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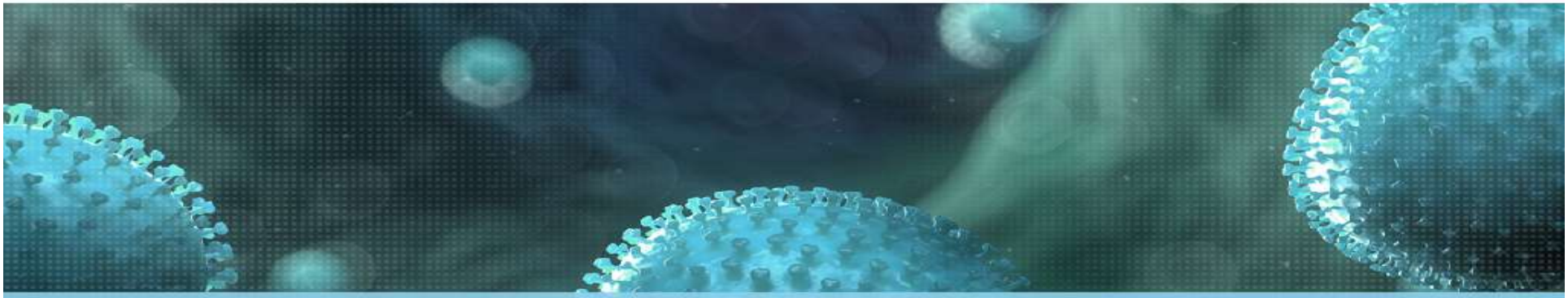


HPAI in the European poultry sector: siloed versus nexus response options

Thijs Kuiken

31st Annual Meeting of the NRLs for AI/ND, Treviso, Italy, 16-17 October 2025

Overview

- Transformative changes of society needed
- Siloed versus nexus approaches to solving problems
- Recommendations for HPAI prevention in Europe: siloed or nexus?

EFSA/ECDC/EURL-AI recommendations, HPAI in Europe

(EFSA et al. 2021, EFSA J; doi:10.2903/j.efsa.2021.7108)

"Short-term preparedness and medium- and long-term prevention strategies, including

- *revising and reinforcing biosecurity measures*
- *reduction of the density of commercial poultry farms*
- *possible application of appropriate vaccination strategies*

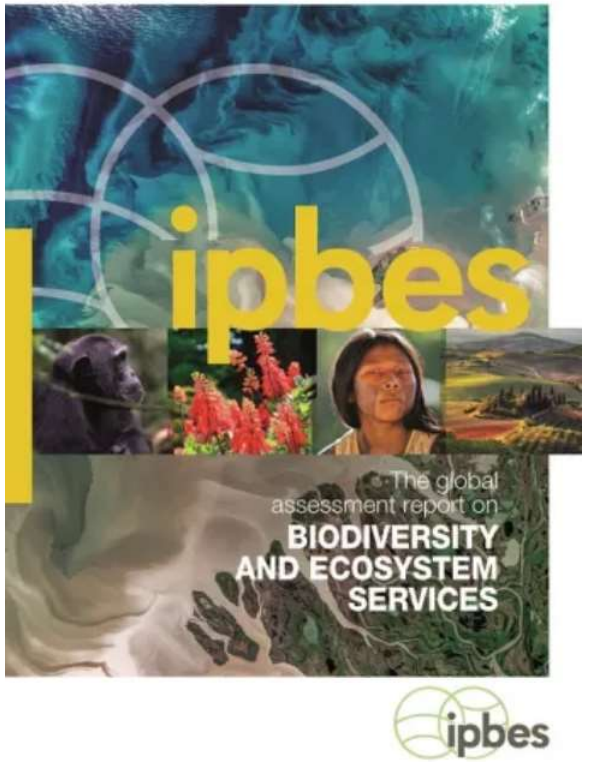
should be implemented."

Question: which of these follow siloed approach, which nexus approach?

The need for transformative changes of society

(IPBES 2019; https://zenodo.org/records/3553579)

