

RECIPES
Precaution • Innovation • Science

Media coverage and public debate on the precautionary principle and the 'innovation principle'

UK / The Guardian



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1 Introduction

The media – old and new – play an important role in political and societal discussions. They report on the political debate, reflecting it, and offer a platform for the societal debate. Opinion pages in newspapers aim to present a wide spectrum of different stimulating societal opinions, thus fostering the societal debate and clarifying differences of opinion.

But the media also inform the political debate. News reports can trigger parliamentarians to pose questions to the minister in charge or place topics on the political agenda. In a more indirect manner, media attention can put pressure on politicians to place topics on the agenda through grassroots support. The media reflects not only on the political and societal debate, but also influences it to a degree.

With regards to the precautionary principle, innovation, and the case studies covered in the RECIPES project, a media analysis provides an avenue for understanding the public discourses surrounding the topic. In particular, this report forms one of three reports for the media analysis in *WP1, Task 1.3: Public discourse of the precautionary principle, controversies and interests*. In this task we investigate spokespersons and arguments on the PP in selected newspapers, providing insights into how the PP has been framed in public debate and how/if this has changed since 2000.

Media analysis can answer the following questions: How do the media frame the public discussion of an issue? Who are the main spokespeople on a particular topic, and how are they being quoted or cited? How often are various spokespeople quoted and in what context? What topics are being covered? Is the topic front-page news, and if not, where in the paper is the topic covered? Which reporters are writing on this issue? What messages are being used, and by who?

A few limitations of such a media analysis can be pointed out: 1) When an issue becomes a 'public' discussion is not the same thing as when it becomes a pressing issue, and the one shouldn't be confused for the other. This means that when issues actually show up in the media, and if they do at all, is not the conclusive statement on whether the issue is important and relevant, or even if it is part of the public debate taking place in other spaces (online, at the NGO level, in other forms of public discourse); 2) Much of the analysis is subjective – we need to assess and decide which messages are being employed and how – and this is inherently subjective. Nonetheless, the media analysis carried out here is one valuable way to try to figure out how the print media is potentially shaping and driving public interest and knowledge on particular topics.

This report will analyse how the one influential UK newspaper, the Guardian, has reported about the precautionary principle, innovation, and the RECIPES case study topics, in the period from 2000 to 2018. The full list of analysed newspapers is displayed in table 1:

Table 1 - Selected News outlets

Newspapers	Language / Nation	Partner
Le Monde	French / France	UM
The Guardian	English / UK	UiB
Süddeutsche Zeitung	German / Germany	IASS

These newspapers were selected for their quality of journalism and influence on their respective countries and beyond.

2 Methodology

Below you will find a brief description on the methodology of the media analysis task. A more in-depth description of each how the analysis was performed in each sub-section will be explained within the subsection.

In short, the media analysis methodology consists of both quantitative and qualitative components. The quantitative component consists of various metrics drawn from the meta-data of relevant articles. This includes charting historical hot spots for published articles related to PP and IP and looking into the reason for the spikes, as well as counting and outlining which sections the articles appeared in, article types, the topics being covered in the article, and so on.

The qualitative analysis consists of an in-depth, subjective content analysis where we read and coded the newspaper relevant articles according a framework loosely inspired by qualitative discourse analysis procedures. With these procedures, we identified the general positive/negative stance of the article with respect to the PP, which spokespersons that were quoted and what kinds of arguments on the PP that the articles provided. Further, we looked closer at how the application of the PP was portrayed in particular reporting on some selected cases This data is presented in a variety of overall summaries and by deep-diving into specific case study topics.

2.1 Search terms

The first step in crafting our media analysis methodology was to develop relevant search terms to identify the articles initially. The primary search terms used were “precautionary principle” and “innovation principle”. To obtain the articles, the appropriate search terms are entered into electronic databases, usually Dow Jones/Factiva and the Lexis Nexis search engine. (More information on these databases can be found at www.factiva.com and www.nexis.com). Articles receiving a hit for either of these terms formed the pool of articles to be analysed.

Table 2 - Primary search terms

Search term	Labels
Precautionary principle	Principle of precaution, Precautionary approach
Innovation principle	Principle of innovation

In addition to the primary search terms, a secondary list of search terms was created to search within the pool of selected articles, in order to identify important topics.

Table 3 - Secondary search terms

Search term	Labels
Genetically Modified Organism	GMO, Monsanto, Bayer, MON810
CRISPR	Gene editing, Gene editing techniques, Human Genome Editing
Trade agreements	Comprehensive Economic and Trade Agreement, EU-CAN treaty, CETA, Transatlantic Trade and Investment Partnership, TTIP, hormone meat
Pesticides	Neonicotinoids, DBCP, insecticides, Glyphosate
Chemical industry	PCB’s, DDT, Chemical substances
Endocrine disruptors	Bisphenol A/BPA, phthalates
Nanotechnology	Nano medicine, nanomaterial, nanorobots, nano-cure
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
Financial risks	municipal bankruptcy
Farmers	farm industry, agroindustry
Risk management	Technological Risks, Socio-technical risk assessment, risk reduction measures, Risk research in innovation
<i>EU</i>	European Union, EU court of Justice, EU commission
World Health Organization	WHO

2.2 Number of identified articles

The present report describes how the Guardian has reported about the topic in the last ten years. This comprises the period from 2000 up to 2018. To obtain the articles, the “Innovation Principle” (IP) and the “Precautionary Principle” (PP) and PP search terms were entered into the Lexis Nexis search engine. For the Guardian, there were no hits for the IP. Therefore, the analysis is based on the 199 articles that emerged with the PP search term.

The below table shows the respective number of articles analysed in The Guardian, Le Monde and Süddeutsche Zeitung.

Table 4 - Number of identified articles

Newspapers	Number of articles analysed
Le Monde	210
The Guardian	198
Süddeutsche Zeitung	130

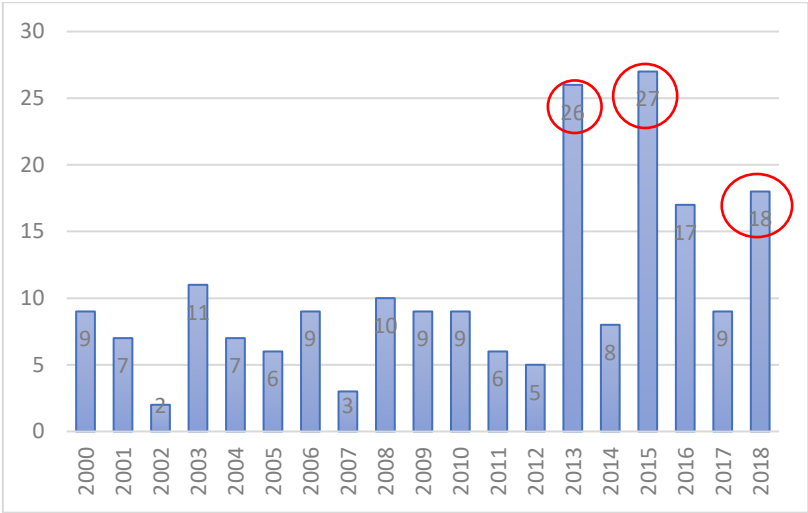
3 Analysis – The Guardian

3.1 Historical hotspots

In the time period 2000- 2018, nexis lexis found 198 articles mentioning the “Precautionary Principle” published in The Guardian. Interestingly, we found no articles that mentioned the “Innovation Principle” in the same period.

The figure below shows that the PP was mentioned occasionally from 2000-2012, with a small peak in 2003. The first major peak appears in 2013 with 26 articles, followed by another peak in 2015.

Figure 1 - Number of articles that appeared in The Guardian on the PP



Looking into the articles, it seems that the peaks are related to the following international political proceedings:

- The G8 discussions in 2000
- International trade negotiations (e.g. between US and EU (over GM food import) 2003

- EU debates on banning neonicotinoids in 2013
- TIPP and trade debates between US and EU in 2015
- Brexit and post-Brexit in 2018

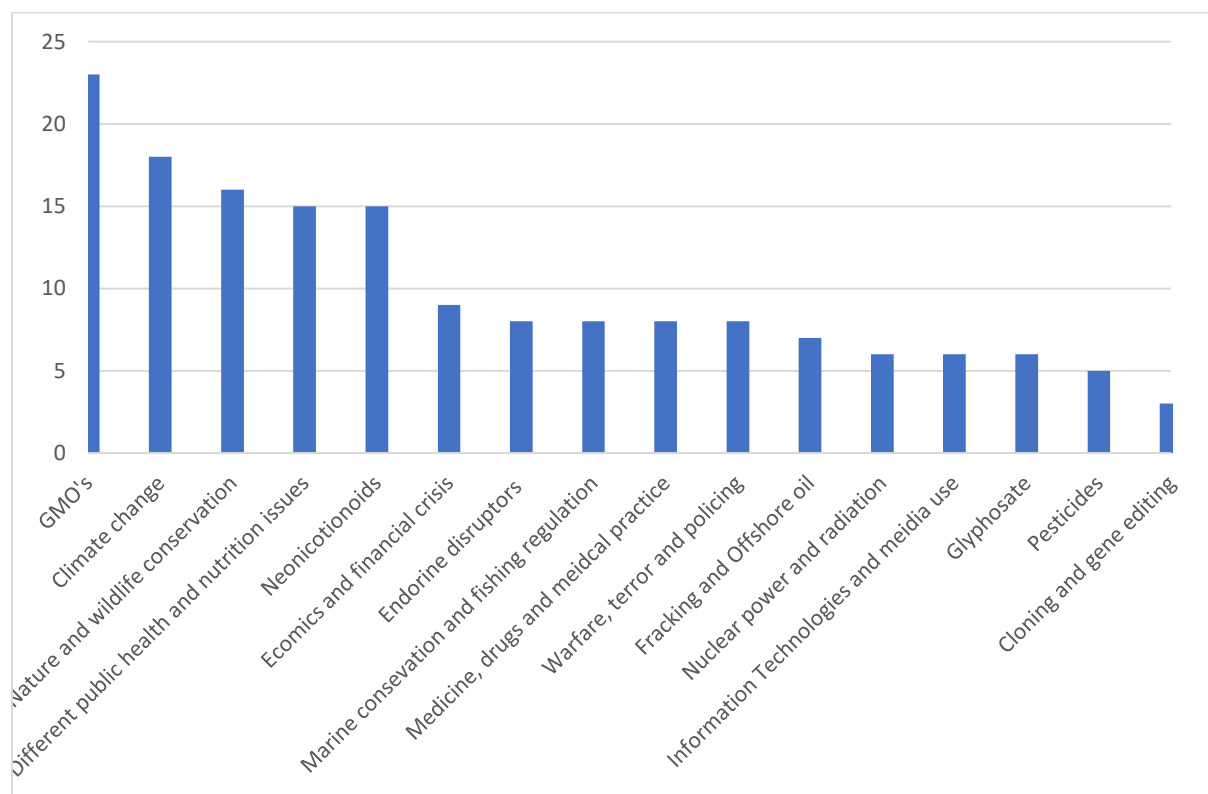
In the articles on international trade politics (like TIPP and Brexit trade deals), the PP is often compared to the US the risk-based approach, which allows for faster authorisations.

