Building Blocks of Success:
The Story of Thailand's AMR Surveillance System in Livestock

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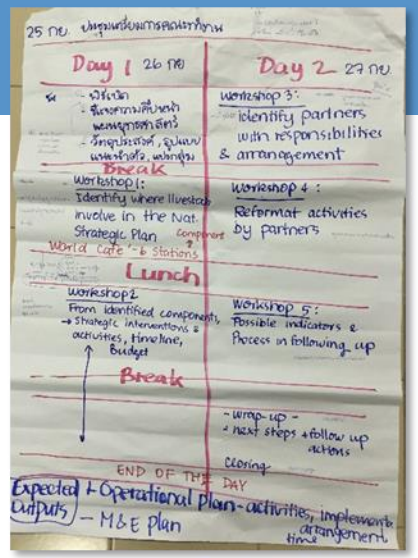
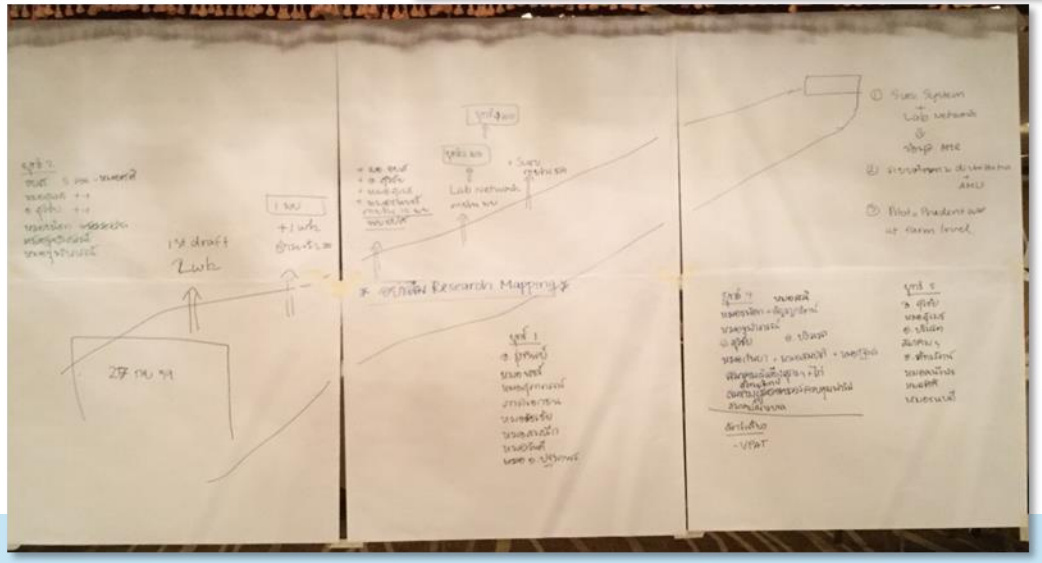
National Strategic Plan (NSP) on AMR Phase 1 (2017-2022)

Developed activities under NSP on AMR: 26-27 Sep 2016





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Antimicrobial resistance governance ranked by aggregate scores on three governance areas and 18 domains by country, 2020–2021

Measuring the global response to antimicrobial resistance, 2020–21: a systematic governance analysis of 114 countries

Jay Patel, Anne Harant, Genevie Fernandes, Ambele Judith Mwamelo, Wolfgang Hein, Denise Dekker, Devi Sridhar

Lancet Infect Dis 2023; 23: 706–18
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https://doi.org/10.1016/S1473-3099(22)00796-4

Summary

Background Understanding strategic commitments and policy responses to overcome antimicrobial resistance at the national, regional, and global levels is required to evaluate current progress and direct future planning. National action plans (NAPs) are the primary mechanism for guiding national strategy and action for antimicrobial resistance governance. Although several NAPs have been developed, no comprehensive content analysis of these plans exists. Using a governance framework, we aimed to assess all publicly available NAPs on antimicrobial resistance.

