PUBLIC KNOWLEDGE, PERCEPTION AND FACTORS ASSOCIATED WITH THE 2009 H1N1 SWINE INFLUENZA VACCINATION:

A literature review

Jean de Dieu Bizimana

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JYVÄSKYLÄN AMMATTIKORKEAKOULU
JAMK UNIVERSITY OF APPLIED SCIENCES

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Tutor(s)

Irmeli Katainen and William Garbrah

Assigned by

JAMK University of Applied Sciences, School of Health and Social Studies

Abstract

The purpose of this study is to analyze public knowledge, perception, and factors associated with the 2009H1N1 swine influenza vaccination. The aim is to contribute to evidence based practice, so that the results of the study could be used for adopting and implementing strategies against pandemics.

Based on search words, twelve articles were selected for the study. The articles came from Pub Med, Google Scholar, other online magazines as well as from Library databases. These articles were analyzed and synthesized for the study results.

The results of the study show that the majority of publications perceived the threat of contracting the disease as harmless despite having enough knowledge about the pandemic. Other preventive measures were considered as being more important than the vaccine as its safety was not clear in the consumers' mind. Future research should concentrate on the use of media and how the public can be provided with sufficient and efficient information regarding their health in general, especially when it comes to pandemics.

Keywords

Public knowledge, public perception, 2009 H1N1 swine influenza pandemic, 2009 swine influenza vaccination

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Abstrakti

Tämän opinnäytetyön tarkoitus on analysoida 2009H1N1-sikainfluenssan rokotteeseen liittyviä kansan keskuudessa vallitsevia tietoja ja käsityksiä. Tutkimuksen tavoitteena on edesauttaa näyttöön perustuvia käytänteitä niin, että tutkimustuloksia voitaisiin käyttää luomaan ja toteuttamaan strategioita taistelussa pandemioita vastaan.

Tutkimusta varten valittiin tiettyjen hakusanojen perusteella yhteensä 12 artikkelia. Lähteinä olivat Pub Med, Google Scholar sekäeri verkkojulkaisut ja kirjastojen tietokonnat. Artikkelien valinnan jälkeen tehtiin artikkelien analyysi ja synteesi.

Tutkimustulokset osoittavat, että valtaosa osallistujista piti tartunnan saamisen riskiä alhaisena, vaikka heillä oli riittävästi tietoa pandemiasta. Muita ennaltaehkäisyn keinoja pidettiin rokotetta tärkeämpinä, koska ihmisillä ei ollut selkeää kuvaa rokotteen turvallisuudesta.

Jatkossa tutkimuksen pitäisikeskittyä tiedotusvälineiden käyttöön ja siihen, miten ihmisille voitaisiin taata riittävät ja tehokkaattiedot koskien heidän terveyttään yleisellä tasolla ja erityisesti silloin, kun kyse on pandemiasta.
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Avainsanat
Tieto, käsitykset, 2009H1N1 sikainfluenssapandemia, sikainfluenssarokote

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1 INTRODUCTION

The 2009 strain of H1N1, commonly known as “swine influenza”, shook the world making its vaccination planning and implementation a priority for health authorities. After all, the virus exhibited rapid changes and it ended up causing the loss of many lives. It broke up in the USA and it spread worldwide like any other type of flu. (CDC, 2010)

On 22 February 2010, the Center for Disease Control (CDC) drafted and published a guide to follow and fight against the pandemic. The target groups for vaccination included pregnant women and anyone aged 6 months through24 years, and such people aged from 25 through 65 years who have certain chronic health conditions or compromised immune system (WHO, 2009). The information about the 2009 H1N1 swine influenza vaccine was made available in clinics, healthcare offices, schools and other private settings. The 2009 H1N1 swine influenza was known to spread from one person to another through cough, and the vaccination was the only effective measure to decrease the spread of the disease. While the vaccination was being processed, public acceptance remained relatively uncertain. (CDC, 2009)

Based on existing literature, the purpose of this study is to analyze public knowledge, perception, and factors associated with the 2009H1N1 swine influenza vaccination. The aim is to contribute to evidence based practice, so that the results of the study could be used for adopting and implementing strategies against pandemics.

2 BACKGROUND

2.1 The build-up of the emergency alert of the pandemic

"On April 29th 2009, the World Health Organization (WHO) declared that the rapid spread of a new swine origin strain of influenza was moving the global flu pandemic alert level to Phase 5. Phase 5 indicates sustained human-to-human transmission of a novel influenza strain of animal origin. Since its outbreak, the new swine influenza H1N1 virus has infected thousand of people worldwide and caused loss of lives. This new influenza outbreak is commonly referred to as the 2009 H1N1 swine flu pandemic" (WHO, 2009).

On March 8, 2010, Center for disease control (CDC) released key facts surrounding the 2009 H1N1 swine flu vaccine. Like any other vaccine, the 2009 H1N1 swine influenza vaccine was approved by the FDA (Food and Drug Administration). It was approved to be safe to human and effective against the virus causing swine influenza. (CDC, 2010)

In most situations, pregnant women are regarded to be prone to any diseases due to their weaker immunity. The CDC recommended that the late were the first group of people to be targeted during the 2009 H1N1 swine influenza vaccination. It was also recommended that healthier people and children above 10 years of age will be required to only receive one shot of the upcoming vaccine. According to the CDC, being healthy was not to be an excuse to refuse the vaccine as it was discovered that among those who were admitted because of the threat, 30% were previously healthy.

