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CULTURE, MEDIA & FILM | RESEARCH ARTICLE

Lessons learned from previous environmental health crises: Narratives of patients with Minamata disease in TV documentaries as the main media outlet

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Abstract: On 16 August 2017, the Minamata Convention on Mercury entered into force to protect human health and the environment from the adverse effects of mercury. Minamata disease is caused by methylmercury poisoning in humans. The victims' acute symptoms were captured in photographs by Eugene Smith by which people worldwide became aware of this environmental health crisis. Over 60 years have passed since the first case of methylmercury poisoning. The victims/patients have aged and little is currently known how the crisis affected them and their community. Additionally, little is understood about patients affected by serious environmental pollution in socio-economic poverty. This study aimed to describe narratives of these patients from public broadcasting company's documentaries, as well as to overview media coverage on TV. Descriptive analysis of TV documentaries showed patients' various concerns and sorrow through their narratives in consecutive years. Archiving these TV documentaries that cover environmental health crises may provide an educational opportunity that does not fade with time. People worldwide can learn from the narratives of patients, even in local environmental health crises, via TV documentaries.

ABOUT THE AUTHORS

The authors in the Department of Health Communication conduct research on the University hospital Medical Information Network (UMIN) Center related activities as well as health communication research at various levels. Main research topics include: (1) Communication of health information to the general public; (2) Patient–provider relationship and communication; (3) Health literacy; (4) Activities related to the UMIN; (5) Information systems for clinical epidemiologic studies; (6) Security of the information network.

As a background in teaching intercultural communication in medical field, Dr Naoko Ono has a career as translator and interpreter, educator and researcher in medical field. She graduated with the PhD in Health Communication in the University of Tokyo and her PhD thesis was about medical interpreter training. She is currently working on a number of research projects on health communication and medical interpreting.

PUBLIC INTEREST STATEMENT

Japan, like other countries, experiences human-made disasters. One of them is Minamata disease, an encephalopathy and peripheral neuropathy caused by daily intake of fish and shellfish that are highly contaminated by methylmercury in Shiranui Sea, the southwest sea. It was in 1956 when the disease was first reported to the local health center, but it was in 1968 when officially recognized as a pollution-caused disease. Although it was more than 60 years ago, the solution to this case has never completed. Why it took long time to be recognized and treated was said that because it is a social problem, not a medical problem. What did the people in Japan other than affected area know about this problem? The authors analyzed the TV documentary programs of the national broadcasting company, NHK, to describe how the patients and their narratives were presented.

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Subjects: Mass Communication; Risk Communication; Health Communication; Journalism; Media Communication; Television; Documentary; Media Effects

Keywords: TV documentary; Minamata disease; Japan Broadcasting Corporation (NHK); narrative; Mercury poisoning

1. Introduction

Discrimination and stigma against victims and affected areas by human-made disasters such as pollution and nuclear power plant accidents are repeated. It is possible that human-made disasters may happen anywhere in the world, however, what do we learn from the past cases? It is easier for us to learn preventive measures that do not cause disasters. However, the fact is that human-made disasters can never be zero. Then, it may be realistic to prepare what will happen to the victims after a disaster, how the atmosphere of society changes, and how discrimination and stigma against victims and the affected areas are born, and what to do to prevent those from happening.

Minamata disease is one of the most serious, unsolved public health crises in Japan, which produced long-term discrimination and prejudice against the patients, the victims, and their descendants. This disease is an encephalopathy and peripheral neuropathy caused by daily intake of fish and shellfish that are highly contaminated by methylmercury in Shiranui Sea, Kumamoto of Kyushu, the southwest part of Japan. Minamata disease is recognized as the first evidence of poisoning, which transfers from the mother to the fetus via the placenta (Imamura, Ide, & Yasunaga, 2007; Ministry of the Environment, Government of Japan, 2002). A detailed chronology of Minamata disease can be found at several research centers (National Institute for Minamata Disease, xxxx; The Open Research Center for Minamata Studies, n.d.). This disease is also recognized as a social problem. A solution to Minamata disease requires not only medicine for treatment, but also other non-medical disciplines, including politics, socio-economics, and culture. This is because the victims lived in poor fishery areas adjacent to industrialized communities during a period of rapid economic growth (Harada, 1978). In 1 May 1956, Minamata disease was first reported to the local health center, but Minamata disease was only officially recognized as a pollution-caused disease in 1968. Between these years, the responsible company compensated victims with a small amount of money in 1959. Lessons learned from this delayed solution have been described in two research papers (Harada, 1995; Imamura et al., 2007). Harada stated that one of the delayed reactions is there is a three-way conflict among the victims, the responsible company, Chisso, and its employees, and the community (Harada, 1978) in Minamata. Also, he implied if this case had happened in Tokyo, a capital city of Japan, the reaction to could have been different. Then, what aspect of this social problem did the people in Japan other than the affected area see? If they knew more about the patients and victims in details and raised a question why this social problem continues, can it be solved in shorter time? What did the media communicate this social problem?

