



I tumori dell'encefalo e del Sistema Nervoso Centrale

Parte I

Epidemiologia

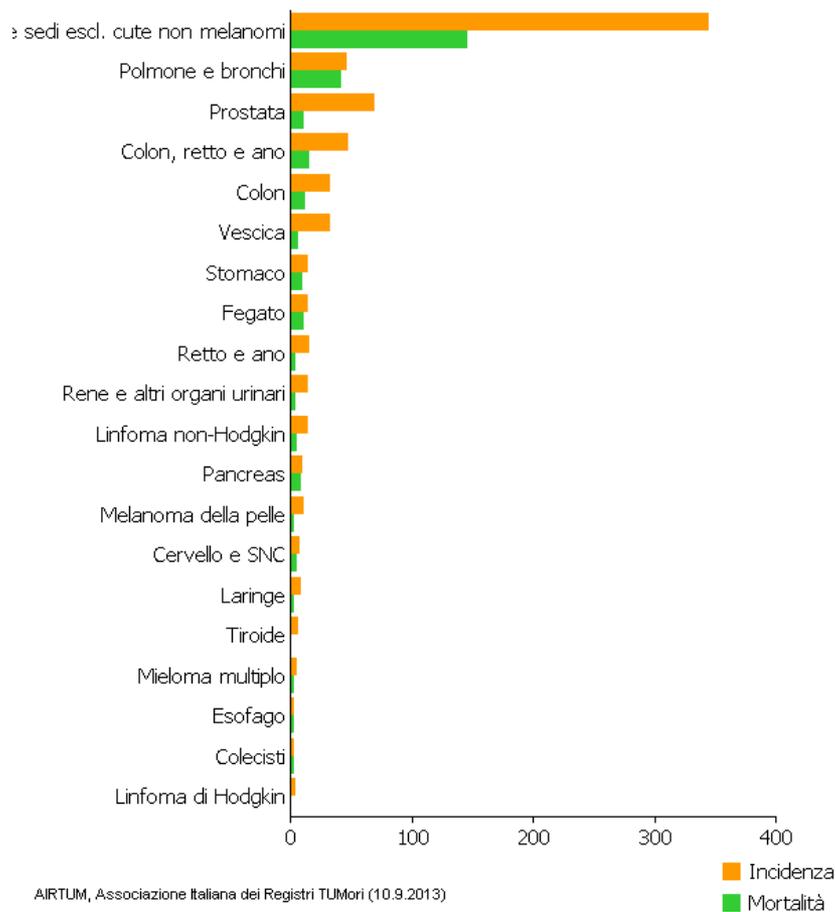
Silvia Patriarca

Registro Tumori Piemonte

Camerino 2013

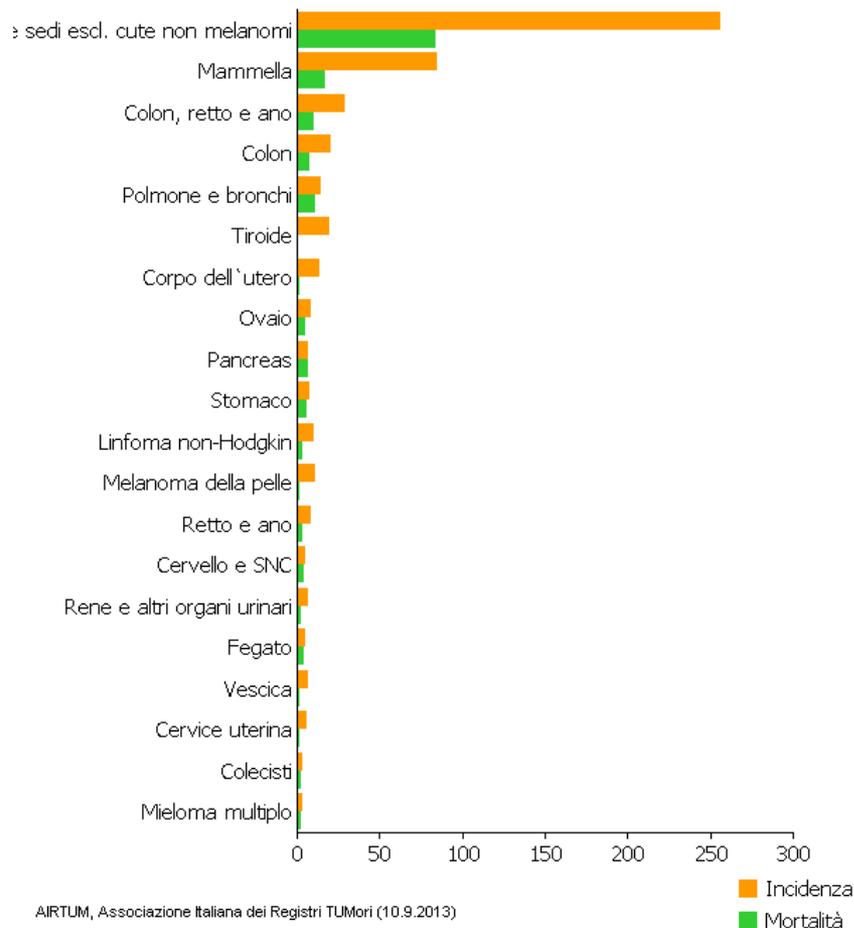
Tassi SE di incidenza e mortalità Italia 2007 Prime 20 neoplasie

AIRTUM (Pool 32 Registri) (2007)
Maschi: TSE (Mondiale) età (0-85+)



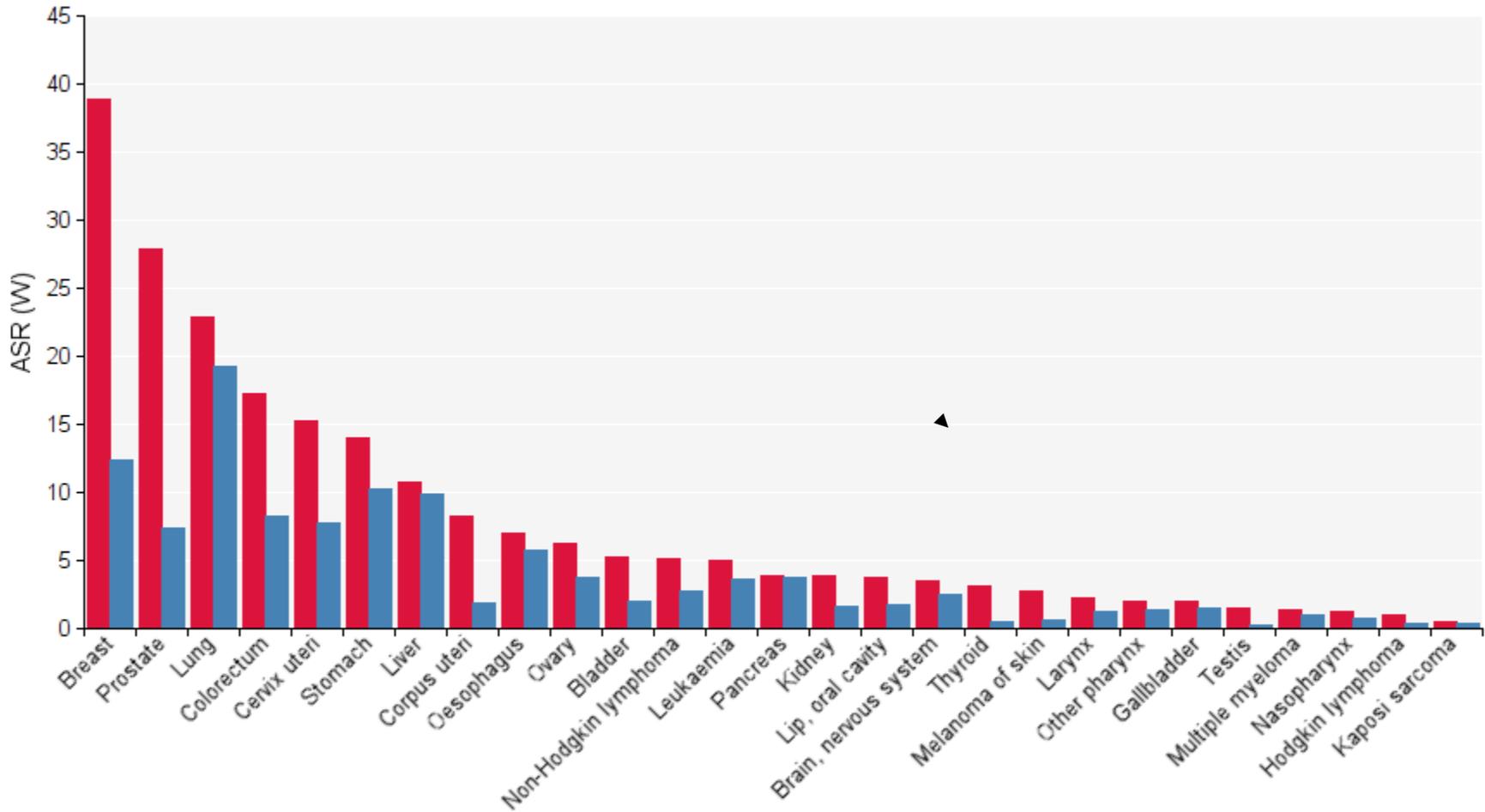
AIRTUM, Associazione Italiana dei Registri Tumori (10.9.2013)

