

Evidence from the Science Media Centre to the Leveson Inquiry

1. Introduction

Science is at the heart of almost all the major challenges we face – how to treat incurable diseases that still lay waste to so many lives, how to feed the growing population, how to tackle climate change. Despite the rapid rise of new media, surveys continue to show that the public get most of their information about science from the mass media including daily newspapers.¹ Scientists now take it for granted that every week the media will convey the news that they have identified a new gene, or discovered a new drug, or engineered a new means of adapting to climate change. Much of the coverage is accurate and balanced and the scientific community owes a huge debt to the skill and dedication of the excellent specialist science, health and environment journalists employed by every national newspaper.

Scientists have also played their part in improving the media coverage of science. The past 10 years have seen more and more researchers emerging from their ivory towers and entering the media fray. The Science Media Centre's philosophy that *The media will 'do' science better when scientists 'do' media better* has been embraced by many researchers who now roll their sleeves up and play the media game rather than shouting from the sidelines.

However, the Science Media Centre and the scientific community warmly welcomes the opportunity provided by the Leveson Inquiry to take a step back and reflect on the role of newspapers in reporting science. The potential of the media to influence and inform the public on science comes with a huge responsibility. When the media gets it wrong the impact is devastating and causes real harm to individuals and society. The furore over the measles, mumps and rubella (MMR) vaccine, which started in 1998 after a rogue doctor claimed a link between the vaccine and autism, is the best known example of how poor media reporting can cause harm. Vaccination rates before the story stood at about 92% but dropped down to 80% after the scare, and it has taken close to 15 years to get over the damage. Cases of measles in England and Wales rose from 56 in 1998 to 1,370 in 2008.²

While the media was not solely responsible for the MMR scare and lessons have been learned by all concerned, some of the underlying values still remain in parts of our newsrooms – the appetite for a great scare story, the desire to overstate a claim made by one expert in a single small study, the reluctance to put one alarming piece of research into its wider more reassuring context, 'journalistic balance' which conveys a scientific divide where there is none, the love of the maverick, and so on. The points and examples summarised in this submission will highlight the ways in which the culture, practices and ethics operating in newsrooms could change to ensure that the UK does not face another MMR. The SMC does not believe that science reporting should be treated as a special case, but we do

¹ BIS Public Attitudes to Science 2011 – <http://www.bis.gov.uk/policies/science/science-and-society/public-attitudes-to-science-2011>

² Figures from the Health Protection Agency - <http://tinyurl.com/5uyldc>

believe that many science stories are of such great public interest that the highest standards of journalism need to be applied.

This evidence comes from the Science Media Centre (SMC)³, an independent press office for science established by the scientific community in the wake of media frenzies over BSE, MMR and GM crops, and in response to recommendations in the House of Lords Science and Technology Select Committee's 2000 report on science in society.⁴ Like everything we do, it is a collaboration between the staff at the SMC and the many scientists, science press officers and science journalists that we work alongside.

2. The Issues

Getting the basics right

If you put the best scientists, science communicators and science journalists in a room it would not take long for them to agree a tick list of the basic ingredients of good science reporting – especially on health stories.

The tick list would look something like this. All science news reports should:-

- Include the sample size and highlight where this may be too small to draw general conclusions;
- Ensure that any increase in risk is reported in absolute terms as well as percentages; for example, a '50% increase in risk or a 'doubling of risk' could merely mean an increase from 1 in 1000 to 1.5 or 2 in 1000;
- Provide a realistic time frame for the research translating into a treatment or cure;
- Include the wider context – what type of study is it (e.g. observational study or meta-analysis)? Is this the first study to find something shocking? In which case it is very preliminary – or the 50th study which shows the same thing, in which case we are justifiably alarmed;
- Include information about where the study has come from – for example a conference lecture, an interview with a scientist or a study in a peer reviewed journal;
- Emphasise what stage the research findings are at; if it is a small study only done in mice it is just the beginning – if it's a huge clinical trial involving thousands of humans it is more significant.

