

# **GOVERNMENT COLLEGE OF ENGINEERING**

Department of Computer Engineering

(Affiliated to DBATU, Lonere)

Dhamangaon Road, Yavatmal - 445001



## **A Report of Mini Project On “LUMPY DISEASE”**

Submitted by:-

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**Government College of Engineering, Yavatmal**

Department of Computer Engineering  
2022-2023

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### CERTIFICATE

Certified that the reported work entitled

**“LUMPY DISEASE”** is a Bonafide work carried out by

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The report has been approved as it satisfies the academic requirements in respect of the seminar work prescribed for the course.

Project Guided By :

**Prof. V. R. Shelke**

Internal Guidance :

**Prof. V. R. Shelke**

External Guidance :

## ACKNOWLEDGEMENT

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## **ABSTRACT**

The objective of the “**LUMPY DISEASES PROJECT**” is to make people aware of an uncommon disease that is commonly spreading all over the world in cattle. As we have explored this we have got so much information regarding it. So in the past 2-3 years, more than 23 million Cattle died in India, mostly in Rajasthan. Thus we must make villagers aware of this dangerous disease. Lumpy skin disease is an economically important poxvirus disease of cattle. Vaccination is the main method of control but sporadic outbreaks have been reported in Turkey. This study was carried out to determine the changes in serum biochemical values of cattle naturally infected with the lumpy skin disease virus (LSDV). It also spreads quite rapidly. Within 16 months of India’s first case — reported from Odisha in 2019 — the disease had spread to 15 states. But the spread of the current wave, which began in April-May, has been exponential, as has the mortality rate. Though there is no cure, the disease has preventive vaccines, which the state governments are trying to administer to cattle populations. Currently, the country uses the goat pox vaccine to protect against lumpy skin disease.

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## **Chapter 1: INTRODUCTION**

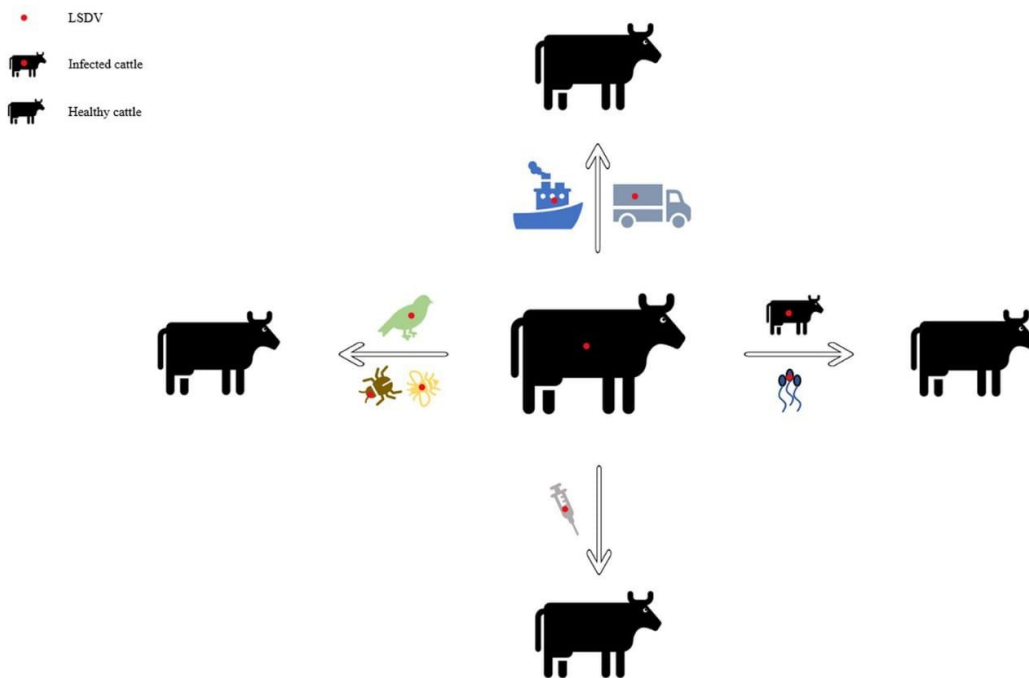
Lumpy skin disease (LSD) is a viral disease of cattle caused by a lumpy skin disease virus (LSDV). LSD is an infectious disease in cattle caused by a virus of the family Poxviridae, also known as the Neethling virus. The disease is characterized by large fever, enlarged lymph nodes, and multiple nodules (measuring 2–5 centimeters (1–2 in) in diameter) on the skin and membranes (including those of the respiratory and gastrointestinal tracts). The virus has important economic implications since affected animals tend to have permanent damage to their skin, additionally, the disease often results in chronic debility, reduced milk production, poor growth, infertility, abortion, and sometimes death. The onset of fever occurs almost one week after infection by the virus. This initial fever may exceed 41 °C (106 °F) and persist for one week. At this time, all of the superficial lymph nodes become enlarged. The nodules, by which the disease is characterized by, appear seven to nineteen days after virus inoculation.