AIRTUM (Pool 32 Registri) (2007)
Femmine: TSE (Mondiale) età (0-85+)



AIRTUM, Associazione Italiana dei Registri Tumori (10.9.2013)

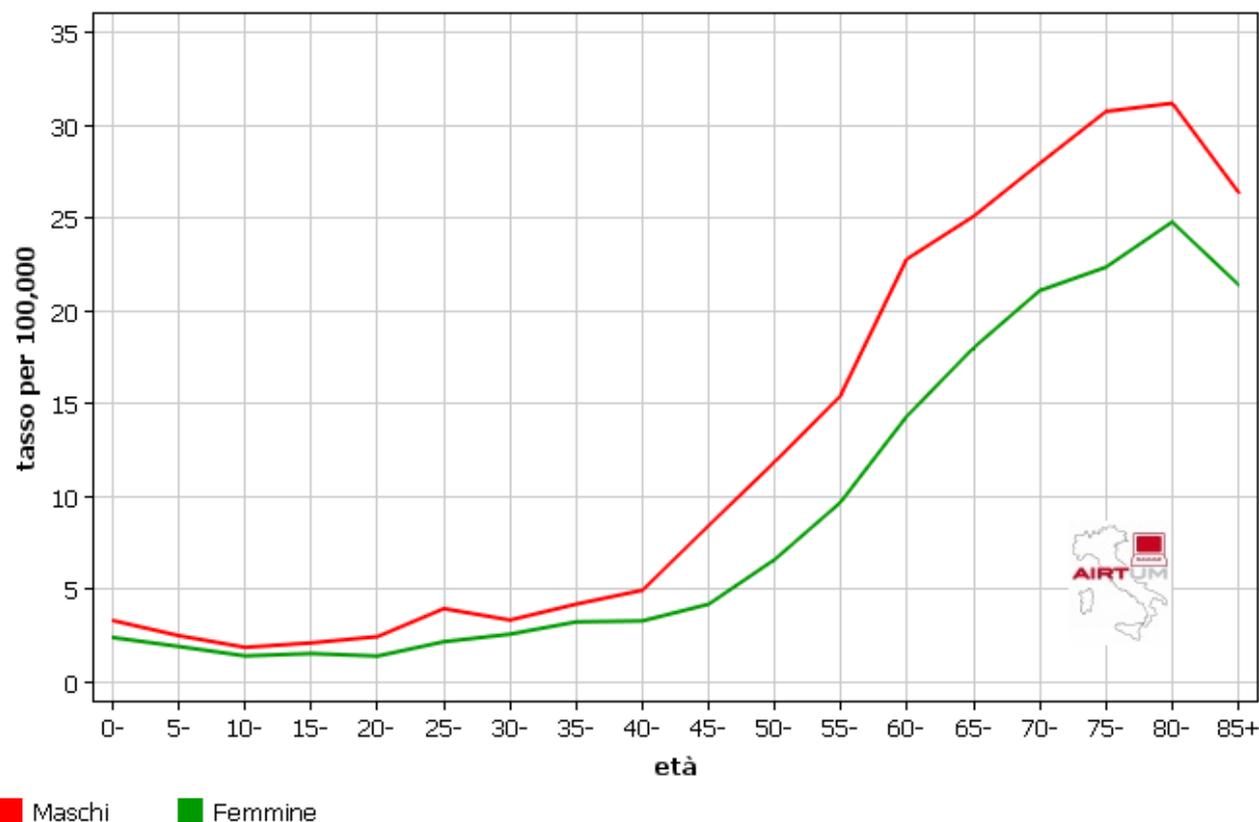
World: Both sexes, all ages



■ Incidence
■ Mortality

Incidenza: distribuzione per classi d'età

AIRTUM (Pool 32 Registri)-Incidenza (2005-2008)
Cervello e SNC

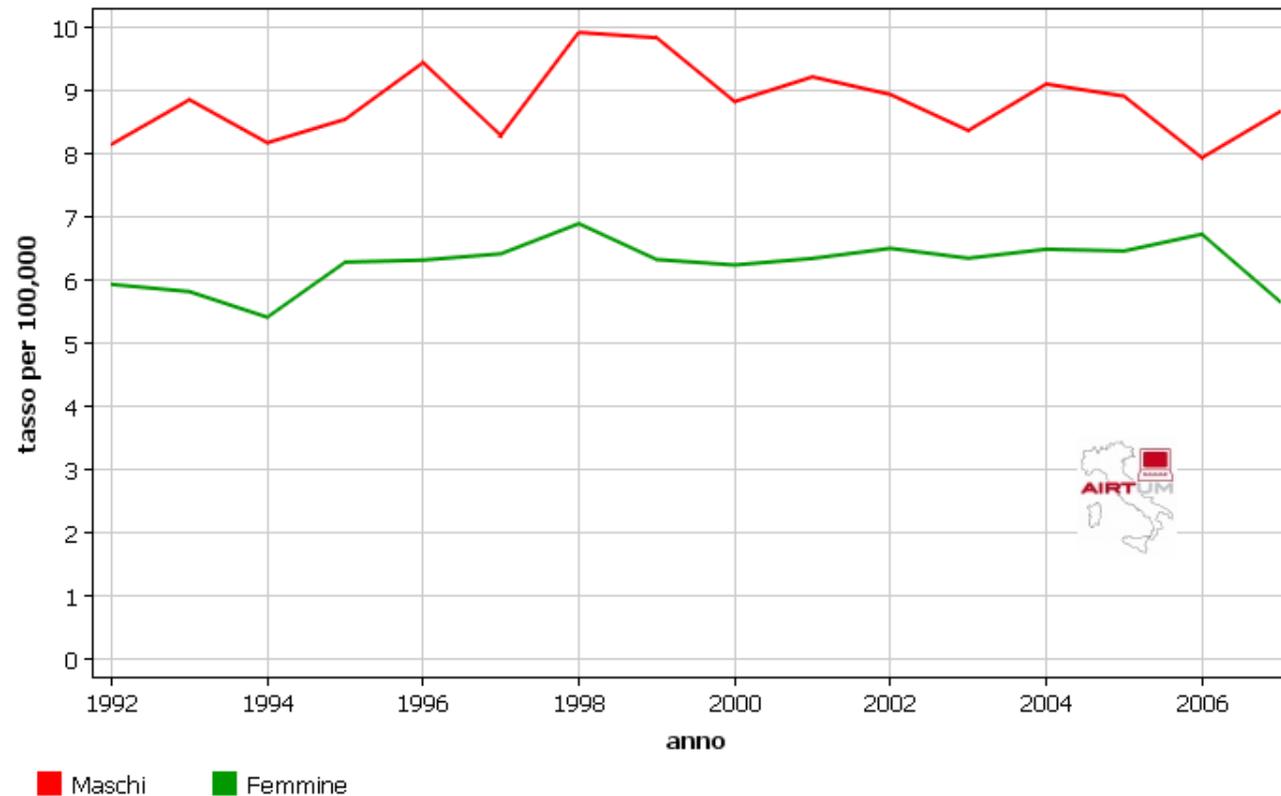


Incidenza: Trend temporale

AIRTUM (Pool 9 Registri)

