Avian pest situation in Africa

A presentation at the Avian influenza dynamic and management at virus, birds and human interfaces

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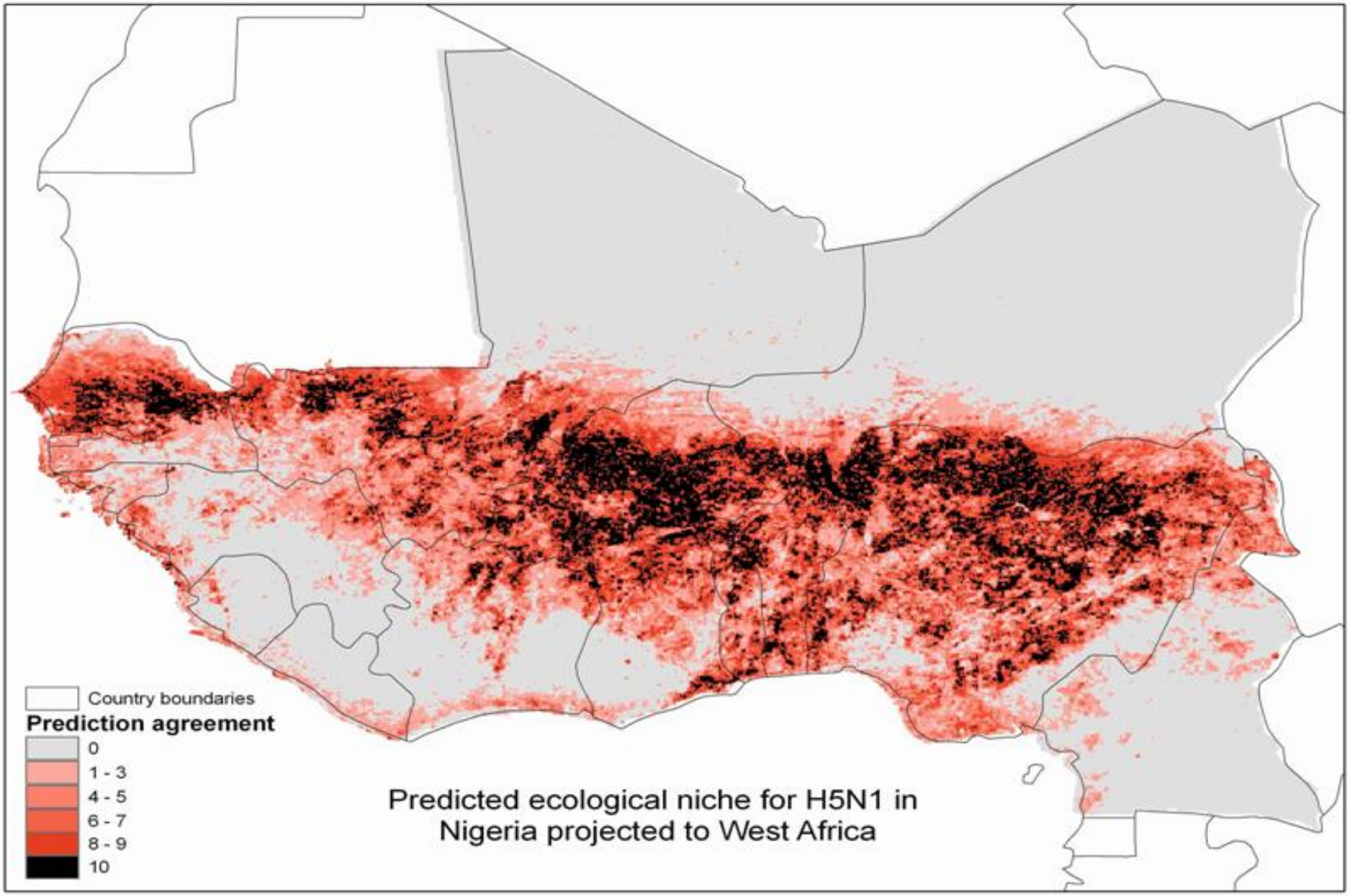
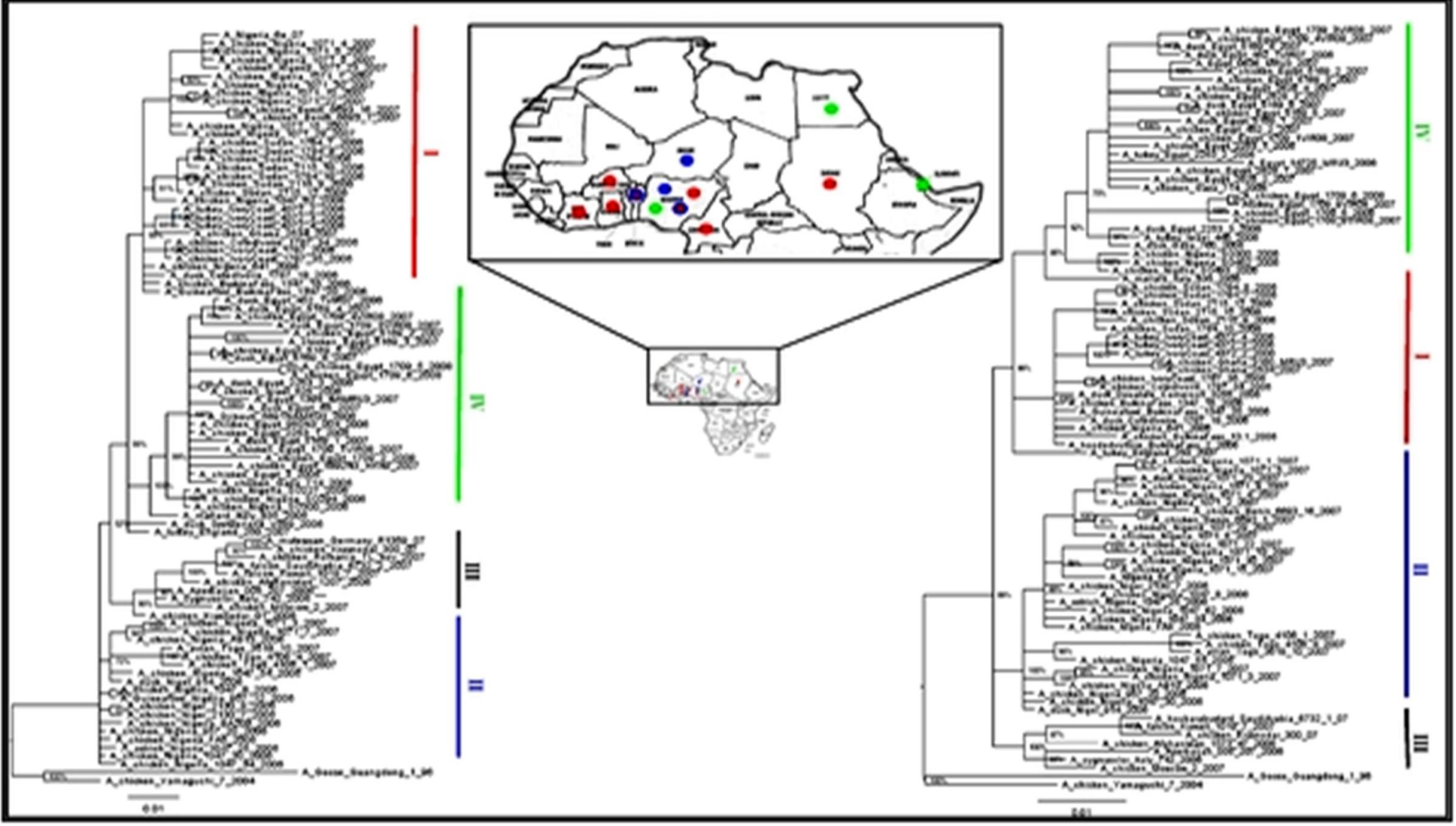
Avian diseases in Africa?

