



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

Germany/ Süddeutsche Zeitung



The RECIPES project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824665

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With thanks to:

Alessia Neyjahr

Project coordination and editing provided by Ecologic Institute.

Manuscript completed in [October 16 2019]

Document title	Media analysis
Work Package	WP1
Document Type	Internal Report (Milestone 1.3, public discourse)
Date	16 October 2019
Document Status	Final version

Acknowledgments & Disclaimer

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1 Introduction

The media – old and new – play an important role in political and societal discussions. The media reports on social and political discussion and offer a platform for the societal debate, and newspapers provide an important part of the overall media landscape. News reports can help put issues on the political and social agenda, steering public opinion, and can go as far as triggering members of parliament to pose questions to the minister in charge. Opinion pages in newspapers aim to present a wide spectrum of different stimulating societal opinions, thus fostering societal debate and clarifying differences of opinion. Thus, 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 this shouldn't be confused. This means that when issues actually show up in the media, if they do at all, is not the conclusive statement on whether the issues 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, it is one valuable way to try to figure out how the print media is potentially shaping and driving public interest and knowledge in particular topics.

With those questions in mind, this report will analyse how the one influential German newspaper, the *Süddeutsche Zeitung*, has reported about the precautionary principle, innovation, and the RECIPES case study topics, in the period from 2000 to 2018. The other analysed newspapers are listed below 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 introduction to 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 that sub-section.

In short, this 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 of the relevant articles. In the qualitative analysis, we read and coded according a framework loosely inspired by qualitative discourse analysis procedures. Here we identified the general positive/negative stance of the article with respect to the PP, which stakeholders are influential in shaping the discourse surrounding the PP, and additionally dove into the specific arguments put forth for and against the PP. This data is presented in a variety of in overall summaries and by deep-diving into specific case study topics

1.1 Search terms

The first step in crafting our media analysis methodology was to develop relevant search terms to identify the articles initially from the large pool of published articles. The primary search terms used to identify articles were “precautionary principle” and “innovation principle”. To obtain the articles, the appropriate search terms were entered into the Lexis Nexis search engine. (More information on these databases can be found at www.factiva.com and www.nexis.com). Articles receiving containing either of these search terms for either of these terms formed the pool of articles to be analysed. A list of the primary search terms is found in Table 2 which also shows synonyms and the German translation which was actually used.

Table 2 - Primary search terms

Search term	Labels	German Translation
Precautionary principle	Principle of precaution, Precautionary approach	Vorsorgeprinzip
Innovation principle	Principle of innovation	Innovationsprinzip

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 term

Search term	Labels	German Translation
Genetically Modified Organism	GMO, Monsanto, Bayer, MON810	GVO, gentechnisch veränderter Organismus, Monsanto, Bayer, MON810, gentechnisch verändert, gentech, Genmanipulation
CRISPR	Gene editing, Gene editing techniques, Human Genome Editing	CRISPR, Cas9-Protein, Genome Editing, Gene Editing, Genom-Editierung, Genomchirurgie, Gen-Schere, Gen-Chirurgie, DNA Veränderung, DNA Mutation, DNA schneiden, DNA editieren
Trade agreements	Comprehensive Economic and Trade Agreement, EU-CAN treaty, CETA, Transatlantic Trade and Investment Partnership, TTIP, hormone meat	Handelsabkommen, umfassends Wirtschafts- und Handelsabkommen EU-Kanada, CETA, Comprehensive Economic and Trade Agreement, TTIP, Freihandel, Freihandelsabkommen, transatlantisches Freihandelsabkommen, Transatlantische Handels- und Investitionspartnerschaft, Hormonfleisch
Pesticides	Neonicotinoids, insecticides, Glyphosate	Neonicotinoide, Insektizide, Imidacloprid, Thiamethoxam, Unkrautvernichtungsmittel, Neonic
Chemical industry	PCB's, DDT, Chemical substances	Polychlorierte Biphenyle, PCB, DDT, Chemikalien, Agrochemie, Agrarchemie, Agrikulturchemie, agrochemisch,
Endocrine disruptors	Bisphenol A/BPA, phthalates	Endokrine Disruptoren, Xenohormone, Umwelthormone, hormonaktive Substanzen, Bisphenol A, BPA, Phthalate, hormonstörende Chemikalien
Nanotechnology	Nanomedicine, nanomaterial, nanorobots, nano-cure	Nanotechnologie, Nanotechnik, Nanomedizin, Nanomaterial, Nanobots, Nanoroboter, Nanocure, Nano Cure Nanopartikel,
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals	REACH, REACH - Verordnung , Verordnung Nr. 1907/2006, Chemikalienverordnung, Registrierung, Bewertung, Zulassung und Beschränkung von Chemikalien
Financial risks	municipal bankruptcy	Finanzrisiko, Finanzrisiken, kommunale Insolvenz
Farmers	farm industry, agroindustry	Landwirtschaft, Agrarwirtschaft, Agrarindustrie, Bauern, Landwirte
Risk management	Technological Risks, Socio-technical risk assessment, risk	Risikomanagement, technologische Risiken, sozio-technologische Risiken, technische Risikobeurteilung, technische Risikobewertung, risikoreduzierende

Search term	Labels	German Translation
	reduction measures, research in innovation	Risk Maßnahmen, risikomindernde Maßnahmen, risikobegrenzende Maßnahmen, Abbau von Risiken, Risikoforschung
<i>EU</i>	European Union, EU court of Justice, EU commission	EU, Europäische Union, EU Kommission, Europäische Kommission, European Union, Gerichtshof der Europäischen Union, EuGH
World Health Organization	WHO	WHO, World Health Organization, Weltgesundheitsorganisation

1.2 Number of identified articles

In the case of the Süddeutsche Zeitung, we took all articles containing the term precautionary principle. Eliminating for duplicates and falsely identified articles, this resulted in 130 articles from the Süddeutsche Zeitung for the period 2000-2018. The below table shows the respective number of articles analysed in The Guardian and Le Monde as well.

Table 4 - Number of identified articles

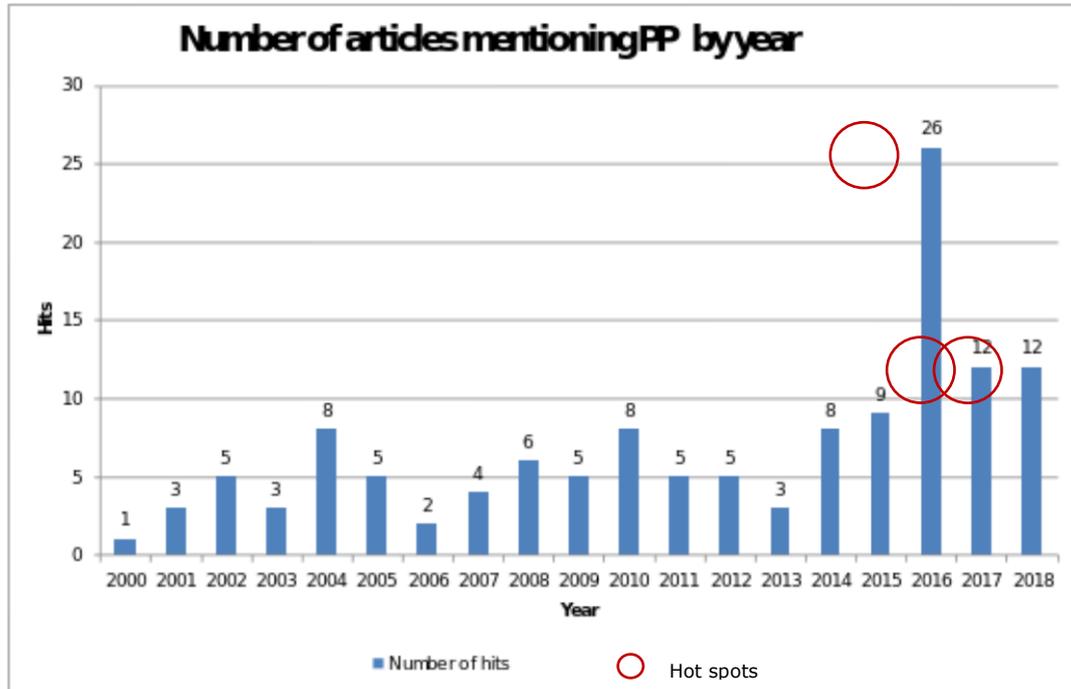
Newspapers	Number of articles analysed
Le monde	210
The guardian	198
Süddeutsche Zeitung	130

