Food and Agriculture Organization
of the United Nations

Economic and Social Development Department (ES)

The Economic Impact of Avian Influenza

CONFERENCE Avian Influenza. A Global Threat
In the Framework of the G7 CVOs Meeting Rome, 4th October 2017

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Presentation Outline

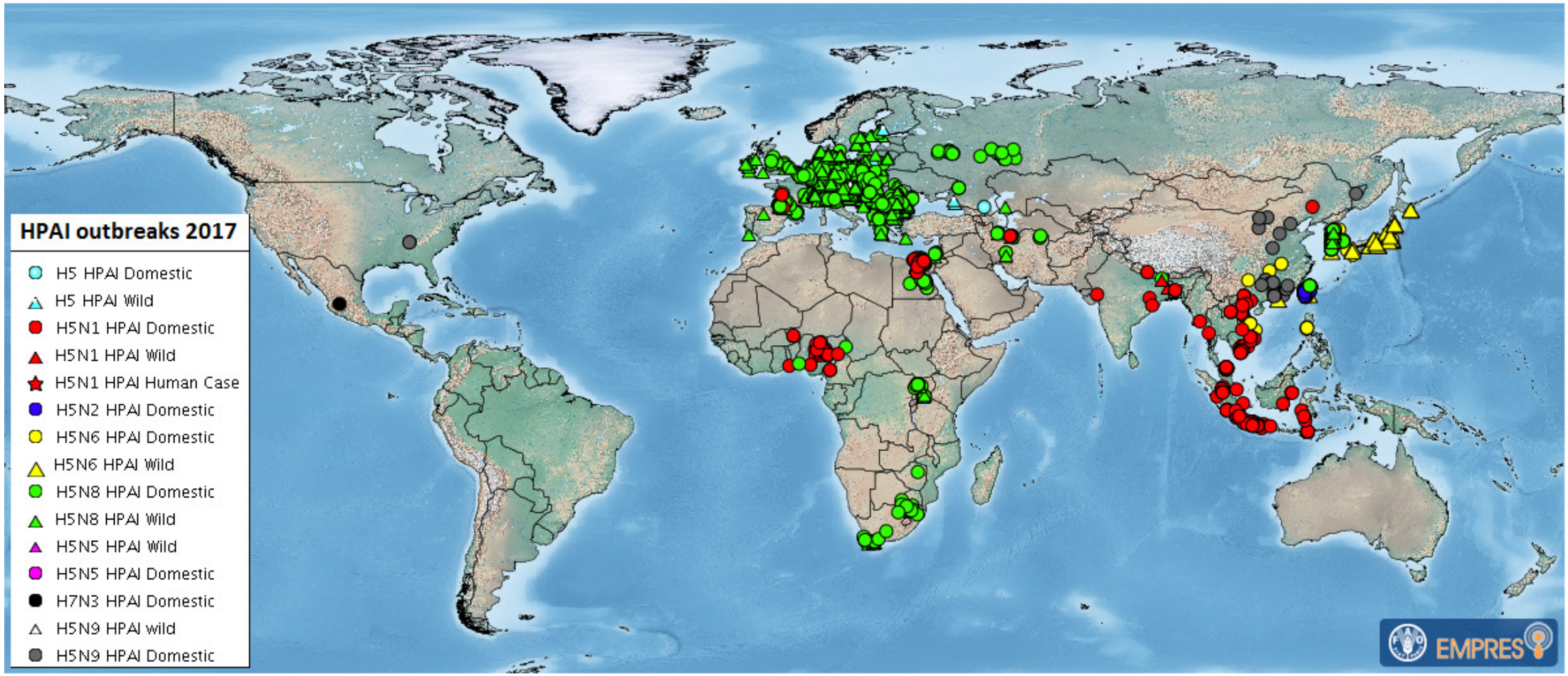
1. Why think about Avian Influenza?
2. What is the economic impact of Avian Influenza?
3. Channels of economic impact
4. What is beyond sector and economy-wide impacts?

Why think about Avian Influenza?

Four factors contribute to HAPI's potential economic and social impact:

1. Risk to people - it is a zoonotic disease, and can cause death in humans.
2. Disease has moved to an endemic status in several countries that experienced large outbreaks.
3. Migratory birds have caused outbreaks to emerge in several countries and regions simultaneously, with rapid spread across central Asia to Europe and Africa.
4. Local effects can be severe both in terms of losses in production and loss of livelihoods of vulnerable people

Confirmed HPAI outbreaks in 2017 worldwide.



Why think about Avian Influenza (AI)? – cont.

