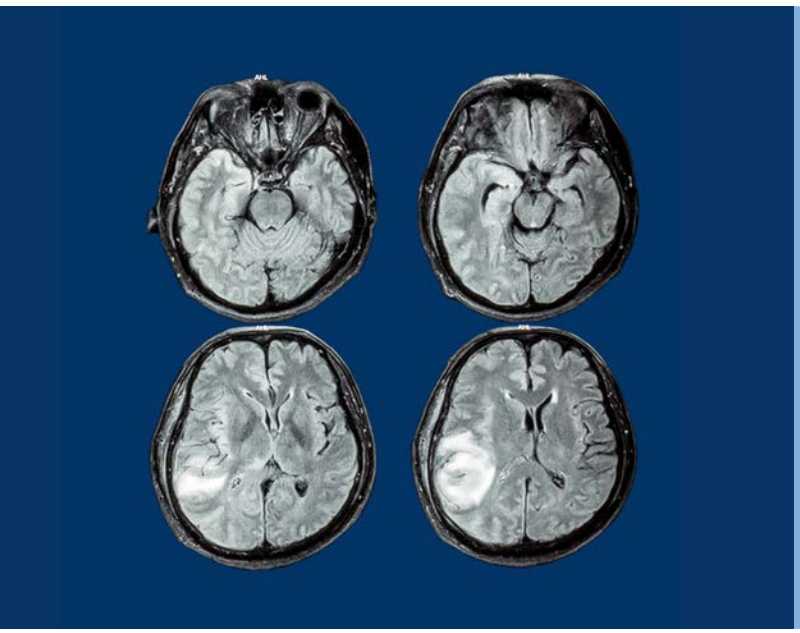
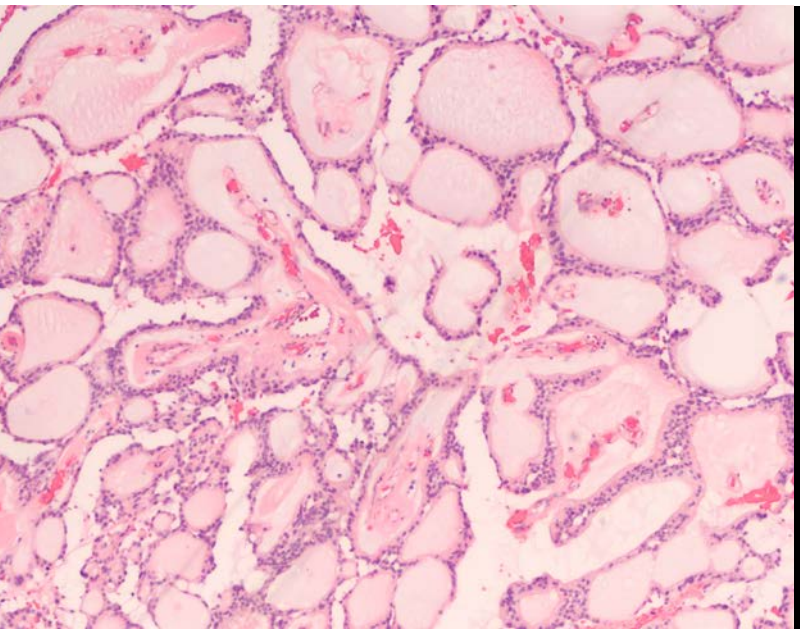
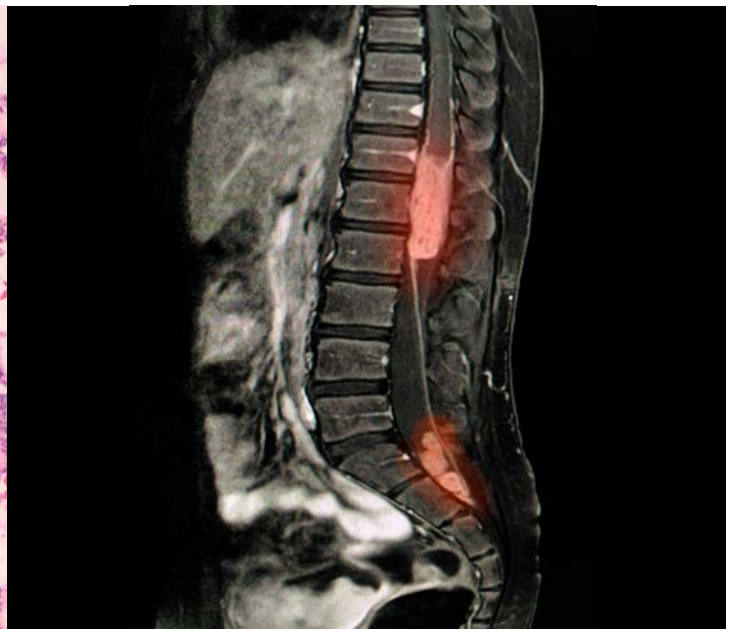


Belgian Cancer Registry





Primary Brain and other Central Nervous System Tumours in Adults

in Belgium 2004-2020

BELGIAN CANCER REGISTRY

Staff at the Belgian Cancer Registry:
Filip Ameye, Andréa Amon, Caroline Androgé, Lien Asselman, Alexandre Audibert, Leen Boesmans, Joanna Bouchat, Annelies Debucquoy, Cindy De Gendt, Anke De Geyndt, Kris Dekoninck, Robin Delvaux, Petra Denolf, Jonathan De Ro, Harlinde De Schutter, Elien De Thaye, Mieke De Wilde, Jeroen Eeckhaut, Katia Emmerechts, Julie Francart, Francesco Giusti, Annelies Goossens, Annemie Haelens, Kris Henau, Sharon Janssens, Méric Klein, Armien Lanssens, Arthur Leloup, Andrea Leurs, Alice Mertens, Elly Mertens, Roselien Pas, Hanna Peacock, Hanne Peirelinck, Anne-Dominique Petit, Lauriane Rouard, Geert Silversmit, Tim Tambuyzer, Linda Thibaut, Inge Truyen, Nancy Van Damme, Kim Vande Loock, Eva Van der Stock, Liesbet Van Eycken, Bart Van Gool, Clarissa Van Hecke, Koen Van Herck, Sarah Van Praet, Katrijn Vanschoenbeek, Lien van Walle, Julie Verbeeck, Freija Verdoodt, Grindl Wilmots, Jérôme Xicluna

D/2023/11.846/2

Responsible editor: Dr. Liesbet Van Eycken, Koningsstraat 215, 1210 Brussels

Editorial team:
Tim Tambuyzer, Joanna Bouchat, Kris Dekoninck, Katrijn Vanschoenbeek, Hanna Peacock, Kim Vande Loock, Geert Silversmit, Kris Henau, Anne-Dominique Petit, Liesbet Van Eycken

Design cover: www.magelaan.be
Interior publication design adapted from[7]. Original design: www.magelaan.be

Recommended reference:
Primary brain and other central nervous system tumours in adults in Belgium 2004-2020, Belgian Cancer Registry, Brussels, 2023

Additional Information can be requested at:
Tel. 0032-2-250 10 10
E-mail: info@kankerregister.org – info@registreducancer.org

The Belgian Cancer Registry receives financial support for its regular and recurrent tasks from:

INAMI-RIZIV

Santé publique
Sécurité de la Chaîne alimentaire
Environnement
Volksgezondheid
Veiligheid van de Voedselketen
Leefmilieu

Vlaanderen
is zorgzaam en gezond samenleven

Wallonie
familles santé handicap
AVIQ

COMMISSION COMMUNAUTAIRE COMMUNE
GEMEENSCHAPPELIJKE GEMEENSCHAPSCOMMISSIE

Francophones Bruxelles

Ostbelgien
Mit Unterstützung der Deutschsprachigen Gemeinschaft Belgiens

This publication was realised with the specific financial support of:

Stichting tegen Kanker
Fondation contre le Cancer

Acknowledgements:
On behalf of the full BCR team, we are grateful for the enthusiastic support and the comprehensive revision of this publication to: Prof. dr. Frank Weyns, Prof. dr. Paul Clement, Prof. dr. Tom Boterberg, Prof. dr. Steven De Vleeschouwer, Dr. Francesca Dedeurwaerdere, Prof. dr. Rafael Sciot, Prof. dr. Nicolas Massager, Dr . Nicolas Whenham, Dr. Dario Di Perri
We wish to express special appreciation to Dr. Dimitri Vanhauwaert for the close collaboration and expert advice throughout the process of making this publication.

CONTENTS

LIST OF ACRONYMS

AAPC	Average Annual Percentage Change
APC	Annual Percentage Change
BCR	Belgian Cancer Registry
CBSS	Crossroads Bank for Social Security
CI	Confidence interval
CNS	Central nervous system
CR	Crude incidence rate
DLBCL	Diffuse large B-cell lymphoma
ICD-O	International Classification of Diseases for Oncology
INSZ-NISS	National social security number
ENCR	European Network of Cancer Registries
M/F-ratio	Male/Female ratio
MOC	Multidisciplinary oncological consultation
MRI	Magnetic resonance imaging
NOS	Not otherwise specified
WHO	World Health Organization
WSR	World Standardised incidence rate

INTRODUCTION

1 INTRODUCTION

The main objective of this publication is to describe the epidemiology of tumours developing in the brain and in other central nervous system (CNS) structures in Belgium between 2004 and 2020 in adults aged 20 and over. Other CNS structures encompass the meninges, the spinal cord, cranial nerves, craniopharyngeal duct, and pituitary and pineal glands. These tumours are very heterogeneous in terms of clinical course and prognosis.

All benign, borderline and malignant tumours of the brain and other CNS structures have to be notified to the Belgian Cancer Registry (BCR) since 2004. This report provides an overview of incidence, prevalence, survival and trends over time in Belgium for these tumours, by primary location.

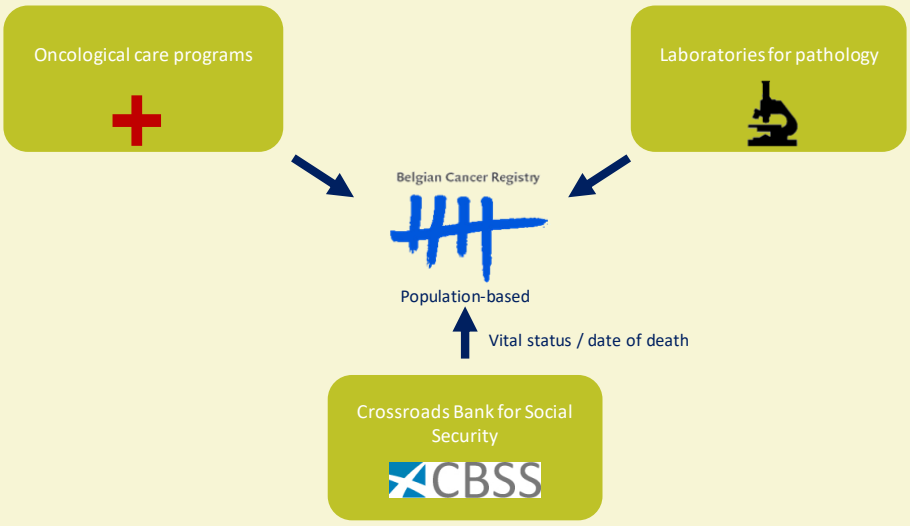
1.1 NOTIFICATION AND SUBMISSION TO THE CANCER REGISTRY

New legislation initiatives in 2003 and the foundation of the Belgian Cancer Registry in 2005, forced a breakthrough in the Belgian cancer registration. Especially the Royal Decree on the oncological care programs in 2003 with the reimbursement of the multidisciplinary oncological consultation (MOC) and the creation of the specific law on the Cancer Registry in 2006 provided a firm legal basis for cancer registration in Belgium[1-2]. This legislation makes cancer registration compulsory for the oncological care programs and for the laboratories for pathology and clinical biology / haematology.

The general data flow (**Figure 1**) relies on information (notifications) received from the oncological care programs ('clinical network') and the laboratories for pathology ('pathology network').
Moreover, the law authorises the use of the national social security number (INSZ-NISS) as unique identifier of the patient as well as linkage with other medical and/or administrative databases. Through linkage with the Crossroads Bank for Social Security (CBSS), this unique number also enables the Cancer Registry to perform active follow-up of the vital status and date of death of the cancer patients.

A detailed description of the cancer data registration and collection related to the care programs and the pathology laboratories has been reported in several previous publications[3-12].

Figure 1 Dataflow at the Belgian Cancer Registry used in this publication



1.2 PRIVACY & PROTECTION OF PERSONAL DATA

The core business of the Belgian Cancer Registry includes the collection and processing of sensitive personal data in order to fulfil its legal obligations as stated in the Coordinated Act of 10 May 2015 on the exercise of health care professions. Consequently, BCR attaches great importance to privacy and data protection and has taken strict measures to comply with the General Data Protection Regulation EU 2016/679. For more information, please read the Privacy Statement available on our website (http://kankerregister.org/).

METHODS AND DATA QUALITY

2 METHODS AND DATA QUALITY

2.1 CLASSIFICATION & REPORTING OF PRIMARY BRAIN AND OTHER CNS TUMOURS

Primary brain and other central nervous system tumours display a huge diversity of tumours depending on the cell or tissue of origin and aggressivity of the tumour. Chapters of this publication are presented based on the primary location of tumours using the International Classification of Diseases for Oncology, 3rd edition (ICD-O-3) topography codes[13]:

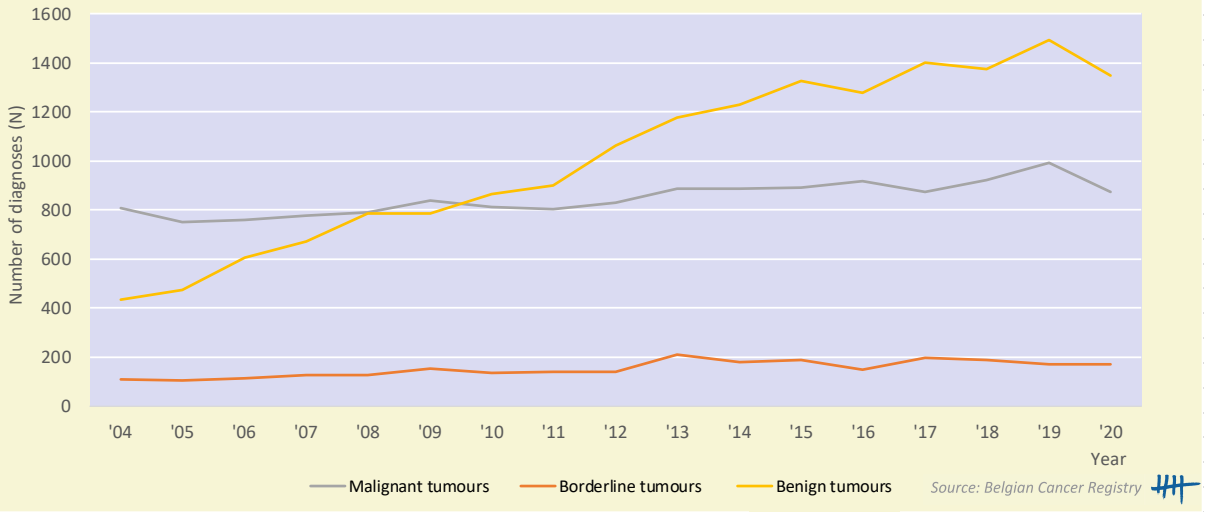
- Tumours of the meninges (ICD-O-3 code C70)
- Tumours of the brain (ICD-O-3 code C71)
- Tumours of the spinal cord, cranial nerves and other parts of the central nervous system (ICD-O-3 code C72)
- Tumours of the pituitary gland (ICD-O-3 code C75.1), craniopharyngeal duct (ICD-O-3 code C75.2) and the pineal gland (ICD-O-3 code C75.3)

Throughout each chapter, results are presented based on sex and age group of patients and behaviour of the tumour (benign, borderline and malignant). This ICD-O-3 behavioural classification may not completely reflect the classical clinical classification of CNS tumours which is based on WHO grade of CNS tumours (I-IV). Nevertheless, this present report describes data based on the behaviour of tumours to keep consistency with international reports. Moreover, this WHO grade was not systematically recorded in the past and is not applicable to all CNS tumours (e.g. haematolymphoid tumours involving the CNS).

Due to the different characteristics of childhood tumours of the CNS, only data for adults aged 20 and over are included in this publication. A specific classification (International Classification of Childhood Cancer, Third Edition) is often used to report on epidemiological data of childhood cancer[14]. Detailed data about childhood cancer (0-19 years) including CNS tumours were described in our publication 'Cancer in children and adolescents in Belgium 2004-2020'[15].

Registration of all benign, borderline and malignant tumours of the CNS is mandatory in Belgium since 2004 (except cysts, haemangiomas and hamartomas). Especially for benign tumours, we observed an increasing incidence between 2004 and 2019 (**Figure 1**). The increase could be linked to the introduction in 2009 of financing of data managers for hospitals based of the number of Multidisciplinary Oncological Consultations (MOC)[16], frequent communications between Cancer Registry and hospitals to improve exhaustivity and awareness among physicians to discuss and register benign tumours during MOC. Since the increasing incidence of benign tumours observed in 2004-2009 could be biased by the improvement of registration completeness, we decided to present data on benign tumours for the incidence period 2010-2020 while period 2004-2020 was used for borderline and malignant tumours. For malignant and benign tumours, a drop in new diagnosis was observed in 2020 due to the COVID-19 pandemic. This decrease was not observed for borderline tumours (**Figure 1**).

Figure 1 **Primary brain and other CNS tumours in adults: Incidence trends, by behaviour, Belgium 2004-2020**



The World Health Organization (WHO) classification of Tumours of the Central Nervous System has evolved over time and in 2021 the fifth and most recent edition was published[17]. As this report describes the epidemiological situation in Belgium from 2004 to 2020 (2010-2020 for benign tumours), the data in this report are presented according to the WHO editions in use at the time of diagnosis, i.e. the 3rd, 4th and revised 4th(18-20). Biomarkers (e.g. IDH), although crucial for diagnosis and prognosis, were not yet described in detail in the WHO editions used in this report and hence not available for this publication.

Table 1 describes the classification of all tumour types included in this publication as well as the time period during which these codes are applicable. The WHO grade, reflecting the aggressivity of the CNS tumour, is presented when available and applicable.

In **Appendix I**, we provide the classification for registration of tumours of the CNS from incidence year 2022. This classification is based on changes introduced by the 5th edition of the WHO classification and integrations in the last version of the ICD-O-3 classification[13, 17].

Table 1 Classification of primary brain and other CNS tumours in adults (inclusion criteria used in this publication)[1]

Tumours classified by histological type	Classification ICD-O-3	WHO Grade	Period during which the code was applied
Gliomas			
Diffuse gliomas			
Astrocytoma			
Diffuse astrocytoma (IDH-mutant or IDH-wildtype or not otherwise specified (NOS))	9400/3	II	2002 and later
Gemistocytic astrocytoma, IDH-mutant	9411/3	II	2002 and later
Protoplasmic astrocytoma	9410/3	II	2002 and later
Fibrillary astrocytoma	9420/3	II	2002 and later
Anaplastic astrocytoma			
Anaplastic astrocytoma (IDH-mutant or IDH-wildtype or NOS)	9401/3	III	2002 and later
Oligodendroglioma			
Oligodendroglioma (IDH-mutant and 1p/19q-codeleted, NOS)	9450/3	II	2002 and later
Anaplastic oligodendroglioma			
Anaplastic oligodendroglioma (IDH-mutant and 1p/19q-mutant, NOS)	9451/3	III	2002 and later
Glioblastoma			
Glioblastoma, IDH-wildtype or epithelioid or NOS	9440/3	IV	2002 and later
Giant cell glioblastoma	9441/3	IV	2002 and later
Gliosarcoma	9442/3	IV	2002 and later
Glioblastoma, IDH-mutant	9445/3	IV	2020 and later
Paediatric-type diffuse low-grade glioma			
Angiocentric glioma	9431/1	I	2012 and later
Paediatric-type diffuse high-grade glioma			
Diffuse midline glioma, H3 K27M-mutant	9385/3	IV	2020 and later
Other types of diffuse glioma			
Oligoastrocytoma (anaplastic or NOS)	9382/3	II or III	2002 and later
Gliomatosis cerebri	9381/3	II-IV	2002 and later
Circumscribed astrocytic gliomas			
Pilocytic astrocytoma	9421/1	I	2002 and later
Optic nerve glioma without pathological confirmation (diagnostic procedure 5,6)	9380/1 or 8000/1	I	2002 and later
Pilomyxoid astrocytoma	9425/3	I	2012 and later
Subependymal giant cell astrocytoma (SEGCA)	9384/1	I	2002 and later
(Anaplastic) pleomorphic xanthoastrocytoma	9424/3	II	2002 and later
Chordoid glioma of the third ventricle	9444/1	II	2002 and later
Astroblastoma	9430/3	I-IV	2002 and later
Gliofibroma	9442/1	I	2002 and later
Other gliomas			
Malignant glioma, NOS	9380/3	II-IV	2002 and later
Ependymal tumours			
Ependymoma, clear cell or tanycitic or RELA fusion-positive or NOS	9391/3; 9396/3	II	9391/3: 2002 and later; 9396/3: 2020 and later
Papillary ependymoma	9393/3	II	2002 and later
Anaplastic ependymoma/ependymoblastoma	9392/3	III	2002 and later
Subependymoma	9383/1	I	2002 and later
Myxopapillary ependymoma	9394/1	I	2002 and later
Glioneuronal and neuronal tumours			
Dysembryoplastic neuroepithelial tumour (DNET)	9413/0	I	2002 and later
Gangliocytoma	9492/0	I	2002 and later
Ganglioglioma	9505/1	I	2002 and later
Anaplastic ganglioglioma	9505/3	III	2002 and later
Dysplastic gangliocytoma of cerebellum (Lhermitte-Duclos disease)	9493/0	I	2002 and later
Desmoplastic infantile astrocytoma/gangliocytoma	9412/1	I	2002 and later
Papillary glioneuronal tumour / Rosette-forming glioneuronal tumour	9509/1	I	2012 and later
Neurocytoma	9506/1	II	2002 and later
Choroid plexus tumours			
Choroid plexus papilloma	9390/0	I	2002 and later
Atypical choroid plexus papilloma	9390/1	II	2002 and later
Choroid plexus carcinoma	9390/3	III	2002 and later
Embryonal tumours			
Medulloblastomas			
Medulloblastomas, molecularly defined			
Medulloblastoma, WNT-activated	9475/3	IV	2020 and later
Medulloblastoma, SHH-activated and TP53-mutant	9476/3	IV	2020 and later
Medulloblastoma, SHH-activated and TP53-wildtype or desmoplastic/nodular or with extensive nodularity	9471/3	IV	2002 and later
Medulloblastoma, non-WNT/non-SHH or group 3/group 4	9477/3	IV	2020 and later
Medulloblastomas, histologically defined			
Medulloblastoma, large cell or anaplastic	9474/3	IV	2002 and later
Medulloblastoma, classic or NOS	9470/3	IV	2002 and later
Other CNS embryonal tumours			
Medulloepithelioma	9501/3	IV	2002 and later
CNS neuroblastoma	9500/3	IV	2002 and later
CNS ganglioneuroblastoma	9490/3	IV	2002 and later
Embryonal tumour with multilayered rosettes, C19MC-altered, NOS	9478/3	IV	2020 and later
CNS embryonal tumour, NOS (former central primitive neuroectodermal tumour (cPNET))	9473/3	IV	2002 and later
Medullomyoblastoma	9472/3	IV	2002 and later
Atypical teratoid/rhabdoid tumour (ATRT)	9508/3	IV	2002 and later

Tumours classified by histological type	Classification ICD-O-3	WHO Grade	Period during which the code was applied
Cranial and paraspinal nerve tumours			
Schwannomas, neurofibromas, perineuriomas & related			
Schwannoma (cellular or plexiform or melanotic) : ex neurilemmoma, malignant	9560/0; 9560/1; 9560/3	I	2002 and later
Neurofibroma, NOS	9540/0	I	2002 and later
Neurofibroma, plexiform	9550/0	I	2002 and later
Perineurioma, NOS	9571/0	I	2002 and later
Malignant perineurioma	9571/3	II or III	2002 and later
Neuroma	9570/0	I	2002 and later
Peripheral nerve sheath tumours			
Hybrid nerve sheath tumour	9563/0	I	2020 and later
Malignant peripheral nerve sheath tumours (MPNST) with mesenchymal or glandular or perineural differentiation or melanotic or epitheliod or NOS	9540/3	II-IV	2002 and later
MPNST with rhabdomyoblastic differentiation	9561/3	II-IV	2002 and later
Cauda equina neuroendocrine tumours			
Cauda equina neuroendocrine tumour (previously paraganglioma)	8680/1; 8693/3; 8680/3	I	8680/1, 8680/3: 2002-2019; 8693/3: 2002 and later
Parasympatic paraganglioma	8682/1; 8682/3	I	8682/1: 2002-2019; 8682/3: 2020 and later
Gangliocytic paraganglioma	8683/0	I	2002 and later
Meningiomas			
Meningioma, microcystic or secretory or lymphoplasmacyte-rich or metaplastic or NOS	9530/0	I	2002 and later
Meningothelial or syncytial meningioma	9531/0	I	2002 and later
Fibrous or fibroblastic meningioma	9532/0	I	2002 and later
Transitional meningioma	9537/0	I	2002 and later
Psammomatous meningioma	9533/0	I	2002 and later
Angiomatous meningioma	9534/0	I	2002 and later
Hemangioblastic meningioma	9535/0	I	2002 and later
Chordoid or clear cell meningioma	9538/1	II	2002 and later
Atypical meningioma	9539/1	II	2002 and later
Papillary or rhabdoid meningioma	9538/3	III	2002 and later
Anaplastic (malignant) meningioma	9530/3	III	2002 and later
Meningeomatose	9530/1		2002 and later
Meningeale sarcomatosis	9539/3		2002 and later
Mesenchymal, non-meningothelial tumours involving the CNS			
Soft tissue tumour, benign	8800/0		2002 and later
Sarcoma, NOS	8800/3		2002 and later
Pleomorphic hyalinizing angiectatic tumour	8802/1		2020 and later
Undifferentiated sarcoma	8805/3		2002 and later
Desmoplastic small round cells tumour	8806/3		2002 and later
Fibrous histiocytoma, malignant	8830/3		2002 and later
Solitary fibrous tumour, grade 1 (benign)	8815/0		2002 and later
Haemangiopericytoma NOS / Solitary fibrous tumour, grade 2 (borderline)	9150/1; 8815/1		9150/1: 2002-2019; 8815/1: 2020 and later
Malignant/anaplastic haemangiopericytoma /solitary fibrous tumour, malignant or grade 3	9150/3; 8815/3		9150/3: 2002-2019; 8815/3: 2020 and later
Haemangioblastoma	9161/1		2002 and later
Epithelioid haemangioendothelioma	9133/1; 9133/3		9133/1: 2002-2019; 9133/3: 2020 and later
Angiosarcoma	9120/3		2002 and later
Kaposi sarcoma	9140/3		2002 and later
Ewing sarcoma (peripheral primitive neuroectodermal tumour)	9260/3; 9364/3		9260/3: 2002-2019; 9364/3: 2002 and later
Lipoma	8850/0		2002 and later
Angiolipoma	8861/0		2002 and later
Hibernoma	8880/0		2002 and later
Liposarcoma	8850/3		2002 and later
Desmoid-type fibromatosis	8821/1		2002 and later
Myofibroblastoma	8825/0		2002 and later
Inflammatory myofibroblastic tumour	8825/1		2002 and later
Benign fibrous histiocytoma	8830/0		2002 and later
Fibrosarcoma	8810/3		2002 and later
Undifferentiated pleomorphic sarcoma	8802/3		2002 and later
Leiomyoma	8890/0		2002 and later
Leiomyosarcoma	8890/3		2002 and later
Rhabdomyoma	8900/0		2002 and later
Rhabdomyosarcoma	8900/3		2002 and later
Embryonal rhabdomyosarcoma, NOS	8910/3		2002 and later
Chondroma	9220/0		2002 and later
Chondrosarcoma	9220/3		2002 and later
Osteoma	9180/0		2002 and later
Osteochondroma	9210/0		2002 and later
Osteosarcoma	9180/3		2002 and later
Melanocytic tumours			
Meningeal melanocytosis	8728/0		2002 and later
Meningeal melanocytoma	8728/1		2002 and later
Meningeal melanoma	8720/3		2002 and later
Meningeal melanomatosis	8728/3		2002 and later

Tumours classified by histological type	Classification ICD-O-3	WHO Grade	Period during which the code was applied
Haematolymphoid tumours involving the CNS			
Acute myeloid leukemia, NOS	9861/3		2002 and later
CNS lymphomas			
Hodgkin lymphoma, NOS	9650/3		2002 and later
Hodgkin lymphoma, nodular sclerosis	9663/3		2002 and later
Composite Hodgkin and non-Hodgkin lymphoma	9596/3		2002 and later
Monoclonal B-cell lymphocytosis, NOS	9591/1		2020 and later
Small lymphocytic lymphoma	9670/3; 9823/3		9670/3: 2002 - 2019; 9823/3: 2002 and later
Lymphoplasmacytic lymphoma	9671/3		2002 and later
Plasmacytoma	9731/3; 9734/3		2002 and later
Mucosa-associated lymphoid tissue (MALT) lymphoma of the dura	9699/3		2002 and later
Mantle cell lymphoma	9673/3		2002 and later
Follicular lymphoma, NOS	9690/3		2002 and later
Follicular lymphoma, grade 2	9691/3		2002 and later
Follicular lymphoma, grade 3	9698/3		2002 and later
Diffuse large B-cell lymphoma (DLBCL) of the CNS	9680/3		2002 and later
Malignant lymphoma, large B-cell or diffuse or immunoblastic or NOS	9684/3		2002 and later
T-cell/histiocyte rich large B-cell lymphoma	9688/3		2012 and later
Lymphomatoid granulomatosis, grade 1 to 3 or NOS	9766/1; 9766/3		9766/1: 2002 and later; 9766/3: 2020 and later
Plasmablastic lymphoma	9735/3		2012 and later
Intravascular large B-cell lymphoma	9712/3		2012 and later
Burkitt lymphoma, NOS	9687/3		2002 and later
Anaplastic large cell lymphoma, ALK-positive or ALK-negative or NOS	9714/3; 9715/3		9714/3: 2002 and later; 9715/3: 2020 and later
B lymphoblastic leukemia/lymphoma, NOS	9811/3; 9728/3; 9836/3		9728/3, 9836/3: 2002-2019; 9811/3: 2012 and later
B lymphoblastic leukemia/lymphoma with t(9;22)(q34:11.2); BCR-ABL1	9812/3		2012 and later
Precursor T-cell lymphoblastic leukemia	9729/3; 9837/3		9729/3: 2002-2019; 9837/3: 2002 and later
Mature T-cell lymphoma, NOS	9702/3		2012 and later
Myeloid sarcoma	9930/3		2002 and later
Lymphoproliferative disorder, NOS	9970/1		2002 and later
Post-transplant lymphoproliferative disorder, NOS	9971/1		2012 and later
Immunoglobuline deposition disease	9769/1		2002 and later
Malignant non-Hodgkin lymphoma, NOS	9591/3		2002 and later
Malignant lymphoma, NOS	9590/3		2002 and later
Histiocytic tumours			
Langerhans cell histiocytosis/granulomatosis; unifocal or monostotic	9752/1; 9751/3		9752/1: 2002-2011; 9751/3: 2012-2019
Langerhans cell histiocytosis, multifocal or polyostotic	9753/1; 9751/3		9753/1: 2002-2011; 9751/3: 2012-2019
Langerhans cell histiocytosis, disseminated (multifocal)	9751/3; 9754/3		9754/3: 2002-2011; 9751/3: 2012 and later
Langerhans cell histiocytosis, NOS	9751/1; 9751/3		9751/1: 2002-2011; 9751/3: 2012-2019
Histiocytic sarcoma	9755/3		2002 and later
Malignant histiocytosis, NOS (Erdheim-Chester disease)	9750/3; 9749/3		9750/3: 2002 and later; 9749/3: 2020 and later
Germ cell tumours			
Germinoma	9064/3		2002 and later
Embryonal carcinoma	9070/3		2002 and later
Yolk sac tumour	9071/3		2002 and later
Choriocarcinoma	9100/3		2002 and later
Teratoma, NOS	9080/1		2002 and later
Mature teratoma	9080/0		2002 and later
Immature teratoma	9080/3		2002 and later
Teratoma with malignant transformation	9084/3		2002 and later
Mixed germ cell tumour	9085/3		2002 and later
Pineal tumours			
Pineocytoma	9361/1	I	2002 and later
Pineal parenchymal tumour of intermediate differentiation / Pineoblastoma (DICER1 syndrome)	9362/3	II-III / IV	2002 and later
Papillary tumour of the pineal region	9395/3	II or III	2012 and later
Tumours of the sellar region			
Tumours of the neurohypophysis			
Granular cell tumour, NOS	9580/0		2002 and later
Granular cell tumour of the sellar region	9582/0	I	2002 and later
Pituicytoma	9432/1	I	2012 and later
Spindle cell oncocytoma	8290/0	I	2002 and later
Ganglioneuroma	9490/0		2002 and later
Tumours of adenohypophysis			
Adenoma, NOS	8140/0	I	2002 and later
Papillary adenoma, NOS	8260/0	I	2002 and later
Chromophobe adenoma	8270/0	I	2002 and later
Lactotroph adenoma	8271/0	I	2002 and later
Pituitary adenoma, somatotroph or thyrotroph or corticotroph or gonadotroph or null cell or plurihormonal or double adenomas or NOS	8272/0	I	2002 and later
Acidophil adenoma	8280/0	I	2002 and later
Mixed acidophil-basophil adenoma	8281/0	I	2002 and later
Basophil adenoma	8300/0	I	2002 and later
Atypical adenoma	8140/1		2002 and later
Pituitary carcinoma/Pituitary neuroendocrine tumour (PitNET)	8272/3		2002 and later
Adrenocorticotropic (ACTH)-producing tumour	8158/3		2002 and later
Other tumours of the hypophysis			
Fibroma, NOS	8810/0		2002 and later
Glomus tumour, NOS	8711/0		2002 and later
Tumour cells, benign	8001/0		2002 and later
Squamous cell carcinoma, NOS	8070/3		2002 and later
Adenocarcinoma, NOS	8140/3		2002 and later
Spindle cell sarcoma	8801/3		2002 and later
Dysgerminoma	9060/3		2002 and later
Germ cell tumour, nonseminomatous	9065/3		2002 and later
Craniopharyngiomas (also called Rathke pouch tumours)			
Craniopharyngioma, NOS	9350/1	I	2002 and later
Adamatinomatous craniopharyngioma	9351/1	I	2002 and later
Papillary craniopharyngioma	9352/1	I	2002 and later
Unspecified tumours			
Benign tumour*	8000/0		2002 and later
Unclassified tumour, borderline malignancy*	8000/1		2002 and later
Neoplasm, malignant*	8000/3		2002 and later

Source: Belgian Cancer Registry

**distinguish between cases with technical diagnostic basis and other microscopic diagnostic basis*

[1] *Recently the classification of Tumours of the Central Nervous System has been updated. The correct inclusion criteria to be applied starting from incidence year 2022 are presented in the Appendices.*

2.2 Quality of incidence data

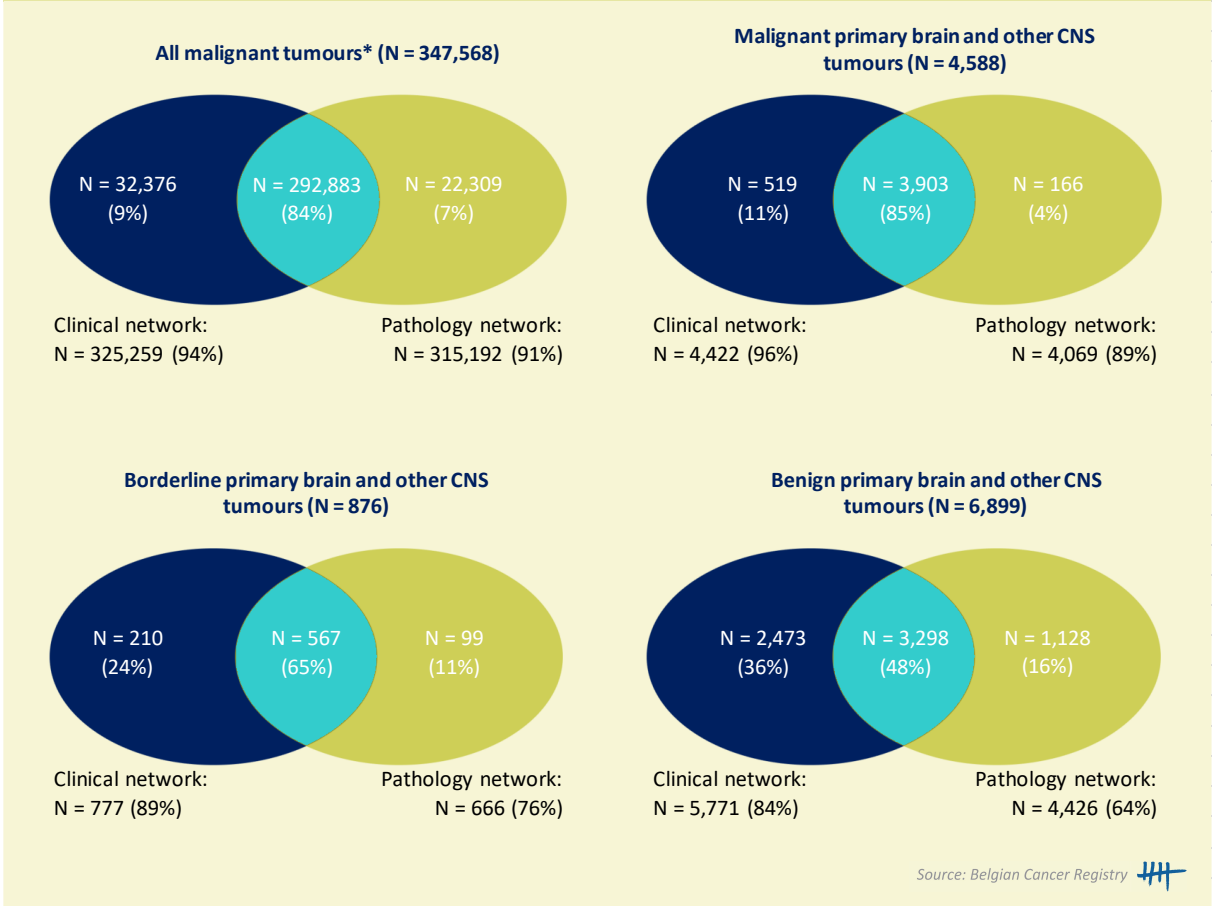
2.2.1 Completeness of the Cancer Registry

Data collection from multiple sources

Registrations received from independent data sources ensure a more exhaustive and reliable cancer database.

In 2016-2020, the BCR recorded 347,568 new cancer diagnoses (excl. non-melanoma skin cancer) for Belgian residents aged 20 and over. Of all these cancers, 93% was registered by the clinical network and 91% via the pathology network. The resulting overlap between both networks is 84%. In that same period, there were 12,363 new diagnoses of tumours of the brain and other CNS structures (all tumours regardless of behaviour). The overlap of registration by both clinical and pathology networks for benign tumours is 48%. This overlap significantly improves for borderline and malignant tumours to 65% and 85%, respectively (**Figure 2**).

Figure 2 Combination of notifications by source type and behaviour of primary brain and other CNS tumours in adults in Belgium

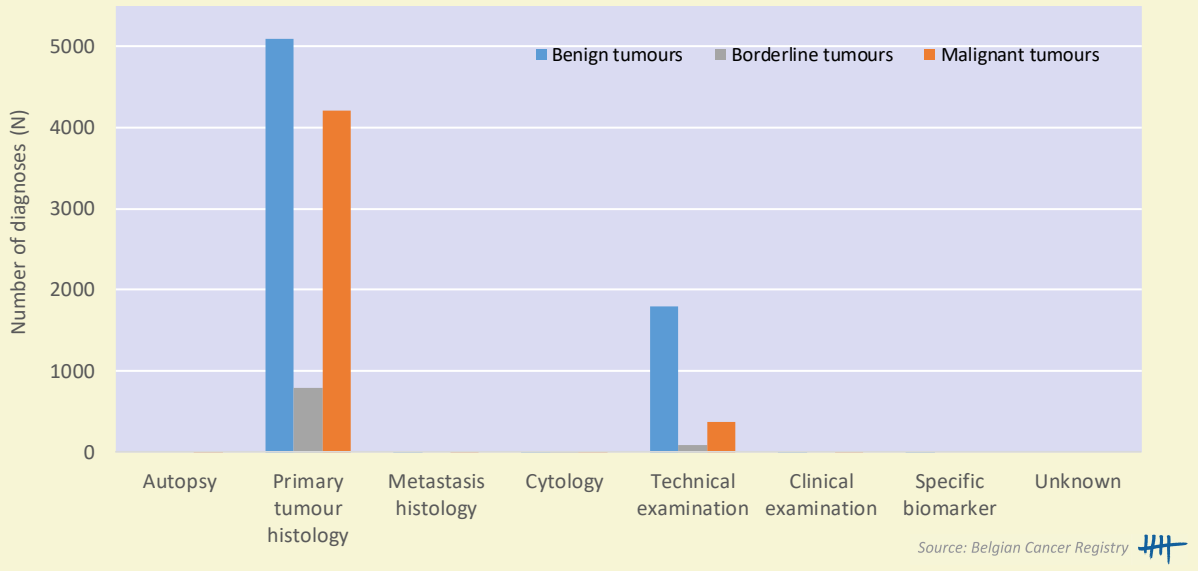


** All cancers excl. non-melanoma skin cancer*

Due to the specific clinical presentation and location of tumours of the CNS, not every radiological diagnosis can be histologically confirmed. The proportion of diagnosis with microscopic (or histologic) confirmation is 92% for malignant tumours, 90% for borderline tumours and 74% for benign tumours. Even in the absence of histological confirmation, radiological diagnosis of some types of tumours is possible thanks to the evolution of imaging techniques, like multiparametric magnetic resonance imaging (MRI). Moreover, treatment for some benign tumours (sometimes even discovered incidentally) does not require surgery in the absence of growth and follows a wait-and-scan policy. These tumours can also be treated with radiotherapy only. All these reasons could explain the high number of diagnoses based on technical (imaging) examination only as represented in **Figure 3**.

Diagnosis made on histology of a metastasis is very rare and concerns only a very few cases (e.g. anaplastic meningioma or adrenocorticotropic (ACTH)-producing tumour of the hypophysis). These diagnosis are not concerning tumours with brain metastasis but a primary brain or other CNS structures malignant tumour with metastasis.

Figure 3 **Primary brain and other CNS tumours in adults: Distribution of diagnostic procedure, by behaviour of the tumour, Belgium 2016-2020**



New registration recommendations published by the European Network of Cancer Registries (ENCR) on 20 October 2022 allow more entities (e.g. schwannomas) to be specifically registered (meaning with specific ICD-O-3 morphology code) without histological confirmation from January 2023 onwards[21]. The previous version of these recommendations (1999) only permitted the use of specific morphology codes in the absence of histological confirmation for pituitary tumours, craniopharyngiomas, meningiomas, subependymal giant cell astrocytomas and gliomas, not otherwise specified[22].

A new diagnostic procedure (based on cytogenetic and/or molecular testing) was also introduced by the ENCR recommendations of 2022[21]. This must be used from January 2023 when presence or absence of a molecular alteration is tested on a histological sample to establish a precise diagnose. We can expect that a large number of CNS tumours will be notified with this diagnostic procedure in the future. Several biomarkers are often analysed for several tumours (especially gliomas) for their importance for precise diagnosis, treatment and patient prognosis.

2.2.2 Validity

Quality checks

The cancer registry validates the data quality on a regular basis[9, 23]. In the context of this publication, the BCR performed additional quality checks on 1500 registrations. Multiple tumours, rare malignancies, unlikely or unusual combinations of topography/morphology were verified during an additional data cleaning effort. Moreover, unspecified tumour codes were classified more precisely when information was available in the pathology protocols.

Stability of incidence data over time

As a result of delays in notification or by recovering additional information not available at the time of registration, the incidence for a given year can change over time. Due to the continuous and thorough data

cleaning, additional data is often incorporated at a later date resulting in small fluctuations over time in the number of new diagnoses for the same incidence year. Very often, the number of cases in the first year after publication will increase due to the inclusion of 'late arrivals', while later on, the number of cases decreases slightly due to the thorough and consistent data cleaning that results in for example the exclusion of cases that after additional investigations were confirmed as non-malignant. The number of new diagnoses of primary malignant brain and other CNS tumours remains fairly stable and rarely exceeds 1% change between 2 consecutive years (**Table 2**). The incidence of borderline and benign tumours of the brain and other CNS structures is slightly less stable over time. The change between 2 consecutive years rarely exceeds 3%.

Table 2 Primary brain and other CNS tumours in adults: Stability of incidence data (N) over time, Belgium 2004-2020

Malignant tumours

Publication year \ Incidence year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
2004	815																
2005	812	754															
2006	818	759	762														
2008	812	755	764	790	787												
2009	812	755	766	786	790	838											
2010	813	757	769	789	790	839	807										
2011	816	761	772	790	792	840	810	801									
2012	815	760	769	786	788	845	814	818	843								
2013	804	754	761	779	785	840	810	810	830	886							
2014	803	753	760	777	785	841	809	809	829	888	893						
2015	802	754	761	775	784	840	809	810	828	886	887	886					
2016	801	754	759	774	785	837	806	807	825	886	886	886	905				
2017	801	754	759	774	785	838	806	806	825	885	886	887	906	874			
2018	803	756	763	777	788	838	806	805	826	889	887	889	912	877	914		
2019	804	756	763	777	789	838	807	805	827	888	887	891	914	878	916	989	
2020	807	753	759	778	789	841	811	806	829	888	889	892	918	875	925	995	875

Borderline tumours

Publication year \ Incidence year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
2004	105																
2005	104	85															
2006	107	89	98														
2008	109	88	102	115	118												
2009	112	94	102	115	120	139											
2010	113	97	104	115	121	141	130										
2011	113	97	108	118	124	144	127	134									
2012	112	98	110	116	125	146	131	139	130								
2013	113	102	114	121	129	148	132	140	133	197							
2014	115	104	114	124	130	149	136	141	135	197	165						
2015	116	104	114	122	130	150	135	140	138	200	169	183					
2016	116	104	115	123	131	152	137	142	139	200	172	186	147				
2017	116	104	115	124	131	156	138	141	141	201	177	188	148	187			
2018	109	99	115	123	125	155	135	139	135	201	170	182	146	191	180		
2019	109	101	115	124	125	156	135	140	137	205	173	185	150	191	183	163	
2020	110	105	116	125	126	155	136	141	139	209	178	190	150	196	187	172	171

Benign tumours

Publication year \ Incidence year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
2010	783										
2011	798	778									
2012	797	792	986								
2013	802	809	996	1111							
2014	829	839	1007	1115	1167						
2015	828	843	1009	1116	1166	1254					
2016	829	860	1020	1136	1178	1283	1225				
2017	831	868	1026	1148	1184	1293	1236	1337			
2018	836	880	1038	1153	1201	1312	1249	1362	1332		
2019	855	892	1058	1168	1219	1320	1253	1377	1351	1472	
2020	865	902	1065	1178	1229	1327	1279	1400	1377	1494	1349

Source: Belgian Cancer Registry

2.3 Calculation of incidence, trends, prevalence and survival

2.3.1 Incidence

Incidence is the number of new cases occurring in each time period in a specific population. It can be used to estimate the probability or risk of illness and can be expressed in different ways. The incidence data presented in the current publication encompass the time period 2004-2020 for borderline and malignant tumours and time period 2010-2020 for benign tumours.

- The **crude incidence rate** (CR) is calculated by dividing the number of new cases observed during a given time period by the corresponding population time at risk in that time period. The crude rate is expressed as the number of new cases per 100,000 person years.
- The **age-specific incidence rate** is the crude incidence rate in a particular 5-year age group and expressed per 100,000 person years.
- The **age-standardised incidence rate** is a weighted average of the individual age-specific rates using an external standard population. It is the incidence that would be observed if the population had the age structure of the standard population (World Standard Population). Since age has a powerful influence on the risk of cancer, this standardisation is necessary when comparing several populations that differ with respect to their age structure. In this publication, the World Standard Population is used for standardisation in the individual chapters and consequently World Standardised incidence Rates (WSR) are reported. These are expressed as the number of new cases per 100,000 person years.
- **Male/Female (M/F) ratios** are calculated by dividing the corresponding age-standardised incidence rates (WSR).

2.3.2 Prevalence

Prevalence is the number of persons who are still alive at a given index date, and who received a cancer diagnosis during a specified time period preceding the index date. For example, 5-year prevalence is the number of persons who received at least one new diagnosis of cancer during a specific five-year period and who are still alive at the end of the five-year period. The prevalence data in this publication were estimated with an index date of 31st December 2020, representing people living in Belgium who were diagnosed with at least one tumour of central nervous system in the period from 1st January 2016 to 31st December 2020 and who were still alive at the end of 2020 (index date) for 5-year prevalence or from 1st January 2011 to 31st December 2020 for 10-year prevalence. Persons with more than one tumour were included as prevalent cases in each subtype, but were counted only once in analyses regrouping multiple tumour types.

The methodology for results on prevalence was described in detail in our publication 'Cancer Prevalence in Belgium 2010'[8].

2.3.3 Incidence trends

Since data have been collected from 2004 onwards, age-standardised incidence rates (WSR) could also be compared over time. In total, 17 consecutive years of incidence data are available for Belgium. The corresponding incidence trends are shown with the corresponding 95% confidence intervals (95% CI).

Trends in age-standardised incidence (WSR) were quantified by the Annual Percentage Change (APC), which expresses a mean multiplicative change per year. Trends and APC calculations are given by sex, age group, morphology and topography. The APC is estimated from a least squares regression on the logarithm of the age-standardised rate (WSR) versus incidence year. Due to the log transformation, no APC can be obtained if the WSR

is zero for at least one year. In cases where the relation of the WSR with incidence year cannot be adequately fit with a loglinear model (i.e. a constant APC for the full data range cannot be assumed), a piecewise log-linear model was estimated in which the different linear segments are connected at certain joinpoints. This model results in an estimated APC per time segment of which an Average Annual Percentage Change (AAPC) is calculated as the average of the APC estimates per segment weighted by the corresponding segment length[24]. The model building process on the logarithm of the WSR was fully automated in SAS (version 9.3) and consists of the following steps:

1. The simple linear regression model, assuming a normal error structure, was compared with a nonparametric smoother fit (PROC REG and PROC LOESS respectively) using an F-test on the residual sets for both models. When the linear regression model was not significantly different from the smoother at the 5% level, the linear model was accepted as final model and a single APC value resulted to quantify the trend over the full-time range.
2. When the linear model at the log scale was rejected, a piecewise model with one joinpoint was fitted. The optimal position of the joinpoint was determined using a non-linear optimisation procedure (PROC NLIN). Joinpoints were not allowed to be the first or second time point or the before last and last time point, as those endpoints can be influential points and induce spurious segments. The estimated joinpoint position was rounded to the nearest integer value and fixed in a re-estimation of the piecewise model with PROC GENMOD. As in the previous step, an F-test was used to accept or reject the piecewise model against the smoother. When the regression model was accepted, the final model consisted of a piecewise model with two connected linear segments each quantified by their own APC and a weighted overall AAPC.
3. When the piecewise model with one joinpoint was not accepted, the process continues to evaluate two joinpoints in the same way as described in step 2. As an additional restriction, the difference in position between the two joinpoints should be at least three years. If the two joinpoints were closer, the piecewise model with only one joinpoint from the previous step was retained.

A 95% confidence interval (CI) and p-value for the individual segments and the overall AAPC were calculated from the final regression model. The loss in degrees of freedom due to the optimisation of the joinpoint position(s) was not taken into account for the construction of the CI and final p-values. When the 95% CI for the AAPC contains the value zero, no significant trend with incidence year is observed.

Combined changes in trends of incidence, mortality and survival can have various causes and are often difficult to interpret and are not considered as an objective of this publication. However, a manuscript by Karim-Kos *et al*. on trends of cancer in Europe provides a framework to help gaining insights and provide possible explanations for the observed trends[25].

2.3.4 Incidence projections

The incidence projections for the period 2020-2025 were obtained from linear and log-linear Poisson regression models by extrapolating the observed incidence trends for the period 2004-2019. Observed data during 2020 can be compared with projected data in 2020 to assess impact of Covid-19 pandemic. As the observed number of cancer diagnoses represent a counting process, Poisson models were used to model the relation between the crude incidence rate and the incidence year. The population size at the start of the calendar year was taken as the (log-) offset in the Poisson rate models and the number of observed cancer diagnoses as dependent variable. The modelling process consisted of 2 main steps. First a log-linear Poisson model was estimated. If a significant slope at the 5% level was obtained, the estimated log-linear Poisson model was selected as final model in case of a decreasing time trend (this to avoid projections that end up with a negative number of cancer cases) while a new linear Poisson model was estimated in case of an increasing time trend (to avoid exponential extrapolation). When the slope coefficient of the initial log-linear Poisson model was found to be non-significant, the mean yearly crude rate was estimated over the available time period.

Evolutions in the population size and age distribution were taken into account using the projections of potential population growth as published by Statistics Belgium. Gender specific incidence projections were performed per 5-year age category (20-24, 25-29, …, 80-84, 85+) to obtain projected sex and age specific crude rates. These projected rates were then applied to the projected population to obtain age-sex specific projected incidence counts. Finally, these age-sex cancer incidence counts were summed, and overall projected numbers of cancer diagnoses and crude incidence rates were obtained. Age-standardised rates (WSR) were directly calculated based on the age-sex specific projected cancer incidence rates. All projections were performed using SAS software version 9.3 (SAS Institute, Cary, NC, USA), p-values below 0.05 were considered statistically significant.

A more detailed description of the methodology can be found in our publication 'Cancer Incidence Projections in Belgium'[11].

2.3.5 Relative survival

The relative survival ratio gives an estimate of the net survival, which is the survival when causes of death not related to the cancer have been eliminated. The relative survival is calculated as the ratio of the observed survival and the expected survival for a comparable group of the general population matched for age, sex, region and calendar period. The expected survival was obtained with the Ederer II method[26].

In this publication, 5-year and 10-year relative survival ratios are reported stratified by age group, sex and behaviour of tumour of the central nervous system. The methodology was described in detail in our publication 'Cancer Survival in Belgium'[6].

The empirical life tables (by sex, age, region and calendar-year), used in the calculation for expected survival, vary considerably by year of age for young (<30 years) and old ages (>90 years)[4]. To reduce the sampling variability and to ensure that death probabilities evolve consistently from one age and calendar year to another, the life tables were smoothed on age and calendar year using the LOESS-method[27-30].

In this publication, relative survival results are not shown when the number of patients at risk is less than 50 cases and all relative survival results are presented with the corresponding 95% confidence intervals (95% CI).

2.3.6 Conditional relative survival

The conditional relative survival reported in this publication is the relative survival proportion given that the person has already survived the first X years since diagnosis (results are shown for *X = 1, 2* and *3* years). It is calculated as the standard relative survival, although only patients who survived the first X years since diagnosis are considered. So, in case of *X = 1,* the reported 5-year conditional relative survival therefore corresponds with the relative survival 6 years after diagnosis for patients that at least survived the first year since diagnosis.

2.3.7 Relative survival trends

Relative survival has been compared between the cohorts 2004-2009, 2010-2015 and 2016-2020 (only 2010-2015 and 2016-2020 for benign tumours). Note that the follow-up period for the cohorts is not the same, as the last date of follow-up is the 11th of April 2022.

ALL PRIMARY BRAIN AND OTHER CNS TUMOURS IN ADULTS

3 ALL PRIMARY BRAIN AND OTHER CNS TUMOURS* IN ADULTS

KEYNOTES

Incidence

- Most primary brain and other CNS tumours are characterised by a benign behaviour (56%), followed by malignant tumours (37%) and the more rare borderline tumours (7%).
- More males are impacted by malignant tumours (male/female ratio = 1.6). This difference is most pronounced in the age group 50+.
- On the contrary, more benign tumours are diagnosed in females (male/female ratio = 0.5). Notably, this difference is not observed for the age group of 85+.
- There is a peak in incidence around 70 years of age for malignant tumours (median age = 64 years). Incidence of benign tumours increases with age until 75 years after which it again decreases (median age = 59 years).
- Gliomas are the most common malignant tumours (86%), while meningiomas constitute the most common benign tumours (61%).
- The majority of malignant tumours (94%) are diagnosed in the brain while most borderline and benign tumours (40% and 63%, respectively) are observed in meninges.
- Whereas the incidence rates of benign tumours increased over the last years (at least partly due to improved registration), no clear trend is observed for malignant tumours.

Survival

- The 10-year relative survival is similar for both sexes.
- The 10-year relative survival varies substantially based on the tumour behaviour with 96% for benign tumours, 80% for borderline tumours and 17% for malignant tumours.
- Assuming that a patient survives the first three years after diagnosis with a malignant brain tumour, the relative survival probability 5 years later is nearly 71% (conditional 5-year relative survival).
- The 5-year relative survival decreases with the age of patients, especially for malignant tumours ranging from about 70% in the age group 20-34 years to less than 3% in the age group 80+.

** All primary brain and other CNS tumours are presented in this chapter by tumour behaviour (malignant/borderline/benign; cf. all chapters with epidemiological results). This distinction does not completely correspond to clinical practice where it is more common to distinguish tumours based on the WHO grade. The relation between tumour behaviour and WHO grade for these tumours can be found in Table 1 of "Methods and data quality".*

Table 1 All primary brain and other CNS tumours in adults: Overview of incidence, prevalence and survival by behaviour and sex in Belgium

	Males								
	Malignant tumours			Borderline tumours			Benign tumours		
Incidence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Incidence, 2016-2020	2,664	12.4	9.6	418	1.9	1.7	2,408	11.2	9.0
Prevalence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Prevalence (5 years), 2016-2020	1,005	23.0	21.0	389	8.9	8.2	2,195	50.3	39.2
Prevalence (10 years), 2011-2020	1,475	33.8	31.5	735	16.8	15.8	3,692	84.6	65.4
Relative survival	N at risk	%	95%CI	N at risk	%	95%CI	N at risk	%	95%CI
5-year Relative survival, 2016-2020	2,650	21.9	[20.0;23.9]	416	84.5	[78.4;89.5]	2,392	96.2	[94.0;98.1]
10-year Relative survival, 2011-2020	5,113	16.1	[14.6;17.6]	824	79.8	[73.0;86.0]	4,234	96.5	[93.6;99.2]
	Females								
	Malignant tumours			Borderline tumours			Benign tumours		
Incidence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Incidence, 2016-2020	1,924	8.5	6.2	458	2.0	2.0	4,491	19.8	16.5
Prevalence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Prevalence (5 years), 2016-2020	751	16.4	14.6	422	9.2	8.9	4,176	91.0	73.2
Prevalence (10 years), 2011-2020	1,142	24.9	22.8	785	17.1	16.3	7,456	162.4	127.0
Relative survival	N at risk	%	95%CI	N at risk	%	95%CI	N at risk	%	95%CI
5-year Relative survival, 2016-2020	1,914	23.2	[21.0;25.5]	456	90.2	[85.5;93.9]	4,464	97.0	[95.6;98.1]
10-year Relative survival, 2011-2020	3,718	18.6	[16.8;20.4]	889	80.3	[74.3;85.5]	8,277	96.3	[94.6;97.9]
Median age at diagnosis, 2016-2020	64 [Q1: 52;Q3: 74]			55 [Q1: 41;Q3: 66]			59 [Q1: 48; Q3: 71]		
M/F-ratio, 2016-2020	1.6			0.9			0.5		

Source: Belgian Cancer Registry

CR: crude (all ages) rate (N/100,000 person years)

WSR: age-standardised rate using the World Standard Population (N/100,000 person years)

Incidence

Table 2 All primary brain and other CNS tumours in adults: Incidence of the three most frequently occuring tumours* by behaviour and primary location in Belgium

Malignant tumours, 2004-2020			Borderline tumours, 2004-2020			Benign tumours, 2010-2020		
Meninges (C70)								
	N	%		N	%		N	%
All tumours	299	100%	All tumours	1,032	100%	All tumours	8,280	100%
Meningiomas	238	80%	Meningiomas	981	95%	Meningiomas	8,198	99%
Haematolymphoid tumours	19	6%	Mesenchymal, non-meningothelial tumours	19	2%	Cranial and paraspinal nerve tumours	59	1%
Unspecified tumours	18	6%	Unspecified tumours	18	2%	Unspecified tumours	15	0%
Other cancer types	24	8%	Other cancer types	14	1%	Other cancer types	8	0%
Brain (C71)								
	N	%		N	%		N	%
All tumours	13,581	100%	All tumours	957	100%	All tumours	305	100%
Gliomas	12,060	89%	Gliomas	362	38%	Cranial and paraspinal nerve tumours	115	38%
Haematolymphoid tumours	979	7%	Mesenchymal, non-meningothelial tumours	243	25%	Unspecified tumours	105	34%
Unspecified tumours	340	3%	Glioneuronal and neuronal tumours	184	19%	Glioneuronal and neuronal tumours	43	14%
Other cancer types	202	1%	Other cancer types	168	18%	Other cancer types	42	14%
Spinal cord, cranial nerves and other parts of CNS (C72)								
	N	%		N	%		N	%
All tumours	443	100%	All tumours	318	100%	All tumours	1,969	100%
Gliomas	292	66%	Gliomas	208	65%	Cranial and paraspinal nerve tumours	1,501	76%
Haematolymphoid tumours	59	13%	Mesenchymal, non-meningothelial tumours	47	15%	Unspecified tumours	455	23%
Cranial and paraspinal nerve tumours	47	11%	Cranial and paraspinal nerve tumours	32	10%	Mesenchymal, non-meningothelial tumours	8	0%
Other cancer types	45	10%	Other cancer types	31	10%	Other cancer types	5	0%
Pineal gland (C75.3)**			**Craniopharyngeal duct (C75.2)****			**Pituitary gland (C75.1)****		
	N	%		N	%		N	%
All tumours	58	100%	All tumours	241	100%	All tumours	2,906	100%
Pineal tumours	33	57%	Craniopharyngiomas**	241	100%	Tumours of adenohypophysis (mostly adenoma)**	2,841	98%
Germ cell tumours	15	26%				Unspecified tumours	51	2%
Gliomas	5	9%				Tumours of the neurohypophysis	12	0%
Other cancer types	5	9%				Other cancer types	2	0%

** The results are predominantly presented based on the thirteen large histological subgroups as shown in Table 1 of "Methods and data quality". More detailed results on subtypes per topo can be found in the individual chapters by primary location.*

** Combinations of topography and behaviour for tumours of the pituitary and pineal gland and craniopharyngeal duct (C75.1-C75.3) are not presented if incidence ($N_{All\ tumours}$) < 50 .*

*** These subgroups belong to the larger group of "tumours of the sellar region".*

Source: Belgian Cancer Registry

The results of benign tumours are only shown for the incidence period 2010-2020, since there was a remarkable improvement of registration completeness in the preceding period (2004-2009).

