



Newsprint media representations of the introduction of the HPV vaccination programme for cervical cancer prevention in the UK (2005–2008)

Shona Hilton*, Kate Hunt, Mairi Langan, Helen Bedford, Mark Petticrew

Medical Research Council, Social and Public Health Sciences Unit, 4 Lilybank Gardens, Glasgow, United Kingdom

ARTICLE INFO

Article history:

Available online 11 January 2010

Keywords:

UK
Human papillomavirus (hpv)
Vaccination
Mass media
Content analysis
Cervical cancer

ABSTRACT

In September 2008, the human papillomavirus (HPV) immunisation programme was introduced in the UK for schoolgirls aged between 12 and 18 years of age. The vaccine shows high efficacy in preventing infection against HPV types 16 and 18 responsible for 70% of cervical cancer. However, to be most effective, the vaccine needs to be administered before exposure to the viruses and therefore, ideally, before young people become sexually active. The introduction of any new vaccine, and perhaps particularly one given to young teenage girls to prevent a sexually transmitted cancer-causing virus, has the potential to attract a great deal of media attention. This paper reports on content analysis of 344 articles published between January 2005 and December 2008 in 15 UK newspapers. It includes both manifest and latent analysis to examine newsprint media coverage of the introduction of the HPV vaccination programme and its role in HPV advocacy. We concluded that the newspapers were generally positive towards the new HPV vaccination and that over the 4 years period the newsworthiness of the HPV vaccination programme increased. In 2008 two events dominated coverage, firstly, the introduction of the HPV programme in September 2008 and secondly, in August 2008 the diagnosis on camera of cervical cancer given to Jade Goody, a 27 year old mother of two, who gained fame and notoriety in the UK through her participation in several reality television shows.

There are two conclusions from this study. Firstly, the positive media coverage surrounding the introduction of the HPV vaccination programme is to be welcomed as it is likely to contribute towards influencing public perceptions about the acceptability and need for HPV vaccination. Secondly, the focus on prevalence rates of HPV infection among women and on women's sexual behaviours, in relation to HPV vaccination 'encouraging' promiscuity, is an unhelpful aspect of media coverage.

© 2010 Elsevier Ltd. Open access under [CC BY license](http://creativecommons.org/licenses/by/3.0/).

Introduction

The introduction of cervical screening has reduced invasive cervical cancer incidence and mortality by more than 50% (Bray et al., 2005; Peto, Gilham, Fletcher, & Matthews, 2004). Nevertheless, cervical cancer still accounts for approximately 2800 cases and 950 deaths per annum in the UK (<http://info.cancerresearchuk.org/cancerstats/types/cervix/>). In September 2008, a new immunisation programme against strains of the sexually-transmitted human papillomavirus (HPV) was introduced in the UK in order to further reduce incidence and mortality from cervical cancer. The programme targets girls aged 12–13 years, and in the first two years is to be supplemented by a 'catch up' campaign for girls aged 14–18 years (UK Department of Health, 2007, October 26). The vaccine chosen (Cervarix®) offers protection against two strains of the

sexually transmitted virus (types 16 and 18) which are responsible for 70% of cervical cancer and may offer cross protection against other HPV strains (Von Krogh et al., 2001). In a randomised control trial of women with no prior evidence of exposure or infection with HPV, the vaccine showed high efficacy in preventing infection with HPV types 16 and 18 for at least 4.5 years (Harper et al., 2004, 2006). Ongoing trials are assessing the duration of efficacy, but it is anticipated that immunity may persist for up to 30 years. To be most effective it is recommended that young people are given the vaccine before they become sexually active (Jit, Choi, & Edmunds, 2008; Jit, Vyse, et al., 2008). According to a study by the Health Protection Agency in which they took blood samples from 1483 girls and women between the ages of 10 and 29 to identify HPV infection, the risk of girls contracting HPV rises 'substantially' after the age of 14, with one in ten teenage girls having been infected by the age of 16 and around 20% of girls having contracted the virus by the time they reach 18 years of age (Jit, Choi, et al., 2008; Jit, Vyse, et al., 2008). In view of this the Joint Committee for Vaccination and Immunisation recommended giving HPV vaccination to girls aged

* Corresponding author. Tel.: +44 (0)141 357 7537.
E-mail address: shona@sphsu.mrc.ac.uk (S. Hilton).

12–13 (Joint Committee for Vaccination and Immunisation statement on Human papillomavirus vaccines to protect against cervical cancer).

To maximise the success of the HPV immunisation programme it needs to achieve a high uptake rate, particularly among girls from more deprived groups who experience the highest rates of cervical cancer (Parikh, Brennan, & Boffetta, 2003). Research in Scotland found that cervical cancer rates amongst women living in the most deprived areas were more than two and a half times of those women living in the least deprived areas (Harris, Sandridge, Black, Brewster, & Gould, 1998). A recent economic evaluation estimated that for the programme to be cost effective the HPV programme needs to achieve uptake rates in excess of 80% (Jit, Choi, et al., 2008; Jit, Vyse, et al., 2008), well above the 70.6% coverage reported in a study conducted to pilot the acceptability of the HPV vaccine (Brabin et al., 2008). Whilst the pilot figures fall short of desired uptake rates, it has been suggested that this uptake should be viewed as 'encouraging' because the pilot was conducted 'in the absence of national publicity' (Waller & Wardle, 2008, p. 1028). Provisional figures on uptake in England up to the end of August 2009 for girls aged 12–13 (year 8) 3rd dose is 78.4% (see: http://www.immunisation.nhs.uk/publications/HPV_VaccineUptake_Aug2009.pdf).

The introduction of any new vaccine, and perhaps particularly one given to young teenage girls to prevent a sexually transmitted cancer-causing virus, has the potential to attract a great deal of media attention. Recent experience shows that the mass media has a key role to play in the perceived desirability and acceptability of vaccines, and hence a key determinant of the uptake of HPV vaccination programme will be the media coverage it receives. Adverse publicity about the safety of the MMR vaccine (Beggs, Ramsay, White, & Bozoky, 1998) and whooping cough vaccine (Church, 1979) caused large numbers of parents to refuse immunisation for their children. Studies of the MMR controversy highlight how important it is to address any gaps in public understanding of the benefits and risks of a vaccine in order to anticipate and plan future public health messages (Bellaby, 2003; Hilton, Hunt, & Petticrew, 2006; Smith, Yarwood, & Salisbury, 2007).

In a recent analysis of Canadian and US national newspaper articles that compared the level of fear-inducing messages about HPV, cervical cancer and HPV vaccination, it was found that some factors that elicit fear about the HPV vaccine and cervical cancer were common to both countries, but that the frequencies of others may have varied based on the cultural and political environments. The authors suggest that: "communicating health risk information in the mass media is not separate from social and political contexts and that health communication efforts may be overshadowed by negative media coverage" (Abdelmutt & Hoffman-Goetz, 2009, p. 438). On the other hand, positive media campaigns to promote immunisation have been shown to improve uptake rates by increasing public knowledge of the dangers of vaccine-preventable diseases (Wallace, Corben, Turahui, & Gilmour, 2008).

