Meeting Report

WORKSHOP ON ANTIMICROBIAL STEWARDSHIP AND RATIONAL DRUG USE IN THE PACIFIC ISLAND

15–16 March 2018

Denarau, Fiji

World Health Organization
Western Pacific Region

WORLD HEALTH ORGANIZATION

REGIONAL OFFICE FOR THE WESTERN PACIFIC

RS/2018/GE/11(FJI) English only

MEETING REPORT

WORKSHOP ON ANTIMICROBIAL STEWARDSHIP AND RATIONAL DRUG USE IN THE PACIFIC ISLAND COUNTRIES

Convened by:

WORLD HEALTH ORGANIZATION

REGIONAL OFFICE FOR THE WESTERN PACIFIC

Denarau, Fiji
15–16 March 2018

Not for sale

Printed and distributed by:

World Health Organization
Regional Office for the Western Pacific
Manila, Philippines
June 2018

NOTE

The views expressed in this report are those of the participants of the Workshop on Antimicrobial Stewardship and Rational Drug Use in the Pacific Island Countries and do not necessarily reflect the policies of the conveners.

This report has been prepared by the World Health Organization Regional Office for the Western Pacific for those who participated in the Workshop on Antimicrobial Stewardship and Rational Drug Use in the Pacific Island Countries in Denarau, Fiji from 15 to 16 March 2018.

CONTENTS

Keywords: Drug resistance, Microbial / Antimicrobial stewardship / Public health / Pacific Islands

SUMMARY

Antimicrobial resistance (AMR) is a serious public health concern that can affect the achievement of universal health coverage and Sustainable Development Goals. AMR occurs naturally, but inappropriate use of antimicrobials in humans and animals is accelerating the process. The *Global Action Plan on Antimicrobial Resistance* highlights the importance of optimizing the use of antimicrobials and identifies the development of systems for antimicrobial stewardship (AMS) as a key intervention to stop their overuse and misuse in health-care settings and in the community.

In recent years, the Pacific islands countries and areas (PICs) have made important gains to improve access to medicines and to optimize the use antimicrobials by further developing an essential medicines list (EML) and the introduction of standard treatment guidelines. However, challenges related to procurement, registration, interrupted supply and stock-outs of medicines in various parts of the Pacific contribute to irrational use of antimicrobials.

To help optimize the use of antimicrobials, the AMS programme needs to also encompass sustainable supply systems to ensure availability of antimicrobials when needed as well as the monitoring of antimicrobial consumption. Though AMS is primarily important in the health and animal sector, it encompasses actions from many stakeholders, including the pharmaceutical industry, the trade sector, professionals and the public as a whole.

The subregional Workshop on Antimicrobial Stewardship and Rational Drug Use in the Pacific Island Countries was held in Denarau, Fiji, from 15 to 16 March 2018. It was organized by the World Health Organization and focused on identifying priority areas of action that will inform the development of country-specific actions to ultimately promote rational use of antimicrobials in PICs. The workshop brought together the heads of pharmaceutical departments and heads of national drugs and therapeutic committees from health ministries to share experiences and discuss challenges and barriers related to irrational use of antimicrobials and how AMS and monitoring of antimicrobial consumption can contribute to rational use of medicines.

Bringing together relevant experts and development partners provided a unique opportunity for discussions on establishing of AMS structures strategically at the country level and at the operational level in hospitals across the Pacific. The workshop participants also reviewed current practices on how EMLs are developed in different countries and shared current practices. The workshop additionally provided an opportunity to exchange lessons learnt and foster future collaborations.

Key messages:

- National action plans on AMR in the PICs provided strong political commitment for the development and introduction of AMS programmes at the system level.
- Developing and disseminating standard treatment guidelines are essential to rationalize the use of antimicrobials in PICs.
- Revising the EML and strengthening drug registration systems in the PICs will help address issues of interrupted supply and frequent stock-outs of medicines as well as resolve difficulties in ensuring the quality of the antimicrobial products.
- Generating reliable and comparable national consumption data over time and across PICs will help guide AMS interventions.

- There is need to collect information on the level of use and types of antimicrobials used.
- The role of legislation and particularly its importance in balancing the access to effective antimicrobials and regulating their inappropriate use is important.
- Developing AMS in most PICs will be an incremental process and particularly strong technical support is required.

1. INTRODUCTION

1.1 Meeting organization

The Workshop on Antimicrobial Stewardship and Rational Drug Use in the Pacific Island Countries was held in Denarau, Fiji from 15 to 16 March 2018. It was attended by 23 nominated experts from 13 countries in the South Pacific (Cook Islands, Fiji, Kiribati, Marshall Islands, Federated States of Micronesia, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu).

1.2 Meeting objectives

The objectives of the workshop were:

1) to discuss factors contributing to irrational use of antimicrobials;
2) to identify ways to strengthen antimicrobial stewardship programmes in order to improve rational use of antimicrobials; and
3) to formulate immediate steps and long-term strategies to implement antimicrobial stewardship in Pacific island countries.

2. PROCEEDINGS

2.1 Opening session

Dr Socorro Escalante highlighted antimicrobial resistance (AMR) as a significant threat to global health, food security and development in general. One of the biggest drivers of AMR is the overuse and misuse of antibiotics. Developing systems for antimicrobial stewardship is the key intervention to help address the irrational use of antimicrobials in the human health and animal sectors.

Following the opening remarks, Dr Escalante introduced the workshop objectives and agenda and encouraged participants to use the meeting as an ideal platform to share country experiences.

Dr Caryl Labe and Mr Apolosi Tmani Vosanibola were elected as co-chairpersons of the workshop. The list of participants is in Annex 1 and the meeting timetable in Annex 2.

2.2 Updates on antimicrobial resistance

Dr Socorro Escalante gave a presentation on the AMR strategies in the Western Pacific Region and actions to combat a global threat. She framed AMR as an issue on the development agenda in the context of universal health coverage (UHC), One Health and the Sustainable Development Goals. UHC plays a vital role in protecting patients from the financial burden that can arise from AMR. Containment of AMR also links directly to Sustainable Development Goals 1, 2, 3, 6, 8, 12 and 17. As regards the common factors driving resistance in humans and animals, Dr Escalante highlighted the need for coordinated strategies to control AMR involving multiple sectors: human and animal health, agriculture, food production and food safety, environmental protection, and trade. She also pointed out the importance of raising awareness and advocacy to drive and sustain actions and change.