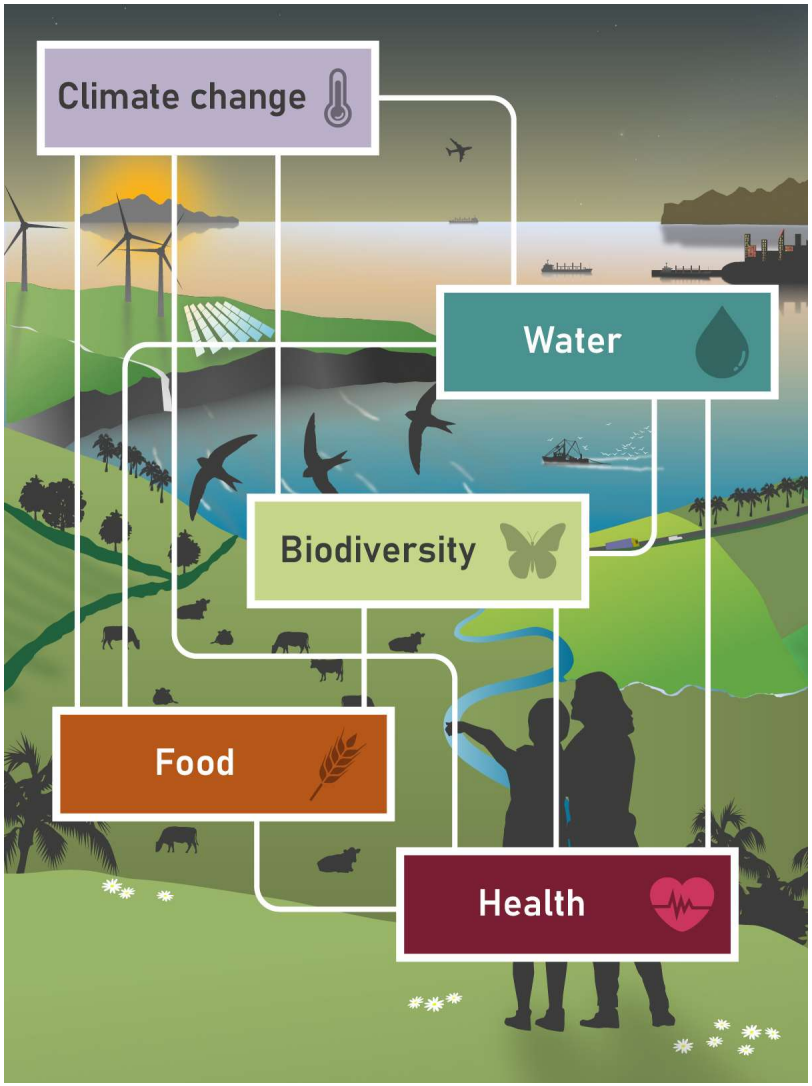
Main conclusion in Summary for Policymakers of IPBES Global Assessment Report: “Goals for conserving and sustainably using nature and achieving sustainability … for 2030 and beyond may only be achieved through **transformative changes**: a fundamental, system-wide reorganization [of society] across technological, economic and social factors, including paradigms, goals and values.”



Global crises are interconnected

(IPBES 2025; https://zenodo.org/records/15673657)

- The **global crises** of biodiversity loss, water and food insecurity, health risks and climate change are **interconnected – our responses to address them are not**
- Theses crises interact and exacerbate each other in ways that make **separate efforts** to address them **ineffective** and **counterproductive**



Summary for Policymakers, Figure SPM.1

Nexus response options

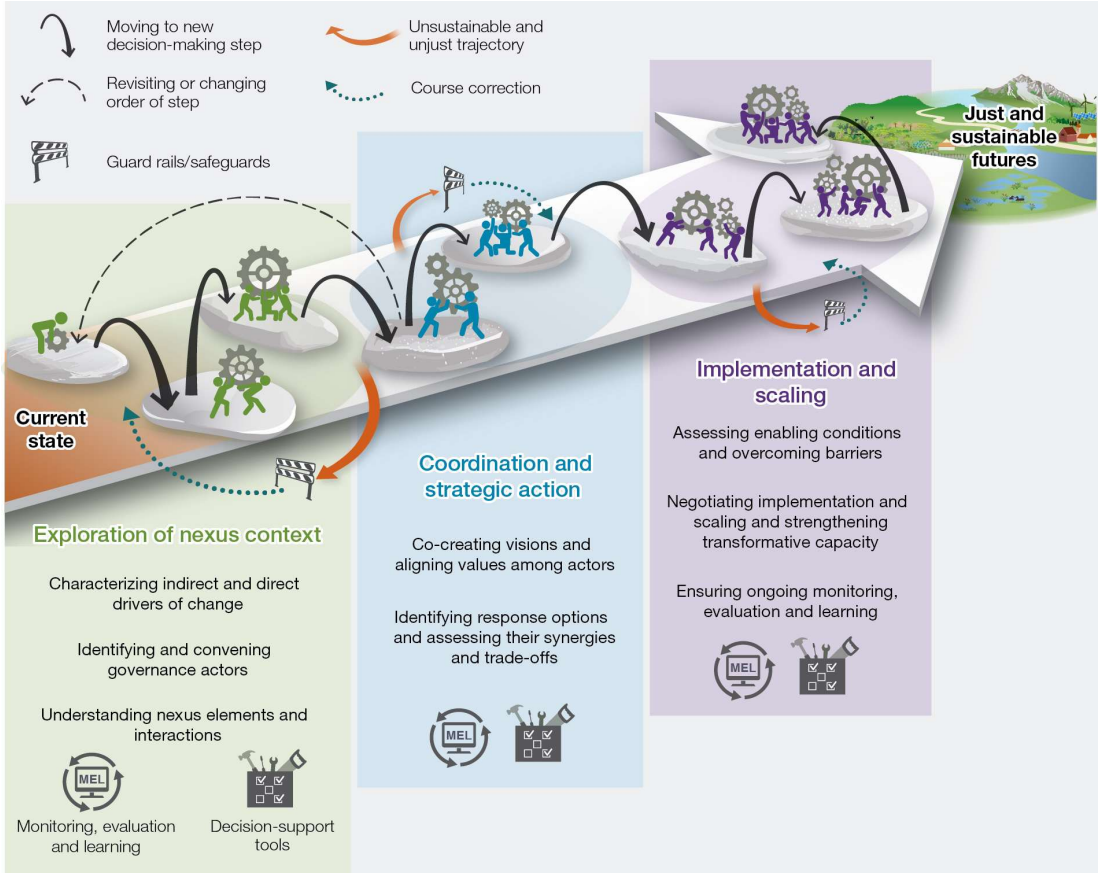
- **Nexus:** The interlinkages among two or more elements, sectors or systems.
- **Synergy:** Enhancement of a desirable outcome in one element leads to enhancement of another element
- **Trade-off:** Enhancement of a desirable outcome in one element leads to deterioration of another element
- **Nexus response options:** Understanding the interlinkages and interdependencies between sectors and systems in a holistic manner to develop integrated and adaptive response options that aim to maximize synergies and minimize trade-offs.

