

# TULARAEMIA

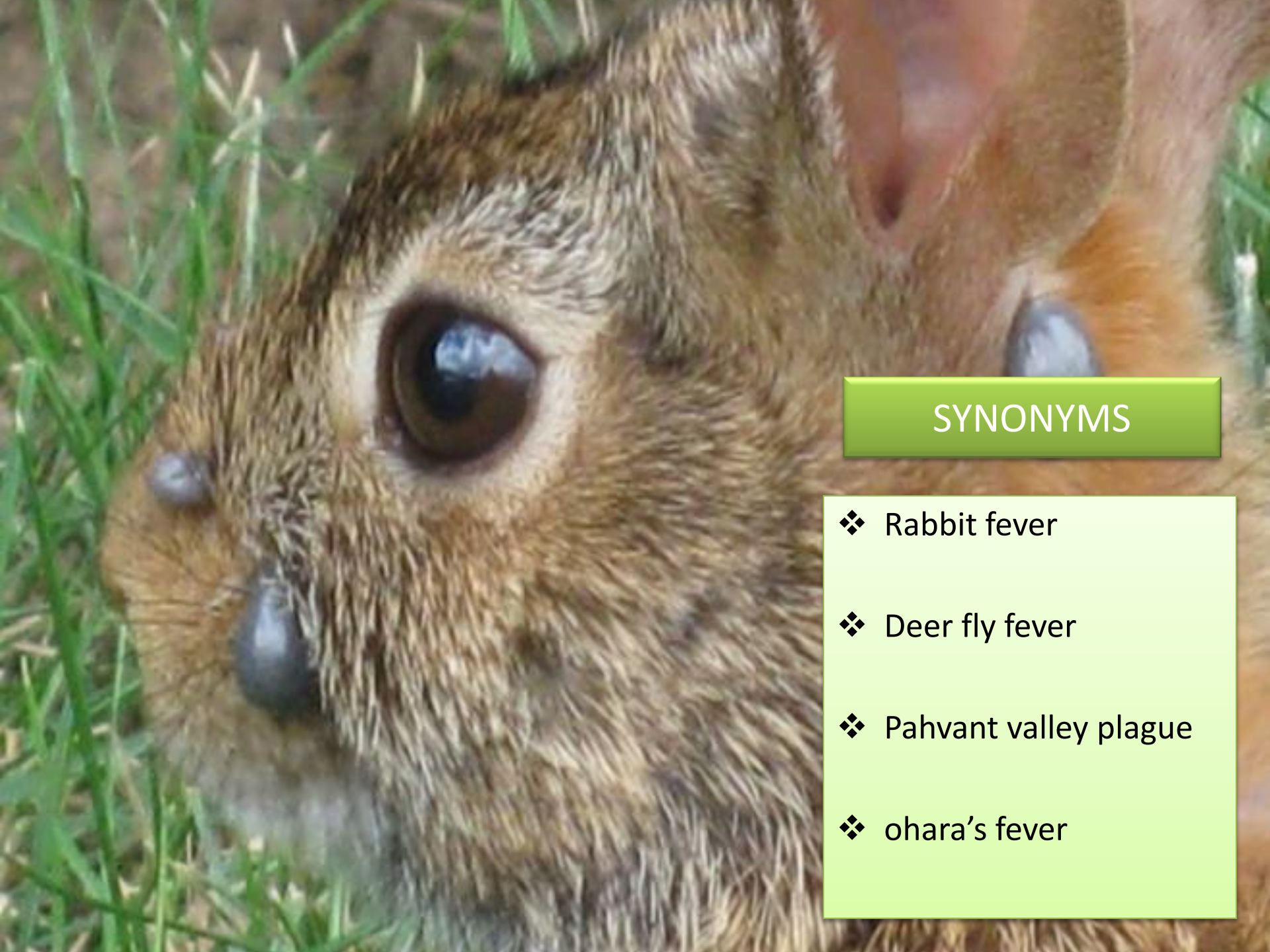
# LEARNING OBJECTIVES

- Introduction
- Synonyms
- Taxonomy
- Hosts
- Epidemiology
- Clinical Manifestations
- Diagnosis
- Prevention and control
- Treatment