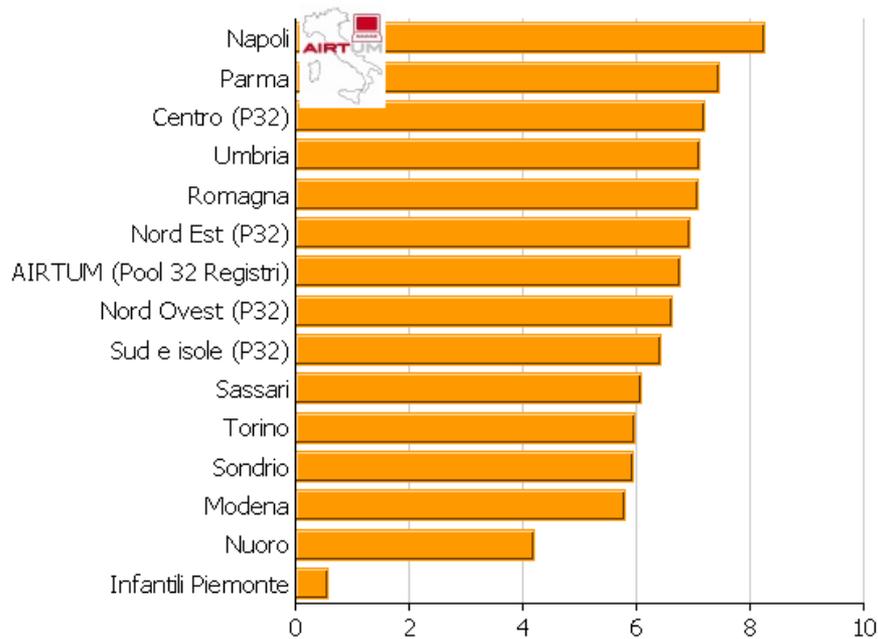
Cervello e SNC

Incidenza: TSE (Europa) età (0-85+)

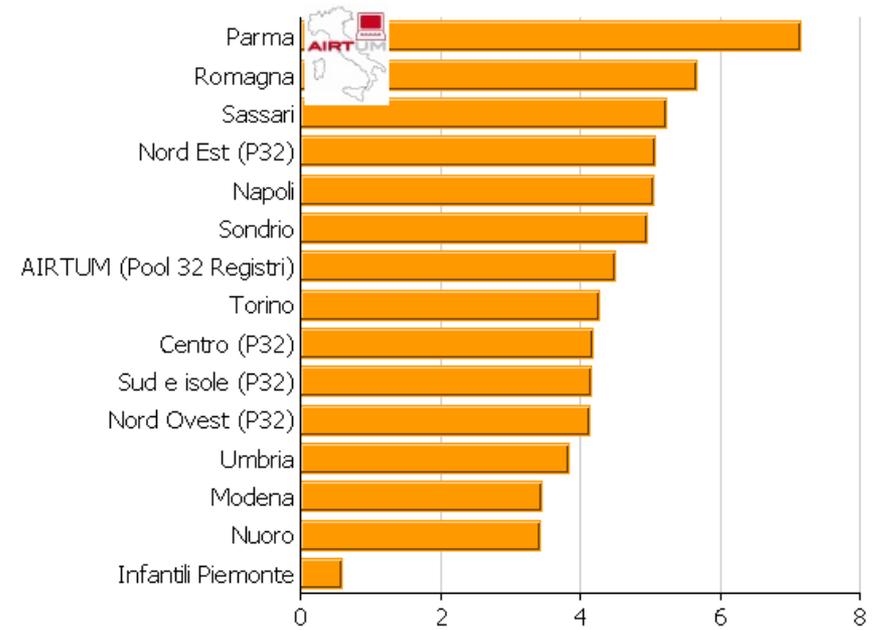


Incidenza distribuzione geografica

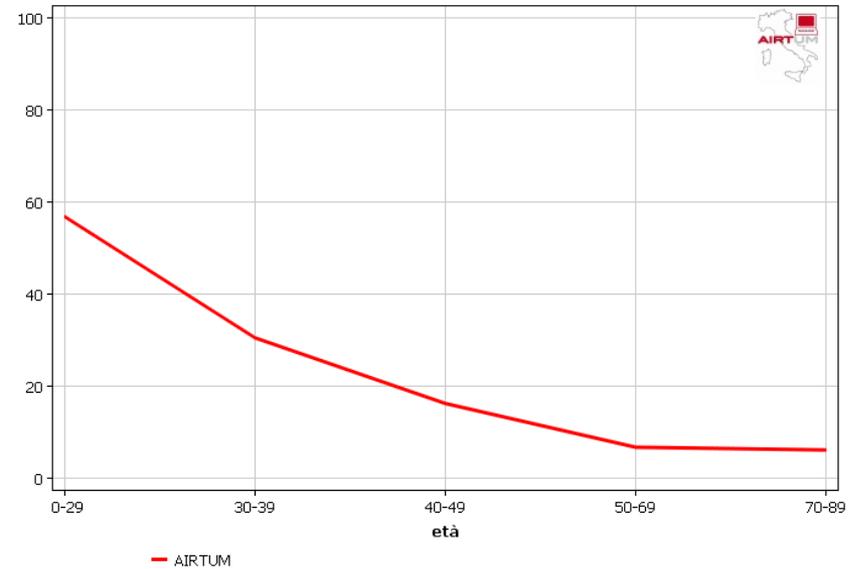
Cervello e SNC, Incidenza (2005-2008)
Maschi: TSE (Mondiale) età (0-85+)



Cervello e SNC, Incidenza (2005-2008)
Femmine: TSE (Mondiale) età (0-85+)

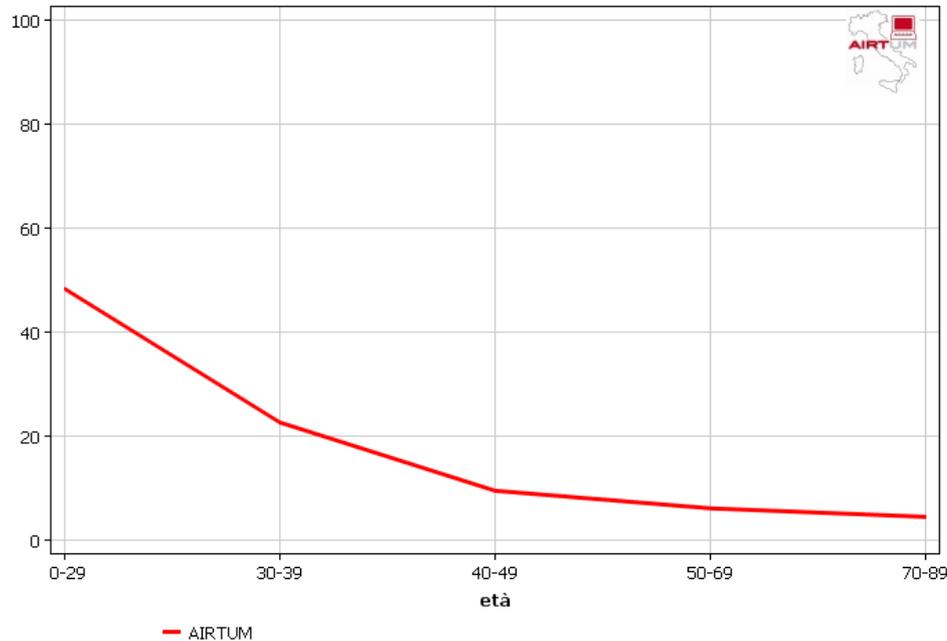


Sopravvivenza



AIRTUM, Associazione Italiana dei Registri Tumori (25.7.2013)