3 Analysis - Süddeutsche Zeitung

1.3 Historical hotspots

As discussed above, we first searched for the appropriate newspaper articles in the Süddeutsche Zeitung for the period January 1 2000 to December 31, 2018. Removing duplicates, this resulted in 130 unique articles. Figure 1 below shows the number of articles per year and identifies for "hotspots". As can be seen, the past 3 years have seen the highest number of articles, with 26 articles in 2016, and 12 in both 2017 and 2018.

Figure 1 - Number of articles that appeared in Süddeutsche Zeitung



Our analysis suggests that the 3 year trend (2016 – 2018) is mainly due to reports about trade agreements (i.e. TTIP, CETA, trade agreements between Germany and Japan) and specific case study topics CRISPR, GMOs and glyphosate. The following summarizes one such sentiment regarding TTIP, quoting a German farmer critical of US farm product imports, and in particular GMOs:

„Wir brauchen keine landwirtschaftlichen Güter aus Amerika“, sagt Kreitmair. „Das muss die Haltung bleiben.“ Gleichzeitig legt er großen Wert darauf, dass sich USA und EU auf Standards einigen, die gut sind für Mensch, Umwelt und natürlich die Wirtschaft. Denn sonst, sagt Kreitmair, könnten dem Markt asiatische Standards aufgedrückt werden, die schlimmstenfalls weit unter hiesigen Vorstellungen von gesunder Lebensmittelproduktion liegen.

„Wenn aus den USA mit künstlichen Hormonen belastetes Fleisch oder gentechnisch veränderte Lebensmittel importiert würden, müssten diese zumindest klar gekennzeichnet sein“¹

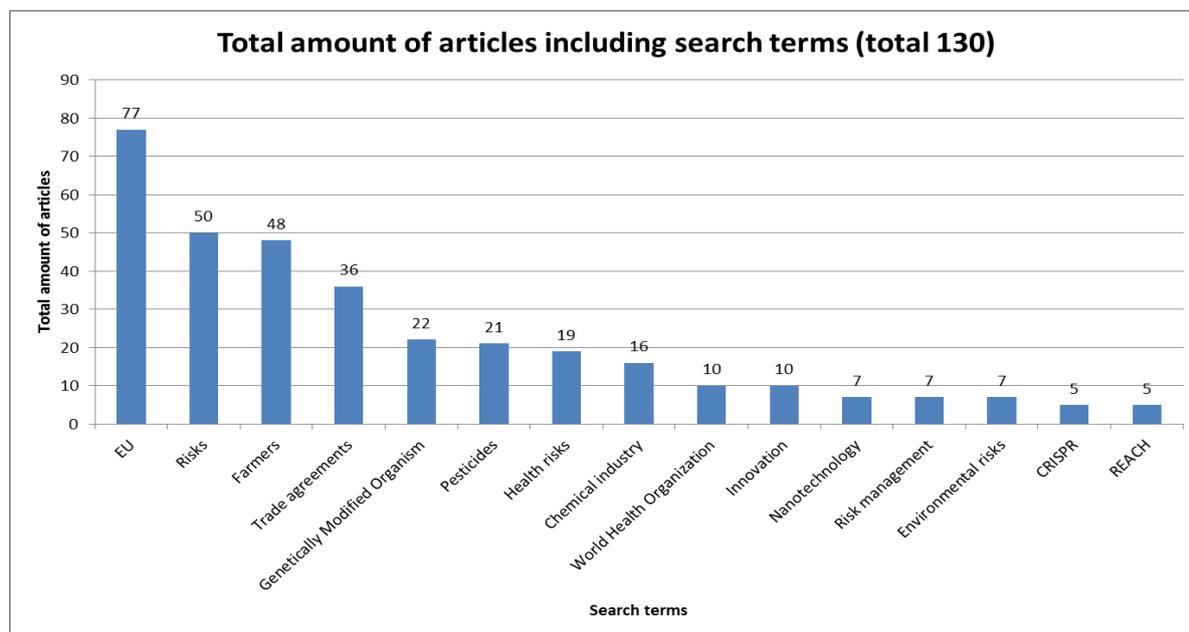
1.4 What topics are being covered?

Below we look at which of the pre-identified search terms occurred within the articles. Only 1 article contained the term innovation principle, although 10 articles included the term innovation. This is important to highlight from the onset, as it appears that the innovation principle received very little attention overall in the Süddeutsche Zeitung.

¹Endlich öffentlich; Kommunalpolitiker und Landtagsabgeordnete im Landkreis lehnen das umstrittene Handelsabkommen TTIP quer durch die Parteien nicht pauschal ab. Sie begrüßen, dass die Geheimniskrämerei nicht mehr möglich ist. Süddeutsche Zeitung. Freitag 6. Mai 2016

As can be seen in figure 2, the search terms appearing in the most articles were EU, risks, farmers, and various trade agreements, only then followed by any of the actual case study topics.

Figure 2 - Number of articles that appeared on different issues



Looking deeper, we then assigned each article to one or more of the case study topics. At the time of this media analysis, 7 case study topics were already chosen, with the 8th case study still to be decided by relevant stakeholders.

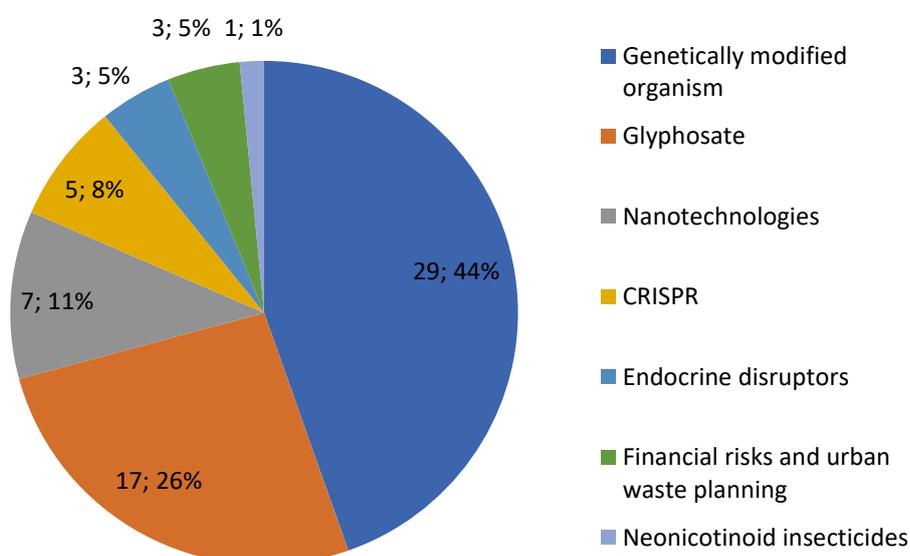
The case study topics analyzed are:

- 1 New gene-editing techniques (CRISPR-Cas9)
- 2 Genetically Modified Organisms (GMO's)
- 3 Endocrine disruptors
- 4 Neonicotinoid insecticides
- 5 Nanotechnologies
- 6 Glyphosate
- 7 Financial risks and urban waste planning

Figure 3 shows breakdown of the number of articles mentioning each case, and the percentage of the total this represents.