- Avian diseases have long been recognized as posing significant risks to animal production in Africa
- Environment, domestic and wild bird densities, peoples' perceptions, animal management and marketing structures correlate/aid the rapid spread of diseases
- Certain diseases has become endemic in most parts of the continent
- Disease lists is lengthening due to human incursion into previously uninhabited locations

Avian influenza situation…

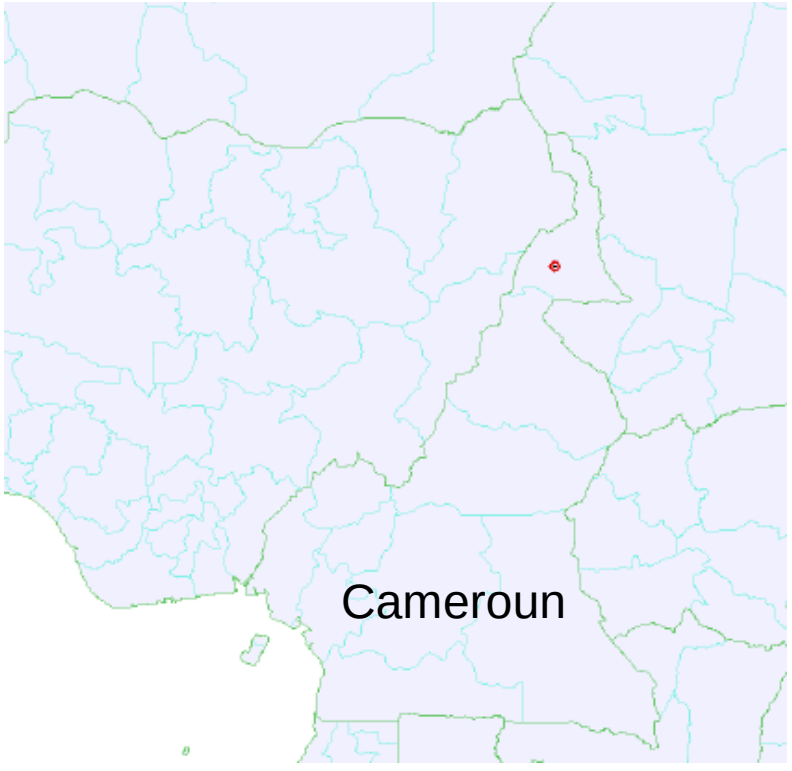
- Influenza A virus (H5N2) was the first infection in Africa.
- HPAI H5N1 was first reported in Africa around January, 2006 (Nigeria/Egypt).
- To date 11 countries in Africa have reported infection (see next slide).
- Egypt still battle with infection in humans and poultry. Does this represent any threat?
- Are other African countries truly free?
  - Intense surveillance (passive and active)
  - Border patrol and wild bird monitoring
  - *Recent papers led from CIRAD proved otherwise (Gaidet et al., Proc. Roy. Soc. B, 2011; Cumming et al., EcoHealth, 2011)*


Country boundaries
Prediction agreement
0
1 - 3
4 - 5
6 - 7
8 - 9
10
Predicted ecological niche for H5N1 in
Nigeria projected to West Africa