2. Coverage of Minamata disease in various communication media

An outbreak of Minamata disease was first reported as a mad cat problem in the local newspaper Kumamoto Nichinichi Shimbun in August 1954 (Kumamoto Nichinichi Shimbun, 1954). However, 3 years later, in April 1957, the nation-wide newspaper Asahi Shimbun reported this case as a mysterious disease (Asahi Shimbun, 1957) and its readers were aware of Minamata disease nation-wide for the first time. The first mention of Minamata disease on TV was in July 1959 (Kobayashi & Nishida, 2012). At this time, people who were remote from Kumamoto could observe the patients' fulminant form of symptoms. Eugene Smith's photograph of an affected mother holding her daughter, a patient with congenital Minamata disease, shocked people worldwide (Smith, 1972).

Portrayal of patients with Minamata disease, family, and supporters has been captured in various communication media. The film maker, Noriaki Tsuchimoto, filmed nine documentaries regarding Minamata disease, and focused on people's lives along with the depiction of beauty of the sea (Tsuchimoto, 1971). The company Seirinsha attempted to capture the supporters' movements, as well as the disease itself, in their documentary films to share with residents in the area (Skanavis,

Koumouris, & Petreniti, 2005). With regard to other forms of documentation of Minamata disease, Michiko Ishimure, a writer, published Kugai jo do [Paradise in the Sea of Sorrow] (Ishimure, 1969, 1990), eloquently describing the reality of patients' lives. Akira Sunada, a stage actor, played a monodrama inspired by victims, and Shisei Kuwabara took and published many photographs of patients (Funabashi, 2006).

Another form of communication media would be TV documentaries. The importance of the views of patients, family, their supporters, and those involved in Chisso Corporation as chemical engineers, the managers of local tourism industry, citizens in the community of Minamata, and executive and legislative branches of Japanese government has since faded. Numerical data of Minamata disease, such as the number of certified patients, the years of trials, and the concentration of methylmercury in the fish can be easily archived. However, the emotion and feelings of people in the affected area, not only of patients, but also of citizens in the community and of the responsible company workers, can be viewed in a narrative form.

3. Perceptions of social reality by TV documentaries

TV documentaries are considered as one of the mass communication means that play the role of a "civic educator". These documentaries not only provide knowledge of the social world, but also affect the viewers' attitudes (Corner, 1995).

One of the media effects is how information about particular issues presented in news reports affects judgments about the issues such as attitudes and likelihood estimates (Shrum, 2009). Although TV documentaries are not exact news reports, they contain social issues which to be elaborated in more details rather than straight news. Iyengar has argued the media coverage can create an accessibility bias through its frequency of coverage of particular social issues. This accessibility bias has been shown to influence a number of judgments, including issue salience, evaluations of politicians' performances, and voting behavior (Iyengar, 1990).

Another related media effect is cultivation effect. Cultivation effect, developed by Gerbner, is defined as a positive relation between frequency of television viewing and social perceptions as it is portrayed (Gerbner, 1998). More recently, cultivation effect is found in the relation between the contents of television program viewing and social perceptions. It is notable that viewing the social problem with human faces, especially the patients and victims, might create the perception of social reality in the viewers.

4. TV documentaries of the public broadcaster Nippon Hoso Kyokai

In the Japanese terrestrial broadcasting environment, TV documentaries and other TV programs are produced and broadcasted by one public broadcaster and five private television networks. The only Japanese public broadcaster, Nippon Hoso Kyokai (NHK; Japan Broadcasting Corporation in English) started broadcasting TV programs in 1953, followed by private broadcasting companies. NHK's two terrestrial channels are as follows. General TV is a broad and balanced programming, including news and information essential to the lives of people in Japan, as well as cultural and entertainment programs. Educational TV is a variety of educational programs, as well as programs focusing on classical art, welfare issues, and music (NHK corporate info, 2016). Therefore, documentary programs are broadcasted on both channels. TV programs broadcasted by NHK are archived and partially available for the general public and for researchers. Other broadcasters also produce TV documentaries, but they are not currently archived and databased.

5. Objective

This study aimed to (1) determine how many TV programs on Minamata disease were broadcasted by NHK during the past 60 years, and (2) to describe the contents of the patients' narratives in their documentary programs.

6. Materials and methods

6.1. Sampling

Documentary programs are broadcasted on both channels (General TV and Educational TV) of NHK. Using the online open-to-public NHK TV program archives data-set "NHK chronicle" (http://www.nhk.or.jp/archives/document), we searched any TV programs on Minamata disease by using the search word "Minamata" on General and Educational TV channels until the end of 2015. The resulting list of program information (broadcasting date, minutes of broadcasting, TV channel type, title of program, and abstract of program) was copied and pasted in Microsoft Excel. We then added several TV programs that did not indicate the phrase "Minamata disease", but appeared in the literature as "mysterious disease" (Kobayashi & Nishida, 2012).