Former science reporter Gary Schwitzer has come up with seven words you should never use in medical news reporting: **Cure, Miracle, Breakthrough, Promising, Dramatic, Hope, Victim**. This is probably overly idealistic as many of these words are what draw readers to medical stories in the first place;

³ <http://www.sciencemediacentre.org>

⁴ Available at <http://www.publications.parliament.uk/pa/ld199900/ldselect/ldsctech/38/3801.htm>

however Schwitzer's article is worth reading as a summary of where many science stories mislead readers.⁵

Previous attempts at drafting guidelines for science reporting have failed miserably because they have come from the scientific community and looked like instructions handed out by the scientific priesthood. But the SMC knows that many science reporters favour the idea of some sort of very basic guidelines. We believe these could be drafted by specialist journalists themselves and could be incredibly useful for newly appointed science journalists, general news reporters and editors. The Inquiry could recommend that media organisations could sign up to such guidelines and that they could be used by a newly-strengthened Press Complaints Commission (or its replacement) when adjudicating on complaints.

Headlines

One of the greatest complaints about newspaper coverage from scientists is the tendency to put sensational, misleading and sometimes downright inaccurate headlines on top of good news reports. This is a major problem in newsrooms where specialist science reporters file their copy and leave for the day only to see their carefully crafted story in the paper the next morning under a totally misleading headline. There is no mystery as to how this happens. Busy sub-editors with no specialist knowledge read the first few lines of a complex and sensitive science story and come up with a bold headline that attracts readers' attention. Writing headlines is a real skill and scientists are often grateful when a great headline attracts readers to their story. But on important public health issues misleading and inaccurate headlines can be dangerous. Evidence from Cancer Research UK suggests that busy staff can spend considerable time trying to manage the distress and anxiety caused to patients and their families by misleading headlines. They also make the point that in the days of new media it is often only the headline that gets pushed out to social media platforms like Twitter, where the resulting 'echo chamber' can further amplify misunderstanding.

While the SMC has always cautioned scientists to accept that there is little we can do to change this, the Leveson Inquiry gives us an opportunity to question this system. We would point to the Guardian newspaper, which has recently appointed the first ever news editor and three sub-editors with specialisms in science and environment. To our knowledge this is the first newspaper to have done this, and we would encourage the Inquiry to consider recommending that other papers follow suit.

While professional training of journalists has been squeezed by the financial crisis effecting the press, most journalists still undergo some training. But the basics of good science and health reporting never feature. Although independent projects such as the National Coordinator for Science Training for Journalists have emerged to deliver this type of training to journalism students, trainees, general news reporters and editors, long term change can only be enacted by accreditation bodies implementing a higher standard of basic science and numeracy in their core curriculum. We would like to see the

⁵ <http://www.healthnewsreview.org/toolkit/tips-for-understanding-studies/7-words-and-more-you-shouldnt-use-in-medical-news/>

Inquiry recommending that this basic science training be offered as a matter of course as part of the overall training of journalists.

Taking the extremes

Another bug-bear of scientists is the media's tendency to emphasise the most alarming figures in a given study. Many areas of scientific research are based on sophisticated models which show the possible spread of infectious diseases or the extent of increase of global warming. However, these models are complex and show a range of possibilities and probabilities which need to be carefully communicated to the public. Once again, the SMC has always understood the pressures to come up with a strong line – what self-respecting journalist will opt for a lower number when there are more alarming numbers available? However, the SMC feels that journalists do need to take care when reporting these kinds of stories. The public are ill-served by a media that emphasizes the most alarming figures when the scientists are saying that these are the least likely scenario.

The former Chief Medical Officer Liam Donaldson was lambasted by the media for claiming that 65,000 people in the UK would die during the swine flu outbreak of 2009, whereas the final figure for deaths was in fact 474.⁶ However, the media that criticised the CMO was the same media that splashed the 65,000 figure in the headlines in spite of the fact that Donaldson had emphasized that this was the worst case scenario and not a definitive figure. Similarly when a *Nature* paper modelling climate change projected warming between 2 degrees and 11 degrees, almost all the newspapers carried the latter figure in their headlines, with one tabloid splashing a huge 11 degrees on the front page alongside an apocalyptic image. This in spite of the fact that the researchers speaking at the SMC press briefing to launch the paper had all emphasised that the vast majority of models showed warming around 2 degrees. Ironically, a Radio 4 programme several years later used the story as an example of scientists exaggerating the case for climate change.