To date, studies investigating levels of knowledge about HPV among the British public suggest a scant awareness of its role in the aetiology of cervical cancer. For example, in a survey of 400 female university employees just 30% had heard of HPV and only 11% knew of the link between HPV and cervical cancer (Pitts & Clarke, 2002). Similarly, in a questionnaire survey of women attending a Well Woman clinic in London (UK) ($n = 1032$) about 30% recognised HPV only in name. On further questioning, less than half knew of the link with cervical cancer and there was confusion about whether condoms or oral contraceptives could prevent HPV infection (Waller et al., 2003). In a more recent study of a representative sample of British women ($n = 1620$), a quarter of respondents were aware of HPV, and awareness was lower in those with less formal education

(Marlow, Waller, & Wardle, 2007). A similar disparity in knowledge was evident in a study investigating knowledge about other preventable cancers such as skin and lung cancers (Viswanath et al., 2006). This may reflect what Tichenor, Donohue, and Olien (1970) proposed as the 'knowledge gap hypothesis' in which they believe that information in society is not acquired evenly by individuals. Their hypothesis is based on the 'apparent failure of mass publicity to inform, the public at large' (Tichenor et al., 1970, p. 161). In short they suggest that people with higher socioeconomic status tend to have better ability to acquire information and the nature of the mass media itself is that it is geared towards persons of a higher socioeconomic status. This leads to a division of two groups: a group of better-educated people who know more about most things, and those with low education who know less.

Further, concerns have been expressed that one consequence of increasing public awareness that a sexually transmitted virus (i.e. HPV) causes cervical cancer might lead to increased stigmatisation of cervical cancer patients (McCaffery, Waller, Nazroo, & Wardle, 2006). Conversely, Waller and colleagues have argued that an emphasis on the high prevalence of HPV in the population may help to normalise the infection and reduce feelings of shame and stigma (Waller, Marlow, & Wardle, 2007). If people perceive that the likelihood of contracting HPV infection is high this may also increase the acceptability of HPV vaccination. Key factors known to influence whether parents will accept vaccination for their children include parents' perceptions of the severity and likelihood of contracting the disease, and the safety of the vaccine. When parents perceive the risk of contracting a serious disease is remote or when they have concerns over its safety the incentive to vaccinate is lessened. Conversely, if parents perceive the risk of contracting a serious disease is high or if they perceive the vaccine to be safe the incentive to vaccinate is increased (Smailbegovic, Laing, & Bedford, 2003). Whilst studies have shown the public know little about HPV and its link with cervical cancer, any vaccine reported as preventing cancer is likely to generate interest since cancer has been described as the most feared of modern diseases.

Sontag draws parallels between the current language used to describe cancer and past descriptions of tuberculosis (TB) where contracting TB was generally viewed as "tantamount to hearing a sentence of death". She goes on to suggest that over the years the lurid metaphors with which diseases such as cancer have been described have led to a situation where in the popular imagination "cancer equals death" (Sontag, 1991). Indeed, portrayals of cancer in the media have led it to being associated with long debilitating treatments, fear, hopelessness and death (Clarke & Everest, 2006). A recent example of this is the high profile media coverage surrounding reality television celebrity Jade Goody's 'battle' with terminal cervical cancer. It has been suggested that the media coverage of her case has raised public awareness about the HPV programme particularly among younger women from lower socioeconomic groups, like Goody, who are most at risk from developing cervical cancer (Cassidy, 2009) and least likely to utilise cervical screening services (Baker & Middleton, 2003). It has been suggested that the prevalence of co-factors such as smoking, sexual promiscuity and multi-parity among women from socially disadvantaged backgrounds explains the higher incidence of cervical cancer among these women (Curran, Jack, Linklater, & Mak, 2009).

More broadly, the mass media play a key role in setting the agenda for some health issues and news stories are often constructed to take one perspective or another. Dominant frames are often constructed to define what issues are viewed as important and these constructs can be particularly powerful when they are consistent over a long period of time (Menashe & Siegel, 1998). These perspectives or frames influence what are included or

excluded from stories and can be misleading in relation to the scientific evidence they present. Researchers at the Cardiff University School of Journalism have investigated media coverage of three scientific issues with social policy implications: climate change; cloning and genetic medical research; and the MMR vaccine. In relation to the MMR controversy, they found that attempts to balance claims about the risks of the MMR vaccine tended merely to indicate that there were two competing bodies of evidence rather than offer more substantive evaluations of the case for or against a causal link between autism and MMR (Hargreaves, Lewis, & Speers, 2003). These perspectives can also be hugely influential on health behaviours. In some cases the role of the media has been shown to contribute towards promoting harmful health behaviours. For example Wakefield and colleagues summarised the results of empirical studies on cigarette advertising and promotions, anti-smoking advertising, product placement in movies, on television and in music media and news coverage about smoking. They found that the media act as a source of observational learning by providing models which teenagers may seek to emulate and that exposure to media messages about smoking also provides direct reinforcement for smoking (Wakefield, Flay, Nichter, & Giovino, 2003). On the other hand, the media can be hugely influential in changing health behaviors and improving health. Taveras and colleagues conducted a cross-sectional mailed survey of 11,606 boys and girls, between the ages of 9–16 years. They found that wanting to look like figures in the media was associated with higher physical activity levels among older children and adolescents, independent of other personal and social influences. These data suggest that television, movie, and magazine industries should be encouraged to cultivate and reinforce realistic and healthy norms of physical activity and body image (Taveras et al., 2004).

Thus a key determinant of the acceptability of HPV vaccination to the public will be how the newsprint media construct and frame messages about the new HPV vaccination programme. This research aims to examine the role the newsprint media have played in HPV advocacy by identifying key messages about the risks and benefits associated with HPV vaccination and HPV infection, and how these stories were constructed and framed for different readership groups.

Methods

Newspaper selection

We selected 15 UK newspapers with high circulation figures and a range of readership profiles (www.abc.org.uk, www.nrs.co.uk) for this study. Our sample consisted of 12 national newspapers and 3 regional Scottish newspapers widely read in Scotland where the HPV programme is first being introduced in the UK. The sample comprised of 8 'serious' papers (previously called broadsheets before the paper sizes changed) (*Times*, *Guardian*, *Telegraph*, *Independent*, *Sunday Times*, *Observer*, *Herald* and *Scotsman*), 2 'middle-market tabloid' papers (*Daily Mail* and *Express*) and 5 'tabloid' papers (*Daily Record*, *Mirror*, *Sun*, *Sunday People*, *News of the World*). Fig. 1 shows the readership profiles of these 12 newspapers by age and social class, illustrating the tendency for the 'serious' newspapers to be read by people from higher socioeconomic groups and conversely the 'tabloid' papers to be read by people from lower socioeconomic groups (www.nmauk.co.uk). This typology has been used by Williams and colleagues to select a broad sample of newspapers with various readership profiles and political orientation when examining the print media discourses on a particular debate (Williams, Seale, Boden, Lowe, & Steinberg, 2008). They suggest that UK newspapers are well suited to studies which aim to differentiate mass media discourses by intended readers' age and

social class because the UK newspaper market is powerfully segmented into 'tabloid' and 'serious' genres catering for distinct readership groups of class and age. This also enables a comparison of newspaper genre to examine whether the educational content supports the knowledge gap theory which is particularly relevant since cervical cancer is known to be socially patterned.

