Brain Cancer Discussion (EMERG)

Starting Questions:

- How accurate is the AIHW cancer registry and what is the real subscription rate?
- Has anyone performed a reconciliation between the register and the hospitals who have provided the records to test for accuracy?

A person I know who is a contract nurse has a friend who worked for QML entering patient data. To protect herself, kept an independent record of the data she entered. After sometime she began to notice that certain diseases were being expunged from the official record, notably brain tumours. She challenged her boss regarding this activity and was told in no uncertain terms that it was none of her business. Of course this is anecdotal and not something that would hold much weight without confirmation. However, it is a major concern if such unethical behaviour is occurring.

The recent poorly conducted study by Professor Chapman is sensationalist and completely irresponsible. The study suffers from some very serious flaws and makes a number of inexcusable assumptions. We believe Prof Chapman has done a great disservice to the public. Through his comments in the media, the public has been misinformed and are likely to now believe that there are no risks when using a mobile device.

This paper has already been widely used across the world with sensational media headlines such as: "***It's safe: Mobile Phones DON'T cause cancer, new study say*"** in the UK press http://www.express.co.uk/life-style/health/668018/mobile-phones-no-cancer-university-study-says

The major flaws in this study include:

Brain Cancer statistics are not subdivided into specific cancer types: The AIHW cancer register data used by Chapman et al. has all brain tumour types lumped together and so provides no specific insights into cancers that are linked to mobile phone usage (i.e. High Grade Glioma) – not all brain tumour types have been linked to cell phone RF exposure. This is most important because a study written by Dobes et al. (2011) which looked at the Australian cancer register in detail found that "The incidence of primary brain tumors by subtype is currently unknown in Australia."

An assumption that all regions of the brain are equally at risk: The AIHW cancer register used by Chapman does not give a fine grained description of the type of tumours or their location. Almost all the absorbed radiation is on the side of head where the cell phone is placed including the frontal lobe, temporal lobe and cerebellum.

No real consideration for long latency period: While the average time between first cell phone use and diagnosis of brain cancer is not yet known, it is however likely to be certainly decades. If you refer to the annexure Figure 1 you will see a graph that shows the time between when smoking began and the diagnosis of lung cancer. It is reasonable to assume that if the is a long latency a similar pattern between when cellphone use and diagnosis of brain cancer is likely to occur if cell phone usage is truly implicated with increased brain tumour risk. It is too early to say at this time.

Assumes the entire population was cell phone users from 1987 to 2014: No information is provided about the average hours of use – the curve provided on cell phone subscription in the paper is therefore a dishonest account of real usage patterns.

Assumes mobile phone use was equal across all ages and between males and females for this analysis: Of course this is simply not true. The most prominent users of the mobile phone in the 1990's up until early 2000 were business people and predominantly men. The study has used phone subscription as a method to show the penetration into our society of mobile telephones. However, the study has neglected to take into consideration phone usage patterns. Despite the rapid uptake of mobile phones, call duration and frequency would have been low for a large section of the community (particularly children and adolescents) for many years due to the high call costs per minute. Free call times and bundled minutes did not come until much later.

What we have is the blatant dismissal of brain cancer being association with mobile phone usage: Instead of acknowledging positive studies, the authors put weight on the negative studies, such as the Danish cohort study, which has been widely criticised, including by IARC members due to unacceptably poor methodology (excluding corporate subscribers, who were most likely the heaviest users in the early years of mobile telephony and leaving them in the control group (non-subscribers). This will direct the study outcome towards a null effect hypothesis.

Data for 2009–2012 are estimated and was not acknowledged by Chapman in the study:
693 cases (0.6%) of the total number of new cases of cancer for 2009 are based on estimates made by the AIHW. This is because the 2009 provisional death-certificate-only incidence data for NSW and the ACT were not available for inclusion in the 2012 version of the ACD.

29 cases (0.02%) of the total number of new cases of cancer for 2010 are based on estimates made by the AIHW. This is because the 2010 provisional death-certificate-only incidence data for the ACT were not available for inclusion in the 2012 version of the ACD

40,995 cases (34.4%) of the total number of new cases of cancer for 2011 are based on estimates made by the AIHW. This is because the 2011 incidence data for NSW and the ACT were not available for inclusion in the 2012 version of the ACD.