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

Articles about the cases



In total, **52 of the 130** articles referred to at least one of the case topics, while some articles mentioned more than 1 case. This means 40% of the articles referred to at least one of the RECIPES case study topics, while 60% did not. Note that the sum of 65 reflects that some articles referred to more than one case study topic. As Figure 3.2.1 shows, the most mentioned cases are GMOs, which appeared in 29 articles in total, or over half of the articles mentioning any case, and nearly a quarter of total articles. To restate this, roughly 25% of all PP articles analysed over the past 18 years referred to GMOs!

GMOs were followed by Glyphosate in 17 of the articles, and Nanotechnology 7 in total. **In other words, in roughly 70% or articles mentioning a case study (46 out of 65 including multi-case mention articles), can be explained by GMOs and Glyphosate.** This finding points our attention to the importance of these 2 cases in the German PP discussion, which is captured below in Figure 3.2.2, and further discussed in the deep dive sections.

Lastly, the 8th case study topic, on artificial intelligence, only occurred in 2 PP articles.

1.5 Newspaper Section & opinion, news, or feature?

In this section, we analyse which section of the newspaper the article appeared, the type of article (opinion, news, or feature), as well as front page coverage. We also list the journalists who wrote most frequently about the PP. This information is provided in the Lexis Nexis search engine metadata.

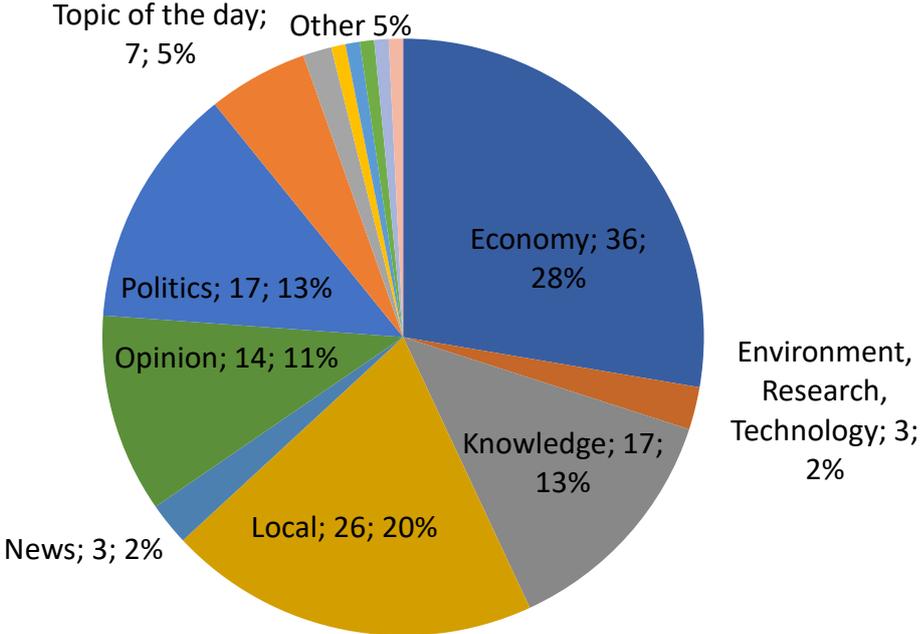
3.1.1 Newspaper Section

Figure 4 shows in which section the article appeared. For each section the total number and the percentage of articles are shown. The section containing the most PP articles is the "Economy" section (28%), followed by sections referring to local regions in Germany

(i.e. Bavaria, cities in Bavaria) (20%), and then knowledge, opinion and politics. As reflected in the figure, the articles are fairly well-spread throughout the paper, with Economy – the Business section in an English-language newspaper – as the leading section. In addition, please note that 6% of all articles (8 in total) appeared on the front page (sometimes these articles are also assigned a section in the newspaper).

Figure 4 - Newspaper section

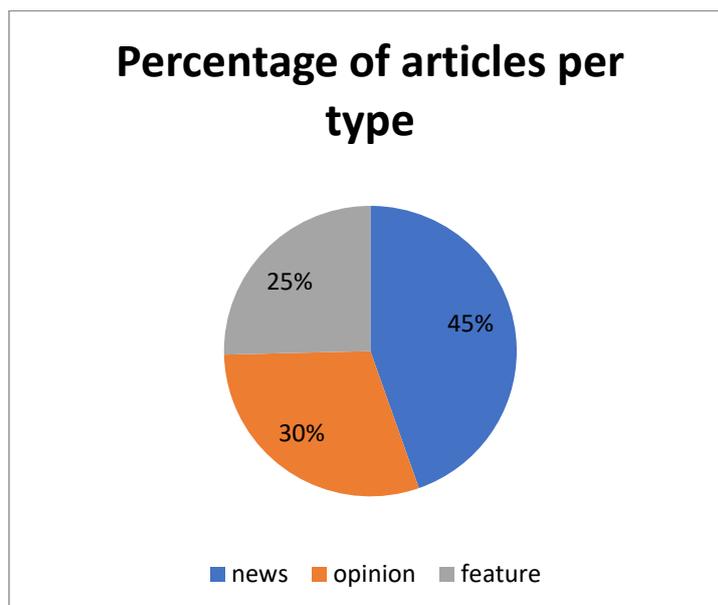
Percentage of articles per section



3.1.2 Type of article

According to the metadata in the Lexis Nexis search engine, articles are either classified news, opinion, or feature pieces. We also analysed the type of articles that made up the 130 articles, as shown in Figure 5. Almost half (45%) of all published articles about the precautionary principle are considered news articles, 30% are opinion and 25% were feature pieces.

Figure 5 - Type of article



3.1.3 Which reporters are writing on this issue?

Table 4 below shows a breakdown of which journalists are writing about which topics. Taking a look at which reporters wrote articles, we see a rather broad distribution, with 11 reporters writing 2 or more articles, and the vast majority of articles written by a non-journalist, such as academic or groups of academics, or a political leader.

We can see that certain journalist have written a disproportionate number of articles. For example, Alexander Hagelüken wrote 11 articles, all on the topic of trade agreements in 2016, 2017 and 2018.

Table 5 - Journalists

Reporters	Case/Topic of the article	Total amount of articles
Alexander Hagelüken	Trade agreements (11)	11
Alexander Mühlauer	Glyphosate (2), Trade agreements (8)	10
Silvia Liebrich	chemical industry (1), financial risk (1), Trade agreements (4), Glyphosate (3)	9
Kathrin Zinkant	Glyphosate (2), tap water quality (1), GMO / CRISPR (4)	7
Michael Bauchmüller	Precautionary Principle (1), Innovation and environment protection (1), Uranium in tap water (1), Trade agreements (3)	3
Hanno Charisius	Bisphenol A (1), Glyphosate (1), GMO / CRISPR (1)	3
Thomas Kirchner	Amalgam (1), Trade agreements (2)	3
Christopher Schrader	Mobile radiation (2)	2

Reporters	Case/Topic of the article	Total amount of articles
Carolin Fries	Mobile radiation (2)	2
Cornelia Bolesch	Scrapie / BSE (1) ; Reach (1)	2
Jan Willmroth	Trade agreements (2)	2

1.6 Framing, spokesperson and analysis of arguments

In this section, we provide an in-depth analysis of the 130 precautionary principle articles found in the Süddeutsche Zeitung from 2000 to 2018. Within those articles, we looked at the overall framing of the articles, the type of spokespersons being referred to, and analysed which arguments were put forth in support of or criticism of the PP. In this section we will present both summary statistics across the relevant articles, and a deep dive into the individual cases.

