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Health Risk Management and Mass Media — Newspaper Reports on BSE in South Korea

Satomi Noguchi and Hajime Sato

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<http://dx.doi.org/10.5772/59080>

1. Introduction

Risk management has become a dominant concern in public policy. In particular, health risks require delicate handling because of the scientific uncertainty surrounding them. In addition to performing a technical assessment of risk, an analysis of the social implications associated with health risks is indispensable. That is, one must consider that a society's coping with risk management leads to an understanding and strategy of each country. Furthermore, consideration of various stakeholders, such as professionals, citizens, and mass media, and how they are positioned is also a key issue in risk communication. Among these stakeholders, mass media are the most important source of information for most people and thus they influence how people understand particular health risks [1]. Specifically, news reports help shape the public definition of health risks and risk-related events, and politicians often interpret such reports as examples of public opinion [2]. Thus, news reports can set the public agenda, prime audiences to ascribe differing degrees of salience to available information, and provide frames for understanding risk events [3]. Therefore, examination of media reports on health risks will help in understanding how health risks emerge and are managed in society.

Bovine spongiform encephalitis (BSE) is a cattle disease that first emerged in the UK in 1985. BSE is caused by prion that is an infectious agent composed of protein in a misfolded form, and enter the food chain through the practice of feeding sheep remains to cattle. In 1996, when eating meat from infected cattle was associated with the human disease variant Creutzfeldt-Jakob disease (vCJD), the general public became extremely concerned about the safety of beef. The US Center for Disease Control and Prevention (CDC) announced that, by January 2007, 200 vCJD patients had been reported from 11 countries since the first patient was reported in 1996. The BSE crisis occurred mainly as a result of indefinite fears and categorization of BSE in the same light as other prion diseases even though the studies were still in process and no clear mechanism for developing and transferring BSE had been identified. In addition, it is

difficult to identify infected animals because biopsies are not possible and ordinary sterilization cannot eliminate the pathogen. A similar crisis also occurred in South Korea despite no BSE being reported in South Korea. According to the South Korea Centers for Disease Control and Prevention (KCDC), 5 CJD cases were reported in 2001, 9 in 2002, 19 in 2003, 13 in 2004, 15 in 2005, 19 in 2006, and 18 in 2007, while no vCJD was reported. In South Korea, a large percentage of consumed beef is imported from other countries, such as the US and Canada. When BSE was reported in those countries, the importation of their beef products was immediately suspended, and soon thereafter negotiations over the necessary risk control measures began between South Korea and its trade partners.

The aims of this chapter are to examine the visibility and faces of BSE issues as they appeared in newspaper articles in South Korea and to compare how the BSE issue was presented to the public during this period. We will first present a short history of the BSE issue and then examine related newspaper reports in South Korea. We will also illustrate the states of affairs and changes in policies and social awareness of BSE in South Korea. An analysis of the quantity and content of the newspaper articles will disclose how BSE incidents, the related health risks, and social effects were portrayed and what policy choices (e.g., aversion versus acceptance of risks, with regard to rationale) were considered appropriate. The results are discussed by comparison of US and Japanese cases, which we have previously explored [4]. The paper then discusses the roles the mass media played in appraising BSE-related safety standards and regulations and harmonizing them among countries. Additionally, implications for future health risk management are also considered.

1.1. Newspaper articles in South Korea

Three national dailies of South Korea, Dong-a, Chosun, and JoongAng, were selected for this study. At the time, these national dailies had the top three circulations in South Korea. According to the survey of 139 daily newspapers by the South Korea Audit Bureau of Circulation, which tracks the circulation of newspapers and magazines, domestic newspapers in South Korea had circulations of 1.84 million for Chosun Ilbo, 1.31 million for JoongAng Ilbo, and 1.29 million for Dong-a Ilbo from February through December 2010 [5]. The Chosun Ilbo was established in 1920 and is regarded as representing rightists, along with JoongAng Ilbo and Dong-a Ilbo. JoongAng Ilbo is a daily newspaper and a key product of JoongAng Media Network, which has 1,000 service centers in South Korea and additional branches in the US. The paper also publishes an English version, the JoongAng Daily, in alliance with the International Herald Tribune. The Dong-a Ilbo was founded in 1920 by Kim Sung-soo, who established Korea University during the Japanese occupation of Korea and later served as second vice president of South Korea in 1951.

1.2. History of BSE issue in South Korea

1.2.1. Period I: January 2002 through April 2003 and earlier

In June 1992, the first discussion of beef trade between South Korea and the US occurred, and the US claimed full opening for the beef trade [6]. On June 26, 1993, the countries agreed to postpone the full opening of the beef market until July 1997 [7]. In December 1995, the US

initiated re-discussion of five items, including beef, and full opening for the beef trade was accepted with the condition of a tariff [8]. On March 26, 1996, due to the BSE problem, South Korea prohibited the importation of livestock products from countries in which BSE had occurred, including the UK and adjacent countries. In 1997, the government of South Korea modified the livestock infectious disease prevention law to cover BSE and scrapie. According to the Ministry of Strategy and Finance, the volume of beef imports increased constantly until May 1995 but after the BSE shock in the UK in 1996, beef imports began to drop (21% from May 1996 to May 1997). Then, by December 1997, imports had again increased and were 19% higher than imports in June 1997 [9].

In 2000, the Food Standards Agency (FSA) was established to evaluate food safety, to control hazardous food, and to exchange information about hazardous food. Being independent from government, the FSA made its own decisions, established its own strategy, and operated on a customer-oriented, open-door, independent, science-and evidence-oriented policy. In addition, the FSA performed its role in supporting local government's food safety tasks, evaluating food-related tasks and outcomes and supervising [10]. In February 2000, the government of South Korea established and ran the "Special Committee for Cow BSE" through the Ministry of Agriculture and Fisheries [11]. The government of South Korea banned importation of beef and related products from countries in which BSE has occurred since 1996. In addition, they also banned feeding meat or bone meal to ruminants such as cattle and sheep [12].