Cervello e SNC (2000-2004): Maschi
Sopravvivenza relativa a 5-anni (per cento)



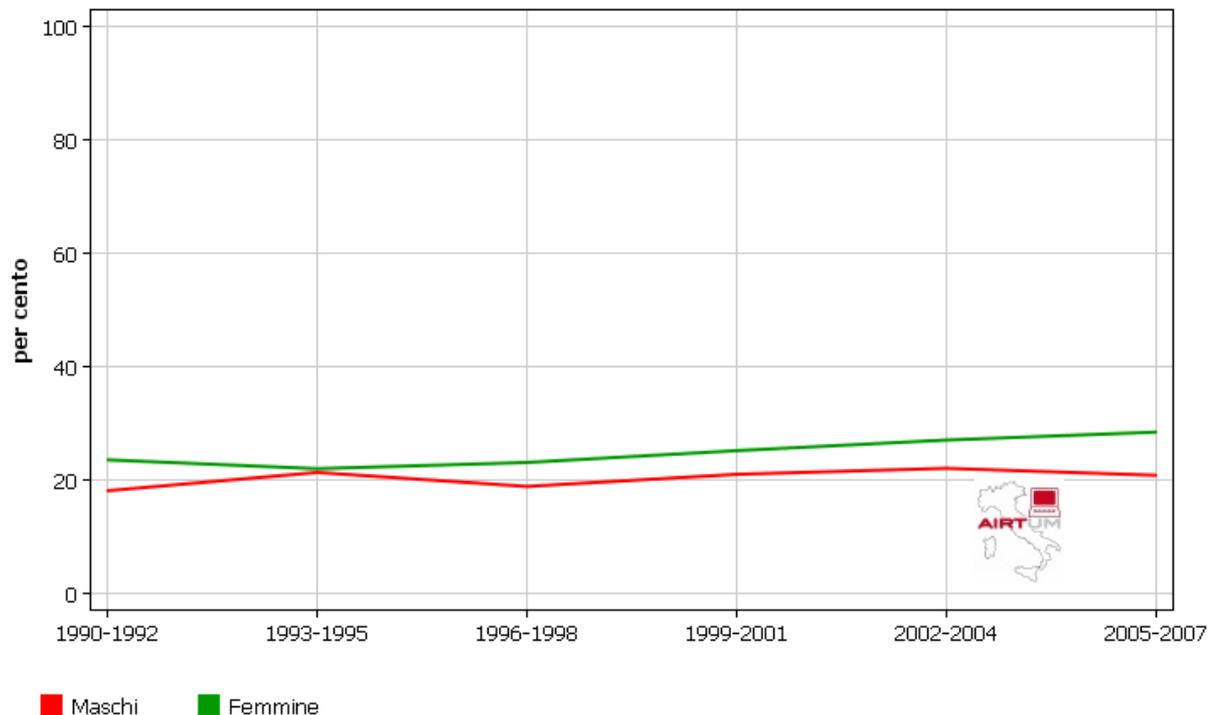
AIRTUM, Associazione Italiana dei Registri Tumori (25.7.2013)

Sopravvivenza: trend temporale

AIRTUM

Cervello e SNC

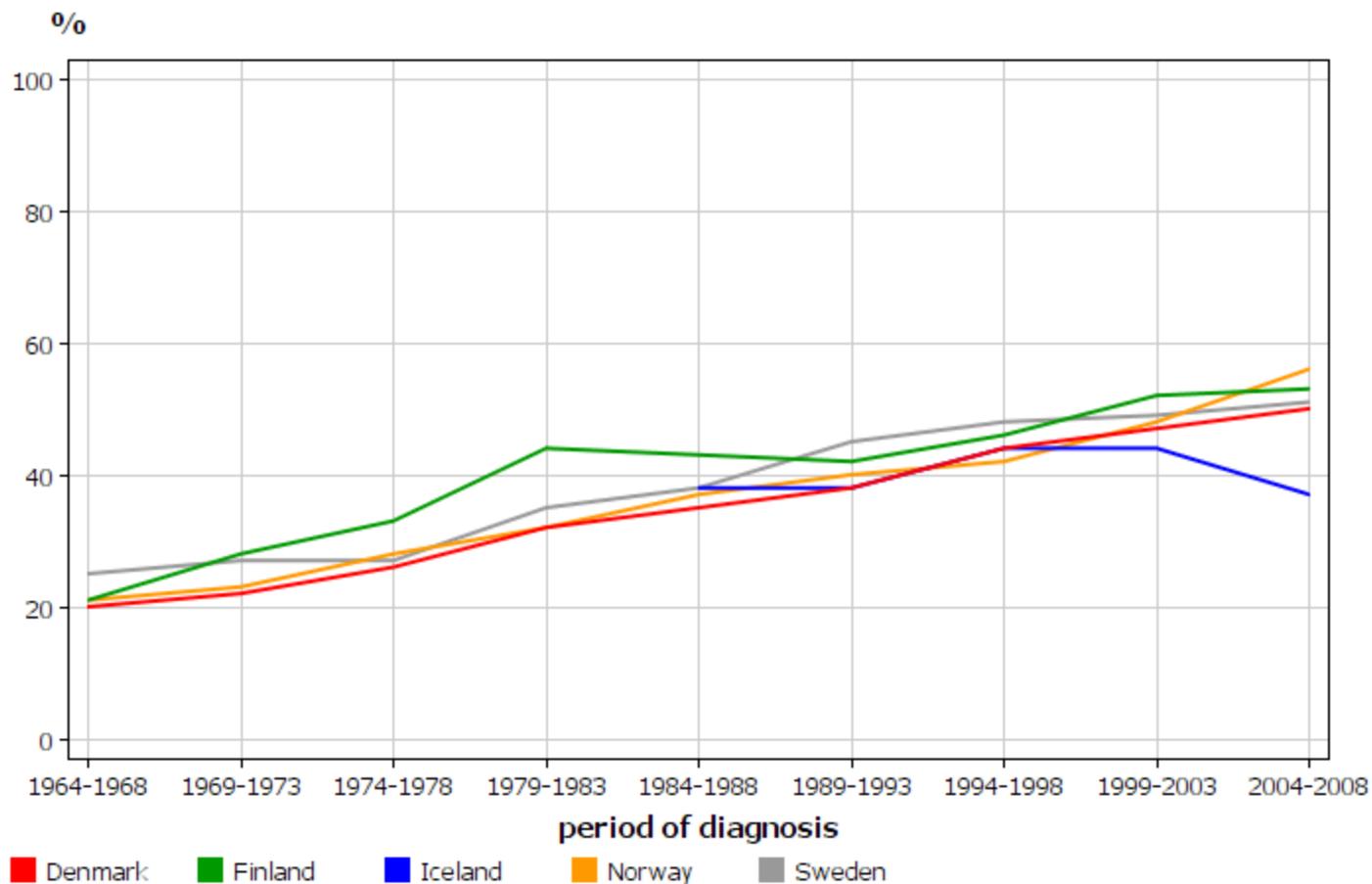
sopravvivenza relativa a 5-anni standardizzata per età (tutte le età)



