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healthy all life long

Overview of a tool for assessing the risks of introducing infectious animal diseases into Belgium (RT 18/02 MORISKIN project).

Xavier Simons

Sciensano Symposium of Animal Health – 26/03/2024

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PROJECT CONTEXT

- RT project: 01/2019 – 04/2021
- Project partners:

service public fédéral
SANTE PUBLIQUE,
SECURITE DE LA CHAINE ALIMENTAIRE
ET ENVIRONNEMENT

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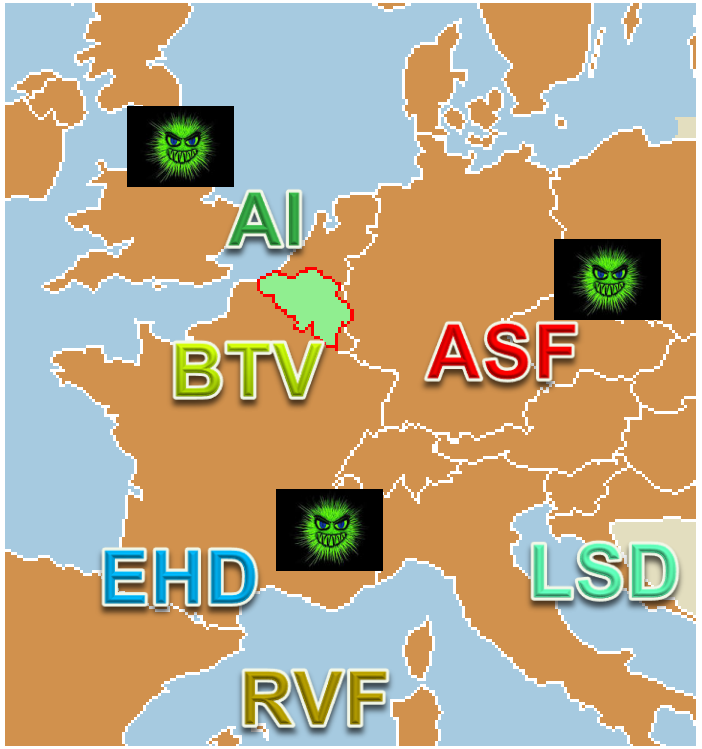
AViAGiS

LIÈGE université

UHASSELT

Context



World Organisation for Animal Health
WAHIS
WORLD ANIMAL HEALTH INFORMATION SYSTEM
European Commission
ADNS
Google
ProMED mail
Program for Monitoring Emerging Diseases

TRACES
eurostat
RMI
SANITEL
Food and Agriculture Organization of the United Nations

Moriskin

GOAL: develop a method → tool (Web app) for risk assessment and threat analysis.
Focus on the **risk of entry** of infectious pathogen in BE.

