Voices of the Valley
Voicing the concerns of the Latrobe Valley community
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Voices of the Valley
Incorporated Association A0060859B

22nd September 2014

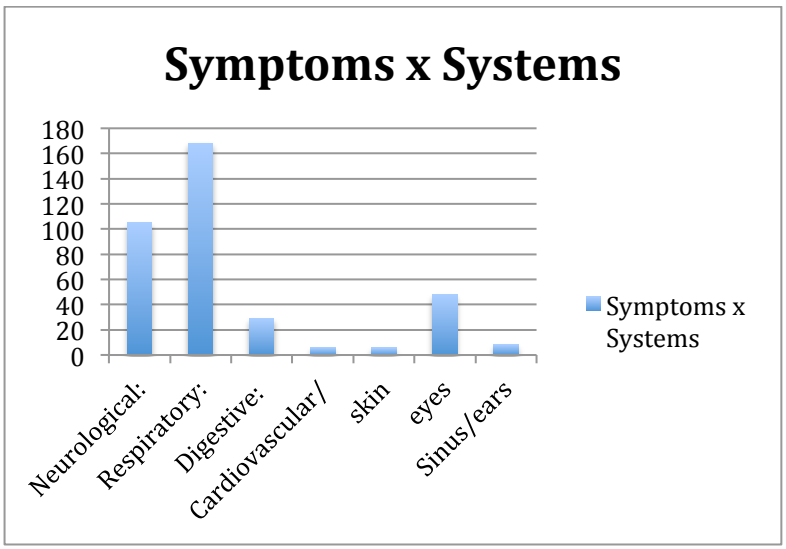
The Coroners Court of Victoria,
Level 11,
222 Exhibition St,
Melbourne ,
3000

Supporting evidence in the Request to investigate a fire – Application, Submitted by Voices of the Valley Inc. 17 September 2014

Dear Coroner,

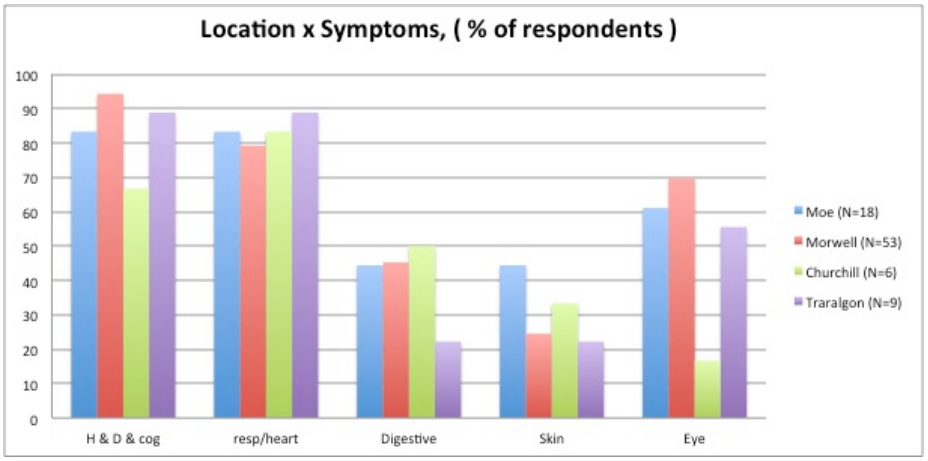
This letter presents an overview and collation of relevant evidence that has emerged locally in the Latrobe Valley through the work of VOTV members volunteering their time

1. Voices of the Valley **Snapshot Survey of 2nd March 2014** highlights the widespread experience of distressing effects from toxic smoke, contrasted with reassuring official statements that health indicators had not significantly changed after three weeks of smoke exposure. That survey concluded that *"the population was effectively disabled by smoke"* and *"disorientated with pain, distress and mobility issues."* and that financial assistance offered was insufficient to cover the actual losses being incurred by many of the most disadvantaged. An annexure there argues passionately for a long term health study.

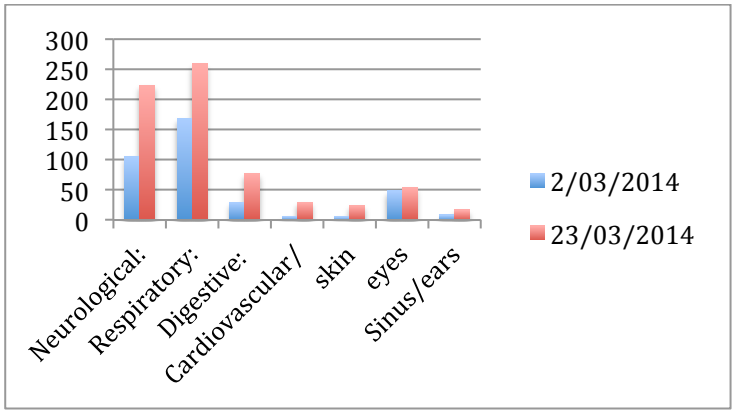


2. Voices of the Valley **Online Wellness Survey 5th – 17th March 2014** exploring the

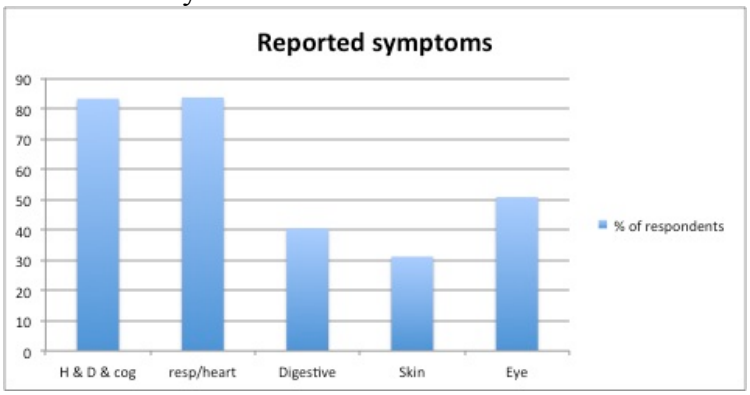
hypothesis that one report of severe symptoms at a range of 10 kilometres was not an isolated case but typical of what many people were experiencing across broad areas of the Latrobe Valley many kilometres from Morwell.



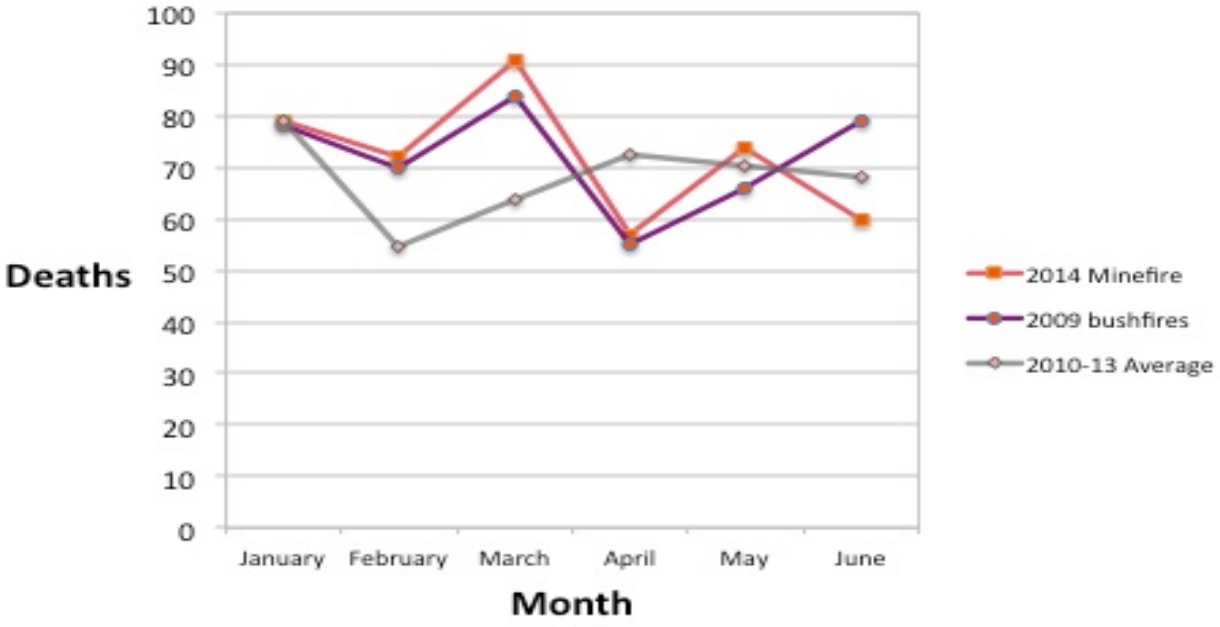
3. Voices of the Valley **(re) Affidavits gathered at Kernott Hall 24th March 2014** – where trends of symptoms are charted and shown to be increasing.



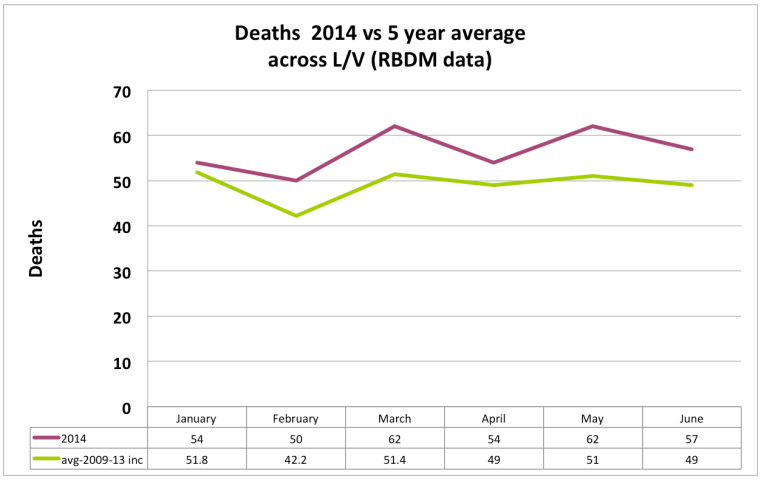
4. The correlated data information sheet given by hand to Rosemary Lester, Chief Health Officer for the Department of Health on the 6th of May during the Community consultations. It was to inform the Health Department that the effects were consistent across a large area, not just the south of Morwell, and requesting an official snapshot of the valleys health as it was feared the long term study would be no more than a body count.

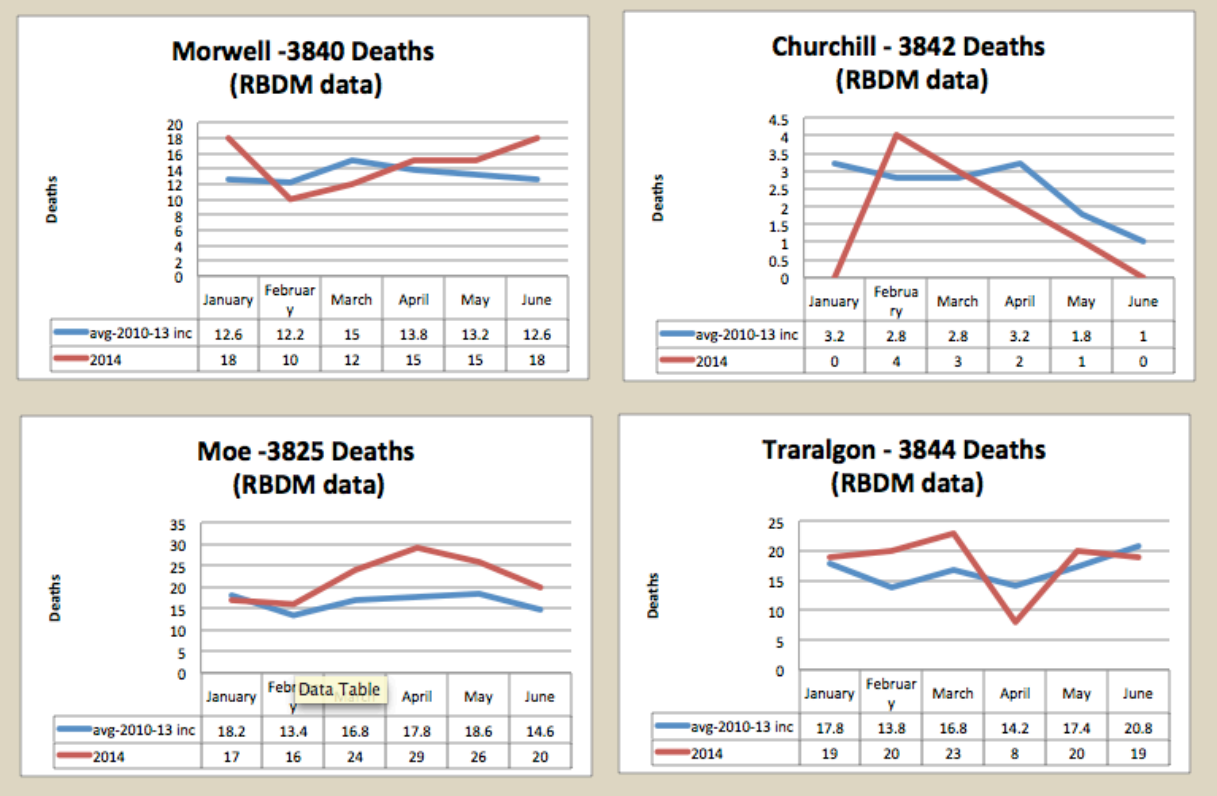


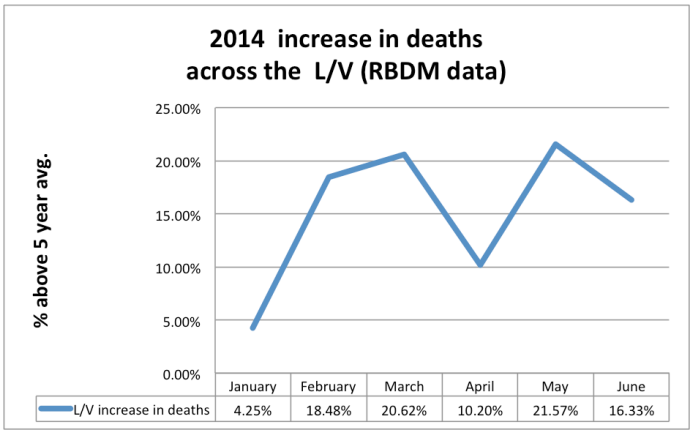
5. This section is a letter with VOTV's initial analysis of deaths statistics obtained by a careful tally of unique death notices in the local newspaper, the **Latrobe Valley Express.** Over 150 editions of the newspaper were photographed, so that relevant data could be extracted and tabulated. Particular care was taken to remove the many duplicate entries. This is the Letter the committee voted unanimously to send immediately to the Inquiry to seek advice. They have informed us that they have forwarded it to you but we are including it for housekeeping.



6.An analysis and presentation of the **Registry of Births Deaths & Marriages official death statistics,** which were not received until after the Inquiry reported.
This data, not only confirmed the trends seen in our "Death Notices" newspaper analysis, but were worse.



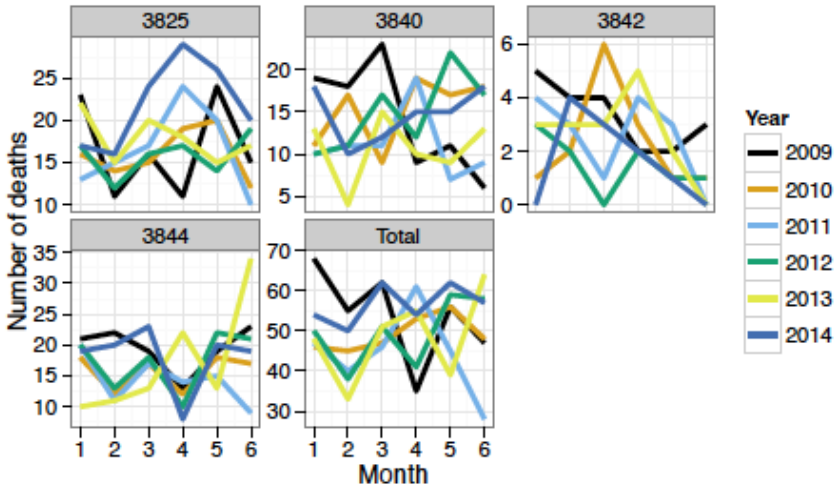




To check for scientific validity and to quantify the deaths, VOTV asked health statistician Associate Professor Adrian Barnett, from Queensland University of Technology to do a thorough statistical analysis.

7. **Associate Professor Adrian Barnett from QUT,** conducts statistical analyses of public health problems, including air pollution. VOTV has no reason to doubt that Professor Barnett is a competent practitioner in applying it appropriately to the simple problem we gave him.

Professor Barnett's key finding is a clear statement of 80% probability that the increased death rate attributable statistically to the fire was 11%.



8. **Voices of the Valley Form 16 application to the Coroner 17th September 2014**

9. Reference receipt for Application Form 16.

Conclusion:

It would be good to get further access to BDM data particularly as to cause of death, and some commitment to and help in righting the historic health deficit pointed out so succinctly in the Minefire Inquiry's report.

We need specialists to hold training sessions with our doctors to give guidance on what to look for and how to treat it.

We need a Health Conservation area and regulatory measures taken to make sure that our area is safe to live in.

This mine fire was an industrial spill on a massive scale, not a natural disaster.

Our cities are surrounded by privatised mines that the government regulates.

We are asking that they are made safe for our health and our children's health.

Yours faithfully,

Wendy Farmer

Voices of the Valley, 22nd September 2014

V.O.T.V.

Snapshot Survey

2nd March

Kernot Hall Morwell

V2.a 11/5/2014

Ron Ipsen

Introduction

Introduction

On February the ninth 2014 a bushfire sparked a fire in the Morwell Open Cut. It burned for 45 days before being declared safe. During this time a plume of toxic smoke covered the cities within the Latrobe Valley with Morwell less than 500 meters from the fire particularly affected. The fire is still officially burning.

During this time The Cities within the Latrobe Valley were subject to unprecedented levels of smoke and toxic ash, the volume and duration of which was dependent on the direction of the changeable winds.

People began to get sick, reporting via friend and relative networks, via social media and via normal social conversations to each other and comparing symptoms and severity.

People turned to the Mainstream media to see what was going on and what was happening to them but The Department of Health Spokesperson there was issuing statements like “There have only been 3 people present to the local hospital with any symptoms so there cannot be any problem.”

After 3 weeks the residents of the Valley held a protest meeting, the media described it as a cry for help and indeed it was.

At that meeting Thousands of questionnaires were handed out and many were filled in on the spot, collected then, and some were mailed in later.

Methodology

The residents at the meeting were handed a questionnaire and encouraged to record their experiences.

The questions were few and open ended

1 page questionnaire handed out at the Rally on 2nd of March 2014

Latrobe Valley Residents

Your information below will help us provide data that will be used to improve the situation in Morwell.

Your personal details will not be disclosed. Feel free to leave out your personal details if you like and just complete the health issues and financial impacts on you.

Thank you for your help.

Name:

Address:

List your families health issues since the mine fire commenced on the 9th of February:

List the financial impact of the mine fires on you and your family or your business:

Additional comments or concerns:

This information will be collated and used to inform relevant departments regarding your needs.

Of the sheets handed out 341 were gathered together and correlated for this study.

The information on the sheets was hand typed into a database by a team of operators and then the resultant data was analysed by symptom reported and appropriate system.