6.2. Categorization

We first categorized genres of TV programs by title and abstract of programs. We then chose documentary programs from the list to further categorize narratives by the victims, the victims' family, the victims' supporters (film maker, writer, photographer, medical doctors, etc.), central and local governments, Chisso Corporation management, former chemical engineers in Chisso Corporation, and medical doctors in Chisso-affiliated Hospital.

7. Results

7.1. Trend of TV programs covering broadcasting of Minamata disease

The keyword search resulted in a total of 390 TV programs (273 on General and 117 on Educational channels), including re-broadcasted programs. TV programs were categorized into (1) straight news programs, (2) in-depth news and documentary programs, (3) school education, children, and youth programs, (4) lifestyle, educational, welfare, and hobby programs, and (5) others (Figure 1). Straight news was broadcasted the most (185, 47.4%), including short and quick news reports on the results of trials, reconciliation, and compensation in morning and evening news programs. Broadcasting in-depth news and documentaries comprised approximately half of straight news (116, 29.7%), followed by school education, children, and youth programs (46, 11.8%), lifestyle, educational, welfare, and hobby programs (42, 10.8%), and others (summary report on a Minamata international conference; 1, 0.3%). In-depth news and documentary programs were broadcasted periodically throughout the past 60 years, but appeared more often in recent years. Interestingly, the TV programs in early years covering Minamata disease were not straight news, but in-depth news, and documentaries. This finding suggested that NHK, the public nationwide broadcaster, had attempted to point out Minamata disease and its patients in detail as a social problem elsewhere of Japan.

Among 116 programs, 49 in-depth news and documentary programs are shown in Table 1 after excluding rebroadcasting and non-archived programs. A total of 17 (34.7%) programs were open to the public and 32 (65.3%) were archived, but not open to the public. Since the first program "True face of Japan - Behind the mysterious disease", in-depth news and documentary programs have been covering patients and supporting them. The themes of programs varied from life of patients in the community to the questioning of government responsibility. In later years, the patients and family were portrayed in the perspectives of their supporters. These supporters included Dr. Masazumi Harada, a physician and university Associate Professor, Professor Sadao Togashi, a lawyer and university Professor, Mr. Hirofumi Uzasa, an economist, Mr. Noriaki Tsuchimoto, a film director, and Ms. Michiko Ishimure, a writer, as well as a local citizen at that time. These supporters played the role of advocators for the patients, uncertified patients (not diagnosed with Minamata disease by a doctor), and their families, who were poor and had low social status.

When we compared the chronology of major events concerning Minamata disease, the number of broadcasted TV programs did not quite correspond to the occurrence of major events. An exception

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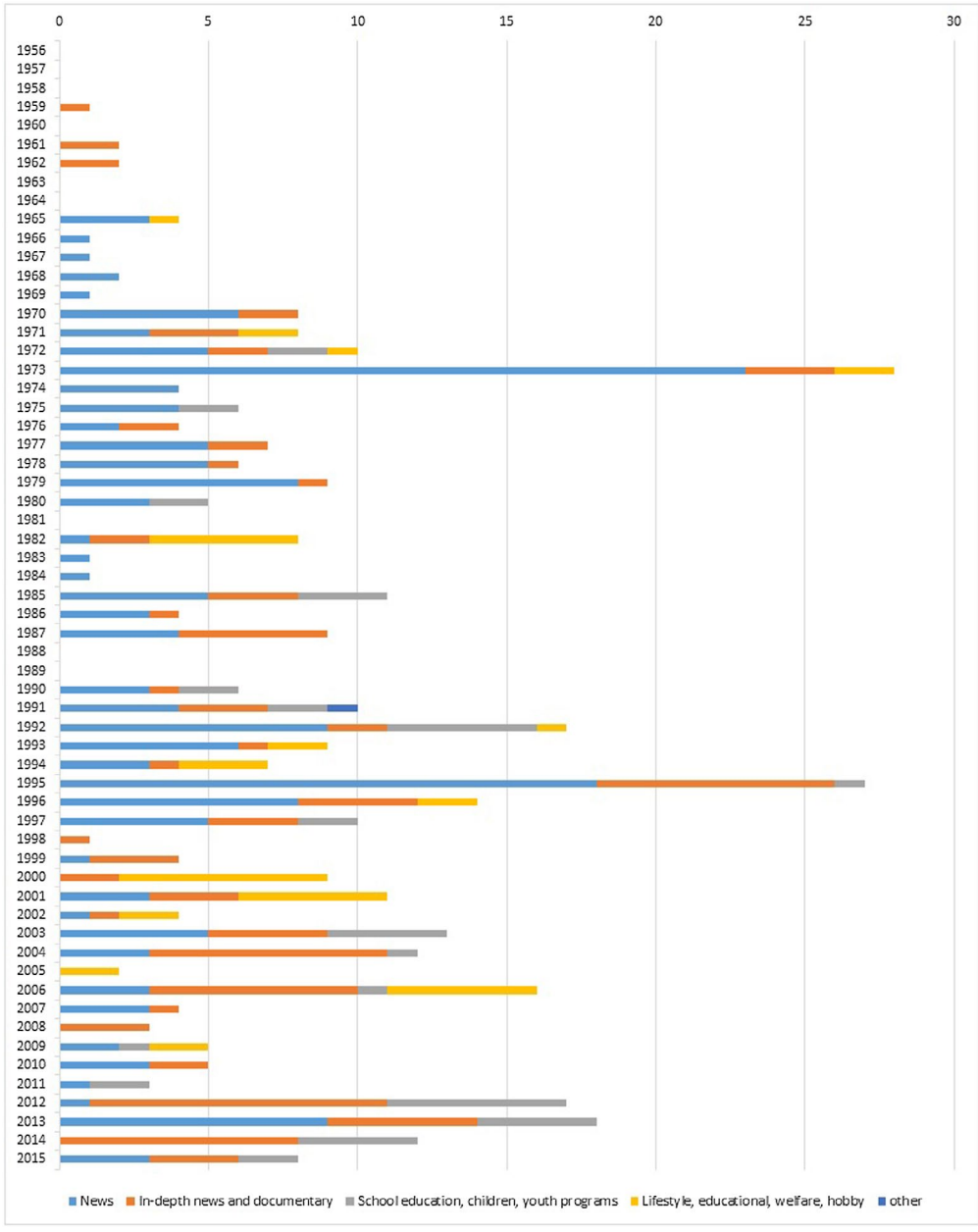

