

A Novel Technique to Predict the Hotspots Swine Flu Effected Regions

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ABSTRACT

In present day days, healthcare is very essential in human life. The World Health Organization (WHO) shows trendy article that more wide variety of human beings are stricken by distinct styles flues. Data mining plays a primary position in Predicting sicknesses however someday the database report of affected person isn't extra efficient, these days we are made an Endeavour to locate the maximum globally spreading influenza virus in all around the international which we name Swine flu. Swine flu or the Influenza A (H1N1) flu are triggered by means if anyone of several types of swine influenza viruses. So the solution for such situation is Advanced facts mining (Machine mastering) techniques. Any manner there may be progressing research in medicinal conclusion that could foresee the maladies of the heart, lungs and different tumors in view of the beyond statistics gathered from the sufferers. Our exploration centers around this apart of Medical conclusion through studying design thru the accumulated records for Swine Flu. This examination has created model Intelligent Swine influenza Prediction show and problem area recognition. We utilized DLSC Classifier (Dynamic Learning Supervised Classifier).

1. INTRODUCTION

Swine influenza sickness inflicting mortality in current society. It is a seasonal Influenza which is due to pigs, there are four forms of seasonal influenza viruses, types A, B, C and D. Influenza A and B viruses circulate and motive seasonal epidemics of ailment.

- Influenza A viruses are in addition categorized into subtypes consistent with the combinations of the haemagglutinin (HA) and the neuraminidase (NA), the proteins at the floor of the virus. Influenza A has 18 awesome H subtypes called H1 to H18 and eleven distinct N subtypes called N1 to N11, Currently circulating in human beings are subtype A(H1N1) and A(H3N2) influenza viruses. The A(H1N1) is likewise written as A(H1N1)pdm09 as it induced the pandemic in 2009 and ultimately replaced the seasonal influenza A(H1N1) virus which had circulated prior to 2009. Only influenza kind A viruses are recognized to have triggered pandemics.
- Influenza B viruses aren't labeled into subtypes, however can be broken down into lineages. Currently circulating influenza kind B viruses belong to both B/Yamagata or B/Victoria lineage.
- Influenza C virus is detected less often and commonly causes slight infections, as a result does not present public fitness importance.
- Influenza D viruses primarily affect cattle and are not recognised to contaminate or motive contamination in human beings.

The first pandemic for which facts are to be had turned into the “Spanish flu” in 1918-1919 which brought on as estimated 20 to 50 million deaths worldwide. The infection become first to be defined by using veterinarian J.S.Koen. In 1930, Shope RE have been first to isolate influenza virus from pigs. In 1957, it's miles the Asian flu(H2N2), In 1968 it's miles Hong Kong flu, In 1974, swine influenza virus became first isolated in human. It is a respiration disorder triggered thru influenza viruses that infect the breathing tract of pigs and result in a barking cough, decreased appetite, nasal secretions, and listless behavior; the virus can be transmitted to human beings. Swine flu viruses are effortlessly transmissible among people beings. Swine influenza is also referred to as pig influenza or swine flu, hog flu and pig flu, is

an contamination resulting from anyone of numerous sorts of swine influenza viruses. Swine influenza virus (SIV) or swine-origin influenza virus (S-OIV) is any strain of the influenza circle of relatives of viruses that is endemic in pigs. In 2009, the recognised influenza C consist of in stress and there are some subtypes of influenza A known as H1N1, H1N2, H2N1, H3N1, H3N2, and H2N3. By researching worldwide, from pig populations the Swine influenza virus comes. If transmission does cause human flu, it's far referred to as zoonotic swine flu. The Swine flu Influenza (pig-human) known as A(H1N1) & A(H3N2), the Avian Influenza (birds) is aware of as A(H5N1) & A(H9N2), the Equine Influenza (Horse) known as H1N1, the Canine Influenza (Dogs) called A (H3N8) & A (H3N2) [17]. People with everyday come in contact to pigs are mostly result in swine flu contamination. Since then, handiest 50 such transmissions were showed. Swine flu is transmitted from character to man or woman through inhalation of droplets existing virus from humans sneezing or coughing; it isn't always transmitted by ingesting cooked pork products. The latest swine flu virus that has prompted swine flu is influenza A H3N2v. Some not unusual symptoms of Swine flu are cough, fever, sore throat, runny nose, headache, chill, fatigue, nausea etc. Statistics of Swine flu In 2009 swine flu turned into an influenza A virus kind exact as H1N1. In 2011, a new swine flu virus turned into detected with new pressure became named influenza A (H3N2) Currently, greater than 1500 humans in India kill via swine flu virus and it'll unexpectedly exploring all around the world so these days there aren't notice big numbers of people affected with H3N2v. Virus H3N2 brought about flu, but this strain isn't the same as H3N2v. In general, all the influenza A viruses have a structure similar to the H1N1 virus; every type has a somewhat one of a kind H and/or N structure.