					Policy design							Implementation tools							Monitoring and evaluation			
	Governance score	Policy design	Implementation tools	Monitoring and evaluation	Strategic vision	Coordination	Participation	Accountability	Transparency	Sustainability	Equity	Surveillance	Antimicrobial stewardship	Infection prevention and control	Education	Public awareness	Medicines regulation	R esearch and development for novel products	Reporting	Feedback mechanism	Effectiveness	Antimicrobial resistance research
Norway	85	76	92	87	72	100	100	50	88	50	100	100	100	81	64	98	100	100	83	67	100	100
USA	84	83	85	83	97	96	94	50	88	72	100	86	81	96	64	90	75	100	83	50	100	100
UK	83	85	80	88	95	100	100	50	88	75	100	99	70	94	42	58	100	100	96	50	100	100
Sweden	78	69	87	76	72	96	94	50	88	47	0	100	91	73	56	93	100	100	83	17	100	100
Denmark	76	85	75	57	94	100	100	67	100	75	0	83	83	81	64	93	83	33	100	58	0	50
Germany	76	74	79	69	39	100	100	50	88	75	100	96	80	77	47	56	100	100	92	33	50	88
Japan	75	67	84	71	93	96	89	50	63	45	0	81	83	96	44	93	92	100	92	33	100	50
Australia	75	76	70	89	60	100	100	50	88	75	50	75	57	94	42	56	67	100	83	75	100	100
Switzerland	75	79	71	74	72	100	94	83	88	74	0	80	74	75	42	56	83	83	96	50	100	38
France	74	73	82	55	97	92	72	50	88	39	100	86	93	92	61	79	83	67	83	33	50	38
Malaysia	73	66	85	60	70	96	94	50	63	47	50	99	99	92	64	95	83	50	83	83	50	13
South Korea	73	72	73	71	91	100	100	50	63	50	50	83	92	96	28	63	67	67	54	75	100	63
Thailand	72	72	69	80	89	100	100	50	63	50	50	92	78	94	42	88	75	0	83	83	50	100
Netherlands	71	63	88	48	41	96	94	50	88	47	0	92	91	98	47	98	83	100	79	33	0	63
Philippines	71	76	68	71	81	96	83	50	75	69	100	64	79	85	28	54	67	83	38	75	100	88
Spain	71	61	82	64	67	69	83	56	75	37	0	93	93	88	47	90	75	83	67	50	100	38
Austria	70	64	86	43	64	100	100	50	63	50	0	95	88	88	61	95	92	83	92	42	0	13
Ireland	69	77	62	72	88	77	89	39	88	67	100	87	53	96	42	14	67	67	83	50	100	50
Singapore	66	58	68	79	45	96	89	50	63	45	0	85	76	85	25	58	50	83	92	17	100	100
Greece	65	63	74	46	33	96	89	50	75	70	0	83	88	88	69	56	83	33	58	58	0	63
Italy	65	66	66	59	95	63	94	28	88	43	0	74	83	81	42	54	75	33	96	58	50	13

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International Health Regulations – Joint External Evaluation (IHR-JEE)

P4: Antimicrobial Resistance (AMR) 31 October – 4 November 2022

2017		2022	
Indicators	Score	Indicators	Score
1. Antimicrobial resistance detection	4	1. Multisectoral coordination on AMR	5
2. Surveillance of infections caused by antimicrobial-resistant pathogens	3	2. Surveillance of AMR	4
3. Health care-associated infection (HCAI) prevention and control programmes	3	3. Prevention of MDRO	4
4. Antimicrobial stewardship activities	2	4. Optimal use of antimicrobial medicines in human health	4
		5. Optimal use of antimicrobial medicines in animal health and agriculture	4
Average total score	3	Average total score	4.2

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Cooperation Among Transdisciplinary and Multi-stakeholders in Combating AMR in Livestock

Cooperation Among Transdisciplinary

- Antimicrobial use and collecting data
- Veterinary drug regulation
- Animal health and antimicrobial resistance
- Veterinary drug residue and food safety
- Antimicrobial surveillance and laboratory testing
- Risk analysis on AMR

Cooperation Among Multi-stakeholders

Quadripartite:

Food and Agriculture Organization of the United Nations

UN environment programme

World Health Organization

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- Ministry of Agriculture and Cooperatives (MOAC)
  - Department of Livestock Development (DLD)
  - National Bureau of Agricultural Commodity and Food Standard (ACFS)
- Ministry of Public Health (MOPH)
  - Thai Food and Drug Administration (Thai FDA)
  - Department of Medical Sciences (DMSC)
  - Department of Disease Control (DDC)
  - International Health Policy Program (IHPP)
- Ministry of Natural Resources and Environment (MNRE)
  - Pollution Control Department (PCD)
- Office of the Veterinary Council
- Thailand Veterinary Dean Consortium (TVDC)
- Associations
  - Thai Swine Veterinary Association (TSVA)
  - Thai Poultry Veterinary Association (T.P.V.A.)
  - Thai Feed Mill Association (TFMA)
  - Animal Health Products Association (AHPA)
  - Thai Broiler Processing Exporters Association

  Etc.
- Private Companies and NGO

Thailand's National Strategic Plan on AMR

Endorsement: By the cabinet on 17 Aug 2016

Vision : Reduction of mortality, morbidity and economic impacts from AMR

Mission: Establish policies and national multi-sectoral mechanisms which support effective and sustained AMR management system

Consist of 6 strategies

Goals

- 50% reduction in AMR morbidity
- 20% reduction in antimicrobial use in human
- **30% reduction in antimicrobial use in animal**
- 20% increase of public knowledge on AMR and awareness of appropriate use of antimicrobials
- AMR management system meets universally accepted standards

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Thailand's National Strategic Plan on AMR consists of 6 strategies (2017-2021 expand 2022)

1. AMR surveillance system using a "One-Health" approach
2. Regulation of antimicrobial distribution
3. • Infection prevention and control and antimicrobial stewardship in human
4. • **AMR prevention and control and antimicrobial stewardship in agriculture and animals**
5. • Public knowledge on AMR and awareness of appropriate use of antimicrobials
6. • Governance mechanisms to develop and sustain AMR-related actions

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Role of DLD in AMR Containment

Thailand's National Strategic plan on AMR (2017-2021)

Development mechanisms & effective coordination	Surveillance & monitoring of AMR/AMU	Regulation & law enforcement	Training & Education	Research & Promote prudent use
Committee/sub-committee of AMR in livestock	Enhancing lab capacities to conduct AMR surveillance	Prohibiting the use of antimicrobials for animal growth promotion	Training veterinarians at feed mills, farm mixers	Research: alternatives (herb, pre/probiotics, autogenous vaccine
Multi-stakeholders -Central, region labs of DLD -Vet council -Vet schools - Associations	Monitoring antimicrobial consumption	Reclassification of antimicrobials	Developing the guidelines for antimicrobial use	Project collaboration (RWA, RAU, RDU)
	Monitoring drug residues in livestock products	Regulations on medicated feed production	Training & education to government and official farmers	Promote standard certification along the food chain (GAP farm, GMP slaughter, certification retailers
	Post-marketing surveillance of VMP	Law enforcement of illegal drugs and medicated feed		

Antimicrobial consumption in food-producing animals (mg/PCU $_{\text{Thailand}}$)