Some of the peaks are also related to topics, especially GMOs in 2003 and 2015, neonics in 2013, and Glyphosate in 2016 (as visualised in Figure 4 - Peaks in the media attention on the different cases of this study).

3.2 What topics are being covered?

All the articles mentioning the PP were coded inductively, and categorised into what topics the PP was discussed in relation to. Figure 2 shows that 17 different topics appeared, illustrating that the PP can be related to a large variety of issues. However, if one had to generalise the topics, many of them could fall into the broad categories 'environment' and 'health'. Further, many of the articles on the topics of e.g. GMOs and neonics often had a focus on international trade negotiations, but this is not included as an own category in this table. Also, note that 38 of the articles are not included and given a specific topic – these were articles who either discuss the concept of PP directly without relating it to a case (9 articles), or articles where the PP is very briefly mentioned unrelated to any particular case (29 articles).

Figure 2 - Number of articles that appeared on different issues



In this project, we are focusing on only five of these topics (in addition to two other topics - Nanotechnologies and CRISPR – but these were not mentioned in any of the articles). The five topics were mentioned **in 60 of the 198 articles**. Figure 3 shows that GMO and Neonics were the most frequently mentioned cases.

Figure 3 - Number of articles about the cases (in total and in percentage)

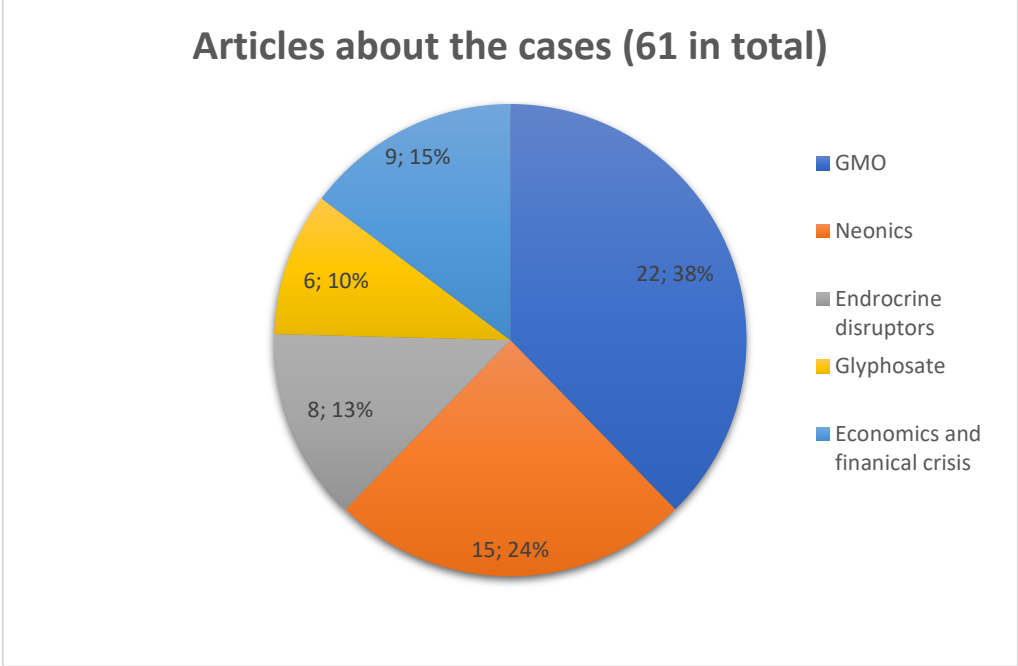
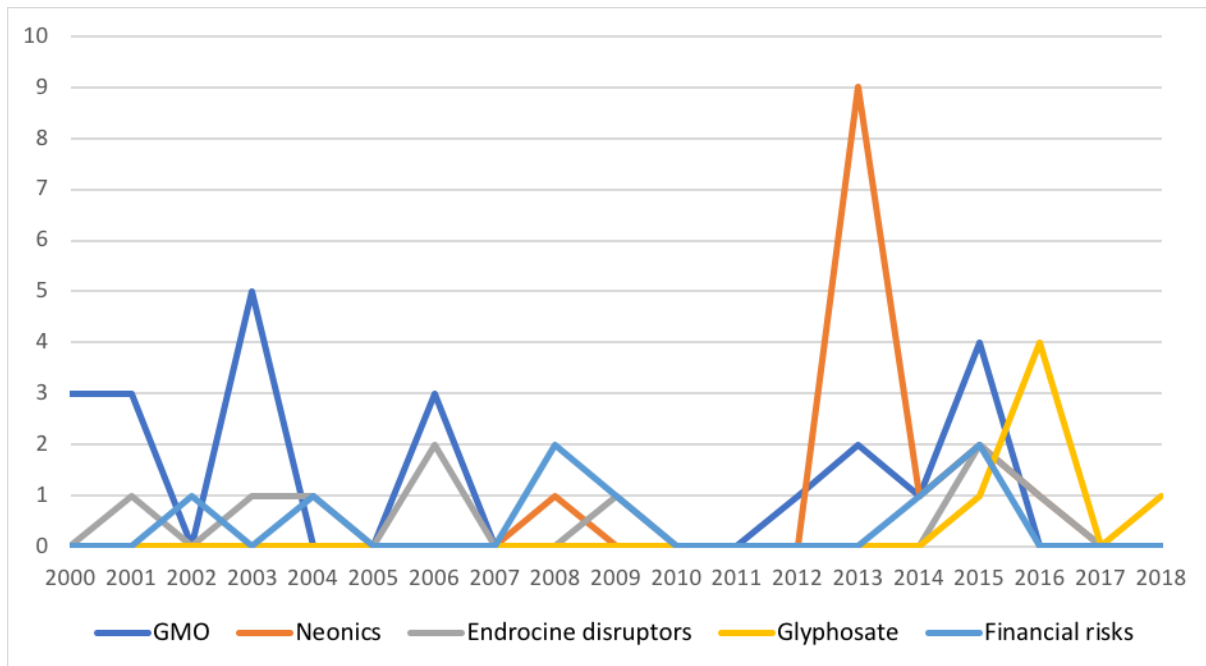


Figure 4 shows how many times the five topics are covered from 2000 – 2018. Comparing figure 1 to figure 4, shows that the peaks in media attention to the PP can be related to discussions of three of the cases: GMO’s in 2003, Neonics in 2013 and Glyphosate in 2016. Compared to 2003 and 2013, the peak in 2015 does not seem to centre around any particular topic. Rather, several different topics appear. In section 3.5, we will analyse the GMO and neonics cases further, and pay attention to the hotspots in the timeline of these cases.

Figure 4 - Peaks in the media attention on the different cases of this study



3.3 Newspaper section and reporters

This section will give an overview over where the 198 articles are placed in the newspaper, what section they are placed in and the journalist that have written the articles.

First, it is noted where each story ran in the newspaper; on the front page, the national, international, business, or metro section, or if it was published in the lifestyles, arts, sports, or a special section. Editors make important decisions regarding where to place each story.

