Informal Consultative Meeting on Antimicrobial Resistance Prevention and Control in Emergencies/Disasters

29-30 November 2011
Manila, Philippines
REPORT

INFORMAL CONSULTATIVE MEETING ON ANTIMICROBIAL RESISTANCE PREVENTION AND CONTROL IN EMERGENCIES/DISASTERS

Convened by:

WORLD HEALTH ORGANIZATION
REGIONAL OFFICE FOR THE WESTERN PACIFIC

Manila, Philippines
29–30 November 2011

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NOTE

The views expressed in this report are those of the participants in the Informal Consultative Meeting on Antimicrobial Resistance Prevention and Control in Emergencies/Disasters and do not necessarily reflect the policies of the Organization.

This report has been prepared by the World Health Organization Regional Office for the Western Pacific for governments of Members States in the Region and for those who participated in the Informal Consultative Meeting on Antimicrobial Resistance Prevention and Control in Emergencies/Disasters, which was held in Manila, Philippines from 29 to 30 November 2011.
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Key words:

Antimicrobial Resistance (AMR) / Emergency / Disaster Management
1. INTRODUCTION

An Informal Consultative Meeting on Antimicrobial Resistance Prevention and Control in Emergencies was held from 29 to 30 November 2011 in Manila, the Philippines, by the World Health Organization (WHO) Western Pacific Regional Office, in collaboration with the WHO Centre for Health Development in Kobe, Japan.

Antimicrobial resistance (AMR) has become a serious problem for both developed and developing countries. On World Health Day 2011, WHO launched a worldwide campaign to fight AMR. Although prevention and control of outbreaks of infectious diseases in emergencies and disasters has received a lot of attention, emergency managers have not yet been engaged in national, regional and global efforts to address the issue of AMR in emergencies.

As part of the preparation for the meeting, a literature review was conducted to document what is currently known about antimicrobial resistance and emergencies.

1.1 Objectives

(1) To understand current knowledge of the prevalence and significance of AMR in emergency situations as presented in the findings of a literature review that was commissioned as part of the preparation for the meeting.

(2) To identify the strengths, weaknesses and gaps of the current emergency preparedness response and recovery arrangements in relation to AMR prevention and control in emergency settings.

1.2 Opening remarks

The participants were welcomed to the meeting by Dr Takeshi Kasai, Director of the Division of Health Security and Emergencies, WHO Regional Office for the Western Pacific. He explained that an informal consultation is a mechanism often used by WHO to gather the views and opinions of selected experts and practitioners, as part of a wider process of informing WHO decision-makers on how best to take an issue forward. Although AMR is not considered a high priority area in the management of most emergencies, it is an important public health issue that needs to be kept in mind by emergency managers. As such, this meeting was an opportunity for emergency managers and those working on AMR to explore new perspectives. Although the issue needs to be addressed through a long-term strategic approach, immediate action is also needed. As such, Dr Kasai requested participants to share their thoughts on what could be done in both the long and short term.

1.3 Participants

Nine experts from three countries joined 13 WHO Regional Office staff from the Division of Health Security and Emergencies and the Division of Health Sector Development, the WHO Kobe Centre in Japan and the WHO Representative’s Office in the Philippines. Two facilitators were recruited to record and document the meeting. See Annex 1 for a list of participants.
1.4 Meeting structure

To provide background to the discussion, six presentations were made by WHO staff and experts on various aspects of the prevention and control of AMR, and of emergency management. The participants were divided into two groups and given a set of guidance questions to assist in developing their observations. Each day, the work of the groups was presented and discussed in plenary. On the second day, the goal of the plenary was to develop a consensus on AMR prevention and control in emergency settings. See Annex 2 for meeting schedule.

2. PROCEEDINGS

The following presentations were given to provide context and background to the discussions. The full text of each presentation is included in Annex 4.

2.1 WHO’s work in AMR prevention and control

Dr Madeleine de Rosas-Valera, Technical Officer, Patient Safety, Division of Health Sector Development, WHO Regional Office, presented an overview of WHO’s work in AMR prevention and control. As a follow-up to World Health Day 2011, WHO developed a six-point policy package to address the issue of AMR prevention and control at the global level. To support implementation of this policy in the Western Pacific Region, WHO undertook key informant interviews in 13 countries, which identified seven priority areas for action. Implementation of the global policy in the Region is constrained by lack of laboratory capacity to confirm AMR and weak surveillance systems to detect it. However, some accomplishments have been made, including: development of a training package on the rational use of antimicrobials for ASEAN countries, conduct of national advocacy workshops on AMR, public advocacy on the rational use of antimicrobials and technical support for pilot implementation of a minimum training package. Future plans include finalization of an AMR Technical Strategic Framework, joint ventures to assist countries developing comprehensive multidisciplinary national plans to address AMR and resource mobilization to support implementation of the AMR Technical Strategic Framework.

2.2 AMR in emergencies

Dr Bipin Verma, Special Adviser, Emergency and Humanitarian Action, Division of Health Security and Emergencies, WHO Regional Office, presented an analysis of pharmaceutical needs in emergencies. He showed how needs are based on both the morbidity profiles of different hazards, and the differing needs of the relief and recovery phases of emergency management. In respect to AMR issues, prescriber habits and the appropriateness and/or relevance of case management protocols are the main determinants of the rational use of antimicrobials in emergencies. AMR can also evolve due to efficacy issues, caused by problems in relation to the quantity, quality, storage, wastage and disposal of antimicrobials that are very common in emergency settings.

2.3 Experience from the field

Mr Michael Chai, Southeast Asia Coordinator, Action on Antibiotic Resistance (ReAct), gave his views on the issue. He felt that although it is not true to say there is no evidence that AMR is a problem in emergencies, it is certainly true that there is a lack of relevant evidence. For
example, there are many reports in the literature of foreign victims of disasters developing resistant infections, but these infections are identified and treated in the victims’ home countries, followed by the affected country addressing the issue where the infection was acquired. Prevention and control of AMR is a problem with multiple factors, and to be successful, engagement is needed outside the clinical/ research laboratory fields. Official guidance on rational use on antimicrobials in emergencies may exist, but it is hard to enforce in the complex environment of an emergency, especially with multiple private sector and international actors. An opportunity to address the issue on a global scale could be taken by including AMR on the Rio +20 agenda.

Professor Mei Che Pang, Head of the School of Nursing, Hong Kong Polytechnic University, presented the experience of Hong Kong (China). She said that lessons learnt from severe acute respiratory syndrome (SARS) have led to revised guidance on intensive care unit (ICU) facilities and the development of the three “Rs” approach – rationing, restriction and responsibility – to maximize the effectiveness of antimicrobial use. An evaluation of the effectiveness of their community health promotion programme on acute respiratory diseases showed that goal-oriented training for trainers and support for engagement of professional health networks are key to improving community health literacy. With support from the WHO Regional Office, the School of Nursing, Hong Kong Polytechnic University has developed a package to support the prevention and control of health care-associated infections in low-resource countries. The package, which consists of an assessment tool, a toolkit and a training programme, is currently being implemented in the Region.

2.4 Literature review on AMR prevention and control and emergencies

Ms Yuki Maehira, Visiting Researcher, Department of Global Health, Medicine and Welfare, Nagasaki University Graduate School of Biomedical Sciences, was commissioned to prepare a literature review of AMR and emergencies. A full report of her findings is attached in Annex 3. The key findings of her review were as follows:

1. There is no internationally accepted guiding framework for AMR prevention and control in emergencies.

2. The priority given to life-saving interventions, and the medical cultural conflict between the curative care of individuals and a public health approach are major determinants of the use of antimicrobials in emergencies.

3. Public health and medical decision-making in emergencies is often based on available resources rather than best practice or public good.

4. Many existing AMR surveillance systems are owned by the private sector, creating issues of conflict of interest, transparency and accountability.

5. Emergency conditions create increased risk for AMR dissemination through treatment provider behaviours, population conditions and reduced capacity of health systems.

6. There is a fundamental lack of information on the prevalence of AMR by location and on the rational use of antimicrobials in emergencies (e.g. prescribing habits, complication rates and treatment failure rates).

7. Detecting and confirming AMR is a highly technical area, requiring extensive surveillance systems, sophisticated laboratories and collaborative partnerships. The issue
can only be addressed in emergencies through strategic investments in risk assessment, risk communication, advocacy, preparedness and confidence building.

2.5 **Urban Health Emergency Management**

Dr Arturo Pesigan, WHO Kobe Centre, Urban Health Emergency Management, presented an overview of current thinking in the urban aspects of emergency management. Projections indicate that 70% of the global population will be urban by 2050, mostly in low- and middle-income nations. Asia’s urban population made up 32% of the world’s urban population in 1950, and this percentage is expected to increase to 55% by 2030. Given the specificity of the determinants of health status in urban populations, a 10-point checklist has been developed for local governments, covering areas such as organization and coordination of services, risk assessment, safety of infrastructure including health facilities and protection of ecosystems and natural buffers. In each of these 10 areas, specific AMR prevention and control issues could be addressed.

The discussions after the presentation highlighted the need to consider context when planning AMR detection and control. Urban and rural areas have differences in pathogen profiles, disease transmission routes and rates, access to primary, secondary and tertiary care, as well as capacities for the detection, reporting and confirmation of resistance. All of these factors need to be taken into account when planning interventions to manage AMR in emergencies.

2.6 **Managing medicines during emergencies: the role of WHO**

Dr Vanchinsuren Lkhagvadorj, Essential Medicines and Health Technologies, WHO Regional Office for the Western Pacific, presented an overview of international and WHO arrangements for managing medical supplies in emergencies and discussed some of the issues around management of drug supplies in emergencies. One of the problems faced by WHO and others is related to logistics and appropriateness – the need to get sufficient quantities of safe, effective and appropriate medicines to the affected population as soon as possible, which includes the effective management of donations. Since 1990, various international initiatives have been taken to address these issues, such as regional stockpiles, the development of specific kits, such as the Interagency Emergency Health Kit, guidelines on making drug donations in emergencies and guidelines on the safe disposal of medicines in emergencies.

A discussion after the presentation highlighted the fact that AMR prevention and control is not explicitly addressed in any of the existing instruments. The emergency management community can contribute to global and national processes for the prevention and control of AMR by reviewing and updating current guidance, and developing additional guidance on AMR in emergency and post emergency settings.

2.7 **Operational Framework for Health Cluster Response in the Western Pacific Region**

Dr Li Ailan, Emergency and Humanitarian Action, WHO Regional Office for the Western Pacific, presented an overview of current international coordination arrangements for emergency management. In 2005, the Humanitarian Reform Initiative was implemented as a response to lessons learnt in the Asian tsunami in 2004/2005. As part of the initiative, the Inter-Agency Standing Committee adopted the global cluster system in an attempt to improve coordination between international actors, and between the international community and host governments. WHO was appointed lead agency for the Health Cluster. In August 2011, the WHO Regional Office organized the First Regional Health Cluster Forum on Humanitarian Emergencies in Kobe, Japan. The aim of the forum was to develop a common operational framework for implementing the health cluster approach at country level in the Western Pacific Region. The
participants developed a governing framework known as “Three plus One”, which organizes health cluster emergency management functions into related areas of Information, Health Services and Resources, as well as Monitoring and Evaluation.

As a universally recognized international mechanism for oversight of all international actions in preparing for, responding to and recovering from emergencies, the Health Cluster may have an important role in the prevention and control of AMR, by ensuring that health actions in specific emergencies do not contribute to the development of AMR, and also, under the Information function, by identifying AMR data or information that might contribute to health needs and risk assessments that inform provision of health services during emergencies. However current guidance will need reviewing and updating, and specific guidance on AMR detection and control in emergency and post emergency settings may be needed, particularly for health services at local level.

2.8 Group work

The group work on day one focussed on developing problem-and-issue statements based on the knowledge and experience of the participants and on information provided in the presentations. Since the output of these discussions fed directly into the group work of day two, a discussion of day one group work is not included here, but a summary is provided in Annex 5.

On day two, the participants worked in groups to develop their observations and findings on how AMR prevention and control in emergencies might be addressed. The conclusions of each group are summarized below.

2.8.1 Group One

(1) Advocacy material is needed to convince policy-makers and decision-makers to make investments in AMR prevention and control in emergencies, and this material should be based on evidence.

(2) Emergency managers need to be engaged in national AMR prevention and control measures.

(3) International and national guidelines and protocols on drug donations and the safe disposal of donations need to be revised and enforced in support of AMR prevention and control.

(4) AMR prevention and control issues need to be included in formal emergency management monitoring and evaluation processes at national and international levels.

2.8.2 Group Two

(1) A mechanism, such as a task force, is needed at the country level to allow emergency managers and those working on AMR prevention and control to work together to identify and address country-specific needs in their own emergency settings.

(2) A mechanism is needed to allow up-to-date information on AMR prevalence and distribution to be made available to emergency managers whenever needed, and to allow emergency managers to contribute information to support AMR prevention and control measures, e.g. by participating in the systematic reporting of unexplained treatment failures in emergency settings.
(3) To be useful to emergency managers, AMR data need to be disaggregated by location, easily accessed and regularly updated.

(4) Information on AMR prevalence and distribution is needed to inform processes to develop, update and revise international guidance and national standard protocols for case management in emergencies, and this information needs to be regularly updated to ensure the appropriateness of first-line treatments is maintained, and to provide up-to-date guidance on appropriate second- and third-line treatments in the event of treatment failure.

(5) National protocols for reporting failed treatment in emergency settings, and guidance on the implementation of those protocols at the local level, need to be developed.

(6) Based on a review of treatment guidelines, managers of stockpiles and warehouses need to ensure second- and third-line treatment options are procured and maintained in stock. Controls need to be put in place on the release and accounting for second- and third-line treatments. Mechanisms are needed to ensure that managers with responsibilities in AMR prevention and control have access to regularly updated information on trends in the use of second- and third-line treatments in emergency and post emergency settings.

3. CONCLUSIONS

In the closing session of the meeting, the participants reached a consensus on the following points:

(1) Although AMR is not a high priority issue in the management of most emergencies, it is an important issue that emergency managers need to keep in mind. The most important elements of a strategic approach to AMR and emergencies are, first, to maintain the effectiveness and capacity of the routine AMR surveillance services, and second, to ensure that institutional mechanisms exist to facilitate the exchange of information between emergency managers and AMR surveillance systems.

(2) This group would like to continue to be involved in the WHO planning process on the issue of AMR prevention and control in emergencies.

(3) Suspecting, detecting and confirming the existence of AMR is a highly technical area, requiring extensive surveillance systems, sophisticated laboratories and collaborative partnerships. The issue can only be addressed in emergency settings through extensive investments in preparedness.

(4) Emergency managers should be invited to join national planning processes for AMR prevention and control, and AMR experts need to participate in high-level public health planning for emergencies.

(5) AMR prevention and control issues should be addressed in emergency management protocols, guidelines, training packages and toolkits, wherever appropriate.

(6) Advocacy is needed to encourage national authorities to strengthen capacities for preventing, suspecting, detecting, reporting, confirming and controlling AMR in emergencies, but the messages need to be based on convincing evidence. The immediate priorities are as follows:
(a) form partnerships to continue to collect data and research evidence;

(b) advocate and enhance national capacity for AMR prevention and control in emergencies, including rational use of medicines, information collection and risk assessments in emergencies, as appropriate; and

(c) develop and use advocacy material to generate support for the national strategy.

(7) As a concrete measure, the Department of Health Philippines committed to revising their national guidelines for case management in emergencies to ensure that AMR prevention and control issues are addressed.

