Chinese Disasters and Just-in-Time Education

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Keywords: China; disaster; education; internet; just-in-time; influenza A (H1N1); outbreak; pandemic; Supercourse; swine flu

Abbreviations:
JIT = just-in-time
PUMC = Peking Union Medical College
SARS = severe acute respiratory syndrome

Received: 05 October 2009
Accepted: 28 December 2009
Revised: 27 January 2010

Web publication: 20 September 2010

Abstract

Just-in-time (JIT) Educational Strategy has been applied successfully to share scientific knowledge about disasters in several countries. This strategy was introduced to China in 2008 with the hopes to quickly disseminate accurate scientific data to the population, and it was applied during the Sichuan Earthquake and Influenza A (H1N1) outbreak. Implementation of this strategy likely educated between 10,000 and 20,000,000 people. The efforts demonstrated that an effective JIT strategy impacted millions of people in China after a disaster occurs as a disaster mitigation education method. This paper describes the Chinese JIT approach, and discusses methodologies for implementing JIT lectures in the context of China's medical and public health system.

Yang Y, Chen Y, Chotani RA, LaPorte RE, Ardalan A, Shubnikov E, Linkov F, Huang J: Chinese disasters and just-in-time education. ***Prehosp Disaster Med*** **2010;25(5):477–481.**

Introduction

China is the most populous country and the third largest country in terms of landmass. With such a large population and broad terrain, it often is affected adversely by various events, such as the heavy flooding in 1998, the severe acute respiratory syndrome (SARS) outbreak in 2003, the spread of avian influenza in 2004, and the Sichuan Earthquake in 2008. As a result of such catastrophes, more than 80,000 people have perished, social life has been disrupted, and the economy been adversely impacted. At the time of an event such as an earthquake, tsunami, or infectious disease outbreak, there is a critical and urgent need for the best possible scientific information. Not only do individuals and front-line workers at "ground zero" need this timely and accurate information, but also others must be informed throughout the country. There also is a critical need for the collection, distribution, and sometimes translation of scientifically accurate information about disasters both in China and worldwide.

Just-in-time (JIT) lectures are a platform to quickly disseminate accurate and up-to-date information about a disaster, outbreak, or a global epidemic for educators and the public during or soon after the event.[1] For experienced public health professionals, it usually takes three to six days to prepare this type of lecture.[2] Just-in-time lectures were produced and disseminated after the Southeast Asia tsunami, Hurricane Katrina, and the SARS and H5N1 outbreaks in 2003 and 2005, respectively, through the Supercourse Website.[3] A JIT lecture for Swine "North American" Influenza A (H1N1) Outbreak first appeared on the Website on 26 April 2009, and was updated every day for several weeks.[4]

A China JIT Educational Strategy was developed along with the preparation of the first two JIT lectures, of which, one is Disaster JIT for the Sichuan Earthquake in 2008 and the other is a Chinese version of a JIT lecture for Swine Influenza A (H1N1) on 01 May 2009. This paper shows that JIT lectures are an important means to share scientific information with the general public and the scientific community of China. This paper also will discuss strategies for JIT lecture preparation using two JIT lectures in Chinese as examples, one for the Sichuan Earthquake and the other for Swine Influenza A (H1N1).

https://doi.org/10.1017/S1049023X00008591 Published online by Cambridge University Press