2. LITERATURE OVERVIEW

The H1N1 viral strains occurring in 2009 flu pandemic, the goal of this study perceive evolutionary origin and divide into three corporations of sequences have been used for phylogenetic analysis, Decision Tree and SVM evaluation. In this, they find brand new pandemic viral of swine origin and they develop web tool and Hidden Markov Model (HMM) for accurate outcomes [1].

Here, database is used to store, build and get entry to the model. These fashions are educated and validated towards a check dataset to predict kingdom. The clinical predictors diagnosed via Naïve Bayes classifier and ISWPS. We used Naive Bayes classifier for classifying the patients of swine flu and get 63.three percent.[2] The essential aim of this paper is discover patient laid low with which sort of swine flu virus by means of using kNN set of rules and Navie Bayes classifier to get greater accuracy result.[3][4]. Swinflu disorder with some statistics at preliminary level with the usage of device studying algorithms to reduce the duration through some deadlines. we have analyzed the present day state of affairs of a clinical diagnosis machine with exceptional system learning strategies[5]. Swine flu cases in the National Capital are seeing an exponential spike with over 3 times cases pronounced within the first 35 days of 2019 as compared to the whole 2018. The city had suggested 205 instances in the year 2018, that have now elevated and long past as much as 895 within the month between January 1 and February four, with 40 clean cases on Monday. While the metropolis had seen deaths last year, one of a kind hospitals across the metropolis have already knowledgeable 15 deaths so far. Overall eight deaths had been knowledgeable to us by way of exclusive centers, but we've now not been able to verify them yet," said Dr. Nutan Mundeja, Delhi Government Health Secretary. We are prepared for the worse. All medicines, IVs are in stock and Isolation wards and ICUs are in to be had too," stated Dr. V. K. Tiwari, Medical Superintendent, Dr. Ram Manohar Lohia Hospital. Despite this, a girl, who became a swine-flu suspect, was surpassed over an AMBU-bag at the RML sanatorium because of unavailability of a ventilator. India had already witnessed 42,592 instances and 3,000 deaths by the stop of 2010, as recorded. According to a Union health ministry data, Delhi, which till January 28 became third inside the quantity of swine flu instances after Rajasthan and Gujarat, is now in the second position. Even though as a minimum 14 deaths have taken place within the national capital -- 3 in Safdarjung Hospital, 10 in Ram Manohar Lohia Hospital and one in AIIMS -- because of the viral disease, those do now not reflect in the statistics[6] Swine flu has claimed the lives of 2,335 humans throughout the united states till April 21 and despite the fact that World Health Organisation (WHO) has declared the pandemic to be over, it has stated that the virus would keep to circulate as seasonal influenza, Government told the Rajya Sabha stated. Health Minister

J P Nadda said. He stated that from July 2014 to April 21, 2015, there had been 2,335 deaths of laboratory confirmed instances of Influenza A (H1N1). He stated that from January 1 this yr to April 21, 2,223 human beings had died with Maharashtra registering the best deaths of 485. Nadda said his Ministry has already procured three,60,000 tablets of Oseltamivir, 10,000 N-95 masks, 10,000 diagnostic kits from which the requirement of the states were met and those figures were over the inventory maintained with the aid of the nation governments[7] [8].

2.1. FLU AFFECTED REGIONS IN 2019

Mumbai: The town has recorded around 134 cases of swine flu this 12 months till mid-April. While there were no cases of swine flu in January, 40 instances were mentioned in February, 81 cases in March and 14 instances until mid-April. Besides swine flu, around 275 instances of gastro had been suggested inside the month of April.