3.1.4 Overall perspective

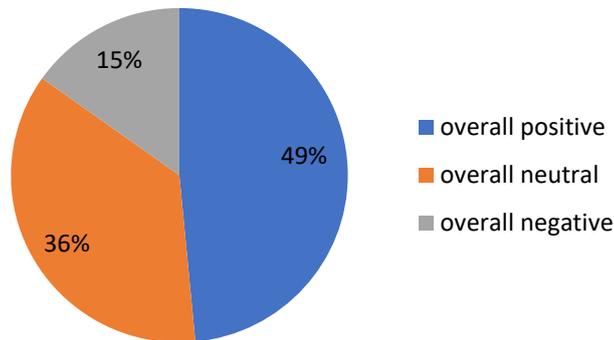
Figure 6 shows the articles' overall perspective (positive, neutral, negative) on the use of the precautionary principle. Each article was assessed and subjectively rated as positive, negative or neutral, in terms of the overall stance the article takes on the PP. A positive perspective indicates that the reporter mainly presented positive arguments towards the precautionary principle. A negative perspective means that mostly negative arguments were reported in the article. A neutral article is either one where there was a similar number of positive and negative arguments put forth with regards to the PP, or for articles which only mention the precautionary principle without expressing any perspective or simply provide a short neutral definition about the precautionary principle.

We acknowledge that this is a subjective exercise, and furthermore 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 an incorrect attribution of neutral to an article 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.

We rate almost half of the articles (48%) as presenting the precautionary principle positively; whereas 36% of all articles are neutral and only 15% express a negative view of the precautionary principle. Interestingly, when analysing just those articles which mention one of the 7 case studies (52 articles) rather than all PP articles (130), we see very little change in the framing; 46% of articles have a positive view (versus 48%), 31% and neutral view (versus 36%) and 23% a negative view (up from 15%). Thus it seems there is a slightly more negative view point found in the case study articles at the expense of some neutral articles, but we caution against making such a more generalized claim along these lines given the relatively small number of articles and subjective nature of the framing.

Figure 6 - The articles' overall perspective on PP



3.1.5 Overall spokesperson summary

For the spokesperson analysis, we looked at a total 399 quotations of various spokespersons over all articles from 2000 to 2018. In this analysis, we looked at all spokesperson quotes or references, not just those referring directly to either the PP or one of the cases. We used the following groups for this analysis: Academics, Public/government officials, Journalists, NGO's, Business leaders/professionals, Members of the general public, Lawyers. Figure 8 below (and the ensuing table 5) shows the *total number of quotations by spokespeople*, and the *number of articles with quotations by spokespeople*

Spokesperson quotes were found in 115 of the 130 total articles, representing 88% of articles. The below chart shows the breakdown of total spokesperson quotes. As is shown, academics were the most quoted spokesperson group, representing 29% of all spokesperson quotes. Academics were quoted in 47 of the PP articles (41%). Public and government officials made up 20% of all quotations, and appeared in 37% of articles.

Figure 7 - All spokesperson mentions

Spokespeople (all mentionings) in percentage

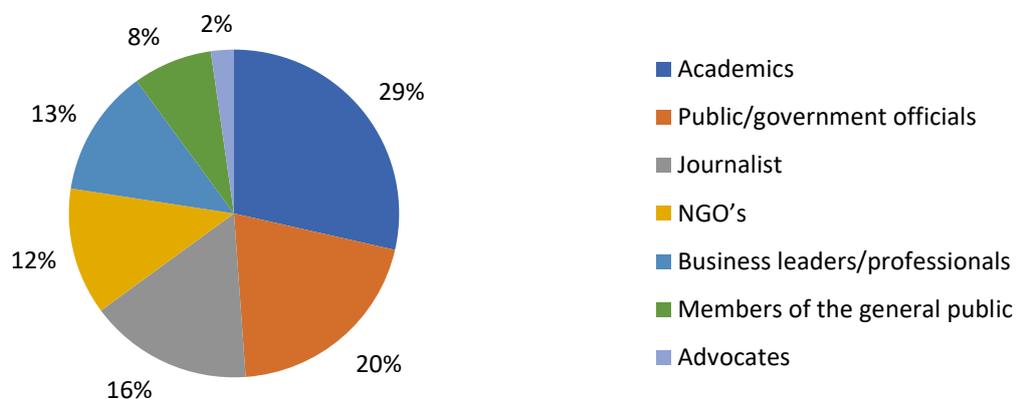


Table 6 - All spokesperson mentions: Percentage and Total

Spokeperson	Total spokesperson quotes	% of total quotes	Total articles appeared	% of articles
Academics	114	28.57	47	36.15
Public/government officials	81	20.30	43	33.08
Journalist	64	16.04	39	30.00
NGO's	50	12.53	32	24.62
Business leaders/professionals	50	12.53	29	22.31
Members of the general public	31	7.77	18	13.85
Lawyers	9	2.26	8	6.15
Total amount	399	100.00	115.00	88%