Presenting on antimicrobial stewardship (AMS) as a necessary component of the global fight against AMR, Dr Ketevan Kandelaki emphasized that the misuse of antimicrobials is accelerating the development and spread of AMR. Therefore, establishing the AMS structures at the hospital and

national levels is critically important to promote rational use of antimicrobials. She further provided an overview of AMS components and approaches. To ensure the sustainability of AMS, accountability and leadership are crucial. Carefully and well-planned governance structures at both the strategic and operational level are key to developing and implementing sustainable AMS programmes. Such programmes also require a clear component of monitoring and evaluation and close cooperation and communication with practitioners (doctors, nurses, etc.) to design a programme fit to their needs. Dr Kandelaki said that further capacity-building will be provided to Member States in order to initiate actions on AMS and on relevant guidelines and tools.

The WHO-produced documentary on AMR "Confronting Antimicrobial Resistance in the Western Pacific" (https://www.youtube.com/watch?v=2YWA7akkm4A) was shown. The video explains what AMR is, and how it has developed and spread. It calls for joint actions to ensure continuity of successful treatment and prevention of infectious diseases with effective and safe medicines.

2.3 Antimicrobial resistance in the Pacific

On the progress of implementing and developing national action plans (NAPs), Mr Asaeli Raikabakaba compared AMR to another "tsunami", referring to increased rates of resistant pathogens seen in most Pacific countries. Lack of regulations, policies and guidelines, as well as weak supply chain and distribution systems were identified as common factors driving AMR in the Pacific. He further highlighted cultural beliefs, poor adherence to treatment and irrational prescribing as common behaviours contributing to the emergence and spread of AMR. Mr Raikabakaba said that key to overcoming the various challenges in the Pacific are coordinated efforts and a multisectoral approach.

Mr Aharoni Majol Viliamu gave a brief overview of the health system and shared the country's experience with shortages and stock-outs of antibiotics. He said that the availability of pharmaceutical stocks has improved, particularly after the National Health Service (NHS) reverted to the annual tender procurement system with a new framework contract for medicines and consumables. He shared challenges relating to manufacturing/production, the controlled stocks in specific markets and delays in awarding the tenders. He explained that without the antibiotics clinicians are unable to effectively treat patients and that prescribing habits and not using antibiotic treatment guidelines give rise to irrational use of antimicrobials,

Mr Timmy Manea presented on the high demand for antimicrobials and impact of irrational use in Solomon Islands. He said that the country's situational analysis was conducted in 2017 and covered: governance and leadership; rational use of medicines; quality and supply of medicines, especially to provincial areas; laboratory capacity; animal/aquaculture and private sector; and intersectoral awareness and collaboration. The assessment pointed out challenges related to dispensing medicines on demand, use of alternative treatments due to stock-outs, and improper diagnosis and cultural behaviour. A case in point is the practice of health workers who take medicines and antibiotics and store them for when needed. He discussed issues from the patient perspective, including sharing antibiotics, treatment compliance issues, demanding the antibiotics upon consultation and beliefs on taking antibiotics before going diving at night. Mr Manea emphasized that strengthening legislation and public health awareness on AMR is important for Solomon Islands.

Mr Natano Elisala gave a presentation about antimicrobial use for tuberculosis (TB), including challenges and successes in Tuvalu. Tuvalu has the fourth highest notification rate of TB among PICs,

after Kiribati, Papua New Guinea and the Marshall Islands. Mr Elisala highlighted that non-compliance with treatment often results in increased number of default cases, requiring prolonged treatment regimens and eventually contributing to increasing rates of resistance. He also mentioned that all TB cases are treated on the capital island, with dedicated teams in the outer islands carrying out contact tracing and referrals. The pharmacy stores have a dedicated storage for TB medicines.

Regarding the quality of antimicrobial products in Tonga, Ms Melenaite Mahe highlighted that the low availability of quality data on quantifications, forecasting, procurement processes, and financial and human resources often leads to medicine shortages. At the core, the absence of a national pharmaceutical law is a challenge for Tonga, creating problems in medicine registration, prequalification, market authorization and quality testing. Possible solutions include establishing a product registration system, strengthening the surveillance, and introducing good storage and distribution practices as well as establishing AMS programmes.

Presenting on the high demand for anti-infective and irrational use of medicines in Palau, Ms Clarette Matlab pointed out the policies for preventing the irrational use of antimicrobials, including an automatic stop for inpatient injection of antibiotics after three days, with a review needed before resuming injections. Further, TB drugs can only be prescribed by the TB unit and following the Directly Observed Treatment, Short Course (DOTS) protocol. For sexually transmitted infections (STIs), antibiotic prescription is verified by the Sexually Transmitted Infections unit or the prescribing physician.

Ms Matlab explained that there are still avenues for demand and irrational use, such as prescribing broad-spectrum antibiotics for minor and/or viral infections, borrowing or sharing antibiotics, and non-adherence to the treatment course. Selling medicines without prescription in private pharmacies and turnover of physicians, particularly from multiple countries with different guidelines, also contribute to irrational use of medicines. Next steps in Palau will be to finalize the NAP on AMR, continue to raise awareness among stakeholders, and update the essential medicines list (EML) and formulary and antibiotic guidelines.

While each country operates in a different political, social and economic context, the session highlighted some common challenges and opportunities on AMR in the Pacific:

- Quantifying the size and scope of AMR in the Pacific remains a challenge due to limited laboratory capacity, absence of AMR surveillance systems, and lack of mechanisms for collecting and validating antimicrobial consumption/use data.
- At a strategic/policy level, gaps in regulations, policies and guidelines are common factors driving AMR in the Pacific.
- At the operational level, interrupted supply and frequent stock-outs of medicines as well as difficulties in ensuring the quality of the antimicrobial products contribute to irrational use of medicines.
- At an individual level, cultural beliefs, patient demand and non-compliance with treatment fuel irrational use of antimicrobials. However, most countries identify this area as one of the most promising to combat AMR.

2.4 Which and how antibiotics are used in the Pacific

Dr Ketevan Kandelaki introduced WHO's model EML in relation to the lists in the Pacific. She compared across broad- and narrow-spectrum antibiotics and the share of anti-infectives from PIC EMLs among those in the model EML.

The most recent EML revision grouped antibiotics into three categories (ACCESS, WATCH and RESERVE) with recommendations on when each category should be used. Initially, the new categories apply only to antibiotics used to treat 21 of the most common general infections. If shown to be useful, they could be broadened in future versions of the EML to apply to drugs to treat other infections.

