

An Ecohealth Approach to Develop a Strategy for the Prudent Use of Antimicrobials to Control Antimicrobial Resistance in Human, Animal, and Environmental Health in Asia

INDONESIA

Regional Meeting APEIR

Alaya Kuta Resort Hotel, Bali, 13-14 October 2016



Country Leaders

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Dr. Fang Jing	China	Institute for Health Sciences, Kunming Medical University
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Dr. Nguyen Viet Khong	Vietnam	National Institute of Veterinary Research

Background

- ✓ The **burden of Antimicrobial resistance (AMR)** in many Asian countries **is enormous**
- ✓ In developing countries, the **problem of antimicrobial overuse or abuse in farms is worse due to weak law enforcement and the lack of drug-use monitoring**
- ✓ **AMR is a complex, multi-dimensional and multi-factorial problem** which involves various stakeholders at local, regional, national and international levels.
- ✓ **Need a trans-disciplinary approach and a wide range of stakeholders** must be involved to solve this problem
- ✓ **Develop an appropriate AMR containment strategy that is acceptable to multiple stakeholders, simple and practical, and adaptable is Essential**



Ecohealth Principles

1. System Thinking
2. Transdisciplinary Research
3. Participation
4. Sustainability
5. Gender and social equity
6. Knowledge to action



Indonesia Team

No.	Nama	Keahlian	Institusi
1	Drs. Edi Basuno, M.Phil, PhD	Socio-Economic and Community Engagement	The Center for Agriculture Socio Economics and Policy Studies (ICASEPS), Ministry of Agriculture
2	Drh. Anak Agung Gde Putra, SH, MSc, PhD	Veterinary Epidemiology	Disease Investigation Centre, Denpasar. Ministry of Agriculture
3	Drh. Iwan Willyanto, MSc, PhD	Veterinary Public Health	Private Consultant
4	Drh.med.vet. Hadri Latif, MSi	Veterinary Public Health	Bogor Agricultural University
5	Drh. Imron Suandy, MVPH	Veterinary Laboratory Expert	Quality Control Laboratory for Livestock Product, Ministry of Agriculture
6	Prof. dr. Agus Suwandono, MPH, Dr.PH	Public Health	Health Research and Development Institute, Ministry of Health
7	dr. Anis Karuniawati, PhD, Sp.MK	Microbiologist, Public Health	Departement Microbiology, Faculty of Medicine. University of Indonesia
8	Drh. Andri Jatikusumah, M.Sc	Veterinary Epidemiology and Veterinary Economic	Center for Indonesian Veterinary Analytical Studies (CIVAS)
9	Drh. M.D. Winda Widyastuti, M.Si	Veterinary Public Health, Community Engagement	Center for Indonesian Veterinary Analytical Studies (CIVAS)
10	Drh. Ridvana Dwibawa Darmawan	GIS & Data, Participatory Epidemiology	Center for Indonesian Veterinary Analytical Studies (CIVAS)
11	Drh. Riana Aryani Arief, MS	Veterinary Epidemiology	Center for Indonesian Veterinary Analytical Studies (CIVAS)

PAC Team

- (1) SC APEIR – Prof. dr. Amin Soebandrio, Ph.D, Sp.MK
- (2) Food and Drug Testing Agency (BPOM),
- (3) DG of Health Improvement, Ministry of Health
- (4) DG of Pharmaceutical and Referral Services, Ministry of Health
- (5) Directorate General of Livestock and Animal Health Services
c.q. Directorate of Animal Health and Directorate of
Veterinary Public Health, Ministry of Agriculture.

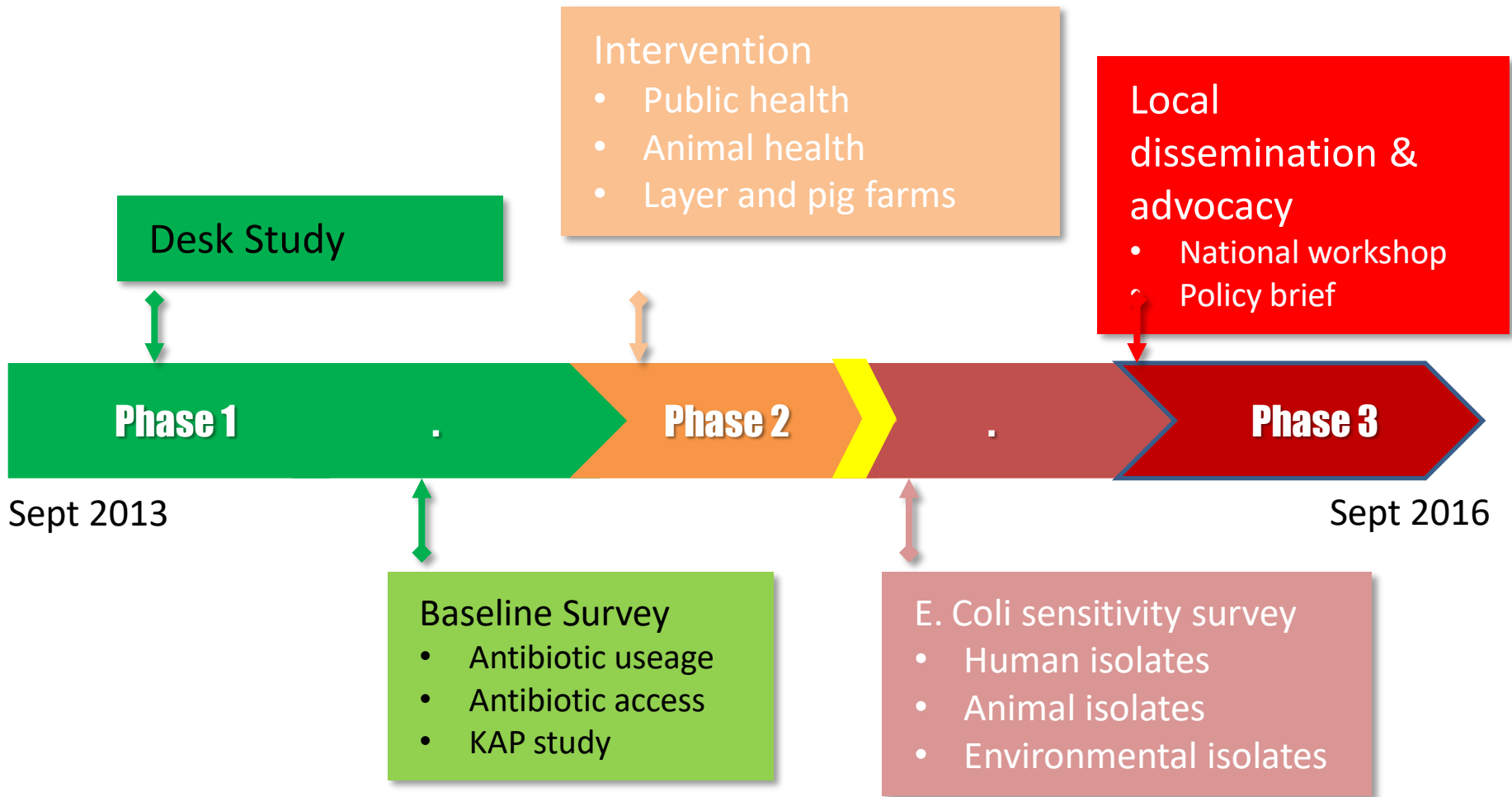


Objectives

To explore, develop and demonstrate the effectiveness of strategies on prudent use of antibiotics in human, animal and environment for antibiotics resistance mitigation program in Indonesia; using an ecohealth approach



