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Newspaper Coverage of SARS: A Comparison among Canada, Hong Kong, Mainland China and Western Europe

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Abstract

A quantitative analysis of newspaper coverage of SARS was conducted, where the occurrence of the word SARS in newspaper articles, rather than newspaper content was examined. Data were collected from six newspapers representing Canada, mainland China, Hong Kong, and Western Europe. These data were then compared with the World Health Organization's data on SARS cases and SARS deaths. A brief history of SARS is also provided to place the results of the study in the context of the SARS events. The analysis finds not only a similarity between the two western media examined, but also a contrast between the western media and the Chinese media in SARS coverage. The study demonstrates the usefulness of informetric methods in analyzing popular media.

Keywords

search engines, Web, performance, stability, case study

1. Introduction

The new respiratory disease called SARS (severe acute respiratory syndrome,

the term first used by WHO spokesman Dick Thompson), dominated health-related news during the first half of the year 2003. As information specialists we are interested in the way the events were covered in different parts of the world. Being informetricians we focused on quantitative aspects, namely the use of the word SARS and its synonyms, in newspaper coverage. We believe that informetrics, especially in its cybermetric form, should deal, not only with static descriptions (e.g. of the Lotka-Zipf type) or time evolutions of such data, but also with monitoring events as they happen (and publishing them promptly). In this way our field will join forces with machine learning and other techniques based on artificial intelligence (Yang et al., 1999).

Bar-Ilan (1997) performed such a study related to the mad cow disease and its coverage in newsgroups. Monitoring the occurrence on the Internet of the words euro and euroland during the year 1999 when the euro was introduced as Europe's single currency, is another example (Rousseau, 2001). Clearly, this is very much related to the general idea of monitoring Internet pages and keeping information current (Brewington & Cybenko, 2000; Vaughan & Wu, 2003). In a business setting one uses the phrase competitive intelligence for this kind of activities (Dou et al., 1990; Miller, 1996; Milani et al., 1999). We also note that by using newspapers as a source of information, we followed Grant Lewison's advise (2002, 2003) to treat mass media as an object of informetric research (and in true cybermetric fashion we mainly used the newspapers' online versions for data collection).

In order to situate our findings in the context of the development of SARS, we include a short history of the events related to the origin, detection and spread of SARS.

2. A short history (based on information found on the website of the World Health Organization - WHO http://www.who.int/csr/sars/en/)

According to the World Health Organization, the first case of the disease which became known as severe acute respiratory syndrome (SARS) was reported in China's Foshan City on 16th November, 2002. In Mandarin Chinese the disease is called 非典型肺炎 (fei dian xing fei yan; or fei dian, for short). China's Guangdong province health department sent a bulletin to the province's hospitals. However, the case wasn't brought to concern. Most people were unaware that a new illness was beginning to gnaw human life worldwide. In fact many people were away for a long Lunar New Year Holiday (China's New Year period).

It was not until the 11th February, 2003 that the Chinese Ministry of Health informed the WHO that 305 cases of a respiratory illness emerged with no known cause. Five cases had already resulted in death. In late February, the WHO sent two doctors to Beijing to look into the new illness, but the Chinese government prevented them from conducting their investigation. On the other hand, two Chinese scientists Yang Ruifi and Zhu Qingyu from the Academy of Military Medical Sciences (AMMS) obtained pictures of the new coronavirus, but kept quiet about it (Enserink, 2003).

In the meantime, a Hong Kong family visited Fujian Province. The 8-year-old daughter died in Mainland China during the stay. Her father died when he returned to Hong Kong, and the 9-year-old boy was hospitalized. This case illustrates a common way in which the disease spread, because many Hong Kong people visited Mainland China, especially Guangdong province, during the holiday.

A medical doctor, Liu from Zhongshan University in Guangdong arrived in Hong Kong to attend a wedding party on the 21st February and he checked into the ninth floor (Room 911) of the Metropole Hotel. The next day, Doctor

Liu sought urgent care at the Kwong Wah Hospital, which is the nearest hospital from the Hotel. He stated that he had previously treated atypical pneumonia patients in Guangdong, and he warned the medical staff that he had contracted a "very virulent disease". He was admitted to the intensive care unit and eventually died on 4th March.