Figure 1 All primary brain and other CNS tumours in adults: Age-specific incidence rates (N/100,000) by sex and behaviour in Belgium

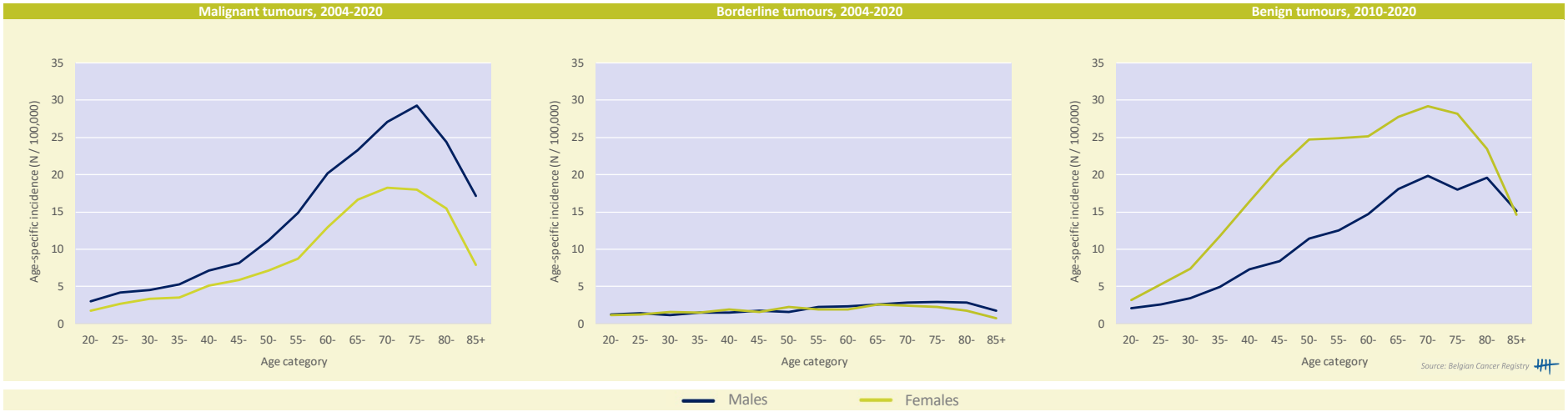


Figure 2 All primary brain and other CNS tumours in adults: Incidence by primary location and behaviour in Belgium

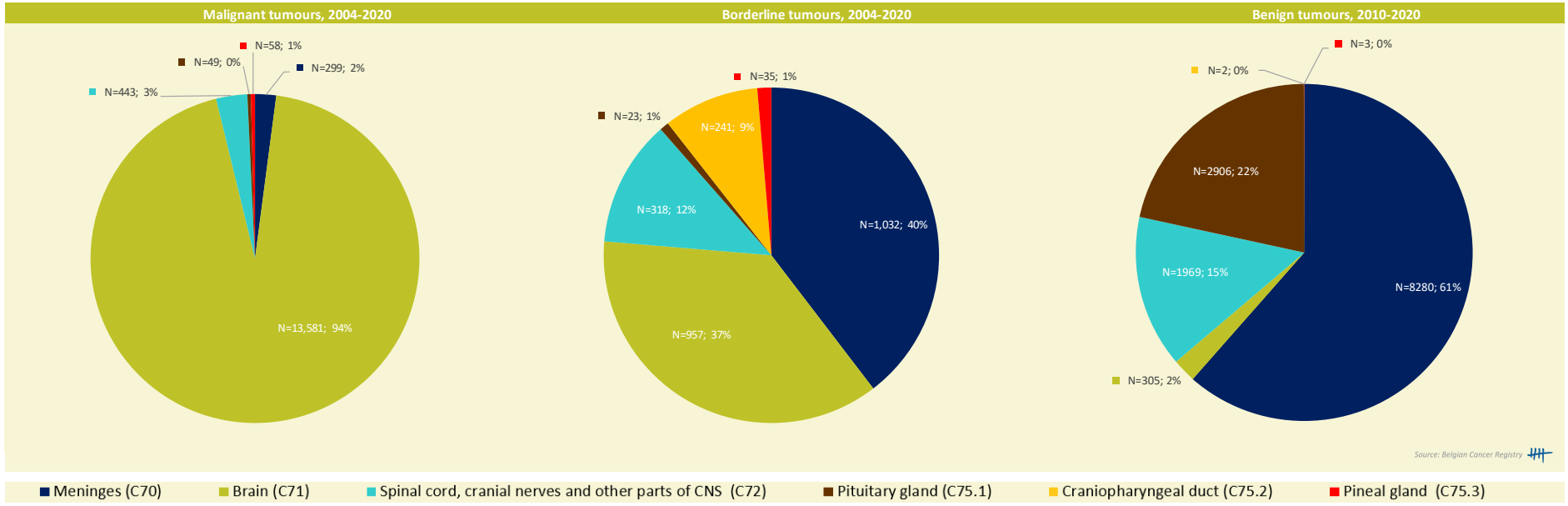
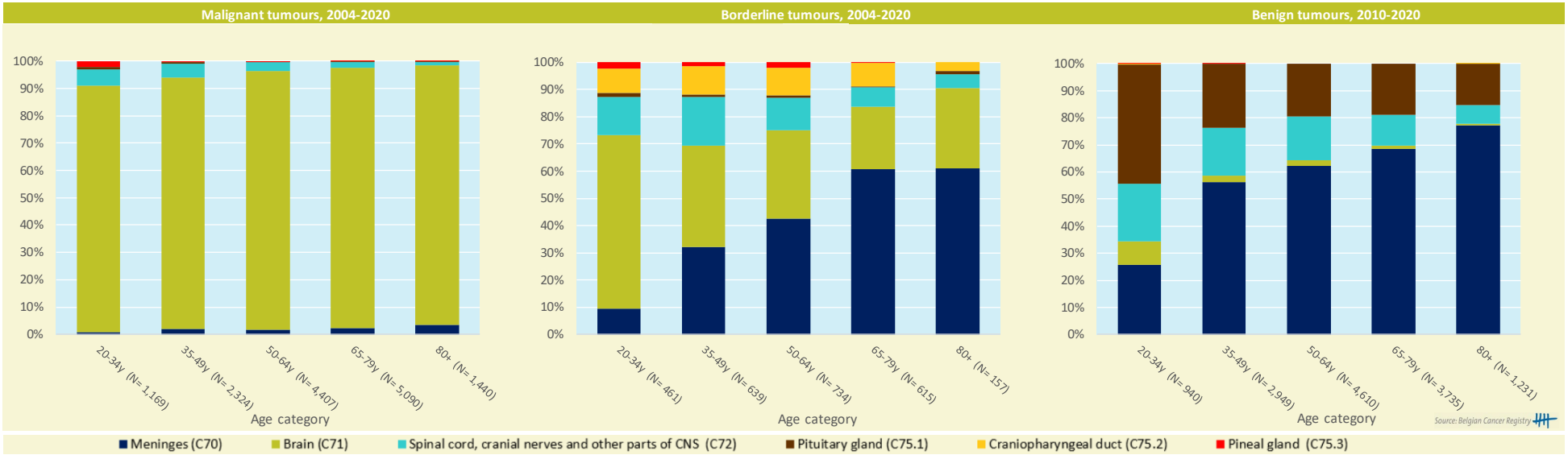


Figure 3 All primary brain and other CNS tumours in adults: Incidence by primary location, age group and behaviour in Belgium

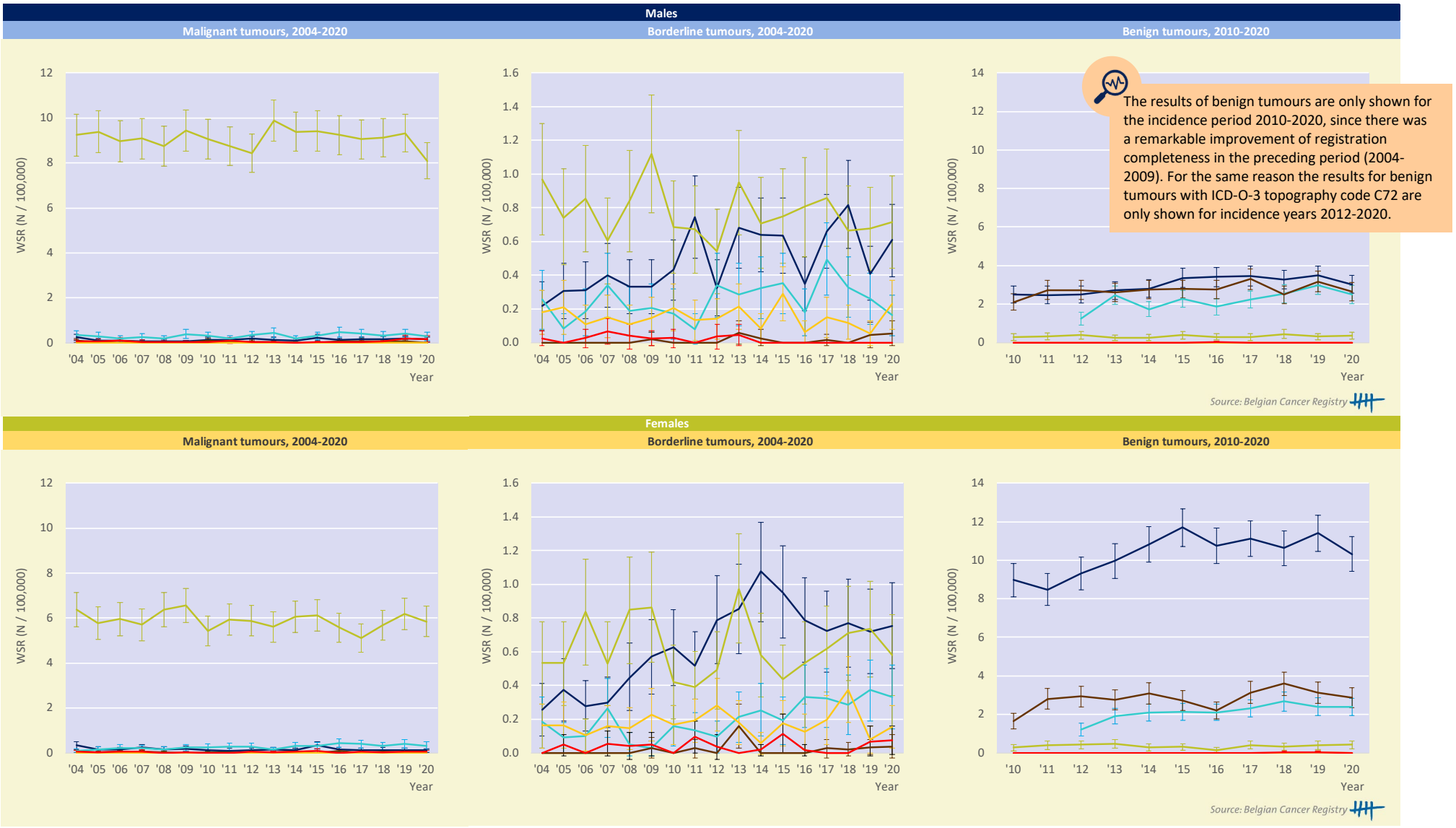


Incidence trends

Figure 4 All primary brain and other CNS tumours in adults: Age-standardised incidence rates* (WSR) by sex, age group and behaviour in Belgium

** The age-standardised incidence rates are represented with 95% Confidence Intervals.*

Figure 5 All primary brain and other CNS tumours in adults: Age-standardised incidence rates* (WSR) by sex, primary location and behaviour in Belgium



** The age-standardised incidence rates are represented with 95% Confidence Intervals.*

Table 3 All primary brain and other CNS tumours in adults: AAPC(%) by sex, age group, primary location and behaviour in Belgium

Incidence by age group and sex	Malignant 2004-2020			Borderline 2004-2020			Benign 2010-2020		
Males	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period
20-34 yrs	-0.7	[-2.5; 1.1]	2004-2020	-2.2	[-4.4; -0.0]	2004-2020	4.6	[0.1; 9.2]	2010-2020
				2.5	[-0.9; 6.0]	2004-2015			
				-11.9	[-18.8; -4.4]	2015-2020			
35-49 yrs	0.0	[-1.1; 1.1]	2004-2020	0.7	[-3.9; 5.6]	2004-2020	4.5	[0.9; 8.2]	2010-2020
							7.7	[2.4; 13.4]	2010-2017
							-2.7	[-14.6; 10.8]	2017-2020
50-64 yrs	-0.1	[-1.1; 0.9]	2004-2020	2.5	[0.4; 4.6]	2004-2020	5.5	[3.7; 7.2]	2010-2020
							12.1	[8.0; 16.4]	2010-2015
							-0.8	[-4.4; 2.9]	2015-2020
65-79 yrs	0.2	[-0.6; 1.0]	2004-2020	2.9	[0.5; 5.2]	2004-2020	5.0	[2.7; 7.4]	2010-2020
				8.0	[3.9; 12.3]	2004-2014			
				-5.2	[-11.6; 1.5]	2014-2020			
80+	2.8	[1.6; 4.1]	2004-2020	2.8	[-3.2; 9.1]	2004-2020	5.4	[1.2; 9.8]	2010-2020
Females	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period
20-34 yrs	-1.9	[-4.2; 0.4]	2004-2020	1.5	[-2.3; 5.5]	2004-2020	2.9	[-0.2; 6.1]	2010-2020
35-49 yrs	-0.5	[-1.7; 0.6]	2004-2020	5.6	[2.8; 8.4]	2004-2020	5.4	[3.9; 6.8]	2010-2020
	-4.9	[-8.2; -1.4]	2004-2010				15.1	[9.4; 21.1]	2010-2013
	2.2	[0.1; 4.2]	2010-2020				1.4	[-0.6; 3.5]	2013-2020
50-64 yrs	-0.7	[-1.8; 0.5]	2004-2020	4.4	[1.5; 7.3]	2004-2020	3.1	[0.9; 5.3]	2010-2020
							6.2	[3.0; 9.5]	2010-2017
							-3.9	[-11.1; 4.0]	2017-2020
65-79 yrs	0.6	[-0.4; 1.7]	2004-2020	3.6	[1.3; 5.8]	2004-2020	1.8	[-0.3; 3.9]	2010-2020
				11.8	[6.6; 17.3]	2004-2012	4.9	[1.1; 8.8]	2010-2016
				-4.1	[-8.6; 0.6]	2012-2020	-2.7	[-8.1; 3.0]	2016-2020
80+	4.3	[2.6; 6.0]	2004-2020	2.3	[-4.5; 9.5]	2004-2020	4.5	[2.6; 6.5]	2010-2020
Incidence by primary location and sex	Malignant 2004-2020			Borderline 2004-2020			Benign 2010-2020		
Males	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period
Meninges (C70)	1.5	[-2.7; 5.9]	2004-2020	4.9	[1.7; 8.1]	2004-2020	2.9	[1.6; 4.2]	2010-2020
	-17.7	[-31.9; -0.5]	2004-2008	9.1	[3.5; 14.9]	2004-2014	5.9	[3.9; 7.8]	2010-2017
	8.9	[3.1; 14.9]	2008-2020	-1.7	[-10.4; 7.8]	2014-2020	-3.7	[-8.1; 0.9]	2017-2020
Brain (C71)	-0.1	[-0.7; 0.4]	2004-2020	-0.9	[-2.8; 1.0]	2004-2020	1.7	[-2.3; 5.8]	2010-2020
Spinal cord, cranial nerves and other parts of CNS (C72)	2.4	[-0.8; 5.7]	2004-2020	3.4	[-1.7; 8.7]	2004-2020	22.3	[17.5; 27.4]	2010-2020
							77.8	[53.0; 106.7]	2010-2013
							4.2	[-1.8; 10.6]	2013-2020
Pituitary gland (C75.1)	-	-	-	-	-	-	1.8	[-0.5; 4.1]	2010-2020
Craniopharyngeal duct (C75.2)	-	-	-	-2.2	[-6.8; 2.7]	2004-2020	-	-	-
Pineal gland (C75.3)	-	-	-	-	-	-	-	-	-
Females	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period
Meninges (C70)	-3.2	[-6.5; 0.3]	2004-2020	6.4	[4.8; 8.1]	2004-2020	2.3	[1.3; 3.3]	2010-2020
				14.3	[11.3; 17.3]	2004-2014	5.9	[3.7; 8.2]	2010-2015
				-5.4	[-9.8; -0.9]	2014-2020	-1.2	[-3.3; 0.9]	2015-2020
Brain (C71)	-0.4	[-1.0; 0.2]	2004-2020	0.1	[-2.8; 3.1]	2004-2020	0.6	[-6.2; 7.9]	2010-2020
Spinal cord, cranial nerves and other parts of CNS (C72)	6.5	[3.7; 9.4]	2004-2020	7.2	[1.4; 13.3]	2004-2020	18.6	[12.5; 25.0]	2010-2020
				-13.6	[-29.3; 5.7]	2004-2009	57.5	[29.7; 91.3]	2010-2013
				18.1	[8.8; 28.3]	2009-2020	5.0	[-2.8; 13.4]	2013-2020
Pituitary gland (C75.1)	-	-	-	-	-	-	3.4	[-0.5; 7.5]	2010-2020
Craniopharyngeal duct (C75.2)	-	-	-	-0.1	[-4.7; 4.7]	2004-2020	-	-	-
Pineal gland (C75.3)	-	-	-	-	-	-	-	-	-

Source: Belgian Cancer Registry

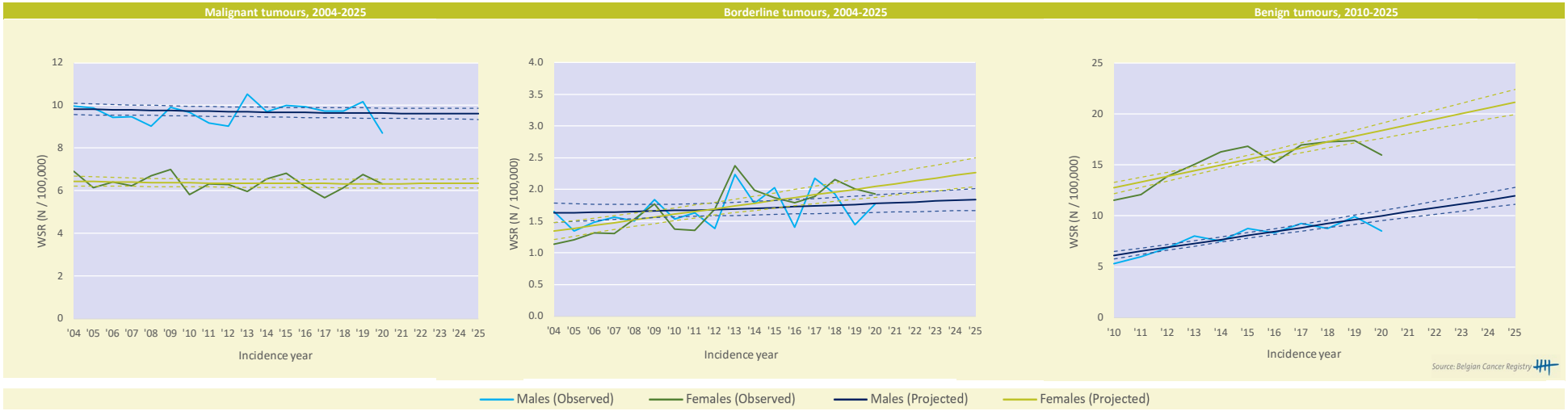
AAPC: average annual percentage change

Period: When a joinpoint occured, APC's are calculated for the period before and after the joinpoint. This column represents the corresponding time interval.

AAPC's are always calculated over the entire study-period.

Incidence projections

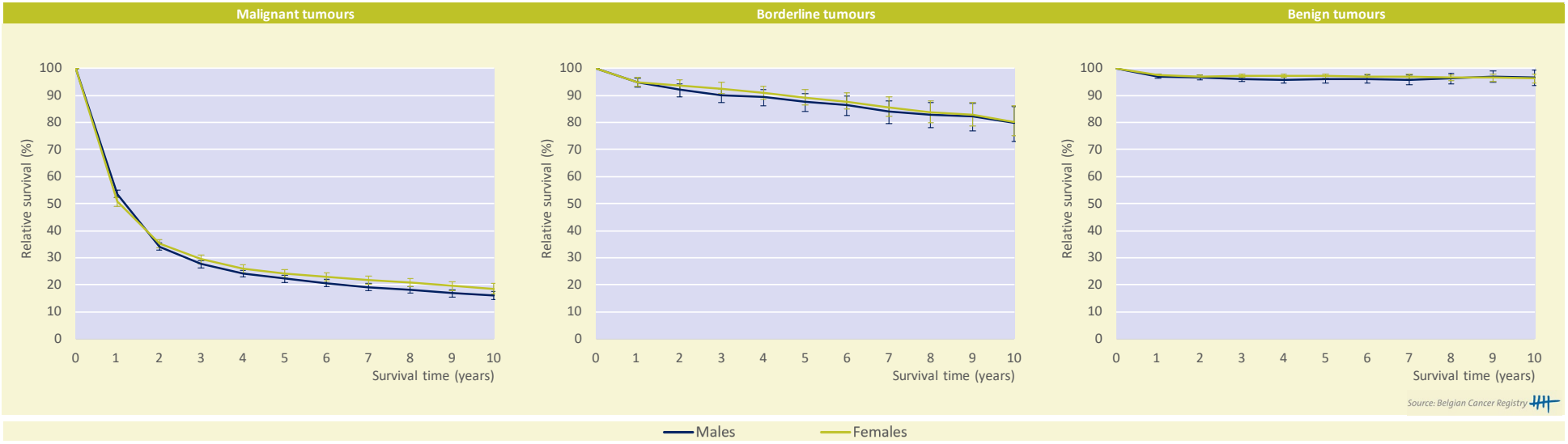
Figure 6 All primary brain and other CNS tumours in adults: Observed and projected* incidence (WSR with 95% Confidence Intervals) by sex and behaviour, Belgium 2004-2025



Incidence projections are calculated for 2020-2025 based on predictions of the observed incidence for 2010-2019. Thus, the projected incidence for 2020 can be compared with the observed incidence of 2020 to assess the potential impact of the COVID-19 pandemic.

Survival

Figure 7 All primary brain and other CNS tumours in adults: Relative survival* by sex and behaviour, Belgium 2011-2020



** The relative survival values are represented with 95% Confidence Intervals.*

Table 4 All primary brain and other CNS tumours in adults: Conditional 5-year relative survival* by sex and behaviour (Belgium, 2011-2020)

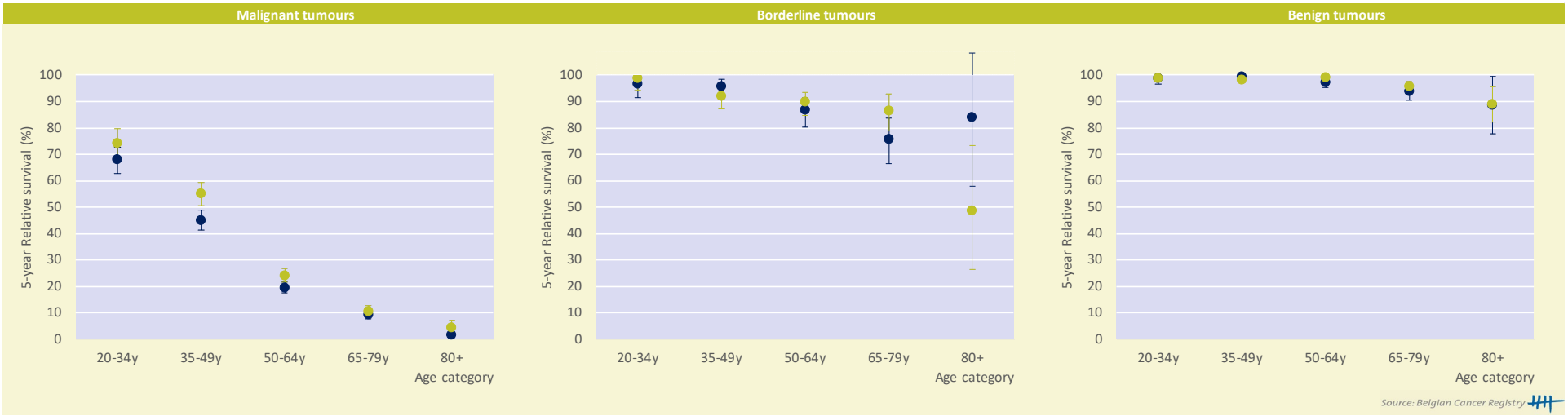
	Males					
	Malignant tumours		Borderline tumours		Benign tumours	
X years since diagnosis	N at risk	%	N at risk	%	N at risk	%
1 year	2,700	38.5	766	91.0	4,001	98.9
2 year	1,599	56.2	675	91.3	3,577	99.1
3 year	1,127	70.9	585	91.9	2,997	100.2
	Females					
	Malignant tumours		Borderline tumours		Benign tumours	
X years since diagnosis	N at risk	%	N at risk	%	N at risk	%
1 year	1,898	45.3	831	92.5	7,931	99.4
2 year	1,222	62.0	752	91.3	7,176	99.8
3 year	907	70.9	658	90.4	6,239	99.1

** Unadjusted 5-yr relative survival probability conditional on surviving the first X years since diagnosis, %*

** Interpretation in lay-man's terms: Given that a patient has already survived X years, what is the relative survival probability 5 years later.*

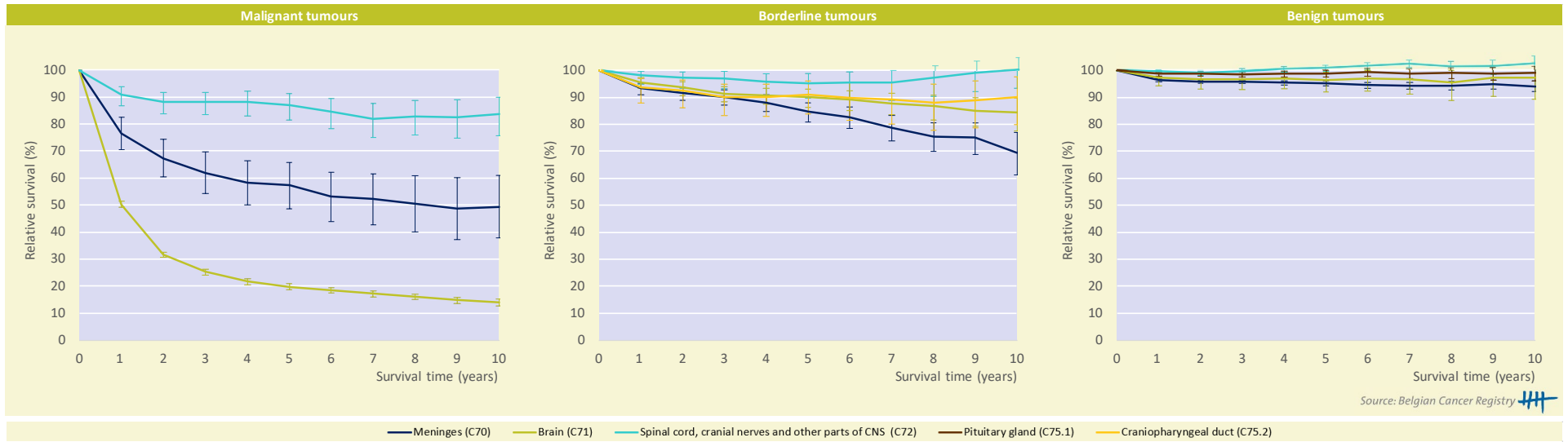
Source: Belgian Cancer Registry

Figure 8 All primary brain and other CNS tumours in adults: Age-specific 5-year relative survival* by sex, age and behaviour, Belgium 2011-2020



** The relative survival values are represented with 95% Confidence Intervals.*
Note: survival analysis of the borderline tumours for the age group 80+ is based on 47 patients only.

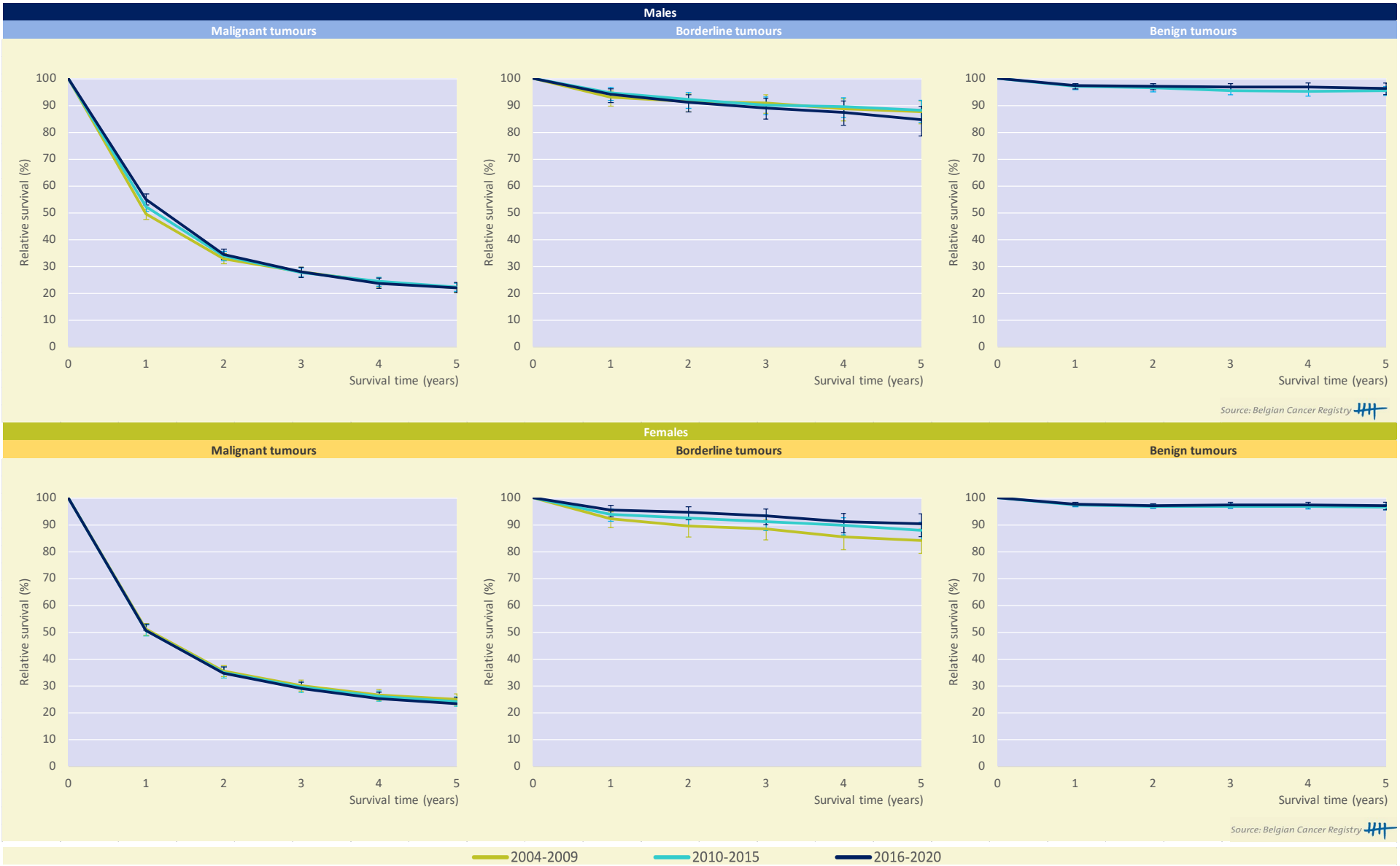
Figure 9 All primary brain and other CNS tumours in adults: 5-year relative survival* by primary location and behaviour, Belgium 2011-2020



** The relative survival values are represented with 95% Confidence Intervals.*

Survival trends

Figure 10 All primary brain and other CNS tumours in adults: Relative survival* by cohort, sex and behaviour, Belgium 2004-2020



** The relative survival values are represented with 95% Confidence Intervals.*

TUMOURS OF THE MENINGES IN ADULTS

3.1 TUMOURS OF THE MENINGES* IN ADULTS

MAIN SUBTYPE:

- *Meningioma*

KEYNOTES

Incidence

- Meningiomas represent 98% of all tumours of the meninges and 36% of all tumours of the brain and surrounding structures.
- Meningiomas are in most cases characterised by a benign behaviour (90%). Benign meningiomas occur more than three times as often in females compared to males (male/female ratio = 0.3) and show an incidence peak between the age of 50 and 84 years.
- The most frequent subtypes:
  - "Anaplastic (malignant) meningioma" represents 76% of all malignant tumours in the meninges.
  - "Atypical meningioma" predominates the borderline tumours (83%)
  - "Meningioma, microcystic or secretory or lymphoplasmacyte-rich or metaplastic or NOS" is the most common subgroup of the benign tumours (43%).
- 69% of all tumours of the meninges are located in the cerebral meninges, 5% in the spinal meninges and nearly 27% of all tumours are registered with the ICD-O-3 topography code C70.9 "Meninges, not otherwise specified".
- No consistent increase is observed for malignant or borderline tumours of the meninges between 2004 and 2020. However, for benign tumours an increasing trend is observed, probably due to increased awareness of the need for registration of these tumours. In addition, the increasing availability and use of imaging equipment might also lead to more incidental findings and partly explain the observed trend.
- In both males and females, the observed incidence in 2020 is lower than the projected incidence for 2020 suggesting a decrease of the number of new diagnoses due to the COVID-19 pandemic.

Survival

- The 10-year relative survival varies substantially depending on the behaviour of the meningioma and ranges from 94% for benign meningiomas, to 69% for borderline meningiomas and 44% for the more rare malignant meningiomas.
- No clear improvements in the 5-year relative survival of meningiomas are observed between 2004 and 2020.

** The tumours of the meninges are presented in this chapter by tumour behaviour (malignant/borderline/benign; cf. all chapters with epidemiological results). This distinction does not completely correspond to clinical practice where it is more common to distinguish tumours based on the WHO grade. The relation between tumour behaviour and WHO grade for these tumours can be found in Table 1 of "Methods and data quality".*

Table 1 Tumours of the meninges in adults: Overview of incidence, prevalence and survival by behaviour and sex in Belgium

	Males								
	Malignant tumours			Borderline tumours			Benign tumours		
Incidence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Incidence, 2016-2020	52	0.2	0.2	163	0.8	0.6	1,014	4.7	3.3
Prevalence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Prevalence (5 years), 2016-2020	32	0.7	0.5	137	3.1	2.3	877	20.1	13.7
Prevalence (10 years), 2011-2020	53	1.2	0.8	239	5.5	4.0	1,410	32.3	22.2
Relative survival	N at risk	%	95%CI	N at risk	%	95%CI	N at risk	%	95%CI
5-year Relative survival, 2016-2020	52	31.6	[10.2;58.6]	163	77.1	[64.5;87.3]	1,011	91.3	[87.2;94.9]
10-year Relative survival, 2011-2020	93	44.7	[28.5;61.6]	328	63.6	[50.2;76.2]	1,766	90.1	[84.6;95.1]
	Females								
	Malignant tumours			Borderline tumours			Benign tumours		
Incidence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Incidence, 2016-2020	44	0.2	0.1	204	0.9	0.7	3,129	13.8	10.8
Prevalence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Prevalence (5 years), 2016-2020	26	0.6	0.4	181	3.9	3.3	2,876	62.6	47.1
Prevalence (10 years), 2011-2020	53	1.2	0.8	342	7.5	5.9	5,167	112.6	82.2
Relative survival	N at risk	%	95%CI	N at risk	%	95%CI	N at risk	%	95%CI
5-year Relative survival, 2016-2020	< 50*	-	-	204	87.7	[79.5;93.8]	3,123	95.9	[94.2;97.4]
10-year Relative survival, 2011-2020	87	54.1	[38.6;68.8]	431	73.6	[63.6;82.3]	5,867	95.2	[93.1;97.2]
Median age at diagnosis, 2016-2020	70 [Q1: 61;Q3: 78]			61 [Q1: 50;Q3: 71]			62 [Q1: 51;Q3: 73]		
M/F-ratio, 2016-2020	1.3			0.8			0.3		

Source: Belgian Cancer Registry

CR: crude (all ages) rate (N/100,000 person years)

WSR: age-standardised rate using the World Standard Population (N/100,000 person years)

** Not enough patients for representative survival analysis*

Incidence

Figure 1 Tumours of the meninges in adults: Age-specific incidence rates (N/100,000) by behaviour and sex in Belgium

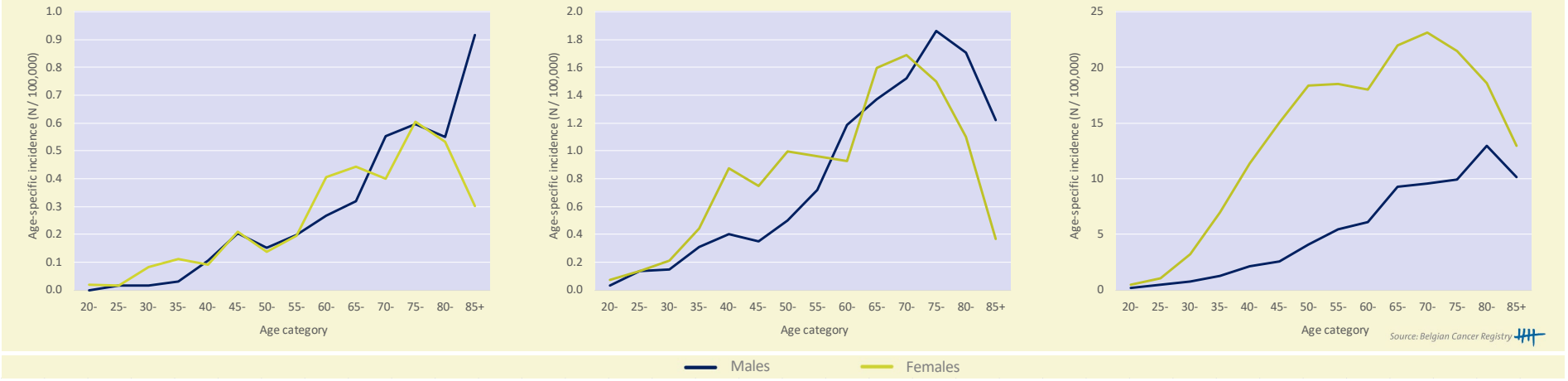
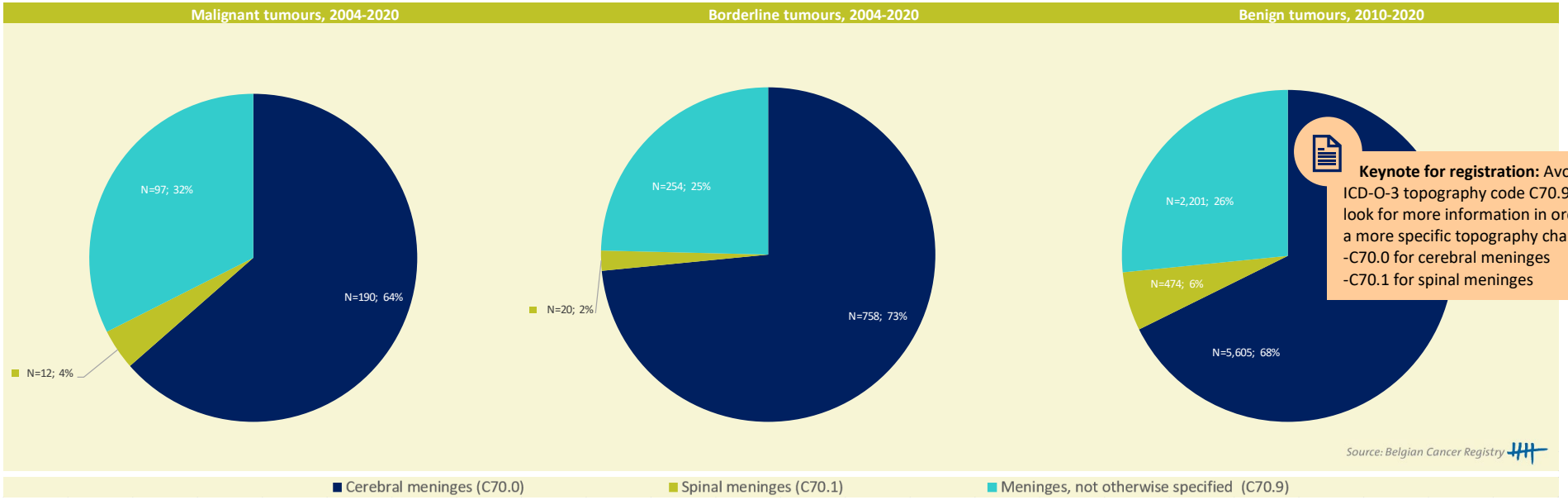
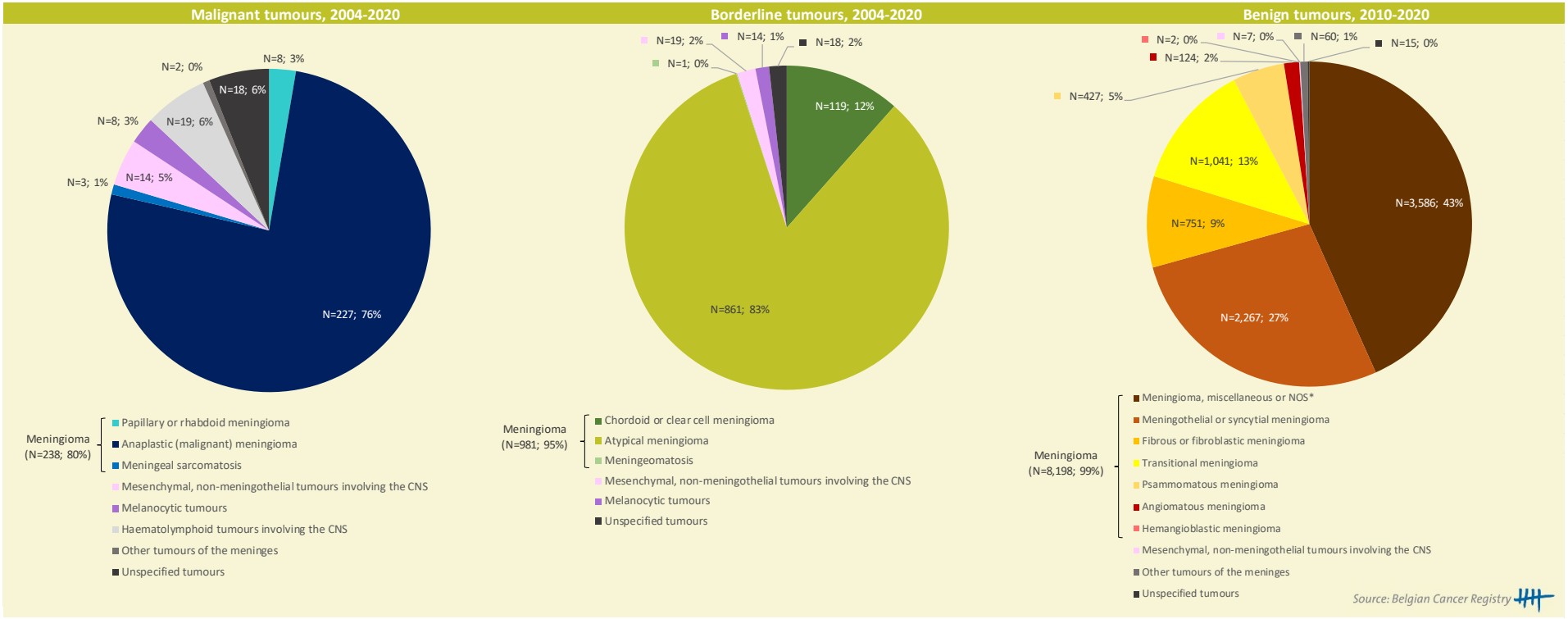


Figure 2 Tumours of the meninges in adults: Incidence by primary location and behaviour in Belgium



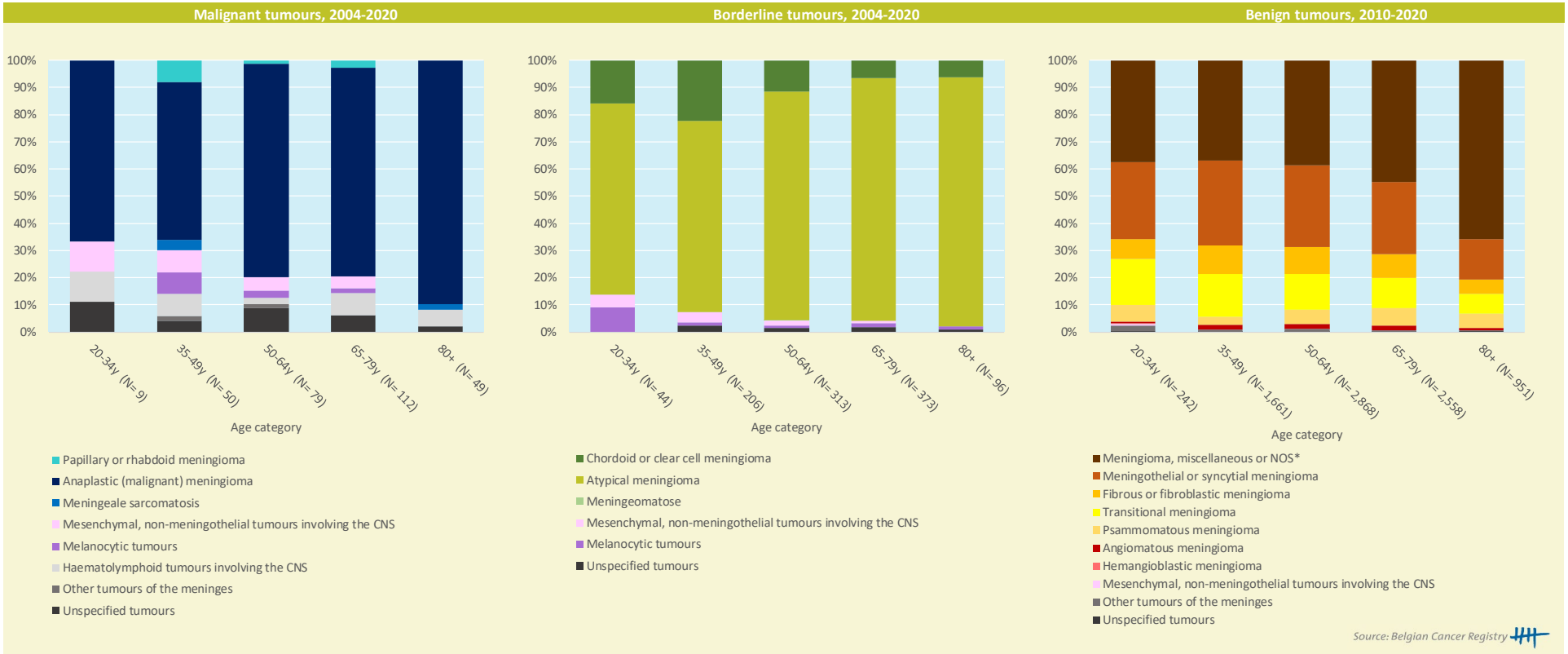
Keynote for registration: Avoid using the ICD-O-3 topography code C70.9 and actively look for more information in order to obtain a more specific topography characterisation:
-C70.0 for cerebral meninges
-C70.1 for spinal meninges

Figure 3 Tumours of the meninges in adults: Incidence by histology and behaviour in Belgium



** Refers to "Meningioma, microcystic or secretory or lymphoplasmacyte-rich or metaplastic or NOS"*

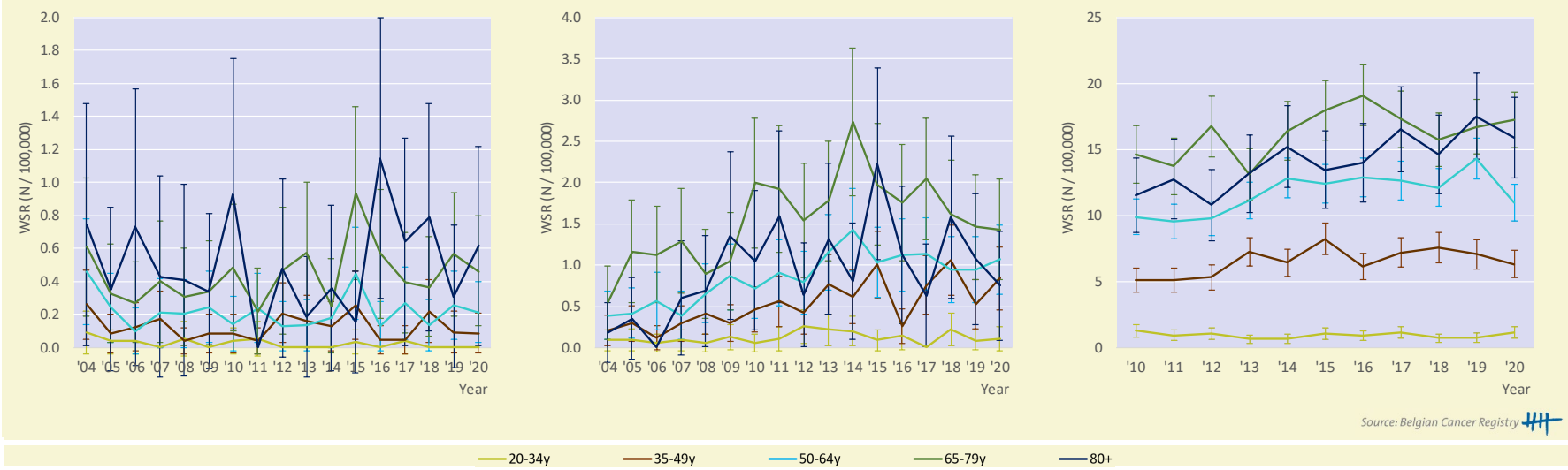
Figure 4 Tumours of the meninges in adults: Incidence by histology, age group and behaviour in Belgium



** Refers to "Meningioma, microcystic or secretory or lymphoplasmacyte-rich or metaplastic or NOS"*

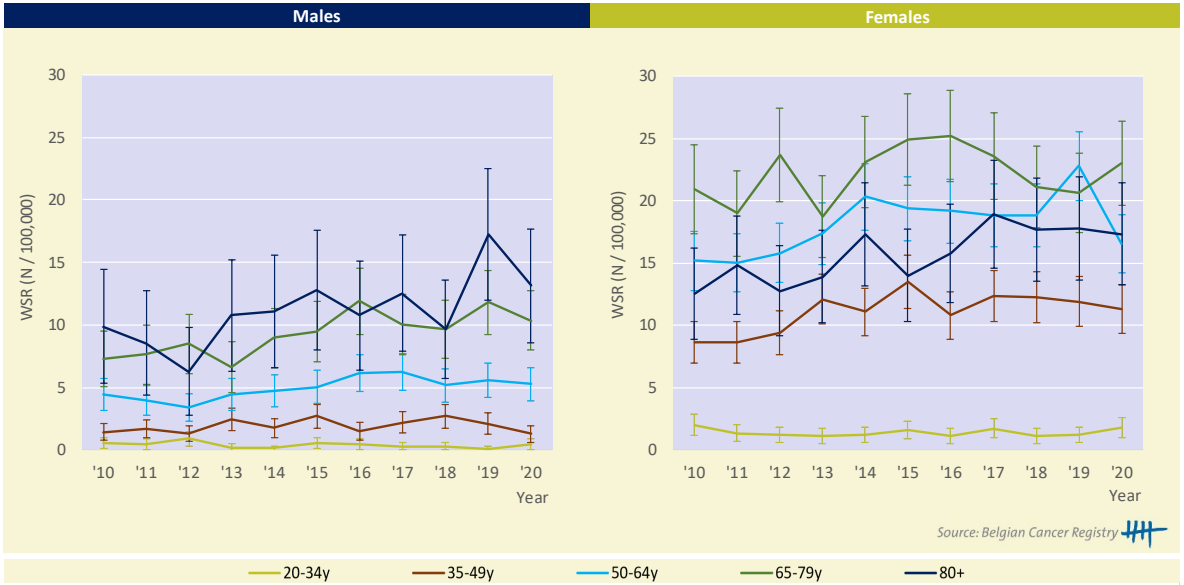
Incidence trends

Figure 5 Tumours of the meninges in adults: Age-standardised incidence rates* (WSR) by age group and behaviour in Belgium



** The age-standardised incidence rates are represented with 95% Confidence Intervals.*

Figure 6 Benign meningiomas in adults: Age-standardised incidence rates* (WSR) by sex and age group, Belgium 2010-2020



** The age-standardised incidence rates are represented with 95% Confidence Intervals.*

The results of benign tumours are only shown for the incidence period 2010-2020, since there was a remarkable improvement of registration completeness in the preceding period (2004-2009).

Table 2 Tumours of the meninges in adults: AAPC(%) by sex, age group and behaviour in Belgium

	Malignant 2004-2020			Borderline 2004-2020			Benign 2010-2020		
Incidence by age group	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period
20-34 yrs	-	-	-	-	-	-	-1.0	[-6.1; 4.4]	2010-2020
35-49 yrs	-1.4	[-8.0; 5.6]	2004-2020	9.1	[4.6; 13.9]	2004-2020	2.4	[-0.3; 5.2]	2010-2020
				5.9	[4.2; 7.7]	2004-2020	5.9	[1.8; 10.2]	2010-2017
				12.3	[9.3; 15.5]	2004-2014	-5.3	[-14.3; 4.6]	2017-2020
50-64 yrs	-0.7	[-5.2; 3.9]	2004-2020	-4.0	[-8.6; 0.9]	2014-2020	2.5	[0.7; 4.3]	2010-2020
							5.9	[2.6; 9.2]	2010-2016
							-2.3	[-7.0; 2.6]	2016-2020
65-79 yrs	2.1	[-1.8; 6.1]	2004-2020	4.7	[2.2; 7.4]	2004-2020	2.0	[-0.2; 4.1]	2010-2020
				13.5	[7.3; 19.9]	2004-2012			
				-3.3	[-8.5; 2.2]	2012-2020			
80+	-	-	-	-	-	-	3.8	[2.0; 5.7]	2010-2020
Incidence by age group and sex	Malignant 2004-2020			Borderline 2004-2020			Benign 2010-2020		
Males	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period
20-34 yrs							-7.3	[-18.4; 5.3]	2010-2020
35-49 yrs							2.0	[-4.0; 8.4]	2010-2020
50-64 yrs							4.1	[0.8; 7.5]	2010-2020
							4.2	[-7.4; 17.2]	2010-2013
							4.1	[-0.7; 9.0]	2013-2020
65-79 yrs							4.6	[2.0; 7.4]	2010-2020
80+							5.4	[1.0; 10.1]	2010-2020
Females	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period
20-34 yrs							-0.3	[-4.9; 4.6]	2010-2020
35-49 yrs							2.9	[0.7; 5.0]	2010-2020
							6.5	[2.6; 10.5]	2010-2016
							-2.3	[-7.9; 3.5]	2016-2020
50-64 yrs							2.8	[0.8; 4.8]	2010-2020
							7.9	[2.1; 14.0]	2010-2014
							-0.4	[-3.9; 3.1]	2014-2020
65-79 yrs							0.9	[-1.3; 3.2]	2010-2020
80+							3.5	[1.6; 5.6]	2010-2020

Source: Belgian Cancer Registry

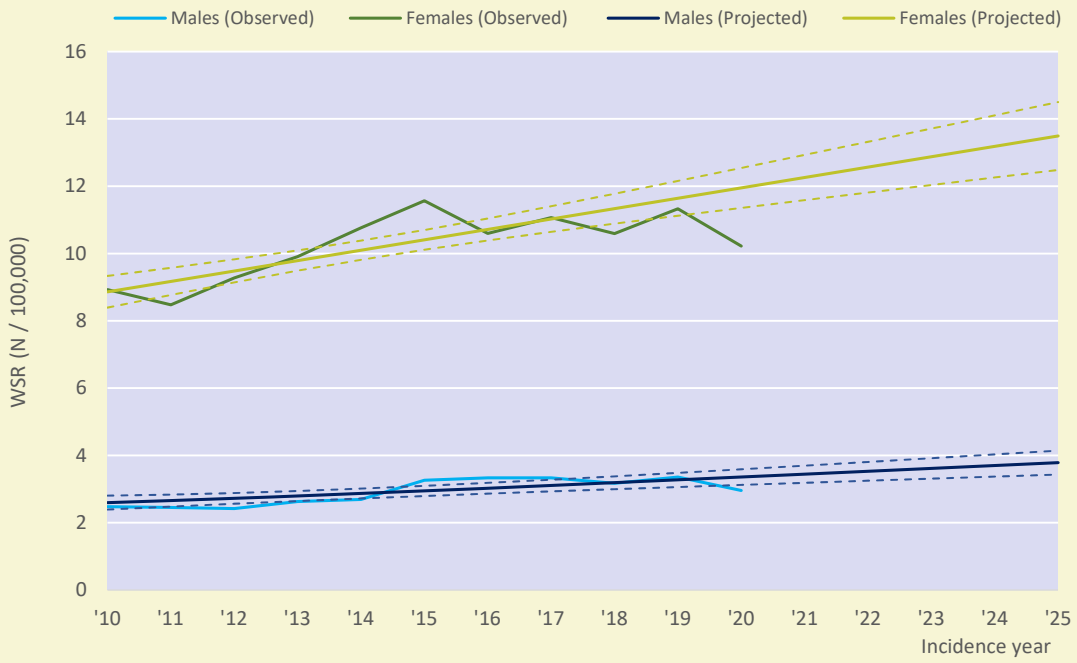
AAPC: average annual percentage change

Period: When a joinpoint occured, APC's are calculated for the period before and after the joinpoint. This column represents the corresponding time interval.

AAPC's are always calculated over the entire study-period.

