Sonar-Global 3rd AMR Hub Meeting:

Social Dimensions of Antibiotic Resistance in Asia: a One Health Perspective

14-15 September, 2021

Acknowledgement

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Contents

Overview

Funded by the European Commission, Sonar-Global is building a sustainable international social sciences network to engage the active participation of the social sciences in preparedness and response to infectious threats, including antimicrobial resistance (AMR).

Antibiotic resistance is a global public health concern, and a particular threat in Asia, where the burden of infectious disease remains high, and antibiotic access and use have increased dramatically. The largest volume of antibiotics is used in agriculture, with little monitoring or regulation. In the human domain, antibiotics are often provided without health providers following diagnostic guidelines; they are also sold widely over-the-counter (OTC) and taken in inappropriate doses. These practices are entwined with the social, cultural, and economic context in which they are found. They also have clear implications for the development and spread of antibiotic resistance. Understanding the social dimensions of these practices is crucial to designing effective interventions to mitigate the threat of antibiotic resistance.

To that end, on 14-15 September 2021, the AMR regional hub in Bangkok-Thailand, hosted a two-day online workshop, inviting researchers working in social sciences, ethics, public engagement, and epidemiology related to AMR in Asia to share research findings and/or research plans.

It was an interactive meeting, consisting of a series of short presentations (two sessions over two days) followed by an optional one-hour online discussion session (on Day 2 after the main meeting) with a focus on identifying research gaps, prioritising a research agenda and brainstorming ideas for potential future funding applications. At its peak, it had 80 participants from all over the world, not just South-East Asia:

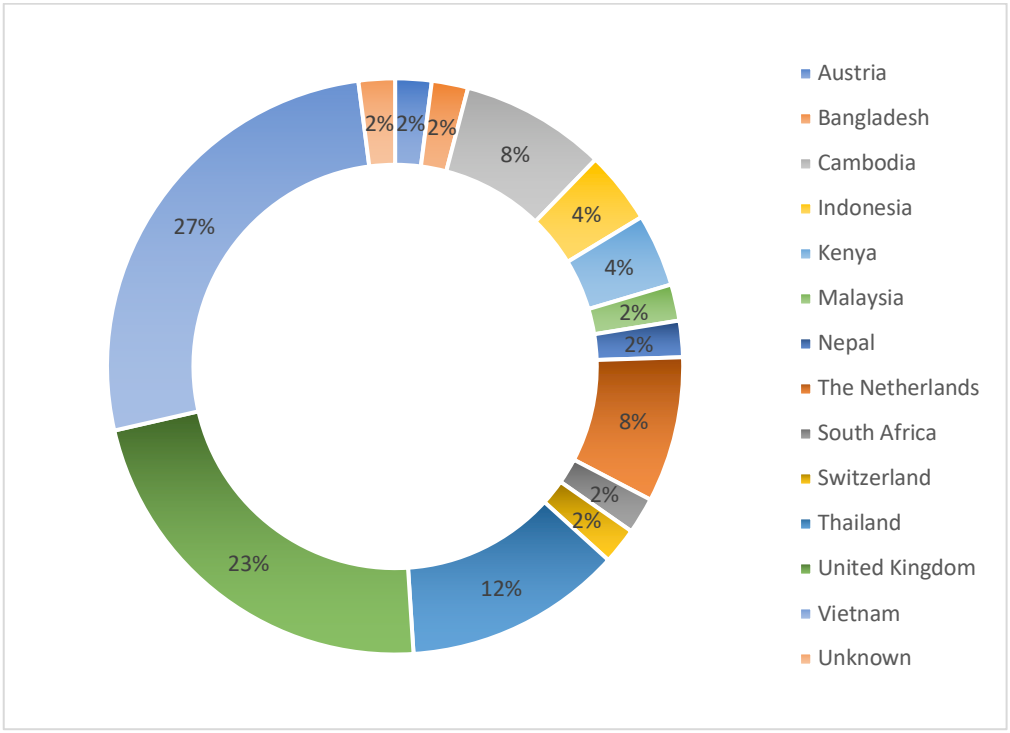


Figure 1: Sample of participant countries from Day 1 introduction activity.

Introduction to the workshop

The opening session was chaired by Dr Chris Pell who introduced the organisers from Work Package 2 (Networking and Communications) and collaborators:

- Prof Phaik Yeong Cheah, Mahidol Oxford Tropical Medicine Research Unit (MORU)
- Dr Chris Pell, Amsterdam Institute for Global Health and Development (AIGHD)
- Maren Jeleff, Medical University of Vienna (MUW)
- Dr Sonia Lewycka, Oxford University Clinical Research Unit, Vietnam (OUCRU)

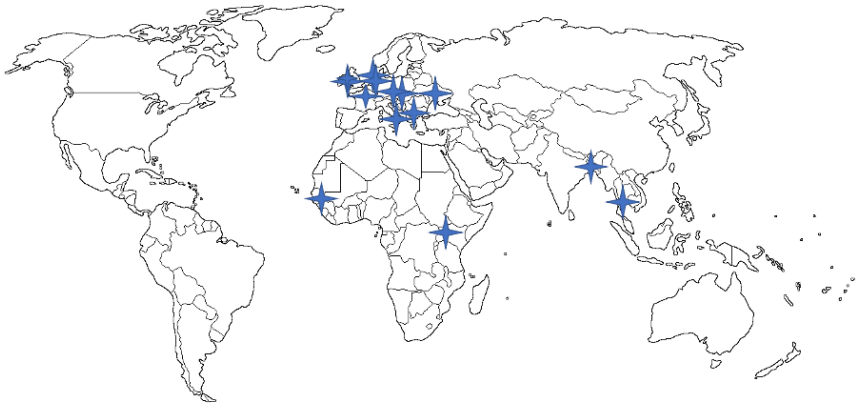
With thanks to Rita Chanviriyavuth, Anne Osterrieder and members of Bioethics and Engagement at MORU.

Submissions are also being invited to a special issue of the same theme in the journal “Antibiotics”: https://www.mdpi.com/journal/antibiotics/special_issues/Asia_antibiotics.

Introduction to Sonar-Global and AMR hub

Dr Tamara Giles-Vernick, of the Institute Pasteur, France and Coordinator of Sonar-Global gave a pre-recorded overview of Sonar-Global and its work, which seeks to bridge the gap that recognises that epidemic outbreaks and AMR are never exclusively biological phenomena and that social sciences insight can help evaluate linkages between infectious events, political economic changes, ecologies, mobilities, local communities and marginalised people; comprehend underlying logics of popular reactions to infectious threats AND interventions to control; and understand the institutions and stakeholders engaged in these infectious threats, their communications channels and responses; and seeks to create better understanding and therefore implementation or integration in practice.

Sonar-Global is a 15-partner consortium of institutions and organisations which seek to create a global network of social scientists for preparedness and response to infectious threats (outbreaks and antimicrobial resistance). It is a network of networks (social scientists, institutions, organisations, other networks), that uses field-based tools to identify vulnerabilities among populations and relations with other structures, including health systems, and to operationalise these insights through community engagement and translates social sciences methodologies to facilitate collaborations with other disciplinary approaches.



France
UK
Netherlands
Ukraine
Austria
Italy
Malta
Germany
Slovenia
Senegal
Uganda
Bangladesh
Thailand

Sonar-Global's key activities are to: 1) develop a platform; 2) create regional hubs; 3) adapt, test and evaluate tools and models; and 4) strengthen capacity. It has set up a number of platforms to achieve this: a directory (706 members and 18 networks); regional hubs in Dakar, Kiev, Bangkok and Chennai; Tools, webinars, podcasts/audio reflections and blogs; and COVID-19 resources.

See: https://www.sonar-global.eu/ for more information.

Keynote addresses

Two keynotes were given at the start of the workshop, looking at social science research gaps in Southeast Asia, and the drivers of antibiotic use in Vietnam and their implications for designing community interventions.

Key social science research gaps: experience in Southeast Asia

Professor Raph Hamers, Eijkman-Oxford Clinical Research Unit, Indonesia

Southeast Asia makes up more than 25% of the global population and is a global hub for AMR, with close human and animal interactions; a high burden of infectious diseases; rapid economic growth driving consumption; unregulated antimicrobial use coupled with lax regulations and policies; self-medication; poor AMR awareness; low-quality or counterfeit drugs; and underuse of diagnostics. And antibiotic consumption is on the rise. In Indonesia, between 2000-2020, national antibiotic sales increased by 146% (from 1230 to 3022 DDDs per 1000 people/year), mostly broad-spectrum penicillins, fluoroquinolones, and cephalosporines.

