	C442	
8440	C07, C08, C25, C481, C482, C54, C56, C57, C80	
8441, 8460	C481, C482, C54, C56, C57, C80	
8442, 8444, 8450, 8451, 8461-8463, 8471-8473	C481, C482, C56, C57	
8452, 8453	C24, C25	

Table 9. *(cont.)*

Morphology codes	Allowed topography codes	Not allowed topography codes
8470	C181, C25, C56, C57, C80	
8500	C07, C08, C24, C25, C50, C61, C80	
8501-8508, 8512-8514, 8520-8524, 8530, 8540, 8541, 8543	C50	
8510	C16, C18, C50, C80	
8525	C003-C005, C01-C08, C300, C31	
8542	C300, C44, C51, C60, C632	
8550, 8551	C003-C005, C01-C08, C25, C30-C34, C61, C80	
8580-8586	C37	
8588, 8589	C73	
8590-8650	C56, C62	
8670	C56	
8690, 8691	C755	
8692	C754	
8700	C741	
8710, 8711		C420, C421, C77
8720		C38, C40-C42, C47-C49, C77
8721-8723, 8730	C21, C300, C44, C51, C60, C632, C69, C80	
8728	C70	
8740, 8761	C44	
8741, 8743, 8745	C300, C44, C51, C60, C632, C690	
8742	C44, C51, C60, C632	
8744	C445, C446	
8746	C00-C06, C09-C11, C15, C20, C21, C30, C31, C680	
8770-8772	C300, C44, C51, C60, C632, C690, C80	
8773, 8774	C693, C694	
8780	C44	

Table 9. *(cont.)*

Morphology codes	Allowed topography codes	Not allowed topography codes
8800-8811, 8814-8831, 8840-8921, 8963, 8990, 8991, 9040-9043, 9120-9150, 9170, 9540, 9550, 9561, 9580, 9581		C420, C421, C77
8812	C40, C41	
8832, 8833	C44, C51, C60, C632	
8930, 8931	C481, C482, C52-C57	
8933, 8934	C52-C57	
8936	C15-C20, C25, C26, C481, C482, C80	
8940	C003-C005, C04-C08, C300, C44	
8941	C003-C005, C04-C08, C300	
8950, 8951	C481, C482, C52-C57, C80	
8959, 8960, 8964	C64	
8970	C220	
8971	C25	
8972, 8973	C34	
8983	C50	
9000	C56	
9013-9015	C481, C482, C56-C57, C80	
9020	C50	
9044	C49, C80	
9050-9053	C380, C384, C481, C482, C637, C80	
9060	C381-C383, C480, C56, C71, C751, C753	
9061-9063	C381-C383, C480, C62	
9064, 9065	C381-C383, C480, C495, C56, C62, C71, C751, C753, C80	
9070-9073, 9080-9085, 9101, 9102	C381-C383, C480, C495, C52-C57, C62, C71, C72, C751, C753, C80	
9090, 9091	C56	
9100	C381-C383, C480, C56-C58, C62, C80	
9104, 9105	C58	
9124	C220	

Table 9. *(cont.)*

Morphology codes	Allowed topography codes	Not allowed topography codes
9161	C71-C72	
9180	C40, C41, C480, C49, C50, C80	
9181-9187, 9250	C40, C41	
9192-9195, 9221	C40	
9220, 9230, 9231, 9240-9243	C300, C31, C323, C33, C40, C41, C480, C49, C80	
9251, 9252	C49	
9260, 9364		C70-C72
9261	C400, C402	
9270-9342	C03, C310, C410, C411	
9350	C751, C752	
9351, 9352	C752	
9360-9362	C753	
9370-9372	C11, C41, C49	
9380-9384, 9391-9393, 9400-9431, 9440-9460	C71, C72, C753	
9390	C715	
9394	C72	
9395	C753	
9432	C751	
9470-9472, 9474, 9480, 9493	C716	
9490, 9500, 9503	C381-C383, C47, C480, C71-C72, C741, C755, C80	
9492, 9505-9509	C71, C72, C753	
9501, 9502	C694, C71	
9510-9513	C692	
9521-9523	C300, C31, C722	
9530-9539	C70	
9560	C38, C47, C480, C71-C72, C80	
9582	C751	

Table 9. *(cont.)*

Morphology codes	Allowed topography codes	Not allowed topography codes
9590-9596, 9670-9675, 9680-9688, 9690-9699, 9702, 9705, 9714, 9724, 9728, 9729, 9735, 9737, 9738, 9750-9760, 9762		C420, C80
9597, 9700, 9709, 9718, 9725, 9726	C300, C44, C51, C60, C632	
9650-9667	C024, C09-C11, C14, C220, C421, C422, C77	
9678	C380, C384, C481, C482	
9679	C379, C381, C383, C771	
9689	C422	
9701	C421, C44, C77	
9708	C44, C49	
9712	C49	
9716	C220, C42	
9717	C16-C18	
9719	C01-C06, C09-C14, C30-C32, C44, C696, C77	
9727 (BPDCN)*	C421, C44	
9731	C40, C41	
9732, 9733, 9742, 9800-9826, 9831-9920, 9931-9967, 9975-9989, 9991, 9992	C421	
9734		C40, C41, C420, C421, C80
9741	C220, C42, C44, C77	
9761	C420	
9764	C17	
9827	C421, C77	
9930		C420, C421, C80

* In ICD-O-3, *9727* was used for precursor cell lymphoblastic lymphoma, NOS; in the 2001 updates to ICD-O-3, *9727* is used for blastic plasmacytoid dendritic cell neoplasm (BPDCN). The topography codes allowed refer to BPDCN only.

3.3. Specific checks for survival analysis

Follow-up time and extent of disease are two important components to evaluate and interpret cancer survival.

- Consistency of vital status / autopsy, autopsy / basis of diagnosis and autopsy / survival / dates of incidence and follow-up.

Vital status = 1 (alive)	Autopsy = 0 (not incidentally diagnosed at autopsy)
	Basis of diagnosis ≠ 0 (DCO)
Basis of diagnosis = 0 (DCO)	Status = 2 (dead)
	Survival (in days) = 0
	Date of incidence = Date of the end of follow-up
	Tumour size/number of examined and metastatic nodes/cTNM/pTNM/condensed TNM/EDO/stage = unknown
Autopsy = 1 (yes)	Status = 2 (dead)
	Survival (in days) = 0
	Date of incidence = Date of the end of follow-up

3.4. Other additional checks on the extent of the disease

Several variables have been included in order to retrieve information about the extent of disease: tumour size, number of examined and metastatic nodes, cTNM, pTNM, condensed_TNM, EOD (summary extent of disease) and stage grouping. *Appendices II* and *III* contain detailed TNM6 and TNM7 stage grouping, respectively, and corresponding T, N, M values.