When considering ethics and values it is also important to consider the impact of these stories on readers. The SMC recently advised scientists publicising a new study on misdiagnosed miscarriages to resist giving journalists a figure because their numbers were uncertain. Frustrated by the uncertainty around the story, journalists selected a number from the study and several newspapers ran shocking headlines such as 'A baby a day dies through test error.' The impact of this distressing story on parents who have lost a baby was already great without using uncertain numbers to exaggerate the shock value (see Case Studies).

Extraordinary claims need extraordinary evidence.

A few years ago the newspapers' front pages ran a series of dramatic headlines claiming that the first human clone had been born. The claims came from maverick scientists operating outside the scientific

⁶ Figure according to the Health Protection Agency

mainstream, and in one case from a little known US sect called the Raelians. Of course the first human clone was not born, and the stories should never have hit the headlines when there was no evidence whatsoever that this extraordinary claim was the truth.

If the media were to decide to hold back from reporting extraordinary claims until they found extraordinary evidence we would have a very different media landscape for science. Gone would be all those stories about finding 'the cure for' or the 'cause of' our most common diseases. And of course we would never have had a massive scare over a safe vaccine based on a small single study not replicated anywhere else in the world. While the cloning and MMR stories are several years old, the SMC sees stories like this every day.

We are not proposing that the media ignore extraordinary stories but that they treat them with extra caution and demand at least some strong evidence before going to print. This may simply mean putting these stories further inside the paper rather than splashing on the front page, including the voices of third party experts casting doubt on the findings, and following up these stories with equally significant coverage if the claims are refuted.

Stories that turn out not to be true

It was not just the human cloning and MMR stories that turned out not to be true. At the height of the media frenzy over the obesity 'epidemic' a few years ago several newspapers splashed on a report from a House of Commons committee claiming that a small child had been effectively fed to death. The child's parents woke up to see this accusation in the media, and the child's clinician contacted the SMC to inform us that the child had a genetic defect and that the story was not true. To the credit of the *Daily Mail* and other papers, this is one of the few cases where the follow-up story was as big as the original, under headlines such as 'A Big Fat Lie'. However, in our view the allegation that parents are now feeding their children to death was so extraordinary as to demand more thorough investigation and reporting in the first place.

More recently the UK's newspapers all gave headlines to a study published in *Science* showing that over 60% of patients with chronic fatigue syndrome (CFS) had tested positive for a virus that had first been linked with prostate cancer. The findings were very surprising and gave fresh hope of a new treatment for those CFS patients who have long been waiting for medical science to find the cause for their debilitating illness. But there was a problem. Successive attempts by research groups around the world to replicate the findings failed, and in the end the research has been discredited amidst claims of contamination. Obviously the media were justified in writing up this interesting new study when it was published, and indeed a virus may one day be found to be the cause of CFS, but the fact that these results were so surprising and had not been replicated by any other group meant that papers should have reported the findings more cautiously than some of them did. As is so often the case, the studies that failed to replicate the surprising findings got much less coverage than the original story.

One commentator has suggested that all journalists using the word 'cure' or 'breakthrough' should agree to publish a long-term follow-up – a 'batting average' – of how many 'breakthroughs' actually panned out. It would be an interesting experiment!

Getting the balance right

Much has been written elsewhere about why the principle of journalistic balance is problematic for science reporting.⁷ Proof of this came in an ESRC study in 2003 which showed that two thirds of the British public thought that scientists were divided on the safety of MMR.⁸ The truth of course was that the 99.9% of scientists who believed the vaccine was safe were pitted against one doctor and his small but vociferous group of supporters. The real balance of this debate was completely lost because editors demanded that every comment from an expert be 'balanced' by a quote from Wakefield's supporters. This issue has impacted on many other important science stories including climate change, GM crops, etc. where the fact that the weight of scientific evidence lies firmly on one side has often been obscured by an obsession with including 'both sides' of the story.⁹

The SMC is not interested in closing down debate or censoring minority voices, but we applaud the many specialist reporters who have fought to ensure that their coverage of these controversies always makes clear where the weight of scientific evidence lies.