While effective interventions to tackle AMR targeting different stakeholders exist, they have been poorly implemented due to lack of prioritisation and limited knowledge on how to bring existing interventions at scale. In addition, the evidence base for AMR and AMR interventions in low and middle income countries (LMICs) is very limited.

The patterns and quality of antibiotic prescribing in Indonesian hospitals in particular[1] see a high rate of empirical use of broad-spectrum antibiotics coupled with poor documentation, guideline adherence, and culture sampling. Some of the perceptions, views and practices include:

Hospital physicians[2]

- "AMR externalised" as a problem, i.e. doctors acknowledge its significance, but don't take responsibility or ownership.
- Lack of confidence in prescribing decisions, and defensive prescribing due to diagnostic uncertainty, fear of clinical failure, and/or patient demands.
- Insufficiently applying antibiotic stewardship principles and underutilising diagnostics.

[1] Limato, EXPLAIN study, JAC-AMR 2021
[2] KAP survey, n=1007

Hospital physicians and other stakeholders[3]

- Prescribers accepted antibiotic stewardship mostly by *social obligation*; explained by a *collectivist culture* in which failure to meet group expectation can result in social sanctions.
- Thwarts rational attempts to deliver sustained change on antibiotic stewardship outputs in Indonesia.
- *Recognition of the contextual and social determinants of antibiotic prescribing decision-making is key to developing context-specific antibiotic stewardship interventions that are indeed adopted by healthcare professionals.*

Consumers and health providers[4]

Theme 1: Lack of awareness of AMR and knowledge about antibiotics in the general population	*Theme 2: Antibiotic self-medication without prescription*	*Theme 3: Antibiotic dispensing without prescription in community pharmacies*
• Indonesia: 23-26% did not know that antibiotics can treat bacterial infections and 58-74% stated that antibiotics can cure viral infections; • Antibiotic use knowledge was associated with higher education and higher income.	• 20-100% had ever self-medicated with an antibiotic and 87-100% had ever purchased an antibiotic without prescription. • No differences by level of education, employment or medical background; people without health insurance more likely to self-medicate • Buy at pharmacy (46-90%), kiosk (20-44%), or received from family and friends (9-12%). • Main reasons: positive previous experience (54-82%), practical (61-83%), easy access from pharmacy (71%), doctor expensive (44-72%) or unpractical (56%) • *Global data: 38 studies from 24 countries in community pharmacies: OTC non-prescription antibiotics comprised 62% of all dispensed antibiotics*	• Antimicrobials are readily available without a prescription, due to lax oversight and enforcement of policies; • Yogyakarta: 68% would dispense antibiotics without prescription • Surabaya: 90% sold oral antibiotics without a prescription • Community health centres (Puskemas) 99% did not provide antibiotics without a prescription, despite patient request.

In LMICs, antibiotics are seen as a "quick fix" for:

- *Care:* a technical *quick fix* instead of addressing the wider political-economic challenges that drive ill-health, fragmented disease prevention efforts and fractured health service delivery systems.

[3] Qualitative exploration, semi-structured interviews.
[4] *Systematic review of 25 KAP surveys in consumers and providers, unpublished data*

- *Productivity:* how these medicines enable people's productivity—by keeping their bodies productive.
- *Hygiene:* The reasons for such prophylactic antimicrobial prescribing are known to be complex but in part can be understood as an extension of infection prevention and control measures and necessary due to inadequate sterilisation of patient rooms and medical tools in hospitals, lack of hospital beds and overcrowding, and unhygienic living and working conditions of patients.
- *Inequality:* For example, when clean water is not made available to certain populations, when public hospitals are underfunded and left to decline and make do without necessary products and materials, or when affordable housing is inaccessible, and people's solutions to housing crises—like informal settlements—are deemed 'illegal' and 'disordered', access to sanitary infrastructure is *made* unequal. This is not about individual behaviour, but is often imagined as such.

Action needed:

- **Goals:** *Prevention of infections* to reduce the need for antimicrobials, and *restrictive and responsible* use of antimicrobials.
- **Evidence-based, multi-component interventions** to influence consumer behaviours, vaccine hesitancy and hygiene practices, or other behaviours that relate to AMR; Interventions *adapted to and anchored in local settings and realities,* based on behavioural insights, regulations, incentives, communication for behavioural change -- to help people make the right choices; and feasibility.

In conclusion, AMR is a silent, slow-moving pandemic (in the shadows of COVID-19), with potentially devastating effects on global health and national economies. LMICs in Asia are particularly vulnerable. Antibiotics are seen as a *"quick fix"* in many settings: underlying structural problems need to be addressed (patient care, productivity, hygiene and equality). Social science is essential to understand the local context and drive change of behaviours and practices (legal and political framework, culture and traditions, social norms and values, knowledge, financial incentives, etc.)

Drivers of antibiotic use in Vietnam: implications for designing community interventions

Dr Thu Anh Nguyen, Woolcock Institute of Medical Research, Australia

V-RESIST is a three-phase programme of research being conducted in Vietnam with national partners to address the health system drivers of AMR. Phase 1 consisted of community–based formative qualitative work to understand the drivers of behaviour about antimicrobials to inform community interventions to reduce inappropriate antimicrobial use. The remainder of the research is on hold (phase 2 - randomised trial and phase 3 - health economic evaluation). The primary method of data collection was in-depth interviews with community members, pharmacists and doctors in two out of the four trial sites. Community members with lower health literacy and those more influential members of the community that people went to for trusted health advice were included in the sample. The formative research serves as a case study to illustrate how entangled behaviour is in broader social, economic, political structures, and how this needs to inform understandings of what interventions are needed and what will work.

Results – appeal of antibiotics

- Antibiotics are largely seen a group of medicines that exemplify trusted quality: presumed to be strong (both effective but also potentially toxic if taken inappropriately), fast-acting (curing symptoms within 2-3 days), and witnessed as working, either for themselves or others. They tend to be purchased without a prescription by individuals looking for a quick and effective treatment; the actual diagnosis was only relevant if the symptoms did not go away.
- The values given to antibiotics weren't necessarily because they are antibiotics, but that they represent a group of powerful, quality and trusted treatments.
- Health literacy was not high among some groups but a proportion of them had still heard about AMR and linked it to their toxicity or strength, so avoided taking them too much, limiting the dosage to reduce exposure to the presumed toxicity by only taking 2-3 days of a course, but not reducing the number of illness occasions they used them for.
- Both the rationing and the broader category of trusted medicines suggests that there is a receptiveness to changing practices.

Structural influences on individuals' use of antibiotics

- Antimicrobial use is deeply interwoven within broader structural influences, reflecting health systems, social networks, economic systems etc.

Instant noodles

- One study participant explained the appeal of using this group of medicines as being like 'instant noodles'; they enable other priorities to be met and after a while, through their familiarity, it becomes habitual practice.
- This also shows that focusing on knowledge as the pivotal or singular mechanism to change 'use' is too narrow.

Approach to 'behaviour' change:

- the design of the community interventions engaged with the values attributed to this broader group of medicines- and shifts them away from antibiotics by considering how to market alternatives, such as paracetamol.
- a locally tailored approach to messaging by working with local influencers within communities who can convey these messages outside of the biomedical realm and utilise the logic that communities themselves use. This approach though is attuned to and can align with local historical and social community context- given this is pivotal in how expectations of treatment and health are formed.
- their effect on behaviour change is likely going to be limited if it is not also accompanied by policy and legislative changes which engage with the structural factors driving use. There is a need to reconsider the acceptability and incentives for engaging in primary healthcare and the value of prescriptions. The hierarchy of need which shapes healthcare consumption currently produces a market for antibiotics and is protective against efforts to ration them.

Integration framework: affecting changes in community use of antibiotics

- Any structural interventions need to: address influential social, economic and legal structures; tailor efforts to local contexts; and address multiple influencing factors in combination.

- For example, on the demand side, alongside interventions focused on promoting alternatives to antibiotics, drawing on the values ascribed to quality and trusted medicines, there needs to be a focus on supporting the development of demand for more accessible pathways to accessing prescribers in primary healthcare and in community pharmacies.
- On the supply side this is supported by the development of policies which are not only about enforcement and legislation, but also rewarding prescribing providers for accessibility and developing policies and interventions which create incentives for employers to support workers' access to primary healthcare.