2.2 Vaccines, their myth, roles and coverage

The causes of some pandemics/infectious diseases remain unclear. Humans and animals have enjoyed the existence of vaccines but how these are received seems not effective. During the time of our ancestors before the existence of vaccines and effective treatments, pandemics/infectious diseases were graded to be the most killers. Fortunately these so called infectious diseases have been controlled and eliminated for good in most developed countries following the availability of safe, effective and affordable vaccines. Despite the availability and access to preventive and effective therapies, these are still challenges in developing countries. Regardless the appraisal given to vaccines, new infections have

overtaken the progress made. Vaccines are well known to be a powerful medical tool that poses powerful biological, social, political and cultural reaction. (Health affair, 24 (2005), 611-621)

Vaccination is a stepping stone of a better health. Vaccines are there to stimulate the body immunity and hence making it stronger against illnesses and death secondary to infectious diseases. Prevention is better than cure and the public health is based on disease prevention. It is not understood why the vaccine is not acknowledged when a threat is eradicated but once a vaccine-related disease occurs, we all stand and conclude that the vaccination caused the disease or increased its stubbornness. Within the past five decades, the world has been encountering regular influenza, which has killed many more people than H1N1 in 2009. During the last episode of the 2009H1N1 Swine influenza, many people were reluctant to get the shot following a campaign of fear and misinformation. The vaccine was being blamed for many bad things from causing harmful side effects to being used as a means to implant citizens with tracking devices. According to an interview from post on "You Tube", the whole flu virus vaccine is a conspiracy and a scandal.
There have been names, rumors and gossip, public reactions, exaggeration even scandal about the pandemic to be specific on the vaccination issue. Misconception came up as a result of misinformation enhanced by those with more accountable and least knowledge about the pandemic (Lynch, 2009).

The benefits and risks associated with vaccination should be communicated in advance to ensure that the vaccination coverage remains high. The CDC advises vaccination against 17 preventable diseases (Diphtheria, Haemophilus influenza b (Hib), Hepatitis B, Measles, Meningitis, Mumps, Neonatal Tetanus, Pertussis, Poliomyelitis, Rotavirus, Rubella and CRS, Tetanus, Tuberculosis, Yellow fever, Influenza and Pneumococcal pneumonia) that can occur at any stage of life. During vaccination, health workers and the public face numerous issues and it is important that these are handled before, during and after vaccination. The government has a task to educate the public about the vaccine and we have to put in mind that an unwanted sequence following a vaccine administration does not mean failure. The CDC recommends that the public is informed in a language that is culturally sensitive and that questions and concerns are taken care of as they arise. It is important that health providers are aware of the public concern to effectively address the

vaccine safety. Vaccination benefits can be graded as partial or complete protection against infections. (CDC, 2009)

If preventable disease cannot be controlled before they occur, they result into hospitalization and end up into premature and unwanted death. Preventable and communicable diseases can only be eliminated if the vaccination coverage is high and factors for non-compliance are known and rectified on time. A number of factors, such as lack of knowledge about the vaccination, unavailability of health services, fear of the vaccine and poor health during the vaccination period, are known to be some of the causes of non-compliance to the vaccination program. In order to have high results in terms of vaccination coverage, it is wise to have solutions to what might be the barriers to vaccination. Determining priorities and intervention planning should focus on the public information about the vaccination (CDC, 2009).

2.3 2009 H1N1 influenza history

Gatherer (2009) says that the influenza virus has been in existence since the 14th century but it was not well-known until the 18th century. The earliest and worst influenza was the Spanish Flu, which contributed to a loss of about 40 million people worldwide. He continues by adding that this flu originated from birds and that its global distribution was aggravated by the military movements during the First World War. Gatherer (2009) also confirms that the H1N1 existed as a regular seasonal influenza from the 1930s to the 1950s. Since then it disappeared but reappeared in 1977-1978. He recalls that during its disappearance, the world was hit by two other viruses; the Asian Flu H2N2 which caused the loss of 1, 5 million lives and the Hong Kong Flu H3N2 with 1 million loss of lives worldwide. (Journal of Clinical Virology, 45(2009), 174-178)

Meers (2009) also confirms the existence of H1N1 flu since 1918. He adds that while World War 1 killed 20 million people in four years, the virus did the same in its four months of occurrence. Following the swine flu outbreak in 1976 in the U.S.A, its vaccination was recommended to everyone. During the same period of vaccination, a report alleged that some people contracted Guillain Barre Syndrome due to the vaccination, and as the news spread, the people who were to be vaccinated lost trust in the vaccine as well as government and medical officials. (Career education 2009, 20-27)

2.4 Swine influenza origin, transmission and policy makers response

Before an outbreak can be recognized as an outbreak, the virus circulates for months among the affected population, as it was with the 2009 swine influenza, which began in a Mexican state called Veracruz (McNeil et al. 2009). While the Mexican government tried to take measures to contain the pandemic, it bounced to the neighboring countries, and hence, spread worldwide (WHO, 2009). Figure 1 demonstrates where the pandemic started and different actions following the outbreak and how various countries responded to it. CDC (2010) adds that the new virus, which appeared in April 2009, is of hybrid genes from the seasonal swine flu and avian flu, and that it does not spread through pork products. The novelty of the 2009 swine influenza came under debate after the WHO had stated that *"the pandemic (H1N1) 2009 is a new influenza virus that has never circulated among humans before".* Its transmission is the same as the one of seasonal influenza and people have no immunity against it. Following its transmission from person to person, it is clear that its spread had put the international public health at risk. According to Fraser et al. (2009), one infected person with 2009H1N1 swine influenza can easily infect other two susceptible individuals.

As the pandemic continued to spread, the health policy makers worldwide were trying to put all the efforts together to stop it. These efforts were nothing else but the use of antiviral, new vaccine development and putting in action the international health regulations (IHR). According to WHO, the aims of IHR are " to help the international community prevent and respond to acute public health risks that have the potential to cross borders and threaten people worldwide".

Despite all the efforts to fight against the pandemic, the public did not welcome them all (Spiegel, 2010).