(8) A commitment was also given by the School of Nursing, Hong Kong Polytechnic University to review their educational and training materials to ensure that AMR prevention and control issues are properly reflected in the content.
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## WORKSHOP SCHEDULE

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<td><strong>WHO's work on AMR</strong></td>
<td>Madeleine de Rosas-Valera</td>
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<td>Overview of health emergencies and disasters</td>
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| 09h00 – 10h30 | Recap of Day 1  
Urban Health Emergency Management  
Managing Medicines during Emergencies: the Role of WHO  
Operational Framework for Health Cluster Response in the Western Pacific Region | Rodger Doran  
Arturo Pesigan  
Vanchinsuren  
Lkhagvadorj  
Ailan Li |
| 10h30 – 12h00 | Working Group  
AMR and Emergency Preparedness                                      | All participants                    |
| **12h00 – 13h30** | **Lunch Break**                                                        |                                    |
|            | **Plenary 5: Discussion on the group work**                          |                                    |
| 13h30 – 14h00 | Presentation of the group work  
Discussion                                                             | Group Rapporteurs  
All participants |
| **14h00 –** | **Closing Session**                                                  |                                    |
| 14h00 – 15h00 | Conclusions and recommendations for the way forward                  |                                    |
| **15h00**  | **Closing of Day 2**                                                 |                                    |
SUMMARY OF LITERATURE REVIEW

Silent Menace: 
Emerging Antimicrobial Resistance behind Dedicated Life-saving Efforts
Literature Review for
Gap Analysis on Antimicrobial Resistance (AMR) Control in Emergencies/Post Disasters

OCTOBER 2011

Yuki MAEHIRA

As the work for Joint country-WHO collaborative programme for 2010-2011, funded by the Ministry of Health, Labour and Welfare, the Government of Japan
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**List of key acronyms and abbreviations**

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<tr>
<td>AM</td>
<td>Antimicrobial (s)</td>
</tr>
<tr>
<td>AMR</td>
<td>Antimicrobial Resistance</td>
</tr>
<tr>
<td>ARI</td>
<td>Acute respiratory infection</td>
</tr>
<tr>
<td>ART</td>
<td>Antiretroviral treatment/therapy</td>
</tr>
<tr>
<td>ATC</td>
<td>Anatomical Therapeutic Classification</td>
</tr>
<tr>
<td>AUC</td>
<td>Area Under the (blood concentration-time) Curve</td>
</tr>
<tr>
<td>BEmOC</td>
<td>Basic Emergency Obstetric Care</td>
</tr>
<tr>
<td>CE-DAT</td>
<td>Complex Emergency Database</td>
</tr>
<tr>
<td>CREDC</td>
<td>Centre for Research on the epidemiology of Disasters</td>
</tr>
<tr>
<td>CSR/HSE</td>
<td>Communicable Diseases Surveillance and Response / Health Security and Environment (Dept. of WHO)</td>
</tr>
<tr>
<td>DDD</td>
<td>Defined Daily Dose</td>
</tr>
<tr>
<td>DOTS</td>
<td>Direct Observed Treatment Short Course</td>
</tr>
<tr>
<td>EDL/EML</td>
<td>Essential Drug List/Essential Medicine List</td>
</tr>
<tr>
<td>EDM/EHT</td>
<td>Essential Drugs and Medicines/Essential Health Technology (Dept. of WHO)</td>
</tr>
<tr>
<td>ESBL</td>
<td>Extended-spectrum β-lactamase producers</td>
</tr>
<tr>
<td>GEJE</td>
<td>Great East Japan Earthquake</td>
</tr>
<tr>
<td>HAC</td>
<td>Health Action in Crisis (Dept. of WHO)</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>Human Immunodeficiency Virus /Acquired Immunodeficiency Syndrome</td>
</tr>
<tr>
<td>HR</td>
<td>Human Resource</td>
</tr>
<tr>
<td>IASC</td>
<td>Inter-Agency Standing Committee</td>
</tr>
<tr>
<td>IMAI</td>
<td>Integrated Management of Adolescent and Adult Illness</td>
</tr>
<tr>
<td>IMCI</td>
<td>Integrated Management of Childhood Illness</td>
</tr>
<tr>
<td>M&amp;E</td>
<td>Monitoring and Evaluation</td>
</tr>
<tr>
<td>MDRP</td>
<td>Multi-drug resistant Pseudomonas aeruginosa</td>
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<tr>
<td>MDR-TB</td>
<td>Multi-Drug resistant Tuberculosis</td>
</tr>
<tr>
<td>MIC</td>
<td>Minimum Inhibitory Concentration</td>
</tr>
<tr>
<td>MRSA</td>
<td>Methicillin-resistant Staphylococcus aureus</td>
</tr>
<tr>
<td>MSF</td>
<td>Medicins Sans Frontieres</td>
</tr>
<tr>
<td>NDM-1</td>
<td>New Delhi metallo β-lactamase-1 (blaNDM-1)</td>
</tr>
<tr>
<td>NGO/CSO</td>
<td>Non-Governmental/Civil Society Organization</td>
</tr>
<tr>
<td>NMCH</td>
<td>Neonatal, Maternal and Child Health</td>
</tr>
<tr>
<td>NTD</td>
<td>Neglected Tropical Disease</td>
</tr>
<tr>
<td>PHC</td>
<td>Primary Health Care</td>
</tr>
<tr>
<td>PMTCT</td>
<td>Prevention of mother to child transmission</td>
</tr>
<tr>
<td>PRSP</td>
<td>Penicillin-resistant Streptococcus pneumoniae</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
</tr>
<tr>
<td>STI</td>
<td>Sexually transmitted infection</td>
</tr>
<tr>
<td>TDM</td>
<td>Therapeutic Drug Monitoring</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations (International) Children’s (Emergency) Fund</td>
</tr>
<tr>
<td>UTI</td>
<td>Urinary tract infection</td>
</tr>
<tr>
<td>VRE</td>
<td>Vancomycin-resistant Escherichia coli</td>
</tr>
<tr>
<td>VRSA/VISA</td>
<td>Vancomycin-resistant/Vancomycin-intermediately resistant Staphylococcus aureus</td>
</tr>
<tr>
<td>U5MR</td>
<td>Under-5 mortality rate</td>
</tr>
<tr>
<td>XDR-TB</td>
<td>Extensive Drug Resistant-Tuberculosis</td>
</tr>
<tr>
<td>WB</td>
<td>The World Bank</td>
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<tr>
<td>WHA</td>
<td>World Health Assembly</td>
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<td>WHD</td>
<td>World Health Day</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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<tr>
<td>WPRO</td>
<td>WHO Office for the Western Pacific</td>
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</table>
Annex 3

1. Background for literature review

In response to the emphasis of global commitment and public awareness largely promoted on occasion of World Health Day, 7 April 2011, the concerns for AMR prevalence and future impacts to emerge AMR has been raised particularly in cases to use them in both quantitatively and qualitatively different ways for varied characteristics of target population in emergency settings.

After the Great East Japan (Tohoku) Earthquake (GEJE) occurred on 11 March 2011, Japan is now confronting difficult restoration, rehabilitation process tackling with multifold challenges due to the earthquake, tsunami and nuclear plant crisis\textsuperscript{1,2,3}, and global concerns about health security in emergencies has been raised to alarming level. This is also because of increased frequency of prolonged complex emergencies associated with political crisis or conflicts worldwide such as the wave of democratization in several countries, which often associated with geophysical environmental changes and de-prioritization of health issues from nation’s development strategies to make it difficult to ensure various infectious diseases control.

The GEJE was the particular case which has rarely occurred to result in large-scale evacuation or relocation due to physical loss of housing and radiation emergency. For this case, special attention shall be typically needed for variety of health risks associated with outbreaks probably caused in dense-shelters, polluted and insecure temporary conditions to live.

In response to the recent emergency medical needs as such where more AM use would be presumed for both prevention and treatment, the immediate situation review and analysis on AMR in post disaster emergencies are strongly required. Conducting the review work is also supported by the below reasons and contexts which has made AMR control rather difficult in such particular circumstances;

- Humanitarian act or emergency relief measures for medical service delivery shall cover larger population with diverse characteristics. Efficiency and effectiveness to provide services is paramount in order to maximize life-saving practices. And the service delivery to cover such hard-to-control populations are now achievable to significant extent by various actors including NGO/CSOs as its capacity has been much enhanced technically and financially. But it is not certain if all of them have received coherent messages to specifically control AMR during and post disasters in a concerted manner.

- Majority of disaster victims is in need of pharmaceuticals and healthcare technologies to prevent and control various infections under insecure living environments to which those have to be adapted physically, psychologically with no choice in emergencies\textsuperscript{4}. However the service delivery may be made through alternative or temporary channel to dispense resources without sufficient medical information or guidance. Many patient records may be lost. Under such circumstances, driving forces to enhance more AM use can be accumulated for prevention and treatment, while more probability of emergence or resurgence of ARM pathogens, which is rare, old or new, may be increased.

- AM misuse includes the use of sub-standardized and sometime counterfeits or adulterates, intentionally or unconsciously. Prescribers’ empirical use may also be a causative for AMR, because it could often lead overuse for uncovered resistant strains of infection to fear treatment failure particularly in difficulties of timely lab-testing for precise diagnosis. Non-prescribed self-medication practices could also be widely prevailed under poorly-
regulated but extremely resource-limited, somewhat coercive health care circumstance. Those favorable conditions are to fuel the emergence of AMR and its transmission can often be associated in various service delivery processes in communities or alternative health care settings\(^5\) particularly after disaster or emergency settings, where unique challenges required for infection prevention. Therefore, clinical practices with the use of pharmaceuticals should be rationalized and optimized in order not to go beyond the threshold of probability\(^6,7\) to emerge further AMR.

- And it is rather difficult circumstances to do appropriate interventions particularly in developing countries where primary health development in populations has been blocked by unstable, fragile public health systems, even not affected by disasters.
- AMR control in emergencies shall be emphasized also because it is rather unfeasible with no doubt to monitor and evaluate whole process to provide preventive measures or treatment throughout the population in a timely manner. Due to such nature of difficulty to conduct epidemiological, operational survey during emergency responses, the data and information cannot be effectively acquired thus assumed useful evidences are scarce.
- Active surveillance are prioritized tasks for outbreak control of re-emergence and emergence of pathogens, but limited resources cannot be mobilized for both retrospective, prospective survey to assess AMR threats and investigate its cause-impact relationship.
- Reiterated that AMR is common in areas with frequent natural disasters (on prevalence, or probability acquired), subject association has not yet been shown objectively, systematically for generalization on scientific basis.
- There may be a possibility that well intentioned public health interventions and actions may in fact exacerbate the diseases burden or impede the diseases eradication\(^8\), whereas those are to aim at controlling post-disaster epidemics in the longer term.
- According to the above overview, we predicted that there shall be critically substantial gap or pitfalls in research and evidence acquisition by studies conducted to assess the impacts of AMR in emergencies. This should be further strongly addressed in addition to the voices regularly raised for AM resource shortfalls in pharmaceutical R&D lists for future. It is also because the approaches and innovative disease control modeling with environmental (e.g. GIS), ecological health data can benefit to general AMR control and definitive infectious diseases eradication providing guiding framework with information for rather effective resource targeting to counter such emergence with prediction.

WHO and relevant inter-agency working groups have had in-depth discussions and developed global strategies and guidelines for AM use and resistance since the 1990s\(^9\), however relevant analytical reviews are mainly based on the resistance emerged through general practices in rather stable, healthcare facility-based detection. Such methodological gap in analysis cannot highlight potentially higher risk and larger vulnerability underestimated in specific post-disaster emergency perspectives, under a remarkably high pressure for urgently required medical assistance beyond to cover diverse needs for life-saving or incentive care.

In order not to modest health gains for ones of the most vulnerable populations in such a post disaster environment as well as the general health development with limited pharmaceutical resources, it necessitates urgent review and analysis of potential gap for commitment or shortfalls of emphasis for the specific characteristics, modalities in AMR control in post disaster settings. The expected analytical review results would serve as the useful decision-criteria and rationale for conceptual integration of AMR control in emergency

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\(^6\) M.A. Kohanski, M.A. DePristo, et al. Sublethal antibiotic treatment leads to multidrug resistance via Radical-Induced Mutagenesis, Molecular Cell, 37:311-320 (Feb-12, 2010).


\(^9\) Summary of discussion process to be referred to; WHO Global Strategy for Containment of Antimicrobial Resistance, Executive Summary (p1), Introduction(p12), WHO, Geneva (2001)
settings, particularly post disasters, into global action plan in health cluster approach\textsuperscript{10}. And the points for intervention of post disaster AMR control should be coordinated strategically as an integral part of essential medical service package needed in the pillar of humanitarian act for emergency response\textsuperscript{11}, by determining the commonality or differences in policies and strategies from general AMR guidelines which are already available.

2. Methods of literature review and gap analysis

Comparative desk-top review was conducted during September-October 2011 based on available AM-related literatures, scientific papers, peer journals gray in addition to the guidelines, standards, fact sheets, commentaries and policy documents for coordination, regulation. However, the gray documents or interim, internal reports probably available at institutional level could not been covered in this review work.

In addition to the collection of general AMR resources for situation review, web databases were explored by key word search addressing; (antibiotic or antimicrobial + resistance )+ (disaster or emergency or crisis or conflict) (Fig.2).

The databases searched were: PubMed, Medline, and major titles including The Lancet, BMJ, JAMA, in order to find global health policy-level comments, suggestions to overview respective trends and analyses. In the review process, we shall be prudent to differentiate various AMR, i.e. antibiotics, antivirals, antiparasites for each different pharmaceutical, microbiological dynamics and characteristics, though many papers deal them regardless such differences without clear specifications.

For further technical area-specific information and evidences to be aggregated, journal-targeted keyword search was also conducted onto: Disaster Management and Response, Disaster Research, The International Journal of Disaster Medicine, International Journal of Rescue and Disaster Medicine, Conflict and Health, in addition to; Antimicrobial agents and chemotherapy, International Journal of antimicrobial agents, Journal of antimicrobial chemotherapy, Open Antimicrobial Agents Journal, and the AMR-related publications available in hand.

Additionally, selective term-specific literature search was conducted to supplement epidemiological, pharmaco-technical information as particularly needed, for instance regarding (laboratory or surveillance) and (PK/PD\textsuperscript{12} or prophylaxis), in combination with (antibiotic or antimicrobial + resistance) + (disaster or emergency), as probable insufficiency of those area-specific information by the above sequence for search.

\textsuperscript{12} PK/PD control: pharmacokinetics/pharmacodynamics theory-based antimicrobial dosage control
After discussions to streamline the process of literature review and analysis, specifically ‘natural, geophysical, hydro-meteorological disasters’ are set as the primary events to lead emergencies in which situational factors like collapse, or weaken governance and leadership may be considered as an important component of health systems strengthening. The biological disaster itself was not regarded as the primary cause of disaster, but recognized the core process to promote AMR. Moreover, the political humanitarian emergencies in conflicts or warfare were not taken into consideration as primarily essential, core events as direct causes to assess ‘AMR in emergency’.

However, we shall keep it in our minds that the disasters and complex emergencies often being associated and interlinked with each other in various dimensions, synergistically, as part of the continuity especially in both cases pre- and post disasters. Explicitly, there may be some commonalities among the inter-linked risk factors for planning of interventions as seen in the studies on outbreak control during the conflicts particularly in developing countries. And there are some important observations that reports the lower impact by natural disaster as direct factor for diseases outbreak, but rather higher implication with post-disaster complex emergencies to increase morbidity and mortality rates as seen in the outside-camp populations, whereas each of response phase of ‘post-disaster’ and ‘acute emergency’ cannot be differentiate easily.

Respective definitions for ‘disaster’ in general, ‘natural disaster’, ‘complex emergencies’ and ‘epidemics’ are provided with practical data including the median duration, while the other studies pointed out its complication and difficulty to give clear classification, taxonomy or terminologies for operational comparison. Basic series of term & definitions are available in the Glossary of Humanitarian Terms.

The AMR are a synergic consequence caused in complex in between above disasters and emergencies. Following natural disasters or being de-prioritized from the public interventions in complex emergencies, massive influx of medicines and drugs, including non-qualified, may facilitate the development of resistance. The preliminary criteria and key areas for reference collection were;

- Major disease-based, causal agent-specific research papers to overview and identify of commonality in microbiological characteristics and transmission modalities with those potentially associated in emergency settings.
- Characteristics of emergency-specific communicable diseases control
- Resources describing from viewpoints of humanitarian action, emergency relief and aid coordination to identify AMR-related points of discussion, intervention or strategies for containment
- Resources to compare AMR control interventions in developing and developed countries.

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15 M. Gayer, et. al. Conflict and Emerging Infectious Diseases, Emerging Infectious Diseases, 13 (11):1625-1631(November 2007).
20 CE-DAT, A Database on the Human Impact of Complex Emergencies (available at http://www.cred)
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- Resources by which we can revisit to the factors to promote AMR and relevant outcomes for patients including socio-economic, health impact
- Resources to compare health care service delivery settings between general infectious control practices and emergency medical assistance for infectious diseases control.
- Resources to provide indicators and characteristics for vulnerability in lab diagnostic, testing capacity in emergencies
- Pharmaceutical policies and systems particularly affected in emergencies including the challenges in procurement, stockpiling strategies
- Impacts of prophylaxis, vaccination and longer-term AM treatment package (e.g. 6-month treatment package for TB-DOTS) applied to the specific infectious diseases control modality in emergency in comparison with general public health development approaches.
- Disaster-type specific outbreak control and treatment modalities to use AMs.