Lessons learned

- Tackling complexity doesn't hinder urgency
- Develop frameworks for multilevel interventions which delineate the logic of connected change across levels
- Emphasis on structural interventions to create enabling environments for sustained behaviour change (system changes to engage in values and consumption)
- Attend to process outcomes which capture indirect and complex pathways
- Social science within intervention trials
    - Tell the why and how as well as whether (learning from failures)
    - Process evaluation of programmes
    - Advocate for realistic and pragmatic evaluation (adjust expectations for thresholds of adequate evidence- plausibility)

Dispensing and use

This session was Chaired by Prof Rogier Van Doorn, this session consisted of three presentations from Nepal, Laos and Afghanistan.

Over-the-counter use of antimicrobials in Nepal: findings from a qualitative study

Dr Bipin Adhikari, Mahidol Oxford Tropical Medicine Research Unit, Thailand

This qualitative study with patients, medical practitioners and dispensers in central, eastern, and western Nepal sought to understand why people purchase antibiotics OTC. This use of antimicrobial occurs when patients use medicines without a prescription from medical practitioner and without medical supervision. OTC medications are given for common infections such as respiratory tract infections, urinary tract infections and typhoid fever by minimally qualified and unqualified allied health professionals. OTC constitutes more than 50% antimicrobials dispensing. Research to understand the trends in antimicrobial use and factors driving the OTC antimicrobial use, and follow-up address to the knowledge gaps through policy interventions is urgently required.

Research methods for this study consisted of qualitative focus group discussions and semi-structured interviews with patients attending tertiary hospitals, clinicians treating patients at these hospitals, and drug dispensers at and around the hospitals. Thematic synthesis was used to analyse the data and found the following:

- **Nature of over-the-counter sales:** The interactions were focused and brief: they resembled retail transactions whereby medicines were purchased for specific illnesses, rather than patient consultations: *'We don't call them for follow ups. As we are not doctors, we ask them to take those medicines for certain days and ask them to visit a doctor if the medicine doesn't work within the period'* [20 years, male, SSI-1, dispenser, Bhairahawa].
- **Drivers of care-seeking at drug shops:** Dispensers often described how patients were hesitated to visit hospitals because of the costs, time and complexity involved: '*Usually doctors ask to carry out different tests. So, I think they feel burdened to spend money on such tests and thus, they try medicines first*' [22 years, female, SSI-1 dispenser, Kathmandu].
- **Drivers of antibiotic selling at drug shops:** Dispensers explained the OTC sales of antibiotics in terms of 'patients' demand' for particular antibiotics. Clinicians also reported that patients visit drug shops and make demands for specific medication using as prompts, the empty blisters/bottles, and old prescription that cured them or a family member's illnesses. *'I think it's because of the ongoing practice in our society. The young generations follow their parents. They have seen their parents going to pharmacies before going to clinics/hospitals, thus they are doing the same. This practice has become a trend in our society. They are doing what they are seeing for* years' [42 years, male, SSI-2 dispenser, Kathmandu].
- **Policies on antibiotic use:** Dispensers explained that all medicines, except for narcotics and the medicines for mental health could be sold at drug shops without a clinician's prescription.
- **Ambiguity in dispensing antibiotics:** *'…[antibiotics] come under Group C so it can be sold and also it needs prescription'* [22 years, female, SSI-1, Dispenser Kathmandu].

Discussion

- In light of their ubiquity and low costs, drug stores were the main source of antibiotics.
- Interactions between drug store staff and patients were transactional in nature: akin to visiting grocery stores, where signs and symptoms were traded for a quick remedy.
- This quick fix circumvented perceived barriers to obtaining a prescription from clinicians and boosted the commercial incentives of drug dispensers.
- High OTC use of antibiotics was also attributed to ambiguous and evadable policy.

Hospital antimicrobial prescribing and evaluation of antimicrobial prescribing guidelines in Laos

Dr Vilada Chansamouth, Laos Oxford Mahosot Wellcome Research Unit, Laos

The project sought to compare the proportion of antimicrobial prescriptions adherent with new prescribing guidelines delivered by mobile phone application (app) *VS* paper-based prescribing guidelines in both in- and outpatients. It was an open cohort stepped-wedge cluster randomised controlled 3-step trial in six general hospitals in Laos using the MicroGuide antimicrobial prescribing guideline mobile phone application and antimicrobial stewardship (AMS) training. Outcome measurement was done via Point prevalence surveys of hospital antimicrobial use**;** Prescriber questionnaires; and AMS knowledge surveys of prescribers.

Preliminary results

- Jan-Mar 2021: 414/499 (83%) prescribers participated during the first data collection round

    - 229 (53%) prescribed antimicrobial(s) nearly everyday
    - 34 (8%) never looked at guidelines before prescribing antimicrobial(s)
    - 161 (43%) had medical application(s) on their phones
    - Average number of training/data collection in each hospital: 3 (2-8) days
- Jun-Jul 2021: XK and LNT (First paired hospitals) accessed prescribing guideline mobile phone app
    - 55/58 (95%) prescribers from XK and 30/33 (91%) from LNT participated in training

Next steps

- Introducing mobile phone app and AMS training in remaining four hospitals
- three more rounds of outcome collections
- Qualitative study has been discussed to understand more about guidelines uptake
- Expected end date: Aug-2022.

Perceptions of antibiotic use 'they eat it like sweets': A mixed methods study of antibiotic perceptions and their use among patients, prescribers and pharmacists in a district hospital in Kabul, Afghanistan

Dr. Doris Burtscher, Médecins Sans Frontières, Vienna Evaluation and Operational Support, Austria

The project objectives were to understand the knowledge and perceptions of antibiotics and antibiotic use; what influences the choice of antibiotics from a doctor's and patient's perspective; how antibiotics were used; and rationales for use among patients, prescribers and pharmacists. The methodology consisted of a mixed method study conducted in two phases: Qualitative: Individual, paired and group interviews (n=37) and observations with patients, caretakers, doctors, drug dispensers, MSF health promoters and private drug store owners; and a Quantitative survey of 19 questions with patients and caretakers (n=351).

Study results: antibiotic perception and knowledge:

- Patients asked for powder syrup and the orange pills (Amoxicillin) and the SIX capsules, which are used for cleaning the body and blood from dirt and are powerful, famous and rapid-acting medication. Names used are zedi cherk = **anti dirt or anti microbe**.
- 65% have heard about antibiotics, 64% said they kill microbes, 59% say best to treat infections, 56% say they cure quickly
- Anti-dirt and anti-microbe local terms imply to clean the body from dirt and microbes because of the dirty and dusty environment
- Amoxicillin most commonly mentioned because it is a strong and effective medication; it cures **quickly**.

Patient indications for antibiotics use include:

- To kill/'dry' bacteria
- Treat infections and wounds
- Treat fever/coughing/sore throat/cold/diarrhea and vomiting
- To treat pneumonia and tuberculosis

- after birth (women)

Sources of information and medication

- Self-medication with antibiotics and leftover drugs - people know where to get antibiotics
- OTC treatment from private pharmacies without prescriptions and on the vendor's recommendation (87% source medication from pharmacies – from survey)
- Health facility (hospital, private doctor)
- ASB hospital
- Private drug store near the hospital
- Previous experience with an antibiotic
- OTC medication and street vendors
- Pharmacist's recommendation

Patient expectations of receiving antibiotics

- **Antibiotics are the desired medication** and they expect to receive them
- Survey results: 97% expected medication but 76% said the doctor decides what to prescribe
- **Patients frustration** when they don't receive the expected medication was reported by dispensers
- **Doctors pressured to prescribe antibiotics**, 40% patients would search elsewhere and 74% would attend a private clinic.

The perceived risks and side effects did not affect positive antibiotic perception, with no risk perceived, instead there is a notion of strengthening the body.

Antibiotic prescription adherence and leftovers

The survey indicated that around 90% said that doctors/dispensers explained clearly how to take drugs. The qualitative part revealed that respondents stop when feeling better and leftovers are used for the same ailment. In addition, a smaller amount is bought when financial means are insufficient.