C70-72+D32-33+D42-43

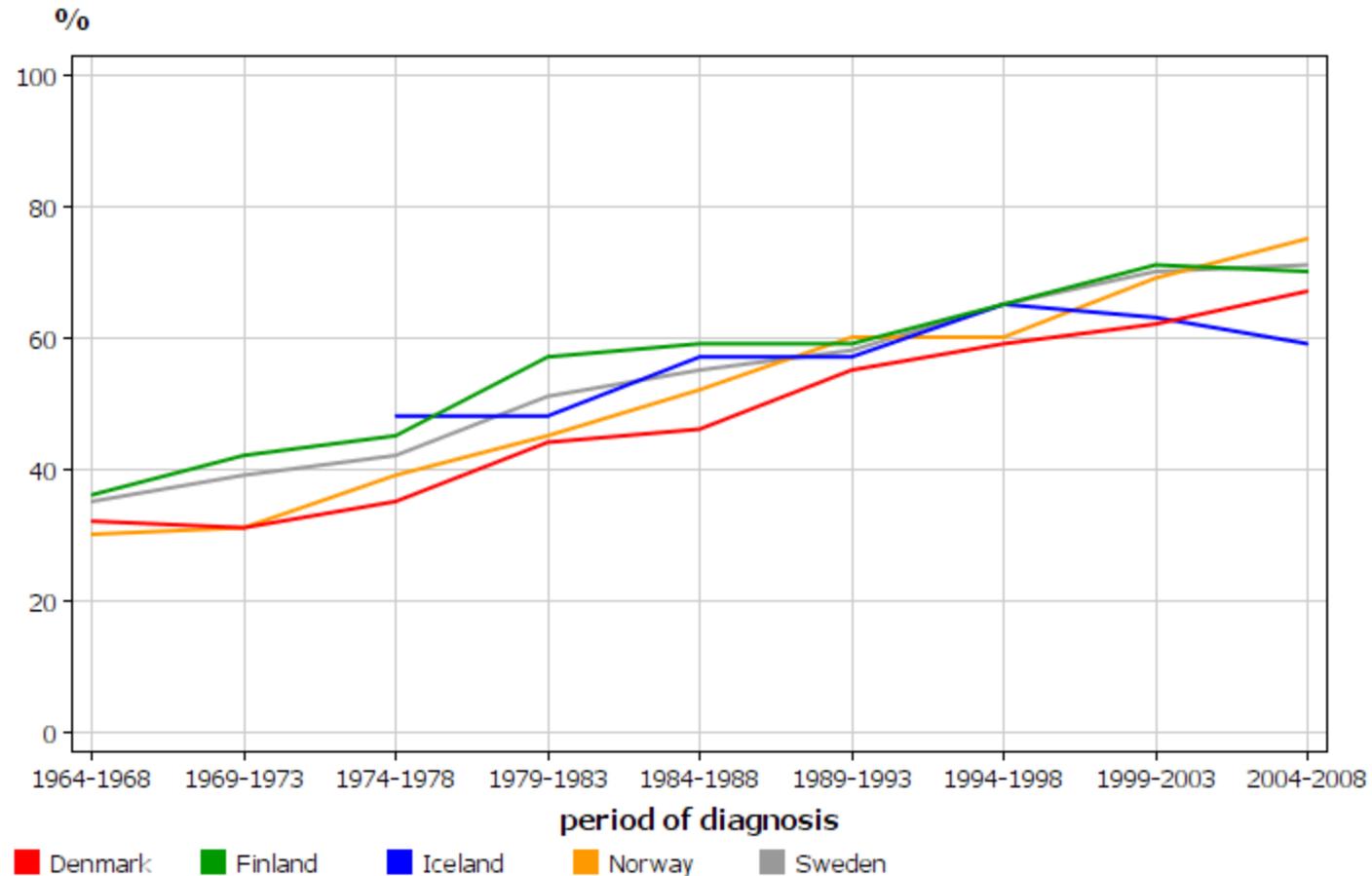
Brain, central nervous system: Male

5-year age standardised relative survival, age at diagnosis 0-89



C70-72+D32-33+D42-43

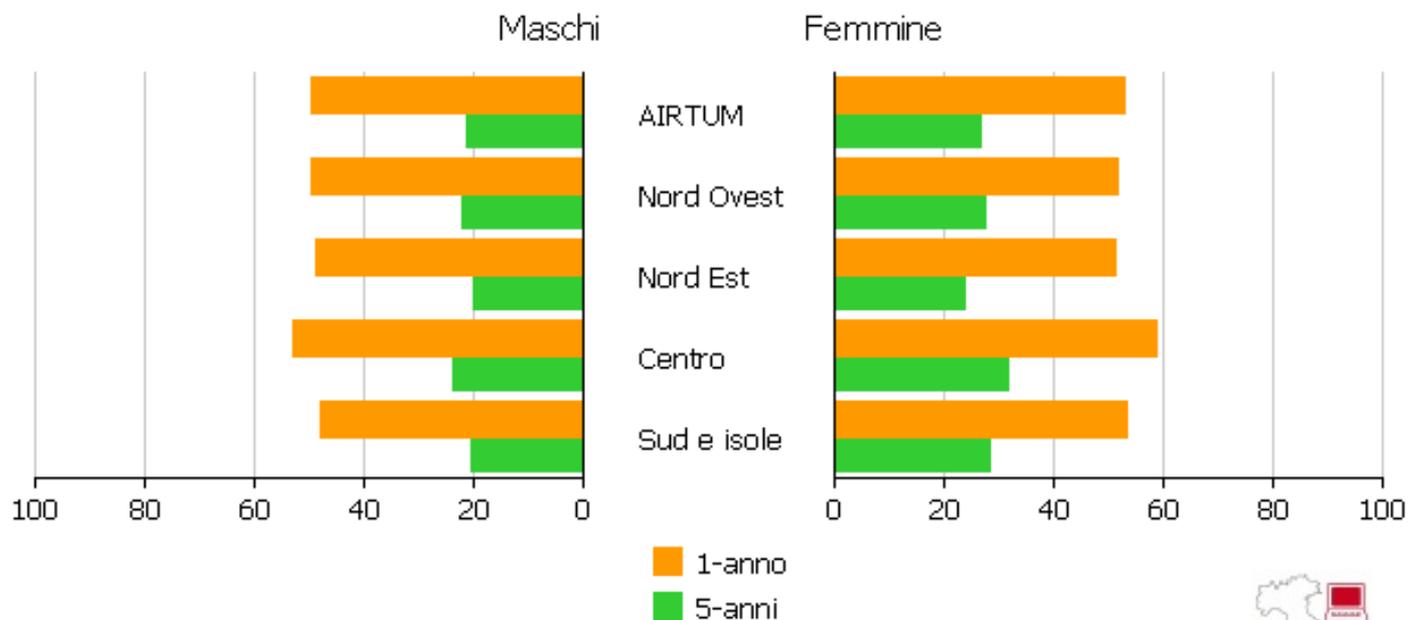
Brain, central nervous system: Female
5-year age standardised relative survival, age at diagnosis 0-89



Sopravvivenza: differenze geografiche

Cervello e SNC

Sopravvivenza relativa standardizzata per età (2000-2004), tutte le età



AIRTUM © Associazione Italiana dei Registri Tumori (25.7.2013)



Fattori di rischio

- **Cancerogeni con sufficiente evidenza (monografie IARC)**

- Raggi X,
- Raggi gamma

- **Cancerogeni con limitata evidenza (monografie IARC)**

- Radiofrequenze
 - Campi elettromagnetici (inclusi quelli provenienti dai telefoni cellulari)

- **Altri fattori di rischio**

- Sindromi genetiche
 - Neurofibromatosi tipo 1
 - Sindrome di von Hippel Lindau
 - Sclerosi tuberosa
 - Sindrome di Li- Fraumeni
 - Sindrome di Turcot

Monografia IARC volume 102

Per le valutazioni sul rapporto tra uso personale di telefoni cellulari e gliomi cerebrali sono stati analizzati numerosi studi:

- Uno studio di coorte danese*
- Alcuni studi caso-controllo, i principali dei quali sono lo studio multicentrico e uno studio svedese
- Numerose analisi dei trends temporali

* Aggiornato poi successivamente all'uscita della monografia

Table 3 ORs between mobile phone use and brain tumours (meningioma and glioma separately) by cumulative call time, stratified by recency of starting regular use—excludes use with hands-free devices