## INTRODUCTION



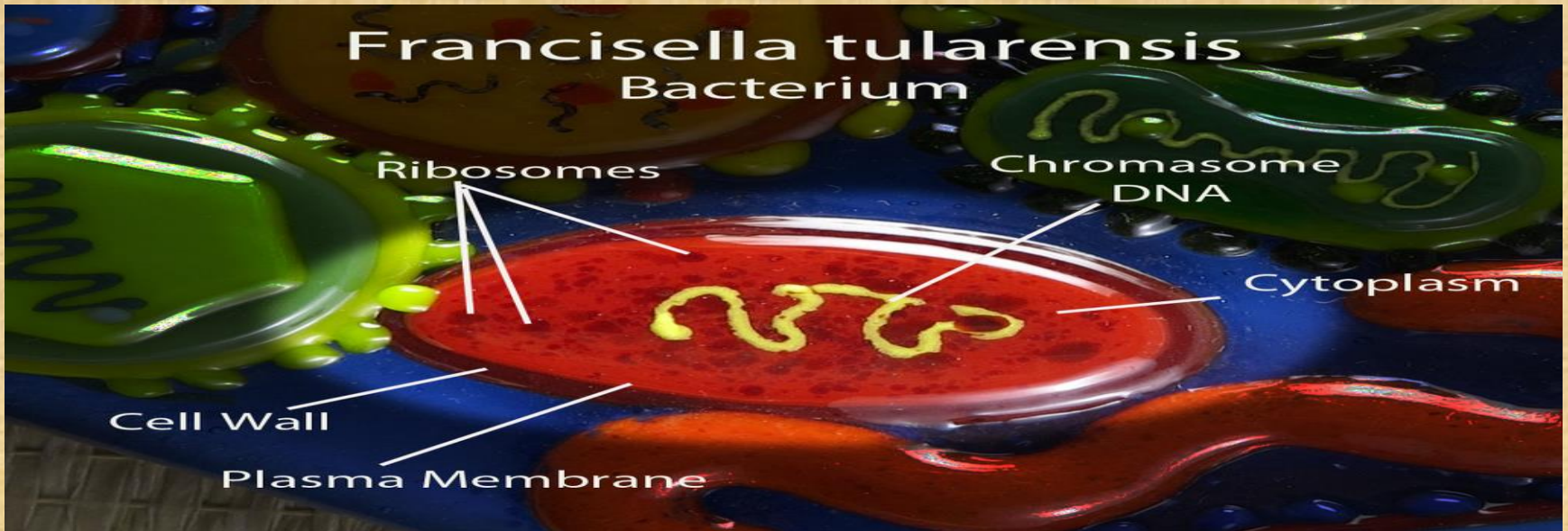
- ❖ Plague like bacterial disease
- ❖ Disease of rodents, hares, rabbits and man
- ❖ Causative agent –  
*Francisella tularensis*  
-  
*Francisella holartica*
- ❖ A1a, A1b and A2 are different virulence for man
- ❖ Primary vector – ticks and deer flies
- ❖ The centre for **Disease Control and Prevention** regarded *F.tularensis* as a viable biological warfare agent