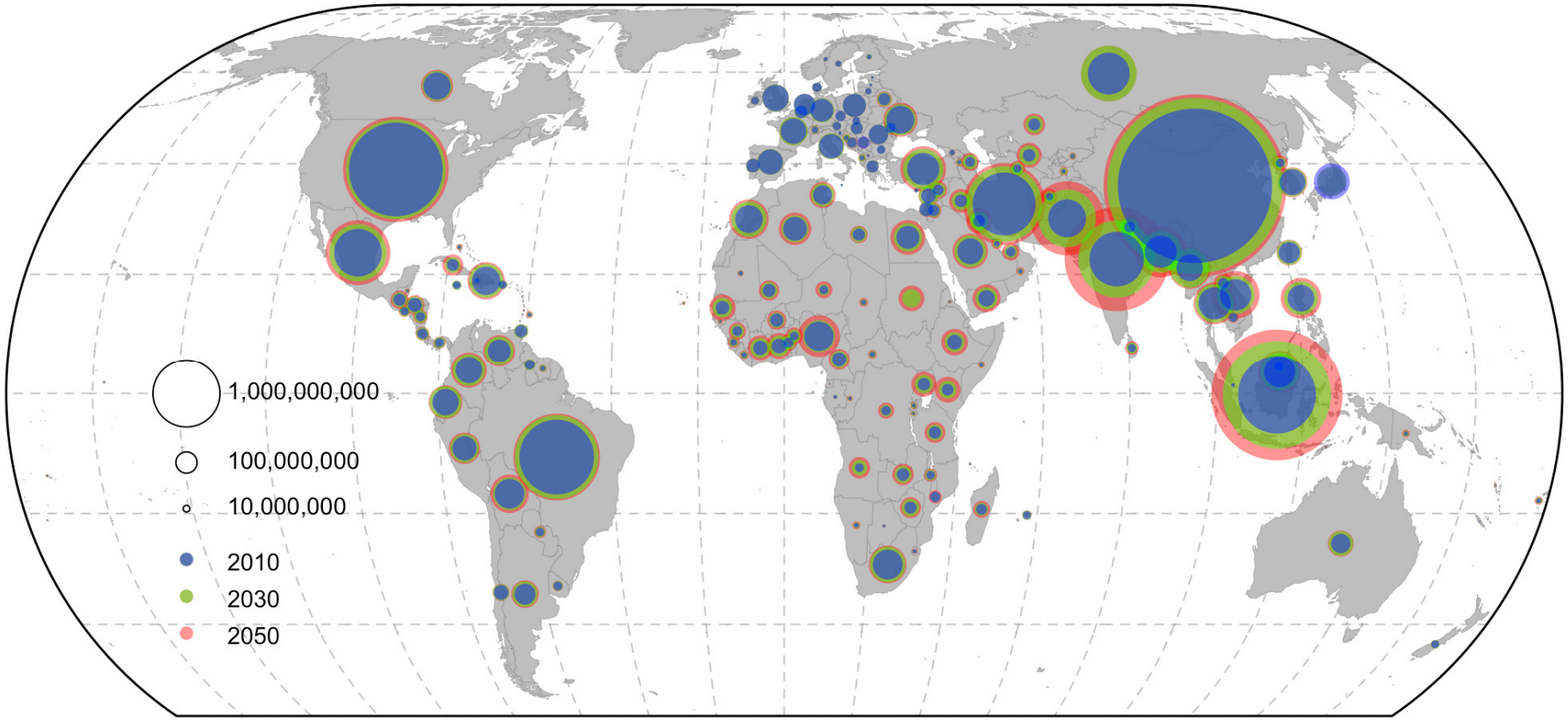
Key global trends

- **Increasing demand** for livestock products, including poultry
  - Linked to increasing incomes and urbanization

- **Increasing supply** in response to rising demand

➢ higher risks of outbreak and potential for greater economic and social impacts

Number of chickens by 2050



Source: Gilbert and Robinson (2017) based on Alexandratos and Bruinsma (2012)

Why think about Avian Influenza (AI)? – cont.

- Increasing supply and changing structure

- Changes in livestock sector:
  - ✓ more intensive, market-oriented systems with greater horizontal and vertical integration. Often established close to large urban centers.

  - ✓ Highly-integrated production networks and the rise in the establishment of international supply chains

  - ✓ But also - in many countries subsistence and small-scale production will continue as an important livelihood for the poor

Economic impact varies depending on poultry system and market chain

Poultry systems in five South East Asian countries affected by HPAI in 2003-5				
Country	Industrial	Large commercial	Small commercial	Backyard
Cambodia		<1% poultry	<1% poultry	99.9% farms, 90% poultry
Indonesia	3.5% poultry, export & national consumption	21.2% poultry	11.8% poultry	63.4% poultry
Lao PDR		Small	10% poultry	90% poultry
Thailand	70% production, export important	20% production	10% production, 98+% producers	
Viet Nam	Small	20-25% production, few producers	10-15% production, few producers	65% production, possibly 70% of poultry
Source: Rushton et al (forthcoming)				

1. Why think about Avian Influenza? – cont.

- In sum, the world is changing.
- More people, more income, more animals, and more domestic markets interaction will increase the level of risk of outbreaks.
- On top of that, investment in veterinary systems for adequate surveillance and control are decreasing.
- The frequency of outbreaks may increase in the future <u>and so will the economic costs</u>.

What is the Economic Impact of an Avian Influenza (AI) Outbreak?

- Avian Influenza outbreaks can have far reaching economic impacts
  - Not only sectoral, but economy-wide impacts
  - Can also lead to significant livelihood, health and nutrition and environmental impacts
- Depends on:
  - Nature, location and spread of AI outbreak, zoonotic or non-zoonotic
  - Economic size of poultry sector and forward and backward linkages
  - Extent of linkages to a globalized value chains network (GVC) and trade

Economic Impact depends on the nature and spread of Outbreaks

- Nature of outbreak
  - Confined to poultry and wild-birds (e.g. H5N1) – highly pathogenic zoonotic virus
  - Bird-Human transmission infections (e.g. H7N9) - low pathogenic [at first]

