

An Analysis of English-language YouTube Videos Related to Minamata Disease: Prior to the Release of the Hollywood Film “*Minamata*”

Richard A. Forrest*

Abstract

This study investigates the state of online English-language video content related to Minamata Disease available prior to the 2020 release of the Hollywood film “*Minamata*” starring popular actor Johnny Depp (in the role of photojournalist W. Eugene Smith). It is intended to serve as a case study of depictions of historic environmental incidents and as a baseline for future comparative research. Utilizing a mixed quantitative and qualitative approach, the study inventoried relevant uploads to YouTube, analyzing in detail the 27 most-viewed videos. Findings include that uploads encompass a wide range of durations, viewcounts, and approaches chosen for portraying the topic. Most had evidently been uploaded by non-specialists (notably as the sole channel upload in 7 cases). Many were produced through excerpting previously existing source materials – mainly a small number of historic documentary films (most notably a 1971 film by Tsuchimoto Noriaki). Uploads often present low-resolution, deteriorated source content, with varying degrees of alterations and additions having been made, and generally lack explanations of the context or the significance of visual material presented. The most-viewed item was a 2017 upload by popular YouTube channel *SciShow*, which was highly unusual in that it focused on biochemistry and included no depictions of symptoms in diseased humans or cats. Additional findings and observations are presented, and relevant implications are discussed; future research directions are also identified.

1. Introduction

In October 2018, it was announced that a commercial motion picture titled “*Minamata*” was entering production. (McNary 2018) This film is scheduled for release in the United States in 2020. (IMDB 2019) Although likely unfamiliar to most moviegoers, the title is the name of the Japanese city that in the 1950s suffered the first outbreak of an initially mysterious, debilitating, and often fatal neurological disorder that has since come to be known as “Minamata Disease.”

The story of Minamata Disease can be seen as starting with the disturbing behavior observed

in cats:

“Around 1953, local cats, which ate great quantities of fish, began exhibiting strange behaviour: drooling and staggering about, undergoing convulsions or running in circles as though they were mad, or leaping up into the air and charging forward (Harada, 2004).” (Yorifuji et al 2013, p. 97)

Before long, human victims were also experiencing deleterious effects:

“The patients complained of a loss of sensation and numbness in their hands and feet, inability to grasp small objects, unsteady gait

* Lecturer, Hiroshima University of Economics

and voice change. Many complained of difficulties seeing, hearing and swallowing. In general these symptoms deteriorated and were followed by convulsions, coma and eventually death.” (Semionov 2018, p. 179)

Through later experiments using cats as subjects, it was determined that the ailment’s cause was ingestion of seafood having high methylmercury concentrations, due to pollution released from a factory owned by Chisso Corporation. (Walker 2010)

The Minamata case was historically significant, prompting one of four key pollution-related citizen lawsuits in Japan (which also included a later occurrence of mercury poisoning in Niigata Prefecture), as well as leading to passage of anti-pollution laws in Japan’s 1970 “Pollution Diet.” (Ui 1992; Gresser et al 1981) International concern resulted, decades later, in ratification of the Minamata Convention on Mercury, which aims to reduce usage and environmental release of this toxic element. (Minamata Convention 2017) Nevertheless, to this day, victims of mercury pollution in Japan still suffer:

“Decades after industrial dumping ceased, thousands of survivors of these incidents are still suffering from a host of neurological symptoms, including tremors, dizziness, headaches, memory loss, and vision and hearing problems; the most severe cases also involve developmental disabilities, cognitive and motor dysfunction, and physical abnormalities.” (Kessler 2013, p. A305)

Despite the significance of the Minamata case, however, more than a half century after

initially shocking the world, it currently appears largely unknown, even among those interested in the study of Japan and environmental issues.¹⁾ However, the film *Minamata* will likely increase awareness as well as influence perceptions long into the future, thanks to the lead role being played by one of the world’s most popular actors, Johnny Depp. He will portray historical figure W. Eugene Smith, an American photojournalist who was instrumental in publicizing the suffering of Minamata’s victims internationally, including through the 1975 book *Minamata*, which Smith produced with his wife Aileen (Smith and Smith 1975). The most influential of Smith’s black-and-white Minamata photographs is “Tomoko and Mother in the Bath” (Smith 2001), which graphically shows the congenitally deformed young girl Uemura Tomoko. This became a well-known depiction of the issue, highlighting the stark reality of the difficult lives of the disease’s victims.

While Hollywood’s film reportedly will be framed around the life journey of one foreign participant-observer, the complex saga of what transpired as a result of the disease outbreak spans decades and involves myriad participants – including pollution victims, community residents, scientists, journalists, corporate and governmental officials, documentary filmmakers, novelists, and others. The story could thus be conveyed in a great variety of ways, with the creators of textual or audiovisual media choosing to selectively focus in on any particular subset of the wide-ranging human and non-human constituents within the overall drama to serve as the center of attention and as the carrier of their chosen narratives (including, as will be seen, by choosing to place the main focus even on animals or chemical compounds).

2. Background – Rationale and Approach

Before the 2020 release of the film *Minamata*, it will be useful to document the manner in which the issue is portrayed in online resources accessible to general audiences. This will facilitate assessment of the film's influence on perceptions, and will provide a case study documenting the state of online sources concerning a historically-important environmental issue. The publicity surrounding the film will likely encourage Internet users to search online for additional information about Minamata disease. The nature of what they encounter will likely frame and determine their perceptions before viewing the Hollywood film.

What information, then, would Internet users likely encounter? Especially given the context prompting online searches – i.e., users' exposure to news concerning a film-based treatment of the topic – it would be useful to investigate online resources which are not primarily text-based (e.g., books, magazines, journal articles or encyclopedia entries). Streaming video content would therefore likely be most appealing and thus accessed; a key focus of inquiry would therefore be resources available through the most-used online global video-sharing platform, YouTube (youtube.com).

To answer this question, this study investigates the state of English-language content related to the Minamata disease issue available on YouTube approximately five months after the announcement of the film *Minamata* and in the year before its release. It first identifies video uploads and inventories in a quantitative manner key data concerning the most-viewed videos, especially characteristics likely reflecting the

videos' presumed influence upon viewers. It further utilizes an open-ended exploratory qualitative approach to analyze the most-viewed uploads in order to gain an understanding of the manner in which the issue is portrayed.

As indicated by Allgaier (2018, p. 2), YouTube is one of the most-used Internet sites and is second only to Google for use by those searching for online content. Moreover, YouTube is frequently utilized, in particular, as a source of information concerning topics related to science. Despite its importance, however, research analyzing YouTube, and especially its communication of scientific or environmentally relevant information, remains at a very nascent stage. Pioneering scholarly analyses of science-related content within YouTube videos have focused on the availability and presentation of health-related information; studies have been conducted, for instance, regarding YouTube content concerning a variety of specific medical topics, including vaccines, dental procedures and kidney stones (e.g., Ekram et al 2018 and Dias da Silva et al 2019). Such studies have focused on whether the content of uploaded videos reflects customarily accepted knowledge within the medical field.

Significantly, however, YouTube content can in principle be provided by any Internet user; it has thus been noted that "it is also of importance to study the production of YouTube content and the intentions and ideas of the actors who are uploading video content." (Allgaier 2018, p. 6) In this connection, it has been found that many YouTube videos are produced by non-experts, and that inaccurate information is common (with, it should be noted, the likelihood that these findings are mutually interrelated). Ekram et al (2018, p. 153) concluded that while "[t]he Internet

is an important resource for the general population[,] widely viewed YouTube videos contain erroneous and incomplete information....” Moreover, Dias da Silva et al (2019 p. 437) found that even in the specialized field of dental medicine, universities provide a mere 5% of available YouTube content; they further concluded that “[m]ost of the content found did not match” tests for reliability.

In connection with the present study, a search of the literature did not yield any previous research concerning online video depictions of the Minamata issue, or YouTube videos concerning other important historical environmental issues and incidents. There evidently thus remains much work to be done to understand the nature of online video depictions of environmental issues – and of historically important cases, in particular, such as that of Minamata Disease.