Incidence projections

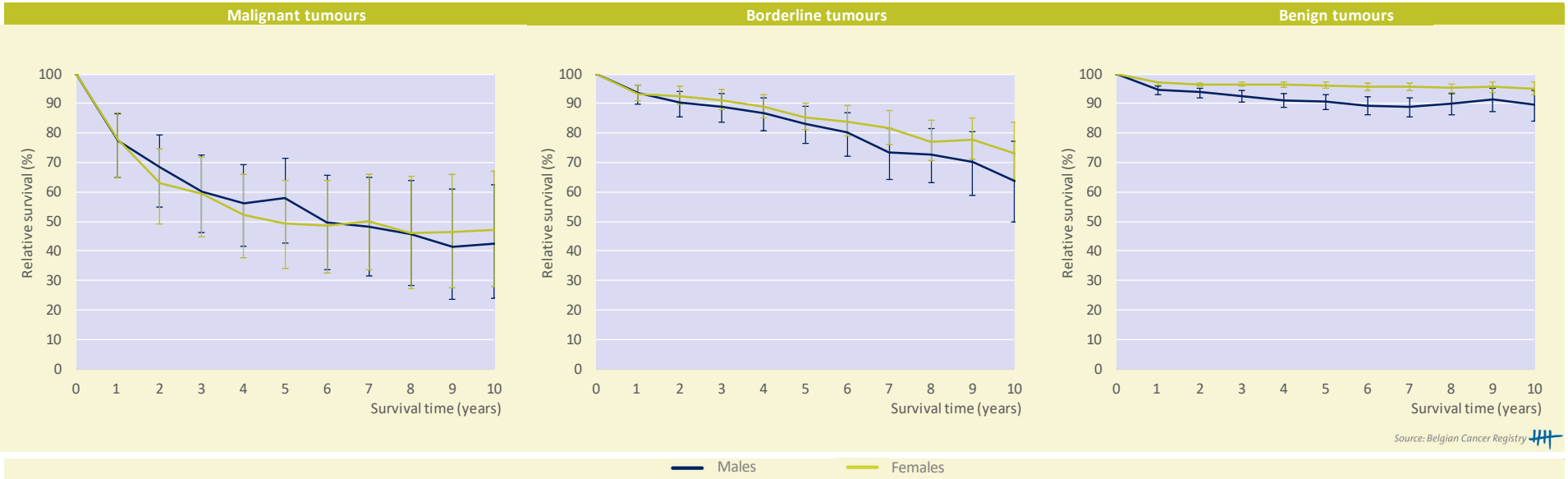
Figure 7 Benign meningiomas in adults:
Observed and projected* incidence (WSR) by sex, Belgium 2004-2025



** Represented with 95% Confidence Intervals. Incidence projections are calculated for 2020-2025 based on extrapolations of the observed incidence trends for 2010-2019*

Survival

Figure 8 Meningiomas* in adults: Relative survival* by sex and behaviour, Belgium 2011-2020



** The relative survival values are represented with 95% Confidence Intervals. Since the great majority of all tumours of the meninges are represented by meningiomas, results are only shown for the latter (see Figure 3).*

Table 3 Meningiomas* in adults: Conditional 5-year relative survival** by sex and behaviour (Belgium, 2011-2020)

	Males					
	Malignant tumours		Borderline tumours		Benign tumours	
X years since diagnosis	N at risk	%	N at risk	%	N at risk	%
1 year	54	64.3	281	85.7	1,576	94.5
2 year	-	-	243	81.3	1,389	94.6
3 year	-	-	214	81.7	1,158	97.2
	Females					
	Malignant tumours		Borderline tumours		Benign tumours	
X years since diagnosis	N at risk	%	N at risk	%	N at risk	%
1 year	-	-	381	89.9	5,539	98.7
2 year	-	-	345	88.3	5,017	99.3
3 year	-	-	307	84.8	4,361	98.7

Source: Belgian Cancer Registry

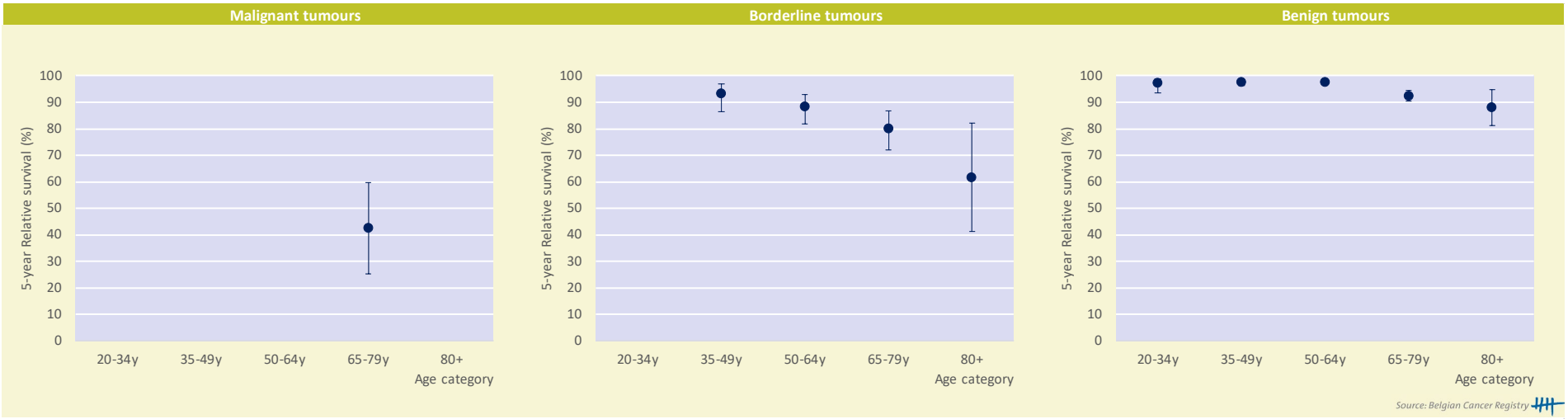
** Since the great majority of all tumours of the meninges are represented by meningiomas, results are only shown for the latter (see Figure 3).*

*** Unadjusted 5-yr relative survival probability conditional on surviving the first X years since diagnosis, %*

Interpretation in lay-man's terms: Given that a patient has already survived X years, what is the relative survival probability 5 years later.

Relative survival data are not presented when the number of patients at risk is less than 50 cases.

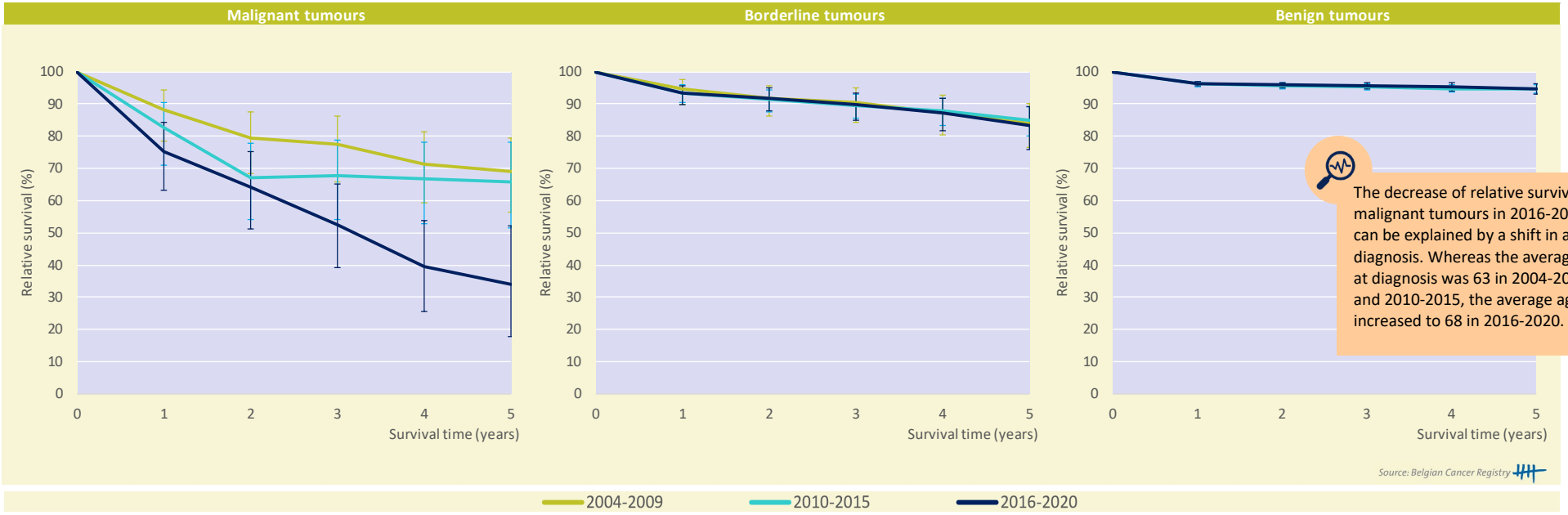
Figure 9 Meningiomas in adults: Age-specific 5-year relative survival* by age and behaviour, Belgium 2011-2020



** The relative survival values are represented with 95% Confidence Intervals. Since the great majority of all tumours of the meninges are represented by meningiomas, results are only shown for the latter (see Figure 3). Relative survival data are not presented when the number of patients at risk is less than 50 cases.*

Survival trends

Figure 10 Meningiomas in adults: Relative survival* by cohort and behaviour, Belgium 2004-2020



The decrease of relative survival for malignant tumours in 2016-2020 can be explained by a shift in age at diagnosis. Whereas the average age at diagnosis was 63 in 2004-2009 and 2010-2015, the average age increased to 68 in 2016-2020.

** The relative survival values are represented with 95% Confidence Intervals. Since the great majority of all tumours of the meninges are represented by meningiomas, results are only shown for the latter (see Figure 3).*

TUMOURS OF THE BRAIN IN ADULTS

3.2 TUMOURS OF THE BRAIN* IN ADULTS

3.2.1 ALL TUMOURS OF THE BRAIN AND MAIN HISTOLOGICAL SUBTYPES IN ADULTS

MAIN SUBTYPES:

- *Astrocytoma*
- *Oligodendroglioma*
- *Glioblastoma*
- *Anaplastic astrocytoma*
- *Anaplastic oligodendroglioma*
- *Diffuse large B-cell lymphoma (DLBCL)*

KEYNOTES

Incidence

- Malignant tumours of the brain are more often observed in males (male/female ratio = 1.6) and incidence increases with age with a peak for patients aged 75.
- Malignant tumours are generally diagnosed in older patients (median age = 64 years) compared to borderline and benign tumours (median ages are 48 years and 48.5, respectively).
- The primary location of the tumour is frequently registered using the unspecified C71.9 topography code (brain, not otherwise specified) with a proportion of about 30% for (borderline) malignant tumours and 50% for benign tumours.
- Gliomas represent 89% of the malignant tumours in the brain and 38% of all borderline tumours. Glioblastomas are the most common subtype of gliomas (73% of all gliomas). Haematolymphoid tumours (especially diffuse large B-cell lymphoma – DLBCL) represent 64% of all the brain tumours when excluding gliomas.
- Within the group of gliomas, glioblastoma is the dominant subtype in all age groups. The proportion of glioblastomas increases with the age of patients: from 26% of all gliomas for the age group 20-34yr to 89% for the age group 80+.
- Incidence of tumours of the brain in adults is stable since 2004 (cfr. the following recent study on adult gliomas[31]). However, a substantial incidence drop is observed for 2020, the first year of the COVID-19 pandemic. Differences between the observed incidence and the incidence projections for 2020 suggest that this decline is mostly seen in males.

Survival

- Relative survival is similar in males and females but is largely dependent upon the tumour subtype. In the group of malignant tumours, patients with medulloblastoma have the best prognosis (10-yr relative survival of 75%), while patients diagnosed with glioblastoma have the poorest prognosis (for every age category; 10-yr relative survival of 2%).
- Since 2004, there was no change in the 5-yr relative survival of all malignant tumours combined, but for some subtypes considerable changes were found. There was a substantial improvement of the 5-yr relative survival for patients with anaplastic astrocytoma (from 22% in 2004-2009 to 36% in 2016-2020) and oligodendroglioma (from 64% in 2004-2009 to 87% in 2016-2020).
- The improvement for oligodendroglioma could partly be explained by the requirement of a molecular diagnosis since 2016 (IDH-mutation and/or 1p/19q codeletion; see[31] for more information on this topic). Probably some registered oligodendroglioma were misclassified in the past because of missing information on those molecular biomarkers. Thus, this could have influenced the survival negatively since both biomarkers are known to have a favourable impact on the prognosis. Moreover, treatment guidelines have been changed with the addition of chemotherapy to standard radiotherapy for both oligodendroglioma as well as for anaplastic astrocytoma.

** The tumours of the brain are presented in this chapter by tumour behaviour (malignant/borderline/benign; cf. all chapters with epidemiological results). This distinction does not completely correspond to clinical practice where it is more common to distinguish tumours based on the WHO grade. The relation between tumour behaviour and WHO grade for these tumours can be found in Table 1 of "Methods and data quality".*

Table 1 Tumours of the brain in adults: Overview of incidence, prevalence and survival by behaviour and sex in Belgium

	Males								
	Malignant tumours			Borderline tumours			Benign tumours		
Incidence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Incidence, 2016-2020	2,497	11.6	9.0	159	0.7	0.7	69	0.3	0.3
Prevalence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Prevalence (5 years), 2016-2020	879	20.1	18.3	163	3.7	4.0	72	1.6	1.8
Prevalence (10 years), 2011-2020	1,271	29.1	27.3	314	7.2	7.8	134	3.1	3.3
Relative survival	N at risk	%	95%CI	N at risk	%	95%CI	N at risk	%	95%CI
5-year Relative survival, 2016-2020	2,486	19.2	[17.4;21.1]	158	87.0	[78.0;93.3]	68	88.0	[69.2;97.1]
10-year Relative survival, 2011-2020	4,831	13.4	[12.0;14.9]	302	88.5	[81.2;94.3]	131	88.5	[72.1;99.6]
	Females								
	Malignant tumours			Borderline tumours			Benign tumours		
Incidence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Incidence, 2016-2020	1,776	7.8	5.7	129	0.6	0.6	71	0.3	0.3
Prevalence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Prevalence (5 years), 2016-2020	635	13.8	12.4	124	2.7	3.0	69	1.5	1.6
Prevalence (10 years), 2011-2020	941	20.5	19.1	239	5.2	5.9	149	3.2	3.3
Relative survival	N at risk	%	95%CI	N at risk	%	95%CI	N at risk	%	95%CI
5-year Relative survival, 2016-2020	1,767	19.3	[17.1;21.6]	127	92.5	[83.8;97.5]	70	100.4	[91.6;102.7]
10-year Relative survival, 2011-2020	3,457	14.5	[12.8;16.3]	242	79.5	[67.3;88.5]	149	104.6	[96.6;108.6]
Median age at diagnosis, 2016-2020	64 [Q1: 52;Q3: 74]			48 [Q1: 31;Q3: 60]			48.5 [Q1: 33;Q3: 62]		
M/F-ratio, 2016-2020	1.6			1.2			1.0		

Source: Belgian Cancer Registry

CR: crude (all ages) rate (N/100,000 person years)

WSR: age-standardised rate using the World Standard Population (N/100,000 person years)

Incidence

Figure 1 Tumours of the brain in adults: Age-specific incidence rates (N/100,000) by behaviour and sex in Belgium

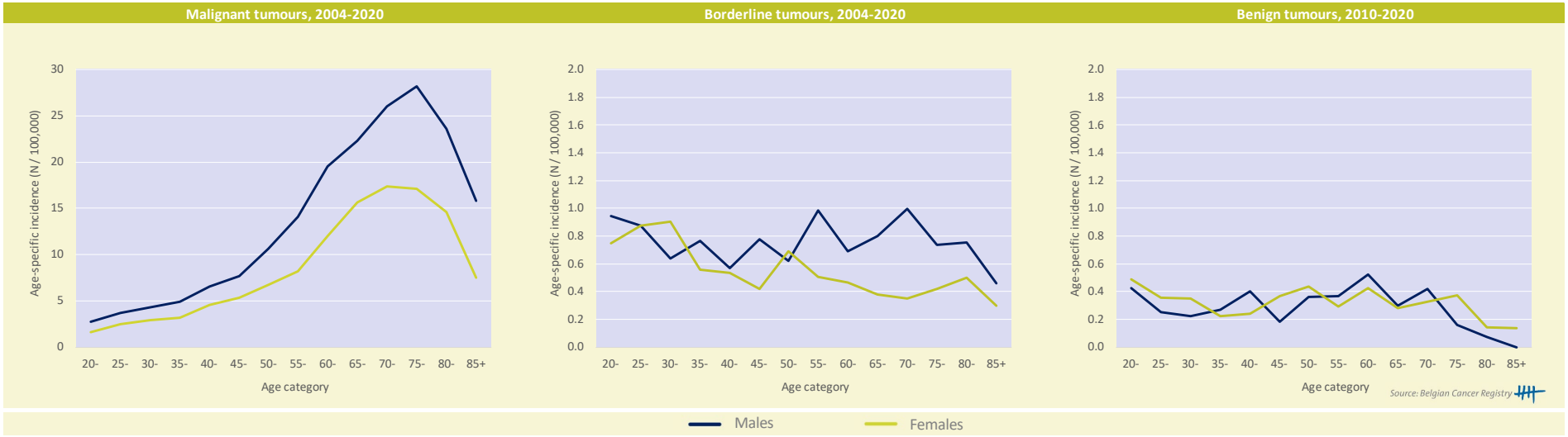
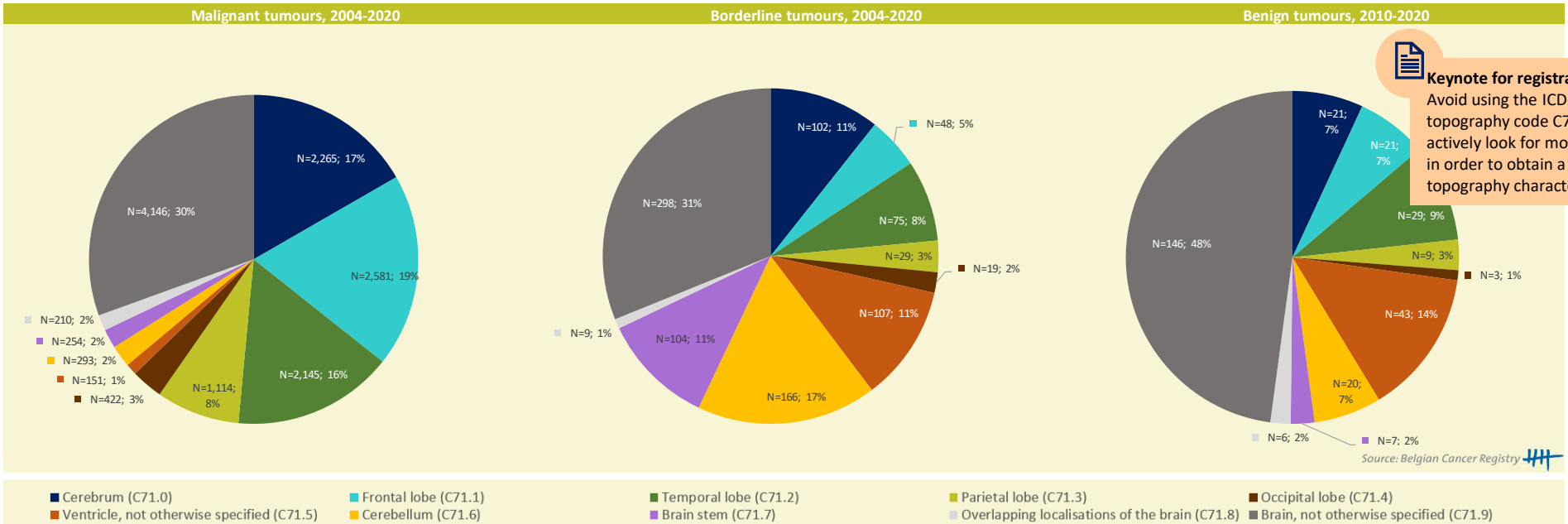
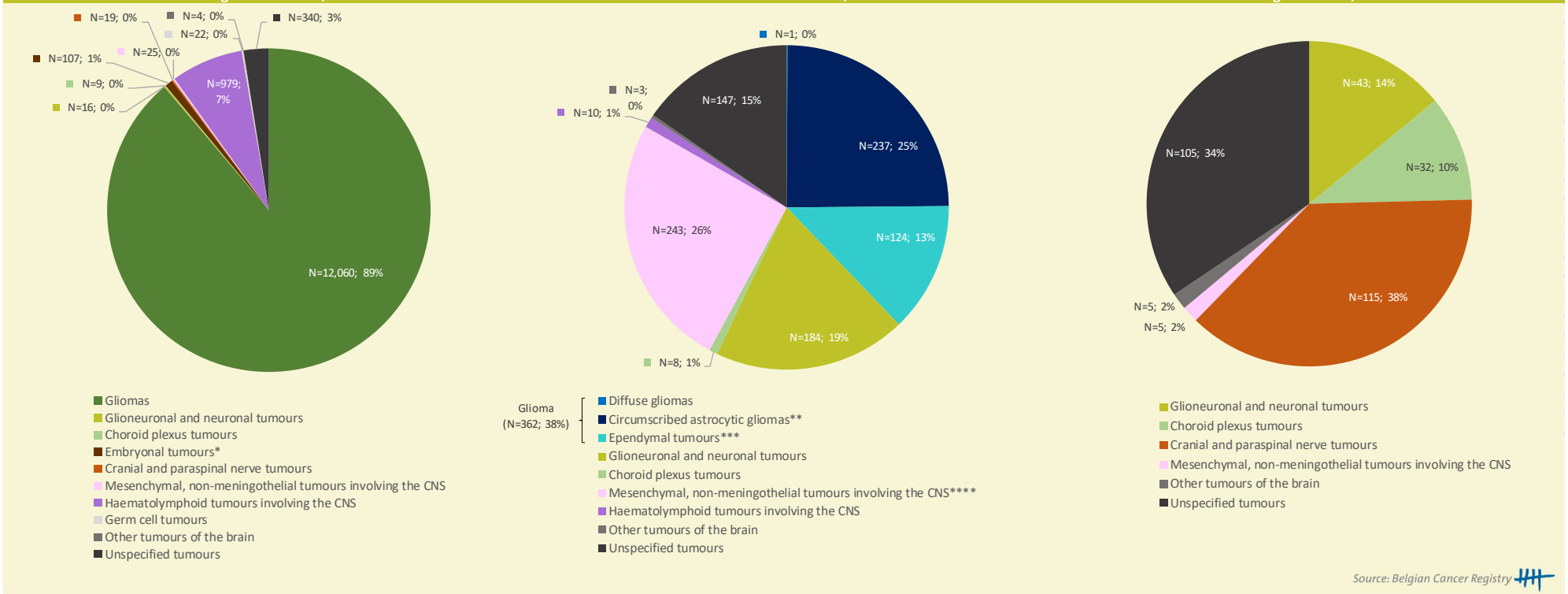


Figure 2 Tumours of the brain in adults: Incidence by primary location and behaviour in Belgium



Keynote for registration:
Avoid using the ICD-O-3 topography code C71.9 and actively look for more information in order to obtain a more specific topography characterisation.

Figure 3 Tumours of the brain in adults: Incidence by histology and behaviour in Belgium



A description of the classification of all tumour types can be found in Table 1 of "Methods and data quality".

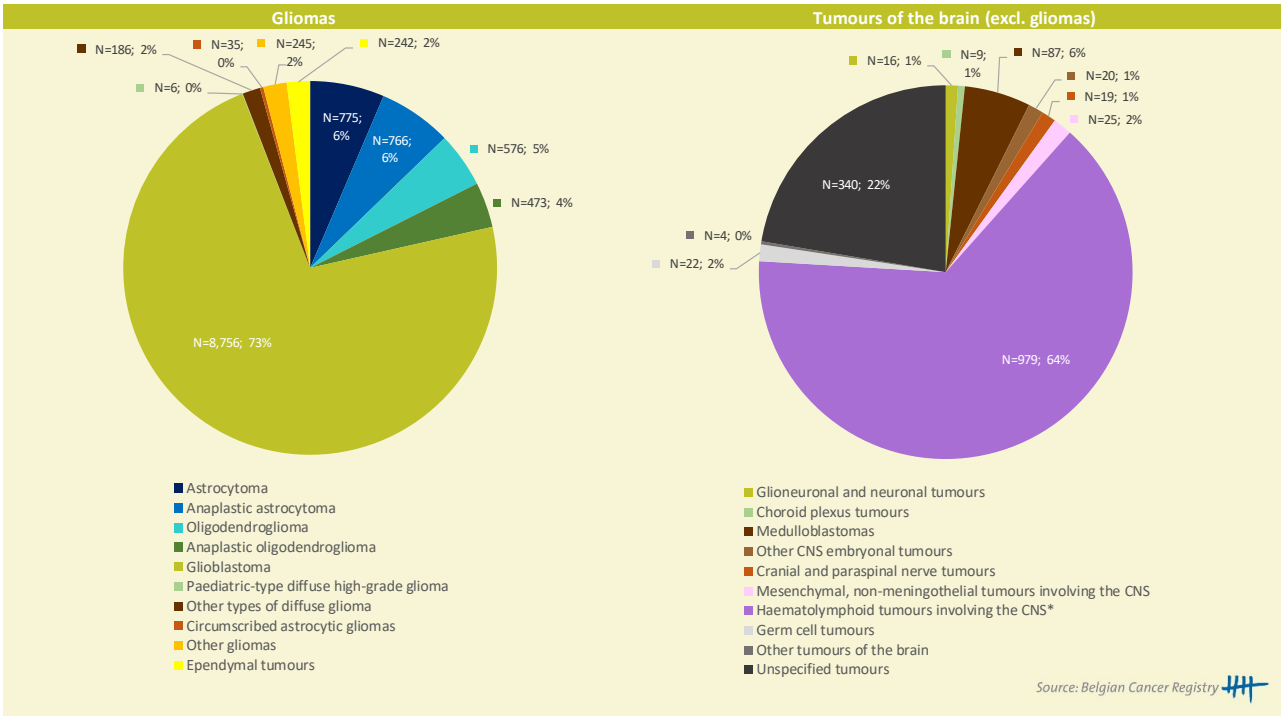
** The majority of malignant embryonal tumours in the brain are represented by medulloblastomas (81%; N=87).*

*** The majority of borderline circumscribed astrocytic gliomas in the brain are represented by pilocytic astrocytoma (91%; N=216).*

**** The majority of borderline ependymal tumours in the brain are represented by subependymoma (96%; N=119).*

***** The majority of borderline mesenchymal, non-meningothelial tumours involving the CNS in the brain are represented by haemangioblastoma of the CNS (94%; N=229).*

Figure 4 Malignant tumours of the brain in adults: Incidence by histology in Belgium, 2004-2020

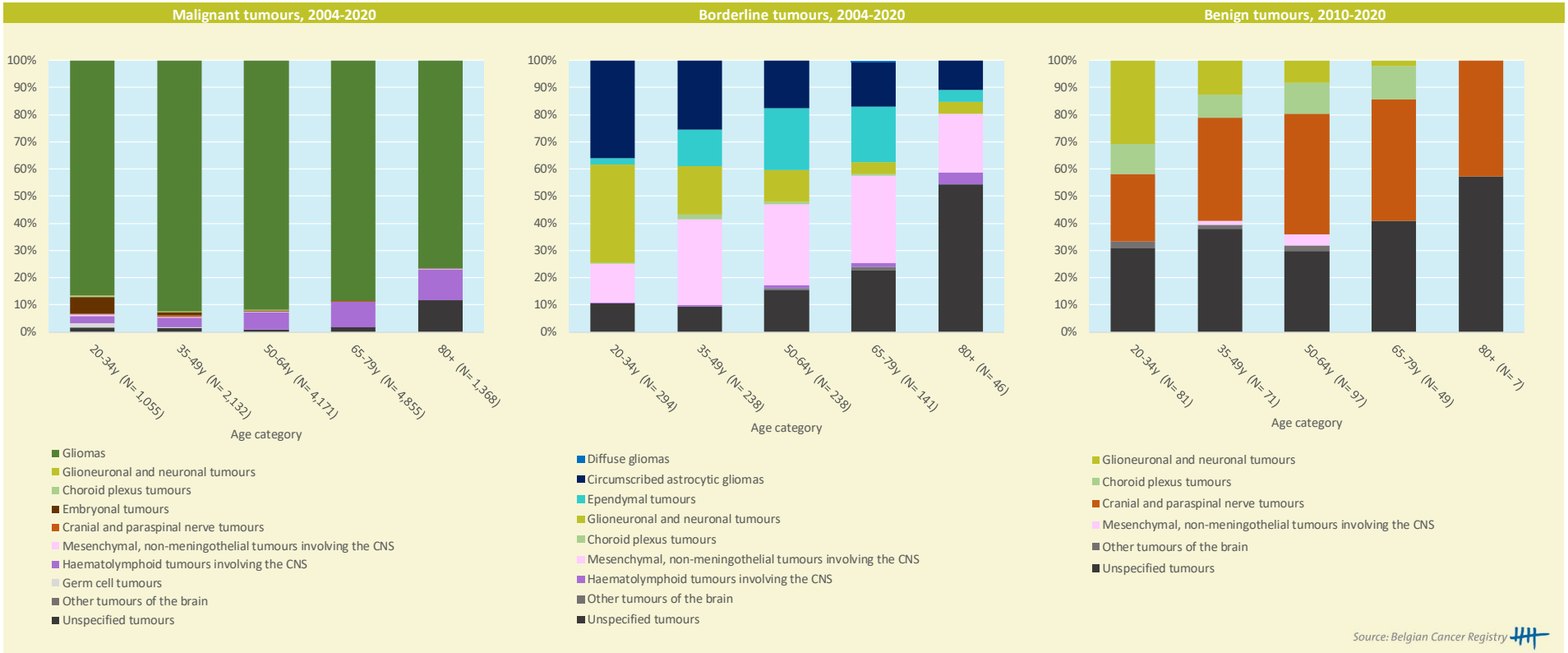


A description of the classification of all tumour types can be found in Table 1 of "Methods and data quality".

** The majority of malignant haematolymphoid tumours involving the CNS in the brain are represented by diffuse large B-cell lymphoma (DLBCL) of the CNS (88%; N=863).*

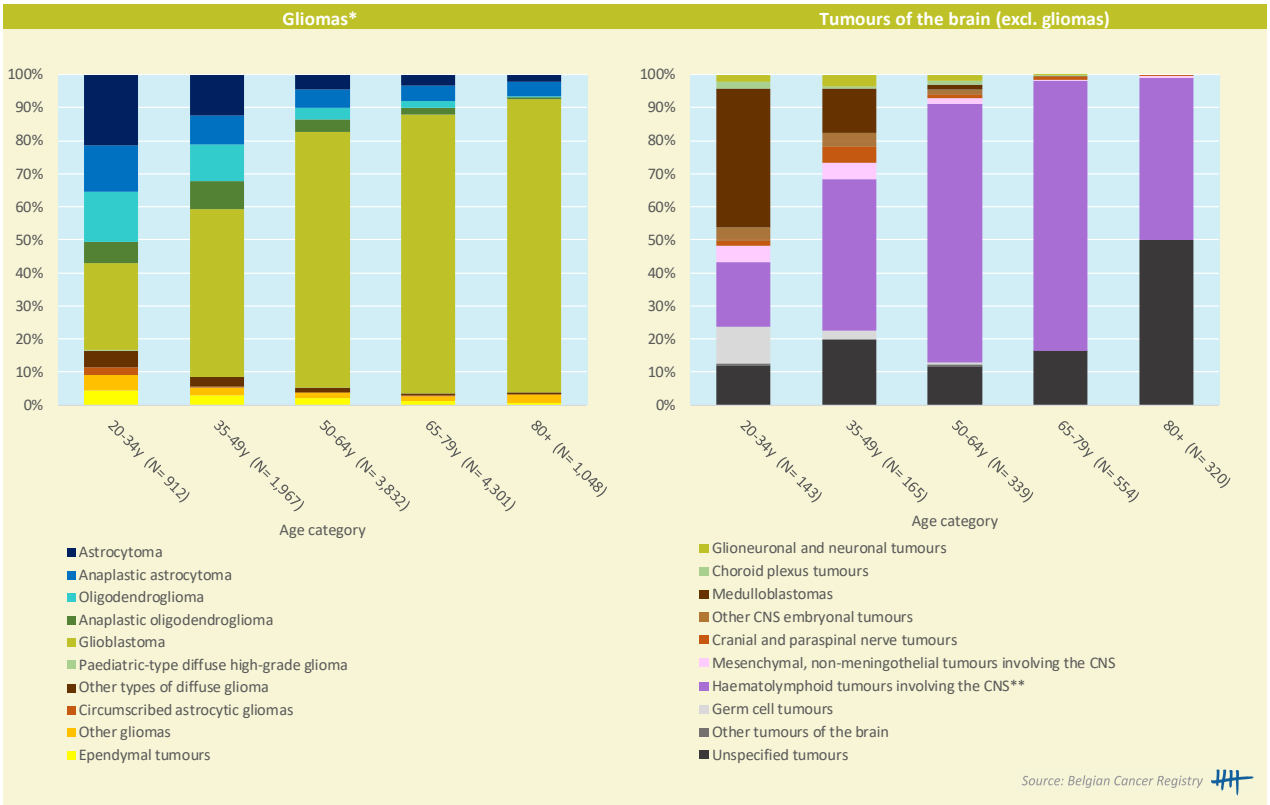
Keynote for registration:
The inclusion criteria used in this publication for the classification of tumours of the brain (cfr. Table 1 in Methods and data quality) do not incorporate information on molecular markers, as required for the 5th edition of the WHO classification (cfr. Appendix I). These specifications are crucial to determine the prognosis.

Figure 5 Tumours of the brain in adults: Incidence by histology, age group and behaviour in Belgium



A description of the classification of all tumour types can be found in Table 1 of "Methods and data quality".

Figure 6 Malignant tumours of the brain in adults: Incidence by histology and age group in Belgium, 2004-2020

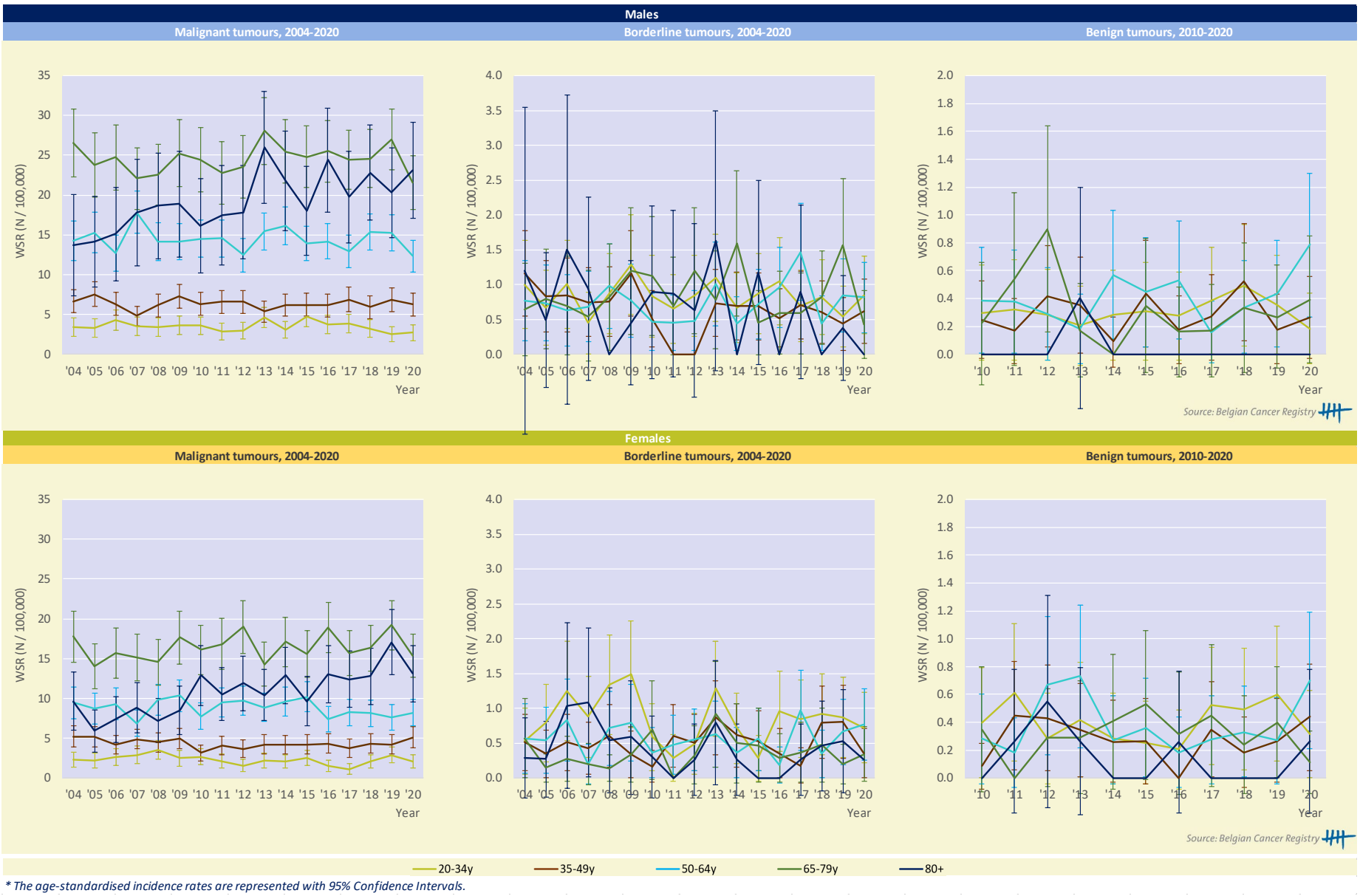


** More exhaustive and specific data on the incidence of gliomas can be found in the "Detailed chapter with focus on adult gliomas".*

*** The majority of malignant haematolymphoid tumours in the brain are represented by diffuse large B-cell lymphoma (DLBCL) of the CNS (88%;N=863).*

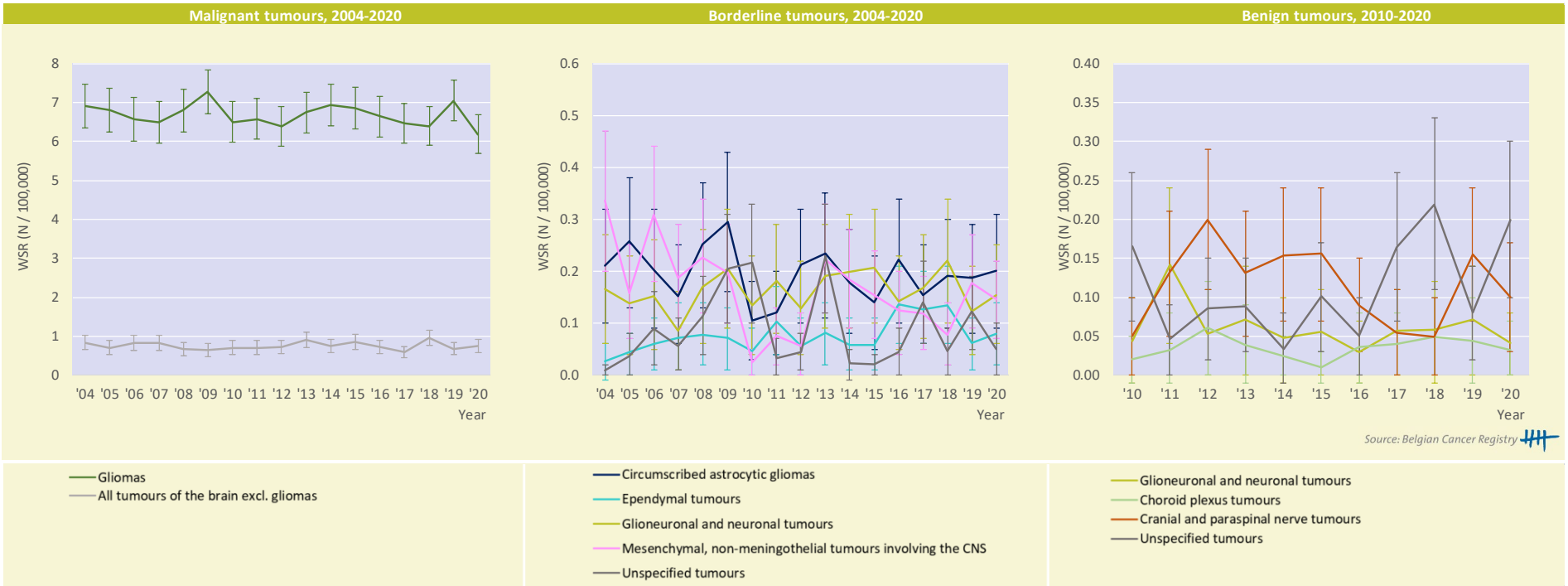
Incidence trends

Figure 7 Tumours of the brain in adults: Age-standardised incidence rates* (WSR) by sex, age group and behaviour in Belgium



** The age-standardised incidence rates are represented with 95% Confidence Intervals.*

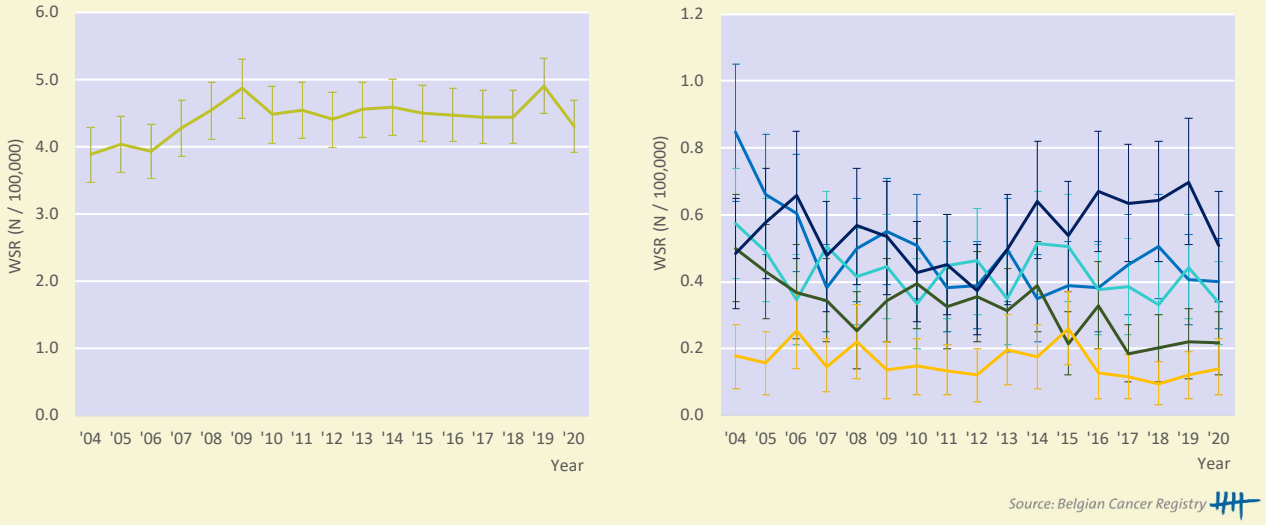
Figure 8 Tumours of the brain in adults: Age-standardised incidence rates* (WSR) by histology and behaviour in Belgium



** The age-standardised incidence rates are represented with 95% Confidence Intervals.*
Only subtypes are shown for which there were enough patients for a representative incidence trend analysis

The results of benign tumours are only shown for the incidence period 2010-2020, since there was a remarkable improvement of registration completeness in the preceding period (2004-2009).

Figure 9 **Malignant gliomas in adults: Age-standardised incidence rates* (WSR) by histology, Belgium 2004-2020**



** The age-standardised incidence rates are represented with 95% Confidence Intervals.*

Table 2 Tumours of the brain in adults: AAPC(%) by sex, age group, histology and behaviour in Belgium

Incidence by age group and sex	Malignant 2004-2020			Borderline 2004-2020			Benign 2010-2020		
Males	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period
20-34 yrs	-0.8	[-2.7; 1.2]	2004-2020	-0.6	[-3.4; 2.4]	2004-2020	0.7	[-5.2; 7.1]	2010-2020
	0.5	[-5.2; 6.6]	2004-2010						
	-1.5	[-4.7; 1.8]	2010-2020						
35-49 yrs	-0.1	[-1.2; 1.0]	2004-2020	-	-	-	1.2	[-9.7; 13.5]	2010-2020
50-64 yrs	-0.4	[-1.4; 0.7]	2004-2020	0.9	[-2.8; 4.7]	2004-2020	3.9	[-6.2; 15.1]	2010-2020
65-79 yrs	0.1	[-0.7; 0.9]	2004-2020	-0.1	[-4.3; 4.2]	2004-2020	-	-	-
80+	2.9	[1.6; 4.2]	2004-2020	-	-	-	-	-	-
Females	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period
20-34 yrs	-2.1	[-4.7; 0.6]	2004-2020	-0.8	[-5.8; 4.5]	2004-2020	0.5	[-7.4; 9.1]	2010-2020
35-49 yrs	-0.9	[-2.0; 0.3]	2004-2020	0.9	[-4.1; 6.1]	2004-2020	-	-	-
	-4.5	[-7.2; -1.6]	2004-2011						
	2.0	[-0.2; 4.3]	2011-2020						
50-64 yrs	-0.7	[-1.9; 0.6]	2004-2020	0.1	[-4.8; 5.3]	2004-2020	1.6	[-9.1; 13.6]	2010-2020
65-79 yrs	0.5	[-0.5; 1.6]	2004-2020	-	-	-	-	-	-
80+	4.4	[2.6; 6.3]	2004-2020	-	-	-	-	-	-
Incidence by histology and behaviour	Malignant 2004-2020			Borderline 2004-2020			Benign 2010-2020		
Malignant tumours	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period
All tumours of the brain excl. Gliomas	-0.2	[-1.5; 1.2]	2004-2020						
Gliomas	-0.2	[-0.7; 0.2]	2004-2020						
Glioblastoma	1.0	[0.6; 1.4]	2004-2020						
	3.7	[2.2; 5.3]	2004-2009						
	-0.3	[-0.8; 0.3]	2009-2020						
Astrocytoma	-0.3	[-2.1; 1.6]	2004-2020						
	-3.4	[-6.5; -0.2]	2004-2012						
	9.9	[4.4; 15.8]	2012-2017						
	-7.6	[-17.0; 3.0]	2017-2020						
Anaplastic astrocytoma	-3.2	[-4.8; -1.6]	2004-2020						
	-7.9	[-11.8; -3.8]	2004-2011						
	0.6	[-2.6; 4.0]	2011-2020						
Oligodendroglioma	-1.5	[-3.2; 0.3]	2004-2020						
Anaplastic oligodendroglioma	-4.4	[-6.3; -2.5]	2004-2020						
Ependymal tumours	-2.5	[-5.1; 0.2]	2004-2020						
Borderline tumours	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period
Circumscribed astrocytic gliomas				-0.9	[-3.8; 2.0]	2004-2020			
Ependymal tumours				6.6	[2.6; 10.7]	2004-2020			
				20.5	[1.6; 43.0]	2004-2008			
				2.3	[-2.6; 7.4]	2008-2020			
Glioneuronal and neuronal tumours				1.1	[-1.4; 3.7]	2004-2020			
Mesenchymal, non-meningothelial tumours involving the CNS				-5.8	[-12.9; 2.0]	2004-2020			
				-26.2	[-53.5; 17.1]	2004-2007			
				-0.3	[-8.7; 8.8]	2007-2020			
Unspecified tumours				5.7	[-3.8; 16.1]	2004-2020			
				44.4	[2.8; 102.9]	2004-2009			
				-8.3	[-20.2; 5.4]	2009-2020			
Benign tumours	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period
Choroid plexus tumours							3.1	[-7.3; 14.8]	2010-2020
Cranial and paraspinal nerve tumours							0.1	[-10.6; 12.0]	2010-2020
							28.2	[-15.4; 94.3]	2010-2013
							-10.0	[-23.7; 6.0]	2013-2020
Glioneuronal and neuronal tumours							-3.4	[-11.3; 5.2]	2010-2020
Unspecified tumours							7.2	[-5.9; 22.2]	2010-2020

Source: Belgian Cancer Registry

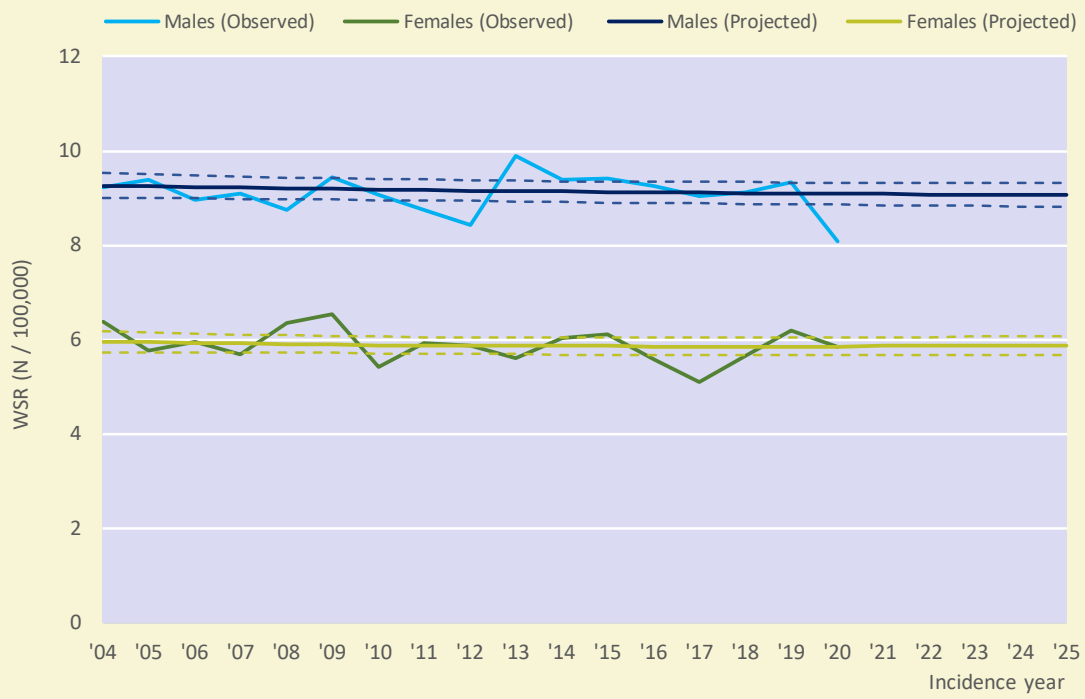
AAPC: average annual percentage change

Period: When a joinpoint occured, APC's are calculated for the period before and after the joinpoint. This column represents the corresponding time interval.

AAPC's are always calculated over the entire study-period.

Incidence projections

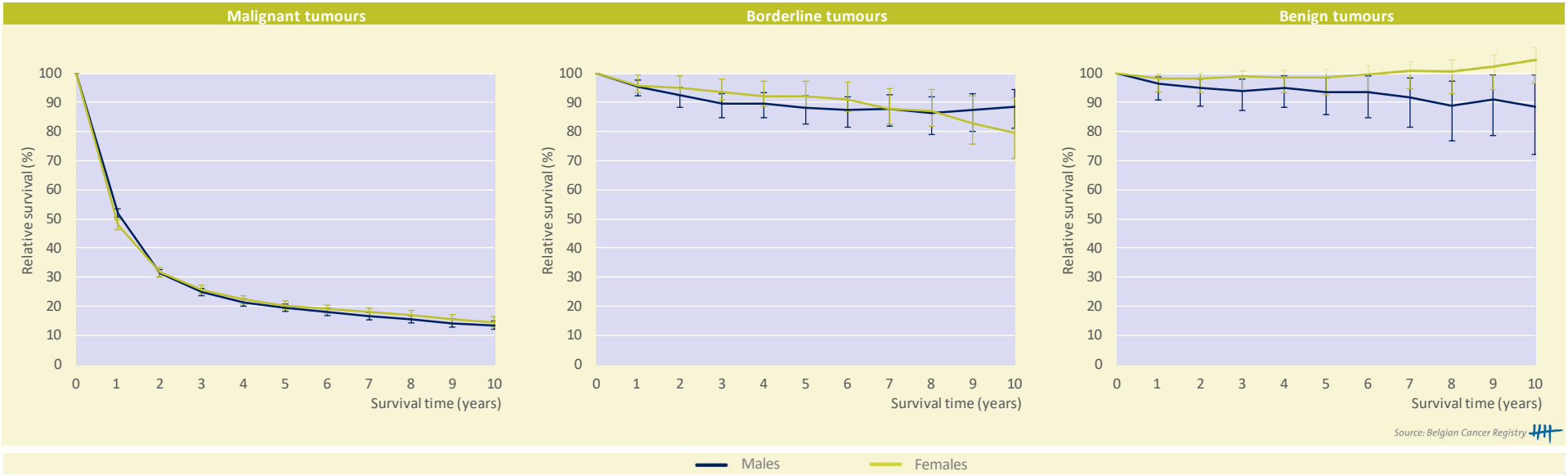
Figure 10 **Malignant tumours of the brain in adults: Observed and projected* incidence (WSR) by sex, Belgium 2004-2025**



** Represented with 95% Confidence Intervals. Incidence projections are calculated for 2020-2025 based on extrapolations of the observed incidence trends for 2004-2019*

Survival

Figure 11 Tumours of the brain in adults: Relative survival* by sex and behaviour, Belgium 2011-2020



*The relative survival values are represented with 95% Confidence Intervals.
Some relative survival values may exceed 100% (see benign tumours). This means that the survival is better than that of a similar group of people (in terms of age, gender and calendar year) from the general population. This phenomenon can be explained by a healthier lifestyle or a closer medical follow-up of patients, but may also be explained by the used methodology (see Methods and data quality). The latter is the case when, for example, the comparison group from the general population is too different from the group of patients (because the comparison was only made based on a limited number of factors).

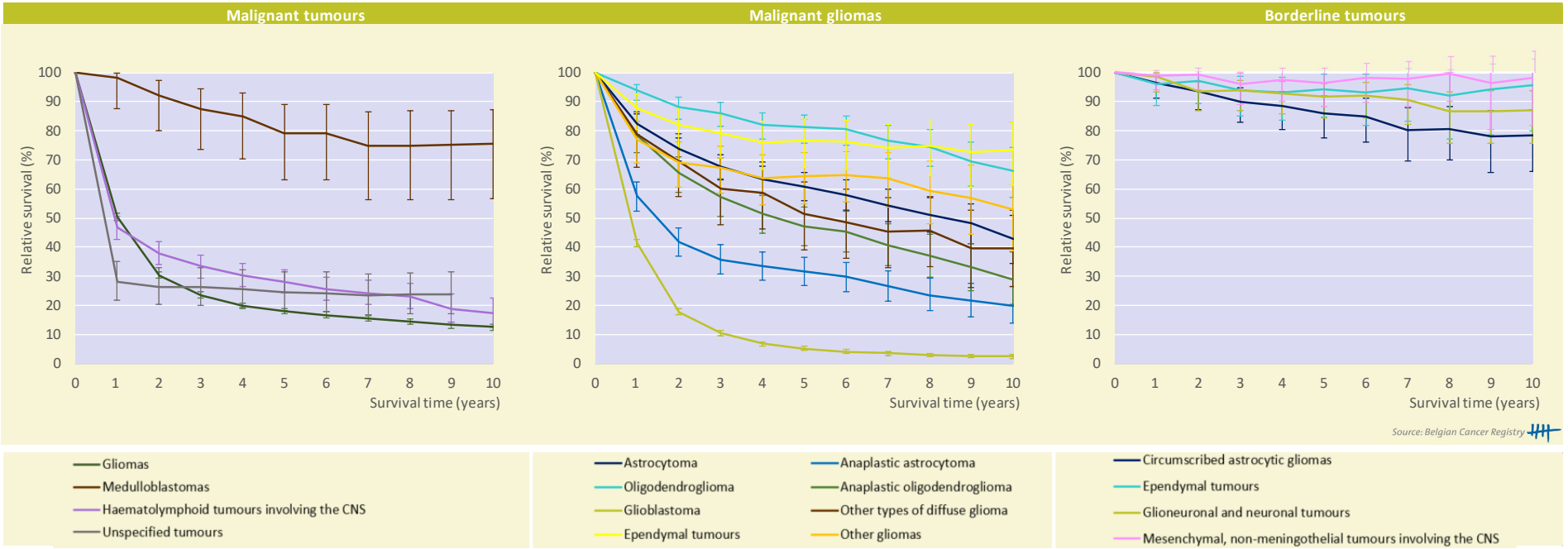
Table 3 Tumours of the brain in adults: Conditional 5-year relative survival* by sex and behaviour (Belgium, 2011-2020)

	Males					
	Malignant tumours		Borderline tumours		Benign tumours	
X years since diagnosis	N at risk	%	N at risk	%	N at risk	%
1 year	2,465	34.6	284	91.5	125	97.1
2 year	1,395	52.4	252	95.2	111	96.7
3 year	964	61.9	209	96.3	96	94.7
	Females					
	Malignant tumours		Borderline tumours		Benign tumours	
X years since diagnosis	N at risk	%	N at risk	%	N at risk	%
1 year	1,677	39.7	227	95.2	144	101.5
2 year	1,029	56.5	209	92.4	131	102.9
3 year	740	66.1	176	93.0	113	101.9

Source: Belgian Cancer Registry

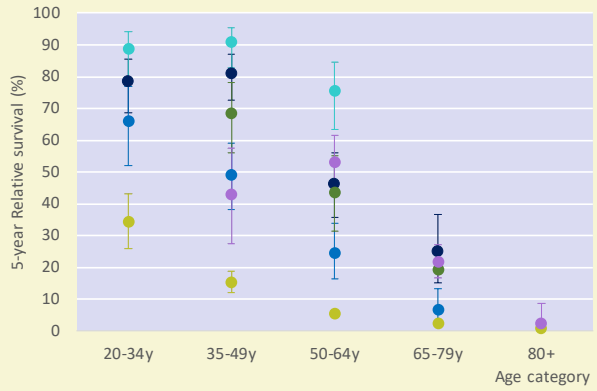
* Unadjusted 5-yr relative survival probability conditional on surviving the first X years since diagnosis, %
* Interpretation in lay-man's terms: Given that a patient has already survived X years, what is the relative survival probability 5 years later.

Figure 12 Tumours of the brain in adults: Relative survival* by histology and behaviour, Belgium 2011-2020



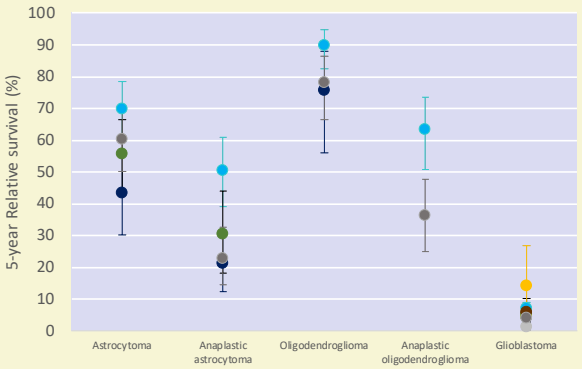
** The relative survival values are represented with 95% Confidence Intervals.*
Relative survival data are not presented for histological subtypes if the number of patients at risk is less than 50 cases.

Figure 13 Malignant tumours of the brain in adults: Age-specific 5-year relative survival* by age and histology, Belgium 2011-2020



- Astrocytoma
- Anaplastic astrocytoma
- Oligodendroglioma
- Anaplastic oligodendroglioma
- Glioblastoma
- Haematolymphoid tumours involving the CNS

Figure 14 Malignant gliomas of the brain in adults: Age-specific 5-year relative survival* by location** and histology, Belgium 2011-2020



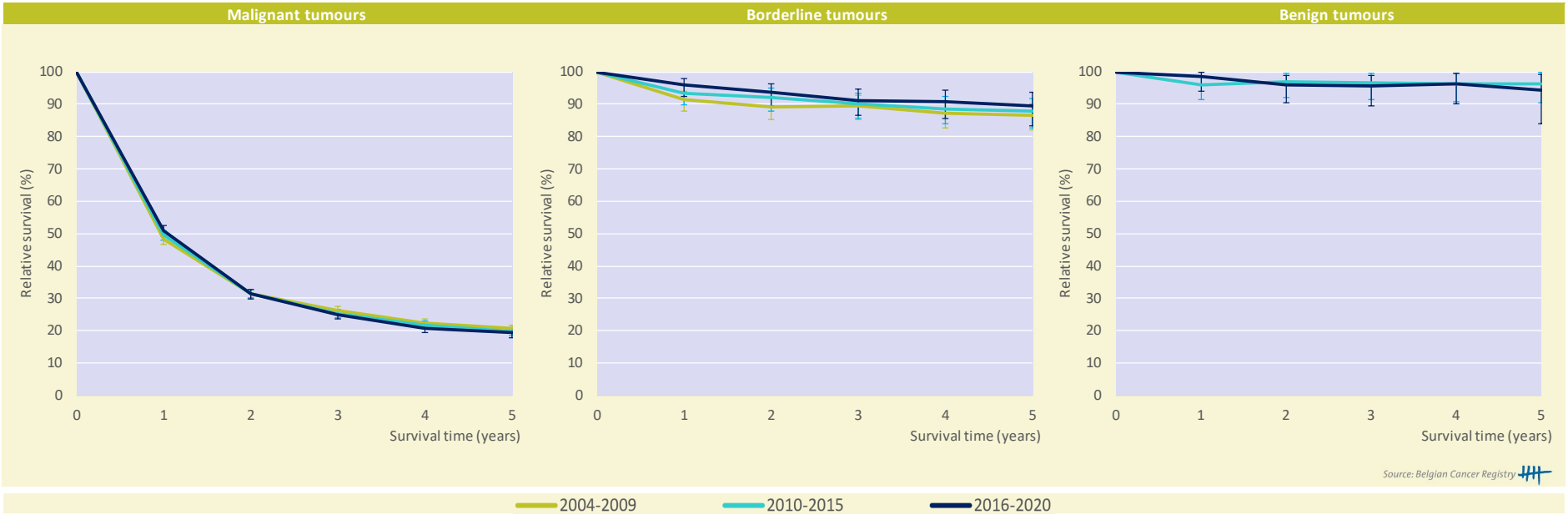
Source: Belgian Cancer Registry

- Cerebrum (C71.0)
- Frontal lobe (C71.1)
- Temporal lobe (C71.2)
- Parietal lobe (C71.3)
- Occipital lobe (C71.4)
- Cerebellum (C71.6)
- Overlapping localisations of the brain (C71.8)
- Brain, not otherwise specified (C71.9)

** The relative survival values are represented with 95% Confidence Intervals.*
Relative survival data are not presented when the number of patients at risk is less than 50 cases (for example 80+ age group).
*** Tumour location is defined by ICD-O-3 topography code.*

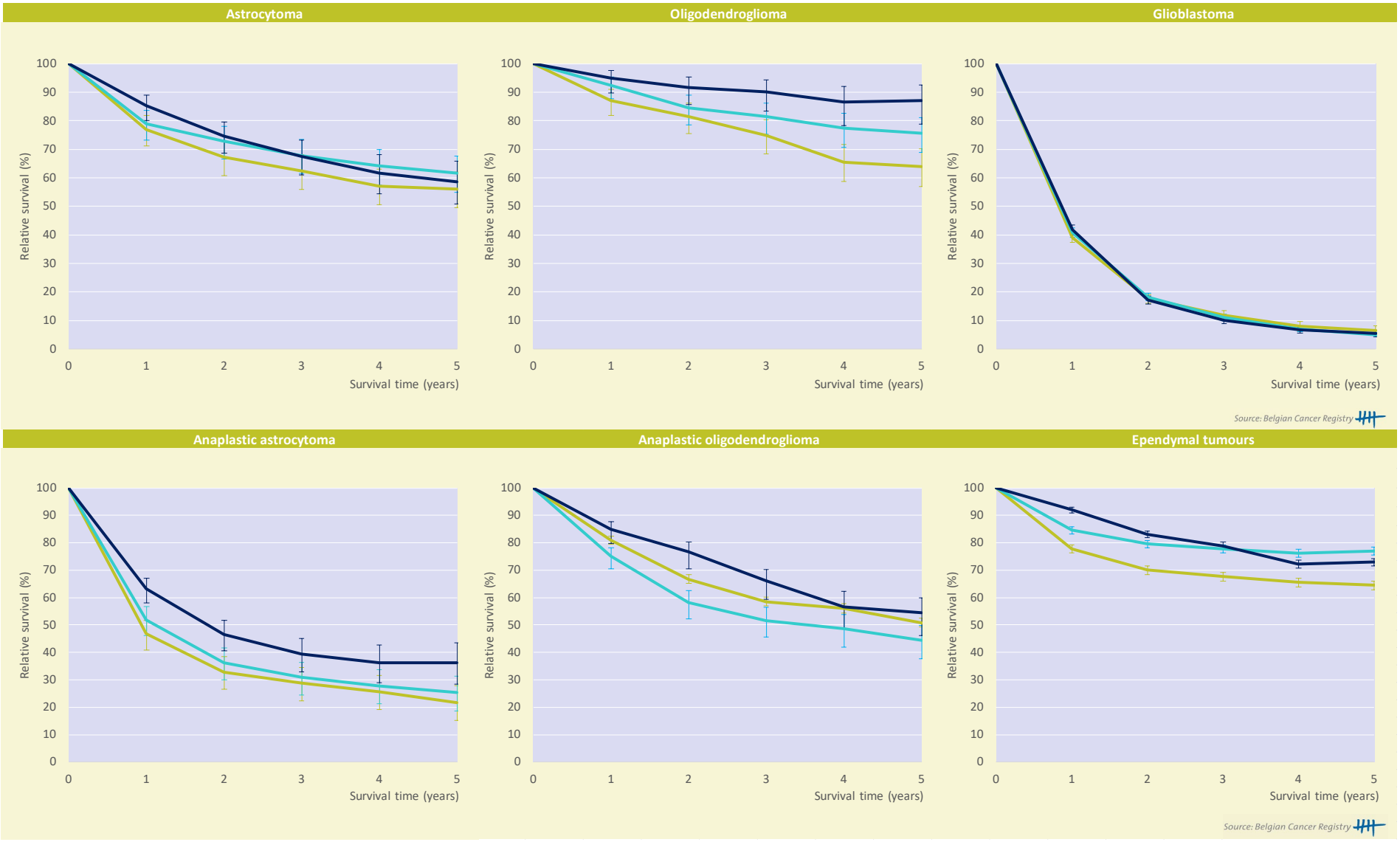
Survival trends

Figure 15 Tumours of the brain in adults: Relative survival* by cohort and behaviour, Belgium 2004-2020



** The relative survival values are represented with 95% Confidence Intervals.*

Figure 16 Malignant gliomas of the brain in adults: Relative survival* by cohort and histology, Belgium 2004-2020



** The relative survival values are represented with 95% Confidence Intervals.*

3.2.2 CAPITA SELECTA OF TUMOURS OF THE BRAIN BY HISTOLOGICAL SUBTYPE *

**Since the previous chapter '3.2.1 All tumours of the brain and main histological subtypes in adults' includes extensive results on both incidence and survival of the most common types of gliomas, four additional subchapters are defined that describe in detail less common types of gliomas (ependymal tumours and unspecified gliomas) and the two most frequent tumours of the brain that don't belong to the group of gliomas (malignant haematolymphoid tumours involving the CNS and malignant embryonal tumours).*

3.2.2.1 EPENDYMAL TUMOURS OF THE BRAIN IN ADULTS

MAIN SUBTYPES:

- *Ependymoma, clear cell or tanycitic or RELA fusion-positive or NOS*
- *Subependymoma*
- *Anaplastic ependymoma/ependymoblastoma*

KEYNOTES

Incidence

- Both malignant and borderline ependymal tumours occur more often in males than in females (male/female-ratio is 2.1 for malignant and 2.7 for borderline tumours).
- The median ages for patients diagnosed with malignant and borderline tumours are 54 years and 56 years, respectively.
- Malignant ependymal tumours are observed in the brain stem in 20% of all cases and in 29% of all borderline ependymal tumours.
- Subependymoma represent 96% of all borderline ependymal tumours diagnosed in the brain and are classified as WHO grade I tumours (cf. Table 1 of "Methods and data quality").