Swine flu claims two lives in Mumbai, 120 throughout kingdom. A 30-yr-antique female from Agripada and a 65-yr-vintage diabetic girl from Mazgaon died in the month of March due to swine flu, as per the facts presented through the demise audit committee assembly held in April. The affirmation of demise because of swine flu was given these days," stated Dr Padmaja Kesar, executive health officer, public fitness department, BMC. "As consistent with records, 5 deaths were suggested within the town. However, three of them aren't citizens of Mumbai. The city has recorded handiest two swine flu deaths so far," said Dr Kesar.[9]

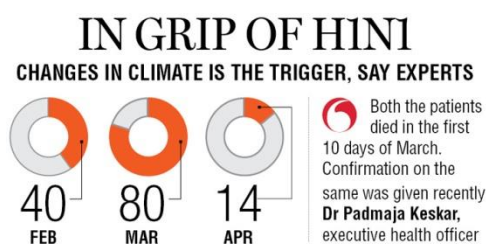


Fig 2.1: Flu affected in Mumbai

Maharashtra: As per the Maharashtra public health branch information, round 120 people have died in the nation due to swine flu until April 21. According to the health department officials, because of climatic change, there was an increase inside the wide variety of instances affected by swine flu this 12 months[7][8]. The wide variety of cases dealt with too has expanded to 1,236 sufferers, who're being dealt with across the nation. As in keeping with the Maharashtra public fitness branch data, around 94 sufferers have died inside the nation because of swine flu till now. According to the kingdom's health branch officials, there was a higher variety of instances of swine flu considering this yr because of climatic changes in the region. A better variety of swine flu.

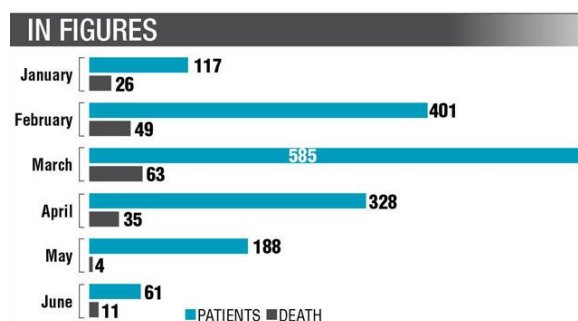


Fig: 2.2: Flu affected in Maharashtra

Ahmadabad: The health department of Ahmedabad Municipal Corporation (AMC) on Monday said two extra people died of swine flu in city final week. Two men, aged 24 and 50, died at Tapan Hospital and Civil Hospital. The metropolis stated 185 cases and three deaths in March. So a ways in 2019, the city has mentioned 1178 cases and 23 deaths. Also, 11 cases of malaria were pronounced in

the first 9 days of March at the same time as one case of falciparum become recorded. The fitness branch has gathered 20,681 blood samples from numerous slum pockets for the diagnose of vector-borne sicknesses. Two died of swine flu in Ahmadabad ultimate week. Two men, elderly 24 and 50, died at Tapan Hospital and Civil Hospital[10].

Gujarat: 53 extra swine flu cases, one death suggested in Gujarat. The second one maximum range of swine flu instances in the us a this year Swine flu instances in the nation touched 4,168 with 53 extra instances coming to mild on Friday. One affected person succumbed to H1N1 virus taking the death toll to 122. The state fitness branch said in a launch that 12 new cases of swine flu were stated in Ahmedabad and Surat cities each. Four instances came to light in Sabarkantha, at the same time as Vadodara town and Banaskantha mentioned 3 cases every[11]. Two cases have been suggested in Kutch, Anand, Rajkot city, Ahmedabad rural, Patan, and Surat rural, whilst one case turned into confirmed in Mehsana, Rajkot, Amreli, Junagadh, Kheda, Botad, and Dwarka."Since January 1, three,617 sufferers have recovered, whilst 429 are under treatment," the fitness branch launch stated. Swine flu cases were at the decline inside the beyond 10 days or so, as previous to that nearly 100 cases were being mentioned on a every day basis. The decline is mainly because of rising temperature. Gujarat has mentioned the second maximum variety of swine flu cases in the u . S . A . this yr. Rajasthan tops the list, whilst Delhi is third. Gujarat is likewise 2d in phrases of loss of life of swine flu patients this year after Rajasthan.[8]

Delhi: which is in advance of Gujarat in terms of instances, had mentioned simply seven swine flu deaths. The information also shows that 14,803 instances had been stated inside the us of a as of February 24, as towards 14,992 final year. The variety of deaths is 448 as compared with 1,103 remaining 12 months.

