Meeting of the WHO Chemical Risk Assessment Sub-Network of Developing Countries
Bangkok, Thailand, 2-4 December 2015

Meeting Record

Opening, Welcome Address and Meeting Arrangements

1. A meeting of the WHO Chemical Risk Assessment Sub-Network of Developing Countries was held in Bangkok, Thailand from 2 to 4 December 2015[1]. The meeting was hosted by the WHO Collaborating Centre for Capacity Building and Research in Environmental Health Science and Toxicology at the Chulabhorn Research Institute. The meeting was formally opened by Mathuros Ruchirawat, Vice-President for Research and Academic Affairs of the Chulabhorn Research Institute. Mathuros Ruchirawat recalled the extensive use of chemicals in many sectors and the importance of being able to manage chemicals safely. The role which the Chulabhorn Research Institute provided in delivering risk assessment training, especially for developing countries, was described.

2. Participants were welcomed to the meeting on behalf of WHO by Kersten Gutschmidt, who described how the proposal for a sub-network to enhance interaction with and between developing country participants had been taken forward after the first Network meeting in Paris in 2014. Since then participation in the Network from developing countries had grown from 5 to approximately 20 institutions, with more applications in progress, and these new participants were welcomed. Kersten Gutschmidt noted the increasing use of chemicals by developing countries, and the need to increase capacity building to inform decision-making/risk management. The objectives of the meeting were: to provide a forum for developing country Chemical Risk Assessment Network members and candidate members to meet, exchange information and enable collaboration on topics of mutual interest, to promote tools developed by WHO and other international organizations for chemical risk assessment in developing countries, and to propose a range of collaborative activities for the Chemical Risk Assessment Sub-Network to achieve its objectives, for the period to the next Network meeting and beyond.

[1] The financial support of the United States Environmental Protection Agency (National Center for Environmental Assessment) towards this meeting is acknowledged.

3. Participants proceeded to introduce themselves – there were 25 institutions from 21 countries represented, in addition to participants from WHO, UNEP and OECD. The meeting elected Jules de Kom (Ministry of Health, Suriname) and Mathuros Ruchirawat (Chulabhorn Research Institute, Thailand) as co-chairs, with the co-chairing task divided between them for different sessions. The provisional meeting programme was adopted (reproduced in Annex 1). The list of participants is presented in Annex 2.

WHO Chemical Risk Assessment Network and Sub-Network

4. Richard Brown (WHO) delivered a presentation on the WHO Chemical Risk Assessment Network, its history, objectives and early collaborative activities. The structure of the Network was described and questions on the nature and scope of the Network and its collaborative activities were addressed.

5. Jules de Kom (Ministry of Health, Suriname) presented Suriname's motivation for the proposed establishment of the CRA Sub-Network at the Paris meeting October 2014. The specific realities and knowledge gaps developing countries are confronted with in the chemical risk assessment process were introduced. Common interests and needs, especially those of small and resource-poor countries, without excluding other developing countries, were mentioned. The process to establish the Sub-Network, the objective, aim and participants were explained. Initial identified activities are:

   - identifying, collecting and sharing information relevant to developing countries,
   - facilitating capacity building activities tailored to the needs of developing countries,
   - facilitating the process to use and/or adapt existing information to the situation in the developing country contexts,
   - facilitating advocacy and resource mobilisation.

6. Questions on the use of train the trainer methods, keeping Network participants well informed and identifying common needs amongst developing country participants were addressed.

7. This was followed by a presentation of the results of earlier WHO surveys on chemical risk assessment activities in countries. It was noted that some specific industries (e.g. gold mining) drive particular risk assessment needs, and that new technologies (e.g. engineered nanomaterials) are affecting developing countries as well as developed countries. Questions addressed how the Sub-network meeting should set priorities, different modes for managing and funding activities (e.g. WHO-managed, or led by an institution or WHO Collaborating Centre) and whether the Network could, through capacity building, assist with meeting the legal obligations of countries (e.g. chemicals conventions, International Health Regulations (IHR)(2005)[2]).

