sciensano

healthy all life long

VECTOR-BORNE ZOONOSES

THE ROLE OF SCIENSANO



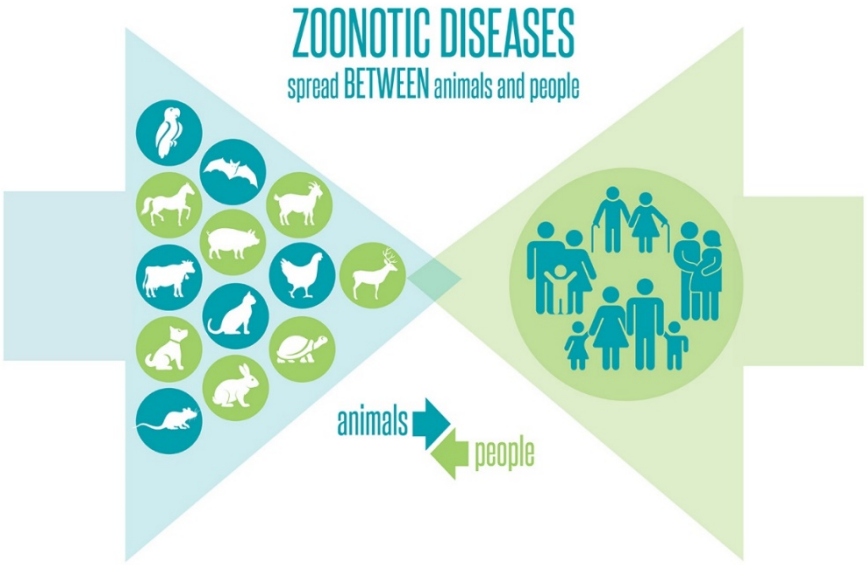


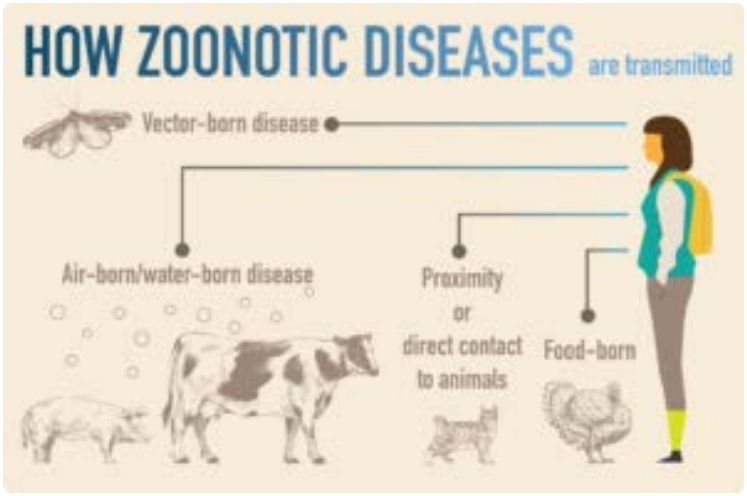



De Regge Nick

.be

CONTEXT

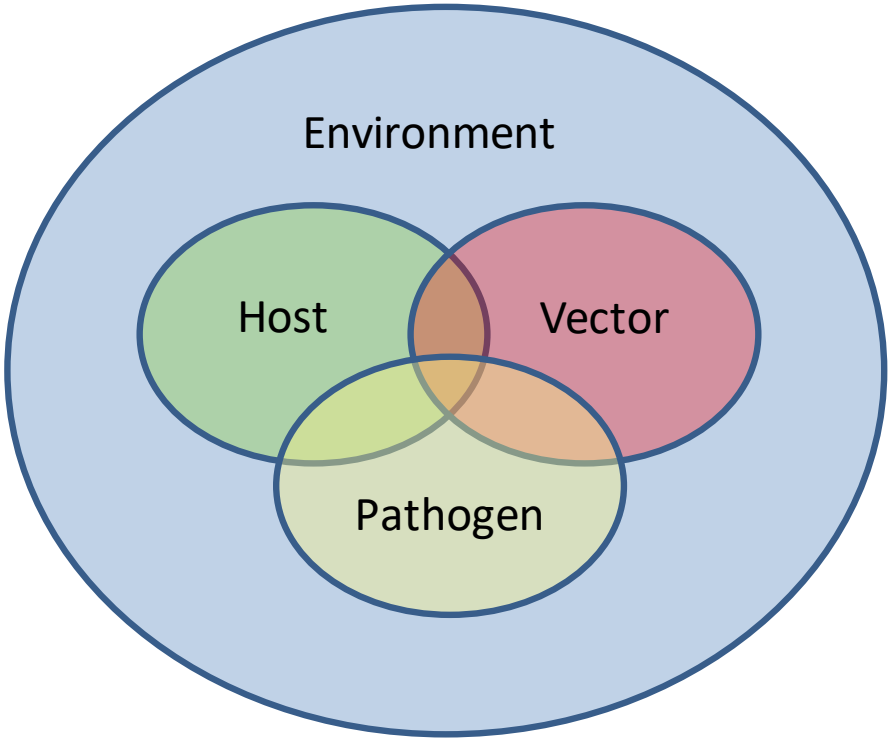




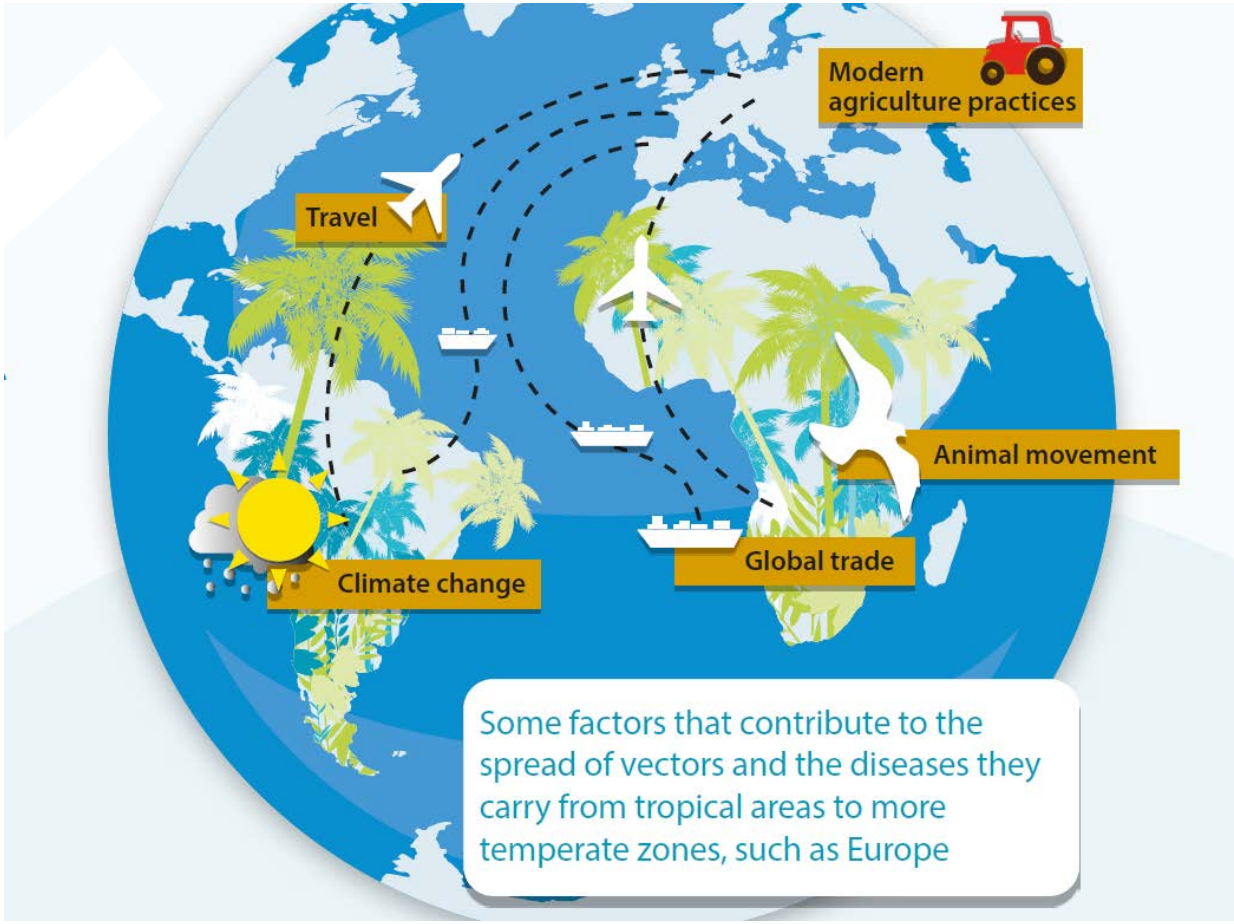
Thornton, 2017

DEFINITION VECTOR BORNE DISEASES

Vector-borne diseases are infections transmitted by the bite of infected arthropod species (ECDC).



INCREASING IMPORTANCE OF VECTOR BORNE DISEASES