Inconvenient truths

There are some stories that have become so politicised and polarised that accuracy is sacrificed in favour of taking an editorial line. This was certainly the case with the early coverage of GM crops in 1999, when newspapers openly campaigned against the introduction of this new technology and rarely allowed the scientific facts to get in the way of their story. More recently we see this particular trend in the coverage of climate change, with some newspapers with a more sceptical approach often playing fast and loose with the facts in their desire to discredit the scientific consensus. We believe there may well be examples of these papers breaching the accuracy clause of the PCC code by misrepresenting scientific evidence with stories like the this piece: '100 reasons why global warming is natural.'¹⁰

⁷ See blog on the BBC College of Journalism website on the subject - <http://tinyurl.com/btl2ue5>

⁸ 'Towards a better map: Science, the public and the media' (2003) – available at http://www.cardiff.ac.uk/jomec/resources/Mapdocfinal_tcm6-5505.pdf

⁹ There is much more on this in Steve Jones' report for the BBC Trust - http://www.bbc.co.uk/bbctrust/our_work/other/science_impartiality.shtml

¹⁰ <http://www.express.co.uk/posts/view/146139/100-reasons-why-global-warming-is-natural>

Equally however there have also been examples of what the Institute for Public Policy Research (IPPR) described as 'climate porn'¹¹ with newspapers choosing apocalyptic headlines and images which exaggerate the extent of warming. Despite the furore over exaggerated claims in previous IPCC reports, not one newspaper reporting the recent *Times Atlas* claims of a 15% reduction in arctic ice questioned this exaggerated figure. It was left to glaciologists speaking via the SMC to let the media know that the figure was completely wrong.

There are other examples of campaigning newspapers loath to let the scientific facts get in the way of a good story. When the SMC brought together an excellent panel of scientists and engineers to explain the science of the next generation of energy saving lightbulbs, the newspapers that had been campaigning against energy saving lightbulbs managed to deliver a scare story where other papers reported an exciting new technology. This is the reality of campaigning newspapers and we understand that. But it's hard to accept when you see some papers including multiple factual inaccuracies in their determination to squeeze the story into their narrative.

The SMC welcomes vigorous and robust debate on scientific controversies like climate change, but the truth must not be the first casualty of these debates. If we accept the predictions of mainstream climate scientists this issue is clearly one where the public interest is served by the highest standards of accuracy.

Columnists

Almost all the scientists we spoke to about this evidence raised the issue of columnists. While most of the media attempt to get things right, columnists it seems are under no such obligation and there are many, many examples of strong opinion pieces based on grossly inaccurate science. At the SMC we think it is healthy for opinionated columnists to challenge science and scientists in vigorous terms but we feel that they should not be free from the general expectations of truth telling and accuracy that govern the rest of journalism.

Damage to reputation & personal lives

The Leveson Inquiry has heard much from big names whose reputation has been damaged by inaccurate reporting. But this problem does not just affect celebrities. While it is thankfully rare, there are scientists who have suffered serious damage to their scientific standing after being misrepresented in the press. A recent article referred to an example of how the media completely distorted a piece of neuroscience to fit in with a pre-determined editorial narrative on the recent riots.¹²

¹¹ 'Warm Words: How are we telling the climate story and can we tell it better?' (2006) - available at <http://www.ippr.org/publications/55/1529/warm-wordshow-are-we-telling-the-climate-story-and-can-we-tell-it-better>

¹² Published on the Guardian science blog - <http://gu.com/p/3xccn>

There is also the case of Professor Phil Jones from the University of East Anglia who was widely accused by the media of fraudulently doctoring data to mislead the public and policy makers about climate change. Even after four independent inquiries cleared Professor Jones of any scientific malpractice some journalists continue to make the same false allegations (see separate submission from UEA). The SMC recommends that Phil Jones be called to the Inquiry to provide evidence. His evidence would be every bit as harrowing as that given by many of those in the media spotlight and would serve as a reminder that scientists are human beings and can also suffer enormously.

In another case that has more in common with the treatment of Hollywood actors than academic scientists, the SMC helped Professor David Nutt to make a complaint to the Press Complaints Commission. Professor Nutt made the headlines after being sacked by the Home Secretary from his role as chair of the Advisory Council on the Misuse of Drugs after speaking out on a study that conflicted with government drugs policy. However, his complaint to the PCC involved articles in various tabloid newspapers which revealed personal details about his three teenage children taken from their Facebook pages.

