

PLAGUE: A Challenge for Urban Crisis Management

Harshit Sinha^{*}

Abstract

The return of plague, an unforgotten scourge of mankind, once again reminds that it continues to smoulder in population of wild rodents in natural foci throughout the world. Its occasional outbreaks reminds of the devastation it caused in the past. The outbreak in Surat caused local panic (mass hysteria) and international concern, leading to the imposition of travel and trade restrictions by a number of countries. The authenticity of the crucial decision in declaring the epidemic as 'Plague' and later, different institutional initiatives taken for isolating the germ (*Y.pestis*) were subject of too many controversies. The uniqueness of extra band in protein profile created much speculation among the media. This gave momentum to various notions, as to whether the disaster was natural or man made, remained unanswered. In spite of all these shortcomings, the wise decision came in identifying the epidemic as plague and the entire catastrophic incidence was controlled within a week with low mortality rate.

Present paper traces the chronological order for the entire plague epidemic and analysed the critical issues of management process undertaken by various authorities and individuals including a common citizen. The emerging key issues of this catastrophic incident are being discussed and anatomy of the crisis is being done. The lesson learnt are put forward for an implication of a model for strengthening long term planning against any such sudden natural or man made disaster.

(c) Copyright Harshit Sinha March 1997

^{*} Associate with Vardaan Foundation Visiting Researcher

PLAGUE: A Challenge for Urban Crisis Management

Harshit Sinha*

"We think according to nature, we speak according to rule, we act according to custom"... Francis Bacon

Introduction: The need for crisis management emerges, when any natural or man-made disaster occurs and disturbs the normal routine life of people. A lot of intelligence, co-operation and concerted efforts are required to tackle such type of sudden incident. Such are the abstract concepts for very concrete events which in a moment can plunge a community, a nation or the entire world into a state of chaos. Social harmony and or conflict among various groups, the virtuous or vicious face of the society etc., and along with their capabilities of the individual, concerned social groups and political systems come up to face it. "It is these very concrete events that bring back memories of fear, political deception, sorrow and yes, even anger. And, we always seem to ask *why did it happen.? What could have been done to avoid the disaster.? Who is responsible.?* However, answers are frequently incomplete, evidence is not made to public and public forgets quickly (Uriel, 1989, p.4)". The outbreak of **Plague** in Surat city, located in the western state (Gujarat) of India, is the prime example of *governance of the crisis's* in urban area.

This was the fourth consecutive crisis that the city experienced in less than two years. The outbreak of plague struck at the time when the city had not yet recovered from the devastating communal carnage of December 1992 that continued intermittently for over six months. In between, the supposed forecast by an unidentified astrologer that the ukai dam on the upstream of river Tapi, (8 km from Surat) was to break, led to an exodus of the people. Then came flood in early September of 1994 and as its aftermath the outbreak of the plague in the city. Though it was controlled within a week, the gravity of the problem remained unresolved for long period of time. Such crises though occur once a while it warrants (or force) a great amount of expenditure and attention of managerial expertise. Intrigues of politics, financial bungling, poor management, ineffective planning and numerous other short comings simultaneous come to fore front that aggravate and

* Public System Group, Indian Institute Of Management, Ahmedabad: 380 015, Gujarat, India. Published in *International Journal of Contingency & Crisis Management*, Laiden University, TheNetherland

intricate the problem. Thus there remain a dire need for the accurate understanding of such critical situation.

Incorporating personal experience in field survey during crisis time in the city, observation and discussions parleys with managerial authorities, medical experts and intellectuals. Thus efforts are being made to give the chronological order for the entire Plague epidemic. The critical issues of management process undertaken by various authorities and individuals (including common citizens), are analysed under the realms of Crises Management. The emerging key issues of this catastrophic incident are discussed. The lesson learnt from this experience are put forward for an implication of a model as to how political, administrative and social institutional systems interact during critical time of any uneven situation.

Plague in the past: Plague is a severe infectious disease caused by bacterium *Yersinia pestis*. Three pandemics have swept across the world claiming many millions of lives and causing untold misery. Looking back, the only large known epidemic of primary pneumonic plague in history has occurred among marmot trappers in Manchuria in China and Mongolia during the early part of this century (Christe and Corbel, 1990). While the first recorded outbreak of plague in India occurred in the year 1031-32 AD and many subsequent one were estimated to have caused 12.5 million deaths during 1889-1950. The disease continued to be major health problem until the mid-1940s. Thereafter it began to decline speedily (**table 1**) as a result of the large-scale application of DDT for the purpose of malaria control (Sehgal, et al 1991). However reported outbreaks of pneumonic plague in India had (1898-1911) occurred as part of bubonic plague epidemic (Seal, 1987) and pneumonic cases constituted a very small proportion of total case's 2-13%. The last human case in India was reported in 1967 from Karnataka state. Since 1966, a few suspected outbreaks have occurred, especially in the historic plague endemic areas of South India and Himachal Province in North India. However, none of these could be confirmed to be plague. One of these outbreaks in Himachal in 1983 was very similar to pneumonic plague and of the 22 cases, 17 died (WHO, 1989). Thereafter, plague had suddenly re-emerged after a gap of twenty-seven years, first with bubonic cases in Beed district of Maharashtra state, and later in Surat pneumonic cases appeared suddenly. It had spread to other states of India as indicated in **table 2**.

Issues for Analysis: The outbreak of plague in Surat raised several important issues in the field of management of crisis. The following questions can provide a useful analytical focus for discussion.

1. Under what circumstances epidemic of plague had occurred in the city.? What was the urban setting at the time of the outbreak?
2. How public, media and scientific community reacted in the atmosphere of panic and fear and what roles were initiated and mechanisms were evolved to cope up with the crisis?

3. How inter organisational and political system perceived and responded to the complexity and impending disaster from the crisis.
4. What were the strength and weakness of the concerned combating authorities in the management of crisis situation?
5. What impact had it caused in different strata of society at regional (local), national and international levels?
6. How communication networking helped in either controlling or aggravating the crisis situation and mobilising the resources at the crucial juncture?
7. What mechanism was involved in detecting and declaring the epidemic as plague?
8. What regulatory responses do plague epidemic of Surat suggest to the authorities of the local, national and international levels?
9. Can there be an implications for a model as to how political, administrative and social institutional systems interact in a disaster?

