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An analysis of Australian print and television media coverage of the public health message 'alcohol causes cancer'

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Abstract

Introduction: Alcohol is a class-1 carcinogen and is a modifiable risk factor for cancer, but public awareness of the link remains low. News media is a common and accessible source of health information in Australia, and influences public opinion and policy agenda. It is important to analyse how the *alcohol causes cancer* message is re-presented, as this may inform public health advocacy and identify needs and potential strategies for raising awareness through health promotion. This is the first study to compare both print and broadcast news media within this context.

Methods: 1502 print articles and 96 broadcast stories published in Australia between 2005 and 2013 were located through the Factiva and Australian Health News Research Collaboration databases. Summative content analysis and descriptive statistics were used to examine the prominence and content of all stories. Thematic analysis was used to identify recurring themes and frames within stories that focused on the link between alcohol and cancer.

Results:

CONTENT: Most print articles were published within the main/first section of the newspaper, with half on odd pages. 95% of articles included the claim that alcohol is carcinogenic, with 5% suggesting it was either non-carcinogenic or preventative for cancer, and 1% including discussion of both. Over time, the ratio of carcinogenic to non-carcinogenic/preventative articles increased. Half of the print database consisted of stories that had been repeated. Most commonly, articles cited 'alcohol' as a generic descriptor while mentioning a specific type of cancer. Organisations connected to cancer were the most frequent authority source mentioned within both sets of data. In the broadcast data, stories most commonly appeared on evening news programs. 95% of the stories stated that alcohol causes cancer, with 5% suggesting alcohol is both carcinogenic and non-carcinogenic. More than half of the broadcast stories were repeated stories.

THEMATIC: The *alcohol causes cancer* message was often framed as shocking. Connections were made between alcohol and cigarettes as both a consumable, and a public health concern. The evidence for the link between alcohol and cancer was framed as either convincing or insufficient, with differing implications drawn regarding the roles and responsibilities of health authorities.

Conclusion: Information regarding the link between alcohol and cancer is available within the Australian media, but is often obscured by discussion of other health issues. Improved collaboration between health promoting organisations and journalists may facilitate greater accuracy and prominence of the *alcohol causes cancer* message.

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Signed,

Joshua McDonough,

November, 2016

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List of Abbreviations

ABC	Australian Broadcasting Corporation
AICR	American Institute of Cancer Research
AHNRC	Australian Health News Research Collaboration
CSIRO	Commonwealth Scientific and Industrial Research Organisation
HPV	Human Papilloma Virus
NHMRC	National Health and Medical Research Council
NSW	New South Wales
PRISMA	Preferred reporting items for systematic reviews and meta-analyses
SA	South Australia
SBS	Special Broadcasting Service
WA	Western Australia
WCRF	World Cancer Research Fund
WHO	World Health Organisation

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Chapter 1: Introduction

Cancer is the second leading cause of mortality in Australian adults. [1] It is estimated that 123, 920 new cases are diagnosed each year, with the most common diagnoses being prostate, colorectal, breast, melanoma of the skin, and lung; by the age of 75, one in three males and one in four females will be diagnosed with cancer. [1] Recent figures indicate that cancer is the cause of between 16% and 19% of the overall burden of disease in Australia, costing the healthcare system \$4.526 billion. [1] Despite recent declines in the mortality rates, incidence rates continue to rise. [1] Additionally, 5-year survival rates for cancer have improved. [2] This suggests that although treatment and management of cancer is improving, there is a need for public health efforts to focus on developing effective preventative strategies, in an effort to target causative factors and reduce the incidence of cancer in the population.

Although precise knowledge of what causes cancer is lacking, a number of risk factors have been identified, including ‘faulty’ genes and ageing, as well as smoking, sun exposure, being overweight and physically inactive, and alcohol consumption. [3, 4] While risk factors such as ageing and genetics are beyond the control of the individual, lifestyle risk factors are modifiable, and therefore can be a target for health promotion action. [3] It has been estimated that lifestyle factors such as those listed above, account for up to one third of cancer cases. [5] Moreover, these are risk factors for cancer of the breast, bowel, skin, and lung, which are in the top five most diagnosed cancers in Australia. [1]

In 1988, the World Health Organization’s (WHO) International Agency for Research on Cancer listed alcohol as a Class-1 carcinogen, that is, as causing cancer in humans. [6] The Agency specifically noted that a causal relationship exists between alcoholic beverage consumption and malignant tumours of the oral cavity, pharynx, larynx, oesophagus and liver. [6] Subsequent reviews conducted by the World Cancer Research Fund (WCRF) and the American Institute of Cancer Research (AICR) have confirmed this relationship, concluding that there is *convincing* evidence that alcohol causes cancer of the mouth, pharynx, larynx, oesophagus, bowel in men, and breast in women. [6] Further, that there is *probable* evidence that alcohol also causes cancers of the bowel in women, and of the liver. [6] Convincing and probable evidence are the two highest level of evidence given by the WCRF and the AICR. [6] Cancer is the most common alcohol-induced cause of mortality in Australia, accounting for 25% of alcohol-related deaths in men, and 31% in women; [7] alcohol is also estimated to cause 5% of all diagnosed cancers in Australia. [8]

Knowledge of the precise biological mechanism of how alcohol causes cancer is lacking, but it is thought that acetyldehyde (a metabolite of ethanol) has carcinogenic effects, through binding with DNA molecules and increasing the risk of gene mutations. [9] Other possible mechanisms include epithelial irritation, which may result in increased absorption of carcinogens through its effects as a

solvent. [6] In addition, alcohol is thought to increase the risk of breast cancer as it increases the levels of oestrogen in the body, [9] and to increase the risk of liver cancer by causing cirrhosis and oxidative stress in the liver. [9]

Although the link between alcohol and cancer was established 28 years ago, and there is significant scientific evidence to support this association, public awareness of the link is still low. [10, 11] In 2015, the Cancer Research UK reported that only 10% of the British population are aware of the link. [10] Australian data from 2016 published by the Foundation for Alcohol Research and Education indicated that although 71% of Australians can identify liver cancer as a consequence of excessive alcohol consumption, only 30% are aware of alcohol's link with cancer of the mouth and throat. [12] Additionally, only 16% are aware of the link with breast cancer. [12]

This suggests that further efforts are required to increase public awareness that consumption of alcohol is associated with an increased risk of cancer. One possible source of information is through the news media, a key source of health information, and thus a focus of public health research for decades. [13] In the example of cancer, news media can be useful for disseminating information regarding preventative behaviours and screening processes. [13] Cancer is the fifth most commonly reported health issue in the news media, [13] so it is important that it is presented to the public in an accurate and beneficial way, as misrepresentation and contradictory reports may lead to public confusion and be detrimental for cancer health outcomes. [13] Thus, analysis of the media portrayal of this issue is key to understanding how the Australian public might view this issue.

Despite evidence of the negative health outcomes associated with alcohol, there is still a low level of public awareness regarding the link between alcohol and cancer. [10, 11] To combat this issue, it is generally accepted that a population level campaign would be the most effective method for increasing awareness of the link, and therefore, at least potentially, lead to behaviour modification (in the form of reduced alcohol intake) and improved outcomes. [14] One possible way of achieving this is through utilising news media, as it may influence attitudes and behaviours of both consumers and policy makers, and reach an audience of millions. [14] However, news media has the ability to purposively frame the issues that it presents, by emphasising certain points and omitting others, and both news content and form may be driven by alcohol companies and other stakeholders who benefit from the public consumption of alcohol. [14] This can be counter-productive for public health messages, as key information may be misunderstood by the public, or not received at all.

As health is a prominent news category in Australia, it is in the interests of the public health community that news reports are framed in a way that promotes health and stimulates policy debates, as well as providing accurate and clear information to the public. [13] Given that visual news media is the most popular source of news among the Australian population, it should be considered for analysis alongside print and other forms of media. [13]

Chapter 2: Literature Review

2.1 Objectives

Initial searches tailored to identify analyses of news media in relation to the message that ‘alcohol causes cancer’ yielded one relevant article from the major peer-reviewed journal databases PubMed, Scopus, and Embase, a study conducted by Houn et al. [15] This study, conducted in 1995, analysed American news coverage of academic research publications relating to alcohol causing breast cancer, and concluded that this was under-reported by the media. [15] This indicates that although some research has been conducted in the area of alcohol-related cancers in the media, there is a need for further research within an Australian context. As searches indicated a lack of recent research in this area, this literature review was expanded to include any media analysis on the topics of alcohol or cancer, as the themes presented in each individual topic are relevant to the research.

The purpose of this systematised literature review is to investigate how identified articles analyse their data and how they present it. Additionally, reviewing the literature will facilitate identification of the main arguments within the field.

2.2 Search strategy

To conduct this literature review, articles were sourced from the databases Embase and Scopus.

2.2.1 Embase

To search Embase, the following logic grid was created (Table 1).

Table 1: Logic grid for searching Embase

Media	Analysis	Alcohol	Cancer	Limitations
“mass medi*”:de,ti,ab OR “media representation*”:de,ti,ab OR “media coverage”:de,ti,ab OR “mass communication”:de,ti,ab NOT “social media”	qualitative research OR content analysis OR thematic analysis	“Alcohol”	“cancer” NOT “screening”	[2006-2016]/py AND english:la AND 'article'/it

The search terms “:de,ab,ti” was used to locate the intended word or phrase within keywords, titles and abstracts. The wildcard ‘*’ was used in some searches to include plurals and other variations of particular words (e.g. “mass medi*” would search for mass media and mass medium). Articles analysing social media were excluded from the search, as these studies tended to frame the analysis on the individual members of the public posting the content, whereas this study focuses on the relevance of the *alcohol causes cancer* message at a population level. The term ‘screening’ was also excluded as a number of studies focusing on representation of screening were included in the yield, which were

not focused on cancer or cancer risk. The search was further limited to articles published in the last 10 years, as well as those published in journal articles and in English. The final search was conducted on 31/08/2016, (See Appendix A for search term) and the search yielded 74 results. All identified articles were imported into EndNote™ for analysis.

2.2.2 Scopus

To search Scopus, the previous search was slightly modified to account for differences in the way the two databases operate. As a result, the following logic grid was constructed (Table 2).

Table 2: Logic grid for searching Scopus

Media	Analysis	Alcohol	Cancer	Limitations
TITLE-ABS-KEY “news media” OR TITLE-ABS-KEY “mass media” OR TITLE-ABS-KEY “mass communication” AND NOT “social media”	qualitative research OR content analysis OR thematic analysis	Alcohol	“cancer” AND NOT “screening”	[2006-2016]/py AND english:la AND 'article'/it

The search term “TITLE-ABS-KEY” was used to locate the intended word or phrase within titles, abstracts, and key phrases. A wildcard function was not used, as Scopus performs this action automatically. To mirror the Embase search, ‘social media’ and ‘screening’ were excluded from the search, and the search was limited to articles published in a journal, in English, and in the last 10 years. The final search was conducted on 31/08/2016. (See Appendix A for search term) This search yielded 87 articles, which were imported into EndNote™ for analysis.

2.3 Summary of the yield

The total yield from the combined searches was 161 articles. Duplicates for articles appearing in both databases were removed, leaving 108. Articles were then reviewed by title, resulting in 38 being excluded, leaving 70 articles. The reasons for being excluded at this stage were that the article:

- did not focus on media
- was not about alcohol or cancer
- performed a systematic review of qualitative studies analysing visual images for skin cancer prevention

The remaining 70 articles were reviewed by abstract. Through this process, 32 articles were removed as they met one of the following exclusion criteria:

- focused on cancer treatment outcomes
- focused on cancer survivorship
- focused on cancer treatment
- focused on tobacco
- focused on e-cigarettes
- focused on illicit drugs
- focused on advertising, not media
- focused on the HPV vaccine
- focused on end of life care
- focused on vitamin d supplements
- focused on global health issues
- focused on equine encephalitis
- conducted semi-structured interviews
- conducted focus groups
- conducted a cohort study
- conducted a survey

A yield of 38 articles remained. After reviewing the full texts, 22 articles were excluded for the following reasons:

- did not focus on cancer risk factors
- focused on hormone replacement therapy
- focused on complementary and alternative medicine
- focused on news reports of celebrity driving while under the influence arrests
- analysed blog posts
- focused on skin cancer

A PRISMA diagram was constructed to summarise the literature search strategy (see Figure 1). For the 16 articles that were included in the literature review, a summary table was constructed to outline the main characteristics of each article (see Appendix A).