Conclusion

- Desire to receive and use antibiotics has an important social and symbolic meaning
- Public perception of antibiotics as powerful and fast-acting
- Self-medication and OTC purchase of antibiotics
- Incomplete treatment courses and use of leftovers add to inappropriate use.

Community engagement

This session was Chaired by Dr Sonia Lewycka and consisted of three presentations looking at the role of different key stakeholders in reducing AMR and the different strategies used to engage them: young people, patients and caregivers, and communities in low resource settings.

Youth Against Antimicrobial Resistance: Involving youth in research and mitigation against antimicrobial resistance[5]

Dr Mary Chambers, Oxford University Clinical Research Unit, Vietnam

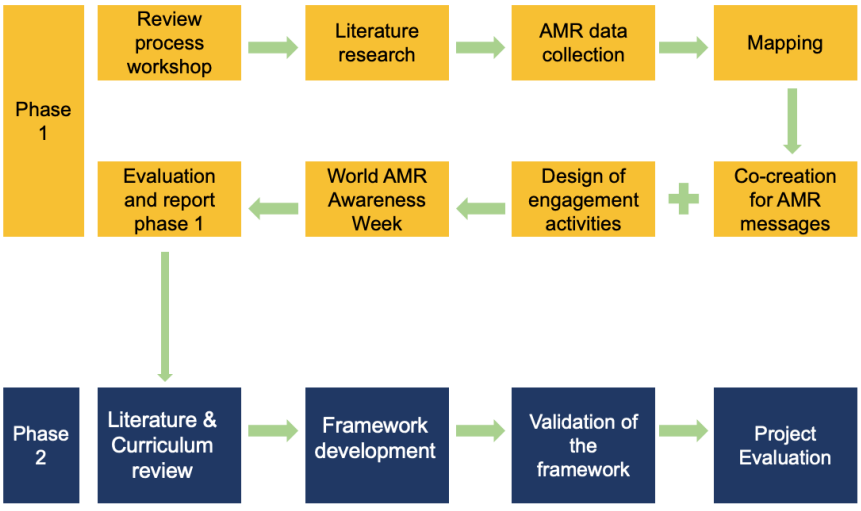
AMR has been framed as a matter of people making ill-informed choices, culminating in over- and irrational use of antimicrobial medicines.'[6] But there are many and complex drivers of behaviour, and change is needed at all levels of society. To effect change, clear, effective language *appropriate for the audience in question* is needed. *There is a clear need for contextually appropriate communication research*

For young people, the consequences and impact of AMR infections are far-reaching (school absence, spread to elderly...) Young people are rarely included in conversations or behaviour change initiatives, and there are few effective platforms to engage young people in issues of AMR. These disparities are heightened in the global south (LMICs).

The Youth Against Antimicrobial Resistance (YAAR) project objectives are to:

1. understand current levels of awareness and knowledge of AMR in amongst children and young people in four countries in the Global South
2. create effective platforms for children and youth involvement in all phases of the project
3. co-create messages and engagement activities about AMR
4. develop a progressive learning framework to be used in formal and informal learning settings

There were two key phases, which involved children and youth though a youth advisory board, youth working groups and wider young public engagement activities:



Survey development focused on antibiotic use and literacy (not antimicrobial) and refers to existing quizzes such as *E-bugs junior*, *UK survey for baseline knowledge*, based on four themes: Understanding of disease; Understanding of antibiotics; Understanding of antibiotic resistance; and

[5] See: www.youthagainstamr.com
[6] Leung et al. 2011, Laxminarayan et al. 2013, Wellcome, Reframing resistance, 2019

Behaviour towards antibiotics. There were 1991 respondents (1971 in analysis) from 19 countries. Results showed an upward trend towards better understanding with increasing age. Overall, understanding of antibiotics and antibiotic resistance has the lowest indices.

Youth-led engagement saw media platforms in each site: FaceBook, Zalo, Twitter, TikTok, website and face to face (varying by context); varying content: memes, cartoons, short films, slogan competition, photo competition, 'postcards', short films, blogs, TikTok dance; a coordinated social media campaign during WAAW. The metrics suggest that the campaign reached over half a million young people in Africa and Asia in one week (n=523,955).

Reflections on youth involvement

- From the youth perspective, there is unanimous support. Short and long-term benefits include: Increased knowledge about AMR and understanding of how their community use and perceive AMs, as well as increased confidence to speak to peers about AMR and more confident communicating in general. There was reported behaviour change towards AM usage and inspiration for career choices. Challenges included the time commitment (particularly during school term), time zones (YAB), comfort in front of the camera and in online meetings, difficulties doing data collection, and the challenges of diverse groups working together.
- From the team perspective, involving young people in the project was approached differently in each site. In Vietnam, Nepal and Kenya, the youth working groups were not associated with a school and had young people from a range of ages. Reflections included:
    - Young people brought a great energy and fun to the project
    - We were challenged to use youth-appropriate but accurate language
    - Youth-created messages were culturally and generationally relevant and widely accepted
    - Media content was not always polished, but was creative
    - Youth review of content highlighted assumptions made by researchers
    - Not all researchers are good at engaging with young people
    - Planning and facilitating the sessions was time consuming for the team
    - Involved considerable time commitment from other stakeholders (teachers, youth leaders, parents, researchers etc)
    - Longer-term involvement needs to be considered before inviting them, as some young people wanted to continue with the project and groups, but short project timeline prevents this.

Training and communication package to reduce AMR among patients/caregivers

Summita Udas Shakya, Oxford University Clinical Research Unit, Nepal

This project sought to explore the impact of a training and communication package for caregivers and users (on clinical outcomes and antibiotic prescriptions, with standard-of-care practices, in children, adolescents and adults presenting with acute febrile illnesses at outpatient clinics in Patan Hospital and Nepal Korea Friendship hospital). It also sought to assess the adherence to new practices by healthcare workers and patients/caregivers. Methods consisted of qualitative data

collection through 57 In-depth Interviews (IDIs) with Patients (n=21), Caregivers (n=160 and Health professionals (Doctors and Nurses, n=20). It was a purposive sample to account for diverse experiences and perceptions of the different people and patients and caregivers who visited the 'Fever Clinic' during the study period.

Examples of barriers to adherence by patients included:

- *Communication gap between Doctors and Patients:* Confusion on medication dosage or prescription or not clear about tests.
- *Hesitation in asking questions to doctors*: don't know about their rights to ask healthcare providers.
- *Antibiotics versus non antibiotic:* Lack/ Inappropriate knowledge of antibiotics versus non-antibiotic
- *Forgetfulness:* They do understand but needed a reminder
- *Linguistic barriers/ use of medical term:* Difficult to follow doctor's advice

Supportive behaviors

Issue	Behaviors
Patients may not understand the prescription	• Follow up with the patient to be reassured that they understand the prescription • Provide OPD phone number if the patient has questions when they get home • By end of patient visit ensure the 3 'ASK ME' questions have been asked and answered and understood
Patient speaks only local dialect (Newari) and doesn't understand the doctor	• Call nurse to help translate
Different experience/behaviours of different patients	• Be consistent in messages to all patients

Communication messages

- **For healthcare providers**

  Table Calendar, (ASK ME): placed on each doctor's desk with the following questions to help doctors ensure that patients/caregivers understand what has been prescribed and how they are supposed to take it:

  1. What is patient/caregivers main problem?
  2. What do I need to do? What if I explain and still the patient don't understand?
  3. Why is it important for me to do this?
  4. Calendar will

  'ASK ME' badge: worn by doctors and nurses of intervention arm and used to encourage patient/caregivers to ask questions related to their complaints, medicine and prescription instructions.

  Take home message (optional): Ensures **clear instructions** are written on the prescription. Doctors provide a **written message** to patients or caregivers when they do not understand the prescription.

- **Patients/Caretakers**
    1. Medical Bag
    2. Awareness flyers/Brochures/posters
    3. Take home messages
    4. Reminder medication Chart
    5. Me and my responsibility flyers
    6. Table Calendar (ASK ME)
    7. Digital Display Boards.

Why Communicate Adherence?

To support adherence to the prescription by the patient, influence current practice to improve the case management of acute febrile illness, and influence antibiotic prescribing practices of physicians and also patients/parents' intentions, expectations and behaviour around antibiotic use.