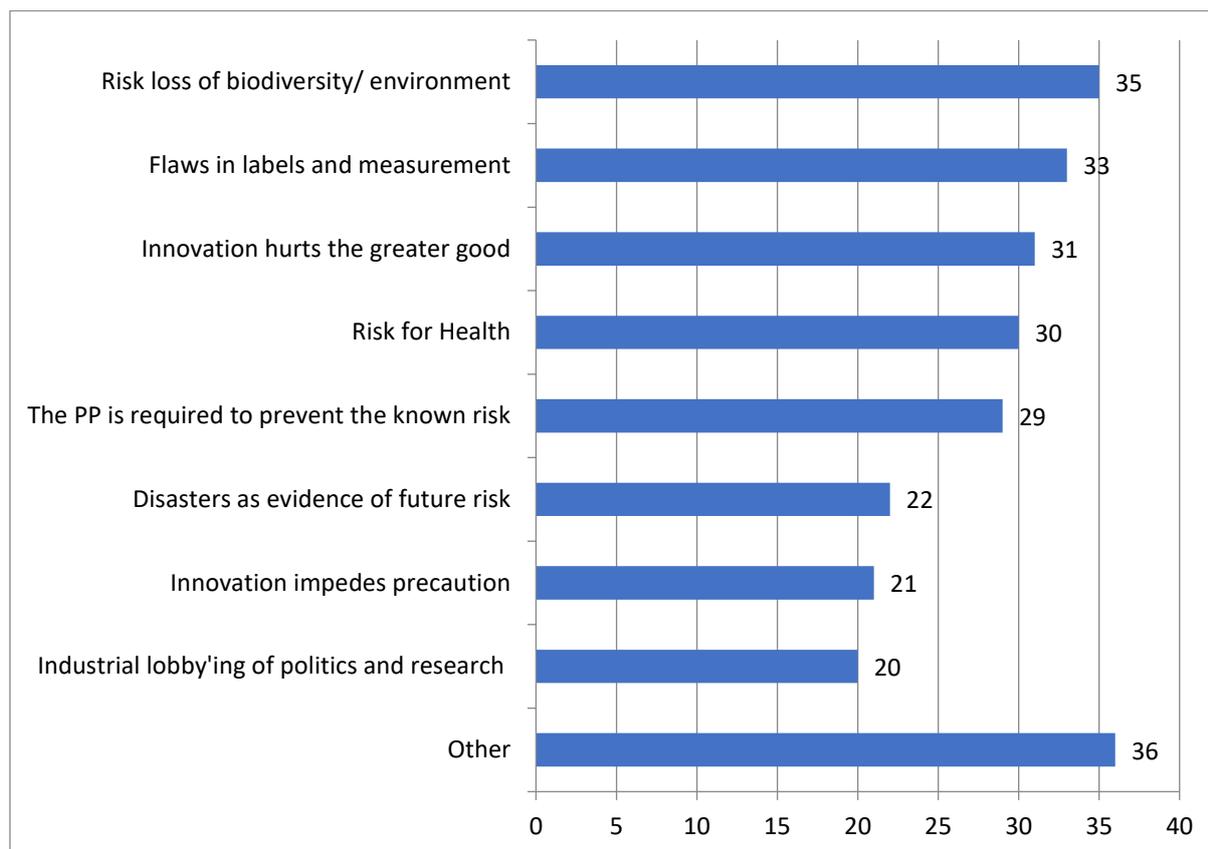
3.1.6 Overall analysis of arguments

In order to understand what types of arguments are used to describe the PP, we performed an analysis of the arguments put forth by the various spokespersons, including the journalist themselves. This was a subjective analysis whereby we identified all occurrences of arguments for or against the PP, as well as the spokesperson type associated with the argument. We then further specified these arguments into the common or dominant type of arguments that we observed both for and against the PP. See table 6 below for a list of all arguments coded for.

In total 408 arguments were analysed, with 151 evaluated as broadly negative (37%), and 257 as broadly positive (63%)

As can be seen, we coded more possible positive arguments which is reflected in a more broadly distribution of positive statements than the set of negative arguments. Figure 8 below shows the topic arguments for the PP.

Figure 8 - Pro PP arguments (257 Total)



The most frequent argument seems to be that the PP should be applied because of risks to biodiversity and the environment, which appears in 35 arguments. For instance, the below quote points to the potential irreversible effects of science and technology when introduced into nature, in the context of GMO agricultural products:

*"Befürworter des Vorsorgeprinzips argumentieren dagegen, dass durch enorme Eingriffe von Wissenschaft und Technologie in die Natur wesentliche und oft lang anhaltende Auswirkungen unvermeidlich sind. Die Folgen könnten katastrophal und irreversibel sein."*²

Another article refers to uncertainty regarding insect species extinction, which is likely caused by a multitude of factors including pesticides and climate change. In addition, neonicotinoid, one of the RECIPES case studies, is mentioned:

"Auch was die Ursachen des Artenschwunds angeht, gibt es noch wenig Gewissheiten. „Das ist schon fast Voodoo“, sagt Settele. „Wir ahnen, was es ist“, sagt Wägele. „Aber wir können es nicht beweisen, uns fehlen die Daten.“ Beide Wissenschaftler meinen damit nicht, dass man tatenlos zusehen soll, bis alles ganz genau erforscht ist. „Wir müssen nach dem Vorsorgeprinzip handeln“³

²Amerikas Chemie-Lobby macht Druck; Von Jeremy Rifkin; Außenansicht Süddeutsche Zeitung 12. Mai 2004

³Die Zählung der Fliegen; Viele Menschen vermissen Schmetterlinge, Hummeln und sogar Mücken in der freien Natur. Gibt es ein Insektensterben in Deutschland? Einiges deutet darauf hin, aber um Gewissheit zu haben, fehlen die Daten. Süddeutsche Zeitung. Montag 7. August 2017

Another often employed argument refers to flaws in labelling and measurement, with 33 mentions. Such an example refers to the apparently unproved trend for tree extinction in forests. In particular, some threshold limit for keeping forests viable is apparently 2 times too high:

"Aus den Ergebnissen entwickelten die Wissenschaftler einen „Critical Load“, eine Art ökologische Belastungsgrenze, von 5,8 Kilogramm Stickstoffeintrag pro Hektar und Jahr. „Der aktuelle Richtwert der Luftreinhaltekonvention ist etwa doppelt so hoch“, sagt Seidling. Er müsse angepasst werden, wolle man weiter nach dem Vorsorgeprinzip handeln.“⁴

Another argument refers to innovation's negative effect on the greater good. In the following extended quote, we see both politicians and academics linked together to criticize the CETA trade agreement, which is said to attack the PP, among other things, and to serve the interests of large corporations:

"Ceta-Kritiker erhalten Unterstützung: Die sozialdemokratischen Kritiker des Freihandelsabkommens Ceta bekommen prominente Unterstützung. In einem Brief an den Sprecher der Parlamentarischen Linken in der SPD-Bundestagsfraktion, Matthias Miersch, schreibt der Umweltexperte und Naturwissenschaftler Ernst Ulrich von Weizsäcker, die wirtschaftlichen Vorteile des europäisch-kanadischen Abkommens seien „anzuzweifeln“...

„Mit Recht stehen die geplanten Investitionsschutzregeln, die vertragliche Einführung vieler unbestimmter Rechtsbegriffe sowie der vertragliche Angriff auf unser Vorsorgeprinzip... Nach bisherigen Erfahrungen sei zu befürchten, dass „diese Sorte von Freihandel den meisten kleinen und mittleren Unternehmen und der Landwirtschaft“ schade. „Gewinner könnten vielleicht Großkonzerne, speziell der Automobil- und Chemiebranche, sein.“⁵

Lastly, a few other interesting arguments employed were 'disasters as evidence of future risk' (22 times), and 'pointing to industry lobbyism' (20 times).

⁴ Zu viel Stickstoff im Wald; Wurzelpilze sterben ab, und damit auch die Bäume. Süddeutsche Zeitung. Dienstag 11. Dezember 2018

⁵ Sprechstundenhilfe; Sigmar Gabriel stellt sich am Tag der offenen Tür den Fragen ganz normaler Bürger. Ob Flüchtlingspolitik, Waffenexporte oder TTIP - der SPD-Mann setzt auf Pointen. Auch wenn er mal keine Ahnung hat. Süddeutsche Zeitung. Montag 29. August 2016

Figure 9 - Against PP arguments (151 Total)

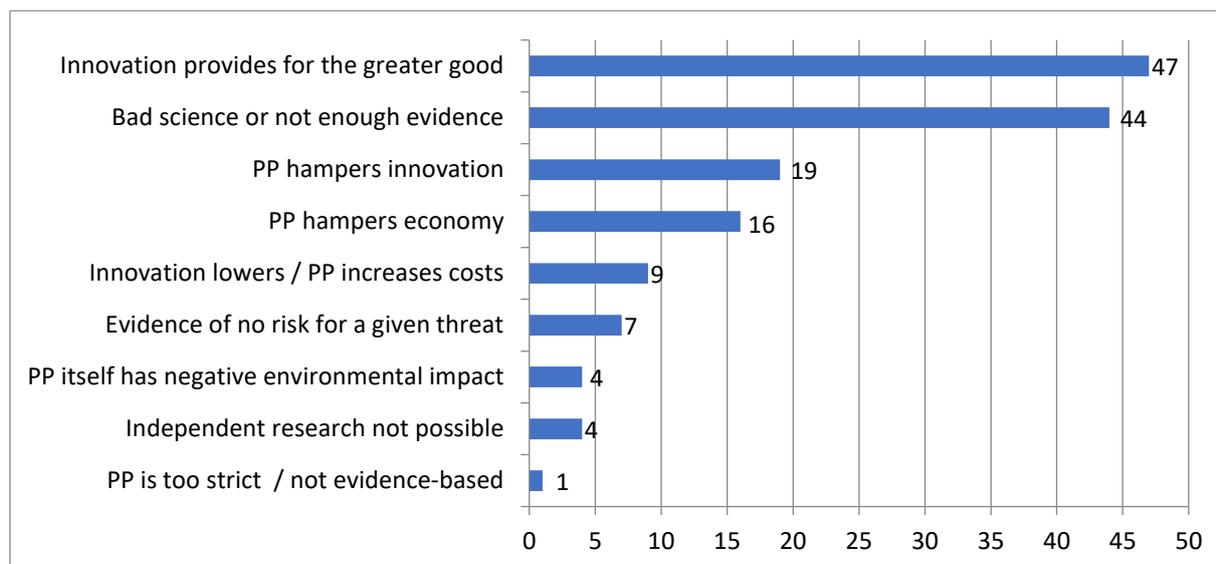


Figure 9 above shows some of the arguments recorded against the PP. The top negative arguments included 'Innovation provides for the greater good' (47 times), 'Bad science or not enough evidence' (44 times), 'PP hampers innovation' (19 times).

