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Article

Messages about Antibiotic Resistance in Different Newspaper Genres

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Abstract: Poorer people are more likely to use antibiotics; inappropriate antibiotic use causes resistance, and health campaigns attempt to change behaviour through education. However, fuelled by the media, the public think antibiotic resistance is outside their control. Differences in the attribution of blame for antibiotic resistance in two genres of UK newspapers, targeting distinct socioeconomic groups, were examined using a mixed methods approach. Firstly, depiction of blame was categorised as either external to the lay public (outside their control) or internal (lay person accountable) and subjected to a chi-square test. Secondly, using critical discourse analysis, we examined the portrayal of the main agents through newspaper language. Data from 597 articles (307 broadsheets) analysed revealed a significant association between newspaper genre and attribution of blame for antibiotic resistance. While both newspaper types blamed antibiotic resistance predominantly on factors external to the lay public, broadsheets were more likely to acknowledge internal factors than tabloids. Tabloids provided a more skewed representation, exposing readers to inaccurate explanations about antibiotic resistance. They highlighted ineptitude in health professionals, victimising patients and blaming others, while broadsheets used less emotive language. Pharmacists should take special care to communicate the importance of appropriate antibiotic use against this backdrop of distortion.

Keywords: antibiotic resistance; risk perception; attribution theory; newspapers; consumer health information; linguistics

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1. Introduction

Antibiotics kill or inhibit the growth of pathogenic bacteria, but less than one hundred years since their discovery, antibiotic resistance is now a palpable threat to public health worldwide [1]. Resistance describes a clinical phenomenon whereby a previously effective antibiotic no longer works because the target pathogen has developed a defence against it, for example through mutations during replication or by acquiring genes encoding resistance from other bacteria [2]. While a range of factors contribute to the development of resistance, it is generally accepted that using antibiotics promotes the emergence and spread of resistance and that once developed resistance can be transmitted from person to person [2,3]. Antibiotic resistance is not a disease in itself but it can result in higher morbidity, mortality, extra hospital and outpatient costs and loses in productivity [4]. A range of antibiotic-resistant bacteria have been identified [5].

The World Health Organisation has defined health professional and patient factors associated with antibiotic misuse or resistance and potential interventions for dealing with these [6]. Antibiotic resistance in the community has become a particular problem in recent times [7] and this makes recommendations relating to patients and the general public especially pertinent. People should be educated about appropriate and inappropriate uses of antibiotics including when to expect an antibiotic prescription, the importance of adherence to prescribed regimen as well as the need to avoid self-medication [6]. Risk factors for the emergence of antibiotic resistance in the community are continually mapped [8]. However, antibiotic prescribing and usage remain a particular risk and initiatives such as the European Antibiotic Awareness Day (EAAD), 18 November, launched in 2008 attempt to encourage responsible use through health promotion [9]. Table 1 combines the factors contributing to antibiotics misuse and/or resistance according to the WHO and EAAD. In the UK, video campaigns too attempt to steer patients away from expecting antibiotic prescriptions for colds and flu [10]. In the US, the Centre for Disease Control and Prevention also runs various campaigns aimed at addressing the issue of antibacterial resistance in different settings [11].

Table 1. Factors contributing to antibiotic misuse and/or resistance according to the WHO and European Antibiotic Awareness Day (EAAD).

Health professionals: prescribers and dispensers	Patients
WHO	**WHO**
Lack of knowledge	Self-medication
Inadequate diagnosis	Poor adherence
Incorrect drug selection	High need (poor underlying health)
Incorrect prescribing (dose/duration/route)	Misinformation/inappropriate beliefs
Prescribing in response to patient pressure	Poverty-associated under treatment
Fear of litigation	An “expensive is better” myth
Financial gain	Expectation of treatment
Response to promotional pressure	Response to advertising
EAAD	**EAAD**
Unnecessary prescription of antibiotics	Not completing a course of as prescribed
Unsuitable use of broad-spectrum antibiotics	Skipping doses of antibiotics
Wrong selection of antibiotics	Not taking antibiotics at regular intervals
Inappropriate duration or dose of antibiotics	Saving some for later

Certainly there is evidence to show a correlation between poor understanding of antibiotics and inappropriate usage and a tendency to demand antibiotics [8]. In addition, those more knowledgeable about antibiotics are more likely to finish a course of antibiotics [11]. What is more, antibiotic prescribing is highest amongst those with lower educational levels and those from lower socioeconomic classes [12]. These findings all give credence to health campaigns attempting to change people's behaviour. Yet, it is also known from years of research in the behavioural field that a multitude of factors influence behaviour at the level of the individual patient and that educational campaigns are not always effective at changing behaviours because of the complexity of decision-making processes [13]. Educational messages about antibiotic usage do not always translate into the desired behaviours [14].

