

An Analysis of Media Dramatization on the News Reports of Five Major Japanese Newspapers on Radiation Protection for Workers in the 2011 Fukushima Nuclear Disaster



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1. Introduction

- During the 2011 Fukushima nuclear disaster, the radiation protection of workers attracted considerable media attention.
- Previous studies have articulated a wide variety of arguments over the media's influence on health risk perceptions.
 - the media's extensive coverage may serve as a **risk amplifier** due to its **sensationalism and dramatization**.
 - U.S. news articles were more likely to **provide quantitative and factual information**.
 - the systematic practices of reporting **minimized** the presence of health risks, contributed to **misinformation and exacerbated uncertainties**.
- This paper aims to identify the factors explaining the variety of accusations against mass media by analyzing articles from five major Japanese NPs.



1.1. Research Perspective

- In previous studies, media coverage has been defined as “dramatizing” if it
 - gives a disproportionate amount of attention to risks considering the actual relevance of the threat they pose;
 - covers the (health) threat primarily using emotional language or emotion-evoking features rather than factual ones.
- These definitions require an objective reference point as to what constitutes “too much” or “exaggerated” media coverage.
 - “normative” and “scientific” assumptions, which contrast media with a definition of “ideal journalism” or an objective quantification of the “actual risk”



1.1. Research Perspective

- Employed non-normative and objectively comparable indicators to analyze differences in five major NPs.
 - The number of relevant articles:
 - the frequency of the relevant articles out of a total number of articles and the frequencies of relevant articles out of the front-page articles
 - The number of relevant articles:
 - Categorizes the primary sources of articles, such as government, TEPCO and experts, and compares their frequency in each newspaper.
 - Direct quotations and their sources:
 - Counted the number of articles with direct quotations and categorizes the source of the quotations and compares their frequencies
 - Differences in headlines based on the same information:
 - selects articles based on the same information, such as press releases from the MHLW, and compares their headlines and space



2. Methodology

- This paper extracted articles related to occupational radiation exposure from the databases of five major NPs (Asahi , Yomiuri, Mainichi, Sankei and Tokyo).
 - The keywords : “NPP & MHLW” or “decontamination & MHLW”
 - Extracted articles published between March 11, 2011 and December 31, 2014.
 - Employed Statistical testing using a chi-square test of independence

3. Results

3.1. Frequency of articles

	Total (2011-2014) ^a				
Number of articles	Related articles		Others	Total	b
Asahi	89	(0.032%)	277,137	277,226	13
Mainichi	70	(0.024%)	288,771	288,841	2
Tokyo	72	(0.164%)	43,769	43,841	2
Yomiuri	52	(0.013%)	402,613	402,665	2
Sankei	39	(0.019%)	204,471	204,510	0
Total	322	(0.026%)	1,216,761	1,217,083	19
P-value for 5 papers			1.27E-74		
P-value for 4 papers ^c			1.30E-06		

a: The articles do not include those of earlier than March 11, 2011.

b: The number of multiple articles in a same page. The number of them are excluded from the number of related articles.

c: Asahi, Mainichi, Yomiuri and Sankei

3.2. Frequency of the front page articles

	Total (2011-2014) ^a		
	Front page		
Number of articles	Yes	No	Total
Asahi	22 (21.6%)	80	102
Mainichi	11 (15.3%)	61	72
Tokyo	16 (21.6%)	58	74
Yomiuri	0 (0.0%)	54	54
Sankei	1 (2.6%)	38	39
Total	50 (14.7%)	291	341
P-value	0.0004		

a: The articles do not include those of earlier than March 11, 2011.

3.3. Distribution of affiliation of primary sources

	Total (2011-2014) ^a			
Number of articles	Gov./TEPCO		Others	Total
Asahi	60	(58.8%)	42	102
Mainichi	51	(70.8%)	21	72
Tokyo	48	(64.9%)	26	74
Yomiuri	43	(79.6%)	11	54
Sankei	26	(66.7%)	13	39
Total	228	(66.9%)	113	341
P-value	0.108			

a: The articles do not include those of earlier than March 11, 2011.