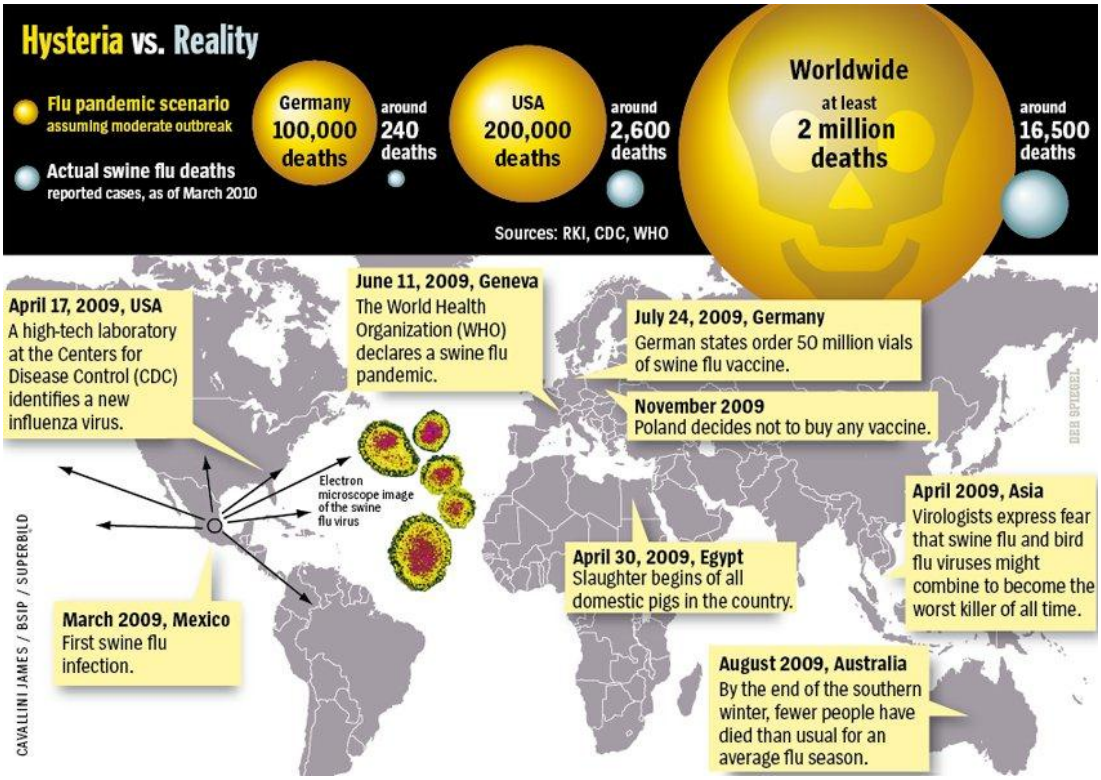


Figure 1: Outbreak of panic (source: Der Spiegel)

3 PURPOSE, AIM OF THE STUDY

Base on existing literature, the purpose of this study is to analyze public knowledge, perception, and factors associated with the 2009H1N1 swine influenza vaccination. The aim is to contribute to evidence based practice, so that the results of the study could be used for adopting and implementing strategies against pandemics.

The study questions are therefore as follows:

- What is the public knowledge on the 2009 H1N1 swine influenza?

- What are the public perceptions surrounding the 2009H1N1 swine influenza?

- What are the factors associated with the 2009 H1N1 Swine Influenza vaccination?

4 METHOD

The method of this study is that a literature review employs certain principles and it is cumulative in a way that it is historically belt. A systemic review is there to identify, select, assess, synthesize and interpret studies and their findings (Hemingway & Brereton 2009, 1-6). A systemic review through synthesizing results of more than one study gives strong evidence base than what one study would do. Once phases of conducting a systemic review have been followed, it is easy to avoid mistakes and allow the review to be repeated later on if needed. A systemic review implies a research plan and the research methods help in defining the research questions. The aim of the review is explained by the study questions. (Centre for Review and Dissemination 2009)

In the field of health, a systemic review is there to enhance the professional practice, its intervention in order to improve clinical outcome through evidence based tools. It allows the review to be reanalyzed in the future. The purpose of the research questions is there to determine the goal of the review and the questions are holistically and objectively answered. Conclusions have to be made according to reported results. (Hemingway & Brereton 2009, 1-6)

4.1 Literature search, criteria and article selection and analysis

The reviewer searched for relevant literature in June, 2011 to January, 2012 from among free online database such as Pub Med, Google Scholar, online magazines, Library database, Reporters and others like Videos, Organizations. Manual search was not part of the search. Articles dated from 2009 to January, 2012 were included. Online free full texts were chosen to be used for the research. The search was internet. The process used to select articles is demonstrated on Appendix 1.

Articles were chosen within the time specified above; step by step and above criteria were followed in choosing the right articles. Based on key search, the articles were to address the topic about public knowledge, perception and factors associated with the 2009H1N1 swine influenza vaccination. Following the key words, available free articles were

browsed and chosen for further triage. During the search; through Pub Med, 356 articles were browsed; 2791 articles were found on Google Scholar; 33 articles were found online based magazines, three articles from library database and nine articles from other sources**(**YouTube; Reporters ; PLoS ONE**)**. Such articles that did include the word "public" but which according to their abstract/or introduction, were not related to the study questions were omitted. Only 12 articles were found to meet the study questions and therefore they were chosen for the analysis. Of the articles used for the study, 5 were dated of the year 2009 and the other 7, the year 2010 and 2011. Four studies used "a cross sectional survey"; two used "online questionnaires"; one used "a focus group study" and other two studies used "a telephone survey".

The research studies have been analyzed in regards to the following steps: each article was summarized, relationship between articles was sought out, gaps in articles used for the research were highlighted, possible awareness and arguments between articles had to be studied and compared, and finally the review was linked to the purpose of the research to be carried out. The analysis of what is common between the articles helps to narrate the approach within the articles using a textual approach. Having a general overview of the chosen articles, it helps to make an analysis between them. The central idea and basic information in regards to articles used is described on appendix 2. The research questions and its purpose help to get data from the used articles. Therefore, the results are presented in a narrative way. Having differences and similarities between the used articles, generalization can be made. (Centre for Review and Dissemination 2009)

5 RESULTS

Looking at the description below, the general overview result in all studies shows that the majority of their participants perceived the threat as harmless; perceived the vaccine to be safe; had fear against the pandemic; did not know anything about the vaccine before it being put on the market; had heard about the pandemic; refused the vaccine because of its safety and preferred to take up other preventive measures instead of the vaccine. On the other hand the minority of the participants in all the studies refused the vaccine for fear of side effects and intended not to receive the vaccine.

