



Hazelwood Health Study

Annual Report 3

16 November 2017

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Contributors

The Hazelwood Health Study team, whose work forms the basis for this Report, comprises a diverse and dedicated group of academic, clinical and administrative staff from several Institutions.

Monash University School of Public Health and Preventive Medicine

Prof Michael Abramson (Principal Investigator)
Ms Shantelle Allgood
Dr Jillian Blackman
Mr Anthony Del Monaco
Dr Martine Dennekamp
Dr Jo Dipnall
Ms Christina Dimitriadis
Dr Caroline Gao
Prof Yuming Guo
Dr Sharon Harrison
Ms Karen Kilpatrick
Mr Para Perera
Dr Sylvia Pomeroy
Prof Malcolm Sim
Dr Dion Stub
Dr Lahn Straney
Ms Andrea Taggart
Ms Kristina Thomas

School Rural Health

Prof Judi Walker (Principal co-Investigator, Gippsland)
Dr Matthew Carroll
Dr Marita Chisolm
Ms Susan Denny
Dr Rebecca Jones
Ms Sarah Lee
Mr Shaun Mallia
Prof Darryl Maybery
Ms Kylie Sawyer

School of Biomedical Sciences

Prof Bruce Thompson

Faculty of Education

Dr Emily Berger

Federation University Centre of Research for Resilient Communities

Dr Ainsley James
Dr Belinda Morrissey
Dr Larissa Walker
Dr Sue Whyte
Dr Sue Yell

University of Tasmania Menzies Institute for Medical Research

Ms Marita Dalton
Dr Fay Johnston
Ms Melanie Reeves
Dr Shannon Melody
Dr Amanda Wheeler
Dr Penelope Jones
Ms Emerson Easley

The Alfred Hospital

Ms Brigitte Borg
Ms Liz Dewar

University of Newcastle

Associate Professor Michelle Duffy

Abbreviations

ABS	Australian Bureau of Statistics
ACD	Australian Cancer Database
AIHW	Australian Institute of Health and Wellbeing
CAC	Community Advisory Committee
CATI	Computer Assisted telephone Interview
CAWI	Computer Assisted Web Interview
CO	Carbon monoxide
CRG	Clinical Reference Group
CRIES	Children's Revised Impact of Event Scale
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DHHS	Victorian Government Department of Health and Human Services
DHS	Commonwealth Government Department of Human Services
ECG	Electrocardiogram
ELF	Latrobe Early Life Follow Up Stream
EPA	Environment Protection Authority
HHS	Hazelwood Health Study
HRF	Hunter Research Foundation
IES-R	Impact of Event Scale - Revised
K10	Kessler 10-item distress scale
LHA	Latrobe Health Assembly
MAC	Ministerial Advisory Committee
MBS	Medicare Benefits Schedule
MUHREC	Monash University Human Research Ethics Committee
NAPLAN	National Assessment Program – Literacy and Numeracy
NDI	National Death Index
NMD	National Mortality Database
PBS	Pharmaceutical Benefits Scheme
PM_{2.5}	Particulate matter with an aerodynamic diameter of 2.5 thousandths of a millimetre or less
PMG	Project Management Group
PSC	Project Steering Committee
REDCap	Research Electronic Data Capture software
SA	Statistical Area

SPHPM	School of Public Health and Preventive Medicine
SRG	Scientific Reference Group
SRH	School of Rural Health
SOP	Standard Operating Procedure
VACAR	Victorian Ambulance Cardiac Arrest Registry
VACIS	Victorian Ambulance Clinical Integration System
VAED	Victorian Admitted Episodes Dataset
VCOSS	Victorian Council of Social Service
VCR	Victorian Cancer Registry
VEC	Victorian Electoral Commission
VEMD	Victorian Emergency Minimum Dataset

Document History

Version Number	Date	Contact	Brief description
1.0	16 November 2017	Hazelwood Health Study Senior Project Manager	Submitted to DHHS in fulfilment of 19 th contractual milestone
1.1	18 December 2017	Hazelwood Health Study Senior Project Manager	Minor revisions made in response to comments received. Resubmitted to DHHS.
1.2	10 January 2018	Hazelwood Health Study Senior Project Manager	Minor revision to Appendix 5 page 11.

1 Executive Summary

This is the third Annual Report to be submitted to the Department of Health and Human Services (DHHS) as part of the milestones for the Hazelwood Health Study. This report provides a summary of progress made since the second Annual Report was submitted in November 2016, and includes a forecast on developments that are expected over the next few months.

The Hazelwood Health Study has undertaken an array of research activities in the last 12 months. A substantial body of health data have been collected, whilst much of the previously collected data have been analysed and reported upon. New research streams have been launched whilst others have commenced follow-up data collection or analysis and write-up. The comprehensive data collected, to date, have been drawn from a variety of sources including: physical testing, interviews, self-report surveys and administrative health records. Combined, these numerous data sources are enabling the researchers to present a comprehensive description of the impact of the Hazelwood mine fire event on the health of residents within the Latrobe Valley.

In anticipation of the release of findings to the community in this 3rd year of the Hazelwood Health Study, the [Clinical Reference Group](#) (CRG) and [Community Advisory Committee](#) (CAC) have increased the frequency of their meetings. Priorities for the CRG have included developing appropriate clinical pathways for abnormal findings and providing advice on dissemination of findings to health providers. The CAC are keenly reviewing findings as they become available and providing valuable feedback on the dissemination plans for these. The CAC are also integral to the development of strategies to increase engagement with the local community.

The [Latrobe Early Life Follow-Up \(ELF\) study](#) completed its first phase of recruitment early in 2017, with 552 families having participated in ELF's baseline survey. Families who consented to clinical respiratory and cardiovascular testing were subsequently invited to participate in those tests. The clinic testing commenced in April 2017 and closed in July 2017 with 263 children having been tested. The ELF stream has obtained numerous ethical approvals, permitting linkage to nine anonymised health datasets. In parallel to these activities, the ELF stream have completed analysis and write up of a preliminary report of findings. That first report draws upon birth outcome data self-reported by parents or carers, such as gestational age and birth weight, plus estimates of mothers' mine fire smoke exposure during pregnancy based upon air pollution levels modelled by the CSIRO Oceans

& Atmosphere Flagship. These preliminary analyses show no association between maternal mine fire smoke exposure and birth outcomes. Further analyses of perinatal outcomes are planned using more refined maternal exposure estimates and also de-identified perinatal data only recently obtained from the Victorian Perinatal Collection Unit.

The [Psychological Impacts Stream](#) has been progressing both the Schools Study and the Adult Psychological Impacts Study. Schools Study researchers have reported on the key findings from the first round of data collection in 2015 and have been progressing the collection of the second round of data, including students continuing from round one and who are now in years 5, 7 and 9, and recruiting a new cohort of year 3 students. The adult component has completed 27 interviews with Morwell residents sampled from the Adult Survey. Thematic analysis of that work is underway. Dr Matthew Carroll will be taking over leadership of the Stream from year 4 onwards, with current lead Professor Darryl Maybery remaining an investigator on the Stream, retaining a mentorship role and also a role in analysis, interpretation and write up of findings.

The [Older People Policy Review](#) was designed to be a discrete piece of work and was completed in December 2016. A report titled *Policy Review of the Impact of the Hazelwood Mine Fire on Older People: Final report* and an accompanying *Policy Brief* have both been accepted by DHHS and are available on the Hazelwood Health Study website. The Review has important implications for policy development and program planning in relation to older people and disasters for best practice to improve preparedness for, and response to, a future disaster event. Presentations have been made at three international conferences and three articles have been drafted for publication in international journals. These are currently under internal review. The Older People Stream will formally merge with the Community Wellbeing Stream in years 4 and 5 of the study in order to maximise resources and findings and to ensure that a focus on older people continues through the study. Further assessment of the impact of the mine fire event on older people will also continue within the Adult Survey, Psychological Impacts, Cardiovascular and Respiratory Streams.

The [Community Wellbeing](#) Stream's focus is on how the community perceived the mine fire's impact on their wellbeing, the effectiveness of the communication during and after the event, and the effectiveness of community rebuilding activities. The social media analysis conducted in Year 1 is complete and has been written up for publication. Stream members are currently writing a report on community recovery and wellbeing, based on the data from the Year 1 and 2 stakeholder interviews and focus groups. The Stream has completed the Years 2 and 3 participatory action research, which has culminated in a photographic

exhibition related to community recovery and involving 18 community groups. This photographic exhibition launched on 13 November and will run to 24 November 2017. Consultation with local media and communications professionals is taking place in regard to effective communication during and after a major event such as the Hazelwood mine fire. The Community Wellbeing Stream will merge with the Older Persons Stream in Years 4 and 5, given both Streams share a common focus on community wellbeing and communication.

After employing numerous strategies to facilitate recruitment, the [Adult Survey](#) closed in mid-February 2017 with 3,096 participants from Morwell (34%) and 960 participants from Sale (23%). Since then substantial resources have been invested in data cleaning, statistical analyses and write up of preliminary findings comparing health outcomes in Morwell relative to Sale. A report outlining those findings was publically released in September 2017 and is available on the Hazelwood Health Study website. A second report, which intends to compare health outcomes in residents who were highly exposed to the mine fire smoke, with residents who were less exposed or even not exposed, is in preparation. Approximately 70% of the Adult Survey participants consented to identified linkage to administrative health datasets. It is anticipated that those linkages will take place in 2018, after some final data cleaning has been completed.

[Hazelinks](#) has had an extremely active year, having received health data from the Medicare Benefits Schedule (MBS) and Pharmaceutical Benefits Scheme (PBS), Victorian Cancer Registry (VCR) and National Death Index to add to the hospital and ambulance data previously obtained. Hazelinks has proceeded with the preparation of several reports based upon analyses of these data.

A Hazelinks report describing analysis of hospital emergency presentations and hospital admissions between January 2009 and June 2015, has been publically released. This report showed increased rates of emergency presentations and hospital admissions for asthma/COPD, and 'all' respiratory diseases during the mine fire period, in comparison with the non-fire periods, but no evidence of increased rates for cardiovascular diseases.

Another Hazelinks analysis, which aimed to identify patterns of cancer in the Latrobe Valley region *prior* to the mine fire, has also been reported. Overall, cancer incidence in the Latrobe Valley region was found to similar to other regional and rural Victorian populations. However, an increased rate of mesothelioma and bladder cancer was observed in males in the Latrobe Valley, and liver, lung and blood cancers were elevated in women. This provides a baseline against which *post* mine fire cancer rates can be compared in future.

Hazelinks is also in the final stages of analyses and write up of MBS and PBS data, and of ambulance attendance data. The MBS and PBS data are being used to investigate whether mine fire-related PM_{2.5} was related to increased health service use or dispensing of prescription medications for respiratory, cardiovascular or mental health conditions. Whereas the ambulance data analysis aimed to investigate whether mine fire-related PM_{2.5} was related to increased ambulance attendances for the same medical conditions.

The [Respiratory Stream](#) has been designed to make objective measures of lung function to assess impacts of smoke from the Hazelwood mine fire on lung health in adult Morwell residents compared to adult Sale residents. Considerable resources were deployed over several months in order to launch this research stream. Appointing and training appropriately qualified clinic staff, sourcing medical equipment, setting up clinic rooms, finalising protocols for recruitment and clinical testing and development of an online bookings and data management system, were just a few of the steps required before testing could commence. Data collection commenced in Morwell in August 2017 and is expected to continue through to mid December 2017 before relocating to Sale. Currently 255 Morwell participants (of a target number of 339) have been tested in Morwell, with a further 43 booked.

Similarly, the [Cardiovascular Stream](#) aims to assess the impact of the mine fire smoke on blood pressure, electrocardiographic (ECG) measures, endothelial function as a marker of early vascular disease and inflammatory markers, such as C-Reactive Protein, in Morwell and Sale adults. As with the Respiratory Stream, substantial effort has gone in to the implementation of the Cardiovascular Stream. Data collection commenced in Sale in October 2017. To date the Cardiovascular Stream has tested 45 Sale participants, and they have a further 50 booked, from a target of 165 in Sale.

[Community engagement](#) continues to be a very high priority for the HHS. An array of activities were aimed at promoting community engagement in Morwell and Sale in the lead-up to the closing of the Adult Survey in early 2017. Increased and comprehensive use of traditional and social media throughout the year has aimed to heighten community awareness about both the Hazelwood Health Study's research findings and new research activities. The decision to appoint a senior Communications and Engagement Adviser has better aligned the HHS with the expectations of the community and the new environment in the Latrobe Valley, with the establishment of the Latrobe Health Assembly, the position of Health Advocate, the Health Innovation Zone and other associated activities. Public community engagement sessions were held in Morwell and Sale in October 2017. The

sessions were moderated by an independent facilitator and featured two-way round table discussions between study team members and the community.

A Ministerial Advisory Committee (MAC) was established in July 2017 to provide independent oversight of the study and facilitate engagement with the community. Professors Abramson and Walker have briefed the MAC and discussed the Hazelwood Health Study's engagement with the MAC's Terms of Reference. Professors Walker and Abramson also attended a meeting of the Latrobe Health Assembly to provide an overview of the study findings to date and to discuss ways to facilitate use of those findings.

In July the Monash-based Hazelwood Health Study team won the 2017 Monash University, Faculty of Medicine, Nursing and Health Science's Dean's [Award for Excellence](#) in Research - Economic and Social Impact. The team was also a finalist in the University's prestigious Vice Chancellor's Award for Research Impact - Economic and Social Impact.

2 Introduction

This is the third Annual Report to be submitted to the Department of Health and Human Services (DHHS) as part of the milestones for the Hazelwood Mine Fire Health Study, henceforth referred to by the shortened name of Hazelwood Health Study (HHS). This report includes a summary of progress made since the second Annual Report was submitted in November 2016, and gives an update on the developments that are expected to occur over the next few months. Copies of the first and second Annual Reports can be found at hazelwoodhealthstudy.org.au/reports.

3 Previously completed contract milestones

Since the signing of the contract with DHHS (30th October 2014), and prior to the submission of this 3rd Annual Report (16th November 2017), 18 contractual milestones have been completed. Those milestones, with their delivery dates, are presented in Table 1.

Table 1 Contractual Milestones completed prior to the 3rd Annual Report

	Contractual milestone	Delivered
1	Project plan	17 December 2014
2	Community and stakeholder engagement strategy	17 December 2014
3	Organisational agreements with sub-contractors	9 February 2015
4	Research ethics submission	9 February 2015
5	Advisory groups established	10 March 2015
6	Outline of Ageing Policy Review	8 May 2015
7	Interim Report 1	15 June 2015
8	1 st Annual Community Briefing	11 August 2015
9	Annual Report 1	13 November 2015
10	1 st Recruitment Report	15 March 2016
11	Interim report 2	15 June 2016
12	Ageing Population Policy review	30 November 2016
13	2 nd Annual Community Briefing	29 November 2016
14	Annual Report 2	15 November 2016
15	2 nd Recruitment Report	19 March 2017
16	Interim report 2	15 June 2017
17	Contract review & revised project plan	17 July 2017
18	Annual community briefing	9 Oct 2017 Morwell & 10 Oct 2017 Sale

4 Project Governance

4.1 Governance structure

The HHS governance structure is documented and reviewed on a regular basis to ensure it is fit for purpose to respond to study and community requirements. The most notable changes in the last year were: the expansion of the membership of the CAC to include up to six community members from Latrobe City and up to four community members from Sale; and the review and expansion of the CRG's Terms of Reference. Each of the HHS governance committees will undergo performance review at the end of the year via an online questionnaire.

The Governance Structure is shown at Appendix 1 and is also publically available on the HHS website at <http://hazelwoodhealthstudy.org.au/about/governance/>.

4.2 Community Advisory Committee

The CAC has increased the frequency of its meetings which had previously been held quarterly. There have been seven meetings held in the past year, the details of which are as follows.

23 November 2016

The CAC reviewed the Dissemination Plan and accompanying Fact Sheet 2 describing preliminary results from the Psychological Impacts Stream Schools Study component highlighting the preliminary analysis of the CRIES impact of event measure. The Committee was given an overview of the Cardiovascular and Respiratory Clinical Streams to be rolled out in 2017 and discussed the role that the Clinical Reference Group would have in establishing a process to address abnormal results.

8 February 2017

The CAC discussed the process for membership renewal with an Expressions of Interest round put in place for community representatives and letters sent to the participating organisations asking them to nominate their representatives for the coming year. In light of the increase in study findings to come out in 2017 the CAC also resolved to meet on a more regular basis. Members reviewed and endorsed dissemination plans for the Older People Policy Review and CSIRO smoke exposure modelling.

Dr Michelle Duffy, at that time Stream lead Community Wellbeing, addressed the CAC, seeking advice regarding groups and organisations to be approached about involvement in the 'What I Like About Morwell' participatory action research project. Members provided multiple suggestions which the Stream team reviewed and followed up on.

8 March 2017

New community members attended their first meeting. Tracie Lund was re-elected as the independent Chair. At this meeting members watched and discussed an animation which demonstrated the movement of the mine fire smoke and associated modelled PM_{2.5} levels on each day of the mine fire period. Discussion included members' advice on appropriate ways to disseminate the CSIRO findings. The CAC discussed the draft timeline of release of results to the community in 2017. Advice on dissemination plans continued to form a major component of the CAC's work plan in 2017.

3 May 2017

CAC members provided feedback on (i) Professor Walker's proposed presentation to the Australia and New Zealand Disaster Management Conference and (ii) draft Respiratory Stream Information Sheet and Consent Form and discussed alternatives for reimbursement of participants' time. The newly appointed Communications and Community Engagement Adviser, Shaun Mallia (refer to section 5.5), was introduced and he sought advice on future directions for communication and engagement.

5 July 2017

Shaun Mallia discussed dates for the Annual Community Briefings with the CAC and proposed the establishment of Morwell and Sale working groups to oversee the design of the briefings. Professor Michael Abramson provided an overview of the Explanatory Statements for the cardiovascular and respiratory clinical assessments and sought feedback from CAC members.

6 September 2017

Professor Judi Walker and Shaun Mallia put forward, for discussion, the idea of conducting a masterclass with local journalists at the Latrobe Valley Express on ways to ensure study findings are easily understood by the community. CAC members suggested this be expanded to include the wider Gippsland media.

Mr Mallia confirmed dates, venues and time for the Annual Community Briefings. On the advice of the working groups a new format for the briefings had been developed that would focus on stronger engagement between researchers and community members.

Community Wellbeing Stream lead Dr Sue Yell previewed the social media video analysis with CAC members and discussed the upcoming 'Our hopes for the future of Morwell' photographic exhibition. CAC members suggested that the exhibition could be taken to Sale and Melbourne.

1 November 2017

Professor Malcolm Sim provided an overview of an extraction of cancer incidence data pre-dating the mine fire, which will provide a baseline against which future cancer rates can be compared. The CAC discussed the Stream's ongoing work and plans for further analyses. Shaun Mallia led a session to evaluate the Community Engagement Sessions in Morwell and Sale with the committee and sought feedback on ways they can be improved. Marita Dalton, project manager for the ELF Study Stream, provided a verbal report on early findings. Professor Michael Abramson updated the Committee on the status of the Respiratory and Cardiovascular Stream testing and Professor Judi Walker introduced the year four and five plans for the Study in the context of the broader ten year project plan.

4.3 Clinical Reference Group

The CRG continues to meet regularly in response to the study's need for local clinical advice. Meetings, held in the period since the 2nd Annual Report, were as follows.

15 November 2016

The main subject of discussion was in relation to the appropriate process to follow in the case of Schools Study participants with high scores on the CRIES impact of event measure. Subsequent to the meeting, the CRG members provided out-of-session feedback on letters to families, GPs and School nurses, and a Fact Sheet, which had been prepared in relation to these preliminary Schools Study findings.

20 December 2016

The primary agenda was to discuss appropriate clinical pathways for abnormal findings that might arise during 2017 data collection in the Respiratory and Cardiovascular Streams.

7 March 2017

CRG members endorsed local GP Dr Fred Edwards as Chair given the resignation of Associate Professor Joseph Tam who has moved away from the region. The CRG discussed the draft timeline of results dissemination for 2017 and clinical pathways for the reporting of abnormal results. The Gippsland Primary Health Network (GPHN) was invited to join the

CRG with CEO Marianne Shearer accepting the invitation and presenting on their HealthPathways project and the potential for the GPHN to assist with dissemination of study findings.

11 July 2017

Prior to their meeting, the CRG had considered the following reports before their submission to DHHS:

- Adult Survey Vol 1 - the initial cross-sectional analyses from the Adult Survey comparing responses from Morwell and Sale;
- two Hazelinks reports on baseline cancer incidence and on hospital emergency presentations and admissions analysis; and
- analysis from the Schools Study on key findings from the survey and NAPLAN analyses.

CRG members discussed draft revised Terms of Reference and agreed that these provided better representation of this Group's activities. Discussion resulted in agreement to increase the scope of membership particularly in terms of cardiology and paediatrics.

Shaun Mallia raised the possibility of involving relevant CRG members as spokespeople in media activities to discuss clinically relevant findings, providing a trusted local interpretation of the findings and their implications for the community.

Members discussed a draft clinical pathway for abnormal respiratory function results. There was considerable discussion regarding the most appropriate way to provide results to the patient or their GP and the duty of care of the study, particularly with for results requiring urgent medical follow up. It was agreed that, in the absence of a nominated medical representative, it may not be appropriate to run some of the cardiovascular tests. Participants who do not have a regular GP will be provided with a list of local GPs.

Dissemination Plans for release of study findings to health professionals for the first tranche of reports (see above) were discussed. Draft explanatory statements for cardiovascular and respiratory clinical testing were presented for feedback out of session.

15 November 2017

CRG members held an *in camera* session with Dr Fay Johnston to discuss findings of clinical significance arising from the ELF Report into a preliminary assessment of possible

associations between mine fire emissions and perinatal outcomes with particular reference to clinical issues that may arise for Latrobe Valley GPs and paediatricians. Members provided advice on dissemination of findings to health professionals through GPHN, LRH and LCHS communication channels.

Members were also apprised of possible findings of clinical significance arising from the yet to be released MBS and PBS anonymous data extraction report, and considered assessment statistics from the respiratory and cardiovascular streams.

4.4 Scientific Reference Group

Two meetings of the Scientific Reference Group (SRG) have been held in the period since the 2nd Annual Report. It was noted that the SRG did not have a member with expertise in qualitative research so Professor Margaret Alston was invited to join the group in September 2017. Professor Alston is Head of Social Work at Monash University and has track record in ageing, rurality, climate and environmental disasters. Associate Professor Graeme Zosky from the University of Tasmania has replaced Prof Brian Priestly as the consultant toxicologist. Associate Professor Christine Roberts has retired and another perinatal epidemiologist will be appointed.

2 December 2016

The SRG reviewed:

- HHS progress throughout the previous year.
- Current recruitment rates in to the Adult Survey and associated issues around participation bias.
- The analysis plan for the Schools Study data.
- The air quality modelling report prepared by CSIRO.
- The protocols for the adult Respiratory and Cardiovascular Streams.