3.4. 1. Frequency of presence of direct quotations

	Total (2011-2014) ^a			
	Direct quotation			
Number of articles	Yes		No	Total
Asahi	60	(58.8%)	42	102
Mainichi	40	(55.6%)	32	72
Tokyo	49	(66.2%)	25	74
Yomiuri	20	(37.0%)	34	54
Sankei	14	(35.9%)	25	39
Total	183	(53.7%)	158	341
P-value	0.002			

a: The articles do not include those of earlier than March 11, 2011.

3.4.2. Frequencies of articles with direct quotations from the government or TEPCO

	Total (2011-2014) ^a			
	Direct quotation from Gov./TEPCO			
Number of articles	Yes		No	Total
Asahi	36	(35.3%)	66	102
Mainichi	23	(31.9%)	49	72
Tokyo	34	(45.9%)	40	74
Yomiuri	14	(25.9%)	40	54
Sankei	6	(15.4%)	33	39
Total	113	(33.1%)	228	341
P-value	0.014			

a: The articles do not include those of earlier than March 11, 2011.

3.5. Distribution of affiliations of directly quoted experts

Number of direct quotation	Experts						Total
	University/Institute		Physicians		NGOs/Lawyers		
Asahi	6	(66.7%)	2	(22.2%)	1	(11.1%)	9
Mainichi	8	(61.5%)	0	(0.0%)	5	(38.5%)	13
Tokyo	5	(41.7%)	0	(0.0%)	7	(58.3%)	12
Yomiuri	2	(50.0%)	2	(50.0%)	0	(0.0%)	4
Sankei	2	(66.7%)	0	(0.0%)	1	(33.3%)	3
Total	23	(56.1%)	4	(9.8%)	14	(34.1%)	41
P-value	2.89E-102						

a: The articles do not include those of earlier than March 11, 2011.

3.6.1. Headlines articles on the estimation of the number of workers exposed more than 50 mSv

NP	Date	Headlines*	Page
Asahi	July 28, 2011	TPCO overestimated that “1600 workers estimated to be exposed more than 50 mSv”. As the reference for deregulation of the emergency dose limits.	6
Mainichi	July 27, 2011	1600 workers to be exposed more than 50 mSv. The METI estimated.	1
Tokyo	July 28, 2011	“Deal the dose at Fukushima accident separately from normal dose” The NISA requested deregulating dose limits for workers to the MHLW in April. “ The maximum dose should be 350 mSv. ”	1
Tokyo	July 28, 2011	Request deregulation of dose limits. Prioritize to secure workers. TEPCO estimated “2000 workers to be exposed more than 50 mSv.”	2
Yomiuri	July 28, 2011	“1600 workers to be exposed more than 50 mSv” for response to the accident, the NISA estimated.	2
Sankei	July 27, 2011	Workers to be exposed more than 50 mSv were estimated to be 1600.	Social
Source	The document disclosed from the Nuclear and Industrial Safety Agency by the request of an NGO. (Nuclear and Industrial Safety Agency, 2011)		

to the manipulation of dosimeter collection efficiency

Newspaper	Date	Headlines*	Page
Asahi	October 31, 2012	19 cases of “inappropriate” dose management were found. The MHLW requested TEPCO and primary contractors for conducting a survey.	1
	October 31, 2012	The survey untouched the cases during the period that radiation dose was high. Far from grasping conditions of “inappropriate” management.	3
Mainichi	-	-	-
Tokyo	October 31, 2012	The MHLW’s survey failed to expose the real situation . No “intentional impropriety” was observed. 19 inappropriate cases were found.	1
Tokyo	October 31, 2012	Workers would lose their jobs by exceeding dose limits. “Workers would not confess the truth.” Workers were cornered.	27
Yomiuri	October 31, 2012	Dose management of the Fukushima accident, 19 cases were inappropriate.	38
Sankei	-	-	-
Source	Press-release from the MHLW on October 31, 2012 (Ministry of Health, Labour and Welfare, 2012)		

