HPAI HIGHLY PATHOGENIC AVIAN INFLUENZA
PRO-POOR HPAI RISK REDUCTION

Controlling Avian Flu and Protecting People's Livelihoods in the Mekong Region, Africa and Indonesia

DFID-Funded Collaborative HPAI Research Project for Asia and Africa

Evaluation of Risk Management Options

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on
Behalf of the team

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Pro-Poor HPAI Risk Reduction Strategies

Motivation: Uncertainty about timing, extent, and severity of a potential animal disease outbreak such as HPAI, yet developing countries must make critical decisions about ways to defend against a potential outbreak.

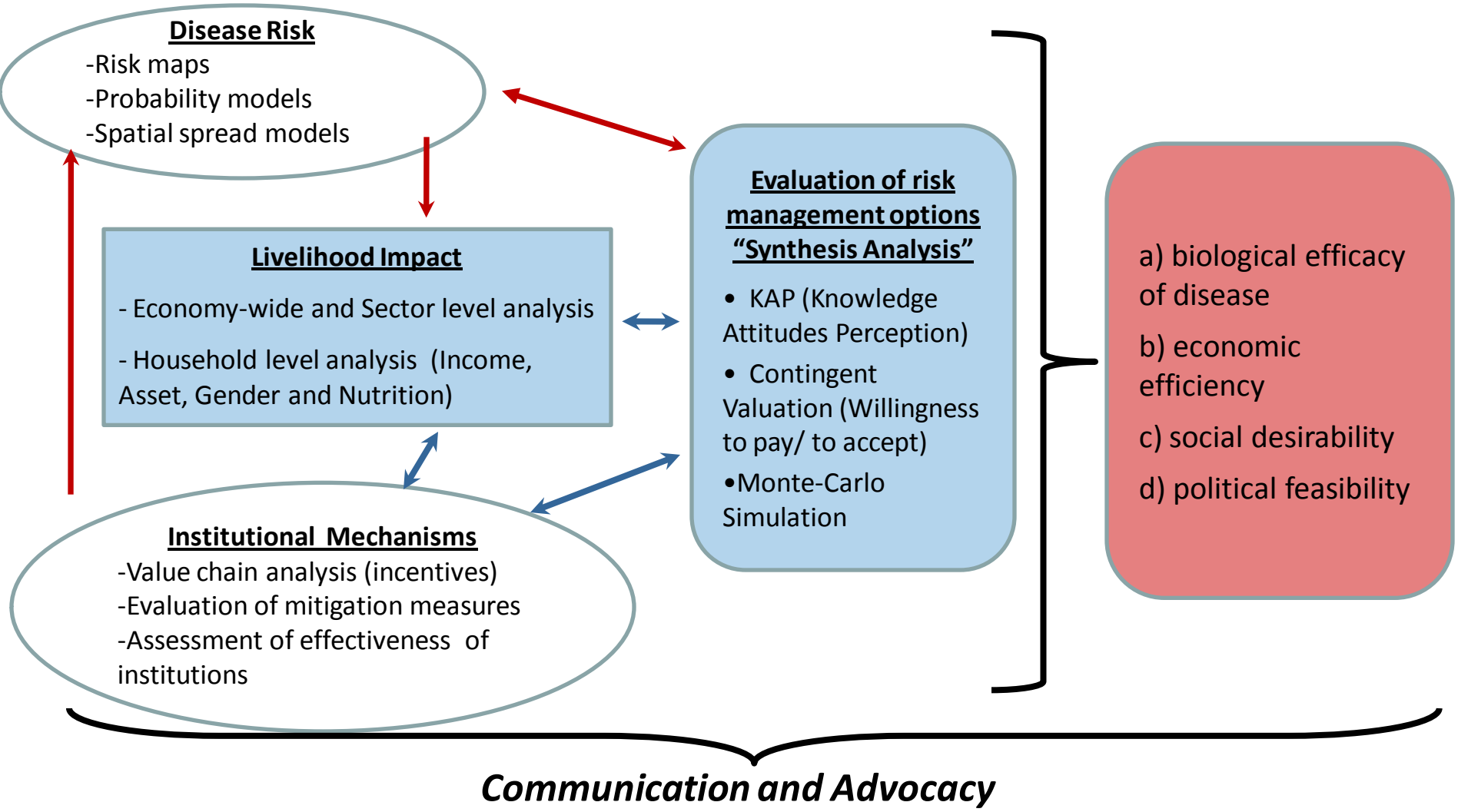
Disease and control measures:

Differential economic impacts on different income groups and sectors

Not all stakeholders may have the same incentive to implement/pay for control strategies for a variety of reasons

How do we choose optimal risk management efforts to reduce the risk?

Research Work Stream



Questions interested in

- KAP Analysis
  - What do poor communities and poultry farmers perceive about the risk of HPAI infections to them and their poultry?
  - What do they think are the factors or drivers of disease transmission?
  - What are their practices for handling sick, infected, or dead birds?
  - What are the attitudinal and knowledge predictors of risk perceptions and behaviour change?

Knowledge, attitude, practices

- **Created KAP indices**
  - **Symptoms**
  - **Transmission**
  - **Management of sick birds**
  - **Disposal of dead birds**
  - **Control**

KAP analysis results – Indonesia

	<10 birds (n=226)		11-20 birds (n=141)		>20 birds (n=329)		all kampong (n=696)	
KAP Indices	***Mean***	***Std err***	***Mean***	***Std err***	***Mean***	***Std err***	***Mean***	***Std err***
Symptoms	1.17	0.753	1.12	0.557	0.995	0.478	1.07	0.572
Treating sick birds	2	0.577	2.18	0.732	2.19	0.46	2.16	0.79
Transmission	6.17	0.408	5.64	1.106	5.8	1.077	5.72	1.09
Disposal of dead birds	5.33	0.516	6.02	0.598	6.11	0.518	6.04	0.578
Control and prevention	2.5	1.049	2.77	1.158	2.84	1.18	2.78	1.16

There is no statistical significant difference between mean KAP indices in different scale of production

- 80 % of producers have heard of HPAI though only few of them, could correctly identify HPAI symptoms
- There is not a significant variation in the KAP indices of small-scale and medium-scale poultry producers (free range and backyard)
- Large-scale producers (semi-commercial &commercial) had higher KAP indices
- Producers who have higher KAP indices have:
  - More diverse and larger flocks; history of poultry diseases &HPAI in their villages
  - higher income and income from poultry activities, and female household heads

Main Findings on KAP Analysis Options

- **In endemic/ high risk areas,** producers had high level of HPAI awareness, **BUT** they actually had limited actual knowledge of HPAI symptoms, and variable knowledge of transmission, preventive measures, and disposal of dead birds

- **In low risk areas or never had disease,** producers understanding on how to manage sick birds, control transmission and disposal of dead birds was influenced by HH's w/ higher level of education, already existing biosecurity measures in place, number of chickens raised, whether operations located in high risk areas where AI outbreak have happened, and access to animal health officer

Main Findings KAP analysis (cont.)

- Regardless of disease status
  - Producers who have higher KAP indices had diverse poultry flocks, history of poultry diseases & HPAI in their villages, higher overall income and income from poultry activities, female household heads, already implementing a number of biosecurity measures, and got information about HPAI from TV.
  - number of socio-economic factor affecting knowledge of HPAI symptoms => **Education campaigns targeted to households that have lower levels of education, income,** will be imperative for effective control programs;

Questions interested in

- WTP/WTA
  - Are different size producers or types of producers likely to be WTP less for different types of control strategies?
  - Do various socio economic factors such as gender, livelihood and educational factors make a difference?
  - Do producers experience with poultry disease in the past alter their WTP or accept compensation?