On the other hand, twelve Metropole guests became ill. A guest from Toronto, Canada checked out of the Hotel and returned home to reunite with her family. She died at Toronto's Scarborough Grace Hospital on 5th March. Five of her family members were found to be infected and were admitted to the hospital. Another guest, who made a business trip to Shanghai and a private trip to Guangdong province and Macao, fell ill in Hanoi, Vietnam. He was admitted to the French Hospital with a 3-day history of fever and respiratory symptoms, and was later transported to the Princess Margaret Hospital in Hong Kong where he died in isolation. In addition, another guest on the ninth floor of the Hotel was admitted to a hospital in Singapore with respiratory symptoms.

Dr. Carlos Urbani from the WHO first identified SARS while examining a hospitalized patient in Hanoi, Vietnam with a severe form of pneumonia, for which there was no known cause. After that patient was admitted to the hospital, twenty hospital staff became sick with similar symptoms. Dr. Urbani was alarmed by the unusual disease and notified the WHO office in Manila, being concerned it might be a new form of avian influenza. His warning brought WHO headquarters into a heightened state of alert. Dr. Urbani himself died of SARS (on March 29, 2003) about one month after making the initial diagnosis.

Germany's first case happened on 15th March. A Singapore physician, who had treated the country's first two SARS cases, boarded a flight from New York City to Singapore via Frankfurt, after attending a medical conference. Shortly before boarding the flight to New York, he reported his symptoms to an alert medical colleague in Singapore, who notified health officials. WHO identified the airline and flight. The physician, his pregnant wife and mother-in-law were removed from the flight in Frankfurt and placed in isolation. On 20th March, the USA reported its first case.

On 12th March, the WHO issued a global alert about cases of severe atypical pneumonia following mounting reports of a spread among staff at hospitals in Hong Kong and Hanoi. In late March, Mainland China decided to join the WHO collaborative networks. Meanwhile, suspected and probable cases of SARS were reported from around the world. People wore masks, washed hands with alcohol, suspended the school days, placed people under quarantine. Health organizations announced travel recommendations, travel advices and travel alerts. Around that time, several labs working in close collaboration, and under the guidance of the WHO, consistently pointed at a new member of the coronavirus family as the causative agent for SARS (Drosten et al., 2003, Ksiazek et al., 2003).

On May 17, 2003, the first global consultation on SARS epidemiology concluded its work (Geneva, Switzerland). The consultation confirmed that control measures recommended by WHO are supported by available evidence. There was even fear for a global pandemic, especially among hospital workers (Maunder et al., 2003; Verma, 2003). A month later (June 17), a two-day global SARS conference was held in Kuala Lumpur, Malaysia to assess the status of research and compare national strategies used to contain the disease.

From late May to late June, the WHO removed travel alerts one by one for Singapore, Hong Kong, Guandong province, other Chinese provinces, Beijing, Toronto (after a re-occurrence of the disease) and finally Taiwan. On July 5th, 2003, the WHO declared that SARS outbreaks have been contained worldwide, but called for continued vigilance.

The following figures (Figs.1, 2, 3) illustrate SARS cases and deaths, as registered by the WHO (data as available during the second week of July 2003). Note that during the seventh week (namely on March 26) Chinese known cases were added. This yields an artificial peak in the data. It is remarkable how western newspapers (see Canadian and Flemish data below) reacted to this event. Note also that there must be something wrong with these data (Figs.1 and 2): the two peaks occur during the same week, while one expects the 'deaths'-peak to occur several weeks later. Cumulative data exhibit a typical S-shape curve (Fig.3). SARS' death toll over the whole period was less than 1000, of which more than 80% occurred in China (Mainland, Hong Kong, and Taiwan).