As there appear to be no standardized methodologies for the study of YouTube and uploaded content, the present study developed and piloted a methodology, as described below.

3. Minamata-Related Videos Available Online Prior to the Hollywood Film

3.1 Initial Scoping Regarding Information Availability

For initial scoping of online information likely to be encountered following exposure to news about Hollywood’s *Minamata*, a search was conducted for news items concerning the film. Approximately ten items were found and reviewed. Most incorporated verbatim or paraphrased informational content from the publicity materials issued by the film’s producers, Hanway Films. (Hanway Films 2018) While some articles also provided additional text, such content was

almost exclusively regarding the past activities of actor Depp, and did not therefore concern the Minamata issue; moreover, such articles did not provide links for readers to readily access further information about the disease or the history of the Minamata case.

One exception was the webpage titled “Minamata Movie” (Teaser-Trailer.com 2018), which used the Hanway Films text, but also added “Check out those [*sic*] videos for a better understanding of the Minamata disaster” – followed by embedded links (which display screenshots of linked videos) for two YouTube uploads: “Mercury Poisoning - The Minamata Story” (muizainal 2009) (displaying a low-resolution image of a cat), and “Japan’s Ominous Dancing Cats and the Disaster That Followed” (SciShow 2017) (showing a black-and-white photograph of large seaside buildings). This was followed by a copy of the text provided by the uploader describing the second of these videos, by channel *SciShow* (which was later determined to be the most-viewed YouTube upload related to the Minamata topic). Hence, a small fraction of Internet users seeking additional information (e.g., those viewing the Teaser-Trailer article, unlike those reading more popular entertainment news sites, e.g., *Variety*) might be expected to view these linked YouTube uploads (as well as other videos on the topic that may be recommended for viewers through the YouTube interface). However, this scoping exercise suggested that Internet users seeking information after learning about Hollywood’s *Minamata* would, instead, in most cases conduct their own Internet searches, including via Google and YouTube.

3.2 Analysis of Videos – Methods and Procedure

Following this scoping activity, online videos were identified through Google searches (google.com) conducted on March 12, 20 and 24, 2019. The search strings and number of results obtained (selecting results categorized as “videos”) were:

- “Minamata” (291 videos);
- “Minamata disaster” (276);
- “Minamata disease” (271); and
- “Minamata disease documentary” (280).

Inspection revealed numerous identical items appearing within results for these various search strings (albeit sometimes ordered differently), allowing for confidence that most relevant items were discovered, and supporting an estimate for the existence of between 200–300 relevant YouTube videos.²⁾

To determine the most-viewed uploads, the same search strings were used to search within the YouTube website, and results were filtered using YouTube’s available sorting options (those for “relevance,” “view count,” and “rating”). This process facilitated identification of approximately 50 highly-viewed videos for review. To narrow down items for analysis, languages of uploads were determined. Inspection of the screenshots and text descriptions revealed that most items utilized English, fully or partially (although multiple items utilized Spanish or Indonesian, with at least one for other languages including Portuguese and French). Solely non-English uploads were excluded from further analysis, as these would likely not be viewed by Internet searchers who predominately use English. (It is notable, however, that many of the uploads with English descriptions incorporated material having significant audible Japanese-language content,

due to utilization of source materials originally produced in Japanese.)

Excluding videos based on these language-based considerations left 44 candidate items for detailed analysis. A database was prepared of the following characteristics for these uploads: Title; URL; duration; upload date; language(s); description provided by uploader; number of comments; uploading channel name, number of subscribers, channel description, main channel language(s), and the number, type and timeframe of channel uploads. Observations were also noted concerning the content of each upload (auditory, visual and textual), manner of presentation, and notable response comments. These data were collected on March 20, 2019 and refined and checked March 24 and 26 and April 1–3. This list was sorted to determine viewcount rankings and thus identify the most highly-viewed uploads.

For analysis, transcripts were developed for uploads having spoken English content (i.e., not items solely having English in the form of graphics, text, or musical lyrics), through copying YouTube’s auto-generated transcripts (which were found to lack punctuation and frequently contained errors; in rare instances, transcripts were generated in incorrect languages, resulting in nonsensical content). These transcripts were then corrected (for meaning, spelling and punctuation) after watching uploads. Finally, as different uploads revealed similar content, observations were made concerning apparent duplicative content, or material likely not originally created by uploaders (e.g., non-digital formats).

3.3 Findings: Quantitative Characteristics of Videos

Videos exceeding 5,000 views were classi-

fied as “high viewcount videos”; 27 such uploads were identified. Appendix 1 provides a table summarizing data concerning the top 27 uploads. Quantifiable characteristics concerning this set of 27 videos found the following:

Video Durations:

- Upload durations ranged from 19 seconds to 19 minutes 41 seconds.

Video Comments:

- The number of comments ranged from zero to 994.

Channel Subscribers:

- The number of subscribers to uploading channels ranged from zero to 5.6 million.
- The most-viewed video was uploaded by the channel having the most subscribers.

Total Channel Uploads:

- Total numbers of uploads by uploading channels ranged from zero to many hundreds (the latter being the channel of the most-viewed upload). (YouTube does not display data concerning the number of total cumulative videos uploaded by each channel.)
- Seven videos constituted a channel’s sole currently available upload.

Collective View Counts:

- The collective number of views for all 27 videos having over 5,000 views was 1.854 million.³⁾
- The top two videos saw 66% of these collective views, or over 1.23 million total views.

Individual Video View Counts:

- Two of the uploads had over 100,000 views; a total of 18 had over 10,000; and 27 were found to have in excess of 5,000.

- A Minamata-related upload exceeding 19,000 views (achieved by 14 videos) would account for approximately at least one percent of the total views for the top 27 videos.

Timing of Uploads:

- The timing of uploads reflected a relatively long-term interest in the topic; 13 of the 27 most-viewed videos had been uploaded more than seven years previously (before March 20, 2012), collectively exceeding 925,000 views and accounting for almost half (49.9%) of cumulative total views for the top 27 items. Appendix 2 provides a graph displaying upload dates and viewcounts for the 27 top uploads; it reveals that the most-viewed item was one of the most recent (uploaded in 2017), while the second-most-viewed item was one of the oldest (uploaded in 2009).
- Uploads also appeared to have a relationship with the timing of international policy developments; 22 of the 27 were uploaded during the timeframe coinciding with official initiation and preparatory negotiations for the Minamata Convention (i.e., 2009 through 2013); collectively such videos had 1.187 million views, representing almost two-thirds (64%) of views. Four of the top videos were described by uploaders as efforts to raise awareness of the Convention and related processes.⁴⁾ Only 3 videos were uploaded during 2017, the year of the Convention’s ratification. The most-viewed upload, by YouTube account *SciShow*, had been uploaded on September 10, 2017 – which coincidentally fell between the dates that the Convention

entered into force (August 16, 2017) and the first meeting of the Conference of the Parties (September 24–29, 2017).

3.4 Findings: Qualitative Analysis of the Videos

This section provides a qualitative analysis of the uploads, including observations about some of the most viewed or noteworthy videos.

Finding: Frequent Re-use of Historical Documentary Sources

One characteristic observed for many Minamata-related uploads was the incorporation of content evidently excerpted or adapted from existing materials and having a “dated” appearance, and thus apparently having been originally recorded using former generations of lower-definition media technologies (e.g., film or videotape); such items were thus unlikely to be originally produced by the uploaders themselves. (YouTube itself having not existed prior to February 14, 2005).

Unfortunately, in the majority of such cases, uploaders provided no information indicating the original source or how and through what means or route it had been obtained. Provisional identifications were thus made concerning the nature of the incorporated content, as well as the number of distinct original sources. Research was thereupon conducted attempting to identify information about these sources, including their original titles, authorship and year of production.