Table 1 and *Table 2* provide accepted values for T, N, M and stage grouping. Furthermore, the following additional checks are proposed to identify inconsistencies among variables related to survival:

- If C70, C71, C76, C42, C77 and C80, then the number of examined and metastatic nodes must be '99'.
- If TNM pT = Tis, then 'basis of diagnosis' = 7.
- TNM cT ≠ Tis.
- If site = C80, tumour size = 999.9.
- If TNM pT ≠ TX or ≠ 999999, then 'basis of diagnosis' = 7.
- If TNM pN ≠ NX or ≠ 99999, then 'basis of diagnosis' = 5 or 7.
- If TNM pM ≠ MX or ≠ 999 then 'basis of diagnosis' = 5 or 7 or 6.
- *Inconsistencies between topographies and summary extent of disease (EOD)*

  Topography = C809 and (TNM N = 0, TNM M = 0).

  Topography = C809 and (condensed N = No, condensed M = Mo).

Topography: the forth digit of the topography is = 8 and EOD = 1.
Topography = C069 and EOD = 1.
Topography = C26 and EOD = 1.
Topography = C39 and EOD = 1.
Topography = C409 and EOD = 1.
Topography = C419 and EOD = 1.
Topography = C479 and EOD = 1.
Topography = C499 and EOD = 1.
Topography = C559 and EOD = 1.
Topography = C579 and EOD = 1.
Topography = C639 and EOD = 1.
Topography = C809 and EOD = 1.
Topography = C76 and EOD = 1.

Topography = C77 and TNM N = No.
Topography = C77 and condensed N = No.

- *Inconsistencies between behaviour and TNM/EOD*
  Behaviour > 2 and pTNM T = Tis.
  Behaviour = 6 and cTNM M = Mo.
  Behaviour = 6 and pTNM M = Mo.
  Behaviour = 6 and condensed M = Mo.
  Behaviour = 6 and EOD = 1.
  Behaviour = 6 and EOD = 2 (excluding nodes).
- *Inconsistencies between EOD = 1 and TNM*
  EOD = 1 and TNM N ≠ No.
  EOD = 1 and TNM M ≠ Mo.
- *Inconsistencies between EOD = 1 and condensed TNM*
  EOD = 1 and condensed T ≠ TL.
  EOD = 1 and condensed N ≠ No.
  EOD = 1 and condensed M ≠ Mo.
- *Inconsistencies between EOD = 2 and TNM*
  EOD = 2 and TNM M ≠ Mo.
  EOD = 2 and (pTNM T = Tis or TNM T = T1).
  EOD = 2 and TNM N = No.
- *Inconsistencies between EOD = 2 and condensed TNM*
  EOD = 2 and condensed M = M1.
- *Inconsistencies between EOD = 3 and TNM*
  EOD = 3 and TNM M = Mo.
- *Inconsistencies between EOD = 3 and condensed TNM*
  EOD = 3 and condensed M = Mo.
- *Inconsistencies between TNM and condensed TNM*
  TNM N ≠ No and condensed N = No.
  TNM N = No and condensed N = N1.
  TNM M = Mo and condensed M = M1.
  TNM M ≠ Mo and condensed M = Mo.
- *Inconsistencies between N+ and stage*
  Number of metastatic nodes > 0 and TNM N = No.
  Number of metastatic nodes > 0 and condensed N = No.
  Number of metastatic nodes > 0 and EOD = 1.

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Appendix I: *The Anatomical Therapeutic Chemical (ATC) code, generic and trade names*

Chemotherapy

ATC code	Generic name	Trade name
L01XX32	Bortezomib	VELCADE
L01XX17	Topotecan	HYCAMTIN
		TOPOTECAN
L01XX19	Irinotecan	IRINOTECAN HYDROCH
		CAMPTO
		IRINOTECAN ACTAVIS
L01XX05	Hydroxycarbamide	HYDREA
L01XX14	Tretinoin	VESANOID
L01XX02	Asparaginase	KIDROLASE
L01XX11	Estramustine	ESTRACYT
L01XA03	Oxaliplatin	ELOXATIN
		OXALIPLATINE ACTAV
		OXALIPLATINE
L01XA02	Carboplatin	CARBOPLATIN
		PARAPLATIN
L01XA01	Cisplatin	SINPLATIN
		CISPLATIN
		PLATIDIAM
		PLATINEX
L01BC06	Capecitabine	XELODA
L01BC05	Gemcitabine	GEMZAR
L01BC02	Fluorouracil	FLUOROURACIL ACCOR
		FLUOROURACIL 5
		5-FU
		FLUOROURACIL

Chemotherapy *(cont.)*

ATC code	Generic name	Trade name
L01BC01	Cytarabine	ALEXAN
		CYTARABINE
		CYTOSAR
L01BC53	Tegafur combinations	UFT
L01BA04	Pemetrexed	ALIMTA
L01BA01	Methotrexate	METHOTREXATE
L01BA03	Raltitrexed	TOMUDEX
L01BB05	Fludarabine	FLUDARA
L01BB02	Mercaptopurine	PURI NETHOL
L01BB07	Nelarabine	ATRIANCE
L01BB04	Cladribine	LITAK 10
L01BB03	Tioguanine	LANVIS
L01CD02	Docetaxel	TAXOTERE
		DOCETAX
L01CD01	Paclitaxel	SINDAXEL
		PACLITAXEL
		TAXOL
		GENEXOL
		PACLITEVA
		PACLITAXIN
L01CA04	Vinorelbine	VINORELBIN ACTAVIS
		NAVELBIN
		VINORELBIN EBEWE
L01CA02	Vincristine	CYTOCRISTIN
		VINCRISTIN
L01CA01	Vinblastine	CYTOBLASTIN
		VINBLASTIN

Chemotherapy *(cont.)*

ATC code	Generic name	Trade name
L01CB01	Etoposide	ETOSID
		ETOPOSIDE
		LASTET
		VEPESID
L01CB02	Teniposide	VUMON
L01CX01	Trabectedin	YONDELIS
L01AX03	Temozolomide	TEMODAL
L01AX04	Dacarbazine	DACARBAZIN
L01AA06	Ifosfamide	HOLOXAN
L01AA01	Cyclophosphamide	ENDOXAN
L01AA03	Melphalan	ALKERAN
L01AA02	Chlorambucil	LEUKERAN
L01AD01	Carmustine	BCNU
L01AD02	Lomustine	CCUN
L01AB01	Busulfan	MYLERAN
L01DB03	Epirubicin	FARMORUBICIN
		EPIRUBICIN
		EPILEM
		EPISINDAN
L01DB06	Idarubicin	ZAVEDOS
L01DB07	Mitoxantrone	MITOXANTRON
		ONCOTRONE
		NOVANTRONE
L01DB01	Doxorubicin	DOXORUBICIN
		CAELYX
L01DC03	Mitomycin	MITOMYCIN C
L01DC01	Bleomycin	BLEOCIN
L01DA01	Dactinomycin	COSMEGEN LYOVAC

