The Factors Contributing to the Outcomes of the National Strategic Plan on AMR Strategy 5 on Public Knowledge and Public Awareness on AMR, and Appropriate Use of Antimicrobials

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Abstract

In Thailand, antimicrobial resistance caused 38,481 hospital deaths in 2010, with 19,000 extra deaths attributable to multidrug-resistant bacterial infections, which have been increasing annually. In August 2016, the Council of Ministers of Thailand approved the National Strategic Plan on AMR 2017-2021 Strategy 5 to strengthen knowledge on antimicrobial resistance (AMR) and awareness of the rationale of antimicrobial use (AMU) among the public. This study aims to investigate the factors contributing to the outcomes of the National Strategic Plan on AMR Strategy 5. This qualitative study used in-depth interviews to find the factors contributing to the outcomes of the national antimicrobial strategy among key informants. Purposive sampling was used to select key informants. The criteria for purposive were key informants responsible for public knowledge and public awareness on antimicrobial resistance for more than three years. The sample size was twenty-three key informants, including eight hospital pharmacists, eight pharmacists in the provincial health office, and seven village health volunteers. The data were analyzed using a thematic approach. The software ATLAS.ti version 22.2.0 (L-33E-E32) was used to analyze the data. The study's results revealed the following 9 factors contributing to the outcomes of the National Strategic Plan on AMR Strategy 5 on public knowledge and awareness of AMR and the appropriate use of antimicrobials: the policy, the network, target groups, officers, executives, public relations, coordination, resources, and environmental factors. It can be concluded that all 9 factors directly affect the implementation of Strategy 5 in the area.

Keywords: Thai AMR strategy; Antimicrobial resistance; Public Knowledge; Public Awareness; Antimicrobial use; Policy Implementation

Introduction

Antimicrobial resistance (AMR) has emerged as one of the principal public health problems of the 21st century that threatens the effective prevention and treatment of an ever–increasing range of infections caused by bacteria, parasites, viruses, and fungi that are no longer susceptible to the common medicines used to treat them (Prestinaci, 2015). In Thailand, antimicrobial resistance caused 38,481 hospital deaths in 2010, with 19,000 extra deaths attributable to multidrug–resistant bacterial infections, which have been increasing yearly (Ministry of Public Health, Ministry of Agriculture, 2017). The National Surveillance System for Antimicrobial Resistance, Thailand (NARST) report found that antimicrobial resistance in Thailand continues and is increasing. Antimicrobial resistance rate of bacteria in the years 2000–2020 found that the rate of vancomycin–resistant in enterococci group in 2020 *E. faecium* at IPD 9.1 %, OPD 13 %, and ICU 10.1. *E. faecalis* at IPD 0.4 %, OPD 0.2 %, and ICU 0.1 %. Rate of *Staphylococcus spp.* resistant in erythromycin 35.5 %, oxacillin (cefoxitin) 34. 1%, clindamycin 29.5 %, and ciprofloxacin 22.4 %. For imipenem and meropenem resistance in *Acinetobacter spp.* found a rate of resistance of 72.5 % and 71.8 %, respectively. In *Pseudomonas aeruginosa*, resistance rates are 21.5 % and 18.2 %, respectively. E. coli has rate of resistant in ampicillin 82.9 %, ciprofloxacin 54.5 %, gentamicin 32.1 % and Imipenem 2.8 %, etc. (NARST, 2020)

During the 2020 SARS–CoV– 2virus outbreak, this epidemic could be attributed to higher antimicrobial use and long–term AMR. On the other hand, a greater focus on public hygiene, such as hand washing, and efforts to limit contact between patients, including interpersonal spacing, could substantially reduce the spread of antimicrobial resistance. However, the spread of antimicrobial resistance may occur and become worse. Because of the increasing rate of prescribing antimicrobial drugs, for example, the International Severe Acute Respiratory and Emerging Infections Consortium (ISARIC) was founded. However, there are few reports of bacterial infections, and 62% of infected COVID–19 patients have received antibiotics. Besides, the order is too large, and irrational, which is causing the spread of other pathogens and multidrug resistance organisms (MDROs) (Rawson et al., 2020).

In Thailand, the knowledge score about AMR and AMU was low to moderate (Tangcharoensathien et al., 2021). The countryside of Thailand needed more knowledge on AMR and AMU. Thai people call antimicrobial drugs like anti-inflammatory drugs "Ya-Kae-akseb" (Haenssgen, et al., 2019) because inflammation in their perspective was pain, swelling, redness, and heat; just like in medical terms, they cannot explain the cause of infection-related inflammation (Wanida & Kornkaew, 2014). Most respondents answered, "Antibiotics can kill viruses" and "Antibiotics are effective against colds and flu." That was the wrong answer. The other countries that studied public knowledge had the same results as Thailand.