Figure 1. Trend of NHK TV program coverage on Minamata disease from 1956, which was the official discovery of this disease, to 2015.

was for 1973 when victims of Minamata disease won their lawsuit against Chisso and in 1995 when the national government proposed a resolution for uncertified patients (Table 2). Both of these events were well covered.

7.2. Patients' narratives in in-depth news and documentaries

Despite the limitation of access to some programs that were broadcasted in early years, 49 of 116 (42.2%) programs were available for analyzing the contents. Many programs invited physicians, lawyers, writers, economists, film makers, photographers, and other supporters of patients to portray the patients, uncertified patients, and their family by explaining the social environment where the patients lived. We identified the programs that primarily focused on patients and their narratives.

Table 1. In-depth news and documentary programs

Date & Time	Open to public	Title
1959/11/29 (Sun)21:30–22:00	Yes	True face of Japan (Episode 99) Behind the weird disease
1970/12/04 (Fri)19:30–19:59	Yes	Modern video "Chisso General Shareholders' meetings"
1971/07/01 (Thu)22:30–23:00	No	Human islands "Buried sufferers –uncertified patients of Minamata disease"
1972/03/26 (Sun)20:45–21:30	Yes	17 years in Minamata
1972/10/21 (Sat)22:30–23:00	Yes	Testimony of Tamano MURANO – 17 years in Minamata-
1973/03/23 (Fri)19:30–19:59	Yes	Documentary "Minamata within myself" –Confessional medical doctor-
1976/12/18 (Sat)22:00–23:00	Yes	Documentary "Report embedded" –Minamata disease written in public record of Kumamoto-
1985/01/23 (Wed)06:15–06:43	No	Cheerful farming village and its record "Minamata sweet Watson Pomelo of pray- Minamata city, Kumamoto
1985/12/09 (Mon)20:00–20:45	No	ETV8 "Two photo journalists"(1- little voice of Tomoko-what Eugene Smith saw in Minamata)
1987/10/19 (Mon)22:00–22:29	Yes	30,000 km of sea way "And then I became a fisherman" –Shiranui Sea in Kumamoto
1990/12/15 (Sat)14:00–15:15	No	"Can we eat fish of Minamata?"
1992/07/23 (Thu)22:30–23:14	No	Prime 10 Document "to live" Minamata in photos –36 years of congenital patient
1994/04/15 (Fri)21:30–22:19	Yes	NHK special "Rising sea –report of Minamata Meshima" 25 years of fishery village fighting against Minamata disease
1995/02/28 (Tue)20:00–20:45	Yes	ETV "Series Minamata disease" (1) warning toward modern society – Testimony by Masazumi HARADA and Sadao TOGASHI
1995/03/01 (Wed)20:00–20:45	No	ETV "Series Minamata disease" (2) What is dignity of human? –Sadao Togashi, Masazumi Harada, what learned from the patients
1995/03/02 (Thu)20:00–20:45	Yes	ETV "Series Minamata disease" (3) Remained problems- Masazumi HARADA and Sadao TOGASHI
1995/07/01 (Sat)19:30–20:29	Yes	NHK special "What happened in Japan 50 years after thewar (4) Confessions of engineers of Chisso Minamata plant
1995/10/19 (Thu)20:00–20:45	Yes	ETV "Agonizing decision-Political showdown at the 40th year of Minamata disease
1997/05/12 (Mon)22:00–22:44	Yes	ETV "We don't forget this sea- 13 years of fighting against Minamata disease
1997/11/28 (Fri)21:40–22:29	No	Document Japan "Rise, Minamata sea" –Reopening of fishery in 24 years
1998/01/06 (Tue)22:00–22:44	No	ETV "Economist Hirofumi UZAWA asks abundance again" (2) Minamata disease never ends
1999/05/15 (Sat)21:45–22:29	No	Japan The twentieth century of video "Kumamoto prefecture" history of Minamata chemical plant and others
1999/07/11 (Sun)08:30–08:54	Yes	Touring new Japan "the sea where the fighters left –Minamata city, Kumamoto prefecture"
2001/04/01 (Sun)01:30–02:29	Yes	The twentieth century, ages of family "the sea of Moyai" –40 years of Sugimoto family in Minamata
2002/04/29 (Mon)02:00–02:49	No	Islands special "Minamata told by photos of 514 deceased
2003/08/07 (Thu)12:20–12:43	No	Lunch time Japan islands "Voyage to the future: we want to pass down the message from Minamata.
2003/11/08 (Sat)21:00–21:49	Yes	NHK special "Trajectory of the heart of the 15-year old"
2004/10/08 (Fri)23:00–23:43	Yes	Human documentary "Minamata: the dance of life –message by Michiko ISHIMURE"
2004/10/30 (Sat)17:00–18:30	No	ETV "Minamata disease, questioned administrative responsibility"
2004/11/07 (Sun)18:10–18:45	No	Voice of disaster victims: what we can do now-NHK 24-h campaign "How do we use our disaster experience
2004/12/12 (Sun)21:15–22:07	No	NHK special "Chained distrust/ Minamata disease never ends"
2006/05/28 (Sun)10:05–10:48	No	Rediscovering Japan special "testimony record of Minamata disease"