5.1 Public knowledge on 2009 H1N1 swine influenza pandemic

The study reviewed that the public had good general knowledge related to previous pandemics but knowledge about the pandemic in question was lacking. Appendix 3 describes what kind of knowledge was among the public during the pandemic. Enough public knowledge about the pandemic was observed among the majority of participants in the studies done by Van et al. (2010) and Purssell & While (2010) studies. Knowledge about the pandemic mode of transmission was still unclear among the participants in Kanadiya et al. (2010) study. Hand washing and maintaining hygiene principles were the best methods known to prevent the threat from spreading (Kiviniemi et al. 2011; Fisher et al. 2010; Kanadiya et al. 2010). The participants' comprehension about the vaccine was poor (Arda et al. 2011, Fisher et al. (2010). Education and employment exposed people to knowing about the pandemic. Male had more knowledge compared to females. The older one was the more knowledge as seen in their studies. (Kamate et al. 2010) and (Rubin et al. 2009)

5.2 Public perception on 2009H1N1 swine influenza pandemic

How the threat is perceived contributes to its vaccine acceptance. There was a mixture of feelings about the 2009swine influenza pandemic as described on appendix 4. On one side the threat was looked to be serious and threatening while other looked at it to be mild with no harm. Few participants; in studies used for the research; expressed anxiety among others parents who have young children.

In their study (Henrich & Holmes 2009), healthy food and strong immunity were conceived as key factors in fighting the threat. Seale et al. (2010); Purssell & While (2010) and Henrich & Holmes (2009) and Eastwood et al. 2010find that the majority of the participants perceived the threat as mild with no harm contrary to Kanadiya et al. (2010) study whose participants were not sure about the measures to contain the threat. On the other hand, the danger of the threat and its impact on human health were being felt among the participants in the study done by Arda et al. (2011); Seale et al. (2010); Kamate et al. (2010); Rubin et al. (2009) and Van et al. (2010). Fisher et al. (2010) found that the ma-

jority of their participants perceived the vaccine to be safe before reaching them even though some claimed to know nothing about it. Kiviniemi et al. (2011) say that in their study the vaccine was not the first choice as it was regarded not to be effective. Henrich & Holmes (2009) add that their participants believed more in eating health food and having a strong immunity to protect them from acquiring the infection.

5.3 Factors associated with 2009H1N1 swine influenza vaccination

Vaccine acceptance

The 2009 H1N1 swine influenza vaccination was not welcome as seen in the studies used for the research (Appendix 5). A good number of factors were seen to be key principles in accepting its vaccine. It was found that the previous seasonal influenza vaccination was one of the reasons why people would accept the 2009 H1N1 swine influenza vaccine (Seale et al. 2010; Arda et al. 2011; Schwarzinger et al. 2010; Van et al. 2010 & Eastwood et al. 2010). The participants were willing to accept the vaccine if the pandemic was to become severe as Fisher et al (2010); Henrich & Holmes (2009); Purssell & While (2010) say. In their studies, Seale et al. (2010) and Arda et al. (2011) find that age played a role in those who were willing to receive the vaccine as the younger the respondent the higher chances to accept the vaccine. Pregnant women and those with chronic illnesses (e.g.: diabetes, COLD) had higher chances to accept the vaccine say Schwarzinger et al (2010). If pressed by the authority, the majority of participants were willing to accept the vaccine, report Van et al (2010). Kamate et al. 2010 say that their participants rated the vaccine to be the most effective preventive method to contain the spread of the threat. Eastwood et al. 2010 also add that those who regarded themselves prone to get the infection were willing to be vaccinated.

Vaccine denial

The common underlying reasons and unwillingness to get the shot were about the vaccine safety, its unknown side effects and secondary illnesses (appendix 5). Seale et al. (2010) report that the participants were concerned about the vaccine safety as they claimed that the vaccine was not well studied before it being used while Arda et al. (2011); Schwarzinger et al. (2010) and Henrich & Holmes (2009) report about the fears surround-

ing its safety and side effects. Fisher et al. (2010) report that despite the fear to get secondary illnesses from the vaccine; the participants thought that the vaccine was not needed. While others were reporting about fears, Kiviniemi et al. (2011) say that the participants were not seeing the efficacy of the vaccine they were called to receive. Surprisingly, Schwarzinger et al. (2010) report that gender was another problem as females were less willing to accept the vaccine compared to males.

Public preferred prevention methods

Even though the vaccine was more recommended than any other methods, it was a public choice to make informal decision on what to follow and what to neglect. At least in all the studies, the participants preferred to adopt one or two methods related to behavioral changes during the pandemic (Appendix 6). Hand washing was the main adopted behavior and avoiding sick people, reducing contact with public places and facial masks were among the preferred methods to prevent the spread of the threat (Kamate et al. 2010, Fisher et al. 2010, Kiviniemi et al. 2011). Kanadiya et al. (2010) say that race played a role as the white people were more likely to follow the preventive behavioral measures than any other race. While the majority of participants in other studies were willing to follow the preventive behavioral changes, participants in Purssell& While (2010) and Kamate et al. 2010 studies were not.

6 DISCUSSION

"Anticipating, educating and informing are the keys to reducing the deadly effect of pandemics. Unfortunately such activities have not been given priority" (UNESCO, 2005). Networking with the public might seem unnecessary, but it is the best way to correctly assess risks and appropriate lessons as well as incite its support for the ongoing programs in a holistic and comprehensive manner. Changes can be seen only if people involved are putting efforts together to bring up changes. The only way knowledge can be transformed into action is by those instantly affected and vulnerable to the pandemic. There is need for mutual dialogue between the policy makers and the public for strong partnership in order to implement successfully and contextually appropriate initiatives.

Public knowledge

With knowledge, the public is able to establish the wastes and possible actions to alleviate them. According to the results, it is clear that the public had not enough knowledge about the 2009H1N1 swine influenza pandemic; its vaccine and effects to health. In the articles used for the study, it has not been that the government or health officials engaged themselves in giving out information regarding the pandemic. The study reviews that the public pandemic knowledge was not other than the existing knowledge about previous pandemics. The level of knowledge is explained on appendix 3, how and what the public knew about the pandemic. During pandemics, it is important to acknowledge that information plays a key role in raising awareness among the public such as students, teachers, parents and the community as a whole. During the pandemic, the vaccine safety messages and prevention methods were lost and there is need to implement new techniques to disseminate information (Kanadiya et al., 2010). Awareness can be done through different ways such as campaigns, media, special events, formal public education. The information should be carefully given out as it may cause harm than bringing gain (Arda et al, 2011). Despite the mildness of the 2009 H1N1 influenza flu, there is always need for educating the public and encourage them to keep up and follow up the health practice advices (Van et al. 2010).