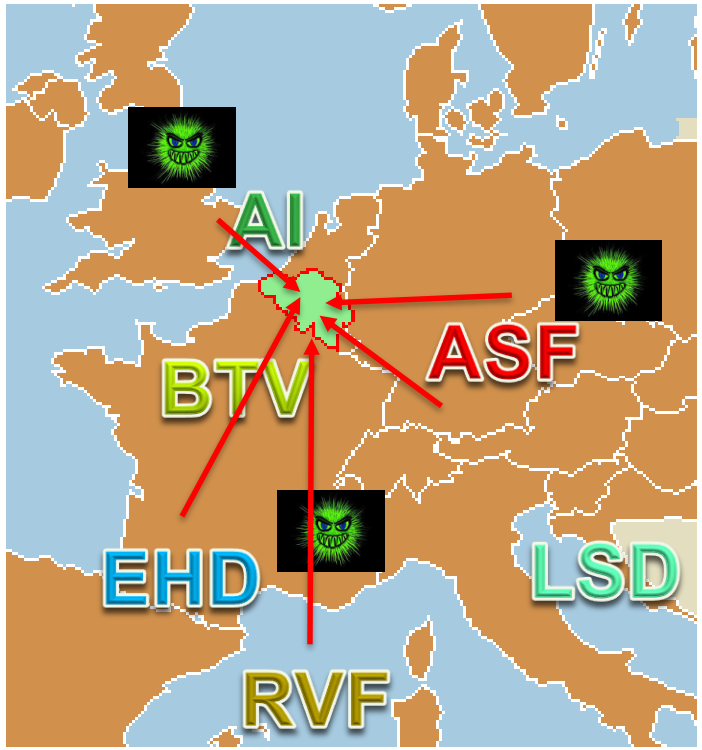
ASF as case study

Method : simple concept

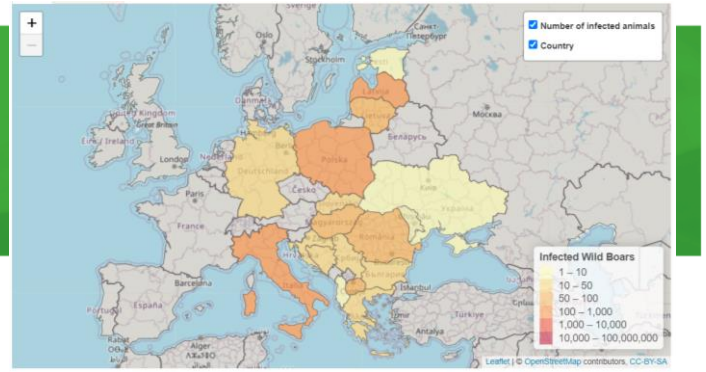
Case(s) in source country

Movement → Risk pathway

Risk of introduction in BELGIUM



ASF – introduction pathways



AFRICAN SWINE FEVER

Trade activities: Importation (legal or illegal) of

Live cultures
for example, germplasm, vaccines, reagents, tissue cultures, diagnostic samples etc.

Animal products.
- **Traded freely within the EU**
- Imports from third countries
- **Personal imports** carried into the country by travellers.

-Wildlife spreading the disease to livestock (e.g. wild boars)

Live animals
- **Live infected /Exposed animal(s) from EU** or third countries
- **Live animals carrying a disease vector .**

Human activities

- **Movement of people.** Tourism and trade related to visit to livestock premises. Hunter
- **Air,** sea or land **transportation activities. Planes,** ships, train, cars and military

Natural phenomena

-Arthropod vectors (insects) blown on the wind
-**Windborne spread of the infectious agent itself** e.g. virus particles
-**Wildlife movements/migration** e.g. wild boars, birds migration

Legend

Pathway considered in the risk calculation in the application

Pathway which is possible but not considered in the risk calculation in the application as it is not applicable for the Belgian context

No arrow implies this is not a pathway for the disease in question

Words coloured in black are the specific category taken into account for the risk calculation

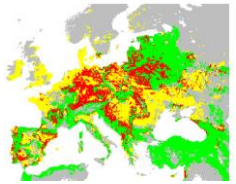
Method : simple concept

By country and time point (week)

Case(s) in source country

- Under-detection
- Underreporting
- Declaration delay

Estimated prevalence in source country



Pigs ↔ Wild boars

Movement → Risk pathway

Food and Agriculture Organization of the United Nations

TRACES

eurostat

Risk of introduction in BELGIUM

=

P (at least one introduction)

P (1 import batch is infected)

Living animals

Germinal products

Movements of people

Food

Farmers

Hunters

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Moriskin: R-Shiny Web application
Risk of entry

MORISKIN project: V1.2 | HOME | RISK ASSESSMENT | DISEASES DISTRIBUTION | TRADE AND MOBILITY | POPULATION DISTRIBUTION | INFOS

