ASSESSMENT OF KNOWLEDGE AND PREVENTIVE BEHAVIOR AGAINST INFLUENZA A (H1N1) AMONG INTERNATIONAL STUDENTS AT CHULALONGKORN UNIVERSITY

Mr. Melvin Ngozi Omelihu

A thesis Submitted in Partial Fulfillment of the Requirements
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การประเมินความรู้ และพฤติกรรมการป้องกันโรคไข้หวัดใหญ่ สายพันธุ์ใหม่ 2009 (H1N1) ของนิสิตต่างชาติ ในจุฬาลงกรณ์มหาวิทยาลัย

นาย เมลวิน โงซิ โอเมลิฮู

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาสาธารณสุขศาสตรมหาบัณฑิต
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Thesis Title	ASSESSMENT OF KNOWLEDGE AND PREVENTIVE BEHAVIOR AGAINST INFLUENZA A (H1N1) AMONG INTERNATIONAL STUDENTS AT CHULALONGKORN UNIVERSITY
By	Mr. Melvin Ngozi Omelihu
Field of Study	Public Health
Thesis Advisor	Assistant Professor Ratana Somrongthong, Ph.D.

Accepted by College of Public Health Sciences, Chulalongkorn University in Partial fulfillment of the requirement for Master in Public Health

.....Dean of the College of Public Health Sciences

(Professor Surasak Taneepanichsakul, M.D.)

THESIS COMMITTEE

.....Chairperson

(Associate Professor Sathirakorn Pongpanich, Ph.D.)

.....Thesis Advisor

(Assistant Professor Ratana Somrongthong, Ph.D.)

.....External Examiner

(Nanta Auamkul, M.D., MPH.)

เมลวิน โงชิ โอเมลิอู : การประเมินความรู้ และพฤติกรรมการป้องกันโรคไข้หวัดใหญ่สายพันธุ์ใหม่ (H1N1) ในนิสิตต่างชาติของจุฬาลงกรณ์มหาวิทยาลัย (ASSESSMENT OF KNOWLEDGE AND PREVENTIVE BEHAVIOR AGAINST INFLUENZA A (H1N1) AMONG INTERNATIONAL STUDENTS AT CHULALONGKORN UNIVERSITY BANGKOK THAILAND) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: ผศ.ดร.รัตนา ลำโรงทอง, 67 หน้า

การระบาดโรคไข้หวัดใหญ่สายพันธุ์ใหม่ (H1N1) ได้เริ่มขึ้นที่ ประเทศแมกซิโก และมีการแพร่กระจายไปสู่ประเทศต่างๆทั่วโลก อันนำไปสู่การเสียชีวิต จนถึงปัจจุบันไข้หวัดใหญ่สายพันธุ์ใหม่ (H1N1) ได้มีการแพร่ระบาดอย่างรวดเร็ว ในประเทศไทยก็เช่นกัน พบว่ามีการระบาดในกลุ่มนักเรียน นักศึกษา และมีแนวโน้มการระบาดเพิ่มขึ้น การศึกษาครั้งนี้มีวัตถุประสงค์เพื่อ ประเมินความรู้ และพฤติกรรมในการป้องกันโรคไข้หวัดใหญ่สายพันธุ์ใหม่ (H1N1) ในนิสิตต่างชาติของจุฬาลงกรณ์มหาวิทยาลัย การดำเนินการวิจัยเป็นการศึกษาภาคตัดขวาง กลุ่มตัวอย่างได้แก่นิสิตต่างชาติ จุฬาลงกรณ์มหาวิทยาลัย โดยเก็บข้อมูลโดยใช้แบบสอบถาม ในเดือนกุมภาพันธ์ ถึง มีนาคม 2553 ผลการศึกษาพบว่า ความรู้ เกี่ยวกับโรค และการการป้องกันโรคไข้หวัดใหญ่สายพันธุ์ใหม่ (H1N1) ของกลุ่มตัวอย่างร้อยละ 63.4 อยู่ในระดับสูง ร้อยละ 36.6 อยู่ในระดับปานกลาง สำหรับพฤติกรรมการป้องกันโรคไข้หวัดใหญ่สายพันธุ์ใหม่ (H1N1) ของกลุ่มตัวอย่าง ร้อยละ 82.2 อยู่ในระดับปานกลาง ร้อยละ 14.7 อยู่ในระดับสูง และร้อยละ 3.1 อยู่ในระดับต่ำ ตามลำดับ สำหรับปัจจัยทางประชากรที่มีความสัมพันธ์ต่อความรู้เรื่องโรคไข้หวัดใหญ่สายพันธุ์ใหม่ (H1N1) อย่างมีนัยสำคัญทางสถิติ ได้แก่เพศ (p value <0.001) และพบว่ามีปัจจัยทางประชากร ไม่มีผลต่อความรู้เรื่องโรคไข้หวัดใหญ่สายพันธุ์ใหม่ (H1N1) การได้รับข้อมูลข่าวสารในเรื่องโรคไข้หวัดใหญ่สายพันธุ์ใหม่อย่างพอเพียง พบว่า มีผลอย่างมีนัยสำคัญทางสถิติ กับ ความรู้เรื่องโรคไข้หวัดใหญ่สายพันธุ์ใหม่ (p -value 0.022), พฤติกรรมการปิดปากปิดจมูกด้วยผ้าเมื่อจามหรือไอ (p value 0.024), และ ความสะอาดของห้องเรียน (p value 0.036) ดังนั้นการสื่อสารในเรื่องโรคไข้หวัดใหญ่สายพันธุ์ใหม่ควรเน้นในเรื่องความสำคัญของพฤติกรรมในการป้องกันโรค และพฤติกรรมเสี่ยงต่อโรค เพื่อส่งเสริมให้มีพฤติกรรมสุขภาพที่ดี

สาขาวิชา สาธารณสุขศาสตร์ ลายมือชื่อนิสิต .....

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MELVIN NGOZI OMELIHU: ASSESSMENT OF KNOWLEDGE AND PREVENTIVE BEHAVIOR AGAINST INFLUENZA A (H1N1) AMONG INTERNATIONAL STUDENTS AT CHULALONGKORN UNIVERSITY BANGKOK THAILAND.THESIS ADVISOR: ASSIST.PROF. RATANA SONGRONGTHONG, Ph.D. 67, pp

Background: An outbreak of Influenza (H1N1) was detected in Mexico with subsequent cases observed in many countries. Influenza A (H1N1) is currently the greatest pandemic disease threat to human. At present, pandemic (H1N1) 2009 has been spreading rapidly. In Thailand cases among students has been reported and still on the increase. **Objective:** To assess the level of knowledge and Preventive behaviors of International students at Chulalongkorn University **Method:** The cross-sectional study on Knowledge and preventive behavior was conducted in 191 international students at Chulalongkorn University from February to March 2010.**Findings:**(1) the samples' knowledge regarding H1N1 was high (63.4%) and moderate (36.6%) None of them had low level of knowledge. Their preventive behavior level was moderate (82.2%); high (14.7%) and low (3.1%). (2) of the demographic variables, only sex had a strong association with knowledge ($p<0.001$). (3) None of the demographic variables had association with Preventive behavior. (4) Enough Information they received regarding H1N1 was significantly associated with knowledge (p-value 0.022); covered their nose when sneezing with mask and knowledge (p-value 0.024); classroom cleaning (p-value 0.036).**Conclusion:** Efforts on communication should be intensified and emphasis on the efficacy of preventive behaviors and risks from the disease may help promote compliance.

Field of Study: Public Health Student's signature .....

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CONTENTS

Page

Page

Page

LIST OF TABLES

Tables **Page**

LIST OF FIGURES

Figure **Page**

CHAPTER I

INTRODUCTION

1.1 Background and Rationale of the Study

In the Late March and early April 2009, an outbreak of Influenza A (H1N1) was detected in Mexico with subsequent cases observed in many countries including the United states. The World Health Organization (WHO) has raised its pandemic alert level to the highest level (Center for Disease Control; CDC 2009).

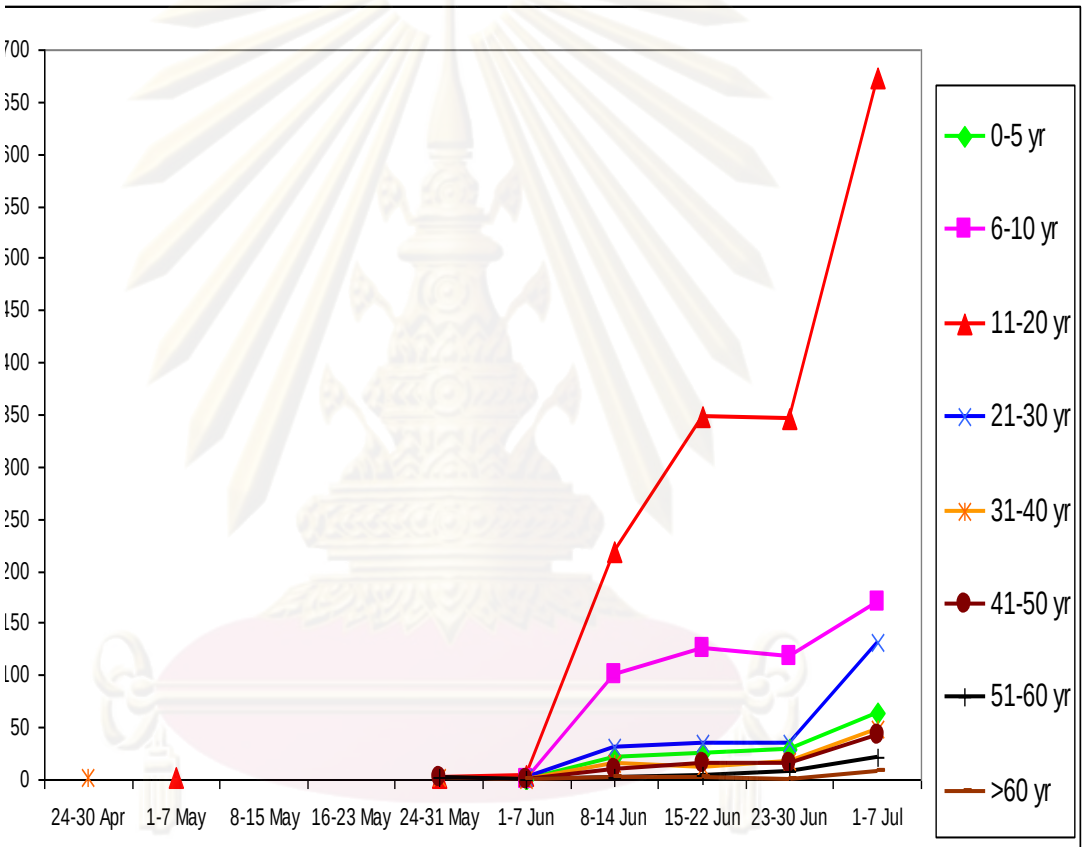
Influenza A (Family Orthomyxoviridae, Genus Influenzavirus A) is currently the greatest pandemic disease threat to humankind. Its rivals for this title (HIV-1, Ebola, SARS, and pneumonic plague) have higher mortality if untreated, but either lack influenza's rapid interpersonal transmission (HIV-1) or its widespread seasonal distribution (Ebola, SARS, pneumonic plague). Influenza A is unique among the major pandemic threats in that it could potentially infect 30% of the world's population within a matter of months. Even at a conservative overall mortality rate of 2%, it would result in around 135 million deaths worldwide within the first year of a new pandemic outbreak. This is about 4 times the total mortality attributed to HIV-1 in the last 30 years. At present, Pandemic (H1N1) 2009 has been spreading rapidly (Ruef, 2009).