- Ducatez *et al*, 2006, *Nature;* Ducatez *et al*, 2007, *EID*
- Njouom *et al*, 2008, *Vet Mic;* Couacy-Hyman *et al*, 2008, *TBED;* Cattolli *et al*., 2009, *PLoS ONE* Fasina *et al*, 2009, *Epid. Infect*


Burkina Faso


Cameroun


Cote d”Ivoire

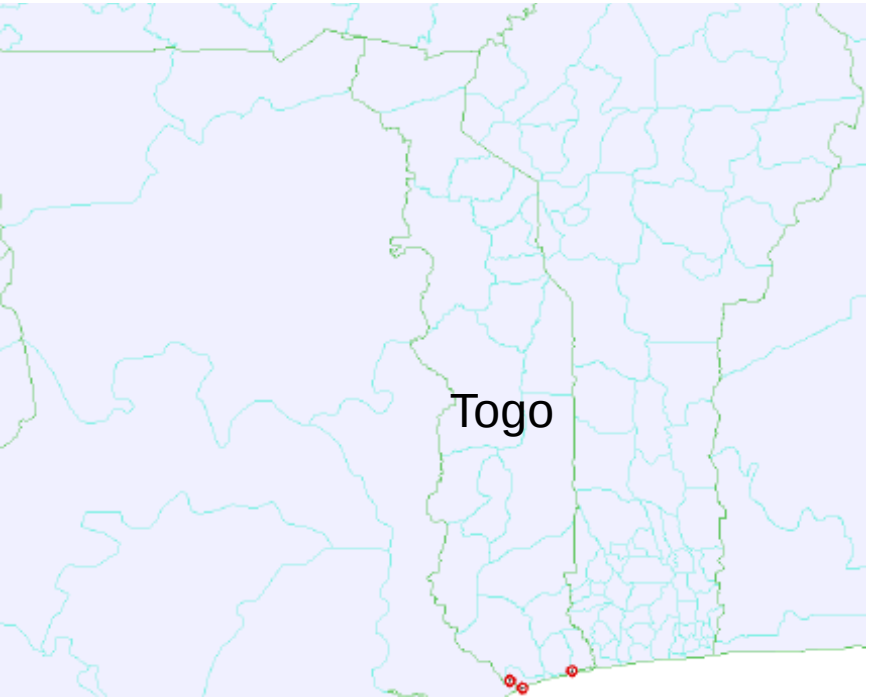

Djibouti


Egypt


Niger


Nigeria


Sudan



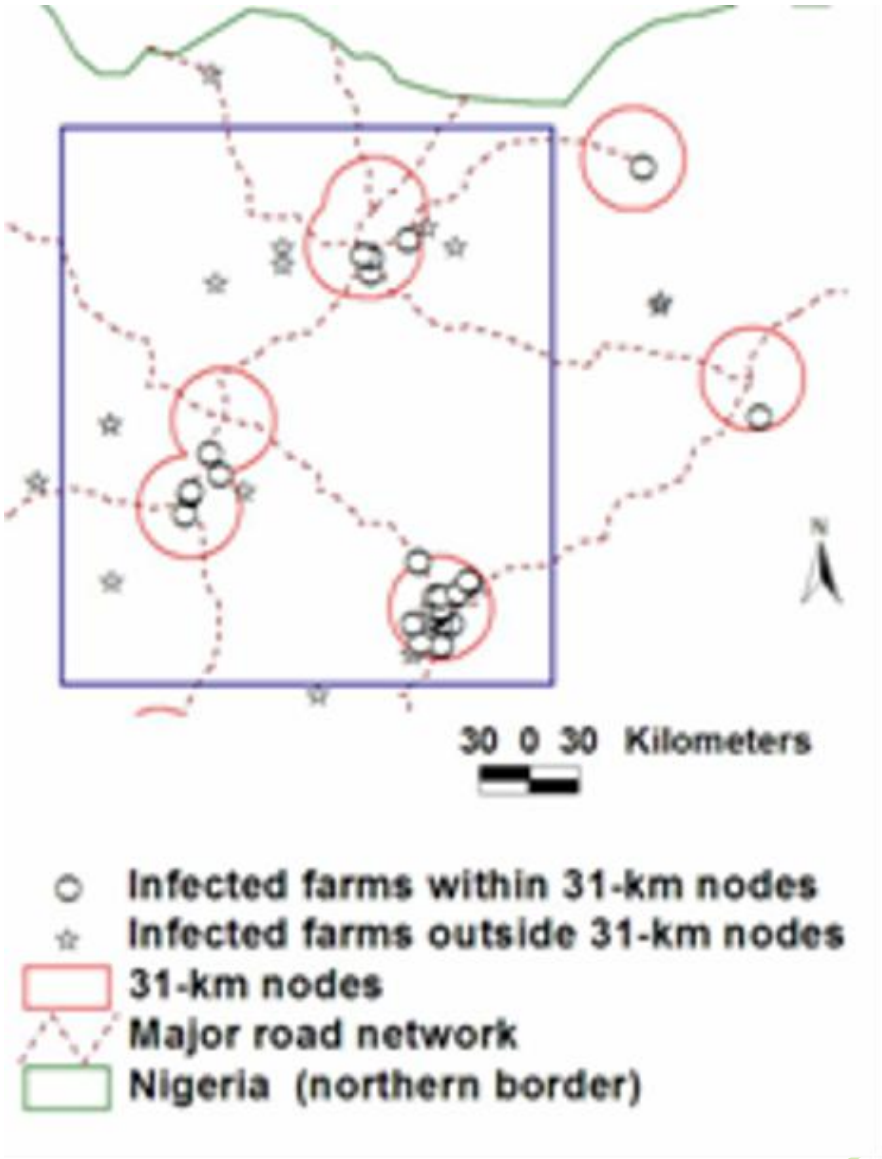
Maps: courtesy, OIE

Risk assessment of important poultry diseases-Egypt

Rank	Disease	Expert Matrix Score ±Standard deviation
1	HPAI H5N1	1.3±0.67
2	Newcastle	2.4±0.42
3	Infectious bronchitis	5.5±0.55