## SYNONYMS

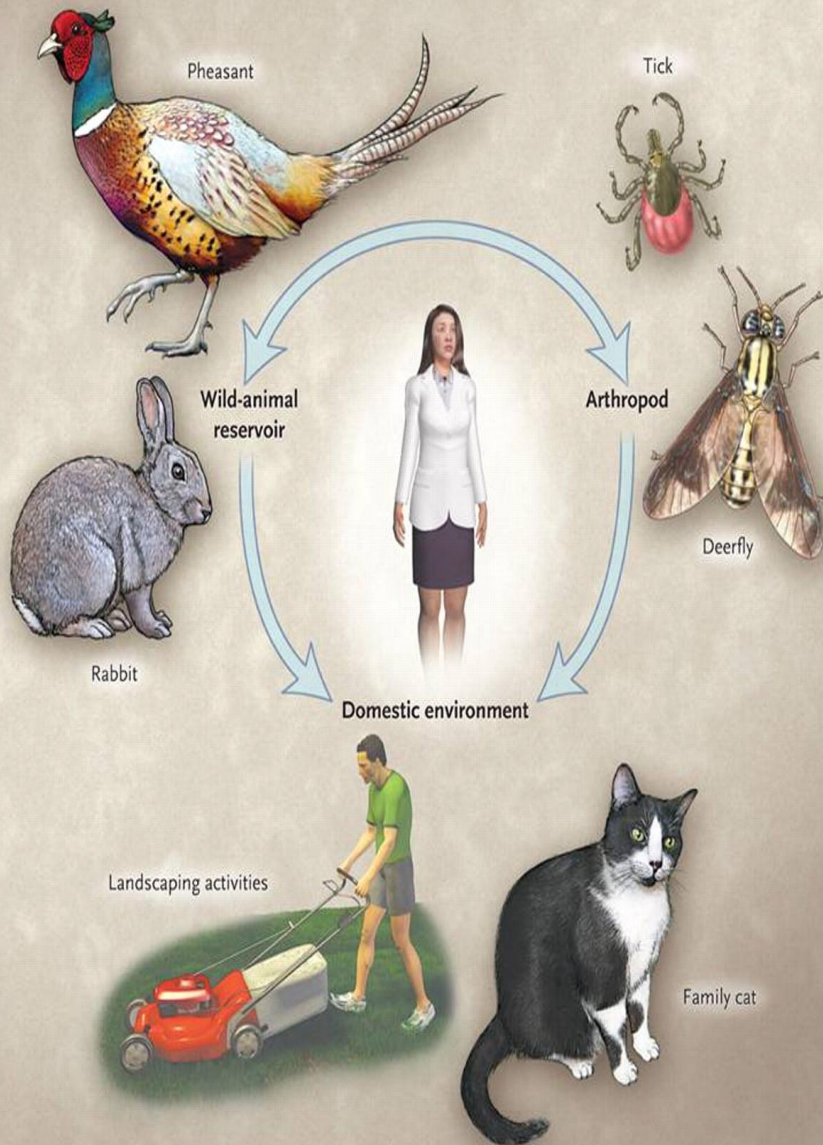
- ❖ Rabbit fever
- ❖ Deer fly fever
- ❖ Pahvant valley plague
- ❖ ohara's fever

# ETIOLOGY



- ❖ Intracellular bacteria
- ❖ *Francisella tularensis tularensis* (type A) – Rabbit, Hares and Pikas in North America
- ❖ *Francisella tularensis palaeartica* (type B) – Aquatic rodents in North America