- Globalization: increased chance on introduction of pathogen or exotic vector

- Climate change: more appropriate conditions for endemic vectors to become competent vectors or for the establishment of exotic vectors

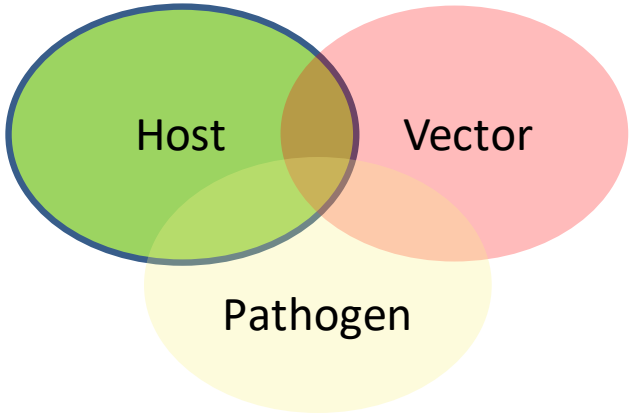
VBD DIVERSITY

Human diseases

Malaria
Dengue
Yellow fever
Chikungunya
Zika
Oropouche virus
River blindness
…

Animal diseases

Bluetongue virus
Schmallenberg virus
Akabane virus
African horse sickness virus