4	Coccidiosis	6.7±3.40
5	Gumboro (IBD)	6.7±1.03
6	Fowl pox	7.2±2.27
7	Fowl cholera	8.8±1.39
8	Clostridial	9.6±1.89
9	Endoparasitosis	12.5±2.00
10	Mycoplasmosis	13.1±1.89
11	*E. coli* infection	16.3±2.52
12	Tumour/Marek's	17.5±2.08
13	Infectious laryngotracheitis	17.5±3.51
14	Salmonella	22.2±1.89
15	Ectoparasitosis	24.3±0.76
16	Coryza	40.0±0.58
17	Nutritional deficiency	50.0±0.76

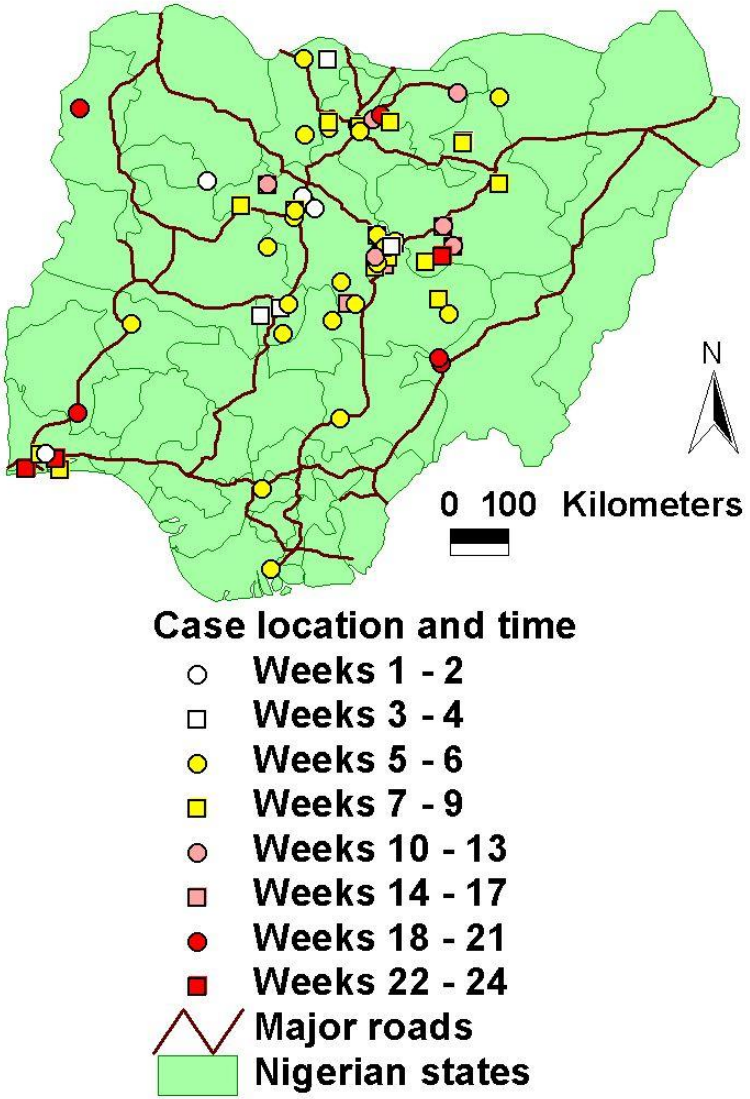
Role of roads-Nigeria

- Epidemic nodes determined on major intersection
- Highway was involved in the spread of the virus