Starting in December 2000, the government gradually banned feeding ruminants meat or bone meal and leftover food; it also took action to prevent cross-contamination in cattle fodder. However, banning the feeding of meat and bone meal to ruminant animals in South Korea started much later than such bans in the UK and USA. Since BSE occurred in Japan, which is adjacent to South Korea, in September 2001 and since the US beef issue was considered one of four pre-conditions for the Free Trade Agreement (FTA) in 2006, the inspection and safety assurance system became a main concern. BSE was the main issue among parties who opposed the FTA: livestock farmers who worried about a decrease in beef prices, consumers who were concerned about a BSE outbreak, veterinarians, health professionals, and environmentalists. In 2003, a periodic audit by the Ministry of Health and Welfare and the Red Cross found that medicine made from the blood of patients who died of vCJD in the UK in 1998 was distributed and administered to 1,492 patients in South Korea, resulting in a hotly contested social issue [13].

1.2.2. Period II: May 2003 through August 2006

In December 2003, as BSE cases were confirmed in the US, the government of South Korea banned beef imported from the US. US beef's market share was 46% in the beef market of South Korea. Being relatively safer, demand for domestic beef was predicted to increase. However, due to customers' increasing concerns, demand for domestic beef also decreased significantly even though BSE had never occurred in South Korea. The decrease in beef consumption seemed to have originated from emotional factors such as fear and worry regarding BSE risk. As a result, even though BSE did not break out in South Korea, the information about BSE breaking out in the US resulted in a significant decrease in demand for domestic beef and thus prices for domestic beef as well.

1.2.3. Period III: September 2006 through October 2007

Importation of beef from the US resumed in 2006 with the condition that the beef must be from less-than-30-month-old cattle and be boneless. The mad cow disease outbreak in the US resulted in an increase in coverage; thus, importing US beef became a hot issue. On November 24, 2006, beef imports partially stopped because bone pieces were found in some imported beef [14]. However, on March 28, 2007, the South Korea and US governments entered “Korean-US technical agreements for livestock inspection,” which stated that South Korea acknowledges the US livestock inspection system. On April 2, 2007, the South Korea and US governments reached a settlement in FTA negotiations [15]. On May 22, 2007, the World Organization for Animal Health (OIE) assessed the US as safely controlling for BSE [16]. This meant that the US could export any part of a cattle at any age without restriction if particular risky material was removed [17]. The OIE established guidelines for countries with less than a million cattle over the age of 24 months to perform tests on 20%~30% of them in seven years and countries with more than a million to test 450,000 head in seven years. Therefore, with about 40,000,000 head, the US performed tests per the second criterion and the percentage of tested individuals was less than 1%.

On August 2, 2007, spinal bones were found in beef from the US, and its importation was suspended [18]. At that time, the Grand National Party (Hannara), as the opposition party, strongly insisted on suspending imports [19]. However, after it became the ruling party, its members supported the resumption of imports and that created doubt in the public’s mind. Despite the situation, restrictions on US beef imports were lifted on August 24, 2007 [20]. In 2007, the Ministry of Agriculture and Forestry reported to the government that the US was not conducting proper inspections, increasing vulnerability of South Korea to vCJD. This was disclosed by legislator Jang, Ki Kap (Democratic Labor Party) [21]. Some people believe this agreement was made in haste because it was settled just before the summit talks between South Korean President Lee and US President Bush.

1.2.4. Period IV: November 2007 through April 2008

In the beef negotiations in April 2008, South Korea and the US agreed to resume imports with drastic cuts in quarantine conditions [22]. Originally, South Korea was to open for importation of every part of a cattle under 30 months of age, excluding tonsils and the end part of the small intestine plus specified risk material (SRM) such as skull, brain, third ganglion, eye, backbone, and spinal cord, and every part of a cattle over the age of 30 months, excluding SRM. However, through additional negotiation, the parties agreed to remove SRM such as eye and brain from cattle under the age of 30 months. The government of South Korea announced that the agreement was in accordance with OIE criteria [23].

On April 29, 2008, MBC TV aired the first report regarding the risk associated with US beef in a program called *PD’s Notebook*. The program resulted in great social shock and triggered a protest against US beef imports in South Korea [24]. In the program “Is US beef safe?” *PD’s Notebook* insisted that 94% of South Koreans have BSE infectable genes and the possibility is 2 to 3 times higher than that of the British and Americans [25]. The program also quoted a US consumer association members’ words: “People who eat US beef are like experimental

animals.” Many parody pictures became popular on the internet after airing of the *PD’s Notebook’s* video [26].

1.2.5. Period V: May 2008 through April 2009

Kookmin Ilbo (a newspaper) reported on May 2, 2008, that BSE transferable SRM would be brought into South Korea according to the Korea-US beef agreement. The paper introduced specialists’ opinions stating that certain SRM (e.g., brain, spinal cord, eye, head bone, tongue, tip of small intestine) from cattle 30 months or older had to be removed. However, since quarantine authority had no way to confirm the history of beef, SRM could be brought in. The Ministry of Food, Agriculture, Forestry, and Fisheries explained that SMR from cattle 30 months or older would be completely removed in the slaughter and manufacturing process and dental examiners determined the age of cattle in the slaughter house under a veterinarian’s supervision. Right after the agreement, the government of South Korea announced that consumers could buy and eat quality beef at low price and the choice was a matter for the consumer. The government did not respond to the argument, calling it a “ghost story” at first. The government did hold a press conference to announce that US beef is very safe on May 2, 2008 [27].