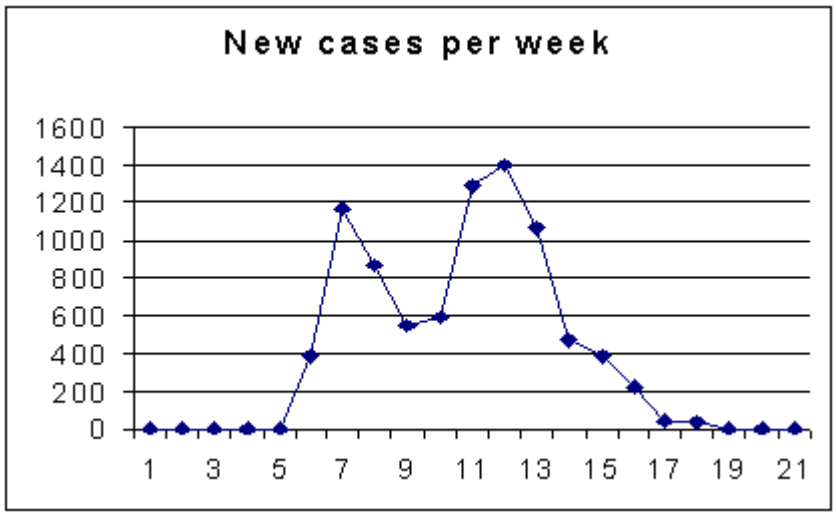

Figure 1: Weekly number of cases, according to official WHO statistics

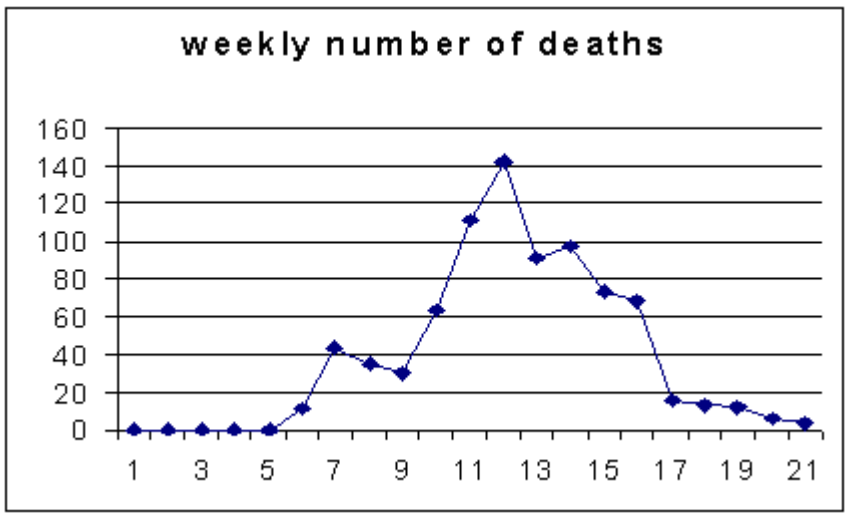

Figure 2: Weekly number of deaths, according to official WHO statistics

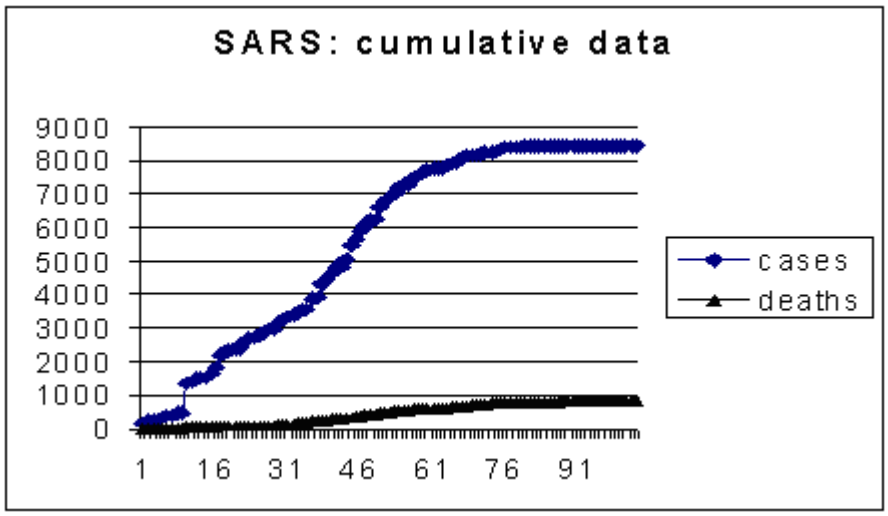

Figure 3: Cumulative SARS data (WHO); days on the horizontal axis: day 1 is March 17, 2003