Telangana: In the year of 2019 Flu impact and said instances are 1,339. The number of deaths are 21 members. Most of the flu affected people in Hyderabad region handiest. Intelangana best flu test center are to be had which are IPM narayanaguga medical institution and fiver clinic Hyderabad.

2.2. ANALYSIS OF FLU:

According to Union Ministry of Health and Family Welfare's Integrated Disease Surveillance Project (IDSP), 14,992 human beings reduced in size swine flu in 2018 and 1,103 of them died. In 2017, the variety of cases stood at 38,811 and of them, 2,270 died.

In 2016, India recorded the highest range of H1N1 cases and deaths. The general wide variety of people who were examined turned into 42,592 and of them, 2,992 died. Swine flu was first pronounced in human beings in India in 2009. Confusion and lack of facts about the ailment is assumed to have suppressed the professional figures of incidence and most effective 600 deaths were officially pronounced notwithstanding suspected instances doping up from throughout the united states of america. In 2010, extra than 20,000 cases had been showed, of which 1,763 led to deaths.

In 2015, India had its worst tangle with the ailment yet (2010-19) as — 137,323 cases and 10,614 deaths have been mentioned nationwide. Maharashtra (26,689 instances, three,183 deaths), Gujarat (21,298 cases, 1,798 deaths), Rajasthan (18,330 cases, 1,523 deaths), Madhya Pradesh (4,127 cases, 751 deaths), Karnataka (12,915 cases, 409 deaths) and Delhi (12,928 instances, 134 deaths) had been the worst-hit states. The scenario improved appreciably in 2016 with just 1,786 cases and 265 deaths registered. This yr, so a ways, seems to be a repeat of 2015, the hotspots, focused in Western India, too are paying homage to India's worst revel in with the disorder.

FLU AFFECTED AREAS IN 2019

S.No	State	No of Effectd	Death
1	Ahmadabad	1178	23
2	Delhi	14,803	448

3	Gujarat	4,168	122
4	Haryana	589	2
5	Himachal Pradesh	224	27
6	Jammu & Kashmir	293	22
7	Karnataka	1,271	14
8	Kerala	35	9
9	Madhya Pradesh	128	30
10	Maharashtra	1,236	94
11	Mumbai	134	4
12	Punjab	410	31
13	Rajasthan	3508	127
14	Tamil Nadu	363	2
15	Telangana	1,339	21