The contents of the agreement of May 5, 2008, were said not to reflect the people’s opinion [28]. Many parties debated the issue and political parties, the press, and specialist groups amplified the debate. Since most BSE cases were found in cattle older than 30 months, countries throughout the world started to import only beef under 30 months but, by the agreement, South Korea also was to import beef over 30 months. The OIE recommended not importing seven parts, including the brain, skull, spinal cord, eye, and backbone, from cattle 30 months or older [29]. However, if under 30 months, only the tonsils and end part of the small intestine were to be excluded. South Korea requested an indication of age, but the US declined. The countries only agreed to indicate under 30 months for T-bone steak, which has backbone – one of the SRMs – for 180 days. For other SRMs, people of South Korea could only hope that the US respected the age guidelines [30]. The government of South Korea could not stop importing or impose a quarantine even though BSE had broken out in the US. Before that agreement, if the US quarantine system was suspected of having a significant problem, the government of South Korea could stop importing based on its own judgment [31]. However, under the hygiene conditions of the new agreement, the only requirement for the US was to conduct epidemiological research and report the results. For that reason, the government’s beef negotiation of South Korea was criticized as abandoning the people’s right to health and to quarantine.

On May 2-3, large demonstrations were held in front of the Chung-gae Square. Celebrities participated in the demonstrations or wrote comments on their mini internet home page criticizing President Lee and US beef imports [32]. President Lee’s mini home page was filled with critical comments from netizens and this led to the home page being closed out. On May 5, 2008, the government started advertising at the bottom of the front page of the main newspapers. On May 6, the departments in charge started public announcements through the internet. Cheongwadae (the presidential residence), the Ministry for Food, Agriculture, Forestry, and Fisheries, and the Ministry of Health and Welfare posted articles such as “BSE, 10 questions and 10 answers” on their web sites and tried to put out the fire by advertising on

the main internet portal sites [33]. On May 12, responding for the US federal official gazette easing the regulation for animal fodder, the government announced that there was a working-level error in the process of the agreement. On May 22, President Lee released a statement to the public [34]. Despite the government's explanation, the argument did not subside. From May 2 to May 6, candlelight rallies gathered 10,000 to 20,000 people. After that, demonstrations criticizing the agreement continued through the weekend. As the official notification date approached, starting May 18, 2008, the Alliance for President Lee's Impeachment held the rallies every day [35].

After May 5, 2008, debate regarding distortion of the agreement came up. The Ministry of Food, Agriculture, Forestry, and Fisheries had a history of declining private organizations' requests for disclosure of original agreements [36]. In addition, the ministry disclosed the information only after it learned that the English-language agreement was posted on the internet. People suspected that the government had hidden factors in translating the original [37]. Indeed, there were more than 20 delicate differences between the original agreement and the agreement in the official announcement of May 5, 2008, as discussed below.

Due to the continuing controversy, South Korea and the US passed an epistolary-style agreement on May 19, 2008. On May 22, 2008, the president released a public announcement indicating an apology for the US beef issue and urging the National Assembly to ratify the agreement [38]. In the public announcement, President Lee acknowledged the lack of effort to get the people's understanding and gather opinions. Despite the government's effort, the street demonstrations spread. From that time, the slogans went beyond the US beef issue and some participants started to turn to anti-government stances [39]. The police's hold-back became active accordingly. On May 29, 2008, Minister of Food, Agriculture, Forestry, and Fisheries Jung, Woon Chan disclosed the sanitary conditions for importing US beef and concluded from surveying 30 slaughter facilities in the US that there was no sanitary management problem such as SRM removal [40]. From June 5 to June 8, the people staged a 72-hour demonstration in Seoul Square, and some protesters stayed all night in tents [41]. On June 6, the first day of long non-working days, the number of participants was estimated at 56,000 by police, but 200,000 by the hosts [42]. On June 7, a candle rally was held in New York, criticizing the government of South Korea. On June 10, the participants numbered 100,000 (police estimate) or 500,000 (host estimate) and in Seoul, 1,000,000 (host estimate) [43].

On July 8, 2008, the government of South Korea began to indicate the country of origin on beef and rice based on the food sanitation law's articles 21 and 69. In December 2008, the products covered extended to pork, chicken, and kim chi [44]. From August 1 to September 5, 2008, the National Assembly's US beef investigation committee was initiated. The Grand National Party insisted that resuming imports of US beef had been agreed upon in the former government and the current government just signed on, while the opposition parties insisted that the negotiation was pushed ahead with haste just for the Korea-US summit talk. Minister Dong Suk, chief officer for agriculture and trade strategy, who led the negotiation, said that the beef negotiation was not South Korea's present to the US but rather it was a present from the US, and he asked for an apology from the opposition parties [45]. Starting on November 25, 2008, large retailers such as E-mart, Home Plus, and Lotte Mart started to sell US beef to customers

[46]. However, by June 2009, the sales proportion of US beef in large retailers had dropped significantly, to 1%, and US beef sales were being considered for elimination [47].

The BSE controversy in South Korea became a main social issue through the writings of netizens who transferred concerns and rumor with their opinions. According to JoongAng Daily's statistics, the issue was very active in internet communities such as the Daum Agora economy forum, free bulletin boards, politics forums and social forums, and many discussions, items of news, and opinions were exchanged. In addition, the issue was dealt with seriously in DC inside, Naver, Yahoo, and Hankyorea Hantoma [48]. Many internet media broadcast the candle rallies, and the videos spread through media such as YouTube, making internet media more influential than conventional news media [49,50]. People boycotted media such as Chosun, JoongAng, and Dong-a and posted a list of the companies that advertised in those newspapers so that netizens could pressure the companies by taking actions such as posting criticism on the companies' web sites. Meanwhile, a controversy about *PD's Notebook* became the trigger for candle rallies. The translator Jung, Ji Min's whistle-blowing caused the controversy to check whether the coverage was exaggerated. The PD personnel who planned and produced the program were arrested with warrants [51]. On June 17, 2009, the Seoul high court decided in favor of the plaintiff, partially in the case the Ministry of Food, Agriculture, Forestry, and Fisheries litigated against *PD's Notebook* claiming an objection and correction coverage. However, MBC *PD's Notebook* appealed to the Supreme Court [52]. On January 20, 2010, the Seoul central district court found that the PD personnel were not guilty [53]. On January 26, 2010, the court decided in favor of the defendant in the civil case of groups against *PD's Notebook*, ordering an apology and correction coverage, plus compensation for damages [54].