Timeline Studi



Sept 2013

Sept 2016

Desk Study

Design & Method

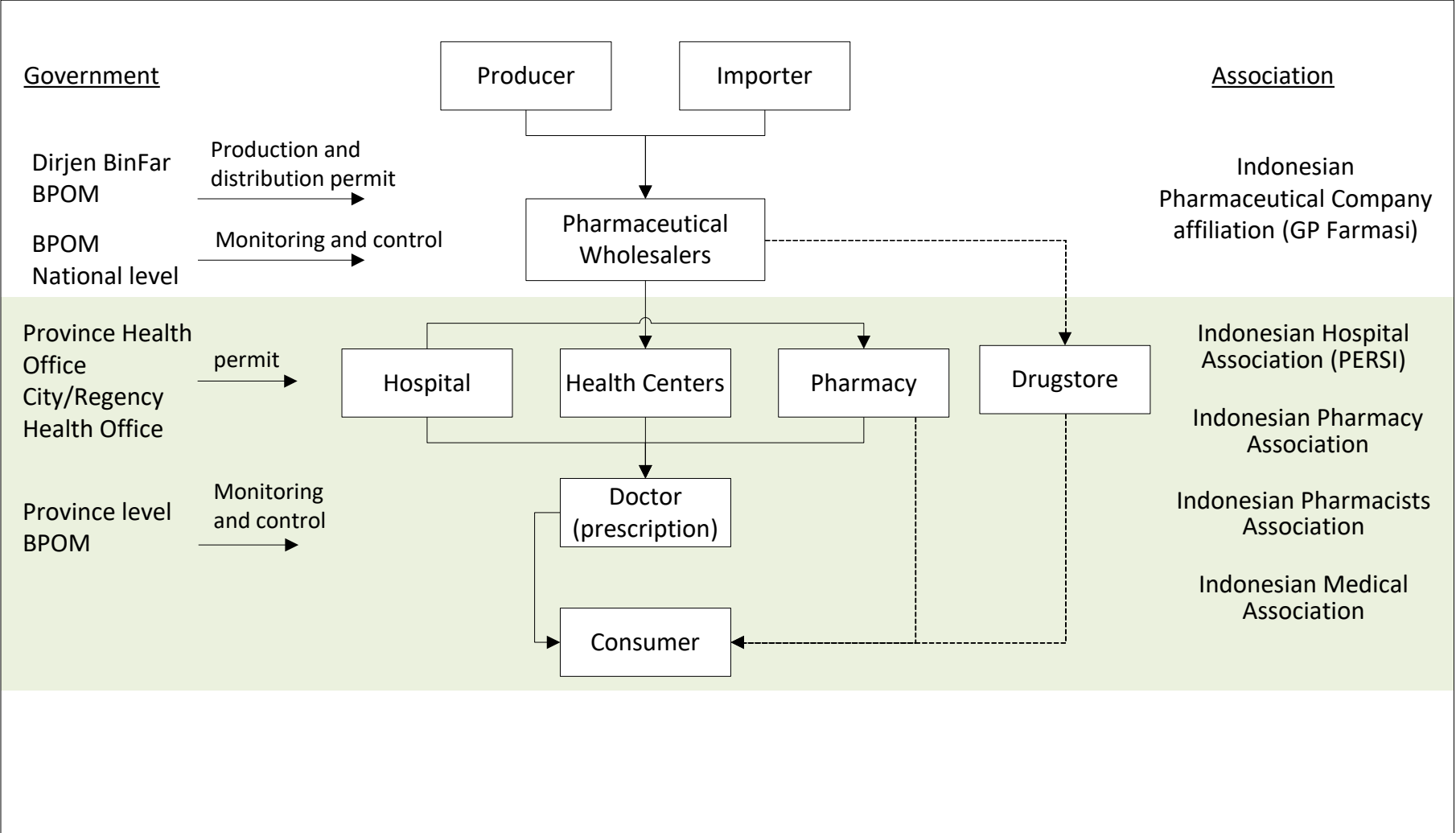
Data collection:

1. Regulations related to antibiotic use in humans and animals;
2. Results of local and international study/research on antibiotic resistance in human, animals and the environment published in the last 10 years ago;
3. Guidelines and standards related to antibiotic resistance.

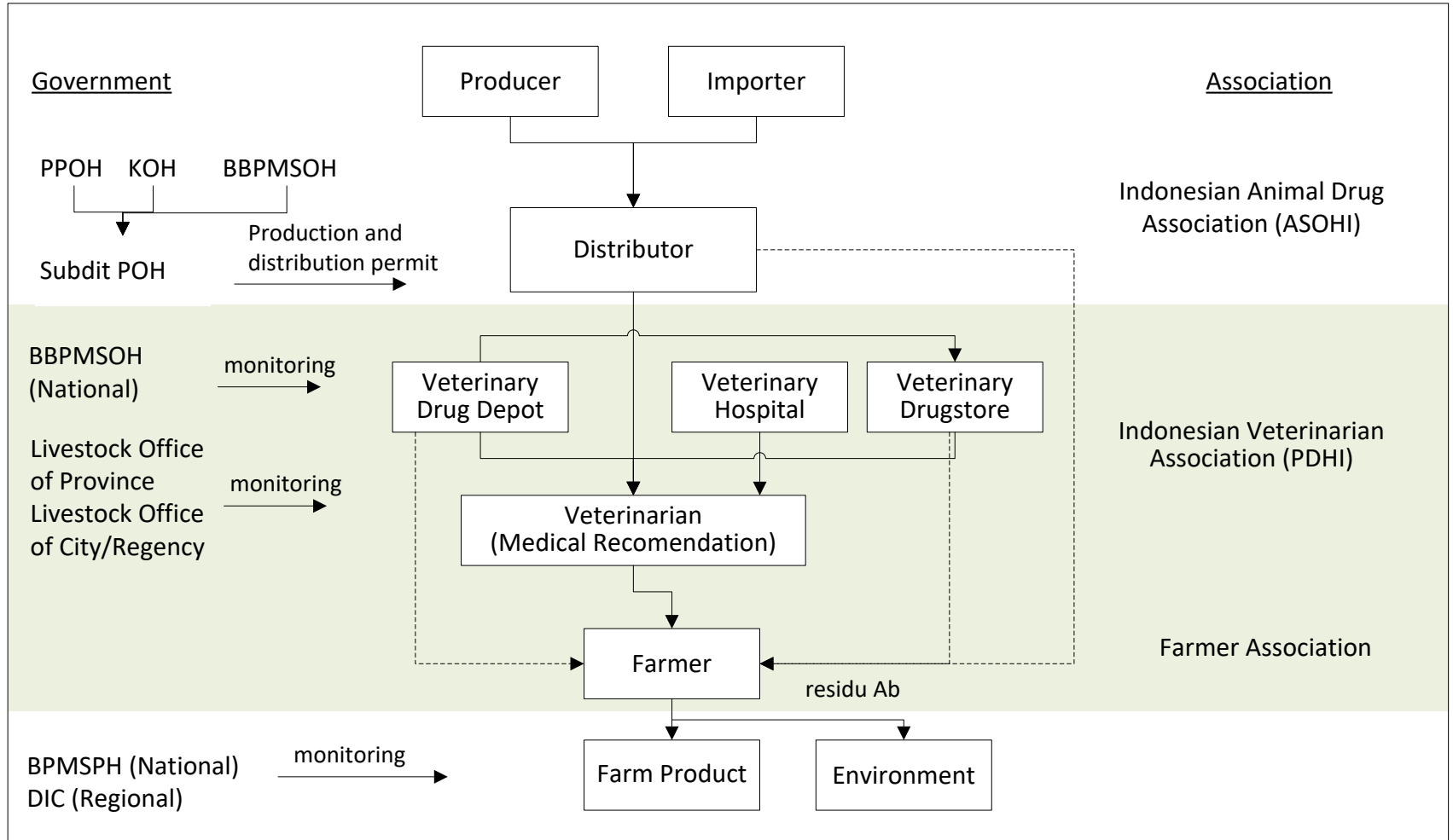
System review & Gap Analysis:

- to demonstrate how the system was functioning and how it should work under perfect conditions based on the data collected above. A gap analysis was performed to identify parts in the systems where discrepancies were considered important and identify stakeholders or system components involved.