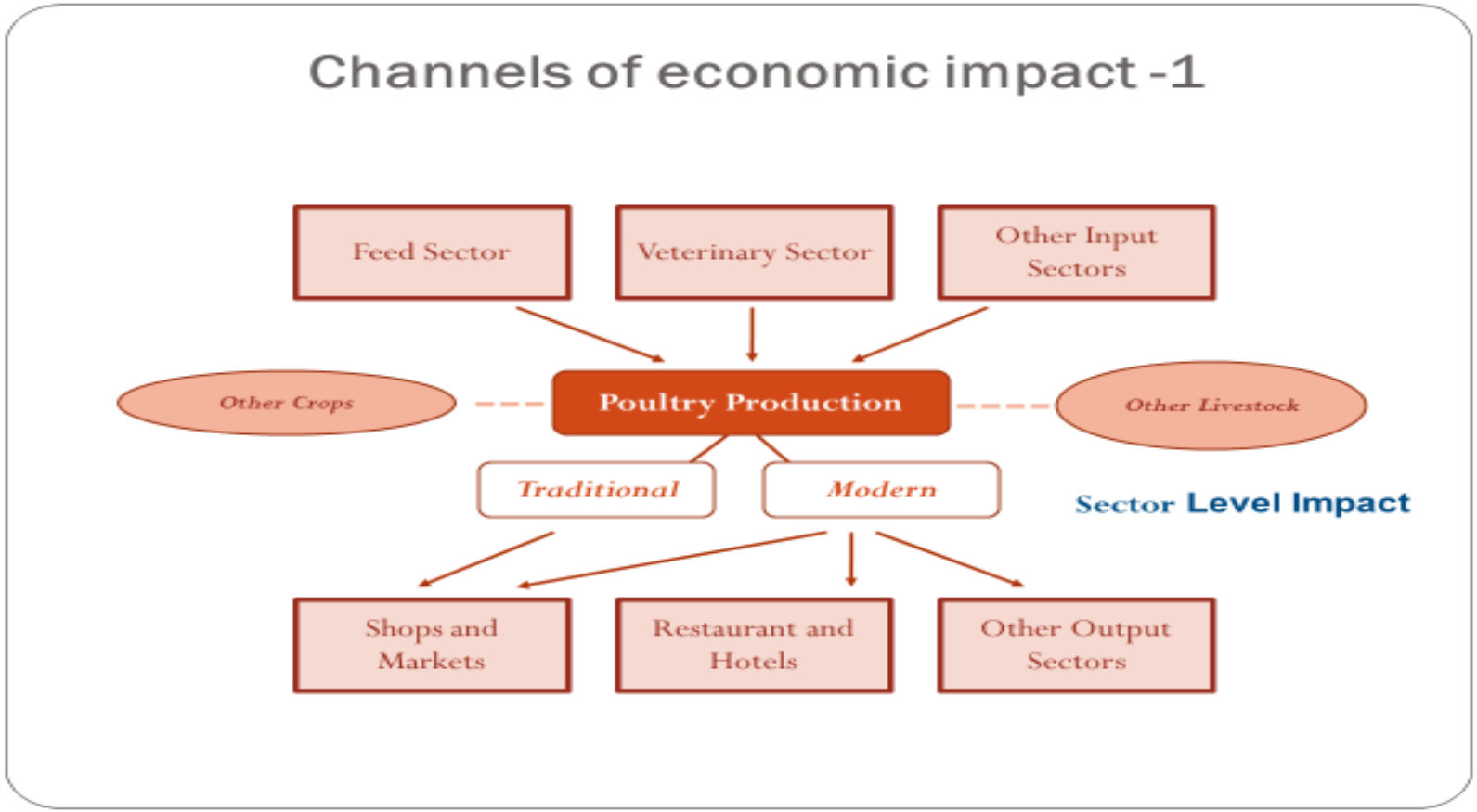
- Location and spread of outbreaks all around the world
  - In G7 countries, the main impact on poultry production, its backward and forward linked sectors and trade (local, national and international)
  - In poorer countries in Latin America, Eastern Europe, Middle East, Africa and Asia, there is a potentially significant impact on livelihoods

3. Channels of Economic Impact

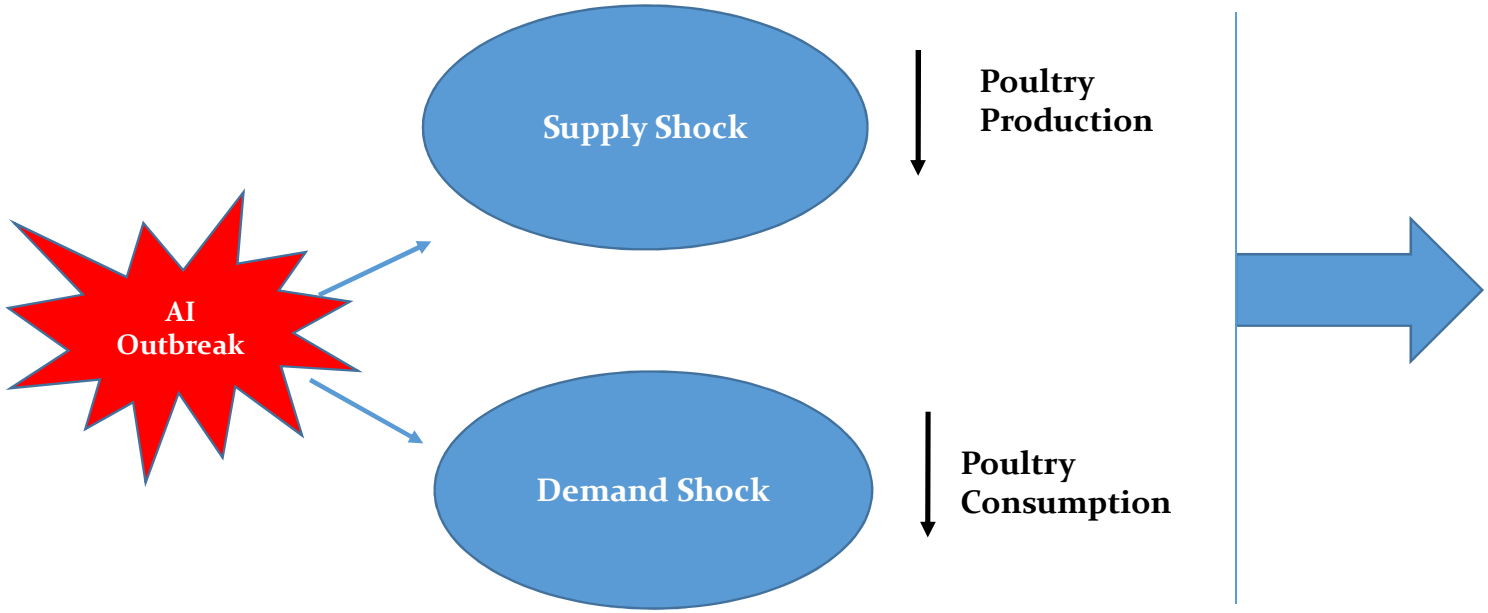
- *Direct* poultry sector impacts
  - Production and revenue loses
  - Compensation for loss animals
  - Animal health service and control costs