Survival

- Relative survival is similar for both sexes with a 10-yr relative survival of 73% for malignant tumours and 96% for borderline tumours.

Table 1 Ependymal tumours of the brain in adults: Overview of incidence, prevalence and survival by behaviour and sex in Belgium

	Males					
	Malignant tumours			Borderline tumours		
Incidence	N	CR	WSR	N	CR	WSR
Incidence, 2016-2020	38	0.2	0.2	38	0.2	0.2
Prevalence	N	CR	WSR	N	CR	WSR
Prevalence (5 years), 2016-2020	31	0.7	0.7	35	0.8	0.7
Prevalence (10 years), 2011-2020	72	1.6	1.6	55	1.3	1.1
Relative survival	N at risk	%	95%CI	N at risk	%	95%CI
5-year Relative survival, 2016-2020	< 50*	-	-	< 50*	-	-
10-year Relative survival, 2011-2020	87	72.3	[54.7;85.8]	63	92.8	[72.0;104.5]
	Females					
	Malignant tumours			Borderline tumours		
Incidence	N	CR	WSR	N	CR	WSR
Incidence, 2016-2020	19	0.1	0.1	15	0.1	0.1
Prevalence	N	CR	WSR	N	CR	WSR
Prevalence (5 years), 2016-2020	17	0.4	0.4	13	0.3	0.2
Prevalence (10 years), 2011-2020	36	0.8	0.8	22	0.5	0.4
Relative survival	N at risk	%	95%CI	N at risk	%	95%CI
5-year Relative survival, 2016-2020	< 50*	-	-	< 50*	-	-
10-year Relative survival, 2011-2020	< 50*	-	-	< 50*	-	-
Median age at diagnosis, 2016-2020	54 [Q1:45;Q3:64]			56 [Q1:46;Q3:62]		
M/F-ratio, 2016-2020	2.1			2.7		

Source: Belgian Cancer Registry

CR: crude (all ages) rate (N/100,000 person years)

WSR: age-standardised rate using the World Standard Population (N/100,000 person years)

** Not enough patients for representative survival analysis*

Incidence

Figure 1 Ependymal tumours of the brain in adults: Age-specific incidence rates (N/100,000) by behaviour and sex in Belgium

Figure 2 Ependymal tumours of the brain in adults: Incidence by primary location and behaviour in Belgium

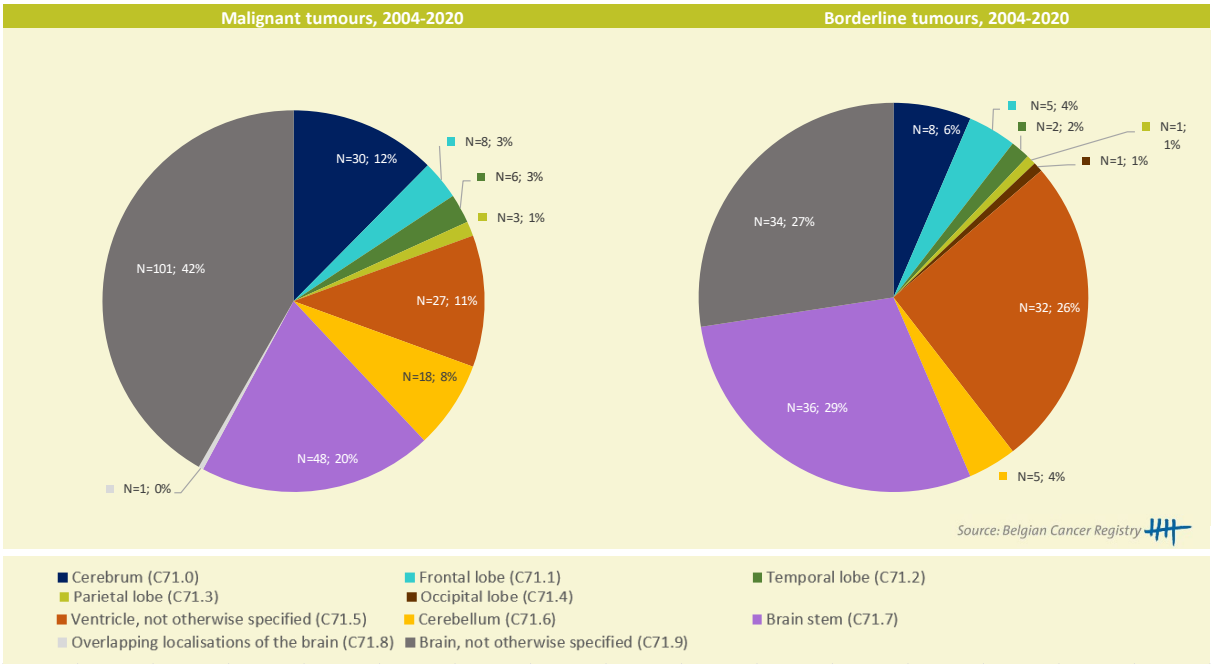
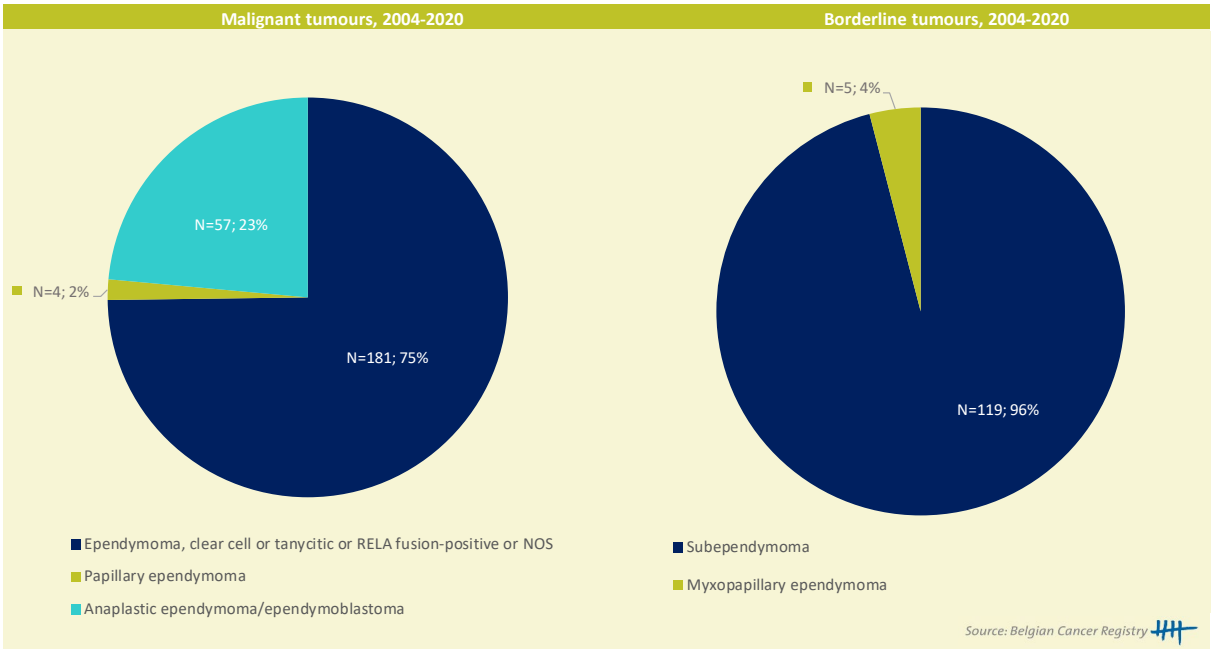
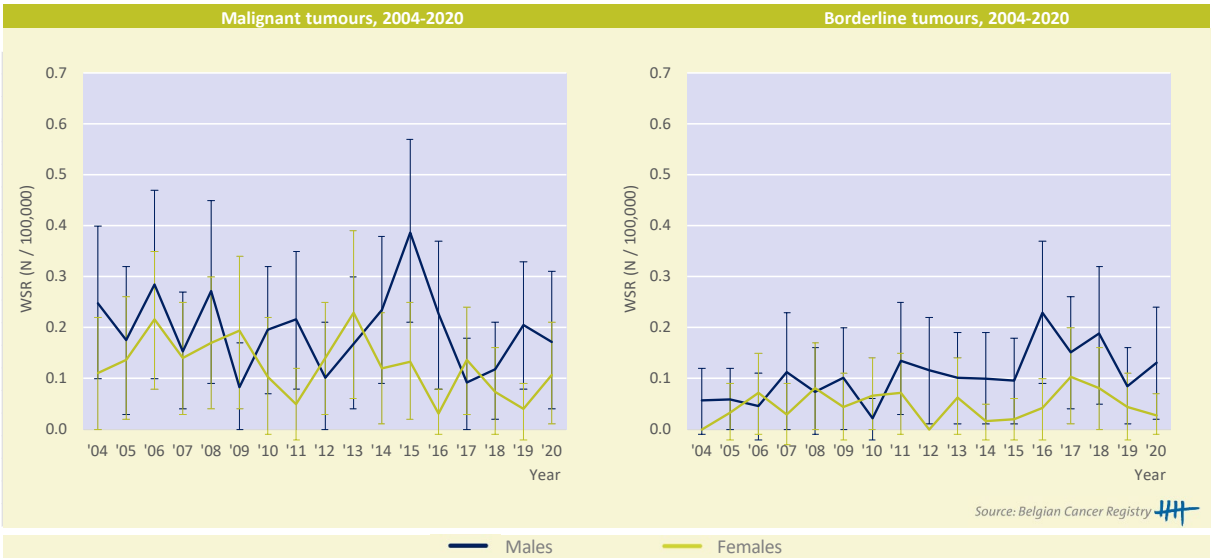


Figure 3 Ependymal tumours of the brain in adults: Incidence by histology and behaviour in Belgium



Incidence trends

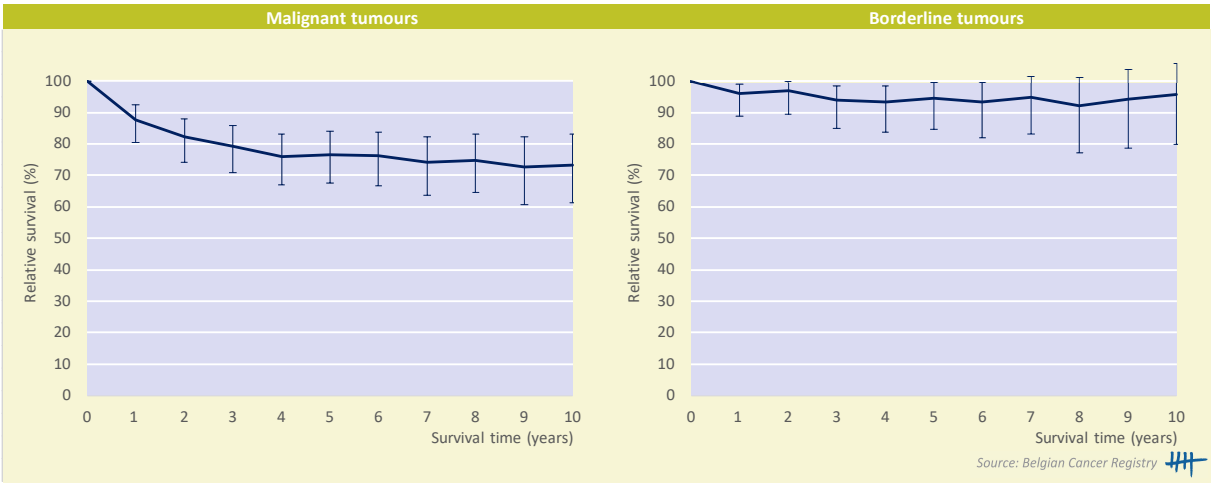
Figure 4 Ependymal tumours of the brain in adults: Age-standardised incidence rates* (WSR) by sex and behaviour in Belgium



** The age-standardised incidence rates are represented with 95% Confidence Intervals.*

Survival

Figure 5 Ependymal tumours of the brain in adults: Relative survival* by behaviour, Belgium 2011-2020



** The relative survival values are represented with 95% Confidence Intervals.*

Table 2 Ependymal tumours of the brain in adults: Conditional 5-year relative survival* by behaviour (Belgium, 2011-2020)

	Malignant tumours		Borderline tumours	
X years since diagnosis	N at risk	%	N at risk	%
1 year	115	86.9	81	96.9
2 year	99	90.1	76	97.6
3 year	83	94.3	64	98.2

Source: Belgian Cancer Registry

** Unadjusted 5-yr relative survival probability conditional on surviving the first X years since diagnosis, %*

** Interpretation in lay-man's terms: Given that a patient has already survived X years, what is the relative survival probability 5 years later.*

3.2.2.2 UNSPECIFIED MALIGNANT GLIOMA OF THE BRAIN IN ADULTS

KEYNOTES

Incidence

- These unspecified gliomas are mostly (76%) diagnosed using technical procedures (e.g. imaging).
- There is no information about the primary location for 26% of all diagnoses. The most commonly registered locations are the brain stem (18%), the cerebrum (16%) and the temporal lobe (14%).
- There is a peak in incidence for males aged 75 years.

Incidence

Figure 1 Unspecified malignant glioma of the brain in adults: Age-specific incidence rates (N/100,000) by behaviour and sex, Belgium 2004-2020

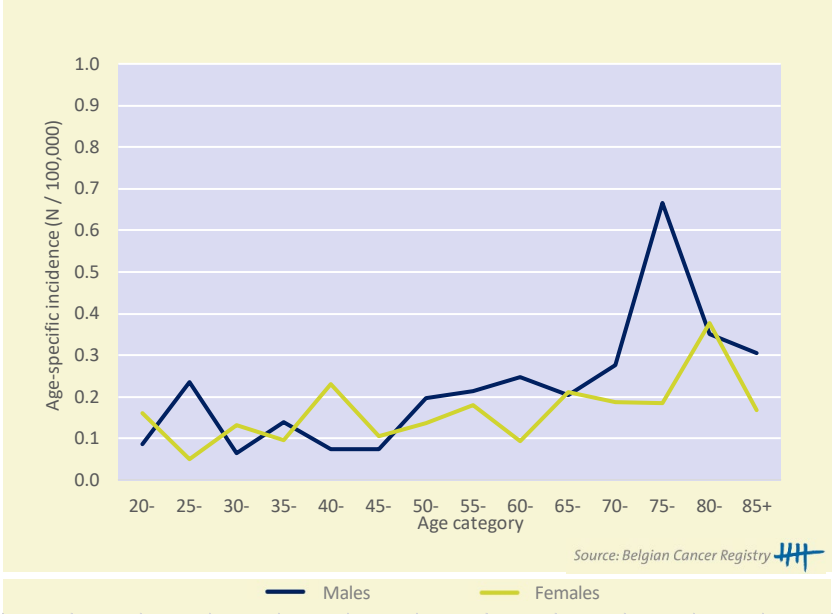
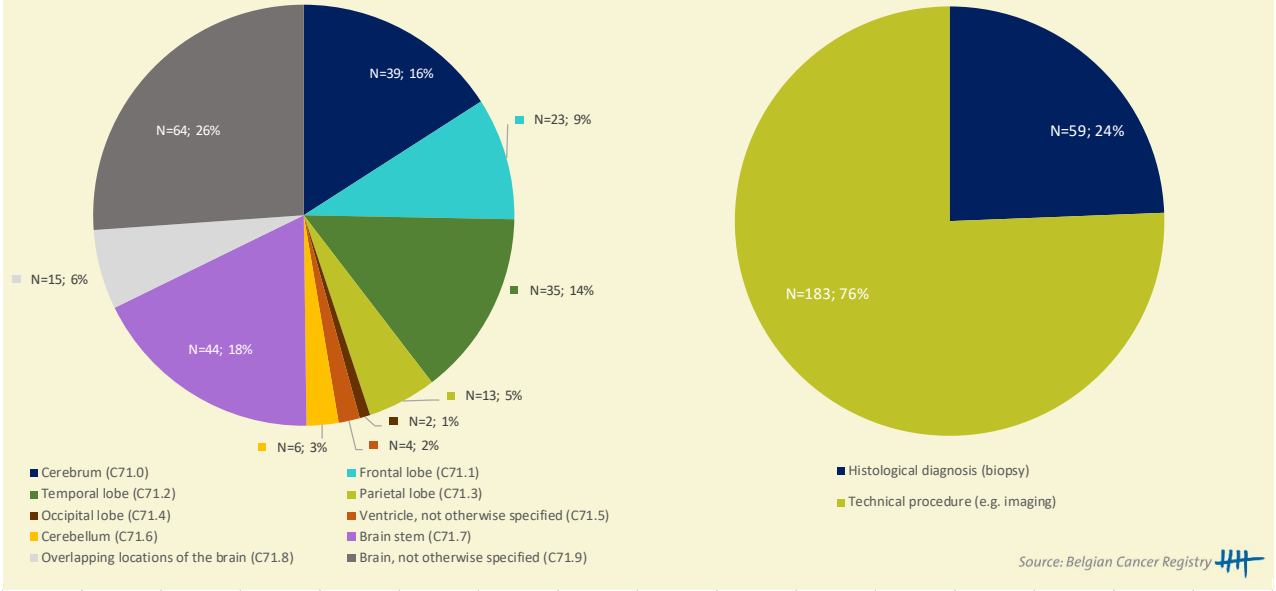


Figure 2 Unspecified malignant glioma of the brain in adults: Incidence by primary localisation and diagnostic procedure, Belgium 2004-2020



3.2.2.3 MALIGNANT EMBRYONAL TUMOURS OF THE BRAIN IN ADULTS

MAIN SUBTYPE:

- *Medulloblastoma*

KEYNOTES

Incidence

- Malignant embryonal tumours are most often diagnosed in males (male/female ratio = 1.9) and at younger ages (median age = 31 years).
- These tumours are very rare with on average about 7 cases per year in Belgium.
- Most cases (83%) are diagnosed in the cerebellum.
- The most frequent subtype is medulloblastoma (82%).

Survival

- The 10-yr relative survival is better for medulloblastoma (75%) than for all embryonal tumours combined (66%).

Table 1 Malignant embryonal tumours of the brain in adults: Overview of incidence, prevalence and survival by sex in Belgium

	Males		
	Malignant tumours		
Incidence	N	CR	WSR
Incidence, 2016-2020	21	0.1	0.1
Prevalence	N	CR	WSR
Prevalence (5 years), 2016-2020	20	0.5	0.6
Prevalence (10 years), 2011-2020	42	1.0	1.3
Relative survival	N at risk	%	95%CI
5-year Relative survival, 2016-2020	< 50*	-	-
10-year Relative survival, 2011-2020	< 50*	-	-
	Females		
	Malignant tumours		
Incidence	N	CR	WSR
Incidence, 2016-2020	12	0.1	0.1
Prevalence	N	CR	WSR
Prevalence (5 years), 2016-2020	10	0.2	0.3
Prevalence (10 years), 2011-2020	19	0.4	0.6
Relative survival	N at risk	%	95%CI
5-year Relative survival, 2016-2020	< 50*	-	-
10-year Relative survival, 2011-2020	< 50*	-	-
Median age at diagnosis, 2016-2020	31 [Q1:27;Q3:40]		
M/F-ratio, 2016-2020	1.9		

Source: Belgian Cancer Registry

CR: crude (all ages) rate (N/100,000 person years)

WSR: age-standardised rate using the World Standard Population (N/100,000 person years)

** Not enough patients for representative survival analysis*

Incidence

Figure 1 Malignant embryonal tumours of the brain in adults: Age-specific incidence rates (N/100,000) by sex, Belgium 2004-2020

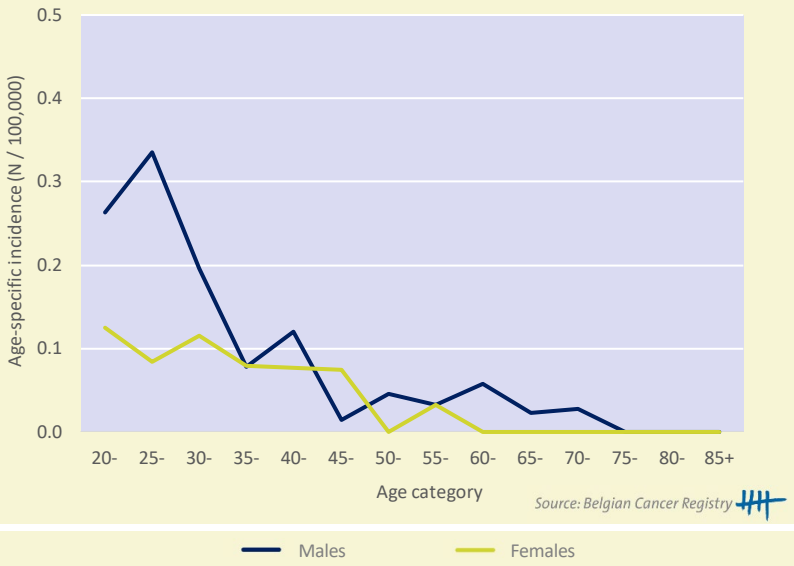


Figure 2 Malignant embryonal tumours of the brain in adults: Incidence by primary location, Belgium 2004-2020

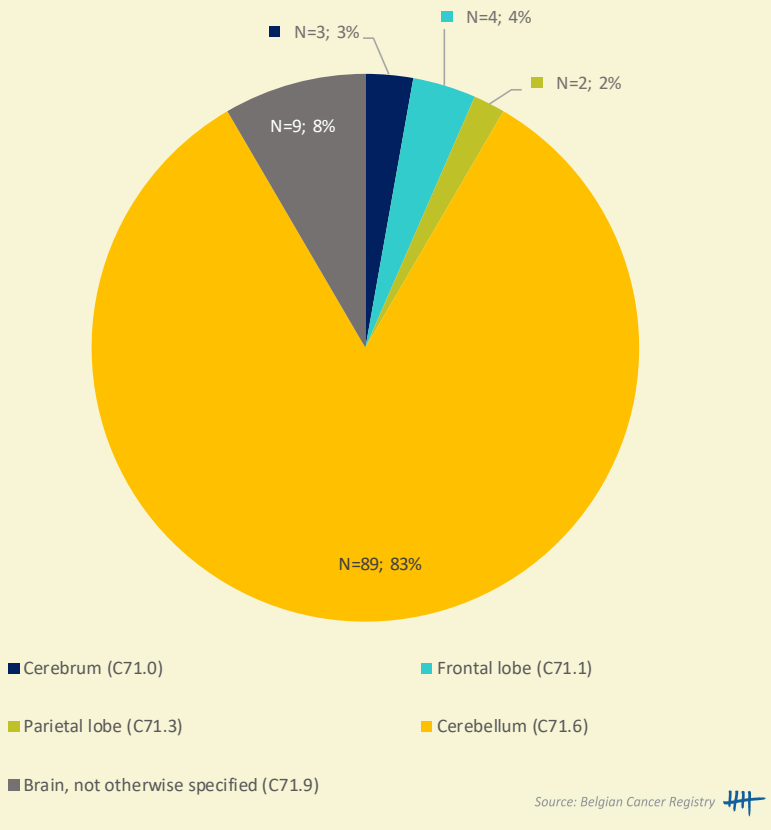
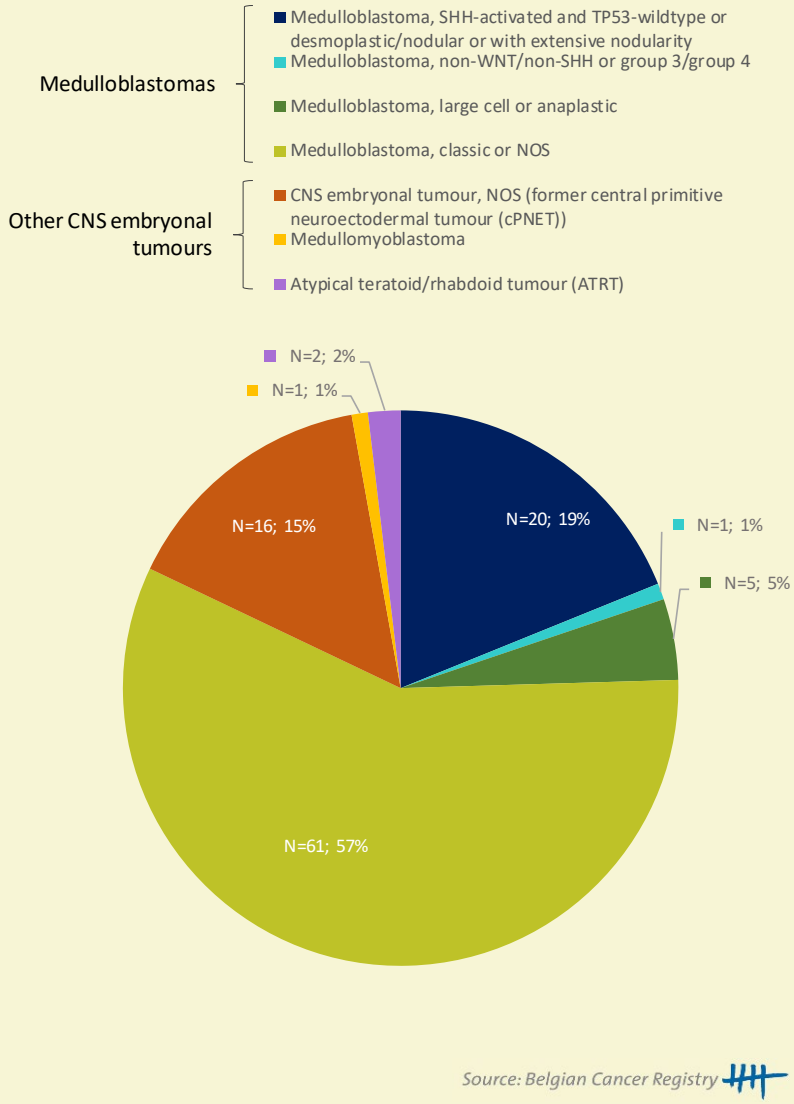


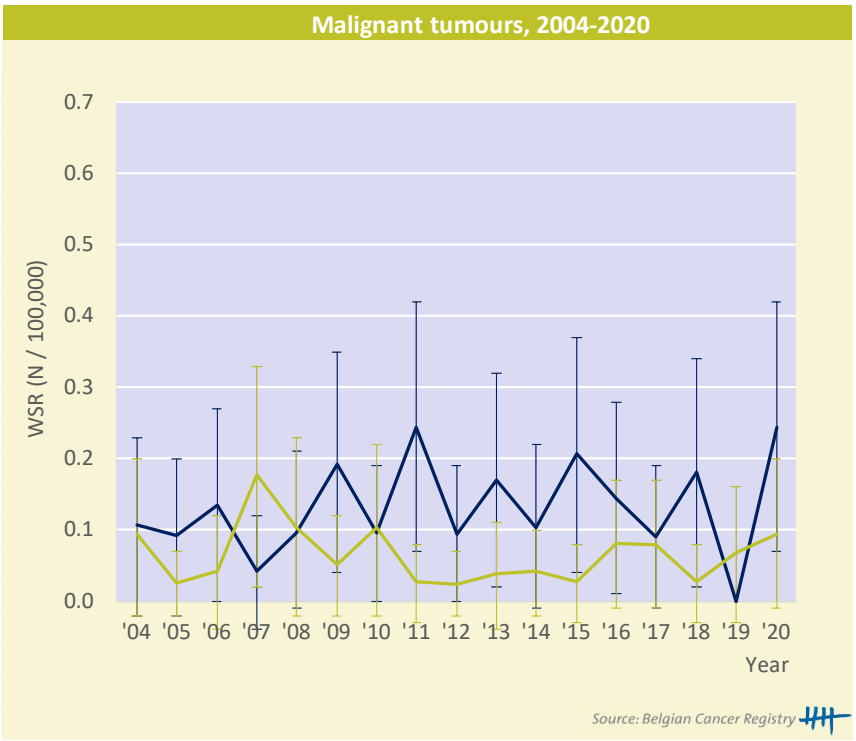
Figure 3 Malignant embryonal tumours of the brain in adults: Incidence by histology, Belgium 2004-2020



Source: Belgian Cancer Registry

Incidence trends

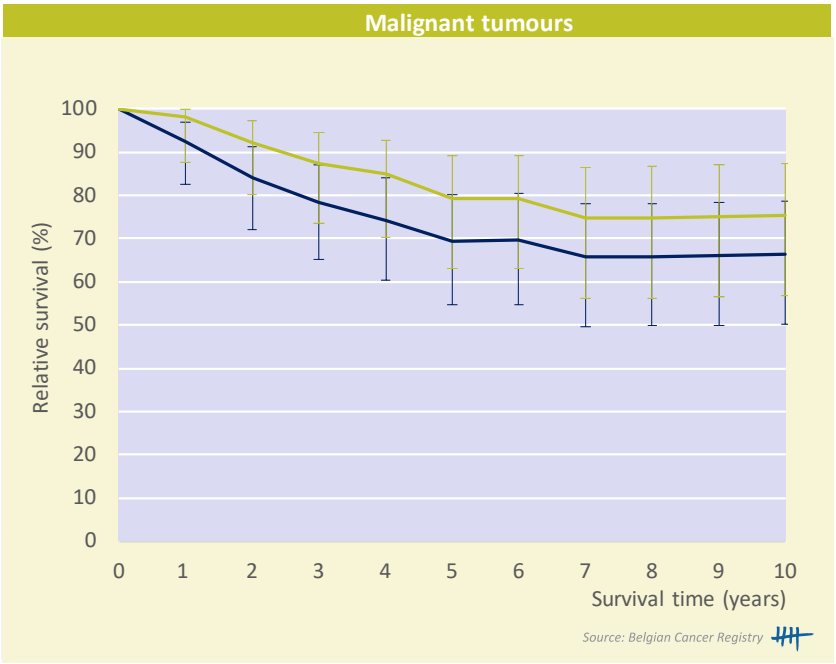
Figure 4 Malignant embryonal tumours of the brain in adults: Age-standardised incidence rates* (WSR) by sex in Belgium



** The age-standardised incidence rates are represented with 95% Confidence Intervals.*

Survival

Figure 5 Malignant embryonal tumours of the brain in adults: Relative survival* by subtype in Belgium, 2011-2020



** The relative survival values are represented with 95% Confidence Intervals.*

Table 2 Malignant embryonal tumours of the brain in adults: Conditional 5-year relative survival* by subtype (Belgium, 2011-2020)

	All embryonal tumours		Medulloblastomas only	
X years since diagnosis	N at risk	%	N at risk	%
1 year	58	75.2	51	80.7
2 year	47	78.3	42	81.1
3 year	38	84.2	34	85.7

Source: Belgian Cancer Registry

** Unadjusted 5-yr relative survival probability conditional on surviving the first X years since diagnosis, %*

** Interpretation in lay-man's terms: Given that a patient has already survived X years, what is the relative survival probability 5 years later.*

3.2.2.4 MALIGNANT HAEMATOLYMPHOID TUMOURS OF THE BRAIN IN ADULTS

MAIN SUBTYPE:

- *Diffuse large B-cell lymphoma (DLBCL) of the brain*

KEYNOTES

Incidence

- Malignant haematolymphoid tumours are more often diagnosed in patients older than 50 years (median age = 71 years).
- For almost half of all diagnoses (45%) there is no information regarding the brain sublocation.
- Diffuse large B-cell lymphoma (DLBCL) is the most common haematolymphoid tumour diagnosed in the brain (88%). In clinical practice, DLBCL of the brain is often referred to by the more general term 'primary CNS lymphomas'. Since this term encompasses also other types of lymphomas (cf. Table 1 in Methods and data quality), the more specific term DLBCL is used in this chapter.

Survival

- The 5-yr relative survival is better for males (32%) than for females (23%).
- The opposite is seen for the 10-yr relative survival with 13% in males and 20% in females.
- No improvement in survival of patients with DLBCL was observed since 2004.

Table 1 Malignant haematolymphoid tumours of the brain in adults: Overview of incidence, prevalence and survival by sex in Belgium

	Males		
	Malignant tumours		
Incidence	N	CR	WSR
Incidence, 2016-2020	162	0.8	0.5
Prevalence	N	CR	WSR
Prevalence (5 years), 2016-2020	69	1.6	1.1
Prevalence (10 years), 2011-2020	99	2.3	1.6
Relative survival	N at risk	%	95%CI
5-year Relative survival, 2016-2020	159	32.0	[22.9;41.6]
10-year Relative survival, 2011-2020	310	12.5	[5.7;22.3]
	Females		
	Malignant tumours		
Incidence	N	CR	WSR
Incidence, 2016-2020	156	0.7	0.4
Prevalence	N	CR	WSR
Prevalence (5 years), 2016-2020	58	1.3	0.7
Prevalence (10 years), 2011-2020	98	2.1	1.3
Relative survival	N at risk	%	95%CI
5-year Relative survival, 2016-2020	155	22.8	[15.1;31.6]
10-year Relative survival, 2011-2020	328	19.8	[13.8;26.7]
Median age at diagnosis, 2016-2020	71 [Q1:62;Q3:78]		
M/F-ratio, 2016-2020	1.3		

Source: Belgian Cancer Registry

CR: crude (all ages) rate (N/100,000 person years)

WSR: age-standardised rate using the World Standard Population (N/100,000 person years)

Incidence

Figure 1 Malignant haematolymphoid tumours of the brain in adults: Age-specific incidence rates (N/100,000) by sex in Belgium

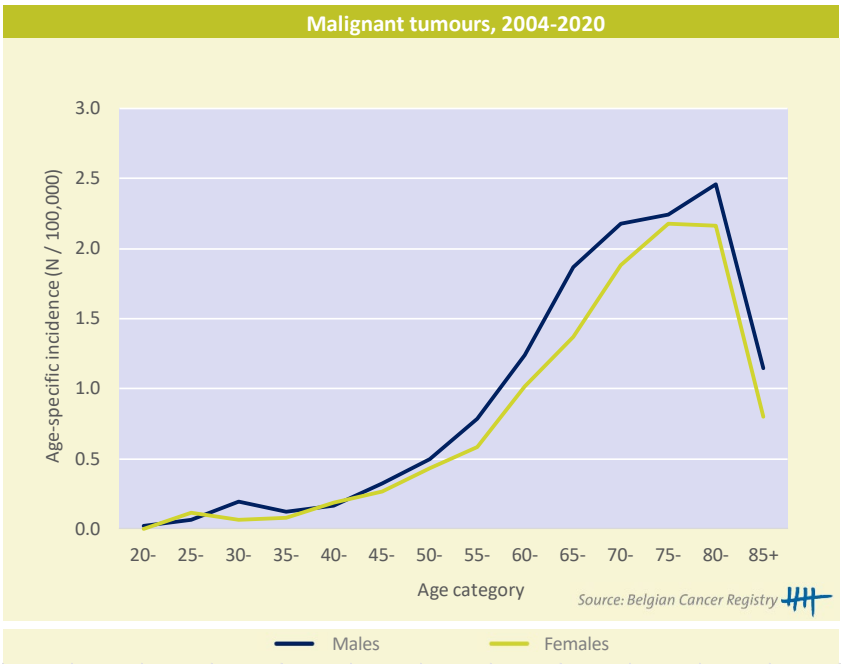


Figure 2 Malignant haematolymphoid tumours of the brain in adults: Incidence by primary location in Belgium

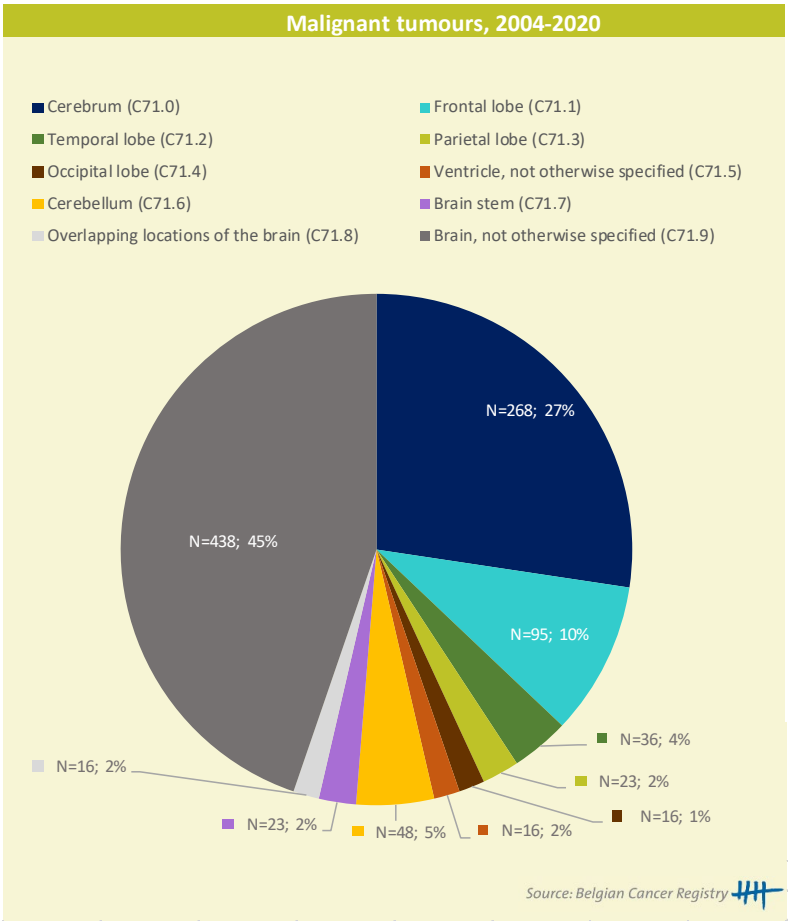
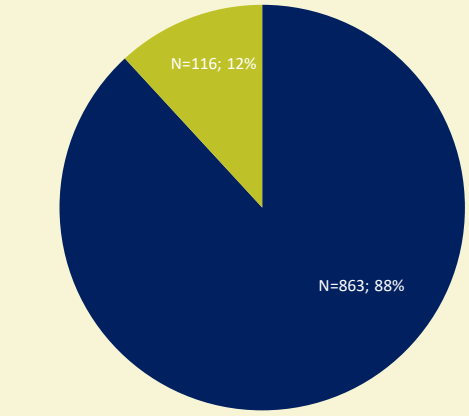


Figure 3 Malignant haematolymphoid tumours of the brain in adults: Incidence by histology in Belgium

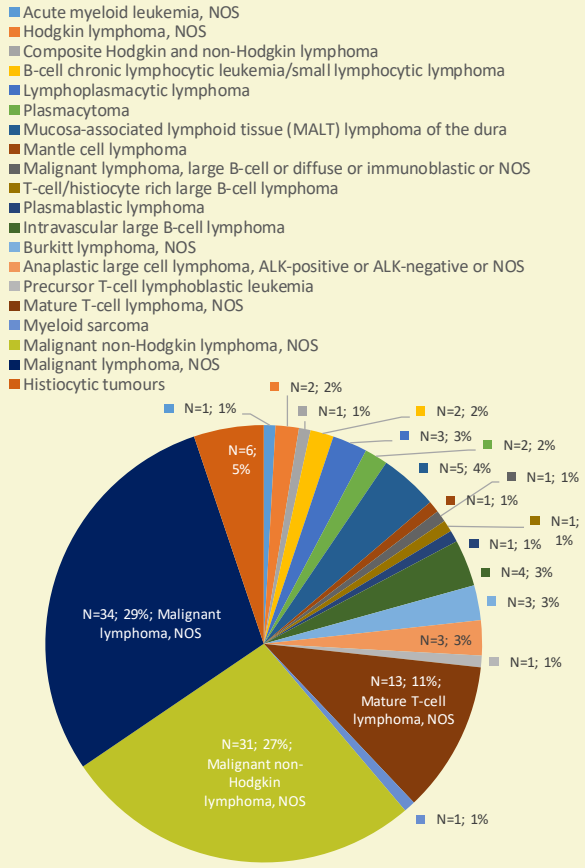
Malignant tumours, 2004-2020



Source: Belgian Cancer Registry

Figure 4 Malignant haematolymphoid tumours (excl. DLBCL) of the brain in adults: Incidence by histology in Belgium

Malignant tumours (excl. DLBCL), 2004-2020

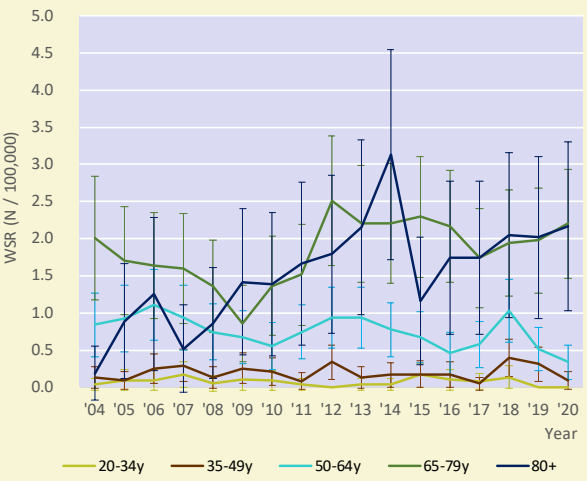


Source: Belgian Cancer Registry

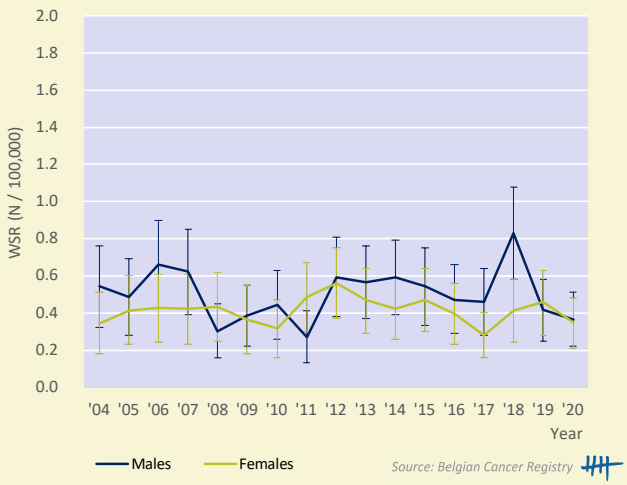
Incidence trends

Figure 5 Malignant haematolymphoid tumours of the brain in adults: Age-standardised incidence rates* (WSR) by age and sex in Belgium

WSR by age



WSR by sex

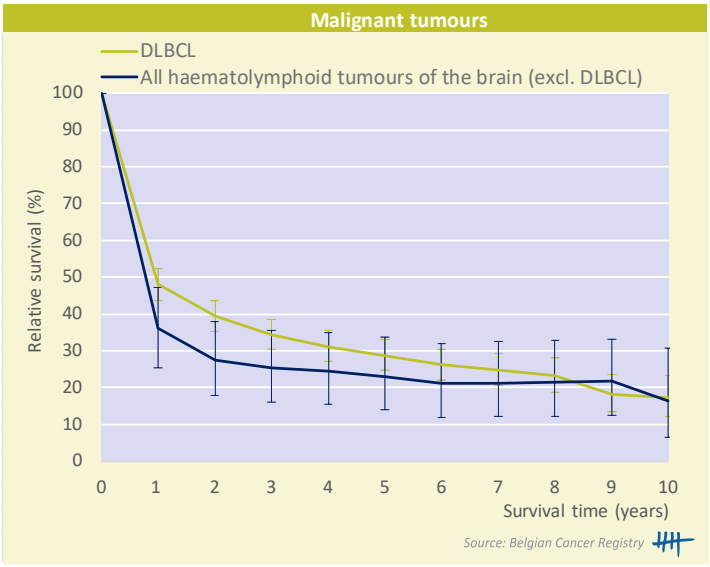


Source: Belgian Cancer Registry

** The age-standardised incidence rates are represented with 95% Confidence Intervals.*

Survival

Figure 6 Malignant haematolymphoid tumours of the brain in adults: Relative survival* by subtype in Belgium, 2011-2020



** The relative survival values are represented with 95% Confidence Intervals.*

Table 2 DLBCL of the brain in adults: Conditional 5-year relative survival* by subtype (Belgium, 2011-2020)

X years since diagnosis	N at risk	%
1 year	283	54.3
2 year	217	62.6
3 year	162	67.4

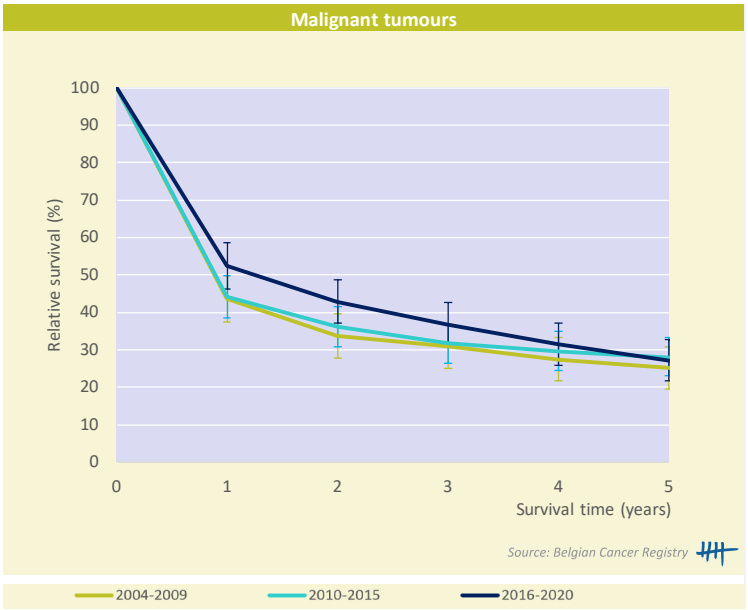
Source: Belgian Cancer Registry

** Unadjusted 5-yr relative survival probability conditional on surviving the first X years since diagnosis, %*

** Interpretation in lay-man's terms: Given that a patient has already survived X years, what is the relative survival probability 5 years later.*

Survival trends

Figure 7 DLBCL of the brain in adults: Relative survival* by cohort and behaviour, Belgium 2004-2020



** The relative survival values are represented with 95% Confidence Intervals.*

TUMOURS OF THE SPINAL CORD, CRANIAL NERVES AND OTHER PARTS OF THE CNS IN ADULTS

3.3 TUMOURS OF THE SPINAL CORD, CRANIAL NERVES AND OTHER PARTS OF THE CNS* IN ADULTS

KEYNOTES

Incidence

- The majority of tumours which are diagnosed in the spinal cord, cranial nerves and other parts of the CNS in adults are benign.
- For malignant and borderline tumours, the most common primary localisations are the spinal cord and cauda equina (81% for malignant tumours and 86% for borderline tumours). Most benign tumours are diagnosed in the cranial nerves (80%).

** This chapter does not include results for spinal meningiomas. These tumours are presented in chapter 3.1 (Tumours of the meninges in adults).*

** The tumours of the spinal cord, cranial nerves and other parts of the CNS are presented in this chapter by tumour behaviour (malignant/borderline/benign; cf. all chapters with epidemiological results). This distinction does not completely correspond to clinical practice where it is more common to distinguish tumours based on the WHO grade. The relation between tumour behaviour and WHO grade for these tumours can be found in Table 1 of "Methods and data quality".*

Table 1 Tumours of the spinal cord, cranial nerves and other parts of CNS in adults: Overview of incidence, prevalence and survival by behaviour and sex in Belgium

	Males								
	Malignant tumours			Borderline tumours			Benign tumours		
Incidence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Incidence, 2016-2020	88	0.4	0.4	63	0.3	0.3	581	2.7	2.4
Prevalence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Prevalence (5 years), 2016-2020	71	1.6	1.6	59	1.4	1.3	558	12.8	11.1
Prevalence (10 years), 2011-2020	118	2.7	2.5	110	2.5	2.4	894	20.5	17.5
Relative survival	N at risk	%	95%CI	N at risk	%	95%CI	N at risk	%	95%CI
5-year Relative survival, 2016-2020	86	83.0	[70.4;91.5]	63	96.1	[83.8;101.7]	574	101.5	[98.5;103.5]
10-year Relative survival, 2011-2020	151	78.0	[65.6;87.9]	118	100.2	[89.7;106.5]	940	104.3	[99.9;107.6]
	Females								
	Malignant tumours			Borderline tumours			Benign tumours		
Incidence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Incidence, 2016-2020	90	0.4	0.4	72	0.3	0.3	605	2.7	2.4
Prevalence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Prevalence (5 years), 2016-2020	80	1.7	1.6	69	1.5	1.5	586	12.8	10.7
Prevalence (10 years), 2011-2020	129	2.8	2.5	103	2.2	2.2	930	20.3	16.9
Relative survival	N at risk	%	95%CI	N at risk	%	95%CI	N at risk	%	95%CI
5-year Relative survival, 2016-2020	89	90.7	[78.9;97.6]	72	93.0	[78.9;99.3]	602	99.4	[95.6;102.0]
10-year Relative survival, 2011-2020	149	89.8	[79.7;96.8]	108	100.2	[89.4;105.8]	966	101.0	[94.8;105.4]
Median age at diagnosis, 2016-2020	54.5 [Q1: 42;Q3: 66]			49 [Q1: 40;Q3: 62]			56 [Q1: 45;Q3: 65]		
M/F-ratio, 2016-2020	1.1			0.9			1.0		

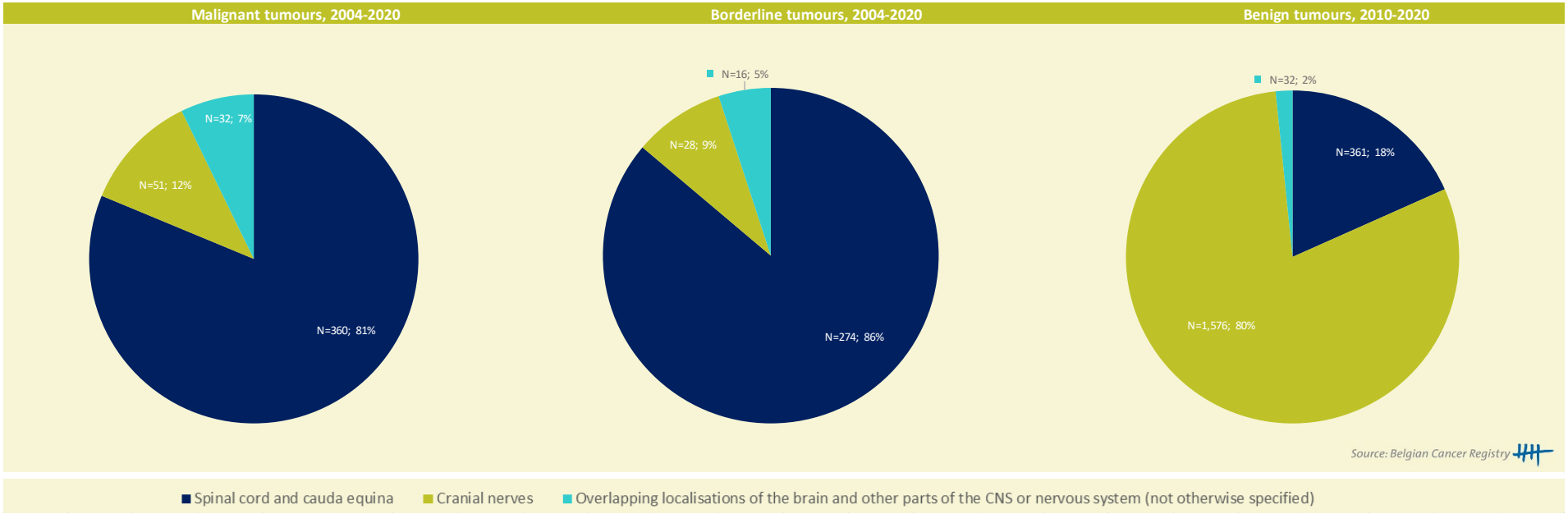
Source: Belgian Cancer Registry

CR: crude (all ages) rate (N/100,000 person years)

WSR: age-standardised rate using the World Standard Population (N/100,000 person years)

Incidence by primary location

Figure 2 Tumours of the spinal cord, cranial nerves and other parts of CNS in adults: Incidence by primary location and behaviour in Belgium



The results of benign tumours are only shown for the incidence period 2010-2020, since there was a remarkable improvement of registration completeness in the preceding period (2004-2009).

3.3.1 TUMOURS OF THE SPINAL CORD AND CAUDA EQUINA IN ADULTS

This chapter does not include results for spinal meningiomas. These tumours are presented in chapter 3.1 (Tumours of the meninges in adults).

MAIN SUBTYPE:

- *Ependymal tumours*
- *Schwannoma*

KEYNOTES

Incidence

- Malignant and benign tumours of the spinal cord and cauda equina are more frequent in males than in females (male/female-ratio of 1.1 and 1.5, respectively). For borderline tumours, conversely, the male/female-ratio is 0.8.
- Ependymal tumours are, by far, the most frequent tumours diagnosed in the spinal cord and cauda equina (71% of malignant tumours and 60% of borderline tumours).
- Schwannomas represent the majority (82%) of the benign tumours observed in the spinal cord and cauda equina.

Survival

- Patients with tumours of the spinal cord and cauda equina have a very good prognosis. For malignant tumours, the 5-yr relative survival is 88%.