For baseline information review, the lists of core reference items were given by WPRO at web-based folder which shares the lists of:
- WHO policy papers, guidelines, presentations related to AMR (including the items originated from CSR/HSE, EDM/EHT, HAC)
- Diseases-, causal agent-specific survey reports, case studies, situation analysis
- 2011 World Health Day promotional package composed of the factsheets, policy frameworks, presentations

List of useful, key reference items and web links are in the Annex.

Predicting the difficulty to extrapolate evidences or findings from one case to another in different emergency settings and response phases, useful data of literature review information was aggregated onto the database matrix to identify pitfalls, gaps between the readily-adapted interventions in conventional AMR control settings.

As indicated below, disease- or causal agent-specific information were tabulated on the spreadsheets over time-action series from pre-incident to post-disaster, follow-up stage which may be rephrased as the restoration, reconstruction phase. As well, target population-based points of intervention were searched. The database matrix was created by data-mining with currently available information based on this literature review and situation analysis, in order to compare probable commonality, gaps in identification of purposes or target populations, barriers to interrupt a seamless modality shift of health service delivery. The database matrix sample mentioned in the above section is shown in the Annex.

This analytical approaches were taken in reference to the strategic forms of intervention plan described in the below 2 core reference items:
- The Race against Drug Resistance (2010)\(^{23}\); in a form of the area-specific, politically committed intervention plan.
- WHO Global Strategy for Containment of Antimicrobial Resistance (2001)\(^{24}\); in a form of target population-based plan

In the meantime, humanitarian action principles for medical response usually employ progressive action frameworks to address the needs to shift respective roles from independently working, tentative ones to locally acceptable, sustainable ones. Modality shift from emergency response to primary health systems development may be implied.

Then additionally, we shall examine the gap and possible integration of the concepts of AMR in emergencies into:
- Health Cluster Guide (2009), A practical guide for country-level implementation of the Health Cluster, by which humanitarian operational guidelines are being coordinated in a comprehensive cluster approach identifying respective institutional roles of work and


\(^{24}\) WHO Global Strategy for Containment of Antimicrobial Resistance, WHO CDS/CSR/DRS (2001)
functionality-explored plan of intervention for output generation over the progressive work phases.

Since the concept of AMR control has not well linked with humanitarian priorities in projects so far, it strongly necessitate to rephrase the issues boldly to address its critical impacts on AMR emergence and transmission rates for pragmatic global commitment, in conjunction with the voices for conventional AMR control needs.

![Fig.3 Concept of gap analysis in comparison with generic AMR control by data-mining of available literature review information](image)

### 3. Summary of literature review; findings and critical lessons learned, issues to be addressed

In summary, there is very limited number of papers to describe the specific modalities or characteristics of AMR control in post disaster settings, and even found, almost all of them only refer it as one point for consideration in the whole procedure to implement communicable disease outbreak control. So, in supporting our prediction as mentioned in the background for this literature review, we can reiterate or rephrase the points reconfirmed as below;

- Most of currently available references on disaster- or emergency medical response related are only to provide list of major infectious diseases which shall be tackled with special emphasis due to its high morbidity and mortality observed in many cases of emergencies (though not specified as ‘directly’ related to the disasters). The diseases targeted usually in emergency medical responses are diarrheal diseases, acute respiratory infections caused by a variety of pathogens.25 Vector/reservoir control and causal pathogens are listed particularly as the points for intervention after geographical disasters, sometime along with possible impacts by each seasonal climate changes in

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general. Some also addressed the resurgence or emergence of rare, old pathogens including haemorrhagic agents, however, the trauma case management is not referred within the infectious diseases control in post-disaster emergencies, while tetanus is addressed in some literatures. (though its treatment is not by AM but with immune globulin)

- However, few literatures have been found which document the characteristics of particular AMR pathogens, its proportions in specific human populations in emergencies. Most of those identified as the review of emergency response, it only pointed the awareness needed for future AMR emergence due to AM misuse (but not much mentioned to its quantitative, qualitative indicators or aspects to cause AMR). AMR prevalence reviews are substantial, primary data needed for optimal measures to predict the AMR trend in affected population for treatment as mentioned e.g. in Rwandan refugee camps (S. dysenteriae type-1 isolation: 3/7 were resistant to nalidixic acid) or TB resistance in refugee and non-refugee populations in northeast Kenya (18% vs 5% resistance in refugee and non-refugee populations) or Somalia (14.5% defaulted treatment).

- Clinical, biological research papers related to AMR are mostly the case report of susceptibility/insusceptibility assessment or highlights of epidemiological event of newly emerged or reemerged old strains and clinical features for treatment on the health facility basis. And there is a fundamental gap for acquisition of research and scientific evidences, operational assessments in developing countries.

- Outstanding research interests have been evolved for comparative assessments with community-acquired and migrated population-base settings from public health development perspectives, recently. Expanded research concept of ‘healthcare associated' AMR has also been developed for comparative assessment between the AMR strains in health facilities and those identified as ‘community-acquired'. And relevant study results indicated the needs to have further comprehensive views to perform medical practices in and outside health facilities for infection control.

- There are no specific interventions for AMR control in emergencies suggested concretely in the form of guidelines or action plan. Just as the same level to address within the scope of general infectious diseases case management including alternative AM use for unsusceptible cases, such as the recommendation only to prescribe minimum use of ‘antibiotics’ by which the individuals can be completely treated within the duration the disaster medical service team could support on site. This probably means that emergency health care intervention measures for AMR control can only focus as part of the case management to treat infections effectively at each clinical site and it may only rely on individual prescribers’ empirical capacities and technical skills, like an unwritten

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38 Activity Manual for Japan Medical Team for Disaster Relief, p55 (revised 2010, in Japanese only)
role as impossible to standardize all AM care services. TB or malaria case management is referred in each particular treatment guidelines in general.

- The uses of other AMs are only referred in the particular-diseases control guidelines such as the Integrated Management of Childhood Illness (IMCI) or the Integrated Management of Adolescent and Adult illness (IMAI) to treat specific, immunocompromised patients like HIV/AIDS infection.
- Reference of anti-parasites (other than Malaria) has only been identified on each prevalence, epidemiological data related to migration in post-disaster emergencies; e.g. trypanosomiasis, leishmaniasis, but no concrete association with AMR is indicated.
- Therefore, eventually it revealed difficult to find either uniqueness or commonalities for AMR control in emergencies, in comparison with general AMR control policies, intervention frameworks, capacity development strategies for both patients and prescribers.

Regarding more area-specific issues for AMR control in emergencies, the below points are considerable as important issues;

- While attention paid to the fatal ravage of childhood dysentery, pneumonia or malaria due to infection of resistant strains, yet insufficient emphasis on Newborn-Maternal-Child Health (NMCH) perspectives to use AMs in post-disaster emergencies. There is lack of scientific evidences to quantify and alert AMR impacts as well on NMCH aspects in emergencies.
- NMCH issues of AMR are mostly referred as vulnerability in primary health care settings, e.g. diarrhea, ARIs and pneumonia, ear infections, or malaria (fever) in link with nutritional management and parasites in the treatment guides or system in IMCI which has been actively used as key NMCH treatment strategies in developing countries. Specific guidance on pediatric HIV care and treatment refers to the choice, duration of AM (antibiotics) use but not enough like ART resistance control, the cases of TB or HBV co-infection. The particular issues of IMCI are providing concrete guidance for AMR control. But AMR issues in emergencies are not particularly mentioned as well in IMAI.
- AM use is critical to prevent infection during delivery and newborn care as part of basic emergency obstetric care (BEmOC), consistently in any health care settings. This remark could be extended to the Prevention of Mother to Child Transmission (PMTCT) procedures for control of vertical HIV transmission, and this shall be stressed as longer prophylaxis with single AM dose, without jeopardizing the effort to maximize the treatment for elimination of pediatric HIV, as well as sustainable ART coverage for those living with HIV/AIDS based on the revised WHO guidelines, even under emergency settings.
- WHO guidelines to control MDR/XDR-TB, Malaria and HIV/AIDS certainly address its particular needs of AMR resistance control implying the poor health system function particularly in developing countries where the vast majority of patients are tackling to

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40 WHO Recommendations on the management of diarrhoea and pneumonia in HIV-infected infants and children, IMCI, WHO (2010)
46 New recommendation in 2009 WHO PMTCT guideline; To start AZT prophylaxis at the beginning of 2nd trimester (14 - 16 wks gestation) or as soon after as possible, and then continue with SD NVP and a “tail” of 7 days of AZT/3TC at labour and delivery. And for breastfeeding, to provide up to 12 months of daily infant Nevirapine to the baby, or until the end of breastfeeding if earlier, while alternative recommendations can be considered by countries, and the guideline committee.
survive under persistently limited resource availability. However, there is no clear linkage of strategic interventions with the post disaster settings and AMR control. 

- TB-DOTS strategies have been widely implemented in countries, and it is essential to sustain the outreach systems in healthy community with effective human-to-human inter-linkage for treatment observation (rephrased as prescriber-patient linkage). But such valued mechanism in communities would easily be collapsed in emergencies. Treatment adherence and compliance to the role in DOTS mechanism shall be maintained by the substituted health workers, probably under the pressure of limited pharmaceutical resources and its logistics. Treatment adherence issues are certainly critical for all of the immuno-compromised patients including HIV/AIDS. Messaging strategies for preventive measures including Malaria infection control would also be failed in shelters or insecure living conditions in emergencies. 

- Vulnerability for AMR (for both emergence and transmission), the immuno-compromised patients are repeatedly addressed for special AM use and strategies. Underlying diseases-specific case reports are many, but the population-based impact on AMR has not been assessed, which could be attributed by the high percentage of patients under treatment of HIV/AIDS, TB or chronic illness including diabetes, hypertension or malnutrition, etc. (Moreover, such vulnerable population-specific assessment in emergency settings has not been found yet even as the general public health impacts to attribute to the morbidity or mortality in general populations) Thus there are yet some room to promote awareness either for major infectious diseases control in consideration of AMR and that in emergency settings. 

- Differentiating the group living settings (i.e. in camp versus non-camp, surrounding communities, etc)\(^\text{47-48}\), emergency medical response framework of intervention addressed the outreach strategies, importance of risk communication and networking to maximize access to ‘available’ health services and best possible number of patients’ survival as a humanitarian priority. 

- Situation review on diagnostic technologies in emergencies has not been identified by which pragmatic approaches or simplified measures could be suggested preferably at the point-of-dispensary. Various rapid testing kits are available, but not many studies have been done to assess its efficacy for diagnosis, or other operational aspects including costing for the use in emergencies. 

- Syndromic(event-based) and routine (indicator-based) surveillance of infectious diseases and its reporting-networking systems have been examined to ensure its function and identify the pitfalls, on occasion of specific environments like mass gathering such as the world football games\(^\text{48}\) or political gatherings, but there are not clear objectives to detect epidemiological AMR information. There may be a potential to identify some commonality for AMR control in emergencies between the ‘mass gathering medicine’ \(^\text{49}\) as large impact made by mass population movement. The time-lag distribution for disease-specific strategies has been addressed to improve the surveillance and reporting systems. 

- There is a lack of the contextual analysis with comprehensive evidence acquisition for emergence of AMR linking the horizontal data. For example, identification of XDR-TB strongly addressed the threats to deliberately be used, for which active surveillance and medical R&D shall be encouraged involving many political arguments particularly led by developed countries’ security concerns. Now, global AMR threat awareness on other potential biological agents such as ‘NDM-1 superbug\(^\text{51-52}\) has just been elevated but yet

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51 Y. Guo, A structural view of the antibiotic degradation enzyme NDM-1 from superbug, Protein & Cell, 2(5):384-94. doi:
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preoccupied with evidence-scarce invalid accusation against AM misuse which is thought to be originated from so-called ‘less-prudent’ countries. It may be true that AM misuse in countries can bring the threats into other countries irrespective to the man-made borders where various factors of responsibilities should be shared not criticizing AMR-favorable environments in developing countries. The factors such as international travel history or patient repatriation should be considered for AMR control in relation to recent globalization including the emergency settings. And this mass population movement issues are to be referred to the first responders, aid workers or medical response teams particularly in emergencies post large-scale disasters.

✓ The 1st line regimens (or 2nd line if 1st line is not applicable) are recommended in many guidelines of infectious diseases control, but it is presumed that the most of affordable conventional list of AMs as categorized for the 1st options may have already conquered by at least one resistant strain for susceptibility or not available in emergency medicine lists. There are no concrete availability-priority mapping efforts to update AM use in line with the essential drug list or emergency medicinal guidelines.

Though there may be a room to retrieve further case studies on disease-specific analytical basis, this analytical review on literatures and references highlights the lack or shortfall in AMR information in post-disaster emergencies and implies critical bottlenecks or barriers to coordinate comprehensive medical strategies for intervention to interpret AMR issues in conventional healthcare settings into that in emergencies. This is probably because of the challenges to understand contextual factors for cause and impact assessment in time-series manner to link with the situation of AM use and the AMR emergence in geographically different environments. There may be some counterproductive policies in emergency health care framework and those should be clearly remarked to pursue comprehensive AMR control. And related challenges and complex in intervention coordination shall be recognized for proper attention in order not to lose the greatly valued pharmaceutical resources and waste our tremendous efforts for treatment and public health gain to safe and prolong lives with huge investments.

4. Annex
List of key references and useful web links

Key references

Policies, commentaries for strategies

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Area-specific policies and situation reviews
An evaluation of Drug Resistant TB Treatment Scale-up, Medicins Sans Frontiers, Partners in Health, Treatment Action Group (July 2011).
Cinti S., Pandemic Influenza: Are We Ready?, Disaster Management & Response, 61-67 (July-Sep. 2005).

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Laboratory capacity and Surveillance


Risk factors and Impacts of AMR in developing country perspective

An Approach to the Evaluation of Quality Indicators of the Outcome of Care in Hospitalized Patients, With a Focus on Nosocomial Infection Indicators, Infection Control and Hospital Epidemiology, 308-316 (May 1995).


Cosgrove SE., The Relationship between antimicrobial Resistance and Patient Outcomes: Mortality, Length of Hospital Stay, and Health Care Costs, CID, 42 (suppl. 2) s82-88 (2006).


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Epidemiology, characteristics in population and its movement


Health economics re. AMR


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Annex 4


**AM R&D**
Global Antibiotic Resistance Partnership
(http://www.cddep.org/projects/global_antibiotic_resistance_partnership)
Infectious Diseases Society of America, The 10 x '20 Initiative: Pursuing a Global Commitment to Develop 10 New Antibacterial Drugs by 2020, CID, 50:1081-1083 (15 Apr. 2010).
The need for new antibiotics, Correspondence, The Lancet, 375:637-638 (27 Feb. 2010).