Willingness to Pay for Control Measures (hypothetical)

1) Containment measures from soft material (e.g. netting or cages)
2) Footbaths and containment measures from soft material
3) Containment measures from hard material (such as wood, bricks or mud)
4) Regular disinfection and containment measures from hard material (e.g., bricks, wood)
5) Vaccination
6) Regular Monitoring by the Veterinary Services

Example of a WTP question

Imagine there is an Avian Flu outbreak in country/region/village and you have no biosecurity measure in place. There is 100% probability that your flock will get infected with HPAI. Would you be willing to adopt the following biosecurity measure(s).

Biosecurity 1:

Imagine you have cage or netting. This biosecurity will reduce the chance that your flock will get infected **by 40%** , would you be willing to pay a one payment of cash to finance this biosecurity measure? This measure is effective up to 1 year

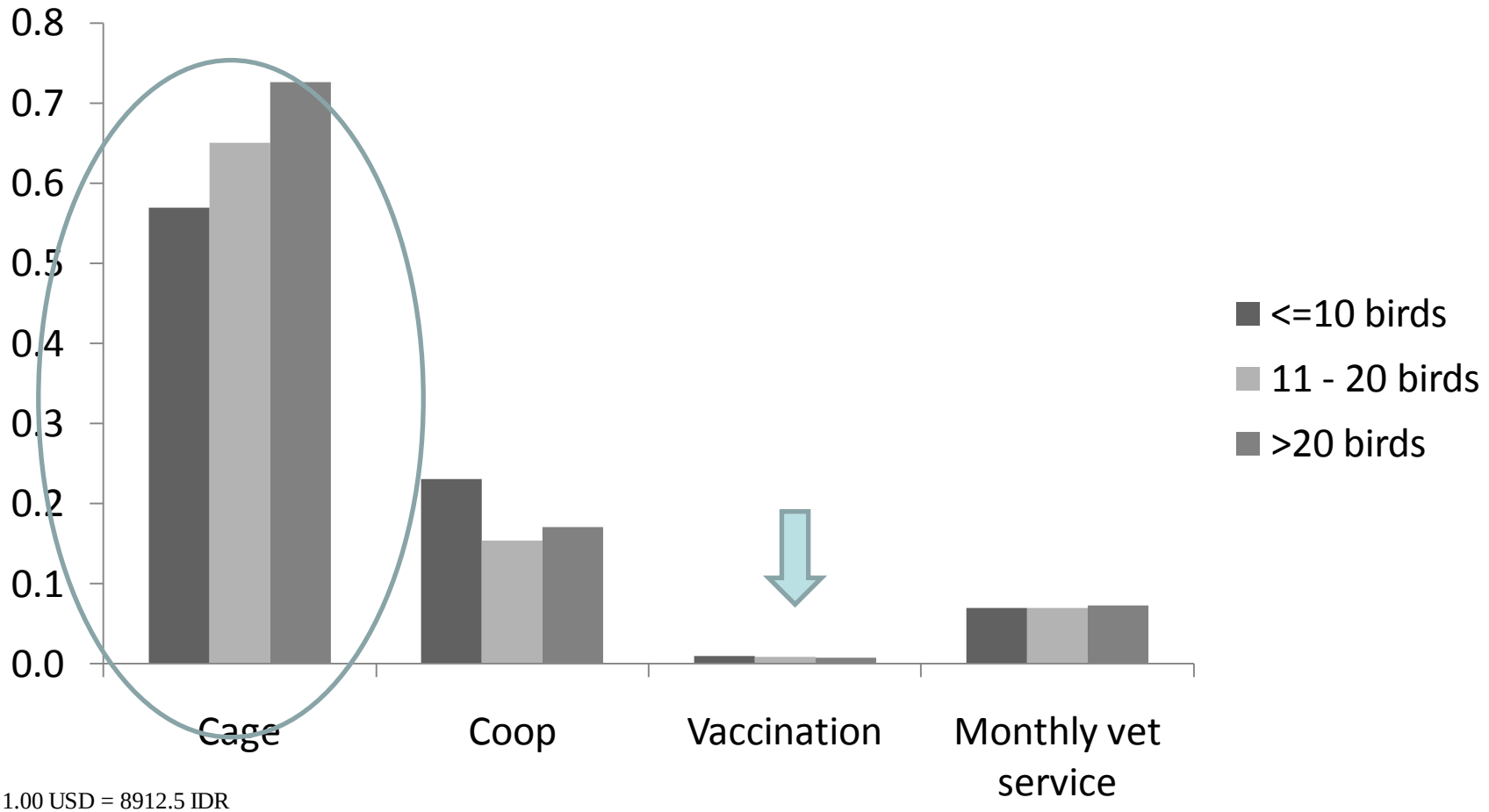
CAGE

And
/ Or

NETTING

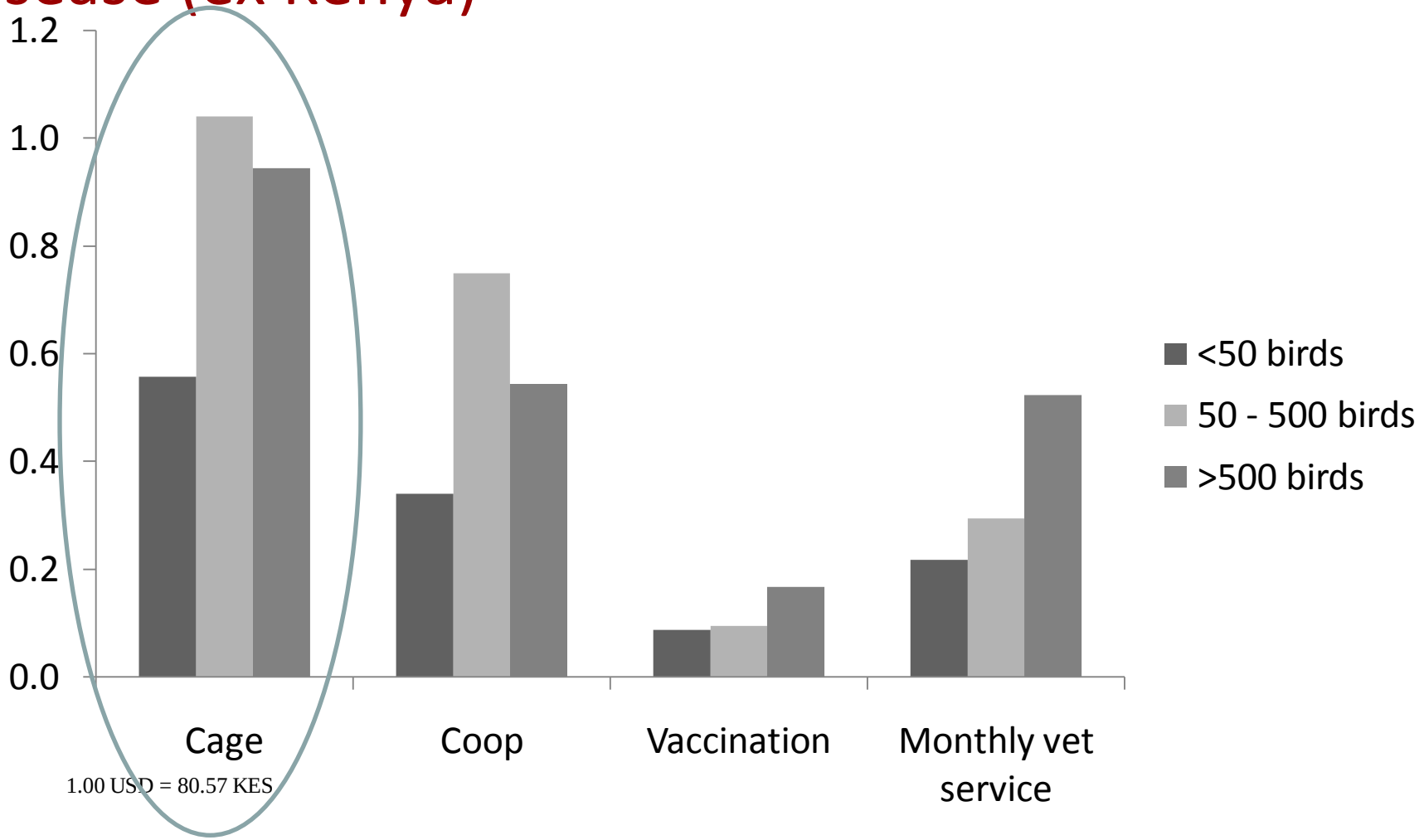
• WTP questions were asked for six such biosecurity measures including: netting/cage, poultry house, footbath, disinfection, vaccination, veterinary monitoring.
•The efficacy of each control measure was estimated through a two-stage expert elicitation (Delphi) study