Better system of redress

The SMC feels that the system of redress for scientists who are misrepresented is currently inadequate. Firstly, we feel it is wrong that the only person who can bring a complaint is an individual scientist involved in the story. We think this is completely wrongheaded and allows newspapers to get away with gross inaccuracy. We recommend that the PCC immediately change the rule that states that only the individual scientist named in the story can complain about an inaccurate article.

It's also the case that even when an individual scientist is willing to tackle an inaccurate report it can be a long hard struggle to get a correction. The example of Simon Lewis reported here is one which demonstrates how hard it is, although the Sunday Times did publish an apology in the end.¹³

We feel that scientists who have been misrepresented, or the organisation representing them, should have the right to reply where possible, and if not should have easier redress to a strengthened PCC.

The role of the specialist science journalist

The good news about science reporting in the UK's main newspapers is that they all employ specialist science reporters. I have referred to them as science reporters throughout this evidence but in fact it's even better than that. Many newspapers employ dedicated science, health and environment reporters. And this is not just the broadsheets. *The Sun* has a health editor and an environment editor. The *Mirror* has a science editor as well as a health editor, and the *Daily Mail* has four dedicated specialists covering

¹³ See <http://gu.com/p/2hzk2>

science, health and environment.¹⁴ These specialists are a dedicated and skilful group of journalists that the UK should be proud of. Despite the pressures of the newsroom and newspapers' editorial lines, these specialists take pride and responsibility in getting science stories right. However, not all editors make the best use of this vast resource. While some newspapers defer to their specialists on the quality of stories crossing the news desk, others ignore the advice of specialists in favour of running weak or sensational stories. One of the best things the Leveson Inquiry could do to improve science reporting would be to urge newsrooms to protect their specialist science reporters from any job cuts and defer more to them about which stories to run and how to run them.

3. Recommendations for change

The Science Media Centre calls on the Leveson Inquiry to consider the following recommendations:-

- New guidelines for the reporting of science – these guidelines would be drawn up by science journalists and used primarily by news editors and general reporters. They could also be used by a newly strengthened PCC to help adjudicate on complaints;
- Encourage newspapers to appoint at least one news editor and sub editor with a background in science reporting;
- Encourage newspapers to ensure that all science stories are checked by specialist science reporters and that news editors defer to their specialists' judgment on the quality or otherwise of science stories;
- Headlines on important public health stories should be agreed by the relevant science reporter;
- Basic science training should be offered as a matter of course as part of the overall training of journalists;
- Scientists and organisations representing them who have been misrepresented should have a right to reply;
- Corrections of serious inaccuracies should be as prominent as the original story, including in how they are promoted (e.g. via social media);
- The PCC must immediately change the rule that states that only an individual scientist can complain about an inaccurate story. The scientific community must be able to make complaints about inaccurate articles which damage the public interest.

¹⁴ 'Mapping the Field: Specialist science news journalism in the UK national media' (2003) - <http://tinyurl.com/yzdrdz7>

4. Case studies

The SMC has hundreds of case studies of science stories that could have been reported better. Here we highlight just a tiny selection which we feel demonstrate the distress and harm that can result from poor reporting on science issues. The Centre would be delighted to provide further case studies if the Inquiry feels that would be of use.

Stillbirth and sleep position

In June 2011 the *British Medical Journal* published a study that looked for associations between women's sleeping habits and their risk of stillbirth. One of several links that it uncovered was with sleep position: the prevalence of stillbirth, while low in all cases (~3 in 1000 overall), was lower in women who slept on their left hand side (~2 in 1000) than those who slept on their back or on their right (~4 in 1000). The results were interesting but preliminary. An accompanying editorial in the *BMJ* made it clear that this was a 'hypothesis-generating' study, rather than one which could reliably test whether sleep position actually affects stillbirth. The study's own authors, as well as the *BMJ* editorial, the journal's own press release and a set of expert comments released by the SMC *all* stated clearly that this was not sufficient evidence to provide any new health advice to pregnant women.