Search strategy

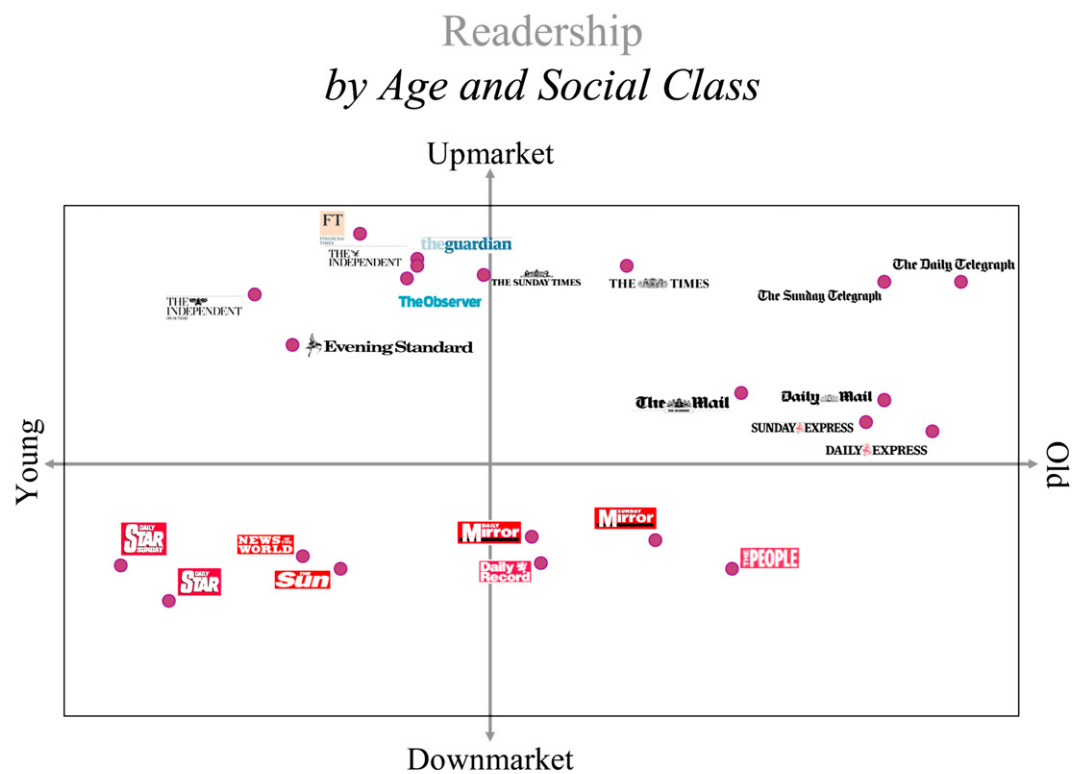
Our search period was from 1st January 2005 to 31st December 2008. We selected this time frame to encompass the period when the findings from HPV vaccine trials began to gain public and media coverage and the months immediately following the roll-out of the programme in September 2008. Articles from our 15 target publications were identified using the electronic database *Newsbank*, adopting the single search term 'HPV' in 'All Text'. Each article was scrutinised (ML) to establish whether its content included reference to: HPV infection, HPV vaccination, HPV and cervical cancer or HPV and cervical cancer screening. We identified a total of 468 articles of which 124 were excluded because: they were duplicate articles; they were published in Irish editions of the papers (because the HPV vaccination has not been introduced in Ireland); they focused on HPV and other health outcomes (e.g. throat cancer, genital warts); or they referred to cervical cancer screening but did not mention HPV.

Data collection

Initially a random selection of 40 articles were examined (SH) to identify the key discourses around HPV vaccination; these became thematic categories in an initial coding frame. This initial coding frame was tested against a further 34 articles (i.e. every tenth article in the sample). Three researchers (SH, KH, ML) independently coded each article. Following discussion of any discrepancies, the coding frame was revised (including more extensive definitions of coding categories) and two researchers (SH, ML) independently coded another 20 randomly selected articles. At this stage no further thematic categories were identified and there was complete agreement between the coders. The final coding framework recorded the publication, date, headline, whether there was any reference to 32 thematic categories and a section assessing the tone of the articles towards HPV vaccination. The tone was employed primarily to assess whether, from a public health perspective, HPV vaccine was being supported or advocated. Thus, if the text was generally favourable towards cervical cancer prevention and HPV vaccination, the tone was recorded as 'positive'. If the text was judged as generally unfavourable towards cervical cancer prevention and HPV vaccination, the tone was recorded as 'negative'. Articles which included both positive and negative messages without favouring either side of the debate were coded as 'mixed'. Neutral articles tended to be informative articles which lacked any rhetoric encouraging or discouraging HPV vaccination. When assessing tone, particular attention was paid to the headline, sub-headline and lead paragraph as these areas act to anchor the most newsworthy aspect of the story, its main trajectory and encapsulate what the journalist might consider most important (Chapman & Chapman, 2005).

Data analysis

Newspaper articles were analysed for both manifest content and latent content (Altheide, 2002). Manifest content refers to what is explicitly stated and thus draws on the objective and replicable qualities of quantitative methods. Clarke suggests that latent content includes the investigation of deeper and perhaps



NMA Marketplace Charts – September 2008

Source: NRS Jan 08 – Jun 08

NMA NEWSPAPER MARKETING AGENCY

Fig. 1. Readership of newspapers by age and social class.

unintended themes (Clarke & Everest, 2006). This involves more in-depth interpretive analytical qualities of qualitative methods to make inferences from the data. A main feature of this textual analysis involved comparing, contrasting and categorising a corpus of data (Schwandt, 1997). First, in order to systematically quantify the manifest content of the articles, each article was read line by line and coded to indicate whether or not each of 32 thematic categories in the coding frame was mentioned. These data were entered into SPSS 14. We formally tested using Chi-square tests (χ^2) whether these aspects of coverage of the introduction of the HPV vaccine were differentially mentioned in the three different types of publication ('serious', 'middle-market tabloid', and 'tabloid').

For the latent and inductive analysis all the text pertaining to each category was transcribed and imported into the qualitative software package Nvivo to aid management of the data. All the text was re-read and re-coded to discover patterns and anomalous ideas. Written summaries of these thematic categories and the constant comparative method (Glaser & Strauss, 1967; Lincoln & Guba, 1985) informed the interpretation of the data across the articles and different genres of newspaper to consider what the key messages were and how messages were being framed at different readership groups.