	Meningioma			Glioma		
	Cases	Controls	OR ^a (95% CI)	Cases	Controls	OR ^a (95% CI)
Cumulative Call time (h)						
Non-regular users						
	1147	1174	1.00	1042	1078	1.00
Short-term users: start of phone use 1–4 years before reference date						
<5 h	150	186	0.92 (0.69–1.22)	127	182	0.68 (0.50–0.93)
5–114.9	401	500	0.74 (0.61–0.90)	449	533	0.82 (0.67–0.99)
115–359.9	95	126	0.79 (0.55–1.12)	121	154	0.74 (0.52–1.03)
360–1639.9	67	72	0.77 (0.49–1.20)	80	95	0.75 (0.50–1.13)
≥ 1640	22	5	4.80 (1.49–15.4)	23	8	3.77 (1.25–11.4)
Medium-term users: start of phone use 5–9 years before reference date						
<5 h	7	9	0.67 (0.23–1.96)	10	13	0.86 (0.32–2.28)
5–114.9	122	145	0.73 (0.54–0.98)	180	208	0.86 (0.66–1.12)
115–359.9	95	140	0.67 (0.48–0.93)	156	192	0.71 (0.53–0.95)
360–1639.9	129	131	0.83 (0.60–1.14)	174	204	0.72 (0.54–0.95)
≥ 1640	64	62	1.03 (0.65–1.65)	94	73	1.28 (0.84–1.95)
Long-term users: start of phone use ≥10 years before reference date						
<5 h	3	2	1.31 (0.21–8.07)	4	2	1.13 (0.16–7.79)
5–114.9	14	15	0.79 (0.36–1.73)	20	25	0.63 (0.32–1.25)
115–359.9	14	22	0.49 (0.24–1.01)	41	42	0.89 (0.53–1.50)
360–1639.9	35	33	1.00 (0.58–1.72)	94	90	0.91 (0.63–1.31)
≥ 1640	44	40	0.95 (0.56–1.63)	93	73	1.34 (0.90–2.01)

^aORs adjusted for sex, age, study centre, ethnicity in Israel and education.

Confronto dei risultati di Interphone a dello studio svedese Ca-Co (Hardell & coll)

Table 1 OR and 95% confidence interval (CI) for all glioma in Interphone compared with the Hardell group

Study group, age	Hardell group, 20-80 (all)	Hardell group, 20-59	Hardell group, 30-59	Hardell group, 30-59, cordless among unexposed	Interphone, 30-59	Interphone, 30-59, according to published Appendix 2
Latency ≥ 10 years	(88/99) 2.26 1.60-3.19	(57/74) 2.15 1.41-3.29	(56/74) 1.96 1.27-3.01	(56/74) 1.79 1.19-2.70	(252/232) 0.98 0.76-1.26	(190/150) 2.18 1.43-3.31
Latency ≥ 10 years, ipsilateral	(57/45) 2.84 1.82-4.44	(36/30) 2.70 1.54-4.73	(35/30) 2.48 1.40-4.38	(35/30) 2.29 1.33-3.97	(108/82) 1.21 0.82-1.80	NR
Latency ≥ 10 years, contralateral	(29/29) 2.18 1.24-3.85	(20/24) 2.04 1.04-4.00	(20/24) 1.96 0.995-3.87	(20/24) 1.71 0.89-3.28	(49/56) 0.70 0.42-1.15	NR
Cumulative use ≥ 1640 h	(42/43) 2.31 1.44-3.70	(32/37) 2.23 1.30-3.82	(29/37) 1.89 1.08-3.30	(29/37) 1.75 1.02-3.00	(210/154) 1.40 1.03-1.89	(160/113) 1.82 1.15-2.89
Cumulative use ≥ 1640 h, ipsilateral	(29/21) 2.94 1.60-5.41	(22/18) 2.71 1.36-5.42	(20/18) 2.32 1.14-4.73	(20/18) 2.18 1.09-4.35	(100/62) 1.96 1.22-3.16	NR
Cumulative use ≥ 1640 h, contralateral	(12/12) 2.10 0.90-4.90	(9/11) 1.99 0.77-5.16	(8/11) 1.73 0.65-4.63	(8/11) 1.48 0.57-3.87	(39/31) 1.25 0.64-2.42	NR

Numbers of cases and controls are given within parenthesis. NR=not reported. Note that >10 years latency were used in the Hardell group studies and contralateral was defined as <50% use of tumour side.

Table 2 OR and 95% CI for glioma temporal lobe in Interphone compared with the Hardell group

Study group, age	Hardell, 20-80 (all)	Hardell, 20-59	Hardell, 30-59	Hardell, 30-59, cordless among unexposed	Interphone, 30-59	Interphone, 30-59, Appendix 2
Latency ≥ 10 years	(28/99) 2.26 1.32-3.86	(15/74) 1.74 0.85-3.56	(14/74) 1.48 0.71-3.10	(14/74) 1.40 0.70-2.81	(94/69) 1.36 0.88-2.11	NR
Latency ≥ 10 years, ipsilateral	(18/45) 2.49 1.29-4.81	(10/30) 1.94 0.81-4.63	(9/30) 1.73 0.70-4.26	(9/30) 1.69 0.71-4.02	NR	NR
Latency ≥ 10 years, contralateral	(9/29) 2.08 0.89-4.87	(4/24) 1.35 0.41-4.49	(4/24) 1.28 0.38-4.28	(4/24) 1.21 0.37-3.90	NR	NR
Cumulative use ≥ 1640 h	(14/43) 2.44 1.21-4.95	(9/37) 1.96 0.82-4.66	(7/37) 1.53 0.60-3.94	(7/37) 1.46 0.59-3.63	(78/47) 1.87 1.09-3.22	NR
Cumulative use ≥ 1640 h, ipsilateral	(11/21) 3.08 1.32-7.19	(7/18) 2.18 0.77-6.24	(5/18) 1.68 0.52-5.41	(5/18) 1.82 0.59-5.60	NR	NR
Cumulative use ≥ 1640 h, contralateral	(2/12) 1.04 0.22-5.00	(1/11) 0.72 0.08-6.11	(1/11) 0.72 0.08-6.12	(1/11) 0.64 0.08-5.33	NR	NR

Numbers of cases and controls are given within parenthesis. NR=not reported. Note that >10 years latency were used in the Hardell group studies and contralateral was defined as <50% use of tumour side.

