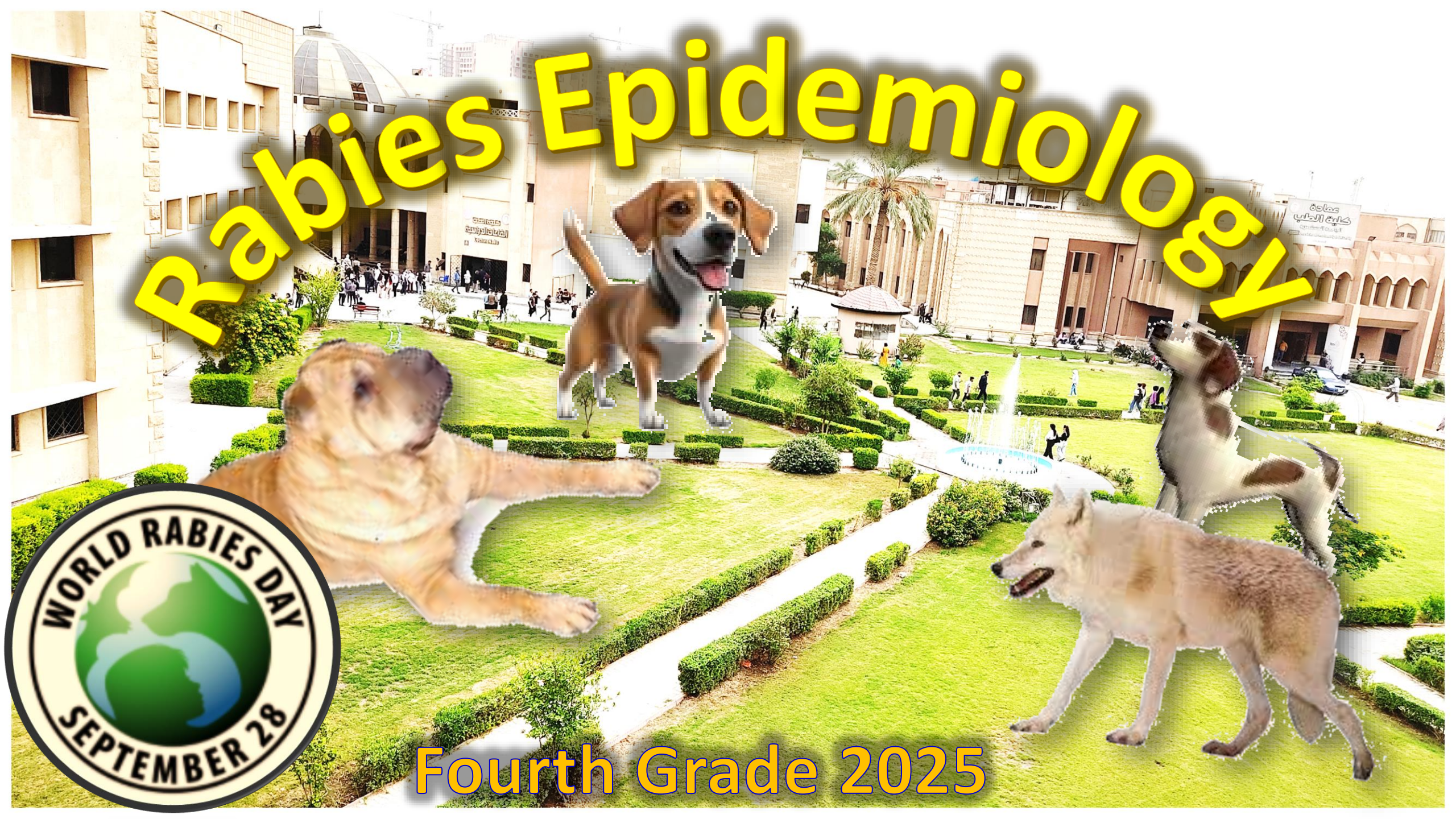


Rabies Epidemiology



Fourth Grade 2025





LECTURE OBJECTIVES

- To show Rabies Agent-host-Env.
- To explain Rabies Immunization
- To outline Pre & Post Exp. Prophylaxis.



Epidemiology of Rabies

Zoonotic acute viral encephalopathy of mammals (carnivorous) Progress into: hydrophobia, convulsions, resp paralysis & death (2-6) days.

60,000 deaths/year (1 death/10min),

40% < 15yrs (why?)

Dog bites: Endemic areas $10-130/10^5$ (Asia & Africa).

