

**Brief for Noting**

Requested by:

- Department  Minister's office

Department RecFind No:	BR060507
Division/HHS:	HSCI
File Ref No:	

**SUBJECT: Right to Information (RTI) Application Number 2500 – Seven Network**

**Issue(s)**

1. Note that an application was lodged under the *Right to Information Act 2009* (RTI) by the Seven Network seeking access to documents in relation to any reports including investigations or incident reports, ministerial/executive briefings and attachments and correspondence such as letters and emails relating to:
  - a. cancer clusters
  - b. spates of asbestos-related illnesses
  - c. health issues related to the former Wunderlich factory in Gaythorne and the James Hardie fibrolite plant at Newstead.
2. The documents identified falling within the request include:
  - a. a report on an alleged cancer cluster at Atherton Fire Station from 2008 and associated briefs
  - b. emails, briefs, Terms of Reference and letters to other stakeholders relating to the investigation into former asbestos manufacturing plants formerly operated in Gaythorne and Newstead.
3. It is believed that all relevant information in the hands of the Department of Health has been included taking regard of the nominated date range.
4. No issues are anticipated due to the release of this information. The cancer cluster report is publicly available. Much of the information related to the asbestos plants is either publicly available or not of a sensitive nature.
5. Key stakeholders in relation to the information are Queensland Hospital and Health Services, other government departments and the local communities of Gaythorne and Newstead. Government stakeholders will not be impacted by the release of the information. There is no information in the documents relating to communities in Gaythorne and Newstead.
6. Health Protection Unit (HPU) has not released any information for these issues on a previous occasion.

**Background**

7. The above RTI application was received in relation to cancer clusters, asbestos related illnesses and health issues related to James Hardie plants at Newstead and Gaythorne.
8. The request was actioned by the Health Protection Unit within the Department of Health.
9. Information was derived as requested from departmental files, emails and other identified sources.

**Consultation**

10. Consultation has been undertaken with the Privacy and Right to Information Unit within the Department of Health and the Senior Departmental Liaison Officer.

**Attachments**

11. Attachment 1 - Marked documents RTI 2500

Department RecFind No:	BR060507
Division/HHS:	HSCI
File Ref No:	

**NOTED**



**DR MICHAEL CLEARY**  
Chief Operations Officer

29 / 1 / 2014

Chief Operations Officer's comments To Minister's Office for Noting

PLEASE PROVIDE TO MEDIA & COMMUNICATION AND  
 COULD THEY LINK WITH OPS & DEN. MEDIA.  
 COULD MS CHO PLEASE ENSURE THAT  
 - THE NEW FIRE SERVICE COMMISSIONER IS AWARE  
 OF MS RTI  
 - THE DEPARTMENT OF ENVIRONMENT AND HERITAGE  
 IS AWARE OF MS RTI

Minister's Office Use Only  
**NOTED**

**NOTED**

**LAWRENCE SPRINGBORG**  
Minister for Health

Chief of Staff

Minister's comments


Briefing note rating

1            2            3            4            (1 = poor and 4 = excellent)

Author	Cleared by: (SD/Dir)	Cleared by: (SD/Dir)
Uma Rajappa	Sophie Dwyer	Dr Jeannette Young
Director	Executive Director	Chief Health Officer
Environmental Hazards	Health Protection Unit	Chief Health Officer Branch
16/01/2015	19/01/2015	20 /01/2015

CONF

3/9/15

RECEIVED  
DATE 15/9 BY OO

16/9/15

11 SEP 2015

2005/026635

22

# Ministerial Brief for Noting

Requested by:

Department  Minister's office

Department RecFind No:	BR062225
Division/HHS:	Cairns and Hinterland
File Ref No:	

**SUBJECT: Atherton Fire fighters Cancer Cluster**

**NOTED** Director-General, please liaise with my office to release the report publicly. **PLEASE DISCUSS** (K) 16.09.15

*Cameron Dick*  
**Cameron Dick MP**  
**Minister for Health and Minister for Ambulance Services**

Date: 16 September 2015

### Key Issues

1. A briefing was provided in March 2014 (BR058279) to the previous Minister of Health regarding the likely need to re-open the 2008 investigation into the cancer cluster at Atherton Fire Station. The investigation report (Attachment 1) is now complete and confirms the existence of a statistical cluster of    brain cancer cases over the past 22 years among employees at Atherton Fire Station, with no discernable environmental explanation or direct association with fire-fighting activities, although these cannot be ruled out.
2. The increase in brain cancer rate observed with this cluster ranges somewhere between 26 to 52 times higher than would be expected by chance alone (up to 110 times, if the persons' years of exposure is defined in an overly narrow way). As with all cancer cluster investigations where very small case numbers are involved, great caution is required in interpretation of the rates.
3. The Minister should be aware of this cancer cluster because it may receive additional public attention as there are presently two relevant Bills before Parliament. The Workers' Compensation and Rehabilitation (Protecting Firefighters) Amendment Bill 2015 is a Private Members Bill introduced by the Member for Kawana on 3 June 2015. The Workers' Compensation and Rehabilitation and Other Legislation Amendment Bill 2015 was introduced by Government on 15 July 2015.
4. A Parliamentary Committee is presently reviewing the proposed legislation; the next scheduled hearing is 4 September 2015. Brain cancer is included on the list of compensable diseases, if a fire fighter has been employed for at least five years before onset.

### Background

5. The previous 2008 Queensland Health report into three brain cancers found that there was a higher than expected rate of brain cancer amongst staff at Atherton Fire Station which fitted the epidemiological definition of a brain cancer cluster.
6. When examining the possible environmental hazards at the station and the associated house, no hazards were identified that were known to be associated with brain tumours

*M Walsh*

**Michael Walsh**  
Director-General

RECORDS TEAM  
 DEPT OF HEALTH  
 RECEIVED  
 21 SEP 2015

Department RecFind No:	BR062225
Division/HHS:	Cairns and Hinterland
File Ref No:	

### Sensitivities

7. The [redacted] case who triggered this re-investigation is the [redacted] of the previous cases ([redacted]); both worked at the same fire station. While family history is a recognised risk factor and may help explain the cluster there is insufficient scientific knowledge of brain cancer causality to exclude potentially unrecognised environmental triggers as co-contributory factors. The report takes care not to overstate the potential role of family history, particularly given that even two cases would still reach statistical significance in such a small cohort of employees.
8. However the previous thorough investigation in 2008 appears to have ruled out local environmental contributory factors.
9. The above-mentioned legislation will not be retrospective; this may cause distress among current cases and/or relatives.
10. The level of concern among employees overall has not been as great during this latest investigation period, as in 2008. A Queensland Fire and Emergency Services (QFES)-owned house near to the Fire Station that had been used by some of the cancer cases and that was one of the areas of concern (although no causative environmental hazards had been identified within it) was demolished in 2008.