30 May 2017

The SRG reviewed:

- The plan for statistical analysis of Adult Survey data comparing self-reported health outcomes in Morwell and Sale.
- The results of the statistical analysis of CRIES and NAPLAN data from the Schools Study.

- Analysis plans for Victorian Cancer Registry data and Medicare data.
- The March 2017 Recruitment Report.

In addition to the formal meetings described above, individual members of the SRG have been consulted throughout the year in regard to those specific components of the HHS research for which they have particular expertise.

4.5 Project Steering Committee

The Project Steering Committee (PSC) meets monthly and provides overall strategic guidance for the Hazelwood Health Study. Its membership comprises each of the Stream leads and the project management team. At each meeting, Stream leads provide a status update for their Stream, present any issues requiring resolution and share expertise relevant to the other Streams.

As several Streams have progressed toward the release of their first findings, important agenda items for the PSC have included the analysis plans, report templates, draft findings and dissemination timelines.

The PSC is also responsible for approving budgetary strategy. Important budgetary decisions, reviewed by the PSC in this reporting period, have included endorsement of funding to:

- employ a Senior Communications and Engagement Adviser (refer section 0);
- employ another Data Manager (refer section 5.6) for the Schools Study, Cardiovascular and Respiratory Streams;
- buy gift vouchers to be offered as reimbursement to participants in the 2017 Schools Study, Cardiovascular and Respiratory Streams;
- employ a Coordinator for the Cardiovascular and Respiratory Streams;
- employ a Research Fellow, or equivalent, to support the Psychological Impacts Stream;
- employ sonographers and a Research Nurse for the Cardiovascular Stream.

4.6 Project Management Group

The Project Management Group (PMG) has continued to liaise regularly, providing oversight to the operationalisation of the Project Plan, reviewing study progress, monitoring the budget

and ensuring adherence to good research practice standards and the successful delivery of contractual milestones.

A very high priority responsibility for the PMG, as the end of the 3rd year of the HHS approached, was to negotiate extensions, and or renewals, to the Master Agreement with DHHS and to the sub-contracts with our collaborative researchers at Federation University and the University of Tasmania. These tasks have been essential to the timely renewal of staff employment contacts and to a seamless transition in to the 4th year of HHS activity.

In this last year, Professor Malcolm Sim has replaced Dr Dennekamp as a Monash University SPHPM-based representative on the PMG.

4.7 Inter-Entity Relationships

The Latrobe Health Assembly and the Latrobe Health Innovation Zone

Professor Judi Walker, Dr Matthew Carroll and Shaun Mallia have been meeting on a monthly basis to exchange information with Ian Needham (Executive Office for the Assembly), Ellen-Jane Browne (Principal Advisor for the Latrobe Health Innovation Zone), and personnel from the DHHS Hazelwood Mine Fire Inquiry Implementation team. This ensures that the key local stakeholders are fully aware of the scope of their activities and that duplication is avoided.

Professor Darryl Maybery and Shaun Mallia, both Gippsland-based HHS researchers, are members of the Latrobe Health Assembly. Ellen-Jane Browne from the Latrobe Health Innovation Zone is an Observer at CAC meetings.

Professors Walker and Abramson attended a meeting of the Assembly on 14 November 2017 to provide an overview of the study findings to date and to discuss ways to facilitate use of those findings. Ways to integrate the study and its findings with the Assembly's Working Groups were explored and communication pathways were discussed.

Ministerial Advisory Committee

A Ministerial Advisory Committee (MAC) was established in July 2017 to provide independent oversight of the study and facilitate engagement with the community. Professor Waker attended the first meeting of the MAC on 26 July and provided a briefing on the HHS.

Professor Walker and Professor Michael Abramson attended a further meeting on 19 October which enabled MAC members to ask questions about the HHS and to discuss the MAC Terms of Reference. Processes for engagement between the study researchers and the MAC were discussed and it was agreed that there will be regular interaction.

5 Project Staff appointments

5.1 Air Pollution Stream and Hazelinks Stream lead

In the past year Associate Prof Yuming Guo has replaced Dr Martine Dennekamp as Stream lead to the HHS Air Pollution and Hazelinks Streams. Supported predominantly by a highly competitive NHMRC Career Development Fellowship, Associate Professor Guo's research experience has focussed on environmental epidemiology, biostatistics, global environmental change, air pollution, climate change, remote sensing modelling and infectious disease modelling. Yuming is a member of the Think Tank for Climate Change and Human Health in Australia. He sits on many research grant review committees and on the editorial board of *Environmental Health Perspectives*, the top journal in the field.

Dr Dennekamp has accepted a new position at the Victorian Environment Protection Authority (EPA) however she retains an adjunct appointment with Monash University and she will continue to be involved in the analysis and reporting of HHS research.

5.2 Psychological Impacts Stream lead

While not a new appointment, there has been a change in leadership with Dr Matthew Carroll stepping up to the leadership role from year 4 onwards. The previous Stream lead, Professor Darryl Maybery, is continuing as an investigator on the Stream, he will be assuming more of mentorship role and continue his involvement in analysis, interpretation and write up of results. This shift recognises the increasing demand, on Professor Maybery's time, from membership of the Latrobe Health Assembly.

5.3 Hazelwood Health Study Biostatistician

The HHS statistician, Dr Lahn Straney, resigned from the position on 13 January 2017. A new HHS Biostatistician, Dr Caroline Gao, commenced on 24 February 2017. Dr Gao obtained her PhD in infectious disease epidemiology from the University of Hong Kong in

2012. After that, she joined Turning Point, Monash University Eastern Health Clinical School working on alcohol and drug epidemiology. Dr Gao has been involved in a diverse range of research projects involved with analysing different types of administrative, clinical and survey data. Dr Gao is based at the Monash University SPHPM in Melbourne

In September 2017, Dr Gao took maternity leave and she has been temporarily replaced by Dr Joanna Dipnall. Dr Dipnall has recently obtained her PhD based upon applying data mining techniques to population health data. Dr Dipnall's professional experience includes teaching Applied Biostatistics, survey methodology and STATA (one of the major computerised statistical packages) programming, researching machine learning algorithms and the application of statistical analysis across health, social and market research fields. Earlier this year, she was an invited member of the Scientific Committee for the 2017 Oceania Stata User Group Meeting.

5.4 Community and Wellbeing interim Stream lead

Dr Michelle Duffy stepped down as Community and Wellbeing Stream lead on 24 March 2017 given her appointment as an Associate Professor at the University of Newcastle. Dr Susan Yell has been promoted to interim Stream lead and, in that capacity, joins the membership of the PSC. Dr Yell is Senior Lecturer in the School of Arts, Humanities and Social Sciences, Federation University, Gippsland and has led the media analysis component of the Community and Wellbeing Stream since its inception.

5.5 Senior Communications and Engagement Advisor

Mr Shaun Mallia commenced as Communications and Engagement Adviser to the Hazelwood Health Study in May 2017. Previously Shaun was the editor of the Latrobe Valley Express where he oversaw the newspaper's award winning coverage of the Hazelwood mine fire and subsequent Hazelwood Mine Fire Inquiries. He has more than 10 years' experience in media and communications having worked for publications including the Gippsland Farmer and the Moe and Narracan News. He has also completed some media consultancy work for Monash School of Rural Health. Shaun is responsible for engaging with the community, stakeholders and media about the Hazelwood Health Study.

This new position builds on the work of the HHS Gippsland-based team, especially the work of the Recruitment Coordinator, Susan Denny, and is working closely with appropriate people involved in the new Latrobe Health Assembly and the Health Innovation Zone. The position has coordinating responsibility for both the study's CAC and CRG, and coordinates the study's communications including media events and releases, the website and social media.

5.6 Hazelwood Health Study Data Manager

In this 3rd year of the HHS, it was determined that there was need for an additional Data Manager to support the data collection needs for the Clinical Streams and Psychological Impacts Streams which have had substantial data collection activities in 2017. Mr Para Perera was appointed to this role on 10 April 2017. Mr Perera had previously worked at Ambulance Victoria and has also worked as a Data Manager at Cancer Council Victoria. Unfortunately Mr Perera was unable to continue his appointment beyond June 2017.

Subsequent to Mr Perera's departure, Mr David Brown was appointed to the Hazelwood Health Study Data Manager position. Mr Brown has a Bachelor of Computing in Information Systems, a Graduate Diploma in Education and substantial professional experience in IT management and analysis.

6 Stream coordination retreat

The project's third Stream coordination retreat was held at the School of Rural Health, Churchill (Federation University, Gippsland campus), on 28 February 2017. The retreat involved members of all HHS research Streams and also overarching project staff (Figure 1).



Figure 1 Hazelwood Health Study investigators and students at the Stream coordination retreat in February 2017

The retreat achieved its objectives which were to:

1. introduce new team members;
2. take stock of HHS progress to date in a changed environment in the Latrobe Valley;
3. increase collective understanding of the study's research Streams and areas for alignment;
4. share ideas and insights;
5. plan and map systematically the dissemination of expected results and research outputs in 2017;
6. review Graduate Research positions and marketing of HHS Graduate Research opportunities;
7. discuss requirements for the next two year contract;
8. Identify potential research collaborations for progressing HHS research funding opportunities.

7 Study Stream updates

7.1 The Latrobe Early Life Follow Up (ELF) Study

7.1.1 Aims and objectives of the ELF Study Stream:

The overall aim is to investigate the potential impacts of exposure to smoke from the Hazelwood mine fire during pregnancy or infancy on subsequent health and development of children in the Latrobe Valley.

Specific objectives include:

- To compare perinatal outcomes, particularly foetal growth and maturity, for infants who were exposed, not exposed or minimally exposed to smoke from the Hazelwood mine fire.
- To compare the frequency of parental reports of minor illnesses in infants, over a three year period, for those exposed, not exposed or minimally exposed to smoke from the Hazelwood mine fire.
- To compare respiratory and vascular function in children, from 3 to 12 years of age, for those exposed, not exposed or minimally exposed to smoke from the Hazelwood mine fire.
- To assess long-term indicators of health and development using an anonymised data linkage study comparing those areas exposed and those not exposed, or minimally exposed, to smoke from the Hazelwood mine fire.

7.1.2 Updates on the ELF Study Stream:

Staff Appointments

The following short-term fractional appointments have been made to support the ELF Stream:

- Kristina Creighton – Clinical Assessments staff.
- Penelope Jones and Tierney O’Sullivan – Exposure allocation to identified participants from the Latrobe Valley and the state-wide anonymous cohort.
- Emerson Easley – Administrative Assistant.
- Shannon Melody – PhD student (Perinatal impacts).

Developments since the 2nd Annual Report

The Latrobe ELF Identified Cohort Study

- Baseline surveys have been completed for 552 participants.
- Protocols have been developed for respiratory (Forced Oscillation Technique) testing and cardiovascular measures.
- Staff training clinics were held in February 2017 involving volunteer participants.
- The Latrobe ELF Study featured in a WIN TV news clip in January 2017.
- ELF clinical testing commenced in April 2017 and concluded in July 2017 with a total of 263 participants tested.
 - 120 participants attended for ultrasound only (those aged < 3 years). Vascular function assessment including pulse wave velocity and intima-media thickness (the innermost two layers of the arterial wall) was carried out. Measurement of vascular diameter is in progress.
 - 107 participants had successful Forced Oscillation Technique (FOT) measurements of lung function carried out.



Figure 2 ELF Stream participants undertaking ultrasound and lung function testing

- Symptoms diaries have continued to be completed each month.
- Permission has been received from Latrobe Regional Hospital (LRH) Human Research Ethics Committee for data release involving LRH patients from the DHHS Perinatal Data Collection.

- Nearly all of the hospitals, where the ELF study cohort were born, have provided in-principle support of the perinatal data extraction component of the study as required by the Consultative Council on Obstetric and Paediatric Mortality and Morbidity. Identified data linkage with the Victorian Perinatal Data Collection Unit is in progress.
- The first extraction of Medicare Benefits Schedule (MBS) and Pharmaceutical Benefits Scheme (PBS) data for these children has been requested for the period 1/3/2012 – 31/7/2017.
- A report on preliminary findings, drawn from the self-reported data from the baseline survey, has been completed. This is mainly examining the association between birth weight and exposure to the fire smoke (refer below for further detail).

The Latrobe ELF anonymised state-wide data linkage study

- The anonymised data linkage study aims to link nine datasets, including the Victorian Perinatal Data Collection (VPDC), Victorian Emergency Minimum Dataset (VEMD), Victorian Admitted Episodes Dataset (VAED), MBS and PBS data, National Death Index, Victorian Cancer Registry, National Assessment Program – Literacy and Numeracy and Australian Early Development Census. This is a joint linkage project with the Victorian Data Linkage Unit and the Australian Institute for Health and Welfare (AIHW). All ethics approvals and annual reports are up to date.
- With the exception of MBS and PBS data, in principle support for data linkage has been received from all data custodians and linkage units. A Public Interest Certificate is required to link the proposed MBS and PBS data. AIHW is in the process of preparing an application for a Public Interest Certificate on the study's behalf. The first data linkage of VPDC, VAED, VEMD, MBS and PBS data is now expected to occur in April 2018 and will include data from 2012-2017.
- An extraction of data pertaining to all births between 1/1/2000 – 31/12/2015, has recently been received from the Victorian Perinatal Data Collection Unit.
- Victorian Birth Registry data files for the period 2012-2015 have been uploaded to the Victorian Data Linkage Unit's server.
- A "Deed of Acknowledgement and Confidentiality" was signed by UTAS in anticipation of receiving linked VAED and VEMD data from the Victorian Department of Health and Human Services.

Reports

The ELF Study Stream has completed the first of a set of reports describing its research findings. This first report draws upon child health data collected by self-report from the parents or carers of 548 children. The exposure of pregnant mothers to mine fire smoke was estimated based on their residential address and air pollution modelling undertaken by the CSIRO Oceans & Atmosphere Flagship. These preliminary analyses did not demonstrate an association between maternal exposure to mine fire smoke and adverse birth outcomes such as gestational age and birth weight.

The Executive Summary, to this first ELF Study report, is reproduced at Appendix 2. The full report will soon be available for public release.

Further studies of perinatal outcomes are planned, using more refined maternal exposure estimates and also de-identified perinatal data obtained from the Victorian Perinatal Collection Unit.

7.1.3 Future plans for the ELF Study Stream

In the upcoming months, the ELF Stream anticipates:

- analysis of clinical data pertaining to cardiovascular measures and FOT measures,
- state-wide perinatal data analysis, with first analysis results expected 6 months after receiving data,
- continued collection of monthly symptom diaries,
- further extraction of anonymised datasets.

7.2 Psychological Impacts

7.2.1 Aims and objectives of the Psychological Impacts Stream:

The aim of the Psychological Impacts Stream is to determine whether exposure to smoke from the fire is associated with psychological trauma and distress. Given that the study commenced more than a year after the smoke event, it is also important to examine recovery and resilience. The Psychological Impacts Stream is targeting both adults and school-aged children.

The specific objectives include:

1. Investigate the extent of trauma and distress symptoms in adults and school-aged children exposed to the mine fire event
2. Examine the role of individual, family and social factors on recovery and wellbeing outcomes
3. Explore the qualitative perceptions of adults and school-aged children regarding the fire and the ensuing circumstances.

The psychological component within the Adult Survey included an assessment of the impact of the event, level of distress, as well as previous exposure to traumatic situations. This information will be used to identify a group of people from each community to complete follow up surveys and interviews and determine how people have responded to the event.

7.2.2 Updates on the Psychological Impacts Stream:

Staff Appointments

Stream Research Fellow Dr Emily Berger took up a new academic appointment as a Lecturer with the Monash Faculty of Education at the beginning of 2017, but remains an active and committed member of the research team.

Ms Sarah Lee has been appointed as the Research Assistant and Administrator for the Stream, after having worked for the study on a casual basis at the end of last year to allow a period of transition before Dr Berger's departure. Ms Lee has a Master of Research in Psychology from the University of Manchester.

Dr Rebecca Jones has been appointed as a Research Fellow on the study and will be focusing on the qualitative interviews with adults from Morwell. Rebecca is an environmental

historian with a background in qualitative research and comes to us from the Australian National University. Rebecca is also a long standing member of the Gippsland community, previously working for Monash University in the region, and has been involved in a considerable number of qualitative research projects including work regarding homelessness, mental health and health services research with Gippsland residents.

Developments since the 2nd Annual Report

- During the period considerable discussion has taken place about the initial findings from the Schools Study component regarding the high scorers on the Children's Revised Impact of Events Scale (CRIES). Following a direction from the Chief Health Officer, the decision was made to communicate these findings prior to public discussion at the Annual Community Briefing scheduled for 29 November 2016. This process included:
 - Development of a Fact Sheet and dissemination plan along with a clinical pathway for high scorers.
 - Convening meetings of the CRG (15 November), PSC (22 November), and CAC (23 November) where input was sought on the draft materials – with further CRG discussion at the 20 December meeting.
 - The outcome of these discussions was the decision to send a letter to the parents of all participating students, not just parents of high scorers, along with a copy of the Fact Sheet.
 - In addition, a media release was disseminated regarding the interim findings and the Fact Sheet was been uploaded to the Hazelwood website.
- Dr Emily Berger presented an overview of the Schools Study and the overarching Psychological Impacts Stream at the annual community briefing on 29 November 2016.
- All four 2016 Postgraduate Diploma in Psychology students working on HHS data submitted their research reports, with one student working with the research team to develop up a possible publication.
- Extensive discussions took place in early 2017 regarding the research plans for the year, including the second round of the Schools Study and the first round of adult data collection based on a sub-cohort to be extracted from the Adult Survey participants. This included discussions with the PMG and PSC about appropriate

staffing arrangements to complete both components of the research Stream, resulting in funding being provided equivalent to one full time research fellow.

- As a result of this additional funding, Dr Rebecca Jones was appointed on a part-time basis to manage the adult interviews.
- Stream Co-lead Dr Matthew Carroll took responsibility for conducting the statistical analyses of the key year 1 Schools Study data, with oversight from Prof Rory Wolfe and assistance from Dr Caroline Gao (HHS Biostatistician).
- The initial focus of this work was on assembling the NAPLAN dataset, considering how to deal with missing data in the survey datasets and addressing concerns regarding possible sample bias.
- A statistical analysis plan was developed in consultation with Professor Wolfe and Dr Gao to analyse the key outcome measures from the first round of data collection



Figure 3 Dr Carroll and Morwell Central Primary Principal Justine Smyth featured in the local media during the release of the Schools Study key round 1 findings

- A report on these analyses has been completed and publically released in June 2017 (Figure 1). The report can be found at www.hazelwoodhealthstudy.org.au/study-findings/study-reports/ . A media release which accompanied the dissemination of

these findings to the community can be found at

www.hazelwoodhealthstudy.org.au/study-releases-key-findings-on-the-psychological-impacts-of-the-mine-fire-on-students/ .

- An associated two-page document was developed to provide a summary of findings to the Gippsland community, particularly to the first round of participants in the Schools Study (from 2015). These participants have been asked to enter the second round of data collection in the second half of 2017. The summary document can be found at www.hazelwoodhealthstudy.org.au/study-findings/fact-sheets-and-summaries/ .
- An extended research group has been established, involving additional researchers from the School of Rural Health, as well as from Nursing and Psychology from Federation University. The expanded group discussion is focusing on analysis of the existing data collection as well as possible new analysis pathways for the next round of collection.
- As part of this expanded arrangement, an internal process for submitting research proposals has been established, involving initial internal review followed by review by the PSC.
- A protocol for the qualitative component of the Adult Psychological Impacts was developed and reviewed by the Project Steering Committee. More details on the interview process and outcomes to date are provided in the subsequent section of this report.
- Considerable work has taken place regarding the roll out of the second round of Schools Study data collection including the submission of an ethics amendment regarding the plan to offer \$25 gift cards as a reimbursement for the time of family members involved in participating in the study.
- Round 2 Schools Study recruitment has commenced (for details see Table 3).
- Two cohorts of Monash Masters of Social Work students have been undertaking 14-week research placements at the Moe School of Rural Health site between June and December 2017, and have been involved in Stream activities including administration and data collection for both the Schools Study and Adult Impacts components (with appropriate training and ethics approvals).
- The team have been working closely with the new Communications and Engagement Adviser Shaun Mallia regarding recruitment and engagement strategies for both the schools and adult components. This collaboration aims to maximise participation and

to develop a dissemination plan associated with the release of the Schools Study 2-page summary document.

- As part of this dissemination and engagement, Dr Matthew Carroll and Ms Sarah Lee engaged in round table discussions at the Morwell Community Engagement session on 9 October 2017.

Adult Psychological Impacts Study – Recruitment summary and initial findings

The aim of these interviews was to explore the experience of the Hazelwood mine fire event fire among adult residents of Morwell, particularly the psychological impact at the time of the event, ongoing impacts and resilience factors which may have ameliorated the psychological impacts of the fire. The Adult Interview process was approved by the Monash University Human Research Ethics Committee (MUHREC) and the protocol was reviewed by the PSC. This component of the study is being coordinated by Dr Rebecca Jones with support from research assistant Sarah Lee and Monash Social Work students.

Recruitment

A sample of seventy adult residents of Morwell was selected from respondents to the Adult Survey. This was a random sample weighted by age and gender. These potential participants were contacted, initially by mail with follow up by phone and/or email using the contact details provided in the Survey.

Twenty-eight of the 70 sampled people (40%) agreed to be interviewed. Seventeen people (24%) declined to participate, one was deceased, two were living interstate and a further 22 (31%) were unable to be contacted after multiple attempts. Multiple strategies were utilised to maximise recruitment including phoning at different times and on different days of the week and using whatever alternative contacts were provided such as mobile phone numbers and email addresses. Because of competency issues that only became apparent at the end of one interview, it was decided (in consultation with MUHREC) that this person was unable to provide informed consent and thus that interview was considered invalid – resulting in 27 completed interviews.

It is standard practice in qualitative research to keep interviewing until such point as nothing new is raised by the interview participants; known as the point of data saturation. Initial analysis of the interview material indicated that this point had been reached so no further interviews were considered necessary for this phase of the study.

All 27 interviews have now been fully transcribed by a professional transcriber and Dr Rebecca Jones is currently completing the detailed thematic analysis – which will be completed by the end of the year.

Interviews

Interviews were semi-structured, conducted face-to-face, and recorded. They were conducted at a time convenient to the participant between Monday and Friday, including evenings. The location of the interview was as convenient to the participant as possible and was discussed and agreed to in advance between the participant and the interviewer. Interview locations included the SRH Offices in Newborough, Lifeline Offices in Morwell and the participants' homes. All interviews followed the same schedule but varied in length (depending on how much the participant wished to discuss) from between 15 minutes and 1 hour 20 minutes. The majority of interviews were between 30 minutes and 1 hour. Participants were given a \$25 Woolworths voucher as modest reimbursement for their time.