The vast genetic variability of Influenza viruses made it difficult to give a name to the virus that is both scientifically correct and useful in general parlance. In July 2009, the WHO announced that it would be referring to the virus responsible for the outbreak as ~~H~~1N1/09 a term that is scientifically and genetically valid.

The virus invades human cells, hijacks their machinery and uses the cells to reproduce. Infected cells produce large amounts of specific chemicals that stimulate body's immune response which in turn causes many of the symptoms common to swine and other types of influenza. Pandemic H1N1 affected a large percent of the population with significant morbidity and mortality. It elicited widespread panic, increased disease burden incidence and societal fear which undoubtedly rendered it not only a public fear but a potential public catastrophe.

In Thailand, there have been many reported cases of the pandemic among children, students and working-age people in Bangkok and its vicinity as well as more than 60 provinces (Ministry of Public Health Thailand May;2009).The increase in the age brackets for students is illustrated in the graph below:

Figure1: Number of Influenza cases by age



Source: Ministry of Public Health Thailand, 2009.

Because of the outbreak of H1N1, In July 2009 Bangkok Metropolitan Administration (BMA) closed its 435 public schools for a week to organize a clean-up of public premises regarding H1N1.The number of cases among students is increasing (MOPH Thailand, 2009).

Following the increase, it is important to assess the knowledge and preventive behaviors among international students at Chulalongkorn University. The institution is among the biggest and has a good number of International students. The researcher

considered the ease to communicate with the international students in English language and for the following reasons other reasons:

- The barriers they experience in reading and understanding several information on the media and materials written in Thai that are posted on notice board and at other conspicuous places regarding the infection.
- They study in air conditioned rooms which helps its spread if there are infected persons in the room unprotected.
- To prevent the performance impairment the infection might cause them if they get it.

Again, some international students attend social events in Thailand and possibly they or their friends have travelled within or out of Thailand during the peak period of H1N1.

1.2 Significance of the Study

The level of knowledge regarding H1N1 among International students at Chulalongkorn University will be useful to the university in preventing spread of the infection.

1.3 Research Questions

- What is the level of knowledge of H1N1 among International students at Chulalongkorn University?
- What are the preventive behaviors of the International students toward H1N1?
- What are the factors determining their preventive behaviors toward H1N1?

1.4 Research Hypotheses (Null)

- There is no association between the level of knowledge of International students and H1N1.
- There is no association between their preventive behaviors and their knowledge towards H1N1.
- There is no association between factors determining their preventive behaviors and H1N1.

1.5 Research Objectives

- To assess the level of knowledge of Influenza A (H1N1) among international students at Chulalongkorn university.
- To describe the preventive behaviors of international students toward the Influenza A (H1N1).
- To identify factors determining their preventive behaviors toward Influenza A (H1N1).

1.6 Conceptual Framework

Independent Variable

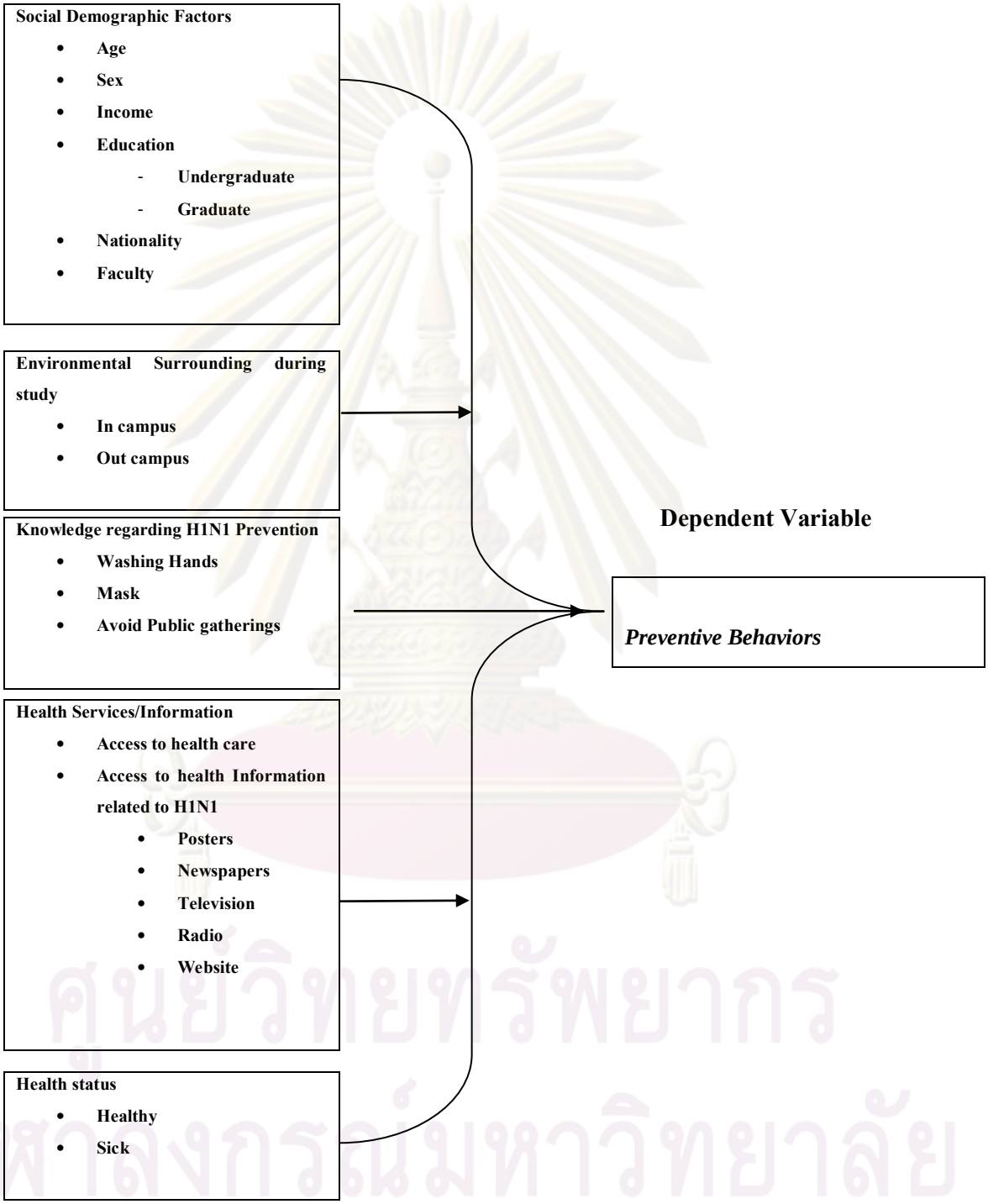


Figure 2: Conceptual Framework

1.7 Operational Definitions

Knowledge: The understanding of cause, spread, prevention and control of Influenza H1N1.

Cause: origin, nature and factors responsible for H1N1

Prevention: personal protective equipments such as masks, respirators, hand washing and vaccination.

Spread: The mode of transmission of influenza H1N1including coughing, sneezing and touching.

Control: Reduction of the spread of H1N1.

Personal Protective Equipment: Materials worn or used to protect oneself from getting H1N1.This includes facemasks and gloves.

Preventive Behaviors: Practical approach adopted by students to avoid getting Influenza A (HINI).These include washing hands, wearing mask, avoiding contact with infected person and public gatherings, environmental hygiene, visiting health care facilities when flu is suspected.

International Students: All foreign students at the university that study in English language from academic year 2005 to 2009.This exclude Thai students.

Environmental Surroundings: The classroom and other places students stay during and after classes.

In campus: The classrooms and surroundings at the university.

Out campus: All other places excluding the university classrooms and surroundings.

Healthy: Not having a disease or not showing signs and symptoms of a disease.

Sick: Having a disease or showing signs and symptoms of a disease.

Severity: The rapid spread of H1N1 infection.

CHAPTER II

LITERATURE REVIEW

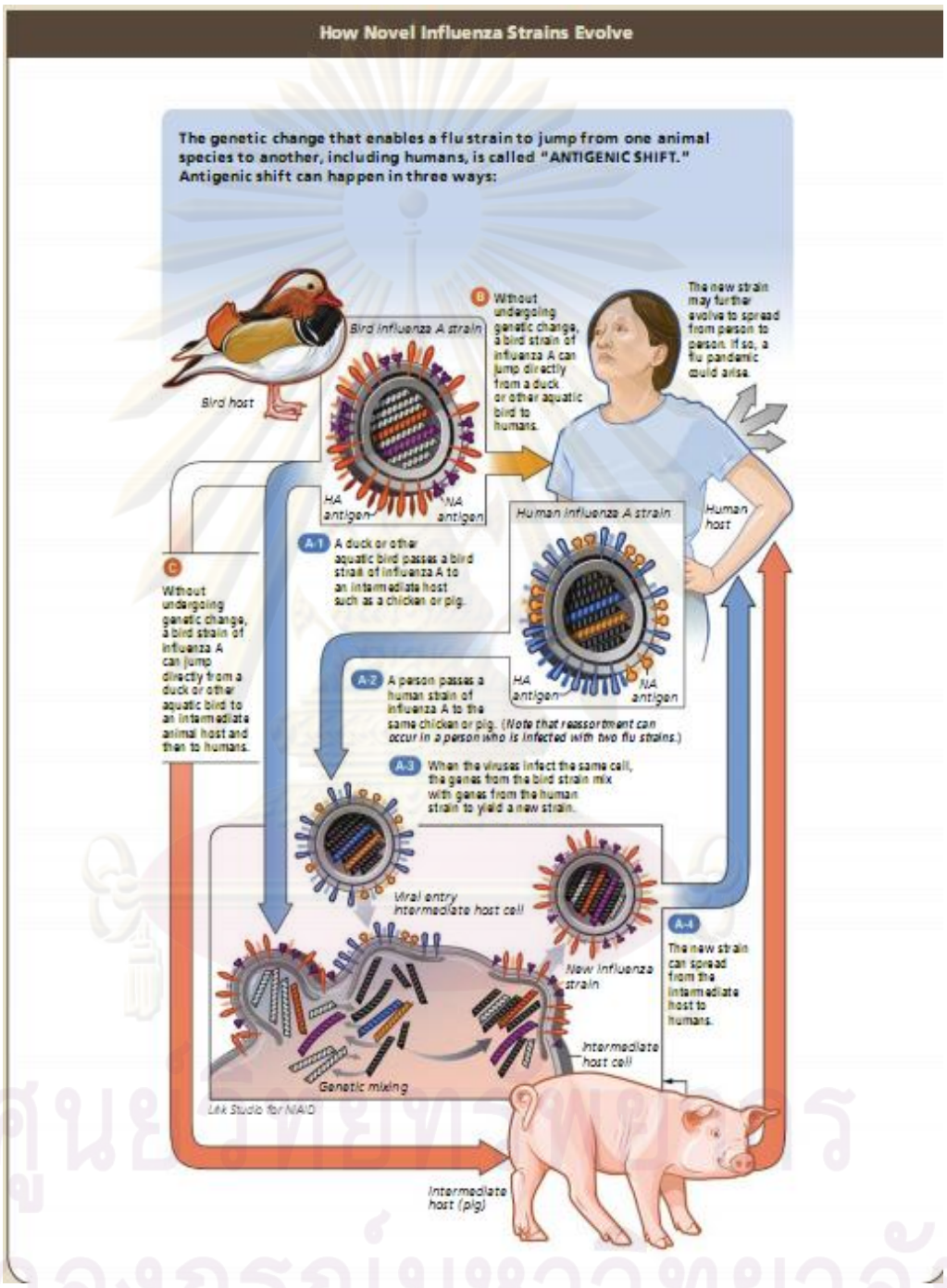
This chapter looks into the history, causes spread and of H1N1, public health concerns, risk groups, school situation, preventive behaviors and preparedness plans.