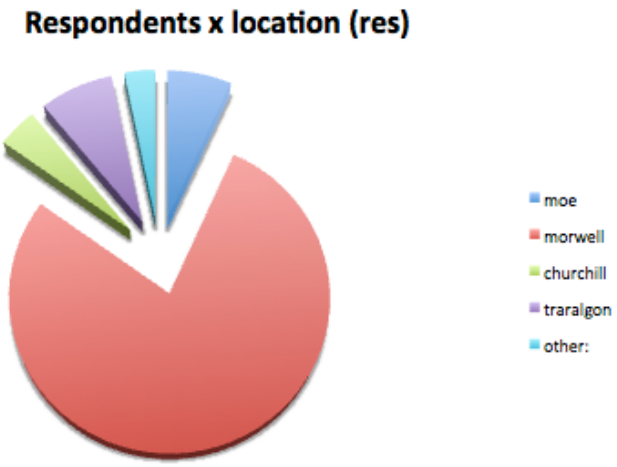
There was little need to analyse by location and symptoms because previous studies had already shown the correlation there.

The individualized symptoms within a system are shown as percentage of respondents reporting that symptom.
Systemic totals were gathered by a simple addition of the percentages of individual reported symptoms within that system. The totals for systemic calculations can exceed 100% of respondents as many respondents had more than one symptom within a group, for example a respondent may have answered both *asthma flare up/start* and *difficulty breathing*

Results

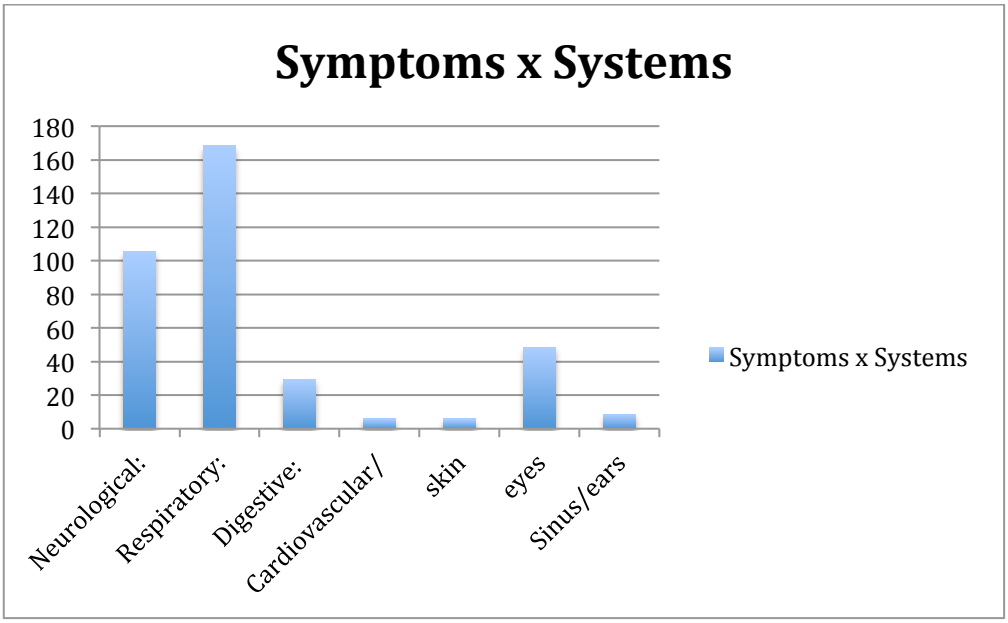
V.O.T.V. snapshot done 2nd March

V2.a 11/5/2014



Respondents to survey are from a wide area across the Latrobe Valley and some beyond.

Symptoms shown are the same across the whole surveyed population. All were affected in the same way, though number of affected respondents varied with location.



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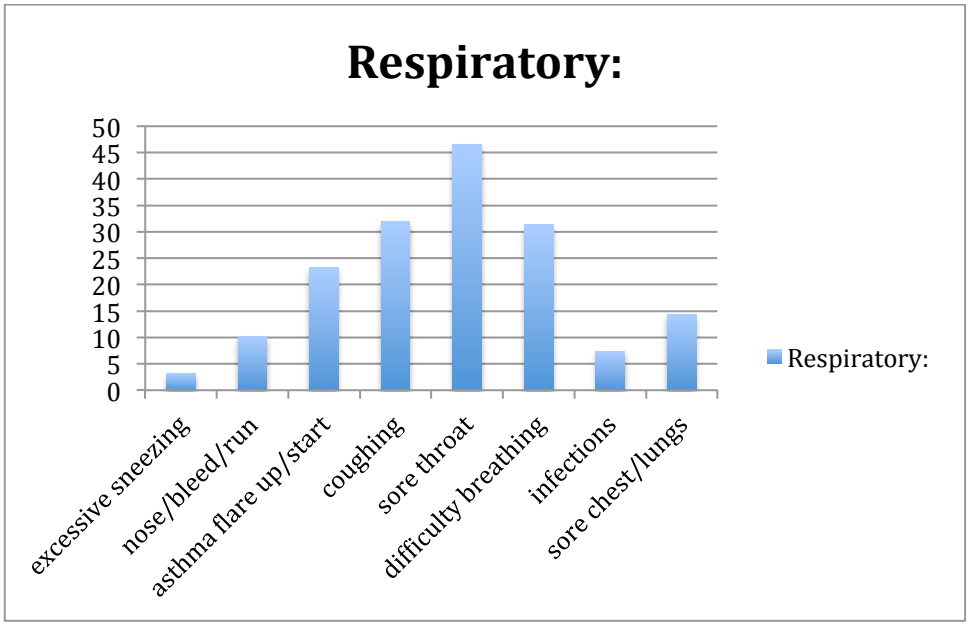
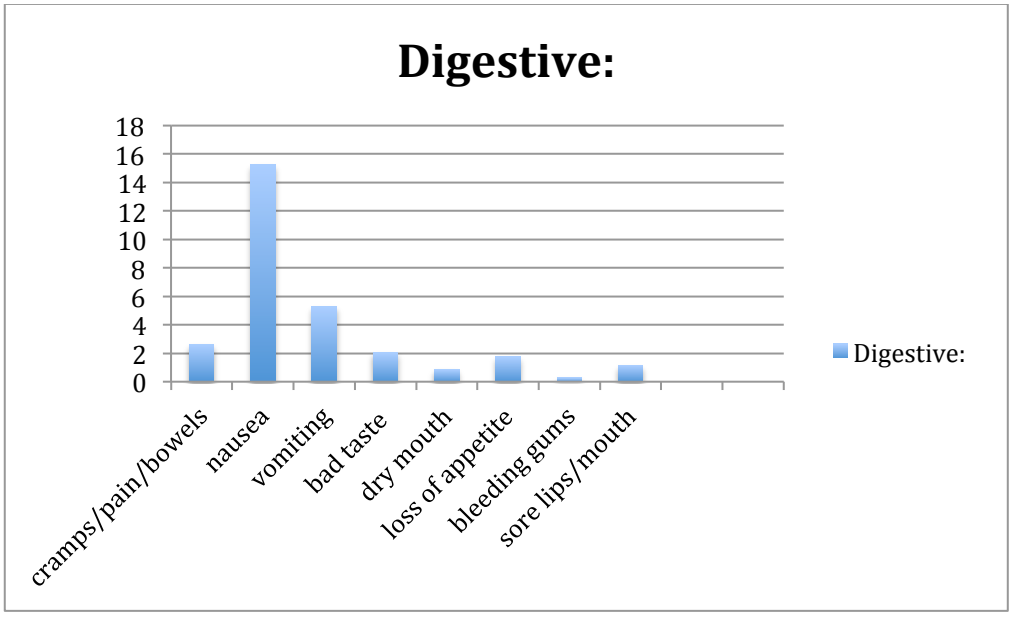


Figures are expressed as percentage of respondents.



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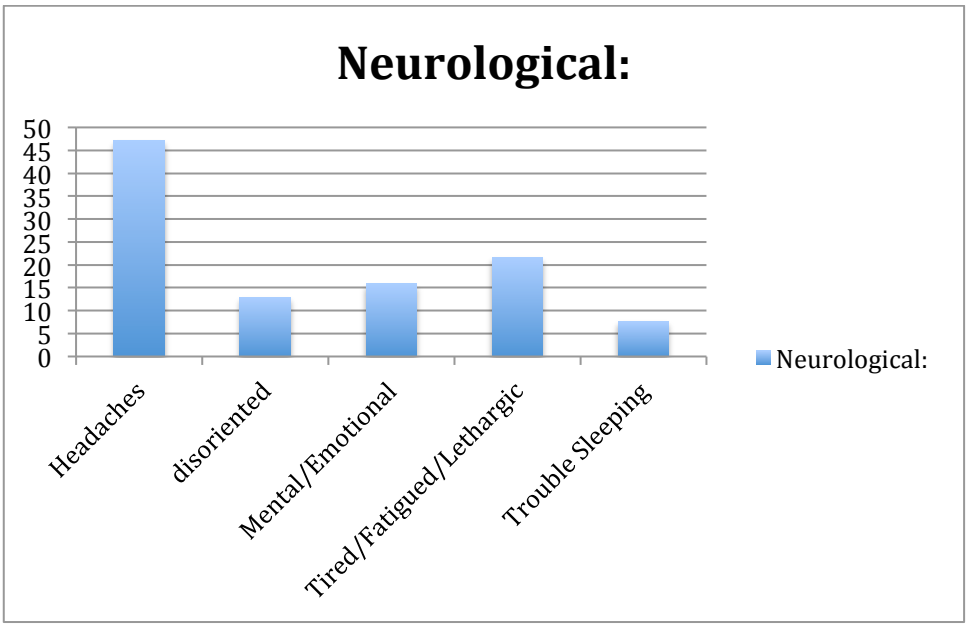

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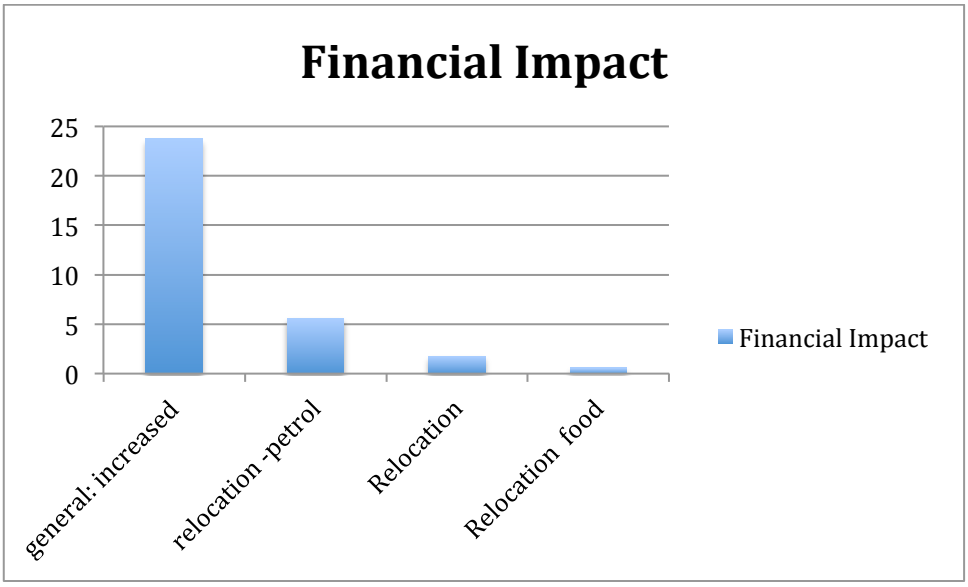


Figures are expressed as percentage of respondents.

Discussion

This results of this survey are consistent with those previously conducted in the spread of symptomology.

Having a base number (N) of 341 gives a respondent level of significant reliability.

The figures give a snapshot of the population with the average person having one or more respiratory difficulties, some neurological/emotional difficulties, bouts of nausea and a 50% chance that their eyes are stinging and sore.

The population was effectively disabled by the smoke, both physically and cognitively.

The population was disorientated with a pain, distress and mobility issues.

This is a low socio economic group with few financial resources which are being tapped to the extreme by this event.

Purchase of air filtering systems, extra travel, inability to attend work increased utility billing are just some of the financial issues cited in the raw data. A one off payment of $500 simply cannot provide the resources for weeks of refuge.

It would seem unreasonable under these circumstances to require them to organize alternative accommodation or refuge from the smoke themselves.

Further

The notes for this document were originally prepared for presentation to The Department of Health in support for a long term health study at the community consultation.

It was perceived that the proposed health study was only of 10 years and composed in such a manner as to produce results that were consistent with statements released by the department that there would be no long term health effects.

Notes:-

All these symptoms are typical of exposure to the hazardous, toxic and carcinogenic substances listed by the EPA in the smoke and ash. For some of the materials there is no safe levels, many have long term health effects that will take years to develop, many are developmental in pregnant women and growing children

We can expect an increase in infertility, birth defects, developmental difficulties and learning disorders. We can also expect an increase in pulmonary vascular disease, cancers such as lung and nose. Blood and lymphatic cancers, nervous system damage, heavy metal poisoning. There will be impacts on the liver and kidneys. The list goes on and is there for anyone with google to see if they compare what is in the smoke and ash, with the effects of exposure to these.

The measures of hazards on the EPA site were deceptive as they compared against levels used in soil contaminants (HIL's) and not suitable for dust that is already inside the house, ceiling and soft furniture.

We need more than a 10 year study to count how many of us die, using a sample so small, over such a short period that it absolves the Government and the industry from responsibilities.

A **health** study, not a **death** study.

We need them to assess how many of us have been sick, what we have been sick with and how widespread the effects have been. We then need our health monitored over a long time and see what treatments are useful in treating the long term effects and document these.

It is imperative that :-

The control group for the study is not from the Latrobe Valley as all in the Valley have been in some way affected.

The study is funded sufficiently and over a sufficiently long term to achieve offsets in health outcomes for the affected population. (Eg $5m over 20 years)

V.O.T.V.

Online wellness survey

5th to 17th March 2014

– (81 respondents)

Ron Ipsen

Introduction

On February the ninth 2014 a bushfire sparked a fire in the Morwell Open Cut. It burned for 45 days before being declared safe. During this time a plume of toxic smoke covered the cities within the Latrobe Valley with Morwell less than 500 meters from the fire particularly affected. The fire is still officially burning.

During this time The Cities within the Latrobe Valley were subject to unprecedented levels of smoke and toxic ash, the volume and duration of which was dependent on the direction of the changeable winds.

People began to get sick, reporting via friend and relative networks, via social media and via normal social conversations to each other and comparing symptoms and severity.

People turned to the Mainstream media to see what was going on and what was happening to them but The Department of Health Spokesperson there was issuing statements like “There have only been 3 people present to the local hospital with any symptoms so there cannot be any problem.”

The media kept up a constant stream of information that expressed the opinion that the problem was confined to the south side of Morwell only.

I lived 10 kilometers away from the fire and would wake up in the morning unable to see the milking shed only 300 meters away for the smoke.

I was sick, my friends were sick and my animals were sick - I simply did not believe what we were being told.

I wanted, and waited for, the Health Department to do some sort of research to find out how large the area of the health effects from the fire was, and what was happening to the people affected.

The Government continued to focus on the extremely small area of what they termed Morwell South, ignoring advice and cries of despair from locals that the problem was much bigger.

On March the third I decided to do an online survey asking for anyone who lived in the region to comment on their health and state where they were from.

Purpose:-

I believed that there was a disparity between what we were experiencing and what we were told we were experiencing.

Hypothesis:-

That there is a health related problem from the Morwell Mine fire. The effects of which cover a much larger area than just Morwell South.

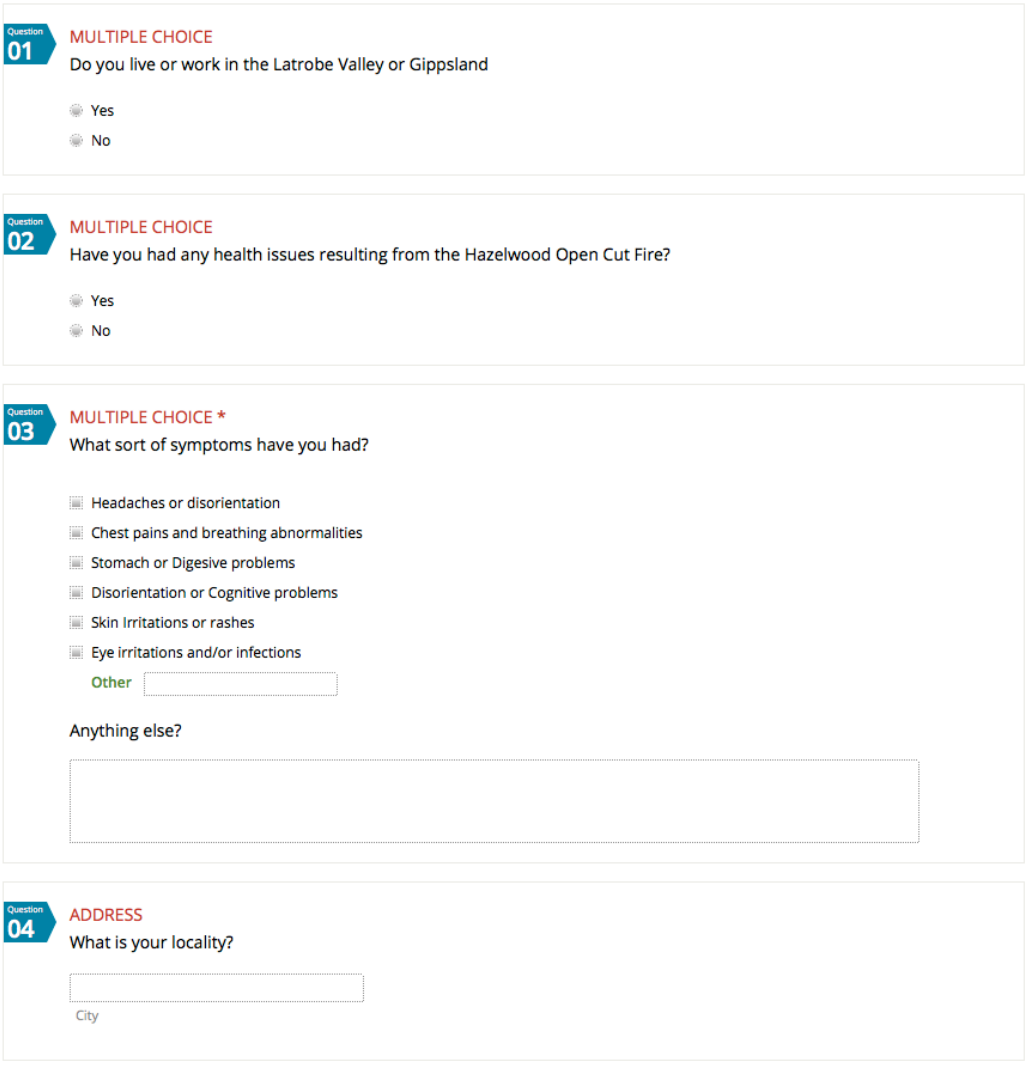
Methodology;-

Having few resources and less funds limited the methodology somewhat to things could be done at extremely low cost (read free).

The Internet has been both a professional vocation and personal interest for the last 20 years so it once again proved to be the most accessible tool for the task.

A site was sourced where a survey could be carried out and the results recorded online.