Desk Study Result



Desk Study Result



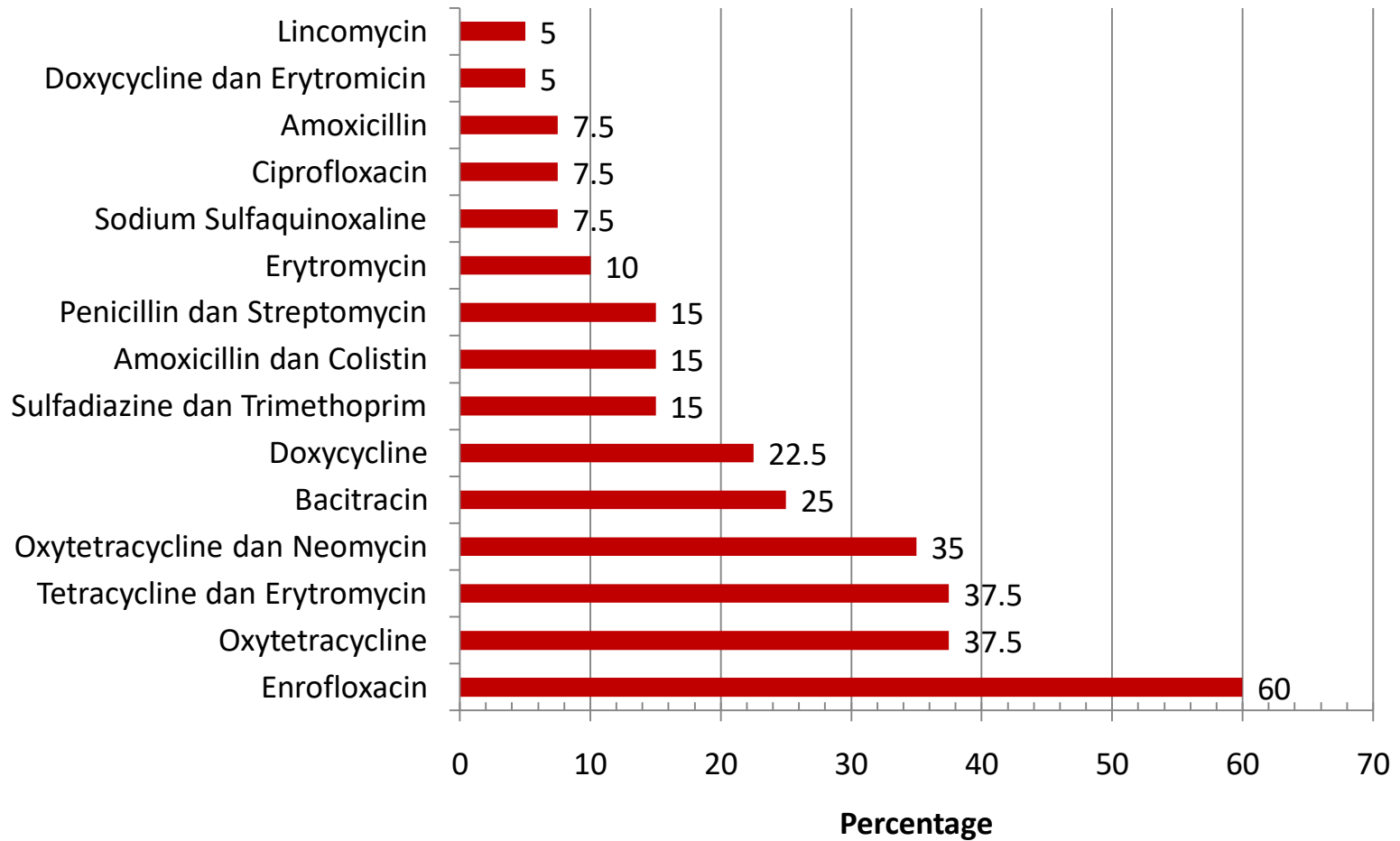
Baseline Survey

Design & Method

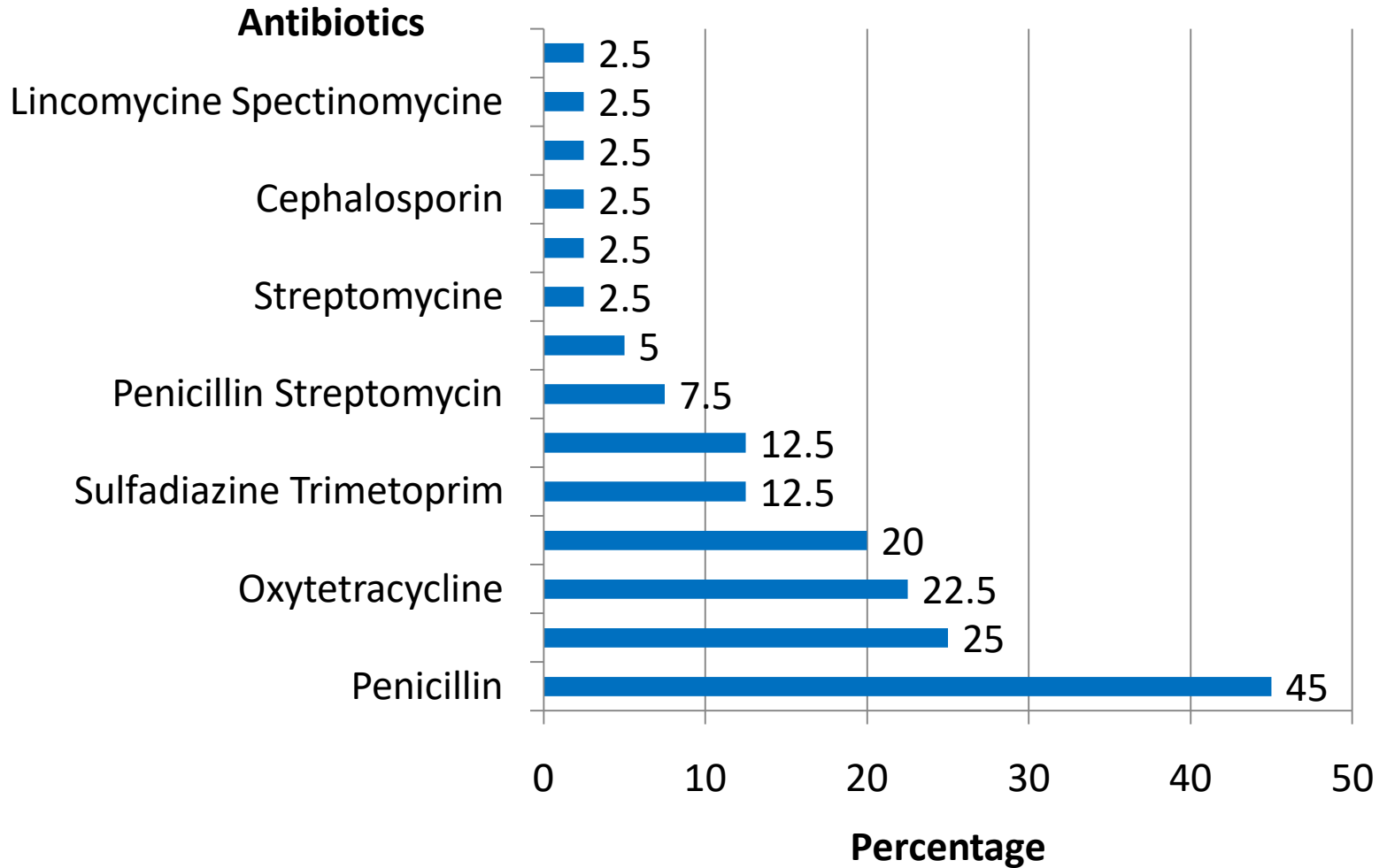
1. Survey on antibiotics usage & accessibility for farm and farmer KAP:
 - a. Layer (40 farms)
 - b. Pig (40 farms)
 2. Survey on antibiotics usage & accessibility for human and human KAP:
 - a. Puskesmas (Community Health Centers/PHF) (40) & Hospitals (14)
 - b. Patients in PHF & hospitals (54 respondents)
 - c. Layer and pig farm workers (77 respondents)
 - d. Doctor in PHF/hospital (54 respondents)
- ➔ 3 district in Central Java = Sukoharjo, Klaten, Karanganyar