An example of 'innovation provides for the greater good' can be found in this extended quote about the benefits of genetically editing agriculture, which is relevant to our gene-editing case study:

"Bei Pflanzensorten, die schon existieren und die sich wenig verändern sollten, wenn man sie vermehrt. Das ist wichtig für den Erhalt der Biodiversität. In der Pflanzenzucht aber geht es immer um Veränderung. Sie ist das Fundament, auf dem sich bessere Sorten mit neuen Eigenschaften entwickeln lassen, eine größere Vielfalt. Da ist es vom Grundsatz her egal, ob man im Kloostergarten Erbsen miteinander kreuzt, um dickere Schoten zu generieren. Oder ob man in einem Hightech-Labor mit Genschere wie Crispr-Cas9 den Code im Erbgut der Hülsenfrüchte umschreibt. Keiner der Prozesse schützt die genetische Integrität der Erbse. Beide Vorgänge bringen das gleiche Ergebnis. Nur dass moderne Gentechniken schneller sind, Ressourcen schonen, weniger Kollateralschäden im Erbgut erzeugen. Also besser sind" (2017_2)⁶.

With regards to the 'bad science/not enough evidence' argument, the following quote attacks the ECJ's legal decision on gene-editing using Crispr-Cas. The quote describes how 130 seed producers were disappointed with the courts apparent rejection of the scientific consensus regarding the safety of gene-editing:

"Vor allem Pflanzenzüchter und -forscher zeigten am Mittwoch und Donnerstag großes Unverständnis für das EuGH-Urteil, nicht zuletzt für die vorgeblich wissenschaftliche Begründung der Entscheidung. Der Bundesverband Deutscher Pflanzenzüchter, der mehr als 130 größtenteils mittelständische Saatguthersteller und -händler vertritt, zeigte sich tief enttäuscht. „Der EuGH ignoriert mit seinem Urteil die wissenschaftliche Bewertung der Experten europäischer und nationaler Behörden, nach der Pflanzen, die sich nicht von klassisch gezüchteten unterscheiden, nicht als GVO einzustufen sind', kritisiert die

⁶ GENTECHNIK; So grün wie nie. Süddeutsche Zeitung. Samstag 21. Januar 2017

*Vorsitzende Stephanie Franck. Man sehe in dem Urteil eine „deutliche Abkehr von Innovationen und Fortschritt in der Landwirtschaft“.*⁷

Fittingly, we can conclude this section by referring to a pro-PP argument found in the same article, where the German Federal Government for the Environment and Nature Conservation in Germany (BUND) praised the decision, as it puts citizens ahead the profits of Monsanto:

*„Der EuGH hat das Vorsorgeprinzip bestätigt und den Schutz der Bürger sowie ihre Wahlfreiheit über die Gewinninteressen von Konzernen wie Bayer-Monsanto gestellt“.*⁸

3.1.7 Spokesperson breakdown by argument

In this section, we combine the above analysis of arguments and spokesperson analysis to provide a detailed breakdown of how various arguments are being positioned by various spokespeople.

In terms of spokesperson group employing the various pro and against arguments for the PP, by far the largest group overall was academics, with 116 recorded arguments in the sample, compared to public/government official with 79. Of the 257 positive arguments analysed, the top contributors were academics with 74, public officials with 44 and journalists with 43. Conversely, the 2 largest spokesperson groups making negative arguments were academics, with 42 negative statements (28% of all negative) and business people / industry spokespeople with 38 negative statements (25% of all negative). To keep this in perspective, whereas academics were recorded in a total of 116 arguments of which 36% were negative, business only recorded 52 total arguments, meaning 72 % of their arguments were negative.

Figure 10 shows the breakdown of positive versus negative arguments by stakeholder group, and figure 11 aggregates this pro/con arguments by stakeholder type in percentage terms.

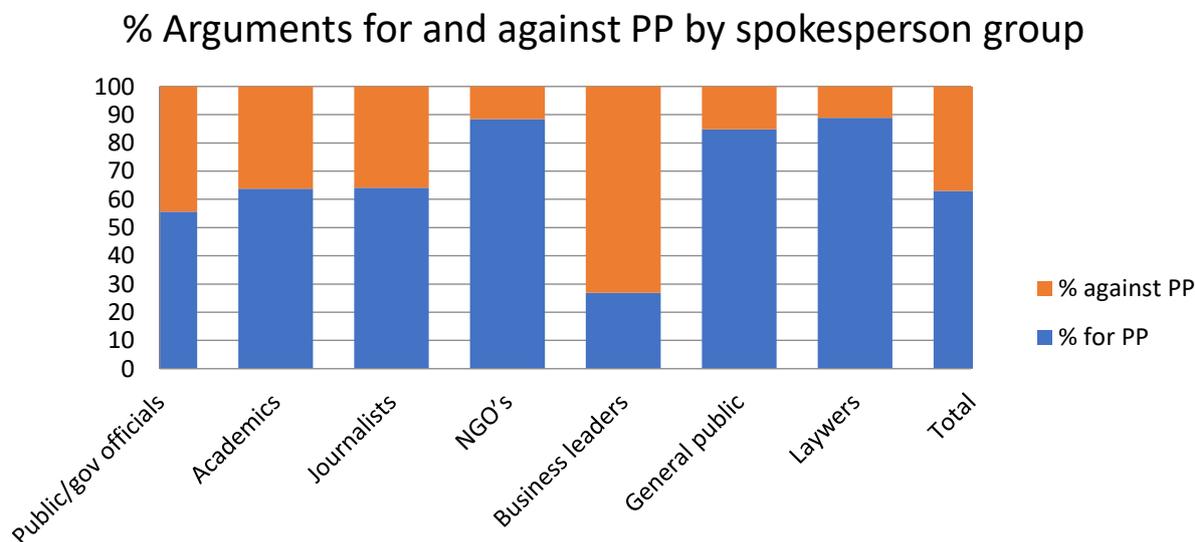
⁷ Erschütterte Wissenschaft; Gentechnikgegner loben EuGH-Urteil, Forscher sind enttäuscht. Süddeutsche Zeitung. Freitag 27. Juli 2018