Hormonal therapy

ATC code	Generic name	Trade name
L02BG04	Letrozole	FEMARA
		LETROZOL NUCLEUS
L02BG03	Anastrozole	ARIMIDEX
		ANAROMAT
L02BG06	Exemestane	AROMASIN
L02BG01	Aminogluthetimide	AMINOGLUTETHIMID
		ORIMETEN
L02BA03	Fulvestrant	FASLODEX
L02BA01	Tamoxifen	NOLVADEX
		TAMOXIFEN
		TAMIFEN
L02BB03	Bicalutamide	BICUSAN
		CASODEX
L02BB01	Flutamide	FLUTASIN
		FLUCINOM
		FLUTAMIDE
L02AE03	Goserelin	ZOLADEX
L02AE02	Leuprorelin	LUCRIN DEPOT
		ELIGARD
L02AE01	Buserelin	SUPREFACT
L02AE04	Triptorelin	DECAPEPTYL
		DIPHERELINE
		DIPHERELINE SR
L02AB01	Megestrol	MEGACE
L02AB02	Medroxyprogesterone	MEDROXYPROGESTERON
		MPA
G03HA01	Cyproterone	ANDROCUR
G03DA02	Medroxyprogesterone	FARLUTAL

Systemic therapies other than chemotherapy and hormonal therapy

Targeted therapy		
ATC code	**Generic name**	**Trade name**
L01XC03	Trastuzumab	HERCEPTIN
L01XC02	Rituximab	MABTHERA
L01XC07	Bevacizumab	AVASTIN
L01XC06	Cetuximab	ERBITUX
L01XC08	Panitumumab	VECTIBIX
L01XC04	Alemtuzumab	MABCAMPATH
L01XE01	Imatinib	GLIVEC
L01XE04	Sunitinib	SUTENT
L01XE03	Erlotinib	TARCEVA
L01XE05	Sorafenib	NEXAVAR
L01XE07	Lapatinib	TYVERB
L01XE06	Dasatinib	SPRYCEL
L01XE08	Nilotinib	TASIGNA

Immunotherapy		
ATC code	**Generic name**	**Trade name**
L03AA13	Pegfilgrastim	NEULASTA
L03AA02	Filgrastim	NEUPOGEN
		TEVAGRASTIM
L03AA10	Lenograstim	GRANOCYTE
L03AB01	Interferon alfa natural	ROFERON A
L03AB05	Interferon alfa-2b	REALDIRON
		INTRON A

Other therapies		
ATC code	**Generic name**	**Trade name**
A04AA01	Ondansetron	ZOFRAN
		ZONDARON

Systemic therapies other than chemotherapy and hormonal therapy *(cont.)*

Other therapies *(cont.)*		
ATC code	**Generic name**	**Trade name**
A04AA02	Granisetron	KYTRIL
		RASETRON
A04AA04	Dolasetron	ANZEMET
A04AA05	Palonosetron	ALOXI
A04AA03	Tropisetron	NAVOBAN
B03XA01	Erythropoietin	NEO RECORMON
		EPREX
B03XA03	Pegzerepoetinalfa	MIRCERA
B03XA02	Darbepoetinalfa	ARANESP
M05BA08	Zoledronic acid	ZOMETA
M05BA06	Ibandronic acid	BONDRONAT
M05BA03	Pamidronic acid	PAMITOR
		AREDIA
M05BA02	Clodronic acid	SINDRONAT
		BONEFOS
		OSTAC
H02AB07	Prednisone	DEHYDROCORTISON
H02AB06	Prednisolone	PREDNISOLON CORTIC
		PREDNISOLON
H02AB02	Dexamethasone	DEXAMETHASONE
		DEXAVEN
		PREDNISOLON F
H02AB04	Methylprednisolone	METHYLPREDN.SOPHAR
		SOLU MEDROL
		DEPO MEDROL
		MEDROL
		METHYLPREDN.CORTIC
		METHYLPREDNISOLON

Appendix II: *TNM 6 edition stage grouping and corresponding T, N, M values*

Lip and Oral Cavity C00, C02-C06 (except C051 and C052)			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
II	T2	N0	M0
III	T1, T2	N1	M0
	T3	N0, N1	M0
IVA	T1, T2, T3	N2	M0
	T4a	N0, N1, N2	M0
IVB	Any T	N3	M0
	T4b	Any N	M0
IVC	Any T	Any N	M1

Oropharynx and Hypopharynx C01, C051, C052, C090, C091, C099, C100, C102, C103, C12, C13			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
II	T2	N0	M0
III	T1, T2	N1	M0
	T3	N0, N1	M0
IVA	T1, T2, T3	N2	M0
	T4a	N0, N1, N2	M0
IVB	T4b	Any N	M0
	Any T	N3	M0
IVC	Any T	Any N	M1

Nasopharynx C11			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
IIA	T2a	N0	M0
IIB	T1	N1	M0
	T2a	N1	M0
	T2b	N0, N1	M0
III	T1	N2	M0
	T2a, T2b	N2	M0
	T3	N0, N1, N2	M0
IVA	T4	N0, N1, N2	M0
IVB	Any T	N3	M0
IVC	Any T	Any N	M1

Larynx C320, C321, C322, C101			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
II	T2	N0	M0
III	T1, T2	N1	M0
	T3	N0, N1	M0
IVA	T1, T2, T3	N2	M0
	T4a	N0, N1, N2	M0
IVB	T4b	Any N	M0
	Any T	N3	M0
IVC	Any T	Any N	M1

Nasal Cavity and Paranasal Sinuses C300, C310, C311			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
II	T2	N0	M0
III	T1, T2	N1	M0
	T3	N0, N1	M0
IVA	T1, T2, T3	N2	M0
	T4a	N0, N1, N2	M0
IVB	T4b	Any N	M0
	Any T	N3	M0
IVC	Any T	Any N	M1

Salivary Glands C07, C08			
Stage	**T**	**N**	**M**
I	T1	N0	M0
II	T2	N0	M0
III	T3	N0	M0
	T1, T2, T3	N1	M0
IVA	T1, T2, T3	N2	M0
	T4a	N0, N1, N2	M0
IVB	T4b	Any N	M0
	Any T	N3	M0
IVC	Any T	Any N	M1

Thyroid Gland C73			
Stage	**T**	**N**	**M**
Papillary or Follicular, under 45 years			
I	Any T	Any N	M0
II	Any T	Any N	M1
Papillary or Follicular, 45 years and older, and Medullary			
I	T1	N0	M0
II	T2	N0	M0
III	T3	N0	M0
	T1, T2, T3	N1a	M0
IVA	T1, T2, T3	N1b	M0
	T4a	N0, N1	M0
IVB	T4b	Any N	M0
IVC	Any T	Any N	M1
Anaplastic/Undifferentiated (all cases are stage IV)			
IVA	T4a	Any N	M0
IVB	T4b	Any N	M0
IVC	Any T	Any N	M1

Oesophagus C15			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
IIA	T2, T3	N0	M0
IIB	T1, T2	N1	M0
III	T3	N1	M0
	T4	Any N	M0
IV	Any T	Any N	M1
IVA	Any T	Any N	M1a
IVB	Any T	Any N	M1b

Stomach C16			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
IA	T1	N0	M0
IB	T1	N1	M0
	T2a/b	N0	M0
II	T1	N2	M0
	T2a/b	N1	M0
	T3	N0	M0
IIIA	T2a/b	N2	M0
	T3	N1	M0
	T4	N0	M0
IIIB	T3	N2	M0
IV	T4	N1, N2, N3	M0
	T1, T2, T3	N3	M0
	Any T	Any N	M1