The change aims to ensure that antibiotics are available when needed and that the right antibiotics are prescribed for the right infections. It should enhance treatment outcomes, reduce the development of drug-resistant bacteria and preserve the effectiveness of so-called last-resort antibiotics that are needed when all others fail. These changes support the WHO *Global Action Plan on Antimicrobial Resistance*.

WHO recommends that antibiotics in the ACCESS group be available at all times as treatments for a wide range of common infections. For example, it includes amoxicillin, a widely used antibiotic to treat infections such as pneumonia.

The WATCH group includes antibiotics that are recommended as first- or second-choice treatments for a small number of infections. For example, the use of ciprofloxacin, used to treat cystitis (a type of urinary tract infection) and upper respiratory tract infections (such as bacterial sinusitis and bacterial bronchitis), should be dramatically reduced to avoid further development of resistance.

The RESERVE group includes antibiotics such as colistin and some cephalosporins that should be considered last-resort options and used only in the most severe circumstances when all other alternatives have failed, such as for life-threatening infections due to multidrug-resistant bacteria.

Dr Kandelaki emphasized that it is important that all antibiotics, regardless of which category they belong to, be prescribed and used appropriately, upon correct diagnosis, and with the optimal choice of the drug, duration of treatment and route of administration.

Ms Lepaitai Hansell moderated the subsequent plenary discussion on EML development in PICs. Countries identified influential factors and opportunities to strengthen the EML as a tool to rationalize the use of antibiotics. Key incentives to revise EMLs include increasing resistant pathogen profiles and raising the cost-effectiveness of the treatments.

Most country representatives agreed that the drug and therapeutic committee (DTC) in each country should, in theory, play a crucial role in developing and revising the EMLs and are an appropriate mechanism to advise which antibiotics should be on the EML. In practice, however, countries fail to make full use of their DTC. They cited unclear terms of references, heavy workloads and conflicting priorities of committee members as reasons why the DTC often meets infrequently and plays an insufficient role as guardian of the EML.

Representatives from Vanuatu and the Cook Islands pointed out that WHO supported and guided the initial development of their EMLs, but that the DTCs are only required to conduct quarterly revisions of the list.

Discussions also focused on ownership of the EML, particularly when external partners are engaged in the development process. Country DTC engagement in EML development was identified as a guarantee for higher ownership and accountability and utilization. Also discussed was the issue of patients who are treated overseas and then return to the Pacific in need for medicines that are not available on the EMLs. In most countries, each case is treated on an individual basis and DTCs are responsible for reviewing the prescribed medicines and agreeing on a potential solution. This might also include sending the patient out of the country again to continue treatment.

The session discussions emphasized the following:

- Regular, scheduled revisions of the EMLs are important to ensure the availability of the medicines and to promote rational use of antimicrobials.
- The EML revision and update is time-consuming and addition of medicines usually follows a multi-step process.
- To strengthen and ensure ownership of countries for the EML, it is very important to engage local DTCs in the process.
- Using available consumption data from the pharmacy department supports and guides the EML revisions.
- It is also important to look at costing of the overall drugs to explore it is worthwhile to use the cost-effectiveness health technology assessment to introduce the drug in the country and to consider the findings in the decision-making process.

2.5 Antimicrobial stewardship in the Pacific

On the AMS programme in Papua New Guinea, Dr Duncan Dobunaba explained that the multisectoral NAP on AMR 2017–2020 was adopted based on a robust situation analysis and after consultations with stakeholder groups from different sectors. The NAP created the framework and legal basis to develop the AMS programme. Papua New Guinea lacks both technical and financial resources to operationalize the programme in the country. Though, like in many other PICs, it is difficult to adopt a full-fledged AMS programme in the short run, small steps can be taken such as improving awareness of health workers or on infection, prevention and control. Dr Dobunaba pointed out that it is equally important to have stronger programmes on AMR advocacy and multi-stakeholder/public engagement.

Ms Lisa Barrow highlighted common challenges in many hospitals in the Federated States of Micronesia with regard to AMS, such as excessive duration of treatment, low rates of treatment de-escalation, and misconceptions about colonizer, contaminant and true pathogens. Ms Barrow also presented a baseline study on the duration of therapies prescribing amoxicillin, ciprofloxacin and ceftriaxone. The study found that medicines were overused, particularly antibiotic use for viral respiratory infections, with limited de-escalation. She pointed out that political commitment and accountability are crucial to implement an AMS programme successfully, as is expertise in drugs and infectious diseases. Fundamental steps and components of AMS are: implementing at least one recommended action, such as systemic evaluation of ongoing treatment after a set period of initial

treatment; monitoring antimicrobial consumption/use and resistance patterns; regularly reporting information on AMR and antimicrobial consumption/use to AMS teams; and providing continuous education to clinicians and health providers about AMR and optimal prescribing.

Ms Uhjin Kim spoke about the role of the medicines and therapeutic committees in promoting the rational use of antimicrobials. Such committees are set up the national level or in hospital settings to bring together multidisciplinary stakeholders to ensure that patients are provided with safe and quality care. Functions include making decisions on the selection of medicines on the EML based on the national standard treatment guidelines (STGs) and monitoring prescribing, usage and adherence to clinical guidelines by prescribers.

In the Pacific, all countries except Nauru have national medicines and therapeutic committees in place. However, despite their crucial role, many are inactive or meet infrequently to be fully functional. The representatives from the Cook Islands, Kiribati, Federated States of Micronesia, Palau and Samoa said that busy work schedules did not allow for the committees to meet on a regular basis. The representatives from Niue and Vanuatu felt there were not enough issues to be discussed on a regular basis unless EML and STG revisions are under way. The representative from Tonga also raised the issue that membership of various committees is limited a small group of experts. DTCs can be revitalized if people saw their importance more clearly. The representative from Samoa suggested that DTCs could contribute to improving clinical governance and the representative from Fiji recommended that the DTC advisory role to the minister of health should be strengthened. The representative from Vanuatu also proposed that incentives are needed for clinicians to be more actively involved. Dr Escalante emphasized that DTCs should be a problem-solving mechanism to address issues of unavailability of medicines and irrational use.