2.1 History of Influenza A (H1N1)

The previous century saw three such pandemics, the first (Spanish flu) caused by influenza A (H1N1) killing around 20-50 million people and a loss in global GDP of around 16 percent. The other two in 1957 and 1968 were relatively milder but still killed nearly one million (Bhatia, 2009).

In April 2009, the novel swine-origin Influenza A (H1N1) virus (S-OIV) WAS identified in specimens obtained from two epidemiologically unlinked patients in the united states. The same strain of the virus was identified in Mexico, Canada and elsewhere.642 confirmed cases of human S-OIV Infection identified from the rapidly evolving U.S outbreak .Influenza virus by nature is highly unpredictable and unstable. They have the unique distinction of having segmented genome which permits them resortment in their genetic structure resulting in evolution of new subtypes. This genetic restructuring occurs regularly in nature and at times provides the virus unusual capability to cause widespread disease in immunologically naïve population and swiftly move across geographical borders across geographical borders to cause pandemics or global scale epidemic (WHO Regional Office for South East Asia, 2009)Preliminary tests conducted in April 2009 indicated that the outbreak of Influenza A(H1N1) which started early in April 2009 in Mexico was a novel reassortant containing genetic elements of Influenza viruses found in swine, birds and human beings.

Fig 3: How Novel Influenza Strains Evolve



Source: Environmental Health Perspectives September 2009

2.2 The Spread of Influenza A (H1N1) in 2009

According to the WHO (2009), current evidence suggests that the main route of human-to-human transmission of the new Influenza A (H1N1) virus is via respiratory droplets, which are expelled by speaking, sneezing or coughing. Any person who is in close contact (approximately 1 meter) with someone who has influenza-like symptoms (fever, sneezing, coughing, running nose, chills, muscle ache etc) is at risk of being exposed to potentially infective respiratory droplets.

The flu like all cases of the fly is passed to you either by inhaling or touching the virus (American Thoracic Society, 2009). When a person with the flu coughs or sneezes near you, you can get the virus by inhaling the infected air .If you shake hands with a person who is ill, they may pass the germs that way. A person can also give you the flu by coughing, sneezing onto a surface or placing their infected hands on a surface (e.g. door handles, table tops, computer keyboards, money).The virus can be picked up on your hands and you infect yourself by touching your contaminated hand or fingers to your eyes, nose or mouth. Because your hands are such an important way of transmitting the virus, it is very important to wash your hands well and often.

Signs and Symptoms of the flu include:

- Chills
- Sore throat
- Fever
- Body or muscle aches
- Runny nose
- Nasal Congestion
- Tiredness
- Headache
- Eye Irritation
- Dry cough

Others such as stomach ache, nausea, vomiting and diarrhea may be complained by children (WHO, 2009).

Table2.1: Cases of Pandemic (H1N1) 2009 worldwide between April-June

	First case reported to WHO	Total Case	Deaths
America	24 April 2009	87965	707
Europe	24 April 2009	16556	34
Western Pacific	28 April 2009	21577	30
South East Asia	13 May 2009	7358	44
Eastern Mediterranean	3 June 2009	890	1
Africa	18 June 2009	157	0
Total	-	134503	816

Source: WHO 2009

In the United States, as of July 24, 2009, over 43,000 confirmed cases had been reported from 55 states and territories, but reporting of case counts has since been discontinued. The majority of cases in the US have been mild, although some patients have required hospitalization and some deaths have occurred. As of August 20, 2009. 7983 patients in the US have required hospitalization and 522 patients have died.

Reported Recently by CDC — As of August 13, 2009, over 182,000 laboratory-confirmed cases had been reported in over 170 countries and territories Since early July, the World Health Organization has ceased closely tracking the number of cases, since it has become extremely difficult for countries to continue such monitoring in the setting of widespread community transmission. Furthermore, even with close tracking, the true numbers of cases are many fold higher than the numbers of confirmed cases. The focus has shifted to following trends of illness rather than individual cases in countries with widespread disease, and to close monitoring of cases only in newly affected countries. Over 10,200 laboratory-confirmed cases of pandemic influenza A H1N1infection had been reported in Mexico by July 6, 2009, with 119 deaths. The World Health Organization reported in early June 2009 that the outbreak likely peaked in Mexico in late April, although cases have continued to be

detected since then. According to Thailand Ministry of Public Health (2009) currently, the morbidity rate is 38.6/1000000 and 165 deaths has been reported.

Developed countries are better prepared to mitigate the effect of the pandemic than developing countries, with Eduardo et al. suggesting few developing countries are adequately prepared. However, studies of previous influenza pandemics suggest that developing countries are disproportionately affected by influenza pandemics. Developing countries are characterized by limited access to medical care, undeveloped public health infrastructure, low socio-economic conditions, increased population density and insufficient public awareness (Khan et al., 2009).

2.3 Public Health Concerns

The rapid evolution of the threat of pandemic has created a lot of anxiety and activity in most countries all over the world (Ruef, 2009).While it seemed to cause only mild disease with the exception of some fatal outcomes mostly in persons with underlying diseases and predisposing conditions. Within a short period, the World Health Organization (WHO) has stage of pandemic alert from 3 to 5; speeding up plans for dealing with phase 6 of the pandemic. However, it's also wise to think about other issues that will arise during such a serious public health challenge. Severity in influenza relates to the virulence of the virus in any given host; the other to the attack rate or numbers of cases of infection per unit of population (Gallaher, 2009).While currently, we are at phase 6 of the pandemic, global community is in good state of preparedness than any time in the past. In the south East Asia (SEA) region, all countries have prepared their national Influenza Pandemic Preparedness Plans and are gearing up to implement these plans at the right time.

2.4 Risk Groups of H1N1

According to Thorner (2009) and U.S Dept of Education (2009) risk groups for the development of complications of pandemic H1N1 influenza A are the following:

- 5 years of age (particularly those less than 2 years of age)
  Individuals 65 years of age or older

- Individuals younger than 19 years of age who are receiving long-term aspirin therapy and who therefore might be at risk for Reye syndrome after influenza virus infection
- Pregnant women
- Individuals with chronic medical conditions
- Students

The median age of patients with pandemic Influenza H1N1 2009 infection was reported as 20-25 years in initial case series from Europe and the United States. This has been lowered to 13 years in the United States after testing of school-aged children as part of the pandemic response.

2.5 H1N1 and Schools

Students in a school outbreak survey in the United States showed an effective reproduction number in a school-based setting is the average number of secondary cases generated by an infectious case during an epidemic. The survey reported fever and either cough or sore throat between 8 and 24 April 2009 (McCaw et al., 2009).

On May 2009, more than 700 schools in the US were closed for health reasons. Schools must be prepared a range of threat and hazards and develop plans that address a variety of situation (US Dept. of Education, 2009)

2.6 H1N1 among University Students

About 2,000 students at Washington State University have reported symptoms of swine flu, university officials said, in one of the largest reported outbreaks of the virus on a US college campus. Acute upper respiratory tract illnesses occur frequently among college and university students and are associated with substantial morbidity, including impaired school and work performance, increased health care use, and lower levels of general health. Influenza viruses are among the common etiologic agents of upper respiratory tract illnesses in adults, accounting for 30% to 79% of febrile cough illnesses (influenza like illnesses [ILIs]) in adults during influenza seasons. In one study, about 28% of university students developed ILIs during the influenza season. If one-third to three-quarters of these ILIs were caused by influenza, then the estimated

incidence of influenza illness among these college and university students would be about 9% to 20%. Some reports of influenza outbreaks on college and university campuses have documented even higher rates of illness among the students. Undoubtedly, influenza is common among college and university students, and its prevention might have an important impact on their health and well-being (Nichol et al., 2008).

2.7 Preventive Behaviors

2.7.1 Global Preventive Behavior Situation

The World Health Organization urges all countries to prepare for the prevention of the pandemic. In accordance to that, understanding how the public responds to reports of a potential pandemic may also be useful in identifying ways of encouraging behavior change during early stages of any future outbreak of infectious disease. The perception that the incident had been hyped up was associated with a lower like hood of behavior change (Rubin et al., 2009) some behavior change includes wearing surgical masks, hand washing and covering nose and mouth when sneezing or coughing.

2.7.2 Preventive behaviors in Thailand

In Thailand, The Ministry of Public Health (2009) recommended the following behaviors:

- Maintaining good health
- Eating nutritious food
- Having enough sleep
- Often washing hands; also rub hands with alcohol gel
- Avoid closely mixing with patients with Influenza-like symptoms

Fostering a habit of not using their fingers or hands to pick their nose, rub their or even touch their face.

Infected person is required to wear a surgical mask to prevent the viral transmission to other people. Infected person is required to stay away from people and should not share personal effects such as handkerchiefs, towels, glasses, straws etc with people.

2.7.3 Hand washing

According the CDC (2009), the influenza virus may be viable on contaminated hands for a mere 5 minutes, which is usually sufficient time for self-inoculation. Of course, frequent hand washing is a prudent means of reducing the spread of any infectious material. Furthermore, alcohol-based hand sanitizers are known to be effective virucides and are more effective than hand washing against infective droplet nuclei. The following proper steps to wash hands were recommended:

1. Use clean running water and soap
2. Rub hands to make a soapy lather
3. Scrub all surfaces, including nails
4. Rub for 20 seconds
5. Rinse hands well under the water.
6. Use a paper towel to turn off the faucet.
7. Dry hands with a paper towel or dryer.

2.7.4 Masks

Use of respiratory protection has been a topic of ongoing debate. It is widely accepted that the spread of influenza occurs by airborne means, although the extent of transmission relative to direct contact with contaminated surfaces or other patients is unknown. Theoretical models suggest increased replacement with fresh air in ventilation systems will decrease risk of influenza. A sneeze can generate up to 40,000 small droplets, which travel upward of 100 meters per second and settle several meters from their origin. Particles that are smaller than 3 μm can remain suspended

indefinitely. Suspension or resuspension of particles can occur simply by opening and closing a hinged door, and sliding doors may reduce movement of infectious droplets.

Facemasks provide respiratory protection and are divided mainly into surgical masks and N-95 high-efficiency particulate air filtering respirators. Surgical masks are worn over the nose and mouth such as those worn in the operating room. N-95 respirators are masks designed to be 95% effective in filtering particles down to 0.3 μm in size and are used in a variety of occupational settings. Facemasks must be replaced frequently because the accumulation of moisture from breathing will decrease the ability to block the penetration of microbes. Use of facemasks and covering the mouth when sneezing may have helped reduce transmission.