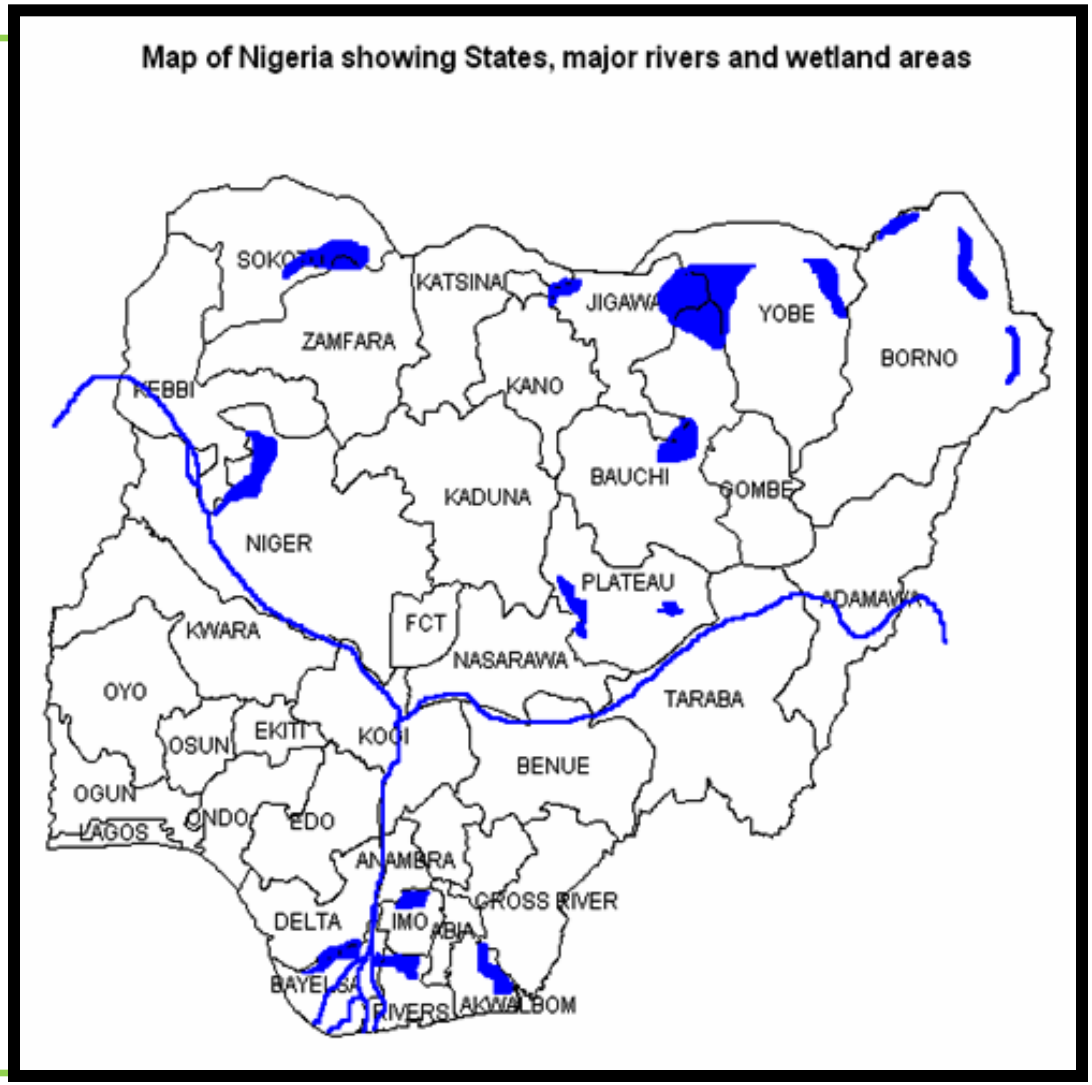
Role of roads-Nigeria

- Temporal simulation on major road network
- Outbreak clustered with major highway intersections