[2] International Health Regulations (2005)
http://www.who.int/entity/ihr/publications/9789241596664/en/index.html

Chemical risk assessment in developing countries

8. A number of participants presented situation reports and case studies describing their experiences and challenges with chemical risk assessment in their countries.

9. Salmaan Inayat-Hussain (Malaysian Society of Toxicology) described experiences in Malaysia, focussing on issues in petrochemical industries such as the need to address complex mixtures, the need to consider chronic as well as acute hazards, that both occupational and environmental hazards are relevant, and the importance of having mechanisms to prioritize which chemicals to focus on (tiered approaches). The issue of differing legislative requirements for reporting in different countries as a barrier to information sharing was raised. The voluntary sharing of data through industry associations or between regulators (possibly facilitated by the Network) was discussed.

10. Participants from two institutions presented experiences in Thailand. Aurus Kongphanich (Food and Drug Administration, Thailand) described how smaller industries have limited capacity for chemical risk assessment and currently rely on capacity building activities from industry associations. The various government agencies responsible for chemicals issues were presented, and these agencies have been increasing their interactions through national strategic plans on chemicals management, starting with chemical inventories and integrating systems for chemicals management, then capacity building for all sectors and finally preventive measures and monitoring of health impacts. The importance of government agencies learning from each other was noted.
    Nalinee Sripaung (Bureau of Occupational and Environmental Diseases, Department of Disease Control, Thailand) described the wide range of sectors impacted by chemicals. In occupations there were both formal sectors (e.g. industrial workers, health care workers) and informal sectors (e.g. farmers, informal recycling from waste sites). There was also environmental pollution (e.g. chemicals contamination, air pollution, power plant). The need to cooperate with a range of actors at all levels (e.g. international organizations, national organizations, local authorities) and to address local needs (e.g. pesticides poisoning, volatile organic compounds poisoning, heavy metal contaminants in areas with mining) was described. Collecting information on chemicals usage, biological and environmental sampling and laboratory analytical techniques were used to assess chemical risk. Besides, simple biological sampling techniques for screening purposes were being used to raise awareness and screening test for chemical risk assessment to pesticides. The benefit of regional cooperation (ASEAN) in setting Biological Exposure Indices (BEIs) and diagnostic criteria for preventative work was noted, and supported by other participants.

11. Meeting participants also noted the importance of seeking good collaboration between government agencies in their countries, the benefit of poisons centres to access data on problem chemicals in communities and the possible value of sharing long-term strategic plans so that countries could learn from each other.

12. Angelique Vickers (Pesticides Control Authority, Jamaica) presented the situation and challenges of pesticide registration in Jamaica. The small number of staff and the need to rely on experts from external institutions who did not have specific chemical risk assessment training was described. It was necessary to obtain information from sources in developed countries, but this was rarely ideally suited to their local needs. The major challenges were having to extrapolate assessments from elsewhere to their geology and climatic conditions, and their local fauna which could differ significantly. The genetic background of different ethnic groups and the different application techniques used, combined with low literacy levels in small-scale farmers, presented additional challenges to adapt risk assessments to the local situation. A case study of an illegally-imported pesticide product with no information available was presented.

13. Meeting participants noted that the problem of having to adapt assessments from developed countries to local conditions such as different application techniques and unique susceptible species was common to many developing countries.

14. Jules de Kom (Ministry of Health, Suriname) described the situation in Suriname, a small and ethnic rich country with an open import economy. Mentioned was the lack of a specific policy for chemical management and that there was limited regulation of chemical waste. Presented were the limitations in chemical risk assessment and illustrated with examples of the extractive industries (e.g. gold mining), pesticides and industry legacy sites. The country was using data on import and uses to prioritize chemicals of concern and was focussing on targeted risk communication. The data gaps for exposure scenarios, financial and local capacity resources, political and institutional commitment, no specific or outdated legislation, were mentioned as challenges. Collaboration with regional or comparable countries and regional institutions on specific issues was considered essential.

