ISSN: 0975-766X
Review Article

Available Online Through
www.ijptonline.com

A NEW VARIENT OF INFLUENZA VIRUS-H1N1 SWINE FLU VIRUS

T.Naga Veeranjaneyulu*, B.Seerishna, T.Naga Ravi Kiran, A.V.S.Madhulatha, A.Hima Bindu
Sarada College of Pharmaceutical Sciences,
Kondakavuru, Guravaiplam post, Narasaraopet(md) Guntur(dt) 522601.
Email:tnvanji@gmail.com

Received on 28-04-2011 *Accepted on 18-05-2011*

Abstract:

In 2009 a swine –origin H1N1 virus strain commonly referred as Swine flu caused the 2009 flu Pandemic. Most of the cold climatic countries affected by the disease. On average 41,000 people died each year in the U.S between 1979 and 2001 from Influenza. Influenza commonly referred to as the flu is an infectious disease caused by RNA viruses of the family Orthomyxoviridae that affects birds and mammals. This virus is mainly classified into three types 1) Influenza virus A 2) Influenza virus B 3) Influenza virus C. Swine flu belongs to the Influenza virus A(H1N1). The virus particle is 80-120 nanometers. It can be difficult to distinguish between the common cold and Influenza in the early stages of swine flu but a flu can be identified by high fever with a sudden onset and extreme fatigue. Transmitted by three main ways direct transmission, the air bone route and direct personal contact (like hand shake). As Influenza virus can persist outside the body, it can also be transmitted by contaminated surfaces such as bank notes, door knobs etc. H1N1 easily spread rarely fatal. H1N1one of the mechanisms is belived to be the inhibition of adrenocorticotropic hormone (ACTH) resulting in lowered cortisol level. Influenza viruses can be inactivated by sunlight, disinfectants and detergents. Commonly used antivirals are oseltamivir & zanamivir these are neuraminidase inhibitors and amantadine & rimantadine block a viral ion channel & prevent virus from infecting cells. Vaccines like Mono Valent Vaccines Live Intranasal, Mono Valent Vaccines for Intramuscular injection, fluzone etc

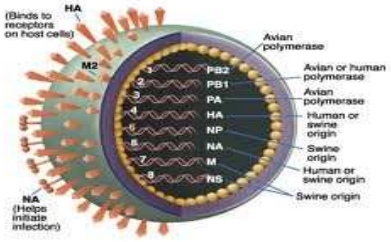
Keywords: H1N1, 2009 Pandemic, Influenza virus,Structure, Replications, Symptoms, Prevention, Vaccines(recent techniques including their side effects), Pandemics,Seasional variations.

Introduction:

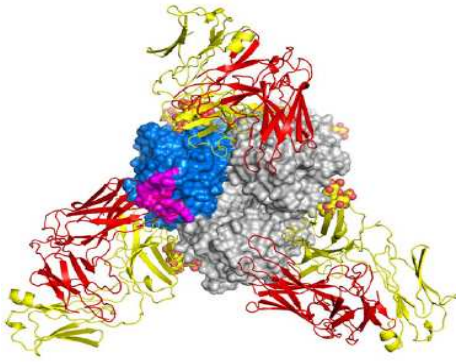
In 2009 a swine origin H1N1 virus strain commonly reffered to as “Swine Flu” caused the 2009 flu pandemic. Swine flu is a respiratory disease in pigs caused by Influenza. Swine flu is also called as Pig Influenza. Pigs can pass the illness onto humans after contact with them. Swine influenza virus is common throughout pig populations worldwide. Transmission of the virus from pigs to humans is not common and does not always lead to human influenza often resulting only in the production of antibiotics in the blood. If transmission does cause human influenza, it is called zoonotic swine flu. People with regular exposure to pigs are at increased risk of swine flu infection. The meat of an infected animal poses no risk of infection when properly cooked.