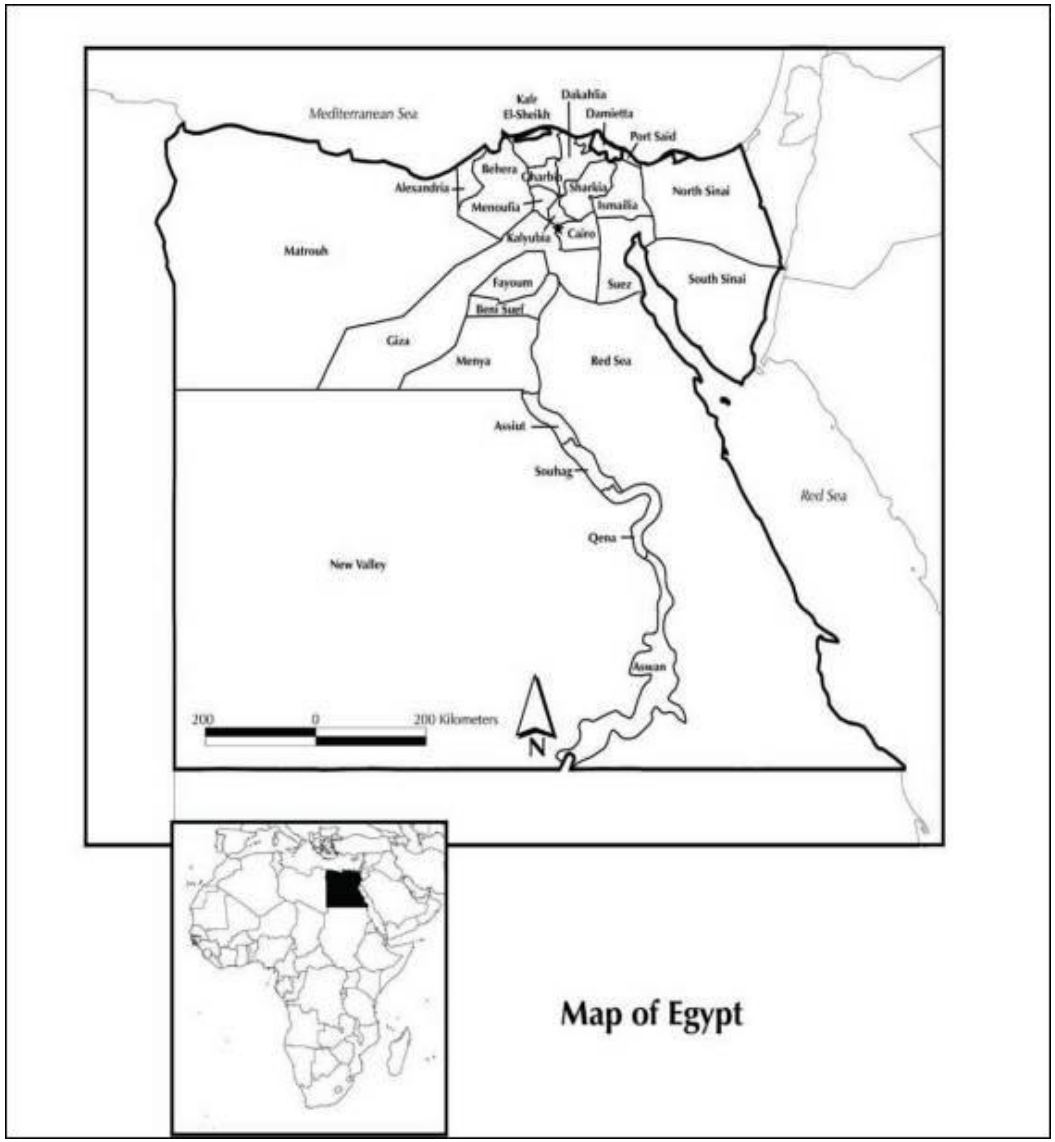


Surveillance- the Nigerian example

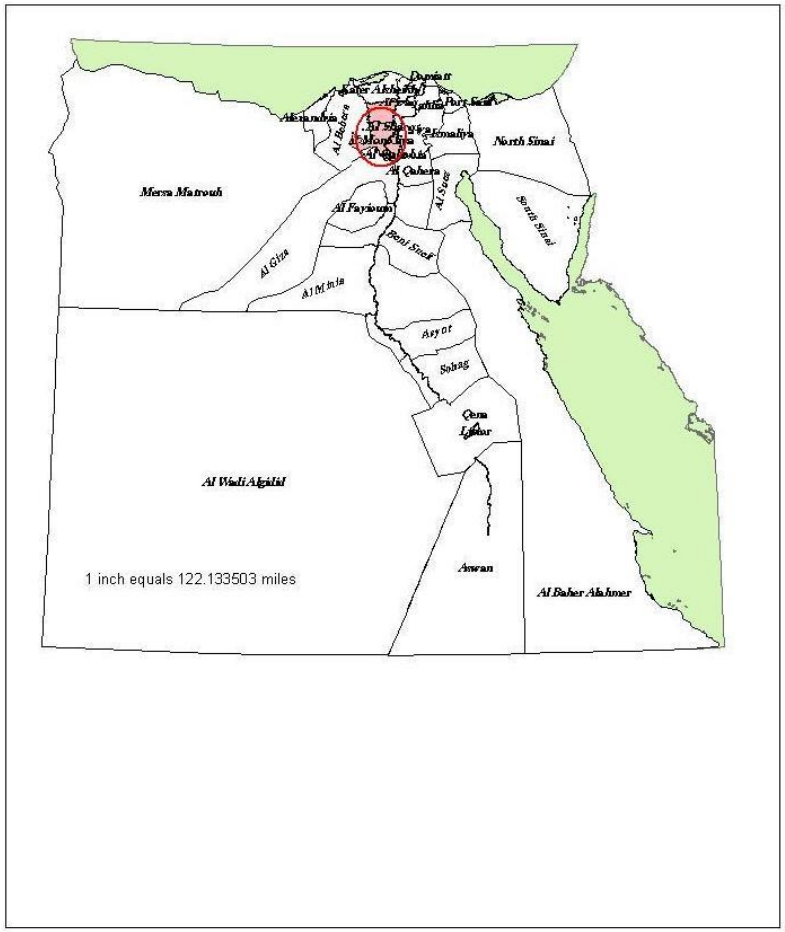
- Wetlands- active
- Backyard farm- active and passive
- Commercial poultry- active and passive
- Live bird market- active and passive
- *Along the marketing chain-not done*