WTP ($) per unit risk reduction given endemic risk (ex Indonesia)



1.00 USD = 8912.5 IDR

WTP ($) per unit reduction in risk given no disease (ex Kenya)



WTP – Endemic/High Risk

- **We know HH's with higher HH's income per capita, tv as source of HPAI information** effects their willingness to pay for biosecuitry measures.
  - **HH's with high levels of knowledge with transmission of disease** effects their willingness to pay for implementing cages or netting, but it is not always significant

WTP-Low Risk

- **We know that HH's with higher education, larger # of native chicken, TV as a source of HPAI information, located in a high risk area:** are more willing to pay for implementing cages or netting;
  - above characteristics + **having HH's having a larger # of layers**: are more wiling to combine the use of cages or netting with foot baths
  - **Larger poultry producers:** are less willing to pay additional funds for implementing cage/netting when combined with foot bath; Probably because they already are implementing that practice

WTP-no disease – mix results for 2 study countries

- **We know that HH's with higher income per capita (yes for Kenya, no for Ethiopia), with TV as a source of AI information and located in regions where indigenous chicken raised** are more WTP for implementing cages, netting with or without foot baths, and vaccination
  - **The above + higher level of education [yes for Kenya, no for Ethiopia for WTP amount]** increases the WTP for coops build of local material and
  - **The above + being located in regions with more indigenous chicken increases HH's** WTP for vaccination and also for monitoring of veterinarians

Policy Implications KAP and WTP

- Information dissemination campaigns need to include more on topics related to treatment of sick birds, disposal of dead birds
- One size does not fit all; it is important to focus on training and transferring of knowledge to practice to targeted audiences and the needs of the rural households including women who perform most of the poultry rearing activities even for those who are free-ranging.
- TV was a positive way to increase peoples knowledge of how to control for HPAI in countries that experienced HPAI

Bioeconomic decision model

How do producers behave?

At each point in time producers choose the level of control measures to maximize the expected stream of utilities of income including income from poultry