Risk assessment for disease introduction in Belgium

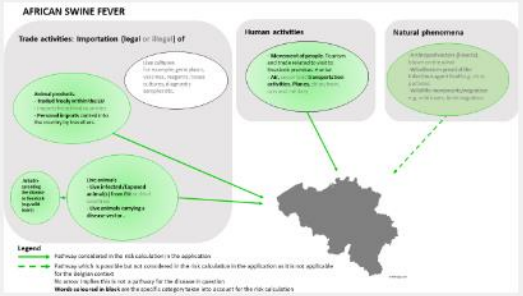
Date of last data update : 2024-01-26

Disease data source : ADIS

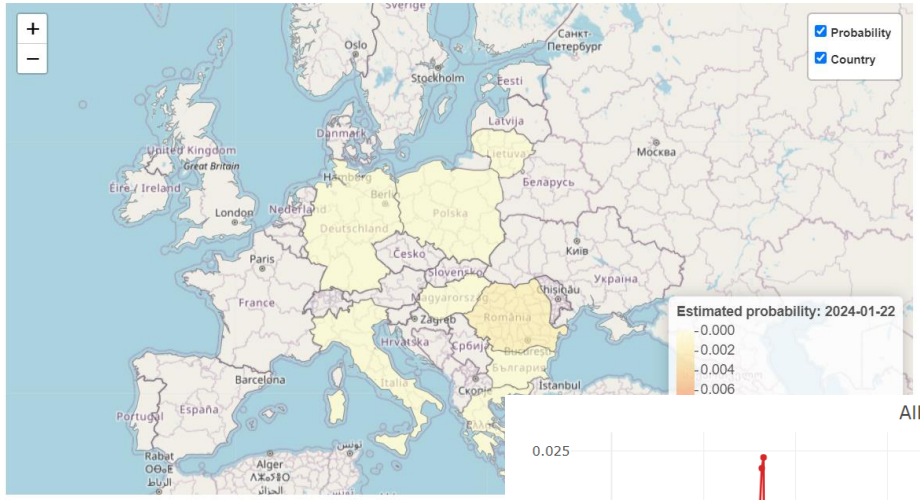
Date input for mapping

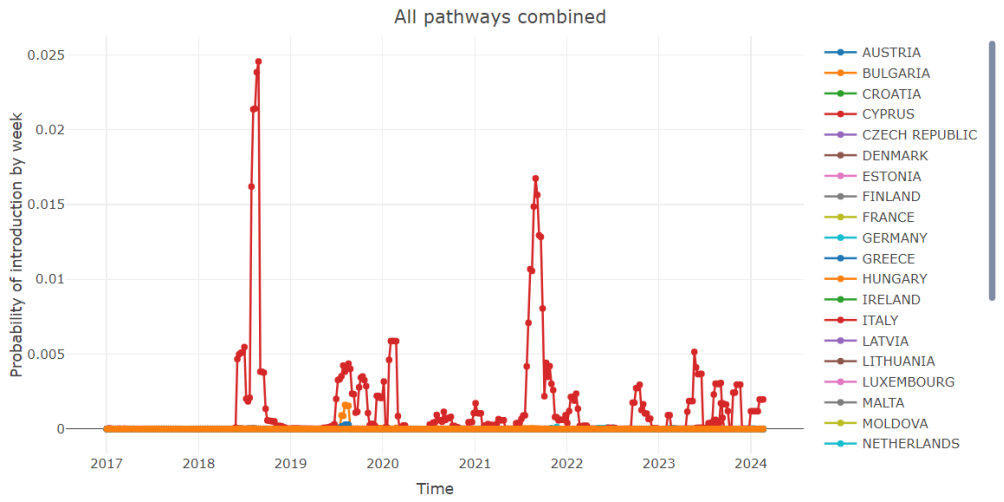
2024-01-22

Risk pathways:

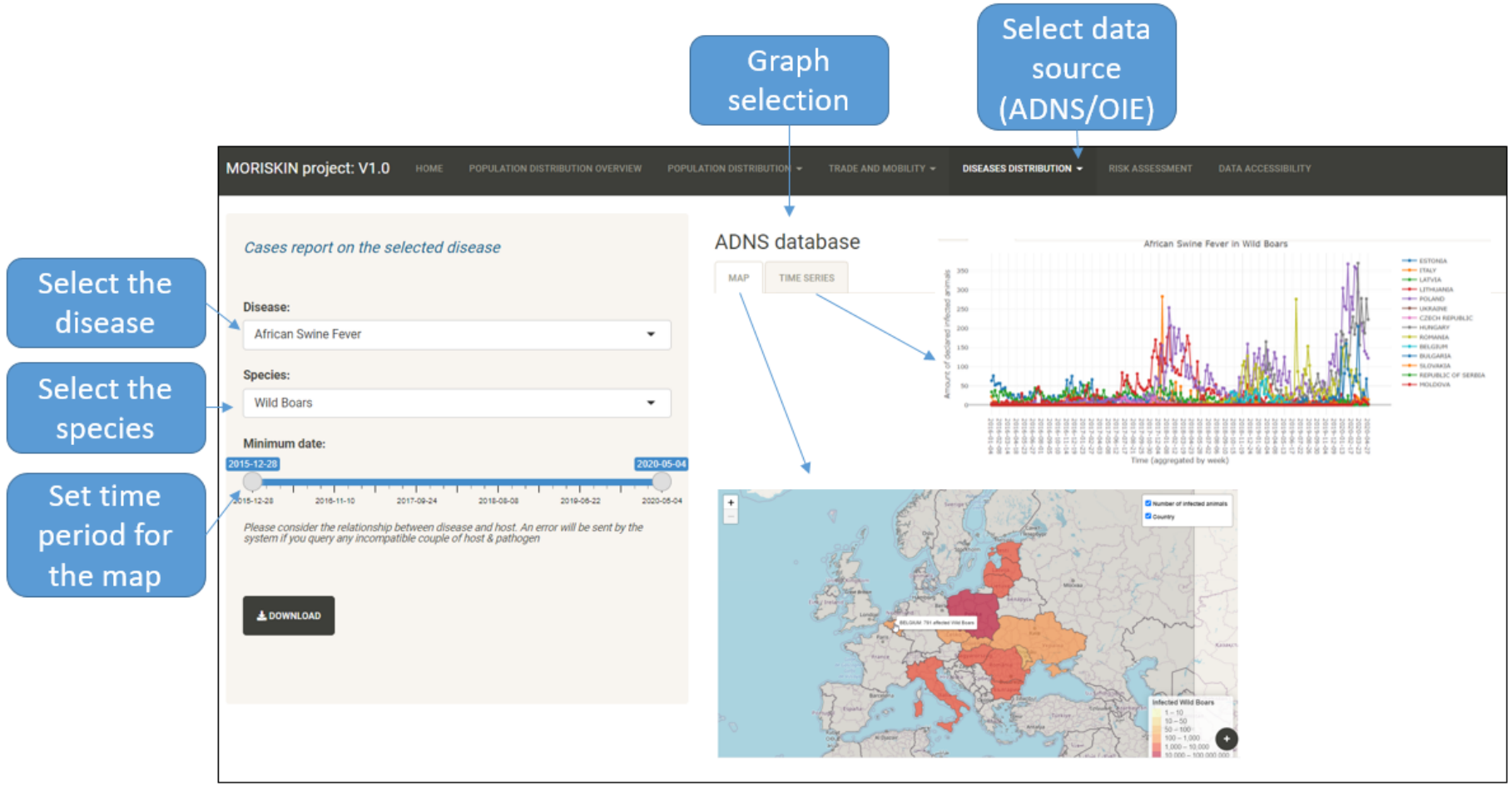


Weekly risk of introduction of ASF in BE from

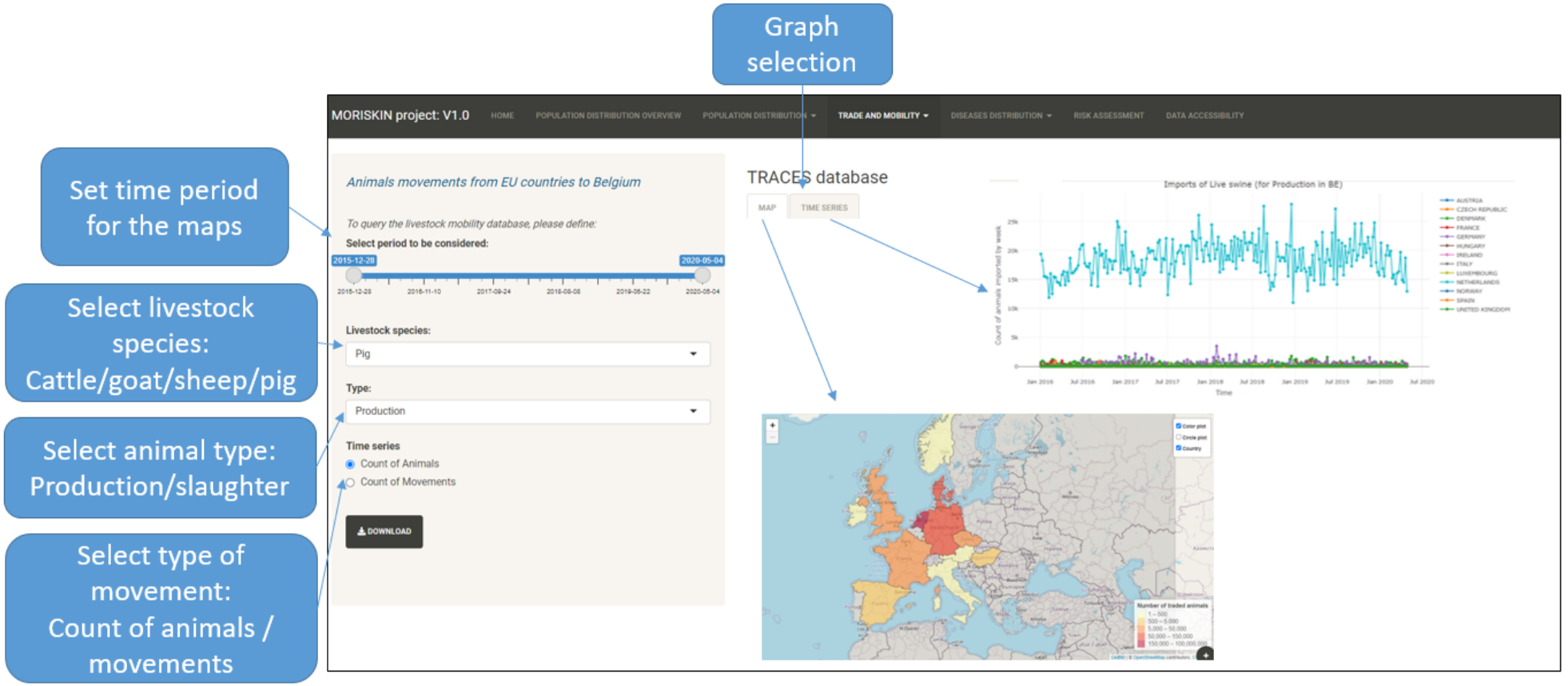




Moriskin: R-Shiny Web application
Disease distribution



Moriskin: R-Shiny Web application
Movements of live animals



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Using the tool

- Tool accessible only for FASFC and SPF
- Monthly updates
- Monthly e-mails

Résumé: Probabilité hebdomadaire moyenne d'introduction du pathogène en Belgique entre le 01/01/2024 et le 31/01/2024, par pays à risque et tenant en compte les voies d'introductions étudiées dans le projet MORISKIN.

Pays	ASF	LSD
Allemagne	$1.2 * 10^{-7}$	0
Bulgarie	$4.0 * 10^{-9}$	0
Grèce	$4.5 * 10^{-6}$	0
Hongrie	$1.2 * 10^{-8}$	0
Italie	$8.5 * 10^{-8}$	0
Lithuanie	$2.0 * 10^{-9}$	0
Pologne	$4.0 * 10^{-9}$	0
République Tchèque	0	0
Roumanie	0.0012	0
Suède	0	0
Tous les pays	**0.0012**	**0**

Code couleur:

- Augmentation par rapport au mois précédent

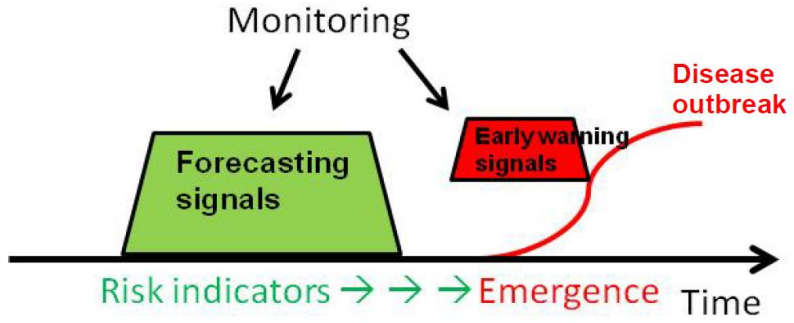
- Alarme 1: Augmentation pendant plus de deux mois consécutifs

- Alarme T1: Au-dessus du seuil de 0.01

- Alarme T2: Au-dessus du seuil de 0.05

Appendix 1: Diagram describing the position over time of the different types of forecasting or early warning system of emergence of animal diseases

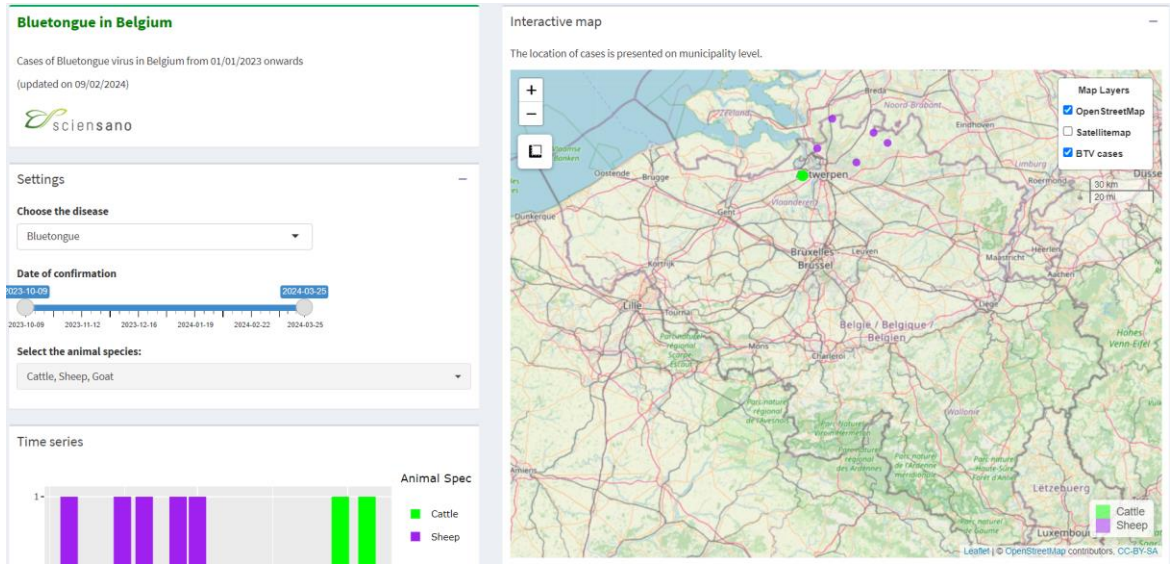
Emergence is represented by the red line (increase in incidence). Early warning is the detection of new cases of disease in the early stages of emergence. The generic and specific forecasting is a monitoring of risk indicators before actual emergence. The specific forecasting already target diseases, unlike the generic forecasting that target a priori any disease.