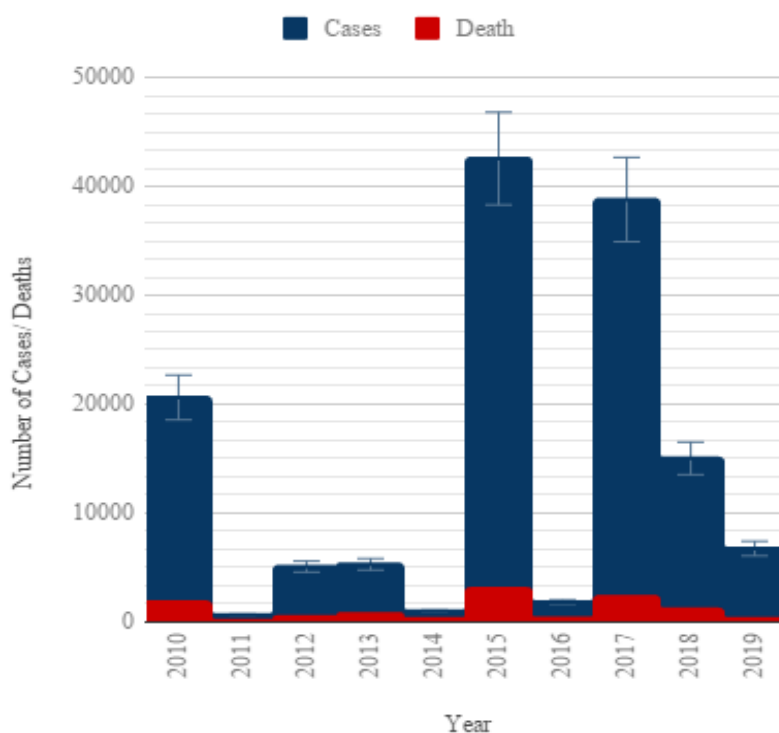


Fig 2.3.: Analysis of flu year wise

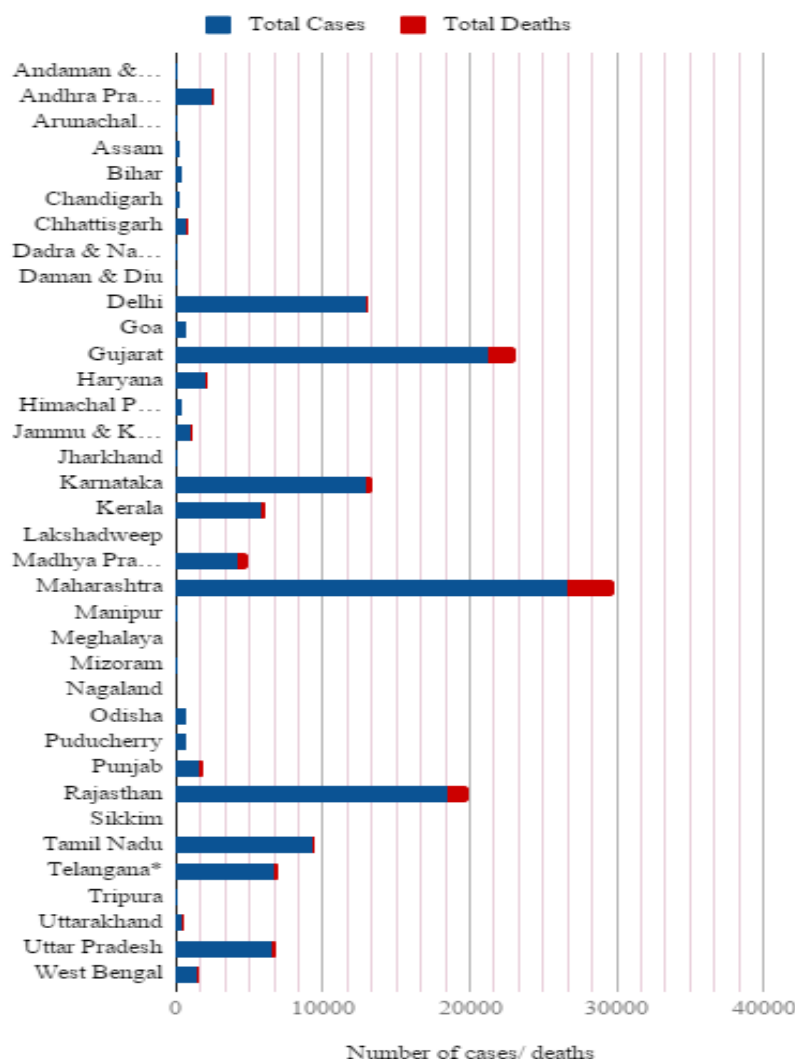


Fig:2.4: Analysis of flu in State wise

The first death become a 14-year-vintage woman in Pune, Maharashtra. On 8 and nine August a 43-yr-antique man in Ahmedabad, Gujarat, a 42-yr-old teacher in Pune and a 53-year-antique lady in Mumbai died. On 10 August a 53-12 months-old health practitioner in Pune and a four-12 months-antique in Chennai died.[11] On eleven August a 7-year-vintage female in Vadodara, Gujarat died. On thirteen August, a 26-year-old female have become Bangalore's first victim of swine flu. An eleven-month-antique boy, a 75-year-vintage female and a 37-yr-old woman died taking the toll in Pune, severely hit by way of the virus, to fifteen and throughout the country, to 24. A lady having a younger daughter of five yrs died close to Mumbai in Khopoli on 14 August. On thirteen August, three people died at one of a kind hospitals in Bangalore, according to the reports. three.

Prevention: The only way to save you the ailment is vaccination.