# HOSTS



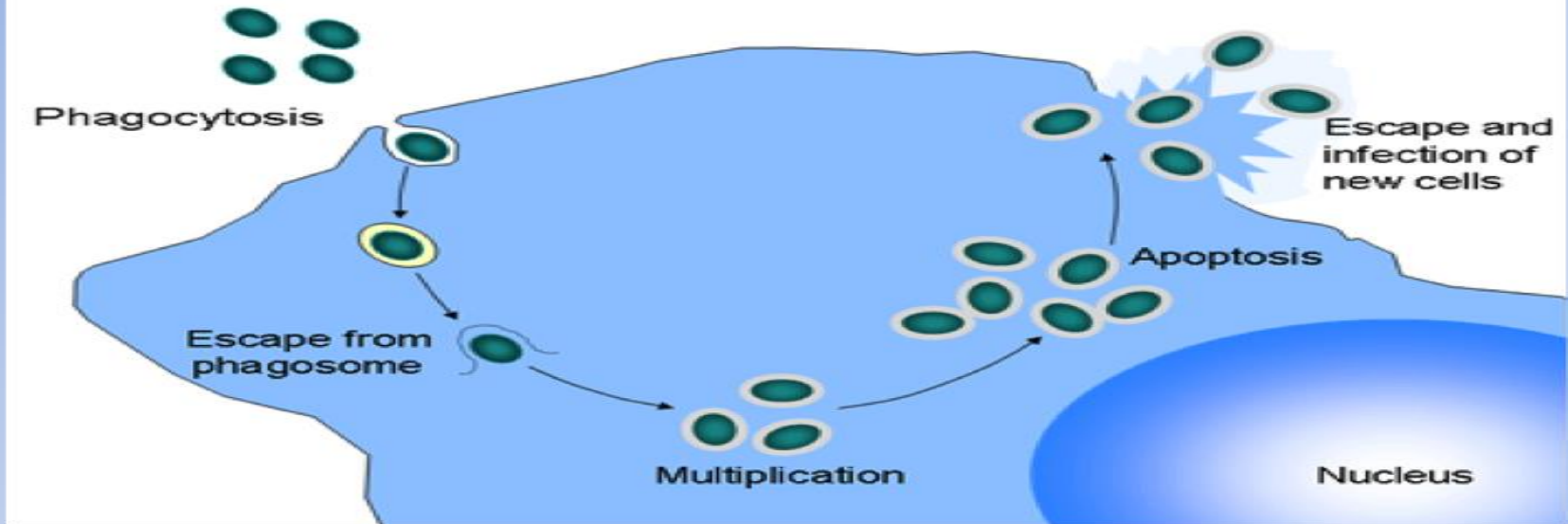
## ❖ Animals –

- Intra cellular pathogen
- Produce **fulminant acute infection** in the susceptible animals
- **Chronic granulomatous infection** in moderately susceptible species