Restarting after the hardship, US beef sales did not reach even half of Australian beef sales in the second half of 2009, which is much less than the sales before the imports stopped [55]. The import increased when the quarantine resumed in June 2008 after the BSE shock, but before long, sales dropped. The remaining negative notions about US beef are regarded as the reason. One of the reasons for the distrust is that the disqualifying rate of US beef is the highest among all imported beef. According to the data Kang, Ki Kap, a member of the National Assembly, received from the Ministry of Food, Agriculture, Forestry, and Fisheries on August 13, 2009, the amount of US beef disqualified in the quarantine process reached 20 cases, 59 tons in the first half of 2009, which is 56.1% of the total of disqualified imported beef (105 tons) [56].

2. Study methods

2.1. Collecting and coding of articles

Our study targeted the period from January 2002 through April 2009, when BSE-infected cattle were discovered in the US and the import ban was introduced and later lifted in South Korea. Articles were searched and collected from the three mentioned papers, using the keywords BSE and mad cow disease. In addition, articles with related keywords, such as vCJD, safety of beef (products), and ban on beef trade, were searched and checked individually to determine whether they reported or discussed BSE-related events; those that did were included for

analysis. We categorized each article as follows: First, we focused our analysis on the number of articles, ignoring their word counts, placement, and font size. Second, all included articles were coded and counted for article content/frame. Here, a frame denotes a way of packaging and positioning an issue so that it conveys a certain meaning [57,58]. Coders in both countries used a coding system based on a framework similar to those previously employed [59,60]. Issues framed elements for coding and were derived from the preliminary qualitative interpretation of articles/policy documents, comprising geographic focus (South Korea, US, and other countries) and topic categories (BSE incidents, biomedical effects and risks to humans, vCJD, effects on commerce and related policies, agricultural effects and related policies, and effects on international trade and related policies). As there could be multiple categories for each article, more than one frame category could be coded per article. Third, the tone or slant (i.e., advocacy orientation) of the articles was analyzed in terms of their advocacy attributes. An article was assessed as positive when it argued for stronger safety measures/policies and negative when it contained arguments for weaker measures/policies. Articles were designated neutral if they did not clearly argue for either stronger or weaker policies, were ambiguous, or had relatively equal coverage of both orientations. Finally, the argumentative bases (policy discussion contexts) of articles, if any, were coded using the categories of health, economy, balance of different policy objectives, and (rational) acceptance of health risks. All the coding was done independently by two pre-trained coders, yielding a reliability rate of 83%, which was considered within the acceptance levels for study [61].

2.2. Statistical analysis

The overall study period was divided into five distinct sub-periods: period I (from January 2002 through April 2003, when BSE problems were reported in the UK through mass media), period II (from May 2003 through August 2006, when the first BSE cases were discovered in Canada and the US, and the import ban was imposed in South Korea), period III (from September 2006 through October 2007, when the trade ban was partly lifted), period IV (from November 2007 through April 2008, when the FTA was negotiated and adopted between South Korea and the US), and period V (from May 2008 through April 2009, when media of South Korea reported US beef risks, the candle protests took place, and afterward). Trends in the numbers, topics, and tones were analyzed over these sub-periods. After obtaining descriptive statistics (numbers, means, and standard deviations), adjacent periods in the given study period were compared. Relationships of advocacy orientation with rationale were examined using multi-nominal logistic regression analysis. In the model, a neutral orientation was chosen as the base outcome, and the coefficients (relative risk ratios) of the presence of each rationale for the article orientation (positive or negative) were estimated [62]. Statistical analyses were conducted using Stata/SE 12.1 for Windows (StataCorp LP, College Station, TX).

3. Results of newspaper reports in South Korea

Table 1 shows the monthly average number of newspaper articles with their geographic focus and topic categories on BSE of three dailies in South Korea. During the study period, the

number of BSE-related newspaper articles prominently increased in period III when beef imports partially stopped because bone pieces were found in some US imported beef and in period V, in which liberalization of the beef market in South Korea became a political agenda, invoking a public protest movement (4.7, 4.4, 8.6, 4.1, 60.9, monthly average of articles per period, respectively). We also draw a scatter plot showing time series trend of weekly average number of newspaper articles in Figure 1.

	Period I				Period II				Period III				Period IV				Period V			
	Jan2002-Apr2003				May2003-Aug2006				Sep2006-Oct2007				Nov2007-Apr2008				May2008-Apr2009			
	mean	±	sd	p	mean	±	sd	p	mean	±	sd	p	mean	±	sd	p	mean	±	sd	p
Number of articles [†]	4.7	±	9.5		4.4	±	6.2		8.6	±	5.6		4.1	±	5.9		60.9	±	82.1	**
Geographic focus (%)																				
Korea Topic	32.4	±	32.5		64.3	±	23.0	**	89.9	±	11.6	**	82.8	±	17.6		94.3	±	6.2	
US topic	10.8	±	19.6		10.1	±	15.6		6.2	±	7.7		11.0	±	16.9		1.5	±	1.9	
Other country's topic	56.9	±	38.9		25.5	±	22.2	***	4.1	±	10.5	*	5.6	±	13.6		2.7	±	3.0	
Topic categories (%)																				
Incidents	19.9	±	23.0		21.1	±	23.2		3.5	±	5.6	*	2.4	±	5.8		2.8	±	3.7	
Biomedical effects	18.9	±	20.5		16.8	±	19.0		17.6	±	12.6		20.0	±	18.3		12.1	±	9.0	
Commerce	27.9	±	22.5		44.3	±	22.7		55.4	±	13.3		31.8	±	17.2		29.9	±	10.8	
Agriculture	9.3	±	12.3		37.2	±	21.2	***	42.5	±	13.4		32.9	±	24.5		19.7	±	9.1	
Trade	15.4	±	20.1		48.6	±	26.2	***	73.1	±	14.8	**	73.4	±	15.8		19.1	±	12.6	***