The 1918 influenza Epidemic called the Spanish Influenza strain & called as pandemic during 1918 & 1919 it is thought to have infected a third in the world population. It kills50million deaths only in U.S That 93 old virus hasn`t been killed

Structure:

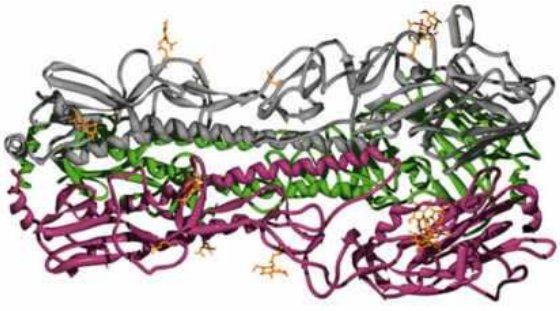


The size of H1N1 virus is about 80-120 nano particles in diameter. Roughly round in shape. Viruses are small infectious agents that replicate only within the cells of living plants and animals. Viruses are approximately ten times smaller than bacteria and consist of a nucleic acid (DNA or RNA) wrapped in a thin coat of protein. Viruses cause many different diseases such as the common cold, chickenpox, polio, and Acquired Immunodeficiency Syndrome (AIDS). Some types of the Human Papilloma Virus (HPV) can cause cancer. The influenza virus is about 0.1 micrometers (millionths of a meter) in size, which is approximately ten times smaller than the width of bacteria like *E. Coli*. The following electron photomicrograph shows the surface protrusions of hemagglutinin and neuraminidase as bright specks on the



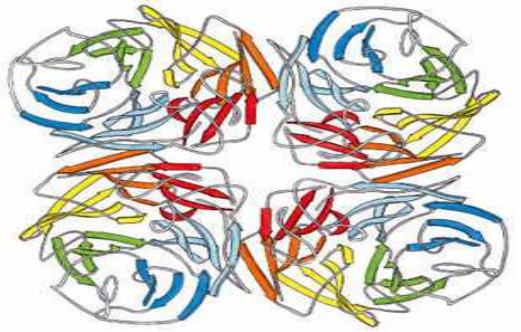
This image, from the Scripps Research Wilson lab, shows part of the 1918 Spanish flu virus in complex with an antibody that also neutralizes the 2009 "swine flu" virus. The antibody 2D1 Fab is depicted as red and yellow ribbons. The hemagglutinin on the flu virus is depicted as a solid surface. One of the three hemagglutinin subunits is highlighted in blue and cyan. The Sa site—the region conserved between the 1918 and swine flu viruses and targeted by the 2D1 antibody—is highlighted in magenta.

Hemagglutinin is a glycoprotein that binds the virus to the cell being infected. There are 16 hemagglutinin antigenic subtypes which are labeled **H1** through **H16**. The hemagglutinin molecule is actually a combination of three identical proteins (shown here as gray, green, and purple) that are bound together to form an elongated cylindrical shape. A mutation that changes just one amino acid in the protein structure can alter the antigenic properties significantly.



Neuraminidase is an enzyme that helps the virus to breach cell walls. Neuraminidase is also known as sialidase because it breaks the linkages between sialic acid and cellular glycoproteins and glycolipids found in cell walls. There are 9 neuraminidase antigenic subtypes labeled **N1** through **N9**. Neuraminidase forms mushroom-like projections on the surface of the influenza virus. The top consists of four identical proteins with a roughly

spherical shape. The picture below shows how each of these subunits is rotated by 90 degrees relative to the center of the arrangement.



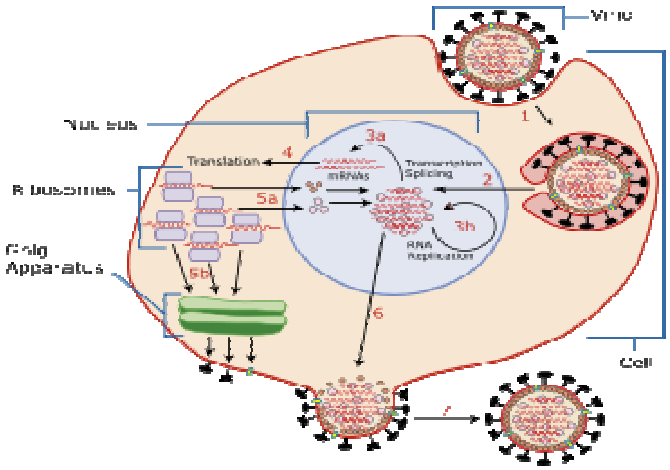
Nomenclature:

Why swine flu is named as H1N1?

What is the reason for naming it as H1N1?

As to the new and official nomenclature **Influenza A (H1N1)**, *H1N1* is the designation for the seasonal flu. The letter *A* corresponds to the type of human influenza which tends to become pandemic. The number *1* is the classification of virus strains. *H* is the initial for *hemagglutinin* and *N* corresponds to the term *neuraminidase* (two viral proteins). All influenza A viruses contain *hemagglutinin* and *neuraminidase*.