Analysis

All interviews were transcribed by a professional transcriber with transcripts being between five and 18 pages. Transcripts of the interviews were independently analysed by three members of the Psychological Impacts Stream team, with discrepancies then discussed between the research team members. Researchers used thematic analysis involving a systematic process of reading and re-reading the transcripts to identify initial codes and patterns in the data to capture themes. Themes which summarise common ideas and experiences in the data were grouped, checked against the data set and refined into overarching themes and underlying subthemes.

Initial findings

Fourteen women and 13 men were interviewed. Twenty-two of these (82%) were aged between 40 and 69 with two aged in their 20s, two aged in their 30s and one over 70 years of age.

Four participants indicated in the interview that they were very distressed at the time of the fire, according to the interview questions designed to capture three key symptoms of distress (intrusive thoughts, hyperarousal, and avoidance behaviours). These were based on the Revised Impact of Event Scale (IESR) which was the primary adult psychological impact measure in the Adult Survey. All four of these were continuing to experience these thoughts at the time of the interview, over three years after the event. According to the answers to these questions, an additional four participants indicated that they were somewhat distressed at the time of the fire but none of these were still experiencing such thoughts.

In addition to consideration of distress responses, the major themes which have emerged to date from the general thematic analysis of all interviews are summarised in Table 2 below:

Table 2 Initial thematic analysis of the adult interview data

Categories	Themes	Subthemes
Emotional impacts	Emotional impacts at the time of the fire	Fear/stress/panic/anxiety about flames and fire (during the first 24-48 hours) Closed in/ claustrophobic Confusion/ uncertainty/ lack of control Anger
	Longer term impacts experienced after the fire	Grief for Morwell Disillusionment and loss of faith in the region Uncertainty/confusion about future health implications Feeling unsafe
Response to the emotional impacts	Avoidance	Morwell Commercial Area Media reports Evacuated temporarily Stayed indoors
	Prescription drugs and alcohol	
Resilience	Communal coping/social networks Religion/spirituality Belief in natural coping abilities Trust in authorities Acceptance/ Normalisation	Inevitability of bushfires/coal fires Normal routine Created new routine Understand coal and coal fires Comparison with privatisation

Schools Study – Recruitment summary

All participating schools have now agreed to partake in the second round of data collection. All students participating in round one, from grades 3, 5, and 7 in 2015, have been invited to participate again. As per the protocol, students who were in year 9 in round one have not been asked to continue.

In 2015 there were 20 schools involved in the Schools Study. Due to the merging of three primary schools in Morwell the number of continuing schools dropped to 18. However, as noted below, two new schools were added to the study to capture two groups of students

who had transitioned to different high schools, resulting in 20 schools being targeted in the second round. To date, recruitment has been completed in seven schools, with ten near completion, and a date locked in to complete the surveys in the remaining senior school. Where students were absent on the day of the survey, alternative times have been arranged in the following two weeks. In addition to resurveying students at the participating schools, 57 students have transitioned to schools other than those which were targeted in 2015. In the case of two schools, there were sufficient numbers to justify seeking permission from the Principals to add those schools to our catchment. This approval was subsequently obtained and survey sessions have been conducted at both schools. The remaining 41 students were scattered among a wide variety of schools across Victoria. In these cases we are approaching the students, through letters and phone calls to their parents, and sending surveys to their home along with instructions.

Recruitment to date, for continuing students, is summarised in Table 3.

Table 3 Current recruitment numbers for round one Schools Study students invited to participate in 2017 follow up testing

2017 school year level (number in previous round)	Recruitment via schools				Recruitment underway via postal survey
	Completed surveys (%)	Withdrawn (%)	Absentees being followed up	Further school to be surveyed	
Year 5 (112)	86 (77%)	9 (8%)	4 (4%)	N/A	13 (12%)
7 (90)	45 (50%)	9 (10%)	6 (7%)	6 (7%)	24 (27%)
9 (83)	54 (65%)	3 (4%)	7 (8%)	15 (18%)	4 (5%)
Total 285	185 (65%)	21 (7%)	17 (6%)	21 (7%)	41 (14%)

Recruitment of continuing students through the schools is progressing well with only 27 (4%) who have withdrawn to date.

In addition to resurveying continuing students, we have been recruiting a new cohort of current year 3 students, who would have been about five years of age at the time of the fire. This is in line with our original protocol and will enable us to assess the impacts in a younger group of students. Relative to the resurveying of continuing students, the recruitment of the new cohort involves considerably more communication with, and from, participating schools. It also involves more resource-intensive data collection from children, their parents and their teachers. For these reasons we delayed recruitment of the new year 3s until the resurveying of continuing year 5 students was well underway at each primary school.

The recruitment of this new year 3 cohort is progressing well with 48 completed consent forms and 31 completed surveys. We are organising dates with schools to complete outstanding surveys of children who have returned consent forms. Once students complete the child-surveys, their teachers and parents will be sent their surveys to complete. We can report that recruitment of this new cohort has been difficult, because of the greater time lag since the event. To address this, we produced a letter for school Principals to distribute on school letterhead, advocating for the study and addressing key concerns that the parents may have. In addition, we have provided text for school newsletter items targeting year 3 parents.

In addition to surveying students, we will be inviting students who completed qualitative interviews in round one to be interviewed again. This process will be undertaken with the assistance of Monash University students participating in the Summer Scholarship program and the Masters of Social Work students currently on placement. Three Monash summer scholars have been recruited and will be working with the Schools Study for three weeks in November/December to complete the interviews.

7.2.3 Future plans for the Psychological Impacts Stream

In the coming months, the Psychological Impacts Stream will be:

1. completing the second round of data collection for the Schools Study;
2. analysing and reporting on the data from both rounds of the Schools Study
3. completing, and reporting upon, the analysis of the data from the adult interviews.

7.3 Policy Review of the Impact on Older People

7.3.1 Aims and objectives of the Impact on Older People Stream:

The aim of this component of the study was to assess the impact of the smoke event on older people, focusing particularly on a review of the policy decisions made with respect to older people during the event. The objective of this work was to inform best practice for future emergency events.

7.3.2 Updates on the Impact on Older People Stream:

Developments since the 2nd Annual Report

At the time of the 2nd Annual Report in November 2016, a major report describing the impact of the Hazelwood mine fire on older people living in the Morwell community in the context of policy-driven decisions made at the time, and an accompanying Policy Brief, were both in the final stages of writing. The completed Report and Policy Brief were subsequently submitted to DHHS on 30 November 2017 and accepted.

The Review has important implications for policy development and program planning in relation to older people and disasters for best practice to improve preparedness for, and response to, a future disaster event.

The Report has been placed on the HHS website at

<http://hazelwoodhealthstudy.org.au/study-findings/study-reports/>

The Policy brief has placed on the HHS website at <http://hazelwoodhealthstudy.org.au/study-findings/fact-sheets-and-summaries/>

These documents were accompanied by a media release on 27 February 2017. The media release is available at <http://hazelwoodhealthstudy.org.au/community-links/media/>

Professor Walker presented this work at the recent Australia and New Zealand Disaster and Emergency Management Conference on the Gold Coast. Her PowerPoint presentation has been placed on the HHS website at <http://hazelwoodhealthstudy.org.au/research-areas/older-people/>.

The team presented this research at two major conferences in November 2017; the Aging and Society Conference at the University of California at Berkeley, Berkeley, USA and the Australian Association of Gerontology National (AAG) Conference in Perth, WA. An abstract has been submitted for the 6th Rural and Remote Health Scientific Symposium in Canberra on 11-12 April 2018 and Professor Walker has been invited to present at a Plenary session.

The team have progressed a number of publications arising from the report. One paper on the impacts of the event on older people has been completed and has gone through internal HHS review prior and submitted to the DHHS for further review. Papers on policy implications and communications during the mine fire event have been drafted for internal review. The team will take up an offer from an international journal to submit a proposal for a book based on the Report.

The Stream team have collaborated with colleagues from the Monash Centre for Population and Urban Research to apply for funding for a proposed pilot project through the Monash Arts/Medicine Interdisciplinary Research Scheme. While this application was unsuccessful due to the extremely competitive nature of this grant round (funding was only available for 2 projects), the research team are keen to find ways to work together to build on the Stream findings re robust older people not being well targeted during the mine fire event. Pilot work will be undertaken next year with a view to expanding to be a major national competitive grant or industry-funded program of work to extend the research to different localities.

7.3.3 Future plans for the Impact on Older People Stream

While the Older People Policy Review was designed to be a discrete piece of work to be completed in 2016, it has been agreed that the Stream will formally merge with the Community Wellbeing Stream in years 4 and 5 of the study in order to maximise resources and findings and to ensure that a focus on older people continues through the study.

As both research Streams address the impact of the Hazelwood mine fire event on communities in Morwell and the Latrobe Valley in terms of community health and wellbeing outcomes, the collective findings will inform strategies and procedures for future disaster events. This focus is particularly important for members of vulnerable communities or those who are, for various reasons, not included in lists of people to be individually identified by service providers and other agencies. Further assessment of the impact of the mine fire event on older people will also continue within the Adult Survey, Psychological Impacts and Clinical Streams.

7.4 Impact on Community Wellbeing

7.4.1 Aims and objectives of the Community Wellbeing Stream:

The first part of this Stream's focus was on providing narrative evidence of the perceived impact of the Hazelwood mine fire smoke event in Morwell and surrounding communities on community wellbeing. Specific objectives were:

- to identify community perceptions of the impact of the smoke event on community wellbeing;
- to identify community perceptions of the effectiveness of community rebuilding activities;
- to identify community perceptions of effective communication during and after the smoke event.

To achieve these aims and objectives, we used a qualitative, interpretive research design with two main components:

1. In the community-engaged component, we conducted focus group discussions and individual interviews.
2. In the media analysis component of the study, we collected and analysed archival sources of relevant local and state newspapers, online news media and social media postings. We interviewed key local media professionals and social media practitioners.

These methods allowed us to create a broad narrative evidence-base of community perceptions of the impact of the smoke event on community wellbeing.

The second part of the Stream's focus (Years 2-3) was to engage with community groups in participatory action research, focusing on strengthening identified aspects of community wellbeing.

In Year 3 the Stream has continued to engage with community groups in participatory action research. We are in the process of reviewing the outcomes of this action research. The media analysis conducted in Year 1 is also being repeated in Year 3, as per the original project plan. In addition, news media and social media data has been collected for Year 2, to provide a continuous narrative, and to capture significant events impacting on community recovery in 2016.

7.4.2 Updates on the Community Wellbeing Stream:

Developments since the 2nd Annual Report

Research activities:

Interviews: Follow-up interviews have been held with either community stakeholders who were previously interviewed in Year 1 or with people who were involved in recovery initiatives that were implemented since the first round of interviews to determine what has changed since the initial interviews were conducted. Participants interviewed included representatives from the Morwell Neighbourhood House, the Community Recovery Committee, the Latrobe City Council Resilience Team, Voices of the Valley, VicHealth, the EPA and Emergency Management Victoria.

All interviews have been analysed and key themes identified. The key themes include:

- loss of trust;
- rebuilding trust;
- emergency management planning;
- participation and empowerment of the community in the recovery process;
- the relationship to the mining and electricity generation industries;
- the impacts of privatisation and its relationship to recovery;
- visions and plans for the future of Morwell; and
- understandings of recovery.

Participatory Action Research: This year, the Community Wellbeing Stream worked with community organisations and their members on a project to foster community recovery and wellbeing. This component of the project investigated what people like about living in Morwell, what needs to change and their hopes for the future of the Morwell community and town. The exact nature of the project has been developed through partnership between the community participants and the researchers. Amended Human Research ethics approval was granted to conduct up to 10 focus groups with community organisations and groups for this research (expanded from 2-3 groups in the original approval). Focus groups were conducted with five community organisations; two of these organisations participated in multiple focus group sessions. There was also one informal brainstorming session with a group of younger participants. The focus groups provided a more in-depth understanding of people's relationship with Morwell and their hopes for the future of Morwell. The focus group data has been analysed thematically.



Figure 4 Dr Sue Whyte is interviewed by local media regarding the Participatory Action Research project.

Exhibition: In the original project design for the participatory action research, we intended to work closely with 2-3 community groups, in part to develop an exhibition. This proved to be very difficult for the groups, and on the basis of feedback from the community it was decided we would change the way the exhibition was created. Rather than being based on the work of 2-3 groups, the exhibition was based on asking a number of community groups to think of something that symbolised their hopes for the future of Morwell and then this object was to be held by a member of the group in their hands and the object photographed. These photographs and an accompanying caption (written by each participating group) form the exhibition.

Over 60 invitations to participate were sent to community organisations, groups and to previous interviewees. Positive responses were received from the following organisations:

- Morwell Swimming Club
- Rose Garden Walkers
- Voices of the Valley
- Latrobe Roller Derby Team
- Morwell Neighbourhood House
- Gippsland Centre Against Sexual Assault
- Life Education
- The Free Library and The Free Store
- Latrobe Valley Chess Club

Gippsland Asbestos Related Diseases Support (GARDS)
St Mary's Anglican Church, Morwell
Morwell Junior Fire Brigade
Girl Guides Morwell
Environment Protection Authority
Morwell Rose Garden Group
St Luke's Opportunity Shop
Latrobe Valley Express
United Muslim Sisters of Latrobe Valley.

Members of these groups were then invited to attend a photographic session kindly hosted by the Morwell Neighbourhood House. Each individual held an object chosen by the group while it was photographed, and explained what the object represented in terms of Morwell's future. Out of this process twenty eight photographs with their captions were produced, enlarged and framed for exhibiting. The photographs were taken by Clive Hutchison of the Gippsland Centre for Art and Design at Federation University. A catalogue was also produced, explaining how the exhibition was developed, and includes copies of the 28 images.

The exhibition launch was held on the evening of Monday 13 November 2017 at the Switchback Gallery, Gippsland Centre for Art and Design, Federation University (see Figure 5). The launch was well attended with over 50 people from the participating community groups, the study team and the wider community. The exhibition will now run until Friday 24 November, before moving to another community location in Morwell and more broadly (future locations to be confirmed).



The photographic shoot at Morwell Neighbourhood House.



OUR HOPES FOR THE FUTURE OF MORWELL.

Opening Night

Monday 13 November
from 6.00pm

Switchback Gallery

Until Friday 24 November

Including the weekend of 18, 19 &
Monday 20 November

With our thanks to:
Gippsland Centre for Art and Design
Federation University
Hazelwood Health Study
Morwell Neighbourhood House
Photography by Clive Hutchison



SWITCHBACK
GALLERY



Figure 5 Poster publicising the community recovery activity – Photographic Exhibition

Media Analysis: The Year 1 data collection of social media has been analysed and the findings written up for publication (S. Yell & M. Duffy (forthcoming), 'Community empowerment and trust: social media use during the Hazelwood Mine Fire, *Australian Journal of Emergency Management*).

Data from the initial interviews with media and social media practitioners regarding the effectiveness of communication during and after the smoke event has been supplemented by further consultation with interviewees and local media professionals. This data will be combined with knowledge about best practice in emergency communication from the literature, and a report will be written with key findings and recommendations.

Years 1-3 media and social media data collection is complete and has been entered into a database. Social media were collected from three local Facebook groups which have focused on the mine fire event, and mine-fire related media articles were collected from local and state media (press, television and online). A total of 2,817 items (articles and social media posts) were collected from February 2014 to September 2017, and entered in a spreadsheet. Graphs have been produced to show the level of media attention to Hazelwood mine-fire related issues in both local and state media, and the amount of media activity on local social media (Facebook) groups. This data will be incorporated into the narrative evidence base being developed from the focus group and interview data on community wellbeing and recovery.

Publications and dissemination: A journal article entitled 'Community empowerment and trust: social media use during the Hazelwood mine fire', by Sue Yell and Michelle Duffy, has been accepted for publication in the *Australian Journal of Emergency Management*.

A journal article by Michelle Duffy and Sue Whyte, entitled 'The Latrobe Valley: The politics of loss and hope in a region of transition', has been approved by DHHS for publication. It has been submitted to the *Australasian Journal of Regional Studies* for a special issue on 'Regional Futures', reviewed by the editorial panel and is expected to be published in 2018.

The team have produced a video reporting their findings on social media use (based on the Yell & Duffy article) to the community. This will soon be publically released, and placed on the HHS website.

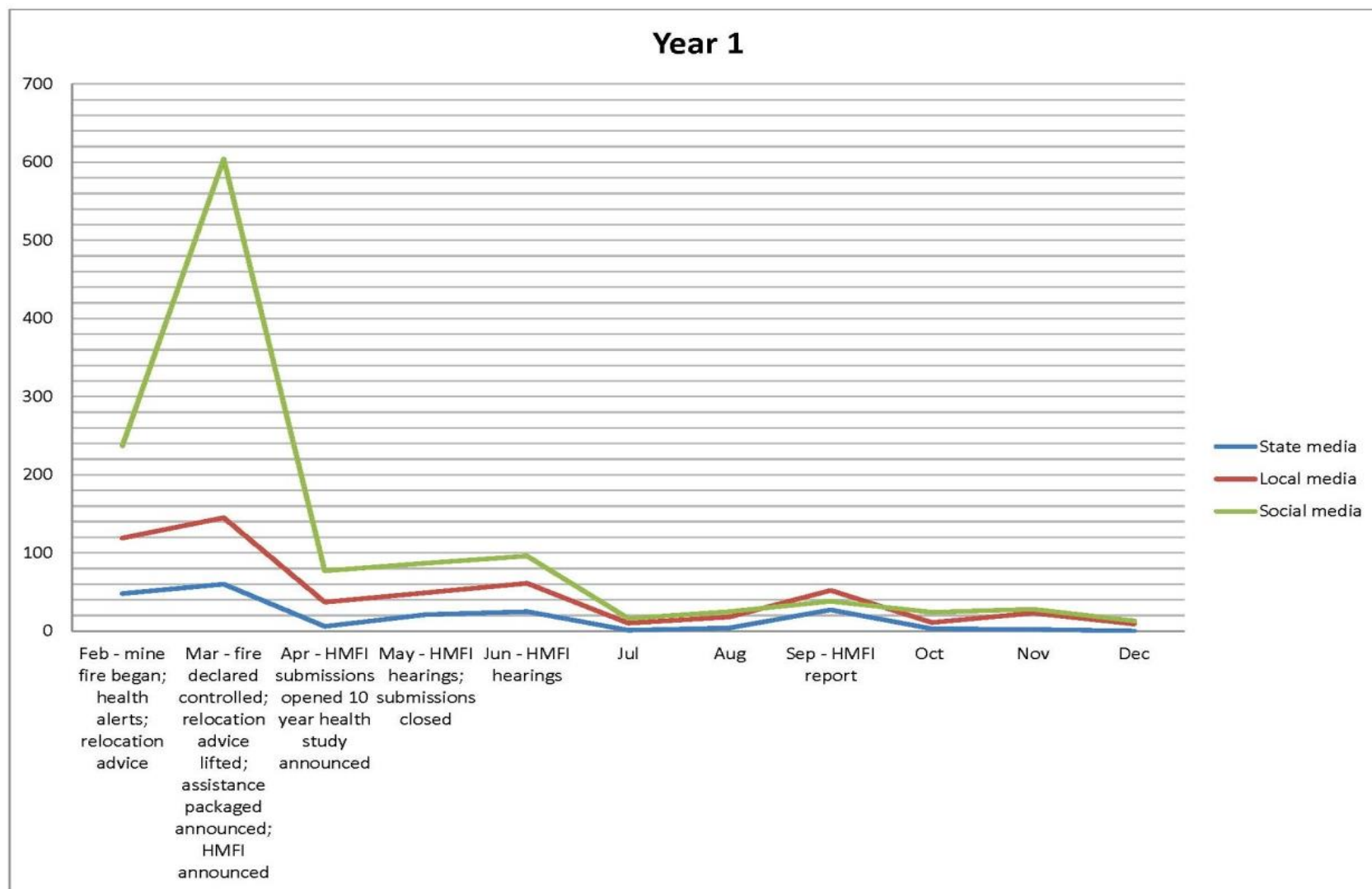


Figure 6 Number of mine fire event-related local, state and social media posts/articles per day throughout 2014

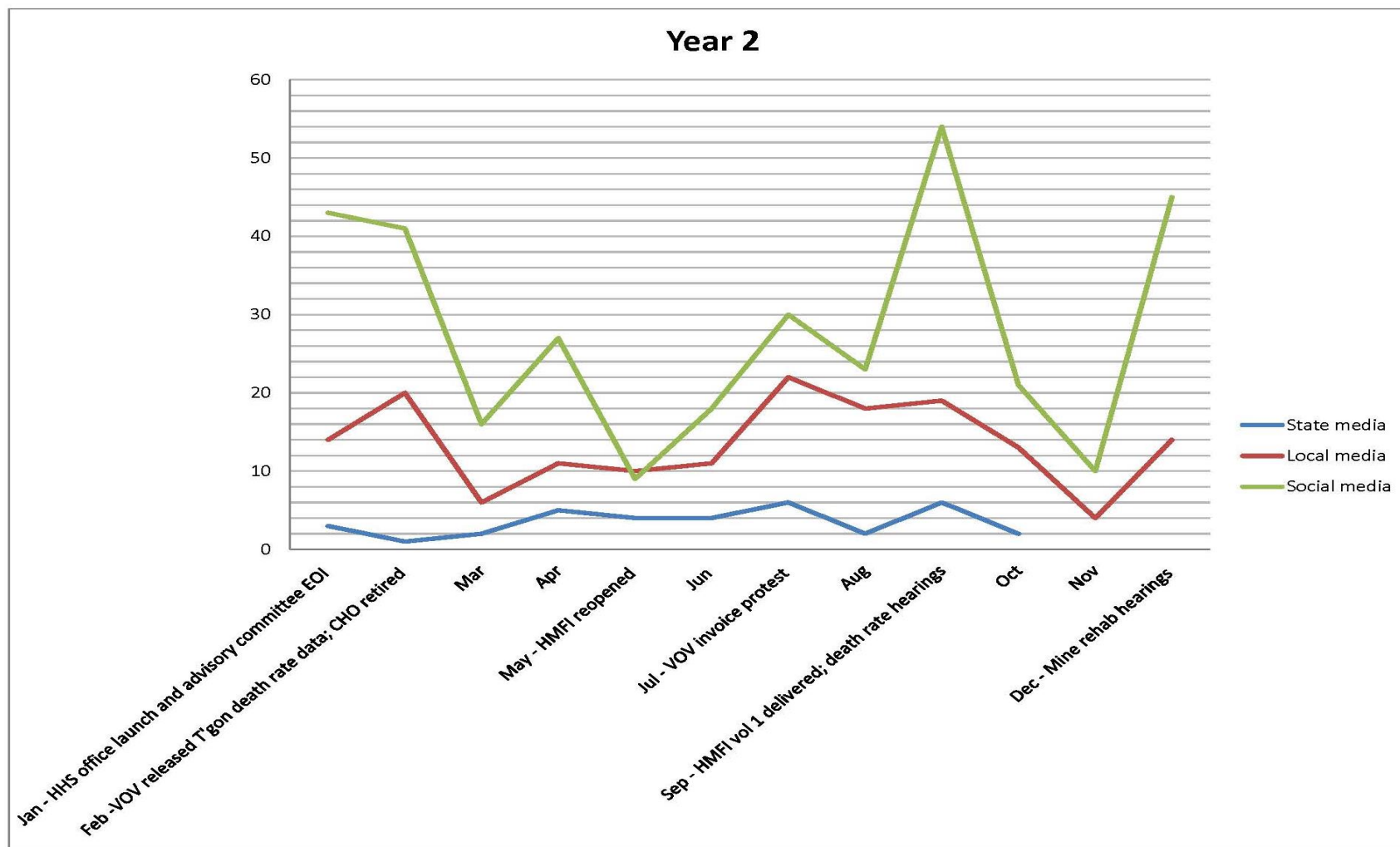


Figure 7 Number of mine fire event-related local, state and social media posts/articles per day throughout 2015