Other CDC guidance documents recommend the use of surgical masks in the event of a shortage of N-95 respirators. Surgical masks offer protection from larger aerosol droplets and are not as effective as the N-95 in protecting the wearer. If respiratory protection is worn, users must be trained in its proper use, including advice on proper fitting, maintenance and hygiene, re-use protocols and proper disposal of used respirators. US Department of Health and Human Services recommends their use by the general public unless they are caring for family members known to be ill from pandemic influenza.

According to WHO the following are correct ways of using masks:

- Place mask carefully to cover mouth and nose and tie securely to minimize any gaps between the face and the mask
- While in use, avoid touching the mask − whenever you touch a used mask, for example when removing or washing, clean hands by washing with soap and water or using an alcohol-based hand rub
- Replace masks with a new clean, dry mask as soon as they become Damp/humid
- Do not re-use, discard masks after each use and dispose of them immediately.

2.7.5 Environmental hygiene

The flu virus is easily killed by commonly available cleaning products and detergents. Freshly prepared detergent and warm water should be used for surface cleaning. Hand contact surfaces in workplaces and public areas should be cleaned frequently and at least once a day. Damp rather than dry dusting should be performed. During a pandemic, Environmental health practitioners may be involved in visiting premises where there may be someone who has flu-like symptoms for investigation. They would also need to demonstrate to people the correct and appropriate use of Personal Protective Equipment (National Health Service; UK 2009).

2.7.6 Ventilation

Filtration and gaseous air cleaning within the Heating, Ventilating and Air conditioning (HVAC) system strongly is important to keep virus and bacteria levels at minimum. Exhausted air should be filtered as well to prevent cross contamination of air uptake. High efficiency gaseous filters control organic and inorganic compounds (Townsend, 2007).If high concentration of oxygen and /or positive ventilation are required, appropriate oxygen delivery system should be filtered with an antimicrobial, hydrophobic filter (Public Health Agency of Canada; 2009)

2.7.7 Stress, Exercise and Nutrition

Health professionals as well as the general public remain cognizant of the health effects of stress. It is a well known fact that stress can affect the body's immune system (U.S Dept of Health and Human services; 2009).

Exercise on a regular basis. Listening to soothing music, talking to your friends and family, workload management, healthy diet, adequate sleep and rest and leading a happy life are better ways of managing stress. Dealing with the stress in life can really be a key part of bolstering your immune system, and in turn, for avoiding the H1N1infection.Adequate nutrition increases body resistance to infections.

2.8 Pandemic Preparedness Plans

The section looks into various efforts and plans regarding H1N1 at global, country and university levels.

2.8.1 Global Preparedness

In accordance to WHO(2009) and reviewed by Khan et al. (2009)The WHO urges all countries to develop and implement national pandemic preparedness plans to prevent ,mitigate and minimize the effects of the pandemic (H1N1) 2009.Effective plans for combating any catastrophic infectious disease (such as pandemic influenza) address six issues:

- surveillance and laboratory services
- communications
- maintenance of community services
- providing medical care
- the supply and delivery of vaccines and drugs
- Social distancing also plays a role in developing countries if one or more of these cannot be addressed.

Individual immunity and persistence of antibody are related to frequency and recent occurrence of exposition to influenza. As concerns the formulation of influenza vaccine it was established that this preserves the antigen selection of the new strains isolated from the population, mainly due to the behavior of the influenza A virus (Mancini et al.; 1991).

2009 H1N1 vaccine is associated with an acceptable safety profile for adult as well as children with the elderly people (Feng-Cai et al., 2009).Vaccination is the principal strategy for reducing the disease burden of many infectious diseases. The evaluation of vaccination policies before their implementation is essential to allocate resources and to minimize disease burden. Outcome measures applied to quantify the success of a vaccination program are fundamental to this evaluation.

Vaccination has the indirect benefit of decreasing transmission, thereby reducing the infection risk even for those who have not been vaccinated

(Medlock et al., 2009).The vaccines are made just like seasonal flu vaccines. They are expected to be safe and effective and will not prevent ~~in~~influenza like illness cause by other viruses. Live attenuated intranasal vaccine (LAIV) is sprayed into the nose. There is also an activated vaccine which is given as shot. The 2009 H1N1 LAIV does not contain thimerosal or other preservatives. It is licensed for people from 2 through 49 years of age. The vaccine virus is attenuated (weakened) so it will not cause illness. People with the following should not get the vaccine:

- weakened immune system
- pregnant
- chronic diseases
- certain muscle or nerve disorders
- long term aspirin treatment
- a life threatening allergic reaction
- Guillian- Barre Syndrome (a severe paralytic illness also called GBS)

2.8.2 Preparedness in Asia

According to International SOS and control Risks (2009), officials in Thailand on 16 May started screening people entering the country from its southern borders after the confirmation of a second case of influenza H1N1 in Malaysia. The frontiers concerned are Yala's Betong and Songhua's Sadao and Padang Besar checkpoints. The Thai authorities also on 24 May decided to install a thermal scanner at their boarder. Meanwhile, the Malaysian authorities have deployed health officials to all border crossing points with Thailand and Singapore to screen visitors entering the country. Hong Kong has also deployed medical teams to its land entry points to detect arrivals with flu symptoms. China has enforced stringent screening measures at border crossing points with Nepal and the latter is implementing screening measures at all its land border crossings. In Vietnam, the health ministry has introduced measures to quarantine suspected cases and intensify inspections at the

country's 17 land border crossing points. The deputy health minister announced in September that screening at land borders would continue.

In India, the government deployed a team of doctors to all highways leading to the northeastern city of Varanasi to prevent the spread of the virus by pilgrims and tourists. In addition, the authorities have intensified the screening of travelers entering the north-eastern states from Bangladesh, Bhutan, China and Myanmar (Burma) by land. The authorities in West Bengal state plan to stop trains arriving from locations in Maharashtra state at the West Bengal border; doctors are to board the trains and test passengers travelling from Mumbai and Pune. Those who have fever and a cough will be given red slips and required to have themselves tested for influenza H1N1 once they arrive at their destinations; travelers not displaying these symptoms will be handed green slips. The Nagpur Municipal Corporation in Maharashtra state has deployed doctors and other health workers to octroi collection posts on Amravati Road and Wardha Road to detect influenza H1N1 patients. The medical workers are testing travelers who display flu symptoms and sending them to the Government Medical College and Hospital at once. In Pakistan, precautionary H1N1 screening measures have been implemented at all railway stations in the capital Islamabad and the nearby city of Rawalpindi. The Singaporean health ministry has decided to discontinue temperature screening at border checkpoints from 11 July because there has been local community spread of influenza H1N1 in the country, making this measure redundant. According to media reports on 19 August, the Bangladeshi authorities have strengthened screening measures at the 11 land borders of the country.

2.8.3 University Preparedness

During the peak outbreak time, many individuals presented for care with no febrile, no severe illness or concern and fear of pH1N1 infection, because little was known about the illness (Nicole et al., 2009).

Furthermore, many individuals sought care because of the media attention about pH1N1. Overall, some individuals presenting to care had an acute

respiratory illness that did not meet the case definitions for ILI. It is unclear how many of these individuals had pH1N1 infection. Following the outbreak at University of Delaware, Iuliano et al.(2009) suggested that healthcare facilities should prepare, not only for an increase in visits for febrile illness, but also for an increase in worried persons with mild illness. Establish an emergency clinic to assist in evaluating students seeking care. In future outbreaks, this system could be replicated if the need for additional health services arose.

Information about illness symptoms, anticipated duration of illness, risk factors for illness, methods to prevent illness, who should seek care, when to seek care and transmission should be provided to the community as early as possible to reduce peak burden on health care services, prevent unnecessary health care–seeking behaviors by the minimally ill, and to reduce transmission. Development of effective communications strategies to boost compliance with non pharmaceutical interventions will be important in preventing the spread of disease and reducing the surge in future outbreaks.

In Thailand, Chulalongkorn University task force developed guidelines for H1N1 prevention/control for CU staffs/students and general population by encouraging university staffs & students with flu like illness to stay home. Cleaning campaign for public areas) in the UniversityH1N1 information dissemination under the supervision of the technical team done through posters, leaflets, brochures, newsletters, radio broadcast, website etc. Providing hand washing spot and/or alcohol gel available at all public areas hotline services for H1N1and postponement of some activities that make crowded settings. Also using the CU demonstration school (Faculty of Education) as a role model school for H1N1 prevention and control. Guidelines and Plans for health promotion. Also for basic care and referral system, health care service provision.

2.9 Conclusion of the Literature review

The rapid spread of the H1N1 pandemic has created a lot of anxiety and activity in most countries all over the world. Influenza virus by nature is highly unpredictable and unstable. They have the unique distinction of having segmented genome which permits them resortment in their genetic structure resulting in evolution of new subtypes. This genetic restructuring occurs regularly in nature and at times provides the virus unusual capability to cause widespread disease in immunologically naïve population and swiftly move across geographical borders to cause pandemics or global scale epidemic. Understanding factors associated with adaptive behavior changes among the students may help communicators to provide more effective public health messages. Altogether, understanding students' response to potential pandemic may also be useful in identifying ways of encouraging behavior change during early stages of future outbreak of infectious disease.

CHAPTER III

RESEARCH METHODOLOGY

This chapter introduces the study design, population, area, sampling technique, sample size, measurement tools, data collection, ethical consideration, data analysis, and limitations.

3.1 Research Design

The study was a cross-sectional design. It's suitable for this study because it describes relationship between disease, respiratory infections and other factors. Good for studies on knowledge, behavior and practices (Abramson et al., 2000).

3.2 Study Population

296 out of 299 International Students of Chulalongkorn University.

3.3 Study Area

The study was conducted at Chulalongkorn University Bangkok Thailand

3.4 Sampling Technique

It was a census study. 296 students from academic year 2005-2009. In general, there were 52 students in bachelor degree, 186 in master degree and 61 in PhD programs. There were 7 students in 2005, 26 in 2006, 51 in 2007,109 in 2008 and 103 in 2009 according to their academic years, faculties and study levels.

Inclusion criteria: All international students in the academic year 2005-2009 that were available during the study.

Exclusion criteria: Those that was not available during the study. They were excluded to avoid bias in the study population.

3.5 Sample Size

65% (191 of the 296) of the subjects participated in the survey.

3.6 Measurement Tool Development

Structured questionnaire of 43 multiple choice questions developed on knowledge and preventive behavior drawn from WHO materials and literature review of reading materials related to H1N1 were in four parts:

(a) Socio demographic information (b) knowledge, (c) preventive behaviors (d) food, stress, exercise and environment regarding H1N1.

The validity was confirmed by the some lecturers and by the ethical committee in Feb.2010.The reliability test was conducted for a number of 30 pretest samples drawn from Mahidol University, Assumption University and Ramkhamhaeng University all in Bangkok Subjects were selected from these universities because of the presence of international students and to have subjects from different faculties since none of those universities had all the International programs as had Chulalongkorn University. Upon analysis, the Cronbach's Alpha value was 0.604 for knowledge part and 0.787 for preventive behavior and overall Cronbach's Alpha value was 0.783.The result was satisfactorily confirmed and the tool to be used for the research.