### Consultation

11. The report was prepared by Tropical Public Health Services Cairns (TPHS) in collaboration with the Statistical Analysis and Linkage Team, Health Statistics Unit, Department of Health.
12. Assistant Commissioner, QFES, Far Northern Region. QFES provided employment data and has communicated actively with Atherton staff regarding this cluster investigation. A combined TPHS/QFES individual briefing to the most recent case, followed by an open briefing to all staff at Atherton Fire Station, is planned in September.
13. There may be media interest in the report once its findings are shared with QFES staff. QFES will be the lead agency for the media with TPHS' role limited to commentary on the report. QFES will prepare a draft media statement in case it is required.
14. QFES, Far Northern Region has also prepared a briefing note for its Minister of Police, Fire and Emergency Services to approve the release of the report.

### Attachments

15. Attachment 1: Investigation into a cluster of brain cancer cases among fire fighters working at Atherton Fire Station, August 2014.

### HHS Contact Officer

Dr Richard Gair, Director, Tropical Public Health Services (Cairns), Cairns and Hinterland Hospital and Health Service.

Telephone [redacted]

<b>Department RecFind No:</b>	<b>BR062225</b>
<b>Division/HHS:</b>	<b>Cairns and Hinterland</b>
<b>File Ref No:</b>	

<b>Author</b>	<b>Cleared by: (SD/Dir)</b>	<b>Content verified by: (CEO/DDG/Div Head)</b>
Richard Gair	Anne Gagie	Julie Hartley-Jones
Director, Tropical Public Health Services (Cairns)	A/Divisional Director,	Chief Executive
Cairns and Hinterland Hospital and Health Service	Family Health and Well Being	Cairns and Hinterland Hospital and Health Service
3 September 2015	4 September 2015	5 September 2015

RTI Release

**Investigation into a cluster of brain cancer  
cases among fire fighters working at  
Atherton Fire Station**

**August 2015**

**Tropical Public Health Services (Cairns)  
Cairns and Hinterland Hospital and Health Service**

**in conjunction with**

**Statistical Analysis and Linkage Team  
Health Statistics Unit**

**Queensland Health**



**Queensland  
Government**

## Summary

This report details an investigation and statistical analysis of [redacted] cases of [redacted] brain cancer that have occurred among fire fighters based at the Atherton Fire Station (AFS) over the 22 year period from 1992 to 2014.

This current investigation builds on a very detailed investigation into a possible cancer cluster at the AFS conducted by Queensland Health in 2008. The 2008 investigation was undertaken, at the request of Queensland Fire and Rescue Service (QFRS) in response to concerns over the number of cancer cases among AFS fire fighters.

In the 2008 investigation five cancer cases were identified, three of which were brain cancers of the [redacted] group. Statistically the number of brain cancers was in excess of that which would be expected compared with the population average, however environmental investigations did not reveal any potential exposures or likely sources of brain cancer risk.

The overall finding by Queensland Health in 2008 was that there was no obvious explanation for the cancer cases at the AFS, however a possible association with the activities of fire-fighting could not be ruled out. The Report recommended that further investigation may be warranted if new information came to light, or further brain cancer cases occurred.

A further such case of brain cancer was reported in 2014, leading to the epidemiological review which is the subject of this report.

This investigation has sought to determine if the rate of [redacted] brain cancers among fire fighters who had worked at the AFS is higher than the rate in the general population, and whether there is any new evidence in the literature to demonstrate a link between occupational or environmental exposures in fire fighting and the development of [redacted] brain cancers.

Brain cancer case numbers were analysed using updated workforce employment data, and standardised incidence ratios were calculated. The results of this current analysis were consistent with the 2008 investigation, indicating a significantly higher than expected rate of [redacted] brain cancers in the cohort of AFS fire fighters.

However caution must be used in interpreting the results due to issues complicating the investigation of cancer clusters including the small number of cases; the generally lengthy latency period associated with cancer development; the movement of the cases; how to deal with cases where there is a familial link, and other factors.

There were several aspects tending to suggest that the observed cluster may have occurred by chance rather than some unrecognised causal factor in the AFS workplace environment. Analysis of different employee groups based on duration of employment did not suggest an association between longer employment and cancer risk. [redacted] of the brain cancer cases occurred within five years of commencing employment at AFS (whereas it is generally held that a longer 'latency period' applies with brain cancers along with many other cancer types). In addition to an

occupational connection, [ ] of the cases had a familial connection, which is recognised as an independent risk factor for brain cancer.

Recent scientific reviews have found that the association between brain cancer and fire fighting has been examined, but while there is suggestive evidence, to date it has not been consistently found to be statistically significant. The rarity of brain cancer makes it difficult for such investigations to be conclusive. Importantly, epidemiological studies carried out in Australia suggest that the rate of occurrence of brain cancer in fire fighters in this country is generally comparable to that of the general population.

In particular, a study of cancer rates among fire fighters across Queensland by Monash University (2009) found that overall male cancer incidence and male brain cancer incidence rates were not higher than expected. Subsequently a major national longitudinal health study, the Australian Fire Fighters' Health Study, was completed by Monash University in 2014. This study did not suggest an elevated risk of brain cancers among male fire fighters.

Given the information provided, the lack of a hypothesised agent of exposure, and the absence of conclusive evidence in the current scientific literature for causal factors associated with exposures in the workplace environment, this investigation was unable to provide significant additional insight to the previous investigation in 2008 in terms of causality of [ ] brain cancers.

Queensland Health guidelines for the assessment of non-communicable disease do not recommend proceeding to a Type 3 (more specialised) cluster assessment unless there is a plausible biological cause, or new evidence about causation. The most relevant new epidemiological evidence since 2008 is a national study undertaken by Monash University which found no conclusive evidence of a link between firefighting and brain cancer among Australian firefighters.

Therefore in accordance with the guidelines it was decided not to proceed to further analysis unless further information which would indicate this should be done becomes available.

## **Background**

Concerns regarding cancer cases amongst fire fighters employed at the AFS were first raised in December 2007.

Queensland Health undertook a comprehensive epidemiological and environmental investigation in 2008 in collaboration with QFRS. <sup>1</sup>

The Queensland Health investigation identified five fire fighters amongst the cohort employed at the AFS who were diagnosed with various types of cancer between 1992 and 2007. Three of these individuals had been diagnosed with [ ] brain cancer from the [ ] group. The three brain cancer types were different from one another but given their similar cell origins and potential for progression between



types, it was considered reasonable to consider them together in an evaluation of a possible cancer cluster.

The investigation included a search of the scientific literature for factors known to cause brain cancer. While ionising radiation and family history of the disease were identified as two important causes, there was little evidence proving a link between other types of environmental exposures and brain cancers – although some possible associations had been noted.