The public policy (Strategy 5 to increase Public Knowledge and Awareness on AMR and Appropriate Use of Antimicrobials) has 3 main responsible organizations, including the Department of health service support, the Thai health promotion foundation, and the national health assembly. The Department of Health Service Support (DHSS) is the main organization to drive Strategy 5 at the local level. Various networks have organized activities to educate and raise awareness by health professionals such as hospital pharmacists, public health office pharmacists, public health technical officers, health volunteers, and health village volunteers at the local level. The Department of Health Service Support has carried out Strategy 5 through health volunteers and health village volunteers. The health volunteers and health village volunteers are the leaders in managing health problems in the community. Therefore, the organizations involved in implementing public policy (Strategy 5) are public health offices and hospitals under the Ministry of Public Health. In Bangkok, the Health Department of the Bangkok Metropolitan Administration is the unit responsible for health volunteers and health village volunteers. No one has studied the factors contributing to the outcomes of the strategy. The research question is: what the factors contributing to the outcomes at the local level are? Therefore, this study would like to know the factors contributing to the outcomes of the National Strategic Plan on AMR Strategy 5 on public knowledge and awareness of AMR and appropriate use of antimicrobials.

Research Objective

This study aimed to investigate the factors contributing to the outcomes of the National Strategic Plan on AMR Strategy 5 on public knowledge and awareness of AMR and the appropriate use of antimicrobials.

Literature Review

Antimicrobial resistance (especially antibiotic resistance) is spreading, and is less likely to develop new antibiotics quickly (O'Neill, 2016). Nonetheless, there is now great awareness of the need and political support for action to combat AMR. The support is multi–sectorial, and cooperation is strengthened among relevant sectors, particularly human, animal, and agricultural health. The need for urgent action is in line with preventive measures. Action and collaboration between national and international levels should be supported by knowledge gaps (Lim et al., 2016).

In August 2016, the cabinet of Thailand approved the National Strategic Plan on AMR 2017–2021. This plan is composed of 6 strategies as follows: 1) Surveillance of AMR under a 'One–Health' approach; 2) Overall national antimicrobial drug distribution control; 3) Control and prevention of infection in healthcare settings and supervising the irrational use of antimicrobial drugs; 4) Control and prevention of antimicrobial drug use (AMU) in agriculture and animal sectors; 5) Strengthening knowledge on AMR and awareness of rational AMU among the public; and 6) Managing and developing policy–level mechanisms to drive sustainable AMR work. The fifth strategy consists of three strategic actions, which include (1) promoting the role of organizations, civil society networks, and mass media to strengthen understanding of AMR and rational AMU among the public; (2) promoting and developing health literacy regarding AMR and awareness on rational AMU, especially for children, youth and working–age groups; and (3) strengthening the community and network of partnerships and their participation (Ministry of Public Health, Ministry of Agriculture, 2017).

The Health Technology and Policy Assessment Program (HITAP) evaluated the implementation of the Strategic Plan when it was completed in November 2019. The report showed that obstacles in implementing Strategy 5 included people still holding inappropriate perceptions, attitudes, and awareness regarding rational AMU, inadequate public communication on the issues, content that was difficult for the public to understand, less participation from various non–governmental organizations, and slow progress in implementation due to delays in establishing key organizations (Health Technology and Policy Assessment Program, 2019). In addition, achieving the goal of a 20% increase among Thais with adequate knowledge of AMR and awareness of rational AMU by the end of 2021 was not reported. A 2019 Health and Welfare Survey interviewed 27,900 Thai adults aged 15 years and up with the Flash Euro–barometer 444, an

AMR knowledge assessment instrument (European Commission, 2018). It revealed that 24.3% of the subjects possessed adequate knowledge of AMR, compared to 23.7% found in a 2017 survey. Moreover, the mean awareness score of AMU was moderate, at 3.3 out of 5 points. Thus, the results indicated a very modest impact from the effort expended. The 2019 Survey also pointed out that misunderstandings of AMU among the public remained. For example, 50.7% of the subjects reported that "antibiotics kill viruses", compared to 49.8% in the 2017 survey (Tangcharoensathien et al., 2021). Therefore, overall, the evidence shows few successes from the effort organized to follow Strategy 5.

The 2019 evaluation report listed educational efforts on AMR by various organizations, such as the Department of Health Service Support (DHSS), the Thai Health Promotion Foundation (THPF), the Thai Food and Drug Administration (Thai FDA), and the Drug System and Monitoring Center (DMDC). However, some crucial information is still needed to provide more effective public education to achieve the goal, and no one has studied about the factors contributing to the outcomes of the strategy. Only the outcomes of Strategy 5 were studied in this review, but no studies were conducted on factors, facilitators, or barriers to policy implementation.

Conceptual Framework

This qualitative research adopts an integrated theory of public policy implementation developed by Chandarasorn (2009) and Mohrs (2015) to provide a conceptual framework for investigating the factors contributing to the outcomes of the National Antimicrobial Strategy on the appropriate use of antimicrobials. The factors in the conceptual framework, including the policy, resource, environment, communication, public relations, target group, executive, and officer, will affect the outcome of the policy implementation, and it can be shown the success or failure of the policy implementation.