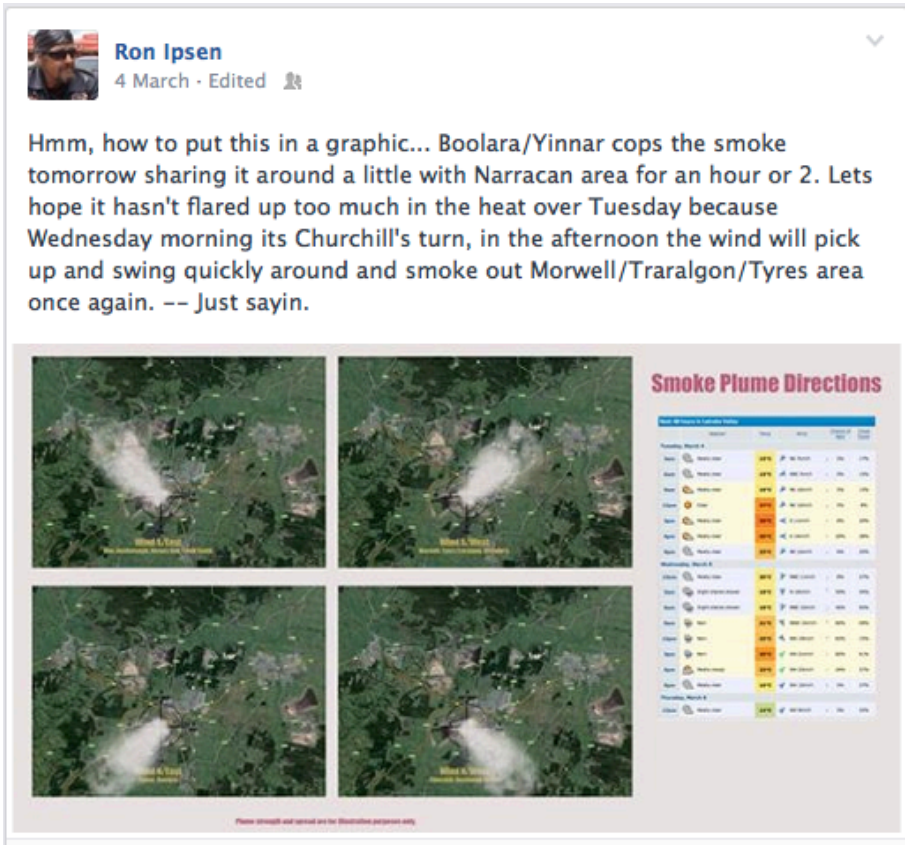
The Polldaddy site was utilized (http://mrsscuzzi.polldaddy.com/s/wellness-survey-minefire) and succinct survey was written asking only 4 questions.



These 4 questions covered what I needed to know and allowed sufficient room for individual answers, validation was by an automatically recorded IP address and timestamp.

A series of awareness graphics were put up and for a few days wind direction and towns affected were forecast and published on Facebook using information from the Bureau of Meteorology, Google Earth images and Photoshop.

After a few days the mainstream media picked up the idea and began to publish similar information so I stopped publishing them.



An Informal invitation to participate was extended on my own timeline and the timeline of the Disaster in the Valley group.

Disaster in the Valley Facebook group rationalized its pages and its main page became Voices Of The Valley Facebook group so the invitation was republished on that timeline.

The Survey ran live from the morning of the 5th of March 2014 with the last response being on the 17th of March 2014. (The Polldaddy timestamp for the responses is in US time, the location of the server and thus a day out.)

All up 91 responses were received covering an area from Warragul to Glengarry and across to Yinnar and Traralgon.

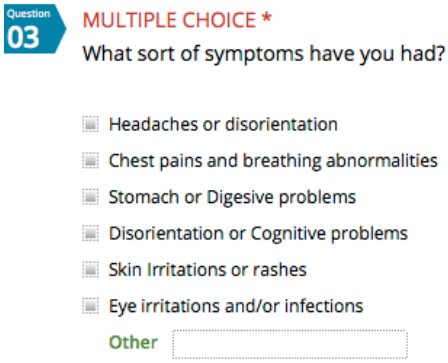
In hindsight Polldaddy may not have been the best site to use as it limited the retrieval methods of the data and the only way to filter and correlate the results easily, or indeed download them, was to pay $200.00 for a “Pro” account. I of course did not have these funds so I manually took screen shots of the individual responses and correlated them manually into a Microsoft Excel spreadsheet.

91 responses were received and all data was manually transferred to an Excel Spreadsheet for collation. There were some duplicates where a respondent had pressed enter twice or had resubmitted.

There were 3 respondents that had no symptoms, and one respondent that appeared vexatious but these were included.

2 Locations that posted only one respondent and they were left out of the calculations also as insignificant data.

After filtering this left 84 valid and verified respondent data sets.



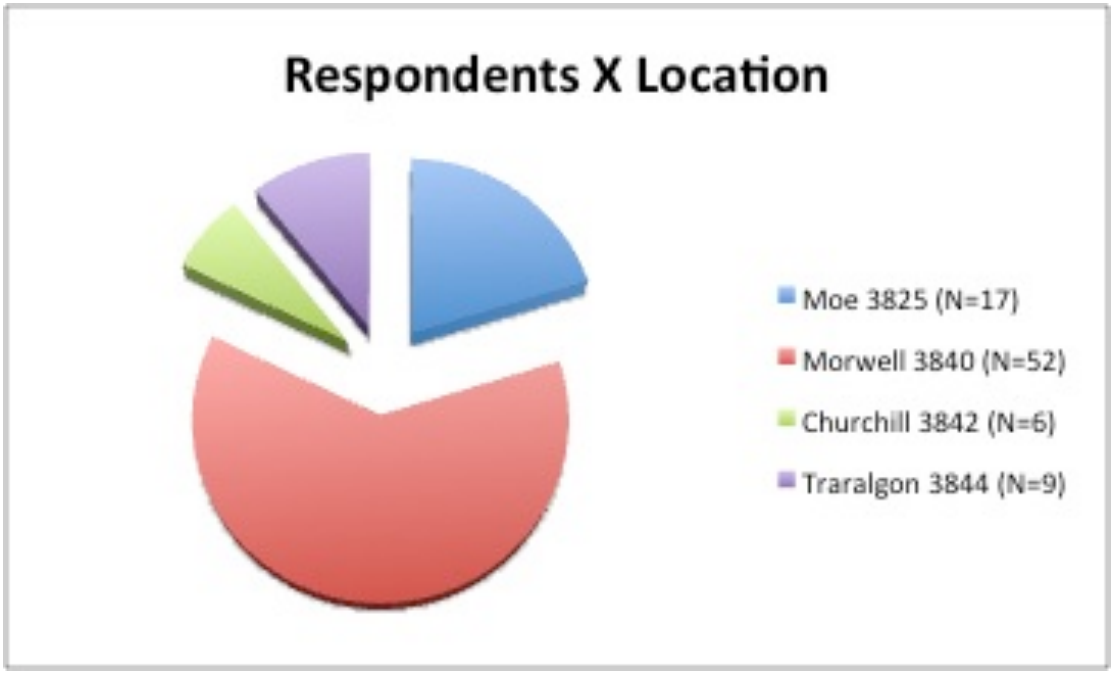
Question 3 in the survey did prove problematic in that answers 1 and 4 both mention disorientation and thus it was felt some duplication existed there. These two groups were rationalised into one answer group of "Headache, Disorientation or Cognitive problems"

In the "Other" text box a large number of throat and nose answers became apparent so these were included in the "chest" results, which then became "Respiratory System & Heart group"

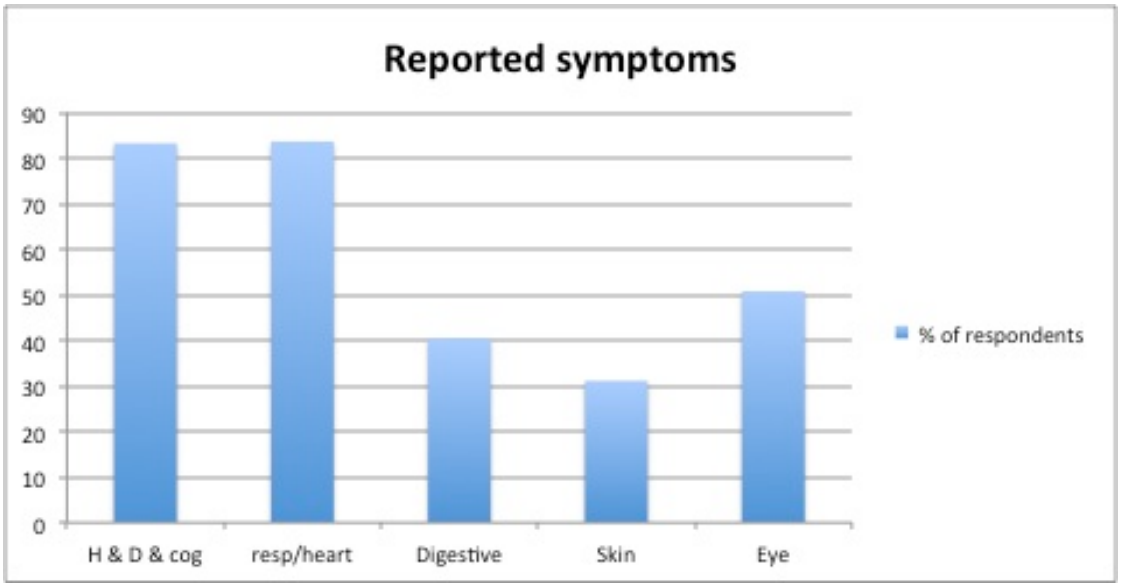
Question 4 , the "Location" question also offered some challenges as many suburbs and unofficial local names were used dividing the data up into small and unsuitable segments. Respondent locality data was then revisited and broken down to postcodes and re-correlated. This gave larger data groups to work with but disadvantaged the Churchill area (3842) as many Hazelwood South and Hazelwood North residents could have been included in there and not in Morwell (3840)

Results.

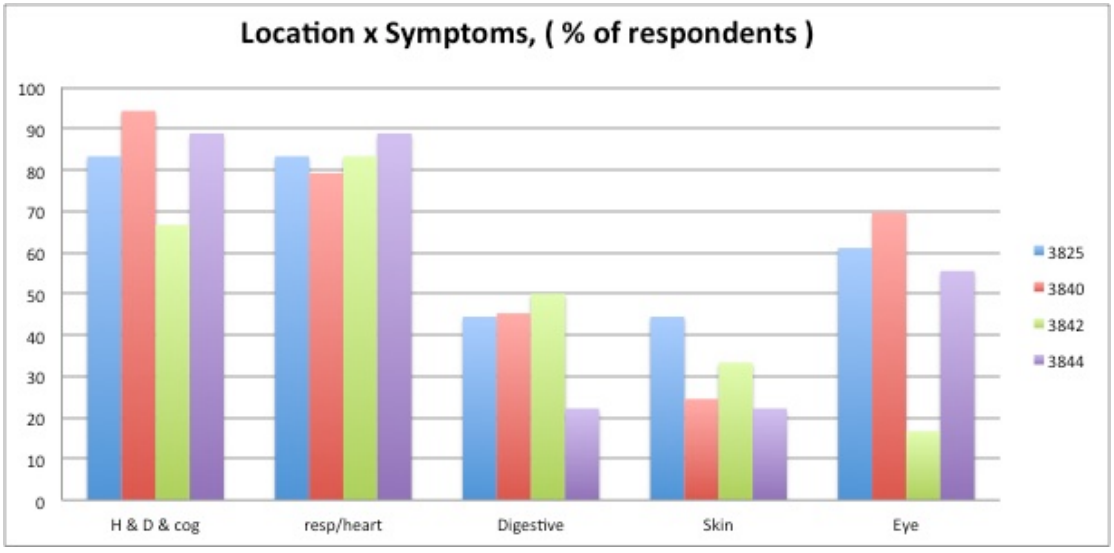
After filtering the respondent groups there were 4 main groups remaining.



The “symptom type” data shows that people were getting sick and what sort of symptoms they were experiencing.



Breaking the data down further by locality showed conclusively that people from all areas were reporting symptoms, and that those symptoms followed very similar trends regardless of location. This would indicate that they were all affected by the same or similar condition irrespective of location.



3% of respondents reported no health symptoms.

Discussion

The hypothesis that there is a health related problem from the Morwell Mine fire, the effects of which cover a much larger area than just Morwell South is supported by the data.

The limitations of this survey are that of motivation and resources. Respondents' motivation must be taken into account and what is glaringly missing is the objective data of "How many" were affected across the region. What percentage of the population in each town was affected, showed symptoms or reported in sick.

Respondents had to be both online and motivated to answer the survey, although one respondent who did not have access put his data in by proxy of his daughter who did.

The results from this sample survey do however demonstrate that the residents of the Latrobe Valley knew that what they were being told was not what they were experiencing. The survey was provided in part to the perceived need to give residents the opportunity to have their concerns heard and documented. The detailed comments included in the raw data at the end of this report and the quantified responses provide evidence of physical and mental suffering and the consistency of the responses regardless of postcode, are suggestive of a causal link between the symptoms and exposure to the smoke from the Hazelwood fire.

Postcode groups were a useful classification tool in this experiment, as the number of participants (N) was relatively low and the experimental survey was taken only over a short time by a non-inclusive methodology.

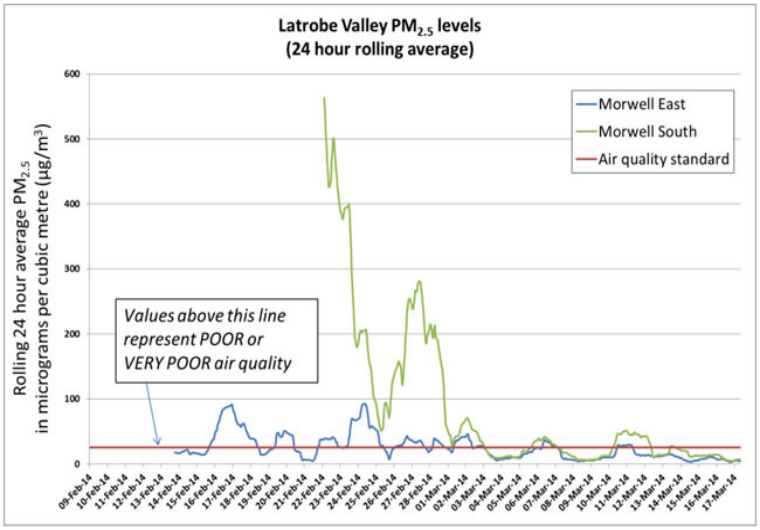
There is only a minor variation between the locations and the symptoms reported and that may be due the smaller numbers in the Churchill (3842) sample due to the size of the area officially covered by that postcode. Drafting respondents from Hazelwood South and North into the Churchill group brings the figures more into line with the statistical mean of the other groups.

The plume of smoke covered the Latrobe Valley for more than a month, the great cloud travelled to and fro at the whim of the wind settling down as a dense blanket at night and shifting along being fed and topped up all along.

At various stages each town in the valley was covered for a time, some towns were covered more than others.

The direction of the wind was a determining factor in the readings gathered at the stationary EPA monitoring stations.

Wind direction can be charted and shows a correlation with the peaks and troughs in the EPA readings. The smoke output of the mine was not changing that quickly, the plume varied little in composition, only in direction.



EPA Data.

http://www.epa.vic.gov.au/air-quality-latrobe-valley-mine-fire/sampling-results/air-monitoring-results

9/2/2014 smoke pounding Morwell at the start of the fire.

11/2/2014 smoke plume heading towards Moe/ Coalville

Smoke heading out towards Churchill / Yinnar

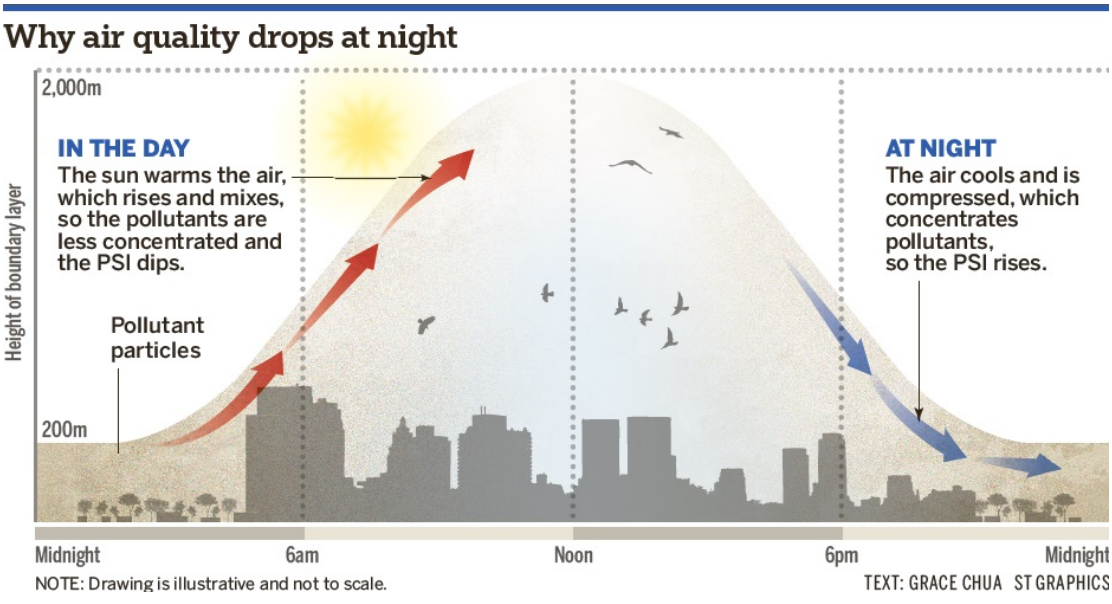
Low smoke cloud sitting in a blanket layer across the valley

This study shows a range of health problems reported from as far as 35km from the fire itself.

As well as the impact of wind direction, residents were commenting with dismay on how they continued to wake up to find the now familiar smell again present in the morning air and did not understand why.

Many of the people commenting on the Voices of the Valley Facebook page referred to waking up vomiting in the morning.

The information that the emergency was over did not fit with what they were experiencing. The pollutant particles had not 'gone' so much as dissipated during the day, only to return overnight, which suggests that the presence of visible smoke is not a reliable indicator.



The assumption touted by the State Government authorities that there would be no health problem for anyone other than a few susceptible residents on the south side of commercial road in Morwell is inaccurate and one might say misleading.

A call for an immediate health survey by the government to assess the scope of the health problem at the time was ignored.

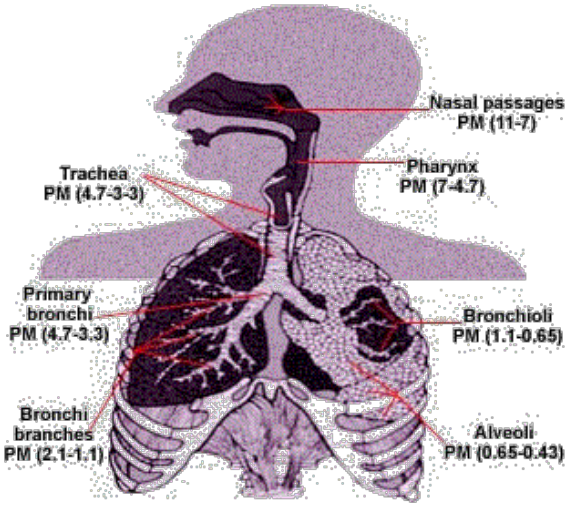
The continued response was that there were no precedents or literature available to suggest that there were health problems associated with the smoke were patently false as any quick search of Google will find. There is substantial literature on the health impacts of pollution, predominantly from traffic congestion, much of which analyses the impact of particulates on health. This situation is similar in that it was known from the start that smoke from coal fires contained this dangerous matter.
Then of course there is literature regarding 'The Great Smog' and other incidences of coal fires around the globe that are pertinent.

The symptoms reported by the respondents are the same symptoms described for centuries …

Way back in 1662, John Evelyn, a brilliant Englishman known for his detailed diaries, wrote a lament about the effects of coal-burning on the city of London. His work was called Fumifugium, or the Inconvenience of the Aer and Smoak of London Dissipated. In it, he described an infernal scene of pollution, air filled with "Columns and Clouds of Smoake" emitted by small industries and residences that burned coal for fuel:

> That hellish and dismal cloud of sea coal [means] that the inhabitants breathe nothing but an impure and thick mist, accompanied by a fuliginous and filthy vapour, which render them obnoxious to a thousand inconveniences, corrupting the lungs and disordering the entire habit of their bodies…
>
> Those who repair to London, no sooner enter into it, but they find a universal alteration in their Bodies, which are either dryed up or enflam'd, the humours being exasperated and made apt to putrefie, their sensories and perspiration so exceedingly stopp'd, with the losse of Appetite, and a kind of general stupefaction, succeeded with such Cathars and Distillations, as do never, or very rarely quit them….

