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## Short Communication

# Implementing national strategies on antimicrobial resistance in Thailand: potential challenges and solutions



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## ABSTRACT

**Background:** Thailand has developed a national strategic plan on antimicrobial resistance (NSP-AMR) and endorsed by the Cabinet in August 2016. This study reviewed the main contents of the NSP-AMR and the mandates of relevant implementing agencies and identified challenges and recommends actions to mitigate implementation gaps.

**Methods:** This study analysed the contents of NSP-AMR, reviewed institutional mandates and assessed the implementation gaps among agencies responsible for NSP-AMR.

**Results:** Two of six strategies are related to monitoring and surveillance of AMR and antimicrobial consumption in human and animal. Two other strategies aim to improve antibiotic stewardship and control the spread of AMR in both clinical and farm settings. The remaining two strategies aim to increase knowledge and public awareness on AMR and establish national governance for inter-sectoral actions. Strategies to overcome implementation challenges are sustaining cross-sectoral policy commitments, effective cross-sectoral coordination using One Health approach, generating evidence which guides policy implementation, and improving enforcement capacities in regulatory authorities.

**Conclusions:** To address AMR, Thailand requires significant improvements in implementation capacities in two dimensions. First, technical capacities among implementing agencies are needed to translate policies into practice. Second, governance and organizational capacities enable effective multi-sectoral actions across human, animal, and environmental sectors.

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## Background

Antimicrobial resistance (AMR) is recognized as a major global human security threat. AMR affects human and animal health and economies worldwide with an estimated 700,000 AMR-attributable deaths annually.<sup>1</sup>

The global risk of AMR requires a comprehensive and integrated approach at global, regional, and country levels applying the ‘One Health’ principle. The global action plan on AMR was adopted in 2015 by all the World Health Organization (WHO) member states at the World Health Assembly, calling on each member state to develop a national action plan in 2 years.<sup>2</sup> The World Organization for Animal Health (OIE)<sup>3</sup> and the Food and Agricultural Organization<sup>4</sup> also adopted AMR resolutions in 2015, fostering tripartite collaboration.

Thailand developed a national strategic plan on AMR (NSP-AMR) during the second half of 2015, based on a strong participatory process. The NSP-AMR, a 5-year plan from 2017 to 2021, was endorsed by the Cabinet resolution in 2016.<sup>5</sup> Given the mandates assigned to implementing agencies, this article identifies their capacities and implementation challenges and proposes recommendations for effective actions.

## NSP-AMR goals and strategic actions

The goal of the NSP-AMR is to reduce morbidity and mortality and minimize the socio-economic impact. There are six strategic actions and five targets to be achieved by 2021, see [Box 1](#).<sup>6</sup>

[Table 1](#) describes the six AMR strategic actions, the main implementing agencies, and their institutional mandates. The

### Box 1

#### Thailand's national strategic plan on AMR 2017–2021.

##### Strategic objectives

1. AMR surveillance using One Health approach
2. Surveillance of antimicrobial consumption
3. Antibiotic stewardship and infection control
4. Control spreading of resistant bacteria
5. Enhance public awareness
6. Governance, research, and development

##### Goals

1. 50% reduction in AMR morbidity
2. 20% reduction in antimicrobial consumption in humans
3. 30% reduction in antimicrobial consumption in animals
4. 20% increase in public knowledge on AMR and awareness of appropriate use of antimicrobials
5. Capacity of the national AMR management system is increased to level 4 as measured by the WHO's Joint External Evaluation Tool for International Health Regulations (2005)

surveillance of AMR and antimicrobial consumption forms the two foundations, which generate evidence for effective policy action in three subsequent actions: antibiotic stewardship and infection control, controlling the spread of resistant bacteria, and enhancing public awareness.

## NSP implementation: analysis of challenges

The National Steering Committee, appointed by the Prime Minister, comprises all concerned ministries and in particular, the ‘One Health’ tripartite partners from human, animal, agricultural, and environmental sectors and technical experts in various fields, including civil society. By November 2017, the committee had met twice and approved the multisectoral action plan where the budget was embedded within each of the implementing agencies. In this article, we identify and categorize implementation challenges in four main areas.

First, there are challenges facing AMR surveillance systems. AMR surveillance is an essential tool for monitoring AMR trends and evaluating the outcomes of NSP-AMR implementation. The Ministry of Public Health established the national AMR surveillance system for humans in 1998, and by 2017, it had extended to 92 sentinel hospitals.<sup>7</sup> However, information about AMR profiles has yet to effectively reach clinicians to enable proper decisions or the general public to raise public awareness. The current surveillance systems have yet to extend their focus beyond bacteria to other pathogens, such as malaria, tuberculosis, and HIV, which is recommended by the WHO.

The situation of AMR in animals is still unknown, although there are several small-scale monitoring programs and some research studies undertaken in universities. Certain large livestock production companies have established microbiology laboratories, but there is no requirement for them to share their AMR profiles. Furthermore, the quality and standardization of AMR laboratories need further strengthening in both public and private human and animal laboratories.

The emergence of resistant foodborne infection calls for an integrated surveillance system, with a specific focus on foodborne pathogens. Such a system is yet to be initiated in Thailand,<sup>8</sup> which is a major exporter of animal products. Food safety protects not only local but also international consumers and safeguards trade sanctions.

The second challenge relates to monitoring antimicrobial consumption. Despite high levels of antimicrobial consumption in humans and livestock in Thailand,<sup>9</sup> no reliable consumption data are readily available. The development of national surveillance of antimicrobial consumption (Thai-SAC) is underway, as recommended by the WHO. The 1987 Drug Act mandates pharmaceutical importers and manufacturers to report the value and volume of all pharmaceutical products including antimicrobials, both human and animal, to the Food and Drug Administration (Thai-FDA) annually. These mandatory reports are the foundation for the development of the national surveillance of antimicrobial consumption.<sup>10</sup> Once the national surveillance of antimicrobial consumption is fully developed by 2018, it will produce an annual report on

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