(*Continued*)

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Table 1. (*Continued*)

Date & Time	Open to public	Title
2006/06/25 (Sun)15:05–15:48	No	Kyushu Okinawa special "Minamata each praying"
2007/07/05 (Thu)19:30–19:56	No	Close-up Modern "Minamata disease never-ending suffering –uncertified patients' suffer"
2008/11/08 (Sat)05:40–05:50	No	NHK video file: want to see the person "Noriaki Tsuchimoto, a documentary film director
2008/12/21 (Sun)22:00–23:29	No	ETV "Facing Minamata –a documentary film writer Noriaki Tsuchimoto's 43 years
2010/05/16 (Sun)22:00–23:29	No	ETV "Living with Minamata disease –Physician Masazumi Harada's 50 years"
2012/02/26 (Sun)22:00–23:29	No	ETV "dedication to the flowers, Michiko Ishimure (a writer)
2012/07/25 (Wed)19:30–19:56	No	Close-up Modern "Minamata disease: is there real relief? Michiko Ishimure"
2012/11/04 (Sun)22:00–22:59	No	ETV "Masazumi Harada, Heritage for the future: Minamata Disease"
2012/12/16 (Sun)00:50–02:19	No	ETV "dedication to the flowers, Michiko Ishimure (a writer)"
2013/03/16 (Sat)05:40–05:50	No	NHK video file: want to see the person "Masazumi Harada (a physician)"
2013/07/13 (Sat)23:00–00:29 (7/14)	No	Testimony post-war history project "What did the Japanese people aim at? No.2 Minamata disease: Postwar rebuilding to Pollution"
2013/11/07 (Thu)19:30–19:56	No	Close-up Modern "Mercury regulation: start to move –How do we use the lesson in Minamata"
2014/05/13 (Tue)20:00–20:29	No	Heart net TV "as a Minamata disease patient, as a woman"
2014/06/28 (Sat)23:00–23:59	No	ETV "living in our hometown Minamata: Message from the next generation"
2014/11/08 (Sat)05:40–05:50	No	NHK video file: want to see the person "Hirofumi Uzawa (an economist)"
2014/12/31 (Wed)07:20–07:45	No	Listening carefully the 3rd episode "walking the way I trust, the words I pass down to the future "Hirofumi Uzawa (economist) and Bunta Sugawara (actor)"
2015/01/17 (Sat)23:00–00:29 (1/18)	No	Testimony post-war history project "What did the Japanese people aim at? Giant of knowledge No.6 "What is modern? Whereabouts of souls –writer Michiko Ishimure"

Note: Program titles were translated by the authors.