The environmental investigations undertaken in 2008 took these other factors into account and found no agents at the AFS that were either conclusively or potentially linked to causing brain cancer, and concluded that it was unlikely that there was a hazard at the AFS that was responsible for the observed cancers.

Statistical analyses of the brain cancer case numbers indicated an elevated rate of [redacted] brain cancers amongst the staff at the AFS compared with the expected rate based on the Queensland population; however, the magnitude of the increase was difficult to assess due to incomplete historical employment records.

The increased rate of [redacted] brain cancers did fit the epidemiological definition of a cluster, whereby a cluster is defined as “the occurrence of a greater than expected number of cancer cases occurring within a group of people in a geographical area over a period of time”.<sup>2</sup> This definition is drawn from a statement by the National Health & Medical Research Council (NHMRC), which goes on to say that “the identification of a cluster using this definition does not necessarily imply that there is a causal agent. It does, however, indicate the need to assess whether the cluster can be related to factors other than chance”.

The scientific literature available at the time of the investigation had not directly implicated fire fighting as a risk factor for brain cancer, but it had been suggested that there might have been an association with fire fighting. However, it was not in the scope of the 2008 Queensland Health investigation to examine the risk of cancer associated with fire fighting in general; rather to examine the risk associated with employment at the Atherton Fire Station.

The Queensland Health 2008 report found that there “was an elevated rate of brain cancer (of the astrocytoma group) amongst staff at the Atherton Fire Station”.

Included in the report's recommendations were the following:

1. “The feasibility of an epidemiological assessment of brain cancer incidence of Queensland fire fighters including comparison with Atherton Fire Station, should be conducted”, and
2. “The feasibility of an epidemiological study or disease registry should be considered to examine the possible risks associated with fire fighting in relation to cancer, particularly brain cancer and those types of cancer identified in the evaluation of the International Agency for Research on Cancer (e.g. testicular cancer, prostate cancer and non-Hodgkin lymphoma).”

Following this report, the QFRS – Cancer Registry Linkage Working Party was established to progress the recommendations. This included oversight of a study of cancer rates among firefighters across Queensland by Monash University. The Monash study (2009) found that overall male cancer incidence and male brain cancer incidence rates were not higher than expected.<sup>3</sup>

Subsequently, Monash University was also engaged by the Australasian Fire Authorities Council (AFAC) to conduct a longitudinal national health study of Australian Firefighters. Monash completed and released their report in December 2014<sup>4</sup>, and it has assisted in informing this current report.

Another recommendation of the 2008 report by Queensland Health was that further investigations be conducted if additional cases of brain cancer were discovered amongst past or current AFS staff. That situation arose in 2014, leading to a further investigation which is the subject of this current report.

This report should be read in conjunction with the 2008 investigation which is available at [www.emergency.qld.gov.au/publications/Final%20report%20AFS.DOC](http://www.emergency.qld.gov.au/publications/Final%20report%20AFS.DOC).

## **Current situation**

In March 2014, QFRS advised Tropical Public Health Services (TPHS) Cairns that there had been an additional case of confirmed brain cancer from the [redacted] group. The affected fire fighter had previously worked at the AFS, and was also a direct relative of one of the earlier cases. This brought the total number of [redacted] cancers reported among AFS fire fighters since 1992 to four.

TPHS Cairns agreed to undertake an epidemiological analysis. Due to the complexity of investigations into cancer clusters with small numbers of cases, TPHS sought expert statistical advice from Queensland Health's Statistical Analysis and Linkage Team (SALT) in Brisbane. SALT has previous experience in cancer investigations, and assisted with the Atherton Investigation in 2008.

## **Aims of the investigation**

Epidemiological analysis was undertaken to determine whether, and to what extent, the rate of [redacted] brain cancers among fire fighters who had worked at the AFS remained higher than observed in the general population.

In addition, recent literature was reviewed to determine if there was any new evidence in the Australian and international literature demonstrating a link between occupational or environmental exposures in fire fighting and the development of [redacted] brain cancers.

## Methods

Cancer case information (confirmation of diagnosis) was provided by the Queensland Cancer Registry (QCR), while AFS employment records were provided by QFRS.

QFRS records were used to define the cohort of fire fighters at risk at AFS. The cohort at risk was defined as all fire fighters, both permanent and auxiliary, who worked at AFS between January 1992 and December 2014<sup>1</sup>.

Information from the QCR was used to confirm that the cases included in the analysis met the inclusion criteria or case definition. Cases were defined as invasive brain cancers ( ) diagnosed in the cohort at risk, namely all fire fighters who worked at AFS between January 1992 and December 2014.

QCR data for the period January 1992 to December 2011 (the most recent data reliably available at the time for the whole state) were also obtained to provide brain cancer rates for the whole of Queensland as a reference population.

To calculate the expected number of brain cancers in the AFS cohort, the total risk period – expressed in terms of ‘person-years’ at risk – was estimated from the duration of service for AFS fire fighters using five different assumptions, described below. The total workplace exposure time for this cohort (n=114 workers) is based on the sum of each person’s employment period (‘Entire tenure’) and totals 722.36 person-years.

Following this, a number of different analyses were performed to examine the potential effect of using different work exposure periods e.g. the analyses were performed after excluding all employees who had only short tenure (less than 1 year), excluding those with medium tenure (less than 5 years), and excluding those who had worked less than 10 years, as well as looking at brain cancer rates diagnosed among employees at any time from commencement through to the end of 2014 (including those who had left that employment). This resulted in the five different risk period categories shown below.

### Risk period categories

- **Entire tenure** – the total employment period at AFS, defined as the duration of exposure period from the employee’s start date at AFS until their separation date, or the date of diagnosis of brain cancer, whichever is sooner. Cancer rate calculations include all cases to 2014 but the risk period (denominator) is based on person-years of employment (exposure) only.
- **All staff, followed to end-2014** - defines the risk period as commencing at the employee’s start date, and continuing until 31 December 2014, or until date of

---

<sup>1</sup> “Auxiliary” fire fighters are employed at a casual capacity to respond to emergencies in a local area. They work a minimum of 2 hours per week plus call outs as required plus 75% of regular drills and training sessions as permanent full-time fire fighters.

diagnosis of brain cancer. This period therefore includes the 'exposure' period plus a possible latency period, and makes the (appropriate) assumption that the risk of cancer progression or latent period may continue on after departure from employment at the AFS.