Urban Setting: The Surat city lies on the golden corridor of Ahmedabad - Bombay national highway on the southern bank of river Tapi in the vicinity of the Gulf of Cambay that confluence in the Arabian sea. The city of Surat has glorious history dating back to 300 BC. Earlier it was under the reign of Hindu monarchy and several Muslim dynasties. Later, the East India Company started with trading and commercial activities. Thus the transition of Surat city from a small trading center to a sprawling metropolis has been a complex process spread over several hundred years. Thus today Surat has emerged as a major force on the textiles, diamond, chemical, plastic, engineering, petrochemicals and fertilizer's fronts. This on one hand has opened the employment opportunities and economic prosperity, and on the other has created scarcities for usual amenities of life. The entire urban waste of Surat is discharged through wide open *nullahas* (sewerage) into Tapi. This along with rain water, goes underground during monsoon, pollutes the under ground water table. Such hazardous consequences of crowded living in industrial areas with squalor, filth, heaps of rotting garbage, pool of overflowing sewerage absence of latrines and in human living conditions had turned Surat the silk city to sick city. Extreme congestion, air and water pollution and deteriorating public health services leading to frequent menace of various diseases every year that culminated in the outbreak of plague in September 1994.

Chronology of the Plague outbreak in 1994: The origin of the first outbreak of plague in India during 1994 (on 21st September) appears to lie in the ruins of the earthquake that struck Maharashtra two years before, and killed thousands of people and demolished the burrows of millions of rats harbouring *Pasteurella pestis* - the Plague bacterium. It was first noticed on 5th August 1994, with the complaint of flea nuisance from the *sarpanch* (village head) of *Mamla* village (of Majalgoan taluka) in Beed district. On the same day the first suspected case of bubonic plague was reported from this village (WHO Mimeo, 1994). After two days, the state government had sent a high level delegation of health professionals to this village. Preventive measures were only

suggested, but surprisingly - neglecting the isolation of this village. Thus the movement of people from Mamla to surrounding villages continued undeterred. Even the August 5 rat fall - did not alert them to the possibility of a plague outbreak. Later, on August 25, when 36 more potential plague cases were identified with *swellings in the groin* (classic symptoms of bubonic plague), the local authority sprayed *benzene hexachloride* (flea control powder) in about 300 villages and distributed tetracycline to the residents of the affected villages to be used as chemoprophylaxis (WHO Report, 1994). Further, on behalf of the central authority, The *National Institution of Communicable Disease* (NICD) team from Bangalore rushed immediately to take serum sample. However the media (Sharma, 1994) reports pointed many irregularities in this regard.

The Second outbreak started when reports emanating from Surat prior to detection of plague had revealed that water was poisoned. On hearing this rumour, the entire population was out on the street on the night (of September 18). The local authority, Surat Municipal Corporation (SMC) reacted sharply to counter the rumours by announcing that water is uncontaminated. They never tested the water because plague cases came only from some parts of the city while the other parts of the city, sharing the water from same source it was not so. As the number of cases increased with similar clinical symptoms and resulted in sudden death (Some within an hour), the local authority came in action. At Surat Government Medical College (SGMC), the head of the department of medicine called emergency meeting of senior doctors. Explaining the clinical picture and briefed the news of bubonic plague outbreak in the neighbouring Maharashtra state, and the population movement (mostly labour) across the border between Surat and different parts of Maharashtra, a clinical diagnosis was made by local experts of New Civil Hospital (NCH). As the "safety pin"-- like organism detected on *Wayson stain* in sputum smear, they took an immediate decision. After exhaustive discussions and referring numerous literature¹, finally the entire group of medical experts, declared the epidemic as "**Plague**". However, after an initial high toll, the fatality rate came down as indicated in figure 1.

Mounting Pressure and Chaotic Situation in the city: Panic about plague spread faster than plague itself. On 21st September 1994, the news hit the front pages of all the newspapers, the numbers of reported plague deaths ranged from an exaggerated 200 (local Gujarati medium) to 2000 (International News Agency on satellite channel) with a provocative headline embellished with picture of snarling rats and skulls with cross bones. Majority of them highlighted, **garbage** as the potent source of infection. Orders to immediate isolation of the affected areas and to shut down all shops, business complexes, industrial and vendor units, made people reticent in procuring essential commodities. The slightest fever and vomiting or coughing of any family members, scared others. Each cough, vomiting or fever created restlessness among them.

Within few hours the entire city engulfed in panic leading even to the collapse of administration. It was first the elite class that ran away, followed by three fourths of doctor's community. It crumpled the confidence of the common mass. This led to mass exodus due to the phobia they had for this disease. The minds of the escapists reeled between fact and fiction. Nearly one third² of the houses of Surat were closed. Emigrants constituted larger number among the fleeing population. Most of them disposed off their belongings and ran away. Railway stations and State Transport Corporation (STC) bus stands were overcrowded. STC authority provided nearly 200 buses especially to take people out of the city. Besides, private carriers took fabulous advantages of this panicky situation. Soon panic gripped in the entire Gujarat state and later the entire country as well as the world.

The atmosphere of panic, as noted by World Health Organisation (WHO) revealed a total 5150 suspected pneumonic or bubonic plague cases and 53 related deaths from the eight states of India as shown in figure 2. Further, the international news agencies (especially in Europe) through satellite channel showed images of people fleeing from this epidemic. In spite of WHO³ declaration that the risk of plague to international travellers is extremely small, yet many governments relying on media reports, reacted with knee jerk measures to protect themselves. Restriction on travel and trade caused massive loss to the economy of India. In Surat alone a loss at the rate of rupees two crore per day was estimated for at least fifteen days.