## ❖ Humans –

- Through infected rodents, rabbits and hares
- Through insect bite

## Replication of *Francisella tularensis* in a macrophage



Bacteraemia and cause type of clinical forms

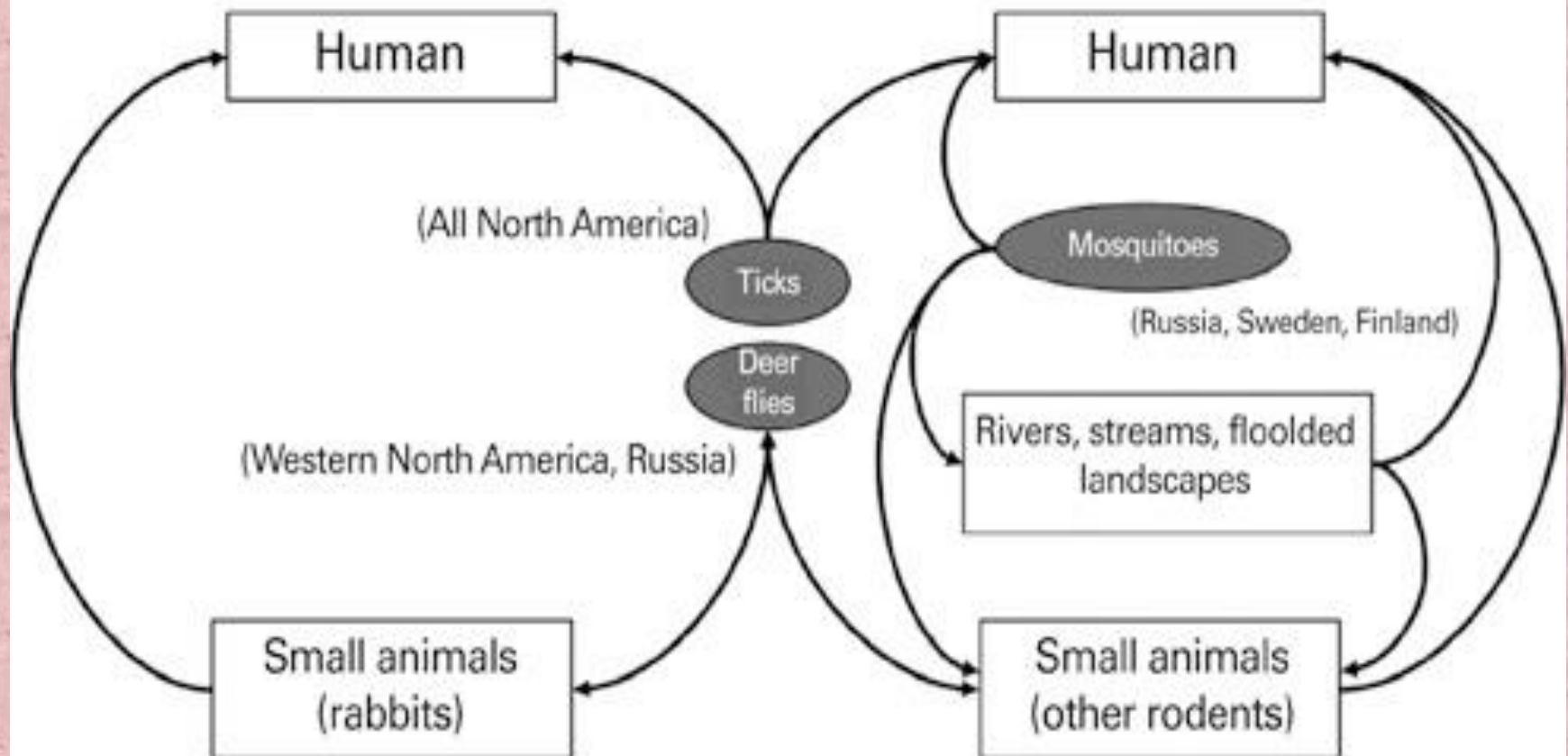


Death but fatality rate about 1%

# PATHOGENIC CYCLES

Type A tularemia:  
terrestrial cycle

Type B tularemia:  
aquatic cycle

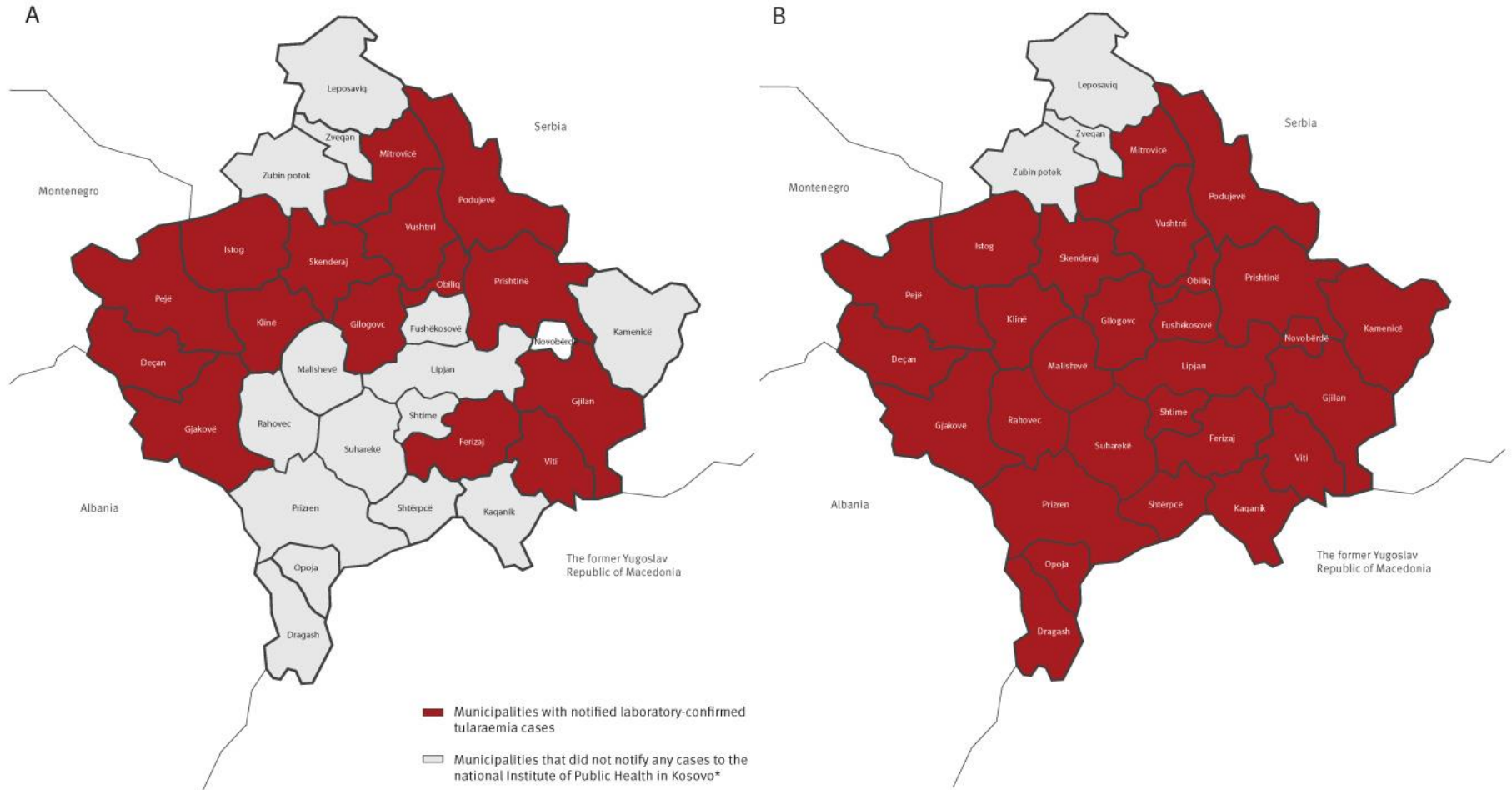




# EPIDEMIOLOGY :-

**FIGURE 3**

Distribution of confirmed tularaemia cases, Kosovo\*, Panel A: 1999–2000 (n=247), Panel B: 1999–2010 (n=1,221)



The three municipalities marked in grey in Panel B were not participating in the surveillance system.

\* This designation is without prejudice to positions on status, and is in line with United Nations Security Council Resolution 1244/99 and the International Court of Justice Opinion on the Kosovo declaration of independence.