3.7 Content of the Questionnaire

3.7.1 Demographic and Socioeconomic background

This section included gender, age, nationality, marital status, monthly income, employment, faculty, study level, year admitted, illness experience in the past 2 months and travel.

3.7.2 Knowledge about H1N1

There were a total of 16 main questions (15 basically for knowledge and 1 with 6 subsets on information). The questions were on the nature of H1N1, its spread, severity, prevention and information about H1N1.

Scoring Criteria:

Yes 2

No 1

Not sure 0

For reverse answer, the score was worked backward.

Categorical scale also used by Kim (2007) on KAP study in Thailand; Yusuf (2006) in Ethiopia and specific interval Rubin et al.(2009) H1N1 study in the UK was used for the scoring. The total score for knowledge ranged from 1-30

Low level : 1-10

Moderate : 11-20

High : 21-30

3.7.3. Preventive Behaviors

There were a total of 16 main questions. It had two sections. The first section was hand washing, mask, health status/services and information.

The categories were:

Never 1

Sometimes 2

Often 3

Always 4

For this research, never meant none (0), sometimes (1-2 times), Often (3-5 times) always (6 and above).

The second section of the preventive behavior which is the last section of the questionnaire was on Food, Stress, Exercise and Environment regarding H1N1 in the past 2 months. The categories were:

Not at all 1

Slightly 2

Moderately 3

Very 4

Extremely 5

The total score for the 2 sections of the preventive behavior ranged from 1-70

Low level : 1-30

Moderate : 31-50

High : 51-70

3.8 Data Collection

The researcher requested the college of Public Health Sciences Chulalongkorn University to send a letter of notification to the fifteen (15) faculties that are running international programs.

Afterwards, the researcher contacted the faculties before administering the questionnaires and having interviews with the students. Some faculty staffs assisted the researcher in collecting the data.

Potential subjects read the consent form and endorsed it before replying to the questionnaire administered. Emails and telephone were used for the interview.

The data were collected between Feb 27 to March 18, 2010.Generally, a total of 191 out 296 subjects participated in the survey.

3.9 Ethical Consideration

The proposal was submitted and it was approved by the Ethical Review Committee for Research Involving Human Research Subjects, Health Science Group Chulalongkorn University. Student's name list was obtained from the University Registry and was kept confidential. Participants were 18 years and over. The objective and purpose of the study was explained to the respondents before signing the consent form and it was voluntary participation and not by compulsion. There were careful and confidential handling of the data collected. Some respondents that refused to participate were not asked to explain reasons. The data would only be for this project.

3.10 Data Analysis

After collecting the data, it was entered, coded, and analyzed using mathematical method. Descriptive statistics such as percentage, mean, median range and standard deviation was used to analyze the general characteristics of the

respondents as well as their knowledge and protective behaviors toward H1N1. Chi square was used to test for association between the variables. SPSS 17 was used for the analyses.

3.11 Limitations

Their preventive behaviors were not monitored over time since it was a cross sectional study. Prior to the data collection, some of the students had finished their exams and gone back to their countries; none of the potential students at faculty of Nursing were available during the study. This study may not represent the entire international student population in Thailand since it was conducted in only one university.

CHAPTER IV

RESEARCH RESULTS

This study was a cross sectional research on knowledge and preventive behaviors of International students at Chulalongkorn University. Total subjects in the study were 191 participants.

The findings from the data analysis are presented in this order:

1. General characteristics of the study
2. Knowledge about H1N1
3. Preventive behaviors towards H1N1
4. Association between Demographic characteristics with Knowledge regarding H1N1
5. Association between Demographic characteristics with Preventive behaviors toward H1N1
6. Association between Preventive behaviors with Knowledge regarding H1N1

4.1 General characteristics of the study subjects.

As presented in table 1, 191 subjects participated in the survey. Those in the age range 18-25 were found to be highest which numbered 109 (57.1%).26-60 with 82 (42.9%) Males were 101 (52.9%) and female 90 (47.1%).Most of them 172 (90.1%) of the subjects lived in Bangkok.14 (7.3%) in Nonthaburi and 5 (2.5%) at other places. Over 80% of the subjects had no monthly income and possibly depended solely on their parents or sponsors. 8 (4.2%) had income between 1000-10000; 17 (8.9%) had income between 11,000-20,000; 5 (2.6%) had income between 21,000-30,000; 1 (0.5%) had income between 31,000-40,000; 3 (1.6%) had income between 41,000-50,000 and 2 (1.0%) had income between 50,000-60,000.More than two third of them had no job. There were a total of 191 subjects out of 296 of the sample size. Communication Arts had 8 (4.2%); Commerce and Accountancy 16 (8.4%); Engineering 41 (21.5%); Economics 32 (16.8%); Science 12 (6.3%); Architecture 5

(2.6%); Arts 18 (9.4%); Veterinary Science 6 (3.1%); Graduate school 22 (11.5%); Education 3 (1.6%); Law 2 (1.0%); Pharmacology 5 (2.6%); Political Science 8 (4.2%); public health 13 (6.8%).Majority of the subjects were in the master degree programs which numbered 102 (53.4%) followed by Bachelor degree 68 (35.8%) and PhD 21 (11%) .

Their nationalities were grouped into developing and developed countries. The researcher used World Bank 2008 GN1 Per Capita as a guide and classified all nationalities with income less than $11,906 as developing and those with income from $11,906 and above (high income countries) as developed. The classification is in accordance with the work done by Khan et al. (2009) on H1N1 pandemic. Most of the subjects 119 (62.3%) came from developing countries while the rest 72 (37.7%) came from developed countries. From the distribution in table 5, 173 (90.6%) were single while 18 (9.4%) were married. None of the subject was a widow. Over half (56%) of them were admitted in 2009 and more than half (53.4%) were in the master level programs. About 94% of them did not visit a doctor. There were 54 (28.3%) of the subjects that had illness in the past 2 months while 137 (71.7%) had not. Over 90% of them had been vaccinated of H1N1.Only 17 (8.9%) traveled or returned from another country during the period.

Table 1: Socio Demographic Characteristics Distribution of the Subjects

Socio-demographic Characteristics	Number	Percent
Age		
18-25	109	57.1
26-60	82	42.9
Sex		
Male	101	52.9
Female	90	47.1
Nationality		
Developing	119	62.3
Developed	72	37.7
Marital Status		
Single	173	90.6
Married	18	9.4
Residential Place		
Bangkok	172	90.1
Nonthaburi	14	7.3
Other places	1	2.6

Table 1: Contd.

Socio-demographic Characteristics	Number	Percent
Monthly Income		
No Income	155	81.2
1000-10000	8	4.2
11000-20000	17	8.9
21000-30000	5	2.6
31000-40000	1	0.5
41000-50000	3	1.6
51000-60000	2	1.0
Employment		
Yes	37	19.4
No	154	80.6
Faculty		
Communication Arts	8	4.2
Commerce and Accountancy	16	8.4
Engineering	41	21.5
Economics	32	16.8
Science	12	6.3
Architecture	5	2.6
Arts	18	9.4

Table 1: Contd.

Socio-demographic Characteristics	Number	Percent
Veterinary Science	6	3.1
Graduate Schools	22	11.5
Education	3	1.6
Law	2	1.0
Pharmaceutical	5	2.6
Political Science	8	4.2
Public Health	13	6.8
Study Level		
Bachelor	68	35.6
Master	102	53.4
PhD	21	11.0
Year Admitted		
2005	2	1.0
2006	8	4.2
2007	19	9.9
2008	55	28.2
2009	107	56.0
Illness Episode	8	4.2
Did not visit a Doctor	179	93.7

Table 1:Contd.

Socio-demographic Characteristics	Number	Percent
Have Experienced illness in the past 2 months		
Yes	54	28.3
No	137	71.7
Fever	20	10.5
Headache	26	13.6
Pain or Pressure	7	3.7
Runny Nose	25	13.1
Sore throat	16	8.4
Cough	22	11.5
Eye Irritation	5	2.6
Tiredness	18	9.4
Vaccinated against H1N1		
Yes	13	6.8
No	178	93.2
Ever stayed and Returned from a country in the past 2 weeks	17	8.9
Mexico	1	0.5
USA	3	1.6
Canada	0	0

Table 1: Contd.

Socio-demographic Characteristics	Number	Percent
Costa Rica	0	0
UK	2	1.0
France	0	0
Spain	0	0
Italy	0	0
Other countries	11	5.8

As shown in table 2, most of the subjects received information regarding H1N1 from more than one source; those that received from TV were 154 (80.6%), newspapers were 146 (76.4%), posters 120 (62.8%), handbills 68 (35.6%), friend 89 (46.6%) and health personnel 73 (38.2%).

Table 2: Sources of Information regarding H1N1

Source	Number (yes)	Percent
TV	154	80.6
Newspapers	146	76.4
Posters	120	62.8
Handbills	68	35.6
Friend	89	46.6
Health Personnel	73	38.2

From the distribution in table 3, most of the subjects 169 (88.5%) responded that H1N1 is spread by coughing or sneezing. 14 (7.3%) disagreed with that, and 8 (4.2%) were not sure if H1N1 is spread by coughing or sneezing. More than half of them responded that one cannot get H1N1 by sharing towels, glasses, phones, door knobs with infected person. There were 109 (57.1%) of the subjects said that one cannot get H1N1 infection from eating raw pork,63 (33%) said yes and 19 (9.9%) were not sure. More than two third of them responded that not only people that travel can get H1N1. It was found that 75 (39.3%) of the subjects said H1N1 spread was higher and faster than H5N1,74 (38.7%) said no and 42 (22. %) of the subjects were not sure and 26 (13.6%) said that H1N1 symptoms is different from that of H5N1.Nearly all the subjects responded that regular hand washing protects one from getting H1N1 infection,19 (9.9%) disagreed with that and 6 (3.1%) were not sure.122 (63.9%) said that H1N1 is preventable by vaccination where as 29 (15.2%) said no and 40 (20.9%) were not sure. Over 70% of the subjects said that inadequate information can increase spread of H1N1 while others said no and some were not sure. Most of the subjects (60.7%) responded that air conditioner can help spread of H1N1 in the classroom, over half of them said that eating a healthy diet can boost immune system to resist H1N1 infection and less than 25% disagreed that Exercise can boost immune system while 21.5% were not sure.

Table 3: Knowledge of the Subjects about H1N1

	[n (%)]		
Characteristics	**Yes**	**No**	**Not Sure**
H1N1 is spread by person to person through coughing or Sneezing with affected person	169 (88.5)	14 (7.3)	8 (4.2)
Cannot get H1N1 by sharing towels,glasses,phones,door knobs with affected person	57 (29.8)	110 (57.6)	24 (12.6)
Risk of H1N1 from eating pork	63 (33.0)	109 (57.1)	19 (9.9)

Table 3: Contd.