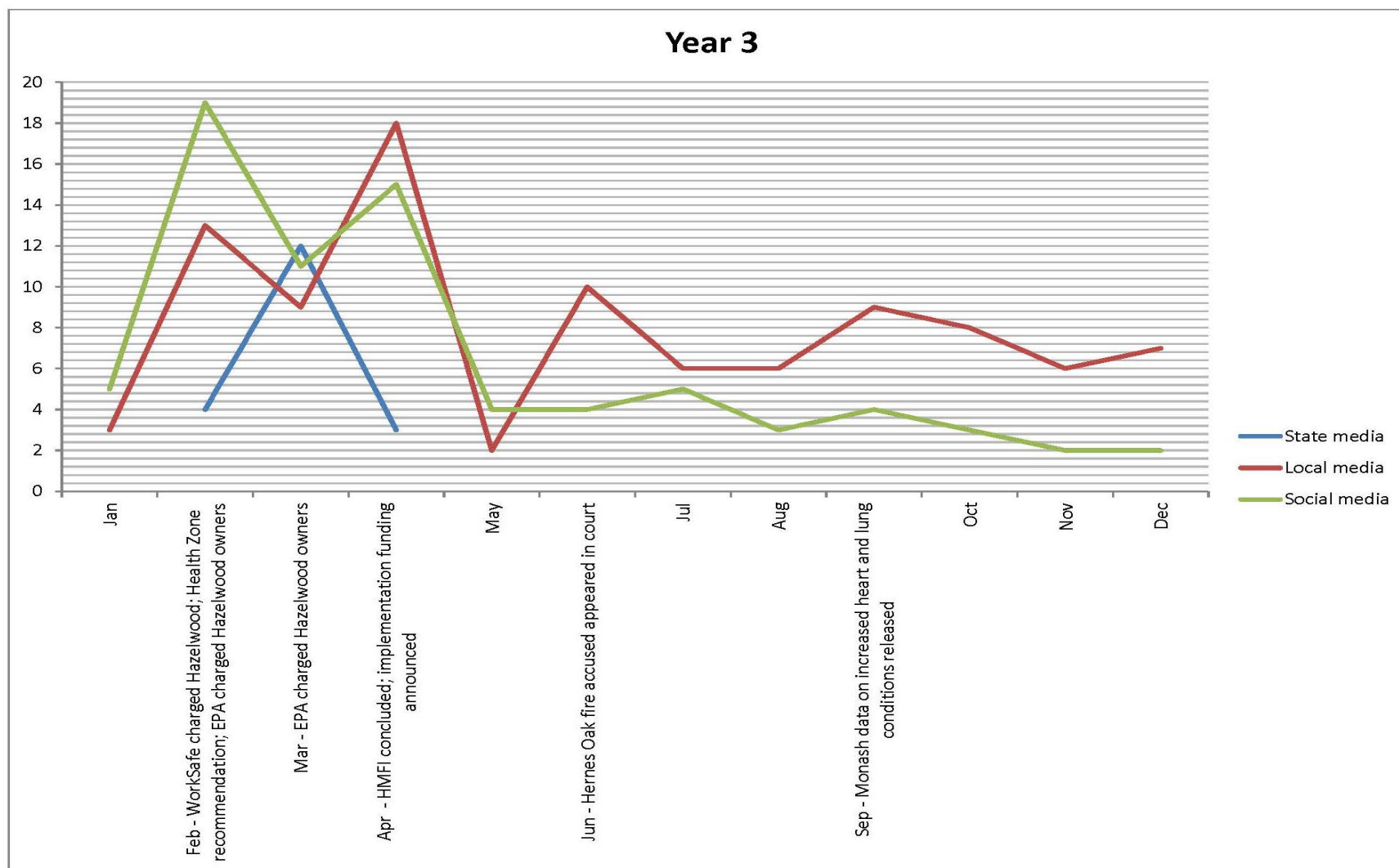


Figure 8 Number of mine fire event-related local, state and social media posts/articles per day throughout 2016

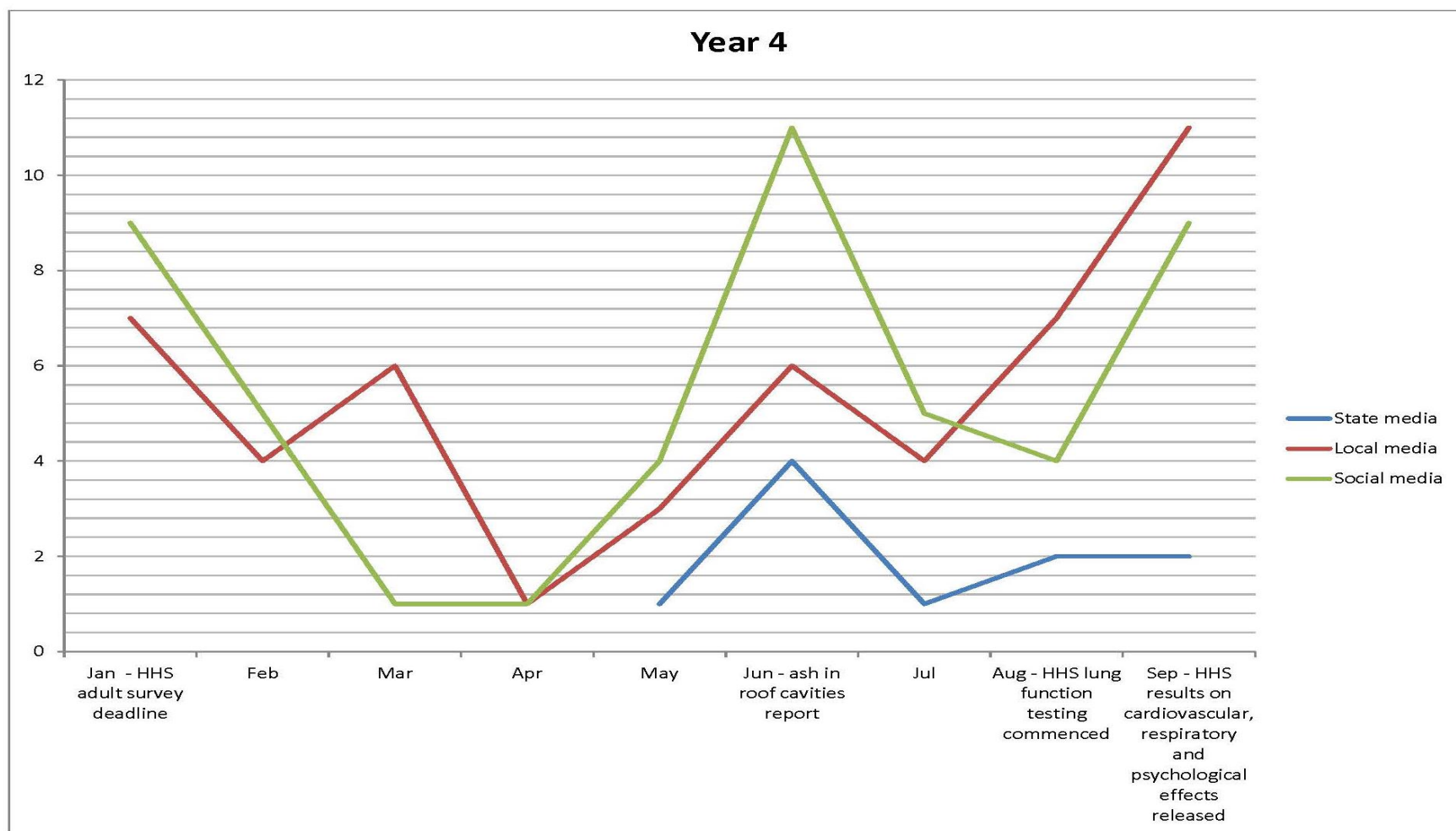


Figure 9 Number of mine fire event-related local, state and social media posts/articles per day throughout 2017

7.4.3 Summary of findings to date:

Impact on community

In Year 1 (2015) of the Hazelwood Health Study interviews with key informants and focus group interviews were conducted to determine people's perceptions of the effectiveness of community rebuilding or recovery activities based on their involvement in recovery activities. The interviews and focus groups presented a perception in the community that not much had happened in terms of recovery and that generally their concerns and issues had not been adequately addressed. There was also the perception that there has been a lack of community engagement and that the recovery process has not been a community-engaged or community-led process.

Other important themes identified from analysis of the interviews and focus groups include:

- the impact of the event on community trust in government, agencies and authorities and wanting accountability;
- the impact of ongoing economic and social disadvantage on both the impacts of the event and recovery from the event and the need for a long-term intervention;
- the need for a plan or vision for the future of Morwell and the Latrobe Valley, particularly in relation to the need to transition from a reliance on the coal industry; and
- a sense that emergency planning was inadequate, was and is not community-engaged, and needs to be based on capacity building.

Understanding and accepting that these interviews and focus groups were conducted prior to some significant recovery milestones, supplementary interviews have been conducted that have targeted particular recovery initiatives and the work of several community organisations and government bodies, these include: the Morwell Neighbourhood House, Voices of the Valley, EPA and VicHealth. What has emerged from these interviews (and ongoing conversations with community members) is that recovery is no longer only framed in relation to the mine fire event. It is talked about as also needing to address the ongoing impacts of the privatisation of the power industry in the late 1980s and early 1990s and the more recent closure of the Morwell open cut mine and Hazelwood power station.

Effectiveness of community rebuilding activities

The Stream researchers have engaged with community groups in participatory action research, focusing on strengthening identified aspects of community wellbeing. In this past 12 months, researchers have continued to engage with community groups in participatory action research. Due to the length of time needed to develop relationships of trust between

the groups and the research team, and to develop directions the communities wish to take, this research has been extended into this year. As this research activity took place in the second half of 2017, the results are still being analysed.

Effective communication

Initial findings on the uses of social media during the Hazelwood mine fire have found that there are significant issues around which organisations and information sources are trusted, and how authority is recognised, by community-initiated social media (Facebook). Social media sites can have positive and negative impacts on a community's relations with one another and with the authorities responding to the crisis. During a crisis, social media occupy an important space in communities as they fill the gap between face-to-face communication and mass media.

Social media are viewed as a space where community members can post their own accounts of what is occurring, in the form of local knowledge and eyewitness accounts. This role becomes particularly important when official sources of information are perceived as inadequate. Hence social media can become a space of conflict – and in the case of the Hazelwood mine fire, this was often exacerbated when apparently conflicting messages were posted or information was misinterpreted. This confusion, as well as what was interpreted as silence from authorities on important matters, fuelled suspicion and lack of trust due to questioning of the accuracy of information provided through official channels.

Rather than relying predominantly on the mainstream local and national media, or on government authorities involved directly in the management of the emergency, social media users turned to a wide range of online sources. Yet many of these information sources, like the eyewitness accounts of community members provided via social media, are not subject to the forms of gatekeeping which exist in professional mainstream media and can therefore be inaccurate, thus compounding an already confusing information space.

As with any set of social processes, the formation of an online community is not without its challenges. Our analysis of the use of social media during the Hazelwood smoke event exposed divisions between members of the broader Latrobe Valley community. Conflict occurred over who was genuinely affected by the event, and disagreement arose over whether or not it was legitimate to complain and criticise the emergency response by authorities. Social media exacerbated these divisions, but didn't create them.

Our initial findings suggest that social media play a complex role during a crisis such as the Hazelwood mine fire. Positive impacts depend on the development of a relation of trust

within the group participating in the social media site, and with the wider community; provision of accurate, trustworthy information (or links to sources which provide this); follow-up action which gains results; and offline relationships and partnership building among key participants. The interviews also made it clear that social media cannot replace face-to-face communication – and this is necessary for rebuilding the fabric of a community. Both the disaster communications literature and our interviewees for this study stress the importance of multiple communication mediums and channels to communicate accurate and timely information during a crisis.

7.4.4 Future plans for the Community Wellbeing Stream

Stream members are currently drafting reports of the research undertaken in Years 1-3 on community wellbeing, resilience and recovery (based on interviews and focus groups), and communication (based on media and social media analysis).

A report will also be drafted on the community's perceptions of effective communication principles during an event such as the mine fire, based on analysis of interviews and consultations with local media and communication professionals.

The researchers plan to conduct analysis of this data in relation to communication flows, themes of trust/mistrust (also related to the focus group and interview data), and the community's reliance on different types of information sources.

The combined Community Wellbeing and Older People Streams have been invited to contribute an article for a special issue of *Political Geography* with the theme 'Caring-with'. Our paper will examine the impacts of the Hazelwood Mine Fire on vulnerable people and how a 'Caring-with' approach may assist in addressing policy gaps to support vulnerable people and the wider community in future disaster events. This journal edition will be published in 2018.

In Years 4 and 5 we plan to continue synthesising and writing up our data, and integrating our findings with those of the Older People Stream, through joint publications.

7.5 Adult Survey

7.5.1 Aims and Objectives of the Adult Survey Stream:

The Adult Survey aims to:

1. cross-sectionally investigate the health status of an exposed versus a comparison adult population;
2. compare the incidence rates of long term health outcomes by linking to administrative health datasets in exposed versus comparison populations; and
3. investigate the association between exposure level and risk of long term health outcomes by linking to administrative health datasets using fine resolution exposure metrics developed by CSIRO.

7.5.2 Updates on the Adult Survey Stream

Developments since the 2nd Annual Report

Recruitment of participants

At the time of the 2nd Annual Report in November 2016, the Adult Survey had collected self-reported health and exposure information on 2,616 (25%) residents from Morwell and 801 (19%) residents from Sale. At that time the schedule of mail outs, of invitation packs and reminder letters, had been completed.

In the period November 2016 to end January 2017, ongoing recruitment efforts included:

- responding on a daily basis to resident enquiries via incoming 1800 number calls or emails;
- weekly attendance by Adult Survey researchers at Morwell and Sale libraries to assist eligible residents with enquiries and to complete the Adult Survey paper questionnaires;
- ongoing efforts by the Hunter Research Foundation to make phone contact with non-responders up until 25 November 2016;
- development, printing, packaging and delivery of Adult Survey Community Packs to numerous public locations in Sale and Morwell, such as doctor's rooms, sports clubs, laundromats and libraries. (A complete list of locations is available at www.hazelwoodhealthstudy.org.au/category/connections/;
- development, printing and delivery of promotional posters to accompany the Adult Survey Community Packs (see Figure 10);

- monthly media releases, developed with the support of Wordwise Communications, highlighting the need to recruit younger adults, that participation opportunities were closing in the coming weeks, and that only Adult Survey participants would be invited for clinical assessments in 2017;
- development and placement of promotional roadside banners (see Figure 11);
- Sale-based recruitment events at the Gippsland Centre in November and December 2016;
- Community event held in the Sale Central Shopping Centre to assist the general public with information and completion of the Adult Survey;
- ongoing attendance, by Adult Survey researchers, at community group meetings.

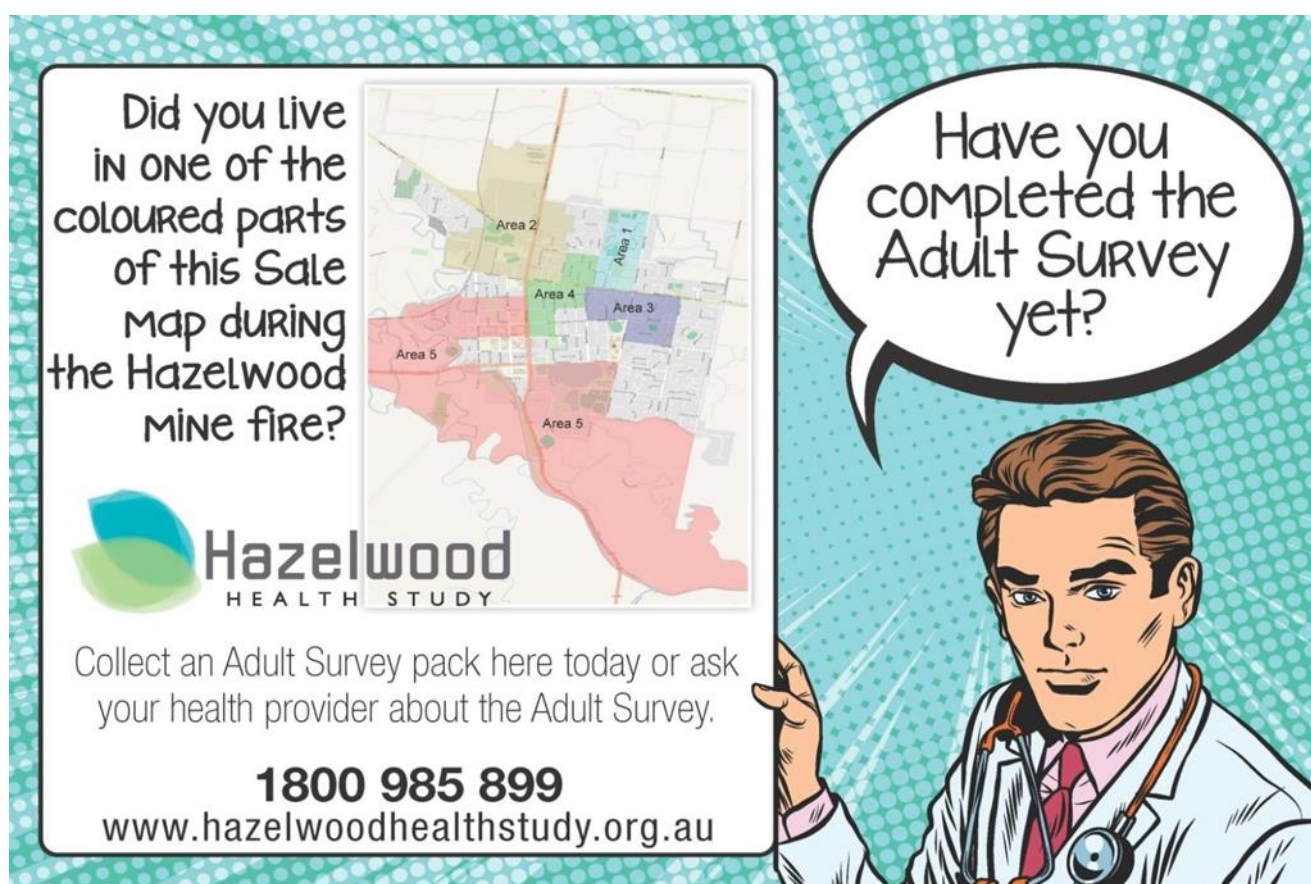


Figure 10 Promotional poster which accompanied the Adult Survey Community Packs in Sale

The options to complete the Adult Survey over the phone, or online, were closed to participants at the end of November 2016. This was because the HRF was closing before transitioning to become the Hunter Research Foundation Centre in partnership with the University of Newcastle. However, participants could continue to complete the Adult Survey by paper questionnaire until the end of January 2017. Allowing for postal times, the Adult Survey accepted paper questionnaires until mid-February, at which time recruitment was closed. By that time, **3,096 adults from Morwell (34%) and 960 adults from Sale (23%) had participated in the Adult Survey.**



Figure 11 Roadside banners promoting the Adult Survey

A detailed description, of all aspects of recruitment in to the Adult Survey, is provided in the Hazelwood Health Study Recruitment Report 1 November 2014 – 16 March 2017. That Report is available on the Hazelwood Health Study website at: www.hazelwoodhealthstudy.org.au/study-findings/study-reports/

Data cleaning

The Adult Survey data set comprises numerous types of data including:

- name and address data provided by the VEC;
- recruitment data (eg. invitation mailed, address invalid, participated, refused, not eligible, call back later) which is updated by the Monash University and HRF researchers as recruitment progresses; and
- health, age, work history, demographic, address and relocation data which is all self-reported by participants via computer-assisted telephone interview (CATI), computer-assisted web-based interview (CAWI) or paper questionnaire.

All data sources required careful and detailed audit and where necessary, editing/cleaning.

Upon receipt, paper questionnaires were sent to Datatime Pty Ltd for data entry and scanning. Datatime employed a double-data entry technique which minimised the likelihood of manual data entry errors. The keyed data, and scanned images, from the paper questionnaires were received from Datatime on 14 March. Data from the CATI, CAWI and paper questionnaires were then merged in to a single database, where they were then run through a series of statistical checks for missing, invalid, inconsistent or outlying results.

Where such problems were found in the data, decision rules were made which allowed most records to be ‘cleaned’ in preference to treating the responses as missing. All such decision rules were incorporated into the *Database Procedures Manual*.

Some data cleaning decision rules can be automated, such that programming syntax can be run to find the relevant records and adjust the relevant data. A substantial amount of data cleaning, however, must also be done manually; *ie.* by a researcher viewing the data and determining the appropriate edit or action. This is because it is not possible to foresee, and therefore program, every scenario where participants’ responses vary from what would be expected.

At the time of this Report, data pertaining to recruitment, demographics, health, health-related lifestyle factors (eg. smoking and alcohol), work history and addresses (residential, work-place and relocation) have been fully cleaned. There is still work to be done to audit and clean participant calendar location information; that being the mine fire period dates on which participants report being at particular addresses.

Statistical analysis

In the last year, substantial time has been spent refining the Adult Survey analysis plan. Dr Gao has led this work under the guidance of Professor Rory Wolfe who represents the SPHPM Biostatistics Unit and is a member of the Hazelwood Health Study SRG. Initially, particular attention was paid to the appropriate evaluation of and correction for sampling bias which may have occurred in the Adult Survey. The next stage of statistical analysis was to compare Morwell and Sale participants on recruitment, demographic and self-reported health data. A report describing those analyses was completed in June 2017 and is further described below.

The next stage of analysis has been to compare health outcomes across Morwell residents with high, medium, low or no mine-fire smoke exposure. These analyses have been undertaken by Dr Jo Dipnall, with review by Professor Wolfe and Associate Professor Guo. These analyses have taken in to consideration employment in jobs that involve exposure to smoke, fumes, fuels or dusts, and other health-related lifestyle factors such as smoking. These analyses are in the final stages and a Report will be completed in the next few months.