Table 1 Tumours of the spinal cord and cauda equina in adults: Overview of incidence, prevalence and survival by behaviour and sex in Belgium

	Males								
	Malignant tumours			Borderline tumours			Benign tumours		
Incidence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Incidence, 2016-2020	74	0.3	0.3	50	0.2	0.2	127	0.6	0.6
Prevalence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Prevalence (5 years), 2016-2020	63	1.4	1.4	47	1.1	1.0	124	2.8	2.6
Prevalence (10 years), 2011-2020	101	2.3	2.2	90	2.1	2.0	199	4.6	4.1
Relative survival	N at risk	%	95%CI	N at risk	%	95%CI	N at risk	%	95%CI
5-year Relative survival, 2016-2020	73	85.6	[71.2;94.2]	50	95.6	[80.8;101.7]	126	102.2	[96.7;104.3]
10-year Relative survival, 2011-2020	124	82.4	[69.8;91.7]	99	96.8	[85.3;103.7]	208	108.0	[96.3;113.7]
	Females								
	Malignant tumours			Borderline tumours			Benign tumours		
Incidence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Incidence, 2016-2020	76	0.3	0.3	66	0.3	0.3	96	0.4	0.4
Prevalence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Prevalence (5 years), 2016-2020	68	1.5	1.4	64	1.4	1.4	95	2.1	1.8
Prevalence (10 years), 2011-2020	108	2.4	2.2	95	2.1	2.0	141	3.1	2.7
Relative survival	N at risk	%	95%CI	N at risk	%	95%CI	N at risk	%	95%CI
5-year Relative survival, 2016-2020	75	90.4	[76.5;97.6]	66	96.4	[81.5;101.6]	96	103.2	[95.9;105.7]
10-year Relative survival, 2011-2020	122	90.4	[79.7;97.3]	99	103.6	[92.0;108.6]	146	84.2	[51.6;100.9]
Median age at diagnosis, 2016-2020	52 [Q1: 41;Q3: 63]			49.5 [Q1: 39.5;Q3: 62]			52 [Q1: 41;Q3: 64]		
M/F-ratio, 2016-2020	1.1			0.8			1.5		

Source: Belgian Cancer Registry

CR: crude (all ages) rate (N/100,000 person years)
WSR: age-standardised rate using the World Standard Population (N/100,000 person years)

Incidence

Figure 1 Tumours of the spinal cord and cauda equina in adults: Age-specific incidence rates (N/100,000) by behaviour and sex in Belgium

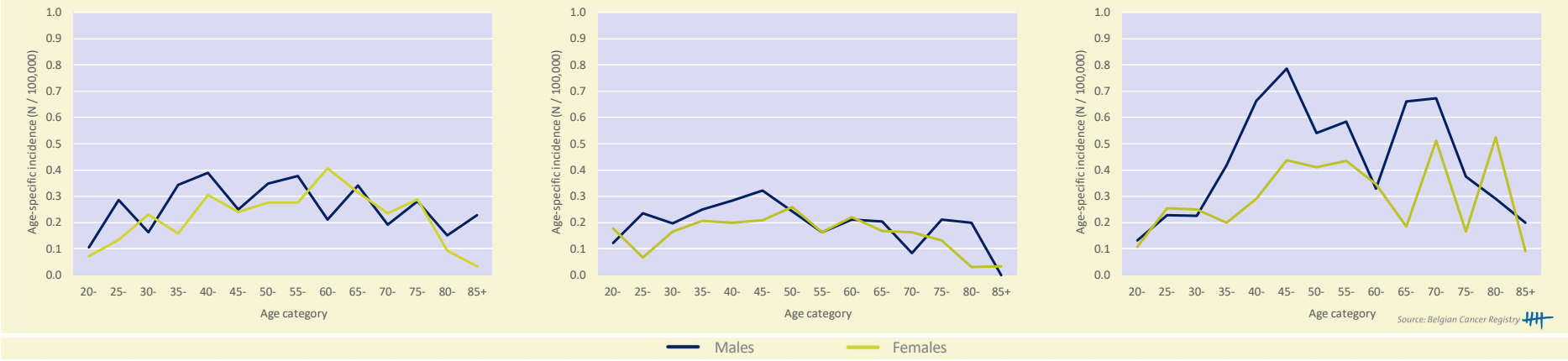


Figure 2 Tumours of the spinal cord and cauda equina in adults: Incidence by primary location and behaviour in Belgium

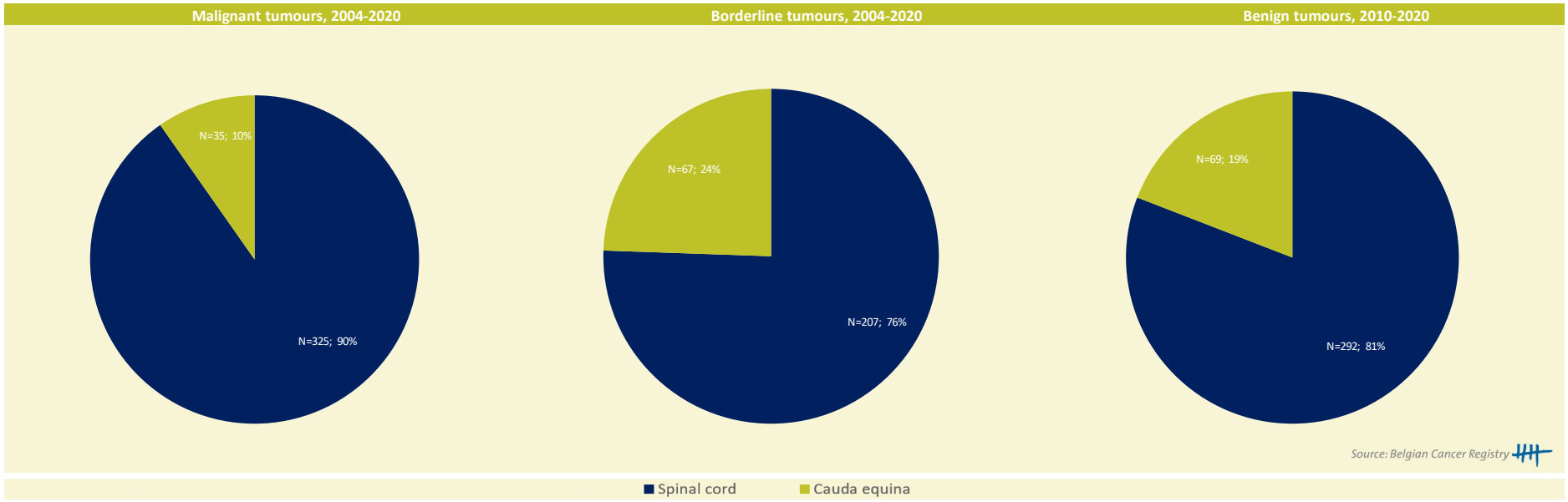
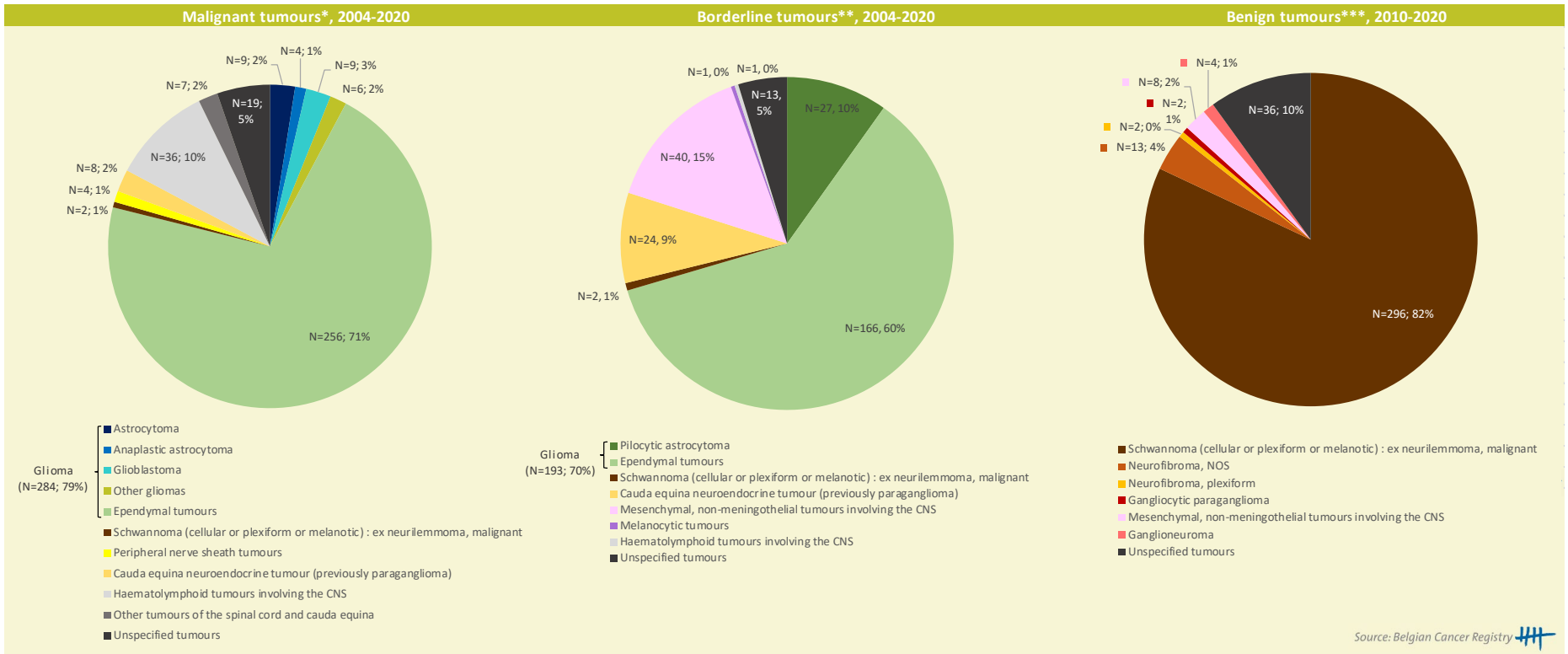


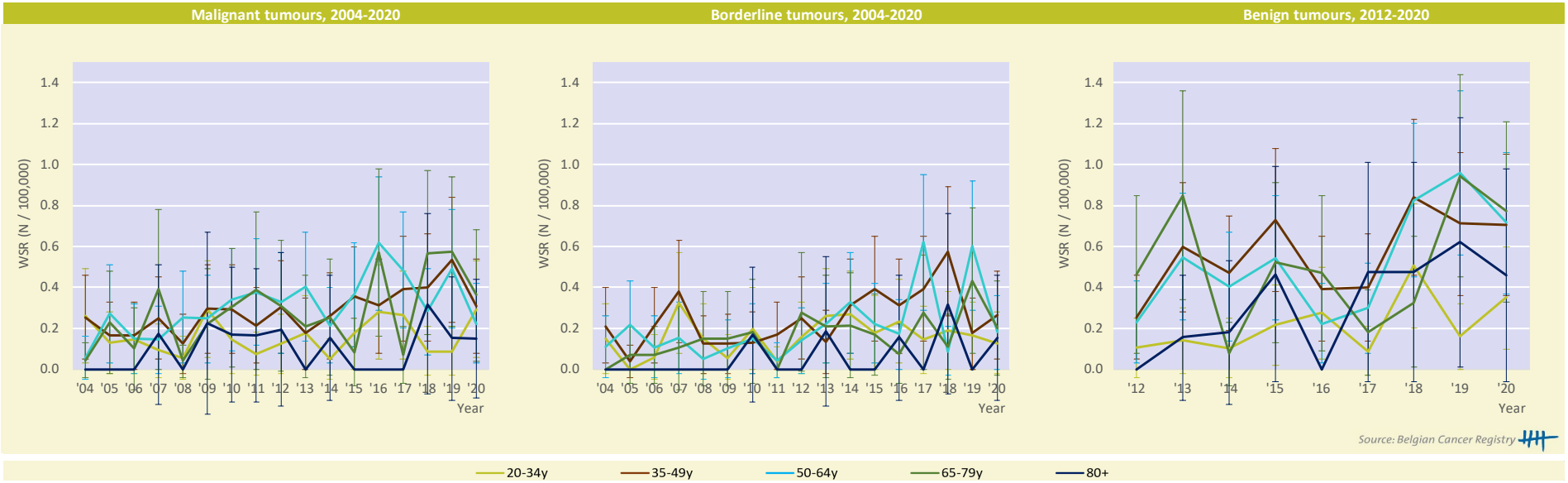
Figure 3 Tumours of the spinal cord and cauda equina in adults: Incidence by histology and behaviour in Belgium



** The majority of malignant ependymal tumours are represented by the subgroup "ependymoma, clear cell or tanycitic or RELA fusion-positive or NOS" (95%; N=243).*
The majority of malignant haematolymphoid tumours involving the CNS are represented by diffuse large B-cell lymphoma (DLBCL) of the CNS (53%; N=19).
*** The majority of borderline ependymal tumours are represented by the subgroup myxopapillary ependymoma (96%; N=160).*

Incidence trends

Figure 4 Tumours of the spinal cord and cauda equina in adults: Age-standardised incidence rates* (WSR) by age group and behaviour in Belgium



** The age-standardised incidence rates are represented with 95% Confidence Intervals.*

The results of benign tumours are only shown for the incidence period 2012-2020, since there was a remarkable improvement of registration completeness in the preceding period (2004-2011).

Table 2 Tumours of the spinal cord and cauda equina in adults: AAPC(%) by age group and behaviour in Belgium

	Malignant 2004-2020			Borderline 2004-2020			Benign 2010-2020		
Incidence by age group	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period
20-34 yrs	1.0	[-5.2; 7.6]	2004-2020	-	-	-	13.3	[-3.4; 32.9]	2012-2020
35-49 yrs	5.3	[2.3; 8.3]	2004-2020	6.8	[0.9; 13.1]	2004-2020	9.0	[-1.3; 20.4]	2012-2020
50-64 yrs	5.0	[0.3; 10.0]	2004-2020	6.9	[-0.3; 14.5]	2004-2020	12.5	[-2.1; 29.2]	2012-2020
	12.6	[6.1; 19.5]	2004-2016						
	-14.9	[-30.8; 4.7]	2016-2020						
65-79 yrs	8.1	[-0.7; 17.6]	2004-2020	-	-	-	7.1	[-16.4; 37.3]	2012-2020
80+	-	-	-	-	-	-	-	-	-

AAPC: average annual percentage change

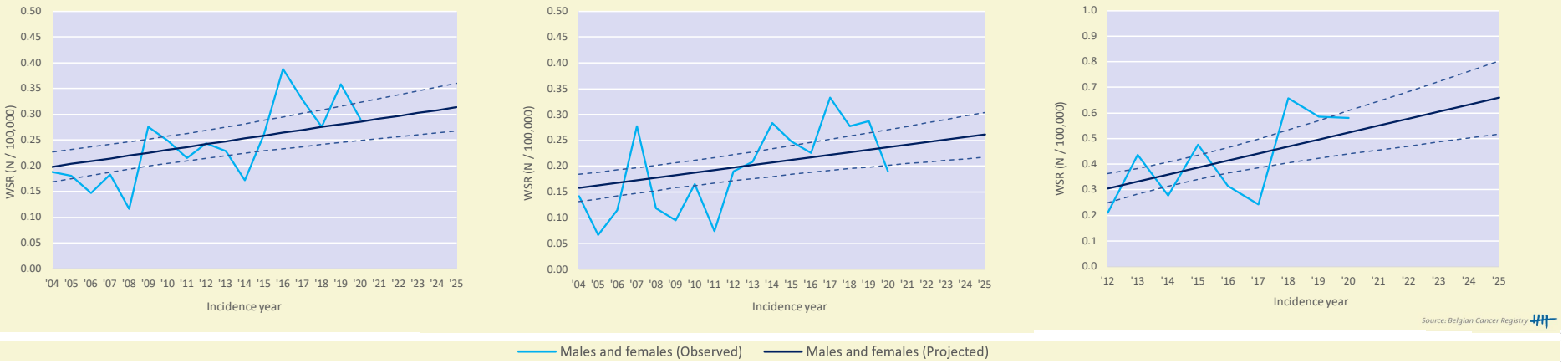
Source: Belgian Cancer Registry

Period: When a joinpoint occured, APC's are calculated for the period before and after the joinpoint. This column represents the corresponding time interval.

AAPC's are always calculated over the entire study-period.

Incidence projections

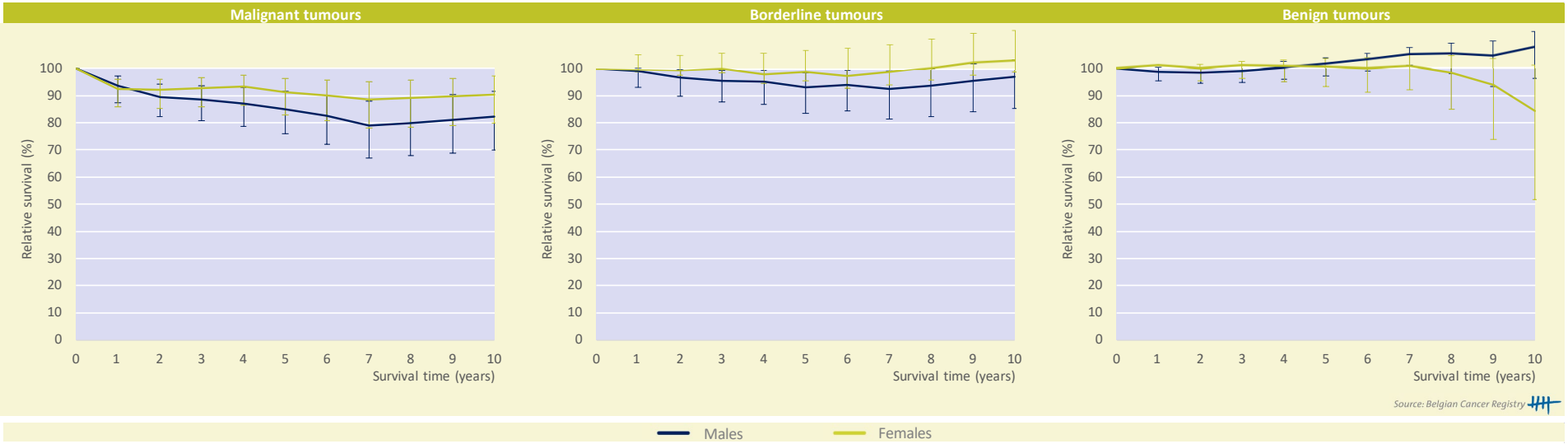
Figure 5 Tumours of the spinal cord and cauda equina in adults: Observed and projected* incidence (WSR with 95% Confidence Intervals) by behaviour, Belgium 2004-2025



Incidence projections are calculated for 2020-2025 based on predictions of the observed incidence for 2010-2019. Thus, the projected incidence for 2020 can be compared with the observed incidence of 2020 to assess the potential impact of the COVID-19 pandemic.

Survival

Figure 6 Tumours of the spinal cord and cauda equina in adults: Relative survival* by sex and behaviour, Belgium 2011-2020



** The relative survival values are represented with 95% Confidence Intervals. Some relative survival values may exceed 100% (see borderline and benign tumours). This means that the survival is better than that of a similar group of people (in terms of age, gender and calendar year) from the general population. This phenomenon can be explained by a healthier lifestyle or a closer medical follow-up of patients, but may also be explained by the used methodology (see Methods and data quality). The latter is the case when, for example, the comparison group from the general population is too different from the group of patients (because the comparison was only made based on a limited number of factors).*

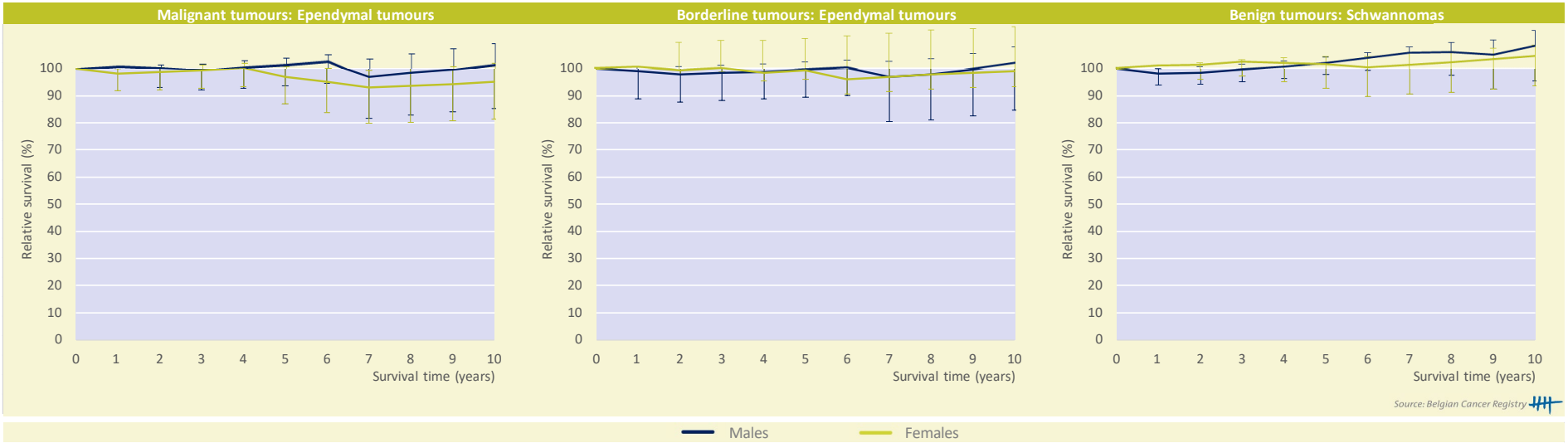
Table 3 Tumours of the spinal cord and cauda equina in adults: Conditional 5-year relative survival* by sex and behaviour (Belgium, 2011-2020)

	Males					
	Malignant tumours		Borderline tumours		Benign tumours	
X years since diagnosis	N at risk	%	N at risk	%	N at risk	%
1 year	115	88.1	96	94.9	202	104.7
2 year	102	88.1	90	95.6	183	107.1
3 year	83	90.4	80	98.1	150	106.7
	Females					
	Malignant tumours		Borderline tumours		Benign tumours	
X years since diagnosis	N at risk	%	N at risk	%	N at risk	%
1 year	110	97.5	98	97.7	145	98.9
2 year	100	96.0	86	99.4	119	101.0
3 year	88	96.1	75	100.4	94	97.4

** Unadjusted 5-yr relative survival probability conditional on surviving the first X years since diagnosis, %*
** Interpretation in lay-man's terms: Given that a patient has already survived X years, what is the relative survival probability 5 years later.*

Source: Belgian Cancer Registry

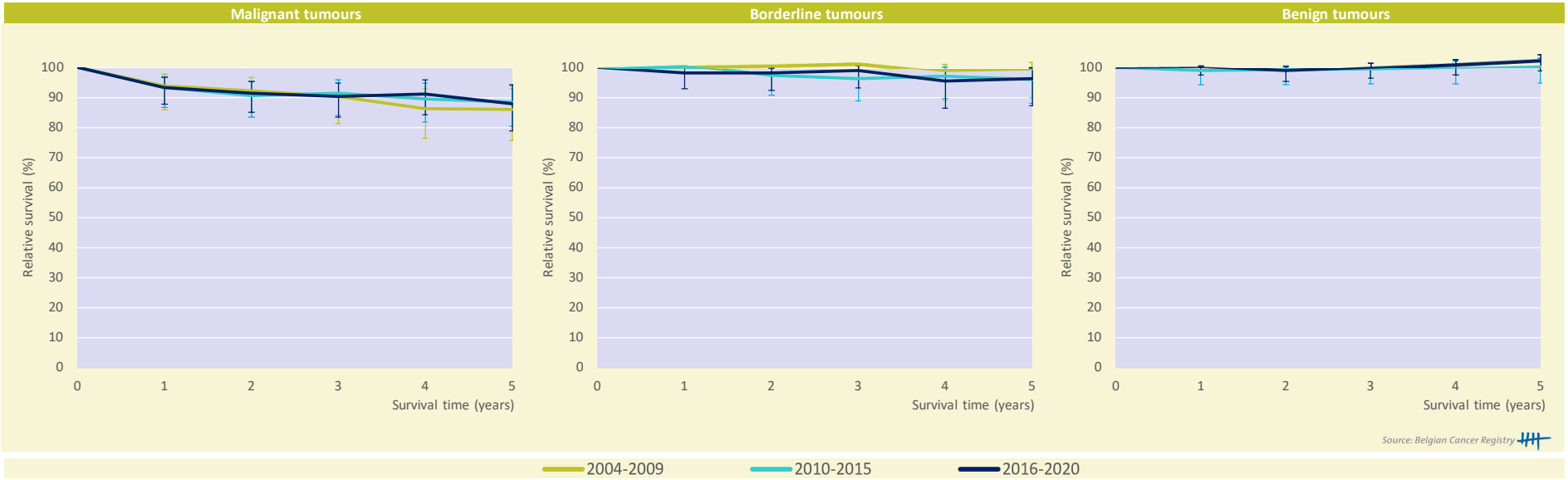
Figure 7 Tumours of the spinal cord and cauda equina in adults: Relative survival* by histology and behaviour, Belgium 2011-2020



** The relative survival values are represented with 95% Confidence Intervals. Some relative survival values may exceed 100%. This means that the survival is better than that of a similar group of people (in terms of age, gender and calendar year) from the general population. This phenomenon can be explained by a healthier lifestyle or a closer medical follow-up of patients, but may also be explained by the used methodology (see Methods and data quality). The latter is the case when, for example, the comparison group from the general population is too different from the group of patients (because the comparison was only made based on a limited number of factors).*
For each behaviour (malignant, borderline, benign), only the predominant histological subtype is shown. Relative survival data are not presented for the other histological subtypes, since the number of patients at risk is less than 50 cases for each of the other subtypes.

Survival trends

Figure 8 Tumours of the spinal cord and cauda equina in adults: Relative survival* by cohort and behaviour, Belgium 2004-2020



** The relative survival values are represented with 95% Confidence Intervals.*

3.3.2 TUMOURS OF THE CRANIAL NERVES IN ADULTS

MAIN SUBTYPE:

- *Schwannoma*

KEYNOTES

Incidence

- Most tumours of the cranial nerves occur in the acoustic nerve and the majority are characterised by a benign behaviour.
- Among benign tumours, schwannomas represent 71% of all diagnoses.
- Incidence rates have increased for benign tumours since 2012 (AAPC = 6.4%). This can, at least, be partly explained by improved registration.

Survival

- For benign tumours, the prognosis is excellent (around 100%).

Table 1 Tumours of the cranial nerves in adults: Overview of incidence, prevalence and survival by behaviour and sex in Belgium

	Males								
	Malignant tumours			Borderline tumours			Benign tumours		
Incidence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Incidence, 2016-2020	9	0.0	0.0	12	0.1	0.1	450	2.1	1.8
Prevalence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Prevalence (5 years), 2016-2020	7	0.2	0.1	11	0.3	0.2	433	9.9	8.5
Prevalence (10 years), 2011-2020	14	0.3	0.2	17	0.4	0.4	692	15.9	13.4
Relative survival	N at risk	%	95%CI	N at risk	%	95%CI	N at risk	%	95%CI
5-year Relative survival, 2016-2020	< 50*	-	-	< 50*	-	-	447	101.1	[97.5;103.4]
10-year Relative survival, 2011-2020	< 50*	-	-	< 50*	-	-	726	104.0	[99.5;107.4]
	Females								
	Malignant tumours			Borderline tumours			Benign tumours		
Incidence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Incidence, 2016-2020	12	0.1	0.0	5	0.0	0.0	498	2.2	1.9
Prevalence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Prevalence (5 years), 2016-2020	12	0.3	0.2	5	0.1	0.1	480	10.5	8.7
Prevalence (10 years), 2011-2020	21	0.5	0.3	8	0.2	0.2	766	16.7	13.8
Relative survival	N at risk	%	95%CI	N at risk	%	95%CI	N at risk	%	95%CI
5-year Relative survival, 2016-2020	< 50*	-	-	< 50*	-	-	495	98.8	[94.4;101.6]
10-year Relative survival, 2011-2020	< 50*	-	-	< 50*	-	-	797	103.5	[98.4;107.2]
Median age at diagnosis, 2016-2020	68 [Q1: 56;Q3: 72]			49 [Q1: 42;Q3: 61]			57 [Q1: 46;Q3: 66]		
M/F-ratio, 2016-2020	0.9			1.9			1.0		

Source: Belgian Cancer Registry

CR: crude (all ages) rate (N/100,000 person years)

WSR: age-standardised rate using the World Standard Population (N/100,000 person years)

** Not enough patients for representative survival analysis*

Incidence

Figure 1 Tumours of the cranial nerves in adults: Age-specific incidence rates (N/100,000) by behaviour and sex in Belgium

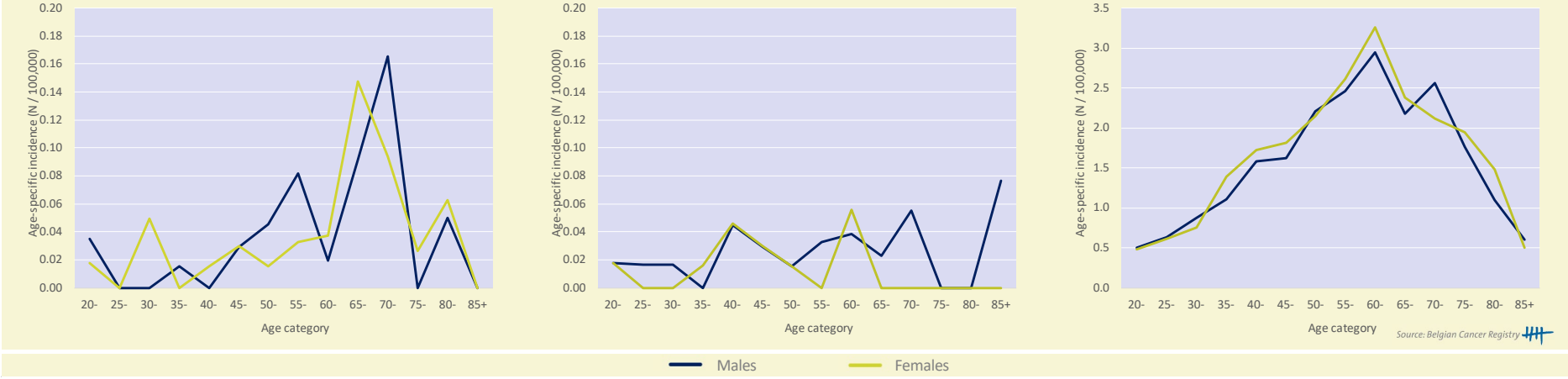


Figure 2 Tumours of the cranial nerves in adults: Incidence by primary location and behaviour in Belgium

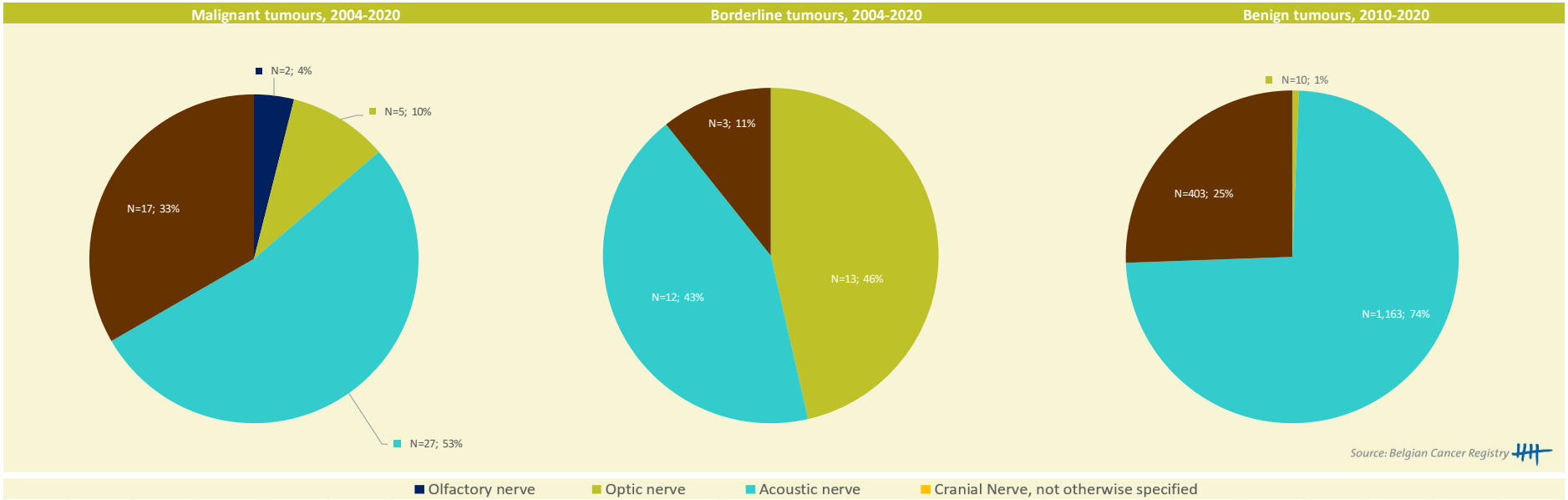
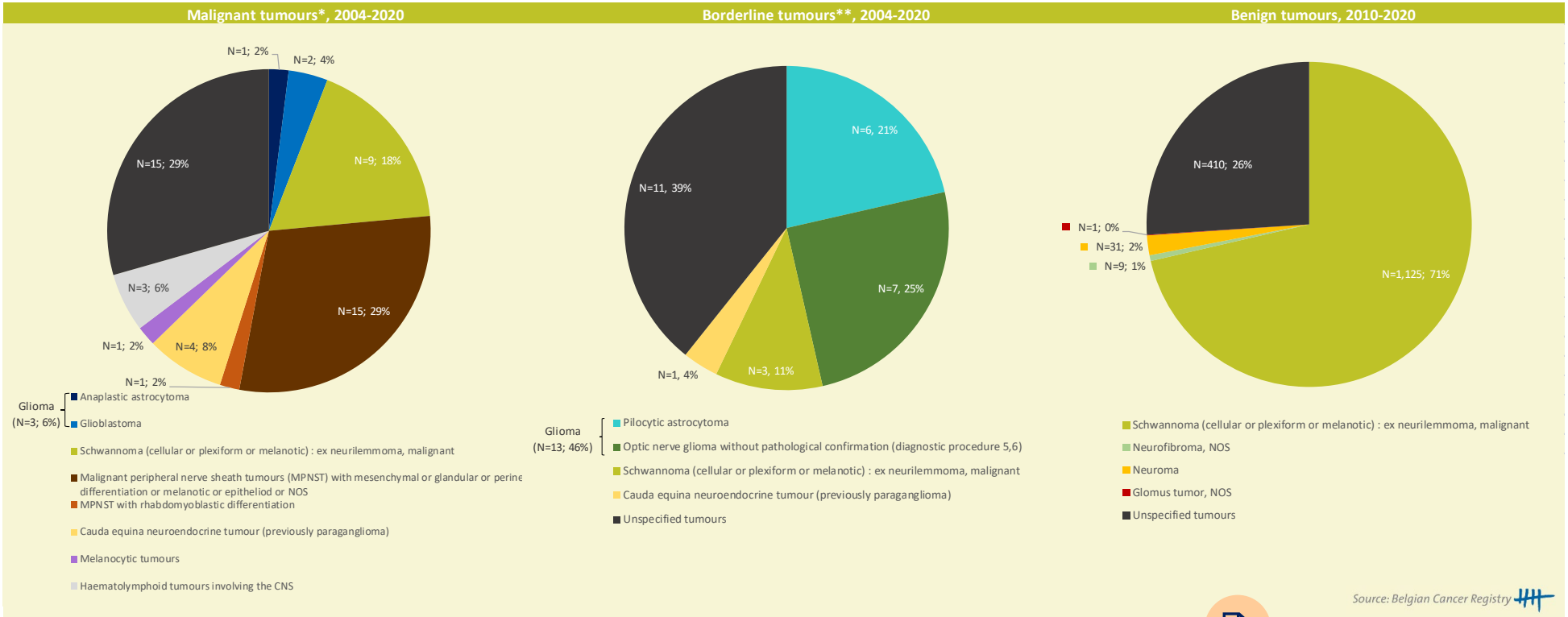


Figure 3 Tumours of the cranial nerves in adults: Incidence by histology and behaviour in Belgium

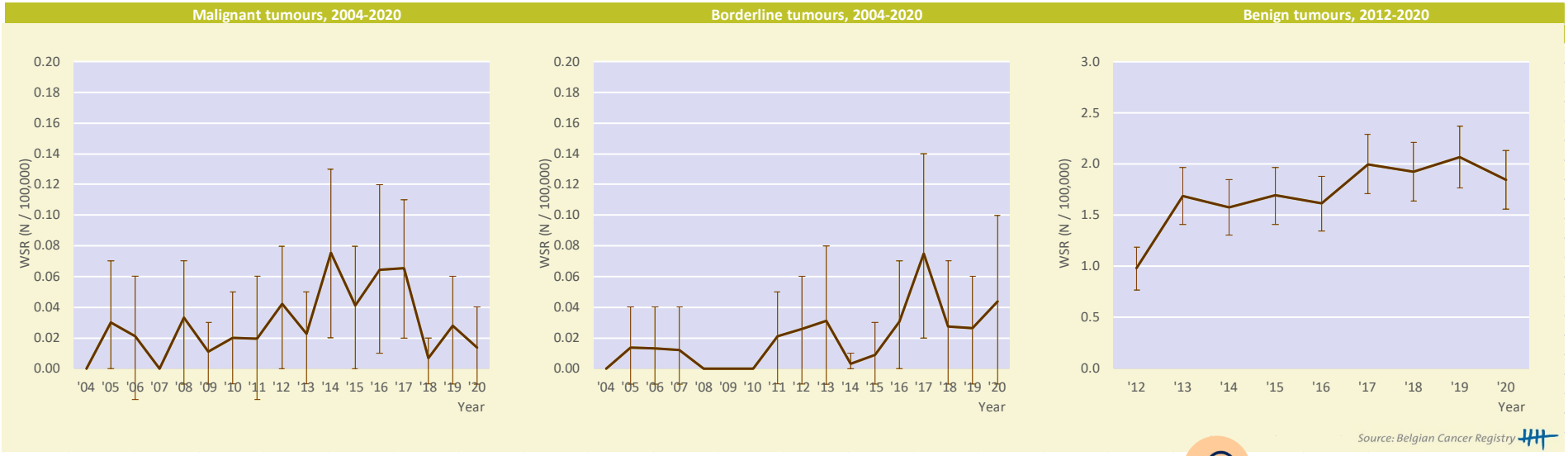


** The majority of malignant ependymal tumours are represented by the subgroup "ependymoma, clear cell or tanycitic or RELA fusion-positive or NOS" (95%; N=243).*
The majority of malignant haematolymphoid tumours involving the CNS are represented by diffuse large B-cell lymphoma (DLBCL) of the CNS (53%; N=19).
*** The majority of borderline ependymal tumours are represented by the subgroup myxopapillary ependymoma (96%; N=160).*

Keynote for registration:
It is expected that the majority of unspecified benign tumours are schwannomas diagnosed only based on imaging (diagnostic procedure 5). Although it is possible to clinically diagnose these tumours with certainty as schwannomas ENCR registration rules only allow coding them as schwannomas based on diagnostic procedure 5 since January 2023.

Incidence trends

Figure 4 Tumours of the cranial nerves in adults: Age-standardised incidence rates* (WSR) by behaviour in Belgium



** The age-standardised incidence rates are represented with 95% Confidence Intervals.*

The results of benign tumours are only shown for the incidence period 2012-2020, since there was a remarkable improvement of registration completeness in the preceding period (2004-2011).

Table 2 Benign tumours of the cranial nerves in adults: AAPC(%) by behaviour in Belgium

	Benign 2010-2020		
Incidence (males and females)	AAPC (%)	95%CI	Period
Incidence (males and females)	6.4	[1.5; 11.4]	2012-2020

Source: Belgian Cancer Registry

AAPC: average annual percentage change

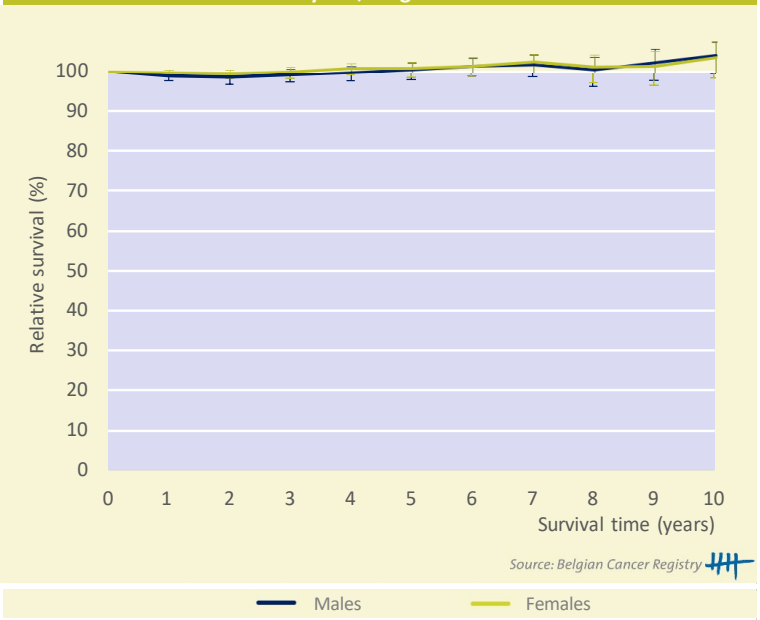
Period: When a joinpoint occured, APC's are calculated for the period before and after the joinpoint. This column represents the corresponding time interval.

AAPC's are always calculated over the entire study-period.

AAPC values cannot be calculated if the minimum age-standardised incidence rate over the incidence years is zero (malignant and benign tumours; see figure 4).

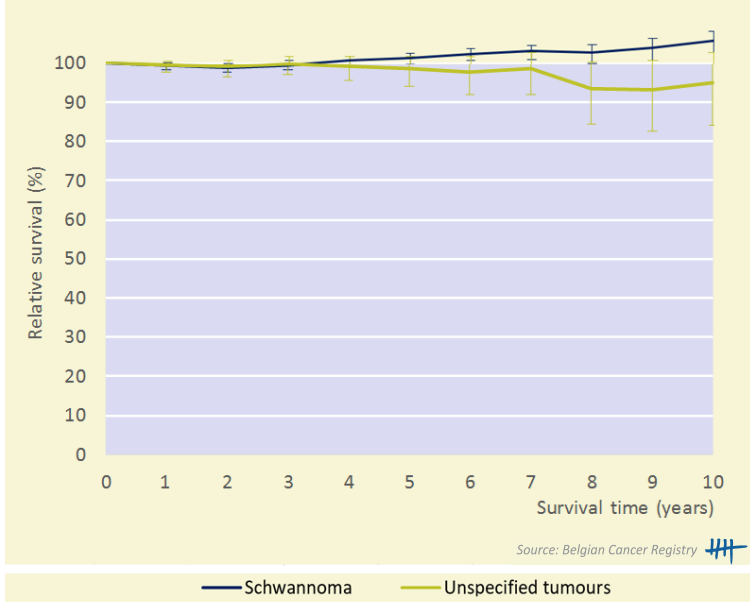
Survival

Figure 5 Benign tumours of the cranial nerves in adults: Relative survival* by sex, Belgium 2011-2020



** The relative survival values are represented with 95% Confidence Intervals.*

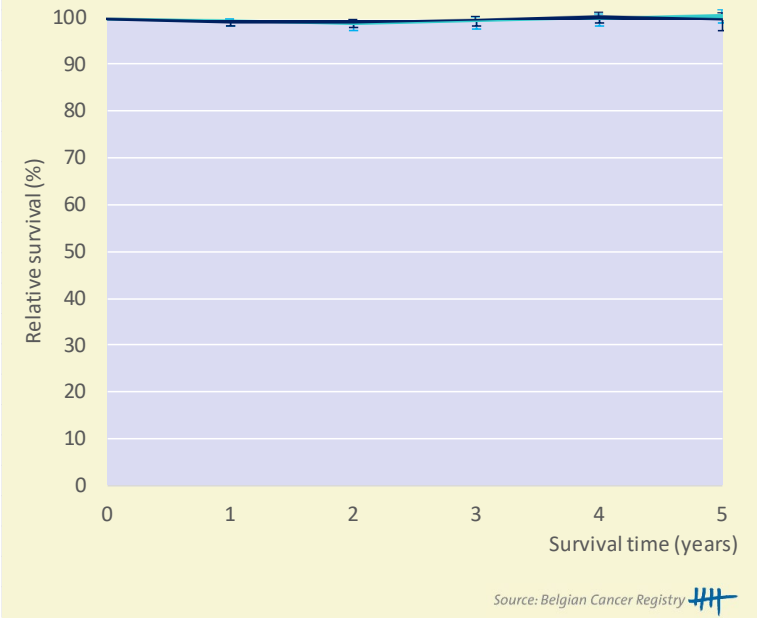
Figure 6 Benign tumours of the cranial nerves in adults: Relative survival* by histology, Belgium 2011-2020



** The relative survival values are represented with 95% Confidence Intervals.*

Survival trends

Figure 7 Benign tumours of the cranial nerves in adults: Relative survival* by cohort, Belgium 2004-2020



** The relative survival values are represented with 95% Confidence Intervals.*

3.3.3 TUMOURS OF OVERLAPPING LOCALISATIONS OF THE BRAIN AND OTHER PARTS OF THE CENTRAL NERVOUS SYSTEM AND NERVOUS SYSTEM, NOT OTHERWISE SPECIFIED

KEYNOTES

Incidence

- Haematolymphoid tumours are the most frequent subtype (63%) of malignant tumours diagnosed in overlapping localisations of the brain and other parts of the CNS or nervous system, not otherwise specified.
- For borderline tumours, the group of mesenchymal, non-meningothelial tumours is the most frequently diagnosed (44% of cases).
- Schwannomas are the most common benign tumours (69%) diagnosed in overlapping localisations of the brain and other parts of the CNS or nervous system, not otherwise specified.

Incidence

Figure 1 Tumours of overlapping localisations of the brain and other parts of the CNS or nervous system (not otherwise specified) in adults: Incidence by primary location and behaviour in Belgium

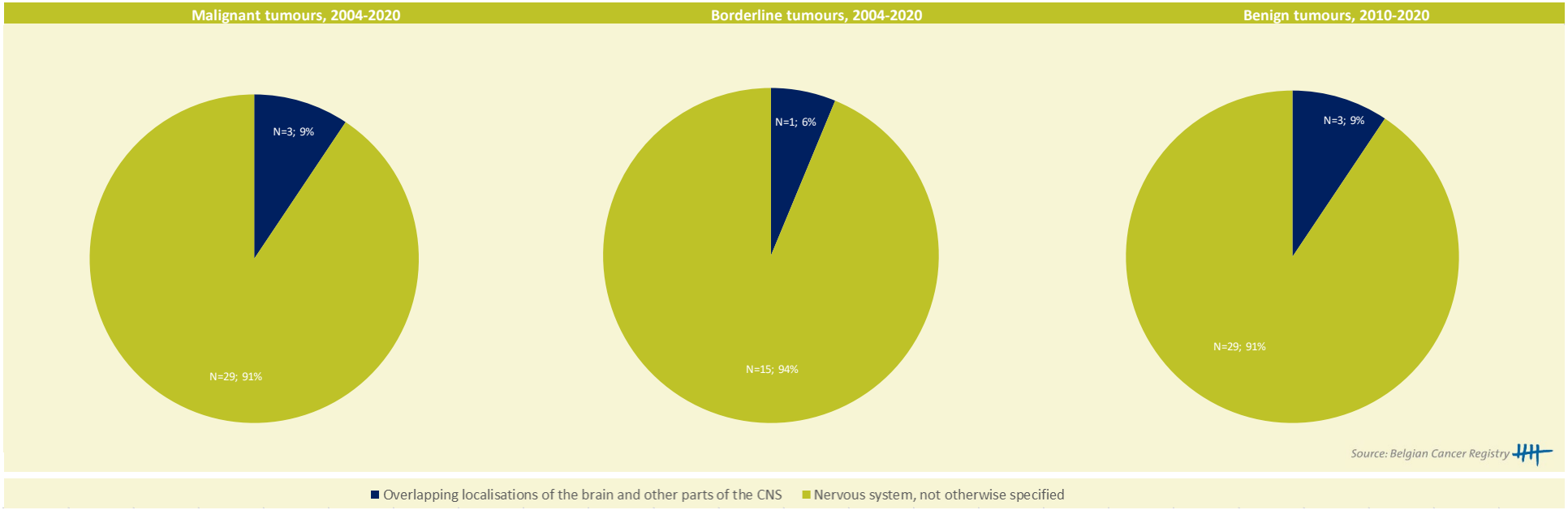
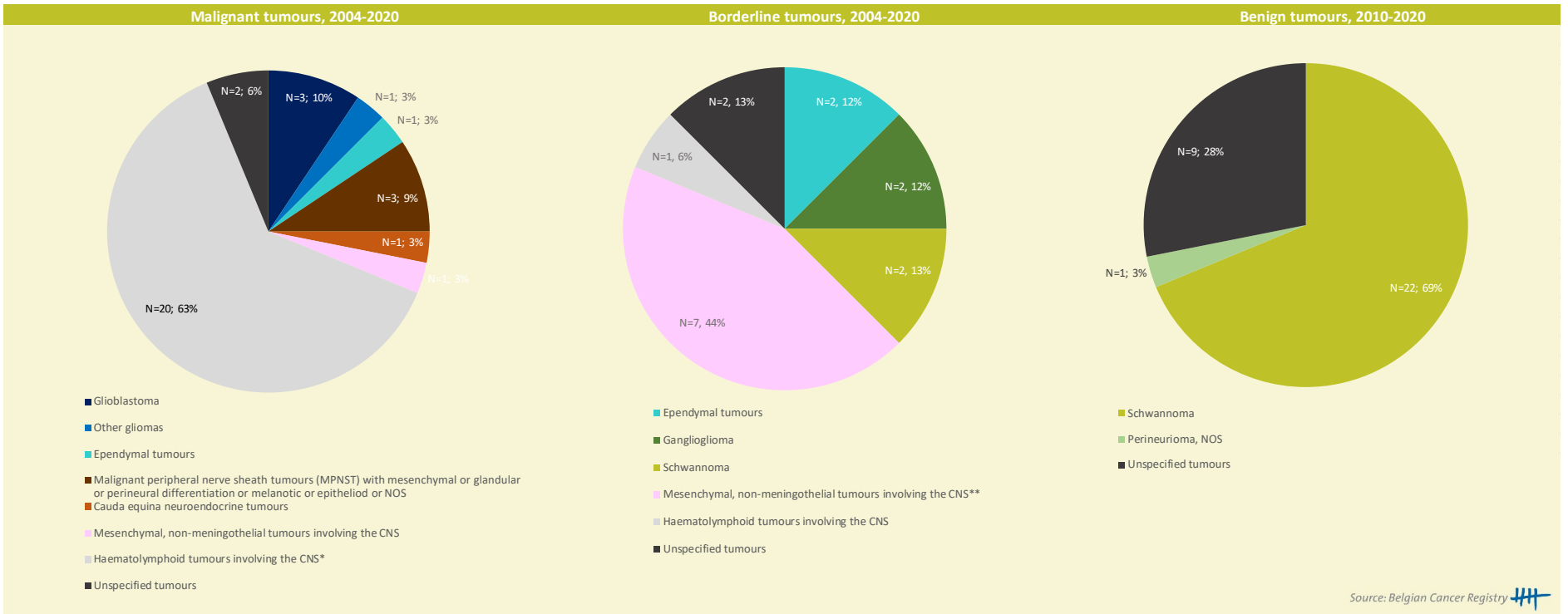


Figure 2 Tumours of overlapping localisations of the brain and other parts of the CNS or nervous system (not otherwise specified) in adults: Incidence by histology and behaviour in Belgium



** The majority of malignant haematolymphoid tumours involving the CNS are represented by "Diffuse large B-cell lymphoma (DLBCL) of the CNS" (N=8) and "Malignant non-Hodgkin lymphoma, NOS" (N=5).*

*** All borderline mesenchymal, non-meningothelial tumours involving the CNS are represented by the subtype haemangioblastoma (N=7).*

TUMOURS OF THE PITUITARY AND PINEAL GLAND AND CRANIOPHARYNGEAL DUCT IN ADULTS

3.4 TUMOURS OF THE PITUITARY AND PINEAL GLAND AND CRANIOPHARYNGEAL DUCT* IN ADULTS

KEYNOTES

Incidence

- Malignant tumours of the pituitary and pineal gland and craniopharyngeal duct are more often observed in males than in females (male/female-ratio = 2.4), while borderline tumours are more frequent in females than in males (male/female-ratio = 0.6).
- Most tumours are characterised by a benign behaviour with an equal distribution between males and females (male/female-ratio = 1.0)
- The most frequent localisation depends strongly on the behaviour of the tumours: most borderline tumours impact the craniopharyngeal duct, while almost all benign tumours are observed in the pituitary gland (predominantly pituitary adenomas). Malignant tumours are exclusively diagnosed in the pituitary and pineal gland, not in the craniopharyngeal duct.

** The tumours of pituitary and pineal gland and craniopharyngeal duct are presented in this chapter by tumour behaviour (malignant/borderline/benign; cf. all chapters with epidemiological results). This distinction does not completely correspond to clinical practice where it is more common to distinguish tumours based on the WHO grade. The relation between tumour behaviour and WHO grade for these tumours can be found in Table 1 of "Methods and data quality".*

Table 1 Tumours of the pituitary and pineal gland and craniopharyngeal duct in adults: Overview of incidence, prevalence and survival by behaviour and sex in Belgium

	Males								
	Malignant tumours			Borderline tumours			Benign tumours		
Incidence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Incidence, 2016-2020	27	0.1	0.1	33	0.2	0.1	744	3.5	2.9
Prevalence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Prevalence (5 years), 2016-2020	24	0.5	0.7	30	0.7	0.6	693	15.9	12.6
Prevalence (10 years), 2011-2020	34	0.8	1.0	72	1.6	1.6	1,265	29.0	22.6
Relative survival	N at risk	%	95%CI	N at risk	%	95%CI	N at risk	%	95%CI
5-year Relative survival, 2016-2020	< 50*	-	-	< 50*	-	-	744	99.4	[95.7;102.3]
10-year Relative survival, 2011-2020	< 50*	-	-	76	85.3	[66.2;98.5]	1,407	100.8	[96.4;104.6]
	Females								
	Malignant tumours			Borderline tumours			Benign tumours		
Incidence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Incidence, 2016-2020	14	0.1	0.1	53	0.2	0.2	686	3.0	3.0
Prevalence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Prevalence (5 years), 2016-2020	10	0.2	0.2	48	1.0	1.1	658	14.3	14.0
Prevalence (10 years), 2011-2020	19	0.4	0.4	101	2.2	2.3	1,234	26.9	25.1
Relative survival	N at risk	%	95%CI	N at risk	%	95%CI	N at risk	%	95%CI
5-year Relative survival, 2016-2020	< 50*	-	-	< 50*	-	-	683	99.3	[96.6;101.2]
10-year Relative survival, 2011-2020	< 50*	-	-	108	91.4	[81.6;97.6]	1,320	96.9	[93.1;100.0]
Median age at diagnosis, 2016-2020	46 [Q1: 31;Q3: 62]			52 [Q1: 41;Q3: 63]			55 [Q1: 42;Q3: 69]		
M/F-ratio, 2016-2020	2.4			0.6			1.0		

Source: Belgian Cancer Registry

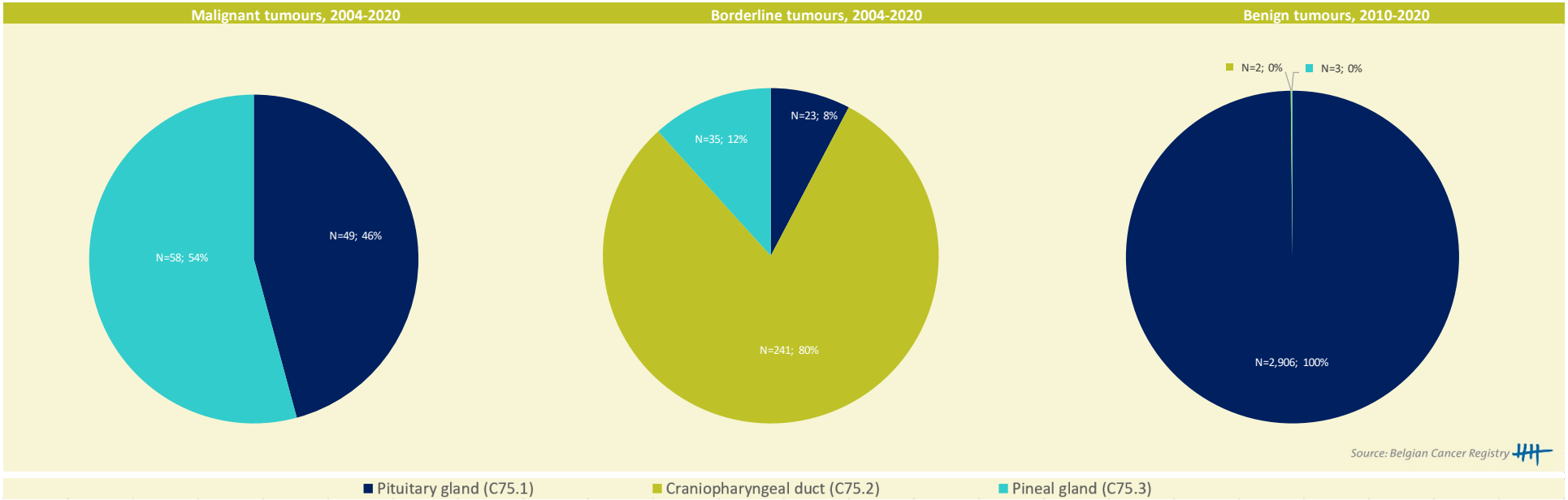
CR: crude (all ages) rate (N/100,000 person years)

WSR: age-standardised rate using the World Standard Population (N/100,000 person years)

** Not enough patients for representative survival analysis*

Incidence by primary location

Figure 1 Tumours of the pituitary and pineal gland and craniopharyngeal duct in adults: Incidence by primary location and behaviour in Belgium



The following subchapters will zoom in on each primary location shown in Figure 1. Due to the low number of diagnoses for other behaviours, the subchapter of the craniopharyngeal duct (C75.2) will only address the borderline tumours. Similarly, the subchapter of the pineal gland (C75.3) will only focus on malignant and borderline tumours. The first subchapter (Pituitary gland – C75.1) will show results for all behaviours (malignant, borderline, benign).

3.4.1 TUMOURS OF THE PITUITARY GLAND IN ADULTS

MAIN SUBTYPE:

- *Adenoma*

KEYNOTES

Incidence

- The incidence of benign tumours increases with age in males with a peak in incidence at 70-74yr, while, in females, a rather stable incidence is observed from 25 years to 70 years, followed by a peak in incidence at 75-79yr.
- Most tumours observed in the pituitary gland are benign adenomas (about 98%).
- Different types of secreting adenomas cannot be distinguished based on their ICD-O-3 histology codes (see Table 1 in Methods and data quality).
- Unspecified tumours represent 27% of all malignant tumours and 52% of the borderline tumours diagnosed in the pituitary gland in adults.

Survival

- Specifically for benign tumours, the 10-yr relative survival is very good for both males and females (99%) and for all age categories including for patients aged 80+ with a 5-yr relative survival of approximately 91%.

Table 1 Tumours of the pituitary gland in adults: Overview of incidence, prevalence and survival by behaviour and sex in Belgium

	Males								
	Malignant tumours			Borderline tumours			Benign tumours		
Incidence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Incidence, 2016-2020	9	0.0	0.0	5	0.0	0.0	743	3.5	2.9
Prevalence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Prevalence (5 years), 2016-2020	7	0.2	0.2	4	0.1	0.1	693	15.9	12.6
Prevalence (10 years), 2011-2020	10	0.2	0.3	9	0.2	0.2	1,265	29.0	22.6
Relative survival	N at risk	%	95%CI	N at risk	%	95%CI	N at risk	%	95%CI
5-year Relative survival, 2016-2020	< 50*	-	-	< 50*	-	-	743	99.5	[95.8;102.4]
10-year Relative survival, 2011-2020	< 50*	-	-	< 50*	-	-	1,406	100.8	[96.4;104.7]
	Females								
	Malignant tumours			Borderline tumours			Benign tumours		
Incidence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Incidence, 2016-2020	7	0.0	0.0	5	0.0	0.0	682	3.0	3.0
Prevalence	N	CR	WSR	N	CR	WSR	N	CR	WSR
Prevalence (5 years), 2016-2020	6	0.1	0.1	6	0.1	0.2	655	14.3	13.9
Prevalence (10 years), 2011-2020	10	0.2	0.2	13	0.3	0.3	1,231	26.8	25.1
Relative survival	N at risk	%	95%CI	N at risk	%	95%CI	N at risk	%	95%CI
5-year Relative survival, 2016-2020	< 50*	-	-	< 50*	-	-	679	99.4	[96.7;101.3]
10-year Relative survival, 2011-2020	< 50*	-	-	< 50*	-	-	1,316	97.0	[93.2;100.1]
Median age at diagnosis, 2016-2020	46.5 [Q1: 40;Q3: 63]			57 [Q1: 27;Q3: 65]			55 [Q1: 42;Q3: 69]		
M/F-ratio, 2016-2020	1.7			1.0			1.0		

Source: Belgian Cancer Registry

CR: crude (all ages) rate (N/100,000 person years)

WSR: age-standardised rate using the World Standard Population (N/100,000 person years)

** Not enough patients for representative survival analysis*

Incidence

Figure 1 Tumours of the pituitary gland in adults: Age-specific incidence rates (N/100,000) by behaviour and sex in Belgium

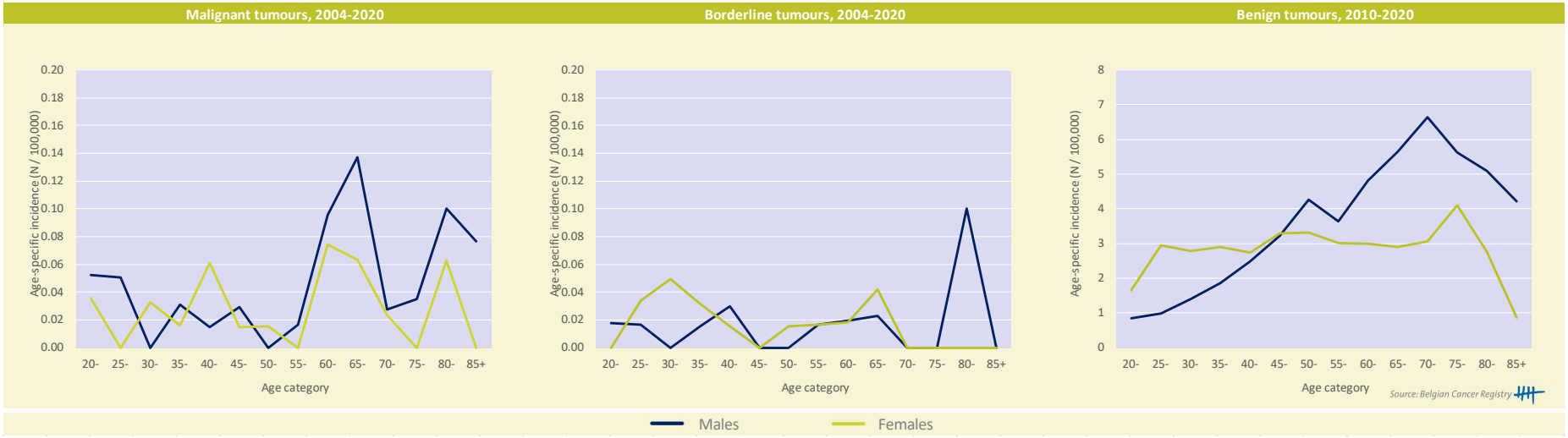
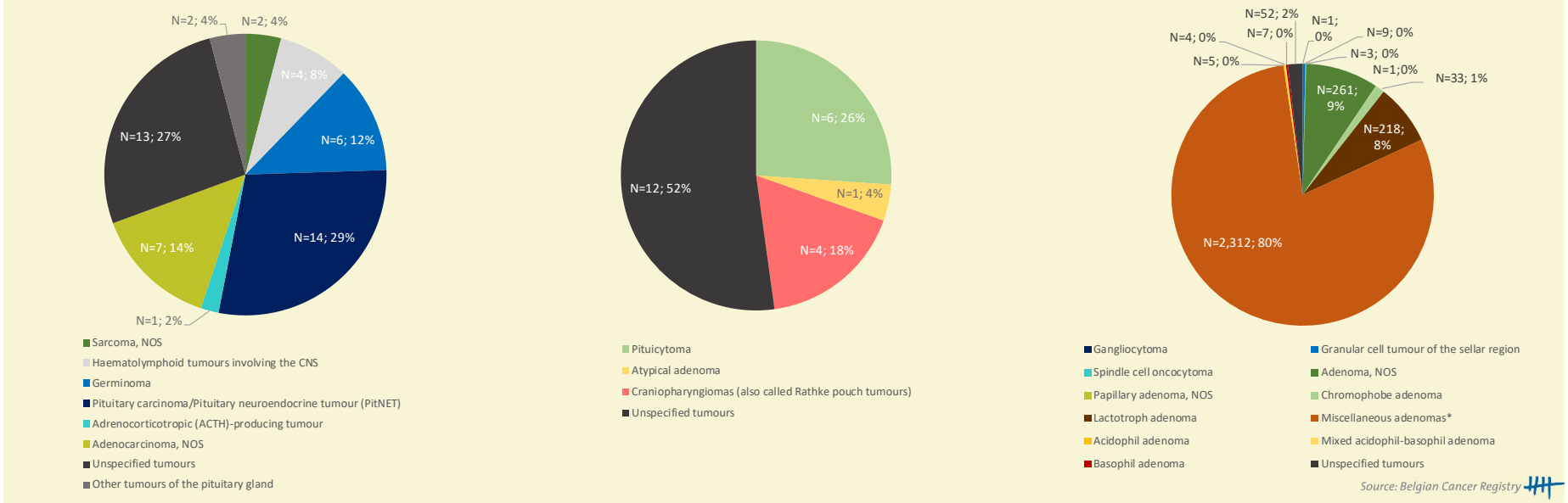


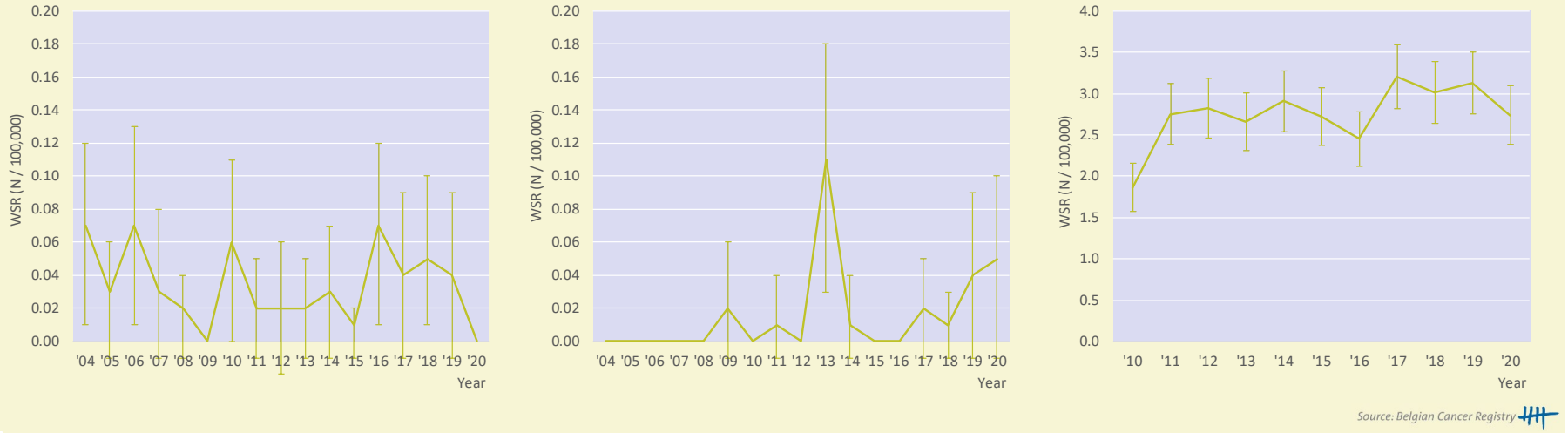
Figure 2 Tumours of the pituitary gland in adults: Incidence by histology and behaviour in Belgium



** Refers to pituitary adenoma, somatotroph or thyrotroph or corticotroph or gonadotroph or null cell or plurihormonal or double adenomas or NOS*

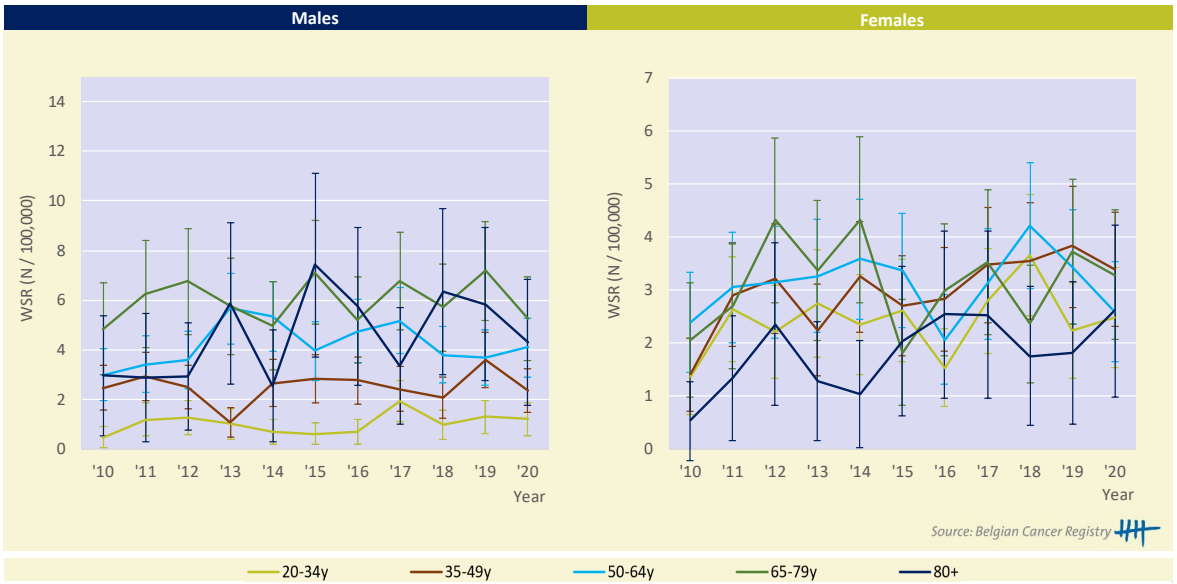
Incidence trends

Figure 3 Tumours of the pituitary gland in adults: Age-standardised incidence rates* (WSR) by behaviour in Belgium



** The age-standardised incidence rates are represented with 95% Confidence Intervals.*

Figure 4 Benign tumours of the pituitary gland in adults: Age-standardised incidence rates* (WSR) by sex and age group, Belgium 2010-2020



** The age-standardised incidence rates are represented with 95% Confidence Intervals.*

The results of benign tumours are only shown for the incidence period 2010-2020, since there was a remarkable improvement of registration completeness in the preceding period (2004-2009).