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Table 2. Abridged timeline of Minamata disease	
1908	Chisso factory built in Minamata village
1932	Chisso begins production of acetaldehyde using mercury catalyst
1953	Fish surfacing, cats dancing and sea birds falling observed in Minamata bay area
	5-year-old girl found officially as the first Minamata disease patient
1956	Official confirmation of Minamata disease
1957	Mutual-aid Association of Minamata Disease Patients and their Families formed.
1959	Sympathy Agreement between Chisso and the victims
1968	The Government admits officially that Chisso's organic mercury causes Minamata disease
1969	Lawsuit filed in Minamata disease trial ("first trial")
1971	Direct negotiations with Chisso begins staging a sit-in in front of the head office in Tokyo
1972	Plaintiff patients express the desire for a support center for patients and their families
	Calls for a Minamata Disease Center made at the First United Nations Conference on the Human Environment (Stockholm)
	Donations solicited nationwide
1973	Victims win suit against Chisso
	Compensation Agreement with Chisso by both trial group and direct negotiations group; applied to all certified patients
1974	Net dividing Minamata Bay from the open sea set up
	Minamata Disease Center completed. Named "Soshisha" (meaning "mutual consideration")
	Minamata Disease Certification Applicants' Council formed
	Mushroom factory constructed. Work by patients and others begins there (-1983)
	Collection and analysis of mercury-laden sludge, fish, and shellfish from Minamata Bay
1975	Exchange of visits with leaders of Canadian Indian Minamata Disease patient group
	Fake patient comment by Sugimura and others, members of Kumamoto Prefectural Assembly
1977	Beginning of activities as base for uncertified patients' movement
	Minamata Experiential School opened (study and exchanges regarding Minamata disease; now the "Gonzui School")
	Beginning of sales of low-pesticide citrus fruit grown by Minamata disease patients
1978	Governmental notification narrowing the certification criteria
	Government begins providing financial support for Chisso by issuing prefectural bonds so that compensation payments continued
1979	Detsuki Health Center established. Acupuncture, moxibustion, and massage treatments provided. (Separated from Soshisha in 1986)
1980	Third lawsuit filed
1982	Minamata Life School opened (free school; study of Minamata disease and organic farming, −1992)
	Minamata disease patients moved to the Osaka district file a suit
1983	Document center completed. Documents related to Minamata disease collected, organized, displayed, loaned, published, etc
1986	Survey of distribution of plants and animals around Minamata Bay shoreline
	The 30th anniversary of the official confirmation of Minamata disease. Asian People's Convention was held
1988	Minamata Disease Museum established
1989	All directors of the Soshisha resign owing to a matter of sales of citrus fruits
	Minamata Disease Patients Alliance formed

(*Continued*)

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Table 2. (*Continued*)

1990	Traveling Exhibition of Minamata Disease Museum held at various places in Japan. (-1994)
	Environmental restoration of Minamata Bay (dredging and reclamation of mercury-laden sludge) finished
	Publication of newsletter begins
	The Environmental Creation Development Project in Minamata begins. (-1999)
1993	Illustrated Minamata Disease published (bilingual, in both Japanese and English)
1994	Citizens' Gatherings to Consider the Recovery of Minamata ("Sorosoro moyainaoshi ba hajimen ba") begin to be held
1995	Cabinet approves "the Final Settlement of Minamata disease".
1996	The 40th anniversary of the official confirmation of Minamata disease. MINAMATA Tokyo Exhibition held
1997	Net dividing Minamata Bay removed
1998	Indonesian and Tagalog editions of Illustrated Minamata Disease published
2000	Financial support for Chisso at Government expense begins
2001	Osaka High Court find national and prefectural governments guilty
	Events in conjunction with International Conference on Mercury as a Global Pollutant held
2002	Attendance at the World Summit on Sustainable Development in Johannesburg
2004	New Noh play Shiranui performed as an offering on land reclaimed from Minamata Bay; attended by 1,300 people from around the country
2004	Supreme Court decides Kansai lawsuit over Minamata disease, recognizes responsibility of national government and Kumamoto Prefecture, orders compensation paid. First Supreme Court decision in a lawsuit over compensation from the national government; clearly recognizes government responsibility
2005	Minamata Disease Shiranui Patients' Association (?ishi Toshio, chairman; hereafter "Shiranui Patients' Association") established
2005	Fifty members of Shiranui Patients' Association file lawsuit demanding compensation payments from national government, Kumamoto Prefecture, and Chisso ("No More Minamata National Government Compensation Lawsuit")
2005	The three prefectures of Kumamoto, Kagoshima, and Niigata begin accepting applications for new health insurance booklets [entitling bearers to treatment for Minamata disease]
2007	Twelve uncertified Niigata Minamata disease patients file lawsuit in Niigata District Court against national government, Niigata Prefecture, and Showa Denko, the company which caused the disease, demanding compensation payments of ¥12 million each for a total of ¥144 million ("Third Niigata Minamata Disease Lawsuit")
2007	Nine members of victims' Mutual Aid Society file lawsuit against national government, Kumamoto Prefecture, and Chisso, demanding compensation of ¥16 million to ¥100 million per person (total ¥228 million)
2009	Law for special measures regarding relief for Minamata disease patients and resolution of the Minamata issue (Minamata Disease Special Measures Law) passed
2010	Fourth conference on out-of-court settlement in Shiranui Association lawsuit. Kumamoto District Court suggestions include one-time payments of ¥2.1 million and average monthly payments of ¥15,000 for medical treatment
2010	Prime Minister Hatoyama attends memorial ceremony for victims of Minamata disease; first time for an incumbent prime minister to attend. After the memorial ceremony, acceptance of applications for assistance under the Minamata Disease Special Measures Law begins
2010	Environment Minister Matsumoto Ryu approves plan to reorganize Chisso (company split-up plan)
2011	In its reorganization under the Minamata Disease Special Measures Law, Chisso establishes a new company, "JNC", to continue its regular operations
2011	Out-of-court settlement ends Shiranui Patients' Association lawsuit ("No More Minamata Kumamoto Lawsuit")
2012	Acceptance of applications for benefits under Minamata Disease Special Measures Law ends
2013	Full victory in Supreme Court in Mizoguchi lawsuit (which demanded cancellation of the rejection of his late mother's application for certification as Minamata disease patient, and that the court require that she be certified)
2016	Japan ratified the Minamata Convention on Mercury, the global treaty to reduce mercury emissions