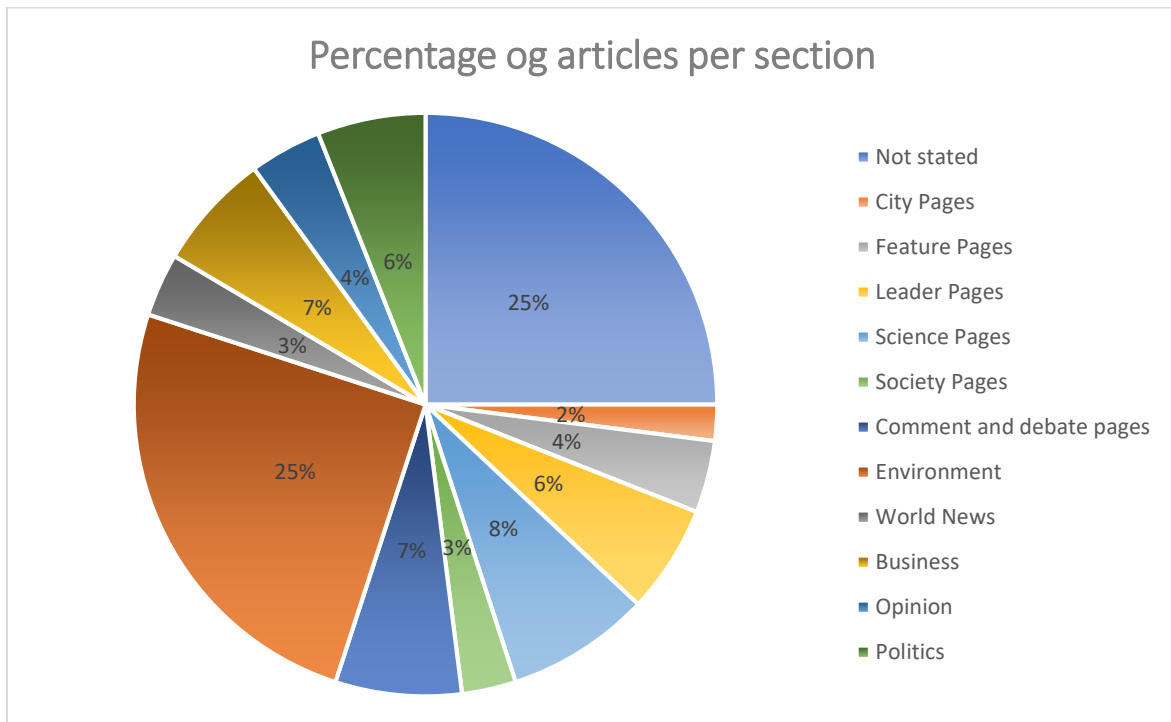
Secondly, the news stories are classified by type - opinion, news, or feature. Opinion pieces can be letters to the editor, op-eds, columns, or editorials. News pieces are straightforward articles which report on the latest events in the world. Feature stories are usually more in-depth pieces, sometimes lighter pieces, and often profile stories.

Third, an overview over the journalist that have written two or more of the 198 articles mentioning PP will be given.

3.3.1 Newspaper section

Figure 5 shows that in 25% of the articles downloaded though Nexis Lexis, it was not stated which section they belonged to. Of the articles where the section was stated, it is evident that the Environment section is dominant with 25%.

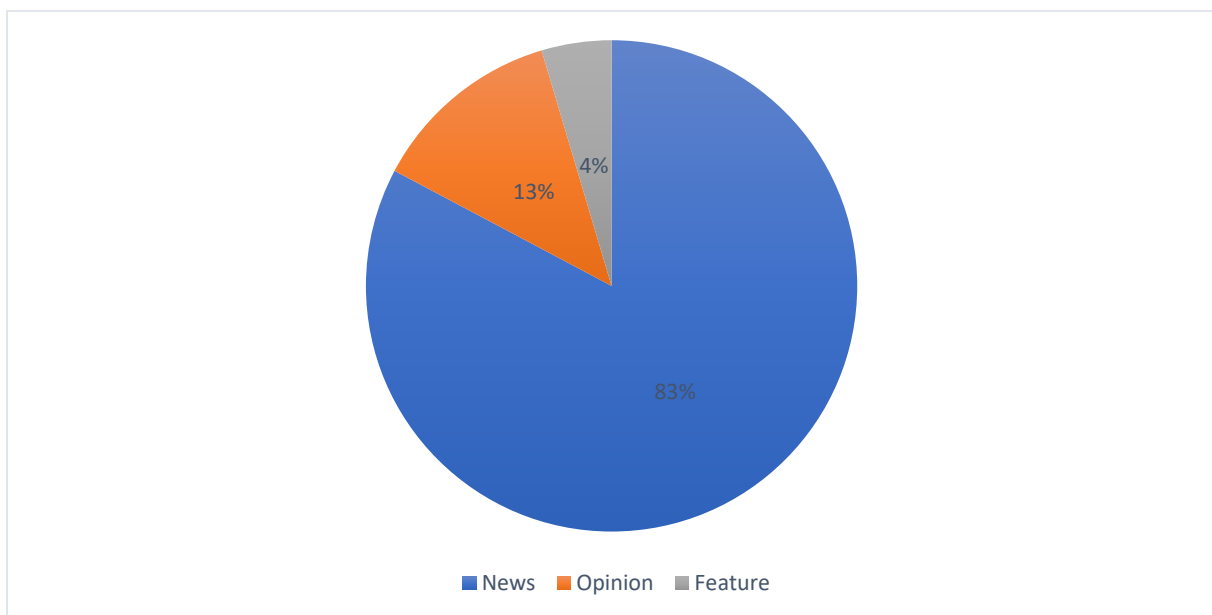
Figure 5 - Sections in the Guardian where the analysed articles have appeared



3.3.2 Type of article

Figure 6 shows that 83% are news articles, while only 13% were opinion articles comprising of "comment and debate" articles, letters and opinion articles.

Figure 6 - Percentages of articles per type



3.3.3 Reporters

The table below lists the reporters who have written two or more of the 198 Guardian articles. It shows that 22 reporters have written **two or more articles on the PP**, and that these 22 reporters have written 100 of the 198 articles. The table shows that environmental journalists and editors (including Daminan Carrinton, Arthur Neslen, Karl Mathiesen and John Vidal) are dominating. Further, the topics of the article reminds us again of the diversity of topics that the PP is mentioned in relation to, as also displayed in figure 3.1 earlier. Generally, many of the topics could fall into the broad categories 'environment', 'politics and international trade negotiations', and 'health'.

Table 5 - Reporters and articles

Reporters	Case/Topic of the article	Total amount of articles
Damian Carrington, Environment editor	Nuclear power (1), neonics (9), wildlife conservation (4), pesticides (2), climate change (1)	17
Arthur Neslen, environmental journalist	Climate change (2), glyphosate (5), international trade (tipp, brexit) (2), endocrine disruptors (2), GMOs (2)	13
George Monbiot, columnist	International trade politics (1), nuclear power (1) Financial crisis (1) environmental conservation (fishing) (1), public health and nutrition (1), neonics (1), warfare and terror (1)	7
Karl Mathiesen, environmental journalist	Neonics (2), GMOs (2), international trade (1), fracking (1)	6
John Vidal, environmental editor	GMOs (3), environment general (1), climate change (1), fracking (1)	6
Larry Elliott, Economics editor	Finance (4), climate change	5
Patrick Barkham, Natural History Writer	Climate change (3), GMO's (1)	4
Sara Boseley, health editor	radiation (1), endocrine disruptors (1), public health (2)	4
Simon Jenkins, columnist	Warfare and terror (2), nuclear power (1), public health (1)	4
James Meikle, special correspondent	GMO's (1), public health - vaccinations and diets(3)	4
Leo Hickman, environmental journalist	Food and nutrition (1), climate change (1), GMO's (2)	4
Felicity Lawrence, Consumer affairs correspondent	Public health (2), international trade politics (1)	3
Andrew Clark, Transport correspondent	Economics (1), medicine and public health (1), public transport (1)	3
James Randerson, Science correspondent	politics on science (1), technology research (1), endocrine disruptors (1)	3

Reporters	Case/Topic of the article	Total amount of articles
Oliver Milman, environment reporter	Nature conservation (3)	3
Andrew Simms, author	Climate change (2)	2
Fiona Harvey, environment correspondent	Marine conservation (1), international trade (1)	2
Sandra Laville, environment correspondent	Nature conservation (2)	2
Alison Benjamin, Society and Opinion editor	Neonics (2)	2
Mark Atkinson, finance reporter	International trade politics (2)	2
Joanna Blythman, investigative journalist	Endocrine disruptors (1), public health (1)	2
Julian Baggini, writer and philosopher	Nutrition and public health (2)	2

Summing up and comparing the data, the fact that many articles on the PP are found in the Environment section and that environmental journalists are dominating the reporter table, indicated that the PP often is framed as a concept relevant to environmental topics. Further, it seems that most articles can be termed overall neutral, although determining what is neutral or not in many cases was challenging as some of these articles often had a slightly critical edge. However, one reason could be that the PP often is mentioned in news articles reporting on national and international politics and trade negotiations, as also displayed when looking at the topics in the reporter list table.

3.4 Framing, spokespersons and analysis of arguments

In this section, we will assess the overall perspective of all of the articles, count spokespersons quotes on the cases, and analyse the specific arguments on the PP that are found in all of the articles.

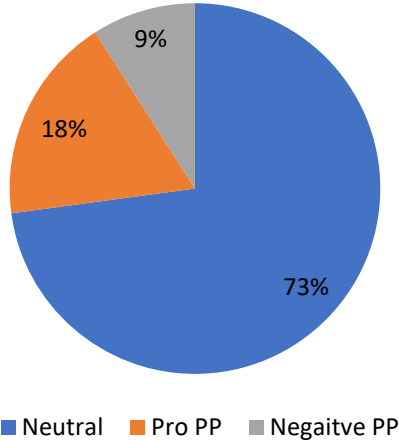
3.4.1 Overall perspective

A general framing of the PP in terms of 'what story that the newspaper wants to tell about the PP' is difficult to draw out. In most of the news articles that mention the PP in the Guardian, the PP is often referred to quite briefly in debates on a large variety of topics, like nutrition, terror, conserving biodiversity, drugs, etc. Only a few articles (9 of 198) discuss the PP directly. For analysing a framing of the PP in all of the 198 articles, we have therefore focused on if the articles generally portray the application of the PP as positive, neutral or negative. Determining this was in many instances challenging, as many news articles were not clearly positive or negative but displayed different opinions from different spokespersons. Although some of these news articles had a sharp edge, we decided on a strict understanding of positive and negative. This implies that the article clearly indicated a stance and/or portrayed only arguments or included only spokespersons from one perspective. Articles that mentioned the PP very briefly were included in the neutral category, as they were not directly taking a stance on the usefulness of the PP. It should be noted that our assessments include positive/negative/neutral analysis about the PP itself, how it is applied, and/or its impact on „innovation“. Thus, an article may be critical

of how the PP has been applied in a given case, but supportive of the PP as a general principle – such an article would likely show up as neutral in our analysis, while a critical observer might claim that in fact the article is pro-PP. We acknowledge this limitation, but assuming false-neutral diagnosis is equally likely for both positive and negative cases, we hope it hasn't been a major detriment to our analysis. Nonetheless, as a first order approximation about the general opinion of the article about the PP it was a revealing process. Furthermore, a more detailed breakdown of arguments for and against the PP can be found in the spokesperson analysis in section 3.4.3, which balances against this overall section.