## Chapter 2: CONCEPTUAL STUDY

**Lumpy skin disease (LSD)** is an infectious disease in cattle caused by a virus of the family Poxviridae. The disease is characterized by large fever, enlarged superficial lymph nodes and multiple nodules (measuring 2–5 centimetres (1–2 in) in diameter) on the skin and mucous membranes (including those of the respiratory and gastrointestinal tracts). Infected cattle also may develop edematous swelling in their limbs and exhibit lameness. The virus has important economic implications since affected animals tend to have permanent damage to their skin, lowering the commercial value of their hide. Additionally, the disease often results in chronic debility, reduced milk production, poor growth, infertility, abortion, and sometimes death. The nodular lesions involve the dermis and the epidermis, but may extend to the underlying subcutis or even to the muscle. These lesions, occurring all over the body (but particularly on the head, neck, udder, scrotum, vulva and perineum), may be either well-circumscribed or they may coalesce. Cutaneous lesions may be resolved rapidly or they may persist as hard lumps. The lesions can also become sequestered, leaving deep ulcers filled with granulation tissue and often suppurating. At the initial onset of the nodules, they have a creamy grey to white color upon cut section, and may exude serum. After about two weeks, a cone-shaped central core of necrotic material may appear within the nodules. Additionally, the nodules on the mucous membranes of the eyes, nose, mouth, rectum, udder and genitalia quickly ulcerate, aiding in transmission of the virus.

## Chapter 3 : TRANSMISSION & DIAGNOSIS

The virus is mainly mechanically transmitted by insect vectors (mosquitoes, flies, ticks, etc.) or by contaminated needles. Some of these could potentially be brought from an infected area on the wind or within vehicles. The particular vectors that will vary between countries have been little studied. Once arrived in a new area spread is likely to be fastest during periods when flies are a nuisance, e.g. summer and autumn months when there are moist, warm conditions. The disease can also be spread through contaminated feed, water, and equipment. The virus is not transmissible to humans. The disease is not zoonotic, meaning it does not spread from animals to humans, and humans cannot get infected with it.



### Clinical diagnosis

LSD signs range from inapparent to severe disease. There is no current evidence of variation in virulence regarding the different LSDV strains.

- ☐ Fever that may exceed 41°C.
- ☐ Marked reduction in milk yield in lactating cattle.
- ☐ Depression, anorexia, and emaciation and Excessive salivation.
- ☐ Enlarged superficial lymph nodes



Cutaneous nodules of 2–5 cm in diameter develop, particularly on the head, neck, limbs, udder, genitalia, and perineum within 48 hours of the onset of the febrile reaction. These nodules are circumscribed, firm, round, and raised, and involve the skin, subcutaneous tissue and sometimes even the underlying muscles.

□ Large nodules may become necrotic and eventually fibrotic and persist for several months (“sit-fasts”); the scars may remain indefinitely. Small nodules may resolve spontaneously without consequences.

□ Limbs and other ventral parts of the body, such as the dewlap, brisket, scrotum and vulva, may be oedematous, causing the animal to be reluctant to move.

□ Bulls may become permanently or temporarily infertile.

□ Pregnant cows may abort and be in anoestrus for several months.

## **Chapter 4 : PREVENTION & CONTROL**

Evidence from the current LSD epidemic in Europe and western Asia has revealed that successful control and eradication of LSD relies on early detection of the index case, followed by a rapid and widespread vaccination campaign. The efficacy of total stamping-out (killing all clinically affected cattle and unaffected herd-mates) and partial stamping-out (killing only clinically affected cattle) policies have been compared using mathematical modelling. The study found that total stamping-out and partial stamping-out resulted in a similar probability of eradicating the infection. The study also highlighted the importance of initiating vaccination campaigns ahead of virus entry.