2.3.1 PRISMA diagram

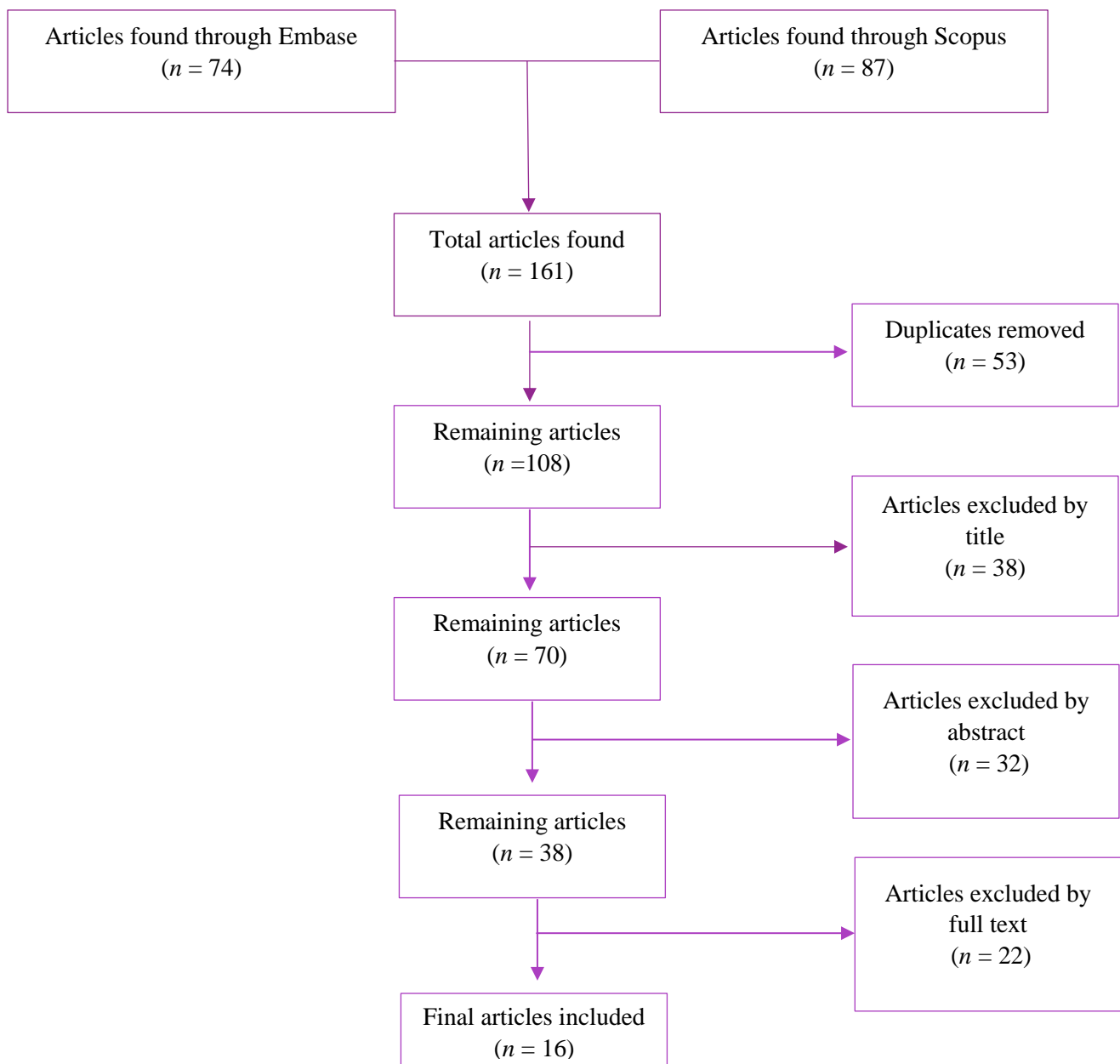


Figure 1: PRISMA diagram summarising the yield of the literature search

2.4 Synthesis

Sixteen articles were included in the literature review. This included studies from Australia, Canada, the United Kingdom, and the United States of America. These are all industrialised, democratic nations, and thus findings from one country may be relevant for another. More articles ($n = 10$) focused on cancer rather than alcohol ($n = 6$), indicating that, compared to alcohol, there is more research regarding media portrayal of cancer.

Media mediums analysed included newspaper ($n = 13$), television news ($n = 11$), magazines ($n = 2$), and radio ($n = 1$), with some studies analysing more than one news medium. All studies included in the literature review conducted a content analysis, with two studies also performing a framing and a thematic analysis.

Among the articles that focused on cancer, a common theme that emerged in their findings included an inaccurate portrayal of cancer. MacKenzie et al. [13], Niederdeppe et al. [16, 17] and Gantz et al. [18] stated in their main findings that news media often presents cancer inaccurately. This may cause the public to receive and act upon inaccurate information, resulting in behaviour change that may have no benefit or potentially cause harm to the individual. Furthermore, dissemination of information that is demonstrably incorrect may weaken future public health messages, making them more suggestive, rather than authoritative.

Although some articles concluded an inaccurate portrayal of cancer, others concluded that news media can misrepresent cancer, through under and over reporting. For example, Konfotion et al. [19] Stryker et al. [20] and Champion et al. [21] concluded that, when considering their respective prevalence rates, breast cancer is over-reported when compared to prostate and colorectal cancers. Additionally, Slater et al. [22] Smith et al. [23], Stryker, [20] and Atkin et al. [24] reported that the media places a focus on stories about treatment, rather than detection, screening or prevention. Moriarty et al. [25] suggest that one way to improve the accuracy and quality of media coverage of cancer could be to increase the number public health advocates being quoted as sources for news stories.

Of the seven articles that focused on alcohol, Azar et al. [26] Patterson et al. [27] and Nicholls [20] observed a trend that, over time, alcohol misuse is being represented more negatively in the media. Despite this, however, findings from Hilton et al. [28] suggest that the population health benefits of alcohol regulation are poorly understood, and therefore should be a focus of public health media advocacy. Fogarty et al., [29] further highlighted that the way/s alcohol is represented in the media is key to public health advocacy, as well as identifying a need for continuous advocacy within media coverage of alcohol regulation. [30]

Overall, the results of this literature summary indicate that media representation of cancer is often inaccurate, misrepresentative, and misdirected. Results regarding alcohol indicate that its use and misuse is becoming increasingly less favourable in the media. This suggests a window for research into media representation of the relationship between alcohol and cancer.

2.5 Gap analysis

This literature review confirms that there is a gap in analysis of media depictions of the relationship between alcohol and cancer. Although there are extensive reviews of how cancer is depicted in the media, none here examined the disease in relation to modifiable lifestyle factors that cause cancer.

Additionally, studies were more likely to analyse print news articles compared to television stories, with few comparing the two mediums. As television is the most popular mass communication device in Australia, [31] analysing the content of television news media is crucial to understanding what information the public is receiving. Furthermore, there was a lack of stories that conducted in-depth, qualitative research of news stories.

Chapter 3: Research Question

3.1 Purpose statement

Following and informed by the literature review, the purpose of this research is to analyse and compare how Australian newspapers and television news programs discuss the relationship between alcohol and cancer. This was achieved using a mixed-methods approach consisting of a summative content analysis, and a thematic analysis. [32, 33]

3.2 Central research question

After describing the problem, reviewing the relevant literature, and developing a purpose for this research, it is proposed that the central research question for this project will be:

How does Australian print and visual media re-present the public health message *alcohol causes cancer* between 2005 and 2013?

Answering this question will provide an insight into the recurring themes and trends within the news media coverage of alcohol as a cause of cancer, allowing for the generation of hypotheses regarding how the public might interact with this message, and how public health professionals can advocate for health promotion messages through the media.

3.3 Identification of media variables for analysis

There are several conventions of news media production that are relevant to this analysis. Many readers of print media will merely scan a newspaper, rather than read it in its entirety. [34] This means that newspaper editors tend to structure content to increase the prominence of certain messages through placing more ‘newsworthy’ stories closer to the front page and on odd-numbered page (right-hand), as this is where the gaze most often falls, and where readers spend most of their attention. [34, 35] In addition, bold, large, and informative headlines are an important tool for attracting attention, as in some cases, it is the only part of the article that is read. [34]

Generally, the longer an article is, the less likely that the audience will read it in its entirety. [35] Therefore, the meaning of longer articles is often missed by the audience. [35] Additionally, articles are often written to be information-dense, due to the limited space within a newspaper. [34] This affects the practice of journalism by structuring articles to have an overview of the subject in the first paragraphs, with the remainder of the article providing information that builds on the story. [36] This formatting style is called the *inverted pyramid* structure, and is the conventional style for reporting health news (see Figure 2). [37]

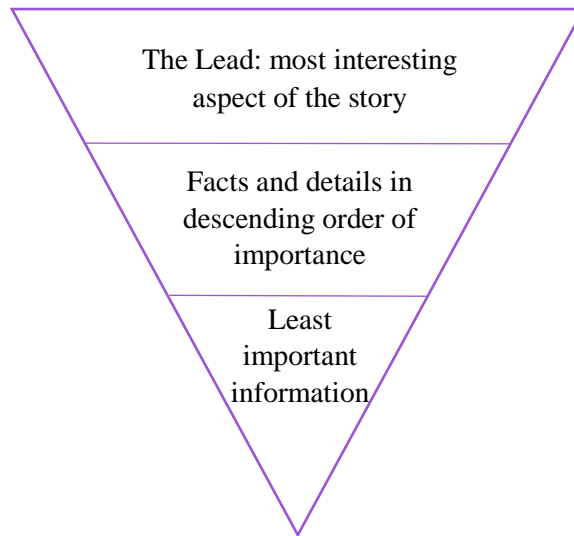


Figure 2: Inverted pyramid structure for news stories. (Adapted from Grundy et al. [37])

Similarly, broadcast news stories focusing on health and medical sciences are usually structured non-chronologically, where the introductory script, combined with the title screen, are used to grab the attention of a disengaged viewer by presenting them with the newest information (e.g. the result of a recent study), referred to as the *hook*. [38] As television news is heavily image-based, graphics are often used to explain complex ideas, emphasise important points, or present numbers and statistics. [39] Additionally, television journalists often use personal stories or anecdotes to add an element of human interest. [38] They may also use a *vox populi*, where a number of randomly selected people are asked their opinion on an issue to serve as a small opinion poll. [38]

Publishing a news story can involve conflict between the different people involved. The editor prioritises the commercial interest of the publisher, and may encourage journalists to cover unusual and sensational health topics, aiming to engage the audience, sell newspapers and increase viewership. [40] At the other end, information sources seek to have their message reported in a way that is accurate and consistent with their narrative. [41] Between these two, journalists are concerned with the accuracy of their writing, and recognise the importance of including independent and respected experts when reporting on complex health issues to counter-balance sensationalised stories. [40] However, journalists reportedly value their independence, and are careful not to appear as ‘mouthpieces’ for their sources. [42-44] Despite this, it is common practice within Australian media to recycle news stories from a prompt between different newspapers and broadcast stations, which is a process referred to as *churnalism*. [45]

Chapter 4: Research Paradigm

4.1 Theoretical perspective

As a mixed methods study, it is important to consider how a theoretical perspective may inform the research. Identification of theoretical perspectives are crucial as they inform the methods used, influence how the data are analysed, and provide rigour and value to the research. [46] The present research is informed by *pragmatism*, which holds that the ‘truth’ cannot be found through one research method, [47] that the methods are a more important aspect to the research than the research question, [48] and that research is conducted in a context influenced by social, political, historical, and cultural factors. [48] This pluralist [48] approach makes pragmatism an appropriate perspective to use in media analysis, as the public’s relationship with news media is complex, and open to multiple interpretations. Pragmatism is also a common perspective in public health research, which is often issue focused. [49]

4.2 Methodology

Mixed methods were used in this research, as combining both quantitative and qualitative techniques will provide a greater understanding of the media data. Quantitative media analysis is useful for determining the existence and prevalence of discussed issues and messages within the data, circulation of a media story, and frequency of various important topics. [50] Quantitative methods can also capture the semiotic methods used within visual media. [50] However, this approach has been criticised, as reducing large amounts of text into quantitative data may simplify the data, and text and visual communication is more complex than mere repetition of categories. [50] Furthermore, researchers can make the mistake of interpreting quantitative data as providing information on social impact and intensity of social meaning. [50] Given the complex relationship between the public and the media, it has been argued that it would be too simplistic to draw conclusions from quantitative data alone. [50]

By contrast, qualitative research is better placed to answer questions of audience perceptions and attitudes than quantitative research. [50] Qualitative research is well equipped to examine public perceptions through analysis of media content and context of the data, as well as likely audience characteristics, all of which influence the likely received meaning of media texts. [50] However, qualitative media analysis is not immune to criticism either. Qualitative media analysis, and qualitative research broadly, is often criticised by positivist researchers for a perceived lack of scientific reliability, as the process relies heavily on the researcher’s interpretation of the data, and is therefore difficult to replicate. [50] Additionally, qualitative media analysis involves an intensive and time consuming focus on the data in order to analyse it adequately, which often results in relatively small sample sizes compared to that required for quantitative analysis. [50]

Given the benefits and limitations of the two methodologies, particularly for media analysis, a combination of the two was used in this study in a mixed methods approach. This enabled examination of the prevalence and nature of stories about the link between alcohol and cancer within an Australian context.

Considering the research question, a convergent mixed methods approach was applied. (See Figure 3)



Figure 3: Visual representation of the convergent parallel mixed methods approach

This mixed methods design allows the quantitative and qualitative analyses to be compared, and to inform each other, creating a more nuanced and balanced understanding of the media overall, and the possible impact upon the population. [50] Finally, a mixed methods approach has been utilised in a number of different media analysis studies. [51-53]

4.3 Analysis methods

4.3.1 Content analysis

Summative content analyses formed the quantitative element of the research, [32] following several similar analyses. [13, 16, 19, 22-24, 26, 27, 29, 54] This approach can be described as a systematic analysis of message characteristics, and involves identification of a set of quantifiable characteristics and trends within large databases deemed relevant to the research question. [50, 55, 56] Variables in the present summative content analyses were adapted from Musso and Wakefield, [52] Macnamara, [50] and Luth et al. [57]

4.3.2 Thematic analysis

Inductive thematic analytical techniques were used to analyse the qualitative component of the research. Thematic analysis is a method of identifying, analysing, and reporting common themes within a dataset through a process of coding and analysis. [33] Often involving smaller datasets than quantitative analyses, this approach facilitates a more detailed understanding of the sample, and is a common method for analysing media data. [52, 55, 58-61] As thematic analysis is flexible in nature, it is important to ensure that the analysis is systematic in nature, transparent to the reader, and of a high standard. [33] Additionally, thematic analysis tends to lend itself to different theoretical orientations, with this research positioned within a pragmatic paradigm informed by critical realism. [33] A critical realist maintains that the natural world functions as a multi-dimensional system, considering the roles of context and larger social structures within which meaning is generated. [62, 63] For this research, the approach proposed by Braun and Clarke [33] was used.