2017	2018	2019	2020
baseline	20.8%	49.0%	36.0%

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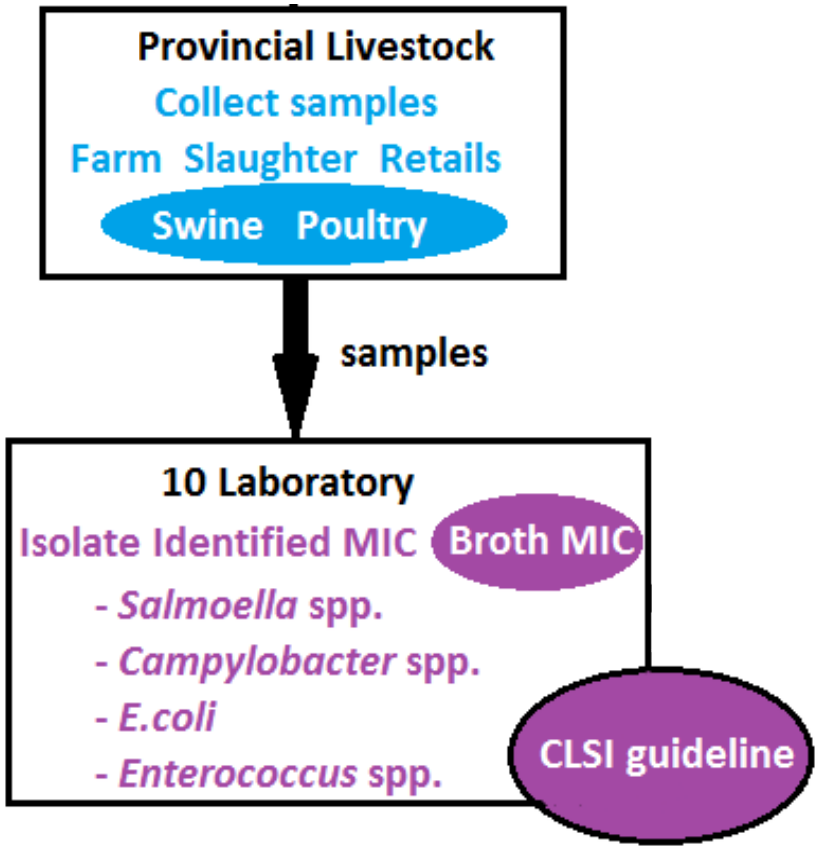
AMR surveillance system

National surveillance of infections caused by AMR pathogens in livestock has been planned since 2016

- Scientific survey 5900 samples / year
- Comply with OIE guideline
- Collect caecum and meat from chicken and pig at slaughterhouse and retailers
- Isolation & Identification, and Antimicrobial susceptibility testing (MIC)
- *Salmonella* spp., *Campylobacter* spp., *E. coli*, *Enterococcus* spp.



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AMR Surveillance

Thailand's National Strategic plan on AMR (2017-2021)

- AMR surveillance in food is jointly carried out by the MOAC and the MOPH
- DLD conducted an AMR analysis of livestock since 2017 via an AMR surveillance platform that covers the food production chain based on the OIE (WOAH) guidelines (which is also consistent with the FAO's and WHO's guidelines and the Codex standard)
- DOF started the AMR monitoring program in aquaculture in the 2017 fiscal year in alignment with the NSP-AMR

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AMR **surveillance System**

Organization Chart on AMR surveillance

DLD

Division of Animal Feed and Veterinary Product Control (AFVC)
Bureau of Disease Control and Veterinary Services (BDCVS)
Bureau of Livestock Standards and Certification (BLSC)

Lab
- National Institute of Animal Health (NIAH)
- Bureau of Quality Control of Livestock Products (BQCLP)
- Veterinary Research and Development center (9 Labs)

Local
- 9 Regions
- 77 Provinces
- 888 District Livestock Offices

DOF

Aquatic Animal Health Research and Development Division (AAHRDD)

Songkhla Aquatic Animal Health Research and Development Center (SAAHRDC)

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AMR **surveillance System**

AMR surveillance in food and agriculture

- Harmonizing and implementing the standard methods for AMR testing
- Validated using the IQC (Internal Quality Control)
- Verified by using EQAs (External Quality Assurance Schemes)
- THAI AGRICULTURAL STANDARD TAS 9062-2022: “Code of practice for AMR surveillance and Monitoring in livestock”
- FAO-ATLASS : FAO Assessment Tool for Laboratories and AMR Surveillance Systems

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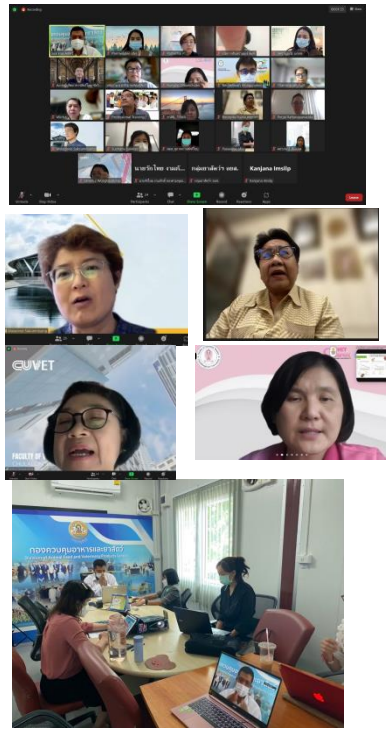
Process to develop on National Strategic Plan on AMR Phase 2 (2023-2027)