### **Sanitary prophylaxis**

#### **➤ Free countries:**

- Import restrictions on domestic cattle and water buffaloes, and selected products from these animals.
- Surveillance measures to detect LSD are recommended over a distance of at least 20 kilometers from an infected country or zone

#### **➤ Infected countries:**

- Control of LSD depends on restriction of movement of cattle in infected regions, removal of clinically affected animals, and vaccination. Movement restrictions and removal of affected animals alone without vaccination are usually not effective.
- Proper disposal of dead animals (e.g. incineration), and cleaning and disinfection of premises and implements are recommended for LSD.
- There is currently no evidence of the efficacy of vector control in preventing disease.
- See OIE Terrestrial Animal Health Code for regulations covering the recovery of LSD-free status of a country or zone.

### **Medical prophylaxis**

- “Homologous” LSDV live attenuated vaccine strain for example “Neethling” LSD strain
- “Heterologous” sheeppox or goatpox virus live attenuated vaccine strain.
- A local reaction at the site of inoculation, as well as fever and reduction in milk yield, may follow vaccination with live, attenuated capripox virus.
- Currently, no new generation recombinant capripox vaccines are commercially available.

## **Chapter 5: ECONOMIC IMPACT**

Lumpy skin disease has led to serious economic losses in affected countries. The disease causes a considerable reduction in milk yield (from 10% to 85%) due to high fever and secondary mastitis. Other consequences of the disease include damaged hides, decline of the growth rate in beef cattle, temporary or permanent infertility, abortion, treatment and vaccination costs and death of infected animals. Total production losses resulting from the disease have been estimated at 45%–65% in industrial cattle farming. The causative agent, capripoxvirus, can induce sheeppox and goatpox as well, and these diseases have economic significance, given that they present a major hindrance to international trade and may be abused as an economic bioterrorism agent.

## **Chapter 7: CONCLUSION**

In this work, we used a statistical approach to identify major changes in the data underlying LSD outbreak reports. Additionally, we utilized time series models to forecast the number of LSD outbreak reports in Africa, Europe, and Asia during 2022–2024. Although LSD outbreak reports in Africa appear to be decreasing since 2020, it is expected that the number of reports will increase slightly. The number of LSD outbreak reports in Europe is projected to continue the previous 5-year steady trend. Additionally, the forecast predicts an increase in the number of outbreak reports in Asia. These findings indicate that LSD remains a substantial threat to the cattle industry in various countries; thus, efforts should be made to monitor its spread within and between regions. Additionally, because LSD is regarded as a significant transboundary disease, strict disease prevention and control in every country are critical. Furthermore, coordination among nations to control and eradicate the disease is essential.

## Chapter 6 : RESULTS

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**LUMPY VIRUS** [HOME](#) MAJOR SYMPTOMS PREVENTIVE MEASURE ABOUT LSD ADMIN LOGIN [Login / Sign In](#)

### Fill Animal Information

Name Of Owner:

Type Of Animal:

Bill Number:

Age Of Animal:

Upload Image Of Animal:

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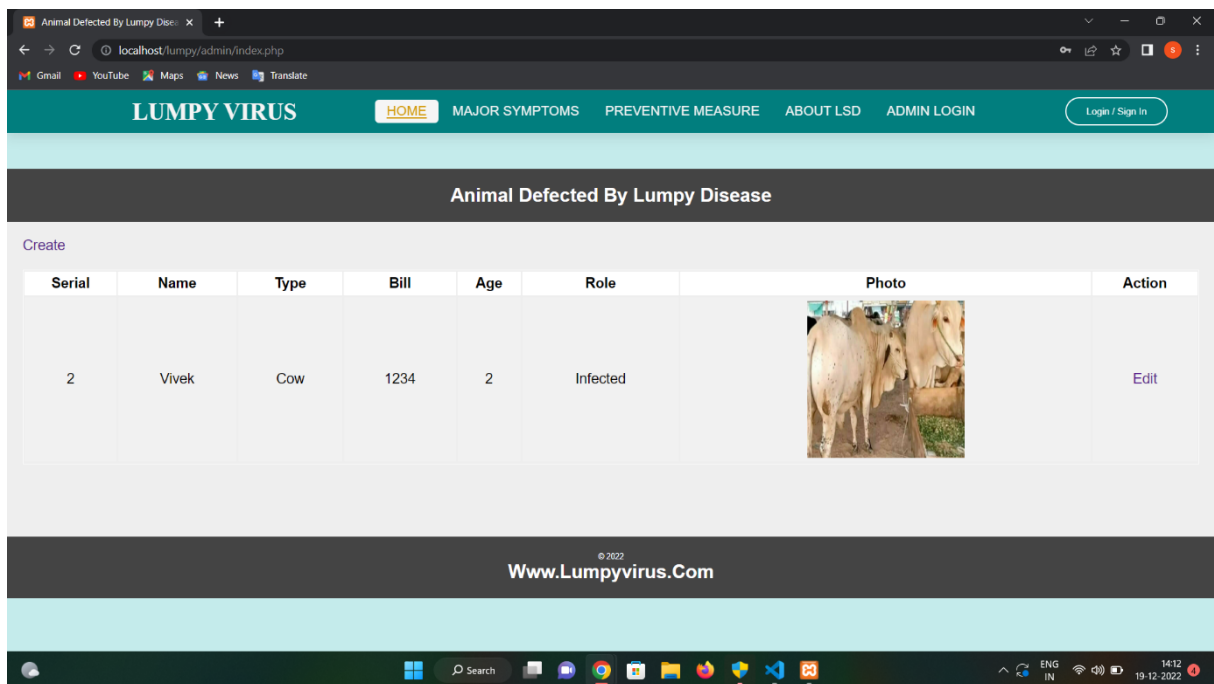
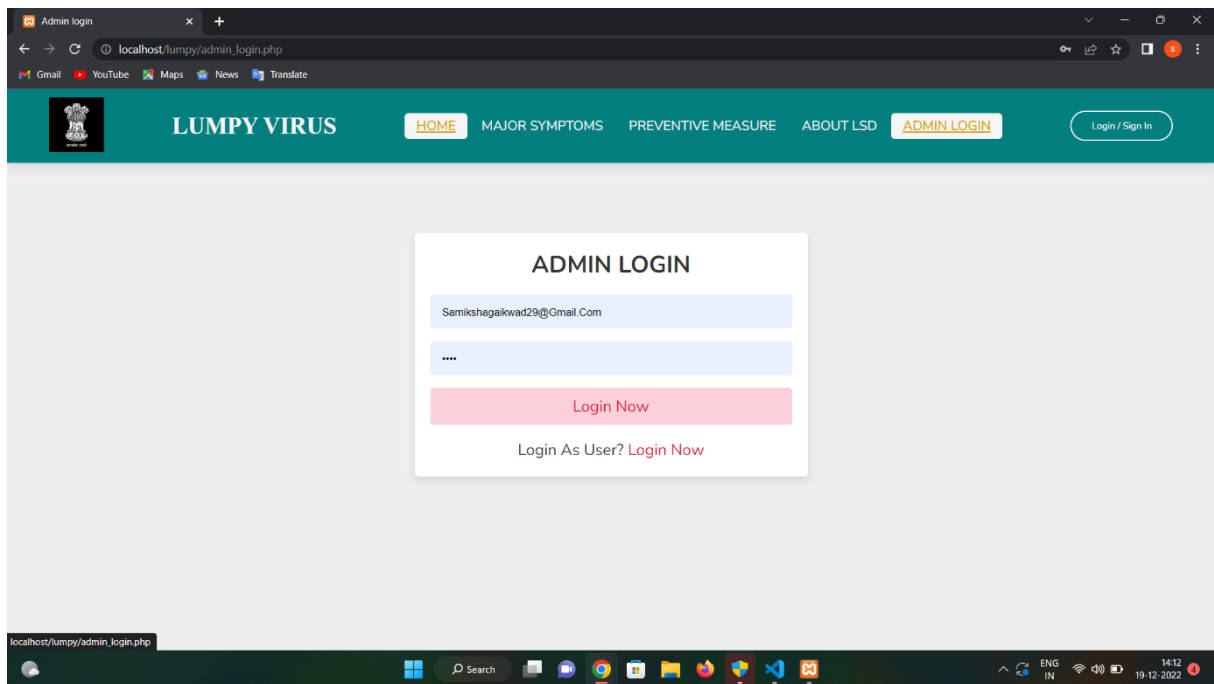
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### Prevention