Replication:



Viruses can only replicate in living cells.[1] Influenza infection and replication is a multi-step process: firstly the virus has to bind to and enter the cell, then deliver its genome to a site where it can produce new copies of viral proteins and RNA, assemble these components into new viral particles and finally exit the host cell.

SIGNS & SYMPTOMS:

All flu viruses spread by jumping from one host (person or animal) to the next mainly in small droplets of saliva and mucus or in feces. Inside each droplet of saliva can be tens of millions of tiny flu viruses. Once a virus finds a new host and infects the new host's cells, it begins to reproduce quietly, making millions of copies of itself before causing symptoms. This time between when the infection begins and when symptoms start is known as the incubation period. With the new swine flu virus, the incubation period is between 3-5 days.

When someone develops a cough and sore throat in flu season, there are several things that tend to distinguish flu from another kind of infection. A person with influenza is more likely to experience the following:

- symptoms start abruptly—over just a few hours
- feel very sick (no energy for anything)
- high fevers (100° F to 105° F) that rise to this level rapidly, in the first 12 to 24 hours
- bad headaches, aching muscles, aching joints, pain on moving the eyes, and discomfort in bright light—along with the cough and sore throat

Here are the differences so far between H1N1 flu and seasonal flu:

- H1N1flu seem to thrive in much warmer than the usual cold weather when seasonal flu thrives.
- Symptoms seem to be no worse than those of seasonal flu, although that may change when the weather gets colder in late fall and winter.

People with flu symptoms should seek immediate medical attention if, instead of recovering, they become sicker with the danger signs listed here.

For adults, the most worrisome symptoms are these:

- shortness of breath
- persistent vomiting
- confusion
- dizziness

For young children, the most worrisome symptoms are:

- very rapid breathing
- not interacting normally, not eating or drinking normally, being unusually irritable, or appearing unusually sleepy
- high fever and rash
- a bluish color of the lips and skin

TRANSMISSION:

How is swine flu transmitted?

Swine flu is transmitted just like any other flu. (Its symptoms are similar too.) So think of the usual cold/flu transmission vectors and you're on the right path. Coughing, sneezing, touching, etc. The best way to avoid swine flu, and I swear, my doctor said as much today when I got my annual physical, "Don't hang out with people who have swine flu!"

Sounds like a smarmy remark, but that's the truth. If you suspect you're near anybody with swine flu or any flu for that matter, go somewhere else! If you must be near those with swine flu and don't mind looking like a flu safety freak, you can try some of these measures.

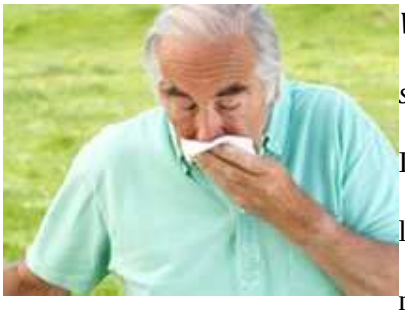
- wash your hands regularly
- don't rub your eyes
- wear a surgical-type mask
- cover your mouth when you sneeze or cough (preferably NOT with your hands!)
- don't shake hands
- don't touch doorknobs and other public items

Basically, if you want to avoid swine flu, watch a few episodes of Monk on USA and act like Mr. Monk. You don't need to solve crimes (or do his unhealthy OCD schtick,) but his knack for cleanliness and fearing germs will prevent swine flu transmission.

INFECTION CONTROL:

Other important actions that you can take are:

- Follow public health advice regarding school closures, avoiding crowds and other social distancing measures.
- Be prepared in case you get sick and need to stay home for a week or so; a supply of over-the-counter medicines, alcohol-based hand rubs (for when soap and water are not available), tissues and other related items could help you to avoid the need to make trips out in public while you are sick and contagious.



What is the best way to keep from spreading the virus through coughing or sneezing?

If you are sick with flu-like illness, CDC recommends that you stay home for at least 24 hours after your fever is gone except to get medical care or for other necessities. (Your fever should be gone without the use of a fever-reducing medicine.

Keep away from others as much as possible. Cover your mouth and nose with a tissue when coughing or sneezing. Put your used tissue in the waste basket. Then, clean your hands, and do so every time you cough or sneeze.

If I have a family member at home who is sick with 2009 H1N1 flu, should I go to work?