# CLINICAL MANIFESTATION

1) Ulcero – glandular

2) Glandular

3) Oropharyngeal

4) Pneumonic

5) Oculoglandular

6) Typhoidal



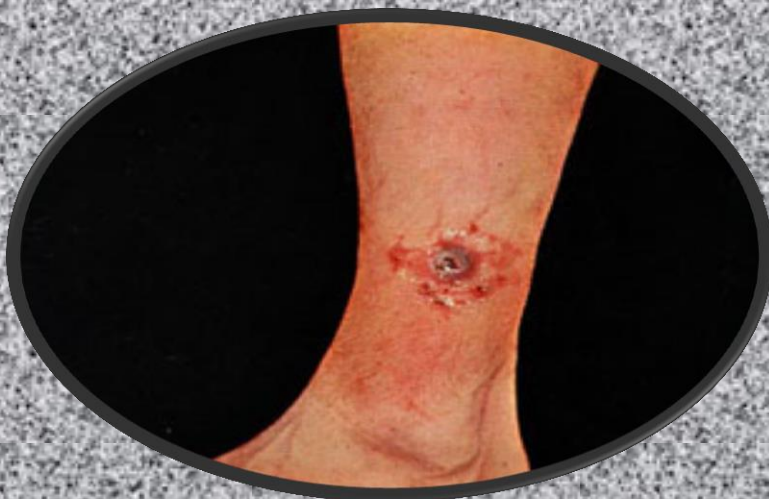
# CLINICAL FORM OF TULARAEMIA TO TRANSMISSION

CLINICAL FORMS	TRANSMISSION ROUTE
1. Ulceroglandular or Glandular	Vector borne or by touching infected animals
2. Oculoglandular	Touching the eye with contaminated fingers or by infected dust
3. Oropharyngeal	Ingestion of contaminated food and water
4. Typhoid	Ingestion of contaminated food and water
5. Respiratory	Inhalation of contaminated dust and laboratory materials

## Passing Tularemia



# TULARAEMIA SKIN & GLANDULAR



## RABBITS & OTHER RODENTS



Tularemia or rabbit fever is an infection caused by the bacteria *Francisella tularensis*.