Control And Prevention Of Lumpy Skin Disease Relies On Four Tactics - Movement Control (Quarantine), Vaccination, Slaughter Campaigns And Management Strategies. Specific National Control Plans Vary Between Countries And So Advice Should Be Sought From The Relevant Authorities And Veterinarians. Vaccination Is The Most Effective Means Of Control, And Live Homologous Vaccines Containing A Neethling-Like Strain Of LSDV Are Recommended. Treatment There Is No Treatment For The Virus, So Prevention By Vaccination Is The Most Effective Means Of Control. Secondary Infections In The Skin May Be Treated With Non-Steroidal Anti-Inflammatories (NSAIDs) And Also Antibiotics (Topical +/- Injectable) When Appropriate. Adapted From The Original Article From EMergence' ( Http://Www.Emergence-Msd-Animal-Health.Com/ Summary Lumpy Skin Disease Virus Causes A Severe Disease In Cattle Characterised By Nodules In The Skin. Transmission Of LSD Occurs Via Insect Vectors And Vaccination Is The Most Effective Means Of Control. During The Past Five Years Lumpy Skin Disease Has Spread Through The Middle East Into Southeast Europe, The Caucasus, Southwest Russia And Western Asia. The Disease Causes Substantial Losses In Affected Herds With Significant Economic Consequences. It Also Blocks Access Of Affected Countries To Lucrative Export Markets, Compounding The Financial Impact Of A LSD Outbreak. The Main Lesson To Be Learnt From The Current European LSD Epidemic Is To Be Vigilant Of Emerging Diseases. NADIS Seeks To Ensure That The Information Contained Within This Document Is Accurate At The Time Of Printing. However, Subject To The Operation Of Law NADIS Accepts No Liability For Loss, Damage Or Injury Howsoever Caused Or Suffered Directly Or Indirectly In Relation To Information And Opinions Contained In Or Omitted From This Document.

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## (About) Lumpy Skin Disease

Pip Beard BVSc, PhD And MRCVS!




### Cause


Lumpy Skin Disease (LSD) Is Caused By Infection Of Cattle Or Water Buffalo With The Poxvirus Lumpy Skin Disease Virus (LSDV). The Virus Is One Of Three Closely Related Species Within The Genus Capripoxvirus, The Other Two Species Being Sheepox Virus And Goatpox Virus . LSD Was First Described In Zambia In 1929. Over The Next 85 Years It Steadily Spread Throughout The Majority Of Africa And Into The Middle East. In 2015 The Virus Entered Mainland Europe In Greece, And The Caucasus And Russia. In 2016 The Virus Spread Further East Into The Balkans, North Towards Moscow, And West Into Kazakhstan. It Is Currently Considered A Rapidly Emerging Disease Of High Consequence. It Is Notifiable With Outbreaks Causing Significant Damage To Productivity And Trade. Sponsor Content

### Transmission

There Is Still A Good Deal Of Information Lacking About The Transmission Of LSD. Experimental Work Has Shown That Direct Transmission From An Infected To A Naïve Animal Is Very Inefficient. Evidence To Date Supports Transmission Of The Virus Via Arthropods Such As Insects Or Ticks (These Are Termed Virus "Vectors"). For Example Outbreaks Of LSD Occur During Warm, Wet Weather While The Disease Usually Diminishes In The Cooler Winter Months. In Addition, LSD Epidemics Are Often Characterised By New Outbreaks Occurring At Distances Over 50km From The Nearest Known Disease Focus. These Characteristics Strongly Suggest Insect-Borne Transmission, Such As Mosquitoes And



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## Lumpy Updates In Maharashtra