2.6 Antimicrobial stewardship programmes

Dr Kirsty Buising shared comprehensive insight into setting up and running an AMS programme at the hospital, drawing on the experience of the Royal Melbourne Hospital and the National Centre for Antimicrobial Stewardship. She provided a brief overview of in-hospital use of antimicrobials, highlighting that almost 75% of inpatients receive antibiotics during their admission and about 40–50% of inpatients receive an antibiotic on any given day. The prescriptions are often for prophylaxis, and 25–50% of antimicrobial use in the hospitals is inappropriate. Misuse of antimicrobials causes harm, whether it is suboptimal therapy or drug toxicity. According to Dr Buising, the focus of the AMS programme should be on *patient safety*, given that AMS is about quality and safety. She emphasized that patients are central and the aim is to provide evidence-based care without posing unnecessary harm through inappropriate use of antimicrobials. AMS is a whole-of-hospital activity, part of the everyday practices, but also targets changing and optimizing the prescribing behaviour of health workers. Dr Buising highlighted that the overall responsibility and accountability for implementing the hospital AMS programme lies with the hospital management. AMS governance structures as well as committee roles and responsibilities were presented and discussed.

Dr Buising further elaborated ways to strengthen AMS programmes in the hospitals in order to improve the rational use of antimicrobials. She again emphasized that the target is to give every patient appropriate care with minimal collateral damage and maximal benefits. Setting an organizational culture with collective values, beliefs and principles such as mutual accountability, transparency, commitment to deliver high-quality and safe care, and evidence-based practices are crucial for AMS programmes.

Furthermore, it is important to work towards behaviour change through AMS advocacy and communication campaigns that address the following questions:

- How are we addressing the current knowledge level?
- How are we changing the attitudes?
- How are we making it easy to do?

Dr Buising emphasized that AMS is not a separate activity owned by individual professional groups, but rather is everyone's business and should always keep patient safety as the core. Doctors, nurses and pharmacists should be part of a multidisciplinary system. Key AMS strategies are providing education to multidisciplinary teams, and endorsing and implementing the guidelines.

Behaviour change must be considered when planning AMS interventions. Simple interventions such as clear documentation of prescriptions facilitate reviews of prescriptions and contribute to rational prescribing. Stepwise algorithms for point-of-care interventions, clinical pathways and checklists make it easy for health practitioners to monitor the duration of the treatment and revise the prescriptions. A switch from intravenous to oral medications to optimize treatment helps empower staff involvement in the AMS programme. To facilitate continuous learning and improvements, audits and reports are important to provide feedback to stakeholders, prescribers and the AMS team.

Dr Ketevan Kandelaki described how tools such as AMC monitoring can be used to guide AMS interventions. AMC and AMR surveillance are fundamental components of a framework for action for health system strengthening. AMC monitoring: provides information on the patterns of use and change over time; evaluates the impact of information efforts, regulatory and policy changes; and identifies the targets for AMS interventions. She pointed out that without proper knowledge about what drug is actually being used and how it is being used it is very difficult to improve rational drug use. Dr Kandelaki introduced the Anatomical Therapeutic Chemical (ATC) classification system that is used for active ingredients of drugs according to the organ or system on which they act. She highlighted that for AMC monitoring purposes the medicines from the anti-infectives for system use are monitored. However, the methodology equally applies to other groups of medicines. She briefly listed the potential sources of data for AMC monitoring and emphasized that it is important to be aware of factors influencing drug use, such as legislation, stock-outs, attitudes, the role of the pharmaceutical industry, price, and morbidity when analysing and interpreting the data. Critical points in the drug utilization study cycle are providing feedback to prescribers and responsible individuals in health administration, holding discussions around what is appropriate prescribing, and closely following up.

The plenary discussion covered the following:

- the role of the hospital management in setting up the AMS programme and ensuring its sustainability at the system level;
- how to set standards for and registration and licensing of health facilities and health workers prescribing antibiotics;
- how to establish a hierarchical classification of antimicrobials in the hospitals;
- establishing a monitoring system to make evidence-based interventions; and
- the value of using AMC to identify the availability, types and quantity of the medicines.

2.7 Antimicrobial resistance strategies in the Western Pacific Region

Dr Socorro Escalante introduced the Western Pacific Region's antibiotic stewardship accountability framework. She argued that the current approach, which covers mainly the rational use of antibiotics among professionals and consumers in the animal and health sector, is important and critical but may not be sufficient to fully address overuse and misuse of antibiotics. This approach does not address the complex nature of stewardship along the antibiotic supply chain. The trade and economic issues complicating antibiotic use also need to be addressed. To this end, the WHO Regional Office for the Western Pacific is proposing to establish a high-level accountability and monitoring mechanism that involves all stakeholders.

The accountability framework aims to cover: research and development of new antibiotics and diagnostics (where feasible), production, supply, marketing, ethical practices, professional guidance and practice, and consumer awareness. The framework should bring together all stakeholders (governments, pharmaceutical and food industry, professionals and consumers) to commit and be held accountable to ensure availability and sustainability of safe, quality and effective antibiotics and stop their misuse and overuse.

The stewardship initiative will serve as a mechanism to forge high-level commitment of key stakeholders in the Region to the accountability framework.

Mr Emmanuel Eraly presented on initiatives of the WHO Regional Office for the Western Pacific and its strategic framework for AMR advocacy and behaviour change. The Regional Office's strategic framework provides a strong direction for WHO to support Member States to conduct advocacy, communications and behaviour change activities. The most visible expression of this has been the observance of the Antibiotic Awareness Week for the past three years. Since its inception in 2015, Antibiotic Awareness Week has become a significant event in all Member States in the Region, and 2017 was the first year of the campaign in which events were organized in all Member States. In addition, in an increasing number of countries, it is being observed by different sectors (human health, animal health, environmental health and trade sectors).

Social media has become one of the most important platforms to raise awareness on AMR. Tapping into this trend, the Regional Office launched a "race" to a million pledges with the aim to commit stakeholders across sectors in the Western Pacific Region to take small, practical actions to combat AMR. PICs have responded well to the call for pledges.

While Antibiotic Awareness Week provided a good opportunity to increase awareness, increased awareness and knowledge does not necessarily translate into practice. Mr Eraly explained that the path to action is complex and awareness is only the first step. A few techniques were introduced to help move countries from awareness and knowledge to sustainable action.

Moreover, the results of a number of international studies were shared, pointing to strong evidence that education is an important mechanism to promote behaviour change. Research suggests that parents also have a strong influence, but the impact of mass media campaigns is limited. Both in the Region and globally increasingly more resources will be devoted to behaviour change in the next few years.