Tests were performed for before period by Bonferroni method. **p* < 0.05, ***p* < 0.01, ****p* < 0.001

[†]The numbers are shown as monthly mean per paper.

Table 1. Numbers and Topics of BSE articles in South Korea

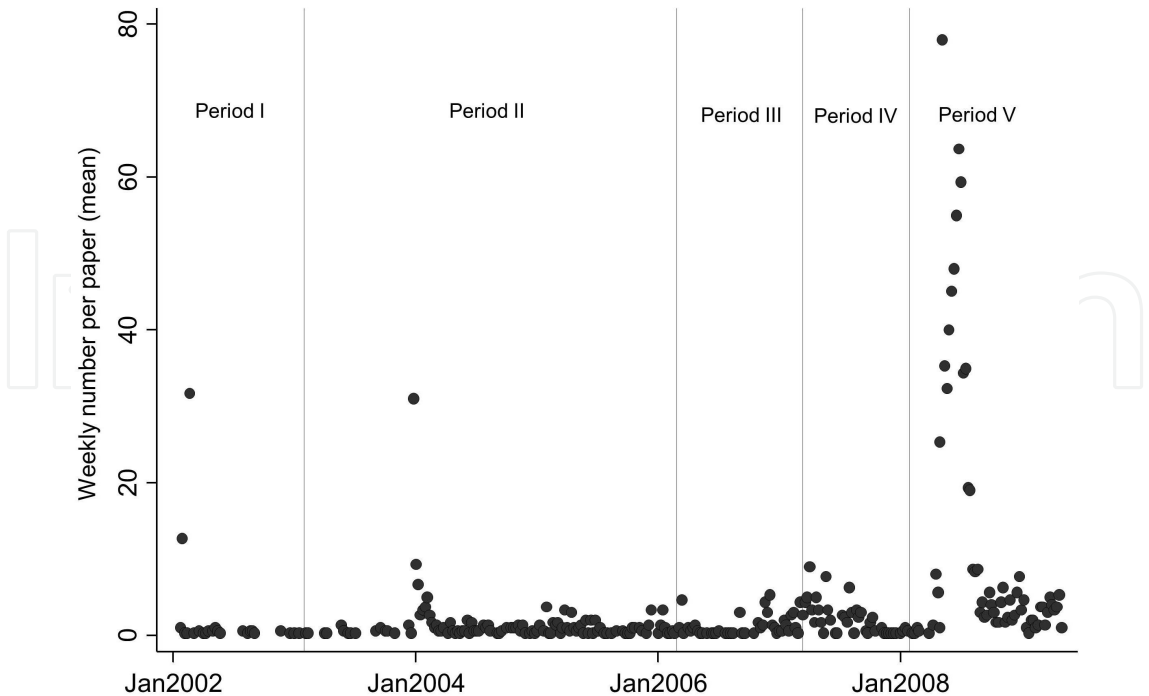


Figure 1. Number of newspaper articles in South Korea

Geographically, in the early phase in period I, more than half of the articles had a foreign focus (56.9%). This period covered the BSE problems reported in the UK through the mass media. In period II, articles with a domestic focus increased in accordance with negotiation of the US-Korea Free Trade Agreement. After this period, the numbers of articles with a domestic focus were high (period III, 89.9%; period IV, 82.8%; period V, 94.3%), while articles with a foreign focus were few. With regard to the topics reported, biomedical effects were reported constantly but with a small proportion throughout the study periods. However, the frequency of reports on trade issues changed remarkably over time. That is, from period III through period IV, trade issue coverage jumped up to a peak (73.1% and 73.4%, respectively) and sharply decreased in period V (19.1%). Articles containing arguments based on commerce and agriculture displayed similar trends but with different peaks in period III (e.g., commerce: 27.9%, 44.3%, 55.4%, 31.8%, and 29.9%, for periods I through V, respectively). These trends and contrasts of geographic focus and topic categories are also shown in Figures 2.

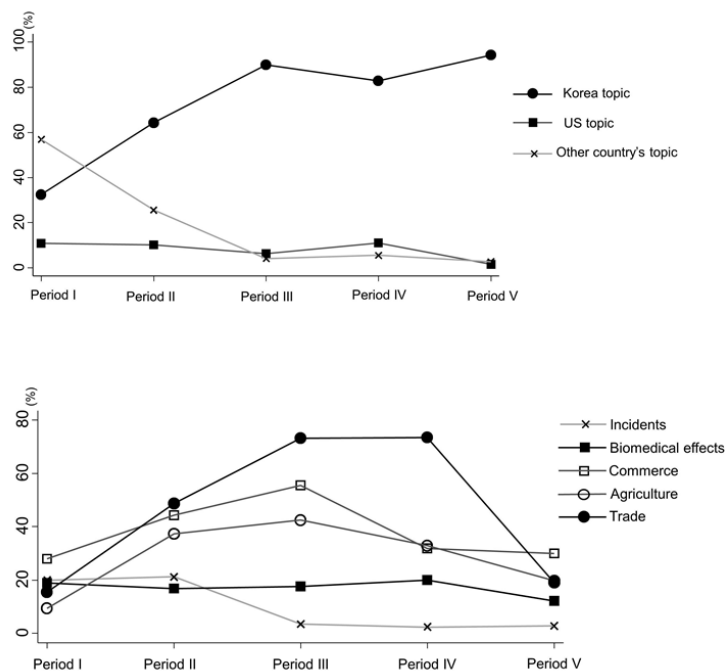


Figure 2. Geographic focus and Topic categories of newspaper articles in South Korea