Using community engagement to generate questions and solutions around AMR in low resource settings[7]

Professor Paul Cooke, Dr Rebecca King and Dr Jessica Mitchell, University of Leeds

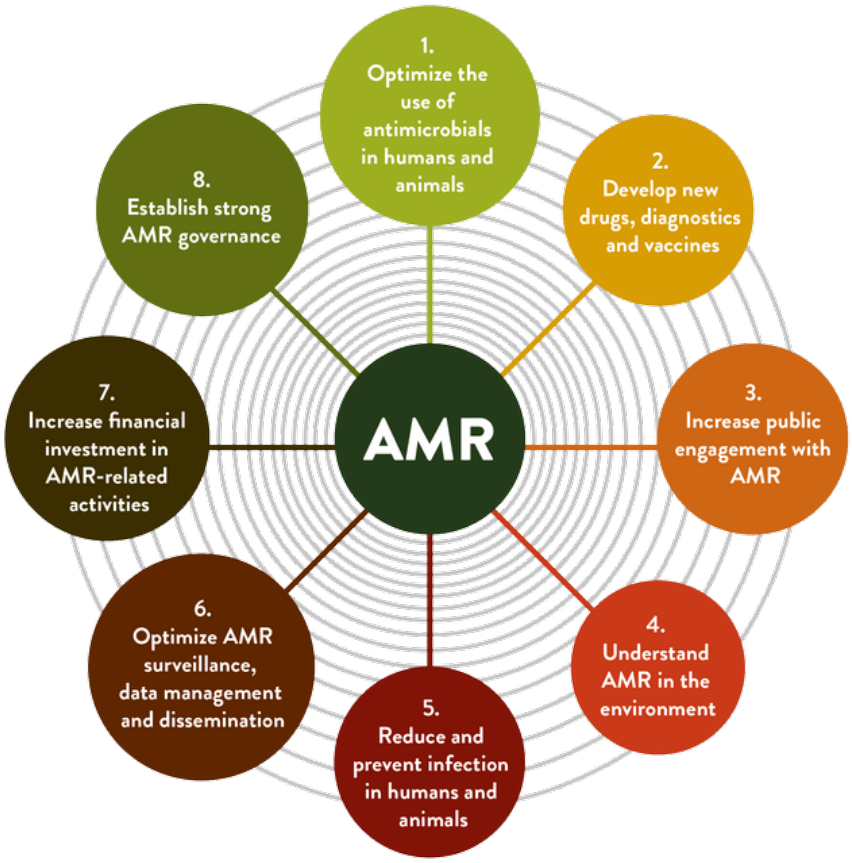
The global response to AMR calls for increased awareness raising amongst the general public. However, "awareness-raising" suggests a focus on top-down, unidirectional health education, which is often not enough to trigger and sustain behaviour change. One approach that has been effective in influencing people's health-related behaviour is community engagement. Community engagement involves enabling communities to identify barriers and community-led solutions to health issues.

CE4AMR defines community engagement as "*a participatory process through which equitable partnerships are developed with community stakeholders, who are enabled to identify, develop and implement community-led sustainable solutions using existing or available resources to issues that are of concern to them and to the wider global community.*"

Framing AMR

- AMR is a complex One Health Challenge.
- Global Guidance recommends 8 key themes for AMR action (see image below)
- We believe CE can be applied to all these themes
- CE can unlock community knowledge on AMR

[7] See: www.ce4amr.leeds.ac.uk



Looking ahead

- A global platform was established to investigate the critical role of community engagement to address AMR, particularly in low resources settings[8]
- Aspiration is to see community engagement recommended explicitly in global and national action plans to address AMR
- Provide outputs which support the development of equitable, knowledge exchange CE interventions across LMICs.

Policy and stewardship

Chaired by Maren Jeleff, this session focused on different aspects of National Action Plans (NAPs), from ensuring community voices are heard in the design (Thailand), to different approaches to assessing their effectiveness (global and Southeast Asia, and Bangladesh).

Embedding community voices in shaping the Thai AMR National Action Plan[9]

Tassawan Poomchaichote and Ravikanya Prapharsavat, Mahidol Oxford Tropical Medicine Research Unit, Thailand

This project sought to co-create an engagement strategy with AMR stakeholders and communities and co-create context-specific solutions relevant to local communities *with* local communities to reduce the burden of AMR. Activities included: Phase 1 Planning dialogues with AMR stakeholders; Phase 2 Community dialogues via online National Conversations and Regional Conversations in four regions in Thailand (on hold due to COVID-19); and Phase 3 Feedback to AMR stakeholders.

The planning dialogues aim was to align the project with the NAP-AMR policymakers and AMR stakeholders. It was a two-day event with 20-30 AMR stakeholders, from Bangkok and upcountry invited. AMR stakeholders included doctors, policymakers, pharmacists, nurses, journalists, social

[8] See: https://ce4amr.leeds.ac.uk/
[9] See: https://wellcomeopenresearch.org/articles/6-188

scientists, mass communication, NGOs, FDA, government agency, researchers, etc., to "rethink, reframe, and refocus AMR issues in Thailand". The outcome was the set-up of a new group or AMR Taskforce to call AMR conversations into actions. The community dialogues aimed to discuss local important AMR issues such as local availability of informal suppliers of antibiotics, level of enforcement, demographics, and socio-economic status of communities. The first of the community dialogues, the national virtual conversations, has been completed.

The National Virtual Conversations held three three-hour sessions in May, June and July 2021 with approximately 14-18 participants from all walks of life: students, pharmacists, farmer, housewives, etc. attending all three sessions. AMR experts joined almost all conversations. The May conversation sough to discuss important AMR issues in the 'wider public'/adult Thai residents and share stories based on their own experiences; the June conversation sought to come up with creative solutions that could address some of the problems that participants have faced with the experts and the July session sought to select promising solutions, plan them in more detail, and consider how the co-created solutions could be implemented or taken forward with experts. Results included:

Theme 1: Antibiotic Users	**Theme 2: Antibiotic providers**	**Theme 3: Where do people get antimicrobials from?**	**Theme 4: Other issues**
Norms and beliefs Cheaper/ convenience "just in case" "quick fix" Farmers: prevent animals from dying/lose profit	Doctors: worried about getting sued/ pressure/ profit Pharmacists: allowed to prescribe by law/ pressure/ profit/ ask outside of expertise	Pharmacists Online pharmacy Beauty clinics Dentists Informal stores Sales person (for farmers) Location = close to people's homes	Side effects Sharing antibiotics Users don't finish the course Difficult to access to clear information about antibiotics

The process also highlighted the limitations to working online rather than face-to-face. Here, these included challenges of digital literacy; power dynamics (experts vs. participants); the limited opportunity for networking; and the challenge of putting the solutions into action.

An assessment of National Action Plans on AMR and the inclusion of vaccination as an intervention to reduce AMR: a global and Southeast Asia review[10]

Dr John Paget, Netherlands Institute for Health Services Research (Nivel), The Netherlands

This project sought to assess the inclusion of vaccination in AMR NAPs through content analysis of 77 NAPs on AMR in Southeast Asia. It focused on vaccination (Influenza, Pneumoccocal, Typhoid, Haemophilus influenza type b, Measles, Rotavirus); and inclusion of the WHO key components of

[10] See: https://www.nivel.nl/en/nieuws/influenza-vaccination-can-decrease-antibiotic-use-and-therefore-reduce-antimicrobial

NAPs[11]: Strategic plan (e.g. goals and objectives); Implementation and Operational Plan; Costs and Budget; and Monitoring and Evaluation Plan.

One of the objectives (3) of the WHO Global Action Plan on AMR[12] is to reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures (e.g., vaccination). To do so, WHO Member States should develop AMR NAPs aligned with the Global Action Plan. Of the 194 Member States, only 144 have done so.

Results found that 67/77 NAPs include vaccination (87%); indicators to capture the role of vaccines against AMR were in 26 countries' plans (34%); and 41 countries present vaccination as an example to reduce AMR (53%). Out of 33 NAPs that include a strategic plan, 11 included specific objectives on promoting vaccination, etc.

WHO South-East Asia Region
All 11 countries in WHO SEA Region have developed a NAP. Vaccination is not included in Bhutan (2018-2022), Bangladesh (2017-2022) and Thailand (2017-2021).

17 NAPs include information on specific vaccines, for instance Afghanistan mentions the effect of pneumococcal, influenza, Hib and typhoid vaccination on AMR. Pneumococcal and influenza vaccination are most frequently included (n=12; n=11).