Adult Survey Report

It has been decided that the results of the Adult Survey will be reported in two or more volumes. The first volume, titled *Hazelwood Health Study Adult Survey, Volume 1 Comparison of Morwell and Sale* has been accepted by the Department and was publically released in August 2017. Volume 1 included a comparison of the Morwell and Sale participants in regard to recruitment outcomes, sampling bias, health-related risk factors, pre-mine fire medical conditions, and post-mine fire respiratory symptoms and conditions, cardiovascular conditions and psychological wellbeing.

Figure 12 below, reproduced from the Executive Summary to Volume 1, summarises some of the findings. Here it can be seen that self-reported doctor diagnosed asthma since the mine fire, and current respiratory symptoms were all significantly more common among Morwell compared with Sale participants. The risks of irritant symptoms from the chest and nose, consistent with chronic bronchitis and rhinitis, were also significantly higher among Morwell compared with Sale participants.

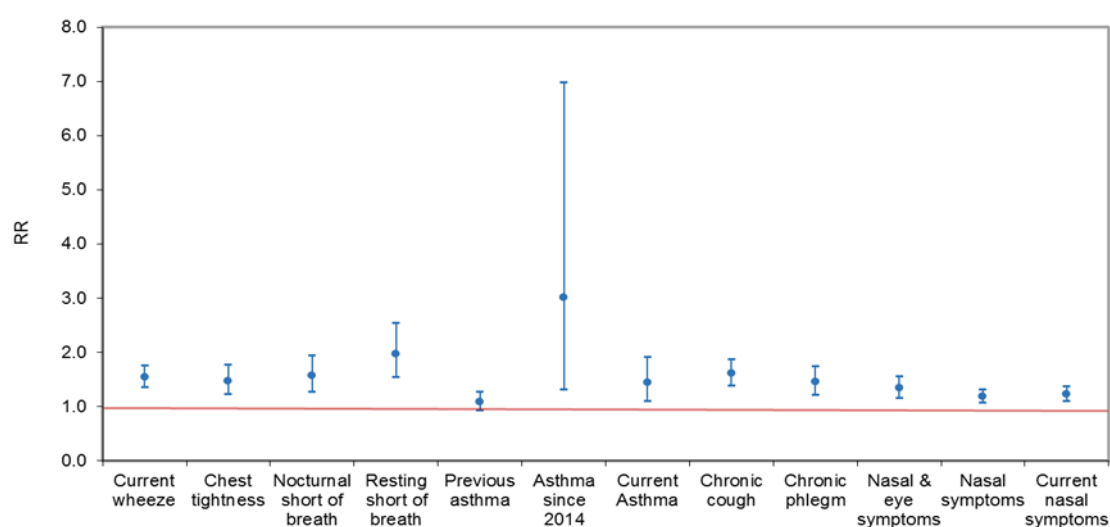


Figure 12 Rate ratios (RR) with 95% Confidence Intervals, comparing Morwell and Sale participants on self-reported asthma previous to the mine fire, post mine fire asthma and current respiratory, chest and nose symptoms.

The Executive Summary to the Volume 1 report is shown in Appendix 3. The complete Volume 1 report is available on the Hazelwood Health Study website at:

www.hazelwoodhealthstudy.org.au/study-findings/study-reports/

As indicated above, further analyses to compare health outcomes across residents with high, medium, low or no mine-fire smoke exposure, will be reported upon in the coming months.

Identified linkage to health databases

The Adult Survey sought participants' consent for the researchers to access their data recorded in a number of health databases. These included:

- the Victorian Ambulance Clinical Integration System (VACIS) and the Victorian Ambulance Cardiac Arrest Registry (VACAR) for identified linkage to ambulance call outs;
- the Victorian Data Linkage Unit at DHHS for identified linkage to the Victorian Emergency Minimum Dataset (VEMD) and the Victorian Admitted Episodes Dataset (VAED) respectively,
- the Victorian Cancer Registry for identified linkage to Victorian cancer incidence data,
- the Australian Institute of Health and Wellbeing (AIHW) for identified linkage to the National Death Index for mortality data, and the Australian Cancer Database for the national cancer incidence data.

The proportion of Adult Survey participants who consented to identified data linkage with the above-data sets is approximately 70%. Further details about data linkage are provided in section 7.6.

7.5.3 Future plans for the Adult Survey Stream

In the following months the Adult Survey researchers will be:

- completing the audit and cleaning of the participant calendar information; that being the dates for the days and nights that participants report being at particular addresses;
- geocoding the cleaned address data for every participant for every day and night of the mine fire period;
- blending the geocoded address data with the calendar data and the air pollution data, modelled by CSIRO, so that an air pollution exposure metric can be estimated for every Adult Survey participant;
- finalising the analysis plan for, and the statistical analysis of, the association between mine fire exposure and health outcomes in Morwell residents;
- completing a report on the results of the analysis of any associations between mine fire exposure and health outcomes in Morwell and Dale residents;
- finalising the audit and cleaning of the Adult Survey data pertaining to participant's consent for linkage with administrative health databases;
- undertaking the linkage with administrative health databases;
- finalising the analysis plans, statistical analysis and writing up of results from the linkage with administrative health databases

7.6 Hazelinks

There are two components of Hazelinks: an identified data linkage study and an anonymised data extraction study.

7.6.1 Aims and objectives of the Hazelinks Stream

Identified linkage with consent

The identified data linkage study aims to investigate the potential health effects from the Hazelwood mine fire by linking participant information from the Adult Survey (Morwell and Sale) to relevant health databases. These include routinely collected data from ambulance, hospital, cancer and death registries. The linkage will identify members of the Adult Survey cohort who subsequently develop respiratory or cardiovascular conditions, develop cancer, and/or die.

Anonymised data extraction

The anonymised data extraction study aims to investigate the short, medium and longer term health effects of exposure from the mine fire smoke across the Latrobe Valley. The registries used for data extraction include ambulance, hospital, cancer and death registries. The Medicare Benefits Schedule (MBS) and Pharmaceutical Benefits Scheme (PBS) data are also being analysed.

Datasets for identified linkage and data extraction

The identified linkage will be undertaken with datasets 1-5 below, and the anonymised data extraction will be undertaken for datasets 2-7 below.

1. National cancer incidence data from the Australian Cancer Database (ACD) held by the Australian Institute of Health and Welfare (AIHW).
2. Victorian cancer incidence data held by the Victorian Cancer registry (VCR).
3. Hospital admissions and emergency presentations data from the Victorian Admitted Episodes Dataset (VAED) and the Victorian Emergency Minimum Dataset (VEMD) respectively, held by the Victorian DHHS.
4. Ambulance data from the Victorian Ambulance Clinical Integration System (VACIS) and the Victorian Ambulance Cardiac Arrest Registry (VACAR) held by Ambulance Victoria.
5. Mortality data from the National Death Index (NDI) held by AIHW.
6. Mortality data from the National Mortality Database (NMD) held by AIHW.
7. MBS data (GP, specialist and consultant attendances) and PBS data for medication use, held by the Commonwealth DHS.

7.6.2 Updates on the Hazelinks Stream

Data custodian approval

At the time of the previous annual report, the researchers had received approval from:

1. Ambulance Victoria to access VACAR and VACIS data for identified linkage and data extraction.
2. DHHS to access to VAED and VEMD data (identified linkage and data extraction).
3. VCR to access Victorian cancer data (identified linkage and data extraction).
4. AIHW to access ACD and NDI data (identified linkage only).
5. AIHW to access the NDI and NMD (data extraction only).

Since the previous annual report, the application to access MBS and PBS data from the Commonwealth DHS has been approved.

Identified linkage update

Identified linkage of Adult Survey participants will be undertaken once consent data have been audited. Data linkage processes and variable requirements vary across each organisation therefore discussions have taken place with the data linkage contact at each organisation, in preparation for the linkage.

It is anticipated that identified linkage to data from the VCR, VACIS, VACAR, VEMD and VAED will be undertaken in 2018. Those linkages should provide health data up to approximately the end of 2016.

Data extraction update

At the time of the previous annual report, the following anonymous datasets had been received:

Datasets	Date range of received data
Ambulance Data (VACAR)	01/01/2009 - 31/03/2015
Ambulance Data (VACIS)	01/01/2009 - 31/03/2015
Hospital data (VAED)	01/01/2009 - 30/06/2015
Hospital data (VEMD)	01/01/2009 - 30/06/2015

Since the time of the previous annual report, the following datasets have been received:

Datasets	Date range of received data
Medicare data (MBS)	01/07/2012- 23/03/2017
Pharmaceutical Benefits Scheme data (PBS)	01/07/2012- 23/03/2017
Victorian Cancer Registry data (VCR)	01/01/2009 - 31/12/2015
Death data (NDI & NMD)	01/01/2009 – 22/12/2015

Data extraction analysis and reports

MBS and PBS

The analysis plan for MBS and PBS data extraction has been reviewed and approved by the PSC. Analysis has been undertaken using MBS data from July 2012 to June 2016, and PBS data from January 2012 to December 2016. The aim of the analysis was to examine whether the mine fire-related PM_{2.5} was related to increased health service use and/or an increase in the numbers of prescriptions medications being dispensed by pharmacies. Of particular interest were health services and medications related to respiratory, cardiovascular and mental health conditions. Time series statistical models have been used to quantify the associations between daily coal mine fire-related PM_{2.5}, health service use and dispensing of medications. A Report describing the MBS and PBS analysis is in the final stages of production and will be completed before the end of 2017.

Ambulance attendances

An analysis of ambulance attendance data from the VACIS is near completion. Included in that analysis is VACIS data from July 2010 to September 2014 for all geographic areas considered to have been exposed to the mine fire smoke (defined as daily average PM_{2.5} concentration of 1µg/m³ or higher on at least one day). The aim of this analysis is to examine whether the coal mine fire-related PM_{2.5} was related to increased risks of ambulance attendances for cardiovascular, respiratory and mental health conditions. Time series statistical models have been used to quantify the associations between daily coal mine fire-related PM_{2.5} and ambulance attendances. A report describing the ambulance attendance analysis is in the final stages of production and should be completed within a few months.

Cancer data extraction

The aim of the cancer data extraction in 2017 was to identify patterns of cancer in the Latrobe Valley and surrounding areas **prior** to the Hazelwood mine fire. The purpose was to provide a baseline against which post-mine fire cancer risk in the community can be compared. An analysis plan was prepared based upon receiving VCR records dating 1 Jan 2009 to 31 December 2013 (prior to the Hazelwood mine fire) and it was reviewed and approved by the PSC. Subsequently, that analysis has been completed and the findings have been collated into a report titled *Hazelinks – Cancer incidence analysis (First data extraction)*. That report was released publically in September 2017 and can be found on the Hazelwood Health Study website at: www.hazelwoodhealthstudy.org.au/study-findings/study-reports/

The Executive Summary, to the Hazelinks Report on cancer incidence prior to the mine fire, is reproduced here:

The aim of this analysis was to identify patterns of cancer in the Latrobe Valley (which closely follows the boundary of Latrobe City) and surrounding areas prior to the Hazelwood mine fire to provide a baseline against which future data extractions and analyses will compare cancer patterns that occur after the mine fire. An anonymised data extract from the Victorian Cancer Registry for the period 1 Jan 2009 to 31 December 2013 was analysed. Rural and regional Victoria was used as the reference population to determine whether observed numbers in the Latrobe Valley and combined surrounding areas were in excess of expected numbers.

Results showed similar overall cancer incidence in the Latrobe Valley and combined surrounding areas when compared with the rural and regional Victorian population. A statistically significant higher rate of mesothelioma and bladder cancer in males was observed in the Latrobe Valley. For females in the Latrobe Valley, significant excesses were observed for liver, lung and overall blood cancers. The combined surrounding areas did not show any statistically significant results.

The identified cancer linkage of Hazelwood Adult Survey participants over time will further examine the cancer incidence in the Latrobe Valley and will be able to take into account the exposure from the Hazelwood mine fire and relevant confounders e.g. smoking and work histories.

Hospital data extraction

The analysis plan for VEMD and VAED data for the period January 2009 to June 2015 has been reviewed and approved by the PSC. Subsequently that analysis of emergency presentations and hospital admissions for the fire impacted areas has been completed and the findings have been collated into a report titled *Hazelinks – Emergency presentations and hospital admissions analysis (First data extraction)*. That report was released publically in September 2017 and can be found on the Hazelwood Health Study website at:

www.hazelwoodhealthstudy.org.au/study-findings/study-reports/

The Executive Summary, to the Hazelinks Report on emergency presentations and hospital admissions, is reproduced here:

The aim of this analysis was to examine whether coal mine fire-related fine particles (PM_{2.5}) were associated with increased risks of emergency presentations or hospital admissions for cardiovascular and respiratory diseases. We analysed daily concentrations of coal mine fire-related PM_{2.5} modelled by CSIRO and the daily counts of hospital emergency department presentations and hospital admissions for the fire-impacted areas, between January 2009 and June 2015. Time series statistical models were used to quantify the associations between daily coal mine fire-related PM_{2.5} and emergency presentations or hospital admissions, controlling for seasonality, day of the week, daily maximum temperature, long-term temporal trends and area variation.

We found increased rates of emergency presentations and hospital admissions for asthma/COPD, and all respiratory diseases during the coal mine fire period, in comparison with the non-fire periods, but no evidence of increased rates for cardiovascular diseases. Emergency presentations for asthma/COPD and all respiratory diseases, and hospital admissions for all respiratory diseases were increased by 21%, 12%, and 16%, respectively, for each 10 µg/m³ increase in coal mine fire-related PM_{2.5}. There were 14 emergency presentations for asthma/COPD and 22 for all respiratory diseases attributable to coal mine fire-related PM_{2.5} in the fire impacted areas.

Further analysis will be conducted later this year to examine the effects of coal mine fire-related PM_{2.5} on ambulance call-outs, medical services and dispensing of medications, and to assess the effects of other air pollutants, particularly carbon monoxide on health outcomes.

7.6.3 Future plans for the Hazelinks Stream

- The timeline for identified linkage to health datasets will be established once the Adult Survey consent data have been audited. Linkage to the VCR, VACIS and VACAR (held by AV), VAED and VEMD (held by DHHS) will likely be undertaken in 2018.
- The anonymised death data will be audited in preparation for analysis.
- The analysis plan for death data extraction to be formulated and circulated for PSC approval.

7.7 Exposure Assessment

CSIRO Oceans & Atmosphere Flagship were subcontracted to conduct an in-depth analysis of existing air quality datasets in order to:

- identify key pollutants relevant to health impacts;
- statistically analyse differences in pollutant concentrations measured at Morwell during smoke-impacted and non-smoke impacted periods (e.g. background ambient air quality in the Latrobe Valley); and
- compare pollutant concentrations, measured at Morwell, to other urban sites within Australia and assess of the impact of the mine fire on ambient air quality.

Since the 2nd Annual Report, CSIRO have completed a report, and have provided associated data fields, for modelling which estimated hourly air exposure for the entire smoke effected area in the Latrobe Valley, distinguishing between exposure from the Hazelwood mine fire and other air pollution sources. The modelled data are integral to the Adult Survey and ELF Streams, which aim to estimate each participant's cumulative exposure to air pollutants by linking the model to geocoded locations where participants spent time during the mine fire.

The complete air quality modelling report and an accompanying lay summary were released publically in June 2017. The report is available at <http://hazelwoodhealthstudy.org.au/study-findings/study-reports/>. The lay summary is available at <http://hazelwoodhealthstudy.org.au/study-findings/fact-sheets-and-summaries/>.



7.8 Respiratory Stream

7.8.1 Aims and objectives of the Respiratory Stream:

The research questions relevant to Respiratory Stream are:

Is there evidence that people in general, and susceptible sub-populations in particular, who were heavily exposed to emissions from the Hazelwood fire, compared with otherwise similar people who were minimally exposed to emissions from the fire:

- a) currently have clinical or sub-clinical respiratory conditions that could be associated with clinically important adverse health consequences in the future?
- b) over time develop clinical or sub-clinical respiratory conditions that could be associated with clinically important adverse health consequences in the future?

The aims of the respiratory Stream are to determine whether exposure to smoke from the Hazelwood mine fire is associated with:

- respiratory symptoms;
- asthma control and lung inflammation;
- rate of decline in lung function; and
- gas transfer and small airway function.

7.8.2 Updates on the Respiratory Stream:

Staff Appointments

Ms Brigitte Borg was appointed as coordinator of this Stream in March 2017. Ms Borg holds a qualification in Applied Science (medical biophysics and instrumentation) and is a Certified Respiratory Function Scientist. She is currently a Senior Respiratory Scientist, Respiratory Medicine at The Alfred in Melbourne.

Mr Thomas McCrabb and Ms Annie Makar have been appointed to collect the Respiratory Stream data in the field. Both Mr McCrabb and Ms Makar hold qualifications in Biomedical Science and are currently Respiratory Scientists, Respiratory Medicine at The Alfred, Melbourne

Ms Kristina Thomas and Ms Kylie Sawyer has been appointed to assist the Recruitment Coordinator, Ms Susan Denny, with booking eligible participants in to the Respiratory Stream test appointments. This is a shared position with the Cardiovascular Stream which also requires eligible participants to be booked in to the available test appointments.

Developments since the 2nd Annual Report

In the period since the 2nd Annual Report in November 2016, Respiratory Stream activities include:

- Sourcing of, and negotiation around, suitable rooms for the clinical assessments in Morwell and Sale.
- Appointment of a Stream coordinator.
- Sourcing, purchasing and taking delivery of testing equipment, associated consumables, furniture and stationary for the Respiratory Stream clinic.
- Finalising of all protocols and operating procedures for recruitment and for all tests to be carried out in the clinic.
- Review and development of respiratory health questionnaires.
- Development of recruitment materials including Information Sheets, Consent Forms and cover letters.
- Review of sample size power calculations based on Adult Survey recruitment rates.
- Review of suitable sampling strategies to ensure that the final Respiratory Stream sample adequately represents men and women, younger and older people, and people with and without asthma and other respiratory symptoms, whilst maintaining suitable numbers to allow for refusal, non-response and attrition.
- Identification of Adult Survey participants who were eligible to be Respiratory Stream participants. Associated random sampling undertaken.
- Submission of application to MUHREC and subsequent amendments.
- Appointing and training Respiratory Scientists to undertake the respiratory testing in Morwell and Sale.
- Reconfiguration of the Adult Survey recruitment database to now meet the needs of Respiratory Stream recruitment and tracking.
- Development and implementation of an online booking system for booking appointments for both Respiratory and Cardiovascular Stream.
- Development and implementation of Respiratory Stream data collection tool in REDCap (Research Electronic Data Capture software) which is a widely used web based software application for clinical studies.
- Invitation packs (and reminders and final letters where applicable) distributed selected participants for Respiratory Stream.
- Complete set up of the Morwell clinic with all furniture, equipment, testing consumables, stationery and so on.
- Clinic site induction for relevant staff.
- A media event to promote the beginning of lung function testing in Morwell took place on 10 August 2017 at Latrobe Community Health Service in Morwell. The media release can be found at www.hazelwoodhealthstudy.org.au/hazelwood-health-study-begins-adult-lung-assessments/.

- A second media event to remind the community about the ongoing lung function testing in Morwell took place in October 2017. The media release can be found at www.hazelwoodhealthstudy.org.au/hazelwood-health-study-lung-function-tests-continue/
- Testing of participants in Morwell commenced in August 2017.
- Sourcing and purchasing of suitable gift vouchers to give participants as reimbursement for their time and inconvenience.
- Review of spirometry and carbon monoxide transfer factor results for all participants within four weeks of their visit. Where abnormal findings are identified, letters have then been forwarded to participants with the recommendation that these be taken to their general practitioner for review.

Recruitment of participants

The Respiratory Stream aims to recruit 339 participants from Morwell and 170 participants from Sale. The current testing schedule allows for 6 participants to be tested per day with two respiratory scientists testing participants in parallel. As the clinic is staffed five days per week, this allows up to 30 participants to be tested each week.

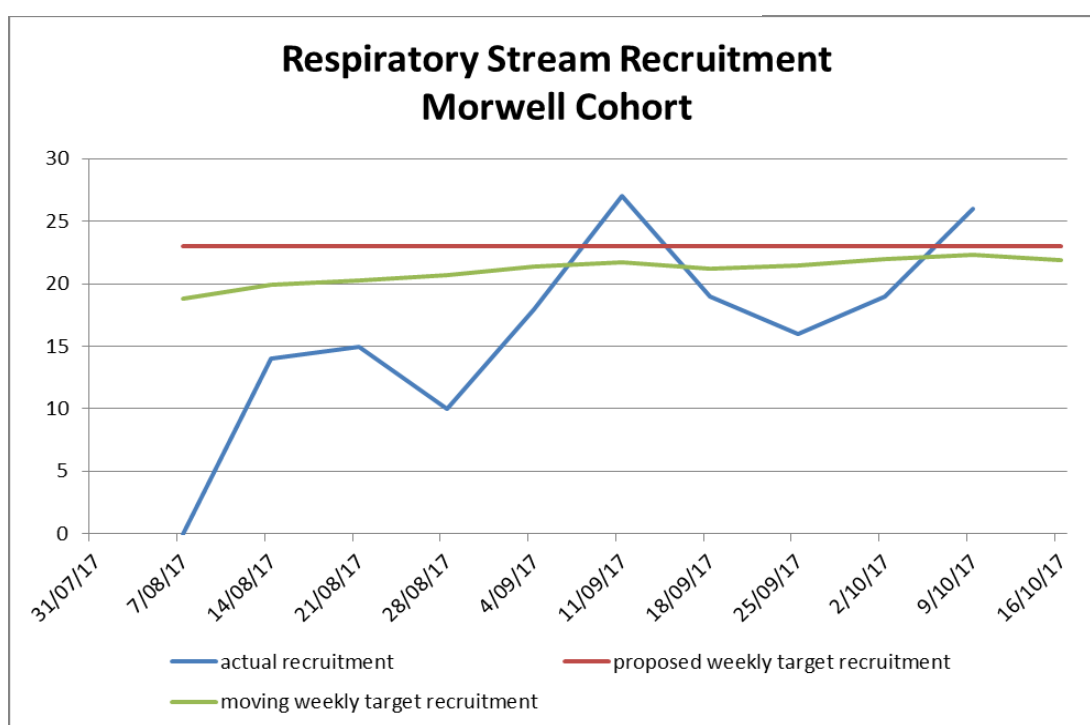


Figure 13 Actual recruitment versus target recruitment for the Respiratory Stream in Morwell

The Respiratory Stream commenced recruitment of Morwell participants in August 2017. Testing is underway in the Morwell clinic which is based within the Latrobe Community Health Service, Buckley St Morwell. Testing is expected to continue at the Morwell site

until mid-December 2017. The actual versus target weekly recruitment numbers for the Morwell cohort are shown in Figure 13.

To date the Respiratory Stream have tested 272 Morwell participants and have a further 43 booked. A participant undertaking testing in Morwell is shown in Figure 14.



Figure 14 Lung function equipment and a participant undergoing assessment by Respiratory Scientist Mr Thomas McCrabbe.