3. Methodology

Data were collected for occurrences of the word SARS, and synonyms, in Chinese, Belgian, Hong Kong and Canadian newspapers, by each author in her/his own country. Newspaper time series data were then compared with official WHO data on SARS cases and deaths. For practical reasons word occurrences were counted in Mainland China while articles occurrences (counting the number of articles where the word SARS occurred at least once) were counted in Hong Kong. Data collection for Belgium and Canada used both counting methods, resulting at two sets of data for each country. Analysis of Belgium and Canadian data shows that the results of these two counting methods are highly correlated. The Pearson correlation coefficient for the two sets of data is 0.99 for both Canadian newspapers involved and 0.96 for the Belgium newspaper. This provides assurance of the validity of the methodology used in the study. It also provides useful information on data collection for future studies.

Using 'trigger' words to monitor events over time is not only a well-known technique in information science but also a regularly used method in sociology in general. A recent example is Baumann's study (2001) on the recognition of film as an art form in the United States in the 1960s (whereas in Europe film has always been recognized as an art form; even in 1911, Ricciotto Canudo proposed the term 'seventh art').

In our data collection the oldest newspaper reference to SARS, actually to atypical pneumonia, occurred on February 11, 2003. Therefore, the week from Monday 10 February till Sunday 16 February 2003 is defined as week 1 in our study. SARS officially ended on July 5th, which is during week 21 of our study. Official WHO data exist only from March 17 on, which is the first day of week 6 in our counting.

Just as a remark we would like to point out that an international collaboration such as ours is just a matter of a small network of people taking the initiative, and using e-mails for communication.

4. International newspaper coverage of SARS

4.1 Mainland China

We collected word occurrence data (fei dian, SARS) in the Guangming Daily

(Fig. 4). The Guangming Daily, founded in 1949, is a national newspaper, based in Beijing with a special focus on science, technology, culture, and health. The first use of the word fei dian occurred on February 12, 2003, probably as a result of the announcement of the Chinese Ministry of Health (see History section). This is much earlier than that in western newspapers, as reported later in this paper, but almost three months after the first case in Guangdong province. It took this newspaper another seven weeks before SARS became a hot topic. Note also that the newspaper peak came three weeks later than the peak of new cases, as reported to the WHO by the Chinese authorities (see Fig. 5).

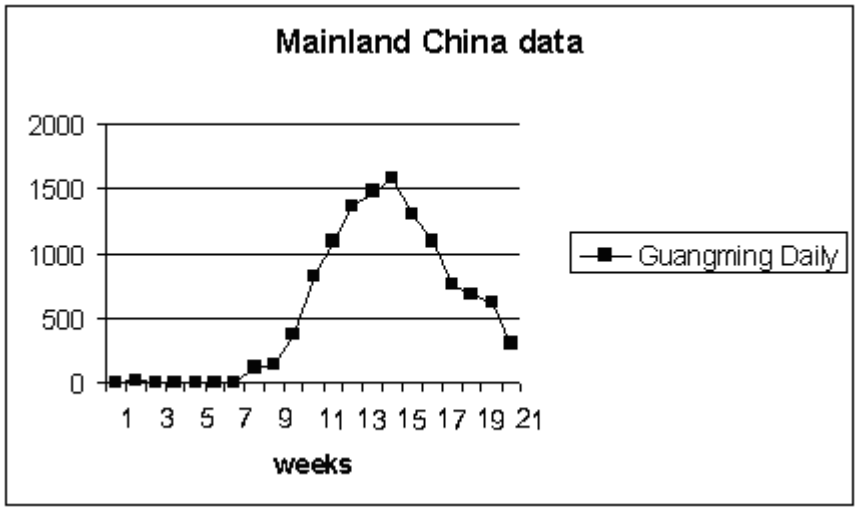

Figure 4: Guangming Daily: a national Chinese newspaper
SARS first mentioned on February 12, 2003