Conclusions
Globally, vaccination is frequently mentioned in NAPs (87%) but not always recognised as a main objective (only 34%). In the Southeast Asia region, all 11 countries developed a NAP and most mention vaccination (8 countries; 73%). However, it appears that vaccination is not always seen as a priority as strategic objectives are often not defined.

Early findings from the implementation of National Action Plans on Antimicrobial Resistance in Bangladesh

Dr Bushra Zarin Islam, BRAC University, Bangladesh

In Bangladesh, antimicrobials are as available as OTC drugs. A NAP for containing AMR from a One Health approach, aligned with WHO GAP guidelines, has been developed and approved, but more detailed information and evidence on the current AMR scenario in Bangladesh through a One Health lens is needed for success. This country case study aimed to explore how different sectors (human, animal, and environment) address the AMR problem in policy and practice in Bangladesh and had the following objectives, which were investigated via desk review and key informant interviews:

- review literature on AMR and policy development in Bangladesh

[11] World Health Organization, Food and Agriculture Organization of the United Nations, and World Organisation for Animal Health, *Antimicrobial resistance: a manual for developing national action plans, version 1.* 2016, World Health Organization.
[12] World Health Organization, *Global Action Plan on Antimicrobial Resistance*. 2015.

- assess the NAP implementation phase, focusing on the WHO (2018) eight areas proposed in the AMR situational analysis tool (see below).
- examine the contextual drivers and power relations of policy actors' behavior and decision-making in relation to AMR policy
- identify policy actors determining policies described in the NAP to combat AMR
- conduct a social network analysis of the relevant actors, adopting One Health approach
- identify policy lessons and practices to use the research findings for policy advocacy regarding AMR policy.

The study mainly applied a qualitative design, including a desk-based review and purposive snowball sampling for key informant interviews with policy/decision makers, regulatory authorities, medical and veterinary practitioners, pharmacists, and representatives from pharmaceutical industries and animal feed industries.

The WHO eight areas are: 1) NAP being in line with GAP-AMR governance; 2) Raising of awareness; 3) National AMR surveillance system; 4) Rational use of antimicrobials and surveillance of use/sales (community-based); 5) Infection, prevention control and AMR stewardship; 6) Research and innovation; 7) One Health engagement' and 8) Overarching coordination mechanisms for One health engagement.

The desk review assessment of policy documents for the human, animal and environment sectors, scholarly articles and the WHO situational analysis found varying levels of AMR awareness and implementation. The main three government sectors actively involved in responding to AMR through policy or practice consisted of the human health, livestock and fisheries sectors, as well as drug administration, pharmaceutical industries/associations, the Institute of Epidemiology Disease Control and Research (IEDCR), WHO, BSMMU-Bangabandhu Sheikh Mujib Medical University etc. Environment and Agriculture will be more actively involved in the revised version of the NAP. Three main key action plans are stipulated in NAP designing: surveillance, operational research, and optimisation of antimicrobial use.

Other findings include:

- **Education and public awareness:** Limited awareness programme.
- **MR Surveillance system:** No national surveillance system that collects data across the sectors (human, animal, food production/safety, and environment), but hospital-based surveillance has been initiated in 9 hospitals.
- **Research and innovation:** No dedicated national budget for AMR research.
- **One Health Management:** Adequate measures have not been taken to regulate the release of antibiotic residue in the environment.
- **Antimicrobial stewardship programme**: No standard guidelines/protocol was made available to all hospitals, only a few hospitals follow their own AMR guidelines.

Challenges implementing the NAP include workforce shortages, financial constraints, engaging new staff who may not be interested in NAP and who need time to adapt to NAP activities and the balancing of multiple tasks, for example many workforces are involved in Covid-19 related activities.

One Health

Chaired by Dr Chris Pell, this session shared the findings from three different One Health projects in Vietnam.

Development of a One Health intervention to tackle AMR in northern Vietnam

Dr Sonia Lewycka, Oxford University Clinical Research Unit, Vietnam

This formative research project sought to understand the social and cultural contexts in which antibiotics are used and interventions will be delivered, and to inform intervention design and messages. The elements include: 1) Ethnographic research to understand the social and cultural context and inform intervention design and content of messages and 2) Household surveys to describe health behaviours and prevalence of antibiotic use and identify risk and protective factors to target for interventions. Sample: 325 households, 1500 participants, 66% engaged in farming, 80% of household farms had used antibiotics. Antibiotic use in last 2 weeks: 17% adults, 26% children under 5 years. ~90% colonised with resistant bacteria in gut and respiratory tract.

The process challenged assumptions as knowledge is not directly associated with antibiotic use, individual antibiotic use is not associated with individual AMR, and One Health factors are important.

The process to design communication materials for public information campaigns consisted of a needs assessment, the development of messages, and work with a graphic designer. Testing with the public included a promotion event, feedback and revision.

A participatory action research + photovoice approach was also taken to test approaches to group formation and participatory learning and use photovoice methods to provide rich insights and stimulate discussion. This consisted of recruitment > camera training > photo selection and sharing narratives > planning the exhibition > engagement activities.

Reflections related to the invisibility of AMR in the community; widespread use outside of the formal health system; knowledge ≠ behaviour; changing social norms involves both participation and action; individual antibiotic use ≠ individual AMR; and that community interventions need to include One Health. A social research gap was also identified around environmental exposures, i.e. Water, Sanitation and Hygiene (WASH), food hygiene and biosecurity.

Growth-promoting antibiotics and farmland in northern Vietnam

Giao Vu Thi Quynh, Oxford University Clinical Research Unit, Vietnam

An ethnographic study into farm antibiotic use in Vietnam looking at the significance of antibiotics relative to other concerns held by farmers. Data collection consisted of in-depth interviews and participant observation and found that the use of antibiotics in animal husbandry is largely for

growth promotion, prevention, treatment. WHO has recommended that antibiotics shouldn't be used for growth promotion and Vietnam banned growth promotion, effective 1 January 2020.

All 15 farmers interviewed confirmed non-use of antibiotics for growth promotion and the majority thought antibiotics actually have the opposite effect, i.e. impaired growth, *"Too much antibiotics will just make chickens **còi** (skinny)!"* [Chicken farmer, 47].

Dilemmas of care: Healthcare seeking and antibiotics use in rural communities in Nam Dinh Province, Vietnam (Preliminary findings)

Yen Nguyen Thi Hong, Oxford University Clinical Research Unit, Vietnam

This project sought to explore the context of healthcare seeking, perceptions and practices of care, medicines and antibiotics use in rural communities and inform interventions in communities to improve the practice of antibiotics use.

Fifteen (15) semi-structured interviews were conducted with women in 15 communes in Xuan Truong, Hai Hau, Nghia Hung District, because they often take the main caring role in the families. Of the 15, 13 were married with children. In each interview, participants sorted prepared medicines under observation.

Norms of healthcare seeking

The process found that participants' pathway of healthcare seeking when they or their family member got respiratory tract symptoms often started with care at home after having symptoms. Then treatment would be sought in pharmacies or commune health centers, or with local healers. If symptoms persisted, most would go to hospitals, though some would change to different pharmacies. Hospitals were often the last resort. Many also used traditional remedies along with seeking western-medicine treatment. Factors that influenced their health facility choice included convenience (time and distance), familiarity and trust, their financial concerns and judgement on the severity of illness.

Participants perceived antibiotics as representative of western medicines, so sometimes used the words interchangeably. Antibiotics were perceived as representative of strength, effectiveness, affordability and accessibility. They understood they should be prescribed by a doctor and taken for a course of 5-7 days. However, overall, they had a low understanding of how they work and of antibiotics resistance.

Dilemmas of care

The study focused on mothers and children to map out a series of dilemmas of care and related contributing factors, though sees that these are broadly applicable to other groups in how they illustrate the challenges that resist change towards more appropriate use of medicines and antibiotics. For example, there is a dilemma between the public health message, "follow doctors' instructions" and the reality of healthcare structures in rural areas that are often low quality and use antibiotics inappropriately. Hospitals are often a last resort because they are hard to reach, overloaded and costly. Here the dilemma is that the healthcare structure has created a logic for

inappropriate antibiotic use in communities. There is also the dilemma mothers or carers have of not wanting to give unnecessary medicine to their children (through their own experiences or through communication with doctors) yet wanting to be socially perceived as "appropriate" and "good mothers" or to relieve their own anxiety about the illness, by giving a sick child medicine.