Employees who are well but who have an ill family member at home with 2009 H1N1 flu can go to work as usual. These employees should monitor their health every day, and take everyday precautions including covering their coughs and sneezes and washing their hands often with soap and water, especially after they cough or sneeze. If soap and water are not available, they should use an alcohol-based hand rub. If they become ill, they should notify their supervisor and stay home. Employees who have an underlying medical condition or who are pregnant should call their health care provider for advice, because they might need to receive influenza antiviral drugs. For more information please see General Business and Workplace Guidance for the Prevention of Novel Influenza A (H1N1) Flu in Workers.

What is the best technique for washing my hands to avoid getting the flu?

Washing your hands often will help protect you from germs. CDC recommends that when you wash your hands -- with soap and warm water -- that you wash for 15 to 20 seconds. When soap and water are not available, alcohol-based disposable hand wipes or gel sanitizers may be used. You can find them in most supermarkets and drugstores. If using gel, rub your hands until the gel is dry. The gel doesn't need water to work; the alcohol in it kills the germs on your hands.

TREATMENT:

How Should Children Younger Than 1 Year Be Treated?

Currently, there are only limited safety data available on the use of oseltamivir or zanamivir for seasonal influenza in this age group, and oseltamivir is not licensed for use in children younger than 1 year.

Because infants typically have high rates of morbidity and mortality from influenza, however, the CDC reports that infants with S-OIV infections may benefit from treatment with oseltamivir. In fact, under an Emergency Use Authorization (EUA), oseltamivir was recently approved by the US Food and Drug Administration for use in children younger than 1 year.

The dosing recommendations for treating S-OIV influenza in infants are now:

- < 3 months old = oseltamivir 12 mg twice daily
- 3-5 months old = oseltamivir 20 mg twice daily
- 6-11 months old = oseltamivir 25 mg twice daily

When considering fever-reducing medications, the CDC recommends the following:

- Do not administer aspirin or aspirin-containing products for confirmed or suspected case of influenza A (H1N1) virus infection in any child 18 years of age or younger due to the risk for life-threatening Reye's syndrome.
- Instead, antipyretic medications such as acetaminophen or nonsteroidal anti-inflammatory drugs are recommended for the relief of fever.

What Are the Current Antiviral Chemoprophylaxis Guidelines for This Group?

Antiviral chemoprophylaxis is currently recommended for:

- Children with household contacts with *confirmed*, *probable*, or *suspected* cases of H1N1 infection;
- School children or daycare attendees who are at high risk for complications of influenza and who have had face-to-face contact with a *confirmed*, *probable*, or *suspected* case of H1N1 influenza;
- Children who traveled to Mexico recently and are at high risk for complications of influenza; and
- Children with chronic medical conditions.

The CDC's current chemoprophylaxis treatment recommendations are:

- For children 1 year of age or older, treatment with either oseltamivir or zanamivir is recommended for antiviral chemoprophylaxis of S-OIV infection.
- For those 3-11 months of age, oseltamivir can be used under an EUA (at doses of 20 mg once daily for those 3-5 months of age and 25 mg once daily for those 6-11 months of age).
- For infants younger than 3 months, chemoprophylaxis is not recommended unless the situation is judged to be critical.

Chemoprophylaxis should be given during a potential exposure period and should be continued for 10 days after the last known exposure to a confirmed case of H1N1 infection.

ALLOPATHY MEDICINE:

If a person becomes sick with swine flu, antiviral drugs[9] can make the illness milder and make the patient feel better faster. They may also prevent serious flu complications. Beside antivirals, palliative care, at home or in hospital, focuses on controlling fevers and maintaining fluid balance.

Antiviral Drugs and H1N1 Flu (Swine Flu):

Antiviral drugs are prescription medicines (pills, liquid or an inhaler) with activity against influenza viruses, including swine influenza viruses. Antiviral drugs can be used to treat swine flu or to prevent infection with swine flu viruses. These medications must be prescribed by a health care professional. Influenza antiviral drugs only work against influenza viruses -- they will not help treat or prevent symptoms caused by infection from other viruses that can cause symptoms similar to the flu. There are four influenza antiviral drugs approved for use in the United States, Amantadine, Rimantadine, Zanamivir, Oseltamivir. The swine influenza A (H1N1) viruses that have been detected in humans in the United States and Mexico are resistantto amantadine and rimantadine so these drugs will not work against these swine influenza viruses. Laboratory testing on these swine influenza A(H1N1) viruses so far indicate that they aresusceptible (sensitive) to oseltamivir and zanamivir.