Findings

Manifest content

Over the period from January 2005 to December 2008, 344 news articles referred to coverage of the HPV virus and the introduction of the new HPV vaccine and satisfied our inclusion criteria in the 15

newspapers that we examined. More than half (56.1%, $n = 193$) were published in 'serious' newspapers, and roughly equal proportions of the remainder appeared in 'middle-market tabloid' (22.4%, $n = 77$) and 'tabloid' (21.5%, $n = 74$) papers (see Table 1). There was an increase in the coverage of HPV related topics over the 4-year period, from 52 articles in 2005, 78 articles in 2006, to 107 articles in both 2007 and 2008. In 2008 two key topics dominated coverage. Firstly, Jade Goody's diagnosis of cervical cancer in the

Table 1

Articles ($n = 344$) by newspaper genre and publication.

Serious	Times	56
	Guardian	29
	Telegraph	31
	Independent	28
	Scotsman	18
	Herald	18
	Sunday Times	11
	Observer	2
	193 (56.1%)	
Middle-market tabloids	Daily mail	46
	Express	31
	77 (22.4%)	
Tabloid	Mirror	34
	Sun	22
	Daily Record	15
	News of the World	3
	Sunday People	0
	74 (21.5%)	
Total $n = 344$		

Table 2Key themes discussed in articles ($n = 344$) by newspaper genre.

Manifest themes discussed in articles	Newspaper 'genre'				All
	'Serious'	'Middle-market tabloid'	'Tabloid'	χ^2 (2df) (p value)	No of articles (% total)
	n (column %)				
Development, vaccine trials and introduction of HPV programme	187 (96.9)	72 (93.5)	63 (85.1)	12.35 (0.002)	322 (93.6)
HPV as causal agent in cervical cancer	165 (85.5)	73 (94.8)	71 (95.9)	9.09 (0.011)	309 (89.8)
The target age and rationale for target age	193 (76.7)	77 (79.2)	74 (60.8)	8.46 (0.15)	254 (73.8)
Prevalence of HPV	133 (68.9)	56 (72.7)	57 (77.0)	1.80 (0.406)	246 (71.8)
Explicit mention of HPV as sexually transmitted infection	131 (67.9)	61 (79.2)	46 (62.2)	5.51 (0.064)	238 (69.2)
Names of pharmaceutical companies developing vaccine or product name (Gardasil or Cervarix)	114 (59.1)	43 (55.8)	25 (33.8)	14.07 (0.001)	182 (52.9)
Green light to sex/promiscuity	98 (50.8)	41 (53.2)	25 (33.8)	7.43 (0.024)	164 (47.7)
Safety and efficacy of HPV	96 (49.7)	43 (55.8)	25 (33.8)	8.11 (0.017)	164 (47.7)
Parents attitudes or behaviours towards HPV vaccination	75 (38.9)	42 (54.5)	16 (21.6)	17.26 (<0.0001)	133 (38.7)
Explicit mention of benefits of HPV vaccination	74 (38.3)	34 (44.2)	23 (31.1)	2.75 (0.253)	131 (38.1)
Explicit mention of HPV vaccination monetary costs	80 (41.5%)	37 (48.1)	14 (18.9)	15.70 (<0.0001)	131 (38.1)
Impact on cervical screening	61 (31.6)	31 (40.3)	18 (24.3)	4.43 (0.109)	110 (32.0)
Comparing UK HPV policy with HPV policy in other countries	53 (27.5)	17 (22.1)	8 (10.8)	8.48 (0.014)	78 (22.7)
Catch up programme	42 (21.8)	16 (20.8)	8 (10.8)	4.30 (0.117)	66 (19.2)
Anti-immunisation sentiments	39 (20.2)	19 (24.7)	1 (1.4)	17.34 (<0.0001)	59 (17.2)
HPV and women above 18 years of age	37 (19.2)	13 (16.9)	8 (10.8)	2.67 (0.264)	58 (16.9)
Health professionals' role in HPV programme	35 (18.1)	13 (16.9)	2 (2.7)	10.70 (0.005)	50 (14.5)
Getting HPV privately	29 (15.0)	11 (14.3)	3 (4.1)	6.18 (0.046)	43 (12.5)
Whether vaccination should be compulsory or voluntary	28 (14.5)	11 (14.3)	3 (4.1)	5.85 (0.054)	42 (12.2)
Herd/population immunity	14 (7.3)	10 (13.0)	2 (2.7)	5.77 (0.056)	26 (7.6)
Sex education on HPV	15 (7.8)	6 (7.8)	4 (5.4)	0.49 (0.785)	25 (7.3)
Total	193	77	74	–	344

August ($n = 77$) and secondly, the introduction of the HPV programme in September ($n = 81$).

More generally, of the 344 articles, 93.6% referred to the development of the vaccine, including reference to vaccine trials and introduction of the HPV programme in the UK (see Table 2). It was also common for articles to make some reference to: the epidemiology of cervical cancer (71.8%), the target age and rationale for the vaccine to be administered (73.8%), HPV infection as being causally associated with cervical cancer (89.8%), and that the virus is sexually transmitted (69.2%). Just under half reported that promiscuity increased the risk of contracting an HPV infection (47.7%) and reported on safety and efficacy of HPV vaccines (47.7%). Over one third of the articles explicitly mentioned the benefits of HPV vaccination (38.1%) and anti-immunisation sentiments featured in less than one in five (17.2%).

Comparisons between the different genres of newspapers

The newspapers were generally positive towards the new HPV vaccination programme, with 76.1% of articles in 'serious' newspapers positively toned, 63.6% of articles in 'middle-market tabloid' positively toned, and 75.6% of articles in 'tabloid' newspapers positively toned ($p = 0.002$). None of the 'tabloid' newspapers were categorised as negatively toned, and only two 'middle-market tabloid' and three 'serious' newspapers articles were negatively toned. The 'tabloid' newspapers were less likely to offer mixed messages about HPV vaccination. They tended not to report opposing views towards the new HPV vaccination and only 4% were rated as mixed toned compared with the 'middle-market tabloid' (19.4%) and 'serious' (11.9%) newspapers, which were more likely to report on the competing views about HPV vaccination (see Table 3).

In terms of content, anti-immunisation sentiments towards the introduction of the HPV programme were slightly more likely to be represented in the 'serious' newspapers, for example, the *Guardian* and *Independent* compared with the tabloid newspapers *The Mirror* and *The Sun*. Likewise in Scotland the 'serious' newspapers the *Scotsman* and *Herald* were more likely than the *Daily Record* to include anti-immunisation sentiments. Only one article (1.4%) out

of the 74 'tabloid' newspaper articles contained any anti-immunisation sentiment compared to 39 (20.2%) of the 193 'serious' newspapers and 19 (24.7%) of the 77 'middle-market tabloid' newspapers (see Table 2).

Some issues were much less likely to be included in articles on HPV and HPV vaccination in the 'tabloid' newspapers (although in part this is a function of the length of the article as most tabloid articles were considerably shorter). Overall the 'tabloids' were significantly less likely to mention cost, anti-immunisation sentiments, pharmaceutical companies, vaccine development, health professionals' role, safety and efficacy of the vaccine, promiscuity, getting the vaccine privately, and whether vaccination should be compulsory or voluntary (see Table 3).