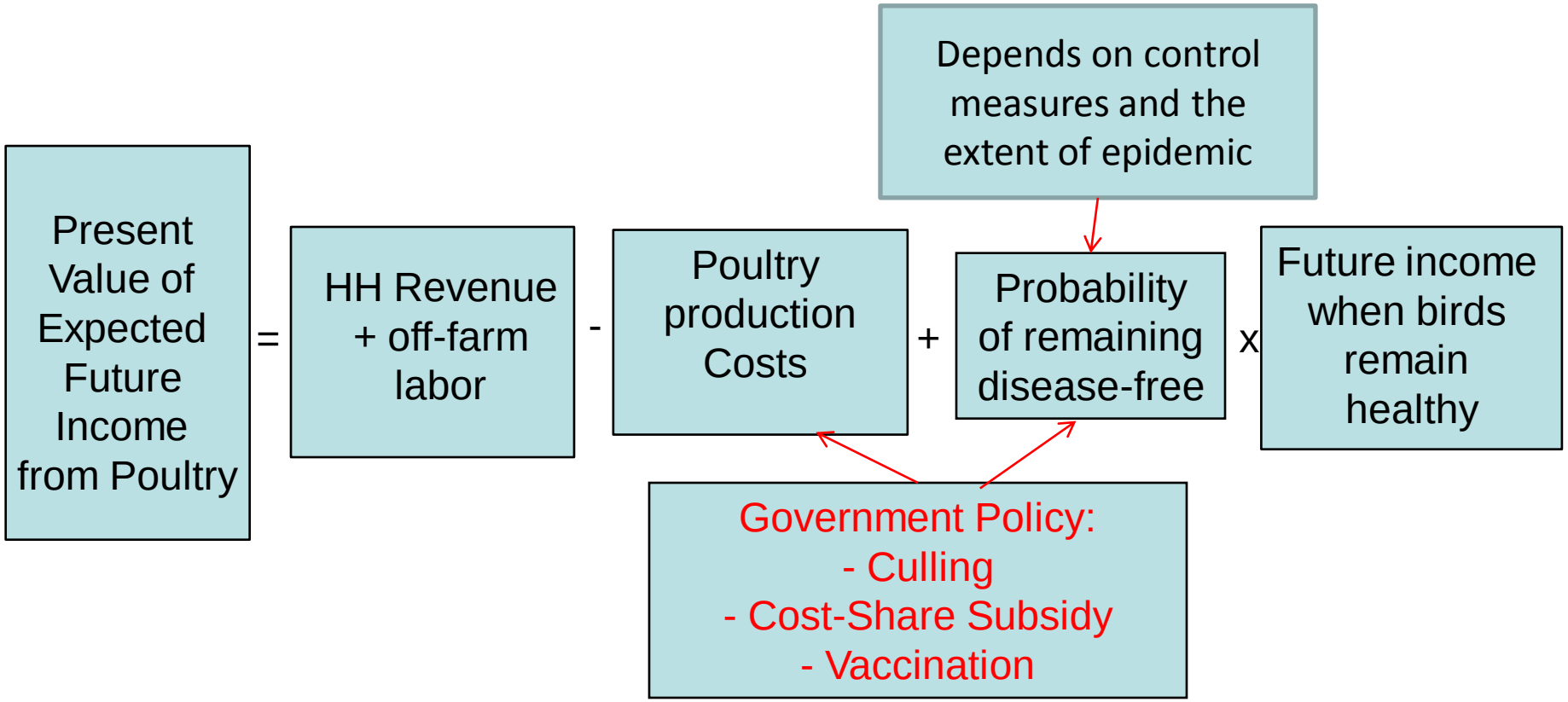
Why are policies needed?

Because the disease is infectious, the privately chosen control measures are not sufficient compared with the socially efficient levels, which calls for government intervention

How are policies chosen?

Policies are chosen in order to achieve the highest level of social welfare as measured by the present value of income of all producers and other affected parties such as consumers and input suppliers