Lumpy skin disease virus
Theileria equi
Babesia caballi
…

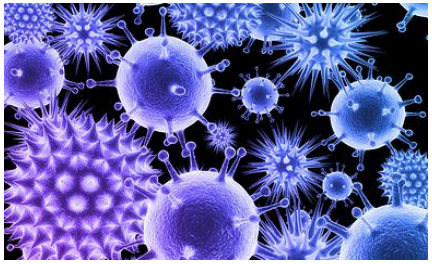


Zoonoses

Tick borne encephalitis virus
Usutu virus
West Nile virus
Equine encephalomyelitis viruses
Japanese encephalitis virus
Rift valley fever
Vesicular stomatis virus
Crimean congo haemorrhagic fever virus
…

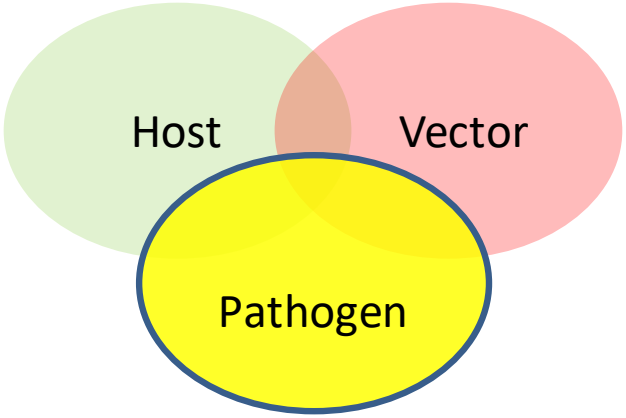
Q-fever
Tularemia
Borrelia sp. (Lyme disease)
Anaplasmosis
Rickettsia
Yersinia pestis
Dirofilaria
Leichmania infantum
…