41,775 cases (34.2%) of the total number of new cases of cancer for 2012 are based on estimates made by the AIHW. This is because the 2012 incidence data for NSW and the ACT were not available for inclusion in the 2012 version of the ACD.

The study suggests that it is only the elderly that are showing an increase and the presumption that this is due to better diagnosis. Such a claim does not align with what well respected Neurosurgeons are suggesting. A quote from Dr Charlie Teo, "People continue to believe that cancer is a disease that strikes as you get older. I **saw 23 patients last week. Twenty were diagnosed with malignant brain cancer.** Eight of those diagnosed were under 16 years old. Source: http://www.cancercouncil.com.au/30904/news-media/latest-news-news-media/media-releases-news-room-news-media/brain-cancer-is-leading-cause-of-cancer-death-in-young-people/

Further commentary:
We believe it is imprudent and irresponsible to only discuss the overall Australian brain cancer incidence without analysing trends in subtypes when glioblastoma multiforme (GBM) is found to be the key subtype associated with mobile phones in multiple studies. Dobes et al. found "A significant increasing incidence in glioblastoma multiforme (GBM) was observed in the study period (annual percentage change [APC], 2.5; 95% confidence interval [CI], 0.4–4.6, n = 2275), particularly after 2006. The data came from "*A retrospective multicenter analysis was performed from January 2009*

through July 2010 of all 13 pathology databases servicing the 24 neurosurgical centers, including all major teaching hospitals, in the Australian Capital Territory (ACT) and New South Wales (NSW) recording brain tumors diagnosed during 2000–2008. The population of NSW and ACT increased from 6.8 to 7.3million between 2000 and 2008." There was no mention of this finding in Chapman's paper.

It is also disappointing that Chapman et al. did not mention the French CERENAT study that directly investigated epidemiological evidence of mobile phone use on brain tumours replicating the Interphone protocol. CERENAT also reported a significantly increased risk for brain cancer with prolonged use of mobile phones, in line with Interphone and Hardell studies.

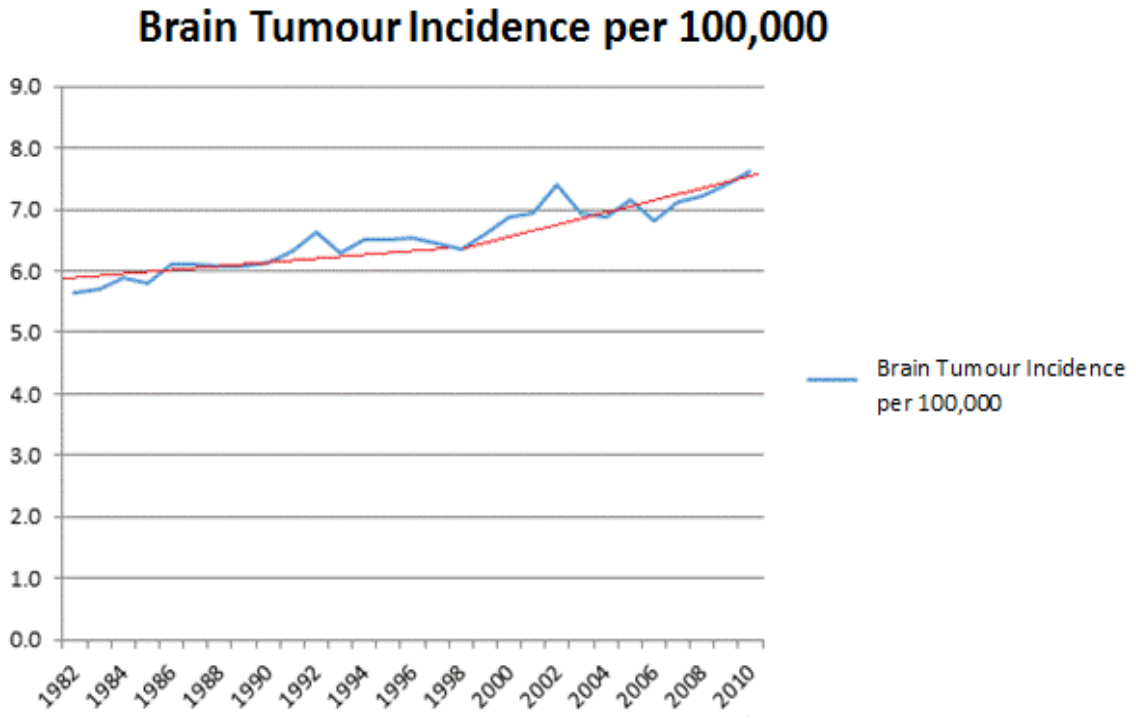
Of course this is not the first time scientists have tried to dismiss the association between cell phone usage and brain tumours. Some researchers were using brain tumour incidence data from Sweden to dismiss evidence of an increased risk for brain tumours associated with the use of mobile and cordless (wireless) phones as published in peer-reviewed scientific literature. Hardell performed a study looking at the Swedish Cancer registry and wrote a paper entitled" ". The main finding of this study was it noted an increasing rate of brain tumour of unknown type in the central nervous system (D43). The study was also able to show that the Swedish Cancer Register is not sufficiently reliable enough "*to be used to dismiss results in epidemiological studies on the use of wireless phones and brain tumour risk and should not be used as reference for such statements. We are aware of a misunderstanding among some clinicians that only cases where the cancer diagnosis has been proven by histology or cytology should be reported, thus they neglect to report cancers diagnosed only clinically*." *Int. J. Environ. Res. Public Health* **2015**, *12* **11666**