Epidemiology Note

Trends in the Incidence of Primary Intracranial Tumors in Osaka, Japan

Etsuko Nomura*, Akiko Ioka and Hideaki Tsukuma

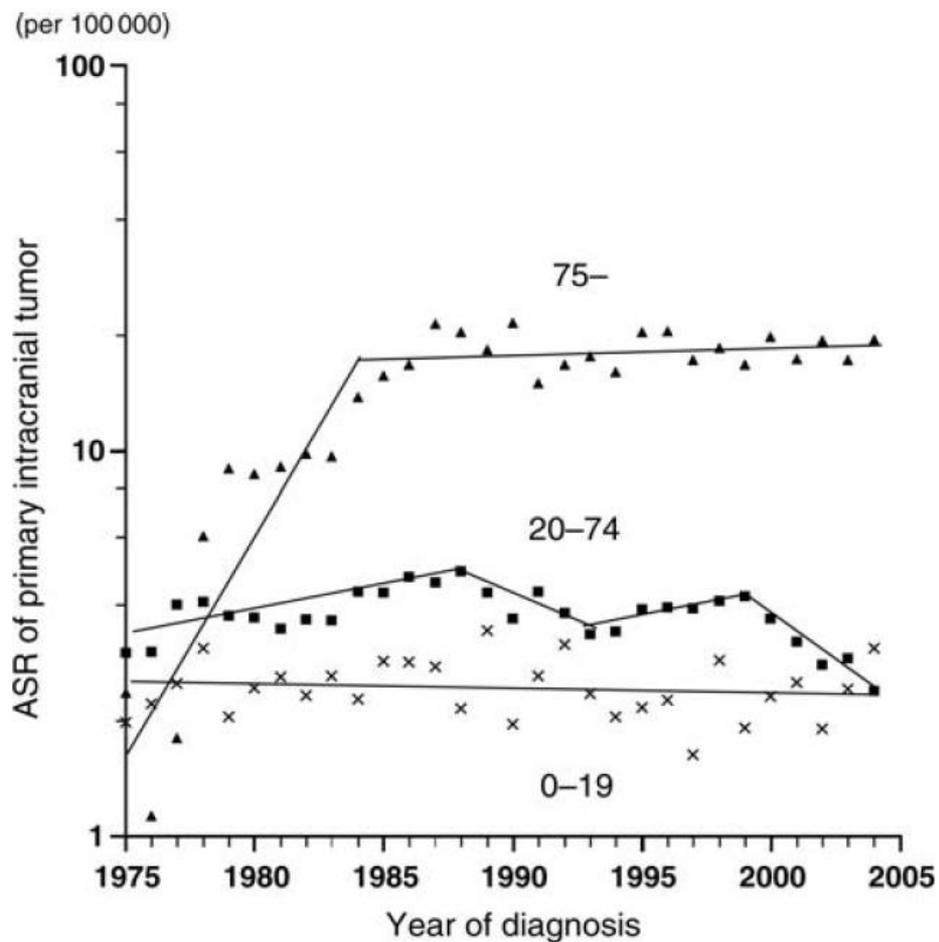
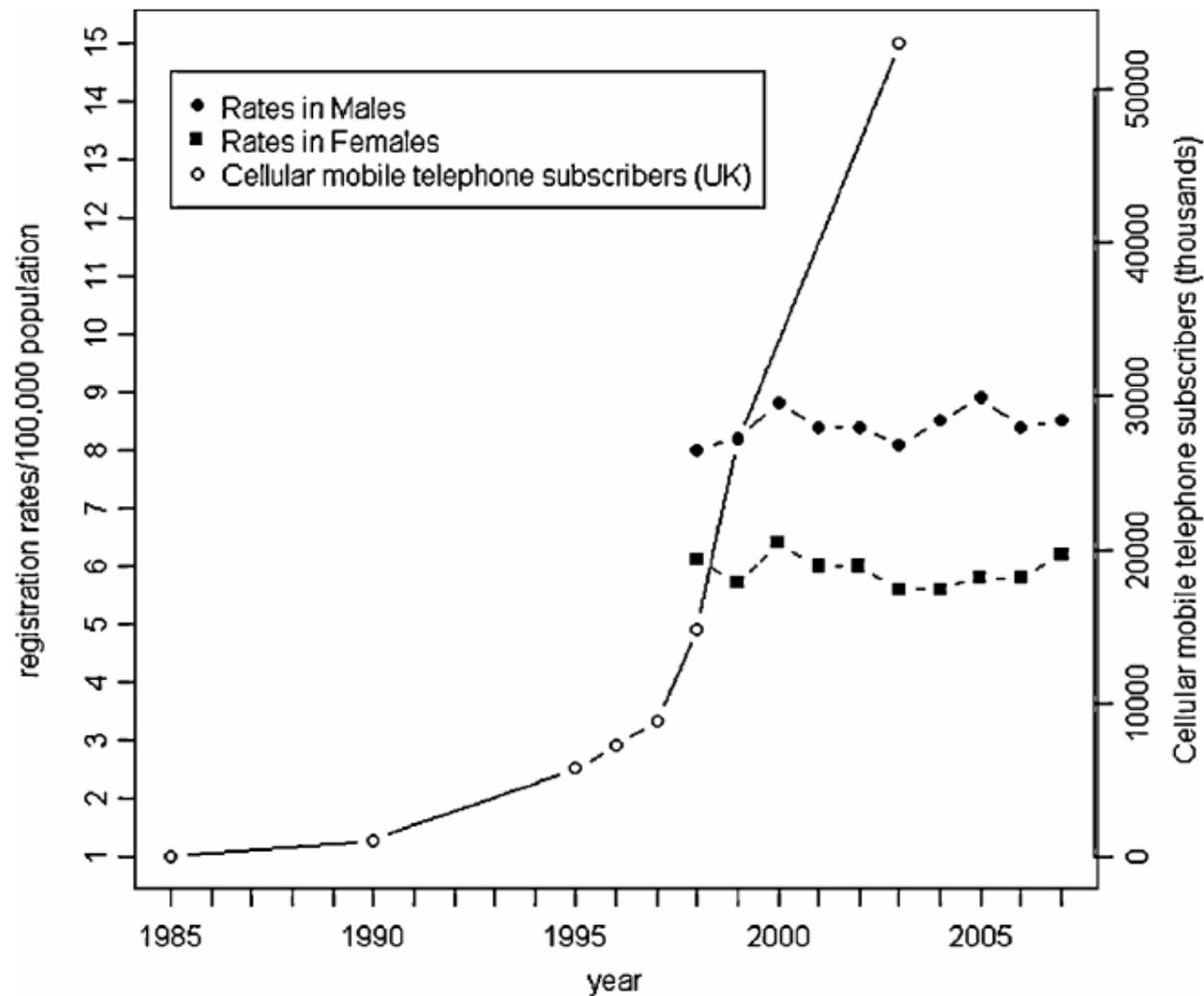


Figure 1. Trends in the age-standardized incidence rates by age groups.

Time Trends (1998–2007) in Brain Cancer Incidence Rates in Relation to Mobile Phone Use in England

Frank de Vocht,^{1*} Igor Burstyn,² and John W. Cherrie³



Brain cancer incidence trends in relation to cellular telephone use in the United States