⁸ Ibid

Figure 10 - Spokesperson breakdown by argument

	Public/government officials	Academics	Journalists	NGO's	Business leaders/professionals	Members of the general public	Advocates	Total
Arguments against the PP	35	42	24	6	38	5	1	151
PP hampers innovation	3	1	1	1	11	2	0	19
Too strict labelling / not evidence based labelling	1	0	0	0	0	0	0	1
No independent research possible	0	0	1	0	2	1	0	4
PP hampers economy	5	2	1	0	6	1	1	16
Innovation lowers costs/ PP causes higher costs	6	1	0	1	1	0	0	9
Negative impact on environment due to PP	0	3	1	0	0	0	0	4
Innovation is providing progress for the greater good	18	9	10	0	9	1	0	47
Evidence for no risk at all	1	3	1	1	1	0	0	7
Bad science or not enough evidence	1	23	9	3	8	0	0	44
	Public/government officials	Academics	Journalists	NGO's	Business leaders/professionals	Members of the general public	Advocates	Sum
Arguments for the PP	44	74	43	46	14	28	8	257
Innovation and PP are compatible	7	1	0	0	0	0	0	8
PP steers innovation	3	3	0	0	0	0	0	6
PP has positive impact on greater good	0	0	2	0	0	2	0	4
Unknown possible longterm impact / too complex	2	5	0	0	0	2	0	9
Innovation endangers the PP	3	2	4	5	0	4	3	21
Innovation has negative impact on greater good	8	6	3	5	7	1	1	31
Industrial lobbism influences politics and research	3	3	3	7	2	2	0	20
Risk for Health	6	5	6	6	2	4	1	30
Big risk for loss of biodiversity/ environment	3	16	7	5	0	4	0	35
research findings illuminating risk	1	12	3	9	1	2	1	29
Current flaws in labelling and allowed measurement	4	16	6	4	1	2	0	33
Use of disasters to provide arguments for future risk	2	5	6	3	0	4	2	22
Ethical based arguments	2	0	3	2	1	1	0	9

Figure 11 - Argument breakdown by stakeholder group: percent for and against

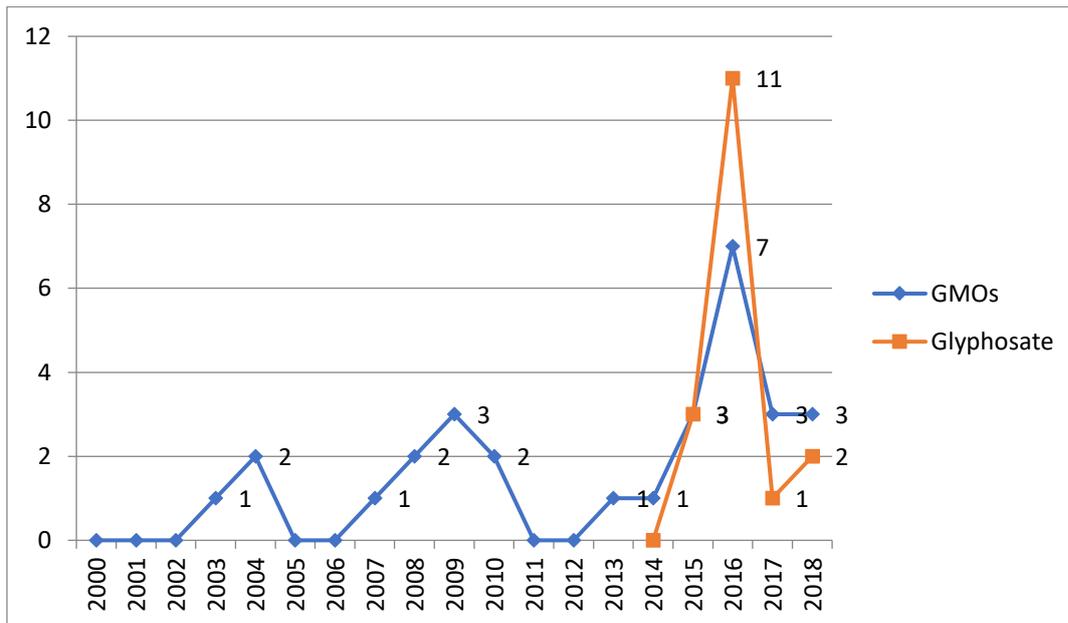


1.7 The Precautionary principle in selected case deep dives

As stated above in the hotspot summary section, 70% of articles mentioning a case study (46 out of 65 including multi-case mention articles) can be at least partially accounted for by GMOs and Glyphosate. Figure 12 below shows this trend, with a heavy peak in 2016. In 2016 alone 7 articles referred to GMOs and 11 to Glyphosate.

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

Figure 12 - Number of articles per year GMOs and Glyphosate



3.1.8 GMOs

In terms of the framing of articles specifically referring to GMOs, we see a slightly more positive view than overall articles, but results that are largely in line with the overall article framing findings. Recall that overall 48% articles were positively, 36% neutral and 15% negative.

In comparison, of the 29 GMO articles, 16 (55%) were framed with an overall positive view of the PP. In addition, 7 (24%) had a negative view, and 6 (21%) were neutral.

In terms of the types of arguments put forth, there were no outliers in comparison with the overall argument analysis. The most common argument for the PP was *Innovation has negative impact on greater good* (5 times) and *Industrial lobbyism influences politics and research control* (4 times), while the most common argument against the PP was *The PP harms the economy* (3 times).

Here is a very intensely worded statement against both the PP, but also government funding of organizations that advocate for the PP at the expense of industry. The quote also makes various value statements about the objectivity of science versus agenda driven activity carried out by environmental groups:

„Aber selbst wenn es solchen Initiativen um scheinbar selbstlose Ziele geht, um Umweltschutz, um das Vorsorgeprinzip, um die Natur, sind sie nicht unabhängig. Sie forschen nicht, um ihre Thesen eigenständig zu belegen und das zu leisten, was unabhängige Wissenschaftler an ihrer Stelle leisten könnten: vorbehaltlos zu sagen, wie die Dinge liegen....Es ist mit umgekehrtem Vorzeichen das Gleiche, als würde man einem aktiv forschenden Gentechnikkonzern wie DowDupont die Bewertung der neuen Gentechniken und die Aufklärung der Öffentlichkeit überlassen - und dafür Geld aus dem Bundeshaushalt bereitstellen. Beides darf nicht sein. Und das sollte auch eine Regierung wissen.“⁹

⁹ NEUE GENTECHNIK; Gefällige Fakten gesucht. Süddeutsche Zeitung Samstag 18. August 2018

The author of the piece is Kathrin Zinkant, biochemist, science correspondent for Süddeutsche Zeitung in Berlin.¹⁰

Key Words:

The following key words may shed a bit of light on the GMO articles: *EU* was mentioned in 20 articles (69%), *trade agreements* were referenced in 10 articles (35%), *farmers* in 22 (76%) and *risks* in 14 (48%).

Here we see a quote bringing together several of these keywords in an article that is largely positive towards the PP. The article refers to how a trade agreement with Japan would allow GMOs including meat into the EU unless scientific proof of harm could be identified. This goes to the heart of the evidence and uncertainty reason that the PP is evoked:

„Das gilt etwa für das sogenannte Vorsorgeprinzip, das im Japan-Vertrag bisher kaum vorkommt. Wenn dieses Prinzip nicht greift, kann die EU die Einfuhr etwa von hormonbehandeltem Fleisch oder genetisch veränderten Lebensmitteln nur noch dann verbieten, wenn wissenschaftlich deren Gesundheitsgefahren erwiesen sind. Bisher genügen entsprechende Anhaltspunkte für ein Verbot.“¹¹

3.1.9 Glyphosate

For glyphosate, it appears that the articles have an even more polarized view, with only 2 (12%) of the 17 relevant articles having a neutral view. Glyphosate articles also has a much more positive view of the PP overall: 12 (71%) had a positive view of the PP, while only 4 (24%) had a negative view.

The type of arguments put forth for the PP were clustered around *(Glyphosate) is a risk for health* in 9 articles and *Big risk for loss of biodiversity/ environment* in 7 articles.