Small Intestine C17			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1, T2	N0	M0
II	T3, T4	N0	M0
III	Any T	N1	M0
IV	Any T	Any N	M1

Colon and Rectum C18-C20			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1, T2	N0	M0
IIA	T3	N0	M0
IIB	T4	N0	M0
IIIA	T1, T2	N1	M0
IIIB	T3, T4	N1	M0
IIIC	Any T	N2	M0
IV	Any T	Any N	M1

Anal Canal C211			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
II	T2	N0	M0
	T3	N0	M0
IIIA	T1, T2, T3	N1	M0
	T4	N0	M0
IIIB	T4	N1	M0
	Any T	N2, N3	M0
IV	Any T	Any N	M1

Liver C220, C221			
Stage	**T**	**N**	**M**
I	T1	N0	M0
II	T2	N0	M0
IIIA	T3	N0	M0
IIIB	T4	N0	M0
IIIC	Any T	N1	M0
IV	Any T	Any N	M1

Gallbladder C23			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
IA	T1	N0	M0
IB	T2	N0	M0
IIA	T3	N0	M0
IIB	T1, T2, T3	N1	M0
III	T4	Any N	M0
IV	Any T	Any N	M1

Extrahepatic Bile Ducts C240			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
IA	T1	N0	M0
IB	T2	N0	M0
IIA	T3	N0	M0
IIB	T1, T2, T3	N1	M0
III	T4	Any N	M0
IV	Any T	Any N	M1

Ampulla of Vater C241			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
IA	T1	N0	M0
IB	T2	N0	M0
IIA	T3	N0	M0
IIB	T1, T2, T3	N1	M0
III	T4	Any N	M0
IV	Any T	Any N	M1

Pancreas C25			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
IA	T1	N0	M0
IB	T2	N0	M0
IIA	T3	N0	M0
IIB	T1, T2, T3	N1	M0
III	T4	Any N	M0
IV	Any T	Any N	M1

Lung C34			
Stage	**T**	**N**	**M**
Occult carcinoma	TX	N0	M0
0	Tis	N0	M0
IA	T1	N0	M0
IB	T2	N0	M0
IIA	T1	N1	M0
IIB	T2	N1	M0
	T3	N0	M0
IIIA	T1, T2	N2	M0
	T3	N1, N2	M0
IIIB	Any T	N3	M0
	T4	Any N	M0
IV	Any T	Any N	M1

Pleural Mesothelioma C384			
Stage	**T**	**N**	**M**
IA	T1a	N0	M0
IB	T1b	N0	M0
II	T2	N0	M0
III	T1, T2	N1	M0
	T1, T2	N2	M0
	T3	N0, N1, N2	M0
IV	T4	Any N	M0
	Any T	N3	M0
	Any T	Any N	M1

Bone C40, C41				
Stage	**T**	**N**	**M**	**Grade (G)**
IA	T1	N0, NX	M0	1, 2
IB	T2	N0, NX	M0	1, 2
IIA	T1	N0, NX	M0	3, 4
IIB	T2	N0, NX	M0	3, 4
III	T3	N0, NX	M0	Any G
IVA	Any T	N0, NX	M1a	Any G
IVB	Any T	N1	Any M	Any G
	Any T	Any N	M1b	Any G

Soft Tissues C381, C382,C383, C47-C49				
Stage	**T**	**N**	**M**	**Grade (G)**
IA	T1a	N0, NX	M0	1, 2
	T1b	N0, NX	M0	1, 2
IB	T2a	N0, NX	M0	1, 2
	T2b	N0, NX	M0	1, 2
IIA	T1a	N0, NX	M0	3, 4
	T1b	N0, NX	M0	3, 4
IIB	T2a	N0, NX	M0	3, 4
III	T2b	N0, NX	M0	3, 4
IV	Any T	N1	M0	Any G
	Any T	Any N	M1	Any G

Carcinoma of Skin (excluding eyelid, vulva, and penis) C440, C442-C449, C632			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
II	T2, T3	N0	M0
III	T4	N0	M0
	Any T	N1	M0
IV	Any T	Any N	M1

Malignant Melanoma of Skin C44, C510, C609, C632			
Stage	**T**	**N**	**M**
0	pTis	N0	M0
I	pT1	N0	M0
IA	pT1a	N0	M0
IB	pT1b	N0	M0
	pT2a	N0	M0
IIA	pT2b	N0	M0
	pT3a	N0	M0
IIB	pT3b	N0	M0
	pT4a	N0	M0
IIC	pT4b	N0	M0
III	Any pT	N1, N2, N3	M0
IIIA	pT1a-pT4a	N1a, N2a	M0
IIIB	pT1a-pT4a	N1b, N2b, N2c	M0
	pT1b-pT4b	N1a, N2a, N2c	M0
IIIC	pT1b-pT4b	N1b, N2b	M0
	Any pT	N3	M0
IV	Any pT	Any N	M1

Breast Tumours C50			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
IIA	T0	N1	M0
	T1	N1	M0
	T2	N0	M0
IIB	T2	N1	M0
	T3	N0	M0
IIIA	T0	N2	M0
	T1	N2	M0
	T2	N2	M0
	T3	N1, N2	M0
IIIB	T4	N0, N1, N2	M0
IIIC	Any T	N3	M0
IV	Any T	Any N	M1

Vulva C51			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
IA	T1a	N0	M0
IB	T1b	N0	M0
II	T2	N0	M0
III	T1, T2	N1	M0
	T3	N0, N1	M0
IVA	T1, T2, T3	N2	M0
	T4	Any N	M0
IVB	Any T	Any N	M1

Vagina C52			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
II	T2	N0	M0
III	T3	N0	M0
	T1, T2, T3	N1	M0
IVA	T4	Any N	M0
IVB	Any T	Any N	M1

Cervix Uteri C53			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
IA	T1a	N0	M0
IA1	T1a1	N0	M0
IA2	T1a2	N0	M0
IB	T1b	N0	M0
IB1	T1b1	N0	M0
IB2	T1b2	N0	M0
IIA	T2a	N0	M0
IIB	T2b	N0	M0
IIIA	T3a	N0	M0
IIIB	T1, T2, T3a	N1	M0
	T3b	Any N	M0
IVA	T4	Any N	M0
IVB	Any T	Any N	M1

Corpus Uteri C54			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
IA	T1a	N0	M0
IB	T1b	N0	M0
IC	T1c	N0	M0
IIA	T2a	N0	M0
IIB	T2b	N0	M0
IIIA	T3a	N0	M0
IIIB	T3b	N0	M0
IIIC	T1, T2, T3	N1	M0
IVA	T4	Any N	M0
IVB	Any T	Any N	M1

Ovary C56			
Stage	**T**	**N**	**M**
IA	T1a	N0	M0
IB	T1b	N0	M0
IC	T1c	N0	M0
IIA	T2a	N0	M0
IIB	T2b	N0	M0
IIC	T2c	N0	M0
IIIA	T3a	N0	M0
IIIB	T3b	N0	M0
IIIC	T3c	N0	M0
	Any T	N1	M0
IV	Any T	Any N	M1