Research has shown that the lay public do not recognise their own contribution towards antibiotic resistance, viewing the matter instead as outside of their own control and blaming "dirty hospitals", unhygienic nurses, the government and hospital managers, doctors overprescribing antibiotics and the "other irresponsible people" who misuse antibiotics [3,10,15,16]. The way in which causation or blame is attributed in relation to health is important because it has been shown to correlate with behaviour. Those who recognise their own internal contribution to events exhibit higher levels of adherence to treatment, engagement in self-management, health awareness, health service utilisation and making positive health behavioural changes [17–19]. In contrast, attributing cause to the environment and external factors outside of one's control correlate with lower levels of engagement in self-management and poorer health behavioural decisions [20,21]. Thus potentially the impact of health campaigns seeking positive behavioural change such those promoting antibiotic awareness could be undermined by whether people recognise their own capacity to influence the problem of antibiotic resistance. This is akin to a vicious circle and warrants an examination of potential differences in how people form their lay opinions.

While health campaigns rely on the media to act as a source of information and learning, lay media, newspapers especially can be a more potent influence on people. In fact participants in qualitative studies have cited newspapers as a primary source of information about their knowledge of antibiotic resistance [22]. Other studies too have investigated the newspapers' power to influence and form the lay public's health perceptions and behaviour at an international level [23–28]. How antibiotic resistance is reported in newspapers has been investigated previously in the context of MRSA in the UK with researchers mainly employing discourse analysis to catalogue the portrayal of the problem. For example, Crawford *et al.* [29] found newspapers depicted doctors and hospitals as perpetrators of crimes of omission by not cleaning hands or wards. Chan *et al.* [30] described the use of "the dirty hospital" a powerful metaphor for political games by journalists and politicians alike. The latter is especially pertinent since in an empirical study no correlation could be demonstrated between general hospital cleanliness and MRSA rates. Nonetheless, Boyce *et al.* [31] examining the reported causes of MRSA in both quality (broadsheets) and popular (tabloid) newspapers in the UK, also reported hospital cleanliness and cleaners as the most cited reason for the problem (36%). But they also identified a host of other spurious causes and worryingly found antibiotic over-prescribing cited in only 5.6% of reports and pressure to over-prescribe in only 0.4%. In terms of solutions, again cleaner wards were cited in most cases (38%) but reducing drug use was cited in only 2.3% of the articles examined. Thus certainly for MRSA it is not science that appears to influence media coverage of MRSA but a motivation for exaggerated reporting.

However, to group together findings from all newspapers in this way might be considered a generalisation. Tabloid and broadsheet address a socioeconomic divide with the former catering mostly for those in lower socioeconomic groups [32]. In the UK, broadsheet newspapers typically report on politics, world news, economics and similar stories, whereas tabloids rather prefer "lighter" news, focusing more on personal stories, celebrity news, popular entertainment and scandal [33–36]. Tabloids are described as sensationalistic, employing simplistic and "everyday" informal speech while broadsheets adopt a more academic, formal speech. Tabloid reporting style has been criticised for distorting facts and providing an inaccurate picture for readers and tabloid readers have been accused of suffering from media malaise, where a lack of informative discourse limits political knowledge. On the other hand, broadsheet readers are thought to engage more in refined political debate because they are "better educated" and better informed. We imagined tabloid newspapers were more likely to report the problem of antibiotic resistance as external to their readers and a "fault" of others such as government, hospitals, policy makers and the like, with broadsheets on the other hand, providing a more balanced representation.

How do the different genres of newspaper in the UK attribute blame for the problem of antibiotic resistance? We asked this research question since tabloids are read mostly by those in lower socioeconomic groups reported to have the highest antibiotic usage [12]. Could it be that those in lower socioeconomic groups are further disadvantaged by distorted reporting? This is an important question for health professionals such as pharmacists who try to tackle misplaced beliefs in their everyday practice and have been shown to reach people across the socioeconomic divide [37]. The topic is also important for policy makers and we sought specifically to look at newspaper reporting from 2008 onwards, a year that saw the launch of the European Antibiotic Awareness Day. Our research hypothesis was that the genre of newspaper would affect the attribution of blame for antibiotic resistance. We sought to examine through the use of content and discourse analysis the way in which blame for antibiotic resistance was depicted through the use of language because the expression of words can impact on people's sense of power and control [38].