7.8.3 Future Plans

- It is expected that the Respiratory Stream will complete recruitment of the Morwell cohort in mid-December 2017. After that time the Respiratory Stream will relocate to Sale where recruitment and testing will likely continue through to March 2018.
- It is anticipated that the Cardiovascular Stream, which only recently commenced in Sale, may not be ready to vacate their clinic rooms by mid-December. Therefore the Respiratory Stream will be attempting to source and negotiate the use of an alternative clinic space in Sale.
- This Stream will commence planning for data analysis following completion of data collection.

7.9 Cardiovascular Stream

7.9.1 Aims and objectives of the Cardiovascular Stream:

The research questions relevant to Cardiovascular Stream are:

Is there evidence that people in general, and susceptible sub-populations in particular, who were heavily exposed to emissions from the Hazelwood fire, compared with otherwise similar people who were minimally exposed to emissions from the fire:

- a) currently have clinical or sub-clinical cardiovascular conditions that could be associated with clinically important adverse health consequences in the future?
- b) over time develop clinical or sub-clinical cardiovascular conditions that could be associated with clinically important adverse health consequences in the future?

The aims of the Cardiovascular Stream are to determine whether exposure to smoke from the Hazelwood mine fire is associated with:

- blood pressure;
- abnormal Electrocardiographs (ECG);
- endothelial function (as a marker of early vascular disease); and
- inflammatory markers, such as C-Reactive Protein.

7.9.2 Updates on the Cardiovascular Stream:

Staff Appointments

Dr Sylvia Pomeroy was appointed to coordinate this Stream in May 2017. Dr Pomeroy has qualifications in nutrition and dietetics, an MPH from Monash and a PhD for research on General practitioners' nutrition promotion among cardiac patients. She has 10 years' experience in research and research management with a particular interest in nutrition in the context of cardiac and respiratory diseases. Having completed substantial work on the testing protocols, clinic requirements, and the appointment of and training of staff. Dr Pomeroy resigned in early October 2017. HHS Senior Project Manager Dr Jillian Blackwood has taken on stream coordination responsibilities until a replacement is in place.

A number of staff have been appointed to conduct the Cardiovascular Stream in-clinic testing. Ms Elizabeth Dewar has been appointed as an ultrasonographer to undertake Flow Mediated Dilatation (FMD) measurement of endothelial function (see Figure 15). Ms Dewar holds qualifications in science and Advanced Cardiac Technology. She is an Accredited

Medical Sonographer and has been working at the Baker Heart and Diabetes Institute. Ms Dewar has provided considerable input to the development of best practice Standard Operating Procedures for the FMD measurements. Ms Karen Kilpatrick is a highly experienced medical sonographer who has also been appointed to assist with FMD measurements in the clinic. Ms Andrea Taggart is a Gippsland-based Nurse with more than 15 years professional experience. Ms Taggart has been appointed to the Cardiovascular Stream to undertake anthropometric measures, blood pressure measurement, ECG testing and to draw blood from the research participants. Dr Berihun Zeleke has also been appointed to undertake anthropometric measures, blood pressure measurement, ECG testing and to draw blood from the research participants. Dr Zeleke is an Ethiopian medical graduate who has recently completed a PhD in women's health and is currently a postdoctoral fellow with the Centre for Population Health Research on Electromagnetic Energy. Ms Melanie Reeves and Ms Shantelle Allgood have been appointed to greet and consent research participants, and to administer detailed questionnaires about health, medical history, family medical history and life-style risk factors. Ms Reeves has previously been assisting the ELF Stream to conduct their in-clinic testing, whilst Ms Allgood has been assisting the Respiratory Stream in booking participant appointments.



Figure 15 Sonographer Ms Liz Dewar conducting a Flow Mediated Dilatation measure of endothelial function in the Cardiovascular Stream clinic in Sale

Developments since the 2nd Annual Report

In the period since the 2nd Annual Report in November 2016, Cardiovascular Stream activities include:

- Meetings with various services for the purpose of sourcing suitable rooms for the clinical assessments in Morwell and Sale.
- Development of Position Descriptions for a Stream coordinator, sonographers, bookings officers and research assistants/nurses to facilitate the cardiovascular testing in Morwell and Sale.
- Appointment of a Stream coordinator.
- Finalising of all protocols and operating procedures for recruitment and for all tests to be carried out in the clinic.
- Determination of all equipment, consumables, stationary and furniture required for the clinical testing, associated sourcing of quotes, purchasing and taking delivery.
- Review and development of cardiovascular health and life-style questionnaires,
- Development of recruitment materials including Information Sheets, Consent Forms and cover letters.
- Discussions with Melbourne Mailing House in readiness for recruitment mail-outs.
- Review of sample size power calculations based on Adult Survey recruitment rates.
- Auditing of Adult Survey participants to identify eligible Cardiovascular Stream participants.
- Review of suitable sampling strategies to ensure that the final Cardiovascular Stream sample adequately represents men and women across the required age-range, and people with and without existing cardiovascular conditions and/or diabetes, whilst maintaining suitable numbers to allow for refusal, non-response and attrition.
- Identification of Adult Survey participants who are eligible to be Cardiovascular Stream participants. Associated random sampling undertaken.
- Organising accommodation for clinical testing staff working in Sale and Morwell.
- Submission of application to MUHREC and later amendments.
- Appointing and training all new clinic staff in regard to the numerous strict SOPs for the participant testing.
- Reconfiguration of the Adult Survey recruitment database to now meet the needs of Cardiovascular Stream recruitment and tracking.
- Development and implementation of an online booking system for booking appointments for both Respiratory and Cardiovascular Stream.
- Development and implementation of the Cardiovascular Stream data collection tool in REDCap.

- Invitation packs (and reminders and final letters where applicable) distributed to the eligible participants in Sale.
- Complete set up of the Sale clinic with all furniture, equipment, testing consumables, stationery and so on. Associated site induction for relevant staff.
- Sourcing and purchasing of suitable gift vouchers to give participants as reimbursement for their time and inconvenience.
- Testing of pilot participants in Sale commenced on 10 October 2017. Testing of 'full' participants in Sale commenced on 26 October 2017.
- Review of blood pressure, ECG and blood test results for all participants with abnormal-findings letters sent to participants where applicable.

Recruitment of participants

The Cardiovascular Stream aims to recruit 329 participants from Morwell and 165 participants from Sale. The current testing schedule allows for only 4 to 5 participants to be tested per day or about 22 per week. Participant appointments are taking in excess of 2 ½ hours to complete. The researchers are currently reviewing strategies to shorten the appointment, so as to increase the number that can be tested each day, whilst not sacrificing important data collection.

The Cardiovascular Stream commenced recruitment of Sale participants in October 2017. Testing is underway in the Sale clinic which is based within the Central Gippsland Health Service, Community Services Building, at 48 Palmerston Street, Sale.

To date the Cardiovascular Stream has tested 49 participants, and a further 46 appointments have been booked.

8 Community Engagement

8.1 Updates on engagement activities:

8.1.1 Developments since the 2nd Annual Report

There has been extensive community engagement over the past twelve months. The Communication and Community Engagement Adviser, Shaun Mallia, has updated the HHS Media Policy (Appendix 4) and the Community Stakeholder and Engagement Strategy (Appendix 5). These will now better align the study with the new health environment in Latrobe City (with the establishment of the Latrobe Health Assembly, Latrobe Health Innovation Zone and other activities) and the needs of the community as the first study findings are disseminated to the community. Other community engagement activities during the last 12 months include:



Figure 16 Annual Community Briefing held at Morwell Bowls Club, November 2016

- The 2016 Annual Community Briefing took place at the Morwell Bowls Club, in Morwell on 29 November (Figure 16). Updates on all Streams were presented. A copy of the presentation slides have been placed on the HHS website at <http://hazelwoodhealthstudy.org.au/the-study/community-briefings>
- Roadside banners, promoting the Adult Survey, were positioned in Sale and Morwell in November and December 2016.
- Organisation and delivery of Adult Survey Community Packs to public locations in Sale and Morwell.
- Organisation, promotion and weekly attendance at Morwell and Sale libraries to assist eligible residents with questions about the HHS and to complete the Adult Survey paper questionnaires.

- Ongoing consultation with Wordwise Communications to identify key messages for monthly media releases for both Sale and Morwell took place up until April 2017 when Mr Shaun Mallia was appointed as HHS Communications and Community Engagement Adviser and took over all liaison with the media and other agencies.
- Ongoing liaison with communications officers from health and local government regarding disseminating study information through their networks.
- Liaison with the Gippsland Primary Health Network to inform the primary health sector about the study and discuss possible involvement in the Clinical Reference Group and in disseminating study information.
- Ongoing liaison with “Shop Latrobe City” Gift Cards project manager to ensure businesses and participants are informed about the use of the cards.
- Ongoing liaison with Newspower Newsagent staff in Morwell with queries from the general public and the dissemination of the gift cards.
- Discussion about Adult Survey Community Packs with Sub Acute Care staff at Latrobe Regional Hospital for the dissemination to patients.
- A major media event to promote ELF clinical assessments took place on 8 June 2017 at the Latrobe Community Health Service in Morwell. Parent Lauren Kitwood participated in the event and provided comment. The media release can be found at www.hazelwoodhealthstudy.org.au/latrobe-valley-children-helping-the-next-generation/.
- A major media event to promote the release of key findings from the Schools Study took place on 29 June 2017 at Morwell Central Primary School (Figure 3). Principal Justine Smyth participated in the event and provided comment. The media release can be found at www.hazelwoodhealthstudy.org.au/study-releases-key-findings-on-the-psychological-impacts-of-the-mine-fire-on-students/.
- A major media event to promote the beginning of lung function testing in Morwell took place on 10 August 2017 at Latrobe Community Health Service in Morwell. The media release can be found at www.hazelwoodhealthstudy.org.au/hazelwood-health-study-begins-adult-lung-assessments/.
- A major media event to promote a community day inviting residents to participate in the ‘Our hopes for the future of Morwell Exhibition’ took place on 18 August 2017 at Morwell Neighbourhood House. Photographer Clive Hutchison and Morwell Neighbourhood House coordinator and Community Advisory Committee Chair, Tracie Lund participated in the event and provided comment. An article about the event can be found at www.latrobevalleyexpress.com.au/story/4867549/handy-push-for-positive-images/.
- A major media event to promote the findings from the Adult Survey and from Emergency Presentations and Hospital Admissions data extraction, took place on 4

September 2017 at Latrobe Community Health Service (see Figure 17. Clinical Reference Group Chair Dr Fred Edwards participated in the event and provided comment. These media releases can be found on the Hazelwood Health Study website at www.hazelwoodhealthstudy.org.au/hazelwood-health-study-releases-first-findings-from-adult-survey/ and at www.hazelwoodhealthstudy.org.au/hospital-admissions-increase-during-hazelwood-mine-fire/ .

- A major media event to promote the findings from the Baseline Cancer Incidence Analysis took place on 19 September 2017 at Latrobe Community Health Service. The Cancer Stream (a part of Hazelinks) is led by Professor Malcolm Sim who was interviewed. Asbestos Council of Victoria/Gippsland Asbestos Related Diseases Support group representative Vicki Hamilton participated in the event and provided comment. The media release can be found at: www.hazelwoodhealthstudy.org.au/hazelwood-health-study-completes-baseline-cancer-analysis/ .



Figure 17 Principal Investigator Professor Michael Abramson speaking to media about the latest findings from the Adult Survey and hospital data.

- Posters and flyers have been handed out to Morwell and Sale businesses promoting the Annual Community Briefings, now known as Community Engagement Sessions.

- Ongoing media interviews including radio, television and print have been conducted in order to update community on the Hazelwood Health Study.
- Ongoing liaison with communications officers from health and local government regarding disseminating study information through their networks.
- Liaison with the Gippsland Primary Health Network to inform the primary health sector about the study and discuss disseminating study information.
- Ongoing liaison with Latrobe Health Assembly regarding disseminating study information.
- Ongoing liaison with state and federal politicians to provide study updates.
- Ongoing meetings with community groups to continue engagement with the study.

8.2 Media coverage:

The appointment of Shaun Mallia as the Communications and Community Engagement Adviser to the study, and his being based in Gippsland, has helped increase the study's presence in local media. Due to the numerous community engagement activities, including the release of major findings, the study has received extensive coverage in Gippsland media including television, radio, online and print. The counts across different media types for the 2017 calendar year to date are shown in Figure 18.

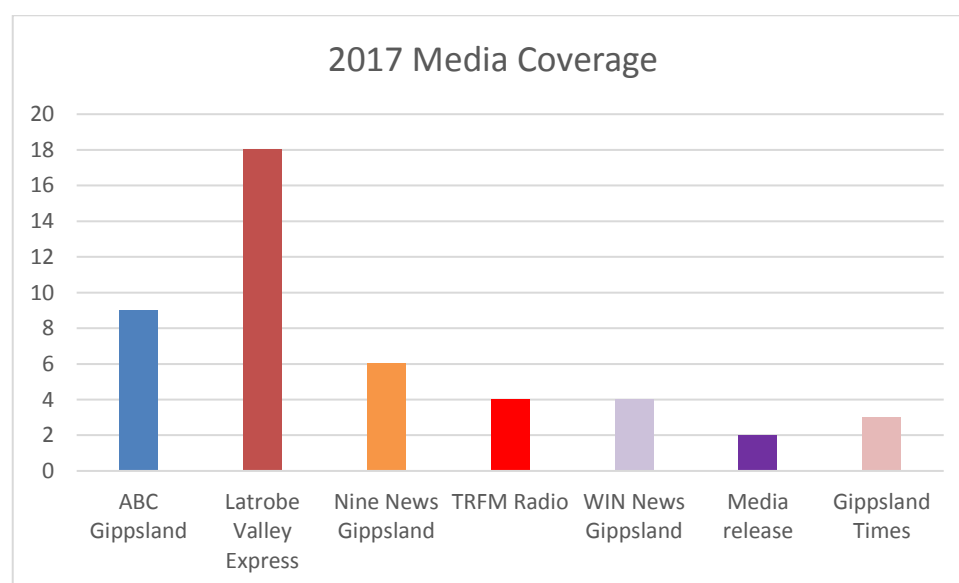


Figure 18 Media coverage for the 2017 calendar year.

8.3 Community Engagement Sessions

8.3.1 Morwell

The first of two Annual Community Briefings, now known as Community Engagement Sessions to reflect their more interactive format, took place at the Morwell Bowls Club, on Monday 9 October. About 40 community members attended the session. The Morwell session was moderated by former ABC Gippsland presenter Gerard Callinan. The format of this year's Morwell CES was overhauled to include several roundtable discussions focusing on each research Stream (see Figure 19). Stream researchers discussed the study with interested participants, providing research updates and an opportunity for two-way conversations engagement. The round-table discussions rotated to enable community members to engage in discussions about multiple research streams. This format encouraged robust discussion between researchers and attendees. Additional changes to the format included Mr Callinan interviewing Principal Investigator Professor Michael Abramson and Principal Co-Investigator Professor Judi Walker. The interview also featured questions from the audience in a wide-reaching Q&A session.



Figure 19 Community and Wellbeing Stream research lead Susan Yell provides an update to attendees at the Morwell Community Engagement Session.

8.3.2 Sale

The second Community Engagement Session took place at the Bond Street Event Centre in Sale on Tuesday 10 October (see Figure 20). About 20 people attended the session moderated by Mr Callinan. This session focused on Streams involving the Sale community, specifically the Adult Survey, Hazelinks, Cardiovascular and Respiratory Streams. The session featured ongoing conversations between presenters and attendees who were particularly interested in how the Hazelwood Health Study benefitted the Sale community. Sale-based CAC representative Ruth Churchill joined Judi Walker on stage for an in-depth interview with Mr Callinan.

Further information about the two Community Engagement Sessions is available at:

www.hazelwoodhealthstudy.org.au/community-links/community-briefings/



Figure 20 Respiratory Scientists Tom McCrabb and Annie Makar provide an update about lung function testing.

8.4 Future plans:

The Hazelwood Health Study website will receive a major content overhaul complemented by social media platforms Facebook and Twitter. Additionally, a bi-monthly newsletter is being developed and will be circulated among the community providing regular updates about the study. Work is also underway to investigate the possibility of including a regular study column in Latrobe Valley and Sale based newspapers as another means of providing regular content about the study to the community..

9 Monash University Award for Excellence in Research

In July 2017, the Monash-based HHS team was nominated for, and the successful recipient of, the 2017 Monash University, Faculty of Medicine, Nursing and Health Science's Dean's Award for Excellence in Research - Economic and Social Impact. As a result the team are now a finalist for the prestigious Vice Chancellor's Award for Research Impact - Economic and Social Impact. This Award is designed to reward excellence by researchers who have achieved or are currently achieving, outstanding economic and societal impacts. The Award celebrates success in collaborative working, partnerships, engagement and knowledge transfer activities that have led to significant impact. The winner will be announced at a ceremony on Monday 20 November 2017.



Figure 21 Professor Michael Abramson, on behalf of the Monash University-based Hazelwood Health Study team, accepting the 2017 Monash University, Faculty of Medicine, Nursing and Health Science's Dean's Award for Excellence in Research – Economic and Social Impact.

10 Appendices

Appendix 1 Hazelwood Health Study Project Governance Structure

Appendix 2 Executive Summary to the ELF Study Report titled “Description of the Latrobe ELF cohort and preliminary assessment of possible associations between mine fire emissions and perinatal outcomes”

Appendix 3 Executive Summary to the Adult Survey Report titled “Hazelwood Health Study Adult Survey Volume 1 Comparison of Morwell and Sale”

Appendix 4 Hazelwood Health Study Media Protocol v 2.0

Appendix 5 Hazelwood Health Study Communication and Community Engagement Strategy v 3.1



Project Governance Structure

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1. Introduction

Monash University has been contracted by the Victorian Department of Health and Human Services to undertake a comprehensive study of the long-term health of residents of Morwell and the wider Latrobe Valley following exposure to the smoke from the Hazelwood coal mine fire. Researchers from the School of Public Health and Preventive Medicine (SPHPM) and School of Rural Health (SRH) lead the project, in collaboration with researchers from elsewhere in Monash University as well as Federation University, University of Tasmania, University of Adelaide, and CSIRO.

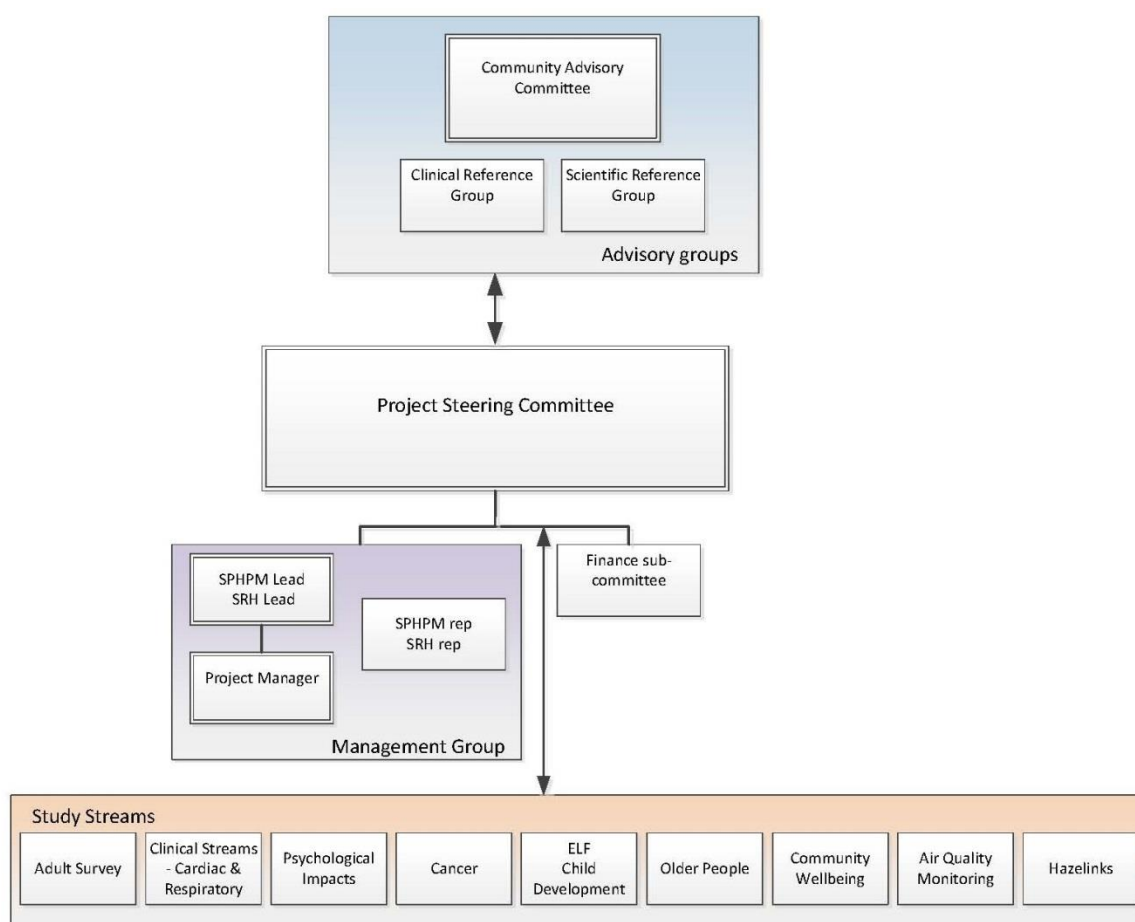


Figure 1: Hazelwood Health Study governance structure.

The cycle of governance of this large and complex long term study into the potential health effects of the Hazelwood coal mine fire (known as the Hazelwood Health Study - HHS) adopts a project management governance structure (**Figure 1**) consisting of:

1. Key **advisory** groups

- Community Advisory Committee
- Clinical Reference Group
- Scientific Reference Group

2. **Research** leadership and direction groups

- The Project Steering Committee
- Study Streams

3. Study **management** groups

- Project Management Group
- Finance subCommittee

2. Community Advisory Committee

Preamble

The Community Advisory Committee (CAC) is the study's primary advisory body.

The purpose of the CAC is to ensure that the study hears directly from and works in partnership with Latrobe City community members, health and community service providers and local government in undertaking the research program and ultimately to improve health services and health outcomes for the local community. In 2015 Sale was identified as the comparison community leading to the need to broaden the CAC to include Sale residents and organisational representatives.

Meetings and Membership

Meeting on a bi-monthly basis from 2015, the Committee started with 10 members reflecting the diversity of stakeholder groups. In September 2015 an additional two community members and two organisational representatives were added from Sale. In 2017 membership of the CAC has been expanded to include up to six community members from Latrobe City and up to four community members from Sale, selected through a public call for Expressions of Interest (EOI). Selection is at the discretion of a selection subcommittee of the CAC to ensure equitable membership across the CAC including gender balance.

The CAC will always convene in the Latrobe Valley. Meetings will be minuted.