The discussion highlighted the following points:

- Country representatives expressed interest in the accountability framework, but requested the Regional Office to undertake more research to concretize the concept, particularly the legal and operational aspects.
- Country representatives shared practical examples of how traditional practices influence the behaviour towards overuse and misuse of antibiotics.
- Country representatives requested having front-line health workers as potential advocates for behaviour change and involving health workers in such campaigns in the PICs.

2.8 Strategies to implement antimicrobial stewardship in the Pacific

Dr Kirsty Buising provided her observations on a way forward for AMS programmes in the Pacific. She highlighted the need for coordinated actions across sectors at the national level, including hospitals, primary care facilities, elderly care facilities, and the veterinary and agriculture sector. The ongoing development of NAPs on AMR is important and will help foster commitment to develop AMS programmes in the Pacific, so efforts to this end should be continued. At the organizational level, hospital accreditation standards could provide a way to further develop or strengthen the AMS programmes. Dr Buising pointed out that AMS straddles two major areas at the government level:

- safety and quality (individual patient care, infection rates, morbidity/mortality, adverse drug reactions, infection prevention and control) and
- public health (broader issue, AMR and transmission of AMR, health-care costs, communicable diseases).

Examples from hospital AMS programmes from various studies were shared. Setting national targets for outpatient prescriptions, defining quality indicators and providing local feedback have proven to improve the rational use of antibiotics in hospitals. The importance of sustainable funding was also highlighted. Other ways forward included setting common strategies to implement guidelines and educational opportunities as well as the development and endorsement of national prescribing guidelines. In addition to a better regulatory framework, PICs could work on capacity-building of local staff and increased awareness of both staff and hospital visitors as key "soft" components.

2.9 Speed networking

Country representatives participated in a speed networking activity, identifying the support needed for implementation of AMS and rational drug use strategies. Workshop participants identified the short-term strategies to be carried out at the national and the hospital level (Annex 3).

2.10 Closing remarks and ways forward

In her closing remarks, Dr Socorro Escalante noted the encouraging progress around the PICs in general related to access to medicines, but also specifically on AMR and AMS

Participants shared what they had learnt during the workshop and expressed their interest in continued collaboration and sharing of AMC data.

Dr Escalante commended the wealth of activities currently ongoing in countries and called on Member States to provide WHO with very clear recommendations at both the policy level and operational level to enable WHO to strengthen its support to Member States At the policy level, the development of regulations with direct links to the AMS programme is very important, including medicines policies, revision of EMLs and finalization of the NAP. Participants also expressed the need for more information and understanding of the role of the agriculture sector. Another request from Member States was to help make existing policies actionable, for which the involvement of health workers is critical.

Operationally, countries wishing to develop an AMS programme would strongly benefit from templates, plans or frameworks in low-resource settings. Also, training for key personnel involved in the AMS programme remains a pressing need. Likewise, several PIC representatives pointed out that the introduction of new protocols by WHO requires close collaboration with clinicians. WHO could also play a role in the provision of technical support (strategic advice) to ensure a sustainable supply chain for antibiotics and essential medicines in general.

3. CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

This workshop provided a unique opportunity to discuss experiences and share challenges and solutions in establishing AMS programmes in PICs, promoting the rational use of antimicrobials and discussing the ways by which the capacity of countries to promote rational use of antimicrobials can be improved.

Factors contributing to irrational use of antibiotics

a. Weak process for the development and poor utilization of the essential medicines list and standard treatment guidelines by the health system

   Participants discussed the process and structure as well as the requirements for developing and revising the Essential Medicines Lists (EMLs particularly focusing on anti-infectives) in PICs. They highlighted ownership of the EML, especially for the cases when external partners are engaged in the development process. They identified country DTC engagement in the EML development process as a guarantee for higher ownership, accountability and utilization of the EML. Increase of resistant pathogen profiles and cost-effectiveness of the treatments were some of the drivers for revising the EMLs. Discussions also touched on the issue of patients treated overseas who return to countries with prescriptions that are not available on their countries' EML.

   Development and dissemination of standard treatment guidelines (STGs) are key to rational prescribing of medicines (including antimicrobials). Lack of implementation of national medicines policies, irregular revision of the EML and STGs contribute to irrational use of antimicrobials. STGs are often difficult to implement on a large scale, but contain many advantages for the patients, health-care providers, drug manufacturers and marketing agencies, and above all, the policy-makers and the legislative system of the country. Therefore, the availability and accessibility of STGs at health-care facilities is crucial. Further work shall be carried out to create awareness about STGs and to prioritize their implementation to build

capacity for medical professionals in utilizing STGs and rationally treating patients in their day-to-day clinical practice.

b. Stock-outs, procurement and quality of medicines

Frequent stock-outs of medicines are common in PICs and Pacific territories, contributing to irrational use of antimicrobials. Although significant improvement in terms of availability of medicines has been achieved, quality of medical products remains a challenge and many countries do not have pharmaceutical regulations in place. Quality assurance is limited, including laboratory capacity to monitor quality and safety and to prevent the proliferation of counterfeit and substandard medicines. Strengthening procurement and supply chain management is important to promote the rational use of medicines and ensure availability of medicines.

c. Lack of AMS programmes including the utilization of the monitoring tools

Lack of AMS programmes and of systematic monitoring of AMC and antimicrobial use – and therefore utilization and analysis of the data – contribute to irrational use of antimicrobials. Establishing the AMS programmes and regularly reporting information on antimicrobial use, AMC and AMR to AMS teams and providing continuous education to clinicians and healthcare providers about AMR and optimal prescribing are fundamental steps and components of AMS.

d. Local practices that contribute to irrational antibiotic use

A number of local practices and beliefs such as using antibiotics to prevent infections during tattooing and such to prevent flu or pneumonia among night divers may contribute to AMR. While the extent of the practice has not been systematically documented participants indicate that this could be a cause for concern. Unnecessary consumption and use of medicines also contribute to medicines stock outs and to limited availability of antimicrobials when they are truly necessary.

Ways to strengthen AMS programmes

Strategies to develop and strengthen AMS programmes were considered. An organizational structure for coordination and collaboration across teams is important. AMS should not be considered as a separate activity owned by individual professional groups, but rather everyone's business framed in the context of patient safety. It needs to involve multidisciplinary teams (doctors, nurses, pharmacists, etc.). Behaviour change must be considered when planning AMS interventions. Simple interventions such as clear documentation of prescriptions can facilitate the prescription audits and reviews and contribute to rational prescribing. Stepwise algorithms for point-of-care interventions, clinical pathways and checklists make it easy for health practitioners to monitor the duration of the treatment, revise the prescriptions as necessary, and optimize treatments and help empower staff involvement in the AMS processes. Audits and reports are important to provide feedback to stakeholders, prescribers and AMS team. Meaningful comparison of data on volumes and types of antimicrobial use as well as appropriateness of the prescriptions identifies targets for action.