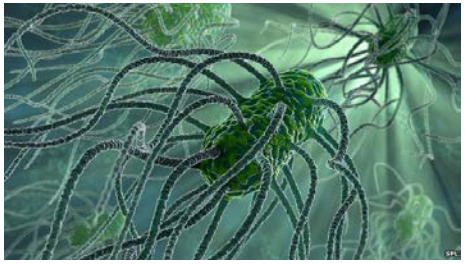
ZOONOTIC VBD DIVERSITY



Viruses

Tick borne encephalitis virus
Usutu virus
West Nile virus
Equine encephalomyelitis viruses
Japanese encephalitis virus
Rift valley fever
Vesicular stomatis virus
Crimean congo haemorrhagic fever virus
…





Bacteria

Borrelia sp. (lyme disease)
Anaplasma sp.
Rickettsia spp.
Coxiella burnettii (Q-fever)
F. tularensis (Tularemia)
Yersinia pestis
…

Parasites

Dirofilaria sp.
Leishmania sp. (Leishmaniosis)
Babesia spp.
…

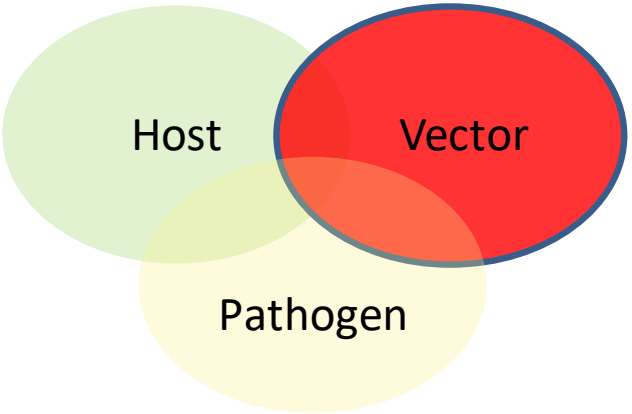
ZOONOTIC VBD DIVERSITY

Ticks

Tick borne encephalitis virus
Louping ill virus
Crimean Congo haemorrhagic fever virsu
Borrelia burgdorferi (lyme disease)
Coxiella burnetti (Q-fever)
Anaplasma spp.
Francisella tularensis
Rickettsia spp.
…

Mosquitoes

West nile virus
Usutu virus
American equine encephalitis viruses
Japanese encephalitis virus
Rift valley fever
Vesicular stomatitis virus
Dirofilaria
…



