The CDC 710 Program at SHSPH

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of
Health Sciences

Fakulteit Gesondheidswetenskappe
Lefapha la Disaense tša Maphelo

From West Nile fever to Streptococcus suis: monitoring outbreaks of emerging zoonoses

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Make today matter

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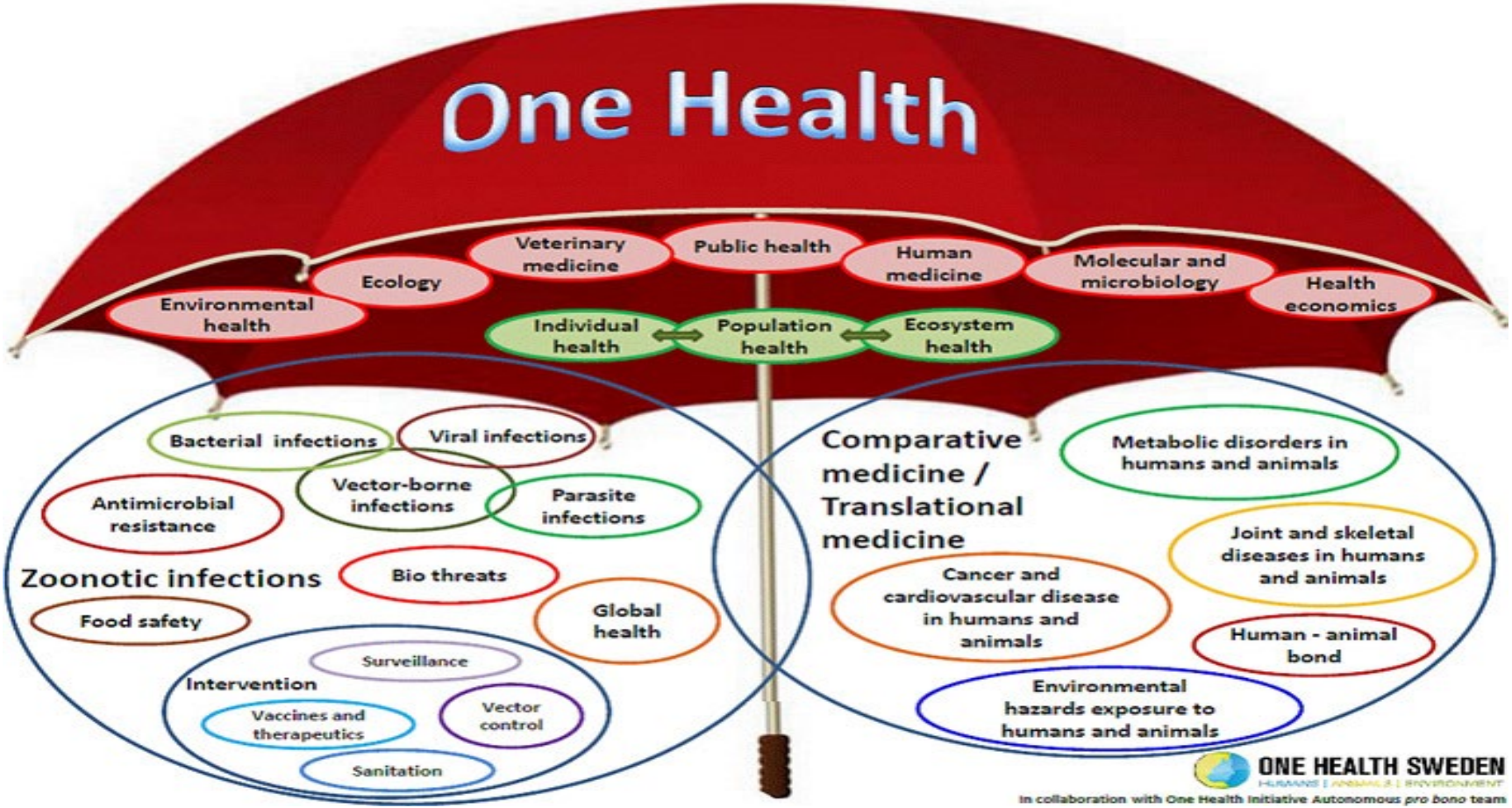
One Health

