

## Rudolph Virchow



- 🐾 **Father of modern pathology**
- 🐾 **First used the term "zoonosis"**
- 🐾 **Strong advocate of "one medicine"**




## Tenet of population medicine:

Most new problems are introduced

**Accidental vs. malicious**


75% of ...



and

80% of ...

humans


and wildlife

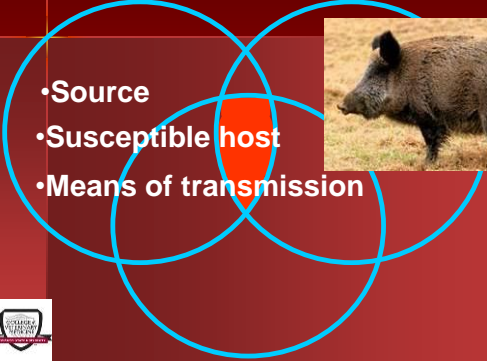







## Disease Transmission

- Source
- Susceptible host
- Means of transmission

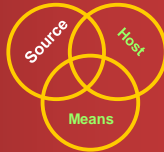




## Source of the agent

- 🐷 Diseased animals
- 🐷 Offal & other waste
- 🐷 Vectors / fomites / environment



**REMEMBER : humans ARE animals !!**



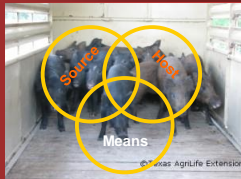
## Susceptible Host

- 🐷 Emigration (natural)
- 🐷 Importation (transportation)
- 🐷 Stressors  
(Population density, weather,  
± nutrition, other disease, etc)

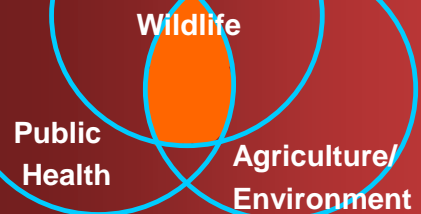


## Means of Transmission

- 🐷 Direct contact
- 🐷 Vectors / fomites / environment



## Disease Impact





## Zoonotic Diseases of Swine

Actinobacillosis

Anthrax

Botulism

### Brucellosis

Clostridial Diseases

Coccidiosis (Coccidia)

Campylobacter

### Cryptosporidiosis

E. coli - Scour (Diarrhea)

Encephalomyocarditis

Enzootic

Japanese B Encephalitis Virus (JE)

### Leptospirosis

Listeriosis

Nipah virus disease

### Rabies

### Salmonellosis

Streptococcal Infections & Meningitis

Swine **Influenza** Virus (SI), Flu

Swine Pox

Internal Parasites (Worms etc.)

Tetanus

### Tuberculosis

Mange Mites,

Sarcoptes Scabiei

Yersinia Infection



## Leptospirosis

#1 zoonotic disease world-wide



*Leptospira interrogans*  
Serovars (*pomona*, *hardjo*,  
*icterohemorrhagica*, *bratislava*, etc)

Urine, contaminated water & reproductive material and fluids

Domestic and wild animals  
Carnivores, hooved stock, rodents



## Leptospirosis



Mainly affect liver & kidney  
Usually low morbidity / mortality  
Jaundice / Icterus  
Flu-like signs (fever, aches, ADR)  
can cause abortion / infertility

Warm moist late summer  
Incubation is several days to weeks  
Water exposure (include animals)  
Contact your physician  
Mucous membrane contact



## Brucellosis

Undulant fever, Malta Fever, Bang's Dz

*Brucella* sp.