(http://www.theatlanticcities.com/politics/2013/02/lessons-we-havent-learned-londons-killer-fog-1952/4660)



Disposition of Particulate Matter (PM) in the Respiratory system (Richard Wilson, Harvard Press,1996)

Metal taste on tongue has been a common complaint and noted particularly by those who had left the Valley even for short periods and who were able to identiy its presence because they had not been tasting it whilst away. Data from the EPA site clearly shows the extremely high level of arsenic in the air which was causing this experience of having the taste of metal on the tongue. In two days of exposure, residents were breathing in almost a year's worth of arsenic alone.

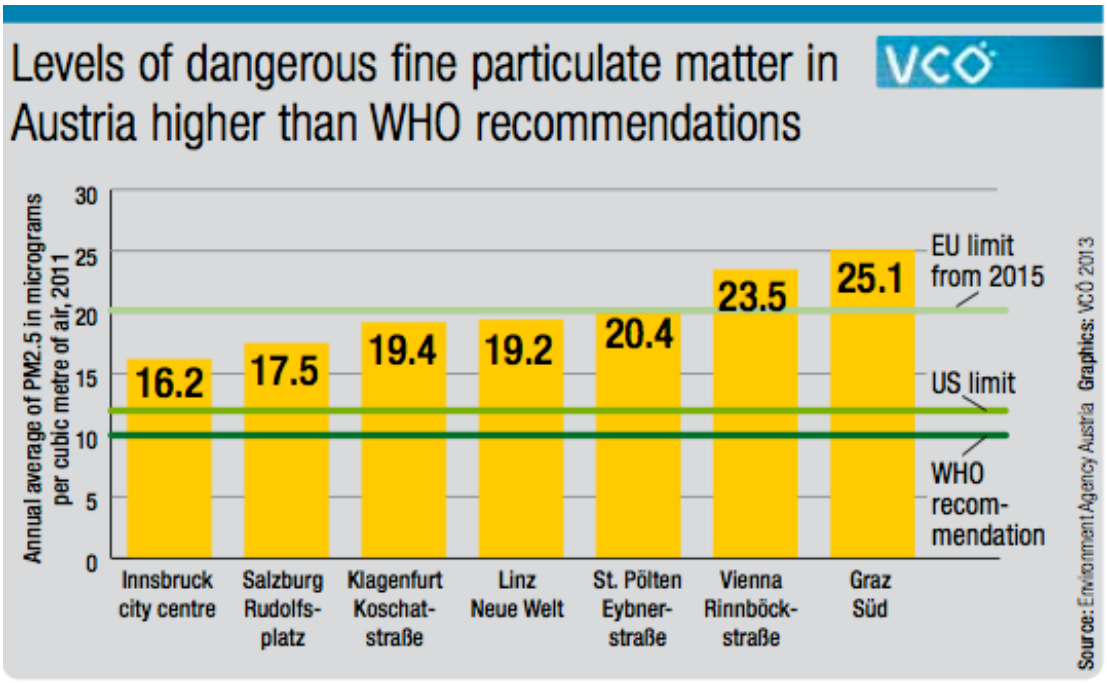
Other compounds

Tables of the results received to date are given below.

Example results of elemental analysis of the smoke (two samples taken)

Contaminant	Worst day (ng/m3)	Annual guideline (ng/m3)
Arsenic	1.13	3

The levels of exposure were much higher than the WHO recommended safe level.



http://www.cleanair-europe.org/fileadmin/user_upload/redaktion/downloads/VCOE/VCOE_FS_Feinstaub_engl.pdf

EPA air quality hourly update: February 21, 2014 1.00 pm - 2.00 pm

Please note that current data may not be shown for some air quality monitoring stations. Measurements are made continuously at air monitoring stations, but there may be temporary technical issues with the collection and display of data.

Hour: current | next | previous | choose... Show: data readings | index values

		Data readings							Air quality index	
Region	Station	Carbon Monoxide	Ozone	Nitrogen Dioxide	Sulfur Dioxide	Particles as PM2.5	Particles as PM10	Visibility Reduction	AQI	Summary
	Units	ppm	ppb	ppb	ppb	ug/m3	ug/m3	none		
EAST	Alphington	0.2	16	3	1		16.5	0.42	21	VERY GOOD
	Box Hill	0.1	16	3	1		13.5	0.41	17	VERY GOOD
	Brighton		18	2			18.8	0.45	24	VERY GOOD
	Dandenong		13	6			17.9	0.59	25	VERY GOOD
	Mooroolbark	0.2	13	5			7.0	0.43	18	VERY GOOD
WEST	Altona North		18	2	1					N/A
	Brooklyn						23.0	0.42	29	VERY GOOD
	Deer Park		18	4			18.7	0.38	23	VERY GOOD
	Footscray	0.0	16	4	3		24.1	0.42	30	VERY GOOD
	Melton		19							N/A
	Pt. Cook		19	1				0.39	19	VERY GOOD
CITY	Richmond	0.1		4			17.4	0.50	22	VERY GOOD
GEELONG	Geelong Sth.	0.0	17	3	3		23.8	0.43	30	VERY GOOD
LATROBE VALLEY	Morwell South	2.6			4	140.4		24.37	1,037	VERY POOR
	Morwell East	0.3			3	7.0		3.55	151	VERY POOR
	Traralgon									OFFLINE

Despite this, residents were not evacuated, neither was a state of emergency declared.

The following are summaries from credible peer reviewed articles of which the abstracts at least are readily available to anyone with an inclination to discover the facts.

There was some hair splitting over the definitions of 'short' and 'long' term scenarios but as Clean Air Europe states: 'No threshold has been identified for these ultrafine particles below which no damage to health is observed.'

http://www.cleanair-europe.org/fileadmin/user_upload/redaktion/downloads/VCOE/VCOE_FS_Feinstaub_engl.pdf

LONGTERM HEALTH STUDIES ON PARTICULATES AND HEALTH.

http://healthandcleanair.org/references/issue7refs.pdf

...conclude that for a 10 microgram/m3 change in PM10 all cause mortality increased by 4 percent; cardiopulmonary mortality increased by 10% and lung cancer mortality increased by 8%.

Authors conclude: "The findings of this study provide the strongest evidence to date that long term exposure to fine particulate air pollution common to many metropolitan areas is an important risk for cardiopulmonary mortality."

http://www.ncbi.nlm.nih.gov/pubmed/23676266

RESULTS:

For short-term exposure, we found that for every 10-μg/m increase in PM 2.5 exposure there was a 2.8% increase in PM-related mortality

From:
http://beijing.usembassy-china.org.cn/20130201-pm25-steps.html

The National Ambient Air Quality Standards for Particle Pollution
PARTICLE POLLUTION
AND
HEALTH

http://www.epa.gov/air/particlepollution/2012/decfshealth.pdf

Fine Particles:
An extensive body of scientific evidence indicates that breathing in PM2.5 over the course of hours to days (short-term exposure) and months to years (long-term exposure) can cause serious public health effects that include premature death and adverse cardiovascular effects. The evidence also links PM2.5 exposure to harmful respiratory effects.

NOTE: Exposure to fine particles has also been linked to a number of other health effects. These include: Respiratory effects in children, such as reduced lung development and the **development** of chronic respiratory diseases, such as asthma.

.

http://www.australasianscience.com.au/article/issue-march-2014/hazelwood-coal-fire-health-impacts.html

"In case of fires, usually particulate matter is the biggest concern, and specifically the PM2.5 fraction (particles smaller than 2.5 microns). Their concentration in the air could be high, and above the WHO health guideline levels even if air pollution is not obvious. However, if smoke is seen, it normally means that the concentrations are very high. I understand some authorities yesterday were trying to calm the public by saying that so far the duration of the exposure (since the beginning of the fire) would classify it as 'short term', and therefore is not expected to cause problems. This is not true. The duration of the London smog incident in 1952 was about two weeks and caused so much mortality. The London fire duration is comparable to the Hazelwood fire. There are many examples of health impacts due to much shorter exposure to combustion products than this fire."

Professor Lidia Morawska is a Professor in the School of Chemistry, Physics and Mechanical Engineering, Faculty of Science & Engineering at the Queensland University of Technology and the Director of the International Laboratory for Air Quality and Health (ILAQH) at QUT, which is a WHO Collaborating Centre on Air Quality and Health

http://www.cleanair-europe.org/fileadmin/user_upload/redaktion/downloads/VCOE/VCOE_FS_Feinstaub_engl.pdf

The most recent WHO study shows that excessive exposure to PM2.5 can cause arteriosclerosis, premature births, and respiratory diseases in children. Particulate matter exposure may also be connected to neurological development and cognitive skills as well as diabetes. A Californian study draws a connection between autism and exposure to nitrogen oxide, PM2.5, and PM10 during pregnancy and the first year of life. There is also evidence suggesting that it may contribute to the development of dementia and Alzheimer's disease.

http://www.theatlanticcities.com/politics/2013/02/lessons-we-havent-learned-londons-killer-fog-1952/4660/

…...We are now in a position to make informed choices as a society about what risks we will accept and how much we're willing to pay to change them. Some have argued that a dirty world is the unavoidable cost of economic growth. People who have a vested interest in not changing the causes of pollution will too often use this claptrap as an excuse for doing nothing and learning nothing.

….people are dying preventable deaths and suffering life-changing illnesses, simply because they must breathe the air of the cities where they live.

http://www.epa.gov/pm/health.html

http://www.epa.gov/pm/pdfs/pm-color.pdf

Conclusions:

This health survey, despite its limitations of motivation and access, provides baseline data that indicates a range of symptoms consistent with known effects of particulates on human health. The respondents provide a reasonably representative cross section regarding age, location and gender. The findings are consistent also with other qualitative data of over 1000 recipients and provide a significant indication that there is a real need both for a long term health survey and for recognition of the severity of the crisis.

APPENDIX 1:
Answers to 'Other' & 'Comments' question on Survey.

Other	Comments
	night sweats.
constricted throat	
	Tired dizzy sore throat
	Vomiting sire throats eye infection asthma like breathing problem where I had to use puffer I don't smoke but can't catch my breath
Vomiting	
Tired , sore throat	
extreme tiredness	Sweating
	Severe asthma!, I managed to go away for a few days over the long weekend and I hardly had to take any medication. Within a 20 min drive of the fire on return my chest felt like it had a brick and continued to get worse. Oh and I'm not in Morwell, but close by.
no symptoms	
muscle pain	
kidneys seem to be working very hard and body seems to be on dehydrated side of normal	
none	I didn't even claim the new TV allowance because I'm better than that.
Minoxide level of 7	
Sore throat	
Nausea	
	Been to the doctor twice and he said i'm fine lol
Chronic Sinus irritation	Loss of sleep. Stress and unhappy.
General feeling of being unwell	

Sore throat like swallowing razors, dry eyes, bronchitis, chest infection, been see dr in traralgon every second now 4th day since fires started	Everything I call besides grant money don't seem to exist called scout camp got answering machine and not had s call bk at all
	Had a very strong dose of antibiotics to kill the infection
Inflamed lungs, one lung not functioning properly, diarrhea, sore throat, sores/blisters on tongue & roof of mouth, other	My pre-existing neurological illness has been greatly exacerbated. All Q3 symptoms and more, but unable to tick all the boxes as survey won't accept them, giving message "you have selected too many choices".I went to doctor at Pakenham the day after I was forced to leave Morwell due to above symptoms.A week later I was able to see my usual doctor in Moe after almost passing out on the footpath near Morwell station having just walked from Council offices and experiencing severe headache disorientation very frightening intense breathlessness not relieved by ventolin inhaler. I'd been in Morwell less than four hours. My doctor was very worried and had a bed been available he would have put me in hospital
loss of taste, irritated throat, high blood pressure and anxiety, sleeplesness, wheezy and breathless	
	Can't live at home - have slept one night at home since feb17. 2 hours a day at home brings on tight chest, itchy skin and sore eyes.
Cough, lethargic,nauseous	
	My kidneys hurt. Really dark urine. Hair loss, coughing up green lumps of stuff. Mood swings. Tiredness depression
nose burning, weakness in body, nesuea	Difficulty sleeping, stress about who will pay to clean my house up and who will pay the value and money ive lost on house ?,since in last year I've spent over 20k fixing it and prior to that spent 16k o it trying to fix it. I would be lucky if I even got 60k for it since the mine fire. I don't want to live there but I have no choice :(

	I was off work for almost two weeks as a result and the financial impact has been stressful, as well it has cost me a lot money and I am not on centre link need to work no financial assistance as I don't live in Morwell I just work in Morwell as a result of needing to work and being in smoke I got sick. experienced vomiting also
Sores up nose	
high CO reading of 12.4	
	We evacuated 2 weeks ago when we couldn't go outside.My dog and bird died
Bad cough	My son and myself had a bad cough
	My son has had gastro vomiting and diarrhea for 12 days off and on
Burning of the throat and mouth . A stinging feeling and then cant talk .	Been to ED hospital on the monday the 3rd and 5th after big days of smoke and ash now each time it flares up or gets bad i cant talk as it hard to gasp and swallow . When i get a smell of it i am dry reaching ?
chest problems	Tiredness
	The kids have also suffered these symptoms.
all of the above as well as Asthma, Tiredness, Aggitation and Nausea	
loss of appetite , stress and anxiety	Alarming concern about being relocated
	The trots, nausea
stress, loss of appetite	Living in toxic smoke. The continued uncertainty of whether I will by forcibly relocated.
Asthma	
	Sores up nose, Blood noses, Sneezing , Diarrhea, Vomiting, This is on behalf of my husband who doesn't have facebook
Sore throat, feverish sweats and an increased need to drink more water (from 2ltrs to 4ltrs a day)	

Depression about the lack if response to the entire thing	It's effecting our families entire life and we live in Traralgon!
Allergies super sensitive,	
	My son had diarrhea and vomiting andwent to hospital and doctors, it was palmed off as gastro however I only got some small amounts of vomiting. We have been very careful about not being exposed to the smoke!
I had Bronchitis it started just after the smoke started	

V.O.T.V.

Affidavits gathered at a meeting

Kernot Hall,

Morwell.

23rd March 2014

– (56 respondents)

Ron Ipsen

The affidavit Set of questions.

About,

23rd march 2014

Introduction

Introduction

On February the ninth 2014 a bushfire sparked a fire in the Morwell Open Cut. It burned for 45 days before being declared safe. During this time a plume of toxic smoke covered the cities within the Latrobe Valley with Morwell less than 500 meters from the fire particularly affected. The fire is still officially burning.

During this time The Cities within the Latrobe Valley were subject to unprecedented levels of smoke and toxic ash, the volume and duration of which was dependent on the direction of the changeable winds.

People began to get sick, reporting via friend and relative networks, via social media and via normal social conversations to each other and comparing symptoms and severity.

People turned to the Mainstream media to see what was going on and what was happening to them but The Department of Health Spokesperson there was issuing statements like “There have only been 3 people present to the local hospital with any symptoms so there cannot be any problem.”

After 3 weeks the residents of the Valley held a protest meeting, the media described it as a cry for help and indeed it was.

At that meeting simple open ended questionnaires were handed out and collected. The results are in the first of these reports.

On the 23rd of March another meeting was called and participants asked to fill out affidavits to document their experiences with the minefire situation.

The questionnaire is enclosed in appendix 3-a

Methodology

The residents at the meeting were handed a questionnaire and encouraged to record their experiences.

The questions were varied, mostly a yes no, with a text box for further expansion of the answer.

Business operators were given an additional questionnaire to cover financial and business issues but only if their business had been affected.

The sheets then went to a Justice of the Peace for stamping and swearing to their validity.

Of these signed and sworn affidavits, 56 were gathered together and correlated for this study.

The information on the sheets was hand typed into a database by a team of operators and then the resultant data was analysed by *symptom reported* and *appropriate system*.

There was little need to analyse by location and symptoms because previous studies had already shown the correlation there.

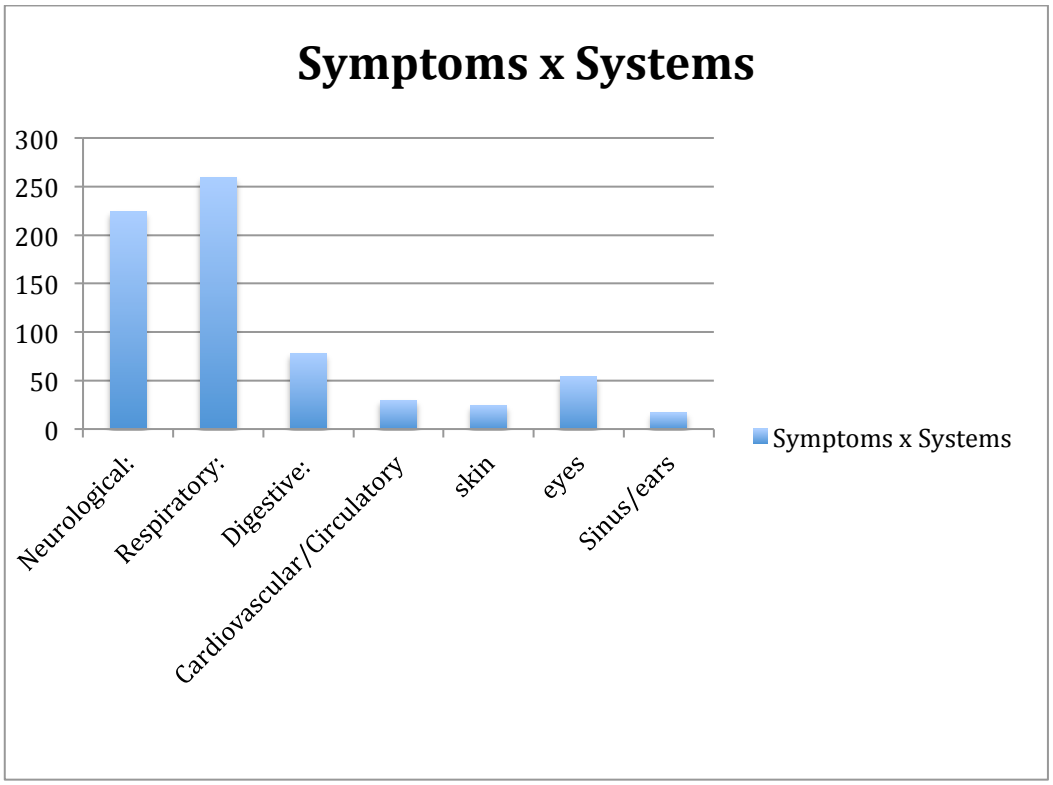
The individualized symptoms within a system are shown as percentage of respondents reporting that symptom.