Immediate steps and long-term strategies

a. Strengthening existing interventions and programmes
This includes: operationalization of medical therapeutic committees with an emphasis on AMS, training on the revised antibiotic guidelines and EML, audit of prescriptions as baseline data gathering, development and implementation of national action plans on AMR, and strengthening infection prevention and control interventions.

b. Tools to support the AMS strategies of infection prevention control
Developing tools to support AMS including monitoring of AMC is important. It was highlighted that without comprehensive and coordinated monitoring of AMC, efforts to prevent and contain AMR, establish and guide the AMS programmes and interventions, and promotion of rational drug use may be misdirected and insufficient, particularly with poor practices in place. Participants also stressed the role of microbiology laboratory surveillance and emphasized the limited lab capacity in PICs , for which further work for lab surveillance system strengthening is required.

c. AMR advocacy and awareness raising
The participants acknowledged the importance of awareness raising, building capacity for quality surveillance of AMR/AMC to inform evidence-based interventions, and strengthening infection prevention and control. Culture-specific examples of AMC and behaviour were shared and potential targets/topics for upcoming World Antibiotic Awareness Week were identified. PICs committed to further raise awareness on AMR and requested for WHO to provide more guidance as to how the impact of awareness and behaviour change campaigns can be measured. The involvement of health workers is important in developing these campaigns, but it was also emphasized that other groups have to be targeted too, such as children or people working in the animal health sector and so on.

Participants shared challenges (e.g. medicine stock-outs, lack of lab capacity and human resources) in combatting AMR and identified priority areas of action that will inform the development of country-specific actions to ultimately promote rational use of antimicrobials in PICs. There was broad consensus among the Member States that AMS structures at the hospital and at the national level have to be developed or further strengthened. Including the AMS programmes as criteria for hospital accreditation was one proposal for strengthening the AMS interventions at the national level. Member States also stressed that a full-fledged AMS system cannot be developed right away in most PICs, but incremental changes (such as clear documentation of prescriptions and treatment indications, putting patients at the centre of AMS programmes, development and dissemination of the treatment guidelines, etc.) are more realistic and feasible at this point. Member States requested that WHO provide technical guidance on the establishment of systems and also help facilitate peer-to-peer learning across the PICs.

3.2 Recommendations

3.2.1 Recommendations for Member States

1. Member States are encouraged to develop and implement their respective multisectoral national action plans on AMR aligned with the Global Action Plan on AMR, including the establishment of the AMS programmes at hospitals.
2. Member States are encouraged to establish AMS programmes at hospitals, as part of the implementation of their respective national action plans and the Global Action Plan on AMR with the goal to improve rational use and optimize the effectiveness of existing antimicrobials.
3. Member States are encouraged to identify ways to strengthen the AMS interventions at the national level, including listing AMS as part of hospital accreditation criteria.
4. Member States are encouraged to collect AMC data using the WHO AMC methodology to support decision-making in the use of antibiotics at the clinical and policy level.
5. Member States are encouraged to use the AMS programmes as a platform for awareness raising on AMR and promotion of rational use of medicines by providing continuous education and feedback to clinicians and health service providers.

3.2.2 Recommendations for WHO Secretariat

1. WHO is requested to continue to provide support to PICs on the development and implementation of national action plans on AMR.
2. WHO is requested to provide technical support and guidance on the establishment of effective AMS programmes in hospitals through a combination of education and training as well as the development of tools, guidelines, regulations and awareness raising. WHO is also requested to provide guidance and expertise to PICs on strengthening systems to improve rational use, including evidence-based review of EMLs and STGs, as well as guiding Member States to systematically embed AMS into routine hospitals/health-care setting operations.
3. upport Member States to initiate multisectoral AMS programmes, focusing on regulations and awareness on the use of antimicrobials in the agriculture, animal, aquatic and plant sectors.
4. WHO is requested to continue to provide guidance and support on awareness raising and behaviour change.
5. WHO is requested to strengthen guidance on developing a sustainable AMC/AMR surveillance system that generates data for action.

ANNEXES

Annex 1. List of participants

1. PARTICIPANTS	
Cook Islands	**Dr Yin Yin MAY**, Director, Hospital Health Services, Ministry of Health, P.O. Box 109, Avarua, Rarotonga, Tel. no.: +682 55965, Email: yin.may@cookislands.gov.ck
	Mr Andrew Francis ORANGE, Chief Pharmacist, Rarotonga Hospital, Ministry of Health, P.O. Box 109, Avarua, Rarotonga, Tel. no.: +682 22664 (Ext. 861), Fax no.: +682 23109, Email: andrew.orange@cookislands.gov.ck
Fiji	**Mr Apolosi Tmani VOSANIBOLA**, Acting Chief Pharmacist, Ministry of Health and Medical Services, Dinem House, Toorak Suva, Tel. no.: 892 1660, Fax no.: 338 8003, Email: avosanibola@govnet.gov.fj
	Mr Ravi Narayan NAIDU, Principal Medical Officer, Acting Consultant, Ministry of Health and Medical Services, Dinem House, Toorak, Suva, Tel. no.: +679 331 3444, Email: ravi22naidu@gmail.com
Kiribati	**Ms Teeteu TEKEAA**, Clinical Pharmacist, Ministry of Health and Medical Services , P.O. Box 268, Bikenibeu, Tarawa, Tel. no.: 73079995 Email: teeteutk@gmail.com
Marshall Islands	**Dr Caryl LABE**, Staff Physician, Internal Medicine, Majuro Hospital Majuro, Tel. no.: +692 456-6318, Email: caryl7879@yahoo.com
Micronesia (Federated States of)	**Ms Resel ELIAS**, Nursing Program Coordinator/ Pharmacist, Department of Health and Social Affairs, Palikir, Pohnpei, Tel. no.: (691) 922-3027 Email: relias@fsmhealth.fm
	Ms Lisa BARROW, Epidemiology and Laboratory Capacity Enhancement Coordinator/ National Laboratory Coordinator, Department of Health and Social Affairs, Palikir, Pohnpei, Tel. no.: 691-320-8300, Fax no.: 691-320-8460, Email: lbarrow@fsmhealth.fm
Niue	**Dr Jason TAUTASI**, Medical Officer, General Practitioner, Niue Hospital Alofi, Tel. no.: 00683-6648, Email: Jason.Tautasi@mail.gov.nu
Palau	**Ms Clarette MATLAB**, Chief of Pharmacy, Medical Supply and Purchasing Department/Chief of Ancillary Services, Ministry of Health Koror, Tel. no.: 680-488-2552 (Ext 257), Email: clarette.matlab@palauhealth.org