15. Meeting participants noted that industrial legacy sites were frequently a problem, and that international NGOs could sometimes assist. An inventory to track sites of concern was considered to be important.

16. Sam Adu-Kumi (Environmental Protection Agency, Ghana) presented on the situation in Ghana. Risk assessment was used in many sectors, including pesticide registration, contaminated sites and chemicals in food. It was important that all stakeholders were informed about the risk assessment methods used so that the results would be accepted. For contaminated sites the UNIDO Contaminated Site Investigation and Management Toolkit[3] was used, and the use of biomonitoring techniques was being researched.

[3] UNIDO Contaminated Site Investigation and Management Toolkit http://www.unido.org/fileadmin/user_media/Services/Environmental_Management/Stockholm_Convention/POPs/toolkit/Contaminated%20site.pdf

Problems with pesticide registration were highlighted as a case study, i.e. low literacy levels, failure to respect pre-harvest intervals due to limited options to transport to market, unauthorised uses.

Existing data for lower tier chemical risk assessments

17. Kersten Gutschmidt (WHO) led a plenary discussion on how lower tier risk assessments could be conducted. International tools and guidance and guideline values available were described (e.g. reference values from WHO applicable to food, air and drinking water, OECD Emission Scenario Documents for industrial processes). Many links to tools and reference sources are available in the WHO Human Health Risk Assessment Toolkit[4], which several meeting participants indicated was being used in their countries. It was noted that there were many information sources for chemicals in food, but few or none for other sectors e.g. no international references were known to be available for chemicals in textiles. It was also noted that WHO reference sources were not necessarily up to date and it was necessary to consider a range of materials e.g. ATSDR, Chemical Safety Reports from the EU, Japanese government risk assessment reports, documents from chemical industry associations.

18. It was noted that a reference source containing lists of the risk assessment models available could be useful, but some models would not be applicable in developing country situations. Information on burden of disease estimates relating to chemicals were generally not available, but more estimates were expected to be released by WHO during 2016 and these could be shared with Network Participants when available.

Chemical risk assessment tools for developing countries

19. Takahiro Hasegawa (OECD) introduced the Environment, Health and Safety Programme of OECD and various OECD tools and products available for chemical risk assessment which could be usable by developing countries, in the following topic areas:

- Mutual Acceptance of Data, Test Guidelines and GLP
- OECD Hazard Assessments and harmonized electronic formats
- Tools for regulatory needs - eChemPortal, QSAR Toolbox
- Emission Scenario Documents for various industry and/or use categories (including default scenarios for risk assessments)
- Environmental Risk Assessment Toolkit

[4] WHO Human Health Risk Assessment Toolkit
http://www.who.int/entity/ipcs/publications/methods/harmonization/toolkit.pdf?ua=1

20. The IOMC Toolbox for Decision-Making in Chemicals Management[5] was also described. This is an internet-based resource which gives access to guidance documents, reference information and training materials produced by IOMC organizations for various aspects of chemicals management via a single interface. The chemicals management schemes currently available in the Toolbox are:
    - A national management scheme for pesticides
    - An occupational health and safety system
    - A chemical accidents prevention, preparedness, and response system for major hazards
    - An industrial chemicals management system
    - A classification and labeling system
    - A system to support health authorities which have a role in the public health management of chemicals
    - Pollutant release and transfer registers

    Many of the toolkits and resources presented in the current meeting are available via the IOMC Toolbox. The Toolbox continues to be developed, and a component for capacity building will be included in the next phase of development.