Public perception

Perception leads to decision making which can be regarded as action. The study results give an insight on how the public perceived the 2009H1N1 swine influenza pandemic. It is undisputable that the public was not aware about the pandemic danger as noticed in the articles used for the study. How the pandemic was perceived is seen by the public actions during the vaccination programs or how the public adopted lifestyle changes (Appendix 4). The way people reason; understand things; solve problems or learn new things is improved by the accumulated knowledge. Once perception is strategically used, it shows better ways to recognize, express and use its diverse forms to upcoming progress. The public ability in analyzing pandemic risks related can be mobilized by linking its knowledge with ongoing responses. During the 2009 H1N1 swine influenza pandemic, the study reviews that the public should

have been looked as an equal partner to increase its response into planning and programs. By providing information to the public about disasters and their prevention, people can become more diligent in their efforts to prevent and combat the spread of diseases.

Vaccine acceptance and denial

Informed and meaningful decision can be made if the public can understand the meaning of past experiences. The main issue about people refusing the vaccine was mounted on its safety as the majority denied receiving the shot. According to the study findings, the public had good reasons to refuse the vaccine as the information it had and how it was being communicated, greatly affected its decision making. Information about the vaccine benefits, risks and safety was lacking among the general public following the media, government officials, public health authority outcry about the pandemic and its vaccine. Despite the availability of the antiviral drugs and the vaccine, the public was not helped with options to make informed decisions and its fears and concerns were not addressed in any way (appendix5). We can only see change if people involved are collectively putting endeavor together to work out change. During pandemics, the public should be looked at as an equal partner to increase its safety by integrating its knowledge into planning and programs. Benefits should sound greater than the risks and these should be communicated in advance.

7 CONCLUSION

Pandemics are still a danger to the society to be precisely the whole world and it seems unclear when it comes to their management. Despite the world efforts to combat these pandemics, the lives of people are still at stake. Even though there are no technical solutions to avoid pandemic risks, if the public can be mobilized and used appropriately, it can become a good source of strength in combating pandemics negative impacts. Therefore, it is a necessity to empower the public with measurable and efficient information regarding pandemics. The media has to be strategically used as teaching tools rather than using it to bring confusion. How the message is designed, transmitted, interpreted and

perceived can hinder or have an influence on common preventive action such as vaccination. Health messages should be available at all the time and factors to non-compliance should be targeted and dealt with as they arise. Promoting a good understanding of factors needed in the emergency; prevention and containing of a health threat should be looked at, considered and investigated at large and fullest. The past should not be left out as it provides a clue on what was done, what is to be done, changed or improved. The study brought an insight on how public remains vulnerable during the pandemics. In a way of maintaining trust when it comes to tackling pandemics, the current policy makers should serve the public with clear and consistent knowledge centered on practical things in order to reduce risks to its health.

8 STUDY LIMITATIONS, RELIABILITY AND FUTURE RESEARCH

The study might have some limitation due to the fact that only few articles on the 2009 H1N1 swine influenza were used for the research. The extensive the search, the easier it becomes to minimize the literature search bias related. Studies used for the research had to be in English to avoid language bias though it is hard to avoid mistakes during the process of making a literature review (Center for Review and Dissemination, 2009). Having done the review, the reviewer feels that the literature selection and synthesis can not be enough reliable since they were based on one's judgment. Therefore it is possible that the above can affect the review reliability. However, with a study plan followed with articles thoroughly selected to meet the study questions it has been possible to mount the study validity and reliability.

Nevertheless, the future research should concentrate much on the use of media and how the public can be empowered with enough and efficient information regarding its health in general especially when it comes to pandemics like the 2009 H1N1 swine influenza. Another area of research is to look at how the vaccine novelty and the scientific excellence can be determined to meet the people concerns.

REFERENCES

Arda B., Durusoy R., Yamazhan T., Sipahi O. R., Tasbakan M., Pullukcu H., Erdem E. &Ulusoy S. 2011. Did the pandemic have an impact on vaccination attitudes? A survey among health workers BMC Infectious diseases. Accessed on 20.6.2011 http://www.ncbi.nlm.nih.gov/pubmed

Center for Disease Control and Prevention. 2009. The 2009 H1N1 Pandemic: Summary Highlights, April 2009-April 2010. Accessed on 19.6.2011 Http://www.cdc.gov/h1n1flu/cdcresponse.htm

Center for Disease Control and Prevention. 2009. Vaccine against 2009H1N1 Influenza Virus. Accessed on 21.6.2021 Http://www.cdc.gov/h1n1flu/vaccination/public/vaccination_qa_pub.htm

Center for Review and Dissemination. 2009. Systematic Review-CDR's guidance for undertaking reviews in health care. Accessed on 26.6.2011Http://www.york.ac.uk/inst/crd/systematic_reviews_bookk.htm

Eastwood K., Durrheim D.N., Jones A. &Bulte M. 2011; Acceptance of pandemic (H1N1) 2009 influenza vaccination by the Australian Public, MJA: 192: 33-36. Accessed on 5.7.2011.http://www.ncbi.nlm.nih.gov/pubmed

Fisher G. K. S., Blendon R. J., Bekheit M. M. &Lubell K. 2010. The public response to the 2009 H1N1 Influenza Pandemic.The New England Journal of Medicine.Accessed on 7.7.2011.Http:/www.nejm.org/doi/full/10.1056/NEJMp1005102

Frazer C.et al., 2009. Pandemic potential of a strain of influenza A (H1N1): Early findings. Accessed on 29.8.2011.Http://www.sciencemag.org/content7324/5934/1557.short

Gatherer D. 2009.The lessons of past pandemics: the 2009H1N1 influenza outbreak in its historical context, Journal of Clinical Virology", 45: 174-178. Accessed on 15.4.2011 Download.thelancet.com/flatcontentassets/H1N1-flu/surneillance/surveillance-24.pdf

Hemingway P. & Brereton N. 2009. What is a systemic review? Accessed on 20.4.2011.http://www.medicine.ox.ac.uk/bandolier/painres/download/whatis/Syst-review.pdf

Henrich N. & Holmes B. 2009.Emerging Health Threats Journal 2009, the public's acceptance of a novel vaccine during a pandemic: a focus group study and its application to influenza H1N1; Emerging Health Threats Journal.Accessed on 2.9.2011. Http://www.eht-journal.net