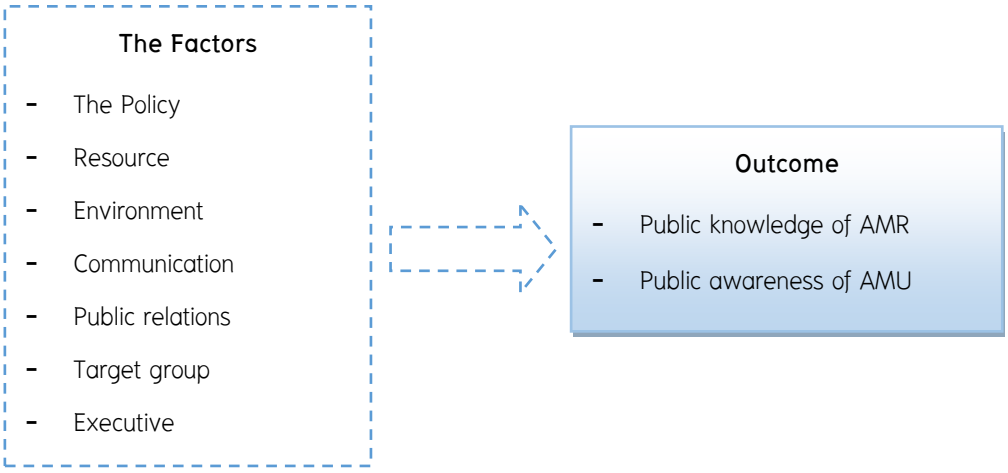

Figure 1 The Conceptual Framework.

Research Methodology

Study design

This qualitative study used in-depth interviews to find the factors contributing to the outcomes of the National antimicrobial strategy in key informants.

Population and Sample

This study used purposive sampling. The criteria for purposive were the key informants responsible for public knowledge and public awareness on antimicrobial resistance for more than three years. The researcher submitted the selection criteria to all 76 provincial public health offices and the Bangkok Health Office, whereby the units above selected key informants. Once the researcher has received the information from the agencies above, the researcher will e-mail key informants inviting them to participate in the study. The sample size was twenty-three key informants, including eight hospital pharmacists, eight pharmacists in the provincial health office, and seven village health volunteers. The researcher will contact the key informant by post-mail to them for permission to interview. Then the researcher will contact key informants directly by e-mail. The interview will be conducted until the data is saturated and no new information is added.

Study Instrument

The tools used to collect data are a semi-structured interview guide and an online interview with key informants. The semi-structured interview consists of 3 parts. The first part is personal key informant information. The second part is the implementation process and activities of

the National Antimicrobial Strategy. The last part concerns factors contributing to the outcomes of the National Antimicrobial Strategy on the appropriate use of antimicrobials.

Data Collection

1. The researcher will contact the key informant by post–mail to them for permission to interview.

2. The researcher contacts the key informants to schedule an interview.

3. The interview is either conducted in Thai. The information sheet, consent form, and interview guide are Thai.

4. The information sheet, consent form, and interview guide will be sent post–mail and e–mailed to the key informants.

5. The key informants are asked if they fully understand, agree, check the consent form, understand the information sheet, and agree to the interview recording. The interview will use the Zoom meeting program for an online interview. The interview will use 40–60 minutes. Depending on key informants, the consent form will be sent back to the researcher by post–mail or electronic forms.

6. When interviewing, the researcher will introduce himself by giving the name, surname, and place of work, suggesting the research project informing about the research ethics protecting the rights of informants keeping data safe secret. The researcher makes a strong relationship for key informants to feel comfortable.

7. The researcher continues in–depth interviews by using semi–structured interviews and records during the interview until data is saturated.

8. The researcher requested a report on the activities of each informant activities for use in data analysis.

9. After interviewing all the informants, the obtained data were analyzed for the qualitative research method. The record will be permanently deleted after the finish.

Data Trustworthiness

This research will use the data triangulation technique to confirm by considering the information from key informants, including pharmacists in the provincial health office, pharmacists in hospitals, and village health volunteers or health volunteers. The researcher will check if the key informants change and whether the information will be the same.

Data analysis

The researcher transcripts from interviews. The researcher takes the information compiled according to the thematic approach, which Braun and Clarke (2006) outline six steps to perform the analysis. The software ATLAS.ti version 22.2.0 (L–33E–E32) was used to analyze the data.

Ethical Considerations

This research was approved by the Research Ethics Review Committee for Research Involving Human Research Participants Group 1, Chulalongkorn University (Reg. No. COA 027/2022).

Research Results

Based on in–depth interviews with 23 key informants, the study's results revealed the following 9 factors contributing to the outcomes of the National Strategic Plan on AMR Strategy 5 on public knowledge and awareness of AMR and the appropriate use of antimicrobials.

1. The Policy.

Most of the key informants said Strategy 5 was important and necessary. This policy can solve the problem of antimicrobial resistance by building a network and strengthening the network for health workers and the public to have knowledge of AMR and raise awareness about the rationale of antimicrobial use, which will help prevent the development of antibiotic resistance. The policy is clear in terms of objectives to solve the problem of AMR. The policy's purpose covers solutions to knowledge and public awareness problems. Most key informants said that the health literacy process was already the role of pharmacists. The hospital's vision and mission were to connect with community networks to strengthen the community through network participation. In addition, raising knowledge and awareness about AMR and the rationale use of antimicrobials is also part of the Ministry of Public Health's RDU policy that is delivered to the Provincial Public Health Office and hospitals.

“The strategy comes, we are trying to adjust according to our context. From what I read, I feel like, well, it's clear and I can see the direction that the strategy wants to go.”