- *Indirect* economy-wide impacts through linkages with other sectors
  - Input sectors: feed, veterinary and other input sectors
  - Output sectors: restaurants, hotels and markets, as well as tourism and trade

Channels of Economic Impact - Upstream and Downstream Sectors



Channels of Economic Impact - Supply and Demand Effects



Net Affect on Economic Losses

- Supply shocks driven by inventory loses and reduced stock following control measures
- Demand shocks driven by rising prices, consumer panic, food safety or trade restrictions

Examples: Sector Production Losses due to Net Effect of Supply & Demand Impacts

Country	Outbreaks	Estimated loss
Greece (2006)	Outbreaks in Turkey & Romania (Oct 2005) Greece poultry consumption dropped by 55% With outbreak in Greece, increased to 70%.	50 million euros (Greek Ministry of Agriculture)
Italy (2006)	Outbreak in other European countries Italy poultry consumption dropped by 7% With outbreak in Italy, increased to 70%.	5 - 6 million euros a day 500 to 700 million euros total costs between Oct. 2005 and Feb. 2006
UK in 2006,2007 and 2014, 2015		£9.4m in lost sales over a 12 week period in first two outbreaks
Turkey in 2005	Prices dropping below the cost of production	£6 million losses due to decrease in production £26 million losses due to decrease in prices

Economy wide impacts – beyond production loses

Economic impact of a single outbreak of HPAI on national GDP depends:

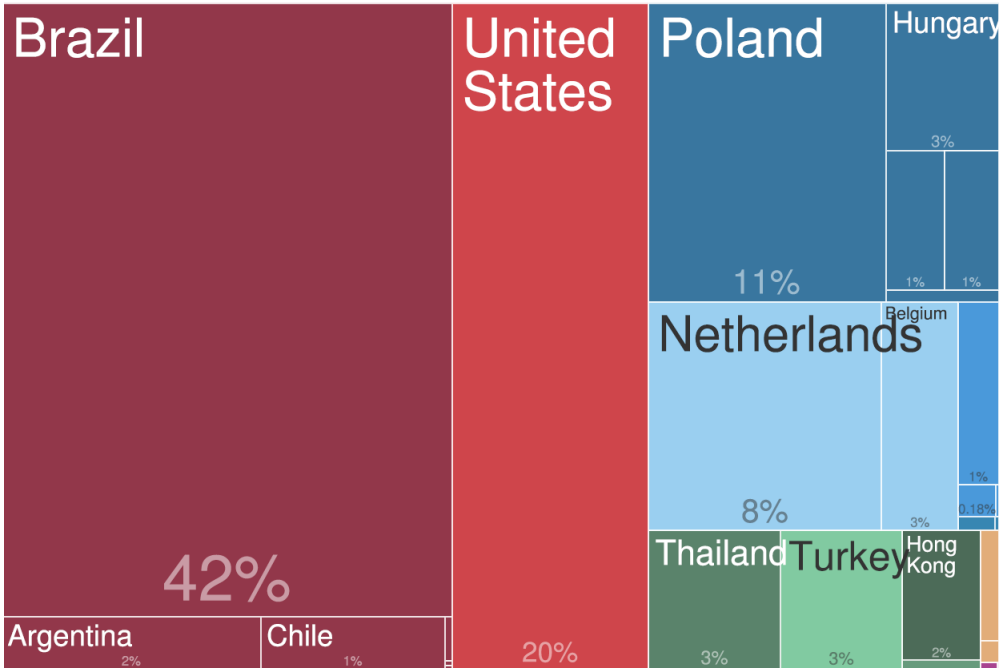
- speed with which it is controlled
- extent to which it spreads
- contribution of poultry to GDP
- structure of the poultry sector
- degree of integration in global and regional markets