The situation at New Civil Hospital (NCH) was found much tense as majority of private doctors had fled away and all other Government and Trust owned hospitals were asked to direct Plague symptomatically suspicious cases to one nodal centre. With rumours of the spread of killer disease, more than 700 suspected plague cases arrived at NCH, sick with fear as well as disease. As perturbed doctors shouted between patient and relatives in an atmosphere of mounting panic and pressure, the correct result of diagnosis and addresses of patients were not noted properly in the requisite. Besides, the deaths occurred on the mid-way to hospital and those died at home with similar symptoms were off the record. There was no pathologist traceable in the hospital and so was the case with more than half of the paramedical staff. Only 200 staff members were willy attending their respective duties. Even several doctors and nurses had contracted the killer disease and many trying to avoid their assigned duties.

The confirmed cases of plague were kept in specifically made isolated wards and admission criteria became more and more restrictive with pathological and other medical tests. To combat the situation, the required logistic support in the NCH in Surat, was either absent or out of stock and those present were not in working condition. Besides, constant intervention from the higher ups in the state capital, led to chaos and confusion that hindered the process of admission and treatment. As a result the entire combating staff of the hospital, (including doctors) threatened to go on strike in protest against the

state authorities. The shortage of essential drugs in the Government hospitals gave momentum to the chaotic situation. With the announcement that medicine like tetracycline, septron or related drugs will be effective against this disease, black marketing was soared in local market. This situation forced to order such medicine from other places. While a handful of people found alternative to these medicines with other type of therapy⁴. And those who could not get any of these, expressed their anger against the fleeing doctors (private) by resorting to arson and looting at their clinics. The panic was so deep-rooted that, despite excess production of tetracycline in the country, the panic ridden department of Revenue of the Union government exempted all the medicaments intended for plague patients from all types of custom duty⁵. Besides, bulk import of the drug was also exempted from all types of duty.

There was so much politicisation of the incidents that it was very difficult to arrive at any definite conclusion during these crucial days. This was very much evident on two occasions, one, when the first plague case was detected at the Ashakta Ashram (Trust hospital), the municipal authorities asked that hospital authorities to remain tight lipped till further orders, secondly, when the first batch of serum samples of the plague affected patients were found missing en - route to the national capital. Besides, it was also noticed that co-ordination among the research institutions (*NICD -Delhi, Haffkine Institute-Bombay and Institute of virology-Pune*) was totally absent. On one occasion, the report of Pune institute was found contradicting the reports of the NICD-Delhi (Mehta, N.R, 1994). Seeing the pathetic condition of the civil hospital, many raised objections about the procedure adopted in collection and pathological testing of serum of victims. Even the state committee report on plague did not make any definite statement (table 3). The central and state authorities remained silent, hiding the facts, in order to divert attention of the people, media, and world community as a whole.

This had created much chaos and confusion that gave birth to several notions and perceptions. Many believed it to be natural disaster while others have identified as man made disaster. Some people believed it as a curse of 'Allah' owing to the demolition of the disputed structure at *Ayodhya*⁶ in December, 1992 and outbreak of communal riots as repercussion, because it was mainly confined to the riot affected localities. While other felt it as revenge against the losses borne by the minority community during the communal riots.

Among experts, confusion and lack of co-ordination created much controversy regarding the nature of this epidemic that occurred under odd epidemiological circumstance. Doubts were raised about the possibility of "plague." Some predicted it as some other disease like *hanta virus* (Dhar et al, 1994) *melodises* (Jacob, T.J., 1995) ,*Plasmodmonas pseudomallei* (Bharadwaj, R. Et al, 1994) etc. while seeing the low death toll (56 deaths only) others were not ready to accept this epidemic as plague (Paneth, N., 1994).

The media began speculation seeing the report on the extra band of protein in molecular analysis of the serum samples. Earlier many experts commented that Surat plague as exacerbated by the negligence of the civic authorities. The flood was assumed as one of the possible reasons for the epidemic that enhanced the chain of infection which later went out of control (Shah, G. 1996; Mehta, N.R. et al, 1994 and TAC, August 1995). Several questions were raised among the experts⁷ about the origin of the plague organism. Some propounded the theory that it was caused by genetically engineered microbe intended for biological warfare⁸. Since the Surat stain was not Indian, possibility of purchasing the plague virus from **Kazakhstan** by militant groups (belonging to another country) was also suggested by the experts⁹. Some scientists believed that this outbreak was an experiment done by a developed country aiming to study how the government, the people, and the scientist community would react in the event of a real attack. In USA, the invention of biological integrated detection system (BIDS) for detecting germs in the air and simultaneously sudden rise in the expenditure for germs defence programme in 1994 (which was 54% more than the previous year) raised many possibilities as it was not difficult to transport the germ (Prasannan, R. 1995). Till date, the incident is a matter of debate, as to whether it was **man-made** or **natural** disaster.

Measures of Control and Relief: Where a section of the city dwellers, in the state of utter chaos and confusion opted for exodus, the other dared to live within the city, keeping their life and fortune at the mercy of the Almighty. The young dynamic people took initiative in social workers helped in burning the garbage, sweeping the roads and spraying insecticides. Some of them worked day and night to rescue flood victims while others arranged to procure medicines from all possible sources and distributed in affected localities.

No sooner the local authority declared the epidemic as "**Plague**," than it was conveyed to all administrative offices of the city, state headquarters and national capital. For better communication, a wide network of wireless system was set up in the entire city connecting SMC head and zonal offices with civil hospital, other district administrative departments and with the state (Gandhinagar) and the national capital (Delhi). At the helm of the gravity of the situation the State government with the support of the municipal authorities prepared an action plan as indicated figure 3, (Report-SMC, 1994). Besides, under essential services act, strict action was enforced against the absentees during these days. To execute the plan, a rapid action force along with eleven companies of State Reserve Police (SRP) intensified the patrolling round the clock. The local authorities, had prepared forty multi-disciplinary survey teams including doctors, nurses, spray workers, teachers and some voluntary workers. Serious efforts were made for early detection, referral services, providing prophylactic treatment, spraying of insecticide, health education and preventive measures against the disease¹⁰.