Siloed response options

- **Siloed response options** are defined as response options that address nexus elements in isolation and without regard to interlinkages between them.
- They **exacerbate** the global crises of biodiversity loss, water and food insecurity, health risks and climate change
- They **perpetuate inequalities** among groups and within and among regions or countries; those more directly reliant on natural resources are the **most vulnerable to environmental change**

A road map for nexus action

- A **road map for nexus action** can be used by a **wide range of actors in multiple sectors** to work collaboratively towards solutions to help **achieve just and sustainable futures**
- There is **a role for everyone** in implementing nexus approaches



Summary for Policymakers, Figure SPM.13

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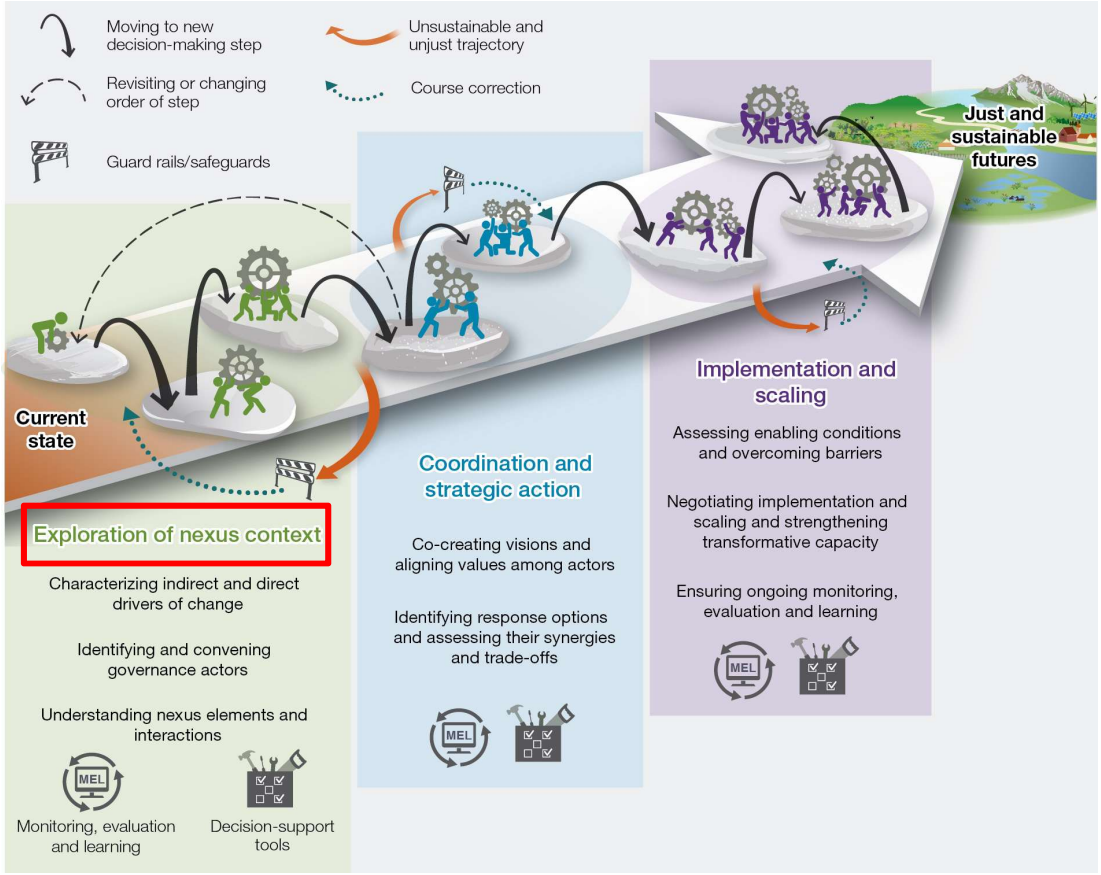
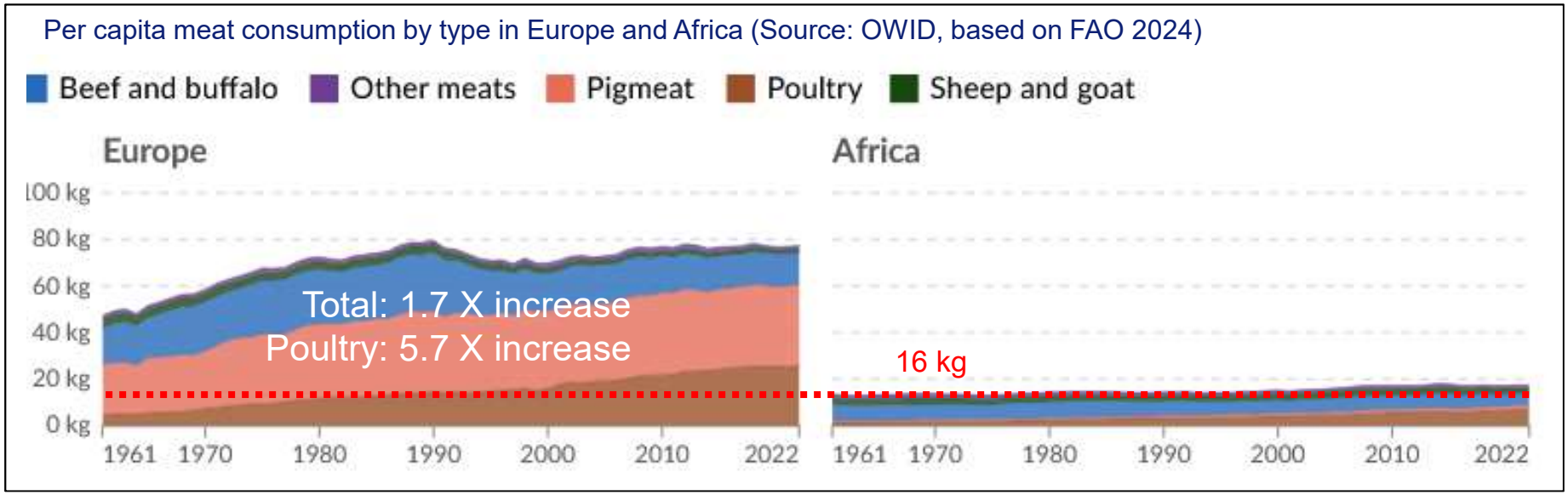