The policy advocacy observed in newspaper articles in each period is shown in Table 2. Calls for stronger domestic policy peaked in period III (14.2%), which was after the beef trade ban was partly lifted, but in period IV, calls for weaker domestic policy gradually increased and became more visible (12.1%). In period V, when a trade issue became a conspicuous political agenda, calls for both stronger and weaker domestic policies appeared less frequently and none of them was dominant. Throughout the study period, the major rationale for policy advocacy was the economy (65.1%, 73.7%, 73.6%, 74.4%, 34.5%, for periods I through V, respectively). Gradually, advocacy articles based on health concerns decreased (e.g., from period I at 42.9% and period II at 39.5% to period IV at 29.5%) and the arguments for balance

in different policy objectives increased (e.g., from period I at 6.0% and period II at 6.6% to period IV at 19.0%). In period V, arguments for rational acceptance of BSE risks became more visible compared to other periods, while the economy, health, and balance were less frequently argued. Graphical charts about policy advocacy and rationale for policy advocacy are shown in Figures 3.

		Period I Jan2002-Apr2003				Period II May2003-Aug2006				Period III Sep2006-Oct2007				Period IV Nov2007-Apr2008				Period V May2008-Apr2009			
		mean	±	sd	p	mean	±	sd	p	mean	±	sd	p	mean	±	sd	p	mean	±	sd	p
Policy advocacy (%)																					
Domestic	Positive	6.5	±	8.2		6.6	±	7.4		14.2	±	5.2	**	4.5	±	6.5	*	3.0	±	3.1	
	Negative	0.0	±	0.0		0.6	±	1.6		2.4	±	1.9		12.1	±	18.9		3.5	±	2.9	
Foreign	Positive	1.8	±	4.8		1.7	±	3.6		1.1	±	2.2		0.0	±	0.0	**	0.2	±	0.4	
	Negative	0.0	±	0.0		4.0	±	5.3		9.9	±	7.2	**	5.3	±	6.6		0.9	±	1.3	
Rationale for policy advocacy (%)																					
Health		42.9	±	34.8		39.5	±	23.0		29.7	±	15.4		29.5	±	25.3		20.0	±	10.3	
Economy		65.1	±	32.7		73.7	±	20.8		73.6	±	14.5		74.4	±	22.4		34.5	±	11.7	**
Balance		6.0	±	14.6		6.6	±	10.1		23.6	±	14.1	***	19.0	±	11.5		10.9	±	7.4	
Acceptance		0.7	±	2.2		1.3	±	3.6		3.3	±	4.7		1.0	±	2.6		3.8	±	2.5	

Tests were performed for before period by Bonferroni method. **p* < 0.05, ***p* < 0.01, ****p* < 0.001

Table 2. Policy advocacy and its rationale for BSE articles in South Korea

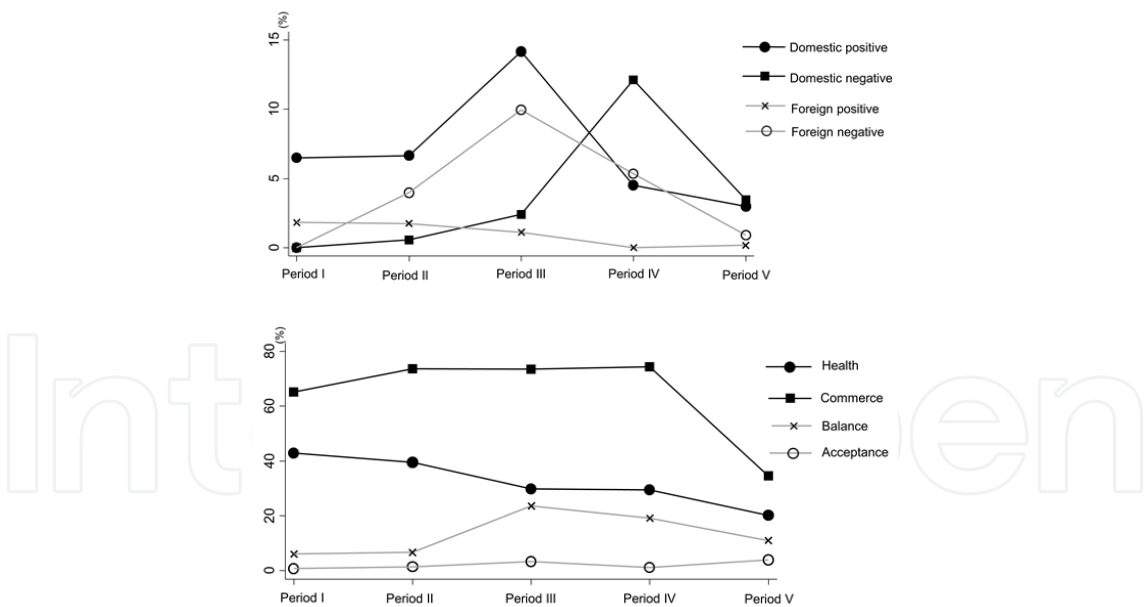


Figure 3. Policy advocacy and Rationale for policy advocacy of newspaper articles in South Korea

The results of the examination of individual articles using a multinomial logistic regression analysis are shown in Table 3. The citation of health concerns indicated a greater likelihood that a given article carried advocacy for a stronger domestic policy rather than no advocacy (RRR=2.62). A discussion of the economy indicated a 2.25 times greater likelihood of stronger

domestic policy advocacy. The discussion on policy balance and risk acceptance is less associated with stronger advocacy (RRR=0.90, 0.61, respectively) and with weaker advocacy (RRR=7.24, 4.06, respectively). Additionally, health concerns was more associated with stronger foreign advocacy (RRR=4.06), and economic discussion was more associated with weaker foreign advocacy (RRR=1.92) with statistical significance, while other advocacy (balance, acceptance) were less associated with stronger/weaker foreign policies.