1,84,616
Infected By Lumpy-Virus

1,22,499
Recover By Lumpy-Virus

3,622
Death By Lumpy-Virus



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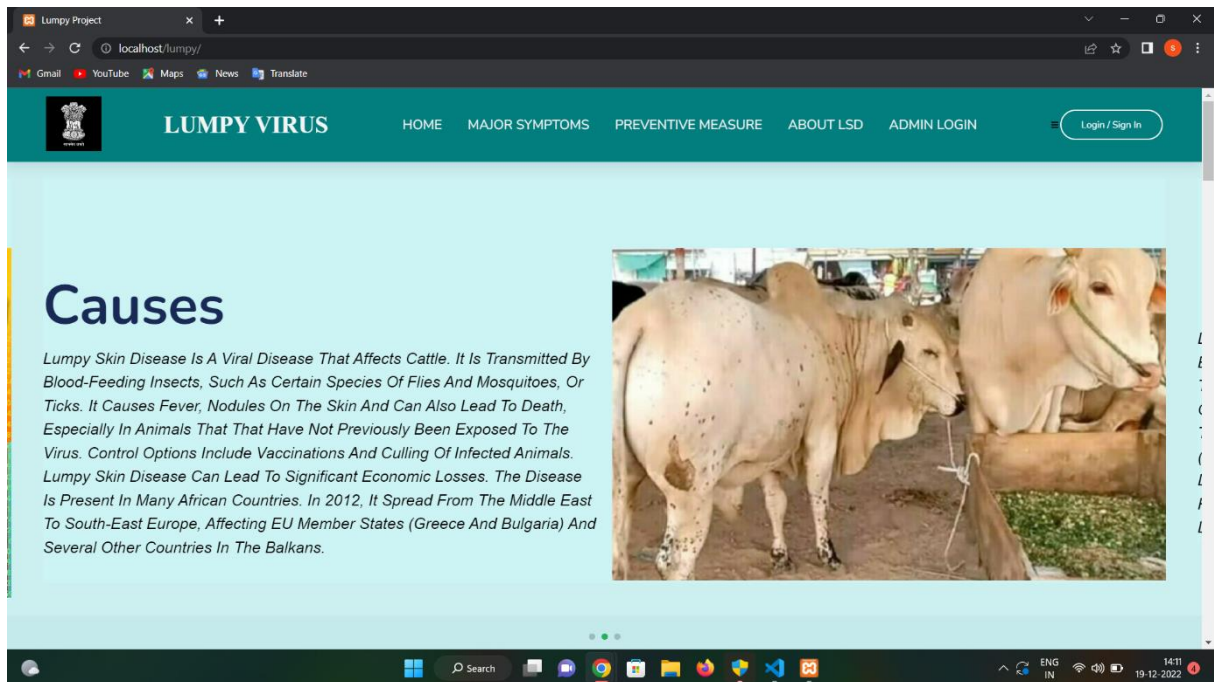
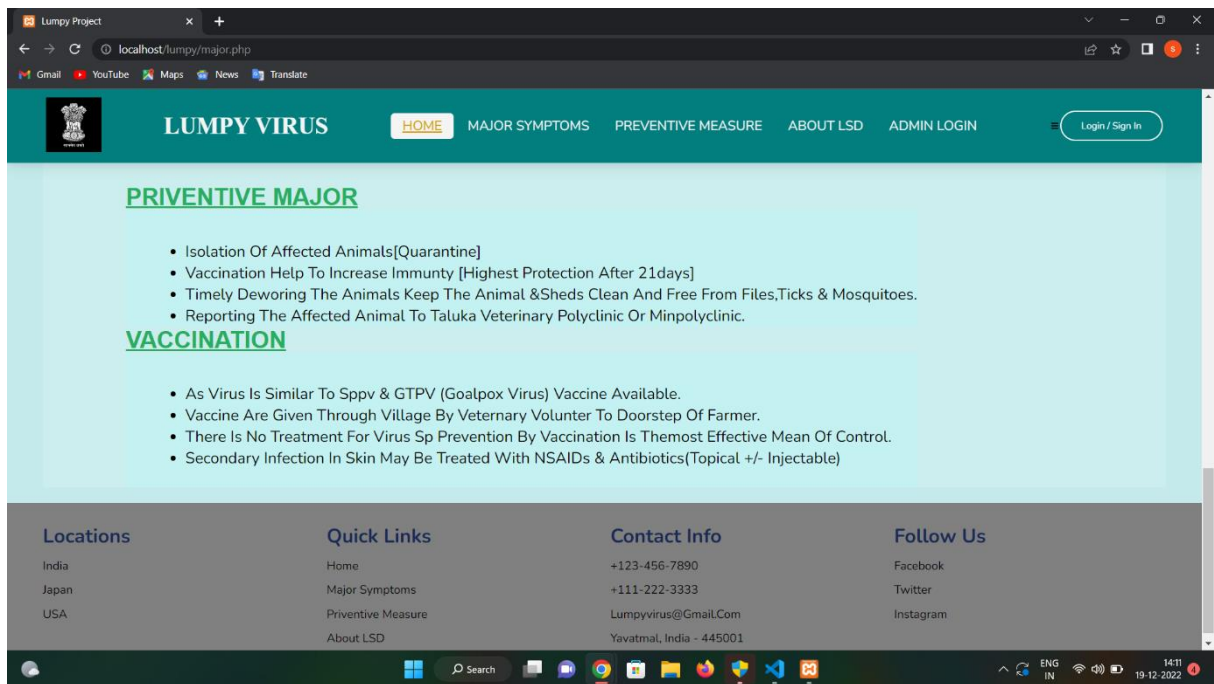

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### MAJOR SIGN AND SYMPTOMS

- Lachrymation And Nasal Discharge
- Subscapular And Perfemoral Lymphnodes
- Enlarged , Swelling Of Timds
- High Fever  $\geq 103$  F







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