2. Experimental Section

2.1. Design

A two-factor design was used. The independent variable was newspaper genre with the two conditions, tabloid and broadsheet. The dependent variable was the attribution of blame for antibiotic resistance with the two conditions, internal (lay person accountable) or external (outside of lay person's control). Attributions were coded as internal if they blamed the problem of antibiotic resistance on patients' antibiotic use/other related behaviours, travellers, health tourists and any other persons considered "lay" in relation to healthcare. Attributions were coded as external attributions if they blamed the problem of antibiotic resistance on doctors, nurses, hospital managers, cleaners, pharmaceutical companies, and the government. Bacterial mechanisms such as evolution, rapid cell division were also categorized as external.

2.2. Materials

Based on circulation figures [39], the top four UK broadsheets (*The Daily Telegraph; The Independent; The Guardian; The Times*) and the top four UK tabloid newspapers (*The Mirror; The Sun; The Daily Mail; The Daily Express*) were selected for study. A total of 877 articles were first retrieved. Once collected, data was entered onto the SPSS v.15 software [40] for Windows for statistical analysis.

2.3. Procedure

Four researchers (SO, KA, MN and RV) jointly collected, coded and analysed the data. The internet search function available on each newspaper's website was employed for retrieving relevant articles. The European Antibiotic Awareness Day was launched in 2008 and this study was undertaken in Spring 2011. Therefore, newspaper articles were retrieved for the three years since the launch of the EAAD, from Jan 2008 to December 2010 inclusive. The search terms antibiotic resistance, antibiotic use, bacterial resistance, MRSA and superbug were employed consistently through the search exercise. Each article retrieved was read and examined to confirm that it included adequate reference to antibiotics and importantly who was to blame for antibiotic resistance. Articles were excluded if they fell outside of the timeframe, were letters to editors, obituaries and other such items not written by a journalist or contributing author, or mentioned antibiotic resistance only in passing or did not attribute blame for the problem.

To enable coding, the main body of each article was pasted into a separate Word document in no specific order, removing any reference to the newspaper source or genre. Two raters "blinded" to article source then independently coded each article as either internal or external in terms of the attribution of blame for antibiotic resistance. The task of coding was apportioned between the researchers SO, KA, MN and RV. A separate pilot assessed inter-rater reliability resulting in a free-marginal kappa of 0.79, indicating sufficient consistency between the raters. Nonetheless, for the main study, all codes were compared for consistency and where necessary agreement reached through a consensus discussion. Where disagreement remained, the article was excluded from analysis. Once coded, the articles were "un-blinded" to enable compilation of the data into a contingency table.

In addition to examining articles for attribution of blame, we used discourse analysis [41] in an attempt to uncover the way in which central actors or agents had been presented through the use of language, style, structure of speech and writing. The fundamental approach was to consider text not as a means with which ideas were being communicated neutrally or objectively but as an instrument for the social construction of (different versions of) reality. The researchers read and re-read the articles focusing on linguistics, the choice and tone of words, symbolic descriptions, and rhetoric, focusing particularly on the devices used to depict the "perpetrators" (those to blame) and "innocents".

3. Results and Discussion

3.1. Quantitative Analysis

A total of 877 articles were retrieved, 280 met one or more exclusion criteria, therefore a total of 597 articles (307 broadsheet) were included in the analysis (see Table 2). The majority of articles were

written in 2008 (55%), with 25% written in 2009 and 20% written in 2010. *The Daily Mail* (34%) and *The Sun* (32%) accounted for more of the tabloid articles than *The Daily Express* (20%) and *The Mirror* (14%). *The Daily Telegraph* (38%) and *The Guardian* (31%) accounted for more broadsheet articles than *The Times* (21%) and *The Independent* (10%).

Table 2. Contingency table showing attribution of blame and newspaper genre.

	Internal attribution of blame	External attribution of blame	Total
Tabloid newspaper	31	259	290
Broadsheet newspaper	56	251	307
Total	87	510	597

The data were analysed using a chi-square test ($\chi^2 = 6.831$, df = 1, $p = 0.009$, Cramer's V = 0.107). The analysis revealed a statistically significant association so the null hypothesis was rejected in favour of the research hypothesis that there is an association between newspaper genre and attribution of blame for antibiotic resistance. While both newspaper genres blamed antibiotic resistance predominantly on factors external to the lay public, broadsheets were more likely to blame internal factors than tabloids.

3.2. Discourse Analysis

While the ranges of topics covered by broadsheet and tabloid articles were similar, there were distinctions in the reporting styles of these newspapers. The way in which main actors/agents, namely hospitals, healthcare professionals and powerful others, patients and bacteria, were presented by the different newspaper genres is summarised in Table 3. Quotes from newspapers illustrate these themes in Table 4.