Fallopian Tube C570			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
IA	T1a	N0	M0
IB	T1b	N0	M0
IC	T1c	N0	M0
IIA	T2a	N0	M0
IIB	T2b	N0	M0
IIC	T2c	N0	M0
IIIA	T3a	N0	M0
IIIB	T3b	N0	M0
IIIC	T3c	N0	M0
	Any T	N1	M0
IV	Any T	Any N	M1

Gestational Trophoblastic Tumours C58				
Stage	**T**	**N – not applicable**	**M**	**Risk category**
I	T1		M0	unknown
IA	T1		M0	low
IB	T1		M0	high
II	T2		M0	unknown
IIA	T2		M0	low
IIB	T2		M0	high
III	Any T		M1a	unknown
IIIA	Any T		M1a	low
IIIB	Any T		M1a	high
IV	Any T		M1b	unknown
IVA	Any T		M1b	low
IVB	Any T		M1b	high

Penis C60			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
	Ta	N0	M0
I	T1	N0	M0
II	T1	N1	M0
	T2	N0	M0
	T2	N1	M0
III	T1, T2	N2	M0
	T3	N0, N1, N2	M0
IV	T4	Any N	M0
	Any T	N3	M0
	Any T	Any N	M1

Prostate C61				
Stage	**T**	**N**	**M**	**Grade (G)**
I	T1a	N0	M0	1
II	T1a	N0	M0	2, 3, 4
	T1b, T1c	N0	M0	Any G
	T1, T2	N0	M0	Any G
III	T3	N0	M0	Any G
IV	T4	N0	M0	Any G
	Any T	N1	M0	Any G
	Any T	Any N	M1	Any G

Testis C62				
Stage	T	N	M	Serum tumour markers
0	pTis	N0	M0	S0, SX
I	pT1-T4	N0	M0	SX
IA	pT1	N0	M0	S0
IB	pT2	N0	M0	S0
	pT3	N0	M0	S0
	pT4	N0	M0	S0
IS	Any pT, Tx	N0	M0	S1-S3
II	Any pT, Tx	N1-N3	M0	SX
IIA	Any pT, Tx	N1	M0	S0
	Any pT, Tx	N1	M0	S1
IIB	Any pT, Tx	N2	M0	S0
	Any pT, Tx	N2	M0	S1
IIC	Any pT, Tx	N3	M0	S0
	Any pT, Tx	N3	M0	S1
III	Any pT, Tx	Any N	M1, M1a	SX
IIIA	Any pT, Tx	Any N	M1, M1a	S0
	Any pT, Tx	Any N	M1, M1a	S1
IIIB	Any pT, Tx	N1-N3	M0	S2
	Any pT, Tx	Any N	M1, M1a	S2
IIIC	Any pT, Tx	N1-N3	M0	S3
	Any pT, Tx	Any N	M1, M1a	S3
	Any pT, Tx	Any N	M1b	Any S

Kidney C64			
Stage	**T**	**N**	**M**
I	T1	N0	M0
II	T2	N0	M0
III	T3	N0	M0
	T1, T2, T3	N1	M0
IV	T4	N0, N1	M0
	Any T	N2	M0
	Any T	Any N	M1

Renal Pelvis and Ureter C65, C66			
Stage	**T**	**N**	**M**
0a	Ta	N0	M0
0is	Tis	N0	M0
I	T1	N0	M0
II	T2	N0	M0
III	T3	N0	M0
IV	T4	N0	M0
	Any T	N1, N2, N3	M0
	Any T	Any N	M1

Urinary Bladder C67			
Stage	**T**	**N**	**M**
0a	Ta	N0	M0
0is	Tis	N0	M0
I	T1	N0	M0
II	T2a, b	N0	M0
III	T3a, b	N0	M0
	T4a	N0	M0
IV	T4b	N0	M0
	Any T	N1, N2, N3	M0
	Any T	Any N	M1

Urethra C680			
Stage	**T**	**N**	**M**
0a	Ta	N0	M0
0is	Tis	N0	M0
	Tispu	N0	M0
	Tispd	N0	M0
I	T1	N0	M0
II	T2	N0	M0
III	T1, T2	N1	M0
	T3	N0, N1	M0
IV	T4	N0, N1	M0
	Any T	N2	M0
	Any T	Any N	M1

Malignant Melanoma of Uvea C693, C694			
Stage	**T**	**N**	**M**
I	T1	N0	M0
II	T2	N0	M0
III	T3, T4	N0	M0
IV	Any T	N1	M0
	Any T	Any N	M1

Appendix III: *TNM 7 edition stage grouping and corresponding T, N, M values*

Lip and Oral Cavity C00, C02-C06 (except C051 and C052)			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
II	T2	N0	M0
III	T1, T2, T3	N1	M0
	T3	N0	M0
IVA	T1, T2, T3, T4a	N2	M0
	T4a	N0, N1	M0
IVB	Any T	N3	M0
	T4b	Any N	M0
IVC	Any T	Any N	M1

Oropharynx and Hypopharynx C01, C051, C052, C09, C100, C102, C103, C12, C13			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
II	T2	N0	M0
III	T1, T2, T3	N1	M0
	T3	N0	M0
IVA	T1, T2, T3	N2	M0
	T4a	N0, N1, N2	M0
IVB	T4b	Any N	M0
	Any T	N3	M0
IVC	Any T	Any N	M1

Nasopharynx C11			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
II	T2	N0, N1	M0
	T1	N1	M0
III	T1, T2	N2	M0
	T3	N0, N1, N2	M0
IVA	T4	N0, N1, N2	M0
IVB	Any T	N3	M0
IVC	Any T	Any N	M1

Larynx C320, C321, C322, C101			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
II	T2	N0	M0
III	T1, T2	N1	M0
	T3	N0, N1	M0
IVA	T1, T2, T3	N2	M0
	T4a, T4b	N0, N1	M0
IVB	T4b	Any N	M0
	Any T	N3	M0
IVC	Any T	Any N	M1

Nasal Cavity and Paranasal Sinuses C300, C310, C311			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
II	T2	N0	M0
III	T1, T2, T3	N1	M0
	T3	N0	M0
IVA	T1, T2, T3	N2	M0
	T4a	N0, N1, N2	M0
IVB	T4b	Any N	M0
	Any T	N3	M0
IVC	Any T	Any N	M1

Malignant Melanoma of Upper Aerodigestive Tract C00-C06, C10-C14, C30-C32			
Stage	**T**	**N**	**M**
III	T3	N0	M0
IVA	T3, T4a	N1	M0
	T4a	N0	M0
IVB	T4b	Any N	M0
IVC	Any T	Any N	M1

Major Salivary Glands C07, C08			
Stage	**T**	**N**	**M**
I	T1	N0	M0
II	T2	N0	M0
III	T3	N0	M0
	T1, T2, T3	N1	M0
IVA	T4a	N0	M0
	T4a	N1	M0
	T1, T2, T3, T4a	N2	M0
IVB	T4b	Any N	M0
	Any T	N3	M0
IVC	Any T	Any N	M1