Summary for Policymakers, Figure SPM.13

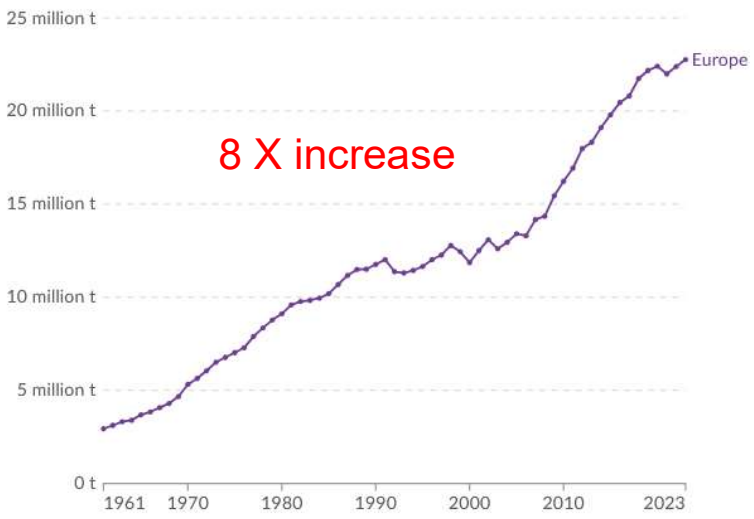
HPAI in poultry in Europe: exploration of nexus context



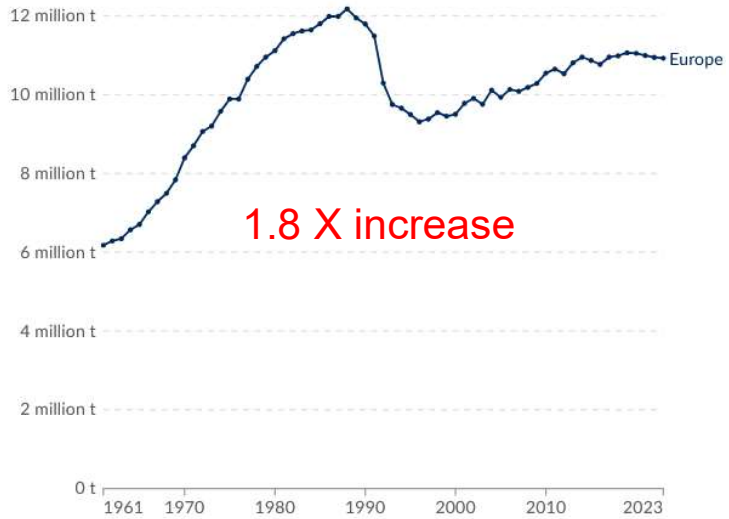
- EAT-Lancet guidelines *(Rockström et al. 2025 Lancet)*: 315 g meat per week, i.e. 16 kg per year (Europe: 78 kg)
- "Aggressive marketing methods increased the per capita consumption of poultry meat more than 5-fold in the 3 decades beginning in 1950, with further substantial increases predicted for the future." *(Garrigus, 1989)*
- Meat consumption not shared equitably around the world: (Africa: 17 kg, Europe: 78 kg)