- **Minimum one year tenure, followed to end-2014** – where duration of exposure for employees was at least one year (i.e. individuals employed for one year or less were excluded from the study). Cancer rate calculations include all brain cancer cases to 2014 and the risk period (denominator) is based on total person-years elapsed since commencement of employment up to the end of 2014 or to the time of diagnosis of a brain cancer case.
- **Minimum 5 years tenure, followed to end-2014** – where duration of workplace exposure was at least 5 years (i.e. excludes those workers who had less than 5 years employment). Cancer rate calculations include all brain cancer cases to 2014 and the risk period (denominator) is based on total person-years elapsed since commencement of employment up to the end of 2014 or to the time of diagnosis of a brain cancer case.
- **Minimum 10 years tenure, followed to end-2014** – where duration of workplace exposure was at least 10 years (i.e. individuals employed at AFS for less than 10 years were excluded). Cancer rate calculations include all brain cancer cases to 2014 and the risk period (denominator) is based on total person-years elapsed since commencement of employment up to the end of 2014 or to the time of diagnosis of a brain cancer case.

To determine if the occurrence of [redacted] brain cancers was higher or lower than would be expected when compared with a reference population, the Standardised Incidence Ratio (SIR) – which is the ratio between the observed and the expected numbers of [redacted] brain cancers in the cohort – was calculated using the above different risk period scenarios.

The data were also analysed using the same five categories of risk period shown above, but after excluding the fourth (most recent) case. This was done to explore an assumption that a familial tendency was the predominant influence (see further discussion below).

Two sets of analyses were undertaken using two reference populations: the general Queensland population and the local Atherton population.

The first set of analyses estimated the number of [redacted] brain cancers that would be expected among AFS fire fighters if their risk of developing these cancers was the same as that in the general Queensland population. The expected number of cases was calculated by stratifying the risk period into five-year age groups and multiplying by the age-specific rates of invasive brain cancers in the Queensland population from 1992 to 2011, sourced from the Oncology Analysis System (OASys), Queensland Cancer Control Analysis Team).

The second set of analyses estimated the number of [redacted] brain cancers that would be expected among AFS fire fighters if the rate was the same as that in the Atherton population between 1992 and 2011. The analysis was similar to the first except that age-specific rates were based on that of the local Atherton population over the same period. As this step made very little difference to the results, they are not shown in any detail in this report.

The year 1992 was chosen as the starting point for the analysis because that was the year in which the first cancer case was reported to have occurred – and it was also used for consistency with the date used in the previous Queensland Health 2008 report. In theory perhaps an earlier date could have been chosen (because of issues such as expected latency periods) and the calculated brain cancer incidence rate may have been slightly different as a result. However less accurate workplace employment data for the pre-1992 period would have impacted on the reliability of such an analysis.

It should be noted that in 2014 Monash University released a longitudinal study on the Health of Fire fighters in Australia<sup>4</sup>, for which QFRS provided service records for Queensland fire fighters.

The analysis team at Queensland Health requested assistance from Monash University to conduct similar analyses related to the number and type of incidents attended by fire fighters from the AFS; however after a review of the data provided, Monash University was not able to provide further analysis due to gaps in the data set. Not all employees had a full job history and incident data was only provided from 1 January 2000, which did not allow for exposure analysis of all cases (first case diagnosed in 1992), and 32% of fire fighters and 56% of auxiliaries did not attend incidents.

## Results

There were [redacted] confirmed cases of [redacted] brain cancers among 114 fire fighters in the AFS cohort. Standardised Incidence Ratio (SIR) estimates indicate that this number of cases is between 43 and 110 times higher than would be expected if the AFS fire fighters had the same risk of developing these cancers as the general Queensland population (see Table 1).

**TABLE 1: Standardised Incidence ratios (SIR) for AFS astrocytoma cases, using Queensland as reference population\***

Risk period	Persons at risk	Observed cases	Expected cases	SIR	p-value	95% CI	99% CI
"Entire tenure" period only	114			110	0.000296	30 - 281	18 - 346
All staff, F/up to 2014	114			43	0.000690	12 - 111	7 - 132
Min 1 y tenure, F/up to 2014	85			52	0.000576	14 - 132	9 - 162
Min 5 y tenure, F/up to 2014	45			35	0.018928	4 - 125	2 - 160
Min 10y tenure, F/up to 2014	22			26	0.108168	1 - 144	0 - 192

(\*Please note that the number of decimal places used in parts of this table suggest a higher degree of precision than is actually possible, given the low case numbers involved)

The SIR estimates shown in Table 1 vary widely depending on assumptions about the risk period.

The “**Entire tenure period**” analysis produces an inflated standardised incidence ratio (SIR) of 110 because it limits the denominator (in this case, person years of work) to the period of employment for each employee, and does not follow employee years of exposure right through to the end of 2014, including when after the employee may have left work. If a hypothetical exposure risk had been occurring at work, a cancer risk may be presumed to continue on after a person has left work (due to latency periods) - and so this particular calculation does not add particular value but is shown for context.

The “All Staff, followed to end – 2014” group analysis essentially follows the entire AFS workplace from commencement of employment through to end-2014, and provides a SIR for the four cases that occurred, without making any assumptions about biological plausibility in relation to latency periods for brain cancers, nor does it take into account other possible influences such as familial factors. The SIR for this entire group was 43, which is statistically significantly higher than the expected number of cases.

The next three scenarios in Table 1 provide SIR estimates in AFS firefighters following employment for at least one year, five years and ten years respectively. These scenarios help to ascertain whether there is any connection between duration of employment and brain cancer risk. If there was an ongoing (but hitherto unrecognised) workplace exposure that was contributing to brain cancer risk, one would expect to see a correlation between duration of employment and the SIR such that the longest employment duration group would have the highest SIR.

In fact, in this analysis, the reverse was seen i.e. the SIR (26) was not higher in the longest-term employee group when compared with the group including shorter-term employees (SIR 52), or compared with all employees combined to end-2014 (SIR 43).

It is difficult to draw any firm conclusions at all regarding trends across employment groups when case numbers are so low, but the SIR results above are likely to reflect the fact that two cases of brain cancer occurred in people who had less than 5 years employment at the AFS before their diagnosis – this is discussed further below.

Statistical calculations for the SIR of 26 seen in the “Minimum 10 years tenure” group produced a *p*-value of 0.11, indicating that the number of observed cases (one) in this group was not statistically significantly higher at the 95% confidence level, than the number of expected cases (0.04). Obviously in practice it is not possible to have just 0.04 of a ‘case’, and this underscores the need for care in interpretation of the figures in Table 1 when such low case numbers are involved.

The above estimates are based on a very small number of cases and therefore have poor precision. The 95% confidence intervals (CI) presented in Table 1 indicate that the precision is such that, with the “All Staff, followed to end – 2014” group for example, the SIR could be as low as 12 or as high as 111.