As a result, three important original source material resources were identified. These were:

- *“Minamata: The Victims and Their World”*
This is a 1971 film directed by Tsuchimoto

Noriaki (hereinafter, the Tsuchimoto source). (zakkafilms 2011) This is an important film that one film historian included in a list of “ten documentaries that shook the world.” (Horne 2007) The film follows Minamata disease victims in their daily lives, as well as attempts by victims and activists to interact with officials of Chisso Corporation in order to receive assistance and changes in company policies. This material was identified as appearing in nine of the 27 most-viewed uploads, representing over 344,000 views (some 19% of the total). The video that was being re-used within these uploads is evidently available for sale as a DVD, in which the original film was adapted into a 120-minute version (zakkafilms 2011). This version incorporates some English text, but does not include full subtitles for all of the audible Japanese-language dialogue. Multiple YouTube uploads not ranking among the most viewed items were also found to include portions of the Tsuchimoto material, including one copy of the full 120-minute English version.⁵⁾ One upload (Kings Cliffe Waste Watchers 2011) presents an excerpt of the Tsuchimoto source as it appeared within a British television program, accompanied by voice-over English narration. As explained in a comment to this upload, “The speaker is Mark Cousins. This clip is taken from [the U.K. television series] *The Story of Film*.” This was corroborated by a news article. (Sandhu 2011) While the narration provides explanatory information, this concerns the nature and significance of the Tsuchimoto source itself, rather than the nature and extent of Minamata disease. In particular it explains the meaning of scenes showing victims and activists confronting officials of Chisso Corporation and corporate representatives’ attitude of evading responsibility for causing

the disease outbreak. It should be noted that director Tsuchimoto made additional films concerning the Minamata issue, including the color film “The Shiranui Sea” in 1975; excerpts from this and other films may also appear in various YouTube uploads.

- “Japan’s Lessons on the Economy and Environment: Our Pollution Experience”

This material is available as a 1996 DVD produced by the organization Television for Education - Asia Pacific (hereinafter, the “TVEAP” source). (TVEAP Films 2009) Material from this work evidently appears in eight of the top 27 videos, with these uploads collectively having received over 784,000 views (42% of total views). In the full original version, prior to mentioning the Minamata case, an introduction section is presented which frames the material presented within the context of the relationship of economic growth to resource use and pollution; many uploads omit this section and contain only the subsequent portion addressing the Minamata issue proper (starting at 5 minutes 46 seconds from the beginning). Also preceding the Minamata content, another important pollution case in Japan, that of Itai-Itai disease, is addressed; this may lead viewers encountering the full original source to discontinue viewing the film prior to exposure to the Minamata-specific content.

- “Minamata Disease: Keeping the Tragedy in Mind”

This original source is a 2000 video by the National Institute for Minamata Disease (hereinafter “NIMD”), a government-related organization established to conduct research concerning

Minamata disease. (NIMD 2000) This source appears in one top upload, having 12,000 views (less than 1% of the top views).

Finding: The Nature of the Most-Viewed Video

The video with the highest view count (627,000 views) was “Japan’s Ominous Dancing Cats and the Disaster That Followed” (SciShow 2017). This is one of the most recent uploads among the 27 most viewed items. It was uploaded by a professionally produced channel that regularly presents video explanations concerning science. This channel has over 5.6 million subscribers and over one hundred uploads exceeding one million views (although the Minamata-related video was not one of the channel’s most-viewed uploads, and does not rank among its top 100).

The content of this video, which is 5 minutes 25 seconds in duration, consists of a view of a male narrator giving a spoken explanation, accompanied by custom-made computer graphics. The presentation is highly polished in nature, and the presenter is clearly a well-seasoned and practiced storyteller, employing commonly recognized storytelling devices and tropes (including mention of a “plot twist”), beginning the video’s presentation in an engaging manner by verbally painting a picture of an idyllic community that becomes confronted with mystery and crisis. Despite its use of traditional storytelling techniques, however, the *SciShow* upload is essentially technical in orientation (and the only upload providing links to scientific authorities), accompanied by animations showing shapes of chemical compounds, as well as of fish eating (thereby schematically depicting the process of the bioaccumulation of pollutants within the food web). It should be acknowledged that the scientific infor-

mation presented in the *SciShow* upload closely conforms to the explanatory material presented in the presumably authoritative NIMD source.

This depiction of the issue thus adopts an unusual approach among the highly viewed uploads, one that focuses on technicalities related to biochemistry, while noticeably refraining from sharing any historic recorded material explicitly conveying the (admittedly often shocking) nature and severity of disease symptoms in human or feline victims (scenes which can be found within all of the three historic documentary sources listed above). Although the upload's title references "ominous dancing cats," the introductory title card and screenshot chosen to introduce the video does not show any cats; it mainly consists of a black-and-white photograph appearing to show what are likely distant industrial buildings near a shore, an effect serving to frame the topic as being distant and far-removed from human lives and concerns. Throughout the entirety of the video, there are in fact no visuals presented of either cats or human victims.

SciShow's treatment is thus carefully crafted and presented in the form of a tidy story, but one which is ultimately antiseptically clinical in its effect, likely leaving viewers unaware of the true nature of Minamata disease's effects and the extent of suffering of its victims – and thus the degree of shock that resulted in the past from awareness of the disease through exposure to films or photographs graphically depicting deformed and suffering victims (as in the Tsuchimoto and TVEAP sources), or the frustrations and tribulations of victims and their activist allies (as can be witnessed through the Tsuchimoto source).

3.5 Further Findings and Discussion

This section provides additional qualitative findings and related discussions concerning the highly-viewed videos useful for understanding the nature of existing online resources. (Note: Appendix 3 provides further brief descriptions and observations concerning many notable uploads.)

Finding: Uploads are Many and Varied

It was found that there are many videos available, likely totaling between 200 and 300, encompassing a wide range of lengths, approaches and levels of popularity. Among uploads, 27 had received over 5,000 views, and thus likely have had an appreciable influence upon the perceptions of the Minamata issue held by numerous viewers, including concerning the presumed nature of the issue, as well as regarding its important elements and actors, and thus the ultimate meaning of the Minamata story and case.

Finding: Many Unknown and Unknowable Uploaders

Who creates and uploads such videos, and why? What can we know about those who uploaded these videos? Some uploads are accompanied by descriptive text specifying or suggesting the expertise and intentions of uploaders. For example, some uploads are by medical organizations (such as two uploads by the channel "IAOMT-International Academy of Oral Medicine and Toxicology"), or are described as being uploaded with the intent to spread awareness of ongoing health hazards associated with mercury usage and its presence in the environment and food. However, for many highly-viewed videos, based on available information, the related

activities, expertise, and intentions of uploaders remains unclear.⁶⁾

This being said, a majority of the highly viewed videos are apparently created by non-specialist amateurs who have reused and repurposed a small number of historical films. Additionally, as well, a significant number (7 out of the 27 top uploads, or 26%) also constitute sole channel uploads (or, possibly, the only upload that the channel has chosen to make publicly available at this time). In these cases, it appears that the excerpted source material had inspired these uploaders to share the material with others, despite uploaders having no other uploaded items and likely no specialized expertise regarding the issue. These efforts are likely therefore earnest attempts to disseminate content perceived as important. Nevertheless, such uploads may contain inaccuracies, especially those prepared by students. It may thus be seen that anonymous amateurs have been integrally involved in the communication of what may be accepted by viewers as being “scientific” or “historical” knowledge concerning this topic.

Finding: Uploads are of Varied and Essentially Unknown Accuracy and Provenance

Much of the content incorporated into uploads is excerpts from historical sources that can be identified, although uploaders usually do not provide acknowledgements of the sources that they incorporate into their uploads. For such original sources, however, research can often establish who had made the original historical films (and thus, as well, the relevant expertise of those who produced them), allowing for evaluations of the creative choices they had made regarding what to portray, and in what manner.