Antibiotics Usage in Layer Farm

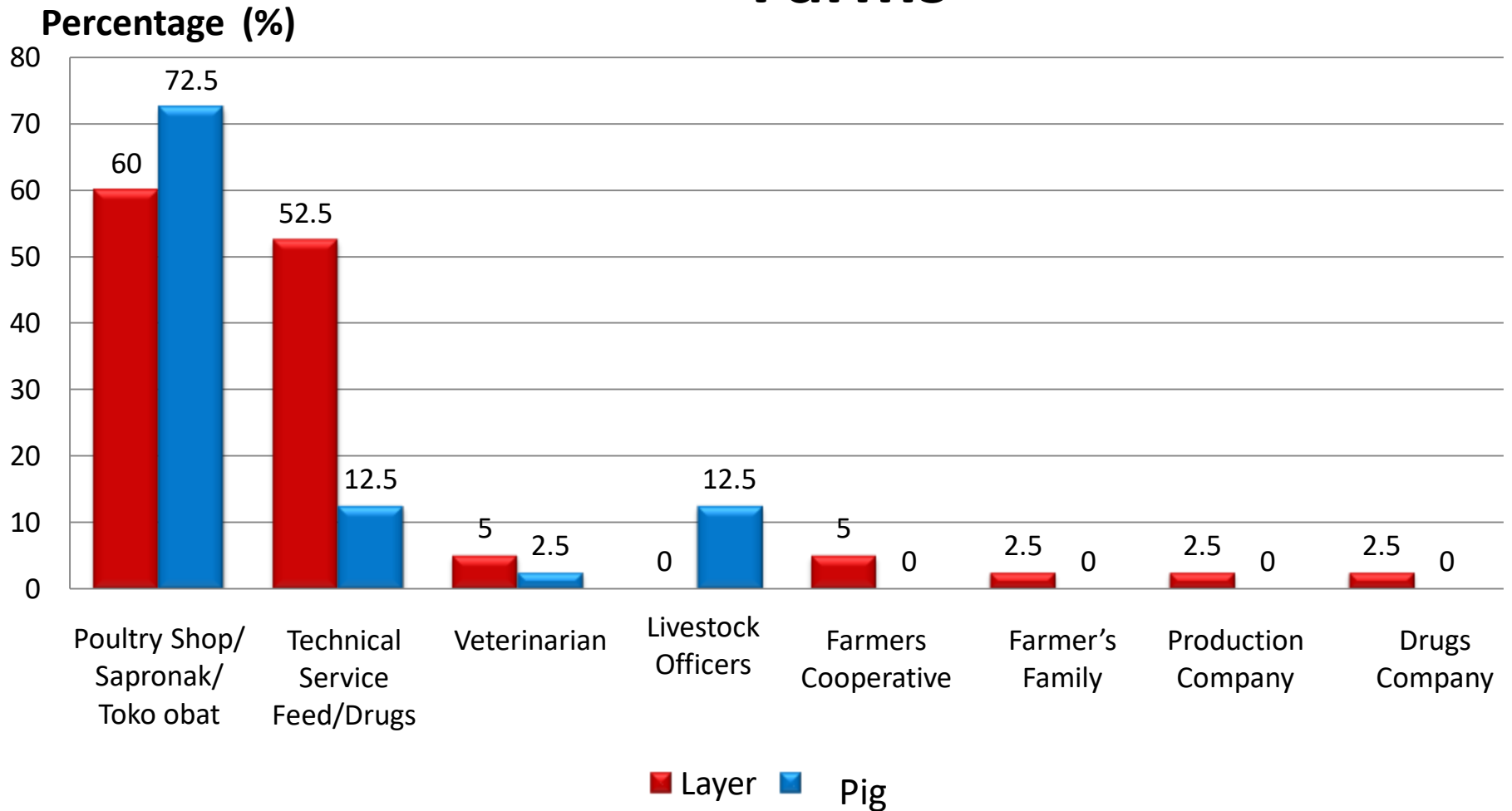
Antibiotics



Antibiotics Usage in Pig Farm

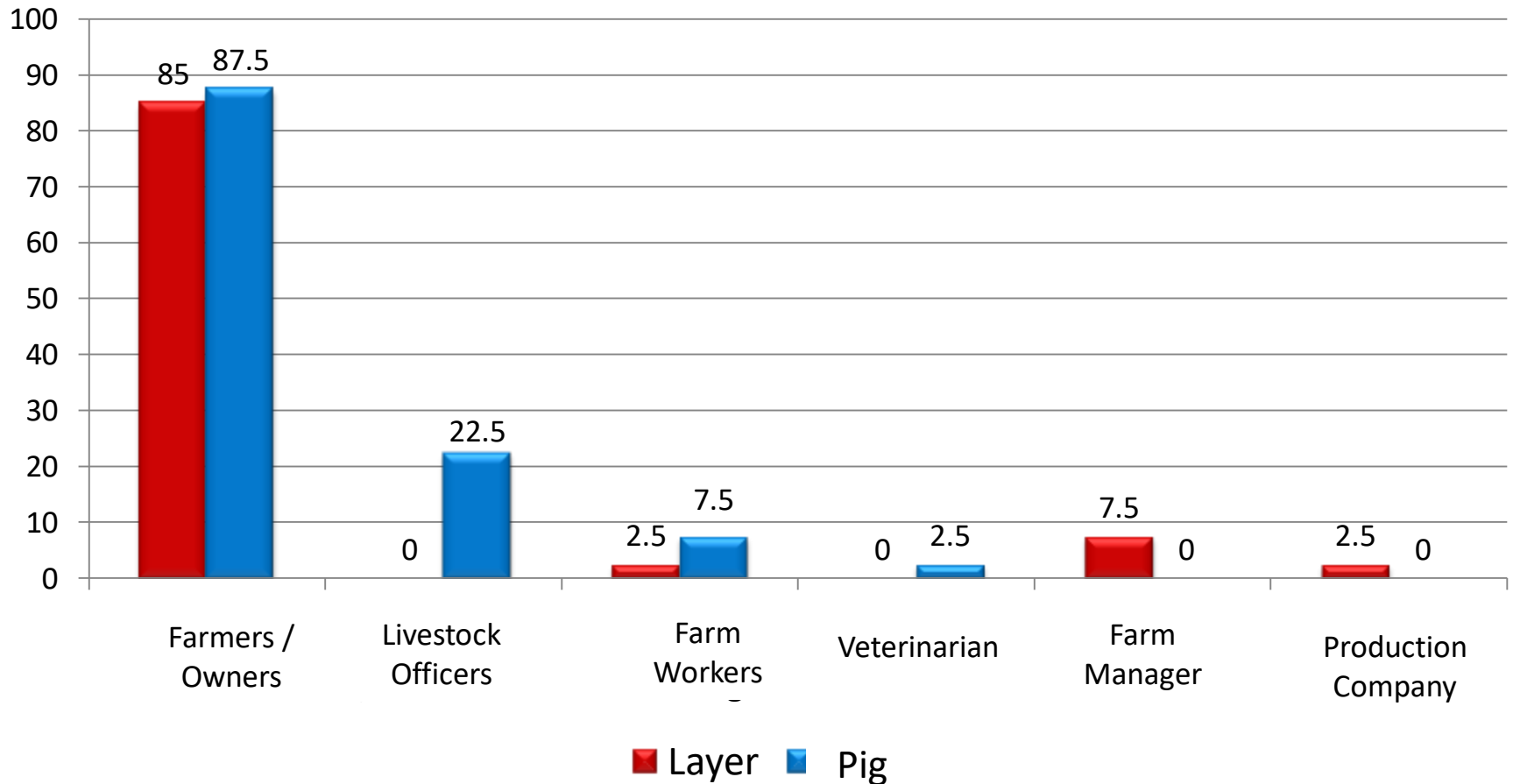


Accessibility to get and use antibiotics in Farms



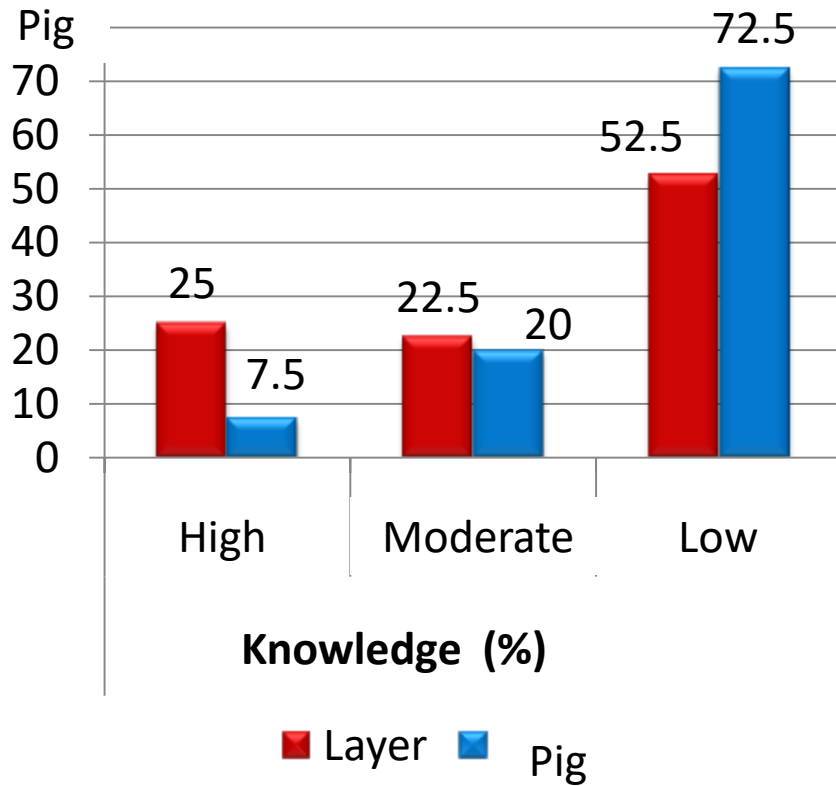
Who is decide for using Antibiotics?

Percentage (%)

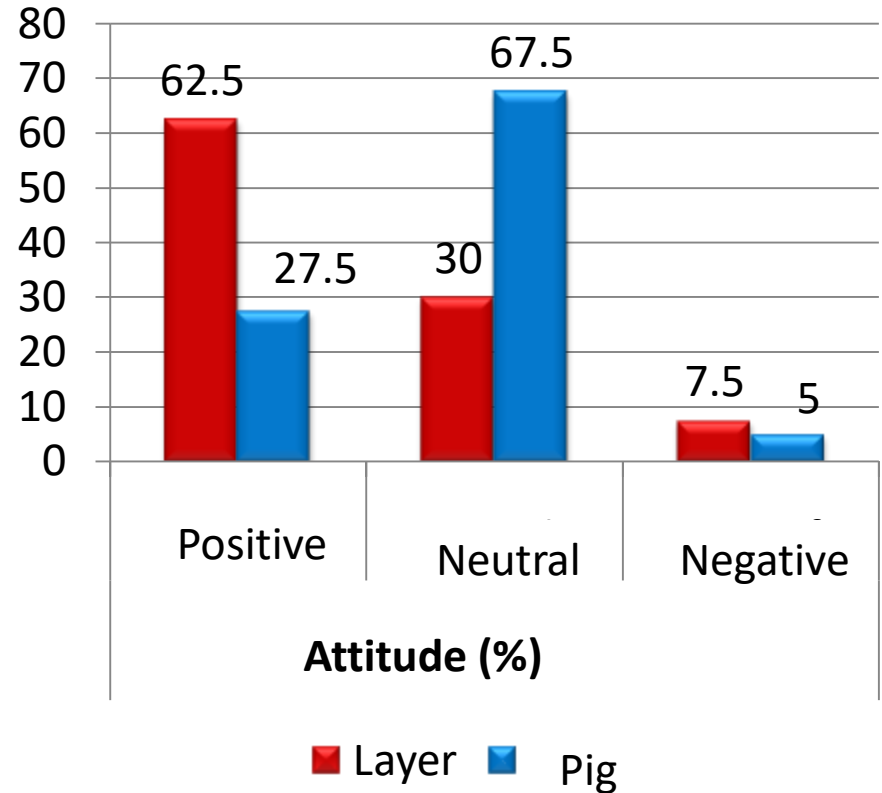


KAP Study for Farmers

Knowledge



Attitude



Antibiotics Usage in Health Facilities

PHF

14 antibiotics

Antibiotics	%	Average usage (mg / month)
Amoxillin	100	2.650.267
Trimethoprim-sulfamethoxazole	85	731.102
Ciprofloxacin	92,5	199.586
Tetrasiklin	72,5	161.909
Metronidazole	90	139.418
Sefadroksil	77,5	113.109
Kloramfenikol	92,5	86.701
Eritromisin	82,5	83.242

Hospital

82 antibiotics

Antibiotics	%	Average usage (mg / month)
Ceftriaxone	71,4	1.936.171
Amoxicillin	92,9	1.862.963
Sefadroksil	78,6	1.663.536
Ciprofloxazine	78,6	1.622.033
Metronidazole	78,6	292.974
Cefixime	78,6	265.47
Levofloxacin	85,7	182.441
Clindasmisin	71,4	88.361
Kloramphenicol	71,4	75.322
Eritomisin	78,6	67.963
Gentamisin	71,4	7.826

KAP Study for Doctors in Health Facilities

- Knowledge Doctors in PHF = moderate, in Hospital = high
→ Attitude = all Positive
- Practices:
 - Still irrational usage of antibiotics (decrease with Rational usage of antibiotics program from the MoH → monthly reporting for 2 diseases indicators : upper resp. infection, diarrhea non specific)
 - Still need for program /knowledge update → especially for antibiotics → several respondents stated not sure that they have do a prudent use