HPAI in poultry in Europe: exploration of nexus context

Poultry meat production (tonnes) in Europe
(Source: OWID, based on FAO 2025)

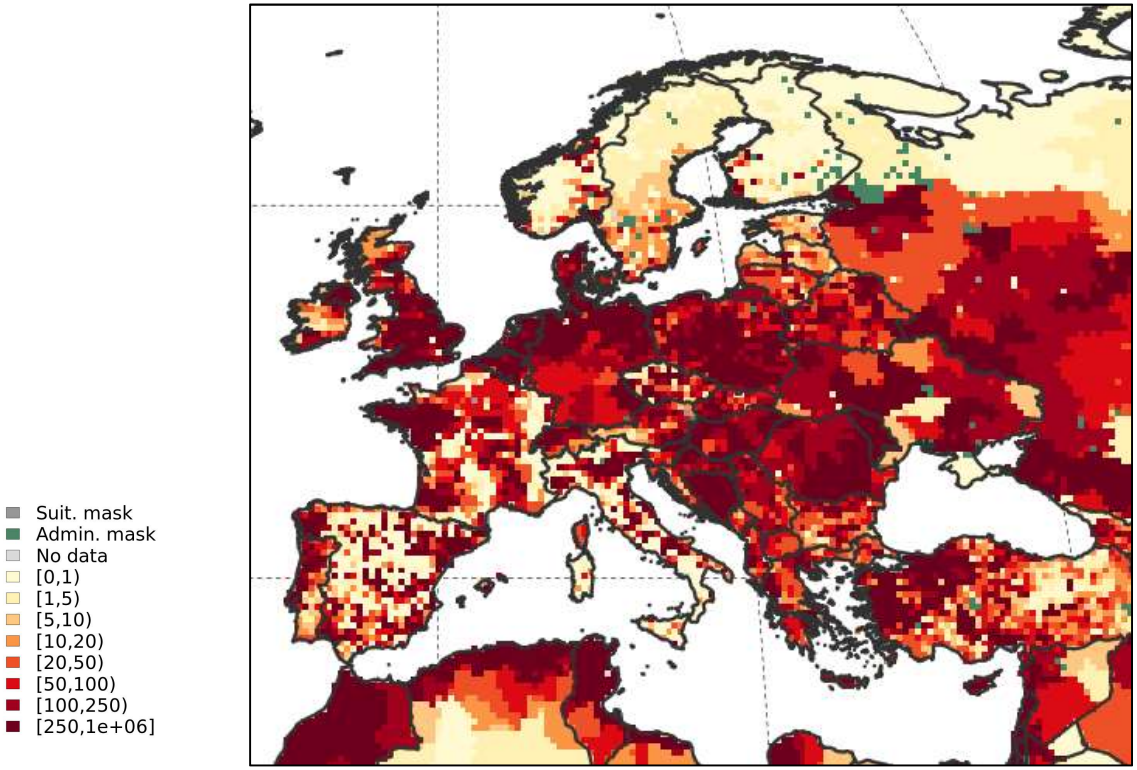


Poultry egg production (tonnes) in Europe
(Source: OWID, based on FAO 2025)