AYURVEDIC MEDICINE

The swine flu virus, just like other viruses, can attack the body when the body's immune system is weak. This is why it is essential to build the body's defense mechanism. Ayurvedic treatment focuses on boosting the body's immunity level. This article dwells on the relation between swine flu and Ayurveda. “The disease (swine flu) and its treatment is already mentioned in our old books of medicines by sages. On the basis of the symptoms of swine flu, it has been given the name `vatashlesmic‘ fever in the ayurvedic medicine books.” Ayurveda, the traditional ’science of life’, has a remedy for diseases when every other stream of medicine fails

In Ayurveda, health ailments like swine flu are because of weakened immunity that the body cannot withstand against the attack of disease causing germs. Ayurveda, as always, believes in strengthening the body systems that fight and win the battle against H1N1 Virus. This is done by prescribing various digestive fire strengthening herbs such as Guduchi licorice), Tulasi (Holy Basil), Sahadevi, Neem (Indian Margosa Tree), Shunthi (ginger), Pippali

(pepper) etc. Once the digestive fire is corrected, medicines such as Triphala, Rasna, Eranda, Guggulu can be prescribed to relieve the symptoms.

Ayurvedic treatment for swine flu involves: (a) Basil,

(b) Ginger and Garlic, (c) Gooseberry and AloeVera,

(d) Camphor and Eucalyptus Oil:

VACCINE:

A Few Things to Consider Before Deciding Not To Get Your Swine Flu Vaccine

First, despite all of the hype, vaccines have repeatedly proven to be the single best method of avoiding coming down with the flu. Those are the facts.

In 1890, **one out of every five American children died before their first birthday**. Another one out of five children died before their fifth birthday and not only poor children. Everyone knew children who had died of measles, mumps, rubella, polio, or whooping cough.

If you don't believe this stop in an old cemetery sometime and read the headstones. You will see that far more children died young than today, little headstones with lambs and angels that we almost never see today.

Today, largely because of vaccination, those diseases barely exist, and many of the internet posters and anti-virus agitators do not remember these epidemics that once carried off hundreds of thousands of men, women, and children each year.

The same results were repeated in country after country around the world during the twentieth century as vaccines became more widely available. Anyone,

Furthermore, the risks of vaccination have been vastly overblown. This article provides an excellent scientific review of the safety and effectiveness of vaccination: Vaccine Concerns

H1N1 Vaccine

The following is an effort to put the best official sources of information about the Swine Flu vaccine from the Centers for Disease Control and World Health Organization into simple easy to understand language. For the full information refer to those sites.

Two kinds of H1N1 vaccines being produced:

- **A 2009 H1N1 "flu shot"** — an inactivated vaccine (containing dead virus) is given with a needle, usually in the arm.

The flu shot is approved for use in people 6 months of age and older, including healthy people, people with chronic medical conditions and pregnant women.

- **The 2009 H1N1 nasal spray flu vaccine** — a vaccine made with live, weakened viruses that do not cause the flu (sometimes called LAIV for "live attenuated influenza vaccine").

Nasal vaccine is approved for use in "healthy" people 2 years to 49 years of age who are not pregnant.

About 2 weeks after vaccination, antibodies that provide protection against 2009 H1N1 influenza virus infection will develop in the body.

However, the 2009 H1N1 vaccine will not protect against seasonal influenza viruses, so to get the best possible protection you will need two flu shots.

Initial Target Groups Are:

When Swine Flu vaccine is first available, the CDC recommends that providers administer vaccine to people in the following five target groups (order of target groups does not indicate priority):

- Pregnant women
- People who live with or provide care for infants younger than 6 months (e.g., parents, siblings, and day care providers),
- Health care and emergency medical services personnel,
- People 6 months through 24 years of age, and,
- People 25 years through 64 years of age who have certain illnesses.

People who should not be vaccinated

Despite all of this there are people who should NOT be vaccinated. Anyone in the following groups should not get any flu vaccine without first consulting a physician. These include:

- People who have a severe allergy to chicken eggs.
- People who have had a severe reaction to an influenza vaccination.
- People who developed Guillain-Barré syndrome (GBS) within 6 weeks of getting an influenza vaccine previously.
- Children younger than 6 months of age (influenza vaccine is not approved for this age group)
- People who have a moderate-to-severe illness with a fever (they should wait until they recover to get vaccinated.)

Vaccine Effectiveness

The ability of a flu vaccine to protect a person depends on the age and health status of the person getting the vaccine, and the similarity or "match" between the viruses or virus in the vaccine and those in circulation.

Vaccine Side Effects (What to Expect)

The same side effects typically associated with the seasonal flu shot and the seasonal nasal spray vaccine are expected with the 2009 H1N1 flu shot and 2009 H1N1 nasal spray vaccine.