With regard to accuracy, fidelity to the original historical record can be observed to be highly varied. Some videos incorporate mistaken information or unrelated images, and could thus be considered to be inaccurate (examples are included in the upload descriptions found in Appendix 3). Even if inaccurate information has not been added, many video depictions of aspects of the Minamata issue could nevertheless be regarded as being misleading, especially if they do not properly explain the nature and context of the visuals shown. For example, in one less-viewed upload (Ammar Kil 2018, with less than 200 views), a film documenting movements of cats afflicted with Minamata disease as a result of experiments was significantly increased in speed, resulting in what could be regarded as an inaccurate or misleading portrayal of the disease’s effects.

Accuracy can be related to provenance (that is, where and how uploaders obtained the historical source materials that they incorporate into their videos). However, concerning the provenance of content that is utilized, it is often not readily possible to determine the source video, or the route that led to the appearance in the upload in which it is excerpted or adapted. We often do not know the origin of the material presented, including whether it has been taken from another source, and if so, what original source is being used – as well as what alterations have been made that affected the fidelity to the original of the uploaded version.

Finding: Uploaded Videos Incorporate Historical Sources of Deteriorated Quality

In many cases, the important original historical source materials had what appeared to be

significant deterioration in quality. When the images are severely degraded, they are likely to result from a process of multiple generations of copying of the source material – i.e., certain uploads likely are copies of previous uploads, a process that may have witnessed multiple iterations. It is therefore likely that previous (including higher resolution) uploads of these sources had at one time been uploaded, but were later removed for various reasons.

This raises the questions: How did uploaders acquire them? How many times have they been edited or altered in the process, and by whom and with what intent? However, as mentioned above, in the majority of cases where uploaders utilized content created by others, no information indicating the original source is provided, and there is no indication whether the material had been altered, and if so, in what manner – raising the question of how accurate or reliable the information presented is. Given the ability of Internet users to alter found material, and in light of the finding that some videos evidently have been edited in ways affecting their integrity, a determination regarding the accuracy of the information incorporated into any video depiction (including any item not uploaded by a channel conclusively identifiable as being associated with the original producer of the material) would necessitate further detailed analysis.

Finding: Different Human and Non-Human Agents Are Portrayed as Being the “Main Actors” of the Minamata Story

Who or what is depicted as being the main actor in the various portrayals of the Minamata story? While the Johnny Depp film will reportedly focus on photographer Smith as the vehicle for

conveying a narrative related to the Minamata case, for many YouTube uploads the focus is on other constituents of the overall story, making them appear to play the leading and most important roles. In the most-viewed upload (SciShow 2017), the choice was made to place the focus on chemical compounds as being the main “actor” in the story (despite the title referencing cats).

In contrast, the bulk of the top uploads, to one extent or another, combine explicit images of suffering cats and human victims, while for a significant number the focus is solely on diseased cats. These include a variety of treatments that may be intended as being comical or shocking to potential viewers. Most such uploads do not provide explanations as to whether the symptoms present in the diseased cats or human victims shown are representative of typical cases, and if so, how many such victims there were as a result of the Minamata pollution incident.

Finding: Most Uploads Lack Cause-and-Effect Explanations and Historical Background and Context

Many uploads do not provide information that would answer key questions relevant to the Minamata case likely to occur to viewers, such as: Who was responsible for these scenes, and through what process or chain of events? Also, how did those involved react to the actions of others (such as the suffering victims), and were their actions proper, ethical, and reasonable? This is despite the fact that many commenters had left comments requesting information on the incorporated historical source films and asking for the uploading channels to make available more extensive excerpts or the full content of the historical sources. It can be surmised that presentations of

the full, unedited historical documentary films would allow viewers to better approach an understanding of the answers to these and other important related questions.

Expressed differently, there is often a lack of reference within most of the available depictions to many of the key actors playing parts in the story, including photographer Smith, who is likely to loom large in future remembrance of the story as a result of the Hollywood film. In some cases, no context is provided to indicate the location or time period of the films; also missing from most portrayals are any depiction or even mention of many key actors and historical developments integral to a full understanding of the Minamata incident and its significance – which arguably would require an explanation of the actions over time on the part of corporations, scientists, journalists, governmental representatives, activists and others.

Such films thus may be seen as existing essentially as context-less moving images, dream-like visions which in important ways are disconnected from human lives and historical processes. There could be significant implications with regard to public perceptions of the Minamata incident resulting from this lack of contextualization and explanation. The tragedy of Minamata may be portrayed essentially as if it just occurred naturally, accidentally or inexplicably; or that it happened in ways too obvious to require elucidation, as opposed to being portrayed in a manner that conveys that the impacts on the environment and human lives and communities were in reality the results of actions taken by particular actors, whether individuals or organizations, at particular times and places.

Finding: Portrayals Change Over Time

A key question is, how have depictions changed over time? For instance, are disease victims shown, and if so, do uploaders in particular choose to show scenes of suffering, and especially the more graphic scenes as can be found in the Tsuchimoto and TVEAP sources? A key unanticipated finding with respect to this question was that the most viewed upload (one of the most recent), as well as other highly-viewed videos, chose to show none of the serious effects on humans or animals – and could therefore be considered to be far less compelling or emotionally engaging than most of the historic documentary portrayals. In contrast to these less engaging more recent depictions, the varied re-purposings of the two black-and-white documentaries (the Tsuchimoto and TVEAP sources) reflect the initial, contemporary portrayals of the issue that focused more on the suffering of people – depictions that communicate the topic with a raw force that maintains its emotional impact despite the passage of five decades.

Finding: Motivations of Viewers and Uploaders are Largely Unknown

There appear to be multiple source films showing disease-affected cats, which appear within various YouTube uploads in differently edited and even combined versions. It is likely that all such films were made by the researchers at Kumamoto University who conducted the original experiments on cats to conclusively determine the cause of the disease. These films would thus predate and serve as source materials for subsequent documentaries, including the Tsuchimoto, TVEAP and NIMD sources, as well as others. Nevertheless, the provenance of these

excerpts is almost universally unacknowledged (or not explained in English) within the analyzed uploads, as is the fact that such feline victims were the subjects of experiments, and that they perhaps exhibit symptoms that differ or are more extreme than cats not subjected to experimentation.

Many uploads focus largely or exclusively on images of suffering humans and cats – whether showing the ghoulish flailing of arms and jerky movements of limbs in human sufferers, or uncontrolled gyrations and wild jumping motions of the cats subjected to experiments. Indeed, within the body of overall content within the set of analyzed videos, there appears to be a marked over-representation of content of this nature (i.e., depictions of the disease’s effects). Hence, uploaders have tended to choose to incorporate into their uploads a non-representative sample of the overall available historic source materials, thus giving great prominence to scenes that originally constituted only relatively minor portions within the source documentaries. A question that could be asked, therefore, is: Do users upload or view such videos for purposes of edification – or, instead, more possibly for the sort of thrill resulting from viewing scenes that seem to be taken from a horror movie? In the absence of information regarding the intent of the uploaders, it could be surmised that at least in some cases, rather than an interest in the scientific nature of the Minamata incident and its historical meanings, uploaders (as well as viewers) may instead have motivations more based on a morbid fascination with the macabre quality of certain images taken from the source materials.

4. Discussion: The Memory and Meanings of “Minamata”

Given the historical significance of the Minamata disease issue, a key concern for the future is: How will society continue to remember Minamata, and what will be its enduring message for the people of the world? In other words, what is the meaning of Minamata’s story, and what are the lessons that should be drawn, and why?

Given the nature of the overall set of highly-viewed related YouTube uploads analyzed, it is likely that viewers will lack a coherent understanding of the context of the images they are presented with, and thus may be unable to sufficiently make sense of the nature and meaning of the historical case of Minamata disease that is ostensibly being portrayed within the videos they encounter.

Further, it may be concluded that Minamata-related uploads on the whole share some of the characteristics observed in previous research into YouTube content: in that a large proportion of available videos are presented by non-specialists, and that the resulting content is of questionable reliability.

The most-viewed Minamata-related YouTube uploads, include multiple (if differing) versions of certain key documentary film materials. It appears that many top Minamata-related YouTube uploads are still actively receiving significant ongoing views, and their viewership may further increase with rising awareness of the film *Minamata*. This could be considered somewhat beneficial, as it allows Internet users to witness (at least partial excerpts of) the compelling and pathos-inducing historical documentary films on the issue; this will likely result in viewers feeling

empathy for disease victims and a shared desire to prevent similar future tragedies.