Tabloids frequently employed symbolic imagery, with depictions of gross negligence within the "dirty hospital". The mention of "victims" at the mercy of the merciless "powerful others" heightened the role of the reader's (*i.e.*, patient's) insignificance to problem of antibiotic resistance. With broadsheets though, infection control was sometimes discussed as a solution to the problem without an accusatory tone towards the hospital and its workers. Also broadsheets were more impartial compared to tabloids which directly connected hospital managers with increasing antibiotic resistance-related deaths. Both genre of newspapers employed statistics within their headlines to arguably portray a scandal. The use of numbers can suggest an impending epidemic, with the possible result of heightening the reader's perception of their risk.

Importantly, the link between misuse of antibiotics and the occurrence of antibiotic resistance was hardly ever mentioned. The one exception was where "expert" or "world authority" opinions were included, advising prudent antibiotic use by a doctor or another authority:

> *"Always finish your course of medication"* ("Mistakes with medicine you shouldn't make" *Mirror*, 18 August 2008).
>
> *"Keep taking the pills"* (*Mirror*, 1 October 2009).

Table 3. Categorisation of main findings according to newspapers depiction of actors/agents in the discourse.

Depiction of actors/agents	**Tabloid newspapers**	**Broadsheet newspapers**
Hospitals	Symbolic images/metaphors of dirt and filth; use of statistics to emphasize impact of dirty hospitals.	Less provocative, fewer metaphors; attribute blame to hospital (un)cleanliness but can also portray hospitals as actively tackling antibiotic resistance.
Healthcare professionals and powerful others	Convey mistrust of managers–"inept", "nincompoops". Articles invoke sense of injustice from "powerful others" at the expense of patients.	Convey mistrust, but more objective; more implicit that explicit in attributing blame to management and government.
Patients	Portrayed as "victims", suffering and defenceless; Use personal narratives, with children, "war heroes" and the elderly particularly reported.	No personal narratives
Bacteria	Anthropomorphized–"killer bugs", "mega bugs", "unfussy"; use of "warfare" metaphor to evoke fear, e.g., they are "unbeatable" in our battle against them–able to "*wriggle...out of tight spaces...to evade the drugs we bombard them with*". "*unfussy with who they mate with...to strengthen their defences*".	Also used the warfare metaphor. describing a "war against superbugs", heightening the battle against bacteria. Less anthropomorphic otherwise.
Scientists	Fight against bacteria was reported by both genres to be fought by medical authority, scientists in particular. Hopes of scientists close to a "cure" as they "*shed light on how to kill MRSA*" were raised, asking if "*science can save us..?*" Responsibility of halting antibiotic resistance was assigned to the "boffins", the knowledgeable others.	
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Table 4. Quotes from newspapers illustrating the ways in which hospitals, health professionals and powerful others as well as patients were portrayed in tabloid and broadsheet newspaper genres.

Depiction of actors/agents	Tabloid newspapers	Broadsheet newspapers
Hospitals	"*...Dirty mops...next to a filthy food trolley*" ("National Filth Service: Report reveals wards overrun with rats" *Daily Mail*. 6 August 2008). "*...dust and dirt everywhere*" ("Superbug in a filthy hospital killed our lovely girl". *Daily Express*. 17 May 2008). "*Viewpoint: How dare we let these dirty hospitals kill 8,000 a year?*" (*Daily Mail*, 17 June 2008).	"*Initiatives such as the "deep clean"...have had the desired effect*" ("MRSA rates fall–but other superbugs increase". *The Times*. 18 July 2008). "*Comprehensive infection control advice... provided...*" ("A new superbug found in Britain is a major concern". *The Daily Telegraph*. 8 August 2009).
Healthcare professionals and powerful others	"*...justice laughs in the face of the victims as it rewards those who least deserve it*" ("A sickening injustice". *Daily Mail*. 24 June 2010). "*criminal negligence...dangerous nincompoops*" ("Op (sic.) went well...pity patient is in morgue". *Daily Express*. 10 February 2008).	"*no evidence that the (MRSA) deaths amounted to manslaughter*" ("Superbug hospital escapes criminal charges". *The Guardian*, 30 July 2008). "Doctors under fire: Handing out antibiotics like Smarties?" ("Briefing: Antibiotic resistance". *The Times*, 20 November 2008).
Patients	"Patients had to drink from flower vases" ("Scandal-hit Stafford Hospital "covered up" 13 new superbug cases". *The Mirror*, 1 May 2009). "*...patients...unwashed for...a MONTH by uncaring nurses...*" ("Fury over report into NHS horror", *The Sun*, 25 February 2010). "*...ninety-year old...so frail...absolutely distraught*" ("Superbug horror for pensioner". *The Mirror*, 24 February, 2009).	No personal narratives.