Chapter 5: Methods

5.1 Sample period

The sample period for this study includes the time between 2005 and 2013 inclusive, and was informed by two factors. First, that alcohol-related cancer was mentioned 37 times in the World Health Organisation's Global Status Report of Alcohol in 2004, [64] compared to just once in the previous 1999 report. [65] This suggests that information regarding alcohol-related cancer would be more prevalent in scientific literature and thus more likely to feature within news stories after the 2004 report. Second, as the visual database only included data from May of 2005 onwards, [66] it was decided to limit the search parameters for the print data to match that of the visual data.

5.2 Search strategies

To locate data for this research, I limited searches to include data published in Australia between 01/01/2005 and 31/12/2013, using the search term 'alcohol and cancer'. I searched the Dow Jones Factiva database to identify print news data (hereafter: *articles*), and the Australian Health News Research Collaboration (AHNRC) TV Health News Database to identify television news data (hereafter: *broadcasts*). Data identified by these searches were screened, and excluded from the research if they did not have any discussion of the *alcohol causes cancer* message (e.g. one article reported on a policeman who created anti-alcohol-fuelled violence operations, who had died of cancer [67]). The remaining articles included either:

- a direct link between alcohol and cancer, e.g.
 - alcohol does cause cancer
 - alcohol does not cause cancer
 - alcohol prevents cancer; or
- one variable in a list of health conditions or risk factors, e.g.
 - alcohol causes brain impairment, liver damage and cancer
 - risk factors for cancer include asbestos, smoking, sun exposure and alcohol

5.2.1 Print media

The dataset for the print media content analysis was originally compiled by an external author as part of a larger project examining public perceptions of the *alcohol causes cancer* message. Before conducting the analysis, I reviewed and recoded the dataset to correct some inconsistencies and errors in the original coding, as well as to ensure that the dataset was complete and accurate. Articles were sourced from 354 Australian newspapers included in the Factiva database, and the search yielded 8,177 articles. These were screened, and 1502 met the inclusion criteria. These articles were included in the dataset and characteristics of each then entered into an Excel spreadsheet for coding and analysis. Some information was lost upon downloading articles from Factiva, so each analysis was conducted using the available information.

5.2.2 Broadcast media

To compile the visual dataset, I searched the AHNRC Television Health News Database, which was created by the universities of Sydney, Canberra and Melbourne due to an interest in how health and medical issues were being covered in Australian broadcast media. [66] Stories were sourced from the five free-to-air Sydney television channels, as the database is limited to these stations. [66] However, due to widespread syndication of broadcast media stories, it may be considered that news coverage in Sydney would be reasonably comparable to that of other major cities. The search yielded 4,293 videos, which I screened, with 96 stories meeting inclusion criteria. I downloaded these videos from the database and entered characteristics of each into an Excel spreadsheet for coding and analysis.

5.3 Reflexivity

It is important to note that during inductive research, a researcher is unable to detach themselves from their theoretical and epistemological responsibilities. [33] Therefore, the codes and frames I identified in this research may have been influenced by the pragmatic critical realist paradigm within which this research was conducted. Additionally, it is important to remain aware that my lived experiences and my role within society may have influenced how I interpreted the data, as well as the importance that I placed on certain recurring themes.

As this analysis has a qualitative component, I have presented the results in the first person. This is common in qualitative research, as it allows the author to be transparent and comprehensive in their discussion of influences and decisions that may affect the results of the analysis. [68]

5.4 Summative content analysis

Based upon the review of the print data coding, a coding template was created for coding of the visual data (see Appendix C). This was modified as the analysis proceeded as new variables arose. Codes and categories for the print and visual datasets have been defined to ensure consistency (see Appendix D).

5.5 Thematic analysis

Following the content analyses, I thematically analysed a sample of the articles and broadcasts (hereafter: *stories*) to identify recurring themes within the re-presentation of the *alcohol causes cancer* message. The sample included stories that had been coded as focusing on the message within the content analysis. This was done to ensure the data included were relevant to the *alcohol causes cancer* message, and determined by considering (for each story), how many times the link was mentioned, where the link was mentioned, the headlines, and the content. The thematic analysis was conducted on written texts. Thus, broadcasts were transcribed verbatim to allow for this analysis. In order to familiarise myself with the data, I read the included stories multiple times, making notes describing the overarching meaning of each story (e.g, framing of *alcohol causes cancer* message). This process was followed by systematic coding of the data, based upon the language used and recurring themes within the data.

Initial coding was followed by grouping and collapsing codes that shared commonalities as per Braun and Clarke. [33] This resulted in 12 semantic themes that comprehensively described the dataset. The dataset was then reviewed again to confirm constancy in coding. Completing this process ensured that the final codes captured themes evident within the dataset. These themes were then further collated into three overarching latent themes.

Chapter 6: Results

6.1 Content analysis

6.1.1 Print media

Over the study period, 1502 articles met the inclusion criteria. Overall, print media coverage of the *alcohol causes cancer* message had an upwards trend, with peaks in 2009 and 2011 (Figure 4).

Articles were located throughout newspapers, appearing between pp. 1-121 for all sections, with most ($n = 1171$) appearing in the main section, and less than half on odd page numbers ($n = 602$). Fifty-eight percent of articles were printed on the first 15 pages. Word counts varied (22-4574), with an average of 514 words. Articles were most commonly printed in state daily newspapers, followed by regional daily, free community, state Sunday, national, and rural non-daily (Figure 5).



Figure 4: Number of articles discussing the alcohol causes cancer message per year

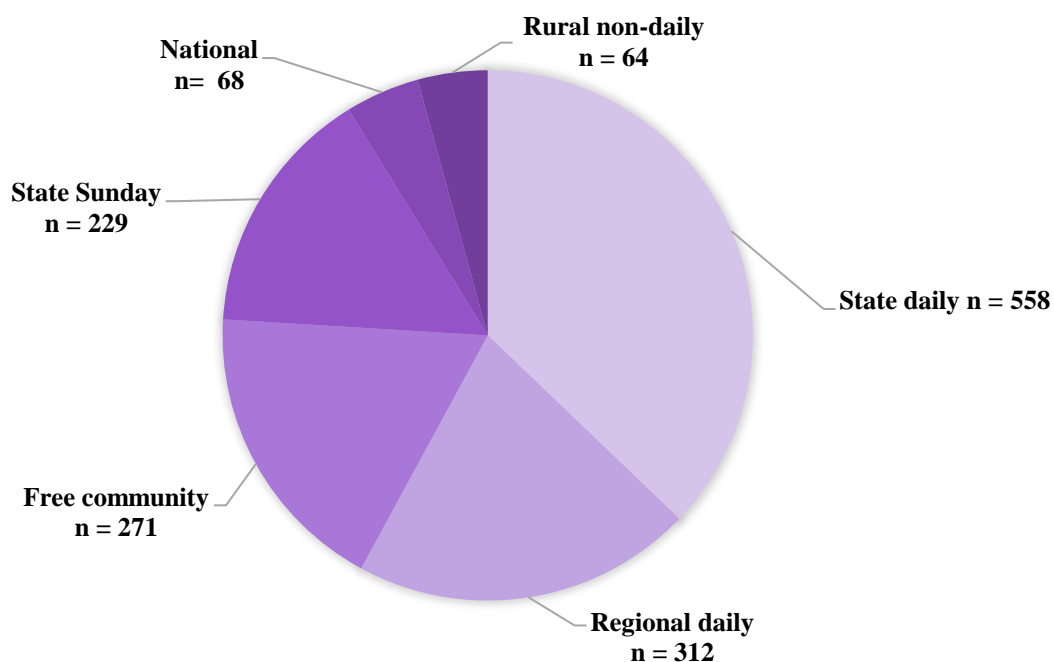


Figure 5: Distribution of articles by the type of newspaper the story was published in

Frequency and prominence of the discussion regarding alcohol and cancer

Almost half ($n = 746$) of the print media dataset consistent of repeated stories, spanning over 173 topics. The number of articles within the repeated topics varied: 57 topics were only reported twice, but one topic was reported 27 times. A majority of the 746 articles were reported less than six times. Forty-seven topics were repeated six or more times, and most ($n = 43$) presented alcohol as carcinogenic. The five most commonly repeated stories can be found in Table 3.

Table 3: The five most commonly reported topics within articles

Topic	Number of articles published
Alcohol-containing mouthwash causes oral cancer	27
Cancer Council states alcohol causes cancer	24
Salvation Army calls for warning labels on alcohol	23
Increase in the incidence of oral cancer	19
Breast cancer awareness stories	19

For carcinogenic articles, 60% were located within the first 15 pages of either the main, or supplement sections, with just under half on odd pages (49%). For non-carcinogenic articles, 53% featured in the first 15 pages of individual sections, with less than half printed on odd pages (44%). The average word-count was slightly higher among carcinogenic articles compared with non-carcinogenic (381 and 324 respectively). Discussion of the link between alcohol and cancer was more likely to occur earlier in articles citing alcohol as non-carcinogenic (48%) rather than carcinogenic (39%), however, there were a higher number of articles in the latter group.

Considering the headlines (Table 4), articles mentioning alcohol in the headline were less common than those mentioning cancer, and those mentioning neither. However, the latter were less likely to focus on the alcohol-cancer message than the former (22% and 26% respectively). Contrastingly, while articles with headlines mentioning alcohol and cancer were reported less frequently, these stories were more likely to focus on the message ($n = 116$).

Table 4: Subjects mentioned in article headlines ($n = 1494$)*

	Carcinogenic	Non-carcinogenic	Both	Total
Cancer	411	9	1	421 (28%)
Alcohol	274	40	8	322 (21%)
Neither	607	19	7	633 (42%)
Both	109	9	0	118 (8%)

*8 articles did not have headlines

The description of the link between alcohol and cancer

Overall, 95% ($n = 1425$) of articles included a claim that alcohol was carcinogenic, with 6% ($n = 93$) suggesting that alcohol is either non-carcinogenic, or prevents cancer. One percent ($n = 16$) included both claims. Few articles, however, focused on the *alcohol causes cancer* message ($n = 244$), with most including the link amongst discussion of other, usually health related topics. Additionally, the number of articles focusing on the message decreased over the study period. Of articles focusing on the link, most ($n = 228$) suggested causation, averaging one carcinogenic story per month that focused on the alcohol-cancer story. Over the study period, the ratio of carcinogenic to non-carcinogenic articles increased (85:15 in 2005; 95:5 in 2013).

Of the carcinogenic articles, the majority (90%) used the non-specific 'alcohol' to describe the carcinogenic agent, where non-carcinogenic articles were more likely to name a specific alcohol (78%): most often red wine, followed by beer, and the strawberry daiquiri cocktail. Contrastingly, while most carcinogenic articles named specific types of cancer (66%), most of non-carcinogenic articles (56%) did not, using the generic term 'cancer.' The three most commonly discussed cancers overall were breast, bowel, and head and neck cancers. The most commonly mentioned cancer within carcinogenic articles was breast cancer (40%), while it was bowel for non-carcinogenic articles (14%), and within articles suggesting both, head and neck cancer was most common (38%).

Within descriptors of the amount of alcohol associated with increased cancer risk, there was great variation in the language used within articles. Carcinogenic articles were slightly more likely to use non-specific descriptors (e.g. consumption, drinking) than non-carcinogenic articles (63% and 59% respectively). However, the latter were more likely to quote a specific amount of alcohol (e.g. less than two standard drinks per day) compared with the former (13% and 6% respectively).

Information Source

Organisations connected to cancer were the most common authority source, with 38% of the articles citing at least one. Within the articles that focused on the link, the proportion citing these organisations increased to 57%. A similar pattern was seen in the citing of educational or research organisation, showing an increase of 7% between the whole database and articles focused on the *alcohol causes cancer* message (see Table 5). Contrastingly, no difference was observed in the citing of alcohol advocacy agencies between articles that focused on the message, and those that did not.

Table 5: Information sources cited regarding the *alcohol causes cancer* message

Type of information source	Examples	Articles		Broadcasts	
		Whole database (n = 1502)	Focus on the link (n = 244)	Whole database (n = 96)	Focus on the link (n = 30)
Cancer advocacy	Cancer Council, Cancer Australia, Journal of Clinical Oncology, National Breast Cancer Foundation, World Cancer Research Fund	564 (38%)	140 (57%)	38 (40%)	10 (33%)
Alcohol advocacy	Salvation Army, Alcohol Policy Coalition, Alcohol Education and Rehabilitation Foundation	87 (6%)	15 (6%)	8 (8%)	5 (16%)
Education/research organisations	University of NSW, Oxford University, Harvard University	242 (16%)	55 (23%)	13 (14%)	5 (16%)
Other health promoting agencies	Australian Medical Association, Department of Health, Australian Dental Association, CSIRO, NHMRC	143 (9%)	13 (5%)	12 (13%)	5 (16%)
Health services	Mayo clinic, Royal Albert Hospital, Royal Adelaide Hospital	49 (3%)	8 (3%)	4 (4%)	0

6.1.2 Broadcast media

Over the study period, 96 broadcasts met the inclusion criteria. Unlike the articles, broadcast media coverage of the *alcohol causes cancer* message had an overall downwards trend during the study period. It shared peaks with the print coverage in 2009, and 2011, but also had a peak in 2007 (see Figure 6). Stories most commonly appeared on Channel 9, followed by Channel 7, Channel 10, ABC, and SBS (see Figure 7). Sixty-four percent of broadcast stories were aired nationally, while 33% were aired in NSW only. The remaining 3% were stories appearing on Channel 9's Nightline, which did not air in SA or WA. Broadcasts were predominantly aired in the evening news block (56%, 5:00pm-7:30pm), followed by morning (33%, 6:00am-7:30am), and night (10%, 9:15pm-11:30pm). Broadcast length varied (18 seconds - 14 minutes 53 seconds) with a mean of 2 minutes 31 seconds.