Peter D. Inskip, Robert N. Hoover, and Susan S. Devesa

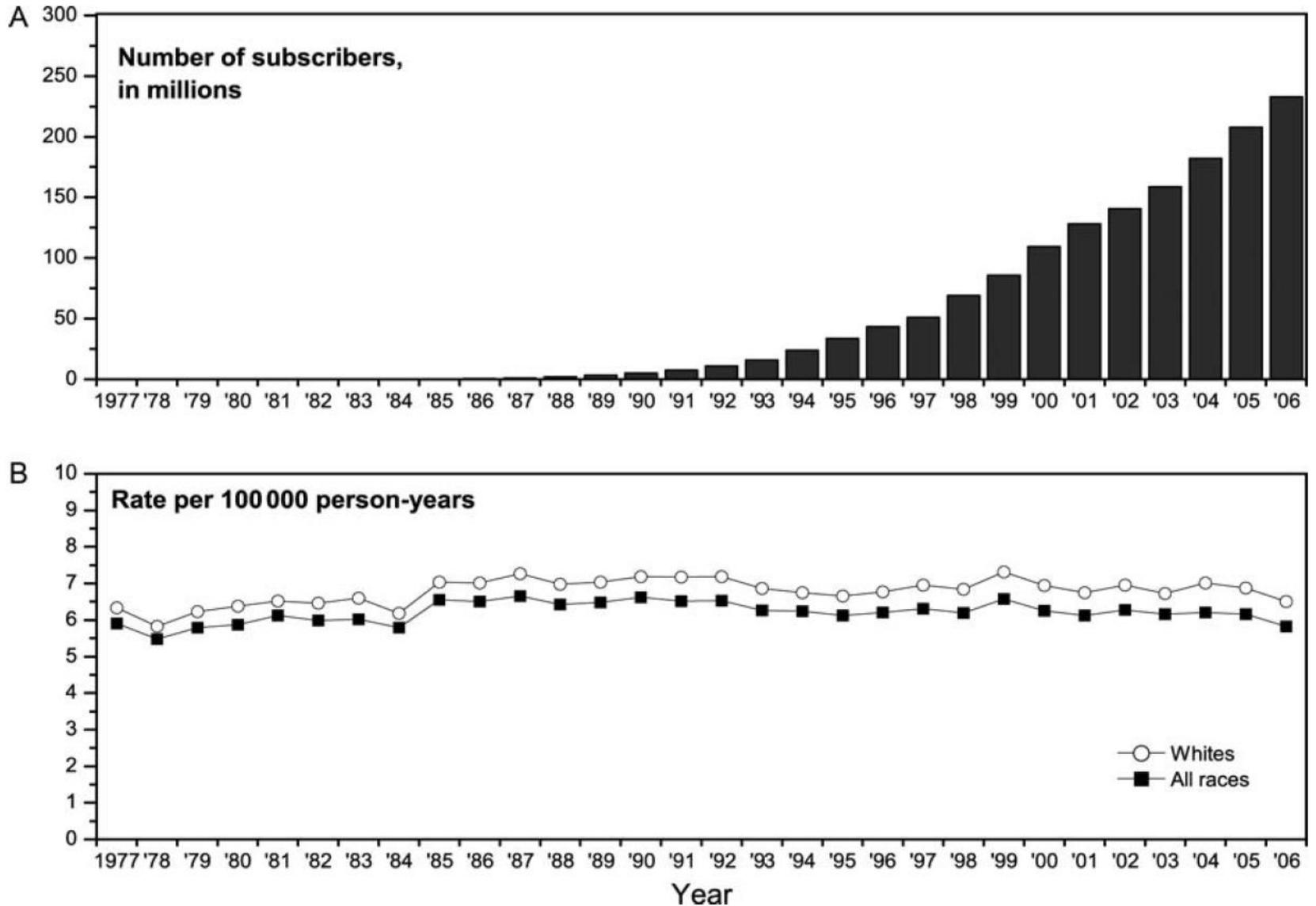


Table 2. Brain cancer incidence rates among whites, ages 20–29 years, by gender, location of cancer within the brain, and calendar year of diagnosis, 1977–1981 to 2002–2006, SEER 9

Site of cancer	Year of diagnosis (Incidence rate, per 100 000 person-years [count])					
	1977–1981	1982–1986	1987–1991	1992–1996	1997–2001	2002–2006
Females						
Frontal lobe	0.56 (45)	0.54 (45)	0.59 (45)	0.63 (45)	0.79 (54)	1.15 (76)
Temporal lobe	0.20 (16)	0.35 (29)	0.37 (28)	0.39 (27)	0.47 (32)	0.38 (25)
Parietal lobe	0.20 (16)	0.16 (13)	0.29 (21)	0.20 (14)	0.19 (13)	0.23 (15)
Cerebellum	0.21 (17)	0.28 (23)	0.25 (19)	0.19 (13)	0.26 (17)	0.32 (21)
Other specified ^a	0.36 (29)	0.47 (38)	0.61 (46)	0.30 (21)	0.39 (26)	0.64 (42)
Poorly specified ^b	0.36 (29)	0.37 (31)	0.50 (38)	0.35 (24)	0.37 (24)	0.53 (35)
Total	1.90 (152)	2.18 (179)	2.60 (197)	2.05 (144)	2.47 (166)	3.25 (214)
Males						
Frontal lobe	0.49 (40)	0.78 (66)	0.81 (64)	0.89 (64)	0.95 (68)	1.20 (86)
Temporal lobe	0.39 (32)	0.31 (26)	0.60 (48)	0.41 (30)	0.41 (29)	0.59 (42)
Parietal lobe	0.20 (16)	0.27 (22)	0.25 (19)	0.34 (24)	0.28 (20)	0.22 (16)
Cerebellum	0.38 (31)	0.25 (21)	0.44 (34)	0.47 (32)	0.32 (22)	0.26 (19)
Other specified ^a	0.53 (43)	0.53 (44)	0.61 (48)	0.45 (32)	0.49 (34)	0.51 (37)
Poorly specified ^b	0.55 (45)	0.48 (40)	0.42 (34)	0.60 (44)	0.66 (47)	0.44 (32)
Total	2.55 (207)	2.62 (219)	3.12 (247)	3.16 (226)	3.11 (220)	3.23 (232)
Male:female ratio ^c	1.34	1.20	1.20	1.54	1.26	0.99

^aOther specified = occipital lobe + cerebrum (lobe not specified) + ventricle, not otherwise specified + brain stem.

^bPoorly specified = overlapping lesions + brain, not otherwise specified.

^cBased on total incidence rates for 20–29-year olds.

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■ 6.1 Cancro negli uomini

- C'è limitata evidenza negli uomini della cancerogenicità delle radiazioni da radiofrequenza. Sono state osservate associazioni positive tra l'esposizione a radiofrequenze da telefoni cellulari e gliomi e neurinoma dell'acustico.

■ 6.2 Cancro negli animali da esperimento

- C'è limitata evidenza negli animali da esperimento della cancerogenicità delle radiazioni da radiofrequenza.

■ 6.3 Valutazione conclusiva

- I campi elettromagnetici da radiofrequenze sono possibili cancerogeni per gli umani (Gruppo 2B).

■ *C'è comunque, nel working group, un'opinione di minoranza che le evidenze negli uomini siano inadeguate a permettere conclusioni circa un'associazione causale*

Aggiornamento della coorte danese

Frei et al., 2011

From: [BMJ. 2011; 343: d6387.](#)

Published online 2011 October 20. doi: 10.1136/bmj.d6387

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Table 2

Incidence rate ratios (95% confidence intervals) for intracranial tumours of central nervous system categorised according to ICD-O morphology and topography codes among men and women with mobile phone subscriptions in Denmark, 1987-95, followed up to 31 December 2007

Tumour category	Men*		Women*	
	Cases	Incidence rate ratio†	Cases	Incidence rate ratio†
Glioma‡				
Non-subscribers	1853	1	1455	1
Subscribers	324	1.08 (0.96 to 1.22)	32	0.98 (0.69 to 1.40)
Years of subscription:				
1-4	85	1.20 (0.96 to 1.50)	8	0.87 (0.43 to 1.75)
5-9	122	1.05 (0.87 to 1.26)	14	1.02 (0.60 to 1.72)
≥10	117	1.04 (0.85 to 1.26)	10	1.04 (0.56 to 1.95)
10-12	80	1.06 (0.85 to 1.34)	NA	—
≥13	37	0.98 (0.70 to 1.36)	NA	—
Meningioma§				
Non-subscribers	429	1	1248	1
Subscribers	50	0.78 (0.58 to 1.05)	30	1.02 (0.71 to 1.47)
Years of subscription:				
1-4	15	0.92 (0.55 to 1.56)	9	1.08 (0.56 to 2.09)
5-9	14	0.56 (0.33 to 0.96)	13	1.04 (0.60 to 1.79)
≥10	21	0.90 (0.57 to 1.42)	8	0.93 (0.46 to 1.87)
Other and unspecified¶				
Non-subscribers	968	1	1297	1
Subscribers	162	1.12 (0.95 to 1.33)	35	1.19 (0.85 to 1.67)
Years of subscription:				
1-4	37	1.09 (0.78 to 1.53)	7	0.95 (0.45 to 2.00)
5-9	60	1.08 (0.83 to 1.40)	16	1.28 (0.78 to 2.09)
≥10	65	1.19 (0.92 to 1.55)	12	1.27 (0.72 to 2.25)

NA=not applicable (numbers too small for analyses).

*See table 1 for person years for men and women.

†Adjusted for age, calendar period, level of education, and disposable income.

‡ICD-O topography codes C71.0-71.9 and morphology codes 93803-94813.

§ICD-O topography codes C70 and morphology codes 93803-94813.

Conclusioni

- I tumori cerebrali sono neoplasie a bassa incidenza ed alta letalità.
- In Italia l'incidenza non presenta grandi differenze geografiche e l'andamento temporale è costante.
- Nei paesi con un maggior periodo di osservazione si è registrato un aumento dell'incidenza in particolare in corrispondenza dell'introduzione delle nuove tecniche di imaging.
- I fattori di rischio sono sostanzialmente ignoti; il rapporto con l'uso dei telefoni cellulari è considerato possibile, ma l'argomento è ancora aperto.
- Tutto questo ha importanti riflessi sulle modalità di registrazione, come vedremo in seguito