HP02

“Policy….part of it. That is, it is like a drive as well. Well, it's clearer from having a policy compared to the past, right? They know what they must do.”

PHP06

“It's appropriate, it's appropriate, because I saw that ministries, bureaus, departments, and related parties are much more enthusiastic than before.”

VHV01

“This hospital is a mission, a vision connected with a community network, a strong community, with the network participating like this. The hospital's end mission is now from the AMR and RDU models, which received HA a few days ago. We plan that the network will not only look at AMR but also look at significant diseases.”

HP01

“I think it's consistent with the strategic plan and can also be driven together.”

PHP05

2. The network.

Empowering and strengthening the network is one of the strategies of strategy 5. Key informants in the network strengthening process must let the network see the importance of the problem of AMR to educating. When the network sees the problem, recognizes it, and has the knowledge, it will make the network learn together and create more cooperation in solving problems. In addition, the encouragement and use of trust between health professionals and people in the community are considered key factors in building the strength of the network that will make the network more willing to work. The process is to encourage the community to be a model community, such as by using rational drugs, drug–free grocery stores, and increasing the potential of consumer networks. Such a process organizes activities to educate various networks, especially youth, and allows leaders to care for patients. There is a process of enhancing the participation of community leaders, local administrative organizations, and consumer foundations in each area to participate in activities to raise awareness about AMR and rationale antimicrobial use.

“Training and educating both volunteers and the owner of the grocery store, and about inviting and exchanging conversations with the village team.”

HP03

“We will have something like.....Ah.....In addition to training and educating, we will be the ones who will strengthen the willpower as well. (Smile)”

PHP08

“At first, it was done in small groups first..... I work with a loving heart, with a bond of heart like brothers and sisters. People reach the locality, reach the people in every aspect..... I built a network by myself first.”

VHV03

“Like the headman of a Tambon, village headmen like this, we go to provide information in their monthly forum to see if there is something new that has been updated or if there is something that needs to be monitored.”

HP07

“Volunteer megaphone, they will know that the word volunteer megaphone is a volunteer that operates in matters of community consumer protection, including dangerous drugs in the community, dangerous drugs in the grocery store, dangerous drugs in animals, and everything that as a consumer protection work in the community, we will use the word "Volunteer Megaphone.”

VHV06

3. Target groups

Most key informants cited their target group as village health volunteers (VHV). Because this target group is considered to be the people who reach the people in the area, officers cannot get to know or introduce themselves to the public directly. VHVs are considered an important target group to raise knowledge and awareness about AMR and the rational use of antimicrobials, as the key informant said:

“We have volunteers come to train, and we emphasize. They have more chances to meet people than we do and ask them to help communicate again.”

HP02

“We intend to develop the potential of the sub-district health-promoting hospitals and the village health volunteers to reach the people because we cannot go to know or explain or advise people directly between pharmacists and the people.”

HP05

Students and "Oryor Noi" were considered the target groups that most key informants gave importance to because key informants viewed that children must receive correct knowledge and be aware of the rationale for antimicrobials use. Therefore, educating people with sustainable knowledge and awareness is training them to provide correct information from an early age.

"Now I see it anyway as a child. I must send them everything because it's them in the future."

HP03

"There is Oryor Noi. Suppose there are radio media with advertisements organized like this. In that case, we can discuss something like this, like a supplementary form in some activities."

PHP06

4. Officers

Most key informants reported that the number of officers needed to be increased. Part of the reason is that officials ignore the issue. In addition, there are other tasks that the officers in the department have to take responsibility for. So, raising knowledge and awareness about AMR and the rational use of antimicrobials among the public needs to be improved. Regarding the competency of the key informants, the sector officers who are health personnel are sufficient because they have been working continually, and officers have been sent to be trained to enhance their knowledge and skills. In terms of working as a team, most of them are fine. There is intense work and good relations between departments.

"In the community setting, I think 1 of my people working in 18 sub-district health promotion hospitals is insufficient. After all, I can only do the Prototype District."

HP08

"If I take myself as a location, it may not be enough. It's not just one dimension to do with the agency if it really has to be done."

PHP02

"Not enough, not enough personnel. (Smiles, chuckles)"

VHV02

"Working as a team, we think we can talk to each other, we can communicate with the team, the team is quite cooperative."

HP05

5. Executive

Most of the key informants reported that executives gave their freedom to organize activities and were motivated by recognizing and praising workers and motivating them to perform according to the indicators of the Ministry of Public Health, of which the issue of drug resistance is

one. There is also a work–point payment system, such as special remuneration. The executive also encouraged those in charge of activities to fully implement them by providing consultative and partial budget support.

"He will have the money information and fill it with the person in charge of the indicators. This is a morale boost for people who look after each indicator."

HP07

"Assuming that the executives ordered everyone to do it because everyone wants to work on health–promoting."

PHP03

"Executive can let me leave the area, so I think the executive is more understanding. Well, for me."

HP03

"The director will support. Here, the director will have a meeting of the medical and nursing teams like this."