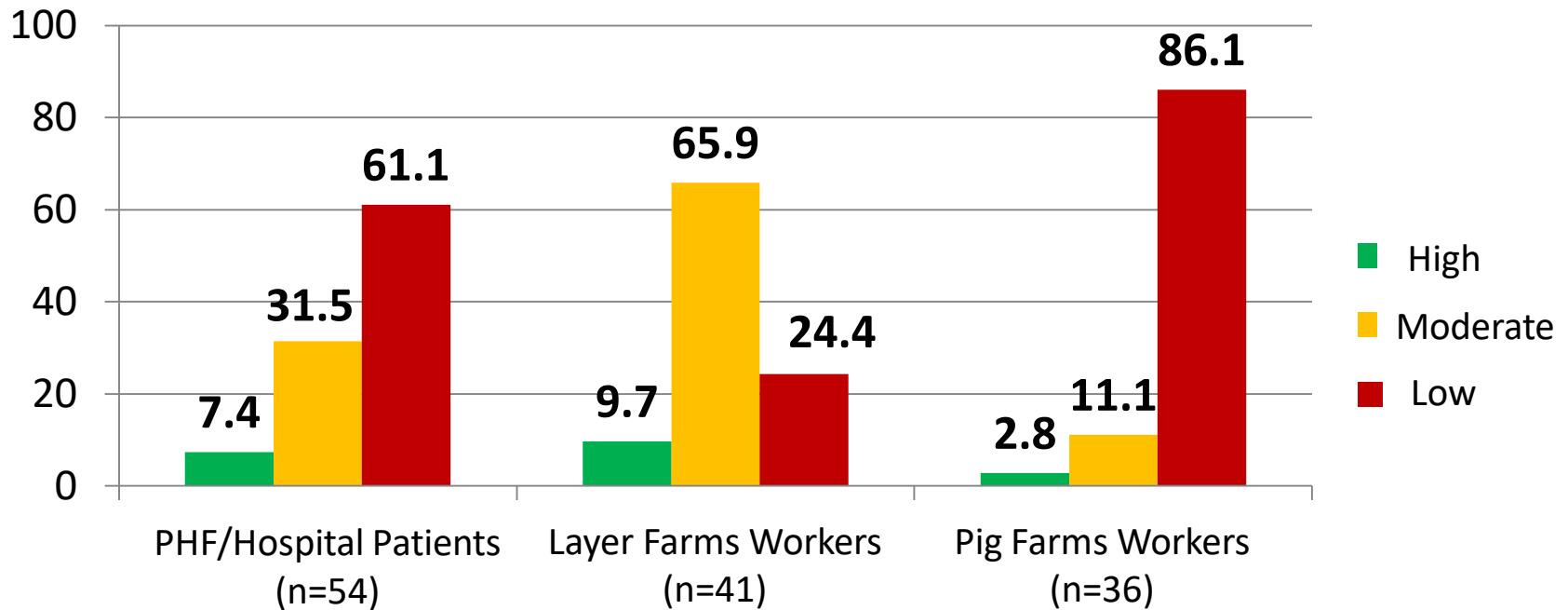
→ Basic information for intervention

Antibiotics Accessibility and Reporting in in Health Facilities

- PHF :
 - ➔ stocking from health services at district level, doctors can make prescription as needed to related pharmacy
 - ➔ Monthly reporting & restocking
- Hospital:
 - ➔ Government hospital: reporting to district health services, stocking were coordinated with related company or private pharmacy
 - ➔ Private hospital/private practitioners: no obligation to report, only narcotics

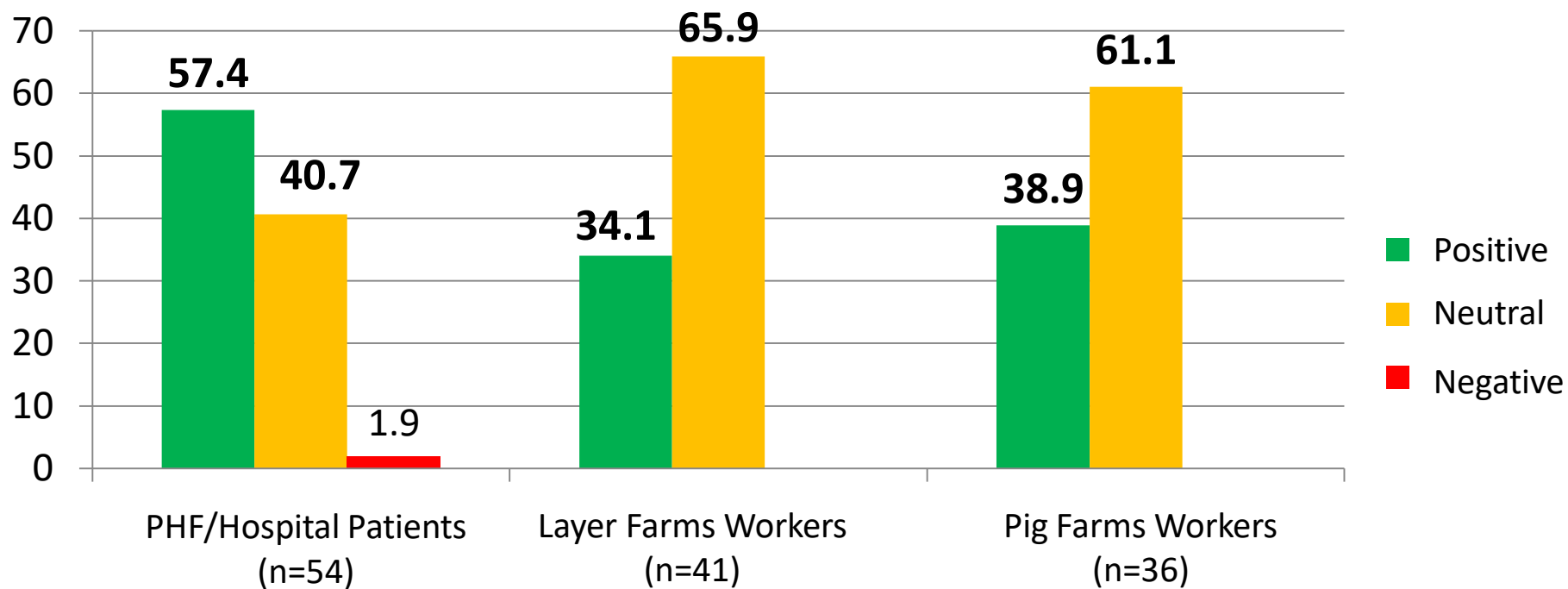
KAP Study for Community (Antibiotics & AMR)

Knowledge



KAP Study for Community (Antibiotics & AMR)

Attitude



KAP Study for Community (Antibiotics & AMR)

Practices:

- ✓ Self medication
- ✓ Buy antibiotics without prescription at “warung” (household store)
- ✓ Stop using antibiotics when clinical sign decrease
- ✓ Giving antibiotics to others
- ✓ Using “drug pocket” for certain clinical sign of diseases
- ➔ Basic condition for intervention program



Intervention Program

Boundary Partners (BP)

Animal Health sector:

1. Animal health officers (district & sub-district level)
2. Pilot farmers (10 pig farms, 6 layer farms)

Public Health sector:

1. Public health officers (district & sub-district level)
2. Village health-volunteer / cadres

Supporting partner:

➔ Village level (local government)



Outcome Mapping (AH)

Progress Marker	Expect to See	Like to see	Love to see
AH Officers	Attend the PA meeting/discussion	Give positive response for farmer consultation	Actively doing PA or mentoring/visit to farmers
		Understand better on indication and risk of AMR, and implement the prudent use of antibiotics	Initiate program for AMR PA for farmers or program mentoring

Outcome Mapping (AH)