Examples - Impact on GDP

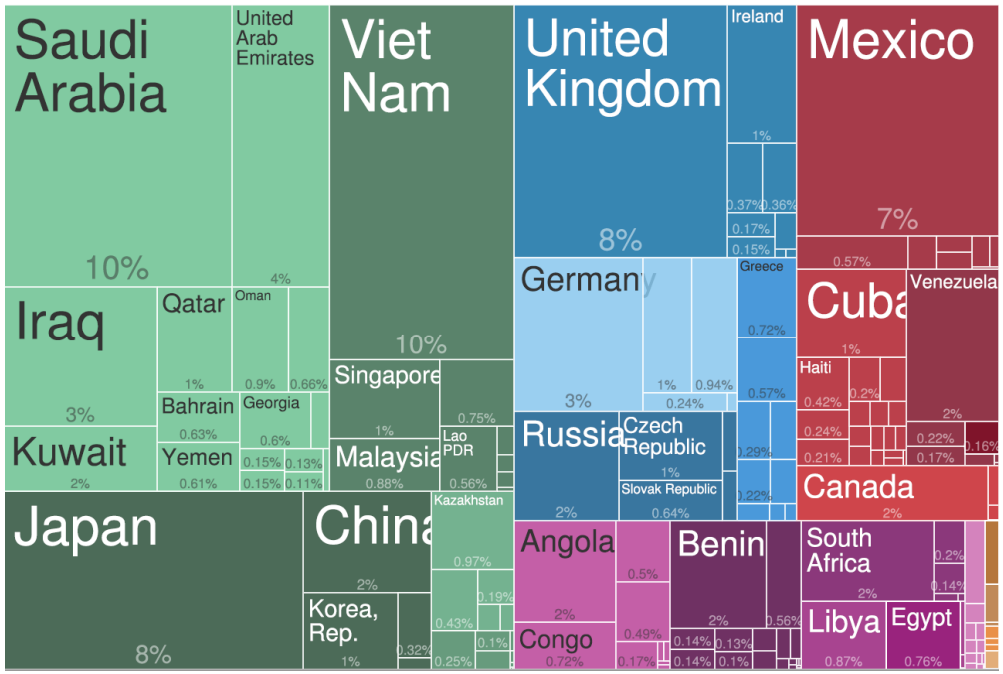
- Vietnam outbreak impact predicted between 0.3%-1.8% of GDP or between USD 76 -450 million, in 2003-2004 outbreak.
- South East Asian Economies, impact of a single large outbreak could result in reduction of up to 1.5% of GDP growth

Countries share in global markets

Who net exported poultry in 2015



Who net imported poultry in 2015



Source: The Atlas of Economic Complexity (2017)

Channel of Economic Impact: Trade and Trade Bans

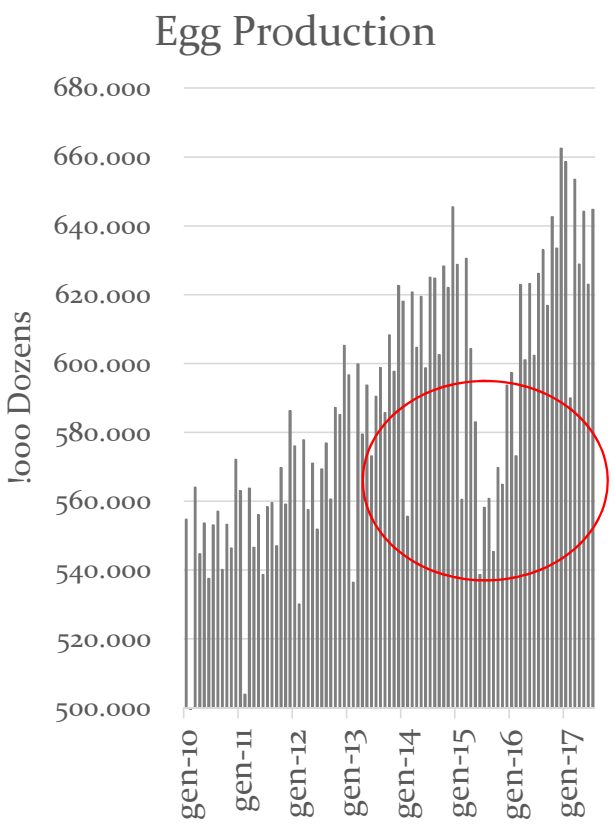
Global and regional economic impacts - due to interlinked global poultry markets of demand and supply

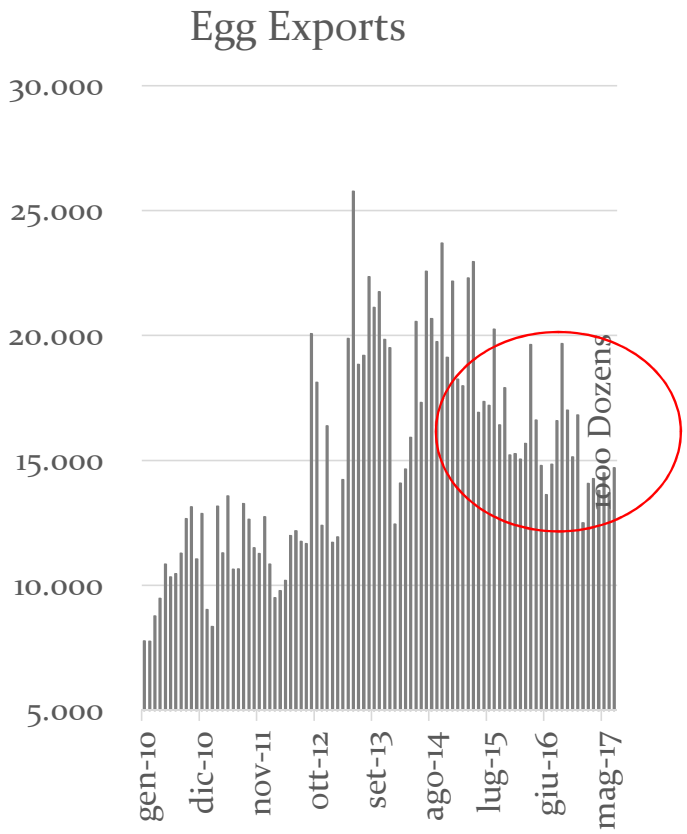
Globalized value chains (GVC) - shocks are transmitted across countries even if not related to livestock production