21. Richard Brown and Kersten Gutschmidt (WHO) presented details of various WHO tools:

    - International Chemical Safety Cards (ICSCs) – concise information products on 1700 chemicals in multiple languages
    - WHO Recommended Classification of Pesticides – a simple hazard-based classification scheme for pesticides
    - WHO publications on chemicals of major public health concern e.g. chrysotile asbestos
    - WHO Human Health Risk Assessment Toolkit – it was noted that this document would soon be made available in an online format.

22. Alex Mangwiro (Basel, Rotterdam and Stockholm Convention Secretariat, UNEP) described the role of the Rotterdam Convention in management of industrial chemicals. Various resources from the Convention web site were presented, including an interactive toolkit. Life-cycle management of asbestos products in the Asia-Pacific region was used as an example to illustrate what was available. The Toolkit for the Elimination of Asbestos-Related Diseases[6] developed by two WHO Collaborating Centres for Occupational Health was also showcased and was very helpful in answering queries from the participants on the management of chrysotile asbestos wastes. Alternative methods for disposal of asbestos waste were discussed by meeting participants, and an information

[5] http://iomctoolbox.oecd.org/

[6] Toolkit for the Elimination of Asbestos-Related Diseases http://envepi.med.uoeh-u.ac.jp/toolkit/

gap on how to handle asbestos-contaminated water was identified. Cooperative working amongst the Basel, Rotterdam and Stockholm Conventions in the area of chemical risk assessment was discussed and noted.

23. Richard Brown (WHO) demonstrated the FAO Pesticide Registration Toolkit. This online resource was being developed by FAO as a system to support pesticide registrars in developing countries. The Toolkit provided technical advice on processes in pesticide registration such as data requirements and assessment methods, and also links to a number of authoritative information sources on pesticides. The Toolkit follows the principles for pesticide registration set out in the International Code of Conduct on Pesticide Management. Some examples of registration processes and information sources in the Toolkit were demonstrated.

Capacity building

24. Mathuros Ruchirawat (Chulabhorn Research Institute, Thailand) described the Capacity Building Programme which was provided by the WHO Collaborating Centre at the CRI to address the shortage of human resource expertise for toxicology and risk assessment in governments. A number of different courses and workshops of varying lengths were offered on an annual or biannual basis at the WHO Collaborating Centre in Bangkok, and additional in-country training courses had been delivered in countries in the local region. The courses were led by a teaching faculty which included international experts coordinated by the WHO Collaborating Centre. It was noted that since 1988, 86 courses had been delivered to more than 4500 participants from 31 countries. It was also noted that there was a continuing demand for this type of training.

25. Daam Settachan (Chulabhorn Research Institute, Thailand) demonstrated the "Electronic Distance Learning Tool on Risk Assessment and Management of Chemicals", commonly known as the 'eDLT'. This distance learning tool had been developed to complement the on-site training which was available, to give access to the training materials to a wider audience for users who could not commit to attend a training venue. The eDLT was developed by the WHO Collaborating Centre at CRI and international partners (including WHO), and development was funded by the SAICM Quick Start Programme. The course materials had been peer reviewed to ensure quality and were designed to be globally applicable, using easily understood language, and the course incorporated monitoring of progress for users. The course was designed to be completed within 4 weeks and since launch in 2013 there had been >150 trainees. The various modules available were described (from problem formulation through to risk communication) and the system was demonstrated to meeting participants.

26. Mary Gulumian (WHO Collaborating Centre at NIOH, South Africa) described post-graduate training on chemical risk assessment which was being developed for delivery in South Africa, but could also be undertaken by students from other African countries or

elsewhere. The course was at Masters level and had received government support as part of expanding toxicology expertise in the country. The assistance of IUTOX was also acknowledged. Completion of the course would assist with achieving professional recognition. Meeting participants noted that there was increasing demand in many countries for certain occupations such as hygienists to be government registered, and hence there was a need for training courses to carry some form of official recognition.