Supplementary information:

Health agencies have relied on the 13-country Interphone Study results as a gauge of health hazards with mobile-phone use. Many of its various studies have consistently found no risk, and one even suggested that mobile devices can actually protect against brain cancer. The Interphone study was partly funded by the Mobile Manufacturers Forum (MMF) and the Global System for Mobile Communication Association (GSMA), two groups that stand to benefit from positive results.

Funding seems to have skewed the results, as a team of independent researchers from the Republic of Korea found when they took another look at the findings. On analysing only the independent studies—and putting to one side the Interphone trials, which the researchers said were of very poor quality—they discovered that continual use of a mobile phone for 10 years or longer increased the chances of developing a brain tumour by up to 34 per cent. Sci Total Environ, 2012; 414: 103–12

Australia's Brain Tumour growth rate from 1982 to 2010 shows a 34% increase.



The total expected lifetime economic cost of cancer per person is around $966,000 – of which the burden of disease is $851,600 and the financial cost is $114,500.

Life time economic and financial costs vary with age and to a large degree are sex dependent because of disproportionate incomes. Younger people who get cancer have a higher projected cost than older members of society. Economic costs can range from $2million for an adolescent to half a million dollars for elderly people.

In terms of the financial costs faced by households (estimate is from NSW Government in 2005), the most expensive cancers are brain cancer ($149,400) and leukaemia ($103,900). Both types of cancers have been associated with manmade non-ionising radiation exposure (Radiofrequencies) from commercial transmitters and cell phones. Source: http://www.cancercouncil.com.au/wp-content/uploads/2010/11/costofcancer_summary.pdf

- In 2012 the Government cancer registry had 1,643 cases for brain tumours and 3297 leukaemia (various types) cases (Note: 2012 AIHW data contains estimates)
- Brain cancer is 3rd leading cause of death in 1 –14 year olds. http://www.aihw.gov.au/deaths/leading-causes-of-death/
- Brain cancer is leading cause of cancer death in 0-39year olds.
- The most common malignant brain cancer is high grade glioma (HGG)