Systemic totals were gathered by a simple addition of the percentages of individual reported symptoms within that system. The totals for systemic calculations can exceed 100% of respondents as many respondents had more than one symptom within a group, for example a respondent may have answered both *asthma flare up/start* and *difficulty breathing*

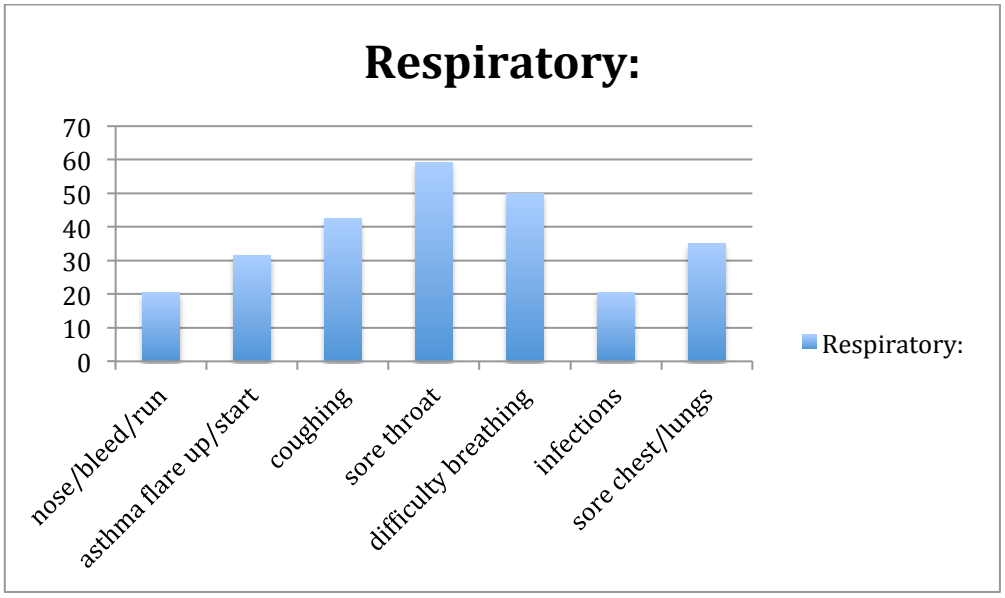
There has been little time given to the researcher to work on the fiscal calculations but they are clearly available in the raw data.

Results

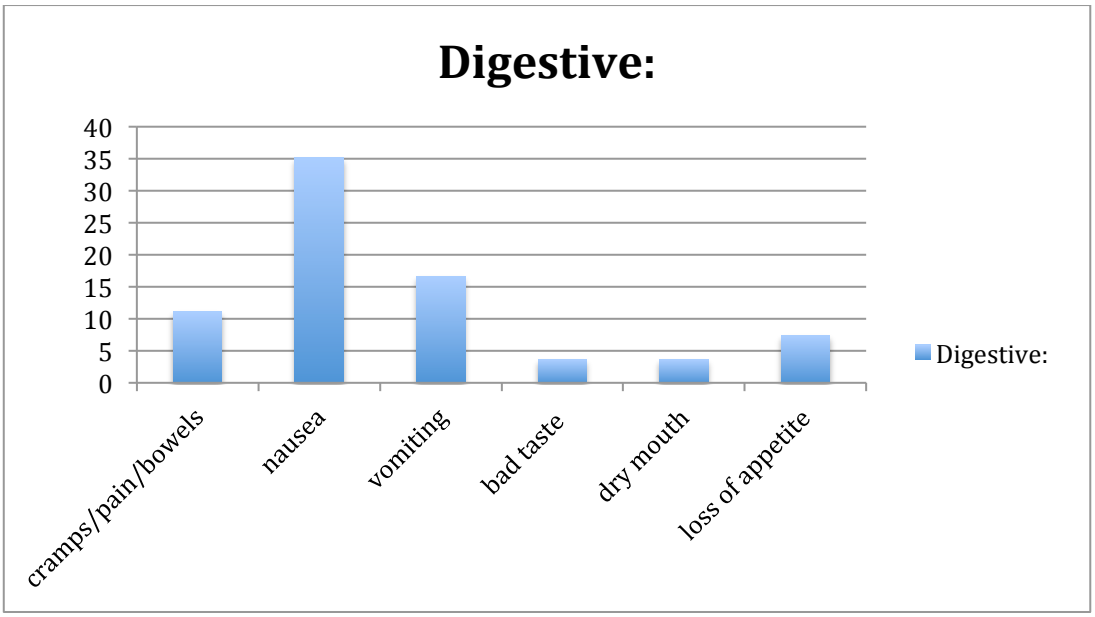
A general increase in symptoms with a few new ones appearing in the neurological category.



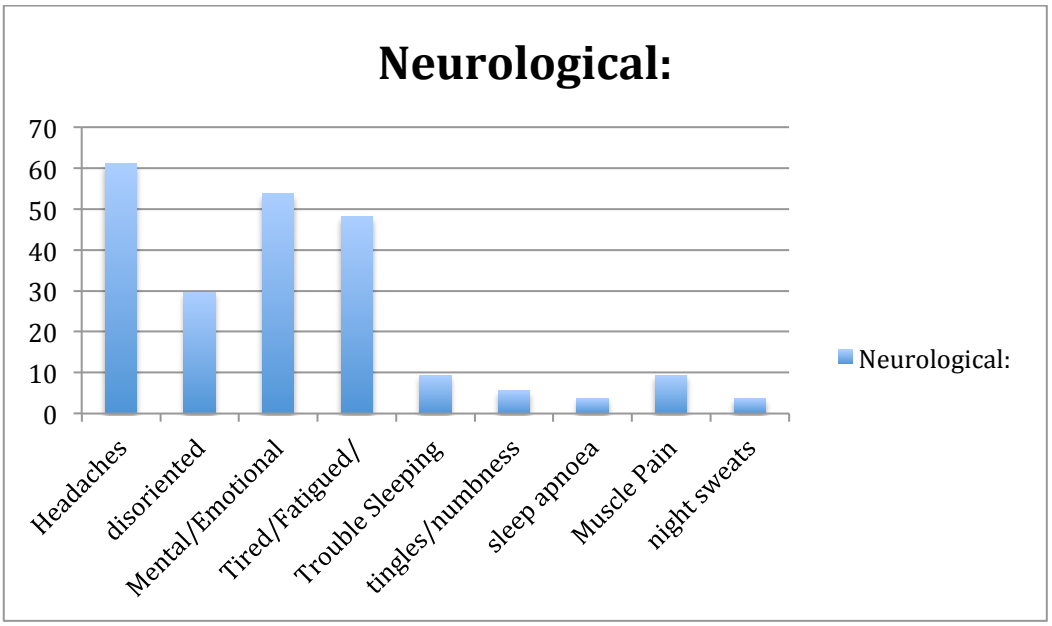
*Note totals for systemic calculations can exceed 100% of respondents as many respondents had more than one symptom within a group, for example a respondent may have answered both *asthma flare up/start* and *difficulty breathing*.



Figures are expressed as percentage of respondents.



Figures are expressed as percentage of respondents.

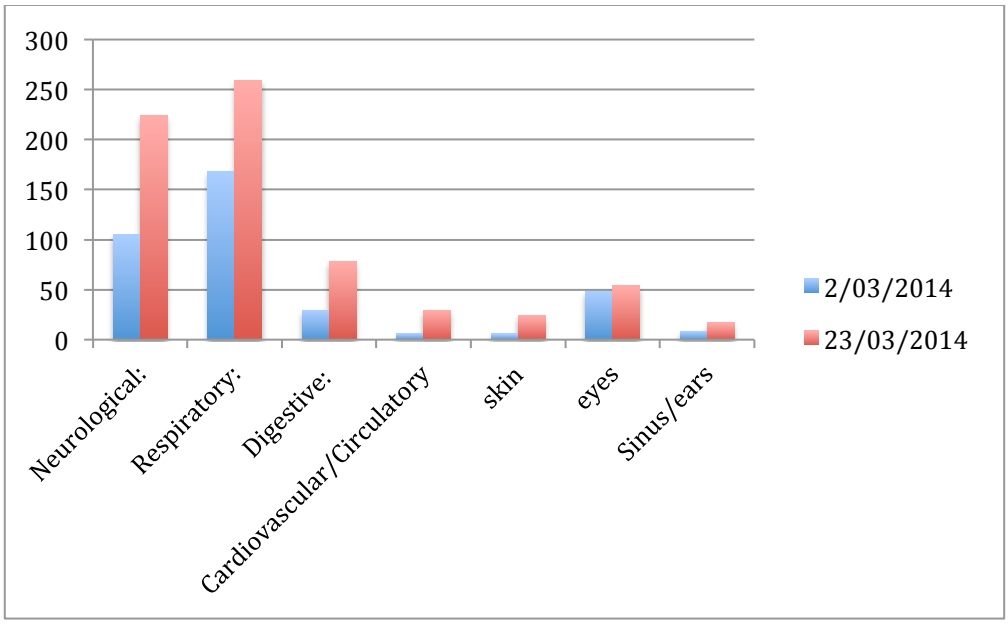


Figures are expressed as percentage of respondents.

Comparing the 2 sets of data directly we get a marked increase in reported symptoms.

In fact the overall increase is 230% over the 3 weeks. (week 4 to week 7 of the fire)

Symptoms x systems



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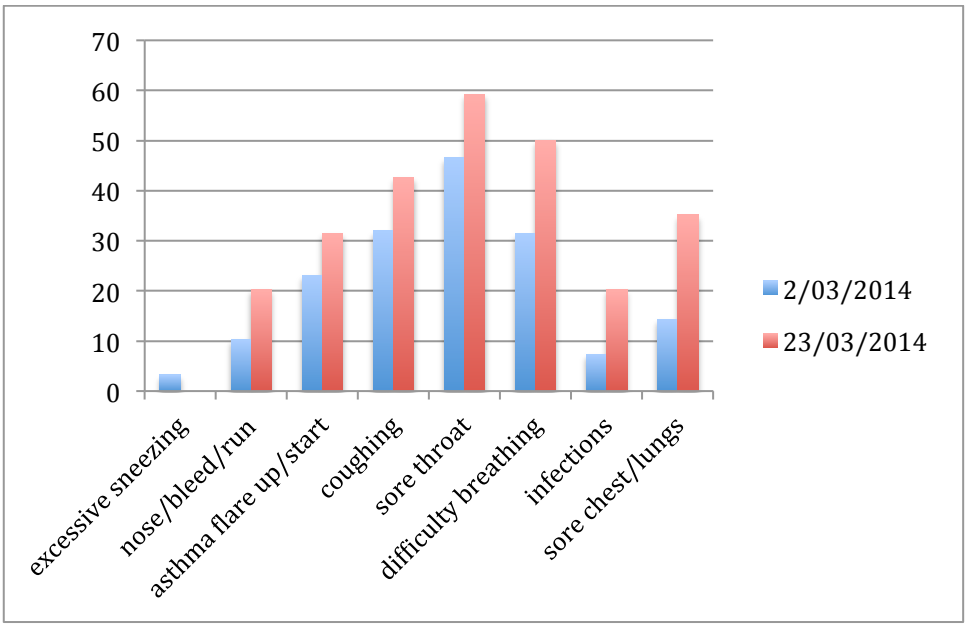
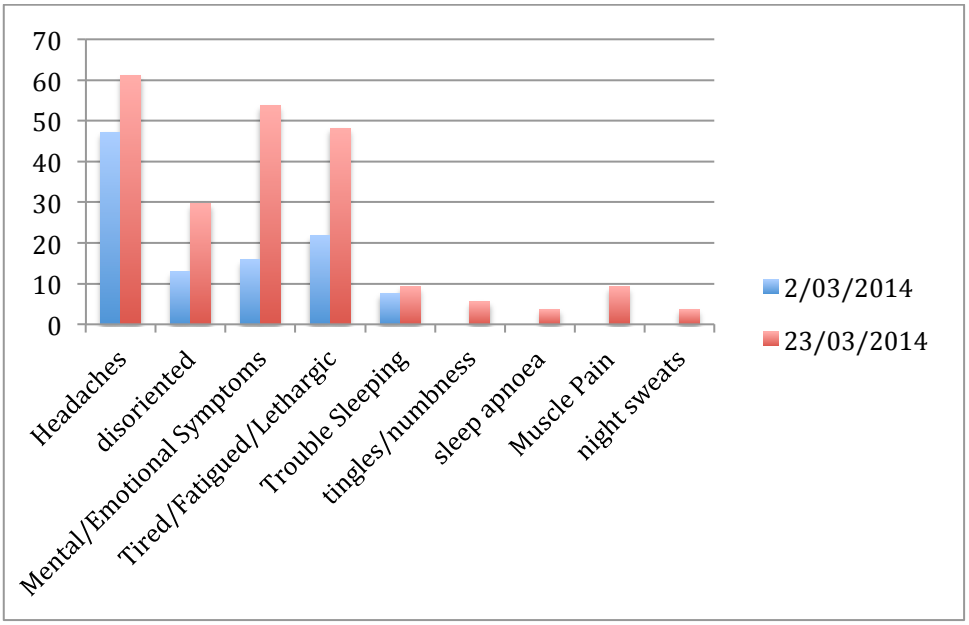
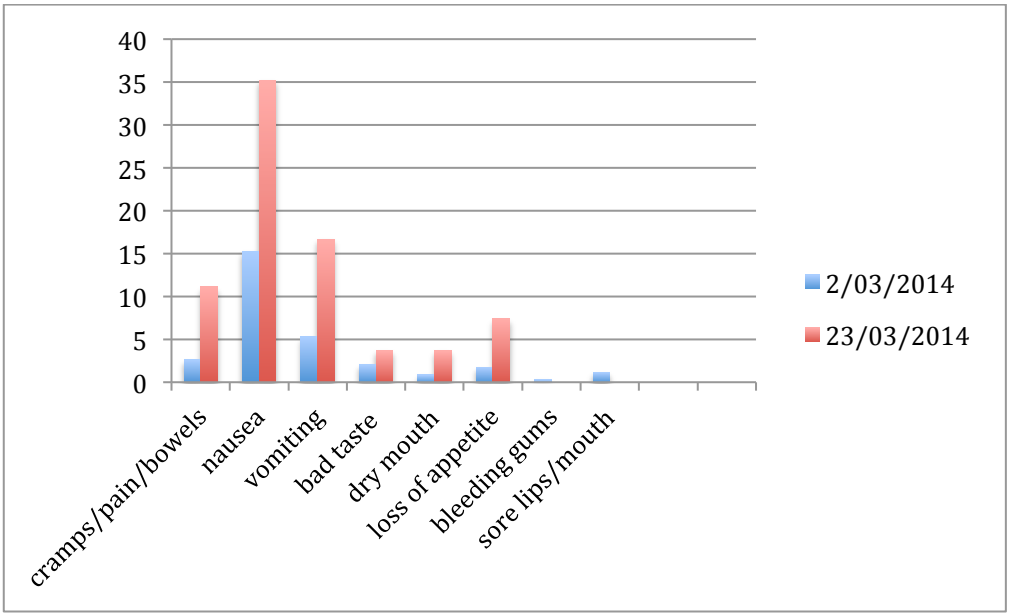


The infections and chest problems are beginning to take hold.



New symptoms are beginning to be reported that mimic alarmingly the heavy metal poisoning. This would make sense at the metals take time to build in the systems and begin to have an effect on the nervous systems operation.



Initial symptoms of smoke are starting to decrease in reportage as the smoke declines but the toxins build up in the systems of the population.

Appendix 3-a

Affidavit Questionnaires

23 March 2014

1. Have you been affected by the fire with health problems?
    - ☐ Yes
    - ☐ No

What Effects have affected you

_____
_____
_____
_____
_____

2. Have you been to see your doctor with these concerns?
    - ☐ Yes
    - ☐ No
    - ☐ Not Yet

What was the outcome from your doctor.

_____
_____
_____
_____
_____
_____

3. Has your house been affected by the fire?
    - ☐ Yes
    - ☐ No
    - ☐ Don't Know

Please list the problems with your house.

_____
_____
_____
_____
_____
_____
_____

4. Have you had to increase you power usage during the fire for Washing, drying etc.?
    - ☐ Yes
    - ☐ No

Include details.

_____
_____
_____
_____
_____

5. Has your emotional health been affected?
   - ☐ Yes
   - ☐ No

Please give details below.

_____
_____
_____
_____
_____
_____

6. Have you or your family had to relocate?
   - ☐ Yes
   - ☐ No

List below any financial outlay for your relocation.

_____
_____
_____
_____
_____
_____

7. Have you or any family members been unable to attend school work or other activities? (sports, Leisure etc.)
   - ☐ Yes
   - ☐ No

Please give details below.

_____
_____
_____
_____
_____
_____

8. Has there been a financial change since the fire
   - ☐ Yes
   - ☐ No

☐ Unknown

Please let us know what losses you have incurred.

_____
_____
_____
_____
_____
_____
_____

9. Do you have pets or animals that have been affected by the fire/smoke?
   ☐ Yes
   ☐ No

Please give details.

_____
_____
_____
_____
_____

10. Do you have any of the following?
    ☐ Tank Water
    ☐ Swimming Pool
    ☐ Vegie Garden
    ☐ Farm
    ☐ Outdoor furniture and equipment

If you have ticked any of the following please leave details below.

_____
_____
_____
_____

11. Do you feel that the local and state governments have generally satisfied your needs in regards to the handling of the mine fire.
    ☐ Yes
    ☐ No

☐ **17-30**
☐ **31-45**

- □ **46-59**
- □ **60+**

B. Are you a business owner?

- □ **Yes**
- □ **No**

1. **Has your business been affected**
   - □ **Yes**
   - □ **No**

(If your business has been affected please fill out our pink business form)

Business Owners Details.

1. Do you own a business in the Valley?
   - ☐ Yes
   - ☐ No

If you have answered yes to this question please continue.

2. What area of the valley is your business?

   _____
   ___

3. Have you had extra expenses to pay out because of the Fire and its effects?
   - ☐ Yes
   - ☐ No

Please leave details below, if there is not enough room please use spare forms. And if you have any evidence to back this up.