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**AM use in food production**

**Key guidelines, Manuals**
Critically Important Antimicrobials for Human Medicine, 2nd Revision, World Health Organization (2009).
Flooding and communicable diseases fact sheet: risk assessment and preventive measures, Communicable Disease Working Group on Emergency, WHO.
HIV-IMAI publications (http://www.who.int/hiv/topics/capacity/en/index.html)
Annex 3
Annex 4

IMCI guidelines and publications
Inter-agency Field Manual on Reproductive Health in Humanitarian Settings, 2010 Revision for Field Review, UNHCR(2010)
USAID, FANTA-2, Community-based Management of Acute Malnutrition (CMAM)Reports ( http://www.fantaproject.org/publications/home_titles.shtml )

Useful websites
In general
http://www.cochrane.org/cochrane-reviews/evidence-aid-project
http://emedicine.medscape.com/emergency_medicine
http://www.dmphp.org/
http://highwire.stanford.edu/lists/devecon.dtl
http://www.cdc.gov/std/
http://www.healthnet.org/essential-links/emergency-medicine-and-trauma#a_1101

Area-specific:
http://www.worldwidewounds.com/
Radiation: http://www.who.int/ionizing_radiation/a_e/en/
http://www.remm.nlm.gov/sns.htm#kinds
http://www.annals.org/content/140/12/1037.full
http://www.upToDate.com/contents/treatment-of-radiation-injury-in-the-adult?source=search_result&selectedTitle=4%7E150
http://science.thomsonreuters.jp/announce/20110317/0318data/
http://www.who.int/th/data:
http://www.who.int/th/challenges/xdr/xdr_map_june08.pdf
Malaria: http://rbm.who.int/cmc_upload/0/000/015/366/REBInfosheet_7.htm
Surveillance:
http://www.cgedev.org/section/initiatives/_active/drugresistanceglobalhealth/resources
Disaster-related database: http://www.cred.be/projects
http://www.cred.be/publications
I. WHO's work on AMR

Contents of the presentation

• AMR Six Policy Package
• Results of key informant interviews in 12 WPR Countries
• Status of the AMR policy package in the WP Region
  – Comprehensive financed AMR plans
  – Surveillance and laboratory capacity
  – Access to quality assured essential medicines
  – Regulation and promotion of medicines, including in animal husbandry
  – Infection prevention and control
  – Innovations, research and new tools
• Conclusions and next steps
Superbugs™ are visible manifestations of our prolonged failure to preserve antibiotics.
WHD 2011 Core Product: Policy Package

1. Commit to a comprehensive, financed national plan with accountability and civil society engagement
2. Strengthen surveillance and laboratory capacity
3. Ensure uninterrupted access to quality essential medicine
4. Regulate and promote rational use of medicines, including in animal husbandry, and ensure proper patient care
5. Enhance infection prevention & control
6. Foster innovations and research & development of new tools

Key Informant Interviews on AMR in 12 Western Pacific countries

Majority of respondents stressed need for:

- Budgeted national AMR plans which address both prevention and management of AMR
- Laboratory capacity building
- Surveillance system for AMR and drug consumption
- Legislation to reduce use of antimicrobials in food animals
- Promoting and enforcing Rational Prescription
- Inclusion of infection prevention and control (IPC) as part of accreditation and registration of health institutions
- Basic research into new diagnostics and antimicrobials.
Annex 4

Status of AMR policy package in Western Pacific Region

- comprehensive financed national AMR plans lacking
- No complete oversight of AB use in animal husbandry
- Many achievements and initiatives in the field of
  - surveillance and lab
  - Uninterrupted access to quality assured drugs
  - Rational use of medicines
  - Infection control and prevention
  - Research and development for new tools

Surveillance and laboratory capacity

Issues and challenges

1. Insufficient laboratory testing
   - Access to QA methods for all relevant markers
   - Reporting on testing and outcomes
   - Technical skills and retention of qualified staff
   - Funding shortages

2. Weak or absent surveillance capacity
   - Weak national surveillance systems
   - Establishing functioning national networks
   - Laboratory network design in view of new tools
   - External quality assurance
But many activities ongoing to strengthen surveillance and lab capacity

- Capacity building on drug susceptibility testing (DST)
  - Training lab techniques & training of trainers in member states
  - Countries rolling out new (crosscutting) laboratory tools
  - Development and use of training modules and SOPs
  - Supportive role of supranational laboratories for EQA and TA

- Normative guidance
  - Data analysis software; WHO endorsement of new techniques
  - Guidelines on representative sampling techniques

- Surveillance
  - Strengthening of AMR surveillance networks (malaria, HIV, TB)
  - Anti-viral resistance monitoring

Example: Antiviral resistance

- WHO CCs routinely test for antiviral resistance in all viruses submitted by National Influenza Centres and other labs.

- As per a 2010 survey of 12 of the NICs in WPR, 9 (75%) were conducting antiviral resistance testing

- The proportion of A(H1N1)pdm09 viruses determined to be oseltamivir (Tamiflu) resistant is about 1%, with the majority of resistant viruses isolated from patients with a history of treatment with antivirals,
Example 2: Gonococcal Antimicrobial Surveillance Programme - WPR/SEAR 2009

- Gonococcal Antimicrobial Surveillance Programme (GASP) since 1992 - long term surveillance of AMR in Neisseria gonorrhoeae

- 8,704 N. gonorrhoeae examined for their susceptibility to one or more antibiotics used for gonorrhoeae treatment by EQAS controlled methods in 2009
  - High rates of penicillin, tetracycline, and quinolone resistance
  - Increasing reports of clinical treatment failures and decreased susceptibility to cephalosporins, the last line treatment for gonorrhoea raising concerns that gonorrhoea may become untreatable.
Surveillance and laboratory capacity: Selection of next steps

- Establishing national AMR surveillance programs
- Support to lab network design and introduction new tools
- Develop guidelines for establishing national AMR surveillance
- Build capacity for EAQ AMR network in member states
- Link surveillance data to health system action
- Close monitoring of bacterial and AMR patterns in children given increased coverage of vaccination with HIB and pneumococcal vaccin
- MDR/XDR surveillance in all previous treated patients
- Children: DST for meningitis, typhoid fever, dysentery

Essential Medicines: Challenges

1. Lack of regulatory control on the availability and distribution of antimicrobials in the market.
2. Wide spread irrational use in health facilities and communities.
3. Sub standard quality of products in the market (malaria, TB, and widely used AB)
4. Lack of awareness on the danger of irrational use of antimicrobials.
5. Lack of systematic program to monitor and promote rational use of antimicrobials
Annex 4

Essential Medicines: Some accomplishments and plans

Accomplishments

- Training on Rational Use of Antimicrobials & Containing AMR for ASEAN countries (Brunei November/December 2011).
- National advocacy workshops on antimicrobial resistance
- Public advocacy on the rational use of antimicrobials
- Technical support for pilot implementation of MTP

Planned activities

- Promoting and monitoring rational use of antimicrobials in hospitals through therapeutics committee.
- National workshops (in context of national AMR plans)

Regulate and promote rational use of medicines: a real challenge

- Major differences between countries, with some addressing causes of AMR and some with an uncontrolled private sector and weak national regulatory authorities

Examples of challenges:

- Malaria: Oral artemisinin monotherapy, fake and counterfeit drugs
- TB: huge sales and uncontrolled use of TB drugs in private sector

Examples of interventions from disease programmes

- Containment of artemisinin resistance and prevention of further emergence (focus on Mekong: huge operations)
- Public private mix models and insurance schemes linked to quality
- Monitoring of MDR-programmes through WHO and partners (GLC)
- Normative: evidence based guidelines, tools, SOPs
**Infection Prevention an control**

**Challenges:**
- Simple effective ‘administrative control’ neglected in comparison with expensive environmental measures (equipment/infrastructure)
- Translating disease specific guidelines into integrated IC approaches at all levels of the health system
- Capacity building and funds for implementation

**Initiatives and plans**
- Regional inventory of the situation in 7 countries (TB)
- Training and training of trainers for HCW capacity building
- Establishment of facility IPC committees; SOPs
- Normative guidance: criteria for equipment and maintenance
- Training of engineers

---

**Innovations, research and development**

**Challenges**
- In country capacity, timelines, developing evidence based guidelines and country operations, funding

**Opportunities in WPR**
- Strong academic environment; some active countries; numbers

**Examples**
- Drug and vaccine trials; new diagnostic tools (TB, malaria,..)
- Linking disease programmes with academic partners
- Drug consumption in relation to disease burden
- Cross border projects (malaria, TB)
- Private sector issues (prescription, over counter sales, quality drugs)
Many efforts, many initiatives, but need for better coordination of initiatives to combat AMR

For instance: improving cost-effectiveness by shared technology platforms

<table>
<thead>
<tr>
<th>Technology</th>
<th>“Menu”</th>
</tr>
</thead>
</table>
| Regional Laboratories | 1. TB Rif / INH  
                        | 2. TB Fluoroquinolones/Inject Aminoglycosides  
                        | 3. EID/HIV |
| District/Subdistrict Laboratories | 1. TB Rif  
                                        | 2. TB Fluoroquinolones/Inject Aminoglycosides  
                                        | 3. STD/Viral load HIV  
                                        | 4. MRSA  
                                        | 5. Others: Hepatitis B/C |
| Microscopy Centres | 1. TB  
                        | 2. Malaria  
                        | 3. HAT  
                        | 4. EID/HIV |
| Microscopy Centres | 1. TB  
                        | 2. HAT  
                        | 3. Malaria |
General Conclusions for WPR

- Surveillance data show worrisome levels of drug resistance for STD, TB and Malaria and other drugs
- Countries show different levels of AMR awareness and control efforts, both encouraging and challenging
- More advocacy necessary with politicians, professionals (medical associations) and general public
- Major opportunities for technical and operational collaboration between sectors and disease programmes
- WPRO AMR WG exchange was an important first step, but needs to be ‘translated’ to comprehensive actions

Current and next steps for WHO WPRO

- Finalization of crosscutting AMR Technical Strategic Framework (TSF)
  - Based on AMR Policy Package
  - Results, targets, indicators, responsibilities, funding gaps
  - Identification of partners

- Joint ventures to assist countries developing comprehensive multidisciplinary costed AMR plans based on a generic assessment tool

- Resource mobilization for implementation AMR-TSF
Annex 4

II. Gap Analysis on Antimicrobial Resistance (AMR) Control in Emergencies

- **Drug Needs**
- **Drug Availability – Emergency, Relief and Recovery Phases**
- **Appropriate drug use during Emergencies - Prescription habits, Treatment protocols**
- **Drug Efficacy – Quantity, Quality issues, Storage, Wastage & Disposal**
Health Sector Disaster Issues (First 5 Days)

• Large number of Injured/Deaths/drowned.
• Extensive infrastructure damage.
• Health Facilities damaged.
• Medical supplies and equipment damaged, lost or non-functional due to absence of essential back-up service support - no electricity, water supply, waste disposal etc.
• Health sector related rumors.
• Health Manpower also affected (dead/injured/missing).
• Families of Medical and Para-medical manpower also affected; needs attention
### Variable Post Emergency Drug Needs

#### Natural Hazard

**Variable Public Health Impact**

**1993 Latur (Maharashtra) Earthquake**

*Injury Pattern - (30.9.93 to 6.10.93)*

2. Pvt. Medical Camp, Latur

<table>
<thead>
<tr>
<th>Indoor admission</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>U. Limb Injury</td>
<td>28</td>
<td>4.42</td>
</tr>
<tr>
<td>L. Limb Injury</td>
<td>19</td>
<td>4.28</td>
</tr>
<tr>
<td>Multi. fracture</td>
<td>18</td>
<td>3.98</td>
</tr>
<tr>
<td>Spinal Injury</td>
<td>15</td>
<td>3.32</td>
</tr>
<tr>
<td>Clavicle fracture</td>
<td>18</td>
<td>2.21</td>
</tr>
<tr>
<td>Paraplegia</td>
<td>9</td>
<td>1.99</td>
</tr>
<tr>
<td>Chest Injury</td>
<td>5</td>
<td>1.11</td>
</tr>
<tr>
<td>Abdominal Injury</td>
<td>4</td>
<td>0.88</td>
</tr>
<tr>
<td>Head Injury</td>
<td>4</td>
<td>0.88</td>
</tr>
<tr>
<td>Nerve Injury (Brach. Plexus)</td>
<td>5</td>
<td>1.10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>109</strong></td>
<td><strong>24.12</strong></td>
</tr>
</tbody>
</table>

#### Radiation emergencies

**Energy Partition**

- Blast 50%
- Thermal 35%
- Initial Radiation 5%
- Fallout 10%

**Systemic Effects of Radiation:**

- Prodromal
- Hematologic
- Gastronintestinal
- Pulmonary
- Cutaneous
- Neurovascular
- Combined Injury
Annex 4

**Variable Post Emergency Drug Needs**

Bhopal Industrial Accident 1984

**Biological Hazard**

**Key Strategies**

- Transparancy in operation and information
- Migratory birds
- Infected poultry
- Man
- Man

**Respiratory Diseases**

- Chronic bronchitis -17% (exposed patients) vs 7% (control);
- Bronchial asthma - 12% vs 5% classified as "reactive airway dysfunction syndrome (RADS);"
- Unspecified lung disease including small airway disease - 57% vs 0.2%;
- Chest Radiography - 80% showed abnormalities like linear, reticulonodular opacities, honey-combing and hyperinflation etc
- Mortuary Findings 18 in 86; 17 in 87; 47 in 1988 - progressive pulmonary damage, including desquamative pneumonitis or fibrosing alveolitis or its variants.

**Pregnancy outcome in women exposed to MI C/toxic gas**

Abnormalities, peri-natal and neonatal mortality were significantly higher in the toxic gas affected areas than the control areas. However, there was no significant difference in the incidence of congenital malformations.

**Ocular changes in MI C/toxic gas exposed population**

- Conjunctival xerosis.
- Corneal opacities.
- Lenticular opacities
- Corneal Opacities in the ‘exposed areas’ were nearly three times more than in the ‘control areas’.

**HEALTH ISSUES**

<table>
<thead>
<tr>
<th>SUMMARY FINDINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abortions, peri-natal and neonatal mortality were significantly higher in the toxic gas affected areas than the control areas. However, there was no significant difference in the incidence of congenital malformations.</td>
</tr>
</tbody>
</table>

**Credits:** MoPH., Thailand
Annex 4

Enhanced Public Health Needs

Compromised Health Infrastructure
Annex 4

Public Health Needs - an example
Army Field Hospital Experience (Gujarat, India- 2001 Earthquake) - First 28 Days

- 26,654 Victims were provided treatment
- 2,002 Major operations performed
- 7,528 Minor operations performed
- 3,004 Patients referred from Bhuj to other hospitals
Annex 4

Army Field Hospital Experience (during First three days)

- Hospital building badly damaged & unsafe for occupation.
- Make-shifts operation theatre in tents with electric supply from generators.
- Large influx of casualties mostly with contaminated wound soiled with foreign material, dirt and mud.
- Shortage of water, hosp beds & clean linen.
- Water & electricity supply disrupted.
- Shortage of disposables & disinfectants.
- Absence of laundry services & other support services.
- Health hazards - large quantity of biomedical waste & human refuse generated.

- Inadequate crowd control.
- Documentation of injured influx not possible with the existing manpower.
- Disruption of Communication Network (Partial Restoration after two days and full restoration after 3 days).
- Restricted food, tentage & fuel.
- AIIMS super-specialty medical teams from Delhi reported without equipment & personal administration.
Health Sector Disaster Issues from day 2 to day 30

- People sheltered all around. Gradually moving to camps with only consideration of safety.
- Camps established with no proper water supply, cooking facilities, latrines, waste disposal arrangement leading to mosquito/flies breeding.
- Overcrowding in camps with possibility of fast-spread of potential disease outbreaks - Measles, water & food-related diseases.
- Outbreak of Potential diseases
- Increase of mosquito breeding sites.
- Disruption of chronic disease control measures like T.B., Malaria, HIV surveillance, Dengue and other vector-control measures.
- Disruption of normal medical services for diseases like hypertension, other cardio-vascular diseases, asthma, peptic ulcer etc.
Post Emergency Changing Drug Needs

1987 Draught - Gujarat

Disease Pattern

Source: DHS Gujarat
Annex 4

Psycho-Somatic Manifestations – Special Drug Needs
Kutch 2001 (Gujarat Earthquake)

- Sleep disturbance
- Hunting of memory
- Digestive problems
- Disenabled and injured people
- Keep thinking of past
- Lack of interest
- Lack of emotional resp
- Irritable / angry

Interviewed 26,000 people in targeted 45 villages after 3 months of EQ (March – Nov 2001)

- 47% were not affected
- 28% were Mildly affected
- 15% were Moderately
- 10% were Severely affected

Post Emergency Special Drug Needs

Post Tsunami Sri Lanka – Southern Province

<table>
<thead>
<tr>
<th>Special Groups</th>
<th>0</th>
<th>0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnant women</td>
<td>134</td>
<td>3%</td>
</tr>
<tr>
<td>Persons with disabilities</td>
<td>244</td>
<td>5%</td>
</tr>
<tr>
<td>Youth addicted to drugs</td>
<td>20</td>
<td>10%</td>
</tr>
<tr>
<td>Lactating mothers</td>
<td>686</td>
<td>13%</td>
</tr>
<tr>
<td>Single parent with preschool children or infants</td>
<td>405</td>
<td>8%</td>
</tr>
<tr>
<td>Elderly citizens (over 60)</td>
<td>902</td>
<td>18%</td>
</tr>
<tr>
<td>People experiencing chronic illnesses</td>
<td>574</td>
<td>11%</td>
</tr>
<tr>
<td>School going children at the risk of abuse &amp; exploitation</td>
<td>1684</td>
<td>33%</td>
</tr>
<tr>
<td>Mentally ill people</td>
<td>119</td>
<td>2%</td>
</tr>
</tbody>
</table>

Source: Basic needs, an NGO working in Southern Province
Annex 4

**Drug Needs for routine care during post Emergency period**

**Hypertension, Diabetes, Asthma etc.**

**Routine Immunization Coverage**

**Vector Borne Diseases**

**DOTS Treatment**

**Post-Emergency Public Health Risks – A summary**

- **Vector Borne**
- **DIAR. Disease**
- **PUO**
- **A.R.I.**
- **Injuries**

- **Chronic Medical Diseases & Long-standing public health issues like TB – day 1**
- **Psycho-social & Mental Health Issues – 4/6 weeks**
- **Adolescent, Maternal, Neonatal & Child Health Issues – 1 week onwards day 1**
Annex 4

Health Sector Disaster Issues beyond 30 days

- New town/village planning sites including housing rehabilitation sites to consider including issues relating to the potential public health risks - location, accessibility.
- Proper Housing Faculties must consider including the adequate essential services important to prevent the potential public health risk like proper water supply system, latrines, sanitation including waste-disposal systems.
- New health facilities to be rebuild must be able to remain functional during future disaster situations.
- Introspection of existing health sector disaster contingency plans and its updating.
- Documentation of best-practices and inadequacies.
- Re-training of health sector manpower.