Nonetheless, the present review of this extensive re-use, re-purposing, and re-editing, of historical documentary material finds that it is often the case that the reuse of these original materials is not acknowledged, explained, or contextualized. With software allowing Internet users to create their own video works, as well as to copy and edit works by others, there has been an increase in the number and variety of media products available on the Internet (including radically edited versions of found materials, as well as multimedia “mash-ups” combining video, still photos, music and graphics). Many of the analyzed uploads intersperse photos, title cards, text, graphics, music, and other elements in a potentially confusing manner – and sometimes also include content unrelated to the Minamata issue. The addition of novel material or editorializing naturally may reduce the accuracy and the credibility of the overall depictions and consequently of each of the elements included, whether intended or not (this may be especially true in cases in which editors such as students may themselves be unaware that they are introducing inaccuracies into the altered or “improved” versions that they upload).

Due to a lack of explanatory descriptions and context – especially when viewed without background knowledge of key elements of the Minamata case and its history – many videos can be regarded as constituting visual presentations that remain enigmatic in nature, even to the extent of appearing to be essentially other-worldly or phantasmagorical – thus resulting in portraying the issue in a manner that appears to be far removed from real-life concerns of potentially

suffering individuals.

The impact on viewers of the differing available presentations of the Minamata story evidently varies depending on whether images of suffering are shown or not. When graphic depictions are presented of the symptoms of victims, numerous commenters responding to uploads state, for example, that they were at first amused by the film of the movements of the cats and human victims, but became concerned after learning more about the context of the images shown. Many commenters also stated that they found it horrifying or scary to witness the films of victims. While there are various reasons a video creator may choose to not show any such images, a middle ground does seem possible, however. One upload by a university professor briefly shows film of human and feline victims (reduced in size on the screen, perhaps to lessen the film’s shocking impact), preceded by a warning (stating, “the following YouTube video shows some striking and disturbing images of the effects. I warn you it’s very sad....”). (Jack Caravanos 2012; video timing of 2:18–2:21)

Perhaps in order to have a proper understanding of an issue such as Minamata disease it may be considered desirable or even necessary to witness that which may be unpleasant – the shocking and affecting scenes showing the nature and severity of the human suffering that has been caused. Indeed, to truly understand and appreciate what happened as a result of the Minamata pollution incident, it could be seen as beneficial to try and approach the emotions and thoughts that people experienced when the issue first was made known to the wider world. In this connection, it is likely that a truly meaningful understanding of the Minamata issue can best be

mediated and facilitated through the ready availability of the uncorrupted original documentary images which those who historically learned about the issue were first presented with at the time – ideally accompanied by clear explanations of the actions that had been taken by specific individuals and organizations and which led in a cause-and-effect manner to the resulting scenes that can be witnessed. Seen from this perspective, the state of available online resources portraying the Minamata issue leaves much to be desired.

Limitations and Future Directions

This study provides only an initial exploration into the presentation of the Minamata disease issue on YouTube. Additional research would be needed in order to understand in better detail the overall nature of how the issue is portrayed, how such portrayals are changing over time, and how differing uploads' contents impact viewer perceptions in different ways.

There are many potential fruitful directions for research that can build on the present study. In terms of possible future research directions, it is hoped that this study can serve as a baseline with which to compare future depictions, especially those after the 2020 release of the motion picture *Minamata*, which can be expected to play an influential role in determining future perceptions of the Minamata issue. For example, a comparison could be made in the future of the movie's portrayal and the YouTube depictions that existed before the film's release, assessing and contrasting details such as the narratives employed within the various depictions, as well as questions such as: who or what is presented as being important or central to the story, and who or what is excluded? Future research could

also examine how related YouTube portrayals change over time, including differences in the popularity of existing and newer video uploads, changes in their relative rankings, and other trends.

This research has touched on issues related to the accuracy and fidelity of available resources to the original source materials, as well as the question of which of the available representations are reliable accounts or could be considered to be valid and accurate. These are also topics that are worthy of further in-depth investigation and analysis. In future, it would therefore also be useful to explore issues related to the recording and preservation of historical memory, especially in relation to important environmental incidents and similar issues – such as regarding how key historical incidents are conveyed, as well as how to best preserve in an accurate manner the valuable original evidence of historically-significant incidents and cases.

Notes

- 1) Anecdotally reflecting this, none of the foreign exchange students enrolled in the author's semester-length course "Japan and the Environment" (two cohorts totaling 12 students from six developed and four developing countries) expressed previous awareness of the issue, although many later remarked that this topic constituted the most engrossing and memorable course content.
- 2) Some of the Google search result items were hosted by websites other than YouTube, including the streaming video service *Vimeo* (vimeo.com) and the website of the Minamata Convention (<http://www.mercuryconvention.org/Resources/Videos/tabid/3455/language/en-US/Default.aspx>).
- 3) It should be noted that Hollywood's *Minamata* likely will have tens of millions of views, an order of magnitude greater than this.
- 4) Numerous videos exceeding one thousand views (although insufficient to rank among the 27 most-viewed) were uploaded by governmental or United Nations-related channels (i.e., UNITAR, GEF and UNEP), or were explicitly intended to facilitate

- national-level adoption or implementation of the Convention after its ratification.
- 5) This full English-language version of the Tsuchimoto source was uploaded to YouTube on January 18, 2019, being one of the newest Minamata-related uploads identified; at the time of this study, it had received less than 400 views.
 - 6) Notably, numerous lesser-viewed videos are described as having been created by students for school projects.

References

Note: Because many YouTube user channel names are pseudonyms or created names (also known as “aliases” or “handles”) that are utilized by anonymous or unidentifiable creators (and are often written without customary spaces between words or upper-case initial letters), such names are presented and alphabetized here in the manner that they appear in full on the YouTube website (i.e., without attempting to identify actual family names for these “authors”).