OIE: "***The One Health concept was introduced at the beginning of the 2000s. In a few words, it summarised an idea that had been known for more than a century; that human health and animal health are interdependent and bound to the health of the ecosystems in which they exist***" (http://www.oie.int/en/for-the-media/onehealth/)

CDC :"***One Health is defined as a collaborative, multisectoral, and trans-disciplinary approach — working at the local, regional, national, and global levels — with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment***."
(https://www.cdc.gov/onehealth/basics/index.html)



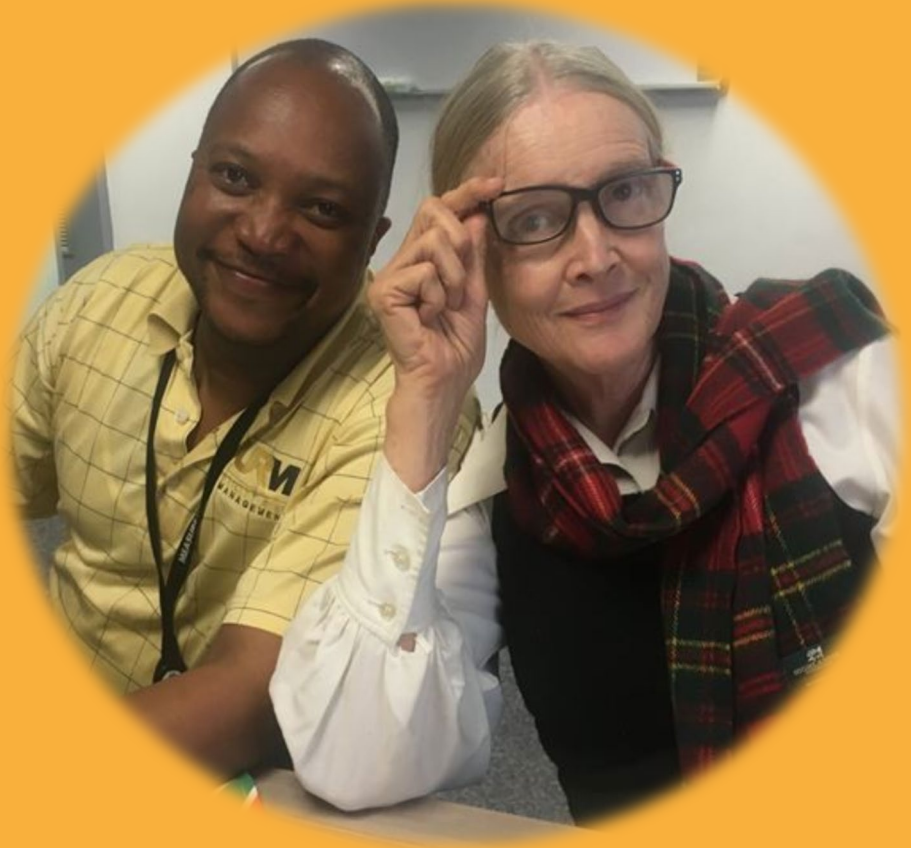
http://www.onehealthinitiative.com/about.php

School of Health Systems and Public Health

One Health is Multidisciplinary, so is SHSPH

- *The Faculty of Health Sciences, comprises of four Schools, one of which is the School of Health Systems and Public Health.*
- *The SHSPH is a University-wide, "horizontal" School: it accesses and strengthens any area relevant to the health system and to public health.*
- *Its nature is, by definition, multidisciplinary; staff is recruited from many departments and faculties throughout the University, as well as from outside institutions and organisations.*