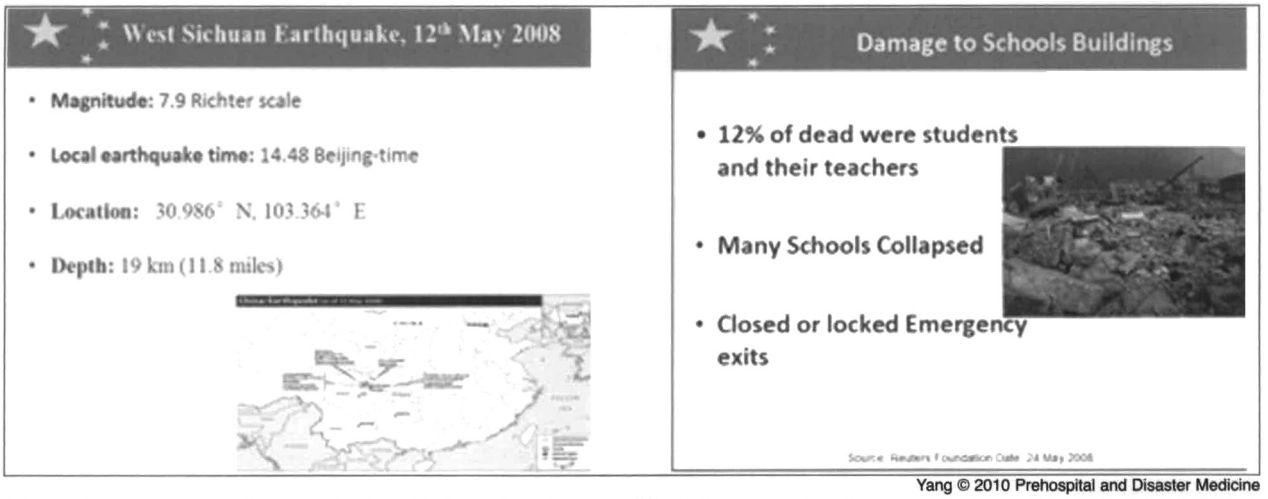


Figure 1—Lecture on Disaster-JIT for Sichuan Earthquake. The left one on the shows the region of earthquake, and the one the right one shows its damage to school building.

JIT Lectures in China

Significance of JIT Lectures in China

Disasters, including infectious disease outbreaks, easily can draw attention. However, a lack of accurate information and knowledge leads to uncertainty, and can produce fear in the country where the disaster occurs and even worldwide.[1] Such a combination of uncertainty, stress, and fear is bad for social stability, rescue attempts, and the economy, especially in larger nations such as China. This was illustrated during the great influenza pandemic of 1918, when frightened people dared not to take care of the sick, and simple public health measures that could have prevented many deaths were not taken.[5] Improving public awareness also has been recognized widely as a basis for reducing risks for disasters and health crisis. Just-in-time Educational Lectures can provide accurate information from academics and scientists to the public, and reduce fears and rapidly educate the community about these events.

Moreover, health professionals such as clinicians, state public health experts, policy-makers, and government-officers also need accurate and updated scientific information to make appropriate decisions. These events also may heighten interest in disasters and public health among students majoring in medicine, nursing, and engineering. Harnessing this interest could be a major incentive to bring more people into the field of public health.[6]

Supercourse China Team

The idea of building a public health lecture-sharing network was brought to China in 2003. Several students from Peking Union Medical College (PUMC) established the network in 2004. In the following year, a Chinese mirror site of Supercourse (http://www.supercourse.cn) was launched. Since 2004, students from PUMC and >100 individuals from several other medical colleges have participated in this effort.

Disaster JIT for Sichuan Earthquake in 2008

On 12 May 2008, a destructive earthquake measuring 7.9 on the Richter scale struck a large area of Sichuan Province in southwest China (Figure 1). The destruction was immense, resulting in more than 87,000 persons killed or missing, and an economic loss of about 845.1 billion yuan [US$124.3 billion]. Many Chinese people were eager to help the victims; however, most did not know what to do. Information from the affected area was not available for at least two days, and the Chinese media made little effort to educate people on how to avoid risks from potential aftershocks. The media presented "scaremonger" pictures that elicited fears. People throughout China were concerned, but there was not enough reliable information on the nature of earthquakes, nor the specifics related to this earthquake. Dr. Jesse Huang took the initiative to build a JIT lecture on Sichuan Earthquake with the help of Professor Ronald E. LaPorte from the University of Pittsburgh, Dr. Ardalan from Iran, and Dr. Shubnikov from Russia. Previously, there were excellent JIT Lectures on earthquakes from Pakistan[7] and Turkey[8] available on the Supercourse Website. Core slides from these lectures created by Dr. Ardalan were used to construct the Chinese JIT lecture. The Supercourse China team organized volunteers from PUMC, selected and translated 10 lectures in four days, and uploaded these to the Supercourse China Website.[3] Lectures presented by educators was the quickest means to provide accurate information about the earthquake, including its nature, physical and psychological impact on public health, and previous experiences on what should be considered during the rescue, etc. At the same time, Ali Ardalan, Jesse Huang, and Ronald E. LaPorte collected information about the Sichuan Earthquake, along with geological information of China. Dr. Tanya Atwater, a member of the US National Academy of Sciences, provided a detailed tectonic explanation with pictures and texts that were easy to understand. Finally, the first English version of a JIT Lecture of Sichuan Earthquake was created. In the following few days, it was translated it into Chinese. The lecture was examined by healthcare officers from the China Centers for Disease Control, China Seismological Bureau, the Red Cross, and several clinicians. With their input and suggestions, a second version of JIT Lecture, both in English and Chinese, was developed. It was divided into five parts: (1) basic knowledge about earthquakes;