A representative discourse demonstrating an argument for the PP based on biodiversity concerns can be found with the quoting of Environmental department president (Präsidentin) Maria Kautzberger (SPD social democrat political party) in 2016:

"Glyphosat ist nur ein Stoff unter vielen. „Der Pflanzenschutz mit Chemie ist einer der Hauptgründe für den Verlust der biologischen Vielfalt auf unseren Äckern," sagt Kautzberger. „Dass es anders geht zeigt der Ökolandbau, der weitgehend auf Pflanzenschutzmittel verzichtet.“¹²

Here we have a quoted farmer pointing to the benefits of moderate pesticide use:

¹⁰ <https://twitter.com/zinkant?lang=en> ; Twitter: @zinkant

¹¹ "Freihandelsvertrag in Arbeit; Trotz Kritik wollen Japan und EU Grundsatzvereinbarung verkünden." Süddeutsche Zeitung: Mittwoch 5. Juli 2017.

¹² „Die Ergebnisse liefern Grund zur Besorgnis"; Das Umweltbundesamt sieht ungeklärte Risiken beim umstrittenen Pestizid Glyphosat. Eine neue Langzeitstudie zeigt, dass sich der Wirkstoff häufig im Urin von Menschen nachweisen lässt. Welche Folgen das etwa bei Kindern hat, sei ungeklärt, kritisiert UBA-Präsidentin Kautzberger. Süddeutsche Zeitung. Donnerstag 21. Januar 2016

"Der Landwirt verzichtet auf seinen eigenen Feldern seit Jahren auf Glyphosat und setzt sich auch für einen glyphosatzfreien Landkreis ein. Einem totalen Pestizidverzicht steht er aber skeptisch gegenüber. „Gift ist immer eine Frage der Dosis“, ist Kraus überzeugt. „Es ist wie in der Medizin - natürliche Heilmittel sind gut, aber manchmal gibt es einen Infekt, wo man ein Antibiotikum braucht.“¹³

Key Words:

The following key words may shed a bit of light on Glyphosate articles: *Pesticide* was mentioned in all 17 articles (perhaps not surprisingly), EU mentioned in 12 articles (71%), *farmers* in 13 (76%). These percentages are quite similar to GMOs, while trade agreements were mentioned in just 3 articles (17%) compared to 35% for GMOs.

If we consider both of the deep dives, it's clear GMOs and Glyphosate make up a disproportionate number of the analysed articles. However, a key finding is that trade treaties do not appear to be the key driver behind this spike around 2014-2017 – at least not directly through mentions of trade treaties in the articles. Some 13 out of 46 Glyphosate and GMO articles mentioned trade treaties. This represents only roughly 35% of total trade treaties mentions.

Furthermore, while caution against making definitive statements based on the number of articles analysed, it appears that in the framing of both GMOs and Glyphosate, neutral opinions gave way to a bit more polarization or divisiveness, with a higher percentage of both positive and negative articles. This may also be reflected in the fact that hot-topic articles like GMOs receive my opinion and feature pieces, which themselves tend to be more opinionated than neutral.

4 Conclusion

This media analysis has provided plenty of areas for further investigation. Some of the key areas worth further attention are performed more in depth analysis of how different stakeholder groups and even individual journalists have framed PP articles. As very informative example, 1 journalist alone, Alexander Hagelüken, published 11 articles on the PP since 2014, all on the more general topic of trade agreements. Thus since 2014 more than 15% of all articles on the PP were written by 1 person, about 1 topic (trade). This example shows how deep dives into cross-cutting issues and data can reveal the mechanics of how opinions are generated via the media.

This calls attention to a further issue that came up through the media analysis, the importance of trade treaties themselves. Further research would try to figure out how this special topic of articles is presented, framed, and what arguments are put forth. Thus it appears to be an overall finding that key hot topics in the PP may have more to do with political and trade issues than specific case issues.

Our deep dive into Glyphosate and GMOs showed that those topics explain just a third of all articles mentioned treaty articles. At the same time, trade treaties are certainly responsible for a large chunk of the spike in PP articles in recent years. Our tentative finding is that these trade treaty articles either refer to other topics that are not included in our 8

¹³ Ein bisschen Gift muss sein; Ismaninger Bauern wehren sich gegen ein Glyphosatverbot für Gemeindeflächen. Ein Feldversuch soll den Streit entschärfen. Süddeutsche Zeitung Donnerstag 15. Februar 2018

case studies, or stay at the abstract PP level. This shows the power of economics drivers like trade treaties to bring attention to and frame PP issues.

Given the aforementioned relative lack of innovation principle focused articles in our analysis, this suggests that trade and larger economic focused articles as represent one of the likely places we will find innovation discussions at the level of PP discussion. Further research might thus deep dive into trade and economic articles across a number of German newspapers to get a different, perhaps more accurate view of how the PP-innovation debate is being presented.

5 Referenced Articles

Endlich öffentlich; Kommunalpolitiker und Landtagsabgeordnete im Landkreis lehnen das umstrittene Handelsabkommen TTIP quer durch die Parteien nicht pauschal ab. Sie begrüßen, dass die Geheimniskrämerei nicht mehr möglich ist. Süddeutsche Zeitung. Freitag 6. Mai 2016

Amerikas Chemie-Lobby macht Druck; Von Jeremy Rifkin; Außenansicht. Süddeutsche Zeitung 12. Mai 2004

Die Zählung der Fliegen; Viele Menschen vermissen Schmetterlinge, Hummeln und sogar Mücken in der freien Natur. Gibt es ein Insektensterben in Deutschland? Einiges deutet darauf hin, aber um Gewissheit zu haben, fehlen die Daten. Süddeutsche Zeitung. Montag 7. August 2017

Zu viel Stickstoff im Wald; Wurzelpilze sterben ab, und damit auch die Bäume

Süddeutsche Zeitung. Dienstag 11. Dezember 2018

Sprechstundenhilfe; Sigmar Gabriel stellt sich am Tag der offenen Tür den Fragen ganz normaler Bürger. Ob Flüchtlingspolitik, Waffenexporte oder TTIP - der SPD-Mann setzt auf Pointen. Auch wenn er mal keine Ahnung hat. Süddeutsche Zeitung. Montag 29. August 2016

Gentechnik; So grün wie nie. Süddeutsche Zeitung. Samstag 21. Januar 2017

Erschütterte Wissenschaft; Gentechnikgegner loben EuGH-Urteil, Forscher sind enttäuscht. Süddeutsche Zeitung. Freitag 27. Juli 2018

Neue Gentechnik; Gefällige Fakten gesucht. Süddeutsche Zeitung Samstag 18. August 2018

"Freihandelsvertrag in Arbeit; Trotz Kritik wollen Japan und EU Grundsatzvereinbarung verkünden." Süddeutsche Zeitung: Mittwoch 5. Juli 2017.

„Die Ergebnisse liefern Grund zur Besorgnis“; Das Umweltbundesamt sieht ungeklärte Risiken beim umstrittenen Pestizid Glyphosat. Eine neue Langzeitstudie zeigt, dass sich der Wirkstoff häufig im Urin von Menschen nachweisen lässt. Welche Folgen das etwa bei Kindern hat, sei ungeklärt, kritisiert UBA-Präsidentin Kautzberger.

Süddeutsche Zeitung. Donnerstag 21. Januar 2016

Ein bisschen Gift muss sein; Ismaninger Bauern wehren sich gegen ein Glyphosatverbot für Gemeindeflächen. Ein Feldversuch soll den Streit entschärfen.

Süddeutsche Zeitung Donnerstag 15. Februar 2018