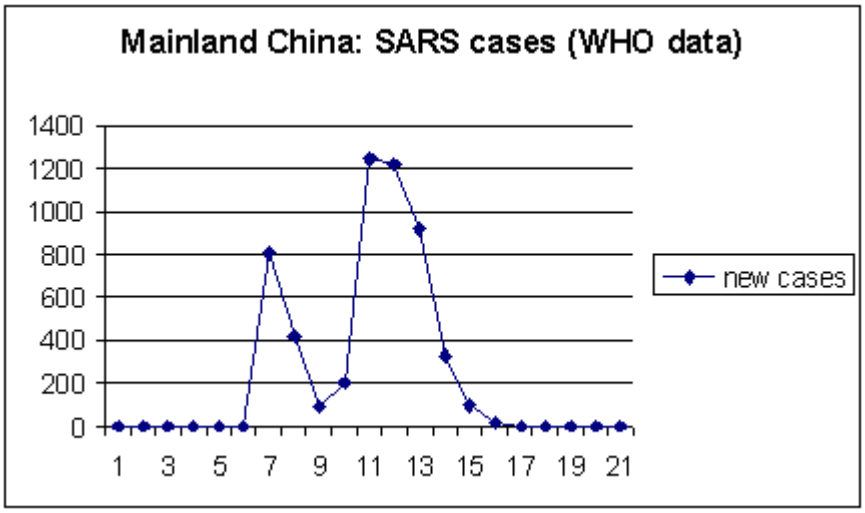

Figure 5: Chinese SARS cases according to the official WHO data
During the 7th week (namely on March 26) all Mainland China data were added,
resulting at an artificial peak in the curve

4.2 Hong Kong

For Hong Kong we collected data from Mingpao, a Chinese language newspaper, and from the online version of South China Morning Post, an English language newspaper. These newspapers reported SARS for the first time on February 12th, and February 11th, respectively (Fig. 6). At that time SARS was still referred to as atypical pneumonia and was largely unknown in

the West. Although Mingpao had many more articles on SARS, the word-use distributions of these two newspapers are very similar as reported later in the paper. Word use peaks by the end of April. Note that Hong Kong data refer to the number of articles containing the word SARS (or its synonyms), not the number of occurrences of the word SARS.

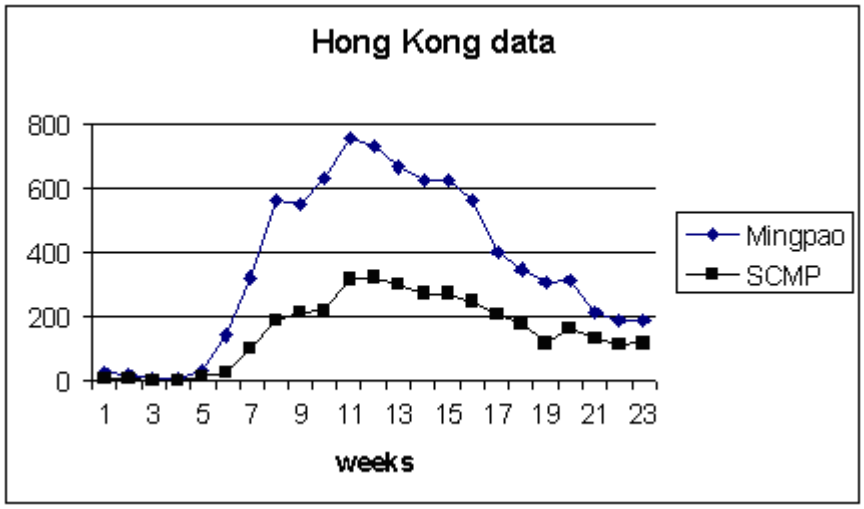

Figure 6: Hong Kong data: Mingpao and the South China Morning Post (SCMP) (two extra weeks were added)

Fig. 7 shows the weekly number of new cases in Hong Kong. This graph is similar to that of the SARS newspaper reports in Hong Kong (see further for the statistical correlation) but peaks three weeks before the newspaper peak. The newspaper peak, however, is due to a number of follow-up actions by the government, and by the activity of a number of voluntary working groups, e.g. fund raising activities for SARS victims and their families.