The [redacted] case diagnosed in [redacted] shared a familial relationship as well as employment history with [redacted] of the three cases included in the 2008 investigation. Family history is one of the known risk factors for brain cancers, and may indicate that other potential factors such as environmental exposures are less relevant. Too little is known to be definitive on this point, but to control for increased risk of brain cancer associated with a family history, SIR estimates for the range of employment categories were also calculated based on three cases of [redacted] brain cancers. This was the same number of cases observed during the first Atherton cancer cluster investigation in 2008, but the calculations were made using the most recently available employment duration data covering a longer period of time to 2014 (after excluding one individual's employment time). As would be expected, this produced lower SIRs (e.g. 33 for the "All staff, followed to end-2014" group). The results do not add substantially to the overall conclusion of this report and given the epidemiological uncertainties about how to deal with cases with a familial link, are not further reproduced here.

SIR estimates were also calculated using the local Atherton population as the reference population, but the results were not substantially different from those derived using the entire Queensland population as the reference. For example, the SIR for the "Entire tenure" group using Atherton as the reference population was 85 (95% CI 23 – 218) compared with a SIR of 110 (95% CI 30 – 281) when Queensland as a whole is the reference population. As it is statistically more appropriate to use a larger population reference group the remainder of the results using Atherton reference population are not reproduced here.

## Discussion

Recent Australian and international studies have examined the risk of brain cancer in large cohorts of fire fighters. In June 2009, Monash University released a Cancer Incidence Study for Queensland Fire Fighters<sup>3</sup>, and found that the SIR for brain and central nervous system malignant tumours was 1.09 (95% confidence interval: 0.45 – 2.62), which was not significantly different to the rate observed in the general population.

The Australian Fire Fighters' Health Study published by Monash University in 2014 involved more than 230,000 volunteer, part and full-time fire fighters<sup>4</sup>. The study did not find elevated risk of brain cancers except in a subset of part-time female fire fighters who made up about 0.6% of the total cohort and included three cases of malignant brain cancers. Another US study involving 30,000 career fire fighters identified 51 cases of malignant brain cancers among firefighters but found that the risk was similar to the general population.

Assessment of other recent scientific literature indicates that the association between brain cancer and fire fighting has been examined, but has not been consistently found to be statistically significant. A 2010 monograph by the International Agency for Research on Cancer<sup>5</sup> examined firefighting as an occupational risk for cancers, including brain cancer, and noted four studies – all among US firefighters – where an increased risk of brain cancer was observed, however as with many other studies the small case numbers of brain cancers observed sometimes contributed to wide confidence intervals in the results. The overall assessment by IARC in relation to the broad range of cancer types reviewed, was that



“occupational exposure as a firefighter is possibly carcinogenic to humans (Group 2B)” (which is defined by IARC as meaning that there is some evidence that firefighting can cause cancer in humans but at present it is far from conclusive).

While this and other work such as that carried out by Monash University in Australia suggests that the rate of occurrence of brain cancer in fire fighters may not be very much different from that of the general population, a ‘weight-of-evidence’ review (which does not necessarily imply scientific proof of causation) carried out for the Department of Veterans’ Affairs in 2014<sup>6</sup> found that there was sufficient evidence to make a recommendation regarding brain cancers (gliomas) being associated with fire fighting.

A number of states and federal jurisdictions have enacted or are enacting “Presumptive Legislation” in relation to a number of defined types of cancers which provides for the removal of the onus on the individual to prove the correlation with their employment. For example the Commonwealth Safety, Rehabilitation and Compensation Act (1988) includes primary brain cancers in the list of conditions eligible for compensation, if employed as a fire fighter for a minimum of five years.<sup>7</sup>

With the current analysis of the AFS brain cancer case numbers, there are several aspects tending to suggest that the observed cluster may have occurred by chance rather than some unrecognised causal factor in the AFS workplace environment. Analysis of different employee groups based on duration of employment did not suggest an association between longer employment and cancer risk. Two of the brain cancer cases occurred within 5 years of commencing employment at AFS (whereas it is generally held that a longer ‘latency period’ applies with brain cancers along with many other cancer types). Two of the cases had a familial connection, which is recognised as an independent risk factor for brain cancers. Once again, however, it has to be stressed that the small case numbers involved make it impossible to draw firm conclusions.

The Monash University review of the current literature suggests that most of the SIR of brain cancer in these types of studies range from less than 1 to approximately 2, the interpretation being that the risk of brain cancer in fire fighters in these studies is similar to that of the general population.

In contrast, the SIR estimates for malignant brain cancer in the AFS cohort were reported as ranging from 21 to 62 times higher than expected in 2008, and 26 to 52 times higher than expected in the present analysis under various assumptions of exposure and risk periods (noting that the SIR figure of 110 is not able to be accorded any weight due to the assumptions used in it). However, despite these apparently extreme results, great caution is required in their interpretation.

First and foremost to take into account in interpretation is the very small numbers of cases under analysis. Compared to SIR values reported in the literature for brain cancer among fire fighters, the SIR estimates in the current analysis can be described as extremely or unusually high. Although standardised incidence ratios are the standard statistical tool used to measure the magnitude of suspected cancer clusters, it should be noted that the occurrence of only one case of  brain cancer in this small population would produce an usually high SIR, appreciably higher than the 1 to 2 cited in the current literature. The high SIR for one

single case highlights the need for caution in interpretation, as well as the challenges involved in investigating these events particularly in relation to defining the population at risk.

Although the quality of the employment data available for the 2015 analysis was more robust overall compared to 2008 data (e.g. in terms of whether an employee was auxiliary or a full time fire fighter), the limitations on the completeness and quality of the original 2008 data set still exist. As the original data set was included in this analysis, those limitations continue to impact the SIR of this current analysis and the statement in the 2008 report still holds true that “the magnitude of the increase was difficult to assess due to incomplete historical employment records”.<sup>1</sup>

A recent comprehensive review of cancer cluster investigation methodology indicated several challenges common to cancer cluster investigations that need to be considered when undertaking these investigations, including the timing of disease development, problems associated with small numbers, defining the boundaries and cluster area populations, and migration.<sup>8</sup> These aspects are discussed further below, in the context of this current investigation.

*Timing of disease development:*

The development of cancer is a complex process influenced by individual and possibly environmental factors. Different cancers develop over differing timeframes or latency periods, and many can take years before individual cell changes turn into larger tumours that manifest or cause symptoms clinically.

In terms of potential environmental factors and cancer-causing events at the cellular level, the latency period for most cancers is generally considered to be at least 5 to 10 years post exposure. Only  of the  cases were diagnosed more than five years after commencing employment with the AFS -  at greater than 10 years (the exact period at AFS for this case could not be determined accurately because of incomplete records), and  at 15 years. Of the other  cases,  was diagnosed just over two years after commencing employment at the AFS and the other was diagnosed  years after employment commenced, therefore they are much less likely to have been related to any occupational exposure at the AFS workplace.