HPAI in poultry in Europe: exploration of nexus context

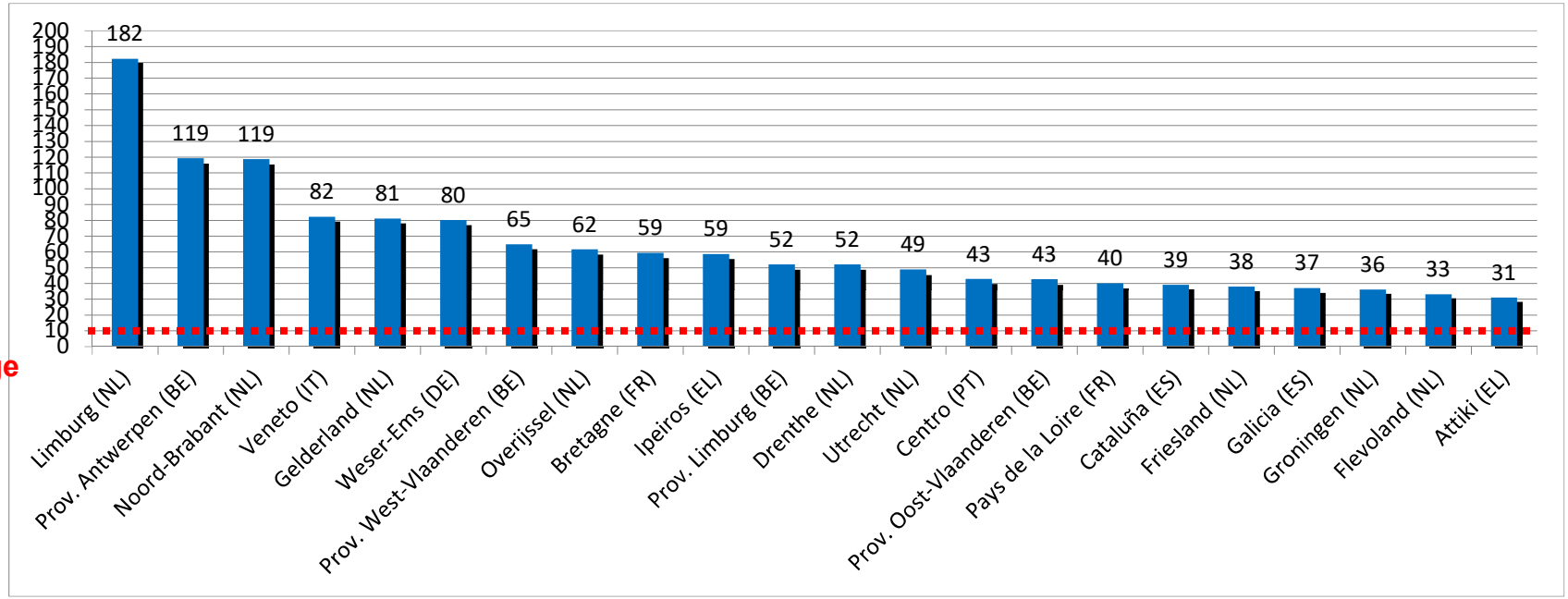
Chicken density (birds/km2) varies across Europe *(Gilbert et al. 2018, Sci Data)*



HPAI in poultry in Europe: exploration of nexus context

The 22 EU regions with highest poultry density per hectare utilised agricultural area

(Source: *https://ec.europa.eu/eurostat/; island states excepted; 2016 data*)



HPAI in poultry in Europe: exploration of nexus context

Impact of poultry production in poultry-dense regions on nexus elements, with poultry production in the Netherlands as an example *(Post et al. 2020, Sci Total Env)*

- **Biodiversity**: excess nitrogen deposition in nature areas; habitat loss for poultry feed production
- **Water**: reduced availability; nitrate pollution of groundwater; surface water eutrophication
- ± **Food**: increased access in Europe; reduced access globally due to feed conversion
- **Health**: premature death and disease from fine particulate matter; transmission of endemic zoonoses; risk of emerging zoonoses; severe odour annoyance
- **Climate change**: greenhouse gas emissions

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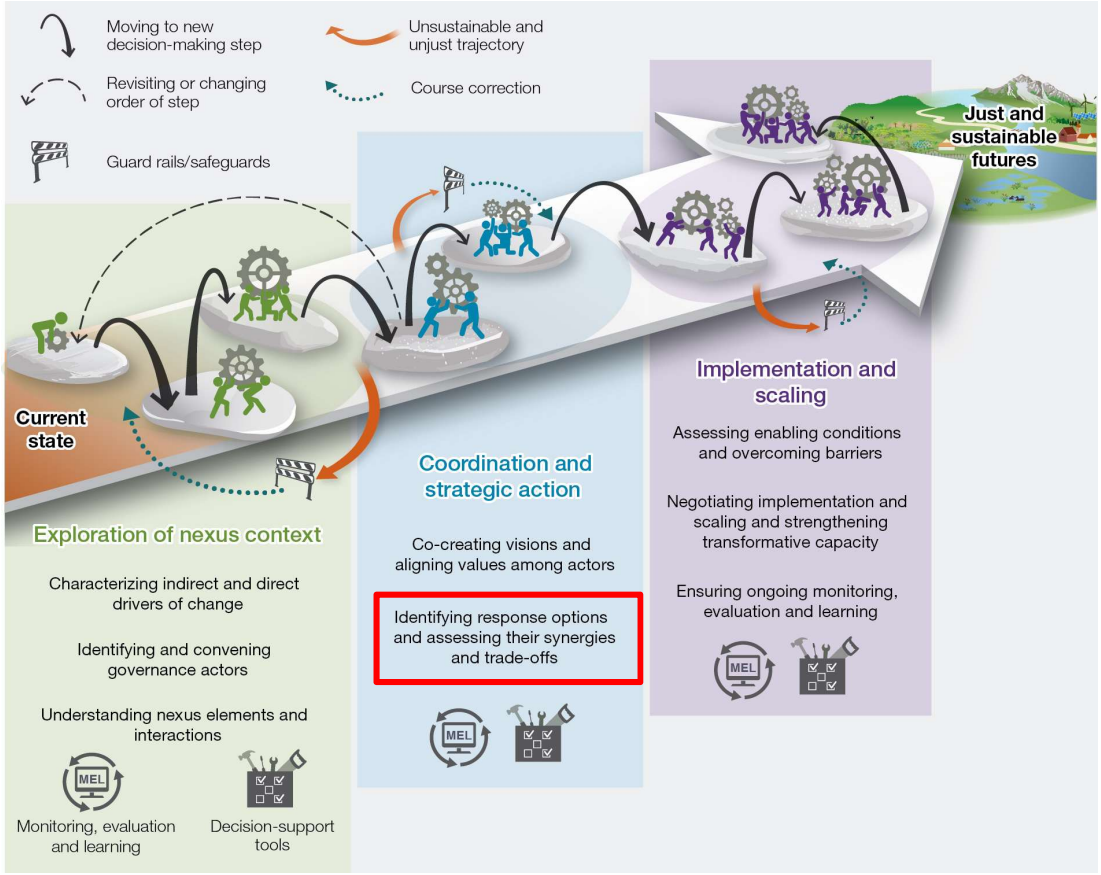