These are:

The flu shot: The viruses in the Swine Flu shot are killed (inactivated), so you cannot get the flu from a flu shot. Some minor side effects that could occur are:

- Soreness, redness, or swelling where the shot was given
- Fever (low grade)
- Aches

If these problems occur, they begin soon after the shot, are usually mild, and usually last 1 to 2 days. Almost all people who receive influenza vaccine have no serious problems from it. However, on rare occasions, flu vaccination can cause serious problems, such as severe allergic reactions.

The nasal spray: The viruses in the nasal-spray vaccine are weakened and do not cause severe symptoms often associated with influenza illness. (In clinical studies, transmission of vaccine viruses to close contacts has occurred only rarely.)

In children, side effects from LAIV can include:

- runny nose
- wheezing
- headache
- vomiting
- muscle aches
- fever

In adults, side effects from LAIV can include

- runny nose
- headache
- sore throat
- cough

SEASONAL VARIATIONS:

In the last century, there has been an increasing interest in the influence of climate on human behavior. Information has mainly been gathered by comparing seasonal variations of behavior with climatic changes. Although pollution, changes in air pressure, rapid changes in temperature, solar activity and humidity all have been discussed, most of the attention has been on the influence of changes in temperature and length of day on human behavior.

- **Summer and Winter**

Since the early 1980s, differences in mood and behavior between summer and winter have been of great interest. Patients with repeated affective episodes that always occur at the same time of the year have been diagnosed

with Seasonal Affective Disorder (SAD). The most frequent form of SAD is winter depression, which is associated with increased weight and sleep. The frequency of winter depression increases with increasing latitude, and young women are the most affected. Most authors link winter depression to changes in length of day. Recurrent depressions and manias in summer have also been described; high temperature may be the trigger for these affective episodes.

- **Spring and Fall**

Until Rosenthal et al. (1984) described SAD, the most studied seasonal pattern of behavior was the increased frequency of suicides (Hakko et al., 1998) and hospital admissions for affective disorders (Eastwood and Peacocke, 1976) in spring and, to a lesser extent, in fall.

The start of an affective episode in bipolar patients (Faedda et al., 1993) and use of electroconvulsive therapy (Eastwood and Peacocke, 1976) are also more frequent in spring and fall. Researchers speculate that disturbances in the sleep-wake rhythm may cause these seasonal peaks. The rapidly changing length of day around the equinoxes might disturb the circadian and sleep-wake rhythms and change mood and activity in vulnerable individuals.

- **Violence and Seasons**

Studies of assaults and rape have detailed an increased frequency of recorded violence in summer, linked to high temperature (Anderson et al., 1997; Michael and Zumpe, 1983). In studies of variations of homicide, the results are more conflicting. Most studies find no seasonal variation at all, while a report from Finland described a summer peak in frequency of homicides (Tiihonen et al., 1997).

Studies of seasonal variations of violence among psychiatric patients are based on recordings of inpatients, and some connect these variations to patients with affective disorders (Roitman et al., 1990). D'Mello et al. (1995) described an increase of violence among patients with mania in spring.

- **Influence of Light**

There are at least two possibilities for the relationship between change in length of day and behavior: 1) The length of day (with maximum impact at midsummer) is the significant factor; and 2) The change in length of day

(with maximum impact at the equinoxes) is important. In both cases, there may be a few weeks delay for the light to sufficiently influence biological systems.

The seasonal variation of violence in the hospital and in the general population were both correlated with monthly length of day and changes in length of day (defined as the mean length of day in one month subtracted from the mean length of day in the preceding month). Due to the possibility of biological systems reacting slowly, we also introduced delays.

- **Epidemiological Studies**

In areas dominated by hot summers and with little changes in length of day during the year, high temperature seems to increase the risk of violence. In northern areas, an increased frequency of violence in May and June and October through December seems to be more prevalent (Morken and Linaker, 2000a).

To my knowledge, only psychiatric studies of seasonal variation of violence among inpatients have been published. Comparing seasonal variation of violence in different diagnostic groups of patients shows that patients with affective disorders are at greater risk than other patients. D'Mello et al. (1995) showed that patients with mania admitted to the hospital in spring had a high risk for violence.