Fleas

Yersinia pestis
Rickettsia typhi

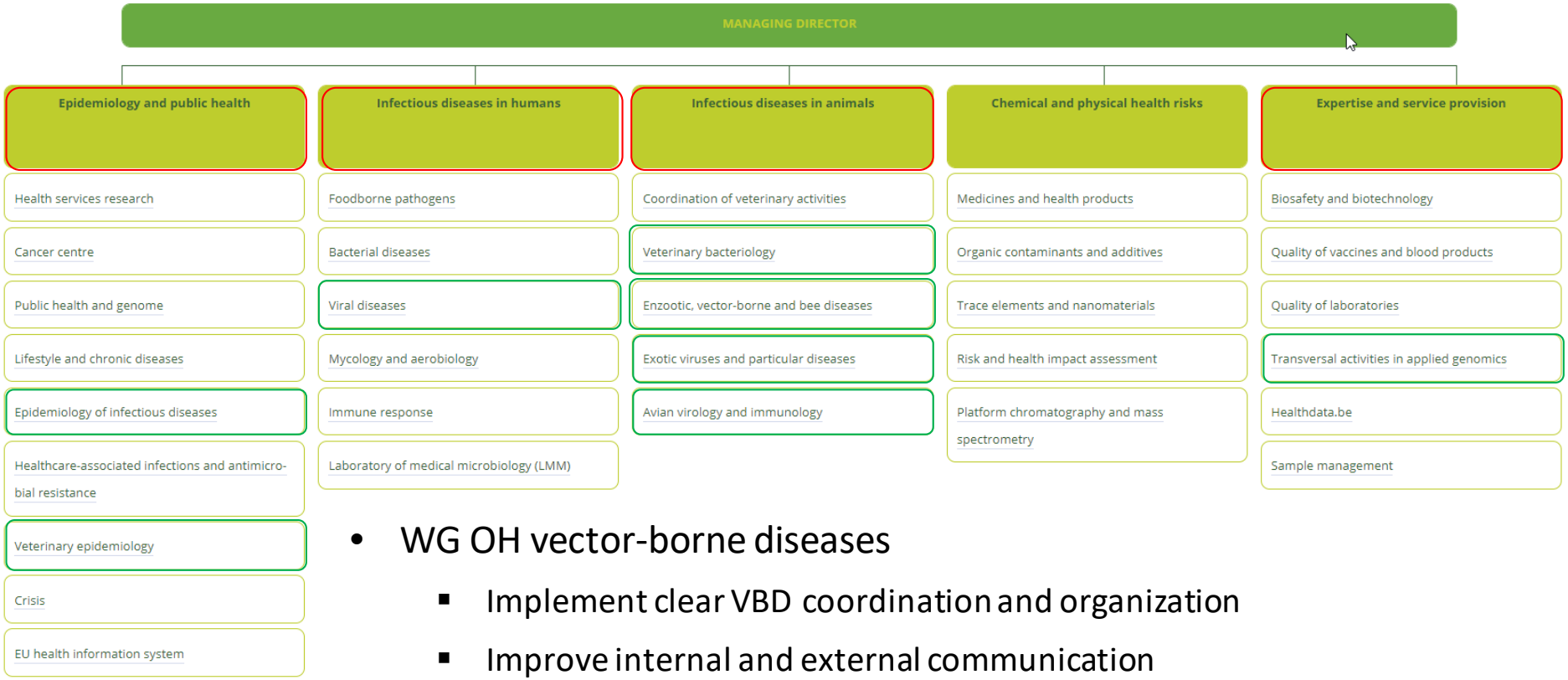
Sandflies

Leishmaniosis

Culicoides

Shuni virus

ZOONOTIC VBD AT SCIENSANO



- WG OH vector-borne diseases
  - Implement clear VBD coordination and organization
  - Improve internal and external communication
  - Increase research – international funding and partnership
  - Engage in discussions with policy makers to determine their needs
- Joint Sciensano research project – 11/2021 till 11/2025
- Research projects within and between specific services
- Focus: TBD (Borrelia, Anaplasma, Q-fever, TBEV); MBD (WNV, JEV)

ZOONOTIC VBD AT SCIENSANO

prevention - preparedness - response - evaluation/feedback

	action
Awareness raising	Yearly zoonosis report
	Burden and costs lyme diseas (Humtick)
	Assistence information campaign: tekenbeten.be
Expertadvice	WG NEHAP EMOV
	MEMO guidance committee
	COST action EURNEGVEC

ZOONOTIC VBD AT SCIENSANO

prevention - **preparedness** - response - evaluation/feedback

	action
Contingency plans	KAP study exotic mosquitoes (VBDExpert)
	OH preparedness plan WNV (VBDExpert)
Diagnostic capacity	WNV, JEV, TBEV, USUV, LIV, RVFV, Coxiella burnetti, Francisella, Rickettsia, Anaplasma spp., Borrelia spp. (VBDExpert)
Early warning/monitoring	Passive monitoring exotic mosquitoes
	WNV/USUV passive monitoring birds Flanders/Brussels
	TBP in ticks from humans (TekenNet 2019-2021)
	TBP in ticks from pets (MSD-ticks)
	TBP in ticks from environment (Tibopath)
	TBP in ruminants (Tibopath)