Conveying the message of a scientific breakthrough

It was common for newspaper headlines to convey a message of a scientific breakthrough and for this dominant discourse to be a key feature of articles. The scientists behind the development of the vaccine were given a particularly high profile role in the media reports. Direct quotes from scientists were used to lend credibility to the development of the HPV vaccines and the ongoing safety and efficacy trials. These direct quotes added to an overall sense that the evidence was irrefutable and that HPV vaccines were a safe scientific advance towards preventing cervical cancer. It was common for the quotes to detail the magnitude and significance of the scientific breakthrough by describing the scientists' emotions and feelings of celebration. For example, it was widely reported across the newspapers that Professor Frazer, was quoted at saying: "...it probably was the most exciting thing, scientifically, that's happened in my lifetime" (*Scotsman*, Oct 27, 2007). Similarly, Professor Margaret Stanley of Cambridge University was described in the *Times* (Oct 7, 2005) as "euphoric." Another element of the discourse was to present the development of the HPV vaccines as a 'genuine' medical breakthrough which would 'revolutionise cervical cancer prevention'. For instance, the *Daily Mail* (Jul 29, 2006) reported: "We are today on the brink of a world and life-changing breakthrough in the fight against cancer through

Table 3Tone of articles ($n = 344$) by newspaper genre and publication.

		Tone towards HPV advocacy				
		positive	negative	mixed	neutral	n/a
		<i>n</i>				
Serious ($n = 193$)	Times	37	1	8	8	2
	Guardian	25	1	2	1	0
	Telegraph	24	0	6	0	1
	Independent	20	1	2	4	1
	Scotsman	16	0	1	1	0
	Herald	17	0	1	0	0
	Sunday Times	6	0	3	0	2
	Observer	2	0	0	0	0
	Total for genre (%)	147 (76.1)	3 (1.5)	23 (11.9)	14 (7.2)	6 (3.1)
Middle-market ($n = 77$)	Daily Mail	27	2	10	6	1
	Express	22	0	5	2	2
	Total for genre (%)	49 (63.6)	2 (2.5)	15 (19.4)	8 (10.3)	3 (3.8)
Tabloid ($n = 74$)	Mirror	25	0	1	1	7
	Sun	15	0	1	3	3
	Daily Record	14	0	0	0	1
	News of the World	2	0	1	0	0
	Sunday People	0	0	0	0	0
	Total for genre (%)	56 (75.6)	0	3 (4.0)	4 (5.4)	11 (14.8)
Total	$n = 344$ (%)	252 (73.2)	5 (1.4)	41 (11.9)	26 (7.5)	20 (5.8)

Freeman–Halton test found association between the genre of newspaper and tone $p = 0.0020$.

vaccination". The *Times* (Oct 10, 2005) stated: "No one can quibble with this good news: each year 1300 women in the United Kingdom die of the disease. So, should we be shouting hurrah" and the *Guardian* "...are we on the cusp of a new age for cancer treatment, in which preventative vaccines will become commonplace?" (*Guardian*, Apr 12, 2005). The language of the scientific breakthrough extended to commentary on the results of efficacy and safety trials. Dramatic language was employed to report on the high efficacy rates from the HPV vaccines trials on Cervarix® (Glaxo-SmithKline, UK) and Gardasil® (Merck, US) published in scientific journals. Across the different newspapers these trial results were reported as "revolutionary" (*Daily Mail* Oct 7, 2005), "scientifically brilliant" (*Guardian*, Mar 26, 2007) and as a "tremendous opportunity" (*Daily Mirror*, Apr 25, 2008).

Using personal testimonies to convey messages

Across the different newspapers there were many instances of compelling, personal testimonies and human interest stories appearing in both the 'tabloid' and 'serious' newspapers from women who had been diagnosed with cervical cancer. These stories tended to be lengthy accounts and most of the articles appeared in the *Daily Mail*, perhaps reflecting the newspaper's intention of appealing to a female readership. There was little difference between the main characters that featured in these stories. In total 21 women featured in 37 stories. On average the women featured in the 'serious' and 'tabloid' newspapers were about the same age (serious 30 years, tabloids 32 years), although the women in the 'serious' newspapers were less likely to be described as single mothers (serious 1, tabloid 6) and more likely to have professional occupations mentioned (serious 11, tabloid 7). These subtle differences in the framing of these key characters may reflect attempts on behalf of the newspaper to select women who may appeal to their readership. In common, these discourses drew on tragic stories of young women with cervical cancer and were primarily used to illustrate the risks associated with HPV infection and cervical cancer. For example, the following excerpt from a story run in the *Daily Mirror* (Dec 11, 2006) started with:

"Attractive, bright, with a loving family, Rachel was planning her wedding and seemed to have everything she could want out of life. But Rachel, was diagnosed with cervical cancer..." "Rachel died aged just 34, six weeks before her wedding".

Other stories acted as warnings to women. The *Daily Mirror* (Jun 18, 2005) reported the case of a woman who had always had normal smear test results, or so she thought, but had in fact abnormal test results which had been overlooked, which was described as "a terrible error that cost the 34-year-old her life". The most high profile personal testimony was that of Jade Goody's 'battle' with cervical cancer. Discourses about Goody tended to closely mirror the emotional stories of ordinary women.

It is of note that the dominant use of women with cancer as main characters to anchor the risks posed by cervical cancer and benefits of the new HPV vaccine silenced most other discourses. There were only a few stories that used interviews with parents and girls to examine and debate the dilemmas about HPV vaccine decision-making and only one case of an interview with a mother and daughter who allegedly became paralysed from the waist down after receiving HPV vaccination. This story ran in the *Daily Mail* (Dec 15, 2008), the *Daily Telegraph* (Dec 15, 2008) and *Sunday Times* (Dec 14, 2008).

Conveying messages using battle metaphors

Military metaphors were liberally used in both the headlines and body of the article. Analysis of the use of this language revealed it was employed to primarily to convey the importance of the development of a vaccine to 'fight' cancer, and secondly to portray cancer as the 'enemy'. For example, to convey the importance of the development of the vaccine the *Times* (Oct 10, 2005) stated: "It's a huge breakthrough in the 'battle' against cervical cancer". The *Sunday Express* (Apr 6, 2008) spoke of: "...a nationwide campaign to 'combat' spiralling rates of the disease," and the *Express* (May 5, 2005) called it: "A simple jab that will 'shield' women from cancer". The *Express* (Jan 25, 2007) described fighting "...a 'war' against what is the most tragic cancer for women" and the *Daily Mail* (May 5, 2005) identified cancer as the "unassailable enemy" and the "silent killer".