Appropriate Drug Use during Emergencies - Prescription habits, Treatment protocols
Drug Efficacy – Quantity, Quality issues, Storage, Wastage & disposal

- MSD storage capacity was constrained. Special bottleneck in shipping and receiving area due to lack of space.
- Many RMSD/Institution stores at or near full capacity, which was further aggravated by emergency Tsunami shipments and donations.
- Warehouse conditions at some locations needed considerable improvement (facilities, temperature, shelving, organization). Some stores were set up in hospital rooms or in tents.
- Batch traceability and shelf life monitoring were not adequate at MSD and periphery facilities due to lack of physical storage capacity, manual book keeping and/or lack of appropriate procedures.
- Proper cold storage capacity (cold rooms) is needed at many locations, currently using multiple household refrigerators without proper monitoring and backup systems.
Annex 4

Post-tsunami Scenario (Sri Lanka)

- Inventory Control System though adequate at Colombo, but programming was needed to include periphery stores, and warehouses.
- General lack of written procedures and manuals.
- Outside of Colombo, the entire supply chain was paper based.
- Limited number of computers, computer software and expertise available at RMSD/Institutions.
- Very limited internet/ e-mail access. Limited data communication capabilities between periphery and Colombo.
- No Local Area Networks available at DPDHS and institutions.

Variable Post-Emergency Drug Needs

(Summary)

<table>
<thead>
<tr>
<th>Drug Needs</th>
<th>Ailments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury Care</td>
<td>- Hypothermia - Hyperthermia</td>
</tr>
<tr>
<td></td>
<td>- Crush injury and crush syndrome</td>
</tr>
<tr>
<td></td>
<td>- Hypovolemia shock</td>
</tr>
<tr>
<td></td>
<td>- Airway obstruction</td>
</tr>
<tr>
<td></td>
<td>- Airway contamination/ respiratory diseases</td>
</tr>
<tr>
<td></td>
<td>- Pneumothorax</td>
</tr>
<tr>
<td></td>
<td>- Abdominal injuries</td>
</tr>
<tr>
<td></td>
<td>- Dehydration</td>
</tr>
<tr>
<td></td>
<td>- Near drowning</td>
</tr>
<tr>
<td></td>
<td>- Burns</td>
</tr>
<tr>
<td></td>
<td>- Chemical injuries and asphyxia</td>
</tr>
<tr>
<td></td>
<td>- Pain control and sedation</td>
</tr>
<tr>
<td>Outbreak of potential Communicable Diseases in temporary shelters</td>
<td>- Acute Respiratory Infections</td>
</tr>
<tr>
<td></td>
<td>- Pyrexia Unknown Origin</td>
</tr>
<tr>
<td></td>
<td>- Food &amp; Water Born Diseases</td>
</tr>
<tr>
<td></td>
<td>- Viral Diseases – Measles, Chicken Pox</td>
</tr>
<tr>
<td>Special Group Drug Needs</td>
<td>- Reproductive, adolescent, Maternal, \</td>
</tr>
<tr>
<td></td>
<td>- Neonatal and Child Health, Sexual Violence, HIV etc, Disabled, Elderly etc</td>
</tr>
<tr>
<td></td>
<td>- Psychological distress</td>
</tr>
<tr>
<td>Non-communicable diseases prevalent in community</td>
<td>- Hypertension, diabetes, Peptic Ulcer, Asthma etc.</td>
</tr>
<tr>
<td>Endemic disease</td>
<td>- Vector borne disease - Malaria etc.</td>
</tr>
</tbody>
</table>
III. Experience from the field:
Infection Control and Prevention: Hong Kong Experience

What we have learned from SARS
• SARS transmission, risk factors, and prevention in Hong Kong (Lau et al, 2004)

Risk factors:
– Visited mainland China
– Hospitals
– Amoy Garden

Protective factors:
– Frequent mask use in public venues
– Frequent hand washing & disinfecting the living quarters

• Why did SARS syndrome occur in some hospital wards but not in others? (Yu et al 2007)

– Minimum distance between beds of < 1 m
– Availability of washing or changing facilities for staff
– Resuscitation was ever performed in the ward
– Staff members worked while experiencing symptoms
– Host patients required oxygen therapy
– Host patients required bi-level positive airway pressure ventilation
• Recommendations on expanding ICU facilities based on SARS experience (Gomersall et al 2006)
  – To base expansion plans on estimates of feasibility rather than estimates of requirements (iatrogenic injury, over-dilution)
  – A step-down approach to err on the side of caution (in absence of knowledge, assume to be spread by contact and airborne transmission)
  – Temporary expansion has to meet minimum standards (infrastructure, ventilation)
  – Protocol for donning and removing PPE
  – Staffing level, staff mix, well-being, and training

Three “R”s ethical challenges: Rationing, Restriction, Responsibility

• Lifeboat ethics: The access to and distribution of limited or scarce lifesaving resources
• Principle for resource distribution: Preserving the functioning of society, priority will be individuals who are essential to the provision of health care, public safety
• Creation of hospital surge capacity: triage
• Balancing community interests and individual liberties
• Human resource surge capacity: Delegation of responsibility and authority to perform procedures and interventions customarily carried out by certain professionals to other less formally qualified individuals
Infection control plan for influenza epidemic outbreak

- Department of Health
- Hospital Authority of Hong Kong
- Other Institutions

Evaluating the effectiveness of an Acute Respiratory Diseases (ARDS) community health promotional programme in Hong Kong

Acknowledgement
This project is supported by a seed money grant from the WHO. The authors would like to thank our nursing colleagues, students from The Hong Kong Polytechnic University and all professional health workers and community staff from Hong Kong, Macau, and mainland China for their active participation in the ARDs programme.
Objective

• Based on the World Health Organization (WHO) Trainers’ and Trainees’ Guides on infection control measures for the health care of ARDs in a community setting, a culturally-specific train-the-trainer (TOT) programme was developed for professional health workers and community workers in Hong Kong., with an aim to enhance the health literacy of the Chinese-speaking community in the prevention and control of the spread of ARDs.

Method

The training programme incorporates infection control measures into a workshop on two case-based scenarios that emphasize the application of knowledge and skills in prevention and control of the spread of ARDs in daily living.

With a 3- and a 6-hour learning package for professional health workers and community healthcare workers respectively.
Evaluation

A pre-post survey was designed to evaluate changes in level of knowledge about ARDs prevention and control after the workshop.

The competencies of participants to re-run the programme were reviewed by the ARDs team within 3 months of the workshop.

![Image of workshop participants]

![Image of workshop participants]

![Image of workshop participants]

Figure 1. Results of Pre-test and Post-test Questions
Implementation (March to September 2009)

A total of 15 sessions of TOT workshops were conducted, and 49 workshops were re-run in the community.

One workshop was held for healthcare professionals in Macau, and 32 and 16 workshops were re-run in Hong Kong elderly centers and schools respectively.

A total of 880 trainers were trained and 2244 professional health workers and community workers participated in the TOT programme.

Disaster Management Continuum

ICN (2009)
Annex 4

Table 1. Alignment of Disaster Nursing Competencies With the Teaching and Learning Activities

<table>
<thead>
<tr>
<th>ICN disaster nursing competencies</th>
<th>Teaching and learning activities</th>
<th>Skill training</th>
<th>Lecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention-mitigation competencies</td>
<td>Action learning</td>
<td>Problem-based learning</td>
<td>Definition and types of disaster</td>
</tr>
<tr>
<td>(1) Risk reduction, disease prevention, and health promotion</td>
<td>Using craft art to illustrate the disasters that commonly happen in different parts of China</td>
<td>Developing disaster preparedness plans for different disaster scenarios</td>
<td></td>
</tr>
<tr>
<td>(2) Policy development and planning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparedness competencies</td>
<td>Community awareness campaign, preparation of personal emergency kits for vulnerable people</td>
<td>Ethical values underpinning decision making in disaster situations</td>
<td></td>
</tr>
<tr>
<td>(3) Communication and information sharing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4) Education and preparedness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(5) Ethical practice, legal practice, and accountability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response competencies</td>
<td>Field visit to earthquake-affected site, temporary settlement residence, tent hospital, emergency care, intensive care, trauma care, and rehabilitation departments</td>
<td>Dealing with problems encountered by different client groups in fire, flood, and earthquake disaster situations</td>
<td></td>
</tr>
<tr>
<td>(6) Care of the community</td>
<td></td>
<td>Prehospital transfer skills</td>
<td></td>
</tr>
<tr>
<td>(7) Care of individuals and families</td>
<td></td>
<td>Wound management</td>
<td></td>
</tr>
<tr>
<td>(8) Psychological care</td>
<td></td>
<td>Interviewing skills</td>
<td></td>
</tr>
<tr>
<td>(9) Care of vulnerable populations</td>
<td></td>
<td>Psychological first aid</td>
<td></td>
</tr>
<tr>
<td>Recovery-rehabilitation competencies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(10) Long-term recovery of individuals, families, and communities</td>
<td></td>
<td>Community health needs assessment</td>
<td></td>
</tr>
<tr>
<td>Visit of residents in resettlement areas</td>
<td></td>
<td>Health self-management, manuals for hypertension, arthritis, insomnia, and mental health</td>
<td></td>
</tr>
<tr>
<td>Role play: addressing vulnerability and fostering hope among residents living in temporary houses</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Chan et al., 2010)
Conclusion
This programme was effective in enhancing the participants’ knowledge of ARDs prevention and control using the WHO guidelines.

Participants were equipped to conduct health promotional activities in the community.

The health literacy of the community can be enhanced through goal-oriented TOT workshops and good networks with professional health workers and community partners.

Bi-regional Training Course for Staff Managing Healthcare-Associated Infection (HAI) with Minimal Resources

Authors’ Name and Affiliations
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² Nursing Division, Hospital Authority
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⁶ World Health Organization Western Pacific Region, Manila, Philippine

Reference
Background

To prevent and control Healthcare-Associated Infection (HAI), it is necessary to have adequately trained staff and substantial financial resources. The aim of this training was to train personnel at various levels in the healthcare system in multifaceted infection control practices specifically for situations where resources are limited.

A Regional Infection Control Assessment Toolkit was developed for low resource countries, consisting of 3 components: An assessment tool, toolkit and training programme.

The training programme will be held in November 2010 in Hong Kong. Target course participants are healthcare workers from different countries with an infection control background. The teaching materials and training activities are under revision.
Method
The training programme consisted of lectures, interactive group work using the PPRR (Prevention, Preparedness, Response and Recovery) model on infectious diseases (figure 1), a skills test on Personal Protective Equipment (PPE), and a written test.

Each participant was required to complete the infection control assessment checklist. Participants were also required to prepare an action plan for developing effective infection control in their countries.
The pilot training programme was held in November 2010 in Hong Kong

69 health care professionals from 16 countries. In their home countries, 37 (53.6%) worked in hospitals; 31 (44.5%) worked in Ministry of Health agencies, and 6 (8.7%) were on teaching faculties of universities. 21 (59.4%) participants had some previous training in infection control.

The highest score on the written test was 46 out of 50 and the lowest score was 27 out of 50 (Figure 2).

Participants strongly agreed that the course was relevant and rewarding; they were satisfied with the training method.
Annex 4

Conclusion

Further consolidate the training material into a toolkit and establish a network with our course participants in order to support and facilitate their work in their home countries. Infection Control Elluminate is held every two weeks to share and review their work.
IV. Literature Review

**Literature review and situation analysis on AMR in emergencies/disasters**

Informal Consultative Meeting on Antimicrobial Resistance (AMR) Prevention and Control in Emergencies/Disasters

Manila, Philippines, 29-30 November 2011

Yuki MAEHIRA
Visiting Researcher / Pharmacist
Department of Global Health, Medicine and Welfare
Nagasaki University Graduate School of Biomedical Sciences, Japan

**PURPOSE of LITERATURE REVIEW**

◆ WHAT we exactly know on AMR for general, routine control related to AMR?
◆ HOW much impact on AMR made during emergencies?
◆ HOW we can assess the gap/differences and its backgrounds (WHY) ?
◆ WHAT currently available resources / tools can be used for AMR control in emergencies?
◆ WHAT & HOW emergency-specific AMR issues to be addressed?
## Key findings:

### Routine AMR control

- Control policy framework available
- Plenty of medical, clinical evidences on diseases, agent-specific case prevalence and treatment models
- Bulk data to accumulate all AMR cases in separate Surveillance-PJs (country-wise, diseases/agent-based trends & data – mostly sentinel)
- Diseases trend & ecological factors for health predictable
- Actors & service target population predictable
- Not solid evidences of AMR to attribute to mortality & morbidity
- Lack of evidences in developing countries & further contextual analyses
- Not definite solution-based guidelines (awareness promotion level)
- Global awareness for commitment not effective without strategic info.

### AMR in emergencies

- No guiding framework
- Priority is on: quantitative life-saving and case management for tentative cure
- Resource availability dependent – decision making
- Mass population movement is particularly critical aspect to potentially accelerate AMR emerge – transmission cycle
- Works & efforts in fragmentation (mainly at health dispensary points – passive?)
- Fundamental lack of information: (1) AMR prevalence on sites & its horizontal aggregation (2) AM use in emergencies
- Following to general AMR control procedures of case management (not population-based)

---

### Wide range variety of AMR prevalence on disease-based surveillance data

Annex 4


- More than 2,500 annual death in US (more than death toll of AIDS)
- Approx. 2,500 annual death in EUR
BASIC SOURCES OF INFORMATION

Trend of AMR prevalence: advance in surveillance

- LIBRA Initiative (by Bayer)
- Prosctive Resistant Organism Tracking and Epidemiology for the Ketolide Telithromycin (PROTEKT), (1999~, by Abentis, agent, diseases-specific: respiratory tract pathogens)
- SENTRY (1997~, by the Bristol-Myers Squibb)
- Tracking Resistance in the US Today (TRUST) (by Ortho-McNeil)
- The Surveillance Network (TSN) (by Focus Diagnostics Inc.)
- European Antimicrobial Resistance Surveillance System (EARSS)
- European Surveillance of Antimicrobial Consumption (ESAC)
- Asian Network for Surveillance of Resistance Pathogens (ANSORP)
- FluNET, EuroFlu (Influenza antiviral susceptibility)

Issues on accountability, transparency and availability of commitment for collaborative coordination
Annex 4

**SENTRY data**: Hospital and community-acquired infections (Source: Bell, Turnridge, Comm. Dis. Intelligence 2003)
Annex 4

ESAC-EARSS data

Figure 6: Total outpatient antibiotic use in 26 European countries in 2002

Table 2. Differences in the proportion of antimicrobial drug resistance in 21 European countries, 2005, and significant trends, 2001–2005

No trend analysis was performed for Denmark and France, and for Ireland and the United Kingdom for proportion of Escherichia coli resistant to fluoroquinolones (FOSE), because data were not available for all years of the study period (2001–2005). See Table 1 footnote for country designations.