Kamate S.K., Agrawal A., Chaudhary H., Singh K., Misshra P., Asawa K. 2010. Public knowledge, attitude and behavioral changes in an Indian population during the Influenza A (H1N1) outbreak. Emerging Problems in Infectious Diseases; The Journal of Infection in Developing Countries, Vol 4, No 01. Accessed on 22.8.2011.Http://www.jidc.org

Kanadiya M. K. &Sallar A. M. 2010: Preventive behaviors, beliefs, and anxieties in relation to the swine flu outbreak among college students aged 18-24years. Journal of Public Health, Volume 19, Number2, 139-145. Accessed on 15.7.2011. Http: //www.springerlink.com

Kiviniemi M. T., Rama P. K., Tkozlowski L., Smith K. M. 2011. Perception and willingness to engage in public health precautions to prevent 2009 H1N1 influenza transmission BMC Public Health 2011.Accessed on 5.11.2011.Http://www.biomedcentral.com/content/pdf/1471-2458-11-152.pdf

Link: http://www.youtube.com/watch?v=AHur7u13woc accessed on 11.4.2011

LYNCH J. *2009:* Health officials working against H1N1 vaccine myths. *Sammamish Reporter Editor*.Accessed on 11.4.2011.http://www.kirklandreporter.com/news/67053707.html?period=W&mpStartDate=01-14-2011

Meers G. 2009. Using the H1N1 Flu Outbreak as a Learning Tool; Career education Page 20-27.Accessed on 17.5.2011. http://www.workforce-com.com/cer/docs/CareerEducationReview_Meers1009.pdf

McNeil Jr., Donald G. 2009. *"In New Theory, Swine Flu Started in Asia, Not Mexico". New York Times.* Accessed on 18.4.2011http://www.nytimes.com/2009/06/24/health/24flu.html

News Network for the United Nations and the International Community: Influenza Pandemic Alert Raised to level 5: WHO Director-General Dr Margaret Chan 29/04/2009. Accessed on 10.7.2011.Http://www.maxmnews.com/news20090430whoswineflucat510904300101.html

Purssell E. & While A. 2010.Knowledge about pandemic in health care and non-health care students in London; Health Education Journal Online First.Accessed on 10.10.2011.Http://www.hejsagepub.com/content/70/2/217.abstract

Rubin G.J., Amlot R., Page L., Wessely S. 2009. Public perception, anxiety and behavior change in relation to the swine flu outbreak. King's College London, Institute of Psychiatry, Department of Psychological Medicine, Weston Education Center, LONDON, BMJ Accessed on 6.9.2011.Http://www.ncbi.nlm.nih.gov/pubmed

Schwarzinger M., Flicoteaux R., Cortarenoda S., Obadia Y., Moatti J.P. 2010: Low Acceptability of A/H1N1 Pandemic Vaccination in French Adult Population: Did Public Health Policy Fuel Public Dissonance? PLoS ONE.Accessed on10.7.2011.http://www.plosone.org/article/info:doi/10.1371/journal.pone.0010199

Seale H., Heywood A. E., McLaws M.L., Ward K. F., Lowbridge C. P., Van D. &Maclntyre C. R 2010 . "Why do I need it? I am not at risk! Public perceptions towards

the pandemic (H1N1) 2009 vaccine BMC Infectious Diseases.Accessed on 23.8.2011.Http://www.ncbi.nlm.gov/pubmed

Selene C.W. H. 2010. Uses of news narratives to enhance health knowledge of the audience: an analysis of the 2009 H1N1 flu vaccination. Accessed on 12.5.2011 http://digitallibrary.usc.edu/assetserver/controller/item/etd-Hu-3322.pdf

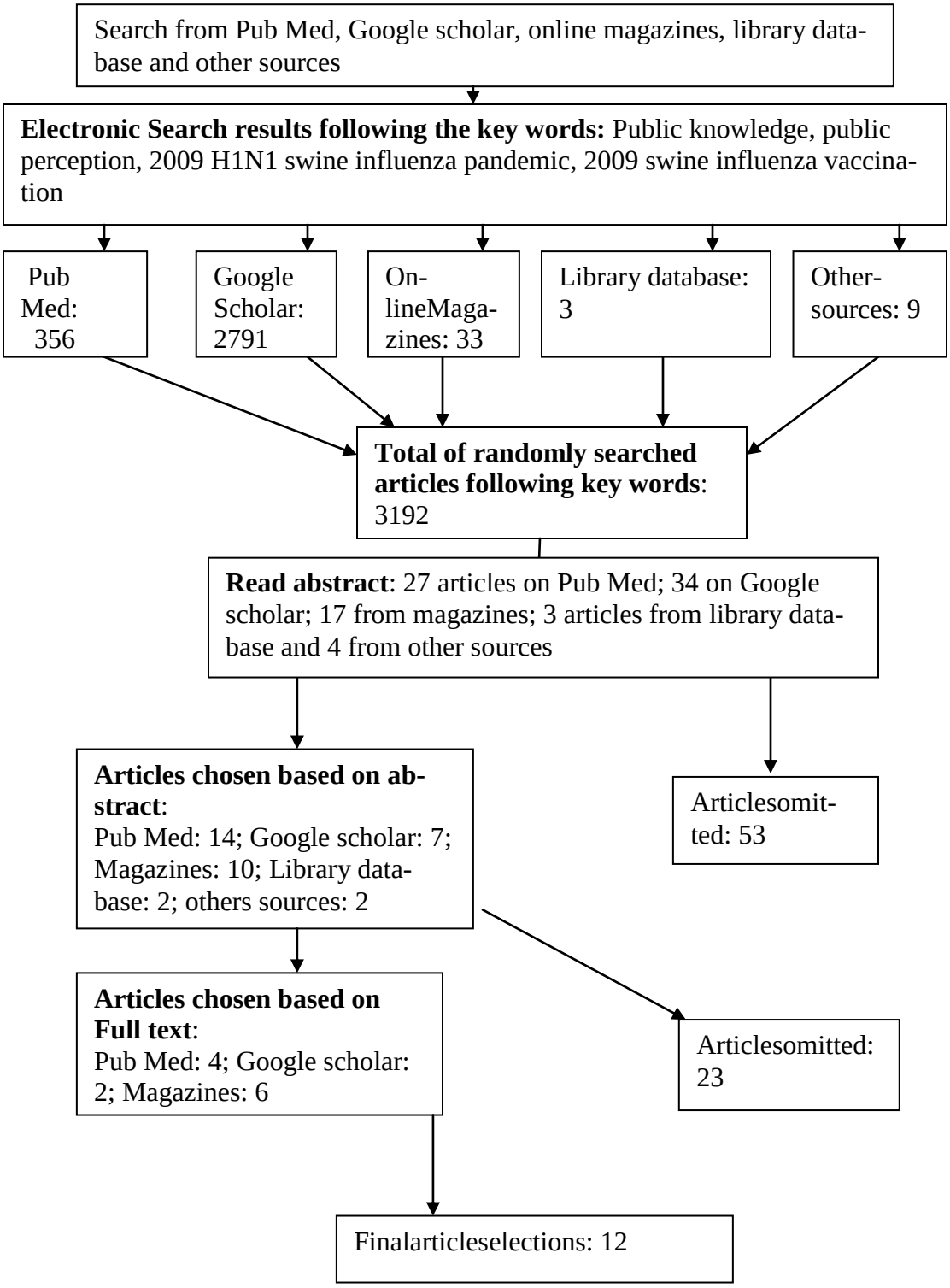
Van D., McLaws M.L., Crimmins J., MacIntyre C. R. & Seale H. 2010. University life and pandemic influenza: Attitudes and intended behavior of staff and students towards pandemic (H1N1) 2009. Accessed on 20.4.2011. Http://www.biomedcentral.com/1471-2458/10/130