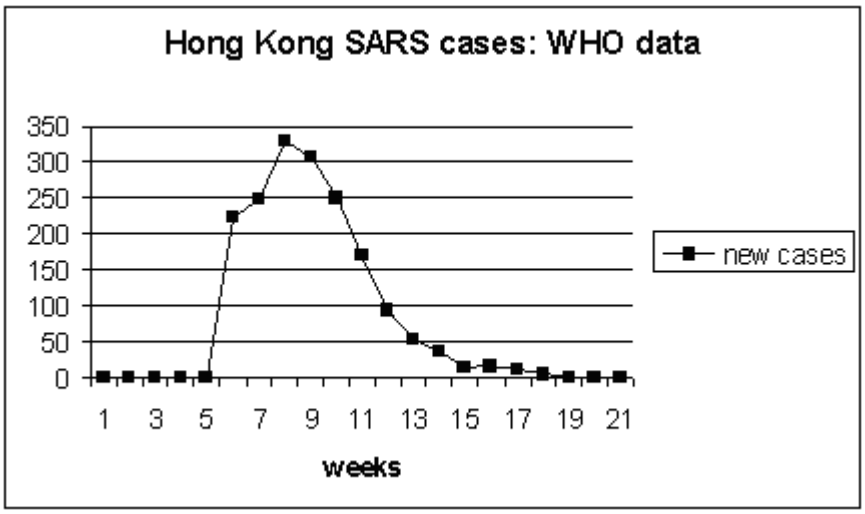

Figure 7: Hong Kong SARS cases according to the official WHO data

4.3 Canada

Canadian data were collected from the Globe and Mail (Globe for short), a Canadian national newspaper, and form the Toronto Star (Star for short), a Toronto-based newspaper. Globe is the most authoritative Canadian national newspaper with high quality news items. First published in 1844, it is the oldest daily newspaper in Canada. Star is the most prominent Toronto area newspaper with news coverage focussing more on Toronto than the Globe

does. First published in 1892, it is Canada's largest English newspaper by circulation. Data for Canada presented below refer to the number of articles using the word SARS at least once. For most weeks during the study, the Toronto-based Star had more SARS-related articles than the national Globe did but the patterns of the two curves are very similar.

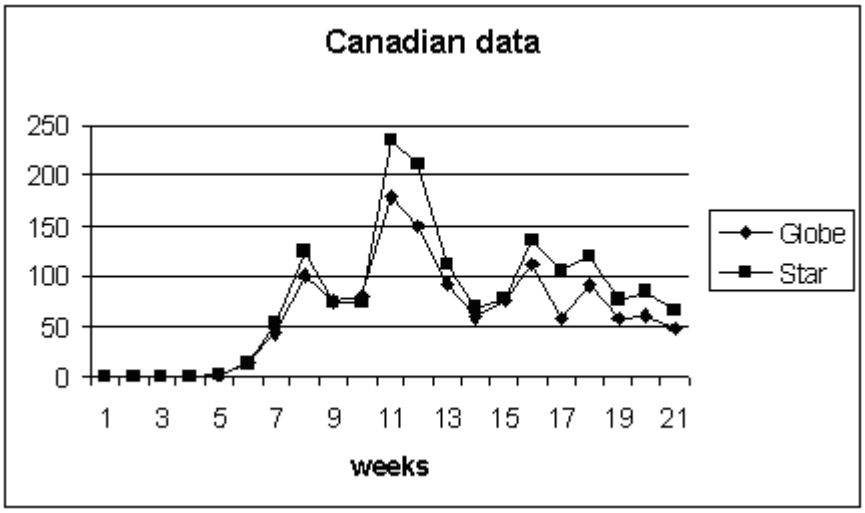

Figure 8: SARS in Canadian newspapers
(SARS first mentioned on March 16, 2003 in Star and on March 17 in Globe)

4.4 Belgian (Flemish) data

Belgian data (representing Western Europe) were collected from the online version of De Standaard. This is a Flemish (Dutch language) quality newspaper, first published in 1918. We counted the number of times the word SARS was used and the weekly number of articles using the word SARS at least ones (see Fig. 9). As expected, these two counting methods result at very similar distributions.