Thyroid Gland C73			
Stage	**T**	**N**	**M**
Papillary or Follicular, under 45 years			
I	Any T	Any N	M0
II	Any T	Any N	M1
Papillary or Follicular, 45 years and older			
I	T1a, T1b	N0	M0
II	T2	N0	M0
III	T3	N0	M0
	T1, T2, T3	N1a	M0
IVA	T1, T2, T3	N1b	M0
	T4a	N0, N1	M0
IVB	T4b	Any N	M0
IVC	Any T	Any N	M1
Medullary			
I	T1a, T1b	N0	M0
II	T2, T3	N0	M0
III	T1, T2, T3	N1a	M0
IVA	T1, T2, T3	N1b	M0
	T4a	Any N	M0
IVB	T4b	Any N	M0
IVC	Any T	Any N	M1
Anaplastic/Undifferentiated (all cases are stage IV)			
IVA	T4a	Any N	M0
IVB	T4b	Any N	M0
IVC	Any T	Any N	M1

Oesophagus C15, C160			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
IA	T1	N0	M0
IB	T2	N0	M0
IIA	T3	N0	M0
IIB	T1, T2	N1	M0
IIIA	T4a	N0	M0
	T3	N1	M0
	T1, T2	N2	M0
IIIB	T3	N2	M0
IIIC	T4a	N1, N2	M0
	T4b	Any N	M0
	Any T	N3	M0
IV	Any T	Any N	M1

Stomach C161-C164			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
IA	T1	N0	M0
IB	T2	N0	M0
	T1	N1	M0
IIA	T3	N0	M0
	T2	N1	M0
	T1	N2	M0
IIB	T4a	N0	M0
	T3	N1	M0
	T2	N2	M0
	T1	N3	M0
IIIA	T4a	N1	M0
	T3	N2	M0
	T2	N3	M0
IIIB	T4b	N0, N1	M0
	T4a	N2	M0
	T3	N3	M0
IIIC	T4a	N3	M0
	T4b	N2, N3	M0
IV	Any T	Any N	M1

Small Intestine C17			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1, T2	N0	M0
IIA	T3	N0	M0
IIB	T4	N0	M0
IIIA	Any T	N1	M0
IIIB	Any T	N2	M0
IV	Any T	Any N	M1

Appendix-Carcinoma C181				
Stage	**T**	**N**	**M**	**Grade (G)**
0	Tis	N0	M0	
I	T1, T2	N0	M0	
IIA	T3	N0	M0	
IIB	T4a	N0	M0	
IIC	T4b	N0	M0	
IIIA	T1, T2	N1	M0	
IIIB	T3, T4	N1	M0	
IIIC	Any T	N2	M0	
IVA	Any T	N0	M1a	G1
IVB	Any T	N0	M1a	G2, G3
	Any T	N1, N2	M1a	Any G
IVC	Any T	Any N	M1b	Any G

Note: G1 well-differentiated/mucinous low grade; G2 moderately differentiated/mucinous high grade; G3 poorly differentiated/mucinous high grade; G4 undifferentiated.

Appendix-Carcinoid (Well-differentiated neuroendocrine tumour)			
Stage	**T**	**N**	**M**
I	T1	N0	M0
II	T2, T3	N0	M0
III	T4	N0	M0
	Any T	N1	M0
IV	Any T	Any N	M1

Colon and Rectum C18-C20, excluded C181			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1, T2	N0	M0
II	T3, T4	N0	M0
IIA	T3	N0	M0
IIB	T4a	N0	M0
IIC	T4b	N0	M0
III	Any T	N1, N2	M0
IIIA	T1, T2	N1	M0
	T1	N2a	M0
IIIB	T3, T4a	N1	M0
	T2, T3	N2a	M0
	T1, T2	N2b	M0
IIIC	T4a	N2a	M0
	T3, T4a	N2b	M0
	T4b	N1, N2	M0
IVA	Any T	Any N	M1a
IVB	Any T	Any N	M1b

Anal Canal C211			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
II	T2, T3	N0	M0
IIIA	T1, T2, T3	N1	M0
	T4	N0	M0
IIIB	T4	N1	M0
	Any T	N2, N3	M0
IV	Any T	Any N	M1

Gastrointestinal Stromal Tumour (GIST)				
Stage	**T**	**N**	**M**	**Mitotic rate**
Gastric GIST*				
IA	T1, T2	N0	M0	Low
IB	T3	N0	M0	Low
II	T1, T2	N0	M0	High
	T4	N0	M0	Low
IIIA	T3	N0	M0	High
IIIB	T4	N0	M0	High
IV	Any T	N1	M0	Any rate
	Any T	Any N	M1	Any rate
Small Intestinal GIST*				
I	T1, T2	N0	M0	Low
II	T3	N0	M0	Low
IIIA	T1	N0	M0	High
	T4	N0	M0	Low
IIIB	T2, T3, T4	N0	M0	High
IV	Any T	N1	M0	Any rate
	Any T	Any N	M1	Any rate

* Staging criteria for gastric tumours can be applied in primary, solitary omental GISTs. Staging criteria for intestinal tumours can be applied to GISTs in less common sites, such as oesophagus, colon, rectum and mesentery.

Gastric, Small, and Large Intestinal Carcinoid Tumours (Well-differentiated Neuroendocrine Tumours and Well-differentiated Neuroendocrine Carcinomas)			
Stage	**T**	**N**	**M**
I	T1	N0	M0
IIA	T2	N0	M0
IIB	T3	N0	M0
IIIA	T4	N0	M0
IIIB	Any T	N1	M0
IV	Any T	Any N	M1

Liver – Hepatocellular Carcinoma C220			
Stage	**T**	**N**	**M**
I	T1	N0	M0
II	T2	N0	M0
IIIA	T3a	N0	M0
IIIB	T3b	N0	M0
IIIC	T4	N1	M0
IVA	Any T	N1	M0
IVB	Any T	Any N	M1

Liver – Intrahepatic Bile Duct C221			
Stage	**T**	**N**	**M**
I	T1	N0	M0
II	T2	N0	M0
III	T3	N0	M0
IVA	T4	N0	M0
	Any T	N1	M0
IVB	Any T	Any N	M1

Gallbladder C23			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
II	T2	N0	M0
IIIA	T3	N0	M0
IIIB	T1, T2, T3	N1	M0
IVA	T4	Any N	M0
IVB	Any T	Any N	M1

Extrahepatic Bile Ducts–Perihiliar C240			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
II	T2a, T2b	N0	M0
IIIA	T3	N0	M0
IIIB	T1, T2, T3	N1	M0
IVA	T4	N0, N1	M0
IVB	Any T	Any N	M1

Extrahepatic Bile Ducts-Distal C240			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
IA	T1	N0	M0
IB	T2	N0	M0
IIA	T3	N0	M0
IIB	T1, T2, T3	N1	M0
III	T4	Any N	M0
IV	Any T	Any N	M1