Membership of the CAC is:

Up to six community members from Latrobe City

Up to four community members from Sale

A representative of Latrobe City Council

A representative of Federation University (Gippsland campus)

A representative of the Latrobe Regional Hospital Board

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Appendix 1. Hazelwood Health Study Project Governance Structure

A representative of the Latrobe Community Health Service Ltd Board

A representative of the Central Gippsland Health Service Board

A representative of Wellington Shire Council

Ex Officio

Principal Investigator, Monash University

Principal Co-Investigator (Gippsland), Monash University

Victorian Chief Health Officer

The Senior Project Manager, Monash University who will act as Secretary to the CAC

Communications and Engagement Adviser (Gippsland), Monash University

Terms of Reference (revised February 2017)

The specific roles of the CAC are to:

1. Discuss and advise on community perspectives in proposed new research/clinical/engagement activities, plans and projects as presented by the study's academic leads.
2. Ensure the study is widely known to people in its catchment.
3. Provide advice to the Project Steering Committee and Management Group on engagement and communication issues including the optimal communications plan.
4. Monitor the effectiveness of communication processes.
5. Provide feedback on the study's proposed recruitment protocols, and thus maximise the enrolment of study participants to the Project Steering Committee and Management Group.
6. Participate in evaluating the impact of the study in the region.
7. Be involved in education and training of field staff and clients when requested by the project's academic leads.
8. Undertake any other activities that contribute to the realisation of the study objectives.

Process for annual election of the Chair

1. The Secretary will act as Returning Officer.
2. Returning Officer to invite nominations for the position of independent Chair from CAC members.
3. There must be two nominators.
4. Only community members are eligible for nomination and must agree to the nomination.
5. If more than one nomination is received the Returning Officer will conduct a ballot from among CAC members.
6. Successful nominee to take up the position of Chair at the second meeting of the year.

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3. Clinical Reference Group

Function of the Clinical Reference Group

The function of the Clinical Reference Group (CRG), is to take responsibility for providing advice to the Project Steering Committee about the clinical aspects of the Hazelwood Health Study (HHS).

Role of the Clinical Reference Group

The role of the CRG is to provide clinically-related advice at all stages of the study including:

- promotional material
- documents provided to HHS participants
- clinical fieldwork
- dissemination plans for HHS findings
- documentation to promote HHS findings to the community
- any issue or risk that has major clinical implications for the HHS
- clinical pathways for abnormal results
- individual abnormal results as they arise
- linkage of relevant local healthcare data
- dissemination of findings to key health and related professional outlets, organisations and agencies

Role of individual members

The role of the individual CRG member includes:

- understanding the clinical implications and outcomes of the HHS
- appreciating the significance of the HHS's subject matter for all stakeholders
- being genuinely interested in the HHS
- being an advocate for HHS clinical outcomes
- being committed to pursuing HHS clinical outcomes.

In reality, this means that CRG members:

- ensure the requirements of all stakeholders are met

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Appendix 1. Hazelwood Health Study Project Governance Structure

- consider ideas and issues raised
- review the progress of the HHS
- check adherence of HHS activities to standards of best clinical practice.

General

Membership

The CRG currently includes the following invited members:

1. Dr Fred Edwards, General Practitioner, Latrobe Valley (Chair)
2. Ms Angela Scully, Head of Child & Maternal Health Services, Latrobe Regional Hospital
3. Clinical Associate Professor Alistair Wright, Consultant Physician (Latrobe Regional Hospital) and Clinical Dean, School of Rural Health
4. Dr Ian Webb, General Practitioner, Latrobe Valley
5. Associate Professor Paul Lee, Consultant Psychiatrist, Latrobe Regional Hospital
6. Dr Jo McCubbin, Paediatrician, Sale
7. Dr Dion Stub, The Alfred Hospital
8. Dr Ryan Hoy, School of Public Health & Preventive Medicine, Monash University
9. Dr David Monash, General Practitioner, Sale
10. Ms Jeannette Douglas, Health Pathways Project Manager, Gippsland Primary Health Network

Ex Officio Membership

Principal Investigator, Monash University

Principal Co-Investigator (Gippsland), Monash University

Communications and Engagement Adviser (Gippsland), Monash University

The Senior Project Manager, Monash University who acts as Secretary.

Guests

Stream Leaders and other experts to be invited to meetings as required.

Proxies

Proxies are not permitted.

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Frequency of meetings

Meeting as required but at least twice a year in the Latrobe Valley or by tele-videoconferencing.

Meetings will be minuted.

Review

Effectiveness of the CRG and its membership will be reviewed annually.

Dispute Resolution

If any dispute arises all parties agree to advise the PI and the Pco-I and to negotiate in good faith to resolve the dispute. Any dispute that is not able to be resolved will be referred to the Deputy Dean Research, Faculty of Medicine, Nursing and Health Sciences, Monash University. If required the Dean will be the final arbiter in any dispute.

4. Scientific Reference Group

Preamble

The Scientific Reference Group (SRG) comprises scientific experts in the various scientific disciplines contributing to the study who will provide input into the study directions. These include, but are not limited to: toxicology, psychiatry, sociodemography, biostatistics etc.

Meetings and Membership

Meeting at least twice a year, by tele-/video-conferencing or face-to-face, the SRG will be initially Chaired by Professor Michael Abramson. Meetings will be minuted.

The SRG comprises:

1. Professor Michael Abramson (Chair), Monash University – Principal Investigator
2. Professor Judi Walker, Monash University – Principal Co-Investigator (Gippsland)
3. Professor Ross Coppel, Deputy Dean Research, FMNHS, Monash University
4. Professor Brian Priestly, Australian Centre for Human Health Risk Assessment
5. Professor Alexander McFarlane, University of Adelaide
6. Associate Professor Christine Roberts, Kolling Institute, University of Sydney
7. Associate Professor Rebecca Kippen, School of Rural Health, Monash University
8. Professor Rory Wolfe, School of Public Health & Preventive Medicine, Monash University
9. Professor John McNeil, School of Public Health & Preventive Medicine, Monash University
10. Michael Keating, Medical Scientist

11. Dr Melita Keywood, CSIRO

12. Professor Dennis Moore, Director, Krongold Centre, Faculty of Education, Monash University

13. Dr Jillian Blackman, Senior Project Manager, Monash University

Other members may be co-opted onto the group as the study progresses.

Terms of Reference

The specific roles of the SRG are to:

1. Assist the academic leads and stream leaders develop their research plans
2. Monitor the progress of the study's research activities
3. Provide the academic leads and stream leaders with ongoing advice
4. Review protocols and adherence
5. Function as a data monitoring and safety board in the event of adverse responses or complaints
6. Consider proposals for new research activities or streams
7. Identify potential new collaborations and recruits
8. Provide guidance on the annual review of research activity, and consider and endorse the review report.

5. Project Steering Committee (PSC)

Function of the Project Steering Committee

The function of the PSC is to take responsibility for the research issues associated with the HHS. The PSC is also responsible for approving budgetary strategy, defining and realising benefits, and monitoring risks, quality and timeliness.

Role of the Project Steering Committee

The role of the PSC is to:

- take on responsibility for the study's feasibility, research streams and achievement of outcomes
- provide overall strategic guidance for the study
- ensure probity

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Appendix 1. Hazelwood Health Study Project Governance Structure

- ensure the study's scope aligns with the requirements of the stakeholder groups
- provide those directly involved in the study with guidance on research issues
- ensure effort and expenditure are appropriate to stakeholder expectations
- address any issue or risk that has major implications for the study
- keep the study scope under control as emergent issues force changes to be considered
- reconcile differences in opinion and approach, and resolve disputes arising from them
- endorse the project plan and major documents relating to the study
- endorse major equipment requests where the value exceeds \$10,000
- sign off on the completion of each phase of the study including the deliverables
- provide advice on the communication of information about the study
- take on responsibility for any 'political' issues associated with the study.

Role of Individual Committee members

The role of the individual PSC member includes:

- understanding the strategic and political implications and outcomes of the study.
- appreciating the significance of the subject matter for all stakeholders and represent their interests.
- being genuinely interested in the study.
- being an advocate for the study's outcomes.
- having a broad understanding of project management issues and the approach being adopted.
- being committed to, and actively involved in pursuing the study's outcomes.

In reality, this means that PSC members:

- ensure the requirements of stakeholders are met
- help balance conflicting priorities and resources
- provide guidance to Principal Investigator and Principal Co-Investigator
- consider ideas and issues raised
- review the progress of the study

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- check adherence of study activities to standards of best practice.

General

Membership

Principal Investigator

Principal Co-Investigator (Gippsland)

Lead, Adult Study

Lead, Cardiovascular research stream

Lead, Alfred / Gippsland liaison

Lead, Cancer research stream

Lead, Respiratory research stream

Lead, Psychological impacts research stream

Lead, Early Life Follow-up research stream

Lead, Community Wellbeing research stream

Lead, Older Persons Policy Review

Lead, Hazelinks

Senior Project Manager

Executive Assistant (Minutes)

Chair

The Chair, the Principal Investigator shall convene the PSC meetings.

If the designated Chair is not available, then the Principal Co-Investigator (Gippsland) will be responsible for convening and conducting that meeting.

Agenda Items

All PSC agenda items must be forwarded to the Project Manager by C.O.B. 5 working days prior to the next scheduled meeting.

The PSC agenda, with attached meeting papers will be distributed at least 2 working days prior to the next scheduled meeting.

The Chair has the right to refuse to list an item on the formal agenda, but members may raise an item under 'Other Business' if necessary and as time permits.

Minutes & Meeting Papers

The minutes of each PSC meeting will be prepared by the Project Manager.

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Full copies of the Minutes, including attachments, shall be provided to all PSC members no later than 5 working days following each meeting.

By agreement of the Committee, out-of-session decisions will be deemed acceptable. Where agreed, all out-of-session decisions shall be recorded in the minutes of the next scheduled PSC meeting.

The Minutes of PSC meeting will be monitored and maintained by the Senior Project Manager as a complete record as required under provisions of the *Archives Act 1983*.

Frequency of Meetings

The PSC shall meet monthly by video/tele-conferencing and at least twice yearly face to face.

Proxies to Meetings

Members of the PSC shall nominate a proxy to attend a meeting if the member is unable to attend.

The Chair will be informed of the substitution at least 2 working days prior to the scheduled nominated meeting.

The nominated proxy shall have voting rights at the attended meeting. The nominated proxy shall provide relevant comments/feedback of the PSC member they are representing to the attended meeting.

Quorum Requirements

A minimum of 6 of PSC members is required for the meeting to be recognised as an authorised meeting for the recommendations or resolutions to be valid.

Review Timetable

Effectiveness of the Committee and its membership will be reviewed annually in November.

Dispute Resolution

If any dispute arises all parties agree to advise Principal Investigator and the Principal Co-Investigator (Gippsland) and to negotiate in good faith to resolve the dispute.

Any dispute that is not able to be resolved will be referred to the FMNHS, Deputy Dean Research. If required, the Dean FMNHS will be the final arbiter in any dispute.

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6. Project Management Group (PMG)

Function of the PMG

The function of the PMG is to support the Senior Project Manager in the operationalisation of the Project Plan and management of the project for the successful delivery of project outputs.

Role of the Project Management Group

The role of the PMG is to:

- provide guidance to the Project Manager for smooth day to day running of the study
- facilitate relations between the Gippsland and Alfred components of the study
- ensure continuity and balance between all elements of the study
- monitor the Project Plan and make recommendations about change and further development
- monitor the Project Risk Register and make recommendations as required
- endorse small equipment requests where the value is less than \$10,000
- manage and coordinate key activities occurring across the lifetime of the project including:
 - the recruitment of project staff
 - the program of stakeholder engagement, both internal and external
 - articulation of issues to be considered by the CAC and Project Reference Groups
 - relationships with the sub-contractors
 - communications (e.g. web site, recruitment materials, reports, media releases)
 - events
- report to the Project Steering Committee and Department of Health and Human Services monthly.

Role of individual members

The **Senior Project Manager** is responsible for organising the project into one or more sub-projects, managing the day-to-day aspects of the project, developing the Project Plan, resolving planning and implementation issues, and monitoring progress and budget.

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Appendix 1. Hazelwood Health Study Project Governance Structure

The **Principal Investigator** and **Principal Co-Investigator**, as sponsors of the project, will provide research leadership and direction at every stage of the project and report on the study's progress to those responsible at a high level. The **SHPM and SRH senior researchers** will provide research content and context to ensure a coordinated approach to the study and provide mentorship and support to junior research staff.

Membership

Senior Project Manager

Principal Investigator

Principal Co-Investigator (Gippsland)

SRH Senior Researcher

SHPM Senior Researcher

Executive Assistant (minutes)

Chair

The Chair, the Senior Project Manager, shall convene the PMG meetings.

Agenda Items

The Senior Project Manager will determine agenda items.

The PMG agenda, with attached meeting papers will be distributed at least 1 working day prior to the next scheduled meeting.

Minutes & Meeting Papers

Full copies of the Minutes, including attachments, shall be provided to all PMG members no later than 5 working days following each meeting.

The Minutes of PMG meeting will be monitored and maintained by the Senior Project Manager as a complete record as required under provisions of the *Archives Act 1983*.

Frequency of Meetings

The PMG shall meet up to twice a month by video/tele-conferencing.

Proxies to Meetings

Members of the PMG shall not nominate a proxy to attend a meeting if the member is unable to attend.

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Quorum Requirements

A minimum of 2 PMG members (one from each School) and the Senior Project Manager is required for the meeting to be recognised as an authorised meeting for the recommendations or resolutions to be valid.

Review Timetable

Effectiveness of the PMG will be reviewed annually in November.

Dispute Resolution

If any dispute arises all parties agree to advise Principal Investigator and the Principal Co-Investigator (Gippsland) and to negotiate in good faith to resolve the dispute.

Any dispute that is not able to be resolved will be referred to the FMNHS, Deputy Dean Research. If required, the Dean FMNHS will be the final arbiter in any dispute.

7. Finance sub-Committee

Preamble

The Finance sub-committee advises the PSC and PMG on all financial and budgetary matters related to the Project. It comprises representatives from the Faculty Office, School of Public Health and Preventive Medicine, School of Rural Health and Research & Revenue Hub.

Meetings and Membership

Meeting twice a year by video/teleconferencing, the finance sub-committee will be chaired by the Senior Project Manager. The sub-committee's membership is:

1. Senior Project Manager (Chair)
2. SPHPM nominee
3. SRH nominee
4. Deputy Manager, Research Revenue Accounting Service, Monash University

Terms of Reference

1. To advise the PSC and Management Group on the financial performance against the project's approved annual budget.
2. To assist the Principal Investigators, Senior Project Manager and Management Group revise

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Appendix 1. Hazelwood Health Study Project Governance Structure

the annual budget and approve variations within the budget.

3. To assist the Senior Project Manager develop a policy on claiming expenses as defined by the DHHS and in monitoring this budgetary item.
4. To assist the Senior Project Manager with financial reporting (internal and external).

Version Number	Date Approved	Approved By	Brief Description
1.0	7 December 2014	Project Steering Committee	Comprised Appendix 3 to Project Plan V 1.0.
2.0	1 June 2016	Principal Co-Investigator	Revised TOR for the CAC and procedure for electing an independent Chair
3.0	27 March 2017	Senior Project Manager	Revised TOR for the CAC. Minor reformatting.
3.1	1 June 2017	Principal Co-Investigator	Revised TOR for the CRG.
4.0	24 August 2017	Principal Co-Investigator	Compliance check

ELF Study Report titled “Description of the Latrobe ELF cohort and preliminary assessment of possible associations between mine fire emissions and perinatal outcomes

Executive Summary

This is the first report of preliminary findings from the Latrobe Early Life Follow-up (ELF) Study, which aims to understand the impacts of exposure to smoke from the 2014 Hazelwood coal mine fire on young children and children born to women who were pregnant during the smoke episode. The ELF Study has three components: (i) studying an identified cohort of children from the Latrobe Valley, (ii) an analysis of de-identified state-wide perinatal data, and (iii) an anonymised data-linkage cohort study of children born in the Latrobe Valley. This report presents some initial results from the identified cohort study. Specifically we present the first findings from the survey completed by the parents or carers of participating children when they enrolled in the study, focussing on birth related outcomes. More results from the survey will be presented in later reports.

Children born from 1 March 2012 until 31 December 2015, whose primary residential address was in the Latrobe City local government area were eligible to enrol in the study. The cohort was designed to have a balance of numbers by the timing of exposure (prenatal exposure, infant exposure, and a comparison group conceived after the fire, with no exposure) and magnitude of smoke exposure (residents of Morwell, which was closest to the fire and had greater smoke exposure, vs residents from the rest of the Latrobe Valley). Recruitment targets were exceeded overall (110% of target) with 548 children enrolled. The approximate balance across exposure groups was achieved with 199 whose mothers were pregnant during the fire, 190 who were aged up to 2 years at the time of the fire, and 159 who were conceived after the fire. All except two children were Australian born. About half (48%) were female, and 31 (6%) identified as Aboriginal and/or Torres Strait Islander.

The mean daily concentration of particulate matter with an aerodynamic diameter less than 2.5 micrometres (PM_{2.5}) directly attributable to the mine fire was the primary exposure evaluated in this study. The average and peak daily PM_{2.5} for the 51-day period from 9 February 2014 to 31 March 2014, at a spatial resolution of 1x1 km, was derived from an atmospheric transport model. The exposure of pregnant mothers to mine fire smoke was estimated from modelled outputs for their residential addresses during pregnancy. For mothers in Morwell, the average daily smoke-derived PM_{2.5} during this period was 18.4 µg/m³ (range 5.4 - 56.1 µg/m³), and the average 24-hour peak was 266.7 µg/m³ (range 95.1 - 991.3 µg/m³). The exposure was much lower for mothers from the rest of the Latrobe valley. Their average daily smoke-derived PM_{2.5} was 2.2 µg/m³ (range 0.1 - 17.4 µg/m³), and the average 24-hour peak was 79.9 µg/m³ (range 5.1 - 617.0 µg/m³). Exposure to PM_{2.5} from mine fire smoke during pregnancy for the mothers of children born before or conceived after the fire was zero.

Most mothers (81%) were aged between 20 to 34 years at the time of the birth of their child, 13% were 35 years or older, while 4% were 19 years or younger. More than half (60%) had a post-secondary qualification. Stress during pregnancy was reported as being experienced ‘sometimes’ by 47% of mothers and ‘most of the time’ by 17% of mothers. Approximately 8% reported consuming alcohol in the first half of pregnancy and 4% during the second half, while smoking at any stage was reported by 18%. The majority of parents reported increased stress in response to the mine fire (74% of mothers and 59% of fathers) and those living closest to the fire reported greater stress in response to the event, than those living further away.

Of the ELF study cohort of children, 70% were born by vaginal delivery. The mean gestational age was 39.2 weeks with 9% born before 37 weeks of gestation. The mean birthweight of children born at term was 3406 grams (standard deviation 636.8 grams).

After adjusting for the influence of known risk factors for adverse perinatal outcomes, no associations were observed between maternal exposure to the average or peak PM_{2.5} from the mine fire and preterm birth, birth weight at term, or being small or large for gestational age (Table 1).

Table 1. Summary of associations between exposure to poor air quality from the Hazelwood coal mine fire and birth outcomes

	Adjusted RR[^] (95%CI) per unit increase in average maternal PM_{2.5} exposure	Adjusted RR[^] (95%CI) per 10 unit increase in peak maternal PM_{2.5} exposure
Preterm birth	1.00 (0.97 to 1.04)	0.99 (0.97 to 1.02)
Low birth weight at term	0.99 (0.96 to 1.03)	0.99 (0.97 to 1.02)
Small for gestational age	0.95 (0.90 to 1.01)	0.97 (0.94 to 1.004)
Large for gestational age	1.01 (0.99 to 1.04)	1.00 (0.99 to 1.02)

[^]Adjusted for child Aboriginality, maternal age, maternal education, maternal smoking in pregnancy and maternal alcohol consumption in pregnancy

We did not observe an association between stress specifically related to the mine fire and adverse perinatal outcomes. However, a number of well-recognised risk factors, including smoking in pregnancy, general stress in pregnancy and lower maternal education, were independently associated with some adverse birth outcomes evaluated in the study cohort.

In summary, these preliminary analyses did not demonstrate an association between maternal exposure to mine fire smoke and adverse birth outcomes. Further studies of perinatal outcomes are planned. These will include an evaluation of birth outcomes in this cohort using improved personal exposure estimates based on more detailed location data than residence during the mine fire, and a separate analysis of de-identified perinatal data for all children in the Latrobe Valley.

Executive Summary

This report comprises Volume 1 of the Hazelwood Health Study Adult Survey findings, which aims to assess whether Morwell adults, who were heavily exposed to smoke from the Hazelwood mine fire, have adverse cardiovascular, respiratory or psychological symptoms compared to Sale adults, who were minimally exposed.

Eligible participants were people aged 18 or older, at the time of the mine fire, who lived in Morwell or in one of 16 selected areas in Sale. Contact details for eligible subjects were drawn from the electoral roll maintained by the Victorian Electoral Commission (VEC). The VEC identified 9,448 registered Morwell residents and 4,444 registered Sale residents. For their convenience, participants were offered the option of completing the Adult Survey in one of three ways: by telephone interview, online or by paper questionnaire. Diverse strategies were utilised in the effort to contact and maximise recruitment of eligible adults from Morwell and Sale. These included personalised mail, \$20 gift vouchers as reimbursement, free public events, radio and print media, posters and flyers. Feedback was monitored in order to identify and address barriers to participation.

Recruitment commenced in May 2016 and concluded in February 2017. In total 3,096 (33%) Morwell residents and 960 (23%) Sale residents participated in the Adult Survey. These recruitment rates were similar to, if not higher than, comparable studies. However sampling (selection) bias was a concern, where the health of participants might differ from the health of non-participants. A comparison of participants with community data, collected by the Australian Bureau of Statistics (ABS), indicated that women, and people aged over 50, were slightly overrepresented amongst participants. Importantly this occurred in both the Morwell and Sale groups which makes bias, that might be caused by gender or age differences, unlikely. To reduce the possibility of participation bias, the results were weighted by gender and age group. Furthermore, to minimise the effects of important health risk factors, multivariable methods were used to adjust for differences between the participating groups in education, employment, smoking, and alcohol use, as well as gender and age.

Prior to the mine fire, the prevalences of most self-reported, doctor diagnosed medical conditions were similar in the two groups. Exceptions were high cholesterol and angina, which were slightly higher in Morwell, and arrhythmia (irregular heart rhythm) which was slightly lower. However, since the time of the mine fire, Morwell participants have been at 1.5-fold higher risk than Sale participants of having high blood pressure diagnosed, and nearly seven-fold risk of heart attack. While this finding for heart attack was striking, the numbers of people affected were small.