Notes: Major events were extracted from the Minamata Disease Chronological Table. In Soshisha (Supporting Center for Minamata Disease), 2016. Retrieved July 25, 2017, from http://www.minamatadiseasemuseum.net/timeline

Source: Minamata Disease Municipal Museum (2001).

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The first narrative was found in the program "Testimony of Tamano MURANO-17 years in Minamata", which was broadcasted on 21 October 1972. The 30 min documentary program only showed Ms. Tamano Murano, who was portrayed as a survivor of the fulminant form of Minamata disease. Her symptoms of quivering and hand-shaking were broadcasted in other TV programs prior to this program. In this program, she faced the camera/interviewer and explained her past and present feelings as a patient by answering the questions by an interviewer. Because of this camera angle, the audience can face her as though they are in the same room. Content of her narratives started with anger and desperation, and then changed to giving up and disconsolate feelings.

The second patient's narrative was found in "Prime 10 Document 'Life' with Minamata in photos—fetal Minamata disease patient's 36 years", which was broadcasted on 23 July 1992. Mr. Kazumitsu Han-naga, a patient with congenital Minamata disease, aged 36 years, has been living in a nursing home, where patients with Minamata disease with severe symptoms live, for 19 years. He started taking photos of people and scenery of Minamata for a record when he was 17 years old. Photographs were the only way for him to express his thoughts because he had difficulty in speaking. He hosted a photo exhibition to express the patients' feelings at an international convention where he fought against the local government, which tried to cancel the exhibition. In this documentary program, the narrative was unspoken, but conveyed in non-verbal communication along with the narration. Because of his appearance in a wheelchair and active movement throughout the city beside the camera, the audience could view his perspective.

The third and fourth narratives were found in an ETV feature show "Series on Minamata disease No. 2. What is human dignity?", broadcasted on 1 March 1995. The program is a talk show of Dr. Masazumi Harada and Professor Sadao Togashi with two patients' narratives in inserted video. One patient is Ms. Shinobu Sakamoto, a patient with congenital Minamata disease. She was a patient of Dr. Harada and was invited by Karolinska Institutet to convey her message as a patient. She is the most visible person with Minamata disease on TV during 60 years. In another TV program "Heart net TV-as a Minamata disease patient, as a woman" on 13 May 2014, Ms. Shinobu Sakamoto provided new insight of a patient's narrative. In this program, she was 56 years old and expressed her wish to live in the manner that she desired. Because her life was always fighting against Minamata disease lawsuits, her mission was to be a representative of fellow patients with congenital Minamata because she could communicate well verbally.

The narratives of patients with Minamata disease expressed their suffering and distress. Besides expressing suffering and distress in their narratives from Minamata disease and care (6/7 narratives, 85.7%), no motivation in life (2/7 narratives, 28.6%), and a relationship with family members (2/7 narratives, 28.6%) were also frequently expressed in their narratives. Other sources of distress were "income, household budget, and debt" due to their unemployment, "relationships with others" due to a lack of communication, "love and sexuality" due to sexual growth of patients with congenital Minamata disease, and "family members' illness and care" due to their aging.

The patients' narratives were obtained from interviews with TV documentary directors. The faces of the patients were presented across to the audience without the interviewers, providing the audience with a feeling of talking with them directly.

Examples of narratives are as follows:

"Why did my mother give birth to me?"—a patient with congenital Minamata disease

"Why do I have to have this disease?"—a patient with congenital Minamata disease

"I should not have given birth to my son (with congenital Minamata disease)".—mother who is also a patient with Minamata disease

"I am afraid of Chisso Corporation being irresponsible by splitting up of the company".