HP04

6. Public Relations

Regarding the public relations factor, key informants mentioned that most use line group communications to publicize activities related to raising knowledge and awareness about AMR and rational antimicrobial use. Since the group line has a group of health personnel and networks, it is easy to communicate when the network receives information from the line group, which can then be used to promote it to the people in the area. In addition, key informants also mentioned other channels for publicizing activities, such as community radio. Public relations will be done through voice calls in the market, temples, or villages. More importantly, community leaders are encouraged to publicize with the people in the area because community leaders can easily reach target groups. More importantly, community leaders are encouraged to publicize with the people in the area because community leaders can easily reach target groups. In terms of public relations through documents, there are letters from hospitals or the provincial public health office to various sub–district health promotion hospitals. There will be activities to invite target groups to join.

"Public relations via voice along the line of the market."

HP06

"Send a letter. Whether it's electronic or something like this, says the province has accepted the policy and has a meeting."

PHP05

"I can always give knowledge through the line of the VHVs group."

PHP07

7. Coordination

Internal coordination is when the person responsible for activities, according to Strategy 5, has to coordinate with the organization's affiliated personnel. The key informant mentioned that the issue of coordination within the organization was a strength because those in charge of the activities were close to the personnel within their departments, so they could create an understanding of the fifth strategic issue, making work continuous and effective. External coordination means those responsible for activities, according to Strategy 5, must coordinate with agencies outside the organization. Key informants cited the issue of external coordination as a strength. Because the activity operators are intimate with personnel outside the organization, resulting in continuous collaboration is a supplement to make the activity successful by having communication through the main channels as line official.

"No problem, because my boss's role, he's the same generation as me, and he already knows the policy. The officers in the department and the doctors themselves happen to be family doctors, meaning they will already know the policy. Therefore, if it is seen that working is fine. They can ask for cooperation. There is no problem."

HP03

"It's not difficult because ours is a group of executives open to it. The department manager himself has the power to talk and exchange here with the executives."

PHP03

"You can coordinate and talk. I can work together. Coordinating and speaking well."

VHV07

"Pretty close. Hospitals, sub-district health promotion hospitals, or VHVs can communicate and coordinate quickly. Because although the hospital may not be close to VHVs, we are quite close to a sub-district health promotion hospital."

HP02

“Oh, if talking about this coordination, I will meet with primary care pharmacists a lot, and there will also be a pharmacist who will coordinate with the head of a pharmacist. There will always be meetings, so there's never been a problem. Keep in touch and talk through the line group all the time.”

PHP07

“No problem. At the hospital, the pharmacist coordinates the participation of all departments in organizing activities and evaluating the hospital. We have to participate.”

VHV01

8. Resources

8.1. Budget

Most key informants felt that the budget allocated needed to be increased. The budget needs to be increased for producing educational media and organizing events, especially if they want to organize events targeting more groups or larger events. Policies assigned by central agencies are not distributed along with the budget, so activities to raise knowledge and awareness about AMR and the rational use of antimicrobials are not fully carried out. Those responsible for activities must bring budgets from other departments to integrate. During the past three years, most of the budget has been drawn to manage the COVID–19 problem, resulting in a decreased budget for activities. Therefore, when the budget is insufficient, activities cannot be organized to cover all areas and activities.

“The budget for media production, I think, is still lacking and educational documents, sometimes I receive 10 copies, like this, it's not enough, it's just giving away, it's like we have to choose to give away something like this, the educational documents are lacking.”

HP04

“Not enough. Because, to put it simply, the policies that have been ordered do not come along with a budget.....Education like just once a year and going through a one–day meeting is, well, that's not enough.”

HP08

“Let's say if given a budget, it's not enough, right?”

PHP04

"If the relevant departments, ministries, or people with authority seeing the importance of in-depth work like me, will give kindness or mercy to support the budget enough to work, it will work to the best of its ability. Because we have nothing and no budget, we still do the best we can."

VHV01

8.2. Media and Equipment

Regarding media and equipment factors, most key informants use paper media such as educational brochures and posters to distribute to target groups. The media has internal content with a short message for the target group to continue communicating. The Food and Drug Administration and the Drug System Monitoring Program at the regional levels will support the source of the paper. In addition, some of the key informants also use video materials for dissemination to target audiences. Most of the video media is mainly the video media of the Drug System Monitoring Program at the regional level.

Regarding the adequacy of the media, most key informants reported that the media and materials used in organizing events to raise knowledge and awareness about AMR and the rational use of antimicrobials are sufficient. Because the media used may be used sparingly or not need to be distributed to the target group. Nevertheless, most will focus on educating the target group. In addition, most informants knew the source of support for media and materials, such as the Drug System Monitoring Program at the regional level.

"Enough, we made it easy to understand. In addition, there is a budget to support our agency. Still, the media we have created may not be pretty and may not be international."

HP05

"The media provides knowledge as if we would give each one. We would separately have each hospital write their activities and then request to withdraw their own budget. We may have to follow up on whether each hospital is doing enough in each area. That is, we will do it."

PHP05

9. Environment

9.1. Socioeconomic

Socioeconomic factors directly affect organizing activities to raise knowledge and awareness about AMR and AMU. Since organizing activities is often ~~the~~ people's working time, the

public's participation is limited to certain target groups, such as the elderly and students. In addition, social issues that cause people to lack awareness about rational antimicrobial use include the fact that people still have to go to work to make a living. Therefore, when ill, people have to find drugs or health products that can make them recover normally and return to work quickly because if people do not have income, they will not raise themselves, including health care.