_____
_____
_____
_____
_____
_____
_____
_____
_____
__

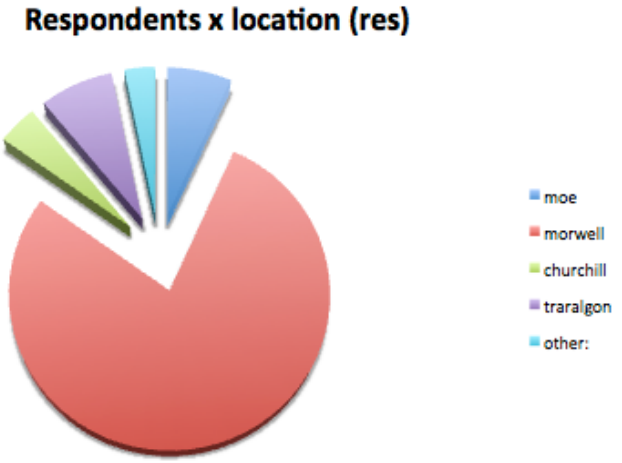
4. Has your business lost revenue due to the fire and its effects?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

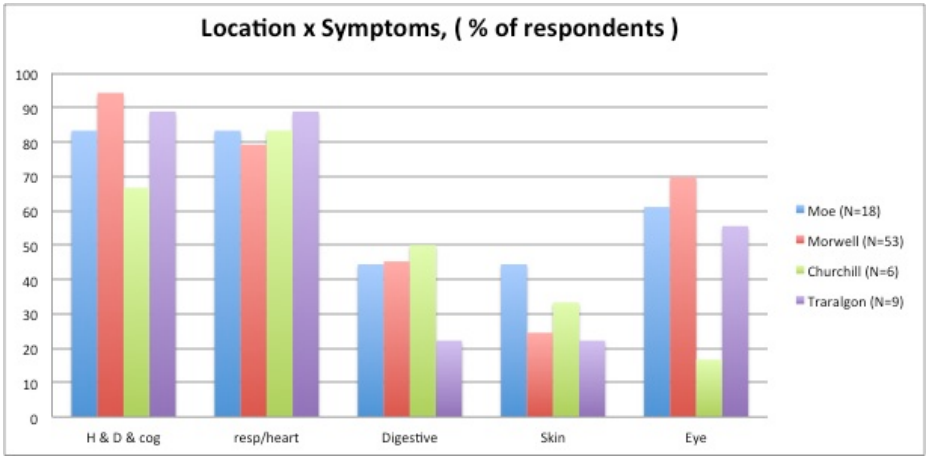
5. Do you feel you have been looked after by the local and state governments in relation to compensation?
   - ☐ Yes
   - ☐ No
6. Has your Insurance company been helpful in this crisis?
   - ☐ Yes
   - ☐ No

BUSINESS NAME:_____
BUSINESS ADDRESS:_____
CONNTACT NAME:_____
CONTACT NUMBER:_____

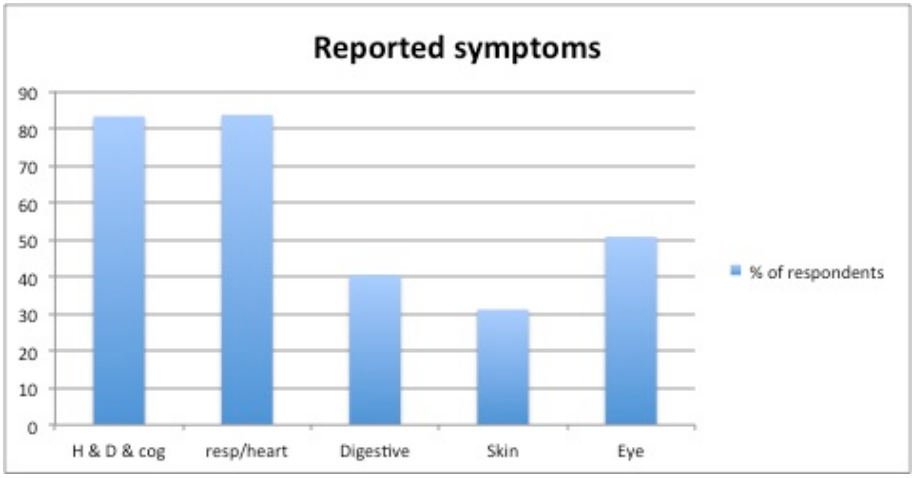
V.O.T.V. Heath snapshot done 2nd March

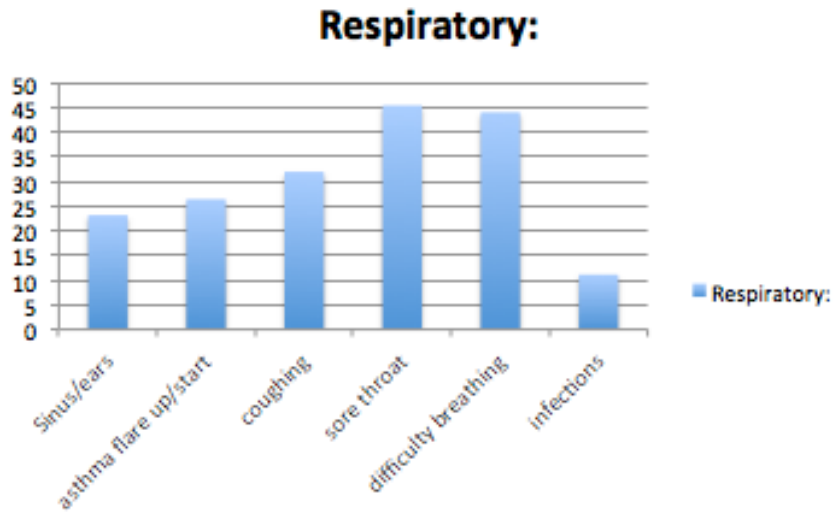


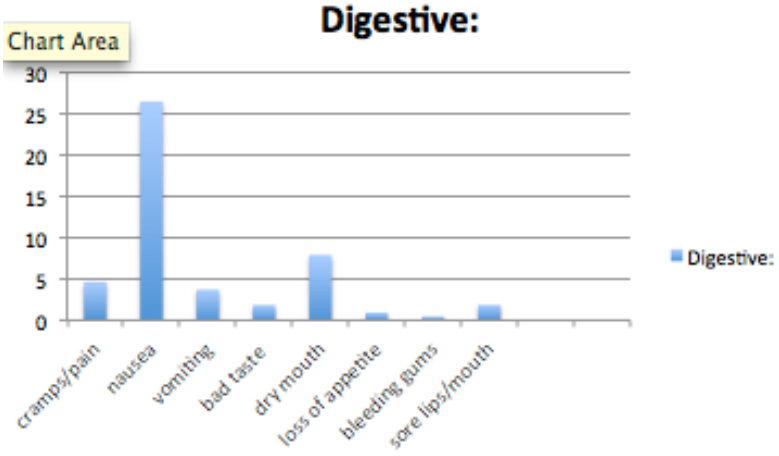
Respondents to survey are from a wide area across the Latrobe Valley and some beyond.

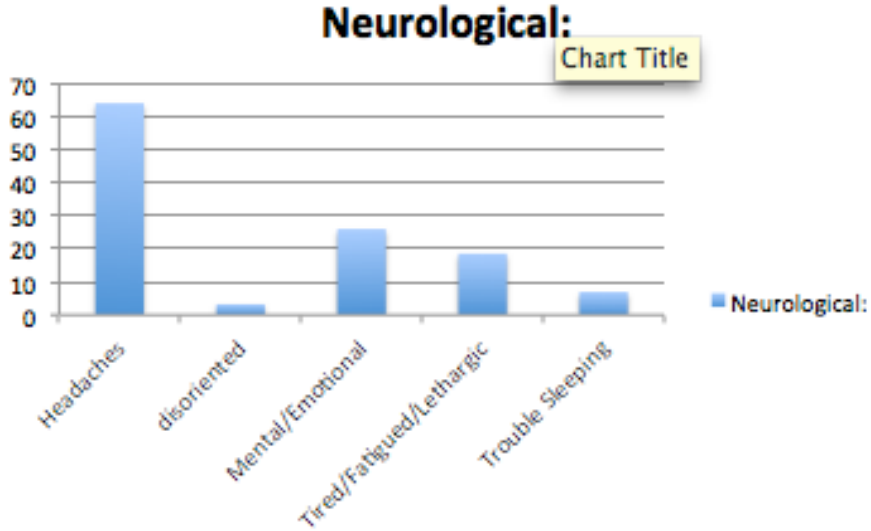


Symptoms shown are the same across the whole surveyed population. All were affected in the same way, though number of affected respondents varied with location.









All these symptoms are typical of exposure to the hazardous, toxic and carcinogenic substances listed by the EPA in the smoke and ash. For some of the materials there is

no safe levels, many have long term health effects that will take years to develop, many are developmental in pregnant women and growing children

We can expect an increase in infertility, birth defects, developmental difficulties and learning disorders. We can also expect an increase in pulmonary vascular disease, cancers such as lung and nose. Blood and lymphatic cancers, nervous system damage, heavy metal poisoning. There will be impacts on the liver and kidneys. The list goes on and is there for anyone with google to see if they compare what is in the smoke and ash, with the effects of exposure to these.

The measures of hazards on the EPA site were deceptive as they compared against levels used in soil contaminants (HIL's) and not suitable for dust that is already inside the house, ceiling and soft furniture.

We need more than a 10 year study to count how many of us die, using a sample so small, over such a short period that it absolves the Government and the industry from responsibilities.

A **health** study, not a **death** study.

We need them to assess how many of us have been sick, what we have been sick with and how widespread the effects have been. We then need our health monitored over a long time and see what treatments are useful in treating the long term effects and document these.

Voices of the Valley

Voicing the concerns of the Latrobe Valley community

www.votv.org.au
contact@votv.org.au
voicesofthevalley.nationbuilder.com
Facebook: Voices of the Valley

Voices of the Valley
Incorporated Association A0060859B

PO Box 593

Moe Vic 3825

14/08/2014

To:-

The Board,

Hazelwood Minefire Inquiry,

(via Justine Stansen)

Following up from the telephone conversation with Justine Stansen this morning we are forwarding the findings of our team into the premature deaths (harvesting effect) brought about by the Hazelwood Minefire within the Latrobe Valley.

As you are aware we at VOTV have been concerned with documenting and reporting the public health issues surrounding the minefire to you. We presented the results of 3 separate health surveys spanning several weeks of the incident and were alarmed at the results. These surveys and the raw data were collated, summarised and submitted to the Inquiry by the due date.

VOTV were also simultaneously chasing up data on death statistics because we had anecdotal evidence and requests about the increase in morbidity and mortality around the time of the incident. For example we were approached at the time by a source within the aged care sector who wanted an investigation into what appeared to be a noticeable increase in deaths. This was reinforced by a local tombstone maker who told us he has never been busier.

We approached Births Deaths and Marriages (BDM) several times beginning in May 2014 to ask for statistics to help us assess this persistent theory. We have had many applications to them but there has been no information forthcoming.

During the waiting period the submission dates for the Inquiry closed but we continued to follow it up.

A team from VOTV then set out to find what data could be obtained about the last 6 years via the long and laborious task of filtering through the death notices in the local media. This took place at the offices of the media, at the local libraries and indeed at the State Library of Victoria Archives.

Voices of the Valley

Voicing the concerns of the Latrobe Valley community

www.votv.org.au
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voicesofthevalley.nationbuilder.com
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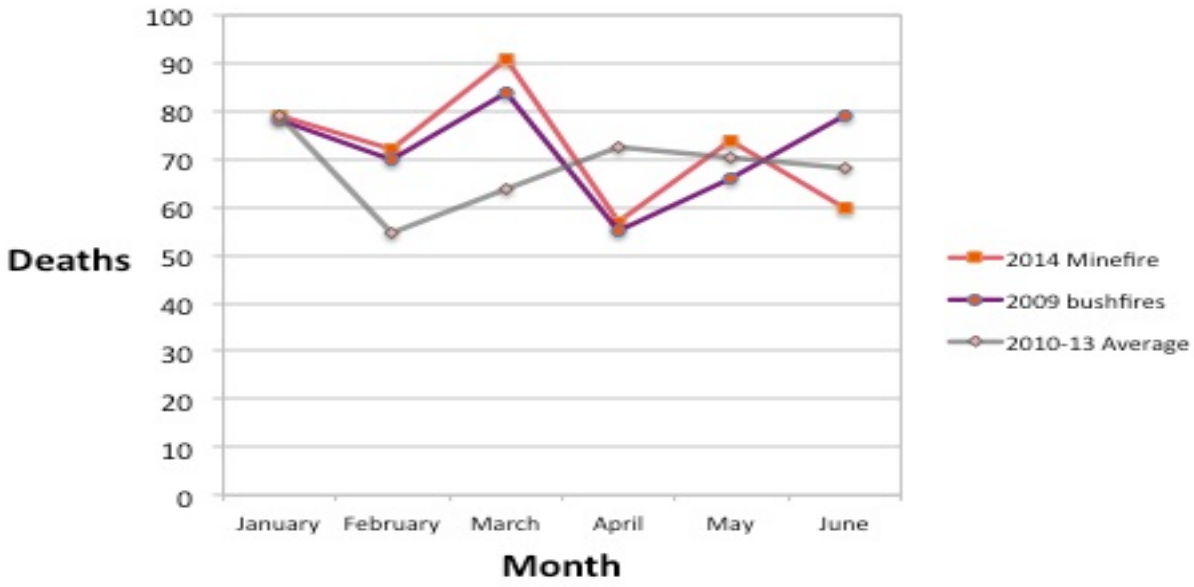
Incorporated Association A0060859B

The figures are beyond what we had imagined and show a harvesting or mortality rate greater than that experienced during the 2009 fires and heatwave where the bushfires killed by burning local people in their homes.



We at VOTV are still trying to get a response and proper statistics from BDM But given that the inquiry is drawing to an end and thus the chance to get to the truth or do anything about it is waning, we are turning to you, the Board Members of the Inquiry.

We have been told all along that there was no problem and that the minefire wasn't a major incident because nobody had died, unlike for example the Black Saturday fires where the deaths were highly visible and public and thus aroused outrage and attention from the public. This it would seem is simply not true.

It would seem that motivation to do something about what happened, or prevent it from happening again within the Government departments we have spoken to is tempered simply because it is being classed as a non-fatal, one off incident.

VOTV voted unanimously on the side of social responsibility to present this data to the Board of the Inquiry as soon as possible as a first step and seek your advice and counsel on this matter. We understand that there may be limitations inherit in the methodology of this data, and that the timing of this is perilously close to the end of the inquiry process and much of the report will already be firmed up. We understand that the board may not be able to accept new information for legal reasons since the closing of the submission date.

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Amongst the possibilities we see are that :-

- The Board may not be able to take the data on board at this late stage either because it is past the closing date for new information or that the Inquiry process is too advanced and almost complete.
- The Board may use its influence to obtain the official data from Births Deaths and Marriages to examine the harvesting effect themselves.
- The Board may have the ability to open a window that allows the new data to be submitted and evaluated.
- The public call for the inquiry to open a window that allows the new data to be submitted and included.
- The Board refer the deaths to a further coroners investigation or inquest.
- The Board is unable to do anything with the new information and VOTV and the people of the area are on their own to pursue the truth and take it to the media.

Attached are the spreadsheet of the data which includes some of the graphs and the very simple calculations used and where and by whom the data was obtained from for this research, copies of the emails sent to BDM during the early attempts to obtain official statistics, and the thanks and trust of the people of the Valley.

Sincerely seeking your assistance and advice

Ron Ipsen

For VOTV

0428512959
scuzzi@bigpond.com

V.O.T.V.

Birth Deaths & Marriages (BDM)

Death Statistics,

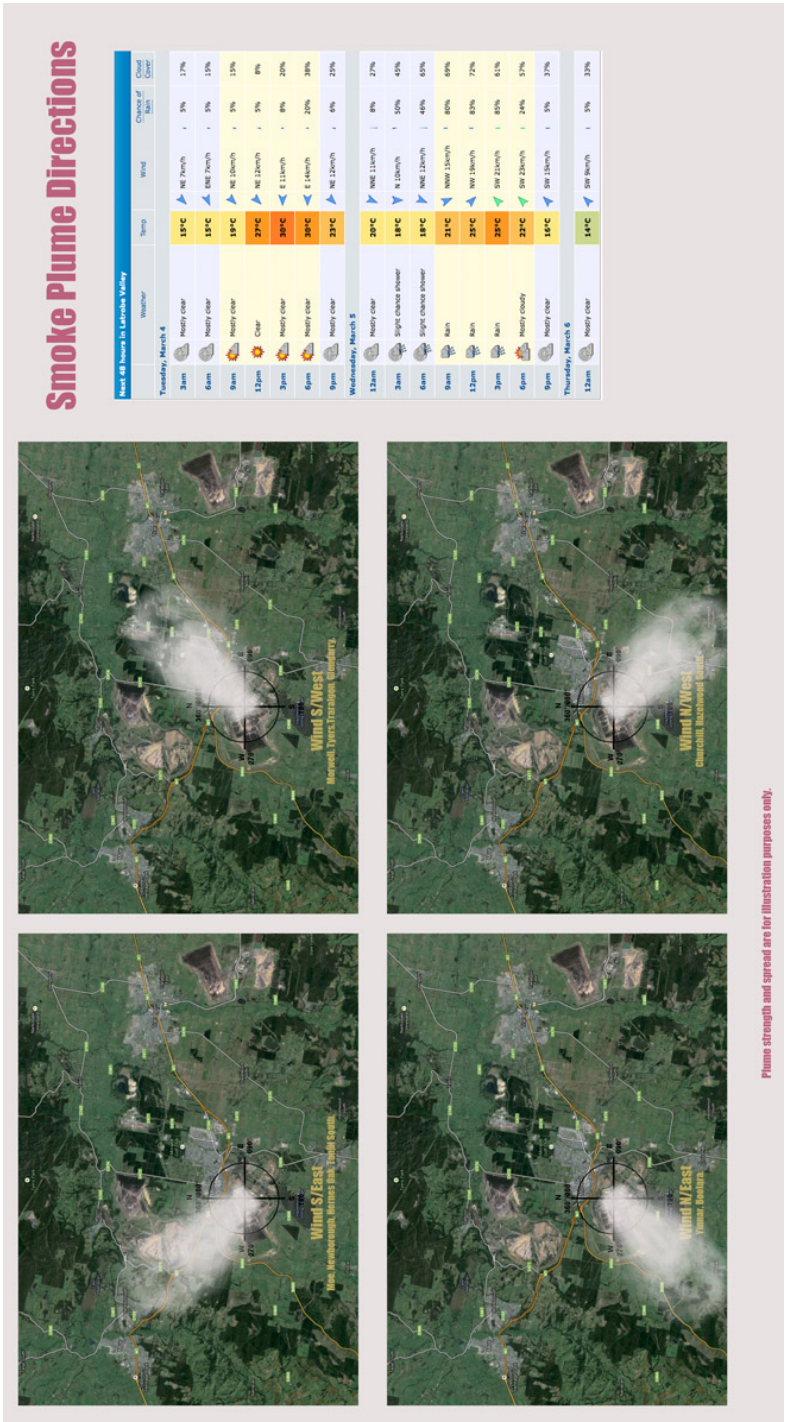
Latrobe Valley

22/09/2014

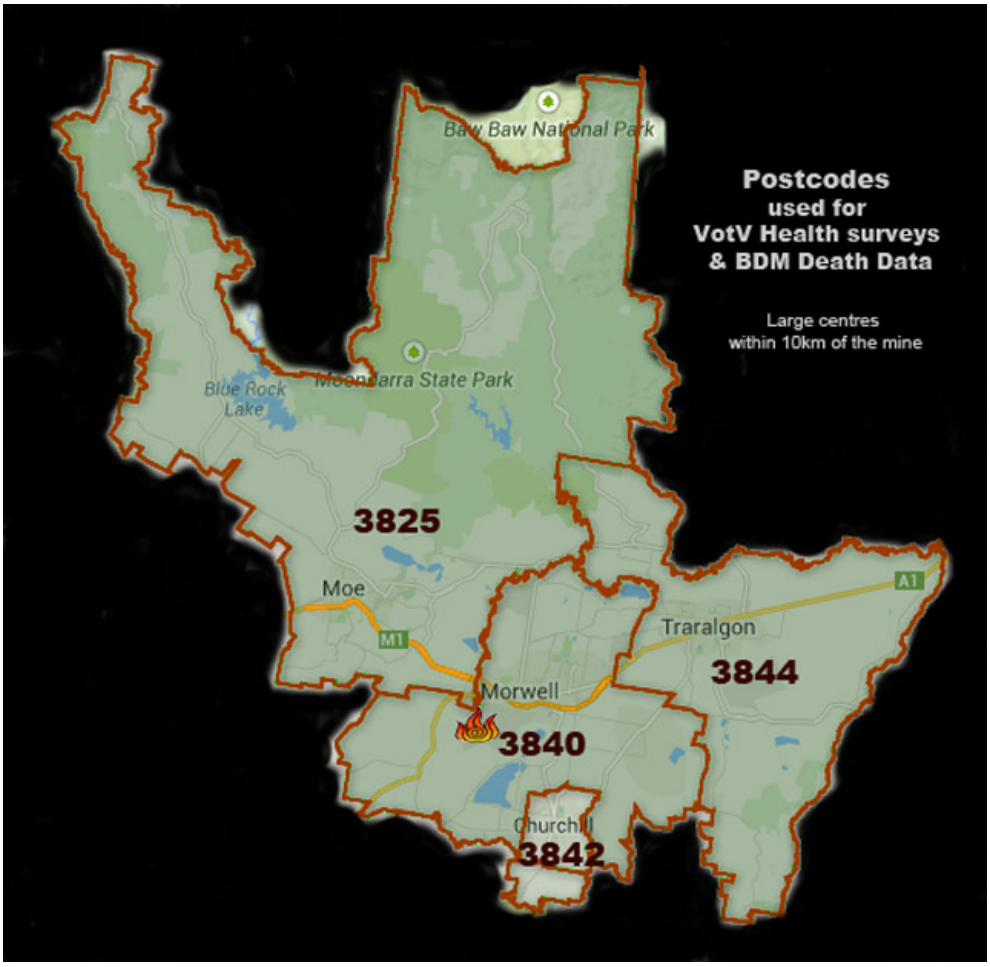
Ron Ipsen
votv.org.au

What happened?