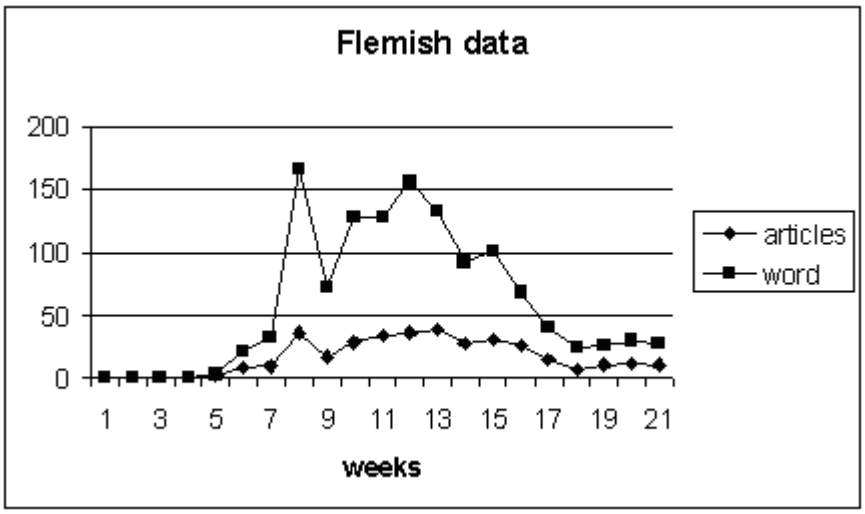

Figure 9: SARS in the Belgian (Flemish) newspaper De Standaard
(first mentioned on March 16th 2003)

4.5 Columns in newspapers

Although SARS articles were published in the columns of national or international news in all the newspapers in the study, the word SARS also occurred frequently in Science and Health columns, very frequently in Stock

Market columns and even in the Sports column (when events were cancelled, or Chinese athletes forbidden to participate). This illustrates the wide impact that SARS had in all sections of society.

5. Statistical analysis

Because WHO data began during week 6, correlations were calculated from that week on, except for the comparison between the two Hong Kong newspapers. If the correlation were calculated from week 1 the values would be spuriously higher. Pearson correlation coefficients are shown in Table 1.

All correlations with the WHO data are statistically significant ($p < 0.05$) except the one for Mainland China (this is also obvious from Fig. 4). Word use for SARS, in the two Canadian and the two Hong Kong newspapers are remarkably similar. Belgium follows the WHO closely, which is no surprise as there are no SARS cases in Belgium. There is, of course, no direct relationship between Canada and Belgium, but they are both highly influenced by the international situation. One would expect the English language HK newspaper (SCMP) to follow more closely the international situation (WHO) than the Chinese language newspaper (Mingpao), but this is not the case. Surprisingly, SCMP has a higher correlation with the Guangming Daily than Mingpao does. One the other hand, the Toronto based Star has a lower correlation with world-wide WHO statistics than the national Globe. This is understandable because Star will be more affected by Toronto local SARS cases (all Canadian SARS cases occurred in Toronto.

Table 1 Correlations (for De Standaard correlations are shown with word counts)

TABLA 1.

Table 2 shows some meaningful linear relations between word occurrences in different newspapers, or between SARS cases and word use in newspapers.

Table 2 Some linear relations

Mingpao = 2.27 SCMP + 19.6
Globe = 0.71 Star + 8.26
SCMP = 0.126 Guangming + 104
De Standaard = 0.08 WHO cases + 33.4

There was no significant correlation between the number of SARS cases in Hong Kong and the use of the word SARS in the newspapers. Yet, when we shift data over three weeks, so that the peaks coincide, we find a correlation of 0.835 between SARS cases in Hong Kong and the use of the word SARS in Mingpao. (We added the Mingpao data for weeks 22 and 23 before shifting, and put three zero weeks with no official WHO cases before the series of official WHO data).

Fig. 10 visually illustrates the high correlation between the Canadian and Belgian (word counts) data. Yet, the Belgian newspaper reacted more strongly when the WHO added the Chinese data. Towards the end of the period the Canadian newspapers paid more attention to SARS than the Belgian one did, probably because Toronto was still not free of the virus.