Table 2 Benign tumours of the pituitary gland in adults: AAPC (%) by sex and age group in Belgium

	Benign 2010-2020		
Incidence (males and females)	AAPC (%)	95%CI	Period
Incidence (males and females)	2.6	[-0.1; 5.4]	2010-2020
Incidence by age group	Benign 2010-2020		
Males	AAPC (%)	95%CI	Period
20-34 yrs	-	-	-
35-49 yrs	5.1	[1.5; 8.7]	2004-2020
	8.1	[2.7; 13.7]	2004-2015
	-1.2	[-12.7; 11.8]	2015-2020
50-64 yrs	7.2	[4.8; 9.8]	2004-2020
	15.9	[10.8; 21.3]	2004-2013
	-3.0	[-8.6; 3.0]	2013-2020
65-79 yrs	8.4	[6.7; 10.2]	2004-2020
	21.1	[16.1; 26.2]	2004-2011
	-0.5	[-3.6; 2.7]	2011-2020
80+	-	-	-
Females	AAPC (%)	95%CI	Period
20-34 yrs	6.3	[3.8; 8.8]	2004-2020
	11.6	[5.8; 17.7]	2004-2012
	1.2	[-4.0; 6.7]	2012-2020
35-49 yrs	8.8	[5.9; 11.7]	2004-2020
	14.2	[7.6; 21.3]	2004-2012
	3.5	[-2.5; 9.9]	2012-2020
50-64 yrs	10.9	[8.1; 13.9]	2004-2020
	43.6	[27.7; 61.4]	2004-2008
	1.8	[-1.6; 5.3]	2008-2020
65-79 yrs	3.4	[0.7; 6.2]	2004-2020
80+	12.6	[7.0; 18.4]	2004-2020

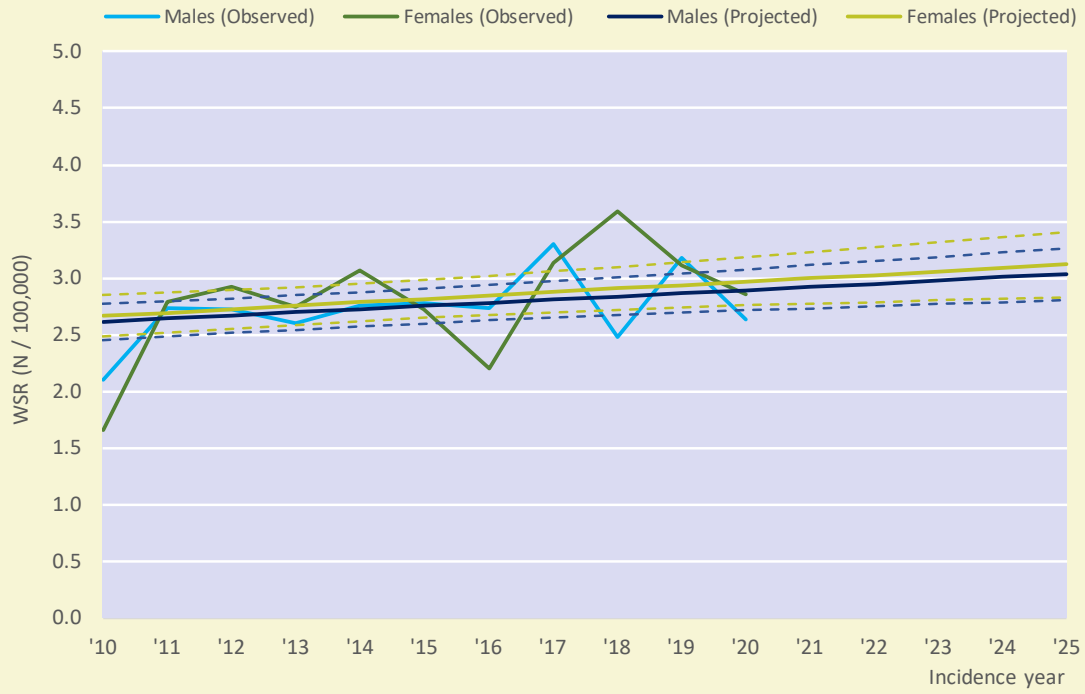
Source: Belgian Cancer Registry

AAPC: average annual percentage change

Period: When a joinpoint occured, APC's are calculated for the period before and after the joinpoint. This column represents the corresponding time interval. AAPC's are always calculated over the entire study-period.

Incidence projections

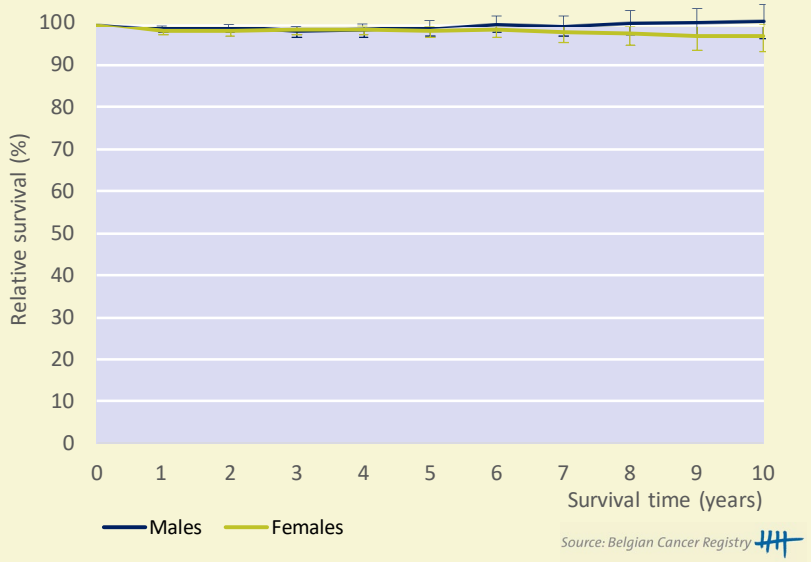
Figure 5 Benign tumours of the pituitary gland in adults: Observed and projected* incidence (WSR) by sex, Belgium 2004-2025



** Represented with 95% Confidence Intervals. Incidence projections are calculated for 2020-2025 based on extrapolations of the observed incidence trends for 2010-2019*

Survival

Figure 6 Benign tumours of the pituitary gland in adults: Relative survival* by sex, Belgium 2011-2020



** The relative survival values are represented with 95% Confidence Intervals.*

Table 3 Benign tumours of the pituitary gland in adults: Conditional 5-year relative survival* by sex (Belgium, 2011-2020)

	Males	
	Benign tumours	
X years since diagnosis	N at risk	%
1 year	1,356	101.1
2 year	1,235	100.5
3 year	1,042	102.2
	Females	
	Benign tumours	
X years since diagnosis	N at risk	%
1 year	1,279	100.3
2 year	1,167	99.7
3 year	1,022	99.0

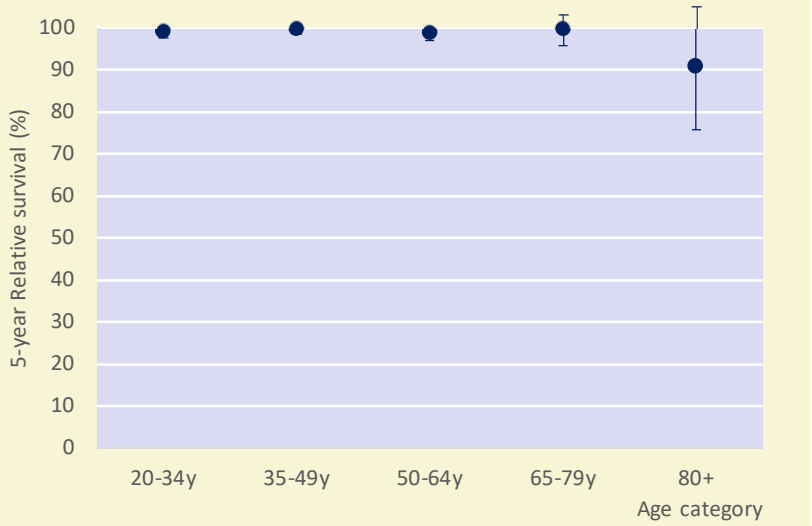
Source: Belgian Cancer Registry

** Unadjusted 5-yr relative survival probability conditional on surviving the first X years since diagnosis, %*

** Interpretation in lay-man's terms: Given that a patient has already survived X years, what is the relative survival probability 5 years later.*

** Relative survival data are not presented when the number of patients at risk is less than 50 cases.*

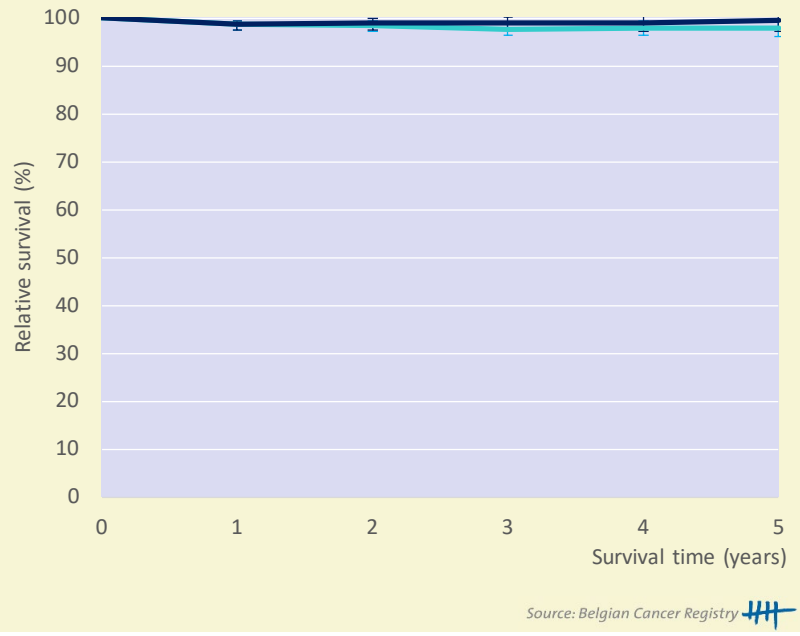
Figure 7 Benign tumours of the pituitary gland in adults: Age-specific 5-year relative survival* by age, Belgium 2011-2020



** The relative survival values are represented with 95% Confidence Intervals.*

Survival trends

Figure 8 Benign tumours of the pituitary gland in adults: Relative survival* by cohort, Belgium 2010-2020



** The relative survival values are represented with 95% Confidence Intervals.*

3.4.2 BORDERLINE TUMOURS OF THE CRANIOPHARYNGEAL DUCT IN ADULTS

MAIN SUBTYPES:

- *Craniopharyngioma, NOS*
- *Adamatinomatous craniopharyngioma*
- *Papillary craniopharyngioma*

KEYNOTES

Incidence

- Borderline tumours of the craniopharyngeal duct are more often observed in females than in males (male/female ratio = 0.7).
- The median age for both males and females is 52 years of age.
- Among craniopharyngiomas with specified subtype, 74% are registered as adamatinomatous craniopharyngiomas. However, in 49% of all cases the subtype is unknown.

Survival

- The relative survival is slightly higher in females than in males (10-yr relative survival of 93.3% vs 86.7%).

Table 1 Borderline tumours of craniopharyngeal duct in adults: Overview of incidence, prevalence and survival by sex in Belgium

	Males		
	Borderline tumours		
Incidence	N	CR	WSR
Incidence, 2016-2020	28	0.1	0.1
Prevalence	N	CR	WSR
Prevalence (5 years), 2016-2020	26	0.6	0.5
Prevalence (10 years), 2011-2020	59	1.4	1.2
Relative survival	N at risk	%	95%CI
5-year Relative survival, 2016-2020	< 50*	-	-
10-year Relative survival, 2011-2020	64	86.7	[67.1;99.6]
	Females		
	Borderline tumours		
Incidence	N	CR	WSR
Incidence, 2016-2020	41	0.2	0.2
Prevalence	N	CR	WSR
Prevalence (5 years), 2016-2020	38	0.8	0.8
Prevalence (10 years), 2011-2020	74	1.6	1.6
Relative survival	N at risk	%	95%CI
5-year Relative survival, 2016-2020	< 50*	-	-
10-year Relative survival, 2011-2020	79	93.3	[81.4;100.0]
Median age at diagnosis, 2016-2020	52 [Q1: 42;Q3: 63]		
M/F-ratio, 2016-2020	0.7		

Source: Belgian Cancer Registry

CR: crude (all ages) rate (N/100,000 person years)

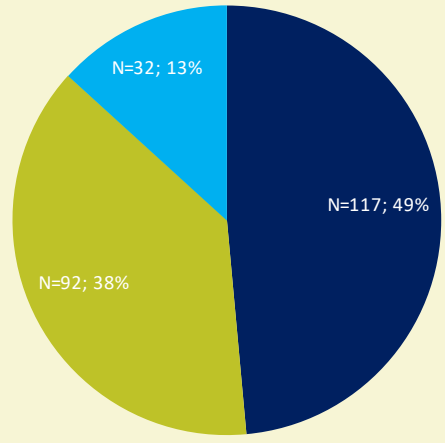
WSR: age-standardised rate using the World Standard Population (N/100,000 person years)

** Not enough patients for representative survival analysis*

Incidence

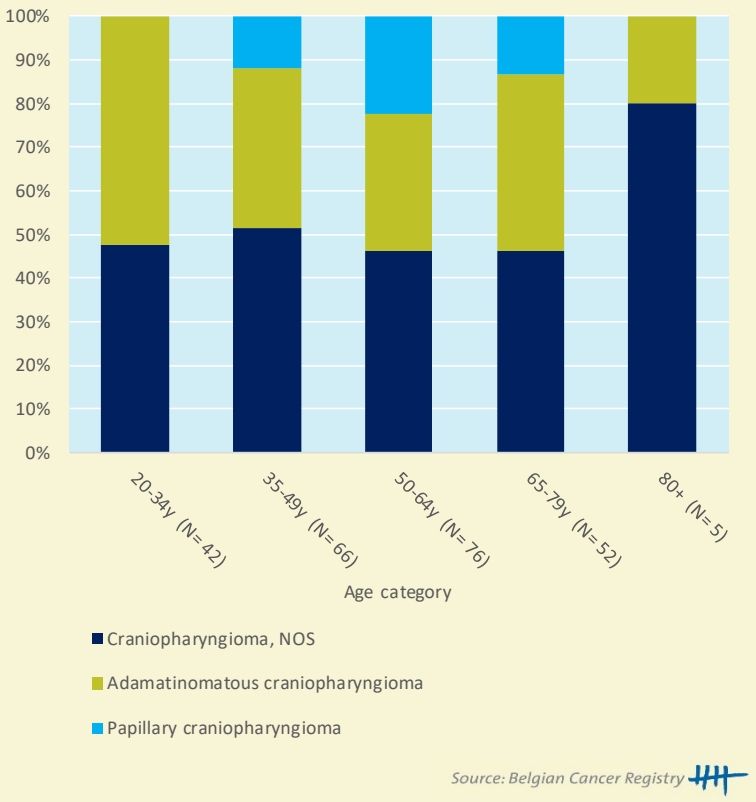
Figure 1 Borderline tumours of craniopharyngeal duct in adults: Age-specific incidence rates (N/100,000) by sex in Belgium, 2004-2020

Figure 2 Borderline tumours of craniopharyngeal duct in adults: Incidence by histology in Belgium, 2004-2020



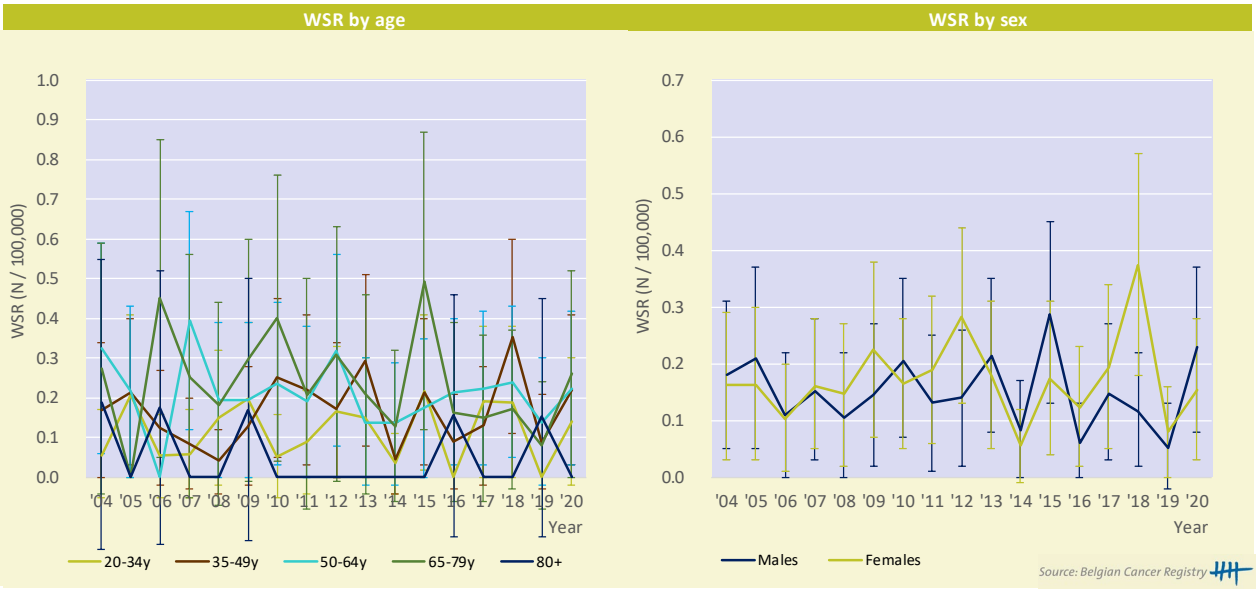
Keynote for registration:
Due to the recent advances and possibilities for molecular pathway inhibitors in craniopharyngioma, the ICD-O-3 histology code for 'Craniopharyngioma, NOS' should be avoided (this code is removed in the 2021 WHO classification; see Appendix I) and the subtype should be specified.

Figure 3 Borderline tumours of craniopharyngeal duct in adults: Incidence by histology and age group in Belgium, 2004-2020



Incidence trends

Figure 4 Borderline tumours of craniopharyngeal duct in adults: Age-standardised incidence rates* (WSR) by age and sex in Belgium



** The age-standardised incidence rates are represented with 95% Confidence Intervals.*

Table 2 Borderline tumours of the craniopharyngeal duct in adults: AAPC(%) by sex and age group in Belgium

	Borderline 2004-2020		
Incidence by age group	AAPC (%)	95%CI	Period
20-34 yrs	-	-	-
35-49 yrs	1.5	[-5.0; 8.4]	2004-2020
50-64 yrs	-	-	-
65-79 yrs	-	-	-
80+	-	-	-
	Borderline 2004-2020		
Incidence by sex	AAPC (%)	95%CI	Period
Males	-2.2	[-6.8; 2.7]	2004-2020
Females	-0.1	[-4.7; 4.7]	2004-2020

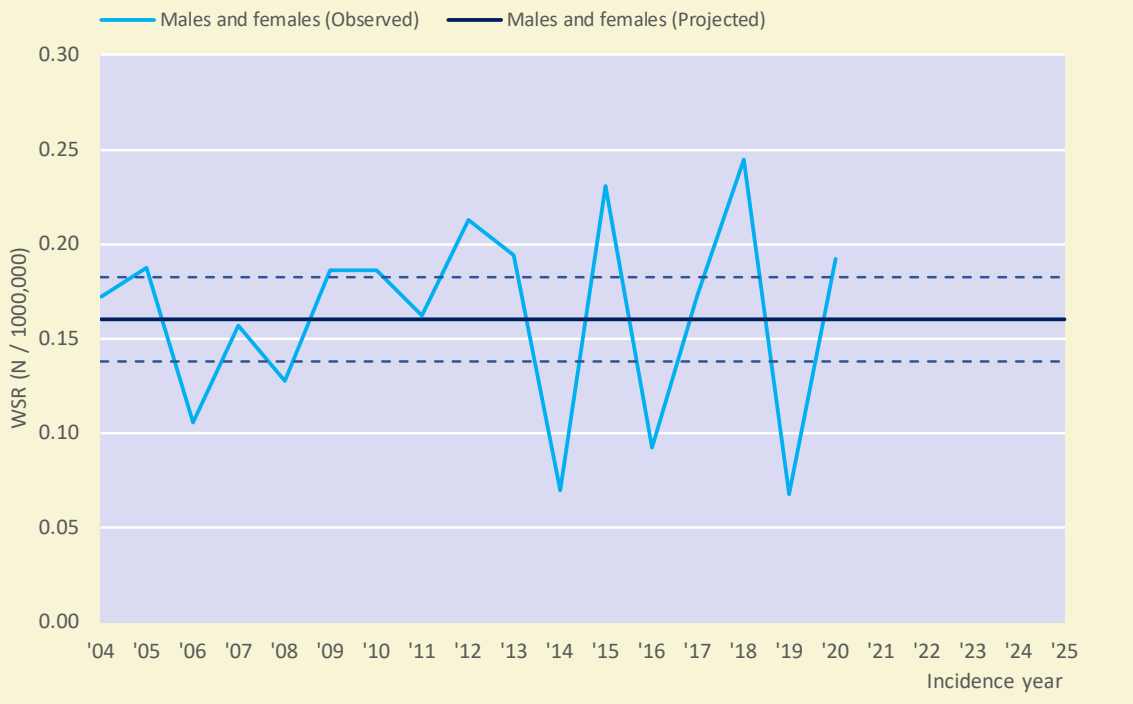
AAPC: average annual percentage change

Source: Belgian Cancer Registry

Period: When a joinpoint occured, APC's are calculated for the period before and after the joinpoint. This column represents the corresponding tim
AAPC's are always calculated over the entire study-period.

Incidence projections

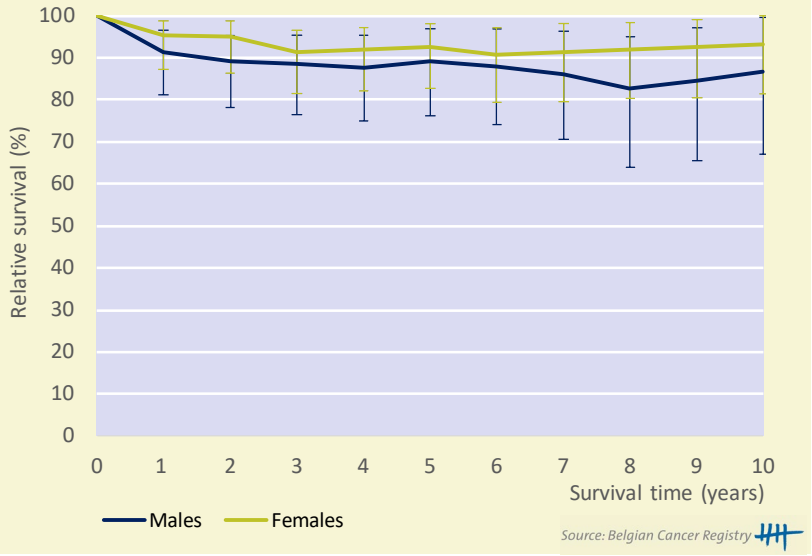
Figure 5 Borderline tumours of the craniopharyngeal duct in adults: Observed and projected* incidence (WSR) by sex, Belgium 2004-2025



** Represented with 95% Confidence Intervals. Incidence projections are calculated for 2020-2025 based on extrapolations of the observed incidence trends for 2004-2019.*

Survival

Figure 6 Borderline tumours of craniopharyngeal duct in adults: Relative survival* by sex, Belgium 2011-2020



** The relative survival values are represented with 95% Confidence Intervals.*

Table 3 Borderline tumours of craniopharyngeal duct in adults: Conditional 5-year relative survival* by sex (Belgium, 2011-2020)

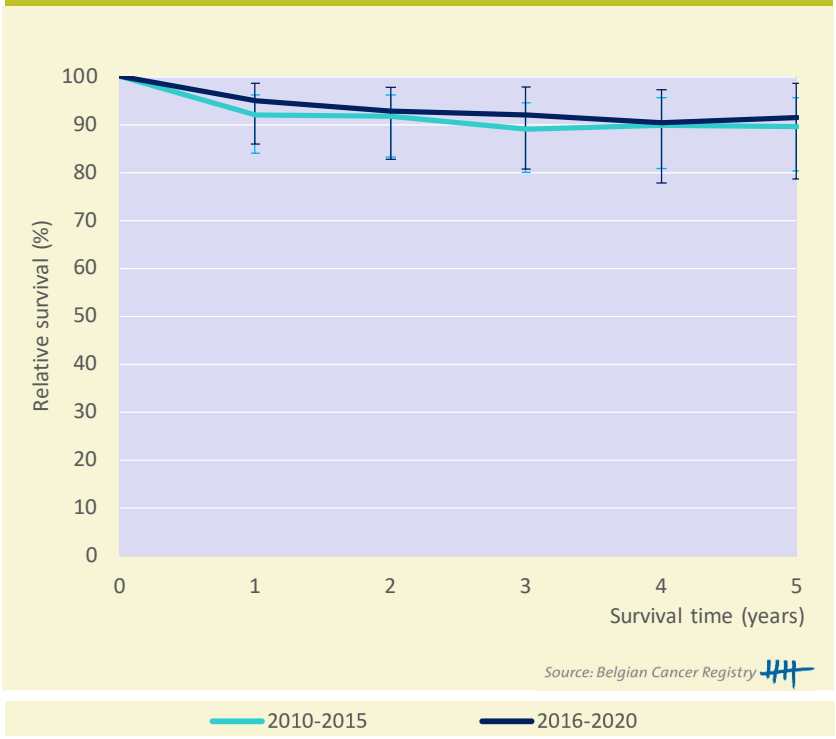
	Males	
	Borderline tumours	
X years since diagnosis	N at risk	%
1 year	58	96.2
2 year	50	96.5
3 year	-	-
	Females	
	Borderline tumours	
X years since diagnosis	N at risk	%
1 year	75	95.1
2 year	68	96.4
3 year	60	100.7

Source: Belgian Cancer Registry

** Unadjusted 5-yr relative survival probability conditional on surviving the first X years since diagnosis, %*
** Interpretation in lay-man's terms: Given that a patient has already survived X years, what is the relative survival probability 5 years later.*
** Relative survival data are not presented when the number of patients at risk is less than 50 cases.*

Survival trends

Figure 7 Borderline tumours of craniopharyngeal duct in adults: Relative survival* by cohort, Belgium 2010-2020



** The relative survival values are represented with 95% Confidence Intervals.*

3.4.3 TUMOURS OF THE PINEAL GLAND IN ADULTS

MAIN SUBTYPE:

- *Pineocytoma*
- *Pineal parenchymal tumour of intermediate differentiation / Pineoblastoma (DICER1 syndrome)*

KEYNOTES

Incidence

- Tumours of the pineal gland are more often diagnosed in females than in males. These results, however, should be interpreted with caution due to the small number of cases.
- The most common malignant tumour (41%) is classified as 'Pineal parenchymal tumour of intermediate differentiation / Pineoblastoma (DICER1 syndrome)'. Pineocytoma represents the majority of the borderline tumours (77%) observed in the pineal gland.

Table 1 Tumours of the pineal gland in adults: Overview of incidence, prevalence and survival by behaviour and sex in Belgium

	Males					
	Malignant tumours			Borderline tumours		
Incidence	N	CR	WSR	N	CR	WSR
Incidence, 2016-2020	18	0.1	0.1	-	-	-
Prevalence	N	CR	WSR	N	CR	WSR
Prevalence (5 years), 2016-2020	17	0.4	0.5	-	-	-
Prevalence (10 years), 2011-2020	24	0.5	0.7	4	0.1	0.1
Relative survival	N at risk	%	95%CI	N at risk	%	95%CI
5-year Relative survival, 2016-2020	< 50*	-	-	< 50*	-	-
10-year Relative survival, 2011-2020	< 50*	-	-	< 50*	-	-
	Females					
	Malignant tumours			Borderline tumours		
Incidence	N	CR	WSR	N	CR	WSR
Incidence, 2016-2020	7	0.0	0.0	7	0.0	0.0
Prevalence	N	CR	WSR	N	CR	WSR
Prevalence (5 years), 2016-2020	4	0.1	0.1	4	0.1	0.1
Prevalence (10 years), 2011-2020	9	0.2	0.2	14	0.3	0.3
Relative survival	N at risk	%	95%CI	N at risk	%	95%CI
5-year Relative survival, 2016-2020	< 50*	-	-	< 50*	-	-
10-year Relative survival, 2011-2020	< 50*	-	-	< 50*	-	-
Median age at diagnosis, 2016-2020	45 [Q1: 29;Q3: 56]			50 [Q1: 41;Q3: 60]		
M/F-ratio, 2016-2020	3.1			-		

Source: Belgian Cancer Registry

CR: crude (all ages) rate (N/100,000 person years)

WSR: age-standardised rate using the World Standard Population (N/100,000 person years)

** Not enough patients for representative survival analysis*

Incidence

Figure 1 Tumours of the pineal gland in adults: Age-specific incidence rates (N/100,000) by behaviour and sex in Belgium

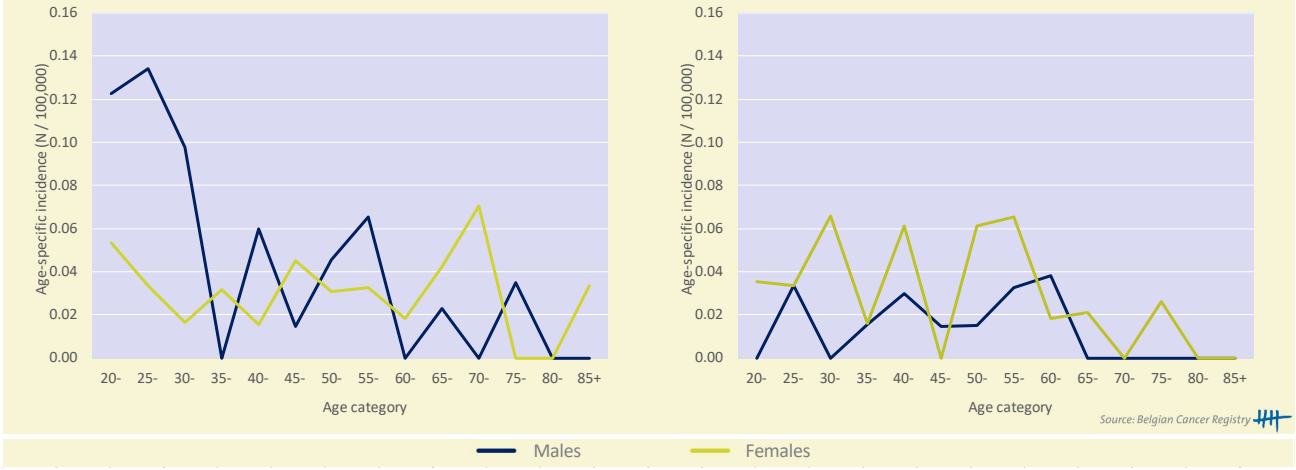
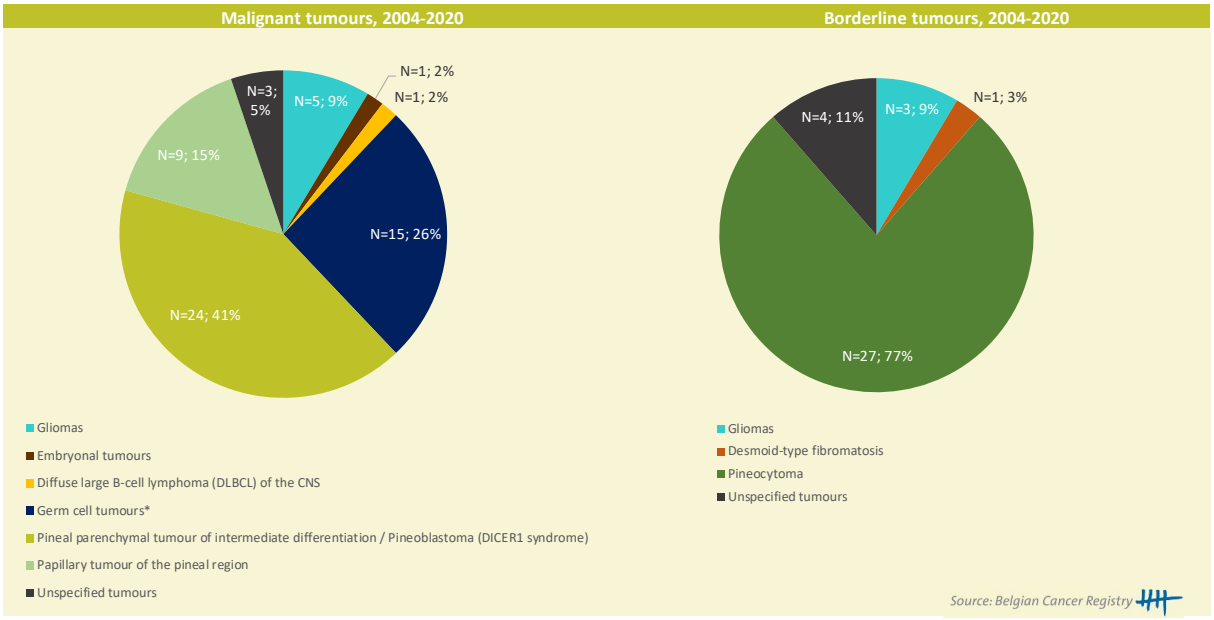


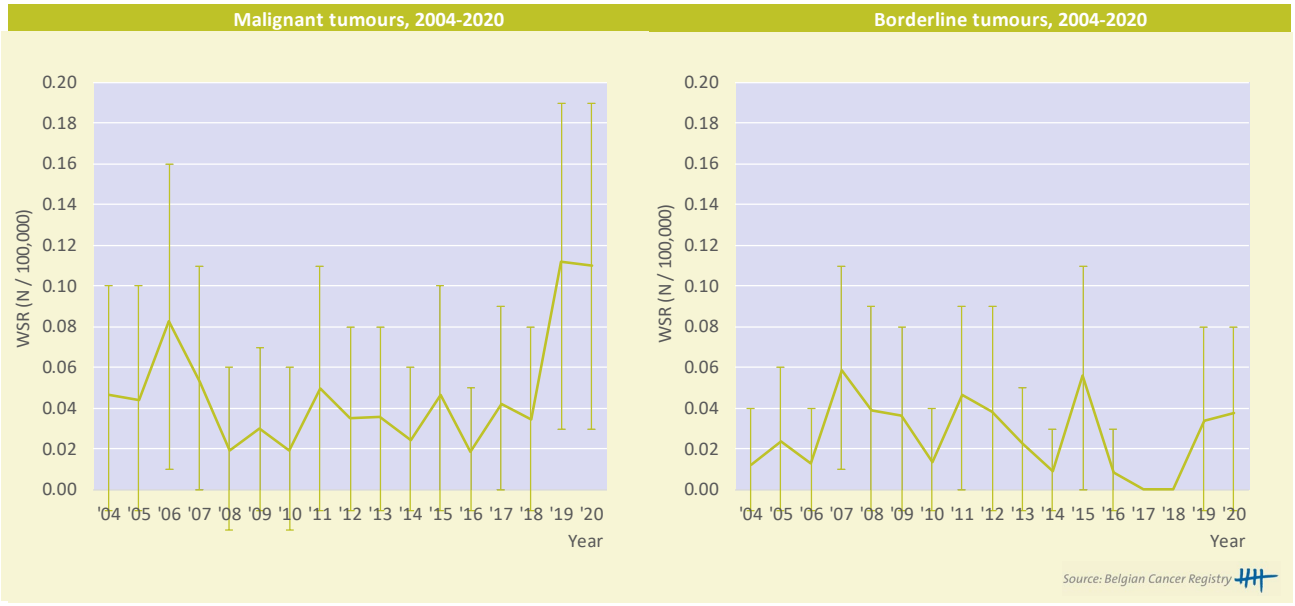
Figure 2 Tumours of the pineal gland in adults: Incidence by histology and behaviour in Belgium



** The majority of malignant germ cell tumours of the pineal gland are represented by germinoma (93%; N=14).*

Incidence trends

Figure 3 Tumours of the pineal gland in adults: Age-standardised incidence rates* (WSR) by behaviour in Belgium



** The age-standardised incidence rates are represented with 95% Confidence Intervals.*

Table 2 Tumours of the pineal gland in adults: AAPC (%) by behaviour in Belgium

	Malignant 2004-2020			Borderline 2004-2020		
Incidence (males and females)	AAPC (%)	95%CI	Period	AAPC (%)	95%CI	Period
Incidence (males and females)	5.6	[0.7; 10.7]	2004-2020	-	-	-
	-5.3	[-10.9; 0.7]	2004-2016			
	46.1	[18.0; 80.8]	2016-2020			

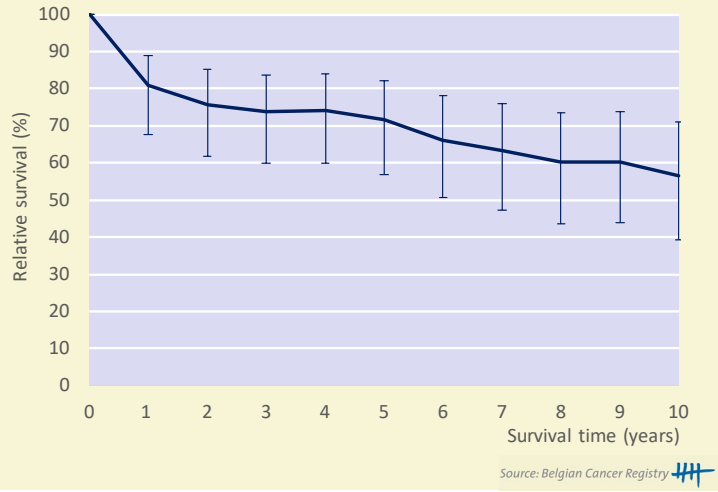
Source: Belgian Cancer Registry

AAPC: average annual percentage change

Period: When a joinpoint occured, APC's are calculated for the period before and after the joinpoint. This column represents the corresponding time interval. AAPC's are always calculated over the entire study-period.

Survival

Figure 4 Malignant tumours* of the pineal gland in adults: Relative survival, Belgium 2004-2020**



** Relative survival data are presented for all malignant tumours combined, which is a miscellaneous group of subtypes as shown in Figure 2. Therefore these results should be interpreted with caution.*

*** The relative survival values are represented with 95% Confidence Intervals.*

REFERENCE LIST

4 REFERENCE LIST

(1) Koninklijk Besluit houdende vaststelling van de normen waaraan het zorgprogramma voor oncologische basiszorg en het zorgprogramma voor oncologie moeten voldoen om te worden erkend. Belgisch Staatsblad, 21 maart 2003.
Arrêté Royal: Fixe les normes auxquelles les programmes de soins de base en oncologie et les programmes de soin en oncologie doivent répondre pour être agréés. Moniteur Belge, 21 mars 2003.

(2) Wet houdende diverse bepalingen betreffende gezondheid van 13 december 2006, artikel 39. Belgisch Staatsblad, 22 december 2006.
Loi portant dispositions diverses en matière de santé du 13 décembre 2006, article 39. Moniteur Belge, 22 décembre 2006.

(3) Henau K, Van Eycken E, Silversmit G, Pukkala E. Regional variation in incidence for smoking and alcohol related cancers in Belgium. Cancer Epidemiology 2015; 39(1): 55-65.

(4) Henau K, Van Eycken E, Silversmit G, Pukkala E. Regional variation in incidence for smoking and alcohol related cancers in Belgium. Cancer Epidemiology 2015; 39(1): 55-65.

(5) Cancer Incidence in Belgium, 2008. Brussels: Belgian Cancer Registry, 2011.

(6) Cancer Survival in Belgium. Brussels: Belgian Cancer Registry, 2012.

(7) Cancer in Children and Adolescents. Brussels: Belgian Cancer Registry, 2013.

(8) Cancer Prevalence in Belgium, 2010. Brussels: Belgian Cancer Registry, 2014.

(9) Haematological Malignancies in Belgium. Brussels: Belgian Cancer Registry, 2015.

(10) Cancer Burden in Belgium, 2004-2013. Brussels: Belgian Cancer Registry, 2015.

(11) Cancer Incidence Projections in Belgium, 2015 to 2025. Brussels: Belgian Cancer Registry, 2017.

(12) Cancer in an Ageing Population in Belgium 2004-2016, Belgian Cancer Registry, Brussels, 2018.

(13) IACR - ICD-O-3.2
(http://www.iacr.com.fr/index.php?option=com_content&view=article&id=149:icd-o-3-2&catid=80&Itemid=545)

(14) Steliarova-Foucher E, Colombet M, Ries LAG, Moreno F, Dolya A, Shin HY, Hesseling P, Stiller CA. International Incidence of Childhood Cancer, Volume III. Lyon: International Agency for Research on Cancer, 2017

(15) Cancer in children and adolescents in Belgium 2004-2020. Brussels: Belgian Cancer Registry, 2023.

(16) Koninklijk besluit tot wijziging van het koninklijk besluit van 25 april 2002 betreffende de vaststelling en de vereffening van het budget van financiële middelen van de ziekenhuizen. Belgisch Staatsblad, 20 september 2009.
Arrêté royal modifiant l'arrêté royal du 25 avril 2002 relatif à la fixation et à la liquidation du budget des moyens financiers des hôpitaux. Moniteur Belge, 20 septembre 2009.

(17) WHO Classification of Tumours Editorial Board. Central nervous system tumours [Internet]. Lyon (France): International Agency for Research on Cancer; 2021 [cited 2022 04 25]. (WHO classification of tumours series, 5th Edition.; vol. 6).
Available from: https://tumourclassification.iarc.who.int/chapters/45

(18) Kleihues P., Cavenee W.K.. WHO Classification of Tumours, Pathology and Genetics: Tumours of the Nervous System. International Agency for Research on Cancer, Lyon, 2000

(19) Louis D.N., Ohgaki H., Wiestler O.D., Cavenee W.K.WHO Classification of Tumours of the Central Nervous System. International Agency for Research on Cancer, Lyon, 2007

(20) Louis D.N., Ohgaki H., Wiestler O.D., Cavenee W.K.WHO Classification of Tumours of the Central Nervous System ; Revised 4th Edition. International Agency for Research on Cancer, Lyon, 2016

(21) ENCR Recommendations for coding Basis of Diagnosis. European Network of Cancer Registries, 2022

(22) ENCR Recommendations for coding Basis of Diagnosis. European Network of Cancer Registries, 1999

(23) Cancer Burden in Belgium, 2004-2017. Brussels: Belgian Cancer Registry, 2020.

(24) Clegg LX, Hankey BF, Tiwari R, Feuer EJ, Edwards BK. Estimating average annual per cent change in trend analysis. Statistics in Medicine 2009; 28(29): 3670-82.
(25) Karim-Kos HE, de Vries E, Soerjomataram I, Lemmens V, Siesling S, Coebergh JW. Recent trends of cancer in Europe: a combined approach of incidence, survival and mortality for 17 cancer sites since the 1990s. European Journal of Cancer. 2008 Jul;44(10):1345-89.
(26) Ederer F, Axtell LM, Cutler SJ. The relative survival rate: A statistical methodology. National Cancer Institute Monograph 1962; 6:101-121.
(27) Cleveland WS. Robust locally weighted regression and smoothing scatterplots. Journal of the American Statistical Association 1979; 74: 829-833.
(28) Cleveland WS, Devlin SJ. Locally weighted regression: an approach to regression analysis by local fitting. Journal of the American Statistical Association 1988; 83: 596-610.
(29) Cleveland WS, Grosse E. Computational Methods for Local Regression. Statistics and Computing 1991; 1:47-62.
(30) Cleveland WS, Grosse EH, Shyu MJ. Local regression models. In: Chambers JM, Hastie TJ. (Editors).Statistical Models in S. New York: Chapman and Hall, 1992. 309-376.
(31) Pinson H, Silversmit G, Vanhauwaert D, Vanschoenbeek K, Okito JPK, De Vleeschouwer S, Boterberg T, De Gendt C. Epidemiology and survival of adult-type diffuse glioma in Belgium during the molecular era. Neuro-oncology 2023; noad158.

APPENDIX I

Prospective classification of primary brain and other CNS tumours to be used from 2022

APPENDIX I

Classification of primary brain and other CNS tumours based on WHO classification 2021 and ICD-O-3.2 (to be used for new registrations from 2022)		
WHO classification of tumours of central nervous system	**Classification ICD-O-3.2**	**Most frequent topography**
Gliomas, glioneuronal tumours and neuronal tumours		
Adult-type diffuse gliomas		
Astrocytoma, IDH-mutant		(C71._)
Astrocytoma, IDH-mutant, grade 2	9400/3	(C71._)
Astrocytoma, NOS	*9400/3*	*(C71._)*
Astrocytoma, IDH-mutant, grade 3	9401/3	(C71._)
Astrocytoma, IDH-mutant, grade 4	9445/3	(C71._)
Gemistocytic astrocytoma, IDH-mutant, NOS	*9411/3*	*(C71._)*
Oligodendroglioma, IDH-mutant and 1p/19q-codeleted		(C71._)
Oligodendroglioma, IDH-mutant and 1p/19q-codeleted, grade 2	9450/3	(C71._)
Oligodendroglioma, NOS	*9450/3*	*(C71._)*
Oligodendroglioma, IDH-mutant and 1p/19q-codeleted, grade 3	9451/3	(C71._)
Glioblastoma, IDH-wildtype	9440/3	(C71._)
Giant cell glioblastoma	9441/3	(C71._)
Gliofibroma	*9442/1*	*(C71._)*
Gliosarcoma	9442/3	(C71._)
(Anaplastic) oligoastrocytoma, NOS or NEC	*9382/3*	*(C71._)*
Paediatric-type diffuse low-grade gliomas		
Diffuse astrocytoma, *MYB* or *MYBL1*-altered*	9421/1	(C71._)
Angiocentric glioma	9431/1	(C71._)
Polymorphous low-grade neuroepithelial tumour of the young (PLNTY)*	9413/0	(C71._)
Diffuse low-grade glioma, MAPK pathway-altered*	9421/1	(C71._)
Paediatric-type diffuse high-grade gliomas		
Diffuse midline glioma, H3 K27-altered*	9385/3	(C71._)
Diffuse hemispheric glioma, H3 G34-mutant*	9385/3	(C71._)
Diffuse paediatric-type high-grade glioma, H3-wildtype and IDH-wildtype	9385/3	(C71._)
Infant-type hemispheric glioma*	9385/3	(C71._)
Circumscribed astrocytic gliomas		
Pilocytic astrocytoma	9421/1	(C71._; C72._)
Pilomyxoid astrocytoma	9425/3	(C71._)
High-grade astrocytoma with piloid features (HGAP)	9421/3[$]	(C71._)
Pleomorphic xanthoastrocytoma (PXA)	9424/3	(C71._)
Subependymal giant cell astrocytoma (SEGCA)	9384/1	(C71._)
Chordoid glioma	9444/1	(C71._)
Astroblastoma, MN1-altered*	9430/3	(C71._)
Glioma, NOS / NEC	*9380/3*	*(C71._)*
Gliomatosis cerebri, NOS	*9381/3*	*(C71._)*
Glioneuronal and neuronal tumours		
Ganglioglioma	9505/1	(C70._; C71._; C72._)
Anaplastic ganglioglioma	9505/3	(C70._; C71._; C72._)
Gangliocytoma	9492/0	(C70._; C71._; C72._)
Desmoplastic infantile ganglioglioma	9412/1	(C71._)
Desmoplastic infantile astrocytoma	9412/1	(C71._)
Dysembryoplastic neuroepithelial tumour (DNET)	9413/0	(C71._)
Diffuse glioneuronal tumour with oligodendroglioma-like features and nuclear clusters (DGONC) (provisional entity)	Not applicable	
Papillary glioneuronal tumour (PGNT)	9509/1	(C71._; C75.3)
Rosette-forming glioneuronal tumour (RGNT)	9509/1	(C71._)
Myxoid glioneuronal tumour*	9509/1	(C71._)
Diffuse leptomeningeal glioneuronal tumour	9509/3[$]	(C70._; C71;_; C72._)
Multinodular and vacuolating neuronal tumour	9509/0[$]	(C71._)
Dysplastic cerebellar gangliocytoma (Lhermitte-Duclos disease)	9493/0	(C71.6)
Central neurocytoma	9506/1	(C71._; C72._)
Extraventricular neurocytoma	9506/1	(C71._)
Cerebellar liponeurocytoma	9506/1	(C71.6)
Ependymal tumours		
Supratentorial ependymoma, *ZFTA* fusion-positive*	9396/3	(C71._)
Supratentorial ependymoma, *YAP1* fusion-positive*	9396/3	(C71.5)
Supratentorial ependymoma, NOS*	9391/3	(C71._)
Posterior fossa group A (PFA) ependymoma*	9396/3	(C71.7)
Posterior fossa group B (PFB) ependymoma*	9396/3	(C71.7)
Posterior ependymoma, NOS*	9391/3	(C71.7)
Subependymoma	9383/1	(C71.7)
Spinal ependymoma, MYCN-amplified*	9396/3	(C72._)
Spinal ependymoma, NOS*	9391/3	(C72._)
Myxopapillary ependymoma	9394/1	(C72._)
Sellar ependymoma	9391/1	(C75.1)

Classification of primary brain and other CNS tumours based on WHO classification 2021 and ICD-O-3.2 (to be used for new registrations from 2022)

WHO classification of tumours of central nervous system	Classification ICD-O-3.2	Most frequent topography
Choroid plexus tumours		
Choroid plexus papilloma	9390/0	(C71.5; C71.7)
Atypical choroid plexus papilloma	9390/1	(C71.5; C71.7)
Choroid plexus carcinoma	9390/3	(C71.5; C71.7)
Embryonal tumours		
Medulloblastomas, molecularly defined		
Medulloblastoma, WNT-activated	9475/3	(C71.6)
Medulloblastoma, SHH-activated and *TP53*-wildtype	9471/3	(C71.6)
Medulloblastoma, SHH-activated and *TP53*-mutant	9476/3	(C71.6)
Medulloblastoma, non-WNT/non-SHH	9477/3	(C71.6)
Medulloblastomas, histologically defined		
Desmoplastic nodular medulloblastoma	9471/3	(C71.6)
Medulloblastoma with extensive nodularity	9471/3	(C71.6)
Large cell medulloblastoma	9474/3	(C71.6)
Anaplastic medulloblastoma	9474/3	(C71.6)
Medulloblastoma, histologically defined	9470/3	(C71.6)
Medullomyoblastoma	9472/3	(C71._)
Other CNS embryonal tumours		
Atypical teratoid/rhabdoid tumour (=ATRT)	9508/3	(C71._)
Cribriform neuroepithelial tumour (CRINET) (provisional entity)	Not applicable	
Embryonal tumour with multilayered rosettes (ETMR)	9478/3	(C71._)
CNS neuroblastoma, *FOXR2*-activated*	9500/3	(C71._;C72._)
Ganglioneuroblastoma	9490/3	(C71._;C72._)
CNS tumour with *BCOR* internal tandem duplication*	9500/3	(C71._)
CNS embryonal tumour, NEC/*NOS*	9473/3	(C71._;C72._)
Medulloepithelioma	9501/3	(C71._;C72._)
Pineal tumours		
Pineocytoma	9361/1	(C75.3)
Pineal parenchymal tumour of intermediate differentiation (PPTID)	9362/3	(C75.3)
Pineoblastoma	9362/3	(C75.3)
Papillary tumour of the pineal region	9395/3	(C75.3)
Desmoplastic myxoid tumour of the pineal region, *SMARCB1*-mutant (provisional entity)	Not applicable	
Cranial and paraspinal nerve tumours		
Schwannoma	9560/0	(C72._)
Neurofibroma	9540/0	(C72._)
Plexiform neurofibroma	9550/0	(C72._)
Perineurioma	9571/0	(C72._)
Hybrid nerve sheath tumour	9563/0	(C72._)
Malignant melanotic nerve sheath tumour	9540/3	(C72._)
Malignant peripheral nerve sheath tumour (MPNST)	9540/3	(C72._)
Epitheliod MPNST	9540/3	(C72._)
Malignant perineurioma	9571/3	(C72._)
Cauda equina neuroendocrine tumour (previously paraganglioma)	8693/3	(C72.1)
Meningiomas		
Meningioma	9530/0	(C70._)
Meningiothelial meningioma	9531/0	(C70._)
Fibrous meningioma	9532/0	(C70._)
Transitional meningioma	9537/0	(C70._)
Psammomatous meningioma	9533/0	(C70._)
Angiomatous meningioma	9534/0	(C70._)
Hemangioblastic meningioma	9535/0	(C70._)
Chordoid or clear cell meningioma	9538/1	(C70._)
Papillary or rhabdoid meningioma	9538/3	(C70._)
Atypical meningioma	*9539/1*	*(C70._)*
Anaplastic malignant meningioma	*9530/3*	*(C70._)*
Mesenchymal, non-meningothelial tumours involving the CNS		
Fibroblastic and myofibroblastic tumours		
Solitary fibrous tumour (SFT; previously termed hemangiopericytoma)	8815/1	(C70._; C71._; C72._)
Vascular tumours		
Cavernous haemangioma	9121/0	(C70._; C71._; C72._)
Capillary haemangioma	9131/0	(C70._; C71._; C72._)
Arteriovenous malformation (=AVM)	9123/0	(C70._; C71._; C72._)
Haemangioblastoma	9161/1	(C70._; C71._; C72._)
Skeletal muscle tumours		
Embryonal rhabdomyosarcoma	8910/3	(C70._; C71._; C72._)
Alveolar rhabdomyosarcoma	8920/3	(C70._; C71._; C72._)
Rhabdomyosarcoma, pleomorphic-type	8901/3	(C70._; C71._; C72._)
Spindle cell rhabdomyosarcoma	8912/3	(C70._; C71._; C72._)

Classification of primary brain and other CNS tumours based on WHO classification 2021 and ICD-O-3.2 (to be used for new registrations from 2022)

WHO classification of tumours of central nervous system	Classification ICD-O-3.2	Most frequent topography
Mesenchymal, non-meningothelial tumours involving the CNS (*continued*)		
Tumours of uncertain differentiation		
Intracranial mesenchymal tumour, FET::CREB fusion-positive (provisional entity)	Not applicable	
CIC-rearranged sarcoma	8803/3	(C70._; C71._; C72._)
Primary intracranial sarcoma, *DICER1*-mutant*	9480/3	(C70._; C71._; C72._)
Ewing sarcoma	9364/3	(C70._; C71._; C72._)
Chondrogenic tumours		
Mesenchymal chondrosarcoma	9240/3	(C70._; C71._; C72._)
Chondrosarcoma	9220/3	(C70._; C71._; C72._)
Dedifferentiated chondrosarcoma	9243/3	(C70._; C71._; C72._)
Notochordal tumours		
Chordoma	9370/3	(C40._;C41._)
Melanocytic tumours		
Diffuse meningeal melanocytic neoplasms		
Meningeal melanocytosis	8728/0	(C70._)
Meningeal melanomatosis	8728/3	(C70._)
Circumscribed meningeal melanocytic neoplasms		
Meningeal melanocytoma	8728/1	(C70._)
Meningeal melanomatosis	8720/3	(C70._)
Melanotic neuroectodermal tumor	9363/0	(C70._)
Haematolymphoid tumours involving the CNS		
CNS lymphomas		
Primary diffuse large B-cell lymphoma of the CNS	9680/3	(C70._; C71._; C72._)
Lymphomatoid granulomatosis	9766/1	(C70._; C71._; C72._)
Lymphomatoid granulomatosis, grade 1	9766/1	(C70._; C71._; C72._)
Lymphomatoid granulomatosis, grade 2	9766/1	(C70._; C71._; C72._)
Lymphomatoid granulomatosis, grade 3	9766/3	(C70._; C71._; C72._)
Intravascular large B-cell lymphoma	9712/3	(C70._; C71._; C72._)
Miscellaneous rare lymphomas in the CNS		
MALT lymphoma of the dura	9699/3	(C70._; C71._; C72._)
Lymphoplasmacytic lymphoma	9671/3	(C70._; C71._; C72._)
Follicular lymphoma	9690/3	(C70._; C71._; C72._)
Anaplastic large cell lymphoma ALK+	9714/3	(C70._; C71._; C72._)
Anaplastic large cell lymphoma ALK-	9715/3	(C70._; C71._; C72._)
Peripheral T-cell lymphoma (PTCL)	9702/3	(C70._; C71._; C72._)
NK/T-cell lymphoma (nasal type), with primary manifestation in the CNS	9719/3	(C70._; C71._; C72._)
Histiocytic tumours		
Erdheim-Chester disease	9749/3	(C70._; C71._; C72._)
Rosai-Dorfman disease*	9749/3	(C70._; C71._; C72._)
Juvenile xanthogranuloma*	9749/1	(C70._; C71._; C72._)
Langerhans cell histiocytosis	9751/1	(C70._; C71._; C72._)
Histiocytic sarcoma	9755/3	(C70._; C71._; C72._)
Germ cell tumours		
Mature teratoma	9080/0	(C70._; C71._; C72._)
Immature teratoma	9080/3	(C70._; C71._; C72._)
Teratoma, NOS	*9080/1*	*(C70._; C71._; C72._)*
Teratoma with somatic-type malignancy	9084/3	(C70._; C71._; C72._)
Germinoma	9064/3	(C70._; C71._; C72._)
Embryonal carcinoma	9070/3	(C70._; C71._; C72._)
Yolk sac tumour	9071/3	(C70._; C71._; C72._)
Choriocarcinoma	9100/3	(C70._; C71._; C72._)
Mixed germ cell tumour	9085/3	(C70._; C71._; C72._)
Tumours of the sellar region		
Craniopharyngioma		
Adamantinomatous craniopharyngioma	9351/1	(C75.2)
Papillary craniopharyngioma	9352/1	(C75.2)
Craniopharyngioma, NOS	*9350/1*	*(C75.2)*
Pituicyte tumours family		
Pituicytoma	9432/1	(C75.1)
Granular cell tumour of the sellar region	9582/0	(C75.1)
Spindle cell oncocytoma	8290/0	(C75.1)
Ependymal pituicytoma	9391/1	(C75.1)
Pituitary adenoma/pituitary neuroendocrine tumour (PitNET)*		
Lactotroph PitNET/adenoma	8271/3	(C75.1)
Somatotroph PitNET/adenoma	8272/3	(C75.1)
Mammosomatotroph PitNET/adenoma	8272/3	(C75.1)
Thyrotroph PitNET/adenoma	8272/3	(C75.1)
Mature plurihormonal PIT1-lineage PitNET/adenoma	8272/3	(C75.1)
Immature PIT1-lineage PitNET/adenoma	8272/3	(C75.1)
Acidophil PitNET/adenoma	8280/3	(C75.1)
Mixed somatotroph-lactotroph PitNET/adenoma	8281/3	(C75.1)
Corticotroph PitNET/adenoma	8272/3	(C75.1)
Gonadotroph PitNET/adenoma	8272/3	(C75.1)
Null cell PitNET/adenoma	8272/3	(C75.1)
Plurihormonal PitNET/adenoma	8272/3	(C75.1)
PitNET/adenoma, NOS	8272/3	(C75.1)
Pituitary blastoma	8273/3	(C75.1)