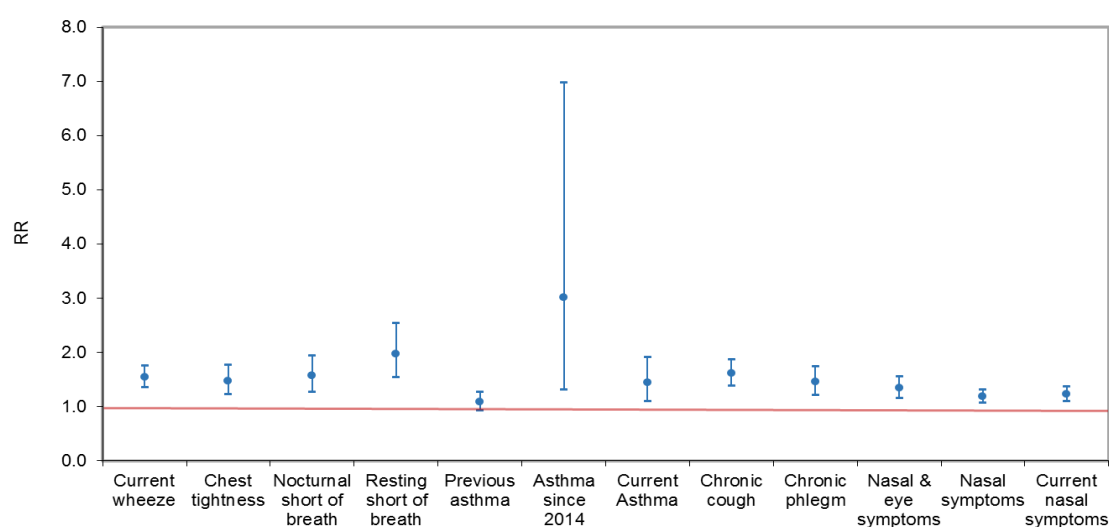


Figure 1 Adjusted Rate ratios and 95% Confidence Intervals for self-reported asthma and current respiratory symptoms

The differences between Morwell and Sale, in self-reported pre- and post-mine fire asthma and respiratory symptoms in the past 12 months, are summarised in Figure 1. Self-reported doctor diagnosed asthma, since the mine fire, and current respiratory symptoms were all significantly more common among Morwell compared with Sale participants. Amongst asthmatics, symptoms were also more severe in Morwell compared to Sale. The risks of irritant symptoms from the chest and nose, consistent with chronic bronchitis and rhinitis, were also significantly higher among Morwell participants compared with Sale.

The Adult Survey included a number of measures of psychological wellbeing, including distress specifically linked to the mine fire event (IES-R) as well as a non-specific measure of current distress (K10). Morwell participants reported higher levels of distress on both measures, including all three subscales of the IES-R representing intrusive thoughts, avoidance behaviours and hyperarousal. In addition, Morwell participants were over three times more likely than Sale participants to report a diagnosis of posttraumatic stress disorder (PTSD) since the mine fire event, although the numbers of people affected were very small. There appeared to be no significant differences between Morwell and Sale in regard to diagnoses of mental health conditions prior to the mine fire, nor any difference in number of lifetime stressful life events.

An important strength of the Adult Survey was the inclusion of a comparison group of adults, from selected areas of Sale, who were similar to the Morwell adults in terms of their regional location and socio-economic indices. The findings were further strengthened by the availability of gender and age information, allowing for appropriate weighting of results. Additional statistical adjustments for gender, age, education, employment, smoking and alcohol also reduced the potential confounding effects of these important health risk factors.

A methodological limitation, of the Adult Survey, was the reliance on self-reported health measures. Such measures could render the results vulnerable to differential recall/reporting bias. For example, this might occur if *exposed* participants had a heightened awareness of symptoms and therefore, reported them more frequently relative to *unexposed* comparison participants whose health was otherwise the same. The Adult Survey design aimed to minimise the risk of differential recall bias by utilising validated questionnaires where possible.

Future analyses will include linked administrative health datasets, such as ambulance and emergency presentations and hospital admissions, which should be less prone to recall bias. Finally, future analyses will also compare similarly exposed Morwell adults. That analysis should be less prone to recall bias and could investigate whether some sub-groups, of similarly exposed participants, are more vulnerable than others to health impacts.

This analysis of the Adult Survey provides the first available evidence of current adverse cardiovascular, respiratory and psychological effects of the Hazelwood mine fire on the adults in Morwell. Increased risks have been observed for high blood pressure, heart attacks, respiratory symptoms, asthma and psychological distress. This report presents just broad differences between Morwell and Sale based on self-reported data. Future linkages to administrative health datasets will complement the self-reported data. The Adult Survey findings will be further strengthened by analyses which blend CSIRO modelled air pollution data with participants' location information, to measure any association between estimated mine fire smoke exposure and health outcomes.

The Adult Survey sub-studies, commencing data collection in the 2nd half of 2017, will further complement the current work. The self-report data will be supplemented with clinical data on blood pressure, vascular function, inflammatory markers, respiratory function, and interview-based information on current perceptions of the mine fire events and the role of other social factors.

Hazelwood Health Study Media Protocol

Background

Monash University has been contracted by the Victorian Government Department of Health and Human Services (DHHS) to undertake a comprehensive study of the long-term health of residents following exposure to the smoke from the Hazelwood coal mine fire.

The project involves considerable engagement with stakeholders locally, nationally and internationally, as outlined in the Hazelwood Health Study Community Stakeholder and Engagement Strategy. Key to this engagement are the leaders of each of the research streams, who make up the Project Steering Committee (PSC). It is expected PSC members and other researchers will be required to release information about study activities and findings through the media.

Media Protocol

It is important there is a coordinated approach to media interactions through the HHS Communications and Engagement Adviser (CEA) and Monash Media prior to response to media enquiries, media releases and media interviews. The CEA should collaborate with partner organisation's media team where necessary.

The DHHS (Senior Media Adviser) and the Monash Faculty of Medicine, Nursing and Health Sciences must be kept informed of all major study media. In case of media alerts expected to have wide distribution, the Faculty media advisor may be involved.

The research stream leaders are the designated spokespeople for their streams and so are able to make general comments about stream operations. Stream leaders will need to use their judgement regarding the seriousness, contentiousness and urgency of the request for comment, and all media responses must be processed through the media enquiry flowchart.

The outcomes of all media interactions, including the release and any subsequent interviews, must be tracked on the project media database maintained by the CEA.

All team members, including those from sub-contracted organisations, are required to follow this protocol. The following flowchart outlines the basic steps that are required in all media interactions.

Media enquiry flowchart





**Communication
and Community
Engagement
Strategy**

Version 3.1 2018

1 Background

The Hazelwood Health Study has been established in response to the concerns of the local community. A key measure of the study's success will be that community voices have been heard.

- Ongoing engagement with the community and key stakeholders is critical to the successful running of this long-term study - the community has expectations of ongoing input into the study's directions and being kept aware of outcomes.
- During the first two years of the study there was consistent messaging and engagement with the community in terms of what the study was about, and recruitment into research stream activity, particularly the large Adult Survey in Morwell and Sale.
- The appointment in Year 3 of a senior Communications and Community Engagement Advisor (CCEA) recognises the importance of; i. making sure the community and key stakeholders are well-informed of study results and findings; and ii. alignment with the recently established Latrobe Health Assembly, the Health Advocate and the development of the Health Innovation Zone.
- The **Community Advisory Committee (CAC)** is the study's peak advisory body. Its purpose is to ensure the study hears directly from and works in partnership with local community members, health and community service providers, Federation University (Gippsland) and local government in undertaking the research program.
- The **Clinical Reference Group (CRG)** of key local clinicians provides advice on the clinical aspects of the project and oversight of clinical pathways to respond to individual abnormal results.

CAC and CRG members participate in community briefing sessions, advise on all aspects of the study including study fact sheets and communiques, website content, social media approaches, survey instruments and information sheets, and media engagement approaches to ensure dissemination strategies are appropriately targeted and that the study instruments address the concerns of the community.

This Communication and Community Engagement Strategy is a work in progress and will be subject to ongoing monitoring, review and evaluation throughout the life of the study. It includes:

1. Community and stakeholder communication and management

- Domains
- Key engagement issues
- Approaches
- *Table 1.* Stakeholder and communication management

2. Communication plan

- *Table 2.* Community and Stakeholder Milestones
- *Table 3.* Methods of Communication Evaluation

3. Community and stakeholder identification

- *Table 4.* Hazelwood Health Study Stakeholder Groups

The Hazelwood Health Study's Media Protocol is closely aligned to the Communication and Community Engagement Strategy.

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2 Community and Stakeholder Communication and Management

Domains

Local Community

- Community members
- Community groups (specific concern)
- Local Government
- Hospitals and health services
- Aged care facilities
- Community and service organisations
- Emergency services
- Environmental Protection Agency
- Schools, childcare early learning centres and pre-schools
- Politicians
- Media

Department of Health and Human Services and other state departments

- State offices
- Gippsland regional offices

Emergency Management Victoria

Monash University

- Human Research Ethics Committee
- Office of General Counsel
- University Council
- Vice Chancellor and Senior Management Team
- Monash Media and Communications
- Faculty of Medicine Nursing and Health Sciences Office
- School of Public Health and Preventive Medicine
- School of Rural Health

Collaborating research organisations

- University of Tasmania
- University of Adelaide
- Federation University
- CSIRO

Project Governance

- Community Advisory Committee
- Clinical Reference Group
- Scientific Reference Group
- Project Steering committee
- Stream leadership teams
- Finance sub-committee
- Project Management Group

Academic and scientific audiences

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Key engagement issues

- Coordinating messaging with key health agencies and departments
- Ongoing compilation of a community group database
- Constant visibility and awareness (presence) of Hazelwood Health Study within community
- Buy-in of local media to report on key findings and updates
- Rate of recruitment to study streams and response rates
- Engagement of local health professionals and health service providers
- Dissemination of study's findings to the community
- Uptake of the study's findings into the knowledge base

Approaches

- Use of diverse means of two-way communication including web-site, social media, community briefings, open office sessions, presentations at meetings of community groups
- Information presented regularly at key stages in each of the research stream areas
- Community involvement throughout the project
- Direct and regular contact with key local media, availability for interviews, media events, media releases
- Establish local presence in Morwell for CCEA and Administration Officer to encourage direct engagement with community, including walk-ins
- Establish collaborative network with Latrobe Health Assembly and Latrobe Health Innovation Zone to coordinate messaging and strategy
- Buy-in of CAC and community leaders to champion key messages of HHS and communicate importance/relevance of study projects

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Table 1: Stakeholder Communication and Management

DOMAIN	NATURE OF STAKEHOLDING	KEY ISSUES FOR STUDY	ENGAGEMENT APPROACH AND COMMITMENT PROCESS	KEY MESSAGES AND CRUCIAL INFORMATION TO BE EXCHANGED
<p>Local Community</p> <ul style="list-style-type: none"> - Local Government - Hospital and health services - Aged care facilities - Community groups (specific concern) - Community and service organisations - Emergency services - Schools and pre-schools - Politicians - Media 	<p>Study is a deeply sensitive issue and local community needs to feel it is being prioritised in all aspects of information dissemination</p> <p>The community, especially local media and active members and groups, will feel disenfranchised and less likely to engage in the process if dissemination of information is promoted in a way that first aims to target government or academic audiences</p> <p>Maximum participation in the ELF, cardiovascular, respiratory and psychological assessments from Year 3</p>	<p>Recruitment rate</p> <p>Attrition rate</p> <p>Dissemination of findings</p> <p>Credibility</p> <p>Poor engagement will compromise the study processes and outcomes</p>	<p>Extensive, proactive, ongoing two-way communication:</p> <ul style="list-style-type: none"> - quarterly community briefings - Interactive web site - social media - flyers - open house - meetings with groups & individuals <p>Direct and regular contact with key local media, availability for interviews, roll out of regular updates</p> <p>Simple and clear messages</p> <p>Regular communiques to study participants thanking them for their contribution</p> <p>Targeted approaches e.g. to local aged care and assisted living facilities; maternal and child health services; schools</p>	<p>Study aims to address valid community concerns</p> <p>Independent and international renowned research team with strong local connection</p> <p>Confidentiality assured</p> <p>Participation is appreciated</p> <p>The higher the participation rate the better opportunity there will be for long-term outcomes</p> <p>Study results will be disseminated as they are known</p> <p>Study findings will be translated into policy and practice for the future and for working with the Latrobe Health Assembly and the Health Innovation Zone</p>

<p>Victorian Department of Health and Human Services</p> <ul style="list-style-type: none"> - State Office - Regional Office 	<p>Commissioned the study funded from the public purse</p> <p>Legal obligation to ensure Contract obligations (reporting and milestones) are met by Monash</p> <p>Regional office acts as the conduit for local public health responsibilities, implementation of HMFI recommendations, establishment of the Latrobe Health Assembly and Health Innovation Zone</p>	<p>Study could be delayed if milestones are not met</p> <p>Contracts may not be continued</p> <p>Coordination of inter-agency communication and engagement</p>	<p>Project deliverables</p> <p>Interim reports</p> <p>Annual reports</p>	<p>Monash delivers on all contractual obligations in a timely and professional manner</p>
<p>Monash University</p> <ul style="list-style-type: none"> - HREC - Office of General Counsel - University Council - Vice Chancellor and Senior Management Team - FMNHS Office - Monash Media & Communications - School of Public Health and Preventive Medicine - School of Rural Health 	<p>Monash University's reputation as the leading research institution in Australia</p>	<p>Shared understanding with Monash Media</p>	<p>Ethics applications and annual reports</p> <p>Instructions for legal matters</p> <p>Regular briefings to University Council, VC and SMT</p> <p>Regular briefings to Dean and Faculty Executive</p> <p>Engagement with Monash Media</p> <p>Inter-schools agreement</p>	<p>This is a very important and complex study</p> <p>Local community engagement underpins the success of the project</p> <p>The research team is highly qualified and professional</p> <p>SPHPM and SRH work collegially, respectfully and productively together</p>

Sub-contractors <ul style="list-style-type: none"> - University of Tasmania - University of Adelaide - Federation University - CSIRO 	Contracted by Monash University for specific components of the study	Timely input within budget Clear relationship defined in sub contract including conflict resolution mechanism All media must be endorsed by the PMG	Project Steering Committee	Collaboration is important to the ongoing success of the project – adds value Monash is the study lead
Project Governance <ul style="list-style-type: none"> - Community Advisory Committee - Clinical Reference Group - Scientific Reference Group - Project Steering committee - Finance sub-committee - Management Group 	Contractual requirement Community participation in the study Expert review and contribution Engagement of study leads at all stages of the study Budgetary and financial accountability High level project management of a long and complex study	Project could be compromised if governance structure is not robust and adhered to	Communit Advisory Committee, Clinical Reference Group and Scientific Reference Group minutes of meetings	Ensure the project continues to hear directly from and works in partnership with the community
Academic and scientific audiences	Access to peer review and expertise Uptake of study findings into the knowledge base	Time to prepare publications Credibility of study methods and translation of study findings	Publications Participation in national and international symposia	High quality world leading research across a wide range of health outcome areas Longitudinal health impact study

3 Communication Plan

Table 2: Community and Stakeholder Milestones

Major Events 2017 (updated monthly)	
Media event of ELF Study recruitment drive	
Media update of ELF Study monthly child health diaries	
Release of ELF Study birthweight analysis findings to participants (community)	
Release of Psychological Impacts – Schools Study year 1, 2-page summary analysis	
Media event of Psychological Impacts – Schools Study year 1 key findings analysis	
Launch of Community Wellbeing social media analysis video (Media, website, social media)	
Release of Adult Survey – Morwell/Sale comparison analysis	
Media event of Adult Survey – Morwell/Sale comparison analysis	
Release of findings from Victorian Cancer Registry data extraction	
Media release of Cancer Stream – baseline cancer analysis	
Release of findings from Hospital Emergency Presentations & Hospital Admissions data extraction	
Media release – Hospital analysis	
Release of findings from Ambulance data extraction	
Media release – Ambulance data extraction	
Media event of Cardiovascular and Respiratory streams recruitment (prior to mail out)	
Media event of Cardiovascular and Respiratory streams health checks (beginning)	
Media update of Cardiovascular and Respiratory streams health checks (during)	
Re-launch of HHS social media (Facebook and Twitter)	
Community Advisory Committee meetings	
Clinical and Scientific Reference Group meetings	
Community engagement with community, groups, leaders, and stakeholders.	
Interim Report	
Annual Report	
Community Briefings in Morwell and Sale	
Conference presentations	
Journal publications	
Media release of Adult Survey - Deadline approaching	

Table 3: Methods of Communication Evaluation

Facebook – Comments, likes, shares, mentions, engagement levels, Facebook Insights
Twitter – Comments, likes, retweets, hashtag mentions, keyword mentions, engagement levels, Twitter Analytics
Website – Google Analytics
Online (other) – Bitly
Community Advisory Committee and Clinical Reference Group
Community engagement (meetings and briefings)
Feedback from key stakeholders including Latrobe Health Assembly, community leaders, groups

4 Stakeholder Identification

Table 4: Hazelwood Health Study Stakeholder Groups (update monthly)

Group	Stakeholders	Study Components
Audit	Victorian Department of Health and Human Services Human research ethics committees Office of the General Counsel (OGC)	All Adult Survey, other streams and sub-studies Contract
Review	<p>Local Government</p> Latrobe City Council <ul style="list-style-type: none"> - Emergency response team - Community rebuilding team - Positive Ageing Reference Committee Wellington Shire Council <ul style="list-style-type: none"> - Community and Culture - Emergency Management <p>Hospital and Health Services</p> Latrobe Regional Hospital Central Gippsland Health Service Latrobe Community Health Services Local GPs Local Pharmacies Gippsland Primary Health Network Gippsland Women's Health Service Ramahyuck Aboriginal Medical Service (Morwell Clinic) Department of Health and Human Services Regional Office Emergency Management Victoria <p>Aged Care</p> Aged Care facilities and Carers networks including St Hilary's Aged Care Heritage Manor <p>Community Groups (specific concern)</p> ReActivate Latrobe (Transitioning cities) Voices of the Valley Advance Morwell	<p>Ongoing engagement and dissemination strategies, Ageing policy, community well-being study, exposure assessment, recruitment (cardiovascular, respiratory and other streams), dissemination of findings, CAC</p> <p>Ongoing engagement and dissemination strategies, CAC, CRG, recruitment (Cardiovascular, respiratory and other streams), sub-studies, dissemination of findings</p> <p>Ongoing engagement and dissemination strategies, Ageing policy, recruitment (Cardiovascular, respiratory and other streams), sub-studies, dissemination of findings</p>

Group	Stakeholders	Study Components
	<p>Morwell and District Community Recovery Committee</p> <p>Gippsland Asbestos Related Disease Support Group</p> <p>Latrobe City Community Groups Network</p> <p>Sale Business and Tourism Association</p> <p>Community and Service Organisations</p> <p>Neighbourhood House (Morwell and Sale)</p> <p>Gippsland Multicultural Services</p> <p>Gippsland Trades and Labour Council</p> <p>Local Real Estate Agents</p> <p>Sporting clubs</p> <p>Senior Citizens Clubs</p> <p>Gippsland Employment Skills Training</p> <p>Probus, Rotary, Lions Clubs</p> <p>Lifeline</p> <p>Centre for Multicultural Youth</p> <p>Schools and pre-schools</p> <p>Local Schools – public and private</p> <p>Childcare early learning centres and pre-schools</p> <p>Department of Education and Early Childhood Development Regional Office</p> <p>Catholic Education Authority</p> <p>Emergency Services</p> <p>Country Fire Authority</p> <p>Victoria Police</p> <p>Ambulance Victoria</p> <p>Environmental monitoring</p> <p>Environmental Protection Agency (EPA)</p> <p>Department of Environment, Land, Water & Planning (DELWP)</p> <p>Politicians – sitting members</p> <p>Jill Hennessy (Minister for Health and Minister for Ambulance Services, ALP)</p> <p>Russell Northe (Morwell, Independent)</p> <p>Darren Chester (Federal, Nat Party)</p> <p>Danny O'Brien (Gippsland Sth, Nat Party)</p> <p>Harriet Shing (Eastern Victoria, ALP)</p>	<p>Ongoing engagement and dissemination strategies, CAC, recruitment (Cardiovascular, respiratory and other streams), sub-studies, dissemination of findings</p> <p>Ongoing engagement and dissemination strategies, CAC, recruitment (Adult Survey and other streams), sub-studies, dissemination of findings</p> <p>Schools and community well-being studies as well as a critical connect point</p> <p>Ongoing engagement and dissemination strategies, CAC, recruitment (Cardiovascular, respiratory and other streams), sub-studies, dissemination of findings</p> <p>Ongoing engagement, dissemination of findings and strategies</p> <p>Recruitment (Cardiovascular, respiratory and other streams), sub-studies, dissemination of findings</p> <p>Recruitment (Adult Survey and other streams), sub-studies, community announcements, dissemination of findings</p>

Group	Stakeholders	Study Components
	<p>Melina Bath (Eastern Victoria, Nat Party) Russell Broadbent (Federal, Lib Party)</p> <p>Local Media ABC Gippsland, WIN TV, Channel 9 Gippsland, Latrobe Valley Express, Gippsland Times, TRFM Radio, Gippsland FM, PRIME</p>	
Related Projects	<p>Centre of Research for Resilient Communities (CoRRC) – narrative analysis study</p> <p>University of Tasmania – infant health study</p> <p>Monash School of Public Health – planned burns study</p> <p>University of Tasmania - Latrobe Residential House Dust Study</p> <p>Hazelwood Mine Fire Inquiries</p> <p>Latrobe Health Assembly and Health Advocate</p> <p>Latrobe Health Innovation Zone</p> <p>Emergency Management Victoria – Community Based Emergency Management Plan</p>	<p>Ongoing engagement and dissemination strategies, Adult Survey and other streams, community well-being study</p> <p>Adult Survey, ELF study</p> <p>Adult Survey, sub-studies</p> <p>All components</p>
Outcome Impacted	<p>Residents of Morwell and the wider Latrobe Valley</p> <p>Residents of Sale</p> <p>Morwell and Latrobe Valley business community</p> <p>Sale business community</p> <p>Individuals in Morwell and the Valley at the time of the mine fire</p> <p>Individuals in Sale at the time of the mine fire</p>	<p>Ongoing engagement and dissemination strategies, CAC, recruitment (Adult Survey and other streams), sub-studies, dissemination of findings</p>
Provider	<p>CSIRO</p> <p>University of Tasmania</p> <p>University of Adelaide</p> <p>Federation University (Gippsland)</p> <p>Community Advisory Committee</p> <p>Clinical Reference Group</p> <p>Scientific Reference Group</p>	<p>Air quality assessment stream</p> <p>ELF study</p> <p>psychology stream</p> <p>community wellbeing stream</p> <p>Ongoing engagement and dissemination strategies</p> <p>Health-related findings from all streams, dissemination of findings</p>

Group	Stakeholders	Study Components
		All streams, dissemination of findings
Output Delivery	Project Management Group Project Steering Committee Researchers and research administration staff at Monash and research collaborating organisations	Dissemination of findings
Output Utilisation	Monash University Victorian Department of Health and Human Services Emergency Management Victoria Collaborating research organisations	Dissemination of findings
Outcome Accountable	Faculty Medicine, Nursing and Health Sciences Office School of Public Health and Preventive Medicine School of Rural Health Collaborating research organisations	All