Figure 7 - The articles' overall perspective on PP

Overall framing of the articles



The pie chart shows the majority (73%) of the 198 news articles are not taking a clear position on the usefulness of the PP. The articles that do take position are mostly comment or opinion letters /reply letters by researchers, politicians or NGOs. However, some (environment) journalists, like George Monbiot and John Vidal provided some pro PP articles in the 'comment and debate', 'feature' or 'leader' sections of the newspaper.

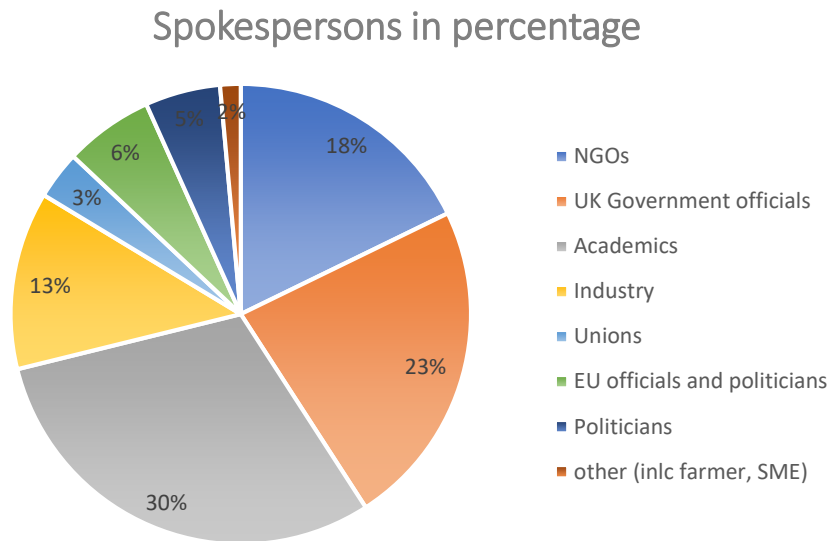
A few news articles are also coded as negative or positive, and these are news articles that only cover one side of the story, like stories medical development hindered by the PP or toxins that should be regulated by the PP.

This implies that a further investigation of the different arguments that are displayed in the articles, and in what kind of context, is useful for understanding the different ways of framing the PP.

3.4.2 Spokesperson summary for the articles on the cases

Whoever is quoted within the news story may have an increased impact on how that issue is portrayed to the public. Here, we counted the various spokesperson in the 60 articles covering the relevant cases (GMO's, neonics, glyphosate, endocrine disruptors and financial crisis). Spokespersons were only counted once per article even if had many quotes, and only if they were quoted directly. It should be noted that most of the quotes were not on the PP, but mainly about the cases more generally. Figure ... shows that academics is the spokesperson groups quoted most frequently, which may underline that the news stories are about scientific issues. In addition, both government officials and NGOs are quoted often, indicating that the news articles also are about politics.

Figure 8 - All spokesperson mentions



3.4.3 Overall analysis of arguments on the PP

In this section, we will look more closely on the range of arguments of the PP within the articles (by different spokespersons). Through an inductive coding off the arguments posed by different spokespersons in all of the 198 the articles, we have categorized various arguments pro and contra the PP. We have only counted the places in the articles that talk directly about the PP within each article. In ten articles, the PP was mentioned but there was not any comment or explanation of the PP. In total, 193 arguments were identified, and of these 116 were positive towards applying the PP while 77 were negative. These arguments were analysed and categories into groups of similar arguments, creating the list below.

Figure 9 - Arguments pro applying PP (116 in total)

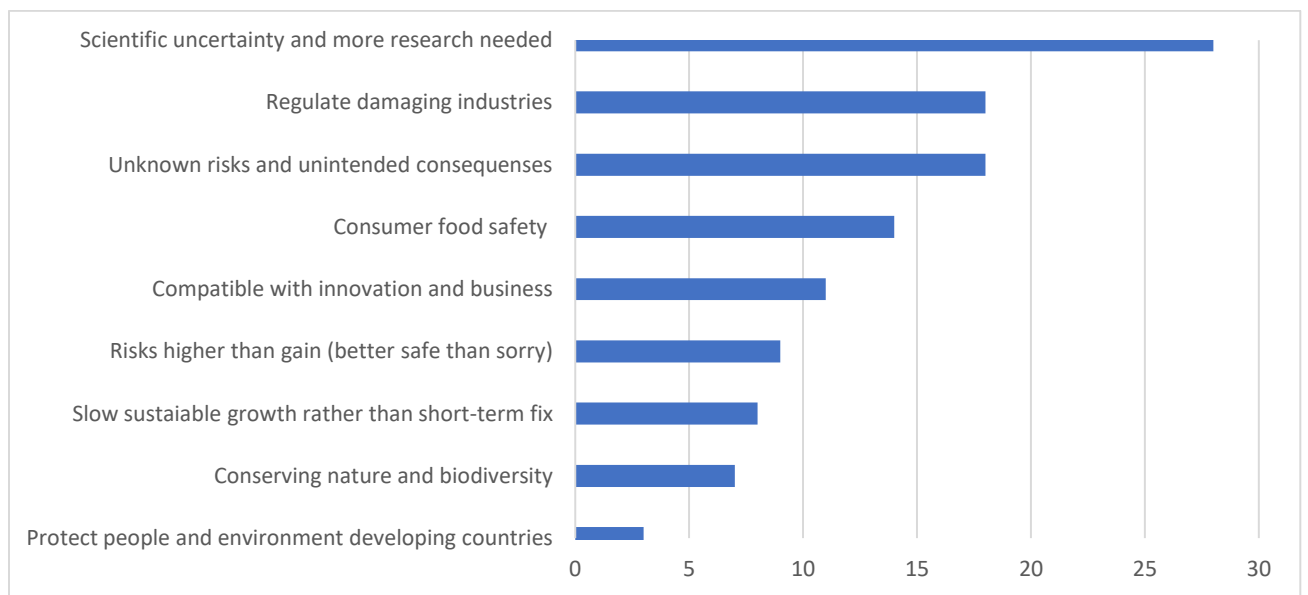


Figure 9 shows that the most frequent argument is related to scientific uncertainty. In general, it is argued that the PP should be applied when there is **scientific uncertainty**, often also calling for more research. Such arguments are stated in most of the case topics, such as radiation, GMOs, pesticides, marine conservation etc. Here are three examples:

In an opinion article on GMO rhetoric's from 2001, a professor highlights that the PP implies that more research is needed:

*While the drive to sustainable food security must include political, social and economic solutions, a "**precautionary principle**" urges accelerated scientific research and the development of strategies for the effective application of technologies tailored to local needs. Resolution of the huge problems facing agriculture and food production will require flexible, pragmatic new partnerships between private and public research, governments, charities, NGOs and agricultural communities - not polarising rhetoric¹.*

In an article from 2013, summarizing a series of posts discussing the PP, a Green party member is quoted highlighting that the PP is calls for more independent analysis:

*The party has a strong pro-science policy where we are committed to high levels of science funding, the Haldane principle and evidence-based practices. A **precautionary principle** calls for more evidence, more peer review and more independent analysis.²*

In a news article on microplastic contamination from 2017, a researcher is quoted, highlighting that the PP is needed in order to investigate risks more in-depth:

*A separate small study in the Republic of Ireland released in June also found microplastic contamination in a handful of tap water and well samples. "We don't know what the [health] impact is and for that reason we should follow the **precautionary principle** and put enough effort into it now, immediately, so we can find out what the real risks are," said Dr Anne Marie Mahon at the Galway-Mayo Institute of Technology, who conducted the research.³*

This the second most frequently mentioned argument is framing the PP as an important tool for **regulating industries or commercial interests** that carry risks for public health or the environment.

*Sadly, Carson's study offers a stark reminder of our failure in the years since its publication fully to appreciate the complex and fragile relationship between ourselves and the planet, and adequately to guard against ecological destruction. There could not be a clearer illustration than that in *Silent Spring* of the disastrous consequences for our natural world and the terrible effects on human health, should we ignore the **precautionary principle** and allow commercial interests to operate unchecked.*

*Thousands of lives could have been saved and extensive damage to ecosystems avoided if the had been applied on the basis of early warnings, say the authors of the 2013 *Late Lessons from Early warnings* report published on Wednesday.*

They accuse industry of working to corrupt or undermine regulation by spinning and manipulating research and applying pressure on governments for financial benefit. "[It has] deliberately recruited reputable scientists, media experts and politicians to call on if their products were linked to possible hazards. Manufacturing doubt, disregarding scientific evidence of risks and claiming over-regulation appear to be a deliberate strategy for some industry groups and think tanks to undermine precautionary decision-making."

Pascal Vollenweider, the campaign director of Avaaz, which organised the poll, said: "Governments are beginning to understand that their citizens refuse to be treated as lab rats.