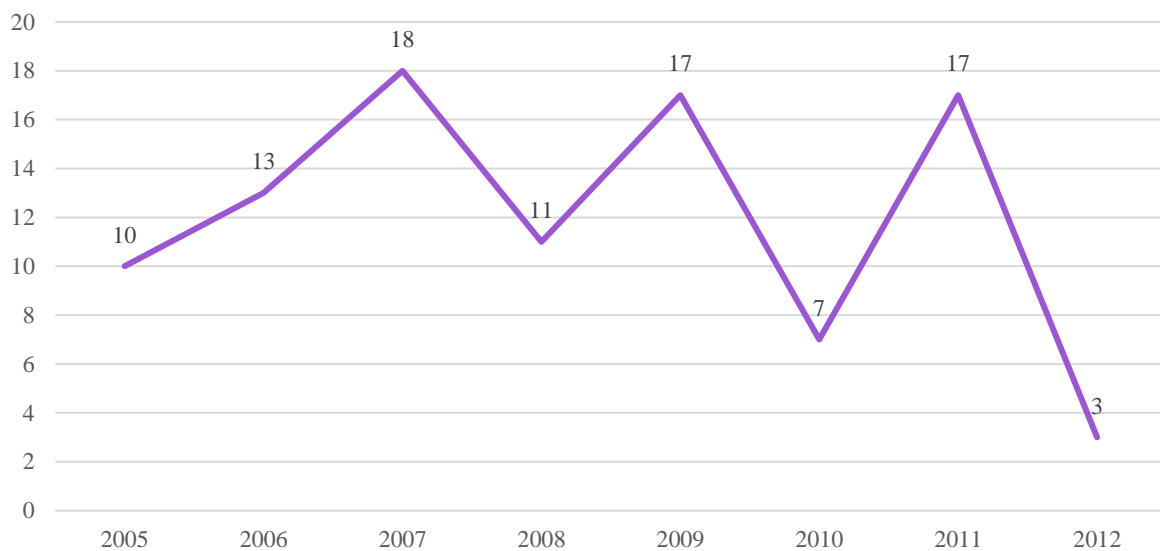


Figure 6: Number of broadcast stories discussing the alcohol causes cancer message by year

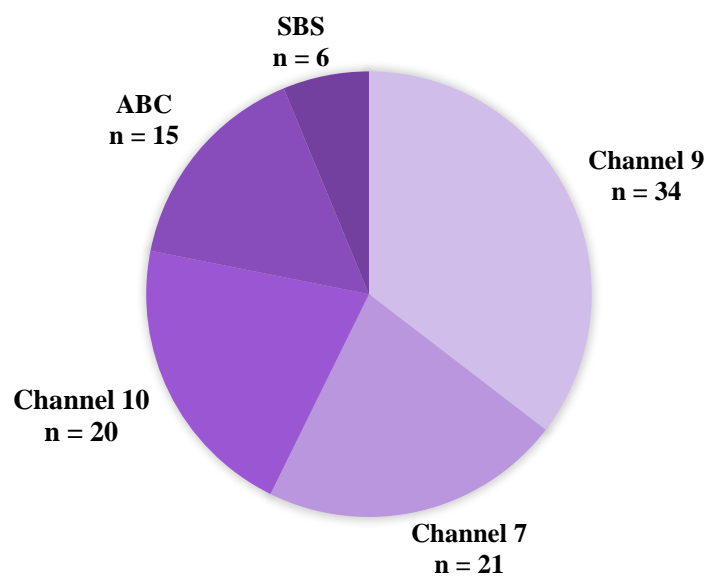


Figure 7: Distribution of broadcast stories by the network station they aired on

Frequency and prominence of the discussion regarding alcohol and cancer

Most ($n = 61$) of the broadcast dataset consisted of repeated stories, spanning over 14 topics. The number of stories within repeated topics ranged from two (four topics) to eight (one topic). Eight topics (totalling 21 broadcasts) were repeated four or less times, while six topics (totalling 40 broadcasts) were repeated between five and eight times. Thirteen topics presented alcohol as carcinogenic, while one topic presented arguments for alcohol being carcinogenic and non-carcinogenic. The five most commonly reported topics can be found in Table 6.

Table 6: Five most commonly reported topics within broadcast stories

Topic	Number of broadcasts aired
Derryn Hinch's battle with liver cancer	8
Alcohol-containing mouthwash causes oral cancer	7
Cancer is caused by lifestyle choices	7
Commonly believed cancer risks ruled out	7
Cancer Council states alcohol causes cancer	6

Within broadcasts, 95% ($n = 91$) included the claim that alcohol is carcinogenic, with the remaining 5% ($n = 5$) including claims that alcohol is both carcinogenic and non-carcinogenic. There were no news stories that solely suggested that alcohol is non-carcinogenic, or that alcohol prevents cancer. Just over one-third ($n = 31$) of these stories focused on the link between alcohol and cancer. Of these, most ($n = 28$) framed alcohol as carcinogenic, with the remainder giving arguments for both.

Within broadcast news stories reporting alcohol as carcinogenic, two-thirds were aired in the evening news period. For broadcasts reporting alcohol as both carcinogenic and non-carcinogenic, half aired in the morning, and half in the evening. The median length of the story was higher for broadcasts citing alcohol as carcinogenic, compared to non-carcinogenic (2 minutes 34 seconds and 1 minute 47 seconds respectively). Discussion of the link was most likely to occur throughout the story for broadcasts suggesting alcohol is carcinogenic (26%). For broadcasts presenting both arguments, discussion of the link was equally as likely to occur at the beginning, and throughout the story (40%).

Considering the broadcasts' headlines, those mentioning only cancer were most common ($n = 34$), with titles mentioning alcohol, alcohol and cancer, or neither sharing similar numbers ($n = 17, 19$, and 16 respectively). Seventy-nine percent of stories with titles mentioning both alcohol and cancer focused on the link between the two.

The description of the link between alcohol and cancer

Within the carcinogenic broadcasts, 94% of article quoted 'alcohol' as being carcinogenic, while under half (42%) quoted the generic descriptor 'cancer' being caused by alcohol. Breast cancer was

the most commonly referenced specific cancer (21%). Additionally, 25% of articles had a female focus, with the remainder having a gender neutral focus. Of the five articles framing alcohol as both carcinogenic and non-carcinogenic, all referred to ‘alcohol’ as the carcinogenic agent, with three mentions of ‘cancer’, two mentions of oral cancer, and one mention of breast cancer. Finally, carcinogenic broadcasts were more likely to use a problematic label when referring to the amount of alcohol associated with an increased cancer risk (e.g. heavy, excessive), while broadcasts presenting both were most likely to use a non-specific descriptor (e.g. drinking, consumption).

Information Source

As with the articles, cancer agencies were the most frequently cited authority source (35%) in all broadcasts. In descending order of frequency, other sources were teaching agencies (15%), unrelated or non-specific health promotion agencies (13%), and then alcohol-related agencies (8%). Thirty-one percent of stories did not cite an information source (see table 5).

Characteristics specific to broadcast news stories

When considering the visual imagery of the title screen of the broadcast, depictions of alcohol were the most common (27%), followed by representations of celebrities (14%), and cancer or generic health symbols (13%). Visual graphics were used in 22% of stories for multiple purposes, the most common being depicting risk (63%). Fifteen stories used a vox populi, (16%) with one being conducted in a setting that sold alcohol, and the remainder in alcohol-free settings. Personal stories ($n = 27$) were used more within the dataset than voces populi, and most commonly involved celebrities (63%), and cancer sufferers or survivors (33%). The most common settings shown within the stories were places involving alcohol ($n = 59$), with working class ‘pubs’ being the most common within this category (29%).

6.2 Thematic analysis

A total of 274 stories (244 articles, and 30 broadcasts) were included in the thematic analysis, and three recurring and overarching themes across both datasets over time were identified. The dominant theme was that the message that alcohol causes cancer is shocking. This theme included sub-themes that, the number of cancers caused by alcohol, and the amount of alcohol that constituted ‘increased risk’ was surprising. Additionally, alcohol was often compared to cigarettes, with specific parallels drawn between their carcinogenic properties, their respective positions within society, and public health measures to reduce the use of both alcohol and cigarettes. Many stories focused on the evidence supporting the claims that alcohol is, or is not, carcinogenic. Such stories fell into two categories, with different implications drawn regarding the roles and responsibilities of health authorities. These themes have been visually represented in Figure 8, and are discussed below.

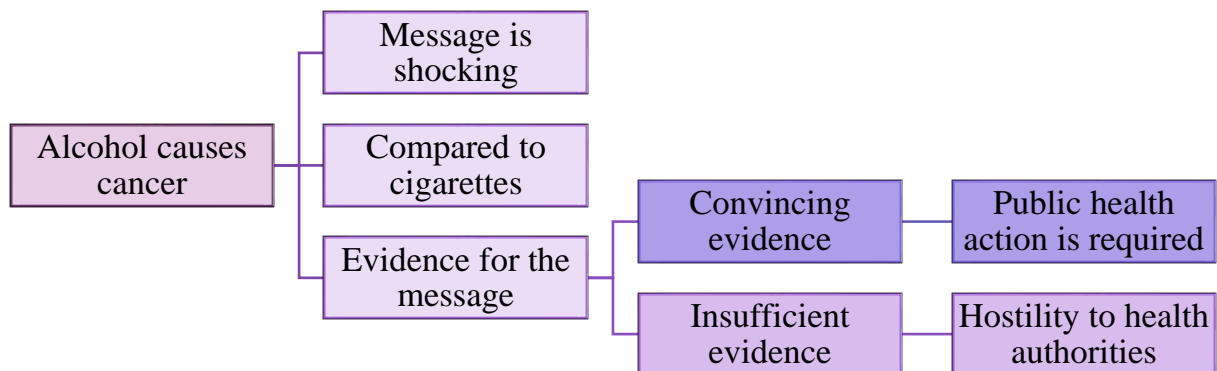


Figure 8: Thematic map depicting the identified themes and how they relate to each other

The message *alcohol causes cancer* is shocking

Seventy-six stories throughout the study period framed the *alcohol causes cancer* message as shocking. This framing was achieved in a number of different ways. For example, this theme was often present in the hook of the story, which is a commonly used device in news reporting, designed to set the tone, capture the attention of the audience early in a story, and persuade them to continue reading. [37]

“Terrifying research has come to light on the carcinogenic properties of alcohol.” [69]

“A Cancer Council of Australia report confirming the link between alcohol and cancer should send a sobering warning to drinkers...” [70]

“A shock new study has linked drinking to breast cancer.” [71]

Here, framing the *alcohol causes cancer* message as shocking, particularly at the beginning of the news piece, may have been done to increase the timeliness, and therefore newsworthiness, of the piece. Furthermore, use of descriptors such as *terrifying*, *sobering*, and *shocking* may convey the idea that this is new and shocking information. News stories often included similar comments from members of the general public, or people used to provide anecdotal evidence for the story. For example, one story focused on a breast cancer survivor, stating she “was pretty horrified” [72] to discover that alcohol may have contributed to her diagnosis. This may have been used to personalise the story, and thus make it more relatable for the audience, potentially increasing their interest in the information provided.

“I was taken aback to find that one small glass of wine a day increases the risk of breast cancer” [73]

“The fact that having one glass of white wine a day could actually increase your risk, that was quite shocking to me.” [74]

Particularly from 2011 onwards, this theme was informed by discussion about the incidence of alcohol-related cancers within the Australian public, which was presented as new and *disturbing* information. This was commonly sourced from health authorities.

“Cancer Council Tasmania says people should be concerned about the disturbing results of a new study that shows alcohol is a much bigger cause of cancer than previously thought.” [75]

“Council chief Ian Olver said the new estimate that alcohol was responsible for 22 percent of breast cancer cases was ‘quite a surprise ... that was a lot higher than we expected’.” [76]

By presenting the incidence of alcohol-related cancers as shocking to health experts, it suggests that the information is new and surprising, and that it has resulted in a change in the expert’s perceptions

of alcohol as a carcinogen. This may serve to add to the newsworthiness of the story by framing alcohol as a significant risk factor for cancer. This technique may also have been used to frame alcohol as a significant modifiable risk factor for cancer, contesting the notion that cancer is an unpreventable disease. Framing alcohol in this way might encourage the audience to change their perceptions of cancer prevention.

Alcohol-related cancers were also compared and contrasted to the well-known short-term dangers of alcohol consumption, which might have been used to draw parallels between the burden of alcohol-related injuries and alcohol poisoning, to those of alcohol-related cancers. It might also provide a standpoint to argue that while the audience may know about other alcohol-related health risks, alcohol causing cancer is new and surprising information.

“Now we know that excessive alcohol intake can have serious health consequences, but experts in the UK now say just two glasses of wine a day can dramatically increase your chances of getting cancer.” [77]

“While 43 percent of these deaths were from intoxication-related injuries, such as car accidents and falls, a surprising 30 percent were linked to cancer.” [78]

However, continually framing the *alcohol causes cancer* message as shocking might be an example of *sensationalism*, a type of editorial bias used to increase the newsworthiness of a story, aiming to increase profits and viewership. By having a lesser focus on subjective journalism in favour of profits and viewership, editors and journalists may obstruct the true meaning and magnitude of the story.

The amount of alcohol needed to increase the risk of developing cancer was also repeatedly described as shocking. This was often done through the use of linguistic markers such as *focusing adverbs*.