Characteristics	Yes	No	Not Sure
Only People that travel can get H1N1	26 (13.6)	155 (81.2)	10 (5.2)
Sick persons with chronic diseases have high risk	121 (63.4)	26 (13.6)	44 (23.0)
H1N1 is more severe than H5N1	75 (39.3)	42 (22.0)	74 (38.7
Symptoms of H1N1 are similar to that Seasonal flu	164 (85.9)	13 (6.8)	14 (7.3)
Washing hands well regularly with soap protects	166 (86.9)	19 (9.9)	6 (3.1)
Covering a nose when coughing or Sneezing prevents spread	67 (35.1)	100 (52.4)	24 (12.6)
H1N1 is preventable by Vaccine	122 (63.9)	29 (15.2)	40 (20.9)
Inadequate Information can increase spread	138 (72.3)	20 (10.5)	33 (17.3)
Air conditioner helps spread in the classroom if flu suspects are in the room	116 (60.7)	34 (17.8)	41 (21.5)
Sharing Spoons cannot increase spread	50 (26.2)	103 (53.9)	38 (19.9)
Eating a healthy diet can help prevent it	104 (54.5)	48 (25.1)	39 (20.4)
Exercise can prevent H1N1	104 (54.5)	46 (24.1)	41 (21.5)

Most of the subjects; 85 (44.5%) rubbed or cleaned their hands with alcohol sometimes. 49 (25.7%) did often, 13 (6.8%) did always and 44 (23%) did not rub or clean their hands with alcohol. About 42% of the subjects washed their hands with soaps daily for 20 seconds sometimes, 41 (21.5%) did often, 40 (20.9%) did always and 30 (15.7%) did not wash their hands well with soap for 20 seconds daily during H1N1 outbreak. Less than half of them sometimes cleaned or disinfected their door knobs, hard surfaces, telephones and bags daily. About 37% of them covered their nose daily with mask sometimes when sneezing, 15.2% of them did cover often, 16.8% did always and 31.4% never covered their nose when sneezing. Less than half of them never covered their mouths daily with mask when coughing. More than half of them never took time off during study to avoid catching H1N1, 30.4% of them did sometimes, and 9.4% often took time off while only 3.7% did that always. Over two third of them never visited a clinic or hospital during the outbreak and 26.7% experienced flu like symptoms sometimes and over 60% never experienced flu like symptoms. Those that did not go to social events weekly and 37.2% that went sometimes were much greater than those that went often and always. Most of the subjects, 113 (59.2%) received information sometimes, 34 (17.8%) received often, 13 (6.8%) received always while 31 (16.2%) never received information during H1N1outbreak as shown in table 4.

Table 4: Preventive Behaviors of the Subjects on Hand Washing, Mask, Health Status/Services and Information toward H1N1

	[n (%)]				
Characteristics	**Never**	**Sometimes**	**Often**	**Always**	**Mean**
Rubbed or Cleaned hands well with alcohol	44 (23.0)	85 (44.5)	49 (25.7)	13 (6.8)	2.16
Washed hands well with soap daily	30 (15.7)	80 (41.9)	41 (21.5)	40 (20.9)	2.48
Cleaned or disinfected					1.72
daily doorknobs	87 (45.5)	79 (41.4)	17 (8.9)	8 (4.2)	
Hard Surfaces	87 (45.5)	72 (37.7)	23 (12.0)	9 (4.7)	1.76
Telephones	88 (46.1)	70 (36.6)	25 (13.1)	8 (4.2)	1.75
Bags	87 (45.5)	72 (37.7)	26 (13.6)	6 (3.1)	1.74
Covered my nose daily with a mask when sneezing	63 (33.0)	69 (36.1)	31 (16.2)	28 (14.7)	2.13
Covered my mouth daily with a mask when coughing	60 (31.4)	70 (36.6)	29 (15.2)	32 (16.8)	2.17
Have taken time off study/work to avoid catching H1N1	108 (56.5)	58 (30.4)	18 (9.4)	7 (3.7)	1.60
Visit Clinic/hospital monthly because of H1N1	149 (78.0)	31 (16.2)	7 (3.7)	4 (2.1)	1.30
Experience Flu like symptoms monthly	123 (64.4)	51 (26.7)	11 (5.8)	6 (3.1)	1.48
Went to Social events weekly	77 (40.3)	71 (37.2)	31 (16.2)	12 (6.3)	1.88

Table 4:contd.

Characteristics	[n (%)] Never	Sometimes	Often	Always	Mean
Went for Sports weekly	73 (38.2)	68 (35.6)	31 (16.2)	19 (9.9)	1.98
Met friends weekly	57 (29.8)	70 (36.6)	38 (19.9)	26 (13.6)	2.17
Ate out weekly	55 (28.8)	64 (33.5)	47 (24.6)	25 (13.1)	2.22
Received enough Information regarding H1N1	31 (16.2)	113 (59.2)	34 (17.8)	13 (6.8)	2.15

From the distribution in table 5, most of the students 120 (62.8%) ate moderate nutritive food.31 (16.2%) ate slightly nutritive food, 27 (14.1%) ate very nutritive food; 3 (1.6%) ate extremely nutritive food and 10 (5.2 %) did not eat nutritive food at all during H1N1 outbreak. Over 40% 0f the subjects got tired slightly during H1N1outbreak. 56 (29.3%) were moderately tired, 25 (13.1%) got very tired; 2 (1%) were extremely tired and 22 (11.5%) did not get tired at all. About half of the subjects had difficulties with sleeping during H1N1 Outbreak. 53 (27.7%) had slight difficulty with sleeping, 34 (17.8%) had moderate difficulty while 8 (4.2%) and 1 (0.5%) found sleeping very and extremely difficult respectively. Most of the Subjects, 78 (40.8%) never did aerobic exercise .Some of them, 54 (28.3%) did moderately, 43 (22.5%) did slightly; less than 10% did much and extreme aerobic exercise during H1N1 outbreak as presented in table 29. About half of the subjects said that their classrooms were moderate clean, 46 (24.1%) said it was slightly clean, 36 (18.8%) and 6 (3.1%) said it was well and extremely clean respectively. Most of the subjects 83 (43.5%) said their homes were moderately clean, 47 (24.6%) said it was slightly clean, 41 (21.5%) said it was very clean. 10 (5.2%) said it was extremely clean and 10 (5.2%) said it was not clean at all. Most of the subjects, 85 (44.5%) responded that their classrooms were slightly ventilated, 60 (31.4%) responded that theirs was moderately ventilation, 13 (6.8%) and 2 (1%) said it was well and extremely

ventilated respectively while 31 (16.2%) said there was no ventilation at all, most of the subjects, 75 (39.3%) responded that their homes were slightly ventilated. 56 (29.3%) responded that moderate, 20 (10.5%) said it was well ventilated and 40 (20.9%) said no ventilation at their homes at all.

Table 5: Preventive Behaviors of the Subjects on Food, Stress, Exercise and Environment regarding H1N1 in the past 2 months

	[n (%)]					
Characteristics	**Not at all**	**Slightly**	**Moderately**	**Very**	**Extremely**	**Mean**
Ate a lot of food	17 (8.9)	43 (22.5)	104 (54.5)	24 (12.6)	3 (1.6)	2.75
Had Nutritive food	10 (5.2)	31 (16.2)	120 (62.8)	27 (14.1)	3 (1.6)	2.91
Got tired	22 (11.5)	86 (45.0)	56 (29.3)	25 (13.1)	2 (1.0)	2.47
Had difficulties with sleeping	95 (49.7)	53 (27.7)	34 (17.8)	8 (4.2)	1 (0.5)	1.78
Did Aerobic exercise	78 (40.8)	43 (22.5)	54 (28.3)	13 (6.8)	3 (1.6)	2.06
Did Vigorous exercise	102 (53.4)	41 (21.5)	33 (17.3)	13 (6.8)	2 (1.0)	1.81
Other games	82 (42.9)	45 (23.6)	42 (22.0)	16 (8.4)	6 (3.1)	2.05
Classroom Cleaning	16 (8.4)	46 (24.1)	87 (45.5)	36 (18.8)	6 (3.1)	2.84
Classroom Spacing	9 (4.7)	49 (25.7)	88 (46.1)	41 (21.5)	4 (2.1)	2.91
Home Cleaning	10 (5.2)	47 (24.6)	83 (43.5)	41 (21.5)	10 (5.2)	2.97
Ventilation in the Classroom	31 (16.2)	85 (44.5)	60 (31.4)	13 (6.8)	2 (1.0)	2.32
Ventilation at home	40 (20.9)	75 (39.3)	56 (29.3)	20 (10.5)	0 (0)	2.29

4.2 Level of Knowledge regarding H1N1 Distribution of the Subjects

All subjects showed moderate and high level of knowledge. Though there was a low category during analysis but none had low level of knowledge. Generally, among the subjects 121 (63.4%) had high level of knowledge and 70 (36.6%) had moderate level of knowledge as presented in table 6.

Table 6: Knowledge Level

Level of Knowledge	Number	Percent
Moderate	70	36.6
High	121	63.4
Total	191	100.0

4.3 Level of Preventive Behavior Distribution of the Subjects.

Generally, 157 (82.2%) had moderate level of preventive behaviors; 28 (14.7%) and 6 (3.1%) had high and low respectively as shown in 7.

Table 7: Preventive Behavior Level

Preventive Behavior Level	Number	Percent
Low	6	3.1
Moderate	157	82.2
High	28	14.7
Total	191	100.0

4.4 Association between Demographic Characteristics and Knowledge regarding H1N1.

As presented in table 8, except sex there were no significant association between other demographic characteristics and the knowledge of the subjects regarding H1N1.

Table 8: Association between Demographic Characteristics and Knowledge regarding H1N1

Demographic Characteristics	Chi Square Value	df	P value
Age	0.584	2	0.747
Sex	**12.998**	**1**	**<0.001**
Residing Place	2.211	1	0.137
Nationality	2.787	1	0.095
Marital Status	0.94	1	0.759
Employment	0.351	1	0.553
Monthly Income	0.006	1	0.941
Faculty	3.256	1	0.071
Level	4.420	2	0.110

There was a high significant association between sex and knowledge of the subjects regarding H1N1 (p value < 0.001) as shown in table 9.

Table 9: Association between Sex and Knowledge regarding H1N1

Level of Knowledge	Male	Female	Total	Chi Square	df	P value
Moderate	49 (70%)	21 (30%)	70 (100%)			
High	52 (43%)	69 (57%)	121(100%)	12.998	1	<0.001
Total	101(52.9%)	90(47.1%)	191(100%)			

4.5 Association between Demographic Characteristics and Preventive Behaviors toward H1N1

As shown in table 10, there were no significant associations between their demographic characteristics and preventive behaviors toward H1N1

Table 10: Association between Demographic Characteristics and Preventive Behaviors toward H1N1

Demographic Characteristics	Chi Square Value	df	P value
Age	1.78	1	0.673
Sex	1.323	1	0.250
Residing Place	0.22	1	1.000
Nationality	0.372	1	0.542
Marital Status	0.064	1	0.732
Employment	1.778	1	0.182
Monthly Income	2.028	1	0.154
Faculty	0.669	1	0.413
Level	0.171	1	0.679

4.6 Association between Preventive Behaviors and Knowledge regarding H1N1

From the Distribution in table 11, there were significant between some preventive behaviors and knowledge regarding H1N1 (P value < 0.05).

Table 11: Association between Preventive Behaviors and Knowledge regarding H1N1

Characteristics	Chi Square	df	P value
Preventive behavior level (low, moderate & high)	0.098	1	0.754
Received Enough Information regarding H1N1	**5.274**	**1**	**0.022**
Covered nose with mask when Sneezing	**5.127**	**1**	**0.024**
Covered my mouth with mask when coughing	0.102	1	0.749
Classroom Cleaning	**4.386**	**1**	**0.036**
Home Cleaning	2.478	1	0.175
Classroom Ventilation	0.925	1	0.336
Home Ventilation	1.824	1	0.177

The amount of information they received during H1N1 outbreak was highly significant (p value =0.022) as shown in table 12.This showed that the amount of information they received had something in common with their knowledge regarding H1N1.