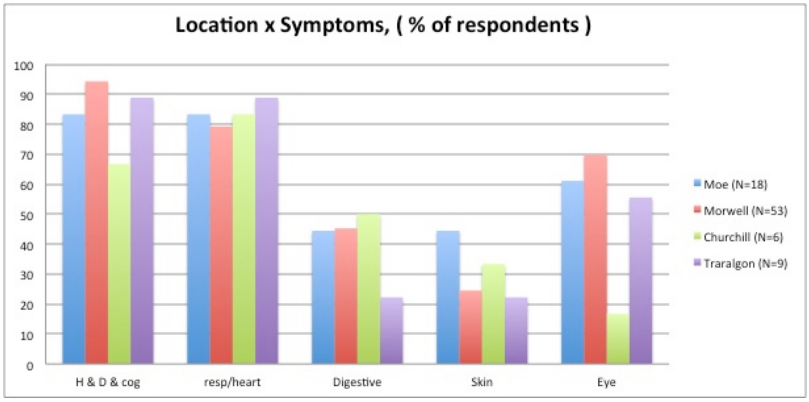
The toxic plume swung around with the wind direction to affect different towns at different times, all however remained under a constant blanket, as layers of smoke previously laid - settled over the valleys like fog.



The area studied.



From the previous health studies we had done we knew there was a rise in respiratory problems associated with the smoke layers and a corresponding rise in neurological symptoms (Headaches, Disorientation and Cognitive).



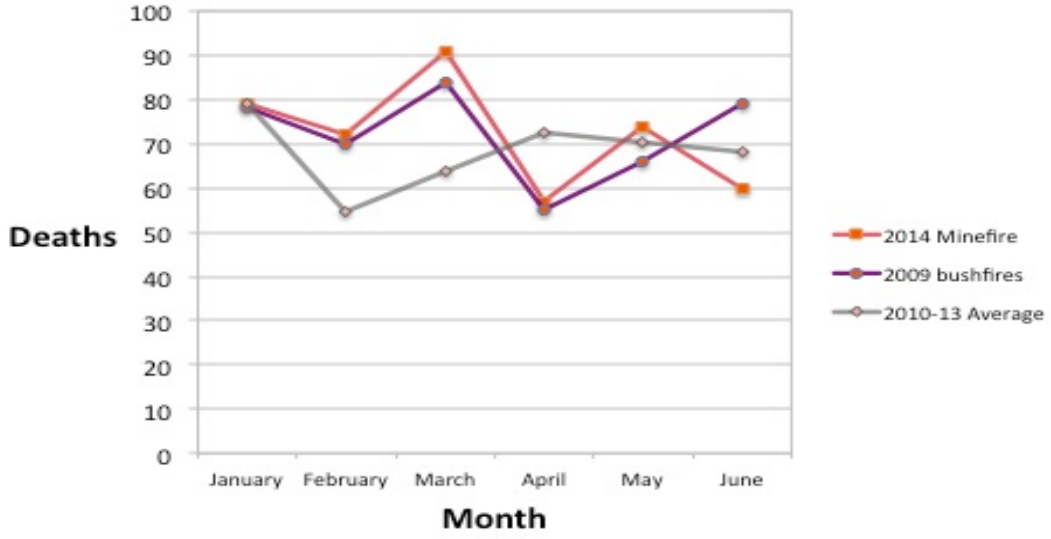
Our quest was simple, we had data on who was sick and where and with what, we wanted to check if there were deaths that corresponded with those figures.

We were unable to get the stats from BDM so we set about trying to find out by manually counting the death notices in the local paper, which serviced approximately the same area.

We researched the previous 6 years so that we had figures to compare the 2014 results to and what we found from our lengthy investigation was alarming. As soon as we had them correlated we had a community meeting to decide what to do. It was unanimously decided to ask the Inquiry for advice.

The previous documentation covers this and their response.

The rough graph looked like this ..



It showed we had more deaths locally than the 2009 heatwave and black Saturday bushfires combined, where 11 people died in their homes in February.

The Inquiry answered us and forwarded our rough information and concerns to the Coroner and The Department of Health (DOH!)

We were told by the Inquiry that they thought it serious and *would NOT state* in their report that "*there were no deaths caused by the minefire*."

They lived up to their word and we thank them.

Sooo…

Eventually …

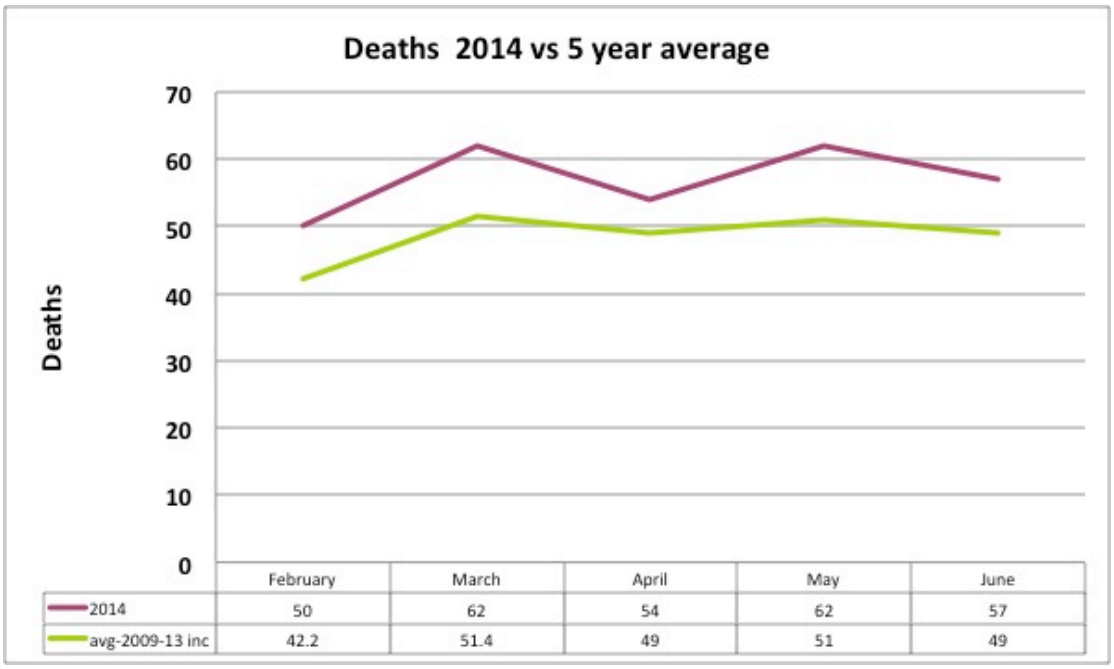
The day after the Inquiry closed we received the information we requested many months before.

Official BDM death stats as sent to us.

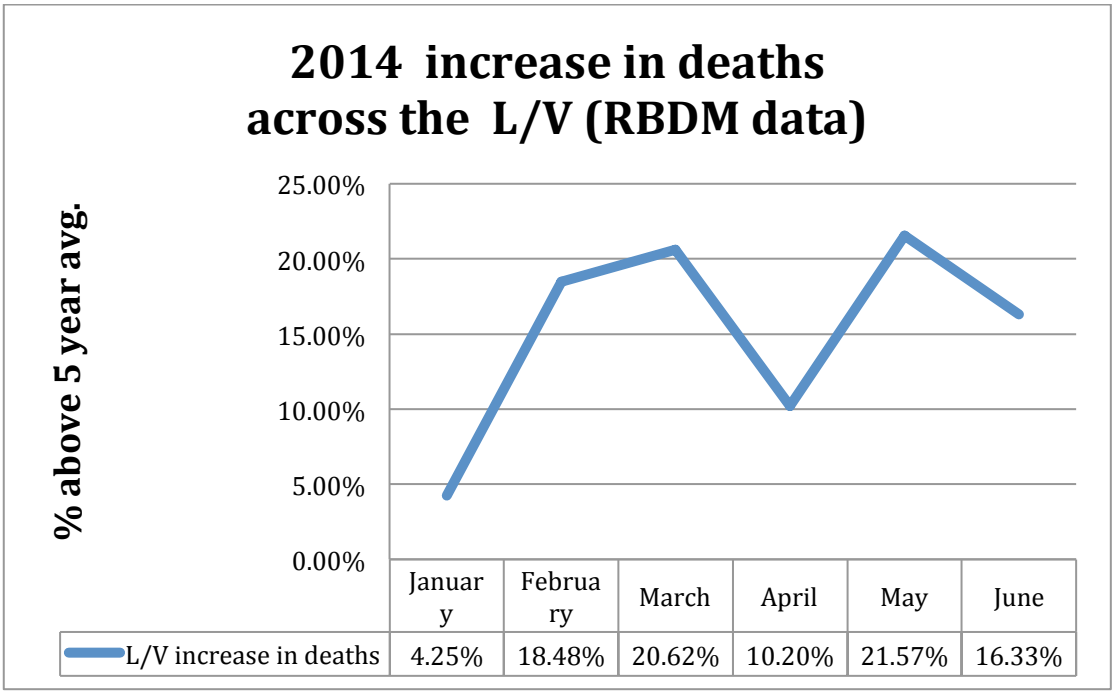
DEATHS BY DATE AND USUAL PLACE OF RESIDENCE								
	POSTCODE							
YEAR	3840		3842		3825		3844	
2009	January	19	January	5	January	23	January	21
	February	18	February	4	February	11	February	22
	March	23	march	4	March	16	March	19
	April	9	April	2	April	11	April	13
	May	11	may	2	May	24	may	19
	June	6	June	3	June	15	June	23
2010	January	11	January	1	January	16	January	18
	February	17	February	2	February	14	February	12
	March	9	March	6	March	15	March	17
	April	19	April	3	April	19	April	12
	May	17	May	1	May	20	May	18
	June	18	June	1	June	12	June	17
2011	January	10	January	4	January	13	January	20
	February	11	February	3	February	15	February	11
	March	11	March	1	March	17	March	17
	April	19	April	4	April	24	April	14
	May	7	May	3	May	20	May	15
	June	9	June	0	June	10	June	9
2012	January	10	January	3	January	17	January	20
	February	11	February	2	February	12	February	13
	March	17	March	0	March	16	March	18
	April	12	April	2	April	17	April	10
	May	22	May	1	May	14	May	22
	June	17	June	1	June	19	June	21
2013	January	13	January	3	January	22	January	10
	February	4	February	3	February	15	February	11
	March	15	March	3	March	20	March	13
	April	10	April	5	April	18	April	22
	May	9	May	2	May	15	May	13
	June	13	June	0	June	17	June	34
2014	January	18	January	0	January	17	January	19
	February	10	February	4	February	16	February	20
	March	12	March	3	March	24	March	23
	April	15	April	2	April	29	April	8
	May	15	May	1	May	26	May	20
	June	18	June	0	June	20	June	19
	NB: As extracted on 2 September 2014							

A simple interpretation of the BDM stats across all 4 postcodes

Its not rocket science to see there is something wrong this year, It's written on the RSL newsletter.



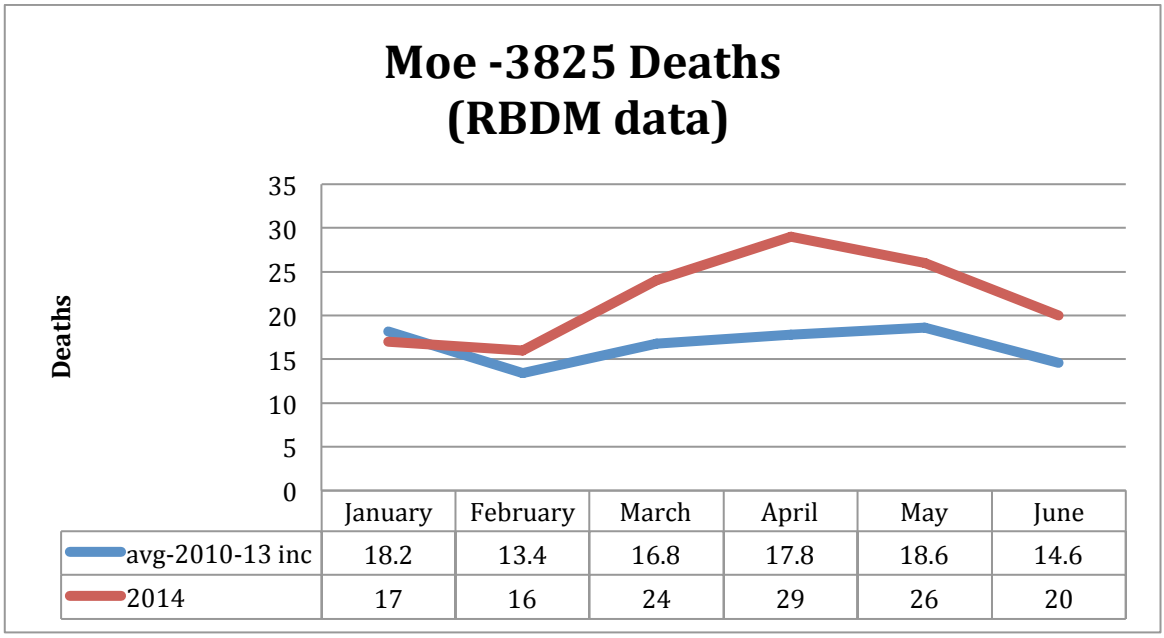
	February	March	April	May	June
2014	50	62	54	62	57
avg-2009-13 inc	42.2	51.4	49	51	49



	January	February	March	April	May	June
L/V increase in deaths	4.25%	18.48%	20.62%	10.20%	21.57%	16.33%

Separated into individual postcodes

Moe 3825

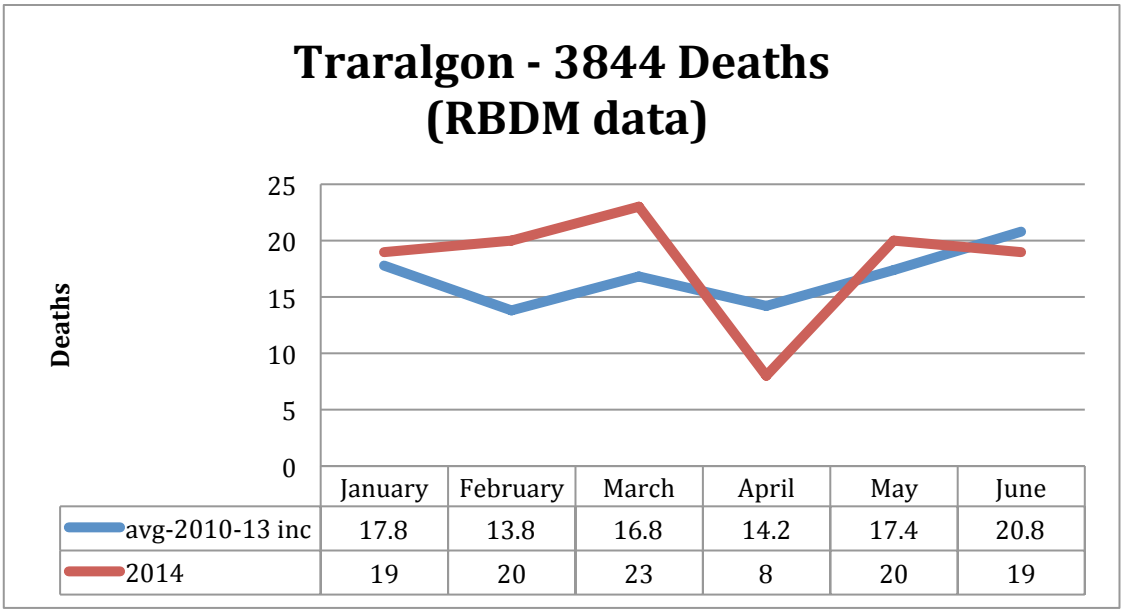


	January	February	March	April	May	June
avg-2010-13 inc	18.2	13.4	16.8	17.8	18.6	14.6
2014	17	16	24	29	26	20

Quite a worrying trend on this graph given that Moe and surrounds were considered safe, and the children were evacuated to here. It is also the place where the Shire respite/refuge centre was set up.

One theory suggests that it is probable that this is caused by the bowl effect of the geography and toxins blowing eastwards were captured in the between the two mountain ranges, flowing downwards as they are heavier than air in the same way the water does and follows the watershed to be caught in the basin. Trapped by where the Divide meets the Strzelecki ranges at the lowest point, Moe and Lake Narracan.

Traralgon 3844



	January	February	March	April	May	June
avg-2010-13 inc	17.8	13.8	16.8	14.2	17.4	20.8
2014	19	20	23	8	20	19

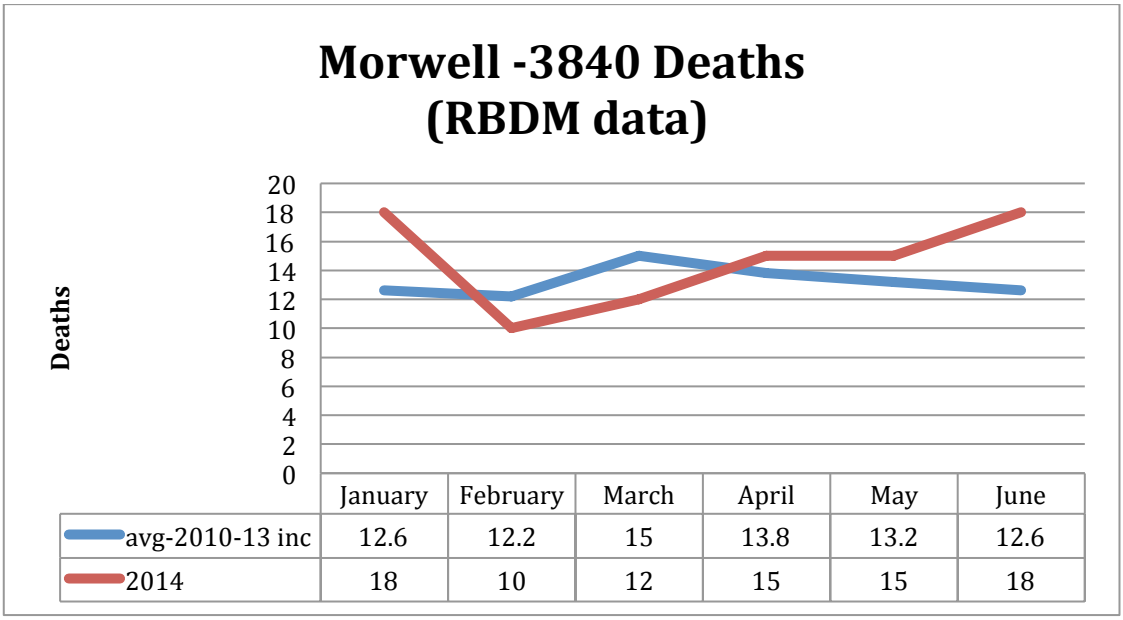
The Traralgon stats from BDM are very telling, showing what is termed a "Harvesting Effect" at the time of the fire and an increase afterwards...

Traralgon is an area that lies downwind of the Hazelwood Open Cut during the predominant westerly breezes that dominate the area.

Some business's and schools relocated to Traralgon as the population were under the belief that areas outside of Morwell, or even Morwell South were safe.

It was a widely held belief that precautions in these areas, such as sheltering indoors or wearing masks, was unnecessary.

Morwell 3840



	January	February	March	April	May	June
avg-2010-13 inc	12.6	12.2	15	13.8	13.2	12.6
2014	18	10	12	15	15	18

3840 January data shows the effect of the heatwave harvesting in January and gives us understanding to why the starting point is so low in feb 2014.

The month of January shows the harvesting effect had temporarily lowered the death stats during the minefire period....

This postcode has been the focus of some serious statistical manipulation by the establishment to obfuscate the obvious, that more people died in 2014 in the electorate than any previous year of the study.