The Egyptian situation



Map of Egypt



1 centimeter equals 7,738,378.780082 centimeters

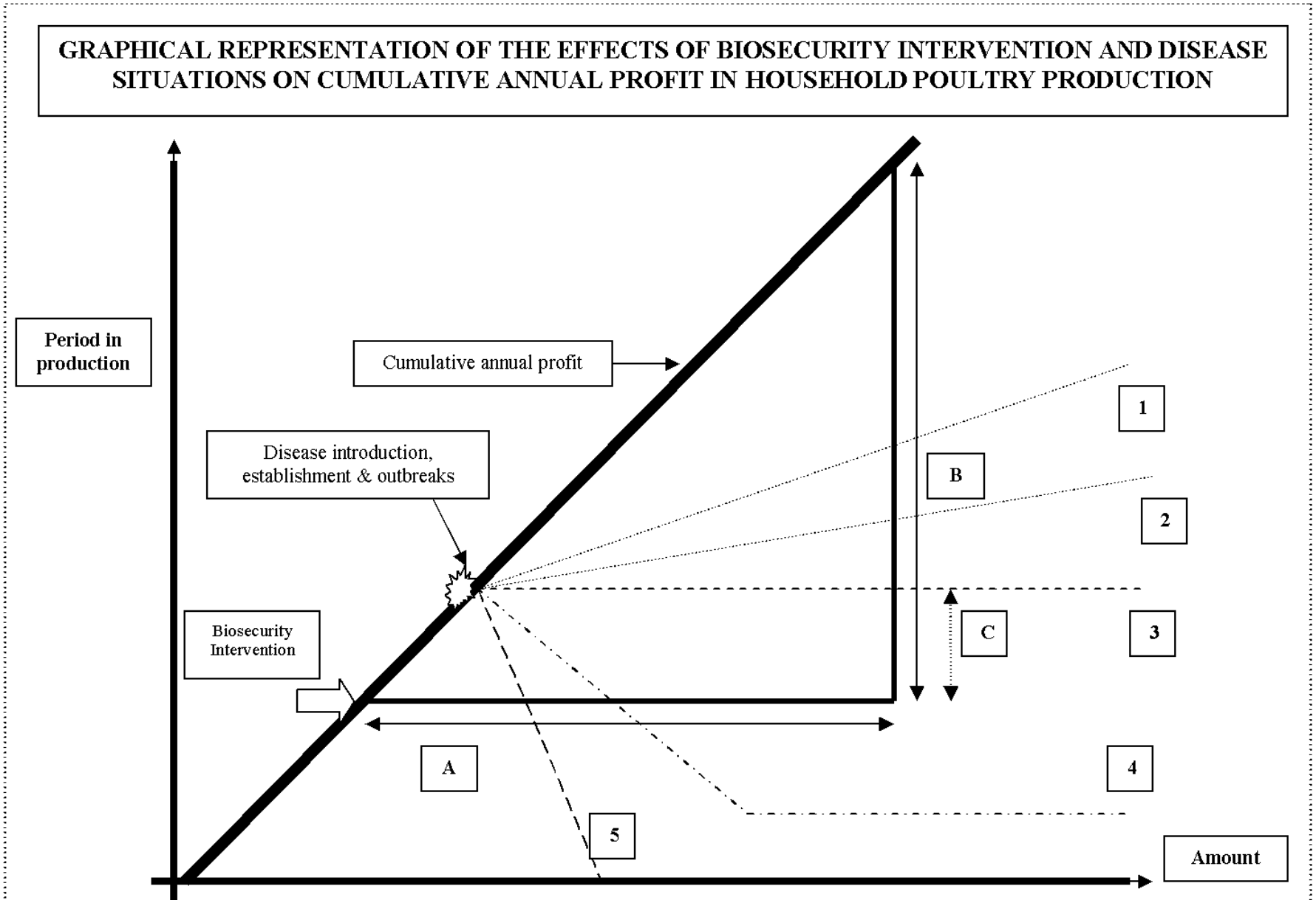
220 110 0 220 Kilometers

Findings from Egypt

- Over 2421 poultry outbreaks recorded to date
- 151 human cases with 52 fatalities
- Increasing number of women and children are being involved
- Approximately 100% of human outbreaks are linked with poultry handling
- 7 high risk governorates:
  - produces over 73% of the total poultry,
  - 40% of human population,
  - 65% of poultry outbreaks and
  - 36% of human outbreaks.

(Dakahlia, Menuofia, Gharbia, Qalyubia, Sharkia, 6th October and Menya)

Biosecurity assessment-Egypt



Categorization of risks

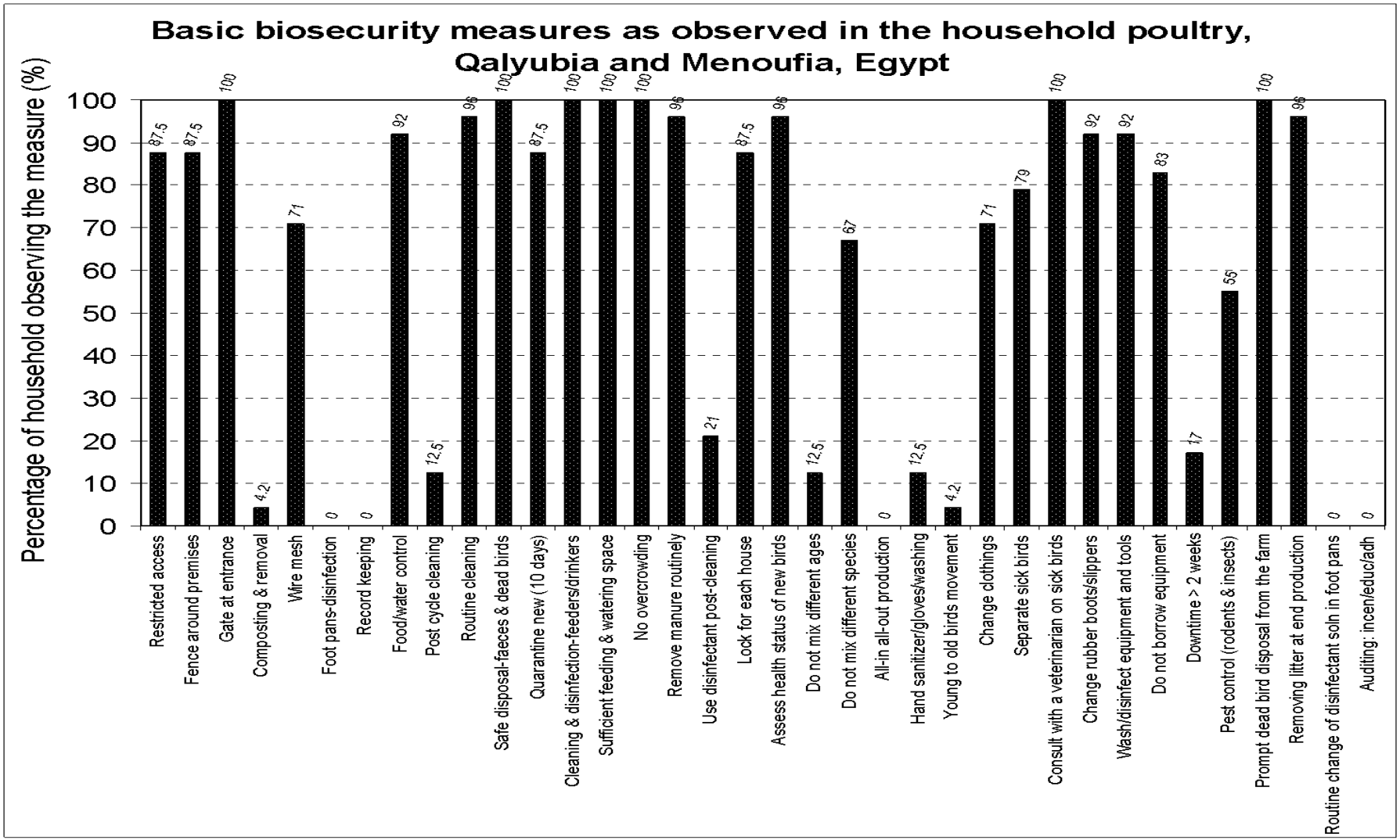
- People-related risks> Environment and flock-related risks> Wild birds and other animal-related risks (P value = 0.001).