Table 12: Association between Enough Information with Knowledge regarding H1N1

Level of Knowledge	Never Enough Information	Enough Information	Total	Chi Square	df	P value
Moderate	17 (24.3%)	53(75.7%)	70(100%)			
High	14 (11.6%)	107(88.4%)	121(100%)	5.274	1	0.022
Total	31 (16.2%)	160(83.8%)	191(100%)			

How much they covered their nose when they sneezed had a high association with their knowledge regarding H1N1 (P value =0.024) as presented in table 13.

Table 13: Association between Covered my nose with Mask when sneezing with Knowledge regarding H1N1

Level of Knowledge	Did not Cover Nose	Covered Nose	Total	Chi Square	df	P value
Moderate	16 (22.9%)	54(77.1%)	70(100%)			
High	47 (38.8%)	74(61.2%)	121(100%)	5.127	1	0.024
Total	63 (33.0%)	128(67.0%)	191(100%)			

From the distribution in table 14, their classroom cleaning had a significant association with their knowledge regarding H1N1 (P value = 0.036).

Table 14: Association between Classrooms Cleaning with Knowledge regarding H1N1

Level of Knowledge	Not Clean Classroom	Clean Classroom	Total	Chi Square	df	P value
Moderate	2 (2.9%)	68(97.1%)	70(100%)			
High	14 (11.6%)	107(88.4%)	121(100%)	4.386	1	0.036
Total	16 (8.4%)	175(91.6%)	191(100%)			

CHAPTER V

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Discussion

The research –Assessment of Knowledge and Preventive Behaviors against Influenza A H1N1 among International students at Chulalongkorn University was a cross sectional study. It focused on the demographic data, knowledge (independent variables) and preventive behaviors (dependent variable) of the subjects toward H1N1.

The tool for the data collection was self-administered questionnaire which was pretested with satisfactory Cronbach Alpha reliability test score. The data was collected between Feb.27 – March 18 2010.Descriptive statistics and chi square of SPSS 17 were used for the analysis.

5.1.1 General Characteristics

More than half of the subjects were in the age range 18-25 (57.1%) and 26-45 (42.4%). Males were (52.9%) and females (47.1%).About 90% of the subjects live in Bangkok.62% of them came from developing countries and 37.7% came from developed (high income) nations.

About 91 % of the subjects were single, most them (81.2%) had no income; some of them (8.9%) had income in the range 11,000-20000 baht. Only a percent had income between 50,000-60,000 baht. Over 80% of them were unemployed.

Among the 14 faculties that participated in the survey, Engineering had the highest number with 21.5% followed by Economics with 16.8%, graduate school (11.5%); Arts (9.4%) Commerce and Accountancy (8.4%) and public health with 6.8%.The rest came from other 8 faculties.

More than half of subjects were in the master degree programs. About 72% of them had no illness in the past 2 months. Over 90% of them had not received H1N1 vaccination. Nearly 90% of them responded that H1N1 is spread by coughing or sneezing. About 57% responded that there was no risk of H1N1

from eating raw pork. Communicators should provide more information to them on the pathogenic nature of H1N1. About 40% of them responded that H1N1 is severe than H5N1, some of them (38.7%) were not sure. Over 80% knew that regular hand washing protects one from getting H1N1 infection. Most of the subjects (63.9%) responded that H1N1 is preventable by vaccine. Over 70% of them knew that inadequate information can increase spread of H1N1.Many of them obtained information regarding H1N1 from more than one source, from television were 80.6%,newspapers(76.4%) and Posters were 62.8%.

About 42% of the subjects washed hands well with soap for 20 minutes daily sometimes. Among those that rubbed or cleaned hands with alcohol, 44.5% did that sometimes. Most of them (40.3%) never attended social events and about 38% did not go for sports weekly. Nearly 60% received enough information weekly. Regarding their food, 62.8% ate moderate nutritive food. Nearly half of them did not have difficulty with sleeping. Their classrooms were moderately clean for 45.5% and about 44% of them had moderate clean homes. Over 40% had a slightly ventilated classroom. Their homes were moderately ventilated for 39.3% and about 21% of them had no ventilated homes.

5.1.2 Knowledge and Preventive behavior Levels regarding H1N1.

There were three categories for each. However, none of the subjects had low level of knowledge. They had high (63.4%) and moderate (36.6%) levels of knowledge .For their preventive behavior, over 80% of them had moderate preventive behavior and nearly 15% had high preventive behavior and only 3.1% had low preventive behavior.

5.1.3 Association between Demographic Characteristics and Knowledge regarding H1N1

There were no significant association between almost all the demographic characteristics and knowledge. Only sex had association with a high significant p value <0.001.The study done in Germany by Alpers et al.(2009) where mainly females with average age of 23 were infected of

H1N1,that possibly heightened their knowledge more than males since enough information regarding H1N1 was received. Females at 57% had high level of knowledge than males and male at 70% had moderate level of knowledge than female (30%).

5.1.4 Association between Demographic Characteristics and Preventive Behaviors toward H1N1.

None of the demographic characteristics had a significant association with preventive behaviors toward H1N1.

5.1.5 Association between Knowledge and Preventive Behaviors toward H1N1

Enough information they received daily about H1N1 was significant (P value 0.022).That showed that 88.4% of them with high knowledge were able to receive enough information regarding H1N1 daily than 75.7% that had moderate level of knowledge. This is consistent with internet survey on information regarding H1N1 influenza by Pandey A, et al. (2010) who stated that adequate dissemination of information about H1N1 Influenza can help decrease the disease in the population. These results suggest that public health communicators had some success in preventing confusion and in conveying a consistent set of comprehensive messages which is in confirmation with study conducted by James Rubin et al. (2009).

They covered their nose with masks when sneezing was significant with knowledge (P value 0.024).Those (77.1%) with moderate knowledge covered their nose with mask when sneezing than 61.2% with high knowledge. This result is consistent with findings of Cowling B.J et al. (2010) who stated that emphasis on wearing mask during illness may help to reduce virus transmission.

Their classroom cleaning also had a significant association with knowledge (p value 0.036). The subjects (88.4%) with high knowledge had clean classrooms than 97.1% with moderate. Cleaning using capable cleaning agents are capable of destroying H1N1 viral genome (Greatorex et al.; 2010).

5.2 Conclusion

Influenza A (H1N1) which was detected in Mexico is currently the greatest pandemic disease threat to human. At present, pandemic (H1N1) 2009 has been spreading rapidly. Following the increase in number of cases in Thailand, It was paramount to assess the level of knowledge and Preventive behaviors of International students at Chulalongkorn University Bangkok Thailand toward H1N1.

The median age of international students was 25.Most of them was single, living in Bangkok and had no income. Their knowledge about H1N1 differed among sex with females having high knowledge than males. They were able to receive enough information daily because of their knowledge regarding H1N1.Possibly, because most of them knew that inadequate information regarding H1N1 can increase its spread. They mainly received information from television; newspapers and posters. More than half of them were receiving information weekly. Those with moderate knowledge were able to cover their nose when sneezing. Almost all of them knew that H1N1 is sprayed by coughing or sneezing. Some washed their hand with soap for 20 seconds daily sometimes. Hand hygiene is highly effective in reducing Influenza A virus on human hand. Those with high knowledge had clean classrooms.

Many of them had moderate preventive behavior. Their high and moderate knowledge possibly could be based on the efforts the university had made through its task force, surveillance centre and their cleaning campaigns for public places. This study will help in preventing performance impairment that might result from the Influenza among students. Communication efforts should be intensified and there should be emphasis on the preventive behaviors and risk of the disease.

5.3 Recommendation

Public health behaviors should be promoted in preparation for future disease outbreaks as responses to a pandemic are subject to change in its stages.

Systematic decontamination of work surfaces (seats, doorknobs faucet handles) at intervals at by the cleaning staffs at school and by the students at their homes.

Use of inexpensive and readily available active cleaning agents would minimize cost and still be effective. Efforts should be heightened to promote preventive behaviors.

Encourage students to get vaccinated where available. Live attenuated vaccine may have greater potential for producing constitutional symptoms like headache, sore throat and nausea and is contradicted in immune-compromised patients those with asthma, cystic fibrosis and some heart related diseases.

5.4 Future Research Suggestions

A study to monitor their preventive behaviors over time would be helpful to understand if their behaviors are permanent or if there could changes and factors that might contribute to such changes.

In depth study on factors influencing their preventive behaviors such as why many of them were unable to clean or disinfect door knobs, hard surfaces, telephones and their bags daily. A study to find out factors hindering them from doing vigorous exercises. The Effect of Ventilation patterns in reducing spreading of HIN1 in the classrooms.

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APPENDICES

APPENDIX A

PRETEST SCORE

Reliability Statistics

Cronbach's Alpha	N of Items
.783	43

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
88.53	136.395	11.679	43

Item-Total Statistics

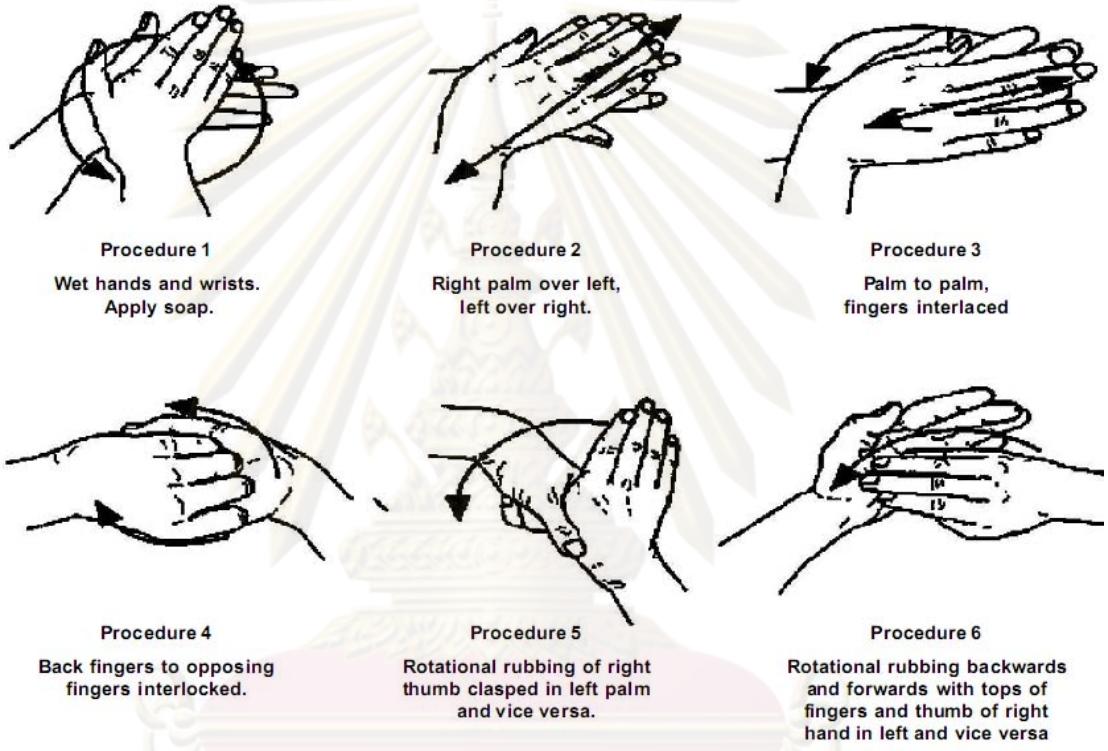
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
H1N1isspreadbycoughingorsneezing	86.63	140.999	-.498	.792
cannogeH1N1bysharingtowelsglassestelephones doorknobs	87.33	128.368	.619	.770
ThereisriskofH1N1fromeatingpork	87.27	133.168	.157	.781
OnlypeoplethattravelabroadcangetH1N1	87.43	134.530	.250	.780
SickpersonswithchronicdiseaseshavehighriskofgettingH1N1	87.13	139.154	-.173	.793
H1N1ismoreseverethanH5N1	87.33	129.885	.268	.778
Thesymptomsaresimilartoseasonalflusuchasfever headachecough	86.73	136.892	-.065	.786
Coveringnosemouthwhencoughingorsneezingcan notpreventtheapread	87.13	133.982	.188	.781
WashinghandsregularlyisthewaytoprotectH1N1infection	86.77	131.978	.314	.777
InfluenzaAH1N1ispreventablebyvaccination	87.20	130.648	.278	.777
InadequateInformationcanincreasespreadofH1N1	87.30	129.390	.304	.776
AChelpsreduceitsspreadifsuspectedpeopleareintheroom	87.07	134.823	.047	.785