School of Health Systems and Public Health



CDC 710 2021

Diploma in Public Health

The Diploma is offered as a part-time completely online course over 18 months. https://online.up.ac.za/onlinepostgraduate-diploma-in-public-health/ Research component: Assignment in Public Health (AHM 710) Admission requirements: A 4-year bachelor's degree + at least 2 years' applicable work experience OR a 3-year bachelor's degree + at least 5 years' applicable work experience

The Module "Zoonoses, Vectors and One Health" (CDC 710) is managed by Mahlatse Moropeng and I am the presenter

1. Describe what “zoonoses” and vectors are (MO1)
2. Describe factors influencing transmission and maintenance of zoonoses (MO3)
3. Classify common bacterial, viral, protozoal, and nematode zoonoses affecting humans and how they contribute to disease occurrence and transmission (MO3)
4. Explain how to break the chains of transmission of zoonotic diseases (MO1)
5. Describe the “Ebola” virus ecology and transmission (MO1, 3)
6. Describe what is meant by “one health” (MO1)
7. Describe the aim and purpose of one health in public health perspective (MO1)
8. Describe the zoonotic diseases of medical importance and their mechanisms of infections between species (cross-barrier species disease profiles) (MO2, 5, 6, 7)
9. Describe factors/causes affecting human and animal health (change/effect) (MO2346)
10. Describe how changes or alterations in the environment can affect the health of animals and humans (MO3, 6)

WHO global alert and response system

WHO, OIE, FAO tripartite collaboration

When a significant public health event takes place, WHO's comprehensive global alert and response system ensures that information is available and response operations are coordinated, including:

- Event-based surveillance, multi-hazard rapid risk assessment and event-based risk communications;

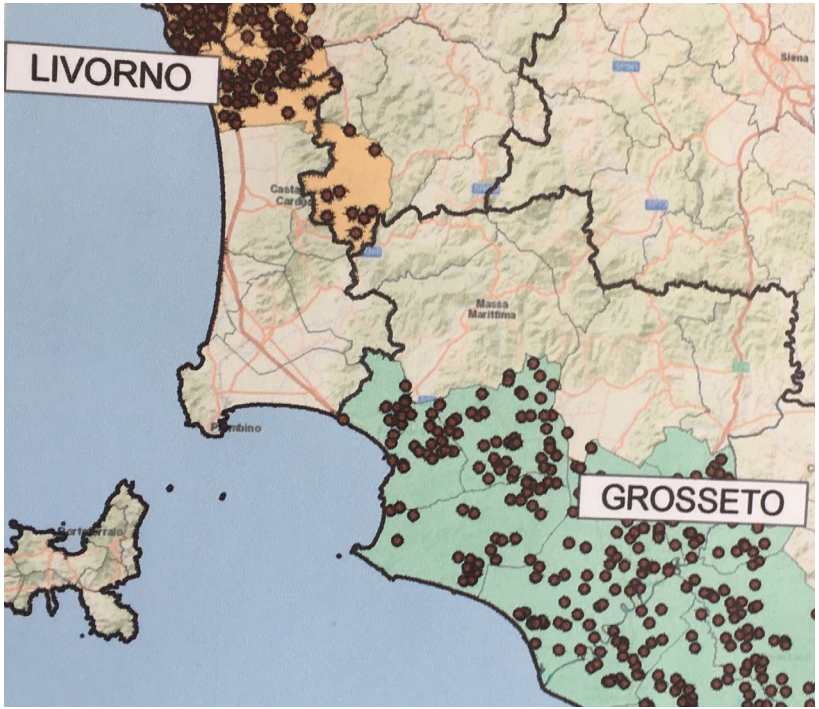
- Critical information and communications platforms for decision support; and

- Operations and logistics platforms for any WHO response to international public health risks.