¹ Chris Lamb, "GM and rhetorical roots". The Guardian, May 2., 2001

² Alice Bell, "What's all the fuss about the precautionary principle?" The Guardian. July 12, 2013.

³ Damian Carrington, "Plastic fibres found in tap water around the world, study reveals." The Guardian, 6. Sept 2017.

*Monsanto and other chemical giants are used to getting their way, but public pressure has forced politicians to stand firm behind the **precautionary principle**.*"

The third most applied argument is about **uncertainty** more generally and the possibility of **unknown consequences**, e.g. with new technologies. Examples:

*Some 886 plaintiffs organised by Urgenda had accused the Dutch government of negligence for "knowingly contributing" to a breach of the 2C maximum target for global warming. Their legal arguments rested on axioms forbidding states from polluting to the extent that they damage other states, and the EU's '**precautionary principle**' which prohibits actions that carry unknown but potentially severe risks.⁴*

*The Green party MEP Molly Scott Cato said: "We are opposed to any expansion of pulse fishing, which seems pretty barbaric and causes unnecessary suffering to fish. While the use of electrical disturbance might reduce the damage caused to seabed habitats through heavy beam trawling, it cannot be justified to replace one damaging fishing technology with another. The impact on fish and other marine wildlife of pulse fishing is unclear, and it thus also appears to violate the **precautionary principle**."⁵*

Some of the most interesting arguments are the ones who frame the **PP as 'innovation and progress friendly'**. This is sometimes indicated implicitly in the arguments noting that PP encourages more research. It is also explicitly stated in five of the articles, and noticeably it is most prominent the articles by academics and journalists that discuss the PP more in-depth. As example, science & technology professor Andy Stirling explains in article from 2013 that the PP is not against innovation:

Precaution is arguably one of the most misunderstood and misrepresented issues in the global politics of science and technology. Misunderstood, because precaution is so often wrongly asserted to be unscientific or anti-technology. Misrepresented, because a large part of the resulting stigma can be a systematic – even deliberate – effect of power.

Powerful interests behind a particular innovation can understandably get pretty exercised when challenged by precautionary concerns over their favoured new technology. But these highly partisan commotions need not provoke such existential angst across society as a whole. Precaution does not necessarily mean a ban. It simply urges that time and space be found to get things right.

... In a nutshell, precaution reminds us that innovation is not a forced one-track race to the future. Instead – like biological evolution – . Though often concealed behind science, each involves intrinsically political choices.⁶

In a more practically oriented opinion article, a journalist argues that applying the PP in the case of climate change can bring long-term economic opportunities and promote the development of new technologies:

*The argument in favour of taking strong action to counter climate change is overwhelming, which is why the Conservative party's Quality of Life Policy Group has taken as its starting point an assumption that climate change is real enough to justify the **precautionary principle**. And, contrary to the government's negative approach, the Conservative party*

⁴ Arthur Nelsen, "Dutch government ordered to cut carbon emissions in landmark ruling; Dutch court orders state to reduce emissions by 25% within five years to protect its citizens from climate change in world's first climate liability suit". The Guardian, June 24, 2015.

⁵ Fiona Harvey, "Calls for EU to reinstate ban on 'destructive' electric pulse fishing; Campaigners say it causes unnecessary suffering but those in favor of method say it is less damaging than trawling". The Guardian, January 8, 2018

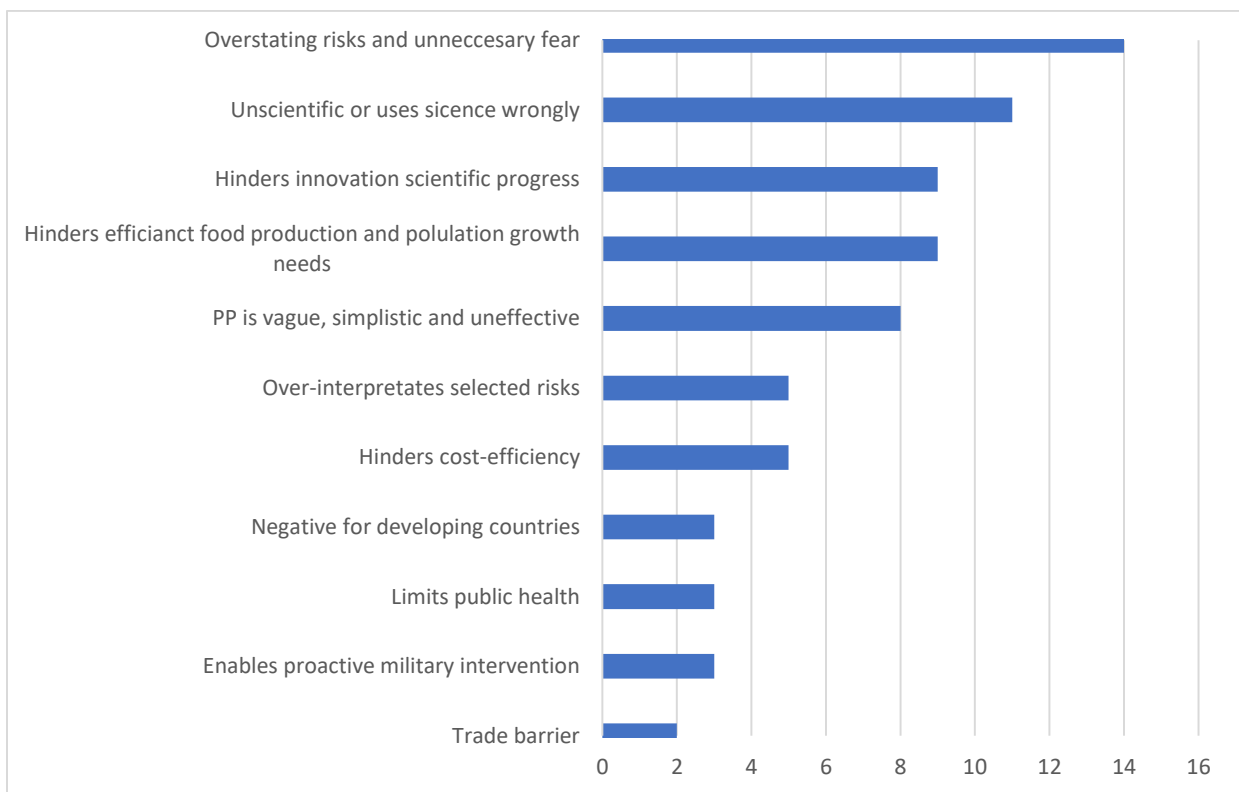
⁶ Andy Stirling, "Why the precautionary principle matters". The Guardian, July 8, 2013.

recognises that, while climate change presents an unprecedented risk, it also presents real long-term economic opportunities. We cannot, for instance, radically reduce greenhouse gas emissions without major investment in new, clean technology - there are opportunities to be found in the need for change. For those at the forefront of delivering a low-carbon economy, these opportunities will come from developing high-value jobs, greater energy efficiency, and secure, affordable energy supplies.⁷

Another article highlights that the limitations that the PP would pose imply, would also contribute to the exploration of new technologies:

The **precautionary principle** should immediately preclude any Arctic drilling for oil. Our imperfect human nature and fallible technology can only handle so much risk. Our environmental track record reveals an inclination towards avarice over our sense of responsibility. Taking stock of our limitations will only contribute to our greater purpose, brilliant exploration of scientific knowledge and technological wizardry, all great human virtues.⁸

Figure 10 - Arguments against applying the PP (77 in total)



⁷ Zac Goldsmith, "" The Guardian, August 31, 2006

⁸ Amy Larkin, "Human error: how business can learn from past mistakes" The Guardian, February 7, 2014.

The most frequent argument negative towards the PP, is framing the application of PP as based overprotective attitudes **overstating risks** generally. Many of these arguments are found in articles on public health issues. Here are two examples:

*Dame Sally Davies, the government's chief medical officer, said the recommendations in the study had taken the **precautionary principle** of minimising risk in everyday life to an absurd point and contained unrealistic and unnecessary suggestions, such as avoiding shower gel while pregnant.⁹*

*But on its own a **precautionary principle** doesn't require that we know much about what we're talking about, let alone the alternatives and implications. At worst, it can play to our most knee-jerk fears, such as "Frankenfoods". Its advocates don't really have much to offer. We don't need to appoint a layer of people to say "ooh, you never know!"¹⁰*

A similar argument is that the PP is applied when **over-interpreting selected risks while ignoring a much more complex context**. This argument was particularly often applied by industries opposing bans on pesticides (neonics), arguing that some risk research has been over-interpreted. Here is one example:

*Bayer's Julian Little told the Guardian: "We do not believe the new EFSA reports alter the quality and validity of [existing] risk assessments and the underlying studies. [But] the company is ready to work with the European commission and member states to address the perceived data gaps. We believe it is very important that any political decision relating to registrations of neonicotinoid-containing products should be based on clear scientific evidence of adverse effects ... and not on the basis of an **over-interpretation of the precautionary principle**."¹¹*

This is related to the second most frequent arguments against the PP, framing it as generally **unscientific** and/ or wrong interpretations of science. Many of these arguments are found in debates over GMOs, but also in articles on medicine, toxins and as in the case below, cloning:

*The success rate of cloning is improving all the time, bringing down costs and ameliorating animal suffering. The progeny of clones are not clones at all, but normal animals created from two parents; and any irregularities in the expression of cloned genes are ironed out, or "reset", in their offspring. As for the string of what-if questions, Walton dismisses that as scaremongering: "That is applying the **precautionary principle**, and the fallacy of that, as any beginners' statistics class will teach you, is that it is impossible to prove a negative. As a scientist, I absolutely reject it."¹²*

The third most frequent group of argument portrays the PP as **hindering innovation and scientific progress**

⁹ Denis Campbell, "National: Royal college's advice to pregnant women fails commonsense test, says health chief: Chief medical officer rejects colleagues' work: Paper suggested avoiding shower gel and perfume". The Guardian, June 8, 2013.