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JIT Lectures on Sichuan Earthquake		
Lecture Topic	Browse Count	Last Updated
Learning from the Sichuan Earthquake (five parts)		
Part 1: Basic Knowledge of Earthquake ppt/pdf	5,831/1,671	20 June 2008
Part 2: How to Prepare for an Earthquake ppt/pdf	2,184/1,376	06 June 2008
Part 3: How to React to an Earthquake ppt/pdf	14,940/1,254	06 June 2008
Part 4: Rescue Considerations after Disaster ppt/pdf	10,363/1,907	06 June 2008
Part 5: Long-Term Problems after Disaster ppt/pdf	6,057/1,337	06 June 2008
Download all the lectures ppt/pdf	9,421/2,708	

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Table 1—Internet usage statistics for JIT lectures on Sichuan Earthquake. All of the lectures are in Chinese. All five parts of the Sichuan Earthquake JIT lectures have been downloaded 12,129 times and some parts have >10,000 times (ppt = Microsoft PowerPoint®)

(2) preparing for an earthquake; (3) reacting to an earthquake; (4) rescue considerations; and (5) long-term problems.[9]

These Lectures were uploaded to the main Supercourse and its mirror Websites, providing accurate and real-time information to the public, and establishing a way for medical and public health communities throughout the world to know more about China's earthquake. In addition, the lectures were disseminated by e-mails to friends of all the contributors, who were asked to forward them to their friends. According to the counts of Supercourse China Website (Table 1), each of the lectures was downloaded more than 1,000 times, and on average was read more than 7,000 times. This is an underestimation, as many people were sent the PowerPoint slides. Work was finished on 06 June, but the lecture continued to attract considerable public attention.

The education provided had helped people obtain helpful information so that they could better respond to the anticipated public health problems. First, people who read the JIT lectures could have learned how an earthquake occurs, recognize it as a scientific phenomenon, and learn how to protect themselves. If all of the Chinese people had been properly educated after the 1976 earthquake, there might have been less people injured and killed. Second, the JIT lecture educated the volunteers on the need to bring their own supplies to the stricken region, including tents, cookware, and clothes. This need was early in the responses. Third, some experts could have met with officers before they traveled to the disaster site. Experts warned officers onsite that they not only should encourage people to keep their environment clean by simply spraying disinfectant, but that they also should come up with rules for dealing with garbage and should build latrines as soon as possible to prevent the spread of infectious diseases.

There are several advantages using PowerPoint as a medium to share information about the lecture. One is that it is more easily accepted by educators and lay people than articles. They can significantly shorten the preparation time for lectures. The lectures can be built upon for the next earthquake.

Infectious Disease Lecture-JIT for Swine Influenza A (H1N1) Outbreak

Though both infectious diseases and often events due to natural hazards or human-made technological hazards are emergent events that can draw significant attention, the importance and strategy of JIT lectures show some differences. Under modern monitoring systems, the threat of infectious disease outbreaks, such as influenza, can be identified early. This allows for gathering and distribution of quick and accurate information on the disease and promulgation of prevention guidelines. This helps to calm the public's fear and maintain social stability.

Another important difference is that an infectious disease can be more global while a disaster due to natural or technological hazards is more regional. It indicates that more international communication is needed for the distribution of an infectious disease JIT lecture.

Facing a potential influenza outbreak, educating the public what the disease is, how severe it may be, and how to prevent oneself from infection is one of the most important ways to prevent a pandemic both nationally and globally. Within three days, the lecture was on its way to be translated into 11 different languages. Several students from Supercourse China translated the lecture into Chinese on 01 May 2009. New information about China's clinical guidelines, the public health department's response and recent relevant policy were added. The complete Chinese version of JIT Educational Lecture was finished on 03 May. The lecture was then disseminated. Since the lecture was uploaded onto the Websites, nearly 500 people read and downloaded it in the first two weeks and >100 other Websites or personal blogs have recommended it.[10] It also was sent by e-mails, then forwarded to other colleagues. Nearly 90,000 people have viewed the lecture. Several healthcare professionals, the Centers for Disease Control and Prevention-China, hospitals, and medical colleges, have used it. It was likely viewed by 20,000,000 people on a television program.[12] The lecture also drew valuable feedback, which provided good suggestions and useful infor-

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mation, such as the current quarantine policy being used in China. The PowerPoint to the second version was verified and updated on 20 May. The further plan of the team is to train volunteers to provide lectures to communities and hospitals. This plan will help cover some poor communities that may not be accessible to media reports.