Variables	Domestic Policy								Foreign Policy							
	Positive				Negative				Positive				Negative			
	RRR	±	SD	<i>p</i>	RRR	±	SD	<i>p</i>	RRR	±	SD	<i>p</i>	RRR	±	SD	<i>p</i>
Health	2.62	±	0.28	***	1.55	±	0.24	**	4.06	±	1.43	***	1.27	±	0.20	
Economy	2.25	±	0.24	***	0.98	±	0.15		1.90	±	0.69		1.92	±	0.29	***
Balance	0.90	±	0.13		7.24	±	1.14	***	0.90	±	0.45		4.99	±	0.78	***
Acceptance	0.61	±	0.19		4.06	±	0.87	***	1.05	±	0.80		1.11	±	0.33	

Results of multinomial logistic regression analysis: Relative risk ratios (RRR) and their standard deviations for a given article to carry positive/negative advocacy (neutral orientation as baseline).
p* < 0.05, *p* < 0.01, ****p* < 0.001

Table 3. Relationship of advocacy orientation with rationale of South Korea newspaper articles

4. Discussion

In South Korea, the number of BSE-related newspaper articles increased with trade disputes and, throughout the study period, the major rationale for policy advocacy was the economy. In the early periods of our analysis, advocacy articles based on health concerns gradually decreased, and the arguments for a balance among different policy objectives increased. At the same time, calls for both stronger domestic policies and weaker domestic policies appeared less frequently and none of them was dominant. Calls for stronger domestic policy peaked immediately after the beef trade ban was lifted, but thereafter calls for weaker domestic policy gradually increased and became more visible. When a trade issue became a conspicuous political agenda, arguments for the rational acceptance of BSE risks became more visible, while the economy, health, and balance were less frequently argued. However, even when trade liberalization became a political agenda, newspapers of South Korea did not disproportionately call for stronger/weaker policies. The media did not focus on any single aspect as the base for their reporting and discussion, but rather argued for the rational acceptance of BSE risks.

4.1. Issue prominence and geographic focuses of newspaper reports on BSE

The framing of the issue, coupled with its visibility, helped set the agenda in the media and society. Characteristics of events/issues and the social configuration around them are the determinants of their social impact and associated news coverage. Therefore, tabulation of the domains of issue reporting reveals the social importance of each domain. Considering the dynamic nature of the relationships, media framing affects and reflects how people understand an issue and how society responds to the issue [63]. The case would be expected to be the same for BSE reporting, and media reports on health risks reflect the social implications of those

risks and the configuration of social interests and powers in which they operate [64]. Discussion in the media of acceptance or aversion of health risks and what policy measures are desirable are also associated with these reports. The media are thus a key arena in which policy choices and responsibilities with regard to food system governance are negotiated [65]. With a focus on topic categories for articles, trade and agriculture topics drastically increased with Korean-US technical agreements for livestock inspection. Trade issues started to jump up in period II, when BSE cases were confirmed in the US in December 2003 and the government of South Korea banned importing beef from the US. In 2006, beef imports from US resumed with conditions (younger than 30-month-old cattle and boneless), but thereafter beef imports partially stopped because bone pieces were found in some parts of imported beef in November 2006. For South Korea, the BSE issue became an important international economic issue rather than a health issue for domestic consumers.

The number of BSE-related newspaper articles first increased when beef importation was partially suspended because bone pieces were found in some beef imported from the US in November 2006. On the other hand, period V could be treated as an atypical period because liberalization of the beef market in South Korea became a political agenda. Large demonstrations were held in front of the Chung-ga Square and media articles increased with the candle protests. Such visibility meant that the total number of articles increased about 15 times compared to the previous period. Under a social crisis such as the BSE issue, "social amplification" can be observed and Renn et al. conceptualized social amplification in their examination of risk-related social processes over time [66]. Events pertaining to hazards interact with psychological, social, institutional, and cultural processes, and they can increase or decrease the public's perception of risk and shape the public's behavior, which in turn can have secondary socio-economic and political consequences. When the initial influence of a risk dissipates and the secondary consequences grow, the risk is said to be socially amplified. However, Chung et al. noticed that risk amplification of media was not reported in South Korea [67]. They analyzed the role and framing of media with the BSE and H1N1 cases and reported that the effect of media was limited in the BSE issue. Rather, the media reduced the voice amplifying BSE risk while public unrest was building in South Korea. That is, the number of articles increased in period V, but those articles may simply have covered the candle protest and issued daily reports that the movement and contents were relatively rational. This is observed in South Korean newspapers that did not focus on any single aspect as the base for reporting and discussion, but rather argued for the rational acceptance of BSE risks.