Prepared 1st drafted
23 June 2022

3rd National forum on
AMR 27-28 June 2022

Public hearing on the
National Strategic Plan (NSP)
on AMR Phase 2 (2023-2027)
17 January 2023

Committee of 4th strategy on
NSP on AMR 20 June 2023

Stakeholder meeting
26 July 2023

Core team on AMR meeting 14-15 September 2023

Way forward and challenge

National Strategic Plan on AMR Phase 2 (2023-2027)

Targets

- The amount of antimicrobial consumption for animals is reduced by 50% compared to 2017.

Outcome indicator

- Total antimicrobial consumption rates in terrestrial and aquatic animal decreased by 10% (compared to 2023).
- Consumption of CIAs (Colistin) decreased by 20% (compared to 2023).
- Antimicrobial resistance rates decreased or did not increase significantly.
- Reporting system of antimicrobial use in companion animals.
- Surveillance and monitoring system for antimicrobial resistance in companion animals.

Way forward and challenge
Implementation of AMR management & International Policies

COMMISSION IMPLEMENTING DECISION (EU) 2020/1729 of 17 November 2020 on the monitoring and reporting of antimicrobial resistance in zoonotic and commensal bacteria and repealing Implementing Decision 2013/652/EU

REGULATION (EU) 2019/6 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2018 on veterinary medicinal products and repealing Directive 2001/82/EC

EU measures to manage AMR

- Prohibit prophylactic use of antibiotics in herds
- Prohibit the use of antimicrobials in feed for preventive purposes
- Limit the prophylactic use of antimicrobials
- Do not use reserved antimicrobials for treatment of certain infections in humans.
- Do not use antimicrobials for growth promotion.
- Compulsory report data of antimicrobial sales and use
- Responsible use of antimicrobials

Supplementing Regulation (EU) 2019/6

1. **REGULATION (EU) 2021/1760** criteria for the designation of antimicrobials to be reserved for the treatment of certain infections in humans
   (apply from 28 January 2022)
2. **REGULATION (EU) 2022/1255** designating antimicrobials or groups of antimicrobials reserved for treatment of certain infections in humans
   (apply from 9 February 2023)
3. **(Draft) The process of importing animals and animal products from third countries to the EU**
   - Prohibit use of antimicrobials for growth promotion
   - Prohibit use of antimicrobials listed in REGULATION (EU) 2022/1255

(1) Antibiotics

(a) Carboxypenicillins
(b) Ureidopenicillins
(c) Ceftobiprole
(d) Ceftaroline
(e) Combinations of cephalosporins with beta-lactamase inhibitors
(f) Siderophore cephalosporins
(g) Carbapenems
(h) Penems
(i) Monobactams
(j) Phosphonic acid derivates
(k) Glycopeptides
(l) Lipopeptides
(m) Oxazolidinones
(n) Fidaxomicin
(o) Plazomicin
(p) Glycylcyclines
(q) Eravacycline
(r) Omadacycline