Unfortunately during the outbreak of plague, there was no public elected body in the SMC and majority of doctors were away from their responsibility. At this crucial juncture, a few members from the committee of *Chamber of Commerce* in association with few private doctors had set up a 24 -- hour camp distributing medicines and had organised several discussions. In order to swage the prevailing panic and terror among the fleeing people, some useful aspects of the discussions were video taped and telecast in the city. From the very first day of the epidemic, the President of Indian Drug Manufacturers Association gave an assurance to meet the demand for the present crises and future consequences. As a result, by the first week of October, (1994), 55 million capsules were supplied¹¹. At the central level, the matter was taken seriously and the position of the supply of drugs was assessed with meeting of the drug producer. It was found that country had drugs more than the level of requirement at that juncture (Goyal, 1994).

As thousands of people from Surat continued to reach different destinations, the adjoining districts of Gujarat and the neighbouring states to which migrants belonged including the capital city (Delhi) was declared Plague threatened¹². The measures taken in these districts included medical examination of the incoming persons, distribution of tetracycline, alerting medical staff, cleaning the garbage etc. Such measures were also adopted by the authorities at railway station and all national and international airports. The state government appointed a senior officer as the chief co-ordinator for plague control measures. The Chief Minister of the Gujarat State held a high level meeting with the Additional Chief Secretary of health and the Chief Co-ordinator, who all reviewed the situation for allocating the relief grant. However field survey (Shah, 1996) revealed the reality of the absence of any such assistance to the victims. Besides, the international responses towards the relief activities was totally absent. On the contrary, many representative of political parties and voluntary organisations in home did a remarkable job for rendering their services.

Origin and Nature of Disease: Much later, at state level, it was decided to appoint a high level expert committee for investigating the plague epidemic. This was also followed up by Government of India to appoint a *Technical Advisory Committee (TAC)* in connection to the outbreak of the plague. As the Defence Research and Development Establishment (DRDE) gave the a controversial clue to the nature of the disease, the samples were send¹³ to *Centre for Disease Control and Prevention, Fort Collins (CDC) lab, Pasteure Institute in Paris for the sample confirmation and to Stavropol Anti - Plague Research Institution in Russia for molecular characterisation*. This controversy ended with the declaration made by these three WHO collaborative institutions that the Surat *Yersinia pestis* was unique and was never recorded anywhere else in the world¹⁴. Confirming the uniqueness of the protein profile, the Russian Institute, on the basis of additional test, reported that Surat strain was a weak Pathogen. The new strain has been classified under group 'S'. Further, since many theories were associated with the outbreak of the plague the central authority took keen interest to find the origin of the germ

through a team from Defence Research Development and Organisation (DRDO) under the leadership of renowned scientist¹⁵.

Anatomy of the Crisis: Tracing the chronology of the events in the process of management of the crisis, many pitfalls and irregularities were found in the action and decision making processes adopted by the authorities. The summarise details of the actions and decisions related with the management of this epidemic are indicated in **table 4**.

Neglecting initial warnings in the Beed district, the consequence of ratfall and non-isolation of village Mamla, resulted in the increase in the number of bubonic cases from 16 to 32 and the spread in the neighbouring villages. However the Maharashtra health infra-structure with immediate preventive measures, restricted the disease from developing into pneumonic type without any fatality. In Surat, the delay in removing the carcasses of dead animals due to flood from the low lying areas, gave momentum to chaotic situation. The possible impact, created congenial atmosphere conducive for the growth and transmission of *Yersina pestis* from wild to domestic rodent. As a result more fatalities occurred in these areas. However with the barest facilities available to the authorities, the wisest decision came in detecting the epidemic as "Plague." Thereafter, the measures taken to break the chain of infection gathered tremendous momentum. It is a different matter that within their own country they were always questioned about the procedure adopted in detecting this disease. But the action plan together with proper communication network, co-operation, realising individual responsibilities and with the unmatched zeal of fighting spirit, restricted the toll to a mere 56 only.

On the other side many technical irregularities were observed while forming the team for survey during the action plan. Absence of an epidemiologist and an entomologist in the survey team retarded the knowledge about the ecology of the rodents for plague. Thus many questions regarding the nature of the disease, its origin and mode of transmission remained unanswered. Procedure and format adopted for maintaining records, created much difficulty in locating the victims for follow up. Constant harassment to the victims for their serum sample (as used for bacteriological examination) made them to act against the authority. They failed to educate the victims regarding the significance of the pathological examinations. Besides, sudden closure of vendor shops, industrial units and private hospitals, enormous sprinkling of insecticide, and administering chemoprophylaxis to all, created much panic among the masses. Instead of providing the correct information on the nature of the disease, the authority arranged for about 200 buses for evacuation for the fleeing people.

In a multi layer system of bureaucracy in our country (Stephen, D.C., 1979), the victims were supposed to be largely dependent upon the state and central authority¹⁶. Making the NCH as the nodal point for the treatment of Plague cases and immediately creating an isolation ward, prevented the diffusion of the infection to other parts of the city, but confusion prevailed in setting clear case definition for admitting the victim as large numbers of cases being suspected as plague victims were admitted. From the very

first day the initiatives taken by doctors for looking after the patients and arranging for drugs and also to exploring right contacts from all possible resources were the right step in prevention and control of such diseases. The absence of other preventive kit (*mask, gloves etc*) generated the risk of infection among the combating staff and many of them have paid for it. The combating team failed to supply drugs and vaccines during the first three days when fatality was higher. The blanket decision for exemption made on import duty for the medicament (related to this disease) had no impact during the crucial days (or hours) of the crisis.

Constant interventions of higher up's in technical aspects had not only deteriorated the situation in the hospital but had created frustration among the combating staff. It had been not so easy for the senior doctors to motivate all the remaining employees to put their efforts together with the barest infrastructure. In spite of many irregularities and lack of co-ordination among various department at the NCH, the doctors of the NCH performed their duty remarkably well, despite's all odds including several limitations of infrastructure and other related facilities. The young doctors (interns), on individual basis and para medical staff, did everything to save the lives of the patients. The strain undertaken during such crisis's time by the doctors and entire para-medical staff including class IV employees are unmatched. Their dedication, courage and commitment can be cited as an example for crisis's management.