Classification of primary brain and other CNS tumours based on WHO classification 2021 and ICD-O-3.2 (to be used for new registrations from 2022)		
WHO classification of tumours of central nervous system	**Classification ICD-O-3.2**	**Most frequent topography**
Unspecified tumours		
Tumour cells, benign	*8000/0*	*(C70._;C71._;C72._)*
Unclassified tumour, borderline malignancy	*8000/1*	*(C70._;C71._;C72._)*
Neoplasm, malignant	*8000/3*	*(C70._;C71._;C72._)*
In grey: codes and / or names of entities which should be avoided in favour of a more specific code		
These following types and codes must not be used anymore :		
Fibrillary astrocytoma	*9420/3*	*(C71._)*
Protoplasmic astrocytoma	*9410/3*	*(C71._)*
Papillary ependymoma	*9393/3*	*(C71._)*
Anaplastic ependymoma	*9392/3*	*(C71._)*
Melanotic schwannoma	*9560/1*	*(C70._)*

Altered genes are italicized while gene families and proteins are not
**These entities have undergone a change in terminology of a previous code*
[$] Codes were approved by the IARC/WHO Committee for ICD-O at its meeting in May 2021

APPENDIX II

Number of new diagnoses (N), age-specific and age-standardised incidence (N/100,000) of primary brain and other CNS tumours in adults in 2004-2020 by primary tumour location, behaviour, sex and age category

Appendix II

Belgium: Number of new diagnoses (N), age-specific and age-standardised of primary brain and other CNS tumours in adults males in 2004-2020 by primary location and behaviour

	Number of new diagnoses (N)						Age specific incidence (N/100,000)					CR	ESR	WSR	CRi
	Total	20-34y	35-49y	50-64y	65-79y	80+	20-34y	35-49y	50-64y	65-79y	80+				
Tumours of the meninges	3 156	103	459	1 017	1 179	398	0,6	2,3	5,7	10,9	12,0	4,5	4,0	3,4	0,23
Malignant behaviour	135	2	23	36	51	23	0,0	0,1	0,2	0,5	0,7	0,2	0,2	0,1	0,01
Borderline behaviour	447	19	71	139	168	50	0,1	0,4	0,8	1,5	1,5	0,6	0,6	0,5	0,03
Benign behaviour	2 574	82	365	842	960	325	0,5	1,8	4,7	8,8	9,8	3,7	3,2	2,8	0,19
Tumours of the brain	8 636	833	1 464	2 789	2 849	701	4,7	7,3	15,6	26,2	21,2	12,4	11,3	10,2	0,67
Malignant behaviour	7 898	638	1 275	2 583	2 725	677	3,6	6,4	14,4	25,1	20,5	11,3	10,3	9,1	0,61
Borderline behaviour	535	145	140	137	92	21	0,8	0,7	0,8	0,8	0,6	0,8	0,8	0,8	0,04
Benign behaviour	203	50	49	69	32	3	0,3	0,2	0,4	0,3	0,1	0,3	0,3	0,3	0,02
Tumours of the spinal cord, cranial nerves and other parts of the CNS	1 505	195	441	522	303	44	1,1	2,2	2,9	2,8	1,3	2,2	2,1	2,0	0,12
Malignant behaviour	237	37	69	70	52	9	0,2	0,3	0,4	0,5	0,3	0,3	0,3	0,3	0,02
Borderline behaviour	173	37	66	43	22	5	0,2	0,3	0,2	0,2	0,2	0,2	0,2	0,3	0,01
Benign behaviour	1 095	121	306	409	229	30	0,7	1,5	2,3	2,1	0,9	1,6	1,5	1,4	0,09
Tumours of the spinal cord and cauda equina	573	93	211	158	95	16	0,5	1,1	0,9	0,9	0,5	0,8	0,8	0,8	0,05
Malignant behaviour	191	33	65	57	30	6	0,2	0,3	0,3	0,3	0,2	0,3	0,3	0,3	0,02
Borderline behaviour	149	33	57	37	18	4	0,2	0,3	0,2	0,2	0,1	0,2	0,2	0,2	0,01
Benign behaviour	233	27	89	64	47	6	0,2	0,4	0,4	0,4	0,2	0,3	0,3	0,3	0,02
Tumours of the cranial nerves	881	96	218	352	190	25	0,5	1,1	2,0	1,8	0,8	1,3	1,2	1,1	0,07
Malignant behaviour	25	2	3	9	10	1	0,0	0,0	0,1	0,1	0,0	0,0	0,0	0,0	0,00
Borderline behaviour	17	3	5	5	3	1	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
Benign behaviour	839	91	210	338	177	23	0,5	1,1	1,9	1,6	0,7	1,2	1,2	1,1	0,07
Tumours of overlapping or other part of the CNS	51	6	12	12	18	3	0,0	0,1	0,1	0,2	0,1	0,1	0,1	0,1	0,00
Malignant behaviour	21	2	1	4	12	2	0,0	0,0	0,0	0,1	0,1	0,0	0,0	0,0	0,00
Borderline behaviour	7	1	4	1	1	-	0,0	0,0	0,0	0,0	-	0,0	0,0	0,0	0,00
Benign behaviour	23	3	7	7	5	1	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
Tumours of the pituitary and pineal glands and craniopharyngeal duct	2 070	201	476	688	566	139	1,1	2,4	3,8	5,2	4,2	3,0	2,8	2,5	0,16
Malignant behaviour	63	27	10	13	10	3	0,2	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,01
Borderline behaviour	132	25	36	47	20	4	0,1	0,2	0,3	0,2	0,1	0,2	0,2	0,2	0,01
Benign behaviour	1 875	149	430	628	536	132	0,8	2,2	3,5	4,9	4,0	2,7	2,5	2,3	0,15
Tumours of the pituitary gland	1 912	157	437	636	545	137	0,9	2,2	3,5	5,0	4,1	2,7	2,6	2,3	0,15
Malignant behaviour	28	6	5	6	8	3	0,0	0,0	0,0	0,1	0,1	0,0	0,0	0,0	0,00
Borderline behaviour	10	2	3	2	1	2	0,0	0,0	0,0	0,0	0,1	0,0	0,0	0,0	0,00
Benign behaviour	1 874	149	429	628	536	132	0,8	2,2	3,5	4,9	4,0	2,7	2,5	2,3	0,15
Tumours of the craniopharyngeal duct	111	21	29	40	19	2	0,1	0,1	0,2	0,2	0,1	0,2	0,2	0,2	0,01
Malignant behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borderline behaviour	111	21	29	40	19	2	0,1	0,1	0,2	0,2	0,1	0,2	0,2	0,2	0,01
Benign behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tumours of the pineal gland	47	23	10	12	2	-	0,1	0,1	0,1	0,0	-	0,1	0,1	0,1	0,00
Malignant behaviour	35	21	5	7	2	-	0,1	0,0	0,0	0,0	-	0,1	0,1	0,1	0,00
Borderline behaviour	11	2	4	5	-	-	0,0	0,0	0,0	-	-	0,0	0,0	0,0	0,00
Benign behaviour	1	-	1	-	-	-	-	0,0	-	-	-	0,0	0,0	0,0	0,00
All primary brain and other CNS tumours	**15 367**	**1 332**	**2 840**	**5 016**	**4 897**	**1 282**	**7,5**	**14,2**	**28,0**	**45,1**	**38,8**	**22,0**	**20,2**	**18,1**	**1,19**
Malignant behaviour	**8 333**	**704**	**1 377**	**2 702**	**2 838**	**712**	**4,0**	**6,9**	**15,1**	**26,1**	**21,5**	**11,9**	**10,8**	**9,7**	**0,64**
Borderline behaviour	**1 287**	**226**	**313**	**366**	**302**	**80**	**1,3**	**1,6**	**2,0**	**2,8**	**2,4**	**1,8**	**1,8**	**1,7**	**0,10**
Benign behaviour	**5 747**	**402**	**1 150**	**1 948**	**1 757**	**490**	**2,3**	**5,8**	**10,9**	**16,2**	**14,8**	**8,2**	**7,6**	**6,7**	**0,45**

CR: crude (all ages) incidence rate (N/100,000 person years)

ESR and WSR: age-standardised incidence using the European or World Standard Population (N/100,000 person years)

CRi: Cumulative risk 0-74 years (%)

Source: Belgian Cancer Registry

Belgium: Number of new diagnoses (N), age-specific and age-standardised of primary brain and other CNS tumours in adults females in 2004-2020 by primary location and behaviour

	Number of new diagnoses (N)						Age specific incidence (N/100,000)					CR	ESR	WSR	CRi
	Total	20-34y	35-49y	50-64y	65-79y	80+	20-34y	35-49y	50-64y	65-79y	80+				
Tumours of the meninges	9 056	304	1 983	3 175	2 732	862	1,7	10,2	17,6	21,3	14,0	12,2	11,0	9,8	0,65
Malignant behaviour	164	7	27	43	61	26	0,0	0,1	0,2	0,5	0,4	0,2	0,2	0,2	0,01
Borderline behaviour	585	25	135	174	205	46	0,1	0,7	1,0	1,6	0,7	0,8	0,7	0,6	0,04
Benign behaviour	8 307	272	1 821	2 958	2 466	790	1,5	9,3	16,4	19,2	12,8	11,2	10,1	9,0	0,60
Tumours of the brain	6 329	623	1 005	1 758	2 220	723	3,5	5,1	9,7	17,3	11,7	8,5	7,5	6,8	0,45
Malignant behaviour	5 683	417	857	1 588	2 130	691	2,4	4,4	8,8	16,6	11,2	7,7	6,6	5,9	0,40
Borderline behaviour	422	149	98	101	49	25	0,8	0,5	0,6	0,4	0,4	0,6	0,6	0,6	0,03
Benign behaviour	224	57	50	69	41	7	0,3	0,3	0,4	0,3	0,1	0,3	0,3	0,3	0,02
Tumours of the spinal cord, cranial nerves and other parts of the CNS	1 504	171	392	549	321	71	1,0	2,0	3,0	2,5	1,1	2,0	2,0	1,9	0,12
Malignant behaviour	206	31	51	64	52	8	0,2	0,3	0,4	0,4	0,1	0,3	0,3	0,3	0,02
Borderline behaviour	145	27	48	45	22	3	0,2	0,2	0,2	0,2	0,0	0,2	0,2	0,2	0,01
Benign behaviour	1 153	113	293	440	247	60	0,6	1,5	2,4	1,9	1,0	1,6	1,5	1,4	0,09
Tumours of the spinal cord and cauda equina	467	78	134	151	85	19	0,4	0,7	0,8	0,7	0,3	0,6	0,6	0,6	0,04
Malignant behaviour	169	26	46	57	36	4	0,1	0,2	0,3	0,3	0,1	0,2	0,2	0,2	0,01
Borderline behaviour	125	24	40	39	20	2	0,1	0,2	0,2	0,2	0,0	0,2	0,2	0,2	0,01
Benign behaviour	173	28	48	55	29	13	0,2	0,2	0,3	0,2	0,2	0,2	0,2	0,2	0,01
Tumours of the cranial nerves	970	86	243	373	219	49	0,5	1,2	2,1	1,7	0,8	1,3	1,3	1,2	0,08
Malignant behaviour	26	4	3	5	12	2	0,0	0,0	0,0	0,1	0,0	0,0	0,0	0,0	0,00
Borderline behaviour	11	1	6	4	-	-	0,0	0,0	0,0	-	-	0,0	0,0	0,0	0,00
Benign behaviour	933	81	234	364	207	47	0,5	1,2	2,0	1,6	0,8	1,3	1,2	1,1	0,07
Tumours of overlapping or other part of the CNS	67	7	15	25	17	3	0,0	0,1	0,1	0,1	0,0	0,1	0,1	0,1	0,01
Malignant behaviour	11	1	2	2	4	2	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
Borderline behaviour	9	2	2	2	2	1	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
Benign behaviour	47	4	11	21	11	-	0,0	0,1	0,1	0,1	-	0,1	0,1	0,1	0,00
Tumours of the pituitary and pineal glands and craniopharyngeal duct	2 007	418	535	537	418	99	2,4	2,7	3,0	3,3	1,6	2,7	2,7	2,7	0,15
Malignant behaviour	44	10	12	10	9	3	0,1	0,1	0,1	0,1	0,0	0,1	0,1	0,1	0,00
Borderline behaviour	167	34	45	48	37	3	0,2	0,2	0,3	0,3	0,0	0,2	0,2	0,2	0,01
Benign behaviour	1 796	374	478	479	372	93	2,1	2,4	2,7	2,9	1,5	2,4	2,4	2,4	0,14
Tumours of the pituitary gland	1 826	381	486	487	378	94	2,2	2,5	2,7	2,9	1,5	2,5	2,5	2,4	0,14
Malignant behaviour	21	4	6	5	4	2	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
Borderline behaviour	13	5	3	3	2	-	0,0	0,0	0,0	0,0	-	0,0	0,0	0,0	0,00
Benign behaviour	1 792	372	477	479	372	92	2,1	2,4	2,7	2,9	1,5	2,4	2,4	2,4	0,13
Tumours of the craniopharyngeal duct	132	22	37	36	33	4	0,1	0,2	0,2	0,3	0,1	0,2	0,2	0,2	0,01
Malignant behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borderline behaviour	130	21	37	36	33	3	0,1	0,2	0,2	0,3	0,0	0,2	0,2	0,2	0,01
Benign behaviour	2	1	-	-	-	1	0,0	-	-	-	0,0	0,0	0,0	0,0	0,00
Tumours of the pineal gland	49	15	12	14	7	1	0,1	0,1	0,1	0,1	0,0	0,1	0,1	0,1	0,00
Malignant behaviour	23	6	6	5	5	1	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
Borderline behaviour	24	8	5	9	2	-	0,0	0,0	0,0	0,0	-	0,0	0,0	0,0	0,00
Benign behaviour	2	1	1	-	-	-	0,0	0,0	-	-	-	0,0	0,0	0,0	0,00
All primary brain and other CNS tumours	**18 896**	**1 516**	**3 915**	**6 019**	**5 691**	**1 755**	**8,6**	**20,1**	**33,3**	**44,4**	**28,4**	**25,5**	**23,2**	**21,1**	**1,37**
Malignant behaviour	**6 097**	**465**	**947**	**1 705**	**2 252**	**728**	**2,6**	**4,9**	**9,4**	**17,6**	**11,8**	**8,2**	**7,1**	**6,4**	**0,43**
Borderline behaviour	**1 319**	**235**	**326**	**368**	**313**	**77**	**1,3**	**1,7**	**2,0**	**2,4**	**1,2**	**1,8**	**1,8**	**1,7**	**0,10**
Benign behaviour	**11 480**	**816**	**2 642**	**3 946**	**3 126**	**950**	**4,6**	**13,5**	**21,8**	**24,4**	**15,4**	**15,5**	**14,4**	**13,1**	**0,84**

CR: crude (all ages) incidence rate (N/100,000 person years)

ESR and WSR: age-standardised incidence using the European or World Standard Population (N/100,000 person years)

CRi: Cumulative risk 0-74 years (%)

Source: Belgian Cancer Registry

APPENDIX III

Number of new diagnoses (N), age-specific and age-standardised incidence (N/100,000) of primary brain and other CNS tumours in adults in 2004-2020 by primary tumour location, behaviour and region

Appendix III

Flemish region: Number of new diagnoses (N), age-specific and age-standardised of primary brain and other CNS tumours in adults males in 2004-2020 by primary location and behaviour

	Number of new diagnoses (N)						Age specific incidence (N/100,000)					CR	ESR	WSR	CRi
	Total	20-34y	35-49y	50-64y	65-79y	80+	20-34y	35-49y	50-64y	65-79y	80+				
Tumours of the meninges	1 994	60	287	619	736	292	0,6	2,5	5,8	10,8	14,1	4,9	4,1	3,5	0,24
Malignant behaviour	73	-	11	18	32	12	-	0,1	0,2	0,5	0,6	0,2	0,1	0,1	0,01
Borderline behaviour	250	11	35	78	94	32	0,1	0,3	0,7	1,4	1,5	0,6	0,5	0,4	0,03
Benign behaviour	1 671	49	241	523	610	248	0,5	2,1	4,9	9,0	12,0	4,1	3,4	2,9	0,20
Tumours of the brain	5 296	453	854	1 681	1 857	451	4,6	7,4	15,6	27,3	21,8	12,9	11,5	10,2	0,68
Malignant behaviour	4 880	357	750	1 557	1 782	434	3,6	6,5	14,5	26,2	20,9	11,9	10,5	9,2	0,62
Borderline behaviour	333	74	86	95	62	16	0,7	0,7	0,9	0,9	0,8	0,8	0,8	0,8	0,04
Benign behaviour	83	22	18	29	13	1	0,2	0,2	0,3	0,2	0,0	0,2	0,2	0,2	0,01
Tumours of the spinal cord, cranial nerves and other parts of the CNS	913	112	259	314	199	29	1,1	2,2	2,9	2,9	1,4	2,2	2,1	2,0	0,13
Malignant behaviour	154	20	41	48	39	6	0,2	0,4	0,4	0,6	0,3	0,4	0,4	0,3	0,02
Borderline behaviour	108	22	41	28	15	2	0,2	0,4	0,3	0,2	0,1	0,3	0,3	0,3	0,02
Benign behaviour	651	70	177	238	145	21	0,7	1,5	2,2	2,1	1,0	1,6	1,5	1,4	0,09
Tumours of the spinal cord and cauda equina	359	57	126	99	66	11	0,6	1,1	0,9	1,0	0,5	0,9	0,9	0,8	0,05
Malignant behaviour	129	17	39	40	28	5	0,2	0,3	0,4	0,4	0,2	0,3	0,3	0,3	0,02
Borderline behaviour	98	22	37	25	12	2	0,2	0,3	0,2	0,2	0,1	0,2	0,2	0,2	0,01
Benign behaviour	132	18	50	34	26	4	0,2	0,4	0,3	0,4	0,2	0,3	0,3	0,3	0,02
Tumours of the cranial nerves	535	52	130	212	124	17	0,5	1,1	2,0	1,8	0,8	1,3	1,2	1,2	0,08
Malignant behaviour	15	1	2	6	6	-	0,0	0,0	0,1	0,1	-	0,0	0,0	0,0	0,00
Borderline behaviour	7	-	2	3	2	-	-	0,0	0,0	0,0	-	0,0	0,0	0,0	0,00
Benign behaviour	513	51	126	203	116	17	0,5	1,1	1,9	1,7	0,8	1,2	1,2	1,1	0,07
Tumours of overlapping or other part of the CNS	19	3	3	3	9	1	0,0	0,0	0,0	0,1	0,0	0,0	0,0	0,0	0,00
Malignant behaviour	10	2	-	2	5	1	0,0	-	0,0	0,1	0,0	0,0	0,0	0,0	0,00
Borderline behaviour	3	-	2	-	1	-	-	0,0	-	0,0	-	0,0	0,0	0,0	0,00
Benign behaviour	6	1	1	1	3	-	0,0	0,0	0,0	0,0	-	0,0	0,0	0,0	0,00
Tumours of the pituitary and pineal glands and craniopharyngeal duct	1 384	117	290	465	404	108	1,2	2,5	4,3	5,9	5,2	3,4	3,1	2,8	0,18
Malignant behaviour	44	19	7	8	8	2	0,2	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,01
Borderline behaviour	81	11	19	30	18	3	0,1	0,2	0,3	0,3	0,1	0,2	0,2	0,2	0,01
Benign behaviour	1 259	87	264	427	378	103	0,9	2,3	4,0	5,6	5,0	3,1	2,8	2,5	0,16
Tumours of the pituitary gland	1 290	93	269	435	386	107	0,9	2,3	4,0	5,7	5,2	3,1	2,8	2,6	0,17
Malignant behaviour	24	5	4	6	7	2	0,1	0,0	0,1	0,1	0,1	0,1	0,1	0,1	0,00
Borderline behaviour	8	1	2	2	1	2	0,0	0,0	0,0	0,0	0,1	0,0	0,0	0,0	0,00
Benign behaviour	1 258	87	263	427	378	103	0,9	2,3	4,0	5,6	5,0	3,1	2,8	2,5	0,16
Tumours of the craniopharyngeal duct	66	9	15	24	17	1	0,1	0,1	0,2	0,2	0,0	0,2	0,2	0,1	0,01
Malignant behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borderline behaviour	66	9	15	24	17	1	0,1	0,1	0,2	0,2	0,0	0,2	0,2	0,1	0,01
Benign behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tumours of the pineal gland	28	15	6	6	1	-	0,2	0,1	0,1	0,0	-	0,1	0,1	0,1	0,00
Malignant behaviour	20	14	3	2	1	-	0,1	0,0	0,0	0,0	-	0,0	0,1	0,1	0,00
Borderline behaviour	7	1	2	4	-	-	0,0	0,0	0,0	-	-	0,0	0,0	0,0	0,00
Benign behaviour	1	-	1	-	-	-	-	0,0	-	-	-	0,0	0,0	0,0	0,00
All primary brain and other CNS tumours	**9 587**	**742**	**1 690**	**3 079**	**3 196**	**880**	**7,5**	**14,7**	**28,6**	**47,0**	**42,4**	**23,3**	**20,8**	**18,5**	**1,22**
Malignant behaviour	**5 151**	**396**	**809**	**1 631**	**1 861**	**454**	**4,0**	**7,0**	**15,2**	**27,4**	**21,9**	**12,5**	**11,1**	**9,8**	**0,66**
Borderline behaviour	**772**	**118**	**181**	**231**	**189**	**53**	**1,2**	**1,6**	**2,1**	**2,8**	**2,6**	**1,9**	**1,8**	**1,7**	**0,10**
Benign behaviour	**3 664**	**228**	**700**	**1 217**	**1 146**	**373**	**2,3**	**6,1**	**11,3**	**16,8**	**18,0**	**8,9**	**7,9**	**7,0**	**0,46**

CR: crude (all ages) incidence rate (N/100,000 person years)

ESR and WSR: age-standardised incidence using the European or World Standard Population (N/100,000 person years)

CRi: Cumulative risk 0-74 years (%)

Source: Belgian Cancer Registry

Flemish region: Number of new diagnoses (N), age-specific and age-standardised of primary brain and other CNS tumours in adults females in 2004-2020 by primary location and behaviour

	Number of new diagnoses (N)						Age specific incidence (N/100,000)					CR	ESR	WSR	CRi
	Total	20-34y	35-49y	50-64y	65-79y	80+	20-34y	35-49y	50-64y	65-79y	80+				
Tumours of the meninges	5 618	166	1 139	1 942	1 749	622	1,7	10,1	18,3	22,6	17,2	13,1	11,4	10,0	0,67
Malignant behaviour	91	2	13	27	32	17	0,0	0,1	0,3	0,4	0,5	0,2	0,2	0,1	0,01
Borderline behaviour	303	10	63	96	113	21	0,1	0,6	0,9	1,5	0,6	0,7	0,6	0,6	0,04
Benign behaviour	5 224	154	1 063	1 819	1 604	584	1,6	9,4	17,1	20,8	16,2	12,2	10,6	9,3	0,62
Tumours of the brain	3 819	359	573	1 041	1 384	462	3,7	5,1	9,8	17,9	12,8	8,9	7,6	6,9	0,46
Malignant behaviour	3 459	249	490	948	1 329	443	2,6	4,4	8,9	17,2	12,3	8,1	6,8	6,0	0,41
Borderline behaviour	245	77	60	61	33	14	0,8	0,5	0,6	0,4	0,4	0,6	0,6	0,6	0,03
Benign behaviour	115	33	23	32	22	5	0,3	0,2	0,3	0,3	0,1	0,3	0,3	0,3	0,02
Tumours of the spinal cord, cranial nerves and other parts of the CNS	871	85	236	324	179	47	0,9	2,1	3,1	2,3	1,3	2,0	2,0	1,9	0,11
Malignant behaviour	140	16	41	43	33	7	0,2	0,4	0,4	0,4	0,2	0,3	0,3	0,3	0,02
Borderline behaviour	82	20	27	18	16	1	0,2	0,2	0,2	0,2	0,0	0,2	0,2	0,2	0,01
Benign behaviour	649	49	168	263	130	39	0,5	1,5	2,5	1,7	1,1	1,5	1,5	1,3	0,09
Tumours of the spinal cord and cauda equina	276	36	84	85	58	13	0,4	0,7	0,8	0,8	0,4	0,6	0,6	0,6	0,04
Malignant behaviour	118	13	36	40	25	4	0,1	0,3	0,4	0,3	0,1	0,3	0,3	0,3	0,02
Borderline behaviour	74	18	23	16	16	1	0,2	0,2	0,2	0,2	0,0	0,2	0,2	0,2	0,01
Benign behaviour	84	5	25	29	17	8	0,1	0,2	0,3	0,2	0,2	0,2	0,2	0,2	0,01
Tumours of the cranial nerves	567	47	143	229	116	32	0,5	1,3	2,2	1,5	0,9	1,3	1,3	1,2	0,07
Malignant behaviour	15	3	3	3	5	1	0,0	0,0	0,0	0,1	0,0	0,0	0,0	0,0	0,00
Borderline behaviour	7	1	4	2	-	-	0,0	0,0	0,0	-	-	0,0	0,0	0,0	0,00
Benign behaviour	545	43	136	224	111	31	0,4	1,2	2,1	1,4	0,9	1,3	1,2	1,1	0,07
Tumours of overlapping or other part of the CNS	28	2	9	10	5	2	0,0	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,00
Malignant behaviour	7	-	2	-	3	2	-	0,0	-	0,0	0,1	0,0	0,0	0,0	0,00
Borderline behaviour	1	1	-	-	-	-	0,0	-	-	-	-	0,0	0,0	0,0	0,00
Benign behaviour	20	1	7	10	2	-	0,0	0,1	0,1	0,0	-	0,0	0,0	0,0	0,00
Tumours of the pituitary and pineal glands and craniopharyngeal duct	1 314	261	325	364	294	70	2,7	2,9	3,4	3,8	1,9	3,1	3,0	3,0	0,17
Malignant behaviour	27	5	8	7	4	3	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,00
Borderline behaviour	99	19	24	29	26	1	0,2	0,2	0,3	0,3	0,0	0,2	0,2	0,2	0,01
Benign behaviour	1 188	237	293	328	264	66	2,4	2,6	3,1	3,4	1,8	2,8	2,7	2,7	0,15
Tumours of the pituitary gland	1 206	239	299	335	266	67	2,5	2,7	3,2	3,4	1,9	2,8	2,8	2,7	0,16
Malignant behaviour	15	2	5	5	1	2	0,0	0,0	0,0	0,0	0,1	0,0	0,0	0,0	0,00
Borderline behaviour	6	2	1	2	1	-	0,0	0,0	0,0	0,0	-	0,0	0,0	0,0	0,00
Benign behaviour	1 185	235	293	328	264	65	2,4	2,6	3,1	3,4	1,8	2,8	2,7	2,7	0,15
Tumours of the craniopharyngeal duct	81	13	22	20	24	2	0,1	0,2	0,2	0,3	0,1	0,2	0,2	0,2	0,01
Malignant behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borderline behaviour	79	12	22	20	24	1	0,1	0,2	0,2	0,3	0,0	0,2	0,2	0,2	0,01
Benign behaviour	2	1	-	-	-	1	0,0	-	-	-	0,0	0,0	0,0	0,0	0,00
Tumours of the pineal gland	27	9	4	9	4	1	0,1	0,0	0,1	0,1	0,0	0,1	0,1	0,1	0,00
Malignant behaviour	12	3	3	2	3	1	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
Borderline behaviour	14	5	1	7	1	-	0,1	0,0	0,1	0,0	-	0,0	0,0	0,0	0,00
Benign behaviour	1	1	-	-	-	-	0,0	-	-	-	-	0,0	0,0	0,0	0,00
All primary brain and other CNS tumours	**11 622**	**871**	**2 273**	**3 671**	**3 606**	**1 201**	**8,9**	**20,2**	**34,6**	**46,7**	**33,3**	**27,1**	**24,1**	**21,8**	**1,41**
Malignant behaviour	**3 717**	**272**	**552**	**1 025**	**1 398**	**470**	**2,8**	**4,9**	**9,7**	**18,1**	**13,0**	**8,7**	**7,3**	**6,5**	**0,44**
Borderline behaviour	**729**	**126**	**174**	**204**	**188**	**37**	**1,3**	**1,5**	**1,9**	**2,4**	**1,0**	**1,7**	**1,7**	**1,6**	**0,10**
Benign behaviour	**7 176**	**473**	**1 547**	**2 442**	**2 020**	**694**	**4,9**	**13,7**	**23,0**	**26,1**	**19,2**	**16,7**	**15,1**	**13,7**	**0,88**

CR: crude (all ages) incidence rate (N/100,000 person years)

ESR and WSR: age-standardised incidence using the European or World Standard Population (N/100,000 person years)

CRi: Cumulative risk 0-74 years (%)

Source: Belgian Cancer Registry

Walloon region: Number of new diagnoses (N), age-specific and age-standardised of primary brain and other CNS tumours in adults males in 2004-2020 by primary location and behaviour

	Number of new diagnoses (N)						Age specific incidence (N/100,000)					CR	ESR	WSR	CRi
	Total	20-34y	35-49y	50-64y	65-79y	80+	20-34y	35-49y	50-64y	65-79y	80+				
Tumours of the meninges	917	35	130	311	354	87	0,6	2,1	5,4	10,8	9,0	4,2	3,8	3,2	0,23
Malignant behaviour	46	2	5	16	13	10	0,0	0,1	0,3	0,4	1,0	0,2	0,2	0,2	0,01
Borderline behaviour	150	6	27	47	55	15	0,1	0,4	0,8	1,7	1,6	0,7	0,6	0,5	0,04
Benign behaviour	721	27	98	248	286	62	0,5	1,6	4,3	8,7	6,4	3,3	3,0	2,5	0,18
Tumours of the brain	2 662	289	461	919	807	186	5,1	7,4	16,0	24,6	19,2	12,2	11,3	10,3	0,67
Malignant behaviour	2 413	216	395	855	766	181	3,8	6,3	14,9	23,3	18,7	11,0	10,2	9,1	0,60
Borderline behaviour	157	54	44	32	23	4	1,0	0,7	0,6	0,7	0,4	0,7	0,7	0,8	0,04
Benign behaviour	92	19	22	32	18	1	0,3	0,4	0,6	0,5	0,1	0,4	0,4	0,4	0,02
Tumours of the spinal cord, cranial nerves and other parts of the CNS	483	60	150	174	91	8	1,1	2,4	3,0	2,8	0,8	2,2	2,2	2,0	0,13
Malignant behaviour	55	13	18	12	10	2	0,2	0,3	0,2	0,3	0,2	0,3	0,3	0,2	0,01
Borderline behaviour	50	7	23	12	6	2	0,1	0,4	0,2	0,2	0,2	0,2	0,2	0,2	0,01
Benign behaviour	378	40	109	150	75	4	0,7	1,7	2,6	2,3	0,4	1,7	1,7	1,6	0,10
Tumours of the spinal cord and cauda equina	165	27	69	40	25	4	0,5	1,1	0,7	0,8	0,4	0,8	0,8	0,7	0,04
Malignant behaviour	40	12	17	9	1	1	0,2	0,3	0,2	0,0	0,1	0,2	0,2	0,2	0,01
Borderline behaviour	44	7	18	11	6	2	0,1	0,3	0,2	0,2	0,2	0,2	0,2	0,2	0,01
Benign behaviour	81	8	34	20	18	1	0,1	0,5	0,3	0,5	0,1	0,4	0,4	0,3	0,02
Tumours of the cranial nerves	294	31	74	128	58	3	0,5	1,2	2,2	1,8	0,3	1,3	1,3	1,2	0,08
Malignant behaviour	8	1	1	3	3	-	0,0	0,0	0,1	0,1	-	0,0	0,0	0,0	0,00
Borderline behaviour	4	-	3	1	-	-	-	0,0	0,0	-	-	0,0	0,0	0,0	0,00
Benign behaviour	282	30	70	124	55	3	0,5	1,1	2,2	1,7	0,3	1,3	1,3	1,2	0,07
Tumours of overlapping or other part of the CNS	24	2	7	6	8	1	0,0	0,1	0,1	0,2	0,1	0,1	0,1	0,1	0,01
Malignant behaviour	7	-	-	-	6	1	-	-	-	0,2	0,1	0,0	0,0	0,0	0,00
Borderline behaviour	2	-	2	-	-	-	-	0,0	-	-	-	0,0	0,0	0,0	0,00
Benign behaviour	15	2	5	6	2	-	0,0	0,1	0,1	0,1	-	0,1	0,1	0,1	0,00
Tumours of the pituitary and pineal glands and craniopharyngeal duct	539	62	135	178	140	24	1,1	2,2	3,1	4,3	2,5	2,5	2,3	2,2	0,14
Malignant behaviour	10	5	2	2	1	-	0,1	0,0	0,0	0,0	-	0,0	0,0	0,1	0,00
Borderline behaviour	38	10	12	13	2	1	0,2	0,2	0,2	0,1	0,1	0,2	0,2	0,2	0,01
Benign behaviour	491	47	121	163	137	23	0,8	1,9	2,8	4,2	2,4	2,2	2,1	1,9	0,13
Tumours of the pituitary gland	496	49	123	163	138	23	0,9	2,0	2,8	4,2	2,4	2,3	2,1	2,0	0,13
Malignant behaviour	3	1	1	-	1	-	0,0	0,0	-	0,0	-	0,0	0,0	0,0	0,00
Borderline behaviour	2	1	1	-	-	-	0,0	0,0	-	-	-	0,0	0,0	0,0	0,00
Benign behaviour	491	47	121	163	137	23	0,8	1,9	2,8	4,2	2,4	2,2	2,1	1,9	0,13
Tumours of the craniopharyngeal duct	35	8	11	13	2	1	0,1	0,2	0,2	0,1	0,1	0,2	0,2	0,2	0,01
Malignant behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borderline behaviour	35	8	11	13	2	1	0,1	0,2	0,2	0,1	0,1	0,2	0,2	0,2	0,01
Benign behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tumours of the pineal gland	8	5	1	2	-	-	0,1	0,0	0,0	-	-	0,0	0,0	0,0	0,00
Malignant behaviour	7	4	1	2	-	-	0,1	0,0	0,0	-	-	0,0	0,0	0,0	0,00
Borderline behaviour	1	1	-	-	-	-	0,0	-	-	-	-	0,0	0,0	0,0	0,00
Benign behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All primary brain and other CNS tumours	**4 601**	**446**	**876**	**1 582**	**1 392**	**305**	**7,9**	**14,0**	**27,6**	**42,4**	**31,5**	**21,0**	**19,6**	**17,7**	**1,16**
Malignant behaviour	**2 524**	**236**	**420**	**885**	**790**	**193**	**4,2**	**6,7**	**15,4**	**24,1**	**20,0**	**11,5**	**10,6**	**9,6**	**0,63**
Borderline behaviour	**395**	**77**	**106**	**104**	**86**	**22**	**1,4**	**1,7**	**1,8**	**2,6**	**2,3**	**1,8**	**1,7**	**1,7**	**0,10**
Benign behaviour	**1 682**	**133**	**350**	**593**	**516**	**90**	**2,4**	**5,6**	**10,3**	**15,7**	**9,3**	**7,7**	**7,2**	**6,5**	**0,43**

CR: crude (all ages) incidence rate (N/100,000 person years)

ESR and WSR: age-standardised incidence using the European or World Standard Population (N/100,000 person years)

CRi: Cumulative risk 0-74 years (%)

Source: Belgian Cancer Registry

Walloon region: Number of new diagnoses (N), age-specific and age-standardised of primary brain and other CNS tumours in adults females in 2004-2020 by primary location and behaviour

	Number of new diagnoses (N)						Age specific incidence (N/100,000)					CR	ESR	WSR	CRi
	Total	20-34y	35-49y	50-64y	65-79y	80+	20-34y	35-49y	50-64y	65-79y	80+				
Tumours of the meninges	2 756	107	664	1 006	791	188	1,9	10,6	17,0	19,4	9,4	11,6	10,8	9,6	0,65
Malignant behaviour	59	3	13	15	21	7	0,1	0,2	0,3	0,5	0,4	0,2	0,2	0,2	0,01
Borderline behaviour	211	14	53	60	67	17	0,3	0,8	1,0	1,6	0,9	0,9	0,8	0,7	0,05
Benign behaviour	2 486	90	598	931	703	164	1,6	9,6	15,7	17,3	8,2	10,4	9,7	8,7	0,59
Tumours of the brain	1 982	182	335	586	672	207	3,3	5,4	9,9	16,5	10,4	8,3	7,4	6,7	0,44
Malignant behaviour	1 768	117	285	523	645	198	2,1	4,6	8,8	15,8	9,9	7,4	6,4	5,8	0,39
Borderline behaviour	124	45	30	30	12	7	0,8	0,5	0,5	0,3	0,4	0,5	0,6	0,6	0,03
Benign behaviour	90	20	20	33	15	2	0,4	0,3	0,6	0,4	0,1	0,4	0,4	0,4	0,02
Tumours of the spinal cord, cranial nerves and other parts of the CNS	512	64	118	187	126	17	1,2	1,9	3,2	3,1	0,9	2,2	2,1	2,0	0,13
Malignant behaviour	47	10	8	13	16	-	0,2	0,1	0,2	0,4	-	0,2	0,2	0,2	0,01
Borderline behaviour	43	6	13	20	3	1	0,1	0,2	0,3	0,1	0,1	0,2	0,2	0,2	0,01
Benign behaviour	422	48	97	154	107	16	0,9	1,6	2,6	2,6	0,8	1,8	1,7	1,6	0,10
Tumours of the spinal cord and cauda equina	139	31	37	45	20	6	0,6	0,6	0,8	0,5	0,3	0,6	0,6	0,6	0,03
Malignant behaviour	34	8	8	9	9	-	0,1	0,1	0,2	0,2	-	0,1	0,1	0,1	0,01
Borderline behaviour	37	6	11	17	2	1	0,1	0,2	0,3	0,0	0,1	0,2	0,2	0,2	0,01
Benign behaviour	68	17	18	19	9	5	0,3	0,3	0,3	0,2	0,3	0,3	0,3	0,3	0,02
Tumours of the cranial nerves	341	30	76	129	95	11	0,5	1,2	2,2	2,3	0,6	1,4	1,4	1,3	0,08
Malignant behaviour	9	1	-	2	6	-	0,0	-	0,0	0,1	-	0,0	0,0	0,0	0,00
Borderline behaviour	1	-	-	1	-	-	-	-	0,0	-	-	0,0	0,0	0,0	0,00
Benign behaviour	331	29	76	126	89	11	0,5	1,2	2,1	2,2	0,6	1,4	1,3	1,3	0,08
Tumours of overlapping or other part of the CNS	32	3	5	13	11	-	0,1	0,1	0,2	0,3	-	0,1	0,1	0,1	0,01
Malignant behaviour	4	1	-	2	1	-	0,0	-	0,0	0,0	-	0,0	0,0	0,0	0,00
Borderline behaviour	5	-	2	2	1	-	-	0,0	0,0	0,0	-	0,0	0,0	0,0	0,00
Benign behaviour	23	2	3	9	9	-	0,0	0,0	0,2	0,2	-	0,1	0,1	0,1	0,01
Tumours of the pituitary and pineal glands and craniopharyngeal duct	520	109	148	142	97	24	2,0	2,4	2,4	2,4	1,2	2,2	2,2	2,2	0,13
Malignant behaviour	15	5	3	3	4	-	0,1	0,0	0,1	0,1	-	0,1	0,1	0,1	0,00
Borderline behaviour	51	12	14	15	8	2	0,2	0,2	0,3	0,2	0,1	0,2	0,2	0,2	0,01
Benign behaviour	454	92	131	124	85	22	1,7	2,1	2,1	2,1	1,1	1,9	1,9	1,9	0,11
Tumours of the pituitary gland	463	97	132	124	88	22	1,7	2,1	2,1	2,2	1,1	1,9	2,0	2,0	0,11
Malignant behaviour	4	2	-	-	2	-	0,0	-	-	0,0	-	0,0	0,0	0,0	0,00
Borderline behaviour	6	3	2	-	1	-	0,1	0,0	-	0,0	-	0,0	0,0	0,0	0,00
Benign behaviour	453	92	130	124	85	22	1,7	2,1	2,1	2,1	1,1	1,9	1,9	1,9	0,11
Tumours of the craniopharyngeal duct	40	7	11	14	6	2	0,1	0,2	0,2	0,1	0,1	0,2	0,2	0,2	0,01
Malignant behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borderline behaviour	40	7	11	14	6	2	0,1	0,2	0,2	0,1	0,1	0,2	0,2	0,2	0,01
Benign behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tumours of the pineal gland	17	5	5	4	3	-	0,1	0,1	0,1	0,1	-	0,1	0,1	0,1	0,00
Malignant behaviour	11	3	3	3	2	-	0,1	0,0	0,1	0,0	-	0,0	0,1	0,1	0,00
Borderline behaviour	5	2	1	1	1	-	0,0	0,0	0,0	0,0	-	0,0	0,0	0,0	0,00
Benign behaviour	1	-	1	-	-	-	-	0,0	-	-	-	0,0	0,0	0,0	0,00
All primary brain and other CNS tumours	**5 770**	**462**	**1 265**	**1 921**	**1 686**	**436**	**8,3**	**20,3**	**32,4**	**41,4**	**21,8**	**24,2**	**22,5**	**20,6**	**1,34**
Malignant behaviour	**1 889**	**135**	**309**	**554**	**686**	**205**	**2,4**	**5,0**	**9,3**	**16,9**	**10,3**	**7,9**	**6,9**	**6,2**	**0,42**
Borderline behaviour	**429**	**77**	**110**	**125**	**90**	**27**	**1,4**	**1,8**	**2,1**	**2,2**	**1,4**	**1,8**	**1,8**	**1,7**	**0,10**
Benign behaviour	**3 452**	**250**	**846**	**1 242**	**910**	**204**	**4,5**	**13,6**	**20,9**	**22,4**	**10,2**	**14,5**	**13,8**	**12,6**	**0,82**

CR: crude (all ages) incidence rate (N/100,000 person years)

ESR and WSR: age-standardised incidence using the European or World Standard Population (N/100,000 person years)

CRi: Cumulative risk 0-74 years (%)

Source: Belgian Cancer Registry

Brussels-Capital region: Number of new diagnoses (N), age-specific and age-standardised of primary brain and other CNS tumours in adults males in 2004-2020 by primary location and behaviour

	Number of new diagnoses (N)						Age specific incidence (N/100,000)					CR	ESR	WSR	CRi
	Total	20-34y	35-49y	50-64y	65-79y	80+	20-34y	35-49y	50-64y	65-79y	80+				
Tumours of the meninges	245	8	42	87	89	19	0,4	1,9	6,0	11,5	7,2	3,6	3,9	3,3	0,25
Malignant behaviour	16	-	7	2	6	1	-	0,3	0,1	0,8	0,4	0,2	0,2	0,2	0,01
Borderline behaviour	47	2	9	14	19	3	0,1	0,4	1,0	2,5	1,1	0,7	0,7	0,6	0,05
Benign behaviour	182	6	26	71	64	15	0,3	1,2	4,9	8,3	5,7	2,7	2,9	2,5	0,19
Tumours of the brain	678	91	149	189	185	64	4,1	6,9	13,1	24,0	24,1	9,9	10,3	9,2	0,62
Malignant behaviour	605	65	130	171	177	62	2,9	6,0	11,8	23,0	23,4	8,8	9,2	8,1	0,55
Borderline behaviour	45	17	10	10	7	1	0,8	0,5	0,7	0,9	0,4	0,7	0,7	0,7	0,04
Benign behaviour	28	9	9	8	1	1	0,4	0,4	0,6	0,1	0,4	0,4	0,4	0,4	0,02
Tumours of the spinal cord, cranial nerves and other parts of the CNS	109	23	32	34	13	7	1,0	1,5	2,4	1,7	2,6	1,6	1,6	1,6	0,09
Malignant behaviour	28	4	10	10	3	1	0,2	0,5	0,7	0,4	0,4	0,4	0,4	0,4	0,02
Borderline behaviour	15	8	2	3	1	1	0,4	0,1	0,2	0,1	0,4	0,2	0,2	0,2	0,01
Benign behaviour	66	11	20	21	9	5	0,5	0,9	1,5	1,2	1,9	1,0	1,0	0,9	0,05
Tumours of the spinal cord and cauda equina	49	9	16	19	4	1	0,4	0,7	1,3	0,5	0,4	0,7	0,8	0,7	0,04
Malignant behaviour	22	4	9	8	1	-	0,2	0,4	0,6	0,1	-	0,3	0,3	0,3	0,02
Borderline behaviour	7	4	2	1	-	-	0,2	0,1	0,1	-	-	0,1	0,1	0,1	0,01
Benign behaviour	20	1	5	10	3	1	0,0	0,2	0,7	0,4	0,4	0,3	0,3	0,3	0,02
Tumours of the cranial nerves	52	13	14	12	8	5	0,6	0,6	0,8	1,0	1,9	0,8	0,8	0,7	0,04
Malignant behaviour	2	-	-	-	1	1	-	-	-	0,1	0,4	0,0	0,0	0,0	0,00
Borderline behaviour	6	3	-	1	1	1	0,1	-	0,1	0,1	0,4	0,1	0,1	0,1	0,01
Benign behaviour	44	10	14	11	6	3	0,5	0,6	0,8	0,8	1,1	0,6	0,6	0,6	0,03
Tumours of overlapping or other part of the CNS	8	1	2	3	1	1	0,0	0,1	0,2	0,1	0,4	0,1	0,1	0,1	0,01
Malignant behaviour	4	-	1	2	1	-	-	0,0	0,1	0,1	-	0,1	0,1	0,1	0,00
Borderline behaviour	2	1	-	1	-	-	0,0	-	0,1	-	-	0,0	0,0	0,0	0,00
Benign behaviour	2	-	1	-	-	1	-	0,0	-	-	0,4	0,0	0,0	0,0	0,00
Tumours of the pituitary and pineal glands and craniopharyngeal duct	147	22	51	45	22	7	1,0	2,4	3,1	2,9	2,6	2,1	2,2	2,1	0,13
Malignant behaviour	9	3	1	3	1	1	0,1	0,0	0,2	0,1	0,4	0,1	0,1	0,1	0,01
Borderline behaviour	13	4	5	4	-	-	0,2	0,2	0,3	-	-	0,2	0,2	0,2	0,01
Benign behaviour	125	15	45	38	21	6	0,7	2,1	2,6	2,7	2,3	1,8	1,9	1,8	0,11
Tumours of the pituitary gland	126	15	45	38	21	7	0,7	2,1	2,6	2,7	2,6	1,8	1,9	1,8	0,11
Malignant behaviour	1	-	-	-	-	1	-	-	-	-	0,4	0,0	0,0	0,0	-
Borderline behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benign behaviour	125	15	45	38	21	6	0,7	2,1	2,6	2,7	2,3	1,8	1,9	1,8	0,11
Tumours of the craniopharyngeal duct	10	4	3	3	-	-	0,2	0,1	0,2	-	-	0,1	0,1	0,2	0,01
Malignant behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borderline behaviour	10	4	3	3	-	-	0,2	0,1	0,2	-	-	0,1	0,1	0,2	0,01
Benign behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tumours of the pineal gland	11	3	3	4	1	-	0,1	0,1	0,3	0,1	-	0,2	0,2	0,2	0,01
Malignant behaviour	8	3	1	3	1	-	0,1	0,0	0,2	0,1	-	0,1	0,1	0,1	0,01
Borderline behaviour	3	-	2	1	-	-	-	0,1	0,1	-	-	0,0	0,0	0,0	0,00
Benign behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All primary brain and other CNS tumours	**1 179**	**144**	**274**	**355**	**309**	**97**	**6,5**	**12,7**	**24,6**	**40,1**	**36,5**	**17,2**	**18,1**	**16,3**	**1,08**
Malignant behaviour	**658**	**72**	**148**	**186**	**187**	**65**	**3,3**	**6,9**	**12,9**	**24,3**	**24,5**	**9,6**	**10,0**	**8,9**	**0,60**
Borderline behaviour	**120**	**31**	**26**	**31**	**27**	**5**	**1,4**	**1,2**	**2,1**	**3,5**	**1,9**	**1,8**	**1,8**	**1,8**	**0,11**
Benign behaviour	**401**	**41**	**100**	**138**	**95**	**27**	**1,9**	**4,6**	**9,6**	**12,3**	**10,2**	**5,9**	**6,2**	**5,6**	**0,38**

CR: crude (all ages) incidence rate (N/100,000 person years)

ESR and WSR: age-standardised incidence using the European or World Standard Population (N/100,000 person years)

CRi: Cumulative risk 0-74 years (%)

Source: Belgian Cancer Registry

Brussels-Capital region: Number of new diagnoses (N), age-specific and age-standardised of primary brain and other CNS tumours in adults females in 2004-2020 by primary location and behaviour

	Number of new diagnoses (N)						Age specific incidence (N/100,000)					CR	ESR	WSR	CRi
	Total	20-34y	35-49y	50-64y	65-79y	80+	20-34y	35-49y	50-64y	65-79y	80+				
Tumours of the meninges	682	31	180	227	192	52	1,3	8,9	14,8	18,8	9,0	9,1	9,5	8,4	0,57
Malignant behaviour	14	2	1	1	8	2	0,1	0,0	0,1	0,8	0,3	0,2	0,2	0,1	0,01
Borderline behaviour	71	1	19	18	25	8	0,0	0,9	1,2	2,4	1,4	0,9	0,9	0,8	0,06
Benign behaviour	597	28	160	208	159	42	1,2	7,9	13,6	15,6	7,3	8,0	8,4	7,5	0,50
Tumours of the brain	528	82	97	131	164	54	3,5	4,8	8,6	16,0	9,4	7,0	6,9	6,3	0,41
Malignant behaviour	456	51	82	117	156	50	2,2	4,0	7,6	15,3	8,7	6,1	5,9	5,3	0,36
Borderline behaviour	53	27	8	10	4	4	1,2	0,4	0,7	0,4	0,7	0,7	0,7	0,7	0,03
Benign behaviour	19	4	7	4	4	-	0,2	0,3	0,3	0,4	-	0,3	0,3	0,3	0,02
Tumours of the spinal cord, cranial nerves and other parts of the CNS	121	22	38	38	16	7	0,9	1,9	2,5	1,6	1,2	1,6	1,7	1,6	0,10
Malignant behaviour	19	5	2	8	3	1	0,2	0,1	0,5	0,3	0,2	0,3	0,3	0,3	0,02
Borderline behaviour	20	1	8	7	3	1	0,0	0,4	0,5	0,3	0,2	0,3	0,3	0,3	0,02
Benign behaviour	82	16	28	23	10	5	0,7	1,4	1,5	1,0	0,9	1,1	1,2	1,1	0,07
Tumours of the spinal cord and cauda equina	52	11	13	21	7	-	0,5	0,6	1,4	0,7	-	0,7	0,8	0,7	0,05
Malignant behaviour	17	5	2	8	2	-	0,2	0,1	0,5	0,2	-	0,2	0,2	0,2	0,02
Borderline behaviour	14	-	6	6	2	-	-	0,3	0,4	0,2	-	0,2	0,2	0,2	0,01
Benign behaviour	21	6	5	7	3	-	0,3	0,2	0,5	0,3	-	0,3	0,3	0,3	0,02
Tumours of the cranial nerves	62	9	24	15	8	6	0,4	1,2	1,0	0,8	1,0	0,8	0,8	0,8	0,05
Malignant behaviour	2	-	-	-	1	1	-	-	-	0,1	0,2	0,0	0,0	0,0	0,00
Borderline behaviour	3	-	2	1	-	-	-	0,1	0,1	-	-	0,0	0,0	0,0	0,00
Benign behaviour	57	9	22	14	7	5	0,4	1,1	0,9	0,7	0,9	0,8	0,8	0,8	0,04
Tumours of overlapping or other part of the CNS	7	2	1	2	1	1	0,1	0,0	0,1	0,1	0,2	0,1	0,1	0,1	0,00
Malignant behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borderline behaviour	3	1	-	-	1	1	0,0	-	-	0,1	0,2	0,0	0,0	0,0	0,00
Benign behaviour	4	1	1	2	-	-	0,0	0,0	0,1	-	-	0,1	0,1	0,1	0,00
Tumours of the pituitary and pineal glands and craniopharyngeal duct	173	48	62	31	27	5	2,1	3,1	2,0	2,6	0,9	2,3	2,3	2,3	0,12
Malignant behaviour	2	-	1	-	1	-	-	0,0	-	0,1	-	0,0	0,0	0,0	0,00
Borderline behaviour	17	3	7	4	3	-	0,1	0,3	0,3	0,3	-	0,2	0,2	0,2	0,02
Benign behaviour	154	45	54	27	23	5	1,9	2,7	1,8	2,2	0,9	2,1	2,1	2,0	0,11
Tumours of the pituitary gland	157	45	55	28	24	5	1,9	2,7	1,8	2,3	0,9	2,1	2,1	2,1	0,11
Malignant behaviour	2	-	1	-	1	-	-	0,0	-	0,1	-	0,0	0,0	0,0	0,00
Borderline behaviour	1	-	-	1	-	-	-	-	0,1	-	-	0,0	0,0	0,0	0,00
Benign behaviour	154	45	54	27	23	5	1,9	2,7	1,8	2,2	0,9	2,1	2,1	2,0	0,11
Tumours of the craniopharyngeal duct	11	2	4	2	3	-	0,1	0,2	0,1	0,3	-	0,1	0,2	0,1	0,01
Malignant behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borderline behaviour	11	2	4	2	3	-	0,1	0,2	0,1	0,3	-	0,1	0,2	0,1	0,01
Benign behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tumours of the pineal gland	5	1	3	1	-	-	0,0	0,1	0,1	-	-	0,1	0,1	0,1	0,00
Malignant behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borderline behaviour	5	1	3	1	-	-	0,0	0,1	0,1	-	-	0,1	0,1	0,1	0,00
Benign behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All primary brain and other CNS tumours	**1 504**	**183**	**377**	**427**	**399**	**118**	**7,8**	**18,6**	**27,9**	**39,0**	**20,5**	**20,1**	**20,4**	**18,6**	**1,19**
Malignant behaviour	**491**	**58**	**86**	**126**	**168**	**53**	**2,5**	**4,2**	**8,2**	**16,4**	**9,2**	**6,6**	**6,4**	**5,7**	**0,39**
Borderline behaviour	**161**	**32**	**42**	**39**	**35**	**13**	**1,4**	**2,1**	**2,5**	**3,4**	**2,3**	**2,1**	**2,1**	**2,0**	**0,12**
Benign behaviour	**852**	**93**	**249**	**262**	**196**	**52**	**4,0**	**12,3**	**17,1**	**19,2**	**9,0**	**11,4**	**11,9**	**10,9**	**0,69**

CR: crude (all ages) incidence rate (N/100,000 person years)

ESR and WSR: age-standardised incidence using the European or World Standard Population (N/100,000 person years)

CRi: Cumulative risk 0-74 years (%)

Source: Belgian Cancer Registry

APPENDIX IV

Incidence, 5-year prevalence and 5-year relative survival of primary brain and other CNS tumours in adults by primary tumour location, behaviour and sex

Belgium: Incidence (2004-2020), 5-year prevalence (31/12/2020) and 5-year relative survival (2004-2020) of primary brain and other CNS tumours in adults by primary location, behaviour and sex