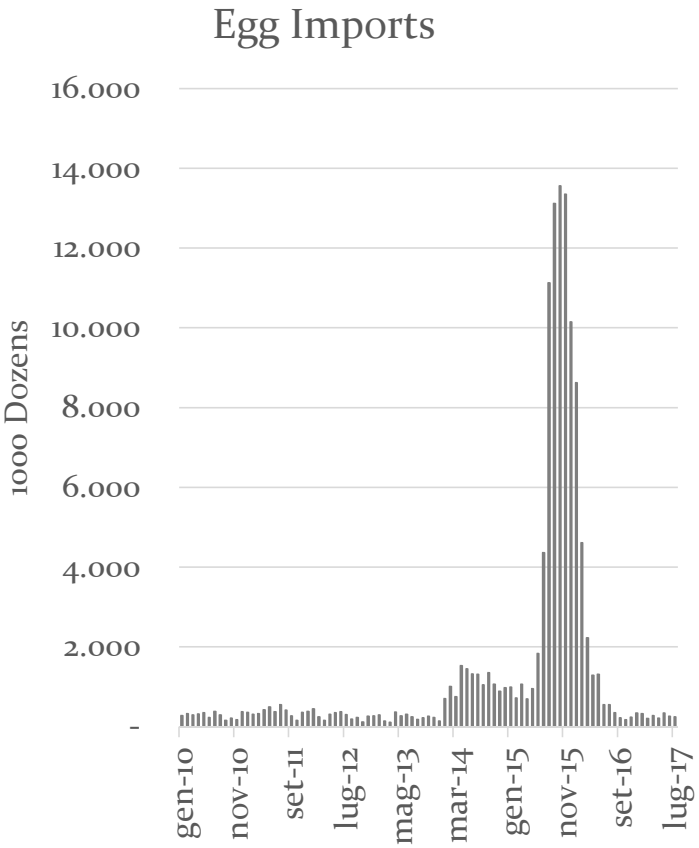
Case Study – USA Poultry Ban (2014-2015)

- Avian flu outbreak in Midwest US, across 15 States
- **$130 million in poultry indemnity payments** and more than 1,200 personnel dispatched to manage outbreak
- By Dec 2014, **75 export partners imposed full or partial bans**
- **Trade bans** affected 233,770 poultry farms in USA
- U.S. year-to-date poultry/poultry product exports at 1.242 million metric tons
  - Year-over-year declines of 6- 11% for chicken broiler meat/eggs and declines of 13-14% for turkey and broiler exports