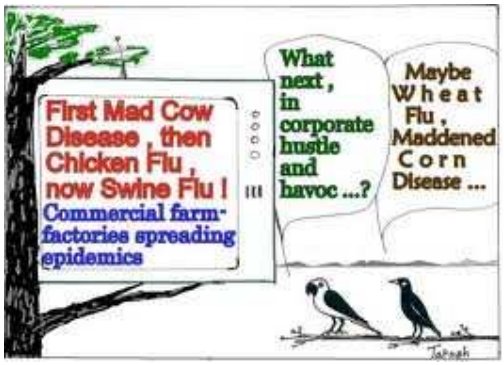
SOCIETY & CULTURE:

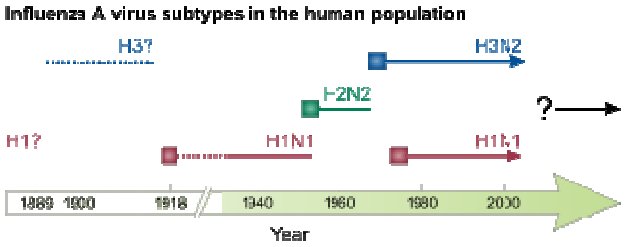
The World Health Organization officially declared the virus a pandemic in June, and announced in early September that at least 3,205 people have died from the virus. And while more than 60 percent of Americans say they are “not too” or “not at all” worried about swine flu (H1N1) affecting them or their families, according to a Washington Post-ABC News poll, the scare has left its mark on many parts of society, both in the United States and abroad. Here, eight ways swine flu is changing the world.

1. People are reconsidering cultural greetings

2. It's scarier than religion
3. Schools, workplaces and day-cares are changing policies
4. People are scared to eat pork
5. Tourism to Mexico has suffered
6. Precautionary (and bizarre) merchandise is flying off shelves
7. Coughing and sneezing are practically federal crimes
8. People may finally get flu shots

PANDEMICS:





2009 flu pandemic data	
Area	Confirmed deaths
Worldwide (total)	**14,286**
European Union and EFTA	2,290
Other European countries and Central Asia	457
Mediterranean and Middle East	1,450
Africa	116
North America	3,642
Central America and Caribbean	237
South America	3,190
Northeast Asia and South Asia	2,294

Southeast Asia	393
Australia and Pacific	217

Source: ECDC – January 18, 2010[150]

Further information: Cases and deaths by country

Note: The ratio of confirmed deaths to total deaths due to the pandemic is unknown. For more information, see "Data reporting and accuracy".

SWINE FLU EFFECT IN INDIA:

Consolidated Status of Influenza A H1N1 : 8 August 2010

Sl.	State	Lab confirmed cases reported during the week	Lab confirmed cases cumulative	Death of Lab confirmed cases during the week	Death of Lab confirmed cases cumulative
1	Delhi	106	11156	0	149
2	Andhra Pradesh	105	1506	6	102
3	Karnataka	200	4409	12	251
4	Tamil Nadu	36	3143	0	7
5	Maharashtra	400	9943	51	924
6	Kerala	17	2850	2911	120
7	Punjab	1	205	0	47
8	Haryana	2	2070	0	48
9	Chandigarh	0	331	0	8
10	Goa	15	129	1	6
11	West Bengal	23	256	1	4
12	Uttarakhand	0	152	0	17
13	Himachal Pradesh	0	24	0	10
14	Jammu & Kashmir	0	112	0	4
15	Gujarat	21	2243	7	486
16	Manipur	0	2	0	0
17	Meghalaya	0	8	0	0
18	Mizoram	0	4	0	1
19	Assam	0	52	0	2
20	Jharkhand	0	2	0	0
21	Rajasthan	2	3932	0	216
22	Bihar	0	7	0	0
23	Uttar Pradesh	5	1601	1	43
24	Puducherry	0	132	0	12
25	Chattisgarh	0	96	0	14
26	Madhya Pradesh	3	410	1	113
27	Daman & Diu	0	1	0	0
28	Orissa	4	118	2	31
29	Nagaland	0	2	0	0
30	Andaman & Nicobar Islands	0	27	0	1

31	Dadra and Nagar Haveli	2	3	0	1
	Total	942	44987	83	2616

Deaths by Cities

- Pune - 125
- Bangalore - 74
- Mumbai - 18
- Nashik- 9
- Ahmedabad - 8
- Baroda - 5
- Chennai - 4
- Delhi - 149
- Bilaspur - 2
- Dehradun - 2
- Aurangabad - 2
- Bijapur - 2
- Hyderabad - 2
- Raipur - 1
- Panaji - 1
- Trivandrum - 1
- Rajkot - 1
- Gandhi Nagar - 1
- Jaipur - 1
- Chandigarh - 1
- Dhule - 1
- Latur - 1
- Mussourie - 1
- Surat - 2
- Nagpur - 1
- Ludhiana -1

Total Deaths till Date

- March 24, 2010 - 1,410

Total Cases till Date

- March 24, 2010–29, 947.