People Related Risks
Poultry caretaker or manager own other birds
Poultry owner visit live bird markets
Family member of poultry owner work in other farms/poultry
Poultry owner visit other poultry
Poultry owner own other birds

Environment/flock related risks
Multi-aged birds kept together
Multi-sourced birds kept together
Multi-breed birds kept together
High density of household poultry in the area
High density of small scale or commercial farms in the area
Presence of another household producers within 250 metres
Dead bird disposal in water canal
Workers (vaccinators, gas supplier, farm gate buyers etc)
Lack of biosecurity awareness by poultry owner
Sick and dead birds are not separated promptly

Bird and other animal Risks
Rats and mice are present in the farm
Wild birds have access to poultry
Old and new batches of birds are mixed
Cats and dogs have access to poultry

Biosecurity assessment



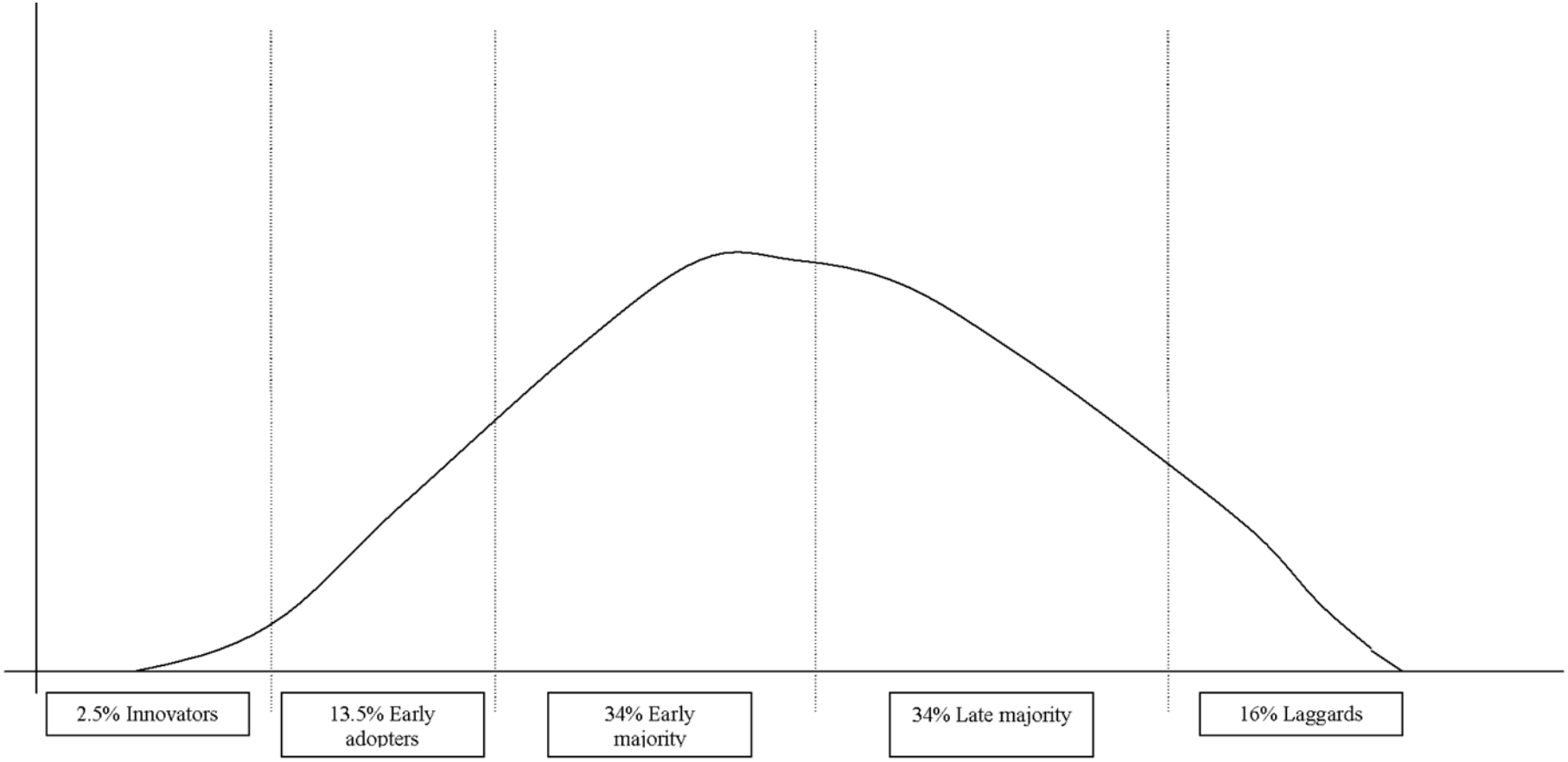
Current situation

- HPAI H5N1 is still a threat to Africa poultry populations
- Outbreaks are still being recorded in Egypt
- Risk of virus mutation exist in Egypt
- Definite Influenza A situations in several African countries are relatively unknown

What must be done

- We need to intensify studies on ecology and epidemiology at country/regional levels.
- Need to assess country specific risk factors and risk levels
- Prospective understanding of the networks and drivers (social, cultural, religious, marketing, value chains) that support outbreaks and rapid dissemination of poultry diseases using realistic empirical simulations and SNA
- Effective means of communicating disease information to farmers at all levels should be devised. Top-down approach will not work

Adoption curve of innovation and relationship to Avian pest situation



Thank you