	Dr Ngirachisau MEKOLL, Director, Bureau of Hospital and Clinical Services, Ministry of Health, Koror, Tel. no.: (680) 488-2552, Email: ngirachisau.mekoll@palauhealth.org
Papua New Guinea	**Mr Vali KARO**, Manager, Pharmaceutical Service Standards Department of Health, Waigani, Tel. no.: +675 301 03887, Fax no.: +675 323 1631 Email: valikaro333@gmail.com
	Dr Duncan DOBUNABA, Acting Executive Manager, Medical Standards Department of Health, Waigani, Tel. no.: 675 728 88024 Email: duncan.dobunaba@gmail.com
Samoa	**Mr Aharoni Majol VILIAMU**, Manager, Pharmaceutical Service National Health Service, Apia, Tel. no.: (685) 767 6010 Email: aharoniv@nhs.gov.ws
	Ms Hinauri Lauasi LEAUPEPE-NGAUCHUN, Manager Laboratory Division, National Health Service, Apia, Tel. no.: +685 66651 Email: hinauril@nhs.gov.ws
Solomon Islands	**Mr Timmy MANEA**, Director of Pharmacy, Pharmacy Division Ministry of Health and Medical Services, Honiara, Tel. no.: 30895 Email: timmy.manea@nms.gov.sb
	Dr Jones GHABU, Physician, Ministry of Health and Medical Services Honiara, Tel. no.: 892 2121, Fax no.: 243 243, Email: jghabu@gmail.com
Tonga	**Ms Melenaite MAHE**, Principal Pharmacist, Central Pharmacy and Medical Store, Ministry of Health, Nuku'alofa, Tel. no.: 676 24-553, Fax no.: 676 25-434, Email: melenaitemahe@gmail.com
	Dr Lisiate ULUFONUA, Medical Superintendent, Ministry of Health, Tel. no.: 676-24553, Fax no.: 676-25434, Email: L.ulufonua@gmail.com
Tuvalu	**Mr Natano ELISALA**, Acting Director of Health, Princess Margaret Hospital, Ministry of Health, Funafuti, Tel. no.: 688 20480 Email: natano_elisala@yahoo.com
	Dr Suria Elisala PUAFOLAU, Medical Doctor, Princess Margaret Hospital Ministry of Health, Funafuti, Tel. no.: 688 20480 / 688 700 6111 Email: surieli16@gmail.com
Vanuatu	**Ms Agnes MATHIAS**, Acting Principal Pharmacist, Ministry of Health Port Vila, Tel. no.: (0678) 7391533, Email: magnes@vanuatu.gov.vu

	Dr Sereana NATUMAN, Senior Consultant, Internal Medicine, Vila Central Hospital, Ministry of Health, Port Vila, Tel. no.: (678) 711 6615 Email: sereananatuman@gmail.com
2. TEMPORARY ADVISERS	
	Dr Kirsty Buising, Infectious Diseases Physician, Victorian Infectious Diseases Service, The Royal Melbourne Hospital, 46 Bowen Crescent, Princes Hill, Victoria, Australia 3054, Email: kirsty.buising@mh.org.au
3. OBSERVERS	
Pacific Paramedical Training Centre (PPTC)	**Mr Russell Cole**, Laboratory Quality Manager, Pacific Paramedical Training Centre (PPTC), Wellington 6242, New Zealand, Email: russellc@pptc.org.nz
4. SECRETARIAT	
WHO/WPRO	**Dr Socorro ESCALANTE**, Coordinator, Essential Medicines and Health Technologies, World Health Organization, Regional Office for the Western Pacific, United Nations Avenue, Manila, Tel no. :+ 63 2 528 9846 Email: escalantes@who.int
	Dr Ketevan Kandelaki, Technical Officer, Essential Medicines and Health Technologies, World Health Organization, Regional Office for the Western Pacific, United Nations Avenue, Manila, Tel: +63 2 5289848 Email: kandelakik@who.int
	Ms Uhjin KIM, Technical Officer, Essential Medicines and Health Technologies, World Health Organization, Regional Office for the Western Pacific, United Nations Avenue, Manila, Tel no.: + 63 2 528 9028 Email: kimu@who.int
	Mr Emmanuel Eraly, Technical Officer, Essential Medicines and Health Technologies, World Health Organization, Regional Office for the Western Pacific, United Nations Avenue, Manila, Tel: +63 2 5289026 Email: eralye@who.int
WHO/WCO	**Mr Asaeli Babiau RAIKABAKABA**, Technical Officer, Essential Medicines and Health Technology, Division of Pacific Technical Support World Health Organization, Suva, Fiji, Tel.: + 679-323 4100 E-mail: raikabakabaa@who.int
	Dr Lepaitai Blanche HANSELL, National Professional Officer World Health Organization, Ioane Viliamu Building, Beach Road Apia, Western Samoa, Tel.: + 82608, Email: hanselll@who.int

Annex 2. Meeting timetable

Time	Thursday 15 March	Time	Friday 16 March
08:30-09:00	Registration	08:30-10:00	**2. Antimicrobial Stewardship Programmes** · AMS in the hospitals and the role of interdisciplinary team - Dr Kirsty Buising, NCAS, Australia · Ways to strengthen AMS programmes in the hospitals to improve rational use of antimicrobials - Dr Kirsty Buising, NCAS, Australia · Antimicrobial Consumption (AMC) Monitoring to guide the Antimicrobial stewardship interventions - Dr Ketevan Kandelaki, WPRO · **Plenary** moderated by Dr Socorro Escalante, WPRO
09:00-09:40	**1.1 Opening session** · Opening remarks – WHO · Meeting objectives – Dr Socorro Escalante, WPRO · Nomination of Chair and Co-chair · Introduction of participants · Group photo		
09:40-10:30	**1.2 Updates on Antimicrobial Resistance** · Global and Regional Updates on Antimicrobial Resistance (AMR) - Dr Socorro Escalante, WPRO · Antimicrobial Stewardship (AMS) as a necessary component of the global fight against AMR - Dr Ketevan Kandelaki, WPRO · *Confronting Antimicrobial Resistance in the Western Pacific* (WPRO AMR Documentary Video)		
10:30-11:00	Morning Tea	10:00-10:30	Morning Tea
11:00-12:45	**1.3 Antimicrobial Resistance in Pacific** · Progress of AMR plan and implementation in the Pacific Mr Asaeli Raikabakaba ,WHO South Pacific **Factors and Challenges contributing to AMR in PICs (country presentations):** · Shortages and stock outs of antibiotics in Samoa · High demand on antimicrobials and impact of irrational use in Solomon Islands	10:30-12:00	**2.2 AMR strategies in Western Pacific** **Plenary**: Antibiotic Stewardship accountability framework - moderated by Dr Socorro Escalante, WPRO · AMR Advocacy and Awareness Raising - Mr Emmanuel Eraly, WPRO