Spiegel D. 2010.The wine Flu Panic if 2009.Accessed on 15.11.2011.http://www.spiegel.de/international/world/0,1518,682613-2,00.html

Sterm A. M. & Markel H. 2005. The history of Vaccines and Immunization: Familiar Patterns, New Challenges, Health Affairs, 24, no. 3: 611-621. Accessed on 1.11.2011.Http://content.healthaffairs.org/content/24/3/611.full

APPENDIXES

Appendix 1: literature search and article selection



Appendix 2: Articles included in the study review

Authors/Country/year	Purpose/Aim	Methods	Study/targetgroup	Findings
Seale, Heywood, McLaws, Ward, Lowbridge, Van &Maclntyre. Australia/2010	Public risk perception, intended protective behavioral changes, willingness to be vaccinated.	Cross section intercept survey	Members of public in the shopping and pedestrian (10 years and above) 627 Australian subjects	Most of participants did not believe to be at risk.
Kanadiya&Sallar. U.S.A/2010	Assess beliefs, misconception and anxiety in relation to swine flu outbreak and whether the perception predicted changes in behavior	Internet-based cross- sectional study	College student aged between 18-24 years. 263 Midwestern state subjects in U.S.A	There was a gap in swine flu knowledge, minimal risk reduction, increased anxiety about swine flu vaccine safety
Arda, Durusoy, Yamazhan, OguzSipahi, Tasbakan, Pullukcu, Erdem&Ulusoy. Turkey/2011	Did the pandemic have an impact on vaccination attitudes?	Cross sectional survey with self administered questionnaire	Health workers. 807 Turkeysubjects	Vaccination rate was low secondary to the negative swine flu approach from the media
Purccell&While. U.K/2010	Knowledge about pandemic in health care and non-health care	Online questionnaire –based survey (survey monkey)	Postgraduate and undergraduate Students of the college	Despite good knowledge, Health care declined the vaccine because of its safety and side effects
Schwarzinger, Flicoteaux, Cortarenoda&Obadia, Moatti. France/2010	Low Acceptability of A/H1N1 Pandemic Vaccination in French Adult Population: Did Public Health Policy Fuel Public Dissonance?	Cross-sectionalonlinesurvey	French Adult Population aged 18 to 64 years. (2253 subjects)	The safety of the vaccine was still an issue and the attitude of health workers contributed to the refusal of the vaccine
Henrich& Holmes. Canada/2009	acceptance of a novel vaccine during a pandemic: a focus group study and its application to influenza H1N1	Focus groups to facilitate qualitative surveys	Members of the public (85 subjects from Vancouver, BC and Canada)	There was a concern about the vaccine novelty and the disease itself.
Fisher, Blendon, Bek-	response to the 2009 H1N1 Influenza Pan-	Telephone interview	Members of the public (Harvard	The public was worried about

heit, Lubell, U.S.A/2010	demic		school of public health subject)	the vaccine safety and its long term side effects
Kiviniemi, Rama, Tkozlowski&Smit.U.S.A/ 2011	response to the 2009 H1N1 Influenza Pandemic to engage in health precautions to prevent 2009H1N1 influenza transmission	Telephone survey	Public (807 adult resident of New York state)	The perception of its severity determined the willingness of the public to accept the vaccine
Van, McLaws, Crimmins, MacIntyre& Seale. Australia/2010	Attitudes and intended behavior towards pandemic (H1N1) 2009	Onlinesurvey	University staffs and students (2882 Australian subjects)	Despite the availability of information , the respondent never made any life style changes
Kamate, Agrawal, Chaudhary , Singh, Misshra&Asawa. India/ 2010	Public knowledge, attitude and behavioral changes in an Indian population during the Influenza A(H1N1) outbreak	A cross section questionnaire survey	Indian population (791 individuals)	47.4%did not have enough information about the pandemic; Knowledge differed according to gender, age, educational and working status. Facial masks and vaccines were rated to be most effective.
Rubin, Amlot, Page &Wessely. London 2009	Public perception, anxiety and behavior change in relation to the swine flu outbreak	A cross section telephone survey	998 adult population of London from 18 years and above with English skills.	The threat severity and risks of catching it were the contributing factors in complying with life style changes.
Eastwood, Durrheim, Jones&Bulte. Australia 2010	Acceptance of pandemic (H1N1) 2009 influenza vaccination	A computer - assisted telephone interview survey	1155 adult selected randomly in Australia	The threat was looked to be mild. Those who looked at it to be severe were willing to be vaccinated same as those who received the previous seasonal influ-