The red numbers on the left are the ones quoted by David Davis on the radio, and only relate to a single towns postcode. Yes it's true, as a single set of numbers they bear little resemblance to each other.

But if you take the first 5 years and average them, a simple enough calculation, then it all starts to show up on a simple graph as a trend. (as above)

	POSTCODE	
YEAR	3840	
2009	January	19
	February	18
	March	23
	April	9
	May	11
	June	6

		86
2010	January	11
	February	17
	March	9
	April	19
	May	17
	June	18

		91
2011	January	10
	February	11
	March	11
	April	19
	May	7
	June	9

		67
2012	January	10
	February	11
	March	17
	April	12
	May	22
	June	17

		89
2013	January	13
	February	4
	March	15
	April	10
	May	9
	June	13

		64
2014	January	18
	February	10
	March	12
	April	15
	May	15
	June	18

		88

5 year avg
12.6
12.2
15
13.8
13.2
12.6

79.4

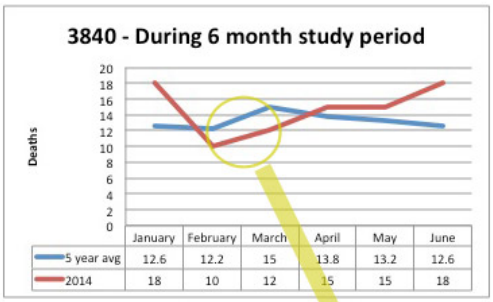
One of the questions that is being asked a lot of us by the media is how did the Govt get a decrease in deaths in Morwell of 19%, and are they using the same set of data.

Yes, I believe they have the same dataset from BDM.

The devil of course is in the detail.

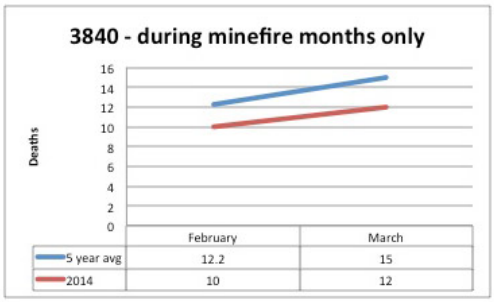
"No increase in deaths in Morwell during the period of the minefire"

"A decrease in death by 19% during the minefire"

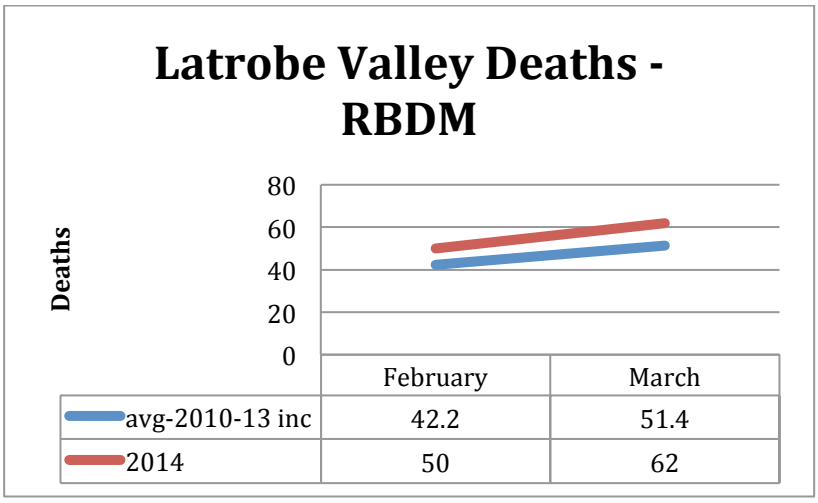


How to get a 19% decrease in deaths?

Limit the data to what suits your purpose only.

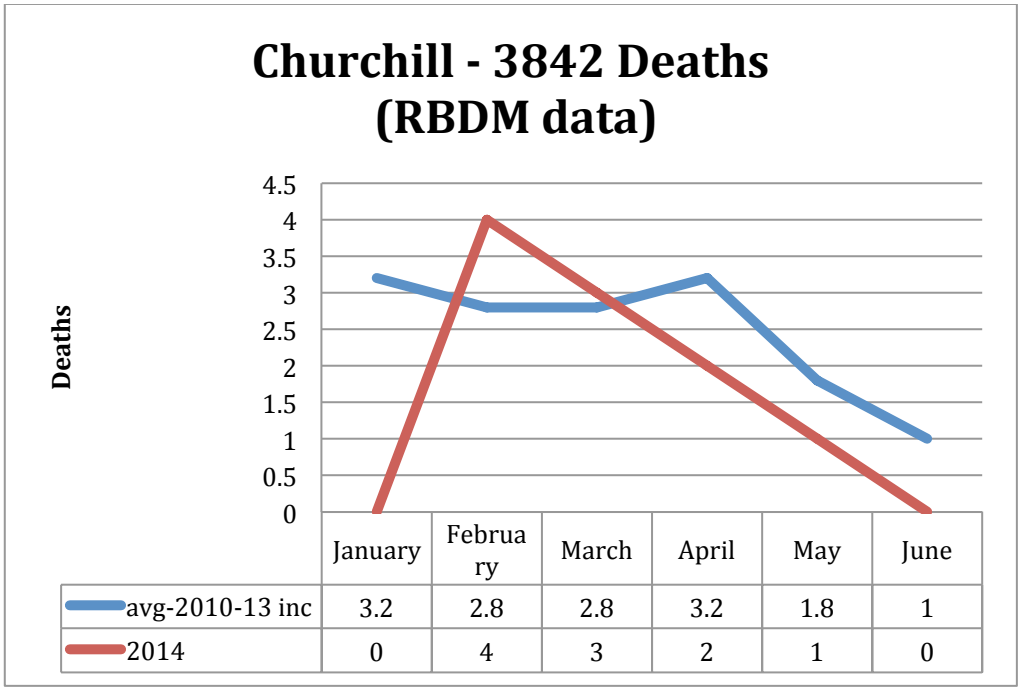


adding the other postcodes of course gives the opposite effect. Up 18% and 20%



Churchill 3842

Is a small area of predominantly young population with a graph showing deaths coinciding with the minefire, not as reliable as the others because of the small population of the postcode and small numbers involved.



	January	February	March	April	May	June
avg-2010-13 inc	3.2	2.8	2.8	3.2	1.8	1
2014	0	4	3	2	1	0

So to sum it all up, we have had 16 more people die this year than our previous high in 2009 when there was both a heat wave and the black Saturday fires in combination, and 44 (15%) more than the average of the previous 5 years.

It would be good to get further access to BDM data particularly as to cause of death, and some commitment to and help in righting the historic health deficit pointed out so succinctly in the Minefire Inquiry's report.

We need specialists to hold training sessions with our doctors to give guidance on what to look for and how to treat it.

We need a Health Conservation area and regulatory measures taken to make sure that our area is safe to live in.

This minefire was an industrial spill on a massive scale, not a natural disaster.

Our Cities are surrounded by privatised mines that the government regulates.

We are asking that they are made safe for our health and our children's health.

Analysis of death data during the Morwell mine fire

Introduction

This document explains my analysis of the Morwell mine fire data. I have tried to give as much technical detail as possible whilst still making it understandable to the non-specialist reader.

I am happy for this document to be freely shared. I am also happy to answer further questions via e-mail: a.barnett@qut.edu.au.

Methods

Data

The data were monthly numbers of deaths from 2009 to 2014 for the months of January to June. The deaths were split by four postcodes (3840, 3842, 3825 and 3844) according to usual place of residence. The six years, six months and four postcodes gives 144 observations. In total there were 1,811 deaths.

Statistical model

I used a regression model to examine the key hypothesis of whether deaths rates were higher during the two months of the fire.

I give the model as an equation below and then explain each line of the equation.

$$
\begin{aligned}
d_{i,t} &\sim \text{Poisson}(\mu_{i,t}), \qquad i = 1, \ldots, 4,\ t = 1, \ldots, 36, \\
\log(\mu_{i,t}) &= \log(\text{pop}_t/10000) + \alpha_0 + \text{trend}_t + \text{season}_t + \text{postcode}_i + \text{fire}_t, \\
\text{trend}_t &= \alpha_1 t, \\
\text{season}_t &= \alpha_2 \cos\left(\frac{2\pi(\text{month}_t - 1)}{12}\right) + \alpha_3 \sin\left(\frac{2\pi(\text{month}_t - 1)}{12}\right), \\
\text{postcode}_i &\sim N(0, \sigma^2) \\
\text{fire}_t &= \begin{cases} \alpha_4, & \text{if year} = 2014 \text{ and month} = 2, 3, \\ 0, & \text{otherwise.} \end{cases}
\end{aligned}
$$

The first line says that the deaths from postcode i at time t are modelled as a Poisson distribution, which is the most appropriate for count data. There are four postcodes and 36 times.

The second line is the regression model, it includes the population at time t (divided by 10,000) as an offset which is used to account for the region's growing population. This

population data is for LaTrobe City Council which includes other postcodes outside the four in the death data. Ideally I would have had population data for each individual postcode, but I've assumed that the influx and outgoings of people in these four postcodes over time mirrors the patterns for the wider council area. In a sensitivity analysis I removed the population data and it had little impact on the results.

The regression equation uses a log-link which means the model is multiplicative and hence gives results as death rates rather than numbers. The overall mean death rate is modelled by α_0 (labelled as the intercept in the tables below). A linear trend in death rates is modelled by α_1 to control for the expected small reduction in death rates over 2009 to 2014.

Deaths in Australia are strongly seasonal with a winter peak. To model this I have include a annual sinusoidal model based on the month in time t.

To adjust for any differences in death rates between postcodes I included a random effect using a Normal distribution with a zero mean. This allows deaths rates to be higher or lower in some postcodes and constrains the differences to follow a Normal distribution.

The effect of the fire is modelled using a simple change in death rates during February and March 2014 compared with all other months.

The absolute number of deaths was estimated using: $\overline{d}[\exp(\alpha_4) - 1]$, which is the mean number of monthly deaths per postcode multiplied by the relative change in deaths.

In an alternative model I included a term for temperature: $\alpha_5 \text{temperature}_t$, where temperature_t is the maximum monthly temperature from the Bureau of Meteorology. This adjustment is added because we know that high temperatures increase the risk of death. Ideally I would have used daily temperature data to give a finer adjustment, but this would also require daily death data.

The model was fitted using a Bayesian paradigm as this allowed me to easily estimate the probability that there was an increase in the death rate: $Pr(\alpha_4 > 0)$.

The plots and tables were created using the R software (`www.r-project.org`) and the Bayesian model was fitted using JAGS (`mcmc-jags.sourceforge.net`).

Results

Plots

The differences in numbers on the y-axes between panels are because some suburbs are larger than others. Looking at the total figures, the deaths in 2014 in February and March do appear to be high. Another year with high deaths rates is 2009 and this may be due to bushfires and extreme heat that summer.

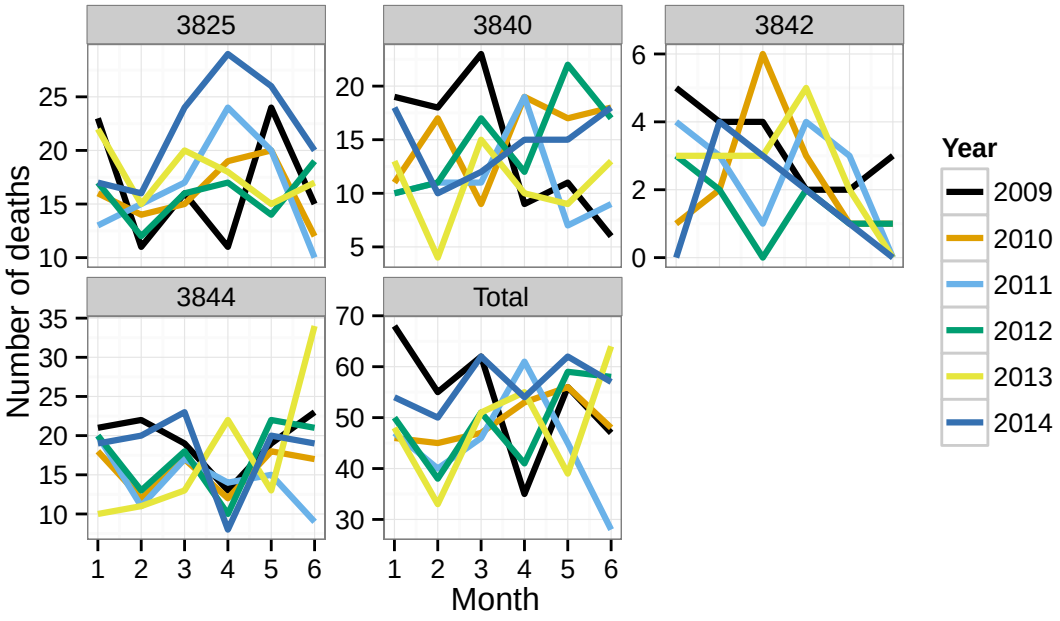


Figure 1: Deaths numbers by month and year in each postcode and the overall number of deaths. The scales on the y-axes differ between postcodes.

Statistical model results

Table 1: Estimates without adjusting for temperature. Statistics are the mean, standard deviation and lower and upper 95% credible interval. Estimates are on a log scale except for the relative risks and absolute number of deaths.

	mean	SD	lower	upper
Intercept	0.30	0.06	0.17	0.42
Trend	0.00	0.01	−0.03	0.03
Postcode 1	0.57	0.04	0.49	0.66
Postcode 2	0.31	0.05	0.22	0.40
Postcode 3	−1.43	0.08	−1.60	−1.27
Postcode 4	0.55	0.04	0.46	0.63
Season, cos	−0.04	0.04	−0.12	0.04
Season, sin	−0.02	0.08	−0.17	0.14
Fire	0.13	0.11	−0.08	0.34
Fire, relative risk	1.14	0.12	0.92	1.41
Absolute deaths	1.82	1.57	−1.02	5.10

The probability that the death rate was higher than the average during the fire is 0.89. This means that the probability that the death rate was not higher than the average during the fire is 0.11. The mean increase in deaths is as a relative risk is 1.14, or 14 as a percentage. The absolute number of deaths per postcode per month is 1.8, which over 4 postcodes and 2 months is 14.4.

Table 2: Estimates after adjusting for monthly temperatures. Statistics are the mean, standard deviation and lower and upper 95% credible interval. Estimates are on a log scale except for the relative risks and absolute number of deaths.

	mean	SD	lower	upper
Intercept	0.30	0.06	0.18	0.42
Trend	0.00	0.01	−0.03	0.03
Postcode 1	0.57	0.04	0.49	0.66
Postcode 2	0.31	0.05	0.22	0.40
Postcode 3	−1.43	0.08	−1.59	−1.27
Postcode 4	0.55	0.04	0.46	0.63
Season, cos	−0.16	0.15	−0.46	0.13
Season, sin	−0.01	0.08	−0.16	0.15
Fire	0.09	0.11	−0.13	0.32
Fire, relative risk	1.11	0.13	0.87	1.37
Absolute deaths	1.34	1.60	−1.58	4.71
Temperature	0.02	0.02	−0.02	0.06

The probability that the death rate was higher than the average during the fire is 0.80. The mean increase in deaths is as a relative risk is 1.11, or 11 as a percentage. The absolute number of deaths per postcode per month is 1.4, which over 4 postcodes and 2 months is 11.2.

The reduction in the risk of the fire and the death numbers after adjusting for temperature is plausible as we know that high temperatures can kill. High temperatures and high levels of air pollution can interact to produce greater combined risks than when only one exposure is present.

The figures in the first released analysis quoted 11 deaths rather than 14. This is because the request to present absolute deaths was made after the request to adjust for temperature.

Court Reference [*if known*]: /

REQUEST TO INVESTIGATE A FIRE

Form 16 Rule 39(1)

*Sections 30 and 31 of the **Coroners Act 2008***

I _____Wendy Farmer

from the:
***Country Fire Authority**
***Metropolitan Fire and Emergency Services Board**
***Other, please specify: _____ Voices of the Valley (Incorporated Association)**

of _____13 Yinnar Street Newborough VIC 3825
request the Coroner to investigate:

DETAILS OF FIRE	
Location of fire	Hazelwood Open Cut Coal Mine
Fire occurred *on/*about/*between	9th February 2014 to at least 2nd April 2014, perhaps underground still.

for the following reason(s):

* The Hazelwood Open cut coal mine, sometimes known as the Morwell open cut coal mine, is adjacent to the southern edge of Morwell township.

* The mine has a very low rank lignite coal, and as such it is recognised by scientists as prone to spontaneous combustion, and ignition by anything as small as a smouldering cigarette dropped on its powdery surface.

* Embers came into the mine from the Hearns Oak fire, according to the Hazelwood Mine Fire Inquiry Report.

* Due to a lack of adequate fire suppression equipment in the worked out areas of the mine and in the combustible overburden dumps, large areas inside the open cut were ignited due to the rapid spread of tiny coal embers on hot strong and gusty winds.

* The resultant smouldering combustion of the thick lignite coal seam ejected huge quantities of poisonous smoke and ash across wide areas of Gippsland, but impacted the people of Morwell and Traralgon especially hard. Thick smoke was present in the area on at least 21 days until the fire was deemed to be safe.

….....continued on annexure.

(attach additional pages if insufficient space)

Signature:

Date: 11 / 9 / 2014

Please lodge this form with the relevant Coroners Court

*Delete if inapplicable

Form 16 application, "for the following reasons" (continued)

* Our community group has analysed death notices in the local press: the Latrobe Valley Express, over six half-year periods January 2009 to June 2014, and discovered an anomaly in the numbers during Feb-March 2009 and Feb-March 2014.

* We sent our data to the Hazelwood Mine Fire Inquiry (HMFI) secretariat on about 15th August, well after the closing date for formal evidence to be submitted. We had communication from the secretariat that the Board members had all been informed of our findings; that they would note in their official report that they had received no evidence about deaths within the required time limits; and that they would therefore refer the matter to your office and to the Victorian Health Department.

* Next we obtained official data from the Victorian Births Deaths and Marriages Registry for four key postcodes and have obtained expert epidemiological opinion on that data, confirming our observation of excess deaths coinciding with the smoke exposure of the population, to a high degree of certainty.

* As of today we are unaware of any approach to any of us by the Coroner's Court or the Health Department what they intend to do with our evidence of excess deaths coinciding with the exposure of a whole population to toxic smoke.

* THEREFORE, pursuant to Section 31(1) of the Coroners Act 2008 we submit this Form 16 formally requesting that you promptly set up an investigation of the fire, which we suggest will quickly validate our findings, and perhaps then best be dealt with by making the process transparent and public i.e. upgrading it to a **public coronial inquest.**

*** We believe that people should come before profits,** and that if people were made ill and even killed by a preventable industrial accident, then the guilty should not escape without sanction. We find little by way of commensurate sanction for the harms caused to the Latrobe Valley community in the Hazelwood Mine Fire Inquiry report or recommendations, while recognising that our information came too late for HMFI to take it into account.

* We will make all relevant information in our possession available to you upon request, particularly a report on how the newspaper data was compiled, and how the expert epidemiologist arrived at his conclusions from his analysis of the Births Deaths and Marriages official death statistics.

(signed)

Wendy Farmer, president Voices of the Valley

Coroners Court of Victoria

Level 11, 222 Exhibition Street Melbourne 3000
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FORM 16 - REQUEST TO INVESTIGATE A FIRE APPLICATION - APPLIED FOR BY 'VOICES OF THE VALLEY'
SUBMITTED TO THE CCOV RECEPTION ON 17-SEP-14.
DELIVERED BY: MICHAEL GUNTER
RECEIVED BY: RECEPTIONIST - HAYLEY PHILPOT.
FORMALLY HANDED TO THE STATE CORONERS EA ON THIS DAY.

With Compliments

coronersteam3@coronerscourt.vic.gov.au.