Limited health knowledge and access to information is a contributing factor caused by an overloaded healthcare system where doctors do not spend enough time to explaining healthcare to patients. Most looked up healthcare information on the internet but did not know if the information was reliable. Additionally, financial pressure is a factor where there is a risk of losing productivity or work if their child does not recover quickly and they must take time off work to care for them.

Setting an AMR social science research agenda for Asia

The final session consisted of a series of interactive breakout discussions, using a combination of virtual post-its (via Padlet) and online discussion to identify research priorities and approaches. Participants were asked to identify gaps under the following four areas and identify any additional methods they would use to take this research forward, as well as prioritise any gap areas identified.

1. What are the social science research gaps in antibiotic dispensing and use in Asia? *Chaired by Dr Anne Osterrieder/Dr Chris Pell*
2. What are the social science research gaps in engagement around AMR in Asia? *Chaired by Dr Phaik Yeong Cheah*
3. What are the social science research gaps in policy and stewardship of antibiotics in Asia? *Chaired by Maren Jeleff*
4. What are the social science research gaps related to antibiotics and one health in Asia? *Chaired by Dr Sonia Lewycka*

This section of the report also integrates reflections from the presenters on research gaps, as related to and emerging from their areas of study.

Antibiotic dispensing and use in Asia

Issues or challenges identified in the breakout session included:

- *Private sector and its full role in dispensing*
  - this has been studied somewhat, but questions remain about interventions and economic interests
  - For example: upstream economic interests in antibiotic production and supply chain

- *The need to study equity impacts of interventions* to reduce prescribing
  - For example: taxes on antibiotics

- *Potential for community-based research*
  - Including surveillance and medicine-cabinet surveys (i.e., beyond the facility

- *Impact of COVID-19 on dispensing*:
  - The need for qualitative research (not just surveys of dispensing) to understanding decision-making process and design interventions.

Engagement around AMR in Asia

Issues or challenges identified in the breakout session included:

- *The need to raise awareness on key issues:*
  - Limited understandings of drug resistance. For crime, fire, heart disease, traffic safety, COVID-19, etc people understand that prevention is better than trying to fix the problem once it has arisen. For antibacterial resistance how can we convince people to accept that prevention is worth it?
  - Lack of understanding, particularly around the environmental side of AMR

- *Community engagement strategies:*
  - Understanding community engagement as something other than public engagement.
  - What are the drivers for public participation in the first place?
  - understanding different target groups wants and needs regarding antibiotic use
  - How do we maximise the possibility of on-going change both with the use of policy and community initiatives?
  - But also a need to think more about the relational aspect of our work to other health and social systems to ensure that our work is sustainable.
  - Need to consider power dynamics, e.g., to change behaviour or policy they are more likely to listen to people in power
  - How do we get policymakers and writers of NAPs to listen to the community?

- *Communication approaches:*
  - How to talk about AMR with the communities while they don't see it a problem
  - Culturally appropriate awareness program needs be designed, tested and implemented using suitable communication channels
  - Understanding which forms of communication different groups are more receptive to.
  - Speak from data: Not echo chambers of what's considered mainstream
  - Meet people where they are: Instead of raising awareness about AMR as an extraordinary issue detached from people's preexisting concerns
  - There is a need for awareness raising, education and training of the general public, doctors and pharmacists to change norms and beliefs.
  - locally relevant training and communication packages are needed that help patients/caregivers understand and follow the instruction provided by healthcare workers
  - The need to evaluate AMR campaigns and apply learning to future strategies and approaches.

Policy and stewardship of antibiotics in Asia

Issues or challenges identified in the break out session included:

- *Global level indicators and action:*
  - A set of global target indicators would help to increase momentum on making change. These should include community and One Health indicators and be incorporated within a global framework like SDGs.
  - How to make people understand that the AMR problem is urgent?

- *National Action Plans:*
  - Inclusion of One Health policies in NAPs, e.g. wastewater management and environmental monitoring
  - Need health service research to improve the implementation of AMR NAPs
  - Need to increase the development and adoption of NAPs on AMR in all WHO member states (currently 144/194)

- *Policy implementation and compliance: (highest prioritization by participants of the discussion!)*
  - How to tackle policymaker's low prioritisation of AMR
  - How are policies aiming to reduce antimicrobial use in livestock production enforced?
  - How to tackle policy implementation gaps (such as lack of implementation of AMR NAPs); what are the barriers to implementation?
  - What kind of action can be taken to increase enforcement of OTC policies?
  - Practitioners' duties and liabilities, offences, penalty and procedure should be revised to prevent AMR.

- *Community engagement:*
  - Are Public Health Campaigns useful and to what extent do they have an effect?
  - Are policymakers aware of AMR? How do they weigh antibiotic use against their other priorities?
  - Community influence on policy - how much do decision makers listen to community perspectives/evidence?

- *Impact of COVID-19:*
  - How much has COVID-19 impacted policy and stewardship approaches to AMR?
  - Some countries reported higher antibiotic use than other countries, why is that the case?

- *More research into vaccination programs:*
  - Why do some countries do better than others?
  - Vaccine hesitancy: Does this play a role in South-East Asia? Does this influence the inclusion of vaccination in AMR NAPs?
  - Global health: Access to vaccines (health equity), supporting vulnerable groups and populations

Antibiotics and one health in Asia

Issues or challenges identified in the breakout session included:

- *Understanding key behaviours of physicians and people* that could be changed/modified in order to prevent and reduce burden of AMR.

- *Linkages between different sectors:*
  - Non integration of environment and agriculture sector in current NAP: One-Health approach incomplete.
  - Need to consider the links between antibiotic use in animals and prevalence and association of antibiotics use in plant farming to risk of AMR in humans
  - Overcoming barriers that make transdisciplinarity difficult to achieve in One Health, e.g. understanding more about the different sectors' actual engagement with AMR, varying attitudes and approaches across the sectors, and where intersects are.
  - Lack of understanding in collaboration of multiple disciplines working locally, nationally and globally to achieve the optimal health of people, animals and the environment
  - Attitudes in farming can influence attitudes of patients, i.e. 'just in case' prescribing mentality is ok for animals (prevention) but is it ok for humans?

- *Making the social science contribution more visible:*
  - The social sciences are not present in the One Health bubble. Its: human medicine - veterinary medicine - environmental sciences. Is this correct? If so, what is the implication?
  - Making AMR visible by framing/connecting it with what people already care about.

A cross cutting theme identified was the need to engage young people: How can researchers be supported to better communicate with youth? Youth involvement should be encouraged in youth focused research to better understand cultural and generational differences in approaches towards antibiotics but must ensure it doesn't become tokenistic.

Overarching challenges include:
- Sensitivity of some topics in some contexts or settings
- Limited skills in some contexts, i.e. social scientists with health sector expertise.

Participant feedback

A post-workshop evaluation was conducted via Google Forms to gather feedback and learning for future events. There were 15 respondents, who shared the following feedback:

1. What interested you about this workshop?

- Applying the social science dimension to AMR - recognising the complex factors that contribute to the burden, as well as understanding barriers and hearing about the range of different projects
- AMR is a public health issue
- The One Health approach – and developing National Action Plans
- antibiotic dispensing and use, and community engagement
- Links to own research and work

- Seeking regional information on AMR issues (Asia)
- Community focus

2. Session usefulness (did not attend, 1 = poor, 5 = excellent)

Respondents ranked the sessions highly – from good to very good, as depicted in the figure below:

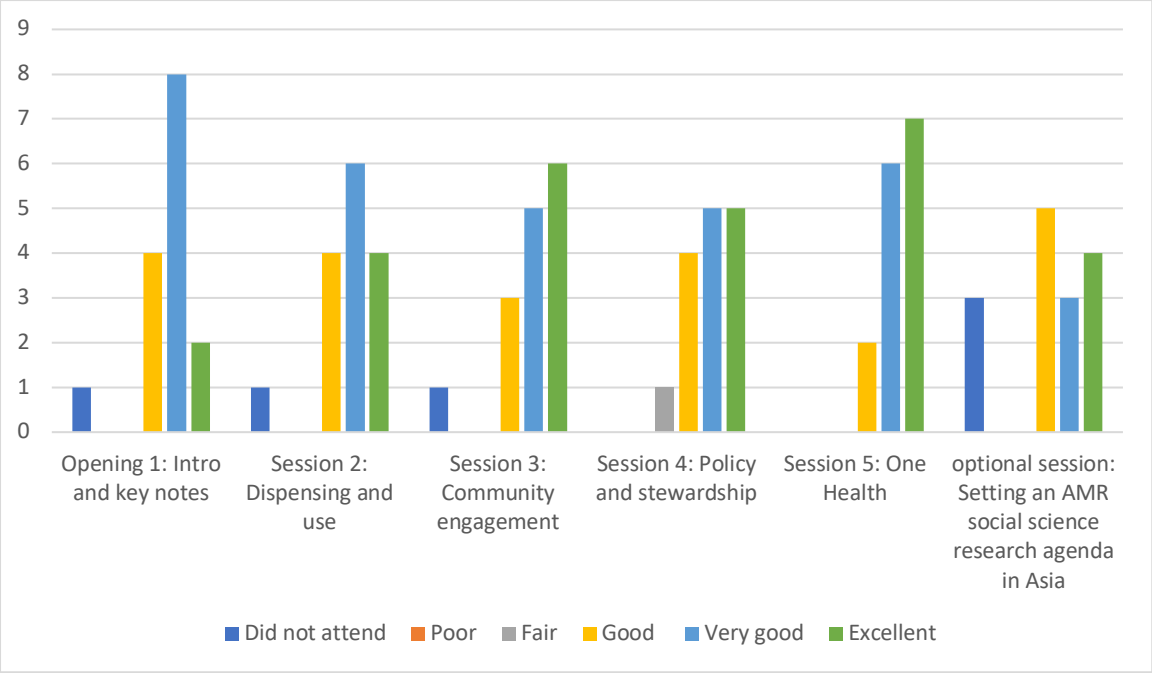


Figure 2: Usefulness of sessions, as rated by participants (n=15)

3. Other AMR social science research priorities that were not discussed in the workshop or breakout sessions.

Respondents felt most were covered and only suggested the following:

- Behavioural changes and psychological perspectives related to AMR
- Using community generated data in academic research setting

One also commented that, *"Lots of areas were covered. As ever with these things it would have just been good to have more time. It really was an excellent event."*

4. Suggestions for topics for future AMR workshops related to social science.

From a content perspective, the following suggestions were made:

- Intervention needed to improve misuse of antimicrobial among population that has low awareness of AMR issue.
- Explore community informed policies to educate and increase awareness of rational antimicrobial use.
- Behavioural changes and psychological perspectives related to AMR
- Language/communication in AMR, AMR ethics
- Perhaps something specific on policy engagement?
- Community activism / school curriculums

- A series of methods lectures might be interesting

From a format perspective, others suggested:

- Ensure slides are shared in a way that gives people time to read them before moving to the next one.
- Debates regarding to AMR topics to make it even more thought provoking to discuss
- Longer discussion times after each set of presentations may help us to move from questions to a discussion about ways forward.
- Better process for assigning participants to break out rooms.

5. Other comments.

Final comments included:

"Great work putting the workshops together. It was a good learning opportunity."

"I think the event was very successful. I enjoyed the presentations and discussions. I would like to say thanks to Rita and PY (Phaik Yeong) and other team members who organised the event."

"Looking forward to the next event."

Next steps

With research gaps identified though the two-day workshop, next steps include:

- planning for potential funding applications; and
- organising the next meeting in 2022.

Annex 1: Agenda

Time	Topic/Discussion item	Speaker
DAY 1: Tuesday 14th September 2021 - 3.00-5.30 pm ICT/9.00-11.30 am BST		
Opening 1 Introduction and key notes Chair: Dr Chris Pell (1 hour)	Welcome and introduction *(10 minutes)*	Prof Phaik Yeong Cheah, Mahidol Oxford Tropical Medicine Research Unit, Thailand
	Introduction to Sonar-Global and AMR hub *(10 minutes)*	Dr Tamara Giles-Vernick, Institute Pasteur, France
	Key Note I *(15 minutes)* Key social science research gaps: experience in Southeast Asia	Professor Raph Hamers, Eijkman-Oxford Clinical Research Unit, Indonesia
	Key Note II *(15 minutes)* Drivers of antibiotic use in Vietnam: implications for designing community interventions	Dr Thu Anh Nguyen, Woolcock Institute of Medical Research, Australia
	Break *(10 minutes)*	
Session 2 Dispensing and use Chair: Prof Rogier Van Doorn (45 minutes)	Over -the-counter use of antimicrobials in Nepal: findings from a qualitative study *(10 minutes)*	Dr Bipin Adhikari, Mahidol OxfordTropical Medicine Research Unit, Thailand
	Hospital antimicrobial prescribing and evaluation of antimicrobial prescribing guidelines in Laos *(10 minutes)*	Dr Vilada Chansamouth, Laos Oxford Mahosot Wellcome Research Unit, Laos
	Perceptions of antibiotic use 'they eat it like sweets': A mixed methods study of antibiotic perceptions and their use among patients, prescribers and pharmacists in a district hospital in Kabul, Afghanistan *(10 minutes)*	Dr Doris Burtscher, Médecins Sans Frontières, Vienna Evaluation and Operational Support, Austria
	Discussion *(15 minutes)*	
Session 3 Community engagement Chair: Dr Sonia Lewycka (45 minutes)	Youth Against Antimicrobial Resistance *(10 minutes)*	Dr Mary Chambers, Oxford University Clinical Research Unit, Vietnam
	Training and communication package to reduce AMR among patients/caregivers *(10 minutes)*	Summita Udas Shakya, Oxford University Clinical Research Unit, Nepal
	Using community Engagement to generate questions and solutions around AMR in low resource settings. *(10 minutes)*	Professor Paul Cooke, Dr Rebecca King and Dr Jessica Mitchell, University of Leeds
	Discussion *(15 minutes)*	

Time	Topic/Discussion item	Speaker
Day 2: Wednesday 15th September 2021 - 3.00-5.30 pm ICT/9.00-11.30 am BST		
	Welcome and objectives	Dr Chris Pell
Session 4 Policy and stewardship Chair: Maren Jeleff (45 minutes)	Embedding community voices in shaping the Thai AMR National Action Plan (https://wellcomeopenresearch.org/articles/6-188) *(10 minutes)*	Tassawan Poomchaichote/Ravikanya Prapharsavat, Mahidol Oxford Tropical Medicine Research Unit, Thailand
	An assessment of National Action Plans on AMR and the inclusion of vaccination as an intervention to reduce AMR: a global and Southeast Asia review *(10 minutes)*	Dr John Paget, Netherlands Institute for Health Services Research (Nivel), The Netherlands
	Early findings from the implementation of National Action Plans on Antimicrobial Resistance in Bangladesh *(10 minutes)*	Dr Bushra Zarin Islam, BRAC University, Bangladesh
	Discussion *(15 minutes)*	
Session 5 One health (45 minutes) Chair: Dr Chris Pell	Development of a One Health intervention to tackle AMR in northern Vietnam *(10 minutes)*	Dr Sonia Lewycka, Oxford University Clinical Research Unit, Vietnam
	Growth-promoting antibiotics and farm land in northern Vietnam (*10 minutes)*	Giao Vu Thi Quynh, Oxford University Clinical Research Unit, Vietnam
	Dilemmas of care: Healthcare seeking and antibiotics use in rural communities in Nam Dinh Province, Vietnam (Preliminary findings) *(10 minutes)*	Yen Nguyen Thi Hong, Oxford University Clinical Research Unit, Vietnam
	Discussion *(15 minutes)*	
Closing of conference (5 minutes)		
BREAK (10 minutes)		
OPTIONAL SESSION: SETTING AN AMR SOCIAL SCIENCE RESEARCH AGENDA FOR ASIA		
Session 6 (25 minutes)	Social science research priority setting	Break-outs
	Antibiotic dispensing and use	Break-out 1 (Dr Anne Osterrieder/ Dr Chris Pell)
	Community engagement	Break-out 2 (Dr Mary Chambers/ Dr Phaik Yeong Cheah)
	Policy and stewardship	Break-out 3 (Maren Jeleff)
	One health	Break-out 4 (Dr Sonia Lewycka)
Session 7 (20 minutes)	Break out reporting and group discussion *(10 minutes)*	Rapporteurs
	Summing up and closing *(10 minutes)*	Dr Chris Pell