Annexure

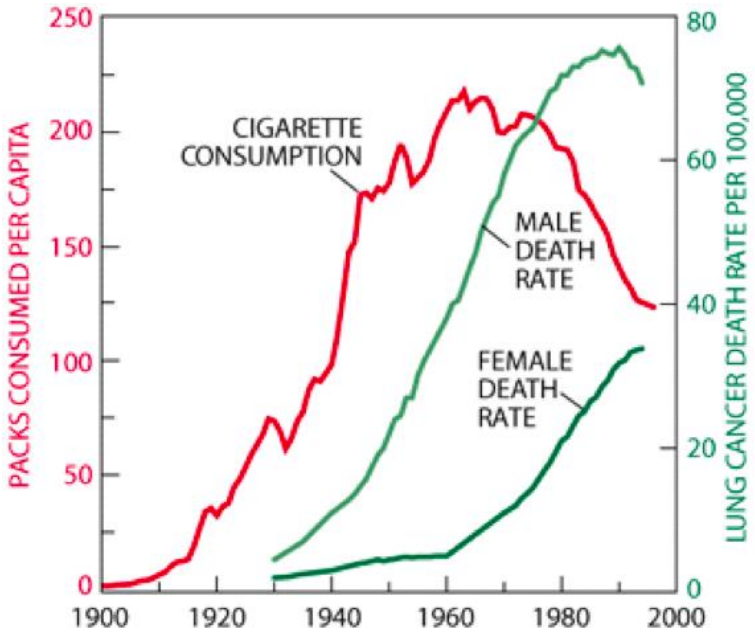


Figure 1: Cigarette consumption vs Lung Cancer Death Rate

Not shown in this smoking and lung cancer example is the fact the female smoking began much later than male smoke. Latency factors between the start of smoking and the diagnosis of lung cancer are similar in men and women. There appears to be an approx. 30-year latency looking at the peaks

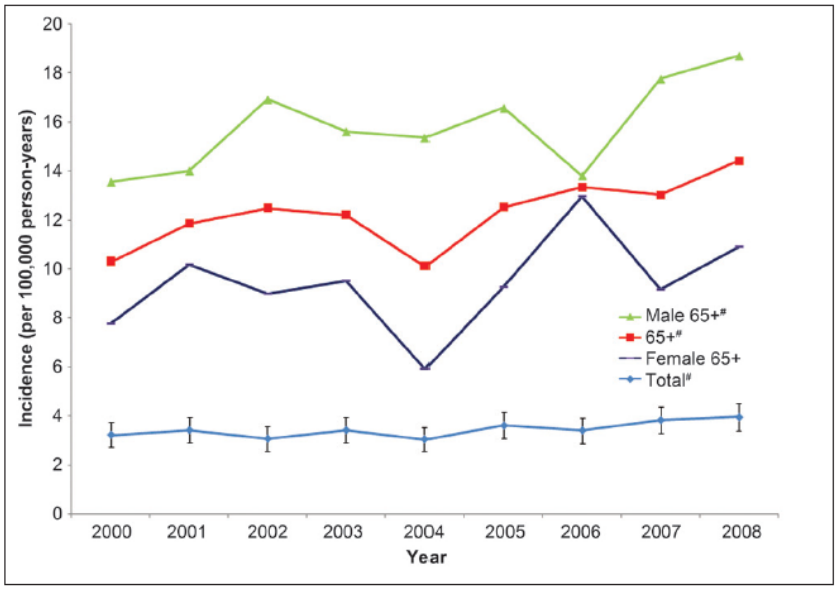


Figure 2: US standardized brain tumor incidence rates for glioblastoma multiforme by calendar year in the Australian Capital Territory and New South Wales populations for the total population, total population aged 65 years and above, and male population aged 65 years and above. Confidence intervals are displayed. All three trends show a significant (*) increase using joinpoint analysis

Rising trends in incidence were also seen for meningioma in the total male population (APC, 5.3; 95% CI, 2.6–8.1, *n* = 515) and males aged 20–64 years (APC, 6.3; 95% CI, 3.8–8.8).