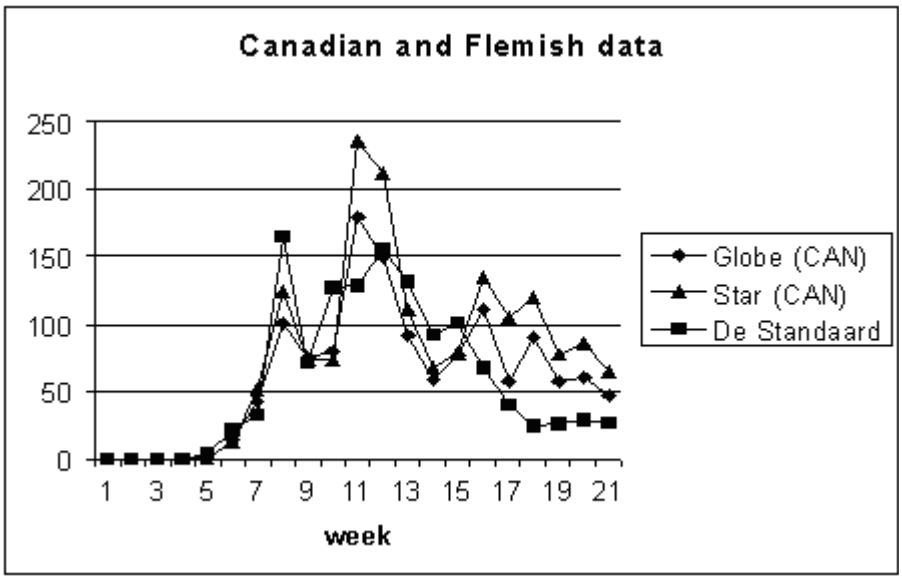

Figure 10: SARS in Belgian and Canadian newspapers: a visual comparison

6. Conclusion

In theory, newspapers - and certainly quality newspapers - should report quickly on various events happening all over the world. According to our statistics, however, there was an abnormal time lag between the real situation and articles reporting about them. Although there were many factors involved, it seems that a combination of originating in a 'remote area' (certainly for people in the West, but even for residents of Beijing) and being poorly understood at first (not only by those carrying the political responsibility, but also by first-line doctors and specialists) were the main causes of this delay. It is just human that the meaning of new phenomena is not immediately clear, and that it takes a whole process of understanding before the full significance of the new phenomena becomes clear. Once the dangers of SARS became known, even in a country like Belgium where no SARS cases were registered, national newspapers and television channels reported its development on a daily basis. In retrospect we may say that SARS was not only a new disease, significant for the medical profession and affected families, but an event influencing all aspects of society including the economy, culture, education, tourism and stock markets. Whatever the intensity or timeliness with which SARS information was brought to the general public, the events made it clear that public health is a global concern. Moreover, information is a delicate commodity: too little or too much - two forms of misinformation - can both lead to unnecessary panic. This certainly is a lesson learned from the 2003 SARS epidemic.

The raw data and the results of the analysis clearly show that the media, specifically the newspapers, covered the SARS phenomenon quite differently in mainland China and the West. One could say that the World Health Organization played a central role in the West, not only from a medical point of view, but also as a source of information. We noticed that often journalists punctually reproduced the information given on the WHO and CDC (Center for Disease Control) websites. SARS-related news in Chinese newspapers on the other hand seems more guided by national medical (health-related) and political events.

On June 14, 2003 (week 18) the organizers of the 9th International Conference on Scientometrics and Informetrics decided to hold the conference in Beijing as planned (from August 25th till August 29th). Looking at the graphs shown in this article this seems like an obvious decision. Although more than 60 researchers from outside China participated in the conference, this number is still smaller than what would be if the SARS epidemic did not

have happen.

We hope that this article will stimulate the use of informetric tools in the studies of general media. Clearly informetrics and cybermetrics can contribute to the analysis of popular media events. More research in this direction will broaden the scope of our field from covering mainly scholarly communication to general media.

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