Summary for Policymakers, Figure SPM.13

HPAI in poultry in Europe: identifying response options

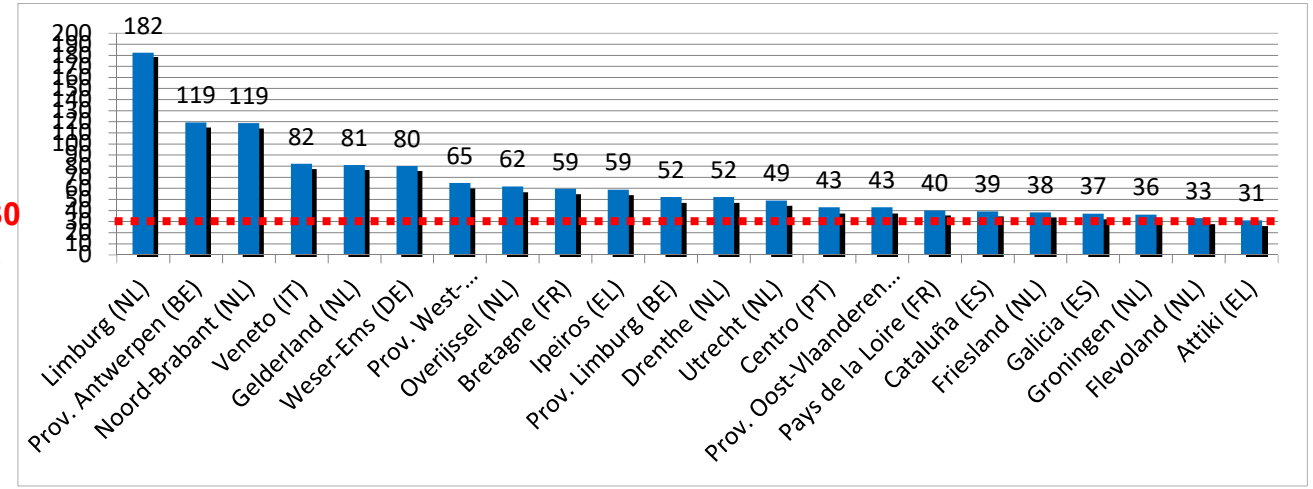
Example 1: Reduction of density of commercial poultry farms

(EFSA et al. 2021, EFSA J; doi:10.2903/j.efsa.2021.7108)

What if poultry density in poultry-dense regions with > 30 birds/ha is reduced to 30?

Would involve 22 regions in 8 countries

Cumulative reduction would be from ~ 1.6 to 1.4 billion birds in Europe: 15% less



Reduction in density of commercial poultry farms: expected impact on nexus elements

▲ **Biodiversity**: *less* excess nitrogen deposition in nature areas; *less* habitat loss for poultry feed production

▲ **Water**: *more* availability; *less* nitrate pollution of groundwater; *less* surface water eutrophication

▼▲ **Food**: *reduced* access in Europe; *increased* access globally due to less feed conversion

▲ **Health**: *less* premature death and disease from fine particulate matter; *less* transmission of endemic zoonoses; *lower* risk of emerging zoonoses; *less* severe odour annoyance

▲ **Climate change**: *less* greenhouse gas emissions

Therefore: a nexus response option with five-way synergies and one trade-off

HPAI in poultry in Europe: identifying response options

Example 2: Possible application of appropriate vaccination strategies

(EFSA et al. 2021, EFSA J; doi:10.2903/j.efsa.2021.7108)

What if all poultry in Europe was vaccinated against H5 HPAI?

Vaccination would prevent H5 HPAI outbreaks, and take away the need for culling.

However, vaccination also may be seen as a opportunity for poultry production to expand.