"They don't care if it's right or wrong. They don't care if their kidneys are damaged or not, don't care if they are infected with AMR, don't know what AMR is, it is intangible, but they care that tomorrow there will be money to give their children to go to school, they must be fine, must be healthy to recover, they must not hurt...because it is earning a living."

HP05

"Let them recover and rest like this. Sometimes we have to accept that sometimes they can't sleep, they have to go to work, yes."

PHP08

"There is an impact, namely the problem of earning a living, expensive goods, and insufficient money in the community."

VHV02

9.2. Politics

Whether it is national politics or local politics, in terms of political factors, key informants said that most local politicians and authorities cooperated and supported exceptionally well, such as spreading the news about AMR to local people to let them know about the problem or persuading people to participate in activities with the Civil Society Network. However, when the management of the local government organization changes, the policies of the local politics will also change, causing some areas to lack continuity. The person responsible for the activity should regularly work with the local government organization because it is the key factor that drives work efficiently.

"It's like changing the mayor, the SAO, or something like this. In that case, the support will be different in our activities. It's a problem, just like what you do at the municipality. When you change the mayor, it's another form."

HP08

"You're going to get them interested. They're already interested because they don't have to do much. They're just part of the whole image. What we do is already good. So they are ready to agree, but it depends on how we present our story."

PHP04

"Full support for training services or budgets that we will request from the NHSO. This municipality fully supports and participates in activities with us, which means walking in the same direction as public health and the community."

VHV05

9.3. Emerging disease

Emerging diseases are one of the factors that the key informants said directly impact the implementation of Strategy 5 . In the past, the coronavirus outbreak has disrupted activities according to Strategy 5 . It was impossible to bring people together because of the policy of not gathering people for activities, so training activities did not hold knowledge or raised public awareness. Moreover, the central government has reduced the budget for organizing activities on AMR. Another critical issue is that people find antibiotics to take by themselves to treat COVID-19 infections without realizing the problem of drug resistance because antibiotics cannot kill COVID-19.

"Covid is that the public is less interested in it (AMR)."

HP04

"Oops! The spread of COVID has made it more difficult to go to the area and do activities. The public will focus on COVID-19 rather than other issues like this."

PHP06

"It's very effective because for most of the training, any meeting requires people to come together, so COVID-19 has an effect."

VHV04

Discussion

This study offers deeper insight into Strategy 5 to raise people's knowledge of antimicrobial resistance and their awareness of the rational use of antimicrobial drugs by identifying nine influential factors affecting policy implementation. At the local level, a key factor was strong

empowering and strengthening the networks and support roles of Networks to increase public understanding of AMR and the rationale use of antimicrobials. In addition, spending the budget on educational media production was also influential. The target group was village health volunteers (VHV) to help officers going down to raise knowledge of AMR, and awareness of AMU was also crucial. The strength of this study was showing which factors were common and specific in the implementation of Strategy 5 to raise people's knowledge of antimicrobial resistance and their awareness of the rational use of antimicrobial drugs. This strength came from comparing data among key informants, including hospital pharmacists, provincial health office pharmacists, and village health volunteers. The nine factors are consistent with factors that affect the process of implementing public policy, as synthesized by Chandarasorn (2009). The studies show the factors, including policy, networks, resources, executive, environment, officer, target group, public relations, and coordination. The network factor is one of the factors considered as a strategy of Strategy 5 used to implement strategic activities that are successful. Therefore, it is in line with the information obtained from key informants.

Practitioners view that the policy can solve the problem of antimicrobial resistance because the strategic action on building networks and strengthening networks of health workers applied for policy implementation will help prevent the emergence of AMR. Knowledge creation is necessary to make the target group remember the correct knowledge for the rest of their lives. The strategy is clear in that its objectives are to tackle AMR, it is flexible, and it can be applied in the area, making policy objectives encompass public knowledge and awareness solutions. This study is consistent with Poyoi's (2017) study that if a policy's goals and objectives are precise, feasible, and consistent, the policy objectives will likely be achieved. Jimba's (2014) study concluded that policy flexibility results in more policy implementation by practitioners. This research was consistent with Ali's. (2017) finding that health policy implementation performance in primary health care is associated with a higher level of clarity of goals and objectives. Therefore, the goals and objectives of the policy are clear and easy to implement, which will help implement Strategy 5 more successfully.

Empowering and strengthening the networks and support roles of Networks increases public understanding of AMR, and the rationale use of antimicrobials. This was a strategic action of Strategy 5 to raise public knowledge on AMR and awareness of the appropriate use of antimicrobials. This study is consistent with Brynard's (2009) relationship of factors influencing successful policy implementation, which states that network use is utilizing one's personal–informed

relationship with others to gain access to or control over resources. Therefore, the network is an important factor that drives the implementation of Strategy 5 in the area.