“The World Research Cancer Fund says even low levels of alcohol increase the risk of colorectal and breast cancers.” [79]

“As little as one glass of wine or a pint of beer each day raises the risk [of cancer]” [80]

“Startling new research shows that just one drink a day can drastically increase your risk of cancer.” [72]

“Research shows that simply having one glass of alcohol can increase your risks of developing cancer by 11 percent.” [81]

Focusing adverbs are typically used to draw the audience’s attention to a particular clause that the author deems important. [82] In these examples, it is also used to qualify the amount of alcohol that increases the risk of cancer. This is an example of *information focus*, where the focusing adverb’s purpose is to highlight what the author believes to be new information, and the main point of the

message. [82] For example, previous research has suggested that the use of the term *just* serves to define and emphasis certain clauses. [83]

The use of focusing adverbs in this context also serves to draw tensions between the definitions of problematic and non-problematic drinking. For example, the statement “alcohol, even at moderate levels, increase the risk” [84] re-frames what is generally considered to be low-risk drinking as problematic. This may work to challenge the audience to consider their own views of low-risk drinking. However, evaluative responses to this claim were mixed.

“But now even ‘moderation’ is under attack. Low levels of alcohol consumption are now, according to some researchers, a health risk.” [85]

“Women who drink even moderate amounts of alcohol run a much higher risk of breast cancer.” [86]

Quote [85] is an example where the *alcohol causes cancer* message may have been weakened by the media. Stating that *some researchers* believe that moderate drinking poses a health risk implies that this position it is not a unanimous verdict. This works to weaken the credibility of both the authority source of the information, as well as the *alcohol causes cancer* message itself.

Alcohol compared to cigarettes

Comparisons between alcohol and cigarettes were made in 46 of the stories. In some instances, the comparison was drawn between the carcinogenic effects of each substance. This was done to either draw an analogy between the levels of risk between cigarettes and alcohol (thus presenting them as equivalent or similar), or to present alcohol as constituting less of a risk than cigarettes (thus presenting them as dissimilar).

“Smoking a pack of cigarettes or more per day is related to a similar (30 percent) increased risk of breast cancer.” [87]

“We already know the dangerous link between smoking and cancer, now we’re being told that alcohol is major risk factor.” [88]

“We don’t want to get the message out of whack – alcohol’s a risk factor but it’s nothing quite like the risk factor of cigarettes.” [79]

“Lots of people try and compare alcohol to tobacco, but whereas one cigarette is bad for you, alcohol in moderation can deliver health benefits.” [89]

As the dangers of smoking are considered common knowledge within the population, [90] this may have been used as a reference point to enable the audience to interpret or understand the harms of alcohol in relation to the harms of smoking. However, responses to these outcomes were mixed. While the affirmative serves to frame alcohol as harmful, the negative serves to undermine the call for public health action, while still presenting the information as accurate.

Drawing a comparison between alcohol and cigarettes may also add to the surprising and dramatic elements of the story, making it more interesting to the audience. This is evident in comments from the general public about the comparison between alcohol and cancer within news stories.

“I relate smoking to cancer, but I certainly wouldn’t relate drinking to cancer.” [88]

“I really wasn’t aware that it was a big contributor to cancer – smoking is the one you always hear about.” [91]

Comparisons about the harms of each substance, the implications, and the response plans were also compared. Debate on this issue hinged on the idea that every cigarette does damage to the body, while the evidence for alcohol consumption is less conclusive. Some argued that the “huge cultural change [that occurred] with tobacco” [92] needs to happen with alcohol. Others argued “it is too early to consider a similar drastic approach to alcohol.” [93]

“Some believe the approach should be as tough as it has been for cigarettes.” [81]

“...the ‘draconian’ measures used to discourage tobacco use are not appropriate for alcohol - because unlike tobacco, moderate alcohol use is not associated with any great harm...” [79]

With particular reference to warning labels, policy measures to increase awareness of the carcinogenic properties of alcohol were compared to the implementation of warning labels and plain packaging of cigarettes in Australia. This comparison may have negative effects for alcohol policy implementation, as it undermines the claim that the aim of public health action surrounding the *alcohol causes cancer* message is to provide the public with the information, [94] while the aim of plain packaging is to reduce the rates of smoking. [95] Additionally, comparisons that distance the levels of risk between alcohol and cancer may hinder public health policy surrounding alcohol, by weakening the impact of the *alcohol causes cancer* message.

As observable in the extracts above, alcohol as a *product* is often described as problematic, rather than the alcohol *industry*. This contrasts the media coverage of cigarettes, which has a heavy focus on the tobacco industry’s responsibility for the adverse health outcomes of smoking. [41]

Evidence for the message and the associated implications

Depending on the linguistic markers used, the quality of the study concluding that alcohol caused cancer, as well as the evidence base for the link, were framed in two different ways. On one hand, evidence for the link was framed as convincing, which was often paired with suggestions that public health action is required to reduce the burden of alcohol-related cancers within Australia. On the other hand, evidence for the link was framed as insufficient, which was often paired with the idea that the health sector is misinformed, and was too prominent in the lives of the public.

Convincing evidence for the alcohol causes cancer message

The evidence supporting the *alcohol causes cancer* message was framed as convincing in 104 stories. This was done by using descriptors suggesting that alcohol was a significant problem, and that the link between alcohol and cancer is indisputable.

“Alcohol is one of the most important known causes of cancer.” [96]

“We now know that alcohol has a strong link to cancer, that’s been increasingly highlighted by research over the last few years...” [97]

This claim was further supported by describing the evidence base for the link to be extensive, and of high quality.

“There’s convincing evidence that alcohol is a cause of cancer...” [98]

“The evidence is now at a point where there is no doubt at all that alcohol, as a chemical, increases the risk of breast cancer.” [99]

“This study crystallises many strands of evidence from different studies on different types of cancer and alcohol consumption...” [100]

Framing the message that *alcohol causes cancer* as reputable and evidence-based serves to improve the validity of the statement. This worked to justify, and was associated with, calls to introduce supporting policy measures aimed at increasing awareness that alcohol is a carcinogen, and/or reducing alcohol consumption (as now discussed).

Public health action is required

Sixty-five stories suggested that public health action is required to reduce the burden of alcohol-related cancers in Australia, often supporting this by citing the evidence as discussed above, thus presenting the link between alcohol and cancer as real and significant. For example, these calls to action were described as “urgent” [101] as the “significance of alcohol on cancer risk had been neglected,” [102] and were supported by the idea that “it is incumbent on governments to take responsibility for warning its citizens of hazards that are in the community.” [71]

Dr Peter Boyle ... is calling for better public health policy to combat excessive drinking.
[103]

“[Public health officials] would like to ... make it easier for [the public] to choose less
unhealthy options.” [104]

Suggestions for public health intervention included warning labels, changes to licencing laws, health
promotion campaigns, drinking guidelines, and in the case of alcohol-containing mouthwashes,
making the product available by prescription only.

“Other countries already label bottles and Australian exporters do the same.” [81]

Weak evidence for the alcohol causes cancer message

This theme was identified in 42 stories, and often framed as a counter argument to the theme that the evidence for the *alcohol causes cancer* message is convincing. Similarly, this theme was defined by the descriptors used to present the alcohol-related cancer burden as low.

“This evidence, although not always of the highest level, is widely accepted within the medical community, both in Australia and overseas” [105]

“...people should not make drastic changes in alcohol consumption based on the research.” [106]

“Well in terms of huge disease burden that alcohol causes in our community, [cancer] is certainly not up there in the top five even.” [107]

Additionally, the evidence for alcohol causing cancer was often framed as minor, inconsistent and confusing. The most common source of conflict was the overstated cardiovascular benefits of red wine.

“Pooled data from seven studies provide weak evidence of a link between alcohol consumption and lung cancer risk...” [108]

“The research found a ‘slightly greater’ risk...” [109]

“Are we also going to have on the label ‘red wine in moderation is good for you?’” [110]

Hostility towards health authorities

This theme was present in 30 stories. As the link between alcohol and cancer was perceived to be insufficient, subsequent actions to either raise public awareness of the link, or reduce alcohol consumption within the population were deemed to be an overreaction, or unnecessary. This theme was often conveyed through sarcastic writing (through exaggeration/hyperbole), or allusions such as “big brother in [the] vineyard.” [111]

“WARNING: Living can increase the risk of cancer.” [112]

“The extremists must not be allowed to take consumers hostage.” [113]

“This is the worst fears of the nanny state. They said they’d go after tobacco, now alcohol, what’s next?”

This theme reflects the ethical tensions between the utilitarian nature of public health and the individual rights of individuals through liberalism. [114] Given that the public perceives the link between alcohol and cancer to be ambiguous, there is likely to be hostility towards public health action.

“Until there’s a unanimous verdict, I’d like my chardies fear-free, thanks all the same.” [112]

Additionally, the idea that everything causes cancer is apparent in this theme, which may serve to weaken the effect of the *alcohol causes cancer* message.

“Next thing you know water is going to be giving you cancer.” [115]

Chapter 7: Discussion

This study is the first to compare Australian print and television news media content discussing the link between alcohol and cancer, and the first to provide an in-depth qualitative analysis of how the media frames this issue. Over the nine-year study period, relatively few stories—an average of 167 articles and 11 broadcasts per year—stated that alcohol is carcinogenic, while less than one per month stated that alcohol is non-carcinogenic, or prevented cancer. Stories discussing the link between alcohol and cancer were significantly less common in the broadcast data, with an average of one story appearing every nine months.

There appeared to be little structural differences between stories supporting or rejecting the link between alcohol and cancer, suggesting that both messages were given equal weighting in terms of newsworthiness. Irrespective of the message, most articles were located in the main section of the newspaper, although articles that focused on alcohol being carcinogenic tended to appear earlier in the newspaper compared to articles framing alcohol as non-carcinogenic. This supports findings by Myhre et al. [116] who found that stories promoting alcohol use were often classified as ‘soft news’ stories, and are therefore situated later within the newspaper, or in supplementary lift-outs. Claims that alcohol may have health benefits might have appeal to journalists seeking lifestyle stories that are likely to appeal to a large audience. [117] However, the idea of health as newsworthy reflects the normative expectations that individuals should be—and are—interested in maximising their health. [118] Paradoxically, this may account for the finding that alcohol causing cancer was rarely the focus of a story, but typically appearing in a list of cancer risk factors, or among various other health issues. This finding parallels a content analysis of articles published in the United States that reported cancer risk factors and prevention were rarely the focus of a story. [119] Instead, there was a consistent focus on cancer treatment, which the authors suggested adds drama and human interest, therefore meeting the criteria for journalist news values, and satisfying the public’s news appetite. [119] However, this focus frames cancer as something to react to, rather than prevent. These studies, as well as the present one, reflect and reinforces the common view that cancer is something that cannot be avoided. [120] Indeed, a recent Australian study reporting on focus groups discussing how people react to the message *alcohol causes cancer* found that participants frequently stated that ‘anything’ and ‘everything’ causes cancer. [120] This indicates that attempts to change behaviour regarding alcohol consumption based upon the cancer risk may have limited success, due to the consumer resistance to the alcohol causes cancer message, and the strong drinking culture within Australia. [120-122]

Within the present research, stories rarely focused on the carcinogenic properties of alcohol. The idea that news media rarely focus on long-term consequences of alcohol consumption is further supported by findings from Fogarty et al. [14], who observed that alcohol ‘problems’ were a common focus of

news stories, but only 10% of stories mentioned any long-term risks, such as cancer, with little discussion on preventative strategies. [14] This highlights the discrepancy between journalist's values and the goals of public health advocacy. [14, 40, 119] While public health advocates aim to improve health behaviours and change public health policy, journalists and editors prioritise the commercial imperatives of the news outlet. [40] This may have accounted for the finding that a wide variety of vague descriptors for the amount of alcohol that was needed to increase the risk of cancer were used, indicating that some level of alcohol consumption is safe where cancer risk is concerned. A more extreme version of the tensions between public health advocates and journalists can be seen in the debate surrounding the strength of the evidence for the link between alcohol and cancer, and the subsequent public health action. Tensions between the desired outcomes for public health advocacy and journalists may have resulted in variation in the representation of the link between alcohol and cancer in this dataset, which could arguably be contributing to the weakening or obstruction of the unequivocal public health message that any consumption of any alcoholic beverage increases the risk of cancer. [8]

Somewhat reassuringly, the number of print articles mentioning a link between alcohol and cancer increased over the study period, while the number suggesting that alcohol prevented, or did not cause cancer, decreased. Additionally, there were no stories within the television dataset that solely suggested that alcohol did not cause cancer. This supports findings concluding that within Australia, positive stories about alcohol have become less frequent. [26] This decrease could reflect a shift in the Australian population's perceptions about alcohol use, particularly overuse. Considering the complex and multidirectional relationship between the news media and its audience, it could also be hypothesised that media coverage of alcohol-related harms, including long-term risks such as cancer, may not only reflect, but contribute to the shift, as is hypothesised regarding tobacco-control. [123] However, it should be noted that while the number of print articles mentioning the link increased, the number of articles focusing on this link decreased. Furthermore, the overall trend of television coverage of the link decreased. This might suggest that over time, the *alcohol causes cancer* message is perceived as less novel, and perhaps less newsworthy in and of its own right.

Although a majority of stories in both datasets did not specify a particular type of cancer, when one was specified, it was most commonly breast cancer. This is despite bowel cancer—which also has alcohol as a risk factor—having a higher prevalence within Australia. [124] This relative overrepresentation of breast cancer may unwittingly gender public perceptions of cancer risk, so that women's consumption of alcohol will be viewed as more problematic, despite rates of cancer, [124] and alcohol abuse, [12] being higher in men. This finding is further supported by the broadcast data, as stories were either framed as gender neutral, or having a focus on females, with none focused solely on men's cancer risk. Nonetheless, Pandaya et al. [125] noted that public health action should be taken to address the increasing rates of female alcohol consumption, as this could lead to increased

rates of a number of different cancers. Therefore, there may be some merit in targeting women with a known increased risk relative to the population (e.g. familial history of cancer), who may, when informed that alcohol causes cancer, choose to modify their alcohol consumption in order to minimise their risk of developing the disease.