¹⁰ Tracy Brown, "The precautionary principle is a blunt instrument". The Guardian, July 9, 2013.

¹¹ Damian Carrington, "Insecticide 'unacceptable' danger to bees, report finds". The Guardian, January 16, 2013.

¹² Ed Pilkington, "If this meat was from a cloned animal, would you eat it?: Cloned animals and their offspring have been declared safe to eat; in a matter of months their meat will be on sale in the US. Ed Pilkington reports on a PR timebomb that's about to blow". The Guardian, April 21, 2008.

*Environmentalists' radical critiques of business and government are really arguments against creativity and innovation. The **precautionary principle** which environmentalists preach and governments are signed up to paralyse innovation.¹³*

*Some argue that the **precautionary principle** demands that we remove Wi-Fi networks from schools, or even ban them altogether until they can be "proved safe". But no scientist can ever tell you that a technology is totally "safe". If Wi-Fi were completely untested technology there might be a stronger case for a precautionary ban, but from what we know, there appears to be no reason for concern.¹⁴*

Under this category, the argument for a 'proactionary principle' replacing PP is mentioned, as it valorises calculated risk-taking as essential to human progress:

"Proactionaries" believe that by restricting risk-taking the "precautionaries" place humanity at still greater risk, as we are prevented from making the sort of radical experiments that in the past had resulted in major leaps in knowledge that enabled us to overcome our natural limits. Perhaps the proactionaries overstate their case. Nevertheless, were any of the path-breaking lab-based research that was done on humans and other mammals before, say, 1980 to be proposed to the precautionary institutional review boards that authorise academic research today, they would probably face serious objections, if not be outright prohibited.¹⁵

Another argument is related to the **need for effective food production**, favouring the use of neonics and GMO's in food production:

*The EU's chief scientific adviser, Ann Glover, drew ire from environmentalists when she said that the EU's long-standing **precautionary principle** was "no longer relevant" for GM, and that it would be "unethical" not to use such biotech produce when other approaches had failed, because of the role that GM could play in alleviating global hunger.¹⁶*

Some arguments also portray the PP as vague, simplistic and/or ineffective:

*However simple we might wish managing uncertainty about the future to be, it's not. The **precautionary principle** misleads us into thinking it is. Its advocates arm-wave about complexity and the unknown future, but they are producing a response that implies the exact opposite. In place of informed, real-world choices that include the potential implications of both doing something and not doing it, we have simplistic bans, precaution's monotonous answer to every challenge.....*

*The **precautionary principle** is also irresponsible because its only tool is to stop a thing - a practice, substance or technology. This can lead us to think we have protected ourselves from outcomes when we haven't. The recent European ban on the pesticides known as neonicotinoids, for example, was appealing. But it has frustrated beekeeping organisations.*

¹³ "Life after Living Marxism: Fighting for freedom - to offend, outrage and question everything: Banning the bans: An agenda for radical change" The Guardian, July 8, 2000.

¹⁴ James Randerson and Charles Arthur, "Newly asked questions: What will more research on Wi-Fi's health effects show?" The Guardian, May 24, 2007.

¹⁵ Steve Fuller, "Beyond the precautionary principle", July 10, 2013.

¹⁶ Arthur Nelsen, "GM crop vote was just the beginning of Europe's biotech battle; A recent EU vote allows states to cultivate GM crops, with the first expected to be grown in the UK in 2017, but big hurdles remain". The Guardian, January 20, 2015.

Contrary to the "job done" jubilation that followed the ban, it will not lead to the revival of the bee population. If only the problem were that simple. ¹⁷

The environmental principles in the bill include , but Tom Fyans, at the Campaign to Protect Rural England, questioned their effectiveness. "They are crucial to the way law is created, yet the draft bill offers only the weak requirement that ministers 'have regard to' them."¹⁸

Summing up and comparing the arguments for and against the PP, the controversies seem to evolve around three major themes:

- a) Different understandings of **science and scientific uncertainty** – is the use of the PP related to 'unscientific' values, or does it allow for more and better research?
- b) Different **understandings of risks** – is applying the PP related to scaremongering and overprotection, or a broader inclusion of risk factors?
- c) Different understandings of what **efficient development** and regulation implies – will applying the PP simply lead to bans which hinders efficient production, or does it restrict damaging industries that could affect development more broadly?

3.4.4 Spokespersons breakdown by arguments

The table below summarises the type of spokespersons that posed the particular arguments on the PP in the news articles. Generally, the table shows that academics dominate both the arguments for and against the PP. Journalists often referred to the PP when explaining

The category 'Government officials' include governmental scientific advisors, who often were quoted or interviewed in order to explain the reasons behind governmental policies.

Table 6 - Spokepersons

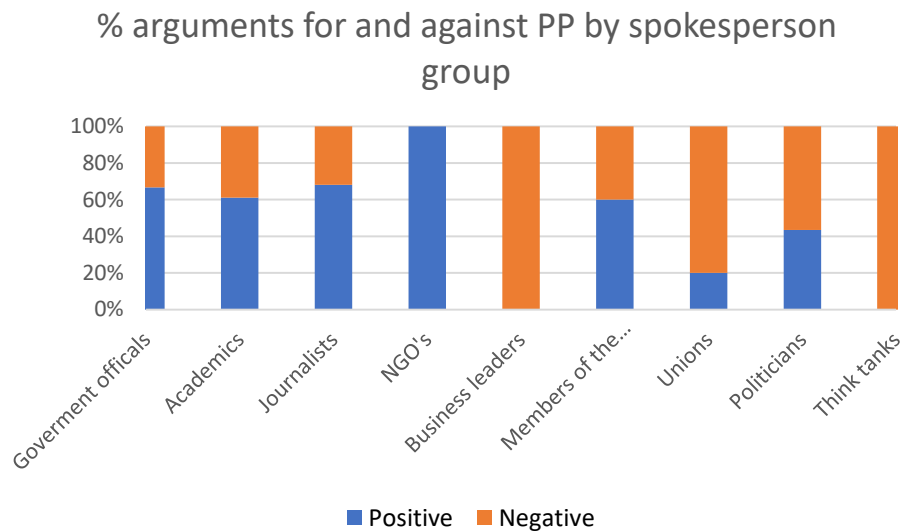
	Govt. officials	Academics	Journalists	NGOs	Business leaders	Members of general public	Unions	Politicians	think tanks	sum
Arguments for the PP	20	33	32	15	0	3	1	10	0	116
Protect people and environment developing countries	1			1				1		3
Conserving nature and biodiversity	3	1	3							7
Slow sustainable growth rather than short-term gain	1	1	4	2						8
Risk higher than gain (Better safe than sorry)	3	1	5							9
Compatible with innovation and business	1	7	3							11

¹⁷ Arthur Nelsen, "GM crop vote was just the beginning of Europe's biotech battle; A recent EU vote allows states to cultivate GM crops, with the first expected to be grown in the UK in 2017, but big hurdles remain". The Guardian, January 20, 2015.

¹⁸ Shaun Spiers, "Brexit is a chance to save our small farms; A fifth of English farms have disappeared in the past 10 years. Farm size diversity is key to sustaining rural communities, writes Graeme Willis". December 5, 2017.

	Govt. officials	Academics	Journalists	NGOs	Business leaders	Members of general public	Unions	Politicians	think tanks	sum
Consumer food safety	1	4	3	3		1		2		14
Unknown risks and unintended consequences	2	3	5	4		2		2		18
Regulate damaging industries	1	7	3	3				4		18
Scientific uncertainty and more research needed	7	9	6	3			1	2		28
	Govt. officials	Academics	Journalists	NGOs	Business leaders	Members of general public	Unions	Politicians	think tanks.	sum
Arguments against the PP	10	21	15	0	11	2	4	13	2	77
Trade barrier								2		2
Enables proactive military intervention	1							2		3
Limits public health		1	1			1				3
Negative for developing countries			3							3
Hinders cost-efficiency	1				1	1		1	1	5
Over-interprets selected risks	1	1	2		4					8
PP is vague, simplistic and ineffective	1	6	1					1		9
Hinders efficient food production and population growth needs	2	3	1		1		2			9
Hinders innovation scientific progress		4	3					2		9
Unscientific or uses science wrongly	2	2			4		2	1		11
Overstating risks and unnecessary fear	2	4	4		1			2	1	14

Figure 11 - Arguments breakdown by spokesperson group: percent for and against



In order to get a better understating of what these tables may imply, we will now look more detailed into the contents of and arguments in two of the cases.

3.5 The Precautionary principle in selected case deep dives

In the next sections, the articles focusing on GMOs and neonics will be analysed in-debt, in order to explain the controversies around applying the PP to the particular case and the different opinions on this. The analysis will focus on which ones of the arguments in table above that are dominating in the case, and which spokespersons that are quoted.

3.5.1 Neonicotinoids

The main bulk of articles on neonics are from 2013. Most of these are reports on the process of banning neonics in the EU, and about the response in UK. They are thereby reporting based on political procedures and the debates surrounding decision-making where the PP is central. Mostly, the articles are balancing different views and opinions by quoting different spokespersons groups, including scientists, government officials, industry representatives and NGO's. Of the 15 articles on neonics where the PP is mentioned, 10 can be termed generally neutral as they are balancing arguments from different spokespersons. It should be noted that the PP is not usually the main focus, rather it is mentioned as one part of the puzzle.