The local authorities divert popular attention towards the garbage pile-up: which was considered the sole source of infection. Thus, public and local authority gave much importance to *operation clean*. This was also witnessed in most of the major cities of India (Lancy, L. 1995). So during the early days of the epidemic, the political pressure delayed in declaring the epidemic as plague. Even the state plague investigating committee did not make any definite statement. Thus hiding the evidence had not only created confusion and chaos among the masses but failed to justify their verdict during crucial hours. This led formulation of many theories for the origin of the epidemic. Fortunately, the germ (*Y.pestis*) was detected at *Defence Research and Development Establishment (DRDE)* Gwalior that proved beyond doubt that the epidemic was plague. The action taken by the state and central government to set up inquiry committee for the two plague epidemics was too late to be of any use.

The exaggerated reports by the vernacular newspapers further enhanced panic among the masses. The government's response to the misinformation and exaggeration done by the print media, was also weak. Thus lack of right information in the print media is also responsible for **mass hysteria** and **fear**. The only positive aspect of the press coverage was that it did mobilise the government into action.

Such catastrophic incidents become issues of international politics, especially if it is in developing countries. At international level the adverse comments made on India in connection with this epidemic, shows the biased nature of the developed countries against India. Since 1986, WHO estimates reported annual death figures due to plague outside India have crossed the 100 mark every year¹⁷. Even in power block country like

U.S.A, between 1970-1991 the plague mortality was 4.5% (Robert, B.C. et al, 1993). These incidents pass almost unnoticed by the world community; whereas India remains the hot bed of adverse comments on the Surat Plague. The international support for the victims in rehabilitation process was cornered due to stigma associated with this disease. All international passengers and their commodities from India were looked as plague suspicious cases. Thus in the atmosphere of panic and fear, people and the media from different countries behaves in the same manner¹⁸.

Lessons for the Future: Cities do grow and so are crises are the constant phenomenon of it. Plague is the warning of a series of medical disaster that could erupt any time with changing ecology, environmental degradation and uneven growth of population.

The situation in Surat resembles other million plus cities of India that reveals imbalances between rural and urban developmental programmes. The former, being neglected, leads to influx of large number of migrant to cities. These uneven life styles of the migrants and main dwellers, lack of co-ordination between urban planning and public health may cause sudden natural or man made disasters plunging the maintaining and strengthening the public health system into chaotic situation. It draws attention of state authority toward uneven distribution of the resource between rural and urban region. Thus in order to attain sustainability in development programme, the widening gap between these regions should be narrowed.

It is high time that the nation formulates a national urban policy and also sees that it is being practically enforced. In Surat the uneven industrial and urban growth, nexus between odd and even personalities, dumping of industrial waste, environmentally destructive suburbs with pathetic lifestyle without any public amenities etc. draws our attention that the basic services to the urban poor have to be provided on priority basis and on war footing. Simultaneously, the Pollution Control authorities must enforce strict law against unauthorised industrial growth and their outgoing waste. The Plague epidemic points out that government have to deal with the main social cause of the disease rather adopting symptomatic approach as a fire fighting exercise. The fragmentary approach to economy and health has to be replaced with holistic approach.

Prompt action to identify the causative agent in an outbreak is of utmost importance in the control of infectious disease. In India, earlier several attempt have been made, it remained as a major weakness in the management of all public health action programme (Sinha, 1997). Thus a well - functioning surveillance system with appropriate diagnostic capability at health centres, hospitals and clinics backed by supportive referral institution must be given high priority in India and other developing countries.

The media has done more damage than the plague. In Surat the media failed to disseminate correct information among the mass. This in turn had swayed the minds of the people between fact and fiction. As all national and international code of ethics of journalism were violated, strict and firm law should be framed so that media exaggeration during crisis time could be curbed penalised under the laid frame of law. In

this regard the role of “Ombudsman” becomes very essential in order to help maintain proper understanding between media, government and the mass.

New infectious diseases continue to emerge, yet there is no clear strategy for managing them. A model response should be devised in the light of past events such as the recent US outbreak of a previously unknown hantavirus. (Gellert, 1994). Epidemic of plague is the similar incident of the past devastating events occurred in Surat. The present epidemic points out many conflicting attitude of individuals while combating the real life situation. The absence of the clear distinctive role of an individual for technical and administrative task during crisis time have never been specified. Besides, the power and associated politics within the working hierarchy (bureaucracy) becomes major hurdle in normalising the tense situation. Looking at this conflicting nature, proper and appropriate guidelines for the management of crisis have to laid down. Irrespective of the nature and the type of crisis, a common model may be adopted as given below.

Future Model: The above said difficulties in such catastrophic incident draw experts’ attention to prepare a common minimum disaster management plan as shown in **figure 4**. The disaster site(s) is being directly linked to the control room, which is later connected with the various levels of administrative bodies. It is advised to setup two parallel divisions with control room. These divisions will also ensure that the technical decisions are taken by technical experts and administrative decisions taken by appropriate administrative authorities. To ensure the regular supply of the essential commodities at the disaster site(s), the control room should command the logistic support division. This will help to know the requirement of present crisis (any type) and its future consequence. The other division, will be involved in rehabilitating the victims and disseminating the correct information through the Information, Education and Communication (IEC) activities. Such activities are being conducted for various individuals at different level. All these activities should be governed and control through control room.

This model would help to avoid confusion, and reduce fear and panic in the community. Further, this would guarantee that the necessarily assistance reaches the victims on time. Information has an important advocacy role to increase public awareness and interest, and to encourage societal forces to influence public policy and resource mobilisation. Implication of such model could be strengthened with proper interaction with the media and the public. Seeking their assistance would of utter importance in the management of any crisis. Thus such type of model should be implemented with a joint venture of State and Central Government in all major cities of India at different level of governing bodies. The suggested model may be useful in the field of management of crises in imperilled cities, for long term planning to combat any natural or man-made disasters.