'The green light to sex'

Few differences were evident in the framing of messages about promiscuity across newspaper genres. In striving to offer 'balance' in reporting, some newspapers gave a voice to religious groups/objectors. Often their quotes were balanced against opposing views. For example, in one article the director of the Christian Institute charity referred to the HPV vaccine as: "...basically a sex jab, encouraging the view that girls can be sexually available. It is a disease that you can only get through being sexually promiscuous. The thing we should be doing is trying to stop kids being sexually active" (*Daily Telegraph*, Jun 20, 2007). The following day the *Daily Telegraph* (Jun 21, 2007) reassured readers, stating that the "sex jab" referred to is:

"...actually a vaccine that gives girls immunity against human papilloma virus (HPV) which is responsible for almost all cases of cervical cancer. Experts have recommended that every girl aged 12 has the vaccine, in order to afford them protection against one of the most deadly and devastating of diseases".

Generally comments from religious groups tended to question HPV vaccination. One exception reported in the *Guardian* (Jun 1, 2007) is that of a spokesman for the Catholic Church who supported HPV advocacy suggesting: "the vaccination programme should be supported by the promotion of sex within marriage and that the promotion of marriage should remain the number one social policy priority". In a similar vein, several newspapers then ran stories about the vaccine under inflammatory headlines. Arguments were made in direct opposition to this stance: "This vaccination is about protecting a woman's health, not about giving a green light to sex" (*Mirror*, Jun 24, 2007). However, HPV vaccination giving 'the green light to sex' was a more dominant discourse as illustrated by the following excerpts from the *Times* newspaper: "Anyone giving this drug to a girl is telling her I think you are a slag" (Spokesperson Christian Voice) and "it will make girls think it's OK to pick up... boys and sleep around" (Spokesperson Islamic Medical Association) (*Times*, Oct 16, 2008).

These excerpts typify the tendency in all articles to focus on promiscuity in relation to the behaviours of young women but not men. One feature article written by Dr Thomas Stuttaford, attempted to redress the balance: "Some of the unreasonable stigma that surrounds carcinoma of the cervix may stem from the belief that it is her fault..." He goes on to state: "...Men who are multipartnered are more likely to hand it on. For example, it is found that cancer of the cervix is diagnosed most commonly in women in societies where although they are expected to be abstinent it is acceptable for men to use brothels" (*Times*, Feb 6, 2006).

HPV prevalence

It was common for all the newspapers to mention that there is a high prevalence of HPV infection in the community and therefore that the likelihood of contracting HPV infection once sexually active is high. The *Times* (Oct 18, 2006) wrote: "about 80 per cent of sexually active women can expect to have an HPV infection at some point in their lives" and the *Daily Mirror* also reported: "up to 70 per cent of women contract HPV at some point" (May 12, 2005). Across the newspapers the high prevalence of HPV infection rates was reported for women and not men.

Latent content

The framing of different messages to target audiences

The 'tabloid' newspapers were more likely to simplify messages and directly advocate HPV vaccination than the 'serious' newspapers which tended towards advocating HPV vaccination whilst offering a critical commentary and competing views. For example,

the *Daily Mail's* (Oct 6, 2006) headline recommended: "girls of 11 'should be given sex disease jab,'" whilst a *Sun* (Apr 27, 2006) headline reported: "Sex jabs 'can foil cancer'" and the *Express* (Oct 27, 2007) stated: "Girls' anti-cancer jabs will stop 400 dying every year". In contrast, the 'serious' newspapers were more likely to debate the issues and highlight areas where the evidence could be misinterpreted or misrepresented, rather than offer unconditional HPV advocacy. For example, it was more likely for concerns to be debated in the serious newspapers about the lack of data on long-term safety of the new HPV vaccines and whether the benefits of immunisation would compensate for any potential risks associated with it. For instance, one article published in the *Independent* on Nov 18, 2008 examined the merits of the programme. The article was written by Jerome Burne (who has written previous anti-immunisation articles). He states that he will not be letting his two daughters have HPV vaccination and goes on to say:

"it's a public health initiative that is unnecessary, reckless and ridiculously expensive. Worse, serious doubts about its wisdom have not been properly presented to the public. Instead, children and parents have been bombarded with publicity – "a totally life-saving, revolutionary vaccine" – while the media have largely parroted official assertions that it is "safe, proven and effective", all of which are unfounded."

Similarly, the *Guardian* (Mar 1, 2008) ran a story in which the columnist Anne Karpf stated:

"This is what concerns me. Not just that Gardasil works on only four strands of HPV when there are between 15 and 40 that can cause cancer. Or that some serious adverse reactions include convulsions and numbness. No, what's really disquieting about this public health campaign is that most cases of HPV clear up of their own accord – a healthy immune system knocks it on its head."

Discussion

Despite the success of immunisation in the reduction or eradication of many once serious diseases there has been growing adverse media publicity about the risks associated with immunisation (Beggs et al., 1998) (Church, 1979). Nevertheless, although some view the HPV vaccine as a controversial vaccine because it is given to young teenage girls to prevent a sexually transmitted disease, UK newsprint coverage has generally been positive. Over the 4-year period of this study the newsworthiness of the vaccination programme increased as the date for the introduction of the HPV programme in September 2008 neared and there was also growing public interest in cervical cancer because of publicity generated by Jade Goody's diagnosis of, and treatment for, cervical cancer. Although this study was conducted prior to the media frenzy leading up to Goody's death from cervical cancer on March 22nd 2009, it is likely that her story may become a major factor in securing high HPV vaccination coverage. Indeed, it has been widely suggested that Jade Goody's legacy will be the publicity generated about the potential for cervical screening and HPV vaccination to save lives, particularly among those 'hard to reach' groups of girls/women who tend to default on screening and vaccination services (Cassidy, 2009).

The use of personal testimonies in newspapers was particularly evident in the newspapers such as the *Daily Mail* whose readership tends to be women. These testimonies served to draw the reader's attention to the importance of the HPV vaccine and provided a powerful incentive towards HPV vaccination. Karpf describes these media portrayals as a powerful way of universalising and personalising human experience which is beyond political and

economic factors (Karpf, 1988). O'Dell and Brownlow argue that it is because of the levels of disbelief in government and concern that corporate issues are more important than the 'truth' that the experiences of everyday people become so powerful and persuasive (O'Dell & Brownlow, 2005). Another feature of the stories was the use of direct quotes, particularly from scientists as a means of lending credibility to the development of the HPV vaccines and the ongoing safety and efficacy trials. These quotes were framed to add to a sense that the evidence was irrefutable and that HPV vaccines were a safe scientific advance towards preventing cervical cancer. It was common for the quotes to detail the magnitude of the scientific breakthrough by using celebratory language.

In general the 'tabloid' newspapers offered the most simplistic messages and were most likely to advocate HPV vaccination unconditionally, whereas the 'serious' newspapers tended to advocate HPV vaccination but also offer some level of critical commentary and competing views. It seems likely that this was to be seen as a means of offering balance (Hargreaves et al., 2003). This reflects what Tichenor and colleagues called the 'knowledge gap hypothesis', in which the information in society is not acquired evenly by individuals nor targeted evenly by the mass media with people of higher socioeconomic status being offered more informed and critical commentary. The fact that tabloid newspapers have offered their readership who may have the most to gain from HPV vaccination unambiguous messages advocating HPV vaccination, may encourage a higher uptake among these girls. However, such uncritical journalism also serves to socially exclude these readers from the wider tapestry of arguments which may leave them *relatively* less informed about the issues surrounding HPV vaccination.