Generally, stories labelling alcohol as non-carcinogenic were more likely (compared to carcinogenic stories) to specify an alcohol type, use the generic ‘cancer’ descriptor, and not name the information source. Within the present data, red wine was the alcoholic beverage most often linked to cancer prevention, echoing findings from previous studies suggesting that red wine is often reported as having health benefits. [26] The strawberry daiquiri cocktail was also depicted as healthy, featuring nine times in the print dataset within one week. This type of coverage may be an example of *churnalism*. [45] Half of the print dataset, and over half of the broadcast dataset consisted of stories that had been published multiple times. These stories were found in a variety of newspaper types and television channels, usually within a short timeframe.

Despite being unable to determine the extent to which original material was reproduced, it seems likely that churnalism can be harnessed to achieve the goals of public health advocacy, as the five most commonly-repeated stories were supported by, and sourced from, public health advocates. Arguably, these stories (as well as the strawberry daiquiri story) exhibit characteristics that identify them as ‘newsworthy’, as they involved powerful organisations, have an element of surprise, and contain ‘scary’ statistics. [126] This provides an opportunity for public health advocates to increase media coverage of public health information. For example, within the most reported story—that alcohol-containing mouthwash was carcinogenic—there was disagreement between health professionals, a widely-used product threatened with removal from circulation, commercial interest, ‘scandalous’ conflicts of interest, and ‘scary’ statistics. While each factor individually might attract media attention, the juxtaposition of all, particularly expert debate, most probably explains the longevity of the story (January-December 2009). [38] As found in an Australian study demonstrating that targeted media engagement by public health advocates prompted increased coverage of anti-tobacco news coverage, [41] this suggests that providing comments on current news stories with public health relevance, particularly those that contradict preferred messages, can garner extensive coverage at relatively low cost and effort.

Within both datasets, the *alcohol causes cancer* message was repeatedly compared to the *smoking causes cancer* message, which may have a number of implications. Firstly, it may serve to increase the newsworthiness of alcohol as a risk factor for cancer. The dramatic decline in rates of smoking in Australia in the last few decades can be attributable to the changes in the public’s beliefs regarding smoking, which facilitated the development of public health policy targeting cigarettes. [127-129] It has been argued that part of the success of advocacy against cigarettes can be attributable to framing

the tobacco industry as responsible for the significant health burden caused by cigarettes. [129] However, at this point, the present analysis indicates that alcohol as a *product* is labelled as problematic by the media, and rarely the alcohol *industry*. This supports observations in other studies that the idea of personal responsibility is often used by the alcohol industry to absolve itself of blame for adverse health effects caused by their product. [129] It has also been suggested that industries such as the alcohol, food, and gambling industries are employing tactics that are used by the tobacco industry to resist policy change. [129] Thus, despite strong public support for warning labels on alcohol products, other strategies that were implemented to reduce smoking rates may meet greater public and political resistance if they were applied to alcohol. [12, 130] This might further be evident in the prevalent beliefs that ‘everything causes cancer’ and that alcohol in moderation can be beneficial to health.

It is plausible that constant citation of public health advocacy organisations, most commonly cancer related, indicated that journalists are attempting to pro-actively seek the opinion of relevant researchers, in order to disseminate information and promote public health. [131, 132] The current finding that public health advocacy organisations were the most common information source supports research from the United Kingdom, which also found that health experts were the preferred information source when discussing alcohol. [20] Despite the prominence of public health advocates in both datasets, a consensus on the health outcomes of alcohol consumption was not reached, and thus, neither was there consensus on appropriate public health response to alcohol. Attempts to portray measures such as warning labels, increased taxation, and changes to—or better enforcement of—liquor licencing laws, were presented as inappropriate, as alcohol consumption was framed as a matter of individual liberty. These strong liberal values conflict with the utilitarian nature of public health approaches, and can be seen in many advocacy debates. [114] This conflict was evident in the framing of public health as paternalistic, and implied through the representation of public perceptions in *voices populi* within the broadcast media, where it was stated that alcohol is only being sold to adults, and they have the ability (and implicit right) to make their own decisions regarding alcohol use.

Although there were a variety of advocacy sources and information within the dataset, cancer advocates were present at a rate much higher than their alcohol advocacy counterparts. To improve the framing of the *alcohol causes cancer* message in the media, and thus better align it with the aims of public health advocacy, it might be beneficial to work to diversifying the type of advocacy groups represented by the media. For example, public health action against tobacco included a diverse range of frequently-cited sources, including professional groups, social activists, and non-government public health organisations. [123] This helped to build and strengthen negative public perceptions of smoking, which ultimately allowed for changes to policy surrounding cigarettes. [123] Within the datasets, there were reports of effective partnership between the Salvation Army and the Cancer

Council in regards to alcohol warning labels. [133] This is an example of collaborative public health advocacy, which may promote media interest in the issue, leading to a greater overall media coverage.

Chapter 8: Limitations and Future Research

Due to the limitations of the Factiva database, I was unable to determine the placement of a print article on the newspaper page, how much space it occupied, the use of graphics, or the surrounding stories and advertisements on the page. Examinations of these may provide further indication of the prominence of an article within the newspaper, and the *alcohol causes cancer* message within a story. [134]

Similarly, the Australian Health News Research Collaboration database does not provide data regarding where within the program the story is placed or the stories before and after the one analysed. Additionally, the database only recorded stories that aired on the five free-to-air channels in NSW, and data collection ended in 2012 due to a loss of funding. Data from each Australian state would provide a more comprehensive analysis of the re-presentation of the *alcohol causes cancer* message in television news.

Future analysis could also consider comparison between the ways that alcohol is reported in the news before and after the WHO's 2004 Global Status Report of Alcohol. [64] Finally, extending the analysis to include more recent years would determine whether the trends identified in the present study are continuing or changing, or if new themes are present within the newer data.

Chapter 9: Conclusion

The analysis presented suggests that the *alcohol causes cancer* message has been reported within the Australian print and television news media, but this message may have been overshadowed by other health information. Furthermore, the message may be obscured by vague descriptions of the link, and conflicting reports of the health outcomes of alcohol. As a result, the impact of the message that *any* alcohol of *any* kind increases the risk of cancer may be lessened. The increasing use of churnalism by journalists may provide an opportunity for public health advocates to inform the public by offering stories that meets the media values of informing and entertaining their audience. [39, 126] These results also suggest that the newsworthiness of alcohol as a cancer risk factor may be decreasing in the Australian media. Therefore, strategies to attract journalist interest in the message could be considered to increase circulation of the message, possibly through diversifying the advocacy organisations addressing population cancer risk-reduction through lifestyle change. Efforts should also be made to ensure consistency of health messages with a diversity of voices through strategic collaboration amongst the many public health organisations with an interest in reducing alcohol-related harm, as well as those with a similar interest in cancer prevention. Finally, information provided to the media regarding alcohol-related cancer risk should be accurate and readily understood, aiming to inform without alienating an audience wherein alcohol consumption is normalised. This will require an in-depth understanding of how such message are responded to and/or acted upon by news recipients. [135]

Appendix A: Literature review search terms

Embase

'mass medi*':de,ab,ti OR 'media representation*':de,ab,ti OR 'media coverage':de,ab,ti OR 'mass communication':de,ab,ti NOT ('social media'/exp OR 'social media') AND ('qualitative research'/exp OR 'qualitative research' OR 'content analysis'/exp OR 'content analysis' OR 'thematic analysis'/exp OR 'thematic analysis') AND ('alcohol'/exp OR 'alcohol' OR 'cancer'/exp OR 'cancer') NOT 'screening' AND [2007-2016]/py AND english:la AND 'article'/it

Scopus

TITLE-ABS-KEY (("news media" OR "mass media" OR "mass communication" OR "media representation*" OR "media coverage" AND NOT "social media") AND ("qualitative research" OR "content analysis" OR "thematic analysis") AND ("cancer" OR "alcohol" AND NOT "screening")) AND (LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2015) OR LIMIT-TO (PUBYEAR , 2014) OR LIMIT-TO (PUBYEAR , 2013) OR LIMIT-TO (PUBYEAR , 2012) OR LIMIT-TO (PUBYEAR , 2011) OR LIMIT-TO (PUBYEAR , 2010) OR LIMIT-TO (PUBYEAR , 2009) OR LIMIT-TO (PUBYEAR , 2008) OR LIMIT-TO (PUBYEAR , 2007)) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English"))

Appendix B: Summary table for literature review articles

Reference	Country	Topic	Medium Studied	Study Design	Main Findings
Atkin CK, Smith SW, McFeters C, Ferguson V. A comprehensive analysis of breast cancer news coverage in leading media outlets focusing on environmental risks and prevention. [24]	U.S.A	Cancer	Newspaper, Magazine, Television news	Content	There is limited reporting on behaviours that can prevent cancer
Azar D, White V, Bland S, Livingston M, Room R, Chikritzhs T, et al. 'Something's brewing': The changing trends in alcohol coverage in Australian newspapers 2000-2011. Alcohol and Alcoholism. 2014;49(3):336-42. [21]	Australia	Alcohol	Newspaper	Content	Alcohol use and misuse has been portrayed as less favourable in recent years
Champion C, Berry TR, Kingsley B, Spence JC. Pink Ribbons and Red Dresses: A Mixed Methods Content Analysis of Media Coverage of Breast Cancer and Heart Disease. Health Communication. 2016;31(10):1242-9. [21]	Canada	Breast cancer	Newspaper, radio, and television news	Content and thematic	Breast cancer receives greater and more prominent coverage
Fogarty AS, Chapman S. Framing and the marginalisation of evidence in media reportage of policy debate about alcopops, Australia 2008-2009: Implications for advocacy. [29]	Australia	Alcohol	Newspaper and Television News	Content	The way in which alcohol is presented in the media is key to public health advocacy
Fogarty AS, Chapman S. Advocates, interest groups and Australian news coverage of alcohol advertising restrictions: Content and framing	Australia	Alcohol	Newspaper	Content and framing	Despite positive media coverage of alcohol advertising restrictions, there is a need of public

analysis. BMC Public Health. 2012;12(1). [30]						health advocacy in the media.
Gantz W, Wang Z. Coverage of cancer in local television news. Journal of Cancer Education. 2009;24(1):65-72. [18]	U.S.A	Cancer	Television news	Content		Coverage of cancer is inconsistent.
Hilton S, Wood K, Patterson C, Katikireddi SV. Implications for alcohol minimum unit pricing advocacy: What can we learn for public health from UK newsprint coverage of key claim-makers in the policy debate? Social Science and Medicine. 2014;102:157-64. [28]	U.K.	Alcohol	Newspaper	Content		There is a need to highlight the population health benefits of alcohol policy and regulation
Konfortion J, Jack RH, Davies EA. Coverage of common cancer types in UK national newspapers: A content analysis. [19]	U.K.	Cancer	Newspaper	Content		Breast cancer is over-reported. Public health and journalism should collaborate
MacKenzie R, Chapman S, Johnson N, McGeechan K, Holding S. The newsworthiness of cancer in Australian television news. [13]	Australia	Cancer	Television news	Content		The burden of cancer is misrepresented in the media
Moriarty CM, Jensen JD, Stryker JE. Frequently cited sources in cancer news coverage: A content analysis examining the relationship between cancer news content and source citation. Cancer Causes and Control. 2010;21(1):41-9. [25]	U.S.A.	Cancer	Newspaper	Content		News media and their information sources can have a considerable effect on the public's health
Nicholls J. UK news reporting of alcohol: An analysis of television and newspaper coverage. Drugs:	U.K	Alcohol	Newspaper and television news	Content		The 'normalisation' of drinking has decreased in recent years

Education, Prevention and Policy. 2011;18(3):200-6. [20]						
Niederdeppe J, Fowler EF, Goldstein K, Pribble J. Does local television news coverage cultivate fatalistic beliefs about cancer prevention? Journal of Communication. 2010;60(2):230-53. [17]	U.S.A.	Cancer	Television	Content		Cancer is often presented as fatalistic and unavoidable
Niederdeppe J, Lee T, Robbins R, Kim HK, Kresovich A, Kirshenblat D, et al. Content and effects of news stories about uncertain cancer causes and preventive behaviors. [16]	U.S.A.	Cancer	Newspaper and Television News	Content		The reporting of cancer is often inaccurate
Patterson C, Katikireddi SV, Wood K, Hilton S. Representations of minimum unit pricing for alcohol in UK newspapers: A case study of a public health policy debate. [27]	U.K.	Alcohol	Newspaper	Content		There is growing support within all parties for alcohol control
Slater MD, Long M, Bettinghaus EP, Reineke JB. News coverage of cancer in the United States: a national sample of newspapers, television, and magazines. [22]	U.S.A.	Cancer	Newspaper, Magazine, Television news	Content		The media places an emphasis on treatment, rather than detection, screening or prevention
Stryker JE, Emmons KM, Viswanath K. Uncovering differences across the cancer control continuum: A comparison of ethnic and mainstream cancer newspaper stories. Preventive Medicine. 2007;44(1):20-5. [136]	U.S.A.	Cancer	Newspaper	Content		Coverage of breast cancer and cancer treatment dominated

Appendix C: Codebook for summative content analysis

Date

Title

Inclusion in Title

- Cancer
- Alcohol
- Alcohol and cancer link
- No relevance

Program

- 10 News - Evening
- 10 News - Late
- National 9 Evening News
- 7 News - Evening
- ABC News
- World News Australia
- Nightline
- Today
- Media Watch
- Lateline
- The 7pm Project
- Sunrise
- Weekend Sunrise
- 60 Minutes