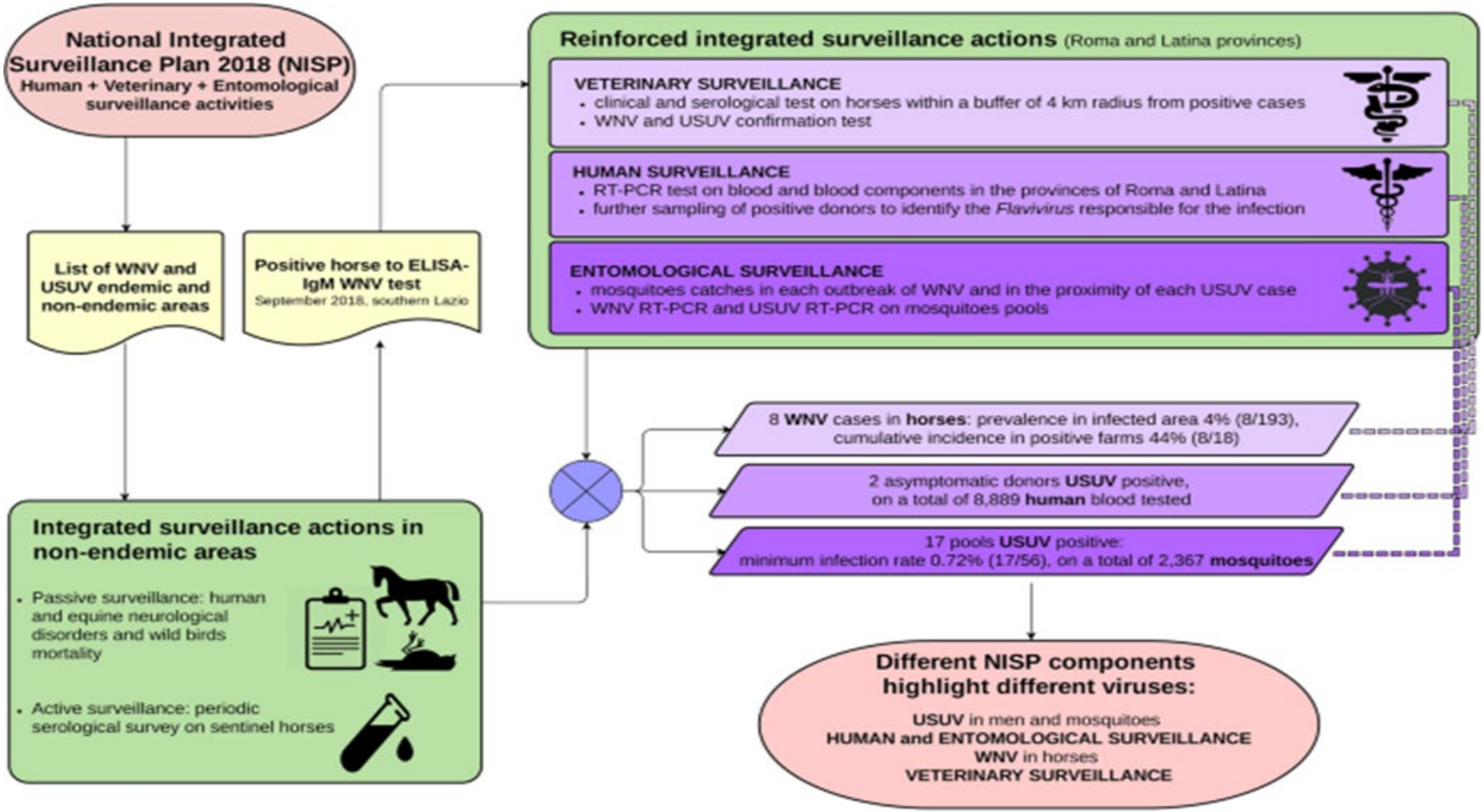
Two exciting developments in One Health

1. Integrated Surveillance of West Nile Fever in Europe
2. Streptococcus suis in sheep and goats

Integrated surveillance of WNF in Tuscany



Integrated surveillance targets mosquitoes, wild birds, humans, and horses and aims at early detecting the viral circulation and reducing the risk of infection in the human population. It involves transdisciplinary and trans-sectorial collaboration between regional institutions involved in public, animal, and environmental health.