				enza shot

Appendix 3: Public knowledge on 2009H1N1 swine influenza pandemic

Author	**Public knowledge**
Kanadiya&Sallar 2010	The majority of their participant knew that washing hands and maintain general hygiene principles could reduce the pandemic from spreading. The mode of transmission was still unclear among the participants. Despite the less knowledge about its transmission, the majority regarded the pandemic as severe.
Arda et al. 2011	The majority of respondents did not understand the vaccine before its marketing
Purssell&While, 2010	There was a good knowledge on the pandemic and need of the vaccine among the participants.
Henrich and Holmes, 2009	Some participants showed interest in knowing the progression of the pandemic but showed no worries about it. They also blamed the media that sometime it can hype the situation for nothing.
Fisher et al., 2010	Personal hygiene and following government recommendation in preventing disease were being observed among Americans. The public confessed not to have got information from their government about the vaccine safety.
Kiviniemi et al., 2011	Hand washing was the common known method to control the infection.
Van et al. 2010	The participants had enough knowledge about the threat.
Kamate et al., 2010	Education and employment exposed people to knowing about the pandemic. Male had more knowledge compared to females. The older the age, the more knowledge as seen in their study.
Rubin et al., 2009	The availability of information about the threat and government effort helped the public to know the importance of preventive measures

Appendix 4: Public perception on 2009H1N1 swine influenza pandemic

Author	Public perception
Seale et al., 2010	Even though the majority of their participants did not see the danger of the pandemic and they perceived the threat not to be severe a small percentage thought that the threat was dangerous to their health
Kanadiya&Sallar, 2010	Despite the fear against the pandemic, the majority of participants perceived its preventive measures not to be safe.
Arda et al., 2011	The majority side of the participants perceived themselves being prone to the threat
Purssell& While, 2010	Despite good knowledge, the pandemic was perceived to be mild with no much harm.
Schwarzinger et al., 2010	The minority of participants perceived the pandemic as severe to very severe and they expressed their worries to contract the disease. Worries were also noted among parents who have young children. Health workers did not show worries for themselves.
Henrich& Holmes, 2009	Some participants perceived the pandemic to be mild and showed no fear as its spread was slow from one country to another. Eating well and having a strong immune system, were believed to be enough in preventing the disease
Fisher et al., 2010	At the beginning of the vaccination, the public believed in the vaccine safety though a 40% of participant was not sure about the safety.
Kiviniemi et al., 2011	The vaccine was looked to have fewer efficacies than hand washing.
Van et al. 2010	The majority had an idea about the pandemic and they regarded it as being serious though some of them showed no fear or interest about it. The fear died down as few cases were reported in the country. The young people hardly believed that they can get infected.
Kamate et al., 2010	Approximately 34, 5% perceived the pandemic to be serious to their health.
Rubin et al., 2009	The participants perceived the pandemic to be severe and that risks of catching it are very high.
Eastwood et al., 2010	The majority of participants perceived the pandemic to be mild and ¼ believed to be at risk of getting the infection.

Appendix 5: Factors associated with the 2009H1N1 swine influenza vaccination

Author	Acceptance	Denial
Seale et al., 2010	Those who received the seasonal influenza vaccine were likely to accept the H1N1 vaccine compared to those who did not. The younger the age, the more likely to accept the vaccine. Some participants were intending to receive the vaccine because of self protection	The vaccine denial was more associated with the fact that the vaccine was not tested adequately. The other reason was that the pandemic was seen not to be severe.
Kanadiya&Sallar, 2010		A slight % perceived the vaccine to be safe for administration and the majority affirmed not to receive the vaccine.
Arda et al, 2011	The acceptance was high among those who previously received the seasonal influenza vaccine. The age played a slight role in accepting the vaccine. The older the participants the less chances of accepting the vaccine.	The majority was scared of its side effects and the pandemic was not severe and less deadly.
Purssell&Sallar, 2010	The acceptance was associated with the severity of the threat in their surrounding.	
Schwarzinger et al., 2010	The majority would accept the vaccine for protection sake and a certain % claimed that getting vaccination was a civic duty. Pregnant women and those with chronic diseases had higher chances of accepting the vaccine. Past seasonal influenza vaccination and past H1N1 experience in the family were also contributing factors to accept the vaccine.	On the other hand, the majority would not get vaccinated because of the vaccine safety and fearing its side effects. Gender played a role as female participants were less willing to receive the vaccine compared to men.
Henrich & Holmes 2009	The vaccination decision would be based on the threat morbidity.	The vaccine safety would hinder its acceptance said the study' participants.
Fisher et al., 2010	Even though the majority was for the vaccine in words, the severity of the disease was one factor that would lead people into accepting the vaccine.	Fear of safety, side effects and secondary illnesses from the vaccine were big issues among the participants. Another factor was that some participants thought that the vaccine was not needed at that time. As the disease progression slowed down, the

		willingness to get vaccinated dropped
Kiviniemi et al., 2011		The vaccine efficacy was not clear among the participants.
Van et al. 2010	People who received the previous influenza vaccine were likely to get the H1N1 vaccine compare d to those who did not. If requested by the authority, the majority of participants were willing to comply	
Kamate et al., 2010	The H1N1 vaccine was rated to be most effective preventive measure.	
Eastwood et al., 2010	The uptake of previous seasonal influenza vaccine and the severity of the threat were the factors to accept the new vaccine.	

Appendix 6: Public preferred method during 2009 H1N1 swine influenza pandemic

Seale et al. 2010	Almost half of the participants preferred to adopt other methods such as behavioral changes to protect themselves from acquiring the infection.
Kanadiya&Sallar, 2010	Behavioral changes were more common in women than men and whites were more likely to apply preventive behavioral measures than any other races.
Purssell&While, 2010	The majority of participants were not willing to comply to preventive behavioral changes
Henrich& Holmes 2009	Another part of the group believed in personal hygiene to handle new diseases. Another idea was to use other alterative to treat the infection once acquired.
Fisher et al., 2010	Hands washing, staying home, avoiding infected people, avoiding social places and reducing contact with the outsiders were among the preferable actions to prevent the infection.
Kiviniemi et al. 2011	Avoiding sick people and washing of hand were some of the actions to stop the infection from spreading. Age played a role as the older the respondent the more willing to comply with preventive measures.
Van et al. 2010	Facial masks and hand hygiene were among the adopted lifestyle.
Kamate et al., 2010	Facial masks were rated to be most effective preventive method. The majority did not change their life style.
Rubin et al., 2009	Life style changes were affected by either the anxiety against the threat, poverty and ethnicity, age, sex,