The target group factor is one of the factors affecting the success of the implementation of the policy of Chantrasorn's (2007). Village health volunteers (VHV) have a role in advising, disseminating, and disseminating health knowledge, including providing health education to change health behaviors, care, and monitoring to help solve public health problems, surveillance, prevention, and disease control (Rasiri et al., 2021). Therefore, it is appropriate that most of the key informants place importance on creating knowledge and awareness about VHVs because VHVs will help create knowledge about drug–resistant pathogens among the people in the area. Anunta and Tonganake (2019) studied the effectiveness of home visits and training programs for village health volunteers in Khwao, Selaphum, Roi, Et. 2012. The study found that after providing the home visit program and training, the knowledge and practice of VHVs significantly improved. In addition, the study of Miaim et al. (2020) found that the overall roles of the VHVs were at a high level, so AMR training for VHVs was an essential part of the success of Strategy 5.

Key informants said there is still a need for more staffing, which directly affects the implementation of Strategy 5 in areas where activities do not occur or are intermittent and only cover some areas. Personnel shortages are an obstacle to policy implementation. Berrou (2019) found that the shortage of antimicrobial stewardship program team members has also been suggested as a significant barrier to ASP adoption and implementation in Saudi MoH hospitals. Regarding personal competence and teamwork, it is sufficient to carry out activities according to Strategy 5 to be successful. The results of this study are consistent with Van Meter and Van Horn's (1975) point of view on the qualifications of personnel responsible for implementing policies. It is an important factor that influences or affects the success or failure of policy implementation.

The executive factor is an important factor that makes the implementation of Strategy 5 successful (Kaewoyaem et al., 2023). Key informants said that executives provided support and motivation to work, affecting the implementation of Strategy 5 activities because workers would have excellent morale. The results align with the study of Kotsombutt (2023), who stated that the factors contributing to the way of command influenced work motivation to a large extent. It also aligns with Yavaprabhas's (2005) concept that leadership competence, leadership, and cooperation influence policy implementation's success.

Coordination, both internal and external to the organization, is an important factor that will make the implementation of Strategy 5 highly successful. Because if the operators have a good

relationship within and outside the department, activities will be carried out smoothly and continuously, and if personnel inside and outside the organization have a correct and consistent understanding, the policy will be successful. Chou (2008) explored organizational structural and process factors that facilitate the implementation of National Foundation for Infectious Diseases/Centers for Disease Control and Prevention strategies in U.S. hospitals and found that coordination was all associated with implementing strategies for optimizing antimicrobials.

Public relations using appropriate channels will make Strategy 5 successful, especially fast, and appropriate communication channels will make Strategy 5 convenient and easy to drive. This study aligns with Prakobchart's (2016) study, which concluded that effective complaint handling and public relations management or policy information, such as brochure, placards, or boards informing project information, should be clearly and easily understood and let the public know thoroughly. Therefore, a form of public relations suitable for the local context will make policy communication more accessible to the public.

The results show that if an agency has sufficient resources, it will be able to implement the policy and achieve complete success. Regarding the budget, most key informants reported that the budget needed to be increased for activities and that they had to manage other budgets for activities. This study is consistent with Rattanataworn's (2015) that the budget for organizing activities to promote health needs to be increased. This study is also consistent with the recommendations of Koonjaetong (2012) on organizational support affecting the performance of committee members of the strong and sustainable disease and health hazard prevention and control district in Khon Khan province that there should be effective budget management. Therefore, the budget is a resource factor that must be sufficient and used correctly, thoroughly, efficiently, and for maximum benefit. Media and equipment are sufficient for organizing activities according to Strategy 5. Key informants know where to get media support and materials, making it easier to drive events. As for the availability of materials and equipment, if they are suitable and sufficient for use, they can solve problems in an emergency (Rajchawangmuang, 2016). Notably, there should be a management plan, care, and appropriate maintenance of materials and equipment for sustainability (Saophun & Sahapattana, 2019).

Key informants discussed socio–economic and political factors affecting the implementation of Strategy 5. This study is in line with Rittikrai's (2016) study, which found that social conditions, local influence and interest group pressures, and economic conditions have a high effect on policy implementation, while local economic and political pressures at both national and local levels have

a moderate effect on policy implementation. This study is also consistent with Klinubol's (2008) study, which concluded that economic and social factors affect policy implementation. People with high incomes will be more involved in policy implementation. For political reasons, a political party in the government would regularly come to help the community, and the people never objected to such policies. Emergency disease factors such as COVID–19 has a wide impact on the economy and society regionally and globally (Phra Sangwongdee, 2020). The impact of COVID–19 significantly affects activities according to Strategy 5 because people cannot participate in related activities, and those in charge of activities do not have time to perform activities according to Strategy 5. However, the New Normal way of life makes people clean, reducing the problem of bacterial infections. On the other hand, people use more antimicrobials due to misunderstandings (Knight et al., 2021). Therefore, emerging disease factors directly affect policy implementation.

Knowledge from Research

This study generates knowledge that is an important factor in implementing Strategy 5 to strengthen knowledge on AMR and awareness of rational AMU among the public. These factors will enable Strategy 5 to succeed in raising knowledge about AMR and awareness about AMU, as shown in Figure 2.