As the major part of the articles display viewpoints from different spokespersons, it seems the media frames the public discussion of applying the PP on regulating neonics is as a polarised discussion, where NGOs¹⁹, academics²⁰ and some public officials oppose major

¹⁹ Friends of the Earth, Soil Association, Greenpeace, Pesticide Action Network, Buglife, and International Bee Association.

²⁰ Academics: EFSA scientists, [David Goulson](#) (prof in biology, University of Stirling), Simon Potts University of Reading, Lynn Dicks university of Cambridge, Christopher Connolly University of Dundee, Lars Straub University of Bern

corporations, the National Farmer Union and some government officials²¹. More specifically, the articles seem to frame the discussion as polarised views on **science, on risk and progress**.

First, the polarised **controversy on science and scientific uncertainty** is a major focus in many of the articles, as they display reactions to scientific reports on the effects of neonics. Business leaders, farmer union members and some government officials often apply the 'unscientific' argument (the most common argument in general against the PP as shown in figure 10). Both the National Farmers Union and business leaders of Syngenta, claim in several of the articles that the use of the PP is not based on 'good science', and question the validity of the EFSA risk-assessment. NGOs, some researchers and some government officials on the other hand, argue that the scientific evidence clearly shows that the PP should be applied by banning some of the neoinics, often underling that more research is needed. An article from 2015 is illustrative, with the headline 'who is winning the PR battle over neonicotinoids?'. Here both the NGO Friends of the Earth, the corporation Syngenta, a farmer, and scientists are quoted. The journalist highlights that scientific controversy has polarized the debate:

The collapse of bee colonies worldwide in 2007 spawned global headlines warning of an ecological Armageddon. Initially, environmental groups and agrichemical firms were united in their concern and support for government action to introduce a national strategy to rescue the UK's pollinators. FoE and the Soil Association created the high-profile campaigns Bee Cause and Keep Britain Buzzing, and Syngenta and Bayer both launched research initiatives dedicated to the issue (Bayer Bee Care and Operation Pollinator), with well-resourced websites. But after a growing number of scientific studies blamed pesticides - and specifically neonicotinoids - for contributing to the hive collapses, and with the European Commission (EC) introducing a two-year moratorium on three types of the insect nerve agent (imidacloprid, clothianidin and thiamethoxam) in 2013, the battlelines between the two camps were drawn. ²²

A scientist quoted in the same article, seems to be somewhere in between the two opposing interpretations on research that evaluates the effects of neonics on bees:

*"Both extremes are complete nonsense," says bee biologist professor Dave Goulson. "The science is pretty convincing that neonicotinoids are contributing to bees' decline, but it's by no means the worst factor. Most scientists agree it's habitat loss that is the single biggest driver, with disease and pesticides contributing. Obviously, any pesticide is damaging to wildlife; it's about finding the right balance between productivity and environmental impact."*²³

Secondly, the discussions seem to display different **interpretations of 'risk'**. Business leaders from Bayer and Syngenta are often quoted using the term 'over-interpretation' of the PP, adhering to the 'overstating risks' and 'over-interpreting some risks' categories of arguments, as visible in this example:

²¹UK government officials quoted are mainly from Officials the Department for the Environment Food and Rural affaires (DEFRA), scientific advisor to DEFRA, and Environmental Audit Committee (EAC). Owen Paterson, Ian Boyd, and Walport from DEFRA are first neutral thereafter negative towards applying the PP, while especially Walley from EAC is favours applying the PP.

²² Shaun Spiers, "Brexit is a chance to save our small farms; A fifth of English farms have disappeared in the past 10 years. Farm size diversity is key to sustaining rural communities, writes Graeme Willis". December 5, 2017.

²³ Ibid

The chemical's manufacturer, Bayer, claimed the report, released on Wednesday, did not alter existing risk assessments and warned against "over-interpretation of the **precautionary principle**".²⁴

Also, the former chief scientist Mark Walport is quoted in claiming that applying the PP to neonics is an overreaction of actual risk:

*Walport (govt. chief scientist) said: "All too often, people citing the **precautionary principle** simply overreact: if there is any potential hazard associated with an activity, then it should be stopped. In the longer term, we need a comprehensive action plan, exploring the complex factors behind the decline of pollinators."²⁵*

Disputing this, columnist George Monbiot critiques Walport for being biased towards industrial lobbyists and for misunderstanding the risk part of the PP:

*But perhaps most revealing is Walport's misunderstanding of the **precautionary principle**. This, he says, "just means working out and balancing in advance all the risks and benefits of action or inaction, and to make a proportionate response". No it doesn't. The Rio declaration, signed by the UK and 171 other states, defines it as follows: "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation." This, as it happens, is the opposite of what his article sought to do.*

Among the official duties of the chief scientist is "to ensure that the scientific method, risk and uncertainty are understood by the public". Less than a month into the job, Walport has misinformed the public about the scientific method, risk and uncertainty. He has made groundless, unscientific and emotionally manipulative claims. He has indulged in scaremongering and wild exaggeration in support of the government's position."²⁶

In a more balanced article, a journalist refers to this different viewpoints on risk a 'clash of ideologies':

That ideological difference is fundamentally about the risk neonicotinoids pose to the environment, with some environmentalists fearing they could wipe out bees entirely, while agrichemical companies say their responsible use is harmless and stoke fears about food security and the inability to feed a growing world population without them."²⁷

Third, there are **controversies on progress and industry**. Only one article is throughout negative towards the application of the PP in the case of neonics. This article, from 2013, is focusing on the negative effects that a ban of neonics (and other pesticides) has for farmers under the challenging circumstances of climate change. The National Farmers Union is quoted, claiming that with the devastating harvests, Europe should not cut itself off from hi-tech solutions:

²⁴ Damian Carrington, "Insecticide 'unacceptable' danger to bees, report finds". January 16, 2013

²⁵ Damian Carrington, "Ban on bee-harming insecticides would be a mistake, says chief science adviser". April 26, 2013

²⁶ George Monbiot, "Beware the rise of the scientists turned lobbyists: From badgers to bees, government science advisers are routinely misleading us to support the politicians' agendas." The Guardian 30.4.2013

²⁷ Dominic Bates, "Who is winning the PR battle over neonicotinoids?; Bee campaigners scored a victory in the German courts, but chemical companies continue to fight the European Commission ban". The guardian, March 20, 2015.

Last summer was just a deluge and plant protection products (pesticides) were incredibly important to us even maintaining a pretty poor harvest: without them, there would have been nothing. When you have rain after rain after rain, the level of disease that grew up within the crop was absolutely out of this world. "He said Europe's decision in April to suspend the use of neonicotinoid pesticides linked to serious harm to bees, for example, was political and based on a very strict interpretation of the precautionary principle."²⁸

Compared to this, proponents of the PP argue that it is necessary to steer development and restrict the power of large industries. In a feature article by the Guardian's Environment Editor in 2013, it is argued that UK government attempt to block the EU ban on neonics because of economic interests:

Despite not having the full data to do the cost-benefit analysis, the UK government has concluded that the financial cost of a neonic ban are likely to be too great. Again, I am not surprised at this given that Paterson's over-riding instruction from prime minister David Cameron is to grow the economy. Why take even a theoretical risk?

Given that the same science is available to all EU countries, that all the big countries that dominate EU voting have significant farming sectors and that public pressure for a neonic ban is high in all countries, what are the other factors that have put the UK and Germany on the other side of the line from France, Spain, Italy and the Netherlands? I genuinely have no idea. But I am finding it harder and harder to ignore the coincidence that the dominant manufacturers of neonicotinoids are Syngenta, based in the UK, and Bayer, based in Germany.²⁹

An underlying scepticism towards industry and politics is also underlined by the journalist above, hinting toward the argument that corporations should be regulated.

Summing up, it can be observed that the debate around the Precautionary principle regarding neonics revolves mainly around the following arguments:

- The PP is necessary for conserving nature (and bees) – posed mainly by NGOs and some government officials
- The PP is necessary for regulating and restraining damaging corporations – posed mainly by NGOs and some journalists
- The PP is necessary because of scientific uncertainty – posed mainly by scientists, NGOs and some government officials
- Applying the PP to neonics may hinder effective production – posed mainly by farmers, unions, government officials
- Applying the PP to neonics is based on an over interpretation of selected risk and is thereby not good science – consistently posed by industry representatives.

The articles on neonics focus on displaying the disagreements between the different spokespersons, framing the discussions of PP as one part of the controversies on science, risk and progress between spokespersons with very different world-views.

²⁸ Damian Carrington, Extreme weather from climate change is biggest threat to British farming, says NFU: Farmers' chief says swings are devastating harvests Europe must not 'cut itself off' from hi-tech solutions." The Guardian, July 29 2013.

²⁹ Damian Carrington, "Why the UK will fail to block an EU ban on bee-harming pesticides" 4.april 2013.

3.5.2 GMO

As displayed earlier, 22 of the 198 articles mentioning the PP focus on GMO's. Unlike the articles on neonics, the GMO articles are not centred around one specific hotspot in time or one political proceeding (as shown in figure 4). Rather, the articles are more diverse and are spread over a longer period, sometimes talking about GMOs more generally and sometimes debating different international political events /debates.

In the period from 2000-2003, there are more opinion articles (5 to be exact) than in the later periods, and most of these articles are promoting a PP approach towards GMOs. Debates on whether GMO's would benefit or harm food production and biodiversity in developing countries are also mentioned.