HPAI vaccination of poultry in Europe: expected impact on nexus elements *if poultry production remains stable*

= **Biodiversity**: excess nitrogen deposition in nature areas; habitat loss for poultry feed production

= **Water**: reduced availability; nitrate pollution of groundwater; surface water eutrophication

▲ = **Food**: *more stable* access in Europe; reduced access globally due to feed conversion

▲ = **Health**: premature death and disease from fine particulate matter; transmission of endemic zoonoses; *less* risk of emerging zoonoses; severe odour annoyance

= **Climate change**: greenhouse gas emissions

Therefore: a nexus response option with a two-way synergy

HPAI vaccination of poultry in Europe: expected impact on nexus elements *if poultry expansion is stimulated*

▼ **Biodiversity**: *more* excess nitrogen deposition in nature areas; *more* habitat loss for poultry feed production

▼ **Water**: *reduced* availability; *more* nitrate pollution of groundwater; *more* surface water eutrophication

▲▼ **Food**: *increased and more stable* access in Europe; *reduced* access globally due to feed conversion

▲▼ **Health**: *more* premature death and disease from fine particulate matter; *more* transmission of endemic zoonoses; *less* risk of emerging zoonoses; *more* severe odour annoyance

▼ **Climate change**: *more* greenhouse gas emissions

Therefore: a siloed response option with five trade-offs

Conclusions

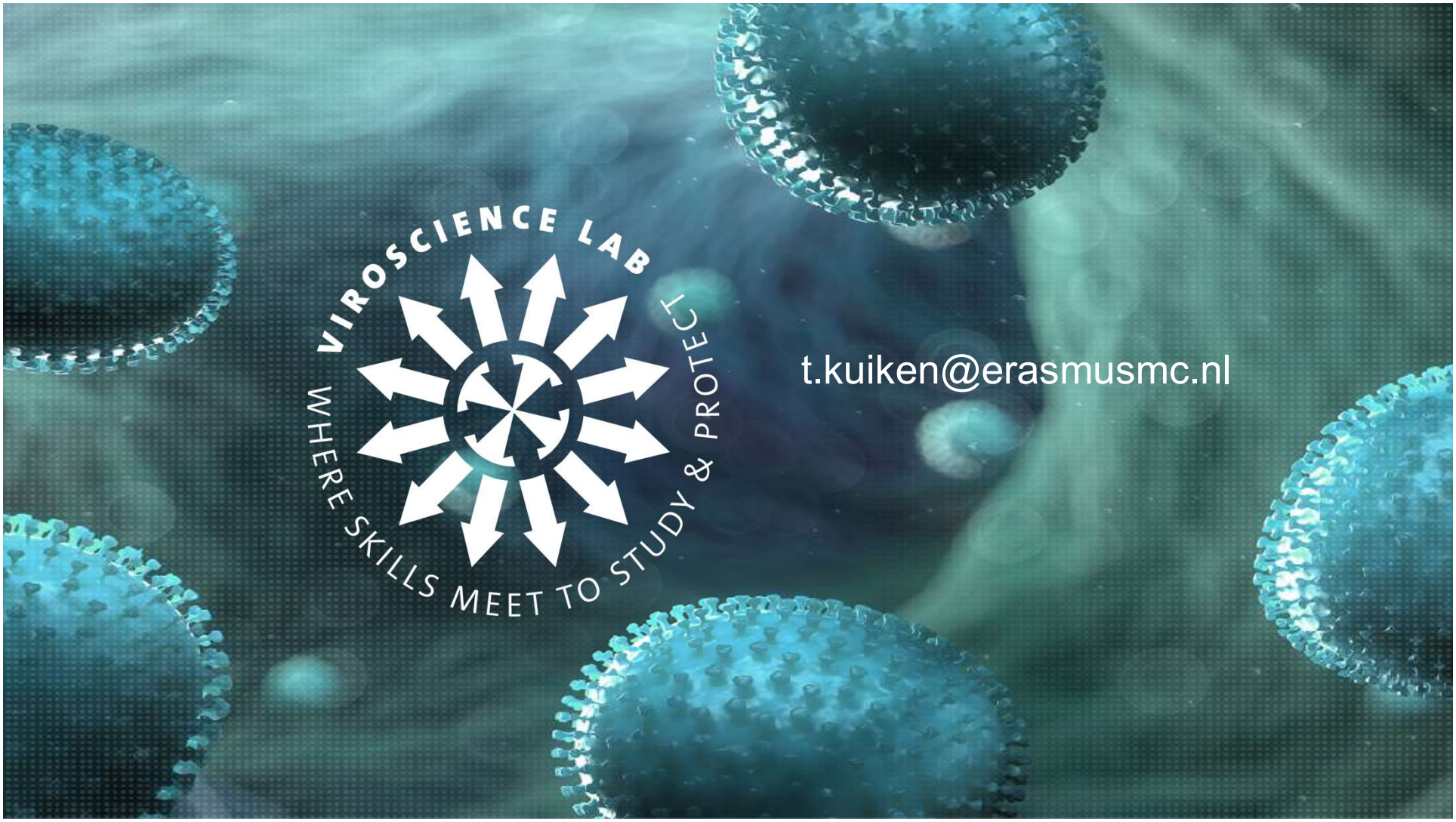
- Reduced density poultry farms: nexus approach
  - Long-term benefits all nexus elements
  - Doesn’t directly mitigate H5 HPAI problem

- HPAI vaccination: siloed approach
  - Direct mitigation of current H5 HPAI for food and health
  - Doesn’t address other nexus elements, no long-term solution for HPAI

- Both response options needed for to obtain short- and long-term benefits across all nexus elements

Acknowledgments

- EFSA AI working group
- OFFLU wildlife group
- IPBES Health Chapter members



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