- "The U.S. expects to have 160 million doses of swine flu vaccine available sometime in October", (Associated Press, 23 July 2009).
- "Vaccine makers could produce 4.9 billion pandemic flu shots per year in the best-case scenario", Margaret Chan, Director-General, World Health Organization (WHO), quoted by Reuters, 21 July 2009).

CONCLUSION:

Swine flu is a dangerous virus. The person infected by this will die within a short period of time that is within days. No proper vaccine is available due to the Genetical modification and forming a new strain in every season and causing a pandemic. Millions of people are infected and among them thousands were died in every year. In this article we discuss about Infection, Structure, Replication, Sings & Symptoms, Infection control, Treatments like Allopathy medicines, Ayurvedic medicines and the Vaccines available up to date including their side effects and pandemics caused up to now and the necessary precautions to be taken to avoid the infection because the virus cannot be killed “Prevenction is better than Cure”.

References:

1. Introduction: Viral Infections: Merck Manual Home Edition Other common viral infections are caused by herpesviruses. Eight different herpesviruses infect people. Three of them—herpes simplex virus type 1, ... www.merck.com/mmhe/sec17/ch198/ch198a.html - 71k.
2. Rui Xu[1] , Damian C. Ekiert[1], Jens C. Krause[2], Rong Hai[3], James E. Crowe, Jr.[2], Ian A. Wilson[1]*, “Structural Basis of Preexisting Immunity to the 2009 H1N1 Pandemic Influenza Virus, Published Online March 25, 2010. Science DOI: 10.1126/science.1186430
3. Influenza A (H1N1): new and official name of swine flu virus, according to the WHO, Friday, May 1, 2009, 18:53 By GSerrano
4. Klenk *et al.* (2008). "Avian Influenza: Molecular Mechanisms of Pathogenesis and Host Range". *Animal Viruses: Molecular Biology*. Caister Academic Press. ISBN 978-1-904455-22-6.
5. International Committee on Taxonomy of Viruses. "The Universal Virus Database, version 4: Influenza A".
6. From Caleb Hellerman CNN (2009-06-11). "Swine flu 'not stoppable,' World Health Organization says". CNN.com. Retrieved 2010-04-03.

7. Trifonov, Vladimir; Khiabanian, Hossein; Rabadan, Raul (July 9, 2009). "Geographic Dependence, Surveillance, and Origins of the 2009 Influenza A (H1N1) Virus". *New England Journal of Medicine* **61** (2): 115–119. doi:10.1056/NEJMp0904572. PMID 19474418. Retrieved 2010-05-14.

8. MMWR. Prevention and Control of Influenza with Vaccines. Recommendations of the Advisory Committee on Immunization Practices (ACIP), 2010. July 29, 2010 / 59(Early Release);1-62

9. "Swine Flu and You". Centers for Disease Control and Prevention. Available at : http://www.cdc.gov/swineflu/swineflu_you.htm.

10. McKinney WP, Volkert P, Kaufman J. "Fatal swine influenza pneumonia during late pregnancy". Archives of Internal Medicine, 1990, 150 (1): 213–5.

11. Interim Guidance for the Use of Masks to Control Influenza Transmission Coordinating Center for Infectious Diseases (CCID). Source: Centers for Disease Control and Prevention. page last updated: August 1, 2009 Available at : http://cdc.gov/flu/professionals/infectioncontrol/maskguidance.htm

12. Priya Johnson “Swine flu-Ayurveda” last updated august 2009, Available at : http://www.buzzle.com/articles/swine-flu-andayurveda. html.

13. CDC. Use of Influenza A (H1N1) 2009 Monovalent Vaccine. Recommendations of the Advisory Committee on Immunization Practices (ACIP), 2009. Accessed September 2009.

14. http://www.cdc.gov/mmwr/preview/mmwrhtml/rr58e0821a1.htm

15. PandemicFlu.gov. Draft Guidance on Allocating and Targeting Pandemic Influenza Vaccine. Accessed April 2009.

16. http://www.pandemicflu.gov/vaccine/prioritization.html

Corresponding Author:

T.N.Veeranjaneyulu*,

Email:*tnvanji@gmail.com*