Relevant to this issue is that cancers of the brain arising from brain tissue are relatively rare and may include twenty or more individual types. Each type may or may not be a different disease, with its own risk factors. Epidemiological studies do not distinguish among them because they are individually rare, subject to miscoding and are aggregated into a more general ICD code when they are reported. Based on expert advice at the time of the 2008 Queensland Health investigation it was determined that although the three brain cancer types recorded at that time were different from one another, given their similar cell origins and potential for progression between types, it was reasonable to consider them together.

*Problems of small numbers:*

The occurrence of a rare disease in a small at risk population complicates hypothesis testing and can produce measures of association that are difficult to interpret meaningfully.<sup>5</sup>

*Defining boundaries and cluster area populations:*

As part of the epidemiological investigation a reference population must be chosen to measure the magnitude of the occurrence of cases to determine if the suspected cluster truly meets the definition of a greater than expected number of cases. The geographical boundaries of the suspected cluster are often based on the population where the event occurred, this referred to as the “natural reference population”. While this selection of a natural reference population seems logical, it is arbitrary and can influence the estimate of relative risk. The result can be a missed opportunity to detect a true cluster or – more commonly - give the impression of observing a cluster where none exists.<sup>9,10</sup>

*Migration:*

As a result of the long latency period between exposure and the development or diagnosis of disease, there is potential for population movement in and out of the location where the suspected exposure exists. In regards to the cases at the AFS, all [redacted] cases had lived in communities other than Atherton, and had worked as fire fighters at other fire stations, further complicating the analysis of exposure.

The analysis was conducted on known cases of primary brain cancer for this cohort, as it was beyond the scope of this investigation to identify any unidentified cases of diagnosed brain cancer among those who have left the AFS. However, QFRS were confident that any past cases would have been previously identified in this small cohort and given the high staff awareness it would be reasonable to assume this is the case.

A similar potential limitation to the investigation may have been that deaths data (for all causes) were not collected across the entire AFS cohort and used to refine the calculation of total person-years of exposure. However based on available information this would be likely to have only minor impact on the overall results.

In addition to the above issues, and as discussed earlier, a further factor for consideration is that [redacted] of the [redacted] cases share a familial relationship and employment history including prior to AFS. This raises the possibility that genetic factors and/or previous occupational hazards may have contributed to the observed incidence of brain cancers at the AFS. Unfortunately, investigation of these factors is beyond the scope of the present analysis.

## Conclusion

This investigation has sought to determine if the rate of [redacted] brain cancers among fire fighters who had worked at the AFS is higher than the rate in the general population, and if there is any new evidence in the literature to demonstrate a link between occupational or environmental exposures in fire fighting and the development of brain cancers.

The analyses indicated a higher than expected rate of [redacted] brain cancers in the cohort of AFS fire fighters. However caution must be used in interpreting the results due to issues complicating the investigation of cancer clusters outlined in the discussion: the small number of cases, the latency period associated with cancer development, movement of the cases and other factors.

Scientific and statistical experts who have been involved in cancer cluster investigation have observed that there is a tendency to observe patterns, especially in small populations where the same illness is observed, when in fact the suspected cluster may in fact be a result of random distribution as part of a larger population.<sup>11</sup>

A review of 400 reports of investigations into suspected cancer clusters in the USA since 1990 demonstrated that an increase in expected incidence was confirmed in 72 of these investigations, with only three were linked to a hypothetical exposure; and only one of the 400 investigations identifying a clear cause.<sup>12</sup>

Given the information provided, the results of the analysis, lack of hypothesised agent of exposure, or conclusive statistical evidence in terms of causation in the current scientific literature (particularly in the Australian context) this investigation was unable to add significant additional insight to the previous investigation in 2008.

This analysis has followed the Queensland Health Guidelines for the Assessment of clusters of non-communicable disease to the level of a Type 2 cluster assessment.<sup>13</sup> Whilst this analysis did find an excess number of cases beyond what would be expected within the population, there was a lack of evidence of exposure to a biologically plausible agent - as was the case in 2008.

Further statistical analysis on this cluster would require highly specialized expertise. A specialized cluster analysis could be undertaken to further examine these cases within a Queensland Health Type 3 cluster investigation, however based on all the available evidence it does not appear likely that additional useful information would be obtained. Queensland Health Guidelines for the assessment of non-communicable disease do not recommend proceeding to a Type 3 cluster assessment unless there is a plausible biological cause, or new evidence about causation, and they also recommend taking into account the practicality of further assessment. In this case, the main relevant new epidemiological evidence since 2008 is a study undertaken by Monash University which found no conclusive evidence of a link between fire fighting and brain cancer.

Therefore in accordance with the guidelines it was decided not to proceed to further analysis unless further information which would indicate this should be done becomes available.

## References

1. Queensland Health. 2008 Queensland Health investigation into concerns regarding cases of cancer in firefighters working at Atherton Fire Station. Report S005.2b available at: [www.emergency.qld.gov.au/publications/Final%20report%20AFS.DOC](http://www.emergency.qld.gov.au/publications/Final%20report%20AFS.DOC), and <http://qheps.health.qld.gov.au/dcho/epidemiology/resources.htm>.
2. National Health & Medical Research Council. Statement on Cancer Clusters. NHMRC [www.nhmrc.gov.au/files/nhmrc/publications/attachments/ps0906\\_statement\\_cancer\\_clusters.pdf](http://www.nhmrc.gov.au/files/nhmrc/publications/attachments/ps0906_statement_cancer_clusters.pdf) (accessed 5 August 2015).
3. Monash University. Final Report on Queensland Fire Fighters' Cancer Incidence Study. Monash Centre for Occupational and Environmental Health. June 2009.
4. Monash University. Final Report Australian Firefighters' Health Study. Monash Centre for Occupational and Environmental Health. December 2014.
5. International Agency for Research on Cancer. IARC Monographs On The Evaluation Of Carcinogenic Risks To Humans. Volume 98 (2010) Painting, Firefighting and Shiftwork. <http://monographs.iarc.fr/ENG/Monographs/vol98/> (accessed 19 August 2015).
6. Guidotto T L. Health Risks and Occupation as a Firefighter. A report prepared for the Department of Veterans' Affairs, Commonwealth of Australia. 2014. <http://www.dva.gov.au/about-dva/publications/research-and-studies/health-risks-and-occupation-firefighter> (accessed 5 August 2015)
7. Australian Government. Safety, Rehabilitation and Compensation Act No. 75 1988 (Applies to Firefighters employed under Federal Awards, ie Civil Aviation Safety Authority (CASA), Aviation Fire and Rescue Firefighters).
8. Michael Goodman, Judy S. Lakind, Jerald A. Fagliano, Timothy L. Lash, Joseph L. Wiemels, Deborah M. Winn, Chirag Patel, Juliet Van Eenwyk, Betsy A. Kohler, Enrique F. Schisterman, Paul Albert and Donald R. Mattison. Cancer Cluster Investigations: Review of the Past and Proposals for the Future. *Int J Environ Res Public Health*. 2014 Feb; 11(2): 1479-1499
9. Michael D. Coory and Susan Jordan. Author's Response to commentaries on 'Assessment of chance should be removed from protocols for investigating cancer cluster'. *International Journal of Epidemiology*. 2013;42(2); 440-447
10. Renato Assuncao. Commentary: Statistical assessment of cancer cluster evidence- in search of a middle ground. *International Journal of Epidemiology*. 2013;42: 453-455
11. Queensland Health. Cancer Clusters: Frequently asked questions. 2011