In Iraq 22000 dog bites 2021 (60% Cat III)

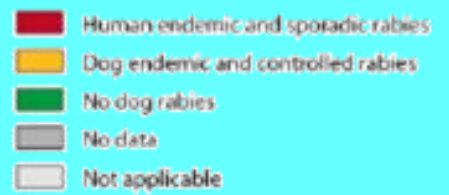
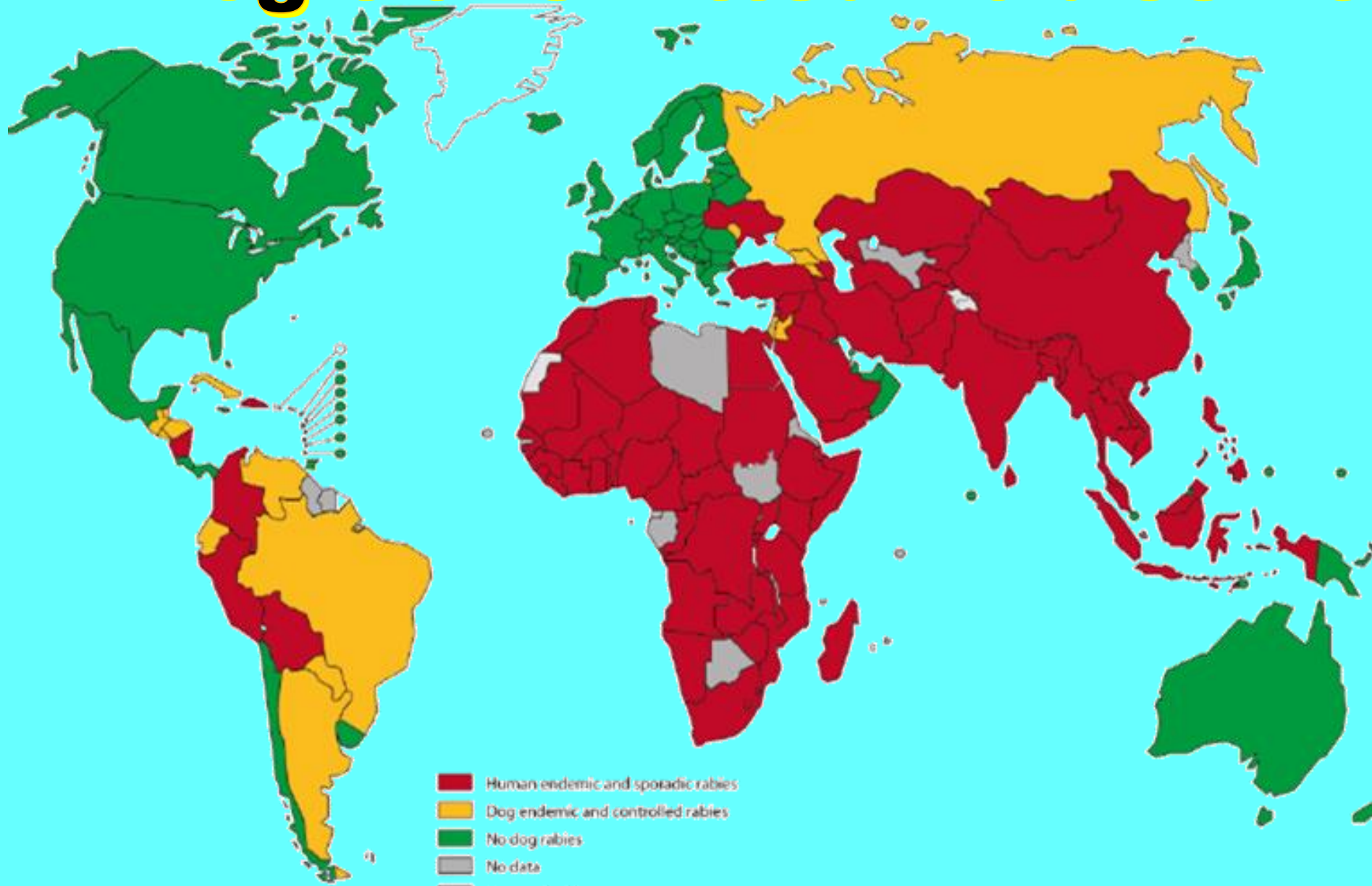
WHO → zero death by 2030

Only always fatal communicable disease in man

- **Urban (canine) type** transmitted by dogs
- **Sylvatic type** transmitted by wild animals & bats.