WHO recommends annual vaccination for: pregnant ladies at any level of pregnancy , children aged among 3 months to 5 years elderly people (aged extra than sixty five years) , individuals with continual scientific situations, fitness-care workers. Apart from vaccination and antiviral treatment, the public fitness management includes private protecting measures like: Regular hand washing with proper drying of the fingers Good respiratory hygiene – protecting mouth and nose while coughing or sneezing, the usage of tissues and casting off them correctly Early self-isolation of these feeling unwell,

feverish and having other signs of influenza Avoiding near touch with sick humans Avoiding touching one's eyes, nose or mouth four.

3. RESEARCH METHODOLOGY

• Machine learning techniques

- Machine learning is an application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed.
- Machine learning focuses on the development of computer programs that can access data and use it learn for themselves.

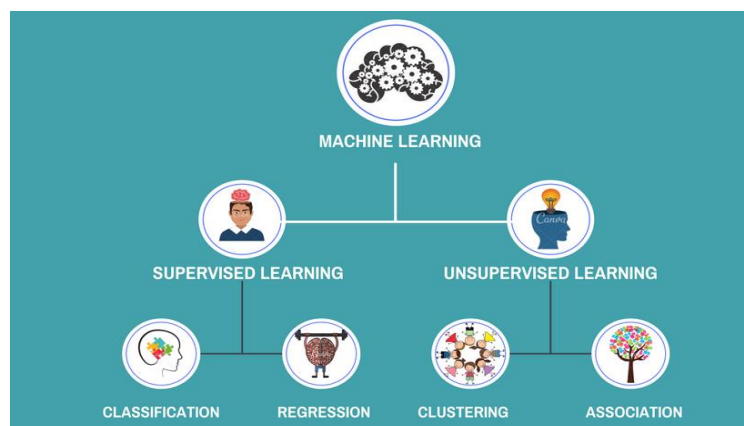


Fig:2.5: Types of Machine learning

- Supervised machine learning algorithms can apply what has been learned in the past to new data using labelled examples to predict future events.
- Unsupervised machine learning algorithms are used when the information used to train is neither classified nor labelled.

4. MOTIVATION:

Dynamic segmentation is the process of transforming linearly referenced data (also known as events) that have been stored in a table into features that can be displayed and analyzed on a map. The dynamic segmentation process imposes two requirements on the data. Each event in an event table must include a unique identifier and position along a linear feature. Our approach resolves statistically significant routes to the sub edge level (i.e., routes between activities), which is not investigated in our previous work. This requires a model called dynamic segmentation [16].

DYNAMIC SEGMENTATION

INPUT:

- 1) A swine flu data $G = (N; E)$ with a set of different symptoms with point locations on data nodes(patients) or edges(locations) and weight function $w(u; v) > 0$
- for each edge $e = (u; v) \sum E$ (e.g., network distance)

OUTPUT:

A dynamically segmented spatial network $D_a(\text{instance})$ derived from G

ALGORITHM:

- 1: for each edges $e \in D$ with $a > 0$ activities do
- 2: Split e into a nodes, n_a , and $a + 1$ edges, e_a
- 3: update weights of e_a based on coordinates of activities
- 4: dynamicNodes n_a , dynamicEdges e_a