HPAI effects production and trade: US egg market

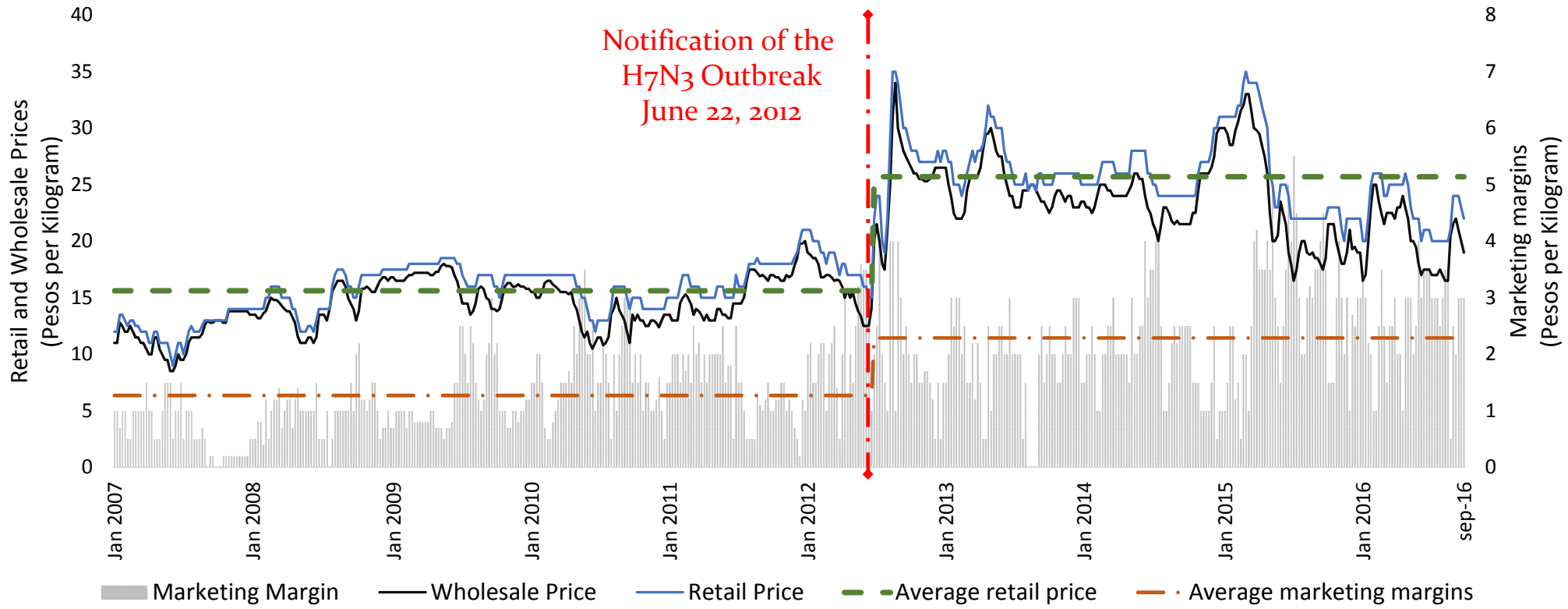






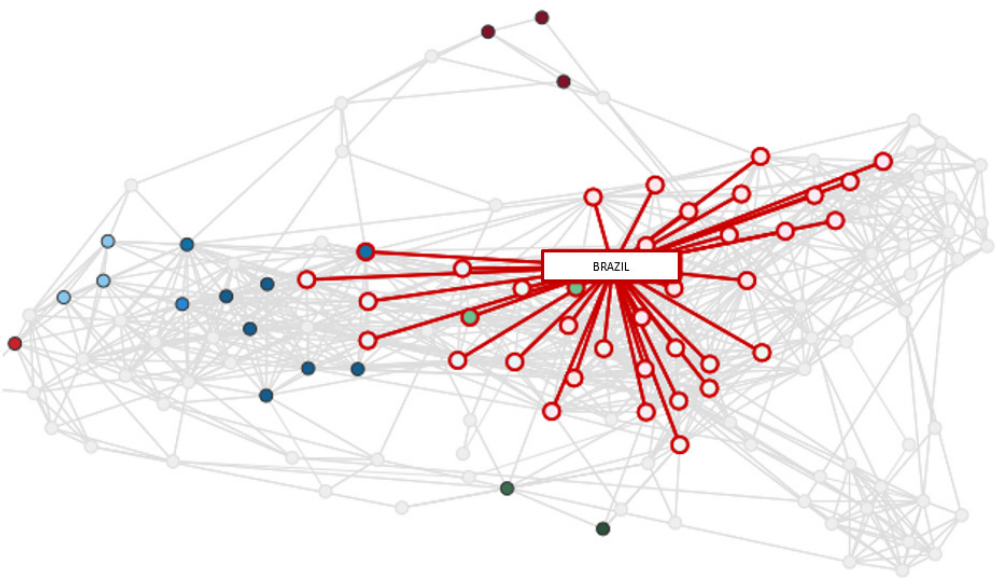
Source: Acosta and Barrantes (2017), using data from U.S. Department of Commerce

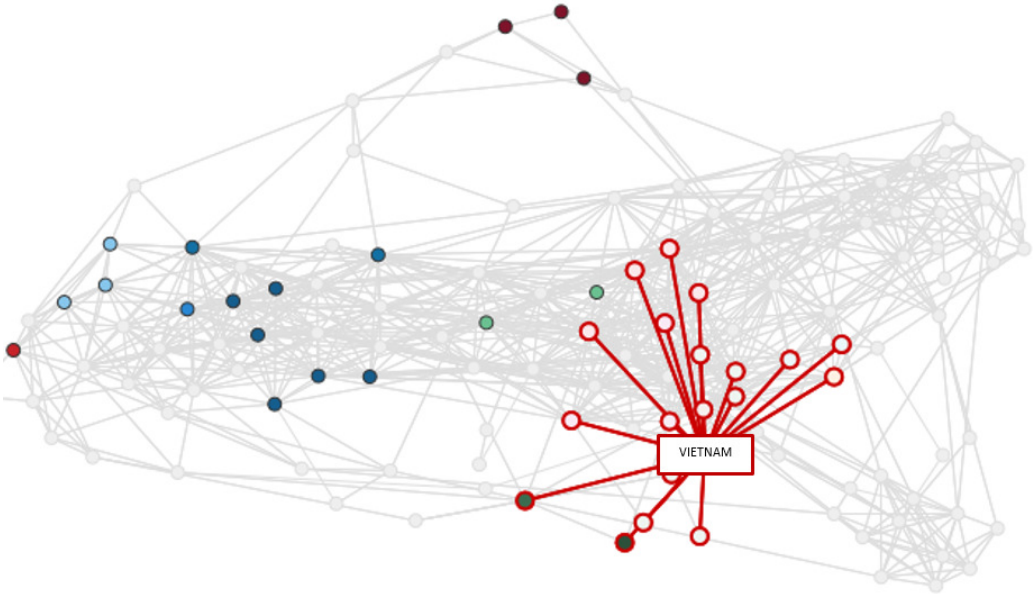
HPAI effects on price dynamics: Mexico egg market



Source: Acosta and Barrantes (2017)

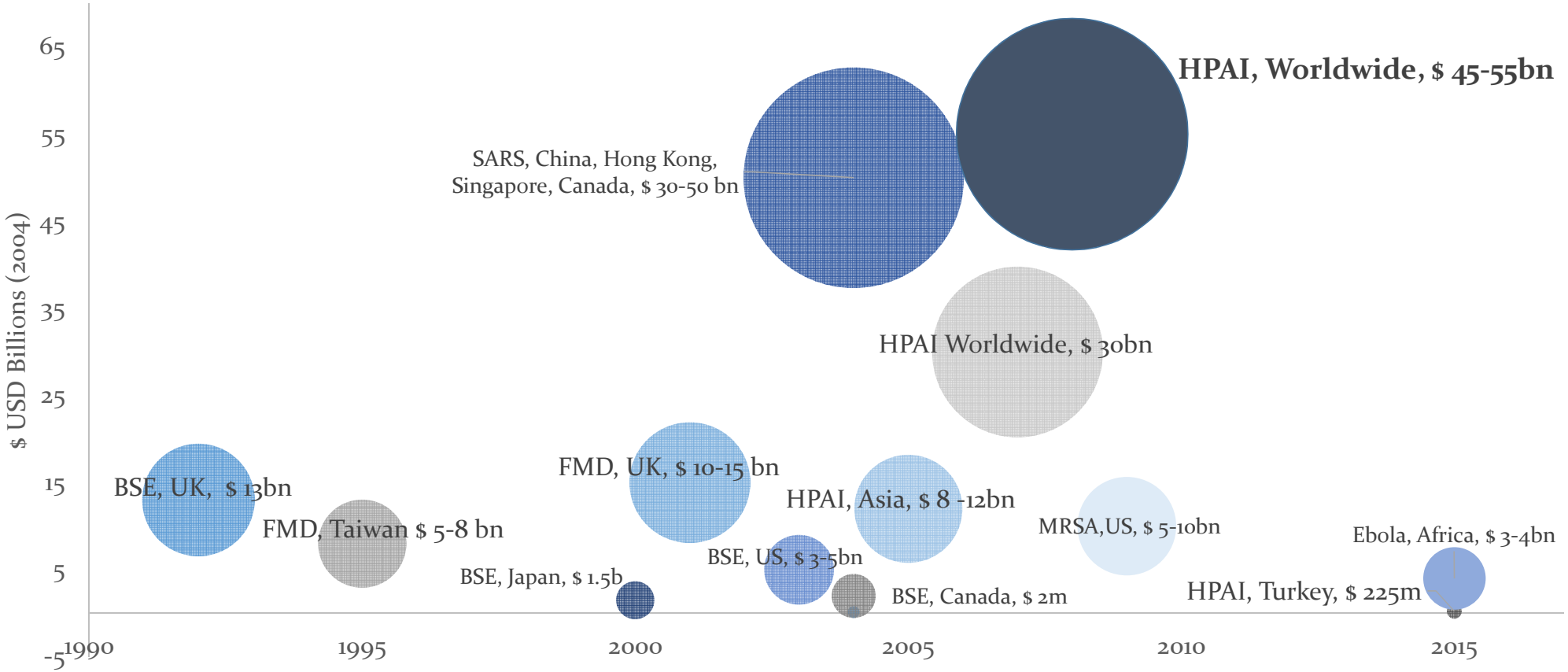
HPAI effects on trade flows and global market structures