The dominant discourses mapped in this study suggest the HPV vaccine was reported as a 'good news story' and hailed as a safe and effective step towards preventing cervical cancer. On the whole, the newspapers keenly presented the benefits of the new HPV vaccination programme and the vaccine was frequently portrayed as offering hope for future generations of young women against developing cervical cancer. Articles were generally very informative about the safety and efficacy trials and rationale for the policy on the target age of girls to be vaccinated. Militaristic language was liberally used to help convey the importance of the vaccine and add a sense of urgency to the need to 'wipe out' cervical cancer. Since the emergence of HIV/AIDS in the 1980s, social scientists and sociologists of health and illness have explored metaphorical framing of diseases and have identified the use of militaristic language to permeate discourses of immunology, bacteriology and infection for at least a century (Sontag, 1991). Such language has been observed more recently in studies of newsprint media representations of how the SARS (severe acute respiratory syndrome) disease threat was depicted (Wallis & Nerlich, 2005; Washer, 2004). Washer examined the phenomena of 'emerging and re-emerging infectious diseases' over the past 30 or so years and suggests that these have impacted on the faith once widely held that Western biomedicine could 'conquer' infectious disease.

There was little mention of any specific risks associated with the HPV vaccine itself. The main risk presented was that the vaccine might 'signal a green light to sex'. This finding is consistent with a recently published study examining the content of newspaper articles on the issue of adolescents engaging in risky sexual behaviour following HPV vaccination (Forster et al., *in press*). Forster and colleagues found that that newspapers provided parents with broadly positive descriptive norms about vaccination; however, the issue that adolescents will engage in risky sexual behaviours following HPV vaccination was regularly discussed in the national press and they suggest it has the potential to increase parents' concerns about vaccination. Similarly, our study found that the issue of promiscuity was raised across all the newspapers, and

religious and ethical views were presented in juxtaposition to those of scientists, parents and journalists. Concerns about the vaccine sexualising young girls and encouraging promiscuity among girls were commonplace. The focus of these excerpts was almost entirely focused on the behaviours of young women rather than men, which is likely to add to a sense of stigma that many women already feel about cervical cancer (McCaffery et al., 2006) and calls into question whether a gender-specific vaccination programme for a sexually transmitted disease add to the heavy burden of responsibility women already have for sexual health. Whilst Waller and colleagues' suggestion that emphasising the high prevalence of HPV in the population may help to normalise the infection and reduce feelings of shame and stigma, as yet the sole focus on high prevalence rates among women might suggest 'the problem' lies entirely with them, and not men.

In conclusion, adverse media publicity about vaccination programmes can have serious public health consequences as seen in the case of the pertussis scare (Church, 1979) and controversy surrounding the safety of the MMR vaccine (Beggs et al., 1998). The positive media coverage which has surrounded the introduction of the new HPV vaccination programme is likely to play a crucial role in influencing public perceptions about the acceptability of HPV vaccination in the early stages of the programme at least and may contribute towards reducing cervical cancer among future generations of young women. Whilst this positive news coverage is to be welcomed, our analysis has uncovered some discourses that may have wider implications for the promotion of equality in sexual health and relationships among young people. To date, some newsprint reporting has tended to present HPV vaccination as encouraging promiscuity among girls with little mention of boys' sexual behaviour and reports have tended to focus on high prevalence of HPV infection among women with little mention of rates among men. Further, although rates of cervical cancer are known to be high in women from less advantaged socioeconomic backgrounds this discourse was absent, which may lead the general public to conclude that that higher prevalence of cervical cancer is wholly due to the sexual behaviours of women from these backgrounds. Whilst newspapers have a wide readership and undoubtedly act as an important information source on health and influence on health behaviours the fact that the newspapers read by more affluent people contained more useful educational information is likely to contribute to increasing the gaps in knowledge between members of society. Further, there is a need to actively challenge possible negative messages which centre upon women and plan more balanced future public health messages about HPV infection and vaccination.

Acknowledgments

We have no competing interests. This study was funded by the Medical Research Council's, Population Health Science Research Network (wbs. U1300.00.008.00003.01). HB has been reimbursed in the past (not in the past five years) by several vaccine manufacturers, for attending and speaking at conferences and conducting research. SH participated in the design, data collection and analysis, and drafted the manuscript. KH, MP and HB participated in the design and KH helped in drafting the manuscript. ML participated in data collection and analysis. All authors approved the final manuscript.

References

- Abdelmutt, N., & Hoffman-Goetz, L. (2009). Risk messages about HPV, cervical cancer, and the HPV vaccine gardasil: a content analysis of Canadian and U.S. national newspaper articles. *Women & Health*, 49, 422–440.