Dog transmitted Rabies 2022



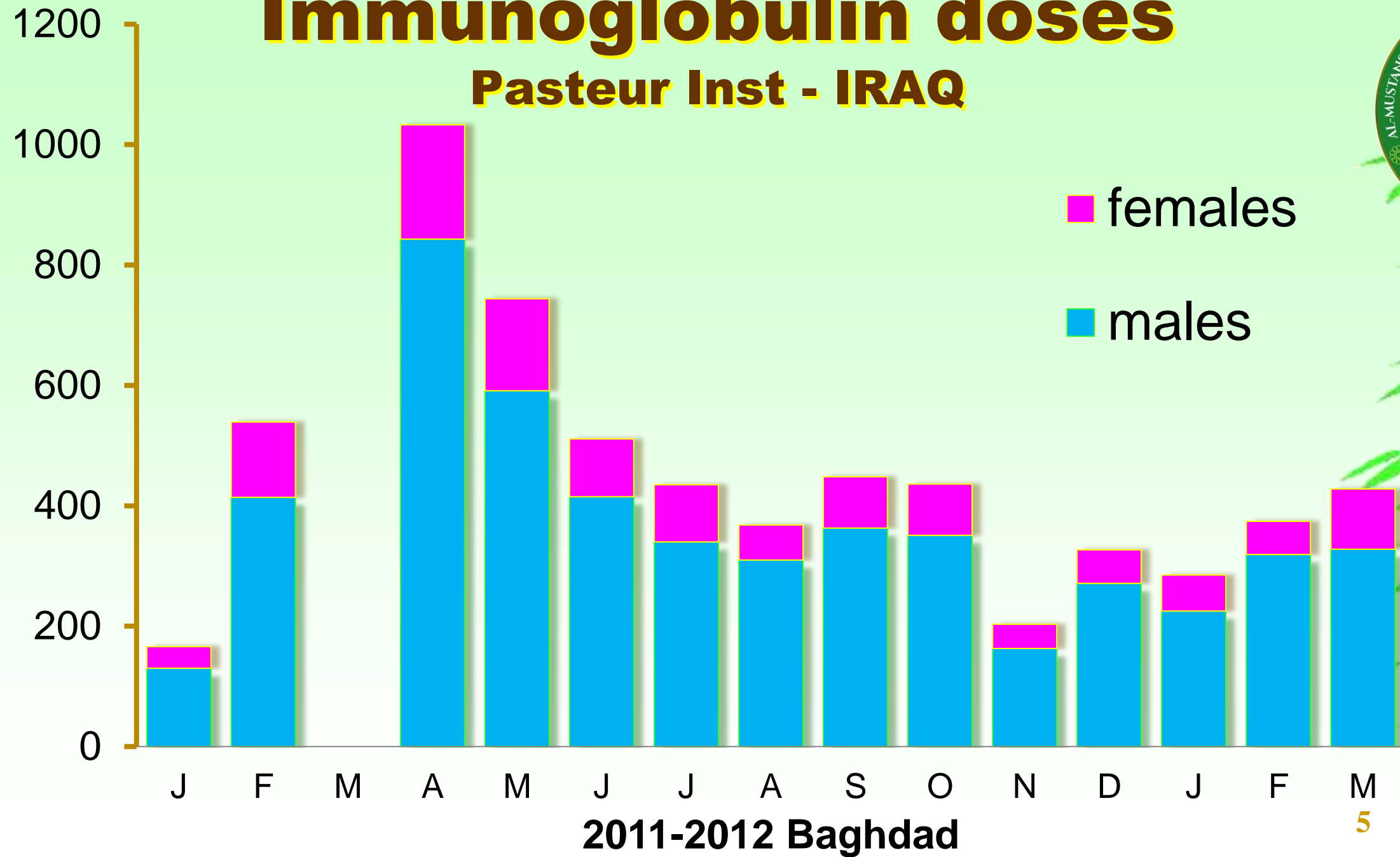
Immunoglobulin doses

Pasteur Inst - IRAQ



■ females

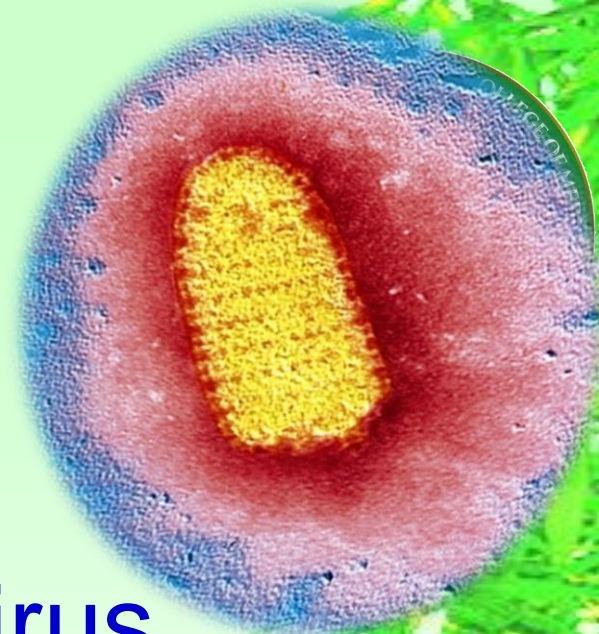
■ males



2011-2012 Baghdad



Animal Diagnosis



Agent: Lyssavirus bullet shape RNA virus.