- Alejandro Diaz Aragon (2016). “60 YEARS AFTER MINAMATA INCIDENT.” Online video clip (YouTube). www.youtube.com/watch?v=EUIa1EqjVc0. Accessed March 26, 2019.
- Allgaier, Joachim (2018). “Science and Medicine on YouTube.” in J. Hunsinger et al (eds.), *Second International Handbook of Internet Research*. Online version: http://doi.org/10.1007/978-94-024-1202-4_1-1. Accessed April 12, 2019.
- Ammar Kil (2018). “The Disease of The Dancing Cats: The Mercury Poisoning of Minamata.” Online video clip (YouTube). www.youtube.com/watch?v=8NRTJPZKiI8. Accessed March 26, 2019.
- bishowkt (2009). “Minimata - Mercury poisoning in Japanese villiage.” Online video clip (YouTube). www.youtube.com/watch?v=Nlt_VCODEJA. Accessed March 26, 2019.
- brittanyjanettem (2011). “Minamata crazy cat.” Online video clip (YouTube). www.youtube.com/watch?v=gYin9wHvyr4. Accessed March 26, 2019.
- Connor McBroom (2012). “The Minamata Disaster: History, Current, And Implications.” Online video clip (YouTube). www.youtube.com/watch?v=UGB1PPs-Apo. Accessed March 26, 2019.
- Dias da Silva, Marco Antônio, Andresa Costa Pereira, Andresa Costa Pereira and Anthony Damien Walmsley (2019). “Who is providing dental education content via YouTube?” *British dental journal*, 226(6): 437–440.
- egawauemon (2013). “‘Regular Days’ in Minamata, Ashikita [水俣・芦北／熊本].” Online video clip (YouTube). www.youtube.com/watch?v=_vwGfb5I8ng. Accessed March 26, 2019.
- Ekram, Sahrish, Katherine E. Debiec, Megan A. Pumper and Megan A. Moreno (2018). “Content and Commentary: HPV Vaccine and YouTube.” *Journal of Pediatric and Adolescent Gynecology*, 32(2): 153–157.
- Funakoshi, Minami and Kyung Hoon Kim (2017). “Minamata disease victims’ voices dim with age but still cry for recognition.” *Japan Times*. Publication date: 2017/09/28. Accessed March 26, 2019.
- George, Timothy S. (2001). *Minamata: Pollution and the Struggle for Democracy in Postwar Japan*. Harvard University; East Asian Monographs 194.
- Gresser, Julian, Koichiro Fujikura and Akio Morishima (1981). *Environmental Law in Japan*. MIT Press.
- Hanway Films (2018). “Minamata.” Online: www.hanwayfilms.com/minamata. Publication date: October 23, 2018. Accessed March 26, 2019.
- Horne, Philip (2007). “Ten documentaries that shook the world.” *The Telegraph*. Publication date: 2007/08/04. Online: www.telegraph.co.uk/culture/film/starsandstories/3666965/Ten-documentaries-that-shook-the-world.html. Accessed March 26, 2019.
- IAOMT - International Academy of Oral Medicine and Toxicology (2013). “The devastating effects of mercury poisoning that occurred in Minamata Japan.” Online video clip (YouTube). www.youtube.com/watch?v=MSKdkssJ6I0. Accessed March 26, 2019.
- IAOMT - International Academy of Oral Medicine and Toxicology (2013). “Minamata Clip for IAOMT TAP.” Online video clip (YouTube). www.youtube.com/watch?v=r2qCkOPCbVs. Accessed March 26, 2019.
- IMDB (Internet Movie Data Base) (2019). “Minamata (2020).” Online: www.imdb.com/title/tt9179096. Accessed March 25, 2019.
- Jack Caravanos (2012). “Minamata Bay Mercury Poisoning.” Online video clip (YouTube). www.youtube.com/watch?v=18s89XTyAl8. Accessed March 26, 2019.
- Jaime Cardenas (2013). “Minamata.” Online video clip (YouTube). www.youtube.com/watch?v=Tux1U3mulqs. Accessed March 26, 2019.
- JapanAngledotcom (2011). “Background to Minamata Disease.” Online video clip (YouTube). www.youtube.com/watch?v=iTQ5zf050-w. Accessed March 26, 2019.
- Joh R (2014). “Minamata disease.” Online video clip (YouTube). www.youtube.com/watch?v=s8TqxBd8c2Y. Accessed March 26, 2019.
- Joseph Larsen (2013). “Tsuchimoto - Minamata Disease 3.” Online video clip (YouTube). www.youtube.com/watch?v=_YRaZFKq92A. Accessed March 26, 2019.
- Joseph Larsen (2013). “Tsuchimoto - Minamata Disease 5.” Online video clip (YouTube). www.youtube.com/watch?v=3xHUfu0Du4c. Accessed March 26,

- 2019.
- Kessler, Rebecca (2013). "The Minamata Convention on Mercury: a first step toward protecting future generations." *Environmental Health Perspectives*, 121(10): A304–A309.
- Kings Cliffe Waste Watchers (2011). "Minamata, The Victims and their World 1971." Online video clip (YouTube). www.youtube.com/watch?v=E4_V1UjDe7Q. Accessed March 26, 2019.
- Matthew Roberts (2019). "Minamata: The Victims and Their World." Online video clip (YouTube). www.youtube.com/watch?v=FB57D7ZL-GY. Accessed March 26, 2019.
- McNary, Dave (2018). "Johnny Depp to Play War Photographer W. Eugene Smith in 'Minamata';" *Variety*, Publication date: 2019/10/23. Online: <http://variety.com/2018/film/markets-festivals/johnny-depp-photographer-minamata-1202989438/>. Accessed March 25, 2019.
- MercuryToxicologySci (2009). "Mercury Poisoning in Whale Meat, Seal Meat, Fish - Japanese Minamata Incident 日本 鯨肉." Online video clip (YouTube). www.youtube.com/watch?v=xRcEfErT0PE. Accessed March 26, 2019.
- Minamata City (2019). "National Institute for Minamata Disease." Online: www.city.minamata.lg.jp/1905.html. Accessed April 14, 2019.
- Minamata Convention on Mercury (2017). "Text and annexes." Online: www.mercuryconvention.org/Convention/Text/tabid/3426/language/en-US/Default.aspx. Accessed March 12, 2019.
- muizainal (2009). "Mercury Poisoning- The Minamata Story." Online video clip (YouTube). www.youtube.com/watch?v=ihFkyPv1jtU. Accessed March 26, 2019.
- National Institute for Minamata Disease (NIMD) (2000). "Minamata Disease: Keeping the Tragedy in Mind." Online: <http://catalog.lib.kagoshima-u.ac.jp/opc/recordID/catalog.bib/TN00001464>. Accessed March 26, 2019.
- Psy357 (2009). "Minamata Disease." Online video clip (YouTube). www.youtube.com/watch?v=oxB_SXbxY28. Accessed March 26, 2019.
- RiaRadioFMHD773 (2011). "The Minamata Disease Truth." Online video clip (YouTube). www.youtube.com/watch?v=LdKG1Y2XFNO. Accessed March 26, 2019.
- Sandhu, Sukhdev (2011). "The Story of Film, cinematic event of the year." *The Telegraph*. Publication date: 2011/09/02. Online: www.telegraph.co.uk/culture/film/film-news/8737598/The-Story-of-Film-cinematic-event-of-the-year.html. Accessed April 19, 2019.
- SciShow (2017). "Japan's Ominous Dancing Cats and the Disaster That Followed." Online video clip (YouTube). www.youtube.com/watch?v=0YhaeiS5oQ. Accessed March 26, 2019.
- Semionov, A. (2018). "Minamata Disease—Review." *World Journal of Neuroscience*, 8: 178–184. Online: <http://doi.org/10.4236/wjns.2018.82016>.
- Shiri624 (2013). "Minamata Disease." Online video clip (YouTube). www.youtube.com/watch?v=a3g0F8McXrs. Accessed March 26, 2019.
- Smith, Aileen M. (2001). "The Photograph 'Tomoko and Mother in the Bath'." Online: http://aileenarchive.or.jp/aileenarchive_en/aboutus/aboutphoto.html. Accessed March 26, 2019.
- Smith, W. Eugene and Smith, A. M. (1975). *Minamata*. Chatto & Windus, Ltd. (London).
- SnowRocker1 (2008). "The Minamata Disaster." Online video clip (YouTube). www.youtube.com/watch?v=djSI23s6JPU. Accessed March 26, 2019.
- study with bhagirath (2017). "minamata disease, minamata convention in hindi." Online video clip (YouTube). www.youtube.com/watch?v=AQ5ekpoC_98. Accessed March 26, 2019.
- Teaser-Trailer.com (2018). "Minamata Movie." Publication date: 2019/02/15. Online: <http://teaser-trailer.com/minamata-movie/>. Accessed March 25, 2019.
- TheDigitalShepherd (2012). "Minamata Disease." Online video clip (YouTube). www.youtube.com/watch?v=-7DPLGlmWmY. Accessed March 26, 2019.
- TVEAP Films (2009). "Japan's Lessons on the Economy and the Environment: Our Pollution Experience Part 1 of 4." Online video clip (YouTube). www.youtube.com/watch?v=VIlzHw3wkPg. Accessed March 26, 2019.
- Ui, Jun (Ed.) (1992). *Industrial Pollution in Japan*. United Nations University Press.
- UN Environment (2017). "Shinobu Sakamoto, Minamata disease survivor call to end Mercury poisoning globally." Online video clip (YouTube). www.youtube.com/watch?v=nN8c98aFQJ4. Accessed March 26, 2019.
- Walker, Brett L. (2010). *Toxic Archipelago: A History of Industrial Disease in Japan*. University of Washington Press.
- Yorifuji, T., Tsuda, T. and Harada, M. (2013). "Minamata disease: a challenge for democracy and justice." *Late Lessons from Early Warnings: Science, Precaution, Innovation. Copenhagen, Denmark: European Environment Agency*. European Environmental Agency. EEA Report No 1/2013.
- Yuki Oba (2013). "水俣病患者 資料映像<Minamata disease> (poisoning caused by industrial mercury pollution)." Online video clip (YouTube). www.youtube.com/watch?v=qSwoO_hG61k. Accessed March 26, 2019.
- zakkafilms (2011). "MINAMATA: The Victims and Their World." Online video clip (YouTube). www.youtube.com/watch?v=Sf6FHMR7LVQ. Accessed March 26, 2019.