*canis*, *suis*, *melitensis*, *abortus*, *ovis*  
(*B melitensis* not in USA)

**ZOONOTIC / Reportable**

Cattle, sheep, goats,  
pigs, horse, bison,  
reindeer, elk, camels,  
otters, dolphins, humans



## Brucellosis

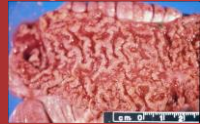
### Animals

Abortion / infertility  
Orchitis, spondylitis (vertebrae)  
STD !!  
Equine "fistulous withers"



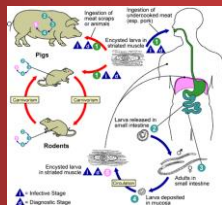
## SALMONELLOSIS & *E. coli*

- Gram negative enteric (GI) bacteria
- Common food-borne pathogen
- Fecal-oral transmission
- Watery to bloody diarrhea ( $\pm$  fatal)



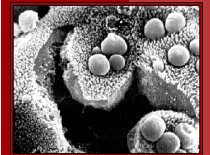
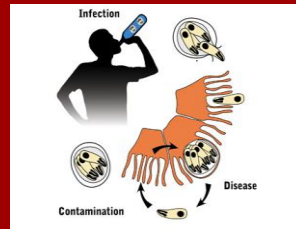
## Trichinella

- Under-cooked pork
- Muscle
- Muscle pain




## Cryptosporidia

Mammals, reptiles, birds, fish



## Pseudorabies (Aujeszky's Dz)

(Porcine Herpes Virus type 1)

 NOT zoonotic  
Other mammals (dogs, cats, cattle)  
"MAD ITCH"

 Reportable  
Interstate commerce



## Foreign Animal Diseases

Vesicular diseases

Foot and Mouth Disease  
Vesicular Exanthema  
Swine Vesicular Disease



**"CALL THE FEDS !!!"**



## Foreign Animal Diseases

S... Fever  
Cl...

**"CALL  
THE  
FEDS !!!"**




[www.fao.org/docrep/003/10756e/10756e122.jpg](http://www.fao.org/docrep/003/10756e/10756e122.jpg)



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## INFLUENZA

-  Multiple strains
- Great variation (H, N)
- Recombination / mutation
-  Amplification host
-  Spill-over to humans



<http://medicnewworld.org/images/blog/avian-flu-virus-342300.jpg>



## Recent Non-Scientific Telephone Poll

- 10 USDA-APHIS-Wildlife Services & National Wildlife Disease Program
- Arkansas, Florida, Georgia, Indiana, Illinois, Louisiana, Mississippi, Maryland, Delaware, DC



## Recent Non-Scientific Telephone Poll

- Does your state (region) have a feral swine problem ?

Yes : 9 No: 2

- Level of concern (scale of 1 – 10) ?

Range 5 - 8

- What's being done ?

Trap/slaughter, hunt, helicopter, education  
Public relations (information)



## Recent Non-Scientific Telephone Poll

- Cooperators ? USDA-VS, state natural resource agencies, state animal health, private industry, public health
- Getting better ? Same or worse ?

All 9 = WORSE !!!

- What is needed ?

Education, public relations,  
LEGISLATION  
STOP MOVING PIGS !!



## Recent Non-Scientific Telephone Poll

- Recommendations ?

Awareness / define the problem(s)

Recognize issues

environmental impacts

human & domestic animal health

land holders

Disease surveillance

Be aggressive ("pig SWAT teams")

Develop regional strategies

Demonstration sites



**What to do ?**

- Harvest only healthy animals
- PPE: personal protective equipment gloves, clean-up, offal disposal
- Report unhealthy animals

**What NOT to do ?**

- Import/transport unhealthy animals
- Harvest unhealthy animals
- Concentrate animals (baiting)
- Improper offal disposal

**Consequences ?**

You saw the pictures  
 Know when to contact your health care professionals !  
 If in doubt, call someone (better safe than sorry !)





**REMEMBER:**

**Not All Invasive Species are VERTEBRATES**

**Not all emerging diseases are FOREIGN**

**Introductions may be accidental, malicious, or intentional, but misguided**





**Are you at RISK ???**




**Avian Flu hits Disney**