	Males								Females							
	Incidence (2004-2020)			Prevalence (5 years) 31/12/2020			5-year Relative survival (2004-2020)		Incidence (2004-2020)			Prevalence (5 years) 31/12/2020			5-year Relative survival (2004-2020)	
	N	CR	WSR	N	CR	WSR	N at risk	% 95%CI	N	CR	WSR	N	CR	WSR	N at risk	% 95%CI
Tumours of the meninges	3 156	4,5	3,4	1 042	23,9	16,4	3 087	89,4 [87.5:91.1]	9 056	12,2	9,8	3 079	67,1	50,7	8 975	94,0 [93.2:94.8]
Malignant behaviour	135	0,2	0,1	32	0,7	0,5	133	59,6 [49.0:69.3]	164	0,2	0,2	26	0,6	0,4	164	61,1 [52.0:69.4]
Borderline behaviour	447	0,6	0,5	137	3,1	2,3	446	83,7 [78.3:88.5]	585	0,8	0,6	181	3,9	3,3	582	84,1 [80.0:87.7]
Benign behaviour	2 574	3,7	2,8	877	20,1	13,7	2 544	91,1 [89.1:93.0]	8 307	11,2	9,0	2 876	62,6	47,1	8 255	95,3 [94.4:96.1]
Tumours of the brain	8 636	12,4	10,2	1 111	25,5	24,1	8 533	25,1 [24.1:26.1]	6 329	8,5	6,8	828	18,0	17,1	6 270	27,6 [26.5:28.8]
Malignant behaviour	7 898	11,3	9,1	879	20,1	18,3	7 828	19,3 [18.4:20.3]	5 683	7,7	5,9	635	13,8	12,4	5 642	20,6 [19.5:21.7]
Borderline behaviour	535	0,8	0,8	163	3,7	4,0	523	86,5 [82.5:89.8]	422	0,6	0,6	124	2,7	3,0	414	89,5 [85.5:92.7]
Benign behaviour	203	0,3	0,3	72	1,6	1,8	200	93,5 [87.5:97.6]	224	0,3	0,3	69	1,5	1,6	221	97,7 [93.2:100.4]
Tumours of the spinal cord, cranial nerves and other parts of the CNS	1 505	2,2	2,0	688	15,8	13,9	1 485	97,4 [95.7:98.9]	1 504	2,0	1,9	735	16,0	13,8	1 493	98,8 [97.3:100.1]
Malignant behaviour	237	0,3	0,3	71	1,6	1,6	233	82,7 [76.3:87.9]	206	0,3	0,3	80	1,7	1,6	202	88,1 [81.6:92.8]
Borderline behaviour	173	0,2	0,3	59	1,4	1,3	169	97,0 [91.1:100.5]	145	0,2	0,2	69	1,5	1,5	143	95,6 [88.9:99.4]
Benign behaviour	1 095	1,6	1,4	558	12,8	11,1	1 083	100,8 [99.1:102.2]	1 153	1,6	1,4	586	12,8	10,7	1 148	101,2 [99.5:102.4]
Tumours of the spinal cord and cauda equina	573	0,8	0,8	234	5,4	5,1	566	94,8 [91.6:97.2]	467	0,6	0,6	227	4,9	4,6	461	95,7 [92.3:98.2]
Malignant behaviour	191	0,3	0,3	63	1,4	1,4	188	86,0 [79.0:91.2]	169	0,2	0,2	68	1,5	1,4	165	89,7 [82.7:94.4]
Borderline behaviour	149	0,2	0,2	47	1,1	1,0	147	96,1 [89.6:99.9]	125	0,2	0,2	64	1,4	1,4	124	97,8 [90.9:101.1]
Benign behaviour	233	0,3	0,3	124	2,8	2,6	231	101,7 [98.0:103.8]	173	0,2	0,2	95	2,1	1,8	172	100,2 [94.3:103.0]
Tumours of the cranial nerves	881	1,3	1,1	451	10,3	8,8	873	100,6 [98.5:102.2]	970	1,3	1,2	497	10,8	9,0	967	100,7 [98.8:102.1]
Malignant behaviour	25	0,0	0,0	7	0,2	0,1	<50	- -	26	0,0	0,0	12	0,3	0,2	<50	- -
Borderline behaviour	17	0,0	0,0	11	0,3	0,2	<50	- -	11	0,0	0,0	5	0,1	0,1	<50	- -
Benign behaviour	839	1,2	1,1	433	9,9	8,5	832	100,8 [98.7:102.3]	933	1,3	1,1	480	10,5	8,7	930	101,1 [99.2:102.4]
Tumours of overlapping or other part of the CNS	51	0,1	0,1	6	0,1	0,1	<50	- -	67	0,1	0,1	11	0,2	0,2	65	91,9 [80.4:98.3]
Malignant behaviour	21	0,0	0,0	1	0,0	0,0	<50	- -	11	0,0	0,0	-	-	-	<50	- -
Borderline behaviour	7	0,0	0,0	1	0,0	0,0	<50	- -	9	0,0	0,0	-	-	-	<50	- -
Benign behaviour	23	0,0	0,0	4	0,1	0,1	<50	- -	47	0,1	0,1	11	0,2	0,2	<50	- -
Tumours of the pituitary and pineal glands and craniopharyngeal duct	2 070	3,0	2,5	747	17,1	14,0	2 051	96,8 [95.0:98.4]	2 007	2,7	2,7	716	15,6	15,3	1 996	95,8 [94.4:97.1]
Malignant behaviour	63	0,1	0,1	24	0,5	0,7	63	71,0 [56.3:81.9]	44	0,1	0,1	10	0,2	0,2	<50	- -
Borderline behaviour	132	0,2	0,2	30	0,7	0,6	129	87,7 [79.3:93.6]	167	0,2	0,2	48	1,0	1,1	166	87,5 [80.5:92.5]
Benign behaviour	1 875	2,7	2,3	693	15,9	12,6	1 863	98,2 [96.4:99.8]	1 796	2,4	2,4	658	14,3	14,0	1 787	97,3 [95.8:98.6]
Tumours of the pituitary gland	1 912	2,7	2,3	704	16,1	12,9	1 897	97,6 [95.8:99.2]	1 826	2,5	2,4	667	14,5	14,1	1 816	97,2 [95.7:98.4]
Malignant behaviour	28	0,0	0,0	7	0,2	0,2	<50	- -	21	0,0	0,0	6	0,1	0,1	<50	- -
Borderline behaviour	10	0,0	0,0	4	0,1	0,1	<50	- -	13	0,0	0,0	6	0,1	0,2	<50	- -
Benign behaviour	1 874	2,7	2,3	693	15,9	12,6	1 862	98,3 [96.4:99.9]	1 792	2,4	2,4	655	14,3	13,9	1 783	97,3 [95.8:98.6]
Tumours of the craniopharyngeal duct	111	0,2	0,2	26	0,6	0,5	108	86,9 [77.6:93.4]	132	0,2	0,2	39	0,8	0,9	131	85,3 [76.8:91.3]
Malignant behaviour	-	-	-	-	-	-	-	- -	-	-	-	-	-	-	-	- -
Borderline behaviour	111	0,2	0,2	26	0,6	0,5	108	86,9 [77.6:93.4]	130	0,2	0,2	38	0,8	0,8	129	85,7 [77.3:91.7]
Benign behaviour	-	-	-	-	-	-	-	- -	2	0,0	0,0	1	0,0	0,0	<50	- -
Tumours of the pineal gland	47	0,1	0,1	17	0,4	0,5	<50	- -	49	0,1	0,1	10	0,2	0,2	<50	- -
Malignant behaviour	35	0,1	0,1	17	0,4	0,5	<50	- -	23	0,0	0,0	4	0,1	0,1	<50	- -
Borderline behaviour	11	0,0	0,0	-	-	-	<50	- -	24	0,0	0,0	4	0,1	0,1	<50	- -
Benign behaviour	1	0,0	0,0	-	-	-	<50	- -	2	0,0	0,0	2	0,0	0,1	<50	- -
All primary brain and other CNS tumours	**15 367**	**22,0**	**18,1**	**3 578**	**82,0**	**68,2**	**15 103**	**54,4** [53.5:55.3]	**18 896**	**25,5**	**21,1**	**5 335**	**116,2**	**96,5**	**18 630**	**72,2** [71.5:73.0]
Malignant behaviour	8 333	11,9	9,7	1 005	23,0	21,0	8 256	22,1 [21.1:23.1]	6 097	8,2	6,4	751	16,4	14,6	6 049	24,2 [23.0:25.3]
Borderline behaviour	1 287	1,8	1,7	389	8,9	8,2	1 267	87,2 [84.5:89.5]	1 319	1,8	1,7	422	9,2	8,9	1 305	87,5 [85.1:89.7]
Benign behaviour	5 747	8,2	6,7	2 195	50,3	39,2	5 670	95,4 [94.3:96.5]	11 480	15,5	13,1	4 176	91,0	73,2	11 371	96,2 [95.5:96.8]

CR: Crude (all ages) rate (N/100,000 person years)

WSR: age-standardised rate, using the world population (N/100,000 person years)

Relative survival calculated for all cases diagnosed between 2004 and 2020

Source: Belgian Cancer Registry

Belgium: Incidence (2004-2020), 5-year prevalence (31/12/2020) and 5-year relative survival (2004-2020) of primary brain and other CNS tumours in adults by primary location and behaviour

	Males and females								
	Incidence (2004-2020)			Prevalence (5 years) 31/12/2020			5-year Relative survival (2004-2020)		
	N	CR	WSR	N	CR	WSR	N at risk	%	95%CI
Tumours of the meninges	12 212	8,5	6,6	4 121	46,0	33,7	12 062	92,9	[92.1:93.6]
Malignant behaviour	299	0,2	0,1	58	0,6	0,4	297	60,4	[53.5:66.8]
Borderline behaviour	1 032	0,7	0,6	318	3,6	2,8	1 028	83,9	[80.7:86.9]
Benign behaviour	10 881	7,6	5,9	3 753	41,9	30,6	10 799	94,3	[93.5:95.1]
Tumours of the brain	14 965	10,4	8,4	1 939	21,7	20,5	14 803	26,2	[25.4:26.9]
Malignant behaviour	13 581	9,4	7,4	1 514	16,9	15,4	13 470	19,9	[19.2:20.6]
Borderline behaviour	957	0,7	0,7	287	3,2	3,5	937	87,8	[85.0:90.2]
Benign behaviour	427	0,3	0,3	141	1,6	1,7	421	95,7	[92.3:98.3]
Tumours of the spinal cord, cranial nerves and other parts of the CNS	3 009	2,1	1,9	1 423	15,9	13,9	2 978	98,1	[97.0:99.1]
Malignant behaviour	443	0,3	0,3	151	1,7	1,6	435	85,2	[80.8:88.9]
Borderline behaviour	318	0,2	0,2	128	1,4	1,4	312	96,4	[92.3:99.1]
Benign behaviour	2 248	1,6	1,4	1 144	12,8	10,9	2 231	101,0	[99.9:102.0]
Tumours of the spinal cord and cauda equina	1 040	0,7	0,7	461	5,1	4,8	1 027	95,2	[93.0:97.0]
Malignant behaviour	360	0,2	0,2	131	1,5	1,4	353	87,7	[83.0:91.4]
Borderline behaviour	274	0,2	0,2	111	1,2	1,2	271	96,9	[92.6:99.7]
Benign behaviour	406	0,3	0,3	219	2,4	2,2	403	101,2	[98.2:103.0]
Tumours of the cranial nerves	1 851	1,3	1,2	948	10,6	8,9	1 840	100,6	[99.3:101.7]
Malignant behaviour	51	0,0	0,0	19	0,2	0,2	51	93,7	[79.2:101.5]
Borderline behaviour	28	0,0	0,0	16	0,2	0,2	<50	-	-
Benign behaviour	1 772	1,2	1,1	913	10,2	8,6	1 762	100,9	[99.6:102.0]
Tumours of overlapping or other part of the CNS	118	0,1	0,1	17	0,2	0,2	114	84,0	[74.5:91.1]
Malignant behaviour	32	0,0	0,0	1	0,0	0,0	<50	-	-
Borderline behaviour	16	0,0	0,0	1	0,0	0,0	<50	-	-
Benign behaviour	70	0,0	0,0	15	0,2	0,1	69	101,7	[92.5:104.8]
Tumours of the pituitary and pineal glands and craniopharyngeal duct	4 077	2,8	2,6	1 463	16,3	14,5	4 047	96,3	[95.2:97.3]
Malignant behaviour	107	0,1	0,1	34	0,4	0,5	107	69,5	[58.9:78.1]
Borderline behaviour	299	0,2	0,2	78	0,9	0,9	295	87,6	[82.5:91.6]
Benign behaviour	3 671	2,5	2,3	1 351	15,1	13,2	3 650	97,8	[96.6:98.8]
Tumours of the pituitary gland	3 738	2,6	2,3	1 371	15,3	13,5	3 713	97,4	[96.2:98.5]
Malignant behaviour	49	0,0	0,0	13	0,1	0,2	<50	-	-
Borderline behaviour	23	0,0	0,0	10	0,1	0,1	<50	-	-
Benign behaviour	3 666	2,5	2,3	1 348	15,1	13,2	3 645	97,8	[96.6:98.8]
Tumours of the craniopharyngeal duct	243	0,2	0,2	65	0,7	0,7	239	86,1	[80.1:90.7]
Malignant behaviour	-	-	-	-	-	-	-	-	-
Borderline behaviour	241	0,2	0,2	64	0,7	0,7	237	86,3	[80.4:90.9]
Benign behaviour	2	0,0	0,0	1	0,0	0,0	<50	-	-
Tumours of the pineal gland	96	0,1	0,1	27	0,3	0,4	96	79,7	[69.5:87.1]
Malignant behaviour	58	0,0	0,0	21	0,2	0,3	58	71,6	[56.9:82.3]
Borderline behaviour	35	0,0	0,0	4	0,0	0,1	<50	-	-
Benign behaviour	3	0,0	0,0	2	0,0	0,0	<50	-	-
All primary brain and other CNS tumours	**34 263**	**23,8**	**19,6**	**8 913**	**99,5**	**82,3**	**33 733**	**64,3**	[63.7:64.9]
Malignant behaviour	14 430	10,0	8,0	1 756	19,6	17,8	14 305	23,0	[22.3:23.7]
Borderline behaviour	2 606	1,8	1,7	811	9,1	8,5	2 572	87,3	[85.6:89.0]
Benign behaviour	17 227	12,0	9,9	6 371	71,1	56,3	17 041	95,9	[95.4:96.5]

CR: Crude (all ages) rate (N/100,000 person years)

WSR: age-standardised rate, using the world population (N/100,000 person years)

Relative survival calculated for all cases diagnosed between 2004 and 2020

Source: Belgian Cancer Registry

APPENDIX V

Number of new diagnoses (N) and age-standardised incidence (N/100,000) of primary brain and other CNS tumours in adults by primary tumour location, behaviour, sex and incidence year, 2004-2020

Belgium: Number of new diagnoses and age-standardised incidence of primary brain and other CNS tumours in adults by primary location, behaviour and incidence year (2004-2020)

	Males and females																															
	N																	WSR														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Tumours of the meninges	365	387	464	526	556	613	699	669	722	785	869	951	907	939	905	966	889	3,7	3,9	4,6	5,2	5,3	5,9	6,5	6,3	6,7	7,3	7,8	8,6	7,8	8,2	7,9	8,2	7,5
Malignant behaviour	29	15	14	15	13	14	18	10	17	15	12	31	20	19	19	19	19	0,3	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,3	0,1	0,1	0,1	0,1	0,1
Borderline behaviour	21	33	30	37	40	49	60	71	58	81	93	92	66	79	85	64	73	0,2	0,3	0,3	0,3	0,4	0,5	0,5	0,6	0,6	0,8	0,9	0,8	0,6	0,7	0,8	0,6	0,7
Benign behaviour	315	339	420	474	503	550	621	588	647	689	764	828	821	841	801	883	797	3,2	3,5	4,2	4,7	4,8	5,3	5,8	5,5	6,0	6,4	6,9	7,6	7,1	7,3	7,0	7,5	6,7
Tumours of the brain	822	782	797	807	847	902	828	839	857	950	922	911	919	903	950	1 016	913	8,7	8,4	8,4	8,2	8,6	9,3	8,0	8,2	8,0	9,0	8,6	8,6	8,3	8,1	8,4	8,8	8,0
Malignant behaviour	752	713	719	736	759	799	761	770	778	841	848	832	848	813	865	924	823	7,8	7,5	7,4	7,3	7,5	7,9	7,2	7,3	7,1	7,7	7,7	7,7	7,4	7,0	7,3	7,7	6,9
Borderline behaviour	57	49	64	47	65	75	45	43	42	80	52	50	52	64	55	63	54	0,7	0,6	0,8	0,6	0,8	1,0	0,6	0,5	0,5	1,0	0,6	0,6	0,7	0,7	0,7	0,7	0,6
Benign behaviour	13	20	14	24	23	28	22	26	37	29	22	29	19	26	30	29	36	0,2	0,3	0,2	0,3	0,3	0,3	0,3	0,4	0,4	0,3	0,3	0,3	0,2	0,3	0,4	0,4	0,4
Tumours of the spinal cord, cranial nerves and other parts of the CNS	65	56	74	92	100	81	87	72	160	250	222	251	251	301	313	344	290	0,8	0,6	0,9	1,1	1,2	0,9	1,0	0,8	1,7	2,7	2,4	2,8	2,7	3,1	3,2	3,4	3,0
Malignant behaviour	17	20	15	21	14	26	26	21	29	27	24	25	42	37	33	41	25	0,2	0,2	0,2	0,2	0,2	0,3	0,3	0,2	0,3	0,3	0,2	0,3	0,5	0,4	0,3	0,4	0,3
Borderline behaviour	16	8	11	22	9	10	13	9	18	20	24	23	21	37	25	31	21	0,2	0,1	0,1	0,3	0,1	0,1	0,2	0,1	0,2	0,2	0,3	0,3	0,3	0,4	0,3	0,3	0,2
Benign behaviour	32	28	48	49	77	45	48	42	113	203	174	203	188	227	255	272	244	0,4	0,3	0,6	0,6	0,9	0,5	0,5	0,5	1,2	2,2	1,9	2,2	2,0	2,3	2,6	2,7	2,4
Tumours of the spinal cord and cauda equina	28	26	27	46	36	32	41	31	57	78	63	86	79	81	107	125	97	0,4	0,3	0,4	0,6	0,5	0,4	0,5	0,4	0,6	0,9	0,7	1,0	0,9	0,9	1,2	1,2	1,1
Malignant behaviour	13	16	11	16	10	22	23	20	22	20	16	21	35	27	28	36	24	0,2	0,2	0,1	0,2	0,1	0,3	0,2	0,2	0,2	0,2	0,2	0,3	0,4	0,3	0,3	0,4	0,3
Borderline behaviour	10	6	9	20	9	8	13	6	16	17	23	21	18	30	23	28	17	0,1	0,1	0,1	0,3	0,1	0,1	0,2	0,1	0,2	0,2	0,3	0,2	0,2	0,3	0,3	0,3	0,2
Benign behaviour	5	4	7	10	17	2	5	5	19	41	24	44	26	24	56	61	56	0,1	0,0	0,1	0,1	0,2	0,0	0,1	0,1	0,2	0,4	0,3	0,5	0,3	0,2	0,7	0,6	0,6
Tumours of the cranial nerves	13	27	29	36	59	43	45	39	98	160	154	162	166	216	200	213	191	0,1	0,3	0,4	0,4	0,7	0,5	0,5	0,4	1,0	1,7	1,7	1,7	1,7	2,1	2,0	2,1	1,9
Malignant behaviour	-	3	1	-	3	1	2	1	5	2	8	4	7	9	1	3	1	-	0,0	0,0	-	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,1	0,0	0,1	0,1	0,0	0,0	0,0
Borderline behaviour	-	1	1	1	-	-	-	2	2	2	1	1	3	7	2	2	3	-	0,0	0,0	0,0	-	-	-	0,0	0,0	0,0	0,0	0,0	0,0	0,1	0,0	0,0	0,0
Benign behaviour	13	23	27	35	56	42	43	36	91	156	145	157	156	200	197	208	187	0,1	0,3	0,3	0,4	0,6	0,4	0,5	0,4	1,0	1,7	1,6	1,7	1,6	2,0	1,9	2,1	1,8
Tumours of overlapping or other part of the CNS	24	3	18	10	5	6	1	2	5	12	5	3	6	4	6	6	2	0,3	0,0	0,2	0,1	0,1	0,1	0,0	0,0	0,0	0,1	0,1	0,0	0,1	0,0	0,1	0,1	0,0
Malignant behaviour	4	1	3	5	1	3	1	-	2	5	-	-	-	1	4	2	-	0,0	0,0	0,0	0,0	0,0	0,0	0,0	-	0,0	0,0	-	-	-	0,0	0,0	0,0	-
Borderline behaviour	6	1	1	1	-	2	-	1	-	1	-	1	-	-	-	1	1	0,1	0,0	0,0	0,0	-	0,0	-	0,0	-	0,0	-	0,0	-	-	-	0,0	0,0
Benign behaviour	14	1	14	4	4	1	-	1	3	6	5	2	6	3	2	3	1	0,2	0,0	0,2	0,0	0,1	0,0	-	0,0	0,0	0,1	0,1	0,0	0,1	0,0	0,0	0,0	0,0
Tumours of the pituitary and pineal glands and craniopharyngeal duct	100	109	148	151	197	185	198	269	294	290	283	296	270	328	321	335	303	1,2	1,3	1,7	1,7	2,2	2,1	2,1	3,0	3,1	3,0	3,1	3,1	2,7	3,5	3,4	3,4	3,1
Malignant behaviour	9	5	11	6	3	2	6	5	5	5	5	4	8	6	8	11	8	0,1	0,1	0,2	0,1	0,0	0,0	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,2	0,1
Borderline behaviour	16	15	11	19	12	21	18	18	21	28	9	25	11	16	22	14	23	0,2	0,2	0,1	0,2	0,2	0,2	0,2	0,2	0,3	0,3	0,1	0,3	0,1	0,2	0,3	0,1	0,3
Benign behaviour	75	89	126	126	182	162	174	246	268	257	269	267	251	306	291	310	272	0,9	1,0	1,4	1,4	2,0	1,8	1,9	2,8	2,8	2,7	2,9	2,7	2,5	3,2	3,0	3,2	2,7
Tumours of the pituitary gland	81	91	132	128	184	164	179	249	270	268	273	268	256	310	295	315	275	0,9	1,0	1,5	1,4	2,0	1,9	1,9	2,8	2,8	2,8	2,9	2,7	2,5	3,3	3,1	3,2	2,8
Malignant behaviour	6	2	6	2	2	-	5	2	2	2	3	1	6	2	5	3	-	0,1	0,0	0,1	0,0	0,0	-	0,1	0,0	0,0	0,0	0,0	0,0	0,1	0,0	0,1	0,0	-
Borderline behaviour	-	-	-	-	-	2	-	1	-	9	1	-	-	2	1	4	3	-	-	-	-	-	0,0	-	0,0	-	0,1	0,0	-	-	0,0	0,0	0,0	0,0
Benign behaviour	75	89	126	126	182	162	174	246	268	257	269	267	250	306	289	308	272	0,9	1,0	1,4	1,4	2,0	1,8	1,9	2,8	2,8	2,7	2,9	2,7	2,5	3,2	3,0	3,1	2,7
Tumours of the craniopharyngeal duct	15	13	10	14	10	16	17	13	19	17	7	21	10	14	22	8	17	0,2	0,2	0,1	0,2	0,1	0,2	0,2	0,2	0,2	0,2	0,1	0,2	0,1	0,2	0,2	0,1	0,2
Malignant behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borderline behaviour	15	13	10	14	10	16	17	13	19	17	7	21	10	14	21	7	17	0,2	0,2	0,1	0,2	0,1	0,2	0,2	0,2	0,2	0,2	0,1	0,2	0,1	0,2	0,2	0,1	0,2
Benign behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,0	0,0	-
Tumours of the pineal gland	4	5	6	9	3	5	2	7	5	5	3	7	4	4	4	12	11	0,1	0,1	0,1	0,1	0,1	0,1	0,0	0,1	0,1	0,1	0,0	0,1	0,0	0,0	0,0	0,2	0,1
Malignant behaviour	3	3	5	4	1	2	1	3	3	3	2	3	2	4	3	8	8	0,0	0,0	0,1	0,1	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,1	0,1
Borderline behaviour	1	2	1	5	2	3	1	4	2	2	1	4	1	-	-	3	3	0,0	0,0	0,0	0,1	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,1	0,0	-	-	0,0	0,0
Benign behaviour	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0,0	-	0,0	0,0	-
All primary brain and other CNS tumours	1 352	1 334	1 483	1 576	1 700	1 781	1 812	1 849	2 033	2 275	2 296	2 409	2 347	2 471	2 489	2 661	2 395	14,4	14,2	15,6	16,2	17,2	18,2	17,6	18,3	19,6	22,0	21,9	23,1	21,4	22,8	22,9	23,8	21,6
Malignant behaviour	807	753	759	778	789	841	811	806	829	888	889	892	918	875	925	995	875	8,4	7,9	7,9	7,8	7,8	8,4	7,7	7,7	7,6	8,1	8,1	8,4	8,0	7,7	7,9	8,4	7,5
Borderline behaviour	110	105	116	125	126	155	136	141	139	209	178	190	150	196	187	172	171	1,4	1,3	1,4	1,4	1,5	1,8	1,4	1,5	1,5	2,3	1,9	1,9	1,6	2,0	2,0	1,7	1,8
Benign behaviour	435	476	608	673	785	785	865	902	1 065	1 178	1 229	1 327	1 279	1 400	1 377	1 494	1 349	4,6	5,0	6,4	7,0	7,9	8,0	8,5	9,1	10,4	11,6	11,9	12,8	11,8	13,1	13,0	13,6	12,3

CR: Crude (all ages) rate (N/100,000 person years)

WSR: age-standardised rate, using the world population (N/100,000 person years)

Source: Belgian Cancer Registry

Belgium: Number of new diagnoses and age-standardised incidence of primary brain and other CNS tumours in adults males by primary location, behaviour and incidence year (2004-2020)

	Males																															
	N																	WSR														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Tumours of the meninges	104	108	117	139	146	174	170	173	159	195	206	236	232	250	245	263	239	2,1	2,2	2,4	2,9	2,8	3,2	3,1	3,3	3,0	3,5	3,6	4,2	3,9	4,3	4,3	4,1	3,8
Malignant behaviour	12	6	4	2	4	4	9	6	10	8	6	12	10	10	10	13	9	0,2	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,2	0,1	0,1	0,2	0,1	0,2	0,2	0,2	0,1
Borderline behaviour	9	15	15	18	17	18	26	40	17	36	36	37	21	38	43	26	35	0,2	0,3	0,3	0,4	0,3	0,3	0,4	0,7	0,3	0,7	0,6	0,6	0,3	0,7	0,8	0,4	0,6
Benign behaviour	83	87	98	119	125	152	135	127	132	151	164	187	201	202	192	224	195	1,7	1,8	2,0	2,4	2,5	2,9	2,5	2,5	2,5	2,7	2,8	3,4	3,4	3,5	3,3	3,5	3,0
Tumours of the brain	464	464	465	473	473	509	484	476	467	569	533	534	543	535	562	577	508	10,3	10,4	10,0	10,1	9,8	10,8	10,0	9,7	9,4	11,1	10,4	10,5	10,3	10,2	10,2	10,3	9,2
Malignant behaviour	422	426	425	434	430	454	445	436	429	519	494	487	499	487	518	531	462	9,2	9,4	9,0	9,1	8,7	9,4	9,1	8,7	8,4	9,9	9,4	9,4	9,3	9,1	9,1	9,3	8,1
Borderline behaviour	36	29	32	25	33	43	28	28	21	40	29	32	32	38	27	33	29	1,0	0,7	0,9	0,6	0,8	1,1	0,7	0,7	0,5	0,9	0,7	0,7	0,8	0,9	0,7	0,7	0,7
Benign behaviour	6	9	8	14	10	12	11	12	17	10	10	15	12	10	17	13	17	0,1	0,2	0,2	0,4	0,2	0,3	0,3	0,3	0,4	0,2	0,3	0,4	0,3	0,3	0,4	0,3	0,4
Tumours of the spinal cord, cranial nerves and other parts of the CNS	30	30	38	47	55	41	40	32	88	138	100	134	110	146	153	184	139	0,8	0,7	1,0	1,1	1,3	1,0	0,9	0,8	1,9	3,2	2,2	2,9	2,5	3,1	3,2	3,7	3,0
Malignant behaviour	12	13	7	12	9	16	15	8	17	19	9	12	20	18	17	23	10	0,3	0,3	0,2	0,3	0,2	0,4	0,3	0,2	0,3	0,4	0,2	0,3	0,5	0,4	0,3	0,4	0,3
Borderline behaviour	9	4	7	13	7	8	6	3	14	11	13	15	7	22	14	12	8	0,3	0,1	0,2	0,3	0,2	0,2	0,2	0,1	0,3	0,3	0,3	0,4	0,2	0,5	0,3	0,3	0,2
Benign behaviour	9	13	24	22	39	17	19	21	57	108	78	107	83	106	122	149	121	0,2	0,4	0,6	0,5	1,0	0,4	0,4	0,5	1,2	2,4	1,7	2,3	1,9	2,2	2,5	3,0	2,5
Tumours of the spinal cord and cauda equina	19	16	14	27	21	20	22	12	36	55	31	49	37	47	60	65	42	0,6	0,4	0,4	0,7	0,5	0,5	0,5	0,3	0,8	1,3	0,7	1,1	0,9	1,1	1,4	1,3	0,9
Malignant behaviour	9	10	6	8	6	13	14	7	12	16	6	10	17	13	14	20	10	0,3	0,2	0,2	0,2	0,1	0,3	0,3	0,2	0,3	0,4	0,1	0,3	0,4	0,3	0,3	0,4	0,3
Borderline behaviour	8	4	6	13	7	6	6	2	12	9	12	14	5	17	13	10	5	0,2	0,1	0,2	0,3	0,2	0,2	0,2	0,1	0,3	0,2	0,3	0,3	0,1	0,4	0,3	0,2	0,1
Benign behaviour	2	2	2	6	8	1	2	3	12	30	13	25	15	17	33	35	27	0,1	0,0	0,1	0,1	0,2	0,0	0,1	0,1	0,3	0,7	0,3	0,5	0,4	0,4	0,8	0,7	0,6
Tumours of the cranial nerves	4	14	14	16	32	16	17	19	49	77	67	85	72	96	91	116	96	0,1	0,4	0,3	0,4	0,8	0,3	0,4	0,4	1,1	1,8	1,5	1,8	1,6	2,0	1,8	2,3	2,0
Malignant behaviour	-	3	-	-	3	1	-	1	3	-	3	2	3	4	1	1	-	-	0,1	-	-	0,1	0,0	-	0,0	0,1	-	0,1	0,0	0,1	0,1	0,0	0,0	-
Borderline behaviour	-	-	-	-	-	-	-	2	1	1	1	2	5	1	2	2	-	-	-	-	-	-	-	-	-	0,1	0,0	0,0	0,0	0,0	0,1	0,0	0,1	0,0	0,0
Benign behaviour	4	11	14	16	29	15	17	18	44	76	63	82	67	87	89	113	94	0,1	0,3	0,3	0,4	0,7	0,3	0,4	0,4	1,0	1,8	1,4	1,8	1,5	1,8	1,7	2,2	1,9
Tumours of overlapping or other part of the CNS	7	-	10	4	2	5	1	1	3	6	2	-	1	3	2	3	1	0,2	-	0,2	0,1	0,0	0,1	0,0	0,0	0,0	0,1	0,0	-	0,0	0,0	0,0	0,1	0,0
Malignant behaviour	3	-	1	4	-	2	1	-	2	3	-	-	-	1	2	2	-	0,1	-	0,0	0,1	-	0,0	0,0	-	0,0	0,1	-	-	-	0,0	0,0	0,0	-
Borderline behaviour	1	-	1	-	-	2	-	1	-	1	-	-	-	-	-	-	1	0,0	-	0,0	-	-	0,0	-	0,0	-	0,0	-	-	-	-	-	-	0,0
Benign behaviour	3	-	8	-	2	1	-	-	1	2	2	-	1	2	-	1	-	0,1	-	0,2	-	0,0	0,0	-	-	0,0	0,0	0,0	0,0	-	0,0	0,0	0,0	-
Tumours of the pituitary and pineal glands and craniopharyngeal duct	42	57	69	79	105	75	116	132	140	150	139	162	152	175	145	176	156	1,0	1,4	1,6	1,8	2,2	1,6	2,5	3,0	3,0	3,0	2,9	3,1	2,9	3,6	2,7	3,5	3,1
Malignant behaviour	6	3	6	2	1	1	5	4	3	2	1	2	4	4	5	8	6	0,1	0,1	0,2	0,1	0,0	0,0	0,1	0,1	0,1	0,1	0,0	0,0	0,1	0,1	0,1	0,2	0,2
Borderline behaviour	9	7	6	9	5	8	10	5	7	15	5	13	4	7	6	4	12	0,2	0,2	0,1	0,2	0,1	0,2	0,2	0,1	0,2	0,3	0,1	0,3	0,1	0,2	0,1	0,1	0,3
Benign behaviour	27	47	57	68	99	66	101	123	130	133	133	147	144	164	134	164	138	0,6	1,0	1,2	1,5	2,0	1,4	2,1	2,7	2,7	2,6	2,8	2,8	2,8	3,3	2,5	3,2	2,6
Tumours of the pituitary gland	31	48	60	69	99	67	105	124	132	137	135	148	145	167	137	168	140	0,7	1,1	1,3	1,5	2,0	1,4	2,2	2,8	2,8	2,7	2,8	2,8	2,8	3,4	2,5	3,3	2,7
Malignant behaviour	4	1	3	1	-	-	4	1	2	1	1	1	2	2	3	2	-	0,1	0,0	0,1	0,0	-	-	0,1	0,0	0,0	0,0	0,0	0,0	0,1	0,1	0,1	0,1	-
Borderline behaviour	-	-	-	-	-	1	-	-	-	3	1	-	-	1	-	2	2	-	-	-	-	-	0,0	-	-	-	0,1	0,0	-	-	0,0	-	0,0	0,1
Benign behaviour	27	47	57	68	99	66	101	123	130	133	133	147	143	164	134	164	138	0,6	1,0	1,2	1,5	2,0	1,4	2,1	2,7	2,7	2,6	2,8	2,8	2,7	3,3	2,5	3,2	2,6
Tumours of the craniopharyngeal duct	8	7	5	6	4	6	9	5	6	10	4	13	4	6	6	2	10	0,2	0,2	0,1	0,2	0,1	0,1	0,2	0,1	0,1	0,2	0,1	0,3	0,1	0,1	0,1	0,1	0,2
Malignant behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borderline behaviour	8	7	5	6	4	6	9	5	6	10	4	13	4	6	6	2	10	0,2	0,2	0,1	0,2	0,1	0,1	0,2	0,1	0,1	0,2	0,1	0,3	0,1	0,1	0,1	0,1	0,2
Benign behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tumours of the pineal gland	3	2	4	4	2	2	2	3	2	3	-	1	3	2	2	6	6	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	-	0,0	0,1	0,0	0,1	0,2	0,2
Malignant behaviour	2	2	3	1	1	1	1	3	1	1	-	1	2	2	2	6	6	0,1	0,1	0,1	0,0	0,0	0,0	0,0	0,1	0,0	0,0	-	0,0	0,0	0,0	0,1	0,2	0,2
Borderline behaviour	1	-	1	3	1	1	1	-	1	2	-	-	-	-	-	-	-	0,0	-	0,0	0,1	0,0	0,0	0,0	-	0,0	0,0	-	-	-	-	-	-	-
Benign behaviour	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,0	-	-	-	-
All primary brain and other CNS tumours	**640**	**659**	**689**	**738**	**779**	**799**	**810**	**813**	**854**	**1 052**	**978**	**1 066**	**1 037**	**1 106**	**1 105**	**1 200**	**1 042**	**14,3**	**14,7**	**15,0**	**15,9**	**16,2**	**16,7**	**16,5**	**16,8**	**17,3**	**20,8**	**19,0**	**20,8**	**19,6**	**21,2**	**20,4**	**21,6**	**19,0**
Malignant behaviour	**452**	**448**	**442**	**450**	**444**	**475**	**474**	**454**	**459**	**548**	**510**	**513**	**533**	**519**	**550**	**575**	**487**	**10,0**	**9,9**	**9,4**	**9,5**	**9,0**	**9,9**	**9,7**	**9,2**	**9,0**	**10,5**	**9,7**	**10,0**	**9,9**	**9,7**	**9,7**	**10,2**	**8,7**
Borderline behaviour	**63**	**55**	**60**	**65**	**62**	**77**	**70**	**76**	**59**	**102**	**83**	**97**	**64**	**105**	**90**	**75**	**84**	**1,6**	**1,3**	**1,5**	**1,6**	**1,5**	**1,8**	**1,5**	**1,6**	**1,4**	**2,2**	**1,8**	**2,0**	**1,4**	**2,2**	**1,9**	**1,4**	**1,8**
Benign behaviour	**125**	**156**	**187**	**223**	**273**	**247**	**266**	**283**	**336**	**402**	**385**	**456**	**440**	**482**	**465**	**550**	**471**	**2,7**	**3,4**	**4,1**	**4,8**	**5,7**	**4,9**	**5,3**	**6,0**	**6,8**	**8,0**	**7,6**	**8,8**	**8,3**	**9,3**	**8,7**	**9,9**	**8,5**

CR: Crude (all ages) rate (N/100,000 person years)

WSR: age-standardised rate, using the world population (N/100,000 person years)

Source: Belgian Cancer Registry

Belgium: Number of new diagnoses and age-standardised incidence of primary brain and other CNS tumours in adults females by primary location, behaviour and incidence year (2004-2020)

	Females																
	N																
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Tumours of the meninges	261	279	347	387	410	439	529	496	563	590	663	715	675	689	660	703	650
Malignant behaviour	17	9	10	13	9	10	9	4	7	7	6	19	10	9	9	6	10
Borderline behaviour	12	18	15	19	23	31	34	31	41	45	57	55	45	41	42	38	38
Benign behaviour	232	252	322	355	378	398	486	461	515	538	600	641	620	639	609	659	602
Tumours of the brain	358	318	332	334	374	393	344	363	390	381	389	377	376	368	388	439	405
Malignant behaviour	330	287	294	302	329	345	316	334	349	322	354	345	349	326	347	393	361
Borderline behaviour	21	20	32	22	32	32	17	15	21	40	23	18	20	26	28	30	25
Benign behaviour	7	11	6	10	13	16	11	14	20	19	12	14	7	16	13	16	19
Tumours of the spinal cord, cranial nerves and other parts of the CNS	35	26	36	45	45	40	47	40	72	112	122	117	141	155	160	160	151
Malignant behaviour	5	7	8	9	5	10	11	13	12	8	15	13	22	19	16	18	15
Borderline behaviour	7	4	4	9	2	2	7	6	4	9	11	8	14	15	11	19	13
Benign behaviour	23	15	24	27	38	28	29	21	56	95	96	96	105	121	133	123	123
Tumours of the spinal cord and cauda equina	9	10	13	19	15	12	19	19	21	23	32	37	42	34	47	60	55
Malignant behaviour	4	6	5	8	4	9	9	13	10	4	10	11	18	14	14	16	14
Borderline behaviour	2	2	3	7	2	2	7	4	4	8	11	7	13	13	10	18	12
Benign behaviour	3	2	5	4	9	1	3	2	7	11	11	19	11	7	23	26	29
Tumours of the cranial nerves	9	13	15	20	27	27	28	20	49	83	87	77	94	120	109	97	95
Malignant behaviour	-	-	1	-	-	-	2	-	2	2	5	2	4	5	-	2	1
Borderline behaviour	-	1	1	1	-	-	-	2	-	1	-	-	1	2	1	-	1
Benign behaviour	9	12	13	19	27	27	26	18	47	80	82	75	89	113	108	95	93
Tumours of overlapping or other part of the CNS	17	3	8	6	3	1	-	1	2	6	3	3	5	1	4	3	1
Malignant behaviour	1	1	2	1	1	1	-	-	-	2	-	-	-	-	2	-	-
Borderline behaviour	5	1	-	1	-	-	-	-	-	-	-	1	-	-	-	1	-
Benign behaviour	11	1	6	4	2	-	-	1	2	4	3	2	5	1	2	2	1
Tumours of the pituitary and pineal glands and craniopharyngeal duct	58	52	79	72	92	110	82	137	154	140	144	134	118	153	176	159	147
Malignant behaviour	3	2	5	4	2	1	1	1	2	3	4	2	4	2	3	3	2
Borderline behaviour	7	8	5	10	7	13	8	13	14	13	4	12	7	9	16	10	11
Benign behaviour	48	42	69	58	83	96	73	123	138	124	136	120	107	142	157	146	134
Tumours of the pituitary gland	50	43	72	59	85	97	74	125	138	131	138	120	111	143	158	147	135
Malignant behaviour	2	1	3	1	2	-	1	1	-	1	2	-	4	-	2	1	-
Borderline behaviour	-	-	-	-	-	1	-	1	-	6	-	-	-	1	1	2	1
Benign behaviour	48	42	69	58	83	96	73	123	138	124	136	120	107	142	155	144	134
Tumours of the craniopharyngeal duct	7	6	5	8	6	10	8	8	13	7	3	8	6	8	16	6	7
Malignant behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borderline behaviour	7	6	5	8	6	10	8	8	13	7	3	8	6	8	15	5	7
Benign behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-
Tumours of the pineal gland	1	3	2	5	1	3	-	4	3	2	3	6	1	2	2	6	5
Malignant behaviour	1	1	2	3	-	1	-	-	2	2	2	2	-	2	1	2	2
Borderline behaviour	-	2	-	2	1	2	-	4	1	-	1	4	1	-	-	3	3
Benign behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-
All primary brain and other CNS tumours	712	675	794	838	921	982	1 002	1 036	1 179	1 223	1 318	1 343	1 310	1 365	1 384	1 461	1 353
Malignant behaviour	355	305	317	328	345	366	337	352	370	340	379	379	385	356	375	420	388
Borderline behaviour	47	50	56	60	64	78	66	65	80	107	95	93	86	91	97	97	87
Benign behaviour	310	320	421	450	512	538	599	619	729	776	844	871	839	918	912	944	878

	WSR																
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Tumours of the meninges	5,3	5,6	6,7	7,5	7,7	8,5	9,7	9,1	10,2	11,0	12,0	13,0	11,7	12,0	11,5	12,2	11,2
Malignant behaviour	0,3	0,2	0,1	0,2	0,2	0,2	0,1	0,1	0,1	0,1	0,1	0,3	0,1	0,1	0,1	0,1	0,1
Borderline behaviour	0,3	0,4	0,3	0,3	0,4	0,6	0,6	0,5	0,8	0,9	1,1	1,0	0,8	0,7	0,8	0,7	0,8
Benign behaviour	4,7	5,1	6,3	7,0	7,1	7,7	9,0	8,5	9,3	10,0	10,8	11,7	10,7	11,1	10,6	11,4	10,3
Tumours of the brain	7,1	6,6	6,9	6,4	7,5	7,8	6,1	6,7	6,8	7,0	6,9	6,9	6,3	6,1	6,7	7,3	6,8
Malignant behaviour	6,4	5,8	5,9	5,7	6,4	6,6	5,4	5,9	5,9	5,6	6,0	6,1	5,6	5,1	5,7	6,2	5,8
Borderline behaviour	0,5	0,5	0,8	0,5	0,8	0,9	0,4	0,4	0,5	1,0	0,6	0,4	0,5	0,6	0,7	0,7	0,6
Benign behaviour	0,2	0,3	0,1	0,2	0,3	0,4	0,3	0,4	0,4	0,4	0,3	0,3	0,2	0,4	0,3	0,4	0,4
Tumours of the spinal cord, cranial nerves and other parts of the CNS	0,8	0,6	0,9	1,1	1,0	0,9	1,1	0,9	1,6	2,3	2,6	2,6	2,9	3,0	3,2	3,2	3,0
Malignant behaviour	0,1	0,2	0,2	0,2	0,1	0,2	0,2	0,3	0,3	0,1	0,3	0,3	0,4	0,4	0,3	0,4	0,3
Borderline behaviour	0,2	0,1	0,1	0,3	0,1	0,0	0,2	0,1	0,1	0,2	0,3	0,2	0,3	0,3	0,3	0,4	0,3
Benign behaviour	0,5	0,3	0,5	0,6	0,8	0,6	0,7	0,4	1,2	1,9	2,1	2,1	2,1	2,3	2,7	2,4	2,4
Tumours of the spinal cord and cauda equina	0,2	0,2	0,3	0,5	0,4	0,3	0,4	0,5	0,5	0,5	0,7	0,8	0,9	0,7	1,0	1,2	1,2
Malignant behaviour	0,1	0,1	0,1	0,2	0,1	0,2	0,2	0,3	0,2	0,1	0,2	0,2	0,4	0,3	0,3	0,3	0,3
Borderline behaviour	0,1	0,1	0,1	0,2	0,1	0,0	0,2	0,1	0,1	0,2	0,3	0,2	0,3	0,3	0,3	0,4	0,3
Benign behaviour	0,1	0,0	0,1	0,1	0,2	0,1	0,1	0,2	0,2	0,3	0,4	0,3	0,3	0,1	0,5	0,4	0,6
Tumours of the cranial nerves	0,2	0,3	0,4	0,4	0,5	0,6	0,6	0,4	1,0	1,7	1,8	1,7	1,8	2,3	2,2	2,0	1,8
Malignant behaviour	-	-	0,0	-	-	-	0,0	-	0,0	0,0	0,1	0,0	0,0	0,1	-	0,0	0,0
Borderline behaviour	-	0,0	0,0	0,0	-	-	-	0,0	-	0,0	-	-	0,0	0,0	0,0	-	0,0
Benign behaviour	0,2	0,2	0,3	0,4	0,5	0,6	0,6	0,3	1,0	1,6	1,7	1,6	1,7	2,2	2,1	1,9	1,7
Tumours of overlapping or other part of the CNS	0,4	0,1	0,2	0,1	0,1	0,0	-	0,0	0,1	0,1	0,1	0,1	0,1	0,0	0,1	0,0	0,0
Malignant behaviour	0,0	0,0	0,1	0,0	0,0	0,0	-	-	-	0,0	-	-	-	-	0,0	-	-
Borderline behaviour	0,1	0,0	-	0,0	-	-	-	-	-	-	-	-	0,0	-	-	0,0	-
Benign behaviour	0,2	0,0	0,1	0,1	0,1	-	-	0,0	0,1	0,1	0,1	0,0	0,1	0,0	0,0	0,0	0,0
Tumours of the pituitary and pineal glands and craniopharyngeal duct	1,3	1,2	1,9	1,6	2,1	2,6	1,9	3,1	3,3	3,1	3,3	3,1	2,4	3,4	4,1	3,4	3,2
Malignant behaviour	0,1	0,0	0,1	0,1	0,0	0,0	0,0	0,0	0,0	0,1	0,1	0,1	0,1	0,0	0,1	0,1	0,1
Borderline behaviour	0,2	0,2	0,1	0,2	0,2	0,3	0,2	0,3	0,3	0,3	0,1	0,3	0,1	0,2	0,4	0,2	0,3
Benign behaviour	1,1	0,9	1,7	1,3	1,9	2,3	1,7	2,8	2,9	2,8	3,1	2,7	2,2	3,1	3,6	3,2	2,9
Tumours of the pituitary gland	1,1	0,9	1,7	1,3	2,0	2,3	1,7	2,8	2,9	2,9	3,1	2,7	2,3	3,2	3,7	3,2	2,9
Malignant behaviour	0,0	0,0	0,1	0,0	0,0	-	0,0	0,0	-	0,0	0,1	-	0,1	-	0,0	0,0	-
Borderline behaviour	-	-	-	-	-	0,0	-	0,0	-	0,2	-	-	-	0,0	0,0	0,0	0,0
Benign behaviour	1,1	0,9	1,7	1,3	1,9	2,3	1,7	2,8	2,9	2,8	3,1	2,7	2,2	3,1	3,6	3,1	2,9
Tumours of the craniopharyngeal duct	0,2	0,2	0,1	0,2	0,1	0,2	0,2	0,2	0,3	0,2	0,1	0,2	0,1	0,2	0,4	0,1	0,2
Malignant behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borderline behaviour	0,2	0,2	0,1	0,2	0,1	0,2	0,2	0,2	0,3	0,2	0,1	0,2	0,1	0,2	0,4	0,1	0,2
Benign behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,0	0,0
Tumours of the pineal gland	0,0	0,1	0,1	0,1	0,0	0,1	-	0,1	0,1	0,0	0,1	0,2	0,0	0,0	0,0	0,1	0,1
Malignant behaviour	0,0	0,0	0,1	0,1	-	0,0	-	0,0	0,0	0,0	0,1	-	0,0	0,0	0,0	0,0	0,1
Borderline behaviour	-	0,0	-	0,1	0,0	0,0	-	0,1	0,0	-	0,0	0,1	0,0	-	-	0,1	0,1
Benign behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,0	-
All primary brain and other CNS tumours	14,5	13,9	16,4	16,6	18,4	19,8	18,8	19,8	21,9	23,4	24,8	25,5	23,2	24,5	25,5	26,1	24,2
Malignant behaviour	6,9	6,1	6,4	6,2	6,7	7,0	5,8	6,3	6,3	6,0	6,6	6,8	6,2	5,7	6,2	6,7	6,3
Borderline behaviour	1,1	1,2	1,3	1,3	1,5	1,8	1,4	1,4	1,7	2,4	2,0	1,9	1,8	1,9	2,2	2,0	1,9
Benign behaviour	6,5	6,6	8,6	9,1	10,2	11,0	11,6	12,1	13,9	15,1	16,3	16,8	15,2	17,0	17,2	17,4	16,0

CR: Crude (all ages) rate (N/100,000 person years)

WSR: age-standardised rate, using the world population (N/100,000 person years)

Source: Belgian Cancer Registry

APPENDIX VI

5-year relative survival trends of primary brain and other CNS tumours in adults by cohort, primary tumour location, behaviour and sex, 2004-2020

Appendix VI

Belgium: 5-year relative survival trends of primary brain and other CNS tumours in adults by cohort, primary location and behaviour

	Males and females								
	N at risk			5-yr RS			95% CI		
	2004-2009	2010-2015	2016-2020	2004-2009	2010-2015	2016-2020	2004-2009	2010-2015	2016-2020
Tumours of the meninges	2 855	4 659	4 587	90,8	93,4	92,7	[89.2:92.3]	[92.2:94.5]	[91.1:94.2]
Malignant behaviour	99	103	96	65,0	70,7	35,1	[53.4:75.0]	[59.2:80.3]	[20.9:50.6]
Borderline behaviour	209	452	367	82,3	84,8	83,5	[75.0:88.3]	[80.1:88.9]	[76.6:89.1]
Benign behaviour	2 549	4 116	4 134	92,4	94,7	94,8	[90.8:93.9]	[93.5:95.8]	[93.2:96.3]
Tumours of the brain	4 893	5 249	4 672	27,0	25,9	25,5	[25.7:28.3]	[24.6:27.1]	[24.0:27.0]
Malignant behaviour	4 427	4 791	4 253	20,6	19,7	19,3	[19.4:21.8]	[18.5:20.8]	[17.8:20.7]
Borderline behaviour	348	304	285	86,5	87,7	89,4	[81.8:90.3]	[82.8:91.7]	[83.4:93.8]
Benign behaviour	120	163	138	95,5	96,3	94,2	[88.4:99.7]	[90.5:99.9]	[84.0:99.2]
Tumours of the spinal cord, cranial nerves and other parts of the CNS	460	1 032	1 486	96,3	98,3	98,2	[93.3:98.6]	[96.5:99.8]	[96.1:99.9]
Malignant behaviour	110	150	175	80,2	87,2	86,9	[70.5:87.5]	[79.8:92.6]	[78.8:92.7]
Borderline behaviour	73	104	135	99,0	96,4	94,6	[90.5:101.9]	[88.6:100.7]	[86.4:99.3]
Benign behaviour	277	778	1 176	102,0	100,7	100,4	[98.9:103.6]	[98.8:102.2]	[98.1:102.1]
Tumours of the spinal cord and cauda equina	189	352	486	93,7	95,2	96,1	[88.4:97.3]	[91.4:97.9]	[92.1:98.9]
Malignant behaviour	85	120	148	85,9	88,5	88,0	[75.6:92.8]	[80.3:94.0]	[78.7:94.1]
Borderline behaviour	60	95	116	99,6	96,0	96,2	[89.7:102.2]	[87.9:100.3]	[87.3:100.6]
Benign behaviour	<50	137	222	-	100,5	102,6	-	[94.8:103.3]	[98.9:104.4]
Tumours of the cranial nerves	207	653	980	101,9	100,6	99,6	[98.0:104.0]	[98.5:102.2]	[97.0:101.6]
Malignant behaviour	<50	<50	<50	-	-	-	-	-	-
Borderline behaviour	<50	<50	<50	-	-	-	-	-	-
Benign behaviour	196	624	942	102,2	101,0	99,8	[98.2:104.2]	[98.8:102.5]	[97.1:101.8]
Tumours of overlapping or other part of the CNS	64	<50	<50	85,6	-	-	[72.7:93.9]	-	-
Malignant behaviour	<50	<50	<50	-	-	-	-	-	-
Borderline behaviour	<50	<50	<50	-	-	-	-	-	-
Benign behaviour	<50	<50	<50	-	-	-	-	-	-
Tumours of the pituitary and pineal glands and craniopharyngeal duct	881	1 617	1 553	92,7	97,2	97,4	[90.0:94.9]	[95.5:98.6]	[95.1:99.3]
Malignant behaviour	<50	<50	<50	-	-	-	-	-	-
Borderline behaviour	93	117	85	81,3	92,6	87,4	[71.0:88.7]	[85.0:97.4]	[75.3:95.1]
Benign behaviour	752	1 471	1 427	95,1	98,0	99,3	[92.3:97.3]	[96.3:99.5]	[97.1:101.2]
Tumours of the pituitary gland	772	1 496	1 448	94,4	97,8	98,6	[91.6:96.7]	[96.1:99.3]	[96.3:100.5]
Malignant behaviour	<50	<50	<50	-	-	-	-	-	-
Borderline behaviour	<50	<50	<50	-	-	-	-	-	-
Benign behaviour	752	1 471	1 422	95,1	98,0	99,4	[92.3:97.3]	[96.3:99.5]	[97.2:101.3]
Tumours of the craniopharyngeal duct	77	92	70	78,2	89,7	90,6	[66.3:86.8]	[80.2:95.6]	[77.7:97.9]
Malignant behaviour	-	-	-	-	-	-	-	-	-
Borderline behaviour	77	92	68	78,2	89,7	91,6	[66.3:86.8]	[80.2:95.6]	[78.7:98.6]
Benign behaviour	-	-	<50	-	-	-	-	-	-
Tumours of the pineal gland	<50	<50	<50	-	-	-	-	-	-
Malignant behaviour	<50	<50	<50	-	-	-	-	-	-
Borderline behaviour	<50	<50	<50	-	-	-	-	-	-
Benign behaviour	-	-	<50	-	-	-	-	-	-
All primary brain and other CNS tumours	**9 064**	**12 523**	**12 249**	**56,7**	**66,0**	**68,3**	[55.6:57.9]	[65.0:66.9]	[67.2:69.4]
Malignant behaviour	4 671	5 074	4 564	23,2	23,0	22,5	[22.0:24.5]	[21.8:24.2]	[21.0:24.0]
Borderline behaviour	723	977	872	85,9	87,9	87,5	[82.7:88.8]	[85.1:90.4]	[83.8:90.7]
Benign behaviour	3 688	6 513	6 856	93,8	96,2	96,7	[92.5:94.9]	[95.3:97.0]	[95.6:97.7]

Source: Belgian Cancer Registry

Belgium: 5-year relative survival trends of primary brain and other CNS tumours in males and females adults by cohort, primary location, behaviour and sex

	Males									Females								
	N at risk			5-yr RS			95% CI			N at risk			5-yr RS			95% CI		
	2004-2009	2010-2015	2016-2020	2004-2009	2010-2015	2016-2020	2004-2009	2010-2015	2016-2020	2004-2009	2010-2015	2016-2020	2004-2009	2010-2015	2016-2020	2004-2009	2010-2015	2016-2020
Tumours of the meninges	765	1 126	1 221	89,1	89,0	87,1	[85.5:92.3]	[86.0:91.8]	[83.3:90.7]	2 090	3 533	3 366	91,4	94,8	94,7	[89.7:93.0]	[93.5:95.9]	[93.0:96.2]
Malignant behaviour	<50	51	52	-	68,9	31,6	-	[52.0:82.6]	[10.2:58.6]	68	52	<50	65,1	72,3	-	[51.1:76.9]	[56.1:84.9]	-
Borderline behaviour	92	191	163	86,5	85,3	77,1	[75.0:95.1]	[77.2:92.0]	[64.5:87.3]	117	261	204	79,0	84,4	87,7	[69.1:86.8]	[78.5:89.3]	[79.5:93.8]
Benign behaviour	644	889	1 011	90,4	90,7	91,3	[86.5:93.8]	[87.3:93.7]	[87.2:94.9]	1 905	3 227	3 123	93,1	95,8	95,9	[91.4:94.6]	[94.5:96.9]	[94.2:97.4]
Tumours of the brain	2 805	3 026	2 709	25,7	24,8	24,8	[24.0:27.4]	[23.2:26.4]	[22.9:26.8]	2 088	2 223	1 963	28,7	27,2	26,5	[26.8:30.7]	[25.4:29.1]	[24.2:28.9]
Malignant behaviour	2 556	2 786	2 486	19,6	19,3	19,2	[18.0:21.2]	[17.8:20.8]	[17.4:21.1]	1 871	2 005	1 767	21,8	20,2	19,3	[20.0:23.8]	[18.4:22.0]	[17.1:21.6]
Borderline behaviour	193	172	158	86,1	86,1	87,0	[79.5:91.1]	[78.9:91.7]	[78.0:93.3]	155	132	127	87,0	89,9	92,5	[79.8:92.1]	[82.5:94.8]	[83.8:97.5]
Benign behaviour	58	74	68	95,3	94,8	88,0	[83.2:101.3]	[84.5:100.4]	[69.2:97.1]	62	89	70	95,6	97,5	100,4	[85.0:100.4]	[89.4:101.4]	[91.6:102.7]
Tumours of the spinal cord, cranial nerves and other parts of the CNS	237	525	723	95,6	96,9	98,6	[90.8:98.9]	[93.8:99.2]	[95.8:100.8]	223	507	763	97,1	99,9	97,8	[92.6:99.9]	[97.5:101.5]	[94.6:100.2]
Malignant behaviour	68	79	86	79,6	84,5	83,0	[66.6:89.0]	[73.2:92.2]	[70.4:91.5]	<50	71	89	-	90,3	90,7	-	[79.5:96.6]	[78.9:97.6]
Borderline behaviour	<50	61	63	-	96,1	96,1	-	[84.6:101.8]	[83.8:101.7]	<50	<50	72	-	-	93,0	-	-	[78.9:99.3]
Benign behaviour	124	385	574	102,4	99,5	101,5	[96.9:104.5]	[96.3:101.8]	[98.5:103.5]	153	393	602	101,7	101,9	99,4	[97.1:103.7]	[99.5:103.4]	[95.6:102.0]
Tumours of the spinal cord and cauda equina	114	203	249	95,7	93,5	95,5	[88.7:99.6]	[87.8:97.5]	[89.7:99.2]	75	149	237	90,7	97,5	96,6	[80.7:96.5]	[91.9:100.5]	[90.2:100.3]
Malignant behaviour	51	64	73	88,5	83,9	85,6	[74.6:96.3]	[71.2:92.2]	[71.2:94.2]	<50	56	75	-	93,8	90,4	-	[82.1:99.2]	[76.5:97.6]
Borderline behaviour	<50	55	50	-	93,9	95,6	-	[81.4:100.1]	[80.8:101.7]	<50	<50	66	-	-	96,4	-	-	[81.5:101.6]
Benign behaviour	<50	84	126	-	100,7	102,2	-	[92.2:104.4]	[96.7:104.3]	<50	53	96	-	100,2	103,2	-	[89.1:103.2]	[95.9:105.7]
Tumours of the cranial nerves	96	309	468	102,1	99,9	100,7	[95.1:104.9]	[96.3:102.3]	[97.2:103.1]	111	344	512	101,8	101,3	98,7	[95.7:104.1]	[98.5:103.1]	[94.5:101.5]
Malignant behaviour	<50	<50	<50	-	-	-	-	-	-	<50	<50	<50	-	-	-	-	-	-
Borderline behaviour	-	<50	<50	-	-	-	-	-	-	<50	<50	<50	-	-	-	-	-	-
Benign behaviour	89	296	447	102,8	99,7	101,1	[95.6:105.2]	[96.0:102.1]	[97.5:103.4]	107	328	495	101,8	102,1	98,8	[95.5:104.2]	[99.3:103.7]	[94.4:101.6]
Tumours of overlapping or other part of the CNS	<50	<50	<50	-	-	-	-	-	-	<50	<50	<50	-	-	-	-	-	-
Malignant behaviour	<50	<50	<50	-	-	-	-	-	-	<50	<50	<50	-	-	-	-	-	-
Borderline behaviour	<50	<50	<50	-	-	-	-	-	-	<50	-	<50	-	-	-	-	-	-
Benign behaviour	<50	<50	<50	-	-	-	-	-	-	<50	<50	<50	-	-	-	-	-	-
Tumours of the pituitary and pineal glands and craniopharyngeal duct	419	832	803	92,7	97,8	97,2	[88.5:96.1]	[95.2:100.0]	[93.5:100.2]	462	785	750	92,6	96,6	97,6	[89.1:95.4]	[94.4:98.3]	[94.8:99.7]
Malignant behaviour	<50	<50	<50	-	-	-	-	-	-	<50	<50	<50	-	-	-	-	-	-
Borderline behaviour	<50	54	<50	-	94,4	-	-	[81.6:100.8]	-	50	63	53	80,1	91,2	91,6	[65.2:89.8]	[80.1:97.0]	[77.7:98.5]
Benign behaviour	357	762	744	94,8	98,6	99,4	[90.3:98.4]	[95.9:100.8]	[95.7:102.3]	395	709	683	95,3	97,4	99,3	[91.7:97.9]	[95.1:99.2]	[96.6:101.2]
Tumours of the pituitary gland	367	775	757	93,7	98,1	98,7	[89.1:97.3]	[95.4:100.3]	[94.9:101.6]	405	721	691	95,0	97,5	98,6	[91.5:97.6]	[95.2:99.2]	[95.7:100.7]
Malignant behaviour	<50	<50	<50	-	-	-	-	-	-	<50	<50	<50	-	-	-	-	-	-
Borderline behaviour	<50	<50	<50	-	-	-	-	-	-	<50	<50	<50	-	-	-	-	-	-
Benign behaviour	357	762	743	94,8	98,6	99,5	[90.3:98.4]	[95.9:100.8]	[95.8:102.4]	395	709	679	95,3	97,4	99,4	[91.7:97.9]	[95.1:99.2]	[96.7:101.3]
Tumours of the craniopharyngeal duct	<50	<50	<50	-	-	-	-	-	-	<50	<50	<50	-	-	-	-	-	-
Malignant behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borderline behaviour	<50	<50	<50	-	-	-	-	-	-	<50	<50	<50	-	-	-	-	-	-
Benign behaviour	-	-	-	-	-	-	-	-	-	-	-	<50	-	-	-	-	-	-
Tumours of the pineal gland	<50	<50	<50	-	-	-	-	-	-	<50	<50	<50	-	-	-	-	-	-
Malignant behaviour	<50	<50	<50	-	-	-	-	-	-	<50	<50	<50	-	-	-	-	-	-
Borderline behaviour	<50	<50	-	-	-	-	-	-	-	<50	<50	<50	-	-	-	-	-	-
Benign behaviour	-	-	<50	-	-	-	-	-	-	-	-	<50	-	-	-	-	-	-
All primary brain and other CNS tumours	**4 219**	**5 496**	**5 440**	**47,4**	**55,6**	**58,7**	[45.8:49.0]	[54.1:57.0]	[57.0:60.4]	**4 845**	**7 027**	**6 809**	**64,8**	**74,0**	**75,9**	[63.3:66.2]	[72.8:75.1]	[74.5:77.2]
Malignant behaviour	2 674	2 933	2 650	22,0	22,2	21,9	[20.4:23.7]	[20.6:23.7]	[20.0:23.9]	1 997	2 141	1 914	24,9	24,0	23,2	[23.0:26.8]	[22.2:25.9]	[21.0:25.5]
Borderline behaviour	373	478	416	87,6	88,1	84,5	[83.0:91.4]	[83.7:91.8]	[78.4:89.5]	350	499	456	84,2	87,8	90,2	[79.3:88.2]	[84.0:91.0]	[85.5:93.9]
Benign behaviour	1 179	2 106	2 392	93,3	95,4	96,2	[90.8:95.6]	[93.6:97.0]	[94.0:98.1]	2 509	4 407	4 464	94,0	96,6	97,0	[92.6:95.3]	[95.6:97.5]	[95.6:98.1]

Source: Belgian Cancer Registry

Belgian Cancer Registry

Belgian Cancer Registry (BCR)
Koningsstraat 215 / Rue Royale 215
1210 Brussel / Bruxelles
belgiancancerregistry

+32 2 250 10 10
info@kankerregister.org
www.kankerregister.org
www.registreducancer.org