12. Michael Goodman, Joshua S. Nairman, Dina Goodman and Judy S. Lakind. Cancer clusters in the USA: What do the last twenty years of state and federal investigations tell us? *Critical Reviews in Toxicology*. 2012 Jul; 42(6): 474-490.
13. Queensland Health. Queensland Health Guidelines: Assessment of clusters of non-communicable disease. 2012 Available at:  
<https://www.health.qld.gov.au/epidemiology/publications/non-comm-diseases.asp>

RTI Release

## Mary Delahenty

---

**From:** Sdlo  
**Sent:** Friday, 18 September 2015 12:58 PM  
**To:** EXEC SUPPORT  
**Subject:** FW: BR062225: Atherton Fire fighters cancer cluster  
**Attachments:** 20150918125053637.pdf

FYI below

Jessica Martin  
Director

Departmental Liaison and Executive Support Unit | System Governance Support Branch | Office of the Director-General Department of Health | Queensland Government Queensland Health Building, Charlotte Street, Brisbane, 4000 t. [REDACTED]@health.qld.gov.au | [www.health.qld.gov.au](http://www.health.qld.gov.au)

-----Original Message-----

**From:** Sdlo  
**Sent:** Friday, 18 September 2015 12:49 PM  
**To:** Tess Bishop  
**Cc:** news; CLLO  
**Subject:** BR062225: Atherton Fire fighters cancer cluster

Hi Tess,

Please see attached comment from the Minister regarding this brief:

"Director-General, please liaise with my office to release the report publically".

I have cc'd the media team in relation to the publication, and CLLO for addition on the next DG/Min meeting agenda.

Regards,  
Jess.

Jessica Martin  
Director

Departmental Liaison and Executive Support Unit | System Governance Support Branch | Office of the Director-General Department of Health | Queensland Government Queensland Health Building, Charlotte Street, Brisbane, 4000 t. [REDACTED]@health.qld.gov.au | [www.health.qld.gov.au](http://www.health.qld.gov.au)

10 JAN 2017

# Director-General Brief for Approval

Requested by:

Department  Minister's office

Department RecFind No:	BR065584
Division/HHS:	Cairns & Hinterland
File Ref No:	

**SUBJECT: Director-General approval to access line-listed cancer registry data for Tropical Public Health Service (Cairns) to facilitate assessment of a possible cancer cluster**

## Recommendation

It is recommended the Director-General:

- Approve** access to line-listed Queensland Cancer Registry data for Dr Richard Gair, Director and Ms Sally Rubenach, Acting Epidemiologist, Tropical Public Health Service Cairns, to facilitate the assessment of a possible cancer cluster in Cairns.

**APPROVED** / ~~NOT APPROVED~~

**MICHAEL WALSH**  
Director-General

Date: 11/1/2017

Ministerial Brief for Approval required

Ministerial Brief for Noting required

## Director-General's comment

Please provide update on outcome once assessment is completed

	RECORDS TEAM	DEPT. OF HEALTH
	12 JAN 2017	

## Issues

- The Queensland Department of Education and Training (DET) has advised the Cairns and Hinterland Hospital and Health Service (CHHHS) of concerns [redacted] regarding several former students of the Redlynch State School in Cairns who have been diagnosed with brain cancer.
- DET is seeking advice from CHHHS regarding the existence of the cancer cluster and whether any relationships between the affected persons, their conditions and the schools they attended are more than coincidental.
- The Tropical Public Health Service (TPHS) Cairns, will undertake a Type 1 cluster assessment as per the Queensland Health Guidelines for the assessment of clusters of non-communicable diseases to determine if the cases reported are potentially a cancer cluster.
- TPHS Cairns requires access to line-list data from the Queensland Cancer Registry (QCR) to confirm that the persons named have been diagnosed with cancer, and to determine if the cancers are the same or similar.
- Under the *Public Health Act 2005* the Director-General's approval is required for the TPHS Cairns to access the following line list data from the QCR: Name of person, date of birth, date of diagnosis, address at time of notification, cancer site and morphology and date and cause of death if relevant/known.
- If this assessment concludes that the persons may potentially be a cancer cluster, a Type 2 cluster assessment will be undertaken to determine whether or not there is an excess of cancer cases meeting the case definition, and if there has been sufficient exposure to a biologically plausible causal agent for the cancers diagnosed.



Department RecFind No:	BR065584
Division/HHS:	Cairns & Hinterland
File Ref No:	

## Vision

- The investigation of a potential cancer cluster aligns with the direction to promote wellbeing and improve the health of Queenslanders through the prevention of illness and injury as set out in the 10 year vision My health, Queensland's future: Advancing health 2026: Promoting wellbeing, Delivering healthcare, Connecting healthcare, and Pursuing innovation.

## Results of Consultation

- Mr James Roche, Director, Organisational Safety and Wellbeing, DET, has been advised that TPHS Cairns will undertake an assessment to determine if the persons named represent a potential cancer cluster.
- TPHS Cairns has been advised that Director-General approval is required to access line list data by the Registrar, QCR, the Preventative Health Branch, Department of Health, and the Cancer Systems Coordinator, QCCAT, Cancer Services.

## Resource Implications (including Financial)

- Funding to make an assessment of whether or not the persons may represent a potential cancer cluster is within the existing allocation for the TPHS Cairns.

## Background

- The TPHS Cairns has been advised by an informant that  persons who attended the Redlynch State School in Cairns (now aged  years) have been diagnosed with brain cancer. The informant has indicated that  of the  persons named have died,  in  and  in .
- Two of the named persons were reported by the Cairns Post in an article published on 4 January 2016 (Attachment 1).

## Attachments

- Attachment 1: Article published in the Cairns Post, 4 January 2016 'Cancer battle for two Cairns school friends'.