Bio-Economic Simulated Decision model



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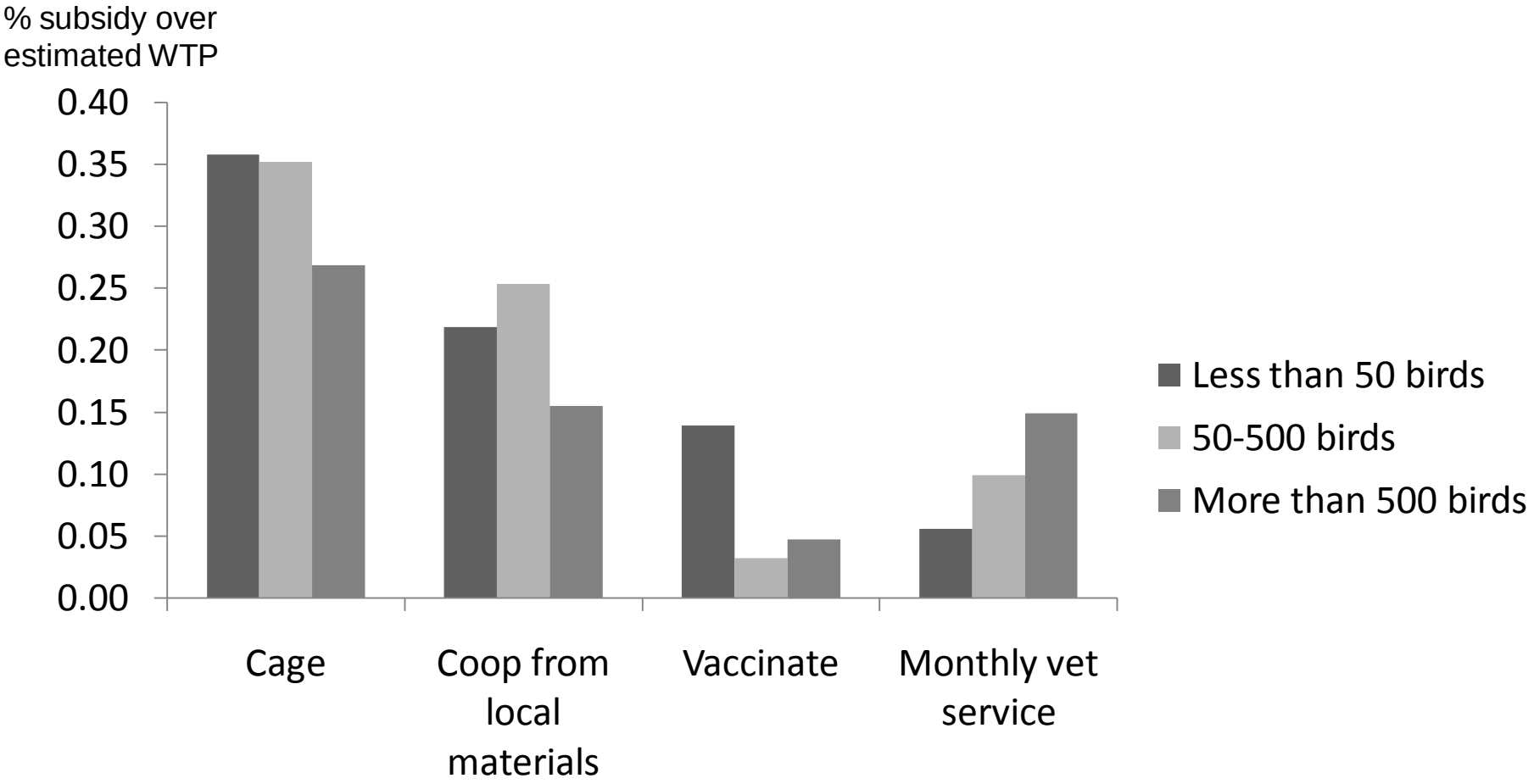
- Assess the changes in outcomes from alternative disease management options (improved surveillance, biosecurity, culling etc)

Subsidy mix for biosecurity based on simulation model of a country no disease (ex Kenya) given allocation of total expenditures



Bio-economic decision model – no disease

- If subsides were to be considered to get producers to adopt biosecurity measures, more should go to cage and netting so as to get backyard/free range producers to adopt
- If requiring additional vet care a smaller subsidy will be needed to get small-scale producer to comply than large-scale producers; large scale producers already using private vets thus they weren't willing to buy the products (because they already had them).
- If vaccination were to be considered, more subsidies would be needed to get small-scale producers to adopt than large-scale producers because it is not cost-effective to them

Bio-economic decision simulated model endemic disease

- If subsides were to be considered to get producers to adopt biosecurity measures, more should go to cage and netting, to get backyard/free range producers to adopt;
  - large scale producers already using cages thus they weren't willing to buy the products (because they already had them).
- If requiring additional vet care a smaller subsidy will be needed to get all size producers to comply;

Research Work Stream