Other JIT-Lectures

There are many more public health issues worth attention in China, such as chronic diseases, health management, tobacco control, food safety, and fire accidents. The problem is that they usually do not progress to great events that stimulate the public's interest. However, the team of Supercourse China recognizes them as threats to the population's health. More than 600 lectures on Supercourse have been translated into Chinese, and the team plans to invite relevant experts to train student volunteers on specific aspects, such as tobacco control, obesity problems, and antibiotic abuse issues, and then the volunteers can give lectures to the communities.

Discussion

Education and training are important in preparing people to mitigate preventable losses from disaster-producing events (e.g., the development of "International Standards and Guidelines on Education and Training for Disaster Medicine" led by WADEM).[13,14] The JIT program is one form of disaster mitigation education. Not only does JIT education help people understand disasters, but also reduces fear.[2] The goal of this publication is to recommend such a methodology to quickly disseminate accurate scientific information in China, and to invite readers of this article to join the network. People have been influenced by JIT information during the last two disasters in China, i.e., JIT can be a capable tool for disaster mitigation.

The production of the JIT lectures must be quick. Generally, there is a very short time window of interest. Within 7–10 days of the event, reports about a disaster recede to the back pages of newspapers and disappear from television. Core materials must be prepared ahead of time. For example, the cause of earthquakes is well-known and is the same across countries. One available resource is the Supercourse Website, which is an established resource for excellent JIT educational lectures.[3] They are produced by global academic experts and can be disseminated to the public in days or even hours after a disaster producing or a public health event occurs. Educators worldwide can use the disaster slides and lectures and modify them depending upon local circumstances and needs. Also, in cases where a proper JIT educational module does not exist, the numerous lectures on the Supercourse Website can be used as supportive materials. Supercourse is a global repository of nearly 3,700 illustrated lectures on public health issues. Also, 45 Supercourse mirror sites have been established to increase the downloading speed.[14] A more valuable resource is the network of more than 64,000 scientists in 174 countries who create, use, share, and disseminate those lectures. Some of them establish core lectures prior to the occurrence of an event or shortly after an event. At times, some experts on epidemiology and public health, and other disciplines are asked to add necessary information to the core lectures. Some of the template modules have been translated into more than 30 languages.

Just-in-time lectures can be produced rapidly. After preparation, rapid dissemination is important. There are several means by which this can occur. A primary means is that of viral marketing. Viral marketing takes place by sending information about the disaster to the more than 64,000 of the Supercourse list-serve e-mail list. The Network is asked to distribute the note to at least five members of their University faculty and to their individual list serves. Also, they can correct and add new information on the lecture before distribution. A variety of methods can be used besides giving only face-to-face lectures, such as simply designed brochures, banners, media messages and e-learning programs, or even television programs.

For China, though the team has successfully introduced the JIT lecture strategy into the country and reached >20 million people, there still are some crucial problems that might make the process far from ideal. The most important is that the network of experts has not been well established in China. First, lacking a good network of public health professionals causes unnecessary difficulties when developing the core lectures. Fortunately, the last two times that a disaster occurred in China, the team had access to excellent earthquake materials and foreign experts and had the support of expert epidemiologists. Based upon past experience of ascertaining information and data from the China Seismological Bureau, it is not easy to judge which information is more accurate and important.

Second, lacking a good network can affect the sharing and updating of the lectures. Collaboration among public health professionals always is needed. At present, the JIT Lectures can be modified by only a few experts before they are disseminated to the public.

Third, experts in health issues, who are deemed experts in their discipline and can add more professional information in these lectures are required in order to help clinicians diagnose and treat patients better, help policy-makers get enough information to make wise decisions, and help rescue teams be better organized and perform better. Also, linking the JIT lectures with the media was successful, but it was just the first attempt. It will be important to be able to rapidly provide JIT lectures and connect them to spokespersons. Creating a direct link between the media and the Supercourse could be powerful.

Lectures also should be delivered to people who do not have access to the Internet or broadcasts. This population is too large to be ignored in China, considering large areas of under-developed villages and the poor living conditions of some.

Conclusions

The recent experiences with disasters in China indicate that the country is in need of a way to disseminate scientific knowledge about disasters. According to the download count of the Supercourse Website, feedback from educators who use the JIT, and audience rate count of the lectures, it appears that the JIT strategy can educate millions with disaster mitigation knowledge. However, there still is much to be done and improve, such as the establishment of a comprehensive network of Chinese experts.

https://doi.org/10.1017/S1049023X00008591 Published online by Cambridge University Press

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