<table>
<thead>
<tr>
<th>Compound pathogen†</th>
<th>Maximum (country)</th>
<th>Minimum (country)</th>
<th>ťdf†</th>
<th>Increase (p&lt;0.05)</th>
<th>Decrease (p&lt;0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNSP</td>
<td>36 (FR)</td>
<td>1.3 (NL)</td>
<td>27.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENBSR</td>
<td>31 (FR)</td>
<td>2 (CZ)</td>
<td>20.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FOSE</td>
<td>29 (IT)</td>
<td>3 (IS)</td>
<td>0.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Increase (p<0.05) | Decrease (p<0.05)
Annex 4

AM USE - accelerate AMR
Quantitative: overuse, duration
Qualitative: drug selection, non-prescribed, single or combined, counterfeited/adulterated
SEASONAL VARIATION – OUTPATIENT ANTIBIOTIC USE (10 EUR countries)

Context of AMR prevalence – information available?

- AMR proportion in Mortality vs. Morbidity
- Quantification of disaster/emergency impact on AMR
- AMR case containment vs. future AMR control on sites
- Factors of AMR;
  - AM dose/volume of usage vs. compliance (interruption)
  - Self-medication, empirical/presumptive medication
  - Food safety
- Variety in;
  - diseases, pathogens, socio-economic/ecological aspects
  (WHERE, WHAT/WHICH )
  - pharmaceuticals, lab-technologies, surveillance, logistics
  (HOW)
- purpose to use (priorities, policies) (WHY)
- actors, target for services (by/for WHOM)

FACTS IN MORTALITY & MORBIDITY

Among those, how many of:
- Failing/Insusceptible cases of AM treatment involved?
- hospital-acquired?
- Community-acquired?
- Elderly or children?
- Immuno-compromised?

AND.. How many of:
- Disaster/emergency-related?
- Failing/Insusceptible cases of AM treatment involved?

Even as for general AMR control situation, many information hidden and not clearly presented as evidences.
Potential of AMR Surveillances

Drivers of AMR

Differentiation between agents/classes of AMs

Mechanism of AMR

Pathogen evolution & coronal spread

Changes in susceptibility over time

Clinical relevance of AMR

Quantitative MIC data

Geographical differences in AMR prevalence

Application of PK/PD based breakpoints

Strategies to combat AMR

Surveillance Networking PJ - data utilization

CHALLENGES

Different aspects among institutions, organizations, countries:
Definitions
Technical consideration – denominators, choice of populations, numbers/types of samples,
Role and responsibility allocation

Potential collaboration:
Enlarge lab-diagnostic network horizontally and vertically
Quality control and manufacture standards in veterinary / food production societies

Action needed?
Pitfall or gap identification in the already existing surveillance systems
Ex. more behavioural surveillance

The role of antimicrobial pressure from agricultural use remains to be evaluated, but there is no evidence to suggest that errors committed in developed countries will not be replicated. Inadequate surveillance means that resistance prevalence and trends are largely understudied and that baseline data for evaluating potential interventions are unlikely to be sufficient.

Generic factors associated with AMR prevalence

Annex 4

Antimicrobial Resistance (AMR): Conditions

- Healthcare-associated
  (including: self-medication oriented)
- Community-acquired
- Non-human antimicrobials use
  (food production, animal husbandry)

Factors to Prevail AMR

- Resistance Emerge
  - microbiological evolution by: misuse, excess use, empirical use, improper prescription (dose, duration, combination, etc.) of AMs
- Transmission
- Colonization
  - population movement, group living/admission, poor surveillance M&E, poor infection control, food insecurity

Weaken health systems and poor governance without leadership

AMR prevalence in emergencies

Driving Forces: governance & regulatory mechanism collapse, mass prophylaxis, AM overuse, lack of lab-diagnosis, mass population movement, poor assessment & surveillance, lack of case follow-up, barriers for sustainability
In many cases, physicians prescribe antibiotics without knowing whether an individual patient is infected with a susceptible or resistant pathogen. As the proportion of resistant organisms in a community increases, physicians substitute away from older-inexpensive drugs to newer, more expensive agents as first line therapy.

Annex 4

What AMR shall we look at in emergencies for control?

- Prevalence on emergency health service delivery sites & target populations as part of comprehensive case management
- Subsequent AMR in near future due to AM misuse in post-disaster/emergency settings
- Differentiation of approaches OR standing on currently available systems which could be strengthened with operational review

5W-1H in emergencies to associate with AM use

- Population characteristics
- Diseases trends
- Ecological changes
- Resource availability
- Medical service delivery structure
- Policies, priority settings for public health outcomes

AMR-favoring environment: potential factors

- Mass population movement
- Larger immuno-compromised mixed-up
- More pathogens contaminations in environmental devastation
- Vulnerable governance and regulatory mechanism for pharmaceuticals
- Poor function of lab & surveillance networks
- Limitation in AM & other medicinal resources
- Loss of medical records, treatment follow-up

Scale of impact may vary in emergencies, strategic approaches to control AMR can provide better useful channels to highlight AMR issues, examples of practices, tools either for application to conventional AMR control in general, primary health settings.
## Annex 4

### Conceptual gap analysis of 2 health service delivery approaches; primary health care (PHC) and emergency medical assistance (EMA)

<table>
<thead>
<tr>
<th>Category</th>
<th>indicator</th>
<th>primary health care (PHC)</th>
<th>emergency medical assistance (EMA)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Paradigms</strong></td>
<td>Aim</td>
<td>Health as a condition for human development and well being</td>
<td>Physical survival as pre-condition for human development</td>
</tr>
<tr>
<td></td>
<td>Relation to context</td>
<td>In harmony with other sectors of society</td>
<td>Part of a package of ‘emergency relief measures’</td>
</tr>
<tr>
<td></td>
<td>Resource use</td>
<td>Use ‘reasonable share’ of all available</td>
<td>Use ‘all’ that can be mobilized</td>
</tr>
<tr>
<td></td>
<td>Technical dimension(rationalization)</td>
<td>Optimization of effectiveness, efficiency</td>
<td>Maximization</td>
</tr>
<tr>
<td></td>
<td>Social dimension</td>
<td>Autonomy and participation (responsiveness)</td>
<td>Dignity and compliance</td>
</tr>
<tr>
<td></td>
<td>Time perspectives</td>
<td>Long</td>
<td>Short</td>
</tr>
<tr>
<td><strong>Characteristics of care</strong></td>
<td>Objectives</td>
<td>Cure, care and autonomy</td>
<td>Cure is dominant over care and autonomy</td>
</tr>
<tr>
<td></td>
<td>Qualitative points for approach</td>
<td>Optimal balance between being effective, integrated, continuous and holistic</td>
<td>Effectiveness takes precedence over other characteristics</td>
</tr>
<tr>
<td></td>
<td>Determinant of care components</td>
<td>Care provided is a compromise between need and demand</td>
<td>Need get precedence over demand</td>
</tr>
<tr>
<td><strong>Characteristics of health services</strong></td>
<td>Accessibility(temporal, geographical)</td>
<td>Permanent facilities are mandatory for curative activities and for emergencies; preventive activities can be intermittent</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Financial accessibility</td>
<td>A balance to be struck between financial participation and financial accessibility</td>
<td>Free of charge services</td>
</tr>
<tr>
<td></td>
<td>Polyvalent or Specialized</td>
<td>Polyvalence for integrated, holistic care</td>
<td>Specialized services</td>
</tr>
<tr>
<td></td>
<td>Clients-provider relationship</td>
<td>Whole range of valued aspects to be aimed at</td>
<td>Quality of relationship to subordinate to other characteristics</td>
</tr>
<tr>
<td><strong>Decentralization of health systems</strong></td>
<td>1st line</td>
<td>Polyvalent health centers to cover a defined population (1/5000–15000)</td>
<td>Curative health posts (1/3000–5000)</td>
</tr>
<tr>
<td></td>
<td>2nd line</td>
<td>District hospitals</td>
<td>Referral hospitals</td>
</tr>
<tr>
<td></td>
<td>Exceptions to two-tier system</td>
<td>Peripheral extensions and intermediate can be justified. Community health workers seldom adequate.</td>
<td>Home visitors and intermediate structures often needed.</td>
</tr>
<tr>
<td></td>
<td>Vertical services</td>
<td>Mobile team sometime justified</td>
<td>Mobile teams and feeding centers often needed.</td>
</tr>
<tr>
<td></td>
<td>Articulation of services</td>
<td>Two-tier integrated district health system, avoiding gap and overlap. A rational referral system to be encouraged.</td>
<td>Often parallel health system; marginally linked to pre-existing health system. A strict referral system to be imposed.</td>
</tr>
<tr>
<td></td>
<td>Management structure</td>
<td>Team of professionals with autonomy over the different health facilities in a health district</td>
<td>Team of professionals with full operational, administrative authority, high degree of autonomy.</td>
</tr>
<tr>
<td></td>
<td>Logic in management</td>
<td>Balancing medico-technical, administrative and sociological type of logic</td>
<td>Medico-technical logic paramount</td>
</tr>
<tr>
<td></td>
<td>Responsiveness to epidemic alerts</td>
<td>Important</td>
<td>Paramount</td>
</tr>
<tr>
<td></td>
<td>Pre-established objectives</td>
<td>May be counterproductive</td>
<td>May be necessary</td>
</tr>
<tr>
<td></td>
<td>Measures to improve resource mobilization</td>
<td>Good quality of care, empathic relationship</td>
<td>Relatively coercive methods can be justified</td>
</tr>
<tr>
<td></td>
<td>Adherence to treatment strategies</td>
<td>Structural dialogue with the community during care</td>
<td></td>
</tr>
</tbody>
</table>
Conceptual gap analysis of 2 health service delivery approaches; primary health care (PHC) and emergency medical assistance (EMA)

(continued)

<table>
<thead>
<tr>
<th>Category</th>
<th>indicator</th>
<th>primary health care (PHC)</th>
<th>emergency medical assistance (EMA)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sustainability</strong></td>
<td>Programme vs. Project</td>
<td>Programme format preferable</td>
<td>Project format preferable</td>
</tr>
<tr>
<td></td>
<td>Institutional strengthening</td>
<td>Managerial sustainability to be obtained</td>
<td>Low priority</td>
</tr>
<tr>
<td></td>
<td>Cost constraints (importance)</td>
<td>Often paramount; sustainable health services to be organized at ‘affordable’ cost</td>
<td>Limited; funding from international donors. Sustainability is not an aim.</td>
</tr>
<tr>
<td></td>
<td>Funding sources</td>
<td>Cost-sharing between government, international donors and users.</td>
<td>Often exclusively funded by international donors.</td>
</tr>
<tr>
<td><strong>Actors</strong></td>
<td>Identity of decision-makers</td>
<td>Local</td>
<td>Often outsiders</td>
</tr>
<tr>
<td></td>
<td>Relation with local authorities</td>
<td>Collaboration needed</td>
<td>Some links needed</td>
</tr>
<tr>
<td></td>
<td>Role of central MoH</td>
<td>To allocate resources, set norms and regulate (Stewardship)</td>
<td>Often very limited</td>
</tr>
<tr>
<td></td>
<td>Role of foreign assistance</td>
<td>Mainly as technical assistance</td>
<td>Substitution is often needed</td>
</tr>
<tr>
<td></td>
<td>Manpower policy</td>
<td>Staffs mainly constituted of health professionals on long-term contracts. Training is important.</td>
<td>Staffs often recruited among beneficiaries, with short-term contracts. Training geared to perform standardized tasks</td>
</tr>
<tr>
<td></td>
<td>Balance of private and public</td>
<td>Increasingly, managers have to come to terms with private healthcare, both non-profit, and for-profit.</td>
<td>Dominated by private, non-profit actors</td>
</tr>
<tr>
<td><strong>Target populations</strong></td>
<td>Variety</td>
<td>Predictable, and streamlined to access to disease-specific health care services.</td>
<td>Unpredictable, as mixed phases of population not based on the conventional community structure</td>
</tr>
<tr>
<td></td>
<td>Mobility</td>
<td>Urbanization, globalization (intentional)</td>
<td>Migration, evacuation, isolation, marginalization(unintended)</td>
</tr>
<tr>
<td></td>
<td>Health modality</td>
<td>Predictable burden following to usual trend of diseases prevalence</td>
<td>Unpredictable high burden with high probability of exposure to various diseases under psycho-physical pressure</td>
</tr>
</tbody>
</table>
## Vector/rodent-borne diseases (in emergencies/disasters)

<table>
<thead>
<tr>
<th>Characteristics of AMR</th>
<th>Categories of disaster/emergency</th>
<th>Characteristics of population in treatment needs</th>
<th>leadership / responsibility / guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria-AM resistance globally prevailed</td>
<td>Direct impact on Hydro-meteorological, geophysical landscape changes (flood, cyclone, earthquake, etc.)</td>
<td>Possibility of Re-infection/recurrence Vaccination coverage varied</td>
<td>Impact from agricultural, mining industries to be considered (some also related to food security)</td>
</tr>
<tr>
<td>Resistant-NTD agents: lack of resistance info. Hantavirus, leptospirosis, leishmaniasis, etc.</td>
<td>Mobility of vector/reservoir pop. In addition to Human pop. movement</td>
<td>Increased exposure by trade/travel, population pressures, civil unrests (including PH-HR deployment)</td>
<td>IHR application?</td>
</tr>
<tr>
<td>Lack of basic treatment measures</td>
<td>Urban vulnerability</td>
<td>Preventive medication</td>
<td>Market pharmaceuticals primarily poor regulatory control</td>
</tr>
<tr>
<td>Resistance transmission cycle with animals</td>
<td>Possibility of highly virulent haemorrhagic infections</td>
<td>Psychological panic control in population sometime needed</td>
<td>Lack of technical resources on specific NTDs.</td>
</tr>
</tbody>
</table>

Fig. 2. Asia-Pacific map centred on the Western Pacific with approximate locations of main plate boundaries (solid black lines) and cyclone/hurricane zone between 20°N and 20°S (blue shading). Symbols represent published reports of treatment failure after chloroquine monotherapy (25 mg base/kg up to 1.55 g over 3 days) for P. vivax infections (Large Red stars = clinical trials of chloroquine monotherapy with >10% recurrence rate by day 28; Yellow stars = case series with >5 recurrences before day 28 with or without chloroquine plasma drug levels; Green circles = clinical trials after 2000, with no recurrences by day 28).

Annex 4

Time-series model of AM use and diseases prevalence post disasters
(in the same population, one disaster-basis)

Cumulative AM use
(rational + empirical, alternative + preventive)

Cumulative No. of infection (all diseases)

No. of death

Disaster

Higher temp. season

Rainy season

Cold, dry season

Diarrhea

Malaria

Influenza

ARI

Crush injuries, trauma, drowning, burn

- 91 -
### Surgical infection for crush-related wounds, injuries, blunt trauma
**in emergencies/disasters**

<table>
<thead>
<tr>
<th>Specific aspects / indicators/factors</th>
<th>Characteristics of AMR</th>
<th>Categories of disaster/emergency</th>
<th>Characteristics of population in treatment needs</th>
<th>leadership / responsibility / guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water, soil contamination of unusual pathogens, polimicrobial Clostridium difficile, non-fermenting species, enterobacteria. Large involvement of gram(-) pathogens.</td>
<td>Water, soil contamination of unusual pathogens, polimicrobial Clostridium difficile, non-fermenting species, enterobacteria. Large involvement of gram(-) pathogens.</td>
<td>Cases in almost type of emergencies</td>
<td>Probably larger geographical coverage. Not always seeking treatment services. Both community-based, health facility-based infection control needed</td>
<td>Emergency response team – project level approach Daily treatment may be performed by non-specialist</td>
</tr>
<tr>
<td></td>
<td>Natural hazards-specific assessment may also be useful</td>
<td>Case management burden huge.</td>
<td>Many cases repatriated or evacuated. Sometime in mix-up with non-injuries but immuno-suppressed groups.</td>
<td>As integral parts of routine case management at health facility base</td>
</tr>
</tbody>
</table>

Annex 4

Time-series model of cumulative AM use / No. of infection (longer perspective)

Cumulative AM use/No. of infection

Population growth/urbanization, globalization

Time

Avoidable?

Unavoidable?

Cumulative risk for emergence and transmission of AMR

Generic AMR control target?

Worsen scenario

Better scenario

No disaster scenario

Disaster-1

Disaster-2

Disaster-3

Disaster-4

Disaster-5

Baseline (ideal)
Annex 4

Changes required in ways of approach?