- Altheide, D. (2002). *Creating fear: news and the construction of crisis*. Hawthorne, New York: Aldine de Gruyter.
- Baker, D., & Middleton, E. (2003). Cervical screening and health inequality in England in the 1990s. *Journal of Epidemiology and Community Health*, 257, 417–423.
- Beggs, N., Ramsay, M., White, J., & Bozoky, Z. (1998). Media dents confidence in MMR vaccine. *British Medical Journal*, 316, 561.
- Bellaby, P. (2003). Communication and miscommunication of risk: understanding UK parents' attitudes to combined MMR vaccination. *British Medical Journal*, 327, 725–727.
- Brabin, L., Roberts, S., Strerch, R., Baxter, D., Chambers, G., Kitchener, H., & McCann, R. (2008). Uptake of first two doses of human papillomavirus vaccine by adolescent schoolgirls in Manchester: prospective cohort study. *British Medical Journal*, 336, 1056–1058.
- Bray, F., Carstensen, B., Møller, H., Zappa, M., Primic akelj, M., Lawrence, G., Hakama, M., & Weiderpass, E. (2005). Incidence trends of adenocarcinoma of the cervix in 13 European countries. *Cancer Epidemiology, Biomarkers and Prevention*, 14, 2191–2199.
- Cassidy, J. (2009). Jade, class, and cervical cancer. Published 18 February 2009. *British Medical Journal*. doi:10.1136/bmj.b691.
- Chapman, D., & Chapman, S. (2005). Framing pub smoking bans: an analysis of Australian print news media coverage, March 1996–March 2003. *Journal of Epidemiology and Community Health*, 59, 679–684.
- Church, M. A. (1979). Return of whooping cough. *British Medical Journal*, 1, 195.
- Clarke, J., & Everest, M. (2006). Cancer in the mass print media: fear, uncertainty and the medical model. *Social Science & Medicine*, 62, 2591–2600.
- Curran, L., Jack, R., Linklater, K., & Mak, V. (2009). Inequalities in the incidence of cervical cancer in south east England 2001–2005: an investigation of population risk factors. *BMC Public Health*, 9, 62.
- Forster, A., Wardle, J., & Waller, J. Passport to promiscuity or lifesaver: press coverage of HPV vaccination and risky sexual behavior. *Journal of Health Communication*, in press.
- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory*. Chicago, IL: Aldine.
- Hargreaves, I., Lewis, J., & Speers, T. (2003). *Towards a better map: Science, the public and the media*. Cardiff: Cardiff University.
- Harper, D., Franco, E., Wheeler, C., Moscicki, A., Romanowski, B., Roteli-Martins, C., Jenkins, D., Schuid, A., Costa Clemens, S., Dubin, G., & HPV Vaccination Group. (2004). Efficacy of a bivalent L1 virus-like particle vaccine in prevention of infection with human papillomavirus types 16 and 18: randomised controlled trial. *Lancet*, 364, 1757–1765.
- Harper, D., Franco, E., Wheeler, C., Moscicki, A., Romanowski, B., Roteli-Martins, C., Jenkins, D., Schuid, A., Costa Clemens, S., Dubin, G., & HPV Vaccination Group. (2006). Sustained efficacy up to 4.5 years of a bivalent L1 virus-like particle vaccine against human papillomavirus types 16 and 18: follow up from a randomized control trial. *Lancet*, 367, 1247–1255.
- Harris, V., Sandridge, A., Black, R., Brewster, D., & Gould, A. (1998). *Cancer registration statistics: Scotland 1986–1995*. Edinburgh: ISD Scotland Publications.
- Hilton, S., Hunt, K., & Petticrew, M. (2006). Gaps in parental understandings and experiences of vaccine-preventable diseases. A qualitative study. *Child: Care, Health and Development*, 33, 170–179.
- Jit, M., Choi, Y., & Edmunds, W. (2008). Economic evaluation of human papillomavirus vaccination in the United Kingdom. *British Medical Journal*, 337, a769.
- Jit, M., Vyse, A., Borrow, R., Pebody, R., Soldan, K., & Miller, E. (2008). Prevalence of human papillomavirus antibodies in young female subjects in England. *British Journal of Cancer*, 98(9), 1595.
- Joint Committee for Vaccination and Immunisation statement on Human papillomavirus vaccines to protect against cervical cancer. http://www.advisorybodies.doh.gov.uk/jcvi/HPV_JCVI_report_18_07_2008.pdf.
- Karpf, A. (1988). *Doctoring the media the reporting of health and medicine*. London: Routledge.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hill, CA: Sage.
- Marlow, L., Waller, J., & Wardle, J. (2007). Public awareness that HPV is a risk factor for cervical cancer. *British Journal of Cancer*, 97, 691–694.
- McCaffery, K., Waller, J., Nazroo, J., & Wardle, J. (2006). Social and psychological impact of HPV testing in cervical screening: a qualitative study. *Sexually Transmitted Infections*, 82, 169–174.
- Menashe, S., & Siegel, M. (1998). The power of a frame: an analysis of newspaper coverage of tobacco issues – United States. *Journal of Health Communication*, 3, 307–325.
- O'Dell, L., & Brownlow, C. (2005). Media reports of links between MMR and autism: a discourse analysis. *British Journal of Learning Disabilities*, 33, 194–199.
- Parikh, S., Brennan, P., & Boffetta, P. (2003). Meta-analysis of social inequality and the risk of cervical cancer. *International Journal of Cancer*, 105, 687–691.
- Peto, J., Gilham, C., Fletcher, O., & Matthews, F. (2004). The cervical cancer epidemic that screening has prevented in the UK. *Lancet*, 364, 249–256.
- Pitts, M., & Clarke, T. (2002). Human papillomavirus infections and risks of cervical cancer: what do women know? *Health Education Research*, 17(6), 706–714.
- Schwandt, T. (1997). *Qualitative inquiry: A dictionary of terms*. California: Sage.
- Smailbegovic, M. S., Laing, G., & Bedford, H. (2003). Why do parents decide against immunization? The effect of health beliefs and health professionals. *Child: Care, Health and Development*, 29, 303–311.
- Smith, A., Yarwood, J., & Salisbury, D. (2007). Tracking mothers' attitudes to MMR immunisation 1996–2006. *Vaccine*, 25, 3996–4002.
- Sontag, S. (1991). *Illness as a metaphor and AIDS and its metaphors*. London: Penguin Books Ltd.
- Taveras, E., Rifas-Shiman, S., Field, A., Frazier, L., Colditz, G., & Gillman, M. (2004). The influence of wanting to look like media figures on adolescent physical activity. *Journal of Adolescent Health*, 35(1), 41–50.
- Tichenor, P., Donohue, G., & Olien, C. (1970). Mass media flow and differential growth in knowledge. *Public Opinion Quarterly*, 34, 159–170.
- UK Department of Health. (2007, October 26). HPV vaccine recommended for NHS immunisation programme.
- Viswanath, K., Breen, N., Meissner, H., Moser, R., Hesse, B., Steele, W., & Rakowski, W. (2006). Cancer knowledge and disparities in the information age. *Journal of Health Communication*, 11(Suppl 1), 1–17.
- Von Krogh, G., Bosch, F., Lacey, C., Gross, G., Barrasso, R., & Schneider, A. (2001). European guideline for the management of anogenital warts. *International Journal of STDs and AIDS*, 12(Suppl 3), 40–47.
- Wakefield, M., Flay, B., Nichter, M., & Giovino, G. (2003). Role of the media in influencing trajectories of youth smoking. *Addiction*, 98(Suppl 1), 79–103.
- Wallace, C., Corben, P., Turahui, J., & Gilmour, R. (2008). The role of television advertising in increasing pneumococcal vaccination coverage among the elderly, North Coast, New South Wales, 2006. *Australian and New Zealand Journal of Public Health*, 32(5), 467–470.
- Waller, J., Marlow, L., & Wardle, J. (2007). The association between knowledge of HPV and feelings of stigma, shame and anxiety. *Sexually Transmitted Infections*, 83, 155–159.
- Waller, J., McCaffery, K., Forrest, S., Szarewski, A., Cadman, L., & Wardle, J. W. (2003). Awareness of human papillomavirus among women attending a well woman clinic. *Sexually Transmitted Infections*, 79, 320–322.
- Waller, J., & Wardle, J. (2008). HPV vaccination in the UK. *British Medical Journal*, 336, 1028–1029.
- Wallis, P., & Nerlich, B. (2005). Disease metaphors in new epidemics: the UK media framing of the 2003 SARS epidemic. *Social Science & Medicine*, 60(11), 2629–2639.
- Washer, P. (2004). Representations of SARS in the British newspapers. *Social Science & Medicine*, 59(12), 2561–2571.
- Williams, S., Seale, C., Boden, S., Lowe, P., & Steinberg, D. (2008). Medicalization and beyond: the social construction of insomnia and snoring in the news. *Health*, 12, 251–268.