SharingspoonscannotincreasespreadofH1N1	87.40	131.628	.275	.778
EatingahealthydietsuchasvegetablescanhelpyouppreventH1N1	86.97	135.620	.020	.785
ExercisecanpreventyougettingH1N1	87.13	132.947	.161	.781
RuborcleanhandswellwithalcoholdailyRuborcleanhandswellwithalcoholdaily	86.43	129.082	.325	.776
washmyhandswellwithsoapfor20secondsdaily	86.10	134.369	.039	.788
Cleanordisinfectdoorknobsdaily	86.47	122.326	.660	.762
hard surfaces	86.20	125.407	.515	.768
telephone	86.33	123.609	.641	.764
bag	86.37	123.137	.644	.763
TopreventH1N1covermynosedaily	86.03	132.723	.129	.783
Covermydaily	86.07	134.340	.032	.789
HavetakentimeoffstudyorworktoavoidcatchingH1N1	86.57	126.944	.392	.773
VisitclinicorhospitalbecauseofH1N1monthly	86.90	127.610	.420	.772
Experienceflulikesymptomsmonthly	86.53	133.361	.091	.785
DuringH1N1Igotosocialeventsweekly	86.27	127.306	.425	.772
goforsportsweekly	86.27	129.720	.269	.778
meetingfriendsweekly	86.03	135.689	-.011	.789
eatingoutweekly	86.03	133.689	.084	.785
IreceiveenoughinformationregardingH1N1weekly	86.20	128.855	.521	.772
EatalotoffoodduringH1N1	85.73	131.168	.195	.781
Hownutritiveisthefoodyoueat	85.37	133.964	.090	.784
Howeasilydoyougetired	86.20	134.166	.085	.784
HavedifficultieswithsleepingduringH1N1	86.73	125.444	.446	.770
Doaerobicexercise	86.17	126.833	.338	.775
vigorousexercise	86.17	125.247	.391	.772
othergames	85.87	125.844	.334	.775
Classroomcleaning	85.50	129.845	.269	.778
Classroomspacing	85.40	130.800	.247	.779
Homecleaning	85.23	125.840	.473	.770
Ventilationinyourclassroom	86.20	127.959	.364	.774
Ventilationatyourhome	86.20	135.062	.015	.788

APPENDIX B

Hand washing procedures

This figure shows the correct way to wash hands to avoid getting an infection by hand to nose or hand to mouth transmission.



Note: Repeat procedures 1-6 until the hands are clean. Rinse hands and pat dry.

APPENDIX C

Time Schedule

Work plan	Time period (month)					
	Sept	Dec	Jan	Feb	March	April
Literature review						
Proposal writing and submission						
Proposal exam						
Ethical consideration from the college						
Pretest questionnaires						
Field preparation and data collection						
Data analysis						
Thesis and report writing						
Thesis exam and final submission						

APPENDIX D

Budget

No	Activities	Cost
1	Pre-test	
	Tools Development	500
	Travel Cost	1000
2	Data Collection	
	Photocopying Questionnaire	1000
	Interviewers per diem	3000
	Transportation cost	2000
	Cost for Communication-tel,fax etc.	2000
	Typing	2000
3	Data Entry and Processing	2000
4	Document Printing	
	Paper + Printing	4,000
	Photocopy (exam+ final submit)	2,500
	Stationery	1000
	Binding Paper (exam)	1000
	Binding Paper (Submit)	1500
	Souvenir for Respondents	2000
5	Report Writing	3,000
6	Publication	3,000
	Miscellaneous	1500
	Total	**30,000**

APPENDIX E

Informed Consent

Number:

Assessment of Knowledge and Preventive Behavior against Influenza A (H1N1) among International Students at Chulalongkorn University Bangkok Thailand

I am Melvin Ngozi Omelihu, a Master of Public Health student at the College of Public Health Sciences Chulalongkorn University. I am doing a research on Knowledge and Preventive Behavior against Influenza A (H1N1) among International Students at Chulalongkorn University Bangkok Thailand.

I am hereby requesting you to participate in this study. Without compulsion, I would interview you as you agree. I hope the information you will provide will help in planning programs that would be of benefit to you.

Any information to be obtained from you will be kept confidential. Your personal details will not be mentioned neither will it be identified in any report. You are also free to withdraw at any time. You are also free to ask any questions during the interview or even have some discussions.

…… ……..

Respondent Name of Interviewer

…….. …….

Place/Date Place/Date

APPENDIX F

Questionnaire

Number .....

Date of Interview .....

Assessment of Knowledge and Preventive Behaviors against Influenza A(H1N1) Among International Students at Chulalongkorn University

Section 1: Socio-demographic Information

1. Name**.....**

2. Age..... 3. Sex ☐ Male ☐ Female 4. Current Address 5. Nationality.....**.....**

6. Marital status ☐ Single ☐ Married ☐ Widow 7. Monthly Income .....THB

8. Current occupation ☐ Student
Faculty……
……
Bachelor ☐
Master ☐
PhD ☐
Year Admitted
……
☐Employee
☐Unemployed
Other.....
.....

9. Illness episodes ☐ No ☐Yes, What illness.....When diagnosed .....year

Did you visit a doctor? ☐ No ☐ Yes

Vaccinated against H1N1 already ☐ Yes ☐ No

10. Have you experienced illness in the past 2 months?

☐ No ☐Yes ☐ Fever ☐ headache ☐ Pain or pressure in the chest or abdomen ☐ Runny nose

☐ Sore throat ☐ Cough ☐ Eye irritation ☐ Tiredness

11. Have you ever stayed or returned from the following countries in the past 2 weeks?

☐ No ☐ Yes (specify below)

☐ Mexico ☐ USA ☐ Canada ☐ Costa Rica

☐ UK ☐ France ☐ Spain ☐ Italy ☐ Other.....

Section 2: Knowledge about H1N1

Details		Yes	No	Not sure
2.1	H1N1 is spread from person to person through coughing or sneezing by people with influenza			
2.2	You cannot get H1N1 by sharing towels, glasses, telephones, door knobs with the affected person			
2.3	There is a risk of H1N1 infection from eating raw pork.			
2.4	Only people that travel abroad can get H1N1			
2.5	Sick persons with chronic diseases have high risk of getting H1N1			
2.6	H1N1 is more severe than H5N1(Avian flu)			
2.7	The symptoms of H1N1 are similar to the seasonal flu such as fever, headache and cough			
2.8	Washing hands well and regularly with soap is the way to protect H1N1infection			
2.9	Covering a nose or mouth when coughing or sneezing cannot prevent spread of H1N1			

2.10	Influenza A (H1N1) is preventable by vaccination			
2.11	Inadequate Information can increase spread of H1N1			
2.12	Had received information on how to prevent H1N1 from: (please tick any or all you do) a. TV b. newspapers c. posters d. handbills e. friend f. health personnel			
2.13	Air conditioner (AC) in the classroom helps the spread of H1N1 if people suspected of flu are in the room.			
2.14	Sharing spoons cannot increase spread of H1N1			
2.15	Eating a healthy diet such vegetables can help you prevent H1N1			
2.16	Exercise can prevent you from getting H1N1			

Preventive behaviors regarding H1N1

Section 3: Hand washing, mask, health status/services and Information

For this section, Never=0, Sometimes= 1-2 times, Often= 3-5 times, Always=6 and above

		Never 1	Sometimes 2	Often 3	Always 4
3.1	I rub or clean hands well with alcohol to protect myself daily from catching H1N1				
3.2	I wash my hands well with soap for 20 seconds daily				
3.3	I clean or disinfect daily things that I might touch such as: (please tick any or all you do) a. doors knobs b. hard surfaces c. telephone d. bag				
		1	2	3	4
3.4	To prevent H1N1 transmission, I have daily to: a. cover my nose with a mask when sneezing b. cover my mouth with a mask when coughing				
3.5	I have taken time off study or work to avoid catching H1N1 infection				
3.6	I visit clinic/hospital because of H1N1 monthly				
3.7	I experience flu like symptoms monthly				
3.8	During H1N1 weekly I go to: (please tick any or all you do) a. social events b. sports c. meeting friends d. eating out				
3.9	I receive enough information regarding H1N1 weekly				

Section 4: Food, Stress, Exercise and

Environment regarding H1N1 in the past 2 months

		Not at all 1	Slightly 2	Moderately 3	Very 4	Extremely 5
4.1	Do you eat a lot of food during H1N1?					
4.2	How nutritive is the food you eat?					
4.3	How easily do you get tired?					
4.4	Do you have difficulties with sleeping during H1N1?					
4.5	How much exercise do you do? (please tick any or all you do) a. aerobic exercise b. vigorous c. other games specify……					
4.6	How healthy is your physical environment? (please tick all) a. classroom cleaning b. classroom spacing c. home cleaning					
4.7	How poor is the ventilation? (please tick both) a. in your classroom b. at your home					

VITAE

Name Mr. Melvin Ngozi Omelihu

Date of Birth 15 June 1981

Place of Birth Nigeria

Education

2008	Food Hygiene Officer (FHO) certificate. Singapore.
2006	Health, Safety &Environment (HSE) Supervision Certificate (Shell Accredited) NISP, Nigeria.
2004	Higher National Diploma in Environmental Health (Upper Credit) West Africa Health Examinations Board (WAHEB).
2000-2004	Higher National Diploma in Environmental Health School of Health Technology Aba Nigeria.
2000	Overseas General Certificate of Standard Education USA.

Experience

Currently	Board Member, Semcon Friends Mission Hospital And Motherless Babies Home Obingwa Aba Nigeria.
2006-2007	Part time Lecturer, School of Health Technology Aba Nigeria.
2003-2004	Member, Education Sub-committee Aba South Local Govt. Nigeria.
2003-2004	President, NAEHSN Abia State Nigeria.