Soil

Insects

**HEALTH**

**HYPE**



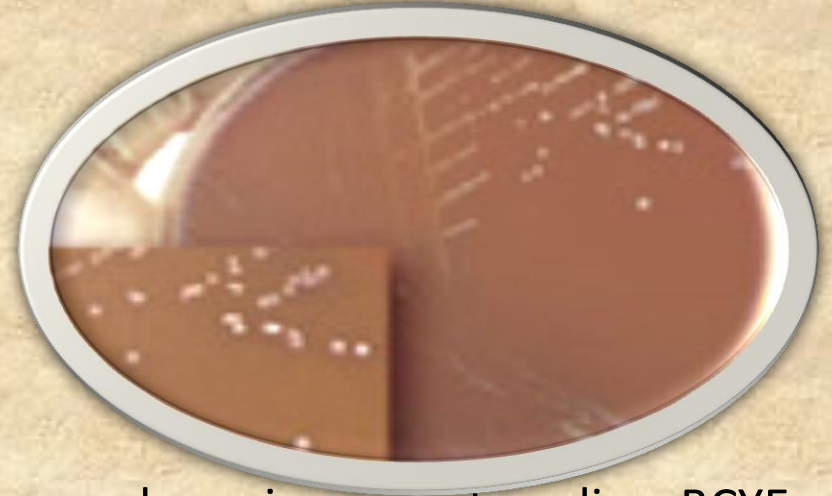
**HUMANS**

Tularemia may affect the skin, eyes, mouth, lungs, or the entire body.

Tularemia (rabbit fever)  
by Health Hype  
[www.healthhype.com](http://www.healthhype.com)

## DIAGNOSIS

1. Direct fluorescent antibody staining, using a FITC-labelled rabbit antibody
2. Slide agglutination
3. Immuno histochemical staining
4. Variety of PCR methods
5. Culture on Cysteine supplemented agar and require special media – BCYE  
(**BUFFERD CHARCOAL AND YEAST EXTRACT**)
6. Serological test – Micro agglutination OR Tube agglutination
7. ELISA test incombination with Western blot technique



## ***Francisella tularensis*** **Sentinel Laboratory Flowchart**

Morphology ► Pleomorphic, minute (0.2 to 0.5 by 0.7 to 1.0 µm) faintly staining, Gram-negative coccobacillus.  
Growth ► Scant to no growth on sheep blood agar after 48 hrs.  
Produces 1 to 2 mm gray to grayish white colonies on chocolate agar by 72 hrs.

Perform all additional work  
in biological safety cabinet

Oxidase Test: Negative  
Catalase: Weak Positive  
B-lactamase: Positive  
Satellite: Negative  
Urease: Negative

Warning: Automated  
identification systems may  
key out as non-*F.tularensis*  
(ie. *Haemophilus influenzae*  
and *Actinobacillus* spp.)

No

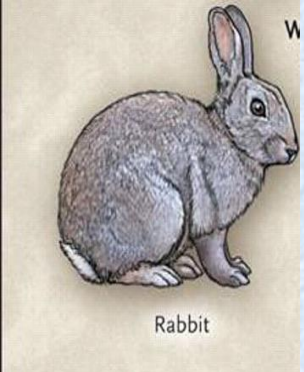
Are all characteristics  
present?

Yes

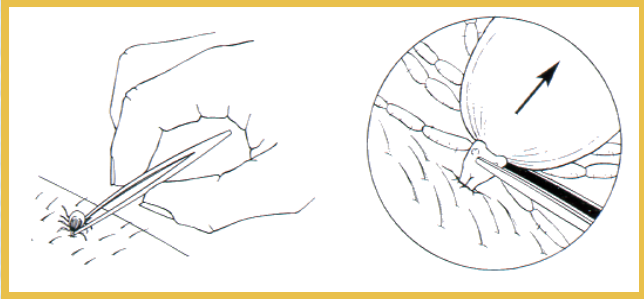
Report: *F. tularensis* is ruled  
out; continue identification  
per laboratory procedures

Report: Unable to rule out  
*F. tularensis*; refer to state public  
health laboratory for confirmation