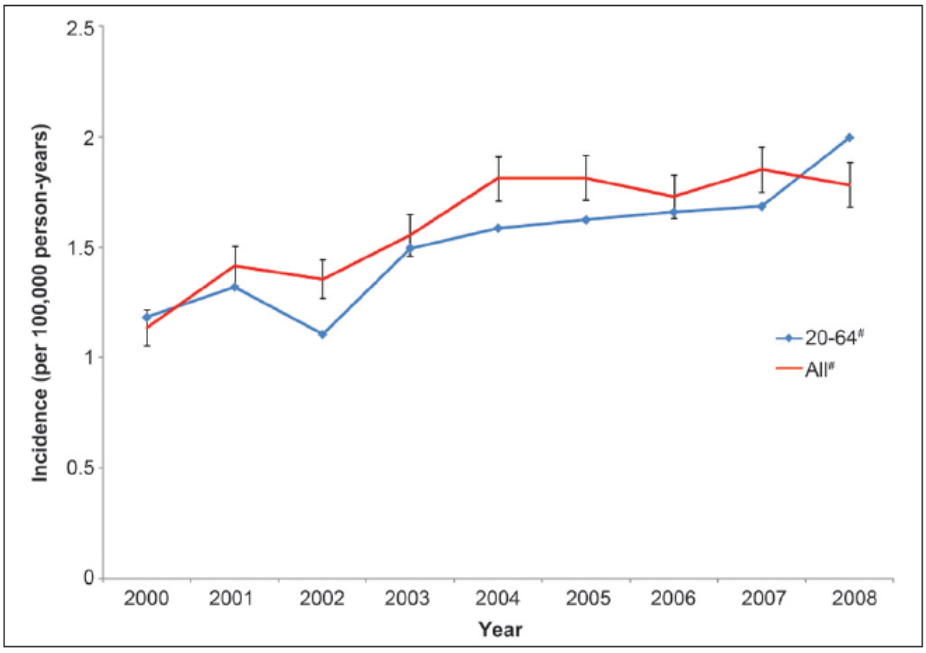


Figure 3: US standardized brain tumor incidence rates for meningioma for the total male population and male population aged 20–64 years by calendar year from the Australian Capital Territory and New South Wales populations. Confidence intervals are displayed. Both trends show a significant (*) increase using joinpoint analysis

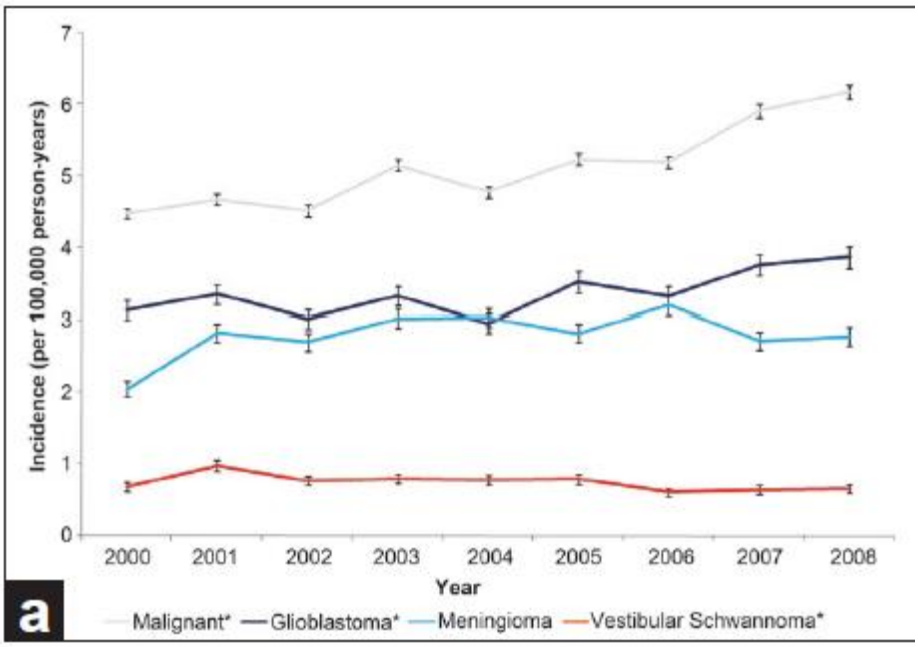


Figure 4 Shows overall trends of Brain Tumours in A.C.T. and N.S.W.