Host: warm blooded animals & man.

Diagnosis: by killing or testing the dead animal:

- FA staining of brain or infected tissue
- Microscopic exam of brain for Negri bodies.
- Mouse inoculation & Virus isolation test.

Diagnosis in man (clinical & post mortem) is too late!

Reservoir

- **Dogs:** in developing countries
- **Wild canines:** (Enzootic): fox, wolf.
- **Bats:** America & Europe

Source of infection

Saliva of rabid animals

Modes of transmission

- ➔ Animal Bite or scratch: dog, fox
- ➔ Licks on abraded skin.
- ➔ Organ transplant: cornea
- ➔ Aerosol: bat caves, lab workers.
- ➔ Man to Man? **Dead end infection**



Incubation period

2-12 weeks

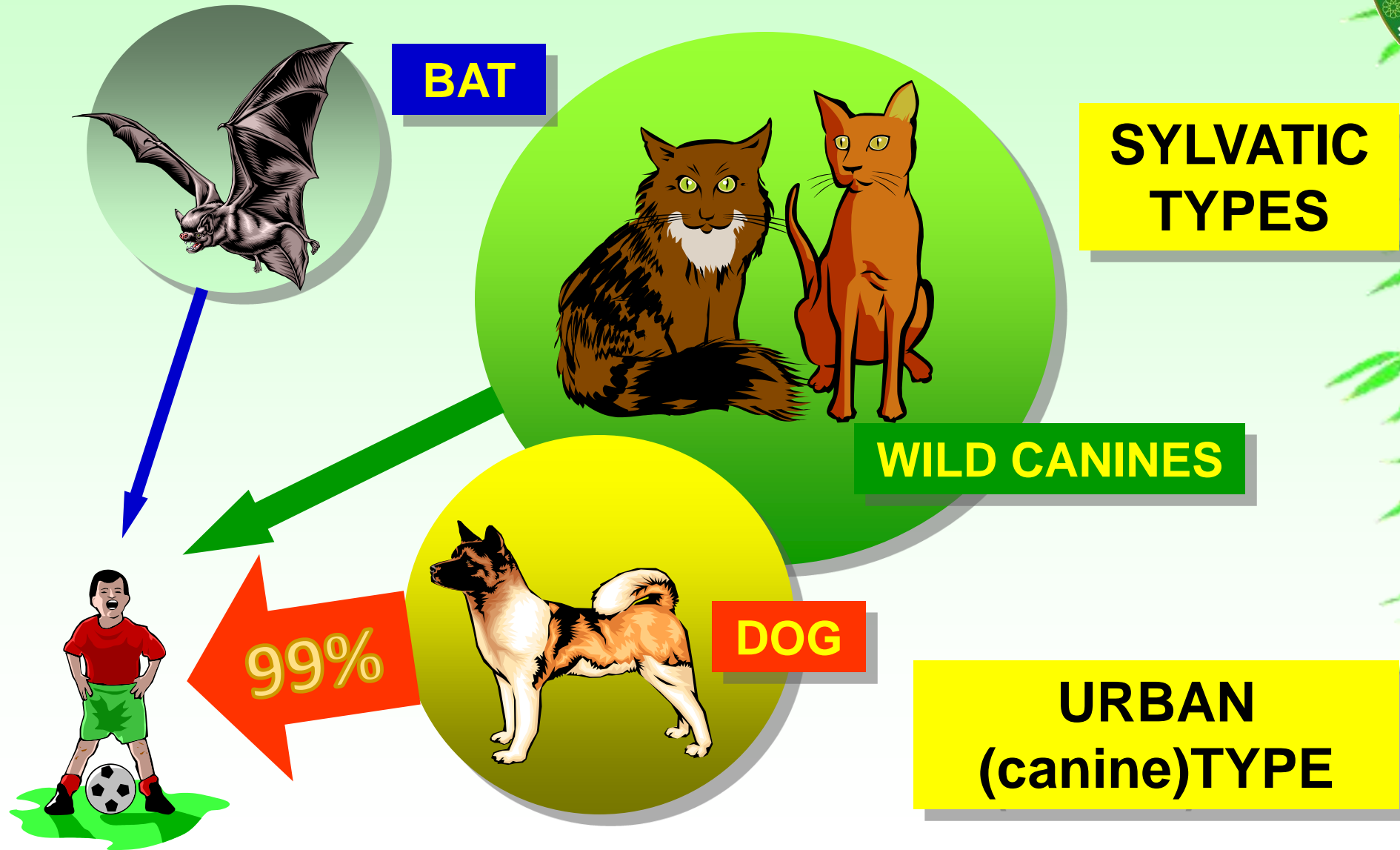
Only communicable disease with so variable and multi factor dependant:

Depends on:

1. Biting animal species
2. wound:
 - Severity**
 - Site**
 - Distance from head**
3. Protection by clothing
4. Immunoglobulin given



Epidemiologic types





RABIES VACCINE (CCEEV)

Inactivated RABV



IM route: 1 ml vials Deltoid, Thigh, (not gluteal region).

ID route: 0.1 ml (more immunogenic) Thigh, Deltoid

Side effects: rare → **Anaphylaxis, encephalopathy**



PrEP (Pre-exposure immunization):

Two doses: IM days 0,7 (or ID 4 doses, day 0,0,7,7)

Boosters: after one year, then every 3 years

Post-exposure immunization:



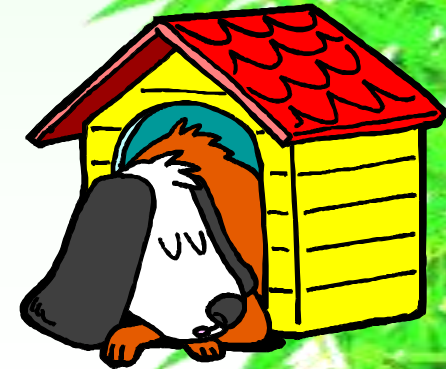
Previously immunized: Two doses: IM days 0,3
(or ID 4 doses day 0,0,0,0)

Not immunized: Four doses: IM days 0,0,7,21
(or ID 6 doses day 0,0,3,3,7,7)

Prevention (100% vaccine preventable)



- License & Immunize dogs
- Euthanize stray dogs القتل الرحيم
- Dog population control تعقيم
- Active surveillance for epizootics
- Oral immunization for wild animals:
using air-drop bait attenuated/recombinant vaccine
- **PrEP** for high-risk people: lab workers,
veterinarians , zoo personnel, hunters.



Passive immunization RIG



Neutralizing the RABV at wound site, before immune system can respond to the vaccine by producing VNAs.

Two types of Rabies immunoglobulin:

Max wound infiltration **ASAP** (<7days)

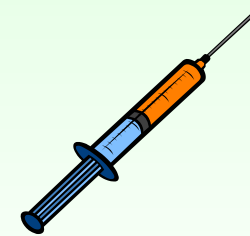
hRIG: human (20 IU/Kg)

eRIG: Equine (40 IU/Kg)

→ given for severe (Cat III) wound

→ **not recommended if patient had taken:**

- Rabies vaccine before.
- First PEP vaccine dose 7 days ago.





PEP: Post-exposure prophylaxis

→ Wound care, +/- CCEEV, +/- RIG

Done after animal bite, depending on:

Category Classification: I, II, III

Serious (usually severe) bites:

- Category III
- Animal nature: wild
- Condition of bite: unprovoked bite
- Rabies surveillance: enzootic or epizootic
- Animal condition: diseased/dies within 10d.



Steps of Post-exposure prophylaxis



- ✓ **Wound management:** washing & flushing with water for **15 minutes** (+/- soap). Then ethanol or povidine iodine. Don't suture, or do it after RIG infiltration. Antibiotics, tetanus booster, analgesics.
- ✓ **Post-exposure vaccination:** series of doses
(only vaccine schedule given after infection)
- ✓ **Passive immunization:** RIG wound infiltration ASAP, except if previously immunized

Dog bites



Classification Categories



Previous Vaccine	Category I (Intact skin)	Category II (scratch)	Category III (wound)
No	Washing No vaccine No RIG	Washing Immediate vaccine	
Yes		No RIG	RIG
Yes	Washing No vaccine No RIG	Washing Immediate vaccine No RIG	



References



- WHO. Expert Consultation on Rabies; Third report 2018
- WHO. Rabies vaccines: WHO position paper; No 16: April 2018
- WHO-FAO. Eliminating Rabies Is An Achievable Goal, If We Work Together; Dec 2020



MUSTANSIRIYAH