3.3. Discussion

In the UK, both newspaper genres blamed antibiotic resistance predominantly on factors external to the lay public but broadsheet newspapers were more likely to acknowledge internal factors compared to tabloids. Importantly, on the whole, both genres of newspapers hardly ever explained the relation between antibiotics misuse and antibiotic resistance. There was a difference in the way tabloids and broadsheets depicted the problem, with tabloids more likely to portray a defenceless public falling victim to external factors outside of their control. Using symbolic imagery to paint suffering, tabloids were inclined to highlight ineptitude in health professionals, victimising patients by stressing their defencelessness. Resistant bacteria were portrayed as invincible. Broadsheets were less critical of the health professions and used more sophisticated, less emotive language, backed up by more in-depth factual content. Both genre of newspaper used statistics to conjure up an impending epidemic. In a small number of instances doctors writing gave advice about appropriate antibiotic use.

Easton *et al.* [16] found the public were aware of MRSA but lacked knowledge about it. When Washer *et al.* [42] examined the social representation of MRSA, they too found a strong tendency for blame to be apportioned to "the other" with sensationalist coverage conjuring an image of doom, while hospital staff's incompetence helped spread a condition that would mark the end of a "golden age of medicine". Before the relationship between germ and disease was established scientifically in the 19th century, the mechanism for transmission of diseases was unclear. When Washer *et al.* [22] compared people's beliefs with newspaper stories, they found stories about dirty and badly managed hospitals and the management culture of the NHS resonated well with the general public indicating a pre-scientific understanding of germs, contagion and blame. Brooks *et al.* [3] found the causes of, and responsibility for, antibiotic resistance were attributed to external rather than personal factors with patients perceiving that solutions were outside of their control. The results here provide further support in relation to the social representation of antibiotic resistance in UK newspapers and its potential impact on the public's perception of blame and control. In addition, our results highlight a difference between the two different genres of newspaper, which suggests those in lower socioeconomic groups reading tabloids are more likely to be presented with inaccurate explanations about the spread of antibiotic resistance.

To the authors' knowledge there is yet no published study using attribution of blame to examine modern-day differences in portrayals of antibiotic resistance across different newspaper genres. We found the predominant message being delivered to the public via newspapers at odds with the aims of the European Antibiotic Awareness Day campaign which attempts to inculcate a sense of personal control over the issue of antibiotic resistance. The findings could mean that tabloid readers may not only come to believe that they have no control over the issue of resistance, but also feel victimised as a community for the "mistakes" of powerful others consequently, re-iterating blame onto doctors, cleaners, the government and the like. Creating misconceptions and sensationalism appeared to take precedence over unambiguous health messages in tabloid newspapers. Because higher levels of antibiotic prescribing occur in practices serving more deprived communities [12], it is thought-provoking that the different newspaper genres might be encouraging health inequalities in their readership through their misaligned coverage of causal attribution and knowledge about antibiotic resistance.

This study focussed on the top 8 newspapers in the UK. Most of the existing research on antibiotic resistance and its representation in the British media has also focused solely on MRSA yet there are other resistant strains of bacteria that perhaps the public need to be made aware of in order to broaden their knowledge of antibiotic resistance. Future studies could specifically investigate the portrayal of resistant bacteria other than MRSA in the print and other media. Future studies could investigate how knowledge of the attributions of blame regarding antibiotic resistance projected by the media in different socioeconomic groups can help shape and further refine material for more tailored public awareness campaigns.

There are implications for practice in terms of public health and pharmacy. First, policy makers should take note of the potent power of tabloid media in particular and the fact that health campaigns could well be undermined by public opinion shaped by the everyday representations of antibiotic resistance as outside of people's control. Second, while also taking note of underlying differences in people's knowledge base, health professionals such as pharmacist should take special care to explain the importance of appropriate use, as a real means with which patients, especially those from lower

socioeconomic classes can help restrain the problem of antibiotic resistance. Perhaps even, health professionals and others could try to work with newspapers to influence reporting.

4. Conclusions

In conclusion, the results of the study reported here offer support for a theory linking newspaper genre with attribution of blame for antibiotic resistance. Future research conducted in this area could verify the findings in other countries and offer better ways of integrating the message from European Antibiotic Awareness Day within the printed press.

Conflicts of Interest

The authors declare no conflict of interest.

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