The more 'neutral' articles in the period from 2000 leading to the peak in articles in 2003 are often covering **international trade politics**. One major framing of the application of PP on GMO's in these articles, relates the principle to the different values of EU and the US. In 2000, news articles report on international events like the G8-summit in Okiwana Japan. Here, the PP is reported as part of an overall international trade dispute between the US and EU, where EU is promoting a PP approach. The US vs EU trade disputes are also dominating articles in 2003, where it is reported that the US criticise Europe for blocking trade by applying the PP. Here is an example:

*The US state department website prominently displays a paper titled "Looking Behind the Curtain: The Growth of Trade Barriers that Ignore Sound Science", published by the NFTC, whose members include Halliburton, the energy firm once run by vice-president Dick Cheney. The report criticises Europe's practice of banning imports it believes may be risky, deriding this "**precautionary principle**" as "an inherently unscientific touchstone".*

It calls Europe's restrictions on GM crops a "disguised trade barrier".³⁰

Against this, an NGO representative is quoted in arguing that this is an attack of 'European values':

"Unless the EU fights back hard and stops further expansion of WTO rules in Cancun in September, much of what Europe holds dear will be systematically attacked," said Ms Stupples.³¹

Thereby, the PP seemed to be framed as a fundamental European value. Debates on whether GMO's would benefit or harm **food production and biodiversity in developing countries** are also mentioned in the articles from 2000-2006. Lastly, it should be noted that some of the articles in the period 2013-2015 also focus on international trade negotiations, questioning if the PP will be lost in the Brexit process.

In the period **2012-2015**, the debate on GMOs seems to be vitalised due the discussions on the process of allowing GM crops in the UK. In these articles, different views and insights from researchers/academics (from fields including genetics, sociology, and biology) are quoted. This indicates that the debate is framed as a matter of diriment scientific insights. However, many different spokespersons are quoted, and particularly the different **understating of science and risk** between general public / environmental NGO's and industry is given much space in the articles. As mentioned by journalist Arthur

³⁰ Stewart and Denny, "US uses GM foods in first assault of EU trade battle". The Guardian, May 20 2003.

³¹ Ibid

Nelsen, the heated debates between these actors include trade deals, evidence-based science and the PP:

GM serves as a proxy and arena for a dizzying range of debates in the EU splitting industry and environmentalists. These cover trade deals, agricultural herbicide use, subsidiarity (dealing with social issues at a local level), evidence-based science and the precautionary principle.³²

The articles often refer to that the general public and NGO's are still sceptical and favouring a PP approach, while industry, some scientists, government officials and politicians highlight research that shows that GMO's are un-harmful. Many of the articles give much quoting different opinions on the matter, underlining the different frames of reference. An example can be found in an article from 2015, that shows how opponents of the PP attempt to frame the controversy as a battle between **science and values/politics**:

"Opposition to genetically modified crops in many European countries is based on values and politics, not science," said Andrew Miller, the chair of the science and technology committee. "The scientific evidence is clear that crops developed using genetic modification pose no more risk to humans, animals or the environment than equivalent crops developed using more 'conventional' techniques."³³

The journalist thereafter goes on to cite NGOs who disagree to this by arguing that they are looking at different kinds of research and are taking a broader approach to what risk impels. Another example from an article by Karl Mathiesen is illustrative, where he first quotes government official Walport who frames the debate as a conflict between science and values / irrational belief:

It is Efsa's job to assess the danger posed by GM crops to humans and animals as well as the environment. The EU, under the precautionary principle, has an obligation to also assess the benefits and then make an informed decision weighing the two against each other. But Perry says the EU has neglected to define the benefits, skewing the bloc's policy.

Walport joined Jones by suggesting the GM debate is a conflict between objective science and irrational belief. "We pretend that the debate about genetically modified crops is a debate about science when the reality is actually that the science is very clear. It is really a debate about values. About people [with] strongly held personal opinions and beliefs [who] believe that there is something wrong in humans modifying nature."³⁴

Following this quote, the journalist gives a critical comment on Walports framing of opponents: *Defining the GM debate as a contest between objective science and irrational belief allows scientists to ignore a wider definition of risk and to frame opponents as fundamentalists.³⁵* The journalist thereafter quotes a NGO on the matter:

But Marco Contiero, Greenpeace's EU policy director on agriculture says many of the scare tactics used against GM - for example the moniker "Frankenfoods" - are red herrings. He says GM technology is "absolutely brilliant" in highly controlled circumstances, but says there are serious, rational, empirical questions about the reality of GM cultivation in the wider

³² Stewart and Denny, "US uses GM foods in first assault of EU trade battle". The Guardian, May 20 2003.

³³ Artur Nelsen, "UK should be given power to regulate GM crops, MPs say; Science and technology committee damns EU rules on authorisations for genetically-modified crops as politicised and unscientific". February 26, 2015.

³⁴ Karl Mathiesen, "Is a ban on GM crops more harmful than growing them?" The Guardian, November 20, 2014

³⁵ Ibid

environment. The benefits attributed to GM can only be seen as benefits if you accept a form of agriculture dominated by five monolithic corporations and vast fields of single crops with a massive ecological footprint, he says.³⁶

These articles show how the NGOs have a broader understanding of risks connected to GMOs, beyond the direct effects that GMOs can have on human health. These articles clearly displaying that the controversies between NGOs and government officials relate to different understandings of what science and risk assessment should include.

Lastly, although most of the articles are 'neutral' by portraying the different sides of the story, some articles tend towards a **critical framing of big corporations**. An illustrative example in an article by reporter Karl Mathiesen, where he after having quoted both sides of the controversy, ends the article by asking who benefits?

The GM story conversation breaks down because of these differing frames of reference.

Opponents refuse to acknowledge the potential and proven benefits of crops that resist pests or drought or have higher concentrations of important nutrients. To do so would undermine their position on agricultural reform.

Scientists are caught uncomfortably between the potential of a technology that is inherently useful and the reality of an agricultural system dominated by corporations with a track record of environmental vandalism.

By defining the costs and benefits within certain parameters, Walport ignores vital questions about how we farm, who owns the means of production and who ultimately benefits.³⁷

Summing up and comparing the periods 2000-2006 and 2013-2015, the first period contain a larger number of opinion based articles, most of which take a more pro-PP approach. Further, the articles in this period that can be termed more neutral are often reporting on international trade negotiations, and are sometimes framing the PP as part of a UK /EU value contrasting the US risk-approach.

In the second period (2013-2015), the articles at first glance seem more neutral, presenting the different sides of controversies. There is however a sharp critical edge towards powerful industries and government officials (perhaps because journalist may see their role as criticizing those in power). Further, it seems that the framing has shifted from portraying the PP as part of a controversy between the UK and the US in the early 2000, to a controversy between government officials and environmental NGOs within the UK in 2013-2015. Underlying the controversies are different understandings of science and on how broad or narrow risk should be defined.

3.5.3 Comparing the two cases

A similarity in the framing of the two cases is that the journalists often display different opinions and include different spokespersons. In both cases, scientists are often quoted, thereby framing the cases as controversies around science. However, the scientists quoted seem to be displayed as taking a stronger stance on favouring the PP in the neonics case.

Besides scientist, a broad range of spokespersons are quoted in both cases. The cases thereby often framed as controversies between actors with very different perceptions of the usefulness of the PP. The fundamentally different understanding and valuing of **risks**,

³⁶ Ibid

³⁷ Ibid

science and industry are highlighted and are underlying the different perceptions of the PP. In the case of GMOs, industry spokespersons and some of the government officials tend to argue that applying the PP to is unscientific, while NGO's are in favour of the PP mainly for regulating powerful industries. In the case of neonics, industry leaders are much more outspoken and rely mostly on the argument that the PP is based on over-stating particular risks, while NGO's are in favour of the due to scientific uncertainty and risks to bio-diversity.

4 Conclusion

This report gives a snapshot into how the Guardian is framing the use of the PP. An overall insight is that the PP is mentioned in relation to a wide range of different issues, many of which could be researched further. However, from the data provided, we can draw out the following main findings that could be useful for the upcoming tasks in the RECIPES project:

A "Innovation Principle" is not mentioned in any articles in the Guardian between 2000 and 2018. Compared, the PP is mentioned in 198 articles. However, the word innovation is mentioned occasionally within the PP articles. In section 3.4.3, we found that one category of argument was that the PP does not hinder innovation or business, but that it rather can steer it in certain directions and lead to more sustainable innovations. However, this argument was not mentioned frequently, and it was mostly academics and some journalists that posed this argument.

Although the PP is mentioned in 198 articles, it is often mentioned very briefly. Further, it is mentioned in relation to a very wide range of cases, ranging from e.g. public health and medicine to toxins and environmental conservation. In section 2, it is however indicated that especially environmental journalists refer to the PP, and that many articles are found in the environmental sector of the newspaper. This indicates that the PP is framed as particularly relevant to different issues related to the environmental.

The majority of the articles could be termed 'neutral' as they display different sides of the story and quote different spokespersons with different opinions. It thereby seems that the journalists in the Guardian focus on displaying the different arguments and allowing the reader to evaluate and decide on their own viewpoint. However, many articles still have a tendency towards favouring an application of the PP, especially when commenting on government proceedings and trade negotiations.

The argument analysis, and the dive into the two cases, indicate that the controversies around applying the PP revolve around different understandings of science and scientific uncertainty, risk and fear, and economic development. The main bulk of the articles on GMOs and neonics are framed as controversies between different spokespersons with different perceptions of the PP and scientific uncertainty more generally. In both cases, industry spokespersons and some of the government officials tend to argue that applying the PP to is unscientific (especially in the GMO case), and is based on over-stating particular risks (especially in the neonics case). NGO's are the main opponents, favouring the application of the PP due to scientific uncertainty and for conserving bio-diversity (especially in the neonics case), and in order to regulate powerful industries (especially in the GMO case). Scientist are often quoted in both cases, but they seem to be displayed as taking a stronger stance on favouring the PP in the neonics case.

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