Progress Marker	Expect to See	Like to see	Love to see
Pilot Farmers	Attend the PA meeting/discussion	Actively participate in the PA meeting/discussion/evaluation program	Initiate better practices on farm health management, applicative biosecurity, etc
	Have a contact number/person for AH services for their area	Actively consult / discuss with AH services officers	Encourage Other farmers to practice and consult with vet/AH services officers
	Able to identify kind of antibiotics they're used	Using antibiotics for treatment based on correct diagnose/vet advices	Develop applicable recording for antibiotics usage in farm

Outcome Mapping (AH)

Progress Marker	Expect to See	Like to see	Love to see
APH Officers	Attend the PA meeting/discussion	Give positive response for cadres consultation	Actively doing PA or mentoring/visit /evaluation to volunteers
		Understand better on indication and risk of AMR, and implement the prudent use of antibiotics, doing PA in health facilities	Initiate upgrade for AMR PA or program mentoring for cadres

Outcome Mapping (PH)

Progress Marker	Expect to See	Like to see	Love to see
Cadres	Attend the PA meeting/discussion	Practice the prudent use of antibiotics in family	Initiate program for better practices on AMU in community
	Understand better on AMU and AMR	Actively doing PA program in community	Encourage Other to promote and practice prudent AMU
	Able to identify kind of antibiotics they're used in family	Actively identify incorrect practices of AMU in community and give suggestions to behavior changes	Actively discuss and regular linking with PH officers

BIJAK Antibiotics (**BIJAK = prudent**)

(*key messages*)

Public Health		Animal Health	
B = Beli	Buy with prescription	B = Beri	Give for treatment, not for prevention
I = Ikuti	Follow the rule of antibiotic usage	I = Ikuti	Follow the rule of antibiotic usage
J = Jeli dan berani	Aware dan be brave to ask doctors	J = Jaga masa henti obat	Aware for withdrawl time
A = Awasi	Caring for antibiotics usage in family	A = Awasi	Caring for antibiotics usage in farm
K = Konsultasi	Consult with doctor	K = Konsultasi	Consult with veterinarian / AH services

Animal Health Officers

Activities:

- (1) Training for Facilitators (AB & AMR with ecohealth concepts)

- (2) Training for livestock officer on pig farming and health management

- (3) Linking with farmers – involve them for regular mentoring

Pig & Layer Farmer (1)

Activities:

(1) Farm mentoring in every 2 weeks

(2) Information sharing:

- Antibiotics, AMR, health management & rearing management
- Basic recording
- Applicable Biosecurity practice

(3) Linking with Animal Health services (government / private)

Pig & Layer Farmer (2)

Findings:

- Farmers are eager to learn, but their learning capacity regarding antibiotics and AMR are limited
- Professional animal health services must be made available for farmers
- Farmers have poor confidence on current animal health services and government services are also lacking

Potential sustainability / program adoption:

- Reasonable to implement because it supports government programs to strengthen veterinary services for small scale farmers
- Challenges: pigs (social, religion), human resources, program priority

Public Health Officers

Activities:

- (1) TOF - Training for Facilitators (AB & AMR with ecohealth concepts)
- (3) Linking with community – involve them for regular mentoring for volunteer/cadres

BIJAK Antibiotics Cadres/Volunteer (1)

Activities:

- ➔ Process: FGDs, Training, Mentoring & Evaluation, linking with PH officers in village & subdistrict-district
- ➔ Total = 93 person (88 = pilot villages; 5 = Observer village)
- ➔ Local people as representatives of sub-villages (3-6 person) within pilot villages; existing health volunteer / non
- ➔ trans - : gender, occupational , social status
- ➔ Activities/duties:
 1. Public Awareness
 2. Information gathering from community (=incorrect practice of AMU)

BIJAK Antibiotics Cadres/Volunteer (2)

Findings:

- Volunteer working in the community with passion, no-rewards (money) → facilitated with PA media, incentives
- Community feel get advantages of the program for themselves & community
- Sensitively to collect information on many incorrect practices in community for AMU
- Still need regular mentoring & knowledge upgrade for problem found in community

BIJAK Antibiotics Cadres/Volunteer (3)

Potential sustainability / program adoption:

- Reasonable to implement, effectively proven to provide data in village level on AMU and detect the trend community practices/behavior

Challenges:

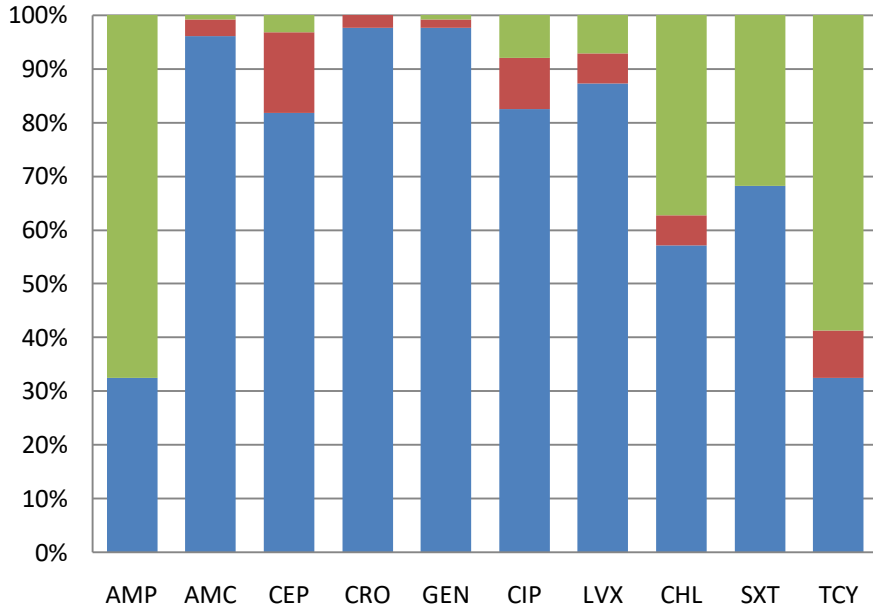
- Need local government (villages/district) support (Villages fund, village legitimation, etc)
- Need regular support and mentoring from PH services in district & sub-district

Biological Sampling

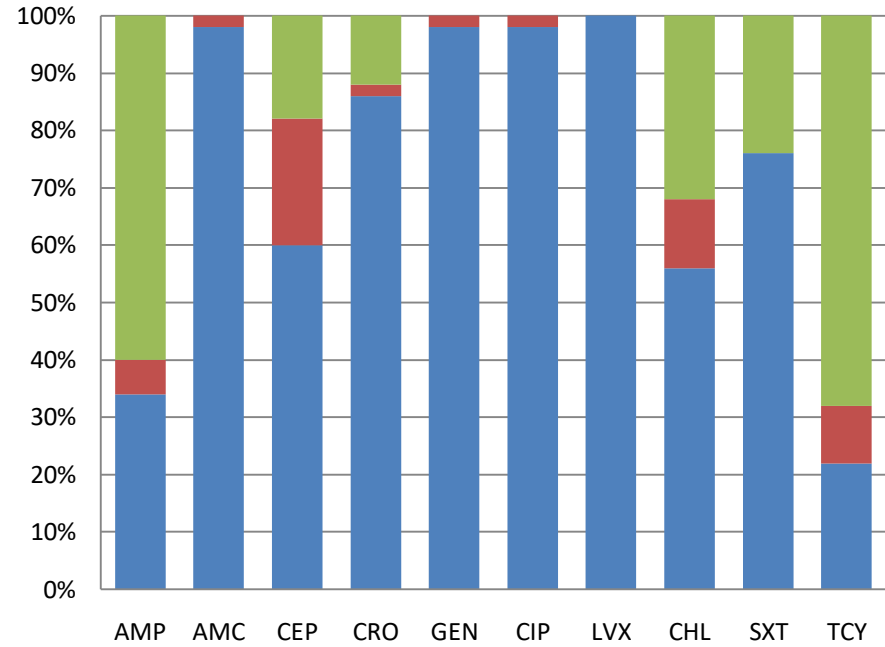
Biological Sampling

- E. coli isolates from animals, people and the environment
- Sample collection from:
 - 27 small-scale pig farms
 - 27 small-scale layer farms
- Phenotypic testing: Disk diffusion tests with 10 antibiotics from 7 groups
- Genotypic testing (ongoing)