National Integrated Surveillance Plan 2018 (NISP)
Human + Veterinary + Entomological surveillance activities
List of WNV and USUV endemic and non-endemic areas
Positive horse to ELISA-IgM WNV test
September 2018, southern Lazio
Reinforced integrated surveillance actions (Roma and Latina provinces)
VETERINARY SURVEILLANCE
clinical and serological test on horses within a buffer of 4 km radius from positive cases
WNV and USUV confirmation test
HUMAN SURVEILLANCE
RT-PCR test on blood and blood components in the provinces of Roma and Latina
further sampling of positive donors to identify the Flavivirus responsible for the infection
ENTOMOLOGICAL SURVEILLANCE
mosquitoes catches in each outbreak of WNV and in the proximity of each USUV case
WNV RT-PCR and USUV RT-PCR on mosquitoes pools
8 WNV cases in horses: prevalence in infected area 4% (8/193), cumulative incidence in positive farms 44% (8/18)
2 asymptomatic donors USUV positive, on a total of 8,889 human blood tested
17 pools USUV positive: minimum infection rate 0.72% (17/56), on a total of 2,367 mosquitoes
Integrated surveillance actions in non-endemic areas
Passive surveillance: human and equine neurological disorders and wild birds mortality
Active surveillance: periodic serological survey on sentinel horses
Different NISP components highlight different viruses:
USUV in men and mosquitoes
HUMAN and ENTOMOLOGICAL SURVEILLANCE
WNV in horses
VETERINARY SURVEILLANCE

Streptococcus suis

- Considered an occupational disease in pig farms/abattoirs
- Presenting signs fever, vomiting headache
- Meningitis common globally, but endocarditis more common in China
- Up to a third have skin findings, including petechiae, purpura, and ecchymoses, all of which can be extensive, and hemorrhagic bullae and skin necrosis (features of purpura fulminans)

Streptococcus suis isolates in South Africa

Records of isolations at OVI from 1977-2002

- The swine pathogen *Streptococcus suis* is a Gram-positive bacterium which causes infections in pigs, with an impact in animal health and in the livestock industry, and it is also an important zoonotic agent (
- Between 1977 and 2002, at Onderstepoort Vet Institute Diagnostic Lab, Streptococcus suis was isolated from several species of livestock The proportions were : Pigs (25.4%), Cattle (14.9%), Sheep (13.2%) and goats (23.8%). None were isolated from horses although international literature describes isolation from equines as well. (Coetzer and Oberem, Anipedia)
- A severe outbreak in a herd of 400 goats occurred in 2021 in Gauteng. The outbreak is ongoing. Animals of all ages have died. In suckling goats, acute deaths occurred in the first week. Pyothorax was noted on PM.
- ???? Is there a risk of zoonosis? No literature was found.

References

- Calzolari M, Pautasso A, Montarsi F, Albieri A, Bellini R, Bonilauri P, et al. (2015) West Nile Virus Surveillance in 2013 via Mosquito Screening in Northern Italy and the Influence of Weather on Virus Circulation. PLoS ONE 10(10): e0140915. https://doi.org/10.1371/journal.pone.0140915
- Coetzer JAW and Oberem P Anipedia .Streptococci, Accresed online on16-11-2021 at https://www.anipedia.org/resources/streptococcus-spp-infections/897
- de la Torre EP, Rodríguez-Franco A, Rodríguez-Ortega MJ. Comparative Exoproteome Analysis of Streptococcus suis Human Isolates. Microorganisms. 2021 Jun 12;9(6):1287. doi: 10.3390/microorganisms9061287. PMID: 34204746; PMCID: PMC8231589.
- Riccò M, Peruzzi S, Balzarini F. Epidemiology of West Nile Virus Infections in Humans, Italy, 2012-2020: A Summary of Available Evidences. *Trop Med Infect Dis*. 2021;6(2):61. Published 2021 Apr 24. doi:10.3390/tropicalmed6020061

ZOONOSES: The bottom line….

IF THE DOG IS HEALTHY AND THE DOGFOOD IS SAFE – YOU DON'T HAVE TO WORRY!

Thank You