Ampulla of Vater C241			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
IA	T1	N0	M0
IB	T2	N0	M0
IIA	T3	N0	M0
IIB	T1, T2, T3	N1	M0
III	T4	Any N	M0
IV	Any T	Any N	M1

Pancreas C25			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
IA	T1	N0	M0
IB	T2	N0	M0
IIA	T3	N0	M0
IIB	T1, T2, T3	N1	M0
III	T4	Any N	M0
IV	Any T	Any N	M1

Lung C34			
Stage	**T**	**N**	**M**
Occult carcinoma	TX	N0	M0
0	Tis	N0	M0
IA	T1a, T1b	N0	M0
IB	T2a	N0	M0
IIA	T2b	N0	M0
	T1a, T1b	N1	M0
	T2a	N1	M0
IIB	T2b	N1	M0
	T3	N0	M0
IIIA	T1a, T1b, T2a, T2b	N2	M0
	T3	N1, N2	M0
	T4	N0, N1	M0
IIIB	Any T	N3	M0
	T4	N2	M0
IV	Any T	Any N	M1

Pleural Mesothelioma C384			
Stage	**T**	**N**	**M**
IA	T1a	N0	M0
IB	T1b	N0	M0
II	T2	N0	M0
III	T1, T2	N1	M0
	T1, T2	N2	M0
	T3	N0, N1, N2	M0
IV	T4	Any N	M0
	Any T	N3	M0
	Any T	Any N	M1

Bone C40, C41				
Stage	**T**	**N**	**M**	**Grade (G)**
IA	T1	N0	M0	1, 2
IB	T2	N0	M0	1, 2
IIA	T1	N0	M0	3, 4
IIB	T2	N0	M0	3, 4
III	T3	N0	M0	Any G
IVA	Any T	N0	M1a	Any G
IVB	Any T	N1	Any M	Any G
	Any T	Any N	M1b	Any G

Note: Use No for NX. For T1 and T2, use low grade if no grade is stated.

Soft Tissues C381-C383, C47, C480, C49				
Stage	**T**	**N**	**M**	**Grade (G)**
IA	T1a	N0	M0	1, 2
	T1b	N0	M0	1, 2
IB	T2a	N0	M0	1, 2
	T2b	N0	M0	1, 2
IIA	T1a	N0	M0	3, 4
	T1b	N0	M0	3, 4
IIB	T2a	N0	M0	3, 4
III	T2b	N0	M0	3, 4
	Any T	N1	M0	Any G
IV	Any T	Any N	M1	Any G

Note: Use low grade for GX. Use No for NX.

Carcinoma of Skin of Eyelid C441			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
IA	T1	N0	M0
IB	T2a	N0	M0
IC	T2b	N0	M0
II	T3a	N0	M0
IIIA	T3b	N0	M0
IIIB	Any T	N1	M0
IIIC	T4	Any N	M0
IV	Any T	Any N	M1

Carcinoma of Skin (excluding eyelid, vulva, and penis) C440, C442-C449, C632			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
II	T2	N0	M0
III	T3	N0	M0
	T1, T2, T3	N1	M0
IV	T1, T2, T3	N2, N3	M0
	T4	Any N	M0
	Any T	Any N	M1

Malignant Melanoma of Skin C44, C510, C609, C632			
Stage	**T**	**N**	**M**
0	pTis	N0	M0
I	pT1	N0	M0
IA	pT1a	N0	M0
IB	pT1b	N0	M0
	pT2a	N0	M0
IIA	pT2b	N0	M0
	pT3a	N0	M0
IIB	pT3b	N0	M0
	pT4a	N0	M0
IIC	pT4b	N0	M0
III	Any pT	N1, N2, N3	M0
IIIA	pT1a-pT4a	N1a, N2a	M0
IIIB	pT1a-pT4a	N1b, N2b, N2c	M0
	pT1b-pT4b	N1a, N2a, N2c	M0
IIIC	pT1b-pT4b	N1b, N2b	M0
	Any pT	N3	M0
IV	Any pT	Any N	M1

Malignant Melanoma of Uvea C693, C694			
Stage	**T**	**N**	**M**
I	T1a	N0	M0
IIA	T1b-T1d, T2a	N0	M0
IIB	T2b, T3a	N0	M0
IIIA	T2c-T2d	N0	M0
	T3b-T3c	N0	M0
	T4a	N0	M0
IIIB	T3d	N0	M0
	T4b-T4c	N0	M0
IIIC	T4d-T4e	N0	M0
IV	Any T	N1	M0
	Any T	Any N	M1

Merkel Cell Carcinoma of Skin C440-C449, C632			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
IA	T1	pN0	M0
IB	T1	cN0	M0
IIA	T2, T3	pN0	M0
IIB	T2, T3	cN0	M0
IIC	T4	N0	M0
IIIA	Any T	N1a	M0
IIIB	Any T	N1b, N2	M0
IV	Any T	Any N	M1

Breast Tumours C50			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
IA	T1*	N0	M0
IB	T0, T1*	N1mi	M0
IIA	T0, T1*	N1	M0
	T2	N0	M0
IIB	T2	N1	M0
	T3	N0	M0
IIIA	T0, T1*, T2	N2	M0
	T3	N1, N2	M0
IIIB	T4	N0, N1, N2	M0
IIIC	Any T	N3	M0
IV	Any T	Any N	M1

* T1 includes T1mi.

Vulva C51			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
IA	T1a	N0	M0
IB	T1b	N0	M0
II	T2	N0	M0
IIIA	T1, T2	N1a, N1b	M0
IIIB	T1, T2	N2a, N2b	M0
IIIC	T1, T2	N2c	M0
IVA	T1, T2	N3	M0
	T3	Any N	M0
IVB	Any T	Any N	M1

Vagina C52			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
II	T2	N0	M0
III	T3	N0	M0
	T1, T2, T3	N1	M0
IVA	T4	Any N	M0
IVB	Any T	Any N	M1

Cervix Uteri C53			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
I	T1	N0	M0
IA	T1a	N0	M0
IA1	T1a1	N0	M0
IA2	T1a2	N0	M0
IB	T1b	N0	M0
IB1	T1b1	N0	M0
IB2	T1b2	N0	M0
II	T2	N0	M0
IIA	T2a	N0	M0
IIA1	T2a1	N0	M0
IIA2	T2a2	N0	M0
IIB	T2b	N0	M0
III	T3	N0	M0
IIIA	T3a	N0	M0
IIIB	T1, T2, T3	N1	M0
	T3b	Any N	M0
IVA	T4	Any N	M0
IVB	Any T	Any N	M1

Corpus Uteri C541, C55			
Stage	**T**	**N**	**M**
IA	T1a	N0	M0
IB	T1b	N0	M0
II	T2	N0	M0
IIIA	T3a	N0	M0
IIIB	T3b	N0	M0
IIIC	T1, T2, T3	N1	M0
IVA	T4	Any N	M0
IVB	Any T	Any N	M1

Uterine Sarcoma: Leiomyosarcoma (8890/3), endometrial stromal sarcoma (8930/3) and adenosarcoma (8933/3) C53, C540, C543			
Stage	**T**	**N**	**M**
I	T1	N0	M0
IA	T1a	N0	M0
IB	T1b	N0	M0
IC*	T1c	N0	M0
II	T2	N0	M0
IIA	T2a	N0	M0
IIB	T2b	N0	M0
IIIA	T3a	N0	M0
IIIB	T3b	N0	M0
IIIC	T1, T2, T3	N1	M0
IVA	T4	Any N	M0
IVB	Any T	Any N	M1

* Stage IC does not apply for leiomyosarcoma and endometrial stromal sarcoma.