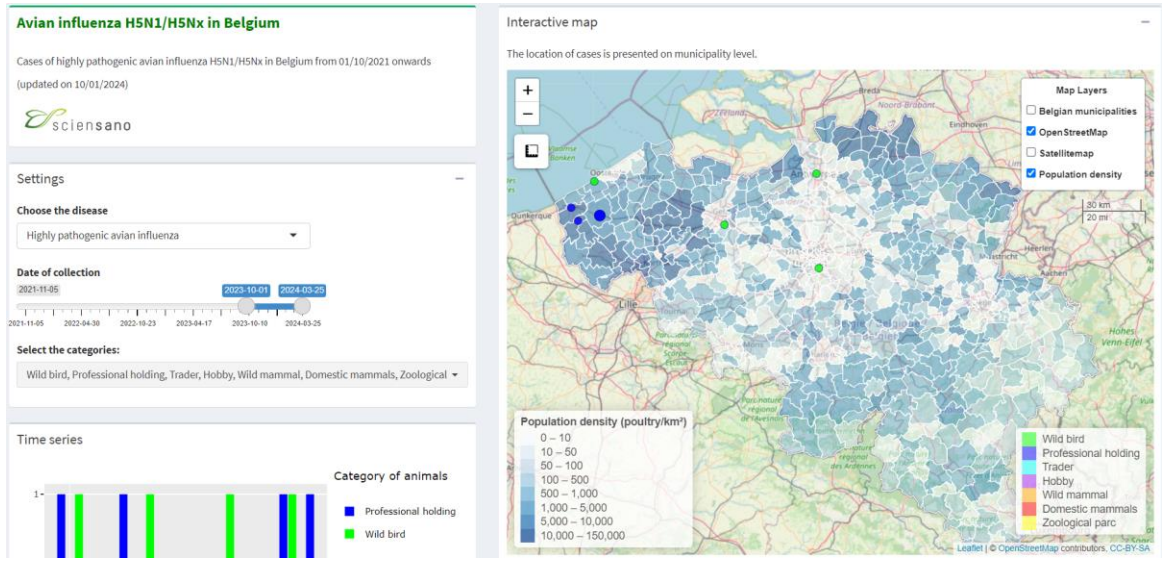


Avis 2016-10 SciCom AFSCA

Other uses

- Moriskin R-Shiny server used to communicate on other diseases:
- See Sciensano Website

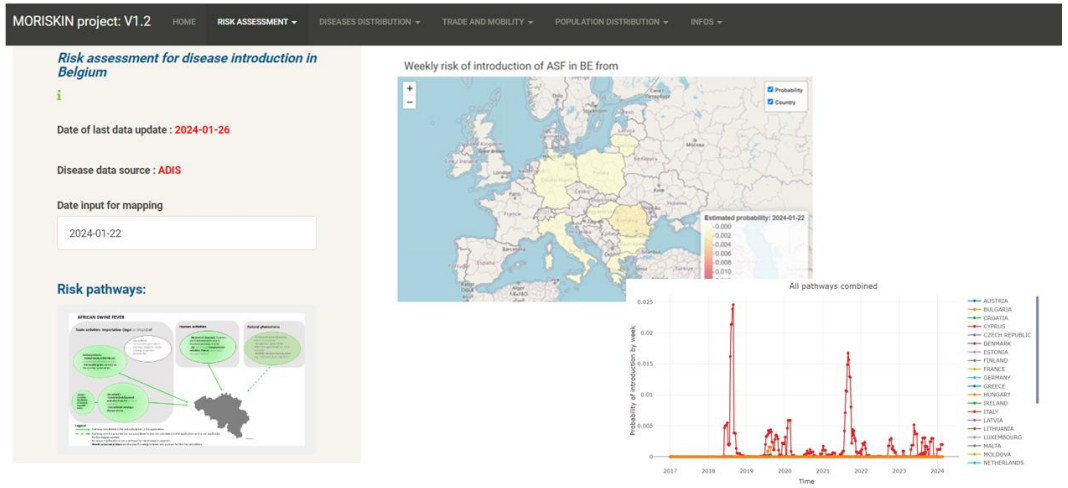




https://moriskin.sciensano.be/shiny/bluetongue/
https://moriskin.sciensano.be/shiny/avianinfluenza/

Conclusion

- Advantages:
  - Data from **various sources** in a unique tool ➔ time saving!
  - **Frequent updates**
  - Dynamic and **user friendly** visualization
  - Risk maps + time series
  - Downloadable outputs
- Limitations:
  - Quality of the input data
  - Introduction ≠ infection
- Future perspectives
  - To monitor **more diseases**
  - To include more pathways (people by road, wind for vectors)
  - International collaborations



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THANK YOU !

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