However, the headlines that followed on 15th June are a clear example of how the drive of the news agenda and subeditors to make a story as 'big' as possible can lead to science being misrepresented: 'Sleeping on left cuts stillbirths: New advice for mums-to-be' (*Mirror*); 'Sleep on your left to avoid stillbirth' (*Sun*); 'Sleeping on your right side "could put your unborn baby at risk"' (*Mail*). To frame this story as one that should change behaviour was irresponsible and contradicted all of the supporting material – and imagine its effect on women who had recently experienced a stillbirth. As the charity Sands said in a statement issued in an attempt to deal with the fallout, "Unfortunately there will be many bereaved mums wondering unnecessarily if they did something wrong." ¹⁵

New research on the misdiagnosis of miscarriages

The SMC was approached by several press officers and scientists about the upcoming publication of new research into the diagnosis of miscarriage. They approached us for help because their collection of studies was extremely controversial and on a very sensitive issue. Their main finding was that variations in the way that miscarriages in the early stages of pregnancy are diagnosed mean it is *possible* that viable pregnancies *might* be terminated. However, in England at least, there are no data on the actual number of viable pregnancies that have been incorrectly terminated (if any at all) and, concerned to not create a scare story, the scientists did not want to give the news media a definitive number for something for which they didn't have definitive evidence.

¹⁵ Statement available on the Sands website: <http://tinyurl.com/6b8fq3>

During an hour-long press briefing for the science and health correspondents from the national news outlets, the scientists provided the journalists with as much information as possible and ensure this important story was covered as accurately as possible. However, during the briefing, several journalists looking for a number to put to the story picked out a single sentence from one of the four studies, and decided to make this the top line: "Applying a cut-off for MSD of 20 mm could lead to 400 viable pregnancies potentially being misclassified".

Despite the researchers clearly repeating to journalists they did not have a definitive number for how many pregnancies had actually been misclassified, and despite the fact this selected sentence contained only one number of countless other possibilities from the four studies, many news outlets ran with headlines like 'A baby a day dies through test 'Hundreds of healthy babies aborted every year in miscarriage test errors', 'Healthy babies lost to "false miscarriages"', and 'Fears hundreds of healthy babies are being aborted every year simply because of scan blunders'. Stories were accompanied by images of very late-stage pregnancy scans, when the research was clearly about early stage miscarriages at 5-7 weeks, when the foetus is usually less than 2cm in size and difficult to see. It was also interesting to see the way that broadcast outlets picked the story up from the print press; the SMC even had a call from one outlet wanting to follow up on "the story of doctors killing babies". This research was extremely controversial and was always going to raise emotions given the subject matter, but the manner in which it was covered in the news reflected neither the careful way in which it had been presented nor indeed its main findings, and the coverage surely gave the public – including many women either pregnant or who had recently miscarried – a very misleading and upsetting scare story.

Pill scare

In 1995, the media widely reported advice from Committee on the Safety of Medicines (CSM) that third generation contraceptive pills containing oestrogen and either gestodene or desogestrel were associated with a higher risk of blood clots. The result was that thousands of women came off the pill, with significant public health costs resulting from the increase in pregnancies and abortions.¹⁶ Other analyses showed very high changes in the type of contraceptive pill used in the immediate six months after the scare, which if not done correctly can result in unintended pregnancy.¹⁷ In fact, as the then Chief Medical Officer, Kenneth Calman noted in his annual report on public health the following year, the increased risk of blood clots from the new pills was raised only from 15 to 30 per 100,000 women, and that more responsible reporting of the story could have made a big difference.

Rapamycin linked to longer lifespan

In 2009 a paper in *Nature* reported that rapamycin, a drug discovered in the soil of a South Pacific island in the 1970s, may have the effect of extending lifespan when given to mice. In a comment issued

¹⁶ Summarised by Ann Furedi in this paper: <http://tinyurl.com/cr9c5mp>

¹⁷ Summarised in this paper: <http://tinyurl.com/dxaq76z>

through the SMC Dr Lynne Cox, a researcher in ageing at the University of Oxford, stated that: "This is a very exciting study where a single drug with a known cellular effect increases the life expectancy and lifespan of mice." However she went on to say that: "In no way should anyone consider using this particular drug to try to extend their own lifespan as rapamycin suppresses immunity. While the lab mice were protected from infection, that's simply impossible in the human population."

However, the media widely reported the finding as the discovery of a drug to extend lifespan, with headlines including "Scientists discover Easter Island 'fountain of youth' drug that can extend life by ten years", "Easter Island drug 'adds decade to life'" and "New pill can add decades to life", with many of the caveats hidden much further down in the stories.

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