ZOONOTIC VBD AT SCIENSANO

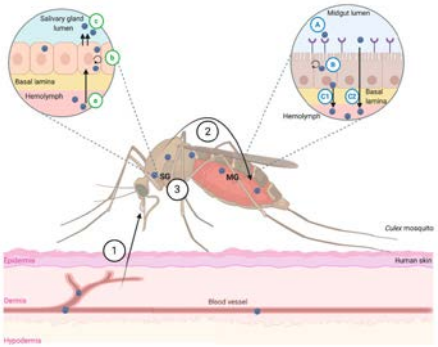
prevention - **preparedness** - response - evaluation/feedback

	action
Early warning/monitoring	Retrospective study neuroborreliosis
	Seroprevalence lyme and TBEV in forestworkers
	TBEV monitoring in cattle, wildboar, deer sera 2010-2015
	TBEV monitoring in wildboar sera 2020 (ANB)
Expertise building	Vector collection
	Vector colonization
	Vector competence studies with mosquitoes and ticks (VBDExpert)
	(neuro)pathogenesis in natural host (JEV-pig; TBEV/LIV in sheep; TBEV in mice)
	Influence vector saliva on innate immunity and pathogenesis

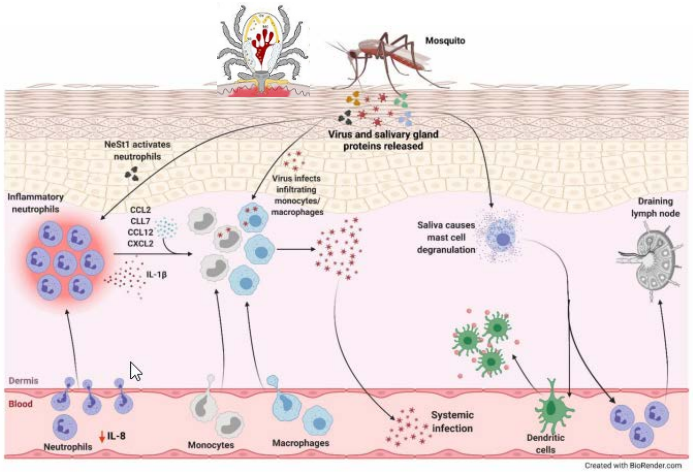
ZOONOTIC VBD AT SCIENSANO

prevention - **preparedness** - response - evaluation/feedback

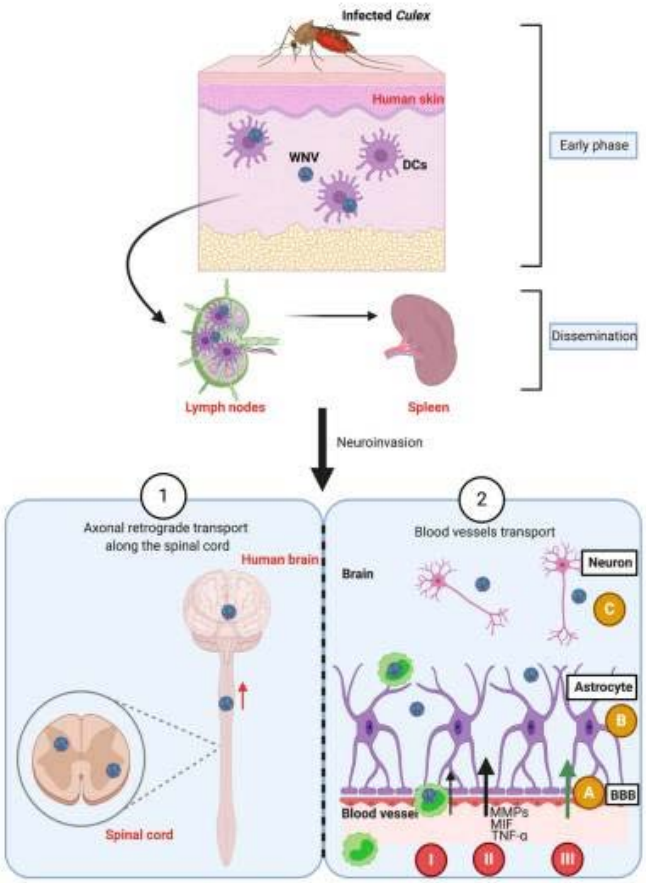
Vector competence and mechanisms



Innate immunity and role of saliva



Pathogenesis and neuroinvasion

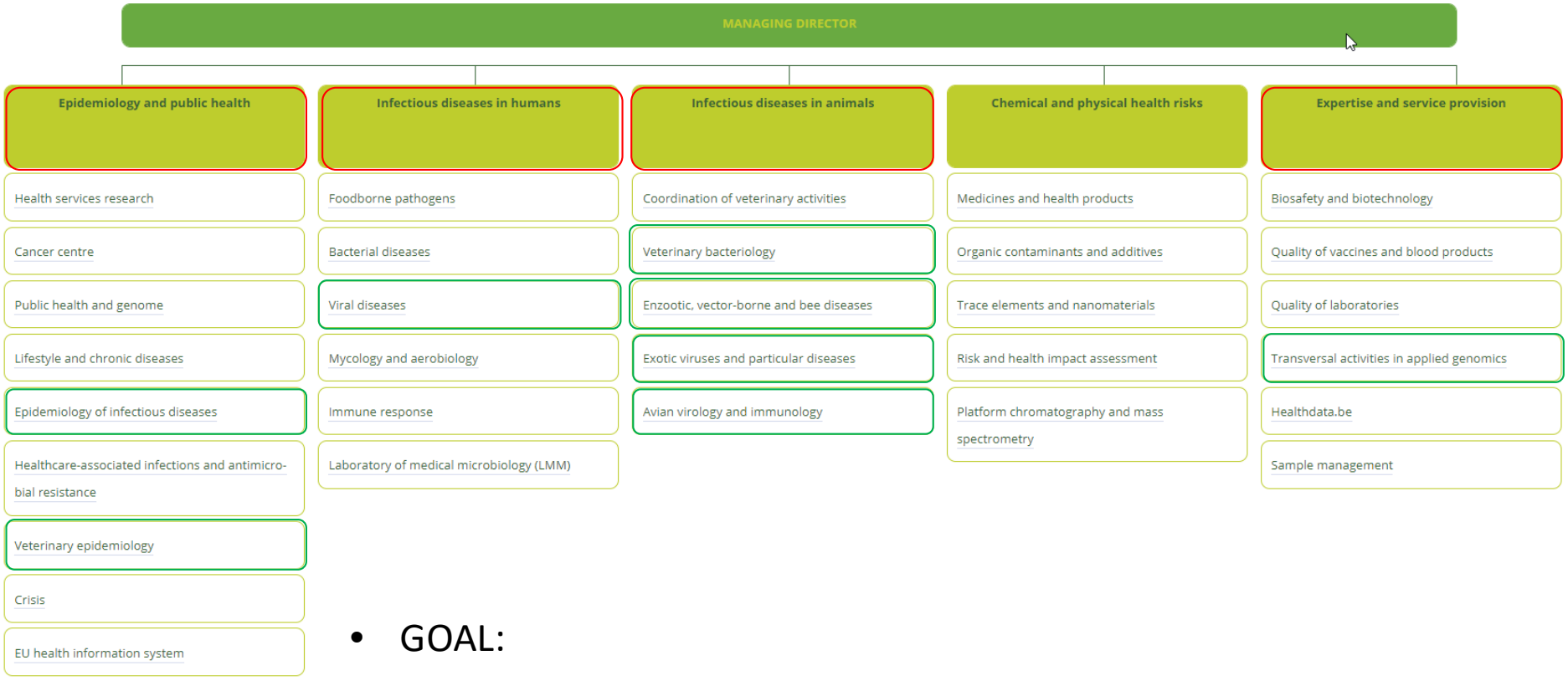


ZOONOTIC VBD AT SCIENSANO