4.2. Comparison with other countries: Cases of US and Japan

Acceptance of BSE-related risks was argued differently in each country, and those differences reflected and affected the public's perception of BSE issues, the related safety policies of the governments, and the configuration of social interests. Previously, we compared the newspaper reports on BSE-related events in major national dailies in Japan and the US around the period when BSE-infected cattle were discovered in the US and the import of US beef products was banned (between December 2002 and November 2006) and reported elsewhere [4]. After the discovery of BSE cattle in the US, articles of commerce and trade issues were dominant in

Japan, while the incidence of BSE, agriculture, and trade dominated in the US. From these results, the trend in South Korean newspapers about BSE was similar to the US rather than Japan because the BSE issue continued to be an issue of agriculture and trade in South Korea. BSE remained largely an issue of human health and trade, so news articles in the commerce category comprised a large part of the related articles in Japan. In the US, even after the detection of BSE in Canada and the US, confidence in the safety of beef products remained high. US newspapers carried significantly fewer articles on BSE than Japanese papers. This could be explained by the cattle-raising agricultural sector being relatively larger in the US and also the beef trade and commercial relationship between the two countries [68,69]. In many countries, a set of major frames provided by the preceding reports in the initial period of BSE dominated media reporting of the issue over time [70,71]. The differences evident in the media could serve as a vehicle for reappraising the existing policies as well as the possible international harmonization of risk management policies.

Beginning in the late 1990s, South Korea became a growing and important market for major beef exporters in the US. In 2003, beef imports accounted for nearly 75% of beef consumption of South Korea and South Korea was the third-largest market for US beef exports before the ban its government imposed after the first US BSE case was discovered. With regard to the trend in beef consumption in South Korea, in 2008, the quantity of US beef exports to South Korea decreased to about 57 thousand metric tons, about one quarter of its former total, and the slide continued to 2009. The falling value of the won and the candle protests evoked a negative attitude toward the government of South Korea and its agreement about US beef [72]. Beef exports to South Korea in 2010 totaled \$518 million, about two-thirds of the record 2003 level. This shows that, in South Korea, although the news media were objective or rational, the reaction of people did not equal that of the media. That is, consumer behavior was typically characterized by panic or reaction to social crisis. A crisis is usually driven by a focus on particular events or one event that surprises people, limited time to develop a response, and threats to high-priority goals [73-75]. These focusing events highlight certain adverse conditions, increase public concern, trigger political mobilization, define the issues as serious, and propel them to a high priority on the political agenda [76,77].

4.3. Policy advocacy and international partnership for risk management

Closely related to aversion and acceptance of a risk is the media advocacy of policy, referring to judgmental statements on the policies already in place and/or calls for stronger or weaker alternatives. Such statements help shape public perceptions of what is left to be done and who is responsible. Therefore, the slant of newspaper articles (advocacy) can also be interpreted as the media's policy appraisal. Our study showed that calls for stronger domestic policy peaked when the beef trade ban was partly lifted (period III), but thereafter calls for weaker domestic policy gradually increased and became more visible (period IV). When a trade issue became a conspicuous political agenda (period V), calls for both stronger domestic policies and weaker domestic policies appeared less frequently and none of them was dominant. Throughout the study period, the major rationale for policy advocacy was the economy in South Korea. Gradually, advocacy articles based on health concerns decreased and arguments for a balance

of different policy objectives increased. In period V, arguments for the rational acceptance of BSE risks became more visible, while the economy, health, and balance were argued less frequently. In summary, the media appraised domestic policy as positive based on health and economic viewpoints in South Korea.

The media play a pivotal role in setting goals, assigning responsibility, and assessing the efforts of governments [78]. For example, the public might be perfectly content with ongoing policies if people are persuaded to accept certain levels of risk or if they regard the policy efforts to be well in place and the incidents beyond the control capacity of the government. On the other hand, when the policy target is zero risk (i.e., the total elimination of risk), the discovery of BSE cattle can easily be interpreted as a policy failure, which might invoke calls for stronger (more effective) policies [4]. In the case of BSE, scientific uncertainty was always a key component of the environment in which the policies were made [79]. The handling of the uncertainty brought about by inconclusive scientific evidence has thus become an important aspect of policy management [80]. Furthermore, mishandling of health risks would undermine public trust in their governments. Therefore, the artificial introduction or the enlarged threat of such risks might be employed as a tool for political maneuvering. This aspect should be deliberately considered in the planning of public management for every government [81,82]. Although scientific information is shared among countries, information about the perception and management of risk is not. Policies are not always in concert and many remain to be internationally disputed, as exemplified by the South Korean import ban on US beef. Analyzing media reports helps in examining the process of policy making and offers an analytic framework for observing how issues are treated.

5. Conclusion and policy implication

We examined the visibility and faces of BSE-related issues in newspapers in South Korea. The media play a role in setting the agenda and assessing governmental efforts. Media reports on health risks and their management can serve as vehicles for the judgment of existing policies. The slant of newspaper articles can be interpreted as a call for stronger or weaker policy alternatives. Even when the trade liberalization became a political agenda, newspapers of South Korea did not disproportionately call for stronger/weaker policies. The media did not focus on any single aspect as the base for their reporting and discussion, but rather argued for the rational acceptance of BSE risks. Based on our findings, the utility of monitoring the mass media as an indicator of public policy appraisal is discussed, along with its use in planning health risk management. Health and safety regulations can be understood as expressions of a nation's political and social values; they are associated with the social configurations around the issue. Reports and discussions in the media reveal which policy measures are considered desirable by the public. Especially during trade disputes, which are sometimes triggered by the introduction of policies for health and safety purposes, the examination of media reports helps in reconsidering the existing domestic safety measures and facilitates international harmonization of health risk management, in addition to helping resolve trade conflicts.

Acknowledgements

This study was supported by the Grants-in-Aid for Scientific Research “Risk communications in mass media during health crises: An international comparative study (2012-2014),” granted by Japan Society for the Promotion of Science to Hajime Sato.

Author details

Satomi Noguchi and Hajime Sato*

*Address all correspondence to: hsato@niph.go.jp

Department of Health Policy and Technology Assessment, National Institute of Public Health, Japan

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