Conclusion: Whatever may here be the controversy persisting during the outbreak of the epidemic in the Surat city, people in general wanted immediate action from the

authorities. The local authority reacted very sharply but failed to disseminate the correct information. As a result mass exodus took place from Surat. It had of course added too many problems to other parts of the country. Better and true information flow was lagging and the media had ignited the entire crisis's situation to such an extent that various ill-notions, psycho-fear and panic have gripped the minds of people even including doctor's community. The only positive aspect of the media was to mobilise the government into action. On the other hand, many voluntary organisations played a significant role individually and along with the local authority in minimising the entire crises. The experts and scientist community had their own perception and were confused, about the facts regarding the outbreak. The non-availability of high-tech facilities in the civil hospitals had created much controversy and confusion in passing technical judgement. In spite of these shortcomings, the wise decision came in declaring the epidemic as a "Plague." However politicisation of the event had delayed the decision in declaring the epidemic as plague. Overall, the joint efforts made by all combating authorities at various institution's levels, with proper action plan and efficient communication network, caused the fatality rates to come down rapidly and entire catastrophic situation was brought under control within a week. Their dedication, courage and commitment, can be cited as an example in the arena of crisis management.

(6500 words)

Notes:

1. The studies made by Park (1972) and Evans and Feldman (1982) were available at the department's library and were immediately referred to clinical features of pneumonic plague, as described by W.D. Tigertt (1982: 712) are the following:

“In pneumonic plague, the onset may often be with a chill followed by fever, cough and splintin of the chest, with the production of sputum that soon becomes bloody. Focal lung lesions are present, as manifested by dullness, decreased breath sounds, and roetgenographic evidence of infiltration, Mediastinal lymphadenopathy may be evident.

Without effective therapy, progress of the disease is rapid, with extensive lung consolidation, septicaemia, prostration, mental confusion, subcutaneous haemorrhages due to intravascular coagulation, and shock, with death ensuring in 2 or 3 days”.

2. “..... Nearly 33 percent of the houses of Surat were closed. Among those who fled away, a majority were entrepreneurs, medical practitioners and other professional and members of the upper middle class. A large number were migratory population.”
....According to a survey carried out by the Surat Municipal Corporation (SMC) on 29th September, 1994.

3. “WHO does not recommend change in individuals’ plans to travel to India, but advises caution in travelling to the city of Surat. There is no restriction for travellers visiting India or passengers in transit in airport in India. Surat is the only locality declared an epidemic zone. It is prudent to advise travellers from potentially infected areas that any illness presenting within six days of leaving the areas should be brought to the attention of a doctor, who should be informed of the travel that has taken place.”
WHO Press release WHO International Team on Plague calls for an end to restrictions, 28th September 1994.

4. Homeopathic Medicine like *Crotalus Horridus*; Ayurvedic Medicine mixing leaves of pipal(*Ficus religiosa*), Bhel (*Aegle marmelos*) and Tulsi (*Ocimum Sanctum*/basilicum L) in boiling water.

5. The Plague - How Serious Is It? India today, 15th October 1994, pp 52-69.

6. Scared city of Hindus, known for the birth place of Lord Ram, is located in the state of Uttar Pradesh in the northern part of India.

7. D. Benerjee, professor (emeritus at the department of Social Science Medicine and community Health, Jawaharlal Nehru University, New Delhi) disagrees with the theory of the spread of the plague from Beed to Surat, "By that reasoning, the entire earthquake-affected zone should have witnessed a plague outbreak". Source: Down to Earth, 31st October, 1994 pp:9.

T. Verghese (former director of the NICD) suggested for detailed examination of the genetic structure of the bacilli, "Only this will give us definite information as to how the bacilli may be evolving in India". Source: Down to Earth, 31st October, 1994 pp:9.
Source: Down to Earth, 31st October, 1994 pp:9

A.K. Mukherjee (Director General of Health Service) commenting for any mechanism in place to combat such eventuality, "No mechanism existed to combat such a situation. We really didn't anticipate it, especially in Surat, where there was no perceptible ratfall. Fortunately, we have the infrastructure to tackle the plague: the NICD has a branch in Bangalore, state branches in Andhra Pradesh, Tamil Nadu, Karnataka and Maharashtra, the

foci of the plague. Honestly, we were baffled by the Surat outbreak". Source: Down to Earth, 31st October, 1994 pp:51.

Commenting on isolation of extra band with molecular weight of 25 000 in protein profile Prof. Indra Nath, (a leading biotechnologist at All-India Institute of Medical Science, New Delhi) "Yersinia pestis is a fairly stable organism and it is not known to have changed its genetic make-up for ages. How then did it change it between 1963 and 1994.? this is what India would like CDC to answer". Further leading Virologist, Dr N.P. Gupta (Headed, The National Institute of Virology, Pune) "Evolution delete genes, it does not add them". The Health Secretary M.S Dayal commented:"This plague germ is different from other representative strains. It could be a natural mutant or genetically engineered strain. But corroborative evidence is necessary to say anything conclusively". Source: The Week, 23rd July, 1995 pp:32-33.

Dr. P.K Rajagopalan, public health expert and one of India's top medical entomologist described as "outlandish" theories that plague bacteria could have been introduced. "The October 1993 earthquake in Maharashtra and unprecedented flood in Gujarat in July brought infected rats out of their natural habitats into the open resulting in spread of the infection to man". Source: Indian Express (Ahmedabad edition) 1st October, 1994.

V.Ramalingaswamy (professor-emeritus at All India Institute of Medical Science, New Delhi) headed, The Technical Advisory Committee report of Govt. of India said: "the report, have "established" that what had occurred in Surat was an epidemic of pneumonic plague. The organism, said the committee, had been put through a series of test which stamped it as Y.pestis beyond doubt." BUT several questioned regarding the nature of the disease, its origin and mode of transmission remained unanswered as reported by the magazine Health and Nutrition, November 1994, pp: 36-42 and March 1995 pp: 20-28.

8. "Surat Plague strain was genetically engineered" 7th July, 1995, The Times of India (Ahmedabad Edition).