# PREVENTION AND CONTROL



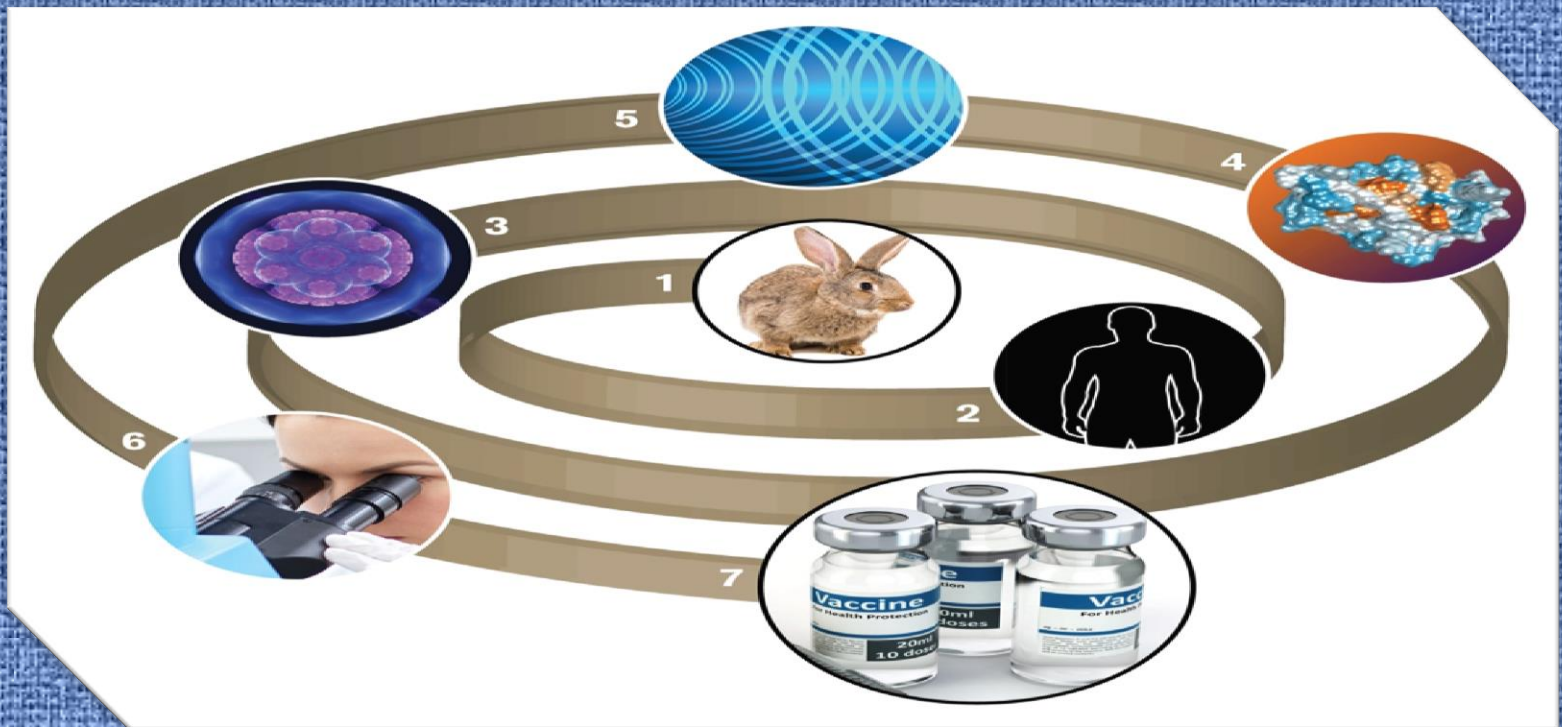
- ❖ Reduce contact with potentially infected animal species
- ❖ Control on ticks and mosquito
- ❖ Education and awareness programme
- ❖ Use of rubber gloves and eye protection when handling potentially infected wild animals
- ❖ Vaccination in selected high risk groups like endemic area due to 2<sup>nd</sup> world war
- ❖ Vaccination programme for laboratory workers





# VACCINATION

- ❖ An attenuated, live vaccine is available
- ❖ Live vaccine for inhalation
- ❖ Live attenuated strains of holartica biotype



A photograph of a brown rabbit sitting on a path in a grassy field. The rabbit is facing left and has its ears perked up. The background is a soft-focus green field. The text "THANK YOU....." is overlaid in the center of the image.

**THANK YOU.....**