prevention - preparedness - **response** - evaluation/feedback

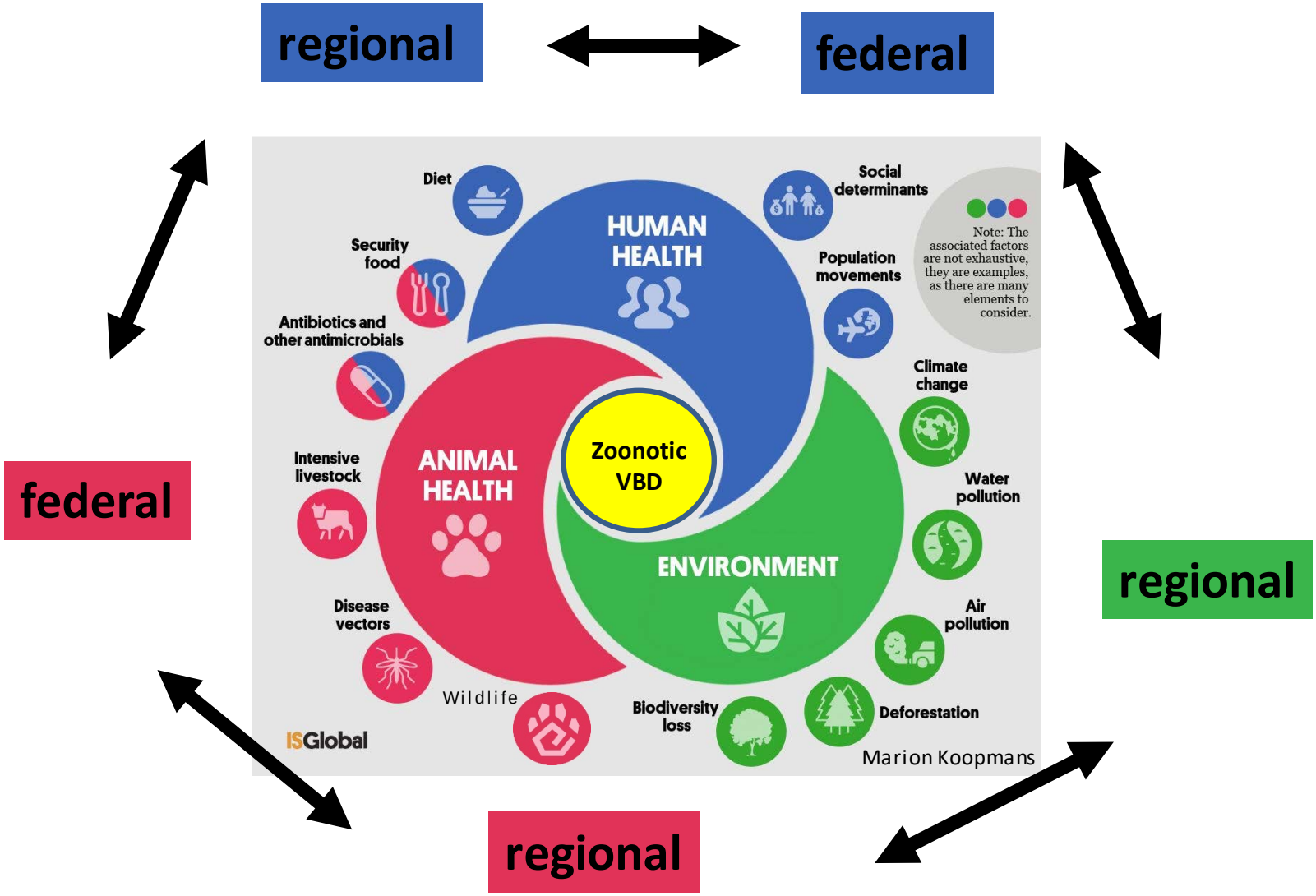
	action
Risk assessment	Risk assessment group
Communication	Parlementary questions, superior health council

ZOONOTIC VBD AT SCIENSANO



- GOAL:
  - Become an expertise center on VBD
  - Provide necessary policy support
  - Coordinate a platform for VBD in Belgium

ZOONOTIC VBD IN A ONEHEALTH APPROACH, NICE BUT…



… matter of competences: collaboration, prioritization and financing are not straightforward