Appendix I: Summary of Top YouTube English Uploads Related to Minamata Disease

The following table provides a summary of key data (compiled as of March 26, 2019) regarding the most viewed English-language uploads to YouTube concerning the Minamata disease issue. (Note: Duration is expressed in the format minutes:seconds.)

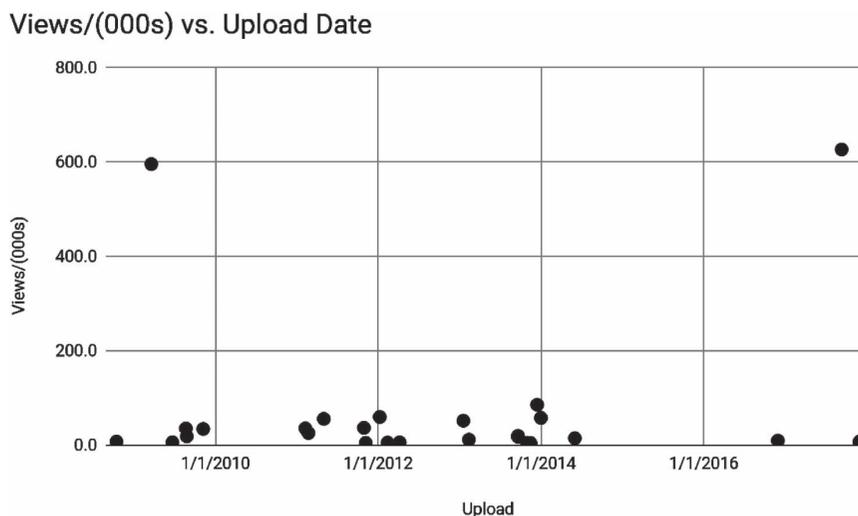
View Rank	Views (000s)	Upload Title	Uploading Channel	Upload Date (mm/dd/yy)	Duration	URL
1	627.0	Japan's Ominous Dancing Cats and the Disaster That Followed	SciShow	09/10/17	5:25	youtube.com/watch?v=0Yhaei1S5oQ
2	596.0	Mercury Poisoning- The Minamata Story	muizainal	03/19/09	3:12	youtube.com/watch?v=ihFkyPv1jtU
3	86.0	水俣病患者 資料映像<Minamata disease> (poisoning caused by industrial mercury pollution)	Yuki Oba	12/14/13	11:01	youtube.com/watch?v=qSwoO_hG61k
4	60.0	Minamata Disease	TheDigital Shepherd	01/08/12	3:25	youtube.com/watch?v=-7DPLGlmWmY
5	58.0	The devastating effects of mercury poisoning that occurred in Minamata Japan	IAOMT - Intl Acad. of Oral Medicine and Toxicology	12/31/13	1:07	youtube.com/watch?v=MSKdkssJ6I0
6	56.0	Minamata crazy cat	brittanyjanettem	05/02/11	0:19	youtube.com/watch?v=gYin9wHvyr4
7	52.1	'Regular Days' in Minamata, Ashikita [水俣・芦北／熊本]	egawauemon	01/17/13	14:14	youtube.com/watch?v=_vwGfb5l8ng
8	37.0	The Minamata Disease Truth	RiaRadioFM HD773	10/29/11	5:15	youtube.com/watch?v=LdKG1Y2XFN0
9	36.0	MINAMATA: The Victims and Their World	zakkafilms	02/08/11	1:55	youtube.com/watch?v=Sf6FHMR7LVQ
10	35.7	Mercury Poisoning in Whale Meat, Seal Meat, Fish - Japanese Minamata Incident 日本 鯨肉	Mercury ToxicologySci	08/21/09	3:08	youtube.com/watch?v=xRcEfErT0PE
11	34.7	Minamata Disease	Psy357	11/07/09	3:11	youtube.com/watch?v=oxB_SXbxY28
12	26.0	Background to Minamata Disease	JapanAngle dotcom	02/22/11	6:31	youtube.com/watch?v=iTQ5zf050-w
13	20.0	Tsuchimoto - Minamata Disease 3	Joseph Larsen	09/19/13	6:30	youtube.com/watch?v=_YRaZFKq92A
14	19.0	Japan's Lessons on the Economy and the Environment: Our Pollution Experience Part 1 of 4	TVEAPfilms	08/25/09	8:58	youtube.com/watch?v=VIIzHw3wkPg
15	18.0	Tsuchimoto - Minamata Disease 5	Joseph Larsen	09/19/13	1:55	youtube.com/watch?v=3xHUfn0Du4c
16	15.0	Minamata disease	Joh R	06/01/14	3:56	youtube.com/watch?v=s8TqxBd8c2Y
17	12.0	Minamata	Jaime Cardenas	02/11/13	19:41	youtube.com/watch?v=Tux1U3mulqs
18	10.0	60 YEARS AFTER MINAMATA INCIDENT	Alejandro Diaz Aragon	11/28/16	13:44	youtube.com/watch?v=EUla1EqjVc0
19	8.1	Shinobu Sakamoto, Minamata disease survivor call to end Mercury poisoning globally	UN Environment	11/30/17	2:15	youtube.com/watch?v=nN8c98aFQJ4
20	7.9	The Minamata Disaster	SnowRocker1	10/14/08	7:19	youtube.com/watch?v=djSI23s6JPU
21	6.3	minamata disease,minamata convention in hindi	study with bhagirath	11/30/17	4:47	youtube.com/watch?v=AQ5ekpoC_98
22	6.3	Minimata - Mercury poisoning in Japanese villiage	bishowkt	06/22/09	3:12	youtube.com/watch?v=Nlt_VCODEJA

23	6.2	Minamata Bay Mercury Poisoning (Caravanos)	Jack Caravanos	04/06/12	5:05	youtube.com/watch?v=18s89XTyAl8
24	5.7	The Minamata Disaster: History, Current, And Implications	Connor McBroom	02/12/12	15:57	youtube.com/watch?v=UGB1PPsApo
25	5.1	Minamata, The Victims and their World 1971	Kings Cliffe Waste Watchers	11/06/11	3:07	youtube.com/watch?v=E4_V1UjDe7Q
26	5.1	Minamata Clip for IAOMT TAP	IAOMT - Intl Acad. of Oral Medicine and Toxicology	10/31/13	2:17	youtube.com/watch?v=r2qCkOPCbVs
27	5.0	Minamata Disease	Shri624	11/14/13	0:43	youtube.com/watch?v=a3g0F8McXrs

Appendix 2: Graph of Viewcount vs. Upload Date for the 27 Most-Viewed Uploads

The following graph indicates the cumulative number of views and upload date of the 27 most-viewed Minamata disease-related YouTube uploads (as of 26 March 2019).

It can be noted that the most-viewed video (SciShow 2017) was uploaded very near the end of the time period encompassing all of the top 27 uploads (the period from 14 October 2008 through 30 November 2017), while the second most-viewed video (muizainal 2009) had been uploaded near the beginning of this time period.



Appendix 3: Key Observations Regarding Content of Highly Viewed Uploads

Note: In the following section, information is presented in the following order: Viewcount ranking; number of views in thousands (expressed as “k” and rounded down); video duration {in minutes and seconds}; upload title; uploading channel and year of upload.