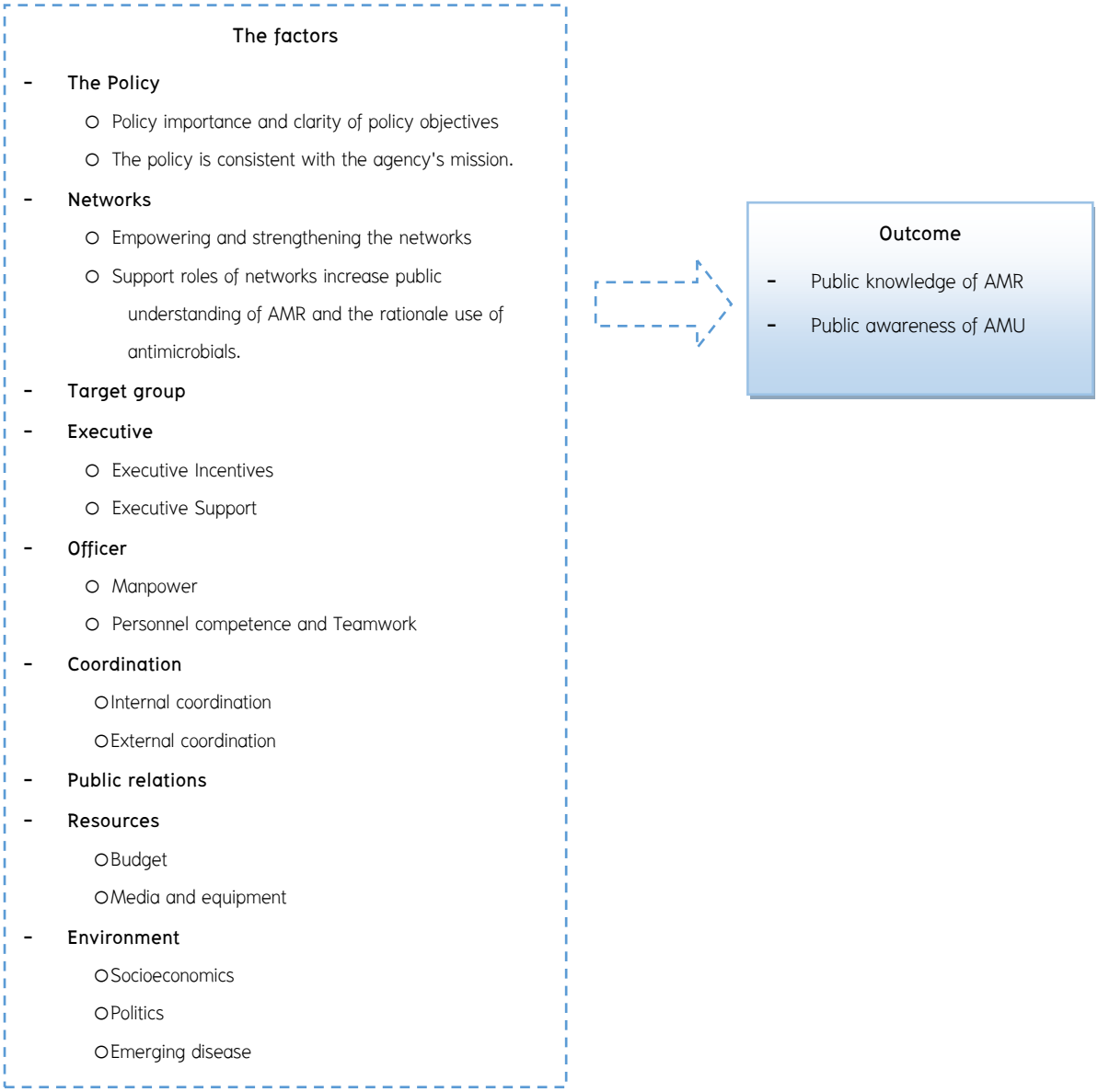

Figure 2 The factors contributing to the outcomes of Strategy 5

Conclusion

This study investigates the factors contributing to the National Strategic Plan on AMR Strategy 5 outcomes. The study found that nine important factors affected the outcome of Strategy 5. The policy factor can solve the problem of antimicrobial resistance by building and strengthening a network for health workers and the public to have knowledge of AMR and raise awareness about the rationale of antimicrobial use, which is consistent with the agency's mission. The networks factor: building the strength of the network will make the network more willing to work. Target groups factor, including VHVs, local administrative organizations, and youth, are all

important target groups that make Strategy 5 successful and sustainable. Officer factors, key components are manpower, teamwork, and personnel competence, which are essential to making Strategy 5 driveable in the area. Executive Incentives and support are executive factors that make practitioners want to participate in activities related to Strategy 5. The public relations factor is a factor that helps the target group gain more access to information related to Strategy 5. Coordinating factors, both internal and external, make the activity successful. Resource factors, including budget, media, and equipment, all affect the implementation of Strategy 5 in the area because if these factors are insufficient, it will be challenging to drive activities. Environmental factors such as socio–economic, political, and emerging diseases all affect the cooperation of the target groups to participate in activities according to Strategy 5.

Suggestion

The results of this study can be used as information to develop the National Strategic Plan on AMR in the second phase (2023–2027). The results of this study will complete the National Strategic Plan and solve the problem of antimicrobial resistance in terms of raising knowledge of AMR and awareness of AMU. This study is qualitative research. In the future, there should be a quantitative study to find factors affecting the implementation of Strategy 5 more comprehensively.

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