- Priority settings – differences to be recognized for strategically, active control
- Time concept (task shifting, resource allocation, etc.)
- Work components & structure (‘preparedness’ or ‘response measures’)
- In which operational guidelines to address the AMR in emergencies?
  - Emergency Prep & Medical Response guidelines
  - AMR control guidelines
  - Diseases-specific treatment guidelines
  - Medicine lists
- Lab-diagnostic & surveillance issues need to be well highlighted for further
  solid evidence collection, strengthening currently available systems & mechanisms
- R&D priorities in which, how to be promoted
Annex 4

Health system building blocks
- service delivery/infrastructure
- health workforce
- health information
- medical products
- financing
- leadership & governance

TARGET FOR INTERVENTION
(Pop. & Behavioral)

TARGET FOR INTERVENTION
(Causal agent, specific)

SYSTEM DEVELOPMENT APPROACH

Points of Intervention

Continuum of rational AM use for care feasible over time course?

TIME CONCEPT

Pre-incidence

In-crisis

Acute phase

Evacuation

Rehabilitation

Follow-up phase

Downstream - disease-specific area to be worked on in the particular guidelines

Laboratory and surveillance capacity strengthening

Diagnosis and treatment of immuno-compromised cases: malnutrition, HIV/AIDS, TB, Malaria, NTDs, those with chronic disease

Promoting Breast Feeding

Prudent diagnosis and treatment strategies for rational use of drugs

Healthcare facility-based

Postpartum/ Newborn Care

Management of childhood illness

AMR surveillance (TB-DOTS, HIV-ART/PMTCT, malaria control, etc.)

Preventer & consumer education for proper medication, compliance

Surgical infection control

Immunization, prophylaxis (MR, Hib, Cholera vaccines, Malaria-IPF, PMTCT)

Food security

Sanitation and hygiene

Immunisation, prophylaxis (MR, Hib, Cholera vaccines, Malaria-IPF, PMTCT)

Vector control (ex Malaria-LLINs, indoor spraying)

Disease-specific (causal agent-specific)

Review & analysis

Chronic Diseases screening

Nutritional support (Vitamin-A and micro nutrients)

STI control, Reproductive Health

System development approach

Conclusion & analysis

Healthcare facility-based

Postpartum/ Newborn Care

Management of childhood illness

AMR surveillance (TB-DOTS, HIV-ART/PMTCT, malaria control, etc.)

Preventer & consumer education for proper medication, compliance

Surgical infection control

Immunization, prophylaxis (MR, Hib, Cholera vaccines, Malaria-IPF, PMTCT)

Food security

Sanitation and hygiene

Immunisation, prophylaxis (MR, Hib, Cholera vaccines, Malaria-IPF, PMTCT)

Vector control (ex Malaria-LLINs, indoor spraying)
Acknowledgements

- Researchers, experts contributed to plenty of scientific evidences & resources to address AMR issues
- Meeting participants for valued contribution and fruitful discussion to develop our recommendations, action plans.
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V. Urban Health Emergency Management

Urban Health Emergency Management

Dr Art Pesigan
WHO Kobe Centre

Urban Health is recognized as a global public health issue
Annex 4

Urbanization

• Proportion of global population living in cities has increased dramatically in past century
  – 1900: 15%
  – Now: 50% and increasing

• One third of the total urban population live in slums (1 billion)

• 70% of urban population of developing countries live in slums

50% of the world is urban.

60% by 2025.

70% by 2050.

United Nations World Urbanization Prospects
(2007 Revision)
Recent Major Emergencies Affecting Cities

- 2010
  - Chile (8.8)
  - Haiti

- 2011
  - Great East Japan Earthquake (9.0)

“While urban living continues to offer many opportunities, including potential access to better healthcare, today’s urban environments can concentrate health risks and introduce new hazards.”
Special Considerations…Urban Areas (1)

- Concentration of population, homes and buildings, transportation
- More ‘government’ in urban than in rural areas—more rules and regulations
- Market pressures—low-income groups struggle to find affordable accommodation and health services

Special Considerations…Urban Areas (2)

- 2010 – 2.5 billion urban dwellers in low- and middle-income nations
- Africa considered predominantly rural but its urban population is now much larger than that of North America
- Most of the world’s largest cities are low- and middle-income nations
Cities in Low Income Nations

Face high levels of risk

- Not because of monetary value of exposed assets
- Due to inadequacies in their infrastructure
- Poor quality of housing
- Weakness of city institutions

Projections

2010-2030

- Almost all the growth in the world’s population will be in urban centres in low- and middle-income nations
- Asia will undergo massive urban growth
- Most of the urban population in low- and middle-income nations
- Asia with 32% of world’s urban population in 1950 to 55% in 2030
Annex 4

Health Challenges in Urban Areas

- Water
- Environment
- Violence and injury
- NCDs
- Unhealthy diets and physical inactivity
- Harmful use of alcohol
- Risks associated with disease outbreak

Health of Children in Urban Areas

- Higher prevalence rate of diarrhea
- Diarrheal diseases account for nearly 2 million deaths out of a total of almost 10 M among children under age of 5
- 1990 to 2006:
  - Industrialized countries: drop of under-5 mortality rates from 10 to 6 per 1,000 live births
  - Developing countries: drop of 103 to 79 per 1,000 live births
Communicable Diseases

- Diarrheal diseases, parasitic infection or diseases associated with inadequate water and sanitation
  - Lancet (2005)
    - Nearly half of the urban population in Africa, Asia and Latin America

- TB incidence
  - New York has 4x the national average TB infection rate
  - Some parts of London, TB incidence is higher than in China

Indoor air pollution

- Use solid fuels for household heating and cooking
  - 25% of city dwellers in developing countries
  - 70% of city dwellers in least developed countries

- Exposure to indoor pollution (2004)
  - Estimated to cause about 2 M deaths globally (pneumonia, chronic lung disease, cancer)
The health effects of climate change

**Health effects**

- Temperature-related illness and death
- Extreme weather-related health effects
- Air pollution-related health effects
- Water and food-borne diseases
- Vector-borne and rodent-borne diseases
- Effects of food and water shortages
- Effects of population displacement

Based on Patz et al, 2000

Climate Change Risk

Vulnerability of low-income urban residents

- Greater exposure to hazards (living in unsafe sites)
- Lack of hazard-reducing infrastructure
- Less adaptive capacity
- Less state provision of assistance
- Less legal and financial protection
Disaster Impact

Vulnerability gap in urban areas

- Lack of knowledge and financial capacity of urban authorities to reduce risks and vulnerabilities

- High proportion of urban households and communities limited in their capacity to reduce risk by
  - inadequate incomes, limited political influence, high land prices and corrupt practices in land-use management

Making Cities Resilient

- 10 point Checklist for Local Governments
  1. Organization and coordination
  2. Budget
  3. Risk assessments
  4. Critical infrastructure that reduces risk
  5. Safety of all schools and health facilities
  6. Risk compliant building regulations and land-use planning
  7. Education programmes and training
  8. Protect ecosystems and natural buffers
  9. Early warning systems and emergency management
  10. Post disaster: needs of survivors at centre of reconstruction
Annex 4

**What Cities Should Do**

- Assessment of vulnerabilities and capacity
- Risk Management
- Policy development
- Response plan
- Training/Human resource development
- Stockpiling

**Good Practice**

Cities in Africa, Asia and Latin America

Disaster risks reduced

- Provision of basic infrastructure and services
- Local governments map disaster risk
- Action in partnership with local communities
- Quality and effectiveness of urban government
VI. Managing medicines during emergencies: the role of WHO

Managing medicines during emergencies: the role of WHO

Outline

• WHO’s contribution to managing medicines during emergencies
• Medicine-issues during and after emergencies
Managing medicines: the problem

Note: most experience in developing countries

Two recurrent problems:

– Needed medicines and medical supplies do not reach patients
– Shipments of donated medicines and supplies that are not useful are being received

Interagency Emergency Health Kit (IEHK)

• Launched in 1990; revised in 2006.

• Endorsed by: Ecumenical Pharmaceutical Network, International Committee of the Red Cross, International Dispensary Association (IDA), International Federation of Red Cross and Red Crescent Societies, International Organization for Migration, Medecins Sans Frontieres (MSF), Merlin, UNFPA, UNHCR, UNICEF, and WHO.

• IEHK 2006 is designed principally to meet the first primary health care needs of a displaced population without medical facilities.
  – Its content is a compromise and there will always be some items which do not completely meet requirements.
  – An ideal kit can only be designed with an exact knowledge of the population characteristics, disease prevalence, morbidity patterns and level of training of those using the kit.
Interagency Emergency Health Kit (IEHK)

- not designed for immunization or nutritional programmes.
- not designed for reproductive health services.
- does not include medicines against communicable diseases such as HIV/AIDS, tuberculosis or leprosy.
  - these may be ordered separately after an assessment of needs.

- will always be supplied with a patient post-exposure prophylaxis (PEP) module;
- will always be supplied with malaria modules
  - unless there is a specific request not to include these items at the time of ordering.

IEHK

10 basic units: can be used by healthcare workers with limited training
1 supplementary unit: for use by physicians or senior healthcare workers

Total: about 1000 kg and 4m³
### IEHK 2006: basic unit (for 1,000 persons for 3 months)

#### Medicines

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>albendazole, chewable tab 400mg</td>
<td>tab</td>
<td>200</td>
</tr>
<tr>
<td>aluminium hydroxide + magnesium hydroxide</td>
<td>tab</td>
<td>1,000</td>
</tr>
<tr>
<td>amoxicillin, tab 250 mg</td>
<td>tab</td>
<td>3,000</td>
</tr>
<tr>
<td>benzyl benzoate, lotion 25%5</td>
<td>bottle, 1 litre</td>
<td>1</td>
</tr>
<tr>
<td>chlorhexidine gluconate, solution 5%</td>
<td>bottle, 1 litre</td>
<td>1</td>
</tr>
<tr>
<td>ferrous sulfate + folic acid, tab 200 + 0.4 mg</td>
<td>tab</td>
<td>2,000</td>
</tr>
<tr>
<td>gentian violet, powder</td>
<td>25 g</td>
<td>4</td>
</tr>
<tr>
<td>ibuprofen, scored tab 400 mg</td>
<td>tab</td>
<td>2,000</td>
</tr>
<tr>
<td>ORS (oral rehydration salts)</td>
<td>sachet for 1 litre</td>
<td>200</td>
</tr>
<tr>
<td>paracetamol, tab 100 mg</td>
<td>tab</td>
<td>1,000</td>
</tr>
<tr>
<td>paracetamol, tab 500 mg</td>
<td>tab</td>
<td>2,000</td>
</tr>
<tr>
<td>tetracycline, eye ointment 1%</td>
<td>tube, 5 g</td>
<td>50</td>
</tr>
<tr>
<td>zinc sulfate, dispersible tab 20 mg</td>
<td>tab</td>
<td>1,000</td>
</tr>
</tbody>
</table>

- **Malaria module (can be withheld upon request)**
  - artemether + lumefantrine, tab 20 + 120 mg assorted packages
  - quinine sulfate, tab 300 mg tab 2000

#### Medical devices, renewable

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>rapid diagnostic tests</td>
<td>unit</td>
<td>800</td>
</tr>
<tr>
<td>lancet for blood sampling (sterile)</td>
<td>unit</td>
<td>1,000</td>
</tr>
<tr>
<td>safety box for used lancets, 5 litres</td>
<td>unit</td>
<td>2</td>
</tr>
<tr>
<td>bandage, elastic, 7.5 cm x 5 m, roll</td>
<td>unit</td>
<td>20</td>
</tr>
<tr>
<td>bandage, gauze, 8 cm x 4 m, roll</td>
<td>unit</td>
<td>200</td>
</tr>
<tr>
<td>compress, gauze, 10 cm x 10 cm, non-sterile</td>
<td>unit</td>
<td>500</td>
</tr>
<tr>
<td>cotton wool, 500 g, roll, non-sterile</td>
<td>unit</td>
<td>2</td>
</tr>
<tr>
<td>gloves, examination, latex, medium, disposable</td>
<td>unit</td>
<td>100</td>
</tr>
<tr>
<td>soap, toilet, bar, approximately 110 g, wrapped</td>
<td>unit</td>
<td>10</td>
</tr>
<tr>
<td>tape, adhesive, zinc oxide, 2.5 cm x 5 m</td>
<td>unit</td>
<td>30</td>
</tr>
</tbody>
</table>

#### Basic stationery

- health card, pen

#### Treatment guidelines

- scissors, thermometer
Drug donations have often created considerable challenges for the recipient country.

- **Interagency Guidelines for Drug Donations.**

Developed and endorsed by:
Good Donation Practices

• Why good donations practices?
  – Donated drugs are often not relevant for the emergency situation, for the disease pattern or for the level of care that is available
  – Drugs are unsorted and labelled in a language which is not easily understood
  – Double standards of drugs (donating returned drugs…)
  – Drugs arrive just before their expiry date etc …

Guidelines for drug donations

Core principles:

1. Donations should benefit the recipient
2. Respect wishes and authority of recipient
3. No double standards in quality
4. Communication between donor and recipients is essential
Examples of problems with medicine donations

- Unknown products labelled in a language that is not understood
  
  Some women (temporarily) lost eyesight after being given a donated, veterinary drug (Lithuania, 1993)

- Products may be useless or unnecessary
  
  A donation to Southern Sudan contained contact lens solution and appetite stimulants (Sudan, 1990)

- Medicines may be sub-standard or expired
  
  17,000 tons of inappropriate donations; estimated disposal cost 34 million US$ (Bosnia and Herzegovina, 1992-1996)

- Inappropriate quantities and/or unsorted medicines
  
  5,000 tons of drugs and supplies received – it took 50 people six months to obtain an overview of what had been received (Armenia, 1988)
Annex 4

Guidelines for drug donations

- Prior information to and consent of recipient
- Approved for use in recipient country
- Presentation, formulation and strength commonly used in recipient country
- Comply with quality standards in both donor and recipient country
- No returned drugs or samples
- One year remaining shelf-life upon arrival *
- Label to contain INN; in language that is understood in recipient country
- Preferably large/hospital packs
- Proper outer packing & packing list
- Value: wholesale price of generic equivalent
- Transport, handling, storage etc paid by donor *

* Except when recipient explicitly agreed otherwise

Sources of obsolete pharmaceuticals:

1. Products damaged by the tsunami;
2. Products provided as aid which are not appropriate;
3. Products in stock that have become or will become obsolete before their likely use.
Annex 4

Obsolete pharmaceuticals

- Damaged, expired, unidentifiable, useless, inappropriate medicines; medicines whose use is not authorized; excess medicines

- **Pose health risks:** when stored in unsecured locations, scavengers may pick them up and they end up circulating and being used, which can result in harm to people

- **Pose environmental risks:**
  - dangerous per se (e.g. antibiotics), and
  - due to chemical transformations and reactions, their toxicity could increase

Local disposal of obsolete pharmaceuticals

<table>
<thead>
<tr>
<th>Method</th>
<th>Advantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>open dump</td>
<td>- risk of scavenging &amp; public exposure&lt;br&gt;- environmental contamination</td>
</tr>
<tr>
<td>engineered landfill</td>
<td>- ok for some products e.g. dressings; ↓ volume&lt;br&gt;- risk of eventual release into environment</td>
</tr>
<tr>
<td>water-treatment plant</td>
<td>- ok for some products e.g. NaCl infusion; ↓ volume</td>
</tr>
<tr>
<td>immobilization</td>
<td>- labour-intensive&lt;br&gt;- increases volume !&lt;br&gt;- risk of eventual release into environment</td>
</tr>
<tr>
<td>incineration (hosp.)</td>
<td>- Aceh: no emission controls =&gt; enters environment&lt;br&gt;- capacity problem (it would take ± 8 years)</td>
</tr>
<tr>
<td>cement kiln</td>
<td>- only if emission control&lt;br&gt;- extract from packaging; labour-intensive&lt;br&gt;- Aceh: need to rebuilt kiln first (takes 2-3 years)</td>
</tr>
</tbody>
</table>

None of these options seem appropriate
Landfill- how?

– Open uncontrolled non-engineered dump
  • Untreated waste discharged into an uncontrolled, non-engineered open dump is not recommended
  • Waste should be discharged after immobilization by encapsulation or inertization
  • Unimmobilized waste must be covered rapidly with large quantities of municipal waste to prevent scavenging
    • High risk of contamination of drinking water

– Engineered landfill: protection from loss of chemicals into the aquifer

– Highly engineered landfill
  • A site that is adequately situated, constructed and managed
  • An appropriate landfill consist of an evacuated pit isolated from watercourses

Landfill- what type of medicines?