- Rank #2 (596k views) {3 min. 12 sec.}: “Mercury Poisoning- The Minamata Story” (muizainal 2009)

This sole user upload is an excerpt of an uncredited documentary source which research established to be the TVEAP source. Uploaded on 19 March 2009, this evidently was the most-viewed video addressing the Minamata issue for some eight years, until the uploading of “Japan’s Ominous Dancing Cats” (SciShow 2017). It shows film of disease-affected humans and cats. Multiple commenters responding to this video noted that they had encountered this upload subsequent to viewing the top-ranked SciShow upload (which

does not show disease symptoms in humans or cats) and expressed shock upon witnessing this upload's content, which includes historical documentation graphically depicting the suffering of victims and cats subjected to experimentation.

- Rank #3 (86k) {11:01}: “水俣病患者 資料映像 <Minamata disease> (poisoning caused by industrial mercury pollution)” (Yuki Oba 2013)

The title of this upload is in both Japanese and English; however, the video itself initially contains no spoken content for 3 minutes and 14 seconds, and then is followed only with Japanese-language dialogue (ending inexplicably at 7 minutes and 43 seconds) that is evidently from the original film that is being excerpted, identified as the Tsuchimoto source. Editing has also resulted in repetitive presentation of certain portions. The uploader's description includes a request that this material be used for educational purposes, but this request appears only in the Japanese language.

- Rank #4 (60k) {3:25}: “Minamata Disease” (TheDigitalShepherd 2012)

This sole user upload includes unacknowledged excerpts from both the Tsuchimoto and TVEAP sources, with added rock-style music and additional photos.

- Rank #5 (58k) {1:07}: “The devastating effects of mercury poisoning that occurred in Minamata Japan” (International Academy of Oral Medicine and Toxicology 2013)

This is a very brief Tsuchimoto excerpt showing suffering cats and human victims. It is notable for being uploaded by a channel described as affiliated with a medical organization; this channel has numerous uploads pertaining to health hazards of mercury, especially in relation to usage in dental applications. This channel has also uploaded a slightly longer version (the upload ranking 26th) from which this was evidently excerpted; nevertheless, in both uploads, the original source is not identified, although it appears to be the Tsuchimoto source. IAOMT is one of two user accounts responsible for two uploads ranking among the top 27 videos.

- Rank #6 (56k) {0:19}: “Minamata crazy cat” (brittanyjanettem 2011)

This sole user upload, at 19 seconds being the briefest of the highly viewed items, shows a montage of uncredited films of Minamata disease affected cats. While the portion between 10-13 seconds matches film between 11:59-12:02 within the longest English-language version of the Tsuchimoto source (Matthew Roberts 2019), these two videos show differently colored cats thereafter. The source material for this upload's beginning and ending portions cannot be definitively identified.

- Rank #7 (52k) {14:14}: “Regular Days’ in Minamata, Ashikita [水俣・芦北／熊本]” (egawauemon 2013)

This upload, by a channel offering many uploads about Japan, depicts contemporary life in the disease-affected region, with dialogue in Japanese and English subtitles. It does not show images of victims or cats used in experiments. The uploader describes it as being “A documentary for Intergovernmental negotiating committee to prepare a global legally binding instrument on mercury (Fifth session) in Geneva, 13-18 January 2013.”

- Rank #8 (37k) {5:15}: “The Minamata Disease Truth” (RiaRadioFMHD773 2011)

This upload, by a channel described as an account associated with a radio station in Kyushu, consists mainly of still photos and text accompanied by music. It includes some photographic images by W. Eugene Smith, although these are uncredited. It also includes images unrelated to the Minamata issue (including a collage of images appearing to depict fighting during World War II as well as a still photograph showing a tiny hand, possibly of an African child suffering malnutrition), which could leave viewers with inaccurate information and false impressions of disease effects.

- Rank #9 (36k) {1:55}: “MINAMATA: The Victims and Their World” (zakkafilms 2011)

This video was uploaded by a channel affiliated with a commercial distributor of Japanese historical documentaries, including the Tsuchimoto source, which it excerpts in the form of a promotional trailer format.

- Rank #10 (35k) {3:08}: “Mercury Poisoning in Whale Meat, Seal Meat, Fish - Japanese Minamata Incident 日本 鯨肉” (MercuryToxicologySci 2009)

This is a sole user upload of the TVEAP source, excerpting only the portion addressing Minamata disease proper. However, unlike any of the other uploads, it is accompanied by a novel description focusing on the dangers of ingesting mercury-containing seafood, especially marine mammals that may be eaten by traditional communities in the Canadian Arctic region. The visual images seem to be even more degraded

in quality than most uploads reusing the TVEAP source, likely indicating a multiple-generation copy.

- Rank #11 (34k) {3:11}: “Minamata Disease” (Psy357 2009)
This is a sole user upload of the TVEAP source which is essentially identical in content to 2nd-ranked upload (muizainal 2009) and 10th-ranked upload (MercuryToxicologySci 2009).
- Rank #12 (26k) {6:31}: “Background to Minamata Disease” (JapanAngledotcom 2011)
This upload presents a fuller version of the TVEAP source, with an added 5-second user introduction. It includes the introductory portion commonly omitted by many uploaders of this source. The description credits TVEAP, unlike many of those who reuse that source’s content, including the items ranked 2nd, 10th and 11th. A viewing of this unabridged version is likely to give viewers the impression that there is too long of an exposition before presentation of Minamata-related images and information, perhaps making it likely that viewers seeking such information may discontinue watching before encountering the Minamata-related material (it should be noted, however, that data regarding the number or percentage of viewers viewing entire uploads versus only portions of uploaded videos would appear to be unavailable through YouTube for access by external researchers).
- Rank #13 (20k) {6:30}: “Tsuchimoto - Minamata Disease 3” (Joseph Larsen 2013)
This is an excerpt of Tsuchimoto showing human disease victims. It is the most-viewed of at least fourteen uploads by this channel whose titles indicate that they are derived from films by Tsuchimoto.
- Rank #14 (19k) {8:58}: “Japan’s Lessons on the Economy and the Environment: Our Pollution Experience Part 1 of 4” (TVEAP Films 2009)
This is an apparently unedited original version of a fuller version of the TVEAP source.
- Rank #15 (18k) {1:55}: “Tsuchimoto - Minamata Disease 5” (Joseph Larsen 2013)
This is an excerpt of Tsuchimoto showing only diseased cats.
- Rank #17 (12k) {19:41}: “Minamata” (Jaime Cardenas 2013)
This is a version of the NIMD source. Some images of human and feline victims are presented, as well as scientific explanations of the detailed biochemical mechanisms of the disease and a dry recounting of a historical chronology of research concerning the disease. This is evidently the only top upload incorporating content addressing more recent domestic public policy developments, specifically political decisions related to compensation for disease victims. It is presented in the context of a moral tale – with the lesson being that giving priority to economic growth is dangerous and leads to destruction of the environment, and must be avoided in the future.
- Rank #19 (8k) {2:15}: “Shinobu Sakamoto, Minamata disease survivor call to end Mercury poisoning globally” (UN Environment 2017)
This is a closed-captioned recorded statement by a wheelchair-bound Minamata disease victim, evidently produced to promote awareness of the Minamata Convention.
- Rank #23 (6k) {5:05}: “Minamata Bay Mercury Poisoning” (Jack Caravanos 2012)
This upload is unusual for being produced by a professor in the field of public health at an American university having multiple uploads concerning pollution and environmental science. It addresses issues of biochemical mechanisms, and also very briefly utilizes the TVEAP source, showing diseased cats and humans, warning viewers of the shocking nature of the images. This appears to be the only top video explicitly mentioning photographer W. Eugene Smith, displaying (with acknowledgement) a Smith photograph and noting: “...this famous photo showing Tomoko taking a bath with her mother shocked the world and called for action...”
- Rank #27 (5k) {0:43}: “Minamata Disease” (Shiri624 2013)
This is a very brief excerpt taken from an unidentified color documentary. The main content shows a disabled girl identified as “Tomoko,” apparently Uemura Tomoko, the subject of perhaps the most famous Minamata-related photograph by W. Eugene Smith, “Tomoko Uemura in Her Bath” (Smith 2001), although there is no mention of the photographer Smith. One of the commenters requests the uploader to share more of the excerpted film source, although there is no indication of a response.