Channel

- 7
- 9
- 10
- ABC
- SBS

Time of Program

Reach

- NSW
- National

Length

Location of the link

- Beginning Middle End

Main Cancer Focus

- Breast Head and Neck Throat
 Bowel Liver
 Cancer Oral

All Cancers Mentioned

- Breast Head and Neck Oesophageal
 Bowel Larynx Oral
 Brain Liver Throat
 Cancer Lung Thyroid

Gender Focus

- Female Male None

Evidence Actor

Evidence Organisation

Causative Amount of alcohol

Type of Alcohol

- Alcohol Spirits
 Beer Wine

Type of Cancer

- | | | |
|------------------------------|-------------------------------------|-----------------------------------|
| <input type="radio"/> Breast | <input type="radio"/> Head and Neck | <input type="radio"/> Oesophageal |
| <input type="radio"/> Bowel | <input type="radio"/> Larynx | <input type="radio"/> Oral |
| <input type="radio"/> Brain | <input type="radio"/> Liver | <input type="radio"/> Throat |
| <input type="radio"/> Cancer | <input type="radio"/> Lung | |

Preventative Action

Main focus

- Yes No

Framing of the Article

- | | |
|--|------------------------------------|
| <input type="radio"/> Carcinogenic | <input type="radio"/> Preventative |
| <input type="radio"/> Non-carcinogenic | <input type="radio"/> Both |

Repeated Story

Title Screen

Graphics used

Vox Populi used

- Yes No

Characteristics:

Personal story

Yes

No

Characteristics:

Settings

Alcohol Shown

None

Cocktail

Spirits

Beer

Mouthwash

White Wine

Champagne

Red Wine

Symbols Used

Appendix D: Definitions for variables in the summative content analysis

Table D.1: List of variables used to analyse the content of 1502 print media articles in relation to alcohol and cancer

Claim	Alcohol causes cancer; alcohol does not cause/prevents cancer
Mention in the headline	Alcohol and cancer; alcohol only; cancer only; no mention of alcohol or cancer
Focus of article	Focused on the alcohol and cancer link or not <ul style="list-style-type: none"> Determined by reviewing the title, lead paragraph and content
Page number	≤15, >15; even or odd
Word-count	Total word count of an article; median of dataset
Location in the article	Where the link between alcohol and cancer is mentioned <ul style="list-style-type: none"> Top, middle, bottom (divided into equal thirds by word count)
Newspaper	Name of the newspaper; where it is published
Location within the newspaper	Main section (not labelled) Main section with feature headings if noted (e.g. BodyWork, Extra, Health & Fitness, Insight, Life, Opinion, Newsworld, Talking Point, World) Other Sections (including supplements) not labelled Supplements/lift-outs including names (e.g. Body & Soul, Feeling Great, Lifestyle, Magazine, Men's Health, Taste, Opinion, Weekend)
Descriptive terms for types of alcohol	Generic (alcohol, drink) Specific types (beer, wine, vodka)
Descriptive terms for types of cancer	Non-descriptive 'cancer' Specific cancers (breast, liver, brain) <ul style="list-style-type: none"> Head and neck, oesophageal, larynx, mouth, throat, oral cancers collated as 'head and neck' Bowel, colon, rectal, colorectal cancers collated as 'bowel'
Descriptive terms for alcohol amount	The amount of alcohol associated with the development of cancer (consumption, two standard drinks)
Source of information	Dominant source of information mentioned or quoted (e.g. public health organisation, government agency, research journal or report, university, or charity exclusively or most frequently mentioned) <ul style="list-style-type: none"> Data collated into categories based on the key function or focus of the organisations (e.g. cancer/alcohol advocacy, other health organisations, educational entities, generic or non-specific sources)
Preventative action	What approaches are mention to reduce harm (e.g. reduce alcohol consumption, warning labels on alcohol products)
Date	Date of newspaper publication

Table D.2: List of variables used to analyse the content of 86 broadcast media articles in relation to alcohol and cancer

Claim	Alcohol causes cancer; alcohol does not cause/prevents cancer
Mention in the headline	Alcohol and cancer; alcohol only; cancer only; no mention of alcohol or cancer <ul style="list-style-type: none"> • Determined by reviewing the title of the story, and the title screen of the story
Focus of article	Focused on the alcohol and cancer link or not <ul style="list-style-type: none"> • Determined by reviewing the title, lead paragraph and content
Broadcast of the story	Program the story was aired on; time that program starts; channel that broadcasts the story
Length	Total length in time of a story; median of dataset
Location in the story	Where the link between alcohol and cancer is mentioned <ul style="list-style-type: none"> • Top, middle, bottom (divided into equal thirds by length)
Descriptive terms for types of alcohol	Generic (alcohol, drink) Specific types (beer, wine, vodka)
Descriptive terms for types of cancer	Non-descriptive ‘cancer’ Specific cancers (breast, liver, brain) <ul style="list-style-type: none"> • Head and neck, oesophageal, larynx, mouth, throat, oral cancers collated as ‘head and neck’ • Bowel, colon, rectal, colorectal cancers collated as ‘bowel’
Descriptive terms for alcohol amount	The amount of alcohol associated with the development of cancer (e.g. consumption, two standard drinks)
Source of information	Dominant source of information mentioned or quoted (e.g. public health organisation, government agency, research journal or report, university, or charity exclusively or most frequently mentioned) <ul style="list-style-type: none"> • Data collated into categories based on the key function or focus of the organisations (e.g. cancer/alcohol advocacy, other health organisations, educational entities, generic or non-specific sources)
Visual techniques	Use of graphics; use of vox populi; symbols shown
Visual elements	Settings shown in the story; type(s) of alcohol shown
Preventative action	What approaches are mention to reduce harm (e.g. reduce alcohol consumption, warning labels on alcohol products)
Date	Date of story broadcast

Reference List

1. Chen C, Shukla S, Davis B, Connell E, Morris G. Cancer in Australia: an overview 2014. Canberra: Australian Institute of Health and Welfare, 2014 Contract No.: 90.
2. Cancer Australia. All cancers in Australia Canberra: Commonwealth of Australia; 2016 [cited 2016 October 31]. Available from: <https://canceraustralia.gov.au/affected-cancer/what-cancer/cancer-australia-statistics>.
3. Lopez ML, Iglesias JM, del Valle MO, Comas A, Fernandez JM, de Vries H, et al. Impact of a primary care intervention on smoking, drinking, diet, weight, sun exposure, and work risk in families with cancer experience. *Cancer Causes Control*. 2007;18(5):525-35.
4. Mysuru Shivanna L, Urooj A. A Review on Dietary and Non-Dietary Risk Factors Associated with Gastrointestinal Cancer. *Journal of Gastrointestinal Cancer*. 2016;47(3):247-54.
5. Danaei G, Vander Hoorn S, Lopez AD, Murray CJL, Ezzati M. Causes of cancer in the world: comparative risk assessment of nine behavioural and environmental risk factors. *The Lancet*.366(9499):1784-93.
6. Winstanley MH, Pratt IS, Chapman k, Griffin HJ, Croager EJ, Olver IN, et al. Alcohol and Cancer: a statement from Cancer Council Australia. *Medical Journal of Australia*. 2011;194(1):479-82.
7. Goa C, Ogeill RP, Lloyd B. Alcohol's Burden of Disease in Australia. Canberra: Foundation for Alcohol Research and Education & VicHealth in Collaboration with Turning Point, 2014.
8. Winstanley MH, Pratt IS, Chapman K, Griffin HJ, Croager EJ, Olver IN, et al. Alcohol and Cancer: a position statement from the Cancer Council Australia. *Medical Journal of Australia*. 2011;194(1):479-82.
9. Druesne-Pecollo N, Tehard B, Mallet Y, Gerber M, Norat T, Hercberg S, et al. Alcohol and Genetic Polymorphisms: effect on risk of alcohol-related cancer. *Lancet Oncol*. 2009;10(2):173-80.
10. Buykx LJ, Gavens L, Lovatt M, Gomes de Matos E, Holmes J, Hooper L, et al. An investigation of public knowledge of the link between alcohol and cancer. Sheffield: University of Sheffield & Cancer Research UK, 2015.

11. Foundation for Alcohol Research and Education. Annual Alcohol Poll: Attitudes and Behaviours. Canberra: Foundation for Alcohol Research and Education, 2014 26 March 2014. Report No.: 1.
12. Foundation for Alcohol Research and Education. Annual Alcohol Poll 2016. Canberra: Foundation for Alcohol Research and Education, 2016.
13. MacKenzie R, Chapman S, Johnson N, McGeechan K, Holding S. The newsworthiness of cancer in Australian television news. *Medical Journal of Australia*. 2008;189(3):155-8.
14. Fogarty AS, Chapman S. Australian television news coverage of alcohol, health and related policies, 2005 to 2010: implications for alcohol policy advocates. *Australian and New Zealand Journal of Public Health*. 2012;36(6):530-6.
15. Houn F, Bober MA, Huerta EE, Hursting SD, Lemon S, Weed DL. The association between alcohol and breast cancer: popular press coverage of research. *American Journal of Public Health*. 1995;85(8 Pt 1):1082-6.
16. Niederdeppe J, Lee T, Robbins R, Kim HK, Kresovich A, Kirshenblat D, et al. Content and effects of news stories about uncertain cancer causes and preventive behaviors. *Health communication*. 2014;29(4):332-46.
17. Niederdeppe J, Fowler EF, Goldstein K, Pribble J. Does local television news coverage cultivate fatalistic beliefs about cancer prevention? *Journal of Communication*. 2010;60(2):230-53.
18. Gantz W, Wang Z. Coverage of cancer in local television news. *Journal of Cancer Education*. 2009;24(1):65-72.
19. Konfortion J, Jack RH, Davies EA. Coverage of common cancer types in UK national newspapers: A content analysis. *British Medical Journal Open*. 2014;4(7).
20. Nicholls J. UK news reporting of alcohol: An analysis of television and newspaper coverage. *Drugs: Education, Prevention and Policy*. 2011;18(3):200-6.
21. Champion C, Berry TR, Kingsley B, Spence JC. Pink Ribbons and Red Dresses: A Mixed Methods Content Analysis of Media Coverage of Breast Cancer and Heart Disease. *Health Communication*. 2016;31(10):1242-9.
22. Slater MD, Long M, Bettinghaus EP, Reineke JB. News coverage of cancer in the United States: a national sample of newspapers, television, and magazines. *Journal of Health Communication*. 2008.

23. Smith KC, Kromm EE, Klassen AC. Print news coverage of cancer: What prevention messages are conveyed when screening is newsworthy? *Cancer Epidemiology*. 2010;34(4):434-41.
24. Atkin CK, Smith SW, McFeters C, Ferguson V. A comprehensive analysis of breast cancer news coverage in leading media outlets focusing on environmental risks and prevention. *Journal of Health Communication*. 2008;13(1):3-19.
25. Moriarty CM, Jensen JD, Stryker JE. Frequently cited sources in cancer news coverage: A content analysis examining the relationship between cancer news content and source citation. *Cancer Causes and Control*. 2010;21(1):41-9.
26. Azar D, White V, Bland S, Livingston M, Room R, Chikritzhs T, et al. 'Something's brewing': The changing trends in alcohol coverage in Australian newspapers 2000-2011. *Alcohol and Alcoholism*. 2014;49(3):336-42.
27. Patterson C, Katikireddi SV, Wood K, Hilton S. Representations of minimum unit pricing for alcohol in UK newspapers: A case study of a public health policy debate. *J Public Health*. 2015;37(1):40-9.
28. Hilton S, Wood K, Patterson C, Katikireddi SV. Implications for alcohol minimum unit pricing advocacy: What can we learn for public health from UK newsprint coverage of key claim-makers in the policy debate? *Social Science and Medicine*. 2014;102:157-64.
29. Fogarty AS, Chapman S. Framing and the marginalisation of evidence in media reportage of policy debate about alcopops, Australia 2008-2009: Implications for advocacy. *Drug and Alcohol Review*. 2011;30(6):569-76.
30. Fogarty AS, Chapman S. Advocates, interest groups and Australian news coverage of alcohol advertising restrictions: Content and framing analysis. *BioMed Central Public Health*. 2012;12(1).
31. Mackenzie R, Johnson N, Chapman S, Holding S. Smoking-related disease on Australian television news: inaccurate portrayals may contribute to public misconceptions. *Australian and New Zealand Journal of Public Health*. 2009;33(2):144-6.
32. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qualitative Health Research*. 2005;15(9):1277-88.
33. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology*. 2006;3(2):77-101.
34. Layton R. *Editing and News Design*. Melbourne: Palgrave MacMillan; 2011.