• Engineered landfill
  – Waste solids, semi-solids and powders, preferably after immobilization.
  – PVC (polyvinyl chloride) plastics

• Highly engineered landfill
  – Limited quantities of untreated solids, semi-solids and powders.
  – Disposal of waste pharmaceutical after immobilization preferable.
  – PVC plastics
Incineration- what type of medicines?

- High temperature incineration with temperatures greatly in excess of 1200°C:
  - Solids, semi-solids,
  - powders,
  - antineoplastics,
  - controlled substances
- Medium temperature incineration with two-chamber incinerator with minimum temperature of 850°C.
  - In the absence of high temperature incinerators, solids, semi-solids, powders and
  - Controlled substances

Waste immobilization

- Encapsulation: Immobilizing the pharmaceuticals in a solid block within plastic or steel drum.
- Drums are filled to 75% capacity with solid and semi-solid pharmaceuticals, and fill up with:
  - Plastic foam
  - Bituminous sand
  - Cement mortar
  - Clay material
- When dry, seal containers and landfill to restrict access to and reduce mobilization of hazardous substances
- Encapsulation of antineoplastic drugs require a slightly different technique
Waste immobilization
Inertization is a variant of encapsulation and involves removing the packaging materials, paper, cardboard and plastic, from the pharmaceuticals

• Method
  – Remove Packaging
  – Grind material (Road Roller)
  – Add Water (5%), Lime (15%) and Cement (15%)
  – Then, either
    • When dry, store or landfill or
    • When wet, decant into municipal waste in landfill

• Types of medicines
  – Solids, semi-solids
  – Powders
  – Antineoplastics
  – Controlled substances

Other treatment and disposal methods

• Sewer
  – Some liquid pharmaceuticals, e.g. syrups and IV fluids, can be diluted with water and flushed into the sewers in small quantities

  Antineoplastics, and undiluted disinfectants, and antisepsics not recommended

• Burning in open container
  – Packaging, paper cardboard

  Pharmaceuticals and PVC should not be destroyed by burning at low temperature in open containers

Chemical decomposition

• not recommended unless chemical expertise and materials available
• not practical for quantities over 50 kg.
Annex 4

Disposal method_ summary

- Pharmaceuticals are ideally disposed of by high temperature (above 1,200 ºC) incineration. Such incineration facilities, equipped with adequate emission control, are mainly found in the industrialized world.

- Quotations for disposing of the pharmaceutical waste in Croatia and Bosnia and Herzegovina in this way range from US$ 2.2/kg to US$ 4.1/kg.


- To dispose 17,000 metric tons of inappropriate donations were received with an estimated disposal cost of US$34 million.

Bad medicines donation

pharmaceutical waste

- Tsunami relief in Indonesia- In 30 October 2005 newsletter the Pharmaciens Sans Frontières Comité International (PSF-CI - see www.psfci.org) reports on its assessment of medicine donations to Banda Aceh province in Indonesia after the 26 December 2004 tsunami:
  - medicines were donated by 140 donors, of which 53 were national organisations and 48 were international organisations from 39 countries
  - 4000 tonnes of medicine were received for a population of less than 2 million people
  - medicines were labelled in more than 16 foreign languages
  - nearly 60% were not on the national List of Essential Drugs
  - 10% had expired before they reached Banda Aceh
  - 30% were due to expire in less than 6 months or had missing expiry dates
  - those medicine that were appropriate were received in quantities equivalent to 6-8 years' use
  - 345 tonnes (1150 cubic metres) have been identified for destruction, which will cost an estimated Euro 1.4 million (75 cubic metres of donated medicines were destroyed in February 2005)
To sum up

1. Drug donations can be essential in alleviating suffering.
2. Some donors have knowingly sent expired stocks. How can this be prevented?
3. Large consignments of obsolete drugs are a threat to human health and to the environment. They need to be secured, inventoried/segregated and disposed off safely.
4. Safe disposal of obsolete drug donations costs 2000-5000 US$ per tonne. Who will pay?
5. Adherence to WHO Guidelines on Drug Donations would help to prevent this problem from recurring in future emergencies, but is voluntary.
VII. Operational Framework for Health Cluster Response in the Western Pacific Region

Health Cluster Operational Framework:  
“Three Plus One” Functional Areas

Emergency & disaster situation...
**Humanitarian Reform in 2005**

- Recommendations to improve
  - Predictability
  - Accountability
  - Leadership
  - Partnership

- 3 pillars of reform

---

**When do we use Clusters?**

“In the event of a sudden major new emergency requiring a multi-sectoral response with the participation of a wide range of international humanitarian actors, the cluster approach should be used from the start in planning and organizing the international response.“

IASC Guidance Note
Annex 4

WHO: Health Cluster Lead

Table 1. Cluster Area of Operation and Cluster Lead Agency

<table>
<thead>
<tr>
<th>Cluster Area of Operation</th>
<th>Cluster Lead Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logistics</td>
<td>WFP</td>
</tr>
<tr>
<td>Shelter and Non-Food Items</td>
<td>IFRC</td>
</tr>
<tr>
<td>Water, Sanitation and Hygiene</td>
<td>UNICEF</td>
</tr>
<tr>
<td>Health</td>
<td>WHO</td>
</tr>
<tr>
<td>Food</td>
<td>WFP</td>
</tr>
<tr>
<td>Early Recovery</td>
<td>UNDP</td>
</tr>
<tr>
<td>Camp Coordination and Camp Management</td>
<td>IOM</td>
</tr>
<tr>
<td>Nutrition</td>
<td>UNICEF</td>
</tr>
<tr>
<td>Protection</td>
<td>UNHCR</td>
</tr>
<tr>
<td>Agriculture</td>
<td>FAO</td>
</tr>
<tr>
<td>Education</td>
<td>UNICEF</td>
</tr>
<tr>
<td>Emergency Telecommunications</td>
<td>WFP</td>
</tr>
</tbody>
</table>

How to operationalize health cluster approach?

First Regional Health Cluster Forum on Humanitarian Emergencies
22-24 August 2011, Kobe, Japan
Regional Health Cluster Forum

- First Regional Health Cluster Forum on Humanitarian Emergencies, 22-24 August 2011, Kobe, Japan
- Aimed to develop a simply, common operational framework for health cluster response at the country level

Why Framework?

- Emergency and disaster management requires a multidimensional approach involving in multiple actors
- A cluster approach developed to improve the efficiency and effectiveness of humanitarian response
- Various policies, guides and tools related to the global health cluster approach are in place
Why Framework?

- However, the health cluster approach and global guidelines are not fully operationalized in a systematic way, taking consideration of region context.

- In the Western Pacific Region
  - Health security threats from various diseases, public health emergencies and disasters
  - Relatively strong government system in place
  - Enhanced existing programme such as EIDs

Process of developing an operational framework...

Policy → Guidelines → Experiences → Operational Framework → Implementation
Annex 4

From various expected outcomes to “Three in One” functional area

“Three plus One” Functional Areas

Health Cluster

Information
Service delivery
Resource
M&E
Information for action

- Disasters often change health needs and remain dynamic at the different phases
- Information is the key to assessing health needs and public health risks that inform appropriate public health actions
- Many ways of collecting, organizing, assessing and using information before, during and after disasters
- Need to operationalize and simplify the process of collecting and using information for health assessments and actions

Proposed framework for information
Annex 4

**Action-oriented modification**

1. **Pre-event basic information**
   - Country profile (district-level)

2. **Preliminary health needs assessment**
   - Within 24-72 hours for immediate health intervention
   - Jointly with the Ministry of Health, whenever possible

3. **Continuing health needs and risks assessments**
   - Jointly with health cluster partners
   - Information includes “health service delivery”

---

**Health Service in Emergency**

- **Post-disaster health needs depend on many factors**
  - Type and extent of disasters
  - Stage of emergency and disaster response
  - Population and geographical locations affected

- **Various way of categorizing health services**
  - Sphere Handbook 2011
  - Many others
Recommended health service grouping...

1. Clinical services (including injury)
2. Child health
3. Nutrition
4. Communicable diseases
5. STI & HIV/AIDS
6. Maternal and new-born health
7. Sexual violence
8. Non-communicable diseases
9. Mental health and psychosocial support (MHPSS)
10. Environmental health
NOTES FROM GROUP WORK

I. Group Work Discussion Questions (Day 1):

1. Are there any AMR issues to be addressed during an emergency response?
   - Are AMR issues different in emergency settings than in normal ("peace time") settings?
   - What are some of the main issues related to drug use during emergencies?
   - Are there examples how AMR issues could be exacerbated during emergencies?

2. How can emergency and disaster response include AMR prevention and control considerations?
   - Is it feasible to address AMR issues during emergency situation? Why?

GROUP-1
Work on Q-1
Annex 5

Question-1:

(1) Yes,
   – Information/data for more solid evidence in emergency settings for any decision-making
   – Surveillance improvement needed: appropriately designed for AMR in emergencies (advocacy more on AMR needed)
   – Difficulties on definition (bioterrorism issues included?), target agents, type of hazards, time-phase for operation

Question-1:

(2) Main issues to related to drug use
   – Control of drug supply (shortage-influx) with appropriate standards, coordination/ regulatory mechanism (donation protocol, …)
   – Need for establishment of knowledge base body to facilitate national guidelines to follow
   – Counterfeit drug (even in normal situation, donation)
   – Coordination among external & local organizations (systematically by some facilitator(s) (coordinating bodies)
   – Patients’ compliance, record keeping
   – Drug disposal: environmental contamination (incinerator management)
   – Animal husbandry: Research-agenda
Question-1:
(3) Examples to exacerbate during emergencies
   – Interruption of medical treatment eg. TB treatment

**Issues to be addressed:**
   – Research agenda: Scale of target populations, definitions of AMR, cause of AMR, monitor the capacity of organizations in disaster, medical disposal
   – Best practices sharing - to reflect to bigger technical frameworks
   – Recording systems to keep track of care
   – Lab-support
   – Training capacity even during emergencies
   – More risk communication mechanism

Question-2

Is it feasible to address AMR issues during emergency situation?

Not necessary to develop emergency-specific
→ by complying to standard guidelines used for routine AM use

– **Prevention is more important!**
Informal Consultative Meeting on AMR Prevention and Control in Emergencies/Disasters

Group 2
Discussion on Response – Day 1

Manila,
29 November 2011

WHO Western Pacific Region

AMR issues to be addressed during emergency response?

• Need to resolve whether treatment guidelines should be different in “emergency, field” situation than during “peacetime” situation.

• There are no AMR guidelines (as to antibiotic choices, doses, duration of treatment) for emergency situations.

• It will be difficult to decide on appropriate guidelines in an “emergency, field” situation; different types of hazards (i.e. trauma, flooding, volcanic eruptions) produce different medical problems and different types of infections.
Annex 5

AMR issues to be addressed during emergency response?

- There are many priority health issues to be managed during emergency response, there may be a challenge to put AMR as a priority
- Different types of emergencies and disasters may have different types of diseases with treatment needs
- An important AMR issue to be addressed is “need different types of treatment guidance during emergencies” (especially for the field e.g. camps)
  - No lab capacity to support diagnosis

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Emergency field</th>
<th>Emergency Intact hospital</th>
<th>Peacetime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab testing</td>
<td>Not available</td>
<td>Available</td>
<td>Available</td>
</tr>
<tr>
<td>Drug formulary</td>
<td>Modified (ex. Hongkong) _&gt; potential misuse (overuse, underuse)</td>
<td>Standard</td>
<td>Standard</td>
</tr>
<tr>
<td>Availability of Antibiotics</td>
<td>Limited availability in terms of quantity, quality (ideal antibiotics not available); antibiotics for pediatrics may be short</td>
<td>Generally available</td>
<td>Generally available</td>
</tr>
</tbody>
</table>
Comparison of “peacetime” vs. “emergency field” situation

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Emergency field</th>
<th>Emergency Intact hospital</th>
<th>Peacetime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health care worker</td>
<td>1) Limited availability of physicians -&gt; inappropriate use of antibiotics</td>
<td>1) Generally available</td>
<td>1) Generally available</td>
</tr>
<tr>
<td></td>
<td>2) Health care workers who are themselves victims of the disaster are</td>
<td>2) Generally less</td>
<td>2) Generally less</td>
</tr>
<tr>
<td></td>
<td>physically &amp; mentally overburdened</td>
<td>physically and mentally</td>
<td>physically and mentally overburdened</td>
</tr>
<tr>
<td>Environment</td>
<td>Dirty environment -&gt; multiple infections requiring antibiotics with broader</td>
<td>Normal clean</td>
<td>Normal clean</td>
</tr>
<tr>
<td></td>
<td>coverage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard treatment protocol</td>
<td>Daily shifting of physicians -&gt; may be following different treatment protocols</td>
<td>Stable pool of physicians -&gt; follow same treatment protocols</td>
<td>Stable pool of physicians -&gt; follow same treatment protocols</td>
</tr>
</tbody>
</table>
**Comparison of “peacetime” vs. “emergency field” situation**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Emergency field</th>
<th>Emergency Intact hospital</th>
<th>Peacetime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infection control protocols</td>
<td>Usually overlooked (no water, no linen, no disinfectants); PPE initially none for first 2-3 days then become so</td>
<td>Implemented well</td>
<td>Implemented well</td>
</tr>
<tr>
<td>Quality of antibiotics</td>
<td>Antibiotics may be improperly stored</td>
<td>Antibiotics kept properly stored</td>
<td>Antibiotics kept properly in the pharmacy</td>
</tr>
</tbody>
</table>

**AMR issues to be addressed during emergency response?**

- AMR issues may be different in emergency settings than in “peace time”
  - Treatment habits (e.g. due to frequent change of medical personnel)
  - Mental and psychosocial effects of affected medical practitioners
  - Inappropriate use of drug due to lifesaving purpose
  - Availability and quality of drug during an emergency
  - Lack of medical records
  - Risk environment and behaviours
  - ICP practice
Annex 5

### AMR issues to be addressed during emergency response?

- AMR work contributing to emergency response
  - Research on AMR (e.g. data and evidence)
- Feasibility of addressing some priority AMR issues
  - E.g. Treatment guideline
II. Group Work Discussion Questions (Day 2):

1. What needs to be put in place during "peace time" in order to support responses to emergencies that take AMR prevention and control into consideration?
   - What system capacities need to be in place?
   - Is data needed? If so, what kind of data is needed?
   - Are there SOPs or guidelines that need to be developed?

GROUP WORK-DAY2: Group 1

1) How can AMR programme managers support and facilitate the network of emergency managers? (strategy + immediate actions)

Routine Systems to be strengthened
- Information Systems (central, local health information management systems)
- Surveillance systems

Advocacy to highlight further on AMR in use of the evidences on emergencies
Help emergency managers (EM) to understand AMR
Provide guidelines /protocols on drug donations for AMR control
Provide M&E guidelines

2) How emergency programme managers contribute to AMR prevention and control? (strategy+immediate actions)

- IASC to include AMR programme managers
- EM programme managers to disseminate treatment/donation guidelines, protocols to enforce them
- EM programme managers to conduct, collect data needed

3) NO single AMR programme managers per country – coordinating body in country on AMR

- Inquire among managers -> AMR country focal points
Annex 5

**Recommendations for the Next Steps**

1. **Research agenda**: gather and have the evidences first.
   “what the research agenda would be?”

2. **Develop advocacy plans**: ongoing advocacy on AMR to continue & strengthen capacity of structure on lab, surveillance, training, etc.

---

**Group Work Day 2: Group 2 (written on a flipchart)**

**AMR Contribution to Emergencies**

- AMR data/pre-event info on AB use, etc made available as part of profiling
- AMR group proactively participate in the decision for drug formula for emergencies and needs/risks assessment
- Emergencies team consult the "AMR Group" for planning, assessment
- Strengthen routine AMR surveillance, coordination mechanism, one entry point for AMR group

Preparedness = use routine system and information
Versus
Readiness = task force

- Increase response capacity including AMR information:
  e.g. policy, GL, mechanism, training, exercise
- SOP for failed treatment (index case)

**AMR**

- **Surveillance**: gives ideas for suspicious cases?
  Possible in the emergency, field situation
- **ICP**: need scale up in emergencies?
  Universal precaution

**Needs:**
1. Information
2. Task force
3. Initiate action for what's lacking