3.6.3. Headlines of articles on the governmental re-evaluation of the internal radiation dose

Newspaper	Date	Headlines*	Page
Asahi	July 6, 2013	Calculation errors were found in internal exposure evaluation for 479 workers of Fukushima Daiichi NPP. 6 workers were additionally beyond dose limits .	38
Mainichi	July 6, 2013	Dose record for 431 workers was revised upwardly by the MHLW.	2
Tokyo	July 6, 2013	The dose for 452 workers revealed to be higher than the reported record . Internal dose at emergency work for the Fukushima accident.	20
Yomiuri	July 6, 2013	Calculation errors were founded in radiation dose records for 479 workers.	37
Sankei	July 6, 2013	Dose records for 479 workers were corrected.	24
Source	Press-release from the MHLW on July 5, 2013. (Ministry of Health Labour and Welfare, 2013)		

3.6.4. Headlines articles on the study on thyroid gland examination for workers

Newspaper	Date	Headlines*	Page
Asahi	August 6, 2014	The tendency for a high frequency of nodule in the thyroid gland.	35
Mainichi	-	-	-
Tokyo	-	-	-
Yomiuri	August 6, 2014	The research continues for health effects on emergency workers. The MHLW said, “research subjects were biased.”	3
Sankei	-	-	-
Source	Press-release from the MHLW on August 5, 2014 (Sobue, et al., 2014)		



4. Discussion

4.1. Difference in the number and space

- The results revealed differences in editorial policies among the five major newspapers.
- The differences among newspapers were more apparent in the articles published on the front page,
 - which is the most prominent place in the paper.
- The difference in editorial policies seems to be much larger than the difference in the awareness and sources of the reporters
 - because the difference in the frequency of front page articles was much larger than that of total related articles.



4.2. Analysis of primary sources

- A potential factor in this difference could be the difference in information sources.
- However, there was no significant difference in the primary sources
 - – the subjects of the leading sentences of articles – among newspapers.



4.3. Analysis of the presence and absence of direct quotations and their sources

- The top three papers (ANP, MNP and TNP) published more articles than others (YNP and SNP) that drew public attention to the response of the government and TEPCO by direct quotation.
- MNP and TNP had a tendency to draw public attention by contrasting the statements of the government with the voices of workers in the form of direct quotations.
 - Sub-categories of these organizations were anti-nuclear activists, a labor journalist and a labor lawyer who represented the voice of workers.
 - At the same time, MNP and TNP had a higher frequency of direct quotations from the government and TEPCO.



4.4. Analysis of headlines

- The editorial managers of ANP, MNP and TNP had editorial policies that gave radiation-related articles larger and more prominent spaces than articles in YNP and SNP.
- ANP, MNP and TNP published the relevant articles on the front page and issued multiple articles on the same date, while YNP and SNP had no such situations.
- ANP, MNP and TNP had editorial policies that stressed information that was negative for workers. YNP and SNP had the tendency to employ neutral headlines.



4.4. Analysis of headlines

- **ANP, MNP and TNP** employed the following phrases in their headlines:
 - **criticisms** of the government or TEPCO,
 - such as “overestimation”, “the survey ignored cases during the period when radiation dose was high.”
 - **challenges to the validity** of official statements based on independent information,
 - such as “allowing 350 mSv at the maximum”, “it is uncertain that workers are confessing the truth,”
 - **emphases on negative information** for workers,
 - such as “beyond the limits,” “dose records were revised upwardly,” “workers had a relatively high frequency of nodules on the thyroid gland.”



4.4. Analysis of headlines

- In Japanese newspapers, headlines tend to reflect the editorial policies of each paper
 - because they are written not by field reporters but by an editorial reporter who is responsible for organizing and allocating articles on the assigned page, including writing headlines.



5. Conclusion

- It is essential that any analysis of media influence on health risk perception takes into account the **differences in editorial policies** at each news agency.
- Further studies of media influence on health risk perceptions are warranted
 - and should analyze the differences in risk perception among **populations who read different newspapers** that have different editorial policies.
- Furthermore, studies are needed to analyze the influence of **other mass media channels** such as television and radio.