9. "Kazakh firm selling plague strains: Militants may have released microbes in Surat" "9th July, 1995, The Times of India (Ahmedabad Edition).

10. Report on Action Plan for controlling Plague , Surat Municipal Corporation, 1994.

11. "The pattern of Chaos" Down to Earth, October, 1994.Pp: 6

12."Rapid Action Force deployed in Surat" 26th September, 1994, The Times of India (Ahmedabad Edition).

13. "NICD asked to probe origin of Surat plague strain" 12 June 1995, Indian Express (Ahmedabad Edition).

14. "Final thought on India's 1994 plague outbreaks. Lancet vol 16 Setember, 1995 Pp: 765.

15. Dr. A.P.J Abdul Kalam, Defence Science Advisor, is personally looking into matter with the help from Scientists of Defence Research Laboratory in Gwalior, who have specilised knowledge in the field of biological and chmeical agents. The decision taken by Dr. Kalam at a meeting he held with defence scientists at midnight last night is not know. "Kazakh firm selling plague strains: Militants may have released microbes in Surat" 9th July, 1995, The Times of India (Ahmedabad Edition). Also see article "Military Microbe" by Prasannan R, The Week, 23rd July, 1995 Pp:30 - 37.

16. A multi layer system in India, permits (indeed encourages) such calcuation of state vs central as well as local vs state interests. The union government is always concerned about its international reputation as well as domestic perceptions of its assistance to a stricken state. The victim were found caught between his need to bargain with union authorities for assistance support, and his responsibility towards local leaders and bureaucrats who must bear the burnt of implementation. Finally a crises may occur in a political environment in which there is a already a prediscription to exploit available issues. Source: Stephen, D.C et al, (1979).

17. "Mystifying the plague" Down to Earth, October, 1994.

18. "The Plague Strikes City in West India". The New York Times, 24th September, 1994. "Calm Return to Indian City Hit by Plague", John F. Burns, The New York Times, 25th September, 1994. "Medical Experts Fear Refugees May Spread India Plague". John F. Burns The New York Times, 25th September, 1994. "Surat: A victim of its Open Seware", The New York Times, 25th September, 1994. "US to Monitor Airport to Find any Plague Carriers". L.K. Altman The New York Times, 25th September, 1994. "Pneumonic Plague Is Deadliest, and Most Rare Form", Lawrence K Altman August 8th, The New York Times, 1995. *also see* "Lesson of Plague: Beware of Vanquished Disease", Lawrence K Altman August 8th, The New York Times, 1995.

Reference:

Bharadwaj, R. et al (1994), Outbreak of plague-like illness caused by *Pseudomonas pseudomallei* in Maharastra, India, Letter to the Editor, The Lancet, Vol 344, 3rd December, pp: 1574.

Christie, A.B., Corbel, M.J, Plague and other (1990) Yersinial diseases, Chap 3.21, In: Smith G.R., Easman CFS, eds. Topley & Willison's Principal of Bacteriology, Virology and Immunity, Vol 3, 8th edn. Edward Arnold, pp: 400.

- Dhar, L. et al (1994), India: is it plague.?, Letter to the Editor, The Lancet, Vol 344 November 12, pp:1359.
- Evans, A and Harry, F (eds) (1982). Bacterial Infections of Humans. New York: Plenum Medical Book Co.
- Gellert, G.A. (1994), Preparing for emerging infections, Nature, Vol 370, August 11. pp 409-410.
- Goyal, A., Plague scare opens up drug import, Economic Times, October 4, 1994.
- Jacob, T.J., (1995), Final thought on India's 1994 Plague outbreaks, The Lancet, Vol 346, September 16, pp: 765.
- Lancy, L. (1995), Inviting Plague, Down to Earth, 15th July, pp:48 (Also see Cover story (1994), Can we clean up the mess.?, India Today 31st October pp: 62-79./ K.S Ramachandran (1994), Plague warns against neglect of Slum, Business ... 10th October/ Nikhil Chakarvatty (1994), The rats will play..., View pont in Economic Times)
- Mehta, N.R. et al (1994), Investigation of Epidemiological Aspects, Report of the expert committee appointed by Government of Gujarat to Investigate Suspected Plague Epidemic in Surat City During Sept-Oct 1994, pp: 28.
- Paneth, N. (1994), Plague in India, Letter to the Editor, The Lancet, Vol 345, 28th January, pp: 258.
- Park, J.E. (1972), Testbook of Preventive and Social Medicine, Jablapur: Banarsidas Bhanot Publisher.
- Prasannan, R. (1995), Germ Detector, The Week, July 23, pp:36-37.
- Robert B.C. etal, (1993), Reported Cases of Human Plague Infections in the United States, 1970-1991, Journal of Medical Entomology, pp: 758-761.
- Seal, S.C. (1987) Plague: Conquest and Eradication in India, New Delhi: Indian council of Medical Research, , 1991: pp: 9.
- Sehgal, S. and Bhatia, R. (1991), History of Plague, Plague, National Institute of Communicable Disease: Directorate General of Health Service, New Delhi, pp: 35-42.
- Sharma, K. (1994), Grappling with Black Death, Hindustan Times, 10th October, 1994, Bombay edition, pp: 1 & 8.
- Shah, G. (1996), Perception and Responses, Public Health-Urban Interface: A Study of Pneumonic Plague in Surat, Centre for Social Studies, Surat: India, , pp: 112-123.
- Sinha, Harshit (1997), Spatial and Epidemiological Aspects of Plague in India: A Case Study of Mamla village and Surat City, journal of Region, Health and Health Care, Aligarh (UP), Vol 2, No. 1, pp: 21-30.
- Report on Action Plan for controlling Plague , Surat Municipal Corporation, 1994.

Stephen, D.C et al, (1979), Why This Calamity, Whose Curse is This?, The Andhra Cyclone of 1977, Vikas Publication House Pvt Ltd, New Delhi, pp:8-9.

Technical Advisory Committee (TAC) on Plague Report of Government of India, August 1995.

Tiggertt, W.D. (1982), Plague, in Alfered S. Evans and Harry A. Feldman (eds) Bacterial Infections of Humans, New York: Plenum Medical Book Co.