Author	Cleared by:	Content verified by:
Sally Rubenach	Dr Richard Gair	Clare Douglas
A/Manager, Health Surveillance	Director	Chief Executive Officer
Tropical Public Health Service Cairns	Tropical Public Health Service Cairns	Cairns and Hinterland HHS
9 December 2016	9 December 2016	23 December 2016

# The Cairns Post

Attachment 1



**SHOCK:** Lisa Griffiths and Courtney Robinson were told by doctors of their large brain tumours in July – just 17 days apart. **PICTURE:** BRENDAN RADKE

Health

## Cancer battle for two Cairns school friends

Bianca Keegan, The Cairns Post  
January 4, 2016 6:25am

LISA Griffiths and Courtney Robinson went to the same Cairns primary and high schools and are now connected in their heartbreaking fight against an aggressive type of brain cancer.

“When you are diagnosed you are asked to do things you never thought you’d have to do at 22,” said Ms Griffiths, 23.

“I had to make a legal will, a power of attorney, advanced health directive ... and I had one night to think about IVF and I felt extremely emotional doing all of those things.

“You don’t plan for those things at 22.”

Both women were told by doctors of their large brain tumours in July – just 17 days apart.

Attachment 1

BOTH WOMEN WERE TOLD BY DOCTORS OF THEIR LARGE BRAIN TUMOURS IN JULY – JUST 17 DAYS apart.

“I was living in Japan working at Universal Studios because I was singing and dancing in a show over there,” Ms Robinson, 22, said.

“I was getting a lot of bad headaches but because of the costumes – the wigs I was wearing – I just put it down to that.

“I started having weird symptoms where my hand and arm would go numb and my face would go numb ...”

After seeing a Japanese neurosurgeon and undergoing an MRI scan, Ms Robinson was told of the life-changing news.

“They showed me the screen and there was this big huge hump right there. It was tough,” she said.

For Ms Griffiths, consistent migraines and the feeling her head was going to explode finally led to a blood test and CT scan.

“I went back to work (after the scan) and I got a call from my GP that I needed to come in immediately,” she said.

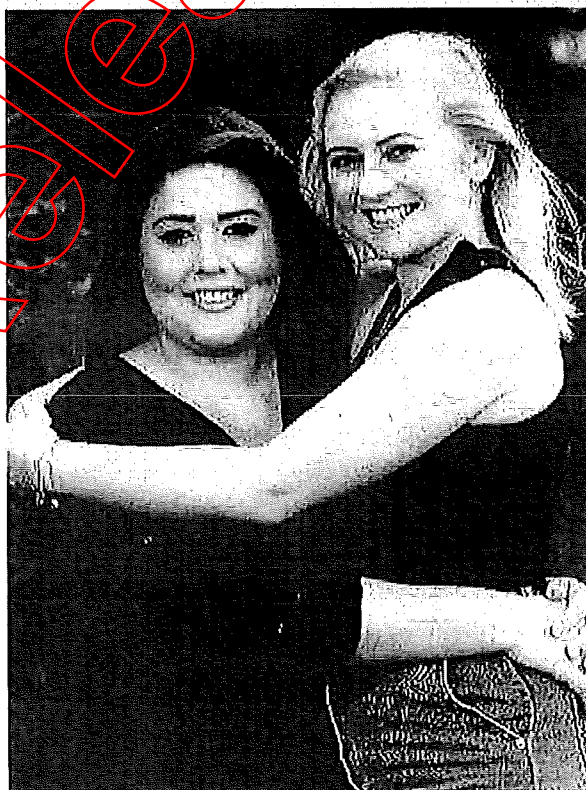
“I was told I had a large mass, a tumour in my brain, that had to be removed.

“I was admitted to hospital that afternoon and they started me on the steroids to stop the swelling in the brain.”

After a five-hour surgery in Brisbane, days in intensive care and learning how to walk again, Ms Griffiths found out her 7cm by 7cm tumour was malignant.

“After surgery I had 50 staples removed from my head, then I started on chemo and radiation,” she said.

“I’m now on a roster of five days of chemo a month and 23 days off and so I’ll do that for six months and I’ll finish that in April.”



© CLOSE BOND: Former Cairns State High students Lisa Griffiths and Courtney Robinson are two of about 1400 people each year are diagnosed with brain cancer. They are staying positive in their fight against the disease. PICTURE: BRENDAN RADKE

## Attachment 1

"I'm now on a roster of five days of chemo a month and 23 days off and so I'll do that for six months and I'll finish that in April."

About 1400 people each year are diagnosed with brain cancer, and despite being the most expensive type of cancer to treat, it is the least-funded in terms of research.

"The prognosis for all brain cancers is only two in 10 people live after five years, but I try not to think about the statistics because everyone is different," Ms Griffiths said.

"With brain cancer, you don't go into remission like you do other cancers."

"Your life consists now of medical appointments and scans every three months until whenever your time is up, I guess.

"You just have to hold on and hope there are more trials that come out."

Ms Robinson, who also underwent surgery and is on a similar treatment plan to her friend, said the pair had to remain positive.

"It's not good. It's a pretty grim prognosis," she said.

"It is the worst kind of cancer you can get but we're young, we have probably a better outlook than other people. You just have to stay positive about it."

While agreeing plans were hard to make for 2016, Ms Griffiths said she would await the completion of chemotherapy in April before planning her wedding to long-time partner Keiren Wilson. The women are hoping to raise awareness of brain cancer and have set up fundraising pages with all money going directly to brain cancer research.

To support the women visit <http://bit.ly/1QZZxdJ> and <http://bit.ly/1MHU4QG>

Data extracted from Non-communicable Disease Cluster Register, Queensland Health

Cluster ID	Data entered by (name)	Region	PHU	Date notified	Staff who was contacted by the informant	Name	Position	Agency	Phone and / or email	Identifiable Location	Setting	Does it involve children?	Disease of suspected cluster	Sub-type 1	No. of cases
T1701	Sally Rubenach	Tropical	Cairns	1/12/2016	Sally Rubenach	[redacted]	[redacted]	Whitfield State School	[redacted]@eq.edu.au	Cairns	[redacted]	No	Cancer	Brain	3

Sub-type 2 (if known)	No. of cases	Sub-type 3 (if known)	No. of cases	Sub-type 4 (if known)	No. of cases	Sex by sub-type(s)	Age by sub-type(s)	Suspected hazard, if any identified	Denominator population or population at risk	Communication strategies applied	Committee involvement	QH Integrated Communications consulted?	Has the minister been informed?	Details verified against cancer registry?	Study period or years of data considered
Adenocarcinoma, unspecified primary site.	1					Sub-type 1 = 1 [redacted] 2 [redacted] Sub-type [redacted] type [redacted]	Age at diagnosis: Sub-type 1 [redacted] [redacted]. Sub-type [redacted]	Unknown	TBD	Brief to DG		No	Yes	Yes, verified	

Assessment status	If 'inactive', date became 'inactive'	Date of completion of assessment	Approx hours worked	Highest level of assessment Type	Final comments
On-going					

RTI Release