Source: Conceptual figures using the Atlas of Economic Complexity (2017) as visualization support

The economic cost of emerging infectious diseases



Source: Adjusted from Newcomb, 2011

What is beyond sector and economy impacts?

- Rural Livelihoods of Poor
- Medical and Health Costs
- Short term and Long term Effects

Channels of Economic Impact – Rural Livelihoods of Poor

- Subsistence and small-scale poultry production - integral to rural poor livelihoods
  - Women are main poultry keepers (e.g. 70% of all poultry owners in Africa are women)
  - Poultry contributes to household income, food and nutrition, and gender equality

- Significant Livelihood Impacts
  - directly affects household income - from reduced sales;
  - increases households' vulnerability to risks - livestock is a risk-coping mechanism
  - affects household wealth - affects savings and future livelihoods outcomes
  - gender equality - women earn significant incomes from poultry sales
  - consumption impacted - reduced food and nutrition security

Channels of Economic Impact – Case of Rural Livelihoods in Nigeria

Nigerian Small-Scale Poultry Farmer Impact of HPAI Outbreak

- 75% reduction of birds (assets)
- 42% reduction livestock income
- 7.4% loss in total household income
- 21% reduction in livestock wealth
- 15% loss in total wealth

- Poultry subsector is widely affected by Avian Influenza (HPAI)
- Poultry is important livelihood of the poor
- Economic impact of an outbreak:
  - Only 4 million USD - compensation paid to farmers culled birds (Feb 2007 –Jan 2008)
  - Significantly reduced demand for poultry /poultry products
  - Loss Sales - up to 100 percent loss in poultry incomes
  - Employment losses in the poultry sector

Channels of Economic Impact – Medical and Health Costs

Economic impact of an avian influenza outbreak increases significantly when the strain affects humans through bird-to-human transmission

Case Study: China (Feb – May 2013)
Severe Avian Influenza Bird-Human Transmissions

- Severe Avian Influenza Outbreak (H7N9) – resulted in human infections and death
  - 131 cases and 39 human deaths (Feb-May 2013)
- Economic Impact: Poultry Sector
  - US$1.24 billion in 10 affected provinces
  - USD$0.59 billion in eight non-affected adjacent provinces.
- Medical and Health Costs:
  - direct medical cost US$2.6 million
  - indirect costs US $2.8 million

Economic Impact – Short Run and Long Term

AI Outbreak

Long-run Characteristics

- Nature of outbreak changes
- Factors of production are mobile
- Expectations updated
- Preventive systems in place

- Changes in product specialization (extensive & intensive margins)
- Changes in organization/integration- fewer small commercial and backyard producers
- Compartmentalization in production
- Changes in markets choice domestic and international

- More biosecurity - lower likelihood of outbreaks
- Potential loss of livelihood for small scale and backyard producers

Key messages

- Animal diseases outbreaks have had major economic impacts during the last years and might affect the next decade economic outlook.
- Income and population growth, combined with higher demand for selected ASF products will posed a particularly higher risk for HPAI outbreaks.
- The direct economic effects are important (sectoral and economy-wide), though the indirect welfare effects thorough prices might be significantly higher.
- Changes in prices might have a particularly negative effect on net importing countries and poor consumers.
- The greatest effect of HPAI outbreaks will be on the structural change of global and domestic markets. The economic costs of such changes are difficult to measure.
- The empirical evidence on the economic effects of HPAI is limited, however a topic of fundamental importance to not only to design control and prevention mechanisms but to understand the structure of future markets.

Policy implications

Actions can target infection both in animals and humans:

1) disease prevention activities
   e.g. on-farm and market bio-security practices, vaccination, and control of wildlife disease reservoir
2) monitoring and information gathering activities
3) disease control activities
   e.g. such as culling infected and expose flocks, ring vaccination, and quarantines, as well as medical treatment

- Appropriate choices depends on reliability and costs of alternative, with monitoring activities the most important category
- The value of preventive activities increases when monitoring capacity is weak.
- Inadequate information is primary constraint to effective disease control

THANK YOU