WHO Mimeograph, Who Consultation on Plague, No. 90.1, 11-15 September, 1989, pp: 1-12.

WHO Plague Investigation Team Report, Plague in India, 9th December, 1994, pp: 1-15.

Uriel, R. et al, (1989), The world of crises and crises management, Coping with Crises, ed. Charles. C. Thomas Publisher, USA, pp: 3-33.

Acknowledgement: The author is very thankful **Prof. Ghanshyam Shah** (*Director, Center for Social Studies. Surat*) for providing me an oppurtunity to work with him for this study. **Dr. R.P.Sinha** (*Dy. Commissioner of Health, Surat Municipal Corporation*) and **Dr. B.D. Parmar** (*Head of the Medicine dept. Surat Medical College*) for providing me the correct information.

Table 1: Mortality From Plague In India

Period	Total deaths from plague	S.M. rate per 10,000 Population	Percent of all deaths
1898 - 1908	60,32,693	183.3	4.32
1909 - 1918	42,21,529	133.8	2.32
1919 - 1928	17,62,718	51.9	1.34
1929 - 1938	4,22,880	11.7	0.33

1939 - 1948	2,68,596	6.8	0.21
1949 - 1958	59,059	1.8	0.55
1959 - 1968	942	0.2	0.01
1969 - 1993	Nil	0.0	0.00

Source: Foundation for Research in Health Systems, 1995, p:167.

Table 2: Cases and deaths due to plague in India: 26 August to 5th October 1994.

Name of the State	Suspected Cases	Sero +ive Cases	Total Deaths
Maharashtra State (Including Bombay)	2793	79	0
Gujarat State (Including Surat)	1391	35	49
Delhi State	749	44	04
Other State	169	09	0
Total of India	5150	167	53

Source: Plague in India: WHO International Plague Investigative Team Report of 9th December, 1994.

Note: Other State includes Andhra Pradesh, Madhya Pradesh, Uttar Pradesh, West Bengal, Rajasthan and Haryana.

Table 3: Shows the dilemma for the Surat epidemic.

<u>WHY NOT PLAGUE . ?</u>	<u>WHY PLAGUE . ?</u>
a) Primary pneumonic plague is highly uncommon (NB only one large epidemic of primary pneumonic plague is known to have occurred in Manchuria in 1910-1912, causing some 60,000 deaths).	a) Highly suggestive symptomatology of LRTI-Pneumonitis, of short duration with positive radiology occurring in a very short time amongst vast population.
b) A classical plague epidemic follows the pattern of rat fall--> Bubonic Plague--> pneumonic plague which does not	b) A reported 'excellent' response to treatment with streptomycin, tetracyclines and chloramphenicol.

seems to have happened in Surat at all. Also typically total number of pneumonic plague cases does not exceed 10% of total plague cases.	
c) Primary pneumonic plague is highly infectious, while here the infectivity is very low. also the age and sex distribution here is not typical.	c) Possible containment of out break by massive use of prophylaxis, curbing the mortality to some extent also.
d) The books write thjat the mortality of a given case of pneumonic plague is very high whereas in Surat, the comparative mortality is very low.	d) Reported occurrence of an epidemic of bubonic plague in nearby Maharastra state.
e) The children and elderly patients seems to have escaped lightly here in surat, an uncommon occurrence.	e) Occurrence of natural disasters like floods in Surat and earthquakes in neighbouring state of Maharastra causing a probable ecological imbalance causing displacement of rodents.
f) conflicting data regarding cross analysis of matching gram stain positivity. Symptomatology and X-ray pictures.	f) Reported occurrence of cases of bubonic plague in Surat also.
g) A reported flea index of 0.21 only in Surat.	g) Corroborative bacteriological and serological data from Surat (through highly unsatisfactory).

Source: Report of the expert committee appointed by government of Gujarat to investigate suspected Plague epidemic in surat city During Sept-Oct 1994, page 23.

Table 4: Analysis of the Surat Epidemic under the realms of Crises Management.

<u>The irregularities/wrong actions/ delayed decisions.</u>	<u>The regularities/ right actions/ positive decisions</u>
1. The delayed action of civic authorities in removing the carcasses from flood affected areas (North Zone) of the city.	1. In identifying the epidemic as PLAGUE.* (*Can't say/not sure)
2. Confusion in setting clear case definition for admitting the victim.	2. Locating the Point of threat at the earliest.
3. The inability of the hospital authorities to for protective measures (hand gloves, mask etc) and	3. Isolating the infected area from rest of the city.

proper record keeping system.	
4. Unable to confirm the correct laboratory diagnosis of the disease.	4. In establishing isolation ward and gathering all victims at one treatment centre.
5. Lack of coordination among the various department of the hospital.	5. In establishing survey team and information network system.
6. The constant interventions of higher up's disturbed not only the working procedure but demoralise the combating staff.	6. The team sprit, patience, dedication and courage shown by the hospital staff members in treating the plague victims.
7. The survey team prepared in action plan by local authority does not include epidemiologist and entomologist.	7. Seeing the magnitude of the problem, the initiative taken up with the spirit of team work was very much appreciable.
8. The local authorities fail to sustain confidence and right information regarding the disease among the people.	8. The plague epidemic diverted people's attention not only towards hygienic living condition (solid waste management) but were consciousness towards civic sense and other essential amenities.
9. The local authorities fail to take action against absentees including doctors and also against media for exaggerating the situation.	9. The media mobilize the immediate government action.
10. Since the disease is air borne closing lari gallas, excessive sprinkling of insecticides on road without chemoprophylaxis etc created much panic among the people.	10. Seeing the pathetic condition and irregularities faced during the crises time, draws attention of the health planners towards health infrastructure.
11. Delay in procuring the medicine and vaccination at the crucial hours of these crises.	11. Draw attention of the planners towards consequent problems of rapid urbanization and industrial growth.
12. Unable to do swift action for follow up of the victims.	12. Draw government attention in preparing <u>Disaster Management Plan.</u>

* **Can't Say.**