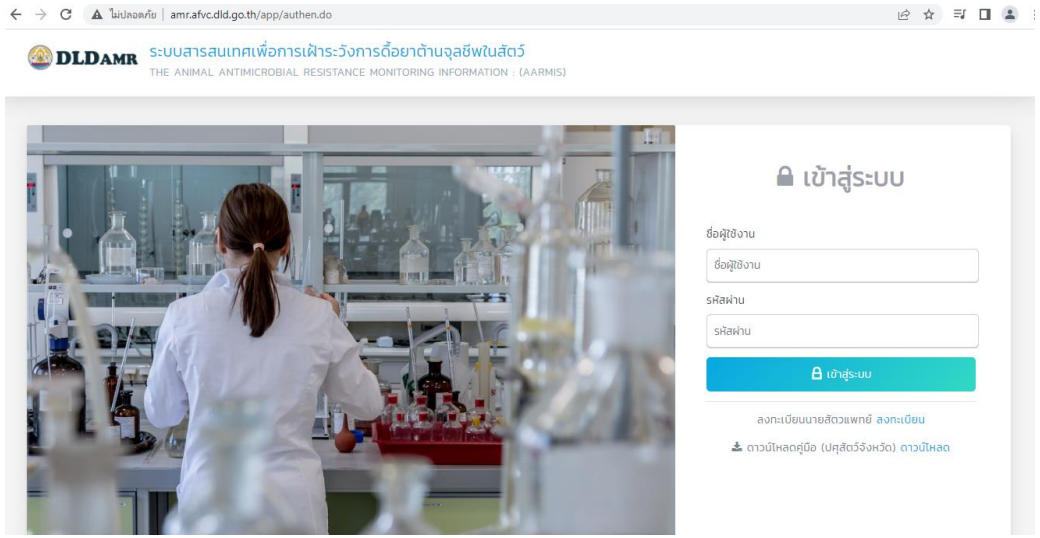
(2) Antivirals

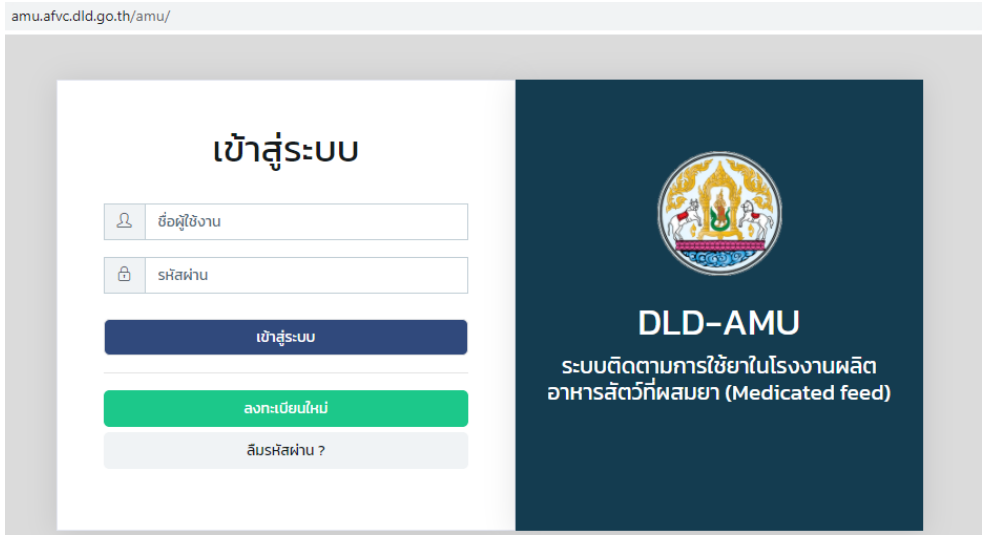
(a) Amantadine
(b) Baloxavir marboxil
(c) Celgosivir
(d) Favipiravir
(e) Galidesivir
(f) Lactimidomycin
(g) Laninamivir
(h) Methisazone/metisazone
(i) Molnupiravir
(j) Nitazoxanide
(k) Oseltamivir
(l) Peramivir
(m) Ribavirin
(n) Rimantadine
(o) Tizoxanide
(p) Triazavirin
(q) Umifenovir
(r) Zanamivir

(3) Antiprotozoals

(a) Nitazoxanide

Develop ICT program for data collection and report





- Sample information
- Examination process
- Examination result
- Statistical Report (ex.Prevalence, Resistant rate)

- Data of feed production for animal species
- Data of medicated feed production for animal species
- List and amount of antimicrobial use for animal species
- Statistical Report (ex. Ratio, Percent)

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Public media

Thailand's NAP on AMR

Midterm progress report

Thailand's One Health Reports 2017, 2018 and 2019

Guidelines prudent use of antimicrobials in companion animals, pigs and poultry

VDO Medicated feed and RWA

Role of DLD and AMR Containment

AMR Brochures

Drawings: FAO/Khin Nyein Chan Oo

Working together to fight antimicrobial resistance