35. Bucher H-J, Duckwitz A, Schumacher P. With the eyes of the readers: A comparison of the broadsheet and compact formats - An eye-tracking study on reader-newspaper interaction: WAN-IFRA; 2007.
36. MacKenzie R, Chapman S, Barratt A, Holding S. "The news is [not] all good": misrepresentations and inaccuracies in Australian news media reports on prostate cancer screening. *Medical Journal of Australia*. 2007;187(9):507-10.
37. Grundy B, Hirst M, Little J, Hayes M, Treadwell G. *So You Want to be a Journalist?: Unplugged*: Cambridge University Press; 2012.
38. Phillips G, Lindgren M. *Australian Broadcast Journalism*. 2 ed. Melbourne: Oxford University Press; 2006.
39. Tuggle CA, Carr F, Huffman S. *Broadcast News Handbook: Writing, Reporting and Producing in the Age of Social Media*. 5 ed. New York City: McGraw-Hill Education; 2013.
40. Leask J, Hooker C, King C. Media coverage of health issues and how to work more effectively with journalists: a qualitative study. *BioMed Central Public Health*. 2010;10:535.
41. Chapman S, Dominello A. A strategy for increasing news media coverage of tobacco and health in Australia. *Health Promot Int*. 2001;16(2):137-43.
42. Macnamara J. Journalism and Public Relations: unpacking myths and stereotypes. *Australian Journalism Review*. 2012;34(1):33-50.
43. Furlan P. Feeling the Pulse: journalists, public relations practitioners and medical news reporting. *Australian Journalism Review*. 2009;31(2):61-74.
44. Forsyth R, Morrell B, Lipworth W, Kerridge I, Jordens CFC, Chapman S. Health Journalists' Perceptions of Their Professional Roles and Responsibilities for Ensuring the Veracity of Reports of Health Research. *Journal of Mass Media Ethics*. 2012;27(2):130-41.
45. Jackson D, Moloney K. Inside Churnalism: PR, journalism and power relationships in flux. *Journalism Studies*. 2016;17(6):763-80.
46. Liamputtong P. *Qualitative Research Methods*. 4th ed: Oxford University Press; 2013.
47. Creswell JW. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*: SAGE Publications; 2003.

48. Andrew S, Halcomb EJ. Mixed methods research is an effective method of enquiry for community health research. *Contemporary Nurse*. 2006;23(2):145-53.
49. Yoong SL, Wolfenden L, Clinton-McHarg T, Waters E, Pettman TL, Steele E, et al. Exploring the pragmatic and explanatory study design on outcomes of systematic reviews of public health interventions: a case study on obesity prevention trials. *Journal of Public Health*. 2014;36(1):170-6.
50. Macnamara J. Media Content Analysis: Its uses; benefits and best practice Methodology. *Asia Pacific Public Relations Journal*. 2005;6(1):1-34.
51. Mercurio R, Elliott JA. Trick or treat? Australian newspaper portrayal of complementary and alternative medicine for the treatment of cancer. *Supportive Care in Cancer*. 2011;19(1):67-80.
52. Musso E, Wakefield SEL. 'Tales of mind over cancer': Cancer risk and prevention in the Canadian print media. *Health, Risk and Society*. 2009;11(1):17-38.
53. Wilson AJ, Bonevski B, Jones AL, Henry DA. Deconstructing cancer: What makes a good-quality news story? *Medical Journal of Australia*. 2010;193(11-12):702-6.
54. Weeks L, Verhoef M, Scott C. Presenting the alternative: Cancer and complementary and alternative medicine in the Canadian print media. *Supportive Care in Cancer*. 2007;15(8):931-8.
55. Champion C, Berry TR, Kingsley B, Spence JC. Pink ribbons and red dresses: A mixed methods content analysis of media coverage of breast cancer and heart disease. *Health Communication*. 2016:1-8.
56. Neuendorf K. *The Content Analysis Guidebook*. Thousand Oaks: Sage Publications, 2002.
57. Luth W, Jardine C, Bubela T. When pictures waste a thousand words: analysis of the 2009 H1N1 pandemic on television news. *PLoS One*. 2013;8(5):e64070.
58. Giles EL, Holmes M, McColl E, Sniehotta FF, Adams JM. Acceptability of financial incentives for breastfeeding: Thematic analysis of readers' comments to UK online news reports. *BMC Pregnancy Childbirth*. 2015;15(1).
59. Basnyat I, Lee S. Framing of Influenza A (H1N1) pandemic in a Singaporean newspaper. *Health Promot Int*. 2015;30(4):942-53.
60. Casciotti DM, Smith KC, Andon L, Vernick J, Tsui A, Klassen AC. Print news coverage of school-based human papillomavirus vaccine mandates. *J Sch Health*. 2014;84(2):71-81.

61. Parke H, Ashcroft R, Brown R, Marteau TM, Seale C. Financial incentives to encourage healthy behaviour: An analysis of UK media coverage. *Health Expectations*. 2013;16(3):292-304.
62. Willig C. Constructivism and 'The Real World': Can they co-exist? *Qualitative Methods in Psychology Bulletin*. 2016;21(1).
63. McEvoy P, Richards D. Critical realism: a way forward for evaluation research in nursing? *Journal of Advanced Nursing*. 2003;43(4):411-20.
64. Global Status Report on Alcohol 2004. Geneva: World Health Organisation, 2004.
65. Global Status Report on Alcohol. Geneva: World Health Organisation, 1999.
66. The Australian Health News Research Collaboration (AHNRC). Sydney 2009 [cited 2016 July 27]. Available from: <http://sydney.edu.au/medicine/public-health/AHNRC/index.html>.
67. No Author. Farewell to Devoted Cop. *Knox Leader*. 2014.
68. Webb C. The use of the first person in academic writing: objectivity, language and gatekeeping. *Journal of Advanced Nursing*. 1992;17(6):747-52.
69. Elliott T. Down the hatch, then. *The Sydney Morning Herald*. 2009.
70. Johnson A. Cancer alcohol wake-up. *Geelong Advertiser*. 2011.
71. Straun N. New study links drinking to breast cancer. *10 Evening News, Network Ten*. 2007.
72. Kelly J. What alcohol is really doing to you. *The Sunday Mail*. 2009.
73. Hagan K. Warning over long-term drinking link to common cancers. *The Age*. 2011.
74. Garret C. Sober Warning. *ABC News, Australian Broadcasting Corporation*. 2011.
75. Bingham L. Alcohol link a warning. *The Advocate*. 2011.
76. Cresswell A. Alcohol blamed for more cancers. *The Australian*. 2011.
77. Doyle M. Alcohol Warning. *Sunrise, Network Seven*. 2012.
78. No author. Booze Kills Women. *The Daily Telegraph*. 2013.
79. Cresswell A. A Sobering Truth. *The Australian*. 2006.
80. No author. Booze raises cancer risk. *Mx (Australia)*. 2007.

81. Straun N. Cancer Link. 10 Evening News, Network 10. 2006.
82. De Cesare A-M. On the Focusing Function of Focusing Adverbs: A Discussion Based on Italian Data. 2013. 2013;44(4).
83. Lindemann S, Mauranen A. "It's just real messy": the occurrence and function of just in a corpus of academic speech. *English for Specific Purposes*. 2001;20, Supplement 1:459-75.
84. MacRae F. Two wines a day lifts risk of breast cancer. *The Advertiser*. 2008.
85. No author. Here we go again. *Canberra Times*. 2009.
86. Saddler R. Cancer Link. 7 News, Seven Network. 2007.
87. No author. Alcohol is the Villain. *The Daily Telegraph*. 2007.
88. Rogers G. Cancer trigger by alcohol. *National Nine News, Network Nine*. 2008.
89. Cummings L. Is this the beer ad's last shout - Salvos demand a review. *The Daily Telegraph*. 2006.
90. Purcell K, Greenhalgh EM, Winstanley MH. Public perceptions of tobacco as a drug, and knowledge and beliefs about the health consequences of smoking Melbourne: Cancer Council of Australia; 2015 [cited 2016 October 25]. Available from: <http://www.tobaccoinaustralia.org.au/chapter-3-health-effects/3-34-public-perceptions-of-tobacco-as-a-drug-and-k>.
91. Phillips K. Cancer link warning for heavy drinkers. *The Advertiser*. 2006.
92. Koremans S. Mixed Messages. *Brisbane News*. 2006.
93. No author. Familiar War Cry. *Herald Sun*. 2006.
94. Pettigrew S, Jongenelis M, Chikritzhs T, Slevin T, Pratt IS, Glance D, et al. Developing cancer warning statements for alcoholic beverages. *BMC Public Health*. 2014;14:786.
95. Wakefield M, Coomber K, Zacher M, Durkin S, Brennan E, Scollo M. Australian adult smokers' responses to plain packaging with larger graphic health warnings 1 year after implementation: results from a national cross-sectional tracking survey. *Tobacco Control*. 2015;24(Suppl 2):ii17-ii25.

96. Margo J. Singing alcohol's praises may be out of tune with reality. *The Australian Financial Review*. 2006.
97. No author. Cancer alcohol warning. *The Perth Advocate*. 2009.
98. No author. Alcohol warning targets every drinker. *The Hobart Mercury*. 2011.
99. McLean T. NZ Study reveals alcohol linked to breast cancer. *The Advertiser*. 2013.
100. No author. Sobering cancer research. *The Gold Coast Bulletin*. 2009.
101. Curtis J. Label plea on drink risk. *The West Australian*. 2006.
102. O'Leary K. Alcohol 'bigger risk factor for cancer than diet'. *The West Australian*. 2011.
103. Weaver C. Drink risk for women. *The Advertiser*. 2007.
104. Laurence J. Low alcohol, less risk. *Canberra Times*. 2010.
105. Monshing N. GPs back Salvo booze bid. *Geelong News*. 2006.
106. No author. A sober warning. *The Herald Sun*. 2009.
107. Rowe J. Alcohol Warning. *Today, Nine Network*. 2005.
108. No author. Alcohol a lung risk. *Townsville Bulletin*. 2005.
109. No author. Lung cancer link to drinkers, non-smokers. *The Daily Telegraph*. 2005.
110. Koch D. First Cigs, Now Booze. *Sunrise, Network Seven*. 2011.
111. Phillips G. Big brother in the vineyard. *The Mercury*. 2009.
112. Toy N. Cheers without feers, Let's enjoy life. *The Daily Telegraph*. 2006.
113. Bremner C. France defies its heritage to condemn alcohol. *The Australian*. 2009.
114. Muhlack M, Elliott J, Carter D, Braunack-Mayer A. Ethical justifications in alcohol-related health warning discourses. *Cancer Forum*. 2016;40(2):93-100.
115. Turner E. Humble stubbie the latest cancer threat. Just hogwash, says drinkers. *Sunday Territorian*. 2011.

116. Myhre SL, Saphir MN, Flora JA, Howard KA, Gonzalez EM. Alcohol coverage in California newspapers: frequency, prominence, and framing. *Journal of Public Health Policy*. 2002;23(2):172-90.
117. Hanusch F. Broadening the focus: The case for lifestyle journalism as a field of scholarly inquiry. *Journalism Practice*. 2012;6(1):2-11.
118. Lupton D. *The Imperative of Health: Public Health and the Regulated Body*: SAGE Publications; 1995.
119. Jensen JD, Moriarty CM, Hurley RJ, Stryker JE. Making Sense of Cancer News Coverage Trends: A Comparison of Three Comprehensive Content Analyses. *Journal of Health Communication*. 2010;15(2):136-51.
120. May N, Elliott J, Crabb S. 'Everything causes cancer': how Australians respond to the message that alcohol causes cancer. *Crit Pub Health*. 2016:1-11.
121. Bartram A, Elliott J, Crabb S. 'Why can't I just not drink?' A qualitative study of adults' social experiences of stopping or reducing alcohol consumption. *Drug and Alcohol Review*. 2016.
122. Fogarty AS, Chapman S. "Like Throwing a Bowling Ball at a Battle Ship" Audience Responses to Australian News Stories about Alcohol Pricing and Promotion Policies: A Qualitative Focus Group Study. *PLoS ONE*. 2013;8(6).
123. Chapman S, Wakefield M. Tobacco control advocacy in Australia: reflections on 30 years of progress. *Health Education and Behaviour*. 2001;28(3):274-89.
124. Australian Institute of Health and Welfare. *Cancer in Australia: an overview 2014*. Canberra: 2014 CAN 88.
125. Pandeya N, Wilson LF, Webb PM, Neale RE, Bain CJ, Whiteman DC. Cancers in Australia in 2010 attributable to the consumption of alcohol. *Australian and New Zealand Journal of Public Health*. 2015;39(5):408-13.
126. Harcup T, O'Neill D. What Is News? Galtung and Ruge revisited. *Journalism Studies*. 2001;2(2):261-80.
127. Australian Institute of Health and Welfare. *Tobacco Smoking Canberra*: Australian Institute of Health and Welfare; 2016 [cited 2016 October 28]. Available from: <http://www.aihw.gov.au/risk-factors/tobacco-smoking/>.

128. Pacheco J. Trends—Public Opinion on Smoking and Anti-Smoking Policies. *Public Opinion Quarterly*. 2011;75(3):576-92.
129. Friedman LC, Cheyne A, Givelber D, Gottlieb MA, Daynard RA. Tobacco Industry Use of Personal Responsibility Rhetoric in Public Relations and Litigation: Disguising Freedom to Blame as Freedom of Choice. *American Journal of Public Health*. 2015;105(2):250-60.
130. Australian Institute of Health and Welfare. 2007 National Drug Strategy Household Survey: detailed findings. Canberra: Australian Institute of Health and Welfare, 2008 Contract No.: PHE 107.
131. Murcott THL, Williams A. The challenges for science journalism in the UK. *Progress in Physical Geography*. 2013;37(2):152-60.
132. Obermaier M, Koch T, Riesmeyer C. Deep Impact? How Journalists Perceive the Influence of Public Relations on Their News Coverage and Which Variables Determine This Impact. *Commun Res*. 2015.
133. No author. Salvos call for alcohol warning. *Kalgoorlie Miner*. 2006.
134. Holsanova J, Holmberg N, Holmqvist K. Tracing integration of text and pictures in newspaper reading 2005 [cited 2016 28 October]. Available from: <http://www.lu.se/lung-university-cognitive-studies-series/>.
135. Elliott JA, Miller ER. Alcohol and cancer: the urgent need for a new message. *The Medical Journal of Australia*. 2014;200(2):71-2.
136. Stryker JE, Emmons KM, Viswanath K. Uncovering differences across the cancer control continuum: A comparison of ethnic and mainstream cancer newspaper stories. *Preventive Medicine*. 2007;44(1):20-5.