	· Antimicrobial use from TB perspective- challenges and success in Tuvalu · Challenges in ensuring quality of antimicrobial products in Tonga · Irrational prescribing and fast turn-over of health practitioners in Palau		
12:45-13:45	Lunch	12:00-13:00	Lunch
13:45-14:45	**1.4 Which and How Antibiotics are used in Pacific** · Overview of PICs essential medicine list (EML) vs WHO EML - Dr Ketevan Kandelaki, WPRO **Plenary:** Moderated by Ms Lepaitai Blanche Hansell , WHO Samoa · How EML are developed in PICs · What are the factors involved in decision making for EML · Opportunities for EML revision	13:00-14:00	**2.3 Strategies to implement Antimicrobial Stewardship in the Pacific Island countries** Immediate steps and long-term strategies to implement Antimicrobial Stewardship in Pacific Island countries - Dr Kirsty Buising, NCAS, Australia - at the national level - at the hospital level
14:45-15:15	Afternoon tea	14:00-14:30	Afternoon tea
15:15-16:30	**1.5 Antimicrobial Stewardship in Pacific** **Country presentation :** · Antimicrobial Stewardship programmes in PNG · Antimicrobial Stewardship programmes in FSM · Role of therapeutic committees to promote rational use of antimicrobials - Ms Uhjin Kim, WPRO	14:30-15:30	**2.4 Speed Networking** · Identify support needed for the implementation for antimicrobial stewardship and rational drug use strategies
		15:30-16:00	**2.5 Closing session** · Recap of meeting and key recommendations · Closing remarks
17:00-18:00	WELCOME RECEPTION	16:00	End of the Meeting

Annex 3. Group work

Cook Islands	
Strategic activities	
National Level	Revisit and review DTC TORs Link Vet service into AMR NAP
Hospital Level	Implement Abs Guidelines -promote -educate Undertake one simple action : - e.g. length of therapy - Feedback - Intravenous (IV) to oral switch therapy - Reassure

Fiji	
Strategic activities	
National Level	Secretarial support AMS policy
Hospital Level	Establish functioning AMS team in the three main hospitals Conduct Audits (Pharmacy)

Kiribati	
Strategic activities	
National Level	Development and endorsement of National Action Plan on AMR Finalized Antibiotic Guidelines
Hospital Level	Establish AMR committee and develop TORs Strengthen infection prevention and control (IPC) committee and interventions Share Guidelines to clinicians/ new doctors/ health workers - so that we can work together as a team To give the best outcome to our patients

Marshall Islands	
Strategic activities	
National Level	Involvement of agricultural sector Hospital administration: - support for staffing (Pharmacy and Laboratory) - staff training in AMS programme - Laboratory accreditation
Hospital Level	Dissemination of Antimicrobial Guidelines and restriction policy Create guidelines for graduating nurse practitioners for use in outer islands Monitor adherence to guidelines among : - hospital based physicians NP's

Federated States of Micronesia	
Strategic activities	
National Level	Multi- sectoral NAP on AMR finalization Assign AMR Focal Points for plan objectives Formalize the governance
Hospital Level	Establish and strengthen IPC teams: - appoint IPC team - appoint AMS team Annual work plan / audit time table

Niue	
Strategic activities	
National Level	Improve awareness on AMR Incorporate in schools: - curriculum revision - school visits
Hospital Level	Development of antimicrobial guidelines Strengthening IPC Conduct audits- monitor Antimicrobial USE

Palau	
Strategic activities	
National Level	Finalization and Endorsement of National Action Plan on AMR Pharmacy Drug Act
Hospital Level	AMS within MOH - Include: epidemiologist; doctor, pharmacist , physicians, infection control, nurse, lab

Papua New Guinea	
Strategic activities	
National Level	Endorsement of National Action Plan
Hospital Level	Operationalize medicines and therapeutic committees with an emphasis on AMS

Samoa	
Strategic activities	
National Level	Endorsement of National Action Plan
Hospital Level	Training on the revised Antibiotic Guidelines and EML Audit of prescriptions as baseline data gathering

Solomon Islands	
Strategic activities	
National Level	Development of National Action Plan on AMR Multi-sectoral Policy- collaboration
Hospital Level	Awareness, clinicians, health workers- "CHAMPIONS" - what clinicians can do now? Structural strengthening, process

Tonga	
Strategic activities	
National Level	National Antibiotic Action Plan - Implementation Plan Public outreach/ 2018 World Antibiotic Awareness Week - outer island involvement
Hospital Level	Antibiotic Guideline endorsed AMS training Capacity Building / system strengthening

Tuvalu	
Strategic activities	
National Level	STG – Antibiotics NDTC: Train/develop materials for health professionals Pharmacy department: responsible to follow up actionable areas Proactive in reactive Work with vertical programme parties - NGO/UNDP/WHO National AMS programme development
Hospital Level	Improve participation/ collaboration - community in promotion of rational use of antibiotics Nurse/pharmacy- develop plan for AMS NDTC- to work on AMS programme in the hospitals Ward revisions (Pharmacy/NDTC: Audits) - weekly activity plan out

Vanuatu	
Strategic activities	
National Level	NDTC engaging in organizing collaboration with other stakeholders - agriculture, foreign affairs, livestock, fisheries Particularly with WHO in developing NAP On AMR
Hospital Level	Pharmacy department – to regularly check the drug charts from hospitals, provide feedback to practitioners - participate and organize ward rounds Pharmacists+ doctors- regular checks of Abs use of inpatients. In every department and provide feedback to prescribers and practitioners Improve and encourage handwashing and IPC interventions

www.wpro.who.int

World Health Organization
Western Pacific Region