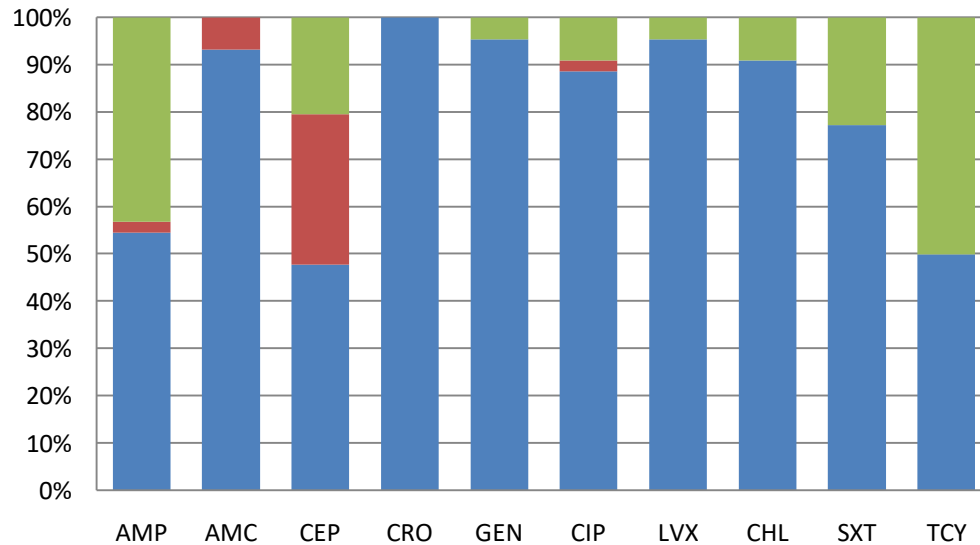
E. coli from Pigs (n=126)



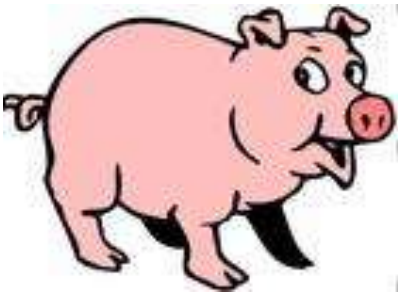
E. coli from Pig Farm Environment (n=50)



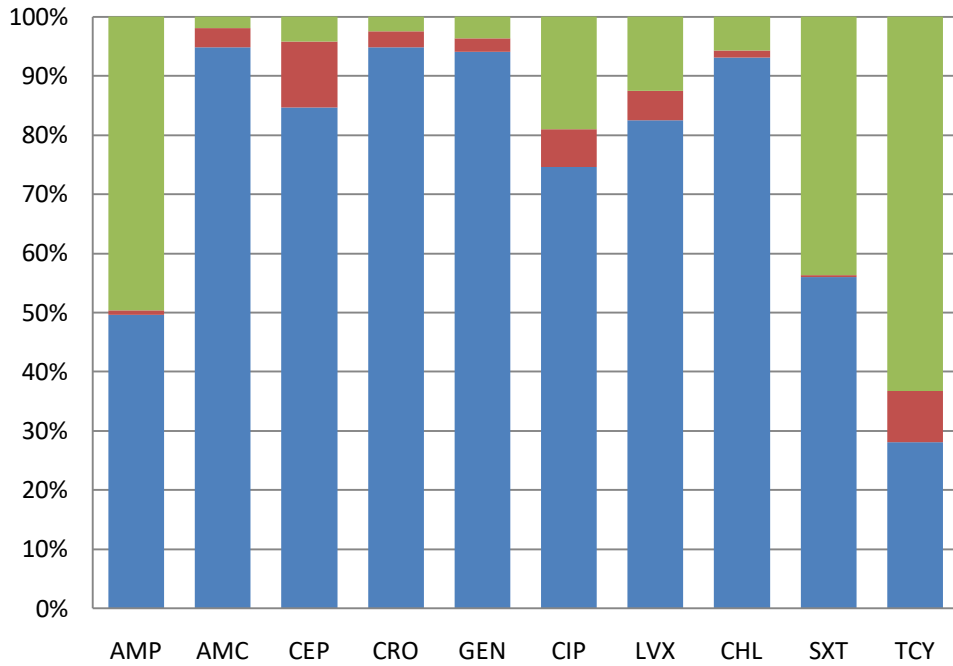
E. coli from Pig Farm Workers (n=44)



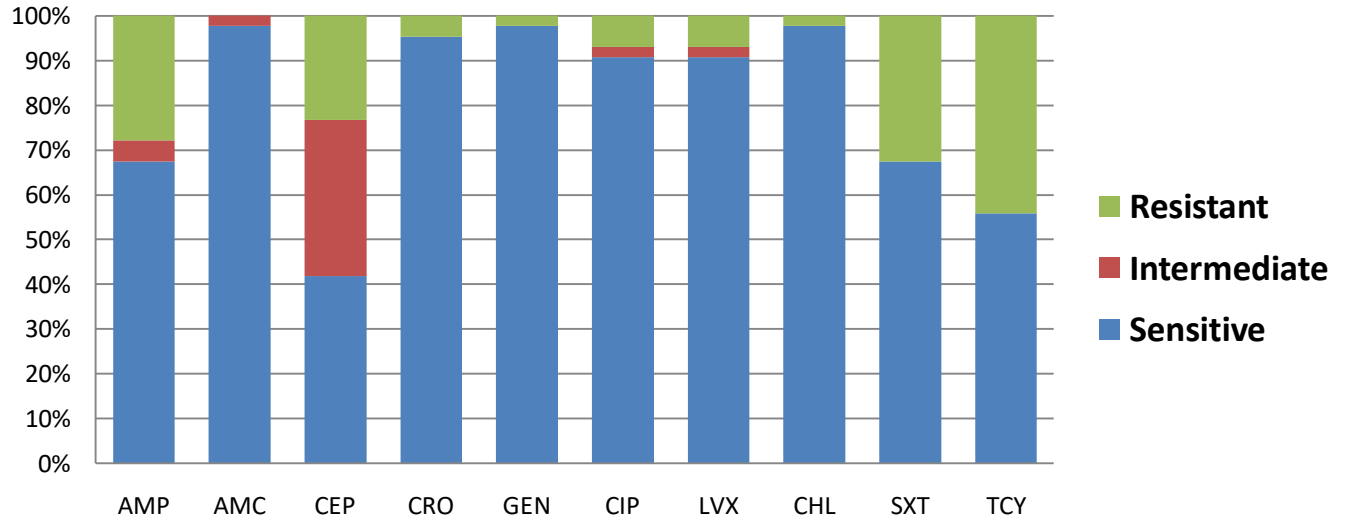
■ Resistant
■ Intermediate
■ Sensitive



E. coli from Layer Chickens (n=405)



E. coli from Layer Farm Workers (n=43)



Recommendation (1)

- (1) Improve Control on AB Import, Production and Distribution
 - a. Strengthen government structure
 - ➔ Animal Drug Supervisors, etc (existing structure)
 - b. Increase regulation of antibiotics to be similar to narcotics

Recommendation (2)

(2) Implement AMR surveillance in farms and primary healthcare facilities

(3) Community engagement

→ Village cadres

→ Improve drug labeling to help identification by the public

Thank You