Ovary C56			
Stage	**T**	**N**	**M**
IA	T1a	N0	M0
IB	T1b	N0	M0
IC	T1c	N0	M0
IIA	T2a	N0	M0
IIB	T2b	N0	M0
IIC	T2c	N0	M0
IIIA	T3a	N0	M0
IIIB	T3b	N0	M0
IIIC	T3c	N0	M0
	Any T	N1	M0
IV	Any T	Any N	M1

Fallopian Tube C570			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
IA	T1a	N0	M0
IB	T1b	N0	M0
IC	T1c	N0	M0
IIA	T2a	N0	M0
IIB	T2b	N0	M0
IIC	T2c	N0	M0
IIIA	T3a	N0	M0
IIIB	T3b	N0	M0
IIIC	T3c	N0	M0
	Any T	N1	M0
IV	Any T	Any N	M1

Gestational Trophoblastic Tumours C58				
Stage	**T**	**N – not applicable**	**M**	**Risk category**
I	T1		M0	unknown
IA	T1		M0	low
IB	T1		M0	high
II	T2		M0	unknown
IIA	T2		M0	low
IIB	T2		M0	high
III	Any T		M1a	unknown
IIIA	Any T		M1a	low
IIIB	Any T		M1a	high
IV	Any T		M1b	unknown
IVA	Any T		M1b	low
IVB	Any T		M1b	high

Penis C60			
Stage	**T**	**N**	**M**
0	Tis	N0	M0
	Ta	N0	M0
I	T1a	N0	M0
II	T1b	N0	M0
	T2	N0, N1	M0
	T3	N0	M0
IIIA	T1, T2, T3	N1	M0
IIIB	T1, T2, T3	N2	M0
IV	T4	Any N	M0
	Any T	N3	M0
	Any T	Any N	M1

Prostate C61			
Stage	**T**	**N**	**M**
I	T1, T2a	N0	M0
II	T2b, T2c	N0	M0
III	T3	N0	M0
IV	T4	N0	M0
	Any T	N1	M0
	Any T	Any N	M1

Testis C62				
Stage	**T**	**N**	**M**	**Serum tumour markers**
0	pTis	N0	M0	S0, SX
I	pT1-T4	N0	M0	SX
IA	pT1	N0	M0	S0
IB	pT2-T4	N0	M0	S0
IS	Any pT/Tx	N0	M0	S1-S3
II	Any pT/Tx	N1-N3	M0	SX
IIA	Any pT/Tx	N1	M0	S0
	Any pT/Tx	N1	M0	S1
IIB	Any pT/Tx	N2	M0	S0
	Any pT/Tx	N2	M0	S1
IIC	Any pT/Tx	N3	M0	S0
	Any pT/Tx	N3	M0	S1
III	Any pT/Tx	Any N	M1a	SX
IIIA	Any pT/Tx	Any N	M1a	S0
	Any pT/Tx	Any N	M1a	S1
IIIB	Any pT/Tx	N1-N3	M0	S2
	Any pT/Tx	Any N	M1a	S2
IIIC	Any pT/Tx	N1-N3	M0	S3
	Any pT/Tx	Any N	M1a	S3
	Any pT/Tx	Any N	M1b	Any S

Kidney C64			
Stage	**T**	**N**	**M**
I	T1	N0	M0
II	T2	N0	M0
III	T3	Any N	M0
	T1, T2, T3	N1	M0
IV	T4	Any N	M0
	Any T	N2	M0
	Any T	Any N	M1

Renal Pelvis and Ureter C65, C66			
Stage	**T**	**N**	**M**
0a	Ta	N0	M0
0is	Tis	N0	M0
I	T1	N0	M0
II	T2	N0	M0
III	T3	N0	M0
IV	T4	N0	M0
	Any T	N1, N2, N3	M0
	Any T	Any N	M1

Urinary Bladder C67			
Stage	**T**	**N**	**M**
0a	Ta	N0	M0
0is	Tis	N0	M0
I	T1	N0	M0
II	T2a, T2b	N0	M0
III	T3a, T3b	N0	M0
	T4a	N0	M0
IV	T4b	N0	M0
	Any T	N1, N2, N3	M0
	Any T	Any N	M1

Urethra C680 and C619 (transitional cell carcinomas)			
Stage	**T**	**N**	**M**
0a	Ta	N0	M0
0is	Tis	N0	M0
	Tispu	N0	M0
	Tispd	N0	M0
I	T1	N0	M0
II	T2	N0	M0
III	T1, T2	N1	M0
	T3	N0, N1	M0
IV	T4	N0, N1	M0
	Any T	N2	M0
	Any T	Any N	M1

Adrenal Cortex Tumours C740			
Stage	**T**	**N**	**M**
I	T1	N0	M0
II	T2	N0	M0
III	T1, T2	N1	M0
	T3	N0	M0
IV	T3	N1	M0
	T4	Any N	M0
	Any T	Any N	M1

European Commission
EUR 27008 EN – Joint Research Centre – Institute for Health and Consumer Protection

Title: A proposal on cancer data quality checks: one common procedure for European cancer registries

Author(s): Carmen Martos, Emanuele Crocetti (Coordinator), Otto Visser, Brian Rous and the Cancer Data Quality Checks Working Group

Luxembourg: Publications Office of the European Union

2014 – 94 pp. – 21.0 x 29.7 cm

EUR – Scientific and Technical Research series – ISSN 1831-9424 (online) – ISSN 1018-5593 (print)

ISBN 978-92-79-44675-7 (pdf)
ISBN 978-92-79-44676-4 (print)

doi:10.2788/182378

Abstract

The aim of population-based cancer registries (CRs) is to obtain information from all new cases in a well-defined geographic area to assess the magnitude of the cancer burden and its evolution. The reliability and utility of the information provided by CRs depends on the quality of the collected data.

A variety of methods and tools have been used to check the data validity of CRs. Therefore the European Network of Cancer Registries (ENCR) in cooperation with the Joint Research Centre (JRC) has been working to establish a comprehensive and standardised list of cancer quality checks to be adopted by European CRs and in the European projects that would overcome the current fragmented and sometimes conflicting situation regarding validation of data collected for different purposes. Outcome of this project is an ENCR-endorsed recommendation document, titled *A proposal on Cancer Data Quality Checks: one common procedure for European Cancer Registries*, reporting final agreements on case definition, variables and their format and data quality control list.

LB-NA-27008-EN-N

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doi:10.2788/182378
ISBN 978-92-79-44675-7