"My daughter was treated as a thing".

Their narratives partially expressed anger and their tone of voice was sometimes resigned.

8. Discussion

Minamata disease was officially recognized on 1 May 1956. However, the first TV program to feature Minamata disease did not appear until 1961 on public TV nationwide. Portrayal of Minamata disease has appeared in TV programs, in both news and documentary programs. Some information, such as the number of victims, chemical agents responsible for methylmercury poisoning, medical conditions of patients, litigation, court trial outcome, compensation, and other factors of Minamata disease, has been covered by straight news programs. However, TV documentary programs captured the multifaceted environmental health crisis. These programs showed Minamata disease in those who were involved. The pain, suffering, sorrow, rage, and disconsolate feeling of the victims, their family and their supporters were mostly described.

Over 60 years, a limited number of in-depth news and documentary programs in NHK covered patients with Minamata disease as a central storyteller. The accessibility bias to a limited number of patients' presence might influence the viewers' judgments on social issues. More documentary programs with trials and governments' activities might give continuous impression of the case without faces of patients and victims to the viewers according to cultivation effect.

There were more TV documentary programs on the patients' appearance in narratives by their supporters. This limited number of narratives of patients may be due to medical and social reasons. First, the patients' symptoms were too serious and severe to be able to talk. However, because the audience can communicate non-verbally with patients in TV programs, this situation should not have prevented media coverage. Second, the patients' family did not want to reveal the fact that the patients have Minamata disease because of concern for any negative effect on extended family members' marriages, study, and career by silent discrimination. Third, in the early stage of Minamata disease, professionals from the media might have found contacting different patients difficult because of the reason mentioned above. Fourth, the patients may have decided to open their dialogue to professionals from the media in later years because they wanted to move on from their experience and share their experience so that the same tragedy is not repeated in the future. Therefore, their narratives struck a chord with the viewers' sympathy.

In terms of understanding patients' sorrow and pain and then understanding the power of the community, TV documentary programs may play a role because they allow the patients' voice to be heard in their narratives. Non-verbal communication, such as tone of voice and facial expression, provide information that is more complete to an audience who have not experienced such health crises. Thus, we relive the feeling of the patients as well as bystanders, drawing our mind to health crises in a comprehensive manner.

Notably, we should not force any victims to express their feelings. When professionals from the media find having an interview with victims for TV difficult because of any particular privacy problem, recording the victims' opinions is still important. This enables different means of presenting the victims' feelings on fictional drama instead. Docudrama, which is defined as "a drama (as for television) dealing freely with historical events especially of a recent and controversial nature" (Merriam-Webster dictionary) could be another method to deliver the presence of the victims' feelings.

People's experience of environmental health crises can fade as time passes. What we learn from crises as the victimizer, victim, or bystander may not be thoroughly passed on to the next generation. This may result in occurrence of the same wrong acts, such as a delay in countermeasures, bullying, and reputational damage, which were observed after the Fukushima nuclear power plant accident (Yoneyama, 2013). Another example of environmental stigma was found in residents in the Midland–Saginaw–Bay City area in Eastern Michigan, US, due to dioxin contamination (Zhuang et al., 2016).

One method of learning lessons from the past could be watching TV documentaries covering environmental health crises with patients' narratives, as well as their family and supporters'. In stigma

reduction program Horizons, where the group used the media to show that AIDS, has a human face, some forms of stigma were significantly reduced among the participants in the intervention (Pulerwitz, Michaelis, Weiss, Brown, & Mahendra, 2010). As mass media play an important role in formulating public opinion, creating and delivering TV documentaries with narratives of patients, victims, supporters, and community members to the anonymous public viewers will have potential influence on public opinions, which may be related to patient advocacy to help society and politics to move toward the countermeasures for a shorter time. Although no force should be given to the patients and their family and supporters, communicating with the journalists in various forms of mass media could be the first step for the supporters to those stigmatized to help the media representatives understand the behind stories with human face. This strategy has been evaluated in one of Horizons intervention studies in Senegal which held a workshop for media representatives with the stigmatized people to help the journalists to understand better the hidden realities which often related to stigma and discrimination (Pulerwitz et al., 2010).

9. Limitations

There are several limitations to our study. First, our target materials only originated from NHK. Other commercial TV networks may have more patient-centered documentary programs. However, the database of TV programs is available from NHK alone in the current research environment. Second, 30.6% of in-depth and documentary programs were not archived. There could be more patients' narratives in the missing videos. The missing videos were broadcasted in the early years of discovering Minamata disease, which might have shown patient's feelings of that time, rather than patients' feelings only by memory. Nonetheless, the present research would provide an overview of the currently available TV documentary programs on Minamata disease from the view of the patients and suggest their educational purpose for the future citizens.

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