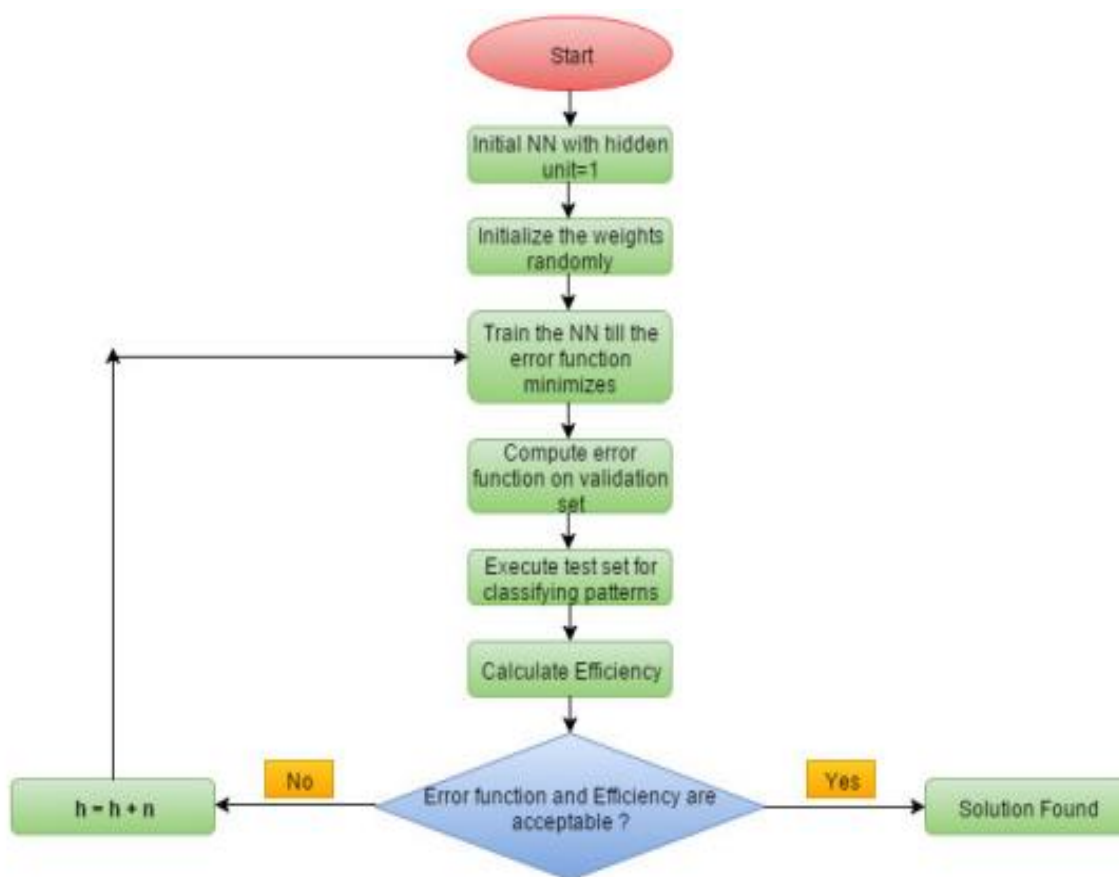


Fig:2.6: Flow chart of Dynamic Segmentation

DATA FORMAT:

DATA REQUIREMENTS

- **Dataset:** We have required data set of Swine Flu for the simulations. Its data collected from the Primary or Urban Health Centers, Osmania and Gandhi Hospitals in Telangana state.

- **Data Collections:**

The following details are collected from the suspected Swine flu patients:

- o Name: It is defined the patient's name.
- o Age: It is defined the age of the patient's in data set.
- o City: It is defined the city/village of the patient.
- o State: It is defined the state of the patient.
- o Clinical Symptoms: It is defined the Clinical symptoms like Fever, fever duration, stuffy nose, sore throat, headache and Respiratory distress..
- o Laboratory Indicators: It is defined the Laboratory symptoms like N/L Ratio and WBC Count.
- o Diagnostic result with Swine Flu Positive cases and Swine Flu Negative cases.

SWINE FLU DETECTION TIME

There are two categories

- Minor Time

- o Sample collections from patients
- o Sample sending to respective laboratory
- Major Time
- o Sample Differentiation
- o Analytical Media Preparation
- o Analysis Time
- o Data Interpretation
- o Report Generation

5. PROBLEM STATEMENT:

The Hotspots Swine flu effected Regions.

6. OBJECTIVE

- Logistic regression for out layer detection.
- Hybrid classifier for diseases Prediction.
- Dynamic segmentation for Hotspot detection

7. CONCLUSION

The Data mining technique, may be utilized in collaboration With a Dynamic Segmentation set of rules which used in diagnosing Swine flu disorder virus affected across in distinct state in India. This proposed technique showed some Promising outcomes which may result in similarly tries to utilize statistics era for diagnosing virus from which patients is suffering from Swine flu . Here we used Dynamic Segmentation which can be clean to interpret [15]. In future, we will try to get extra the accuracy consequences for the swine flu sickness which enables to discover distinctive parameters using exceptional statistics mining strategies as consistent with counseled by means of doctors.

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