27. Richard Brown (WHO) demonstrated the Risk Assessment Training Course Database. This web-based database (https://www.risktraindb.org), development of which was one of the early activities of the Network, provides access to information on human health chemical risk assessment training courses. The database relies on submissions from users for its content, in particular from participants in the Network. The criteria for featuring courses in the database were described (i.e. in-person or online courses, relating to human health chemical risk assessment and administered by not-for-profit organizations), and it was noted that a broad range of subject areas relating to human health were covered.

Identification and formulation of project proposals

28. Prior to the meeting there had been a call for outline proposals for potential collaborative activities from meeting participants. A total of eight proposals had been received and these were briefly presented by WHO, along with the criteria for Network activities which were reproduced from the initial Network Business Plan. Meeting participants were also reminded of the different modes for managing activities (e.g. WHO-managed, institution-led). Participants were then divided into four breakout groups and were asked to identify activities for possible development. The eight submitted proposals represented initial ideas, but further ideas were encouraged. It was clarified that all activities could potentially involve the wider Network, but it was anticipated that these activities would be led by participants from this meeting.

29. The suggestions reported back from the breakout groups were collated into related topics by WHO and were then further formulated by a second round of discussion in breakout groups. For both rounds of discussion the four breakout groups were chaired by Sam Adu-Kumi, Salmaan Inayat-Hussain, Clemens Ruepert and Daam Settachan.

30. After discussion in the breakout groups, nine partially-formulated proposals were presented in plenary, clarifications were provided and further suggestions were recorded. Meeting participants were then invited to express interest in activities or to volunteer to lead the further development (post-meeting) of each of the proposals – see Annex 3.

The proposals are summarized in the following table:

Title	Outline
Improved WHO Chemical Risk Assessment Network Training Database	Establish working group to review the existing Chemical Risk Assessment Network training database; propose action to make it more inter-active and more useful for developing countries.
Training Fellowships	Establish a fellowship programme for sub-network institutions to attend the annual CRI training course on risk assessment and management in Bangkok.
In-Country Training	The well-established training course on risk assessment and management by the CRI will be delivered face-to-face in selected developing countries.
Training Webinars/ Continuing Education Course (CEC)/Satellite Workshops	Conduct a survey to identify training topics and organize training events, including webinars, continuing education courses and satellite workshops in conjunction with conferences. Potential topics include exposure assessment, environmental epidemiology, artisanal and small-scale gold mining (ASGM), heavy metals, biomonitoring, air pollutants, health effects of dietary trans fats, food contaminants, Health Impact Assessment, lead monitoring, exposure and risk modelling, risk perception, risk communication, etc.
Survey to Identify Priority Chemicals	Develop questionnaire survey, collate and analyze data, produce inventory of priority chemicals. Identify existing information for risk assessment for identified chemicals.
Case Studies	Develop case studies to share experience on risk assessment and subjects of common interest, including ASGM, health impacts of oil and gas operations, and other to be identified.
Protocols for Prevention, Preparedness and Response to Chemical Incidents	Development of protocols based on the WHO Manual for the Public Health Management of Chemical Incidents, e.g. for rapid risk assessment and chemical incidents surveillance. The objective is to increase core capacities under the IHR (2005) in small and resource-poor developing countries.
Poison Prevention and Treatment in Low Resource Context	Conduct survey to identify information needs. Develop strategy for poison information in low resource and “remote” context aimed at population with low education and medical professionals (not very familiar with chemical poisonings).
Biomonitoring	Literature review of existing biomonitoring methodologies suitable for supporting risk assessments in resource poor developing countries.

Concluding remarks

31. The follow up steps were described by WHO:

- WHO would follow up with the leader for each proposed activity to further develop the proposals.
- Project leaders could present the activity at the next available teleconference of the Network Coordinating Group.
- The activities would be listed in the meeting report and the wider Network would be invited to participate.
- A webinar to update on progress with the activities for participants in this meeting would be planned for mid-2016. Other teleconferences would be held as necessary.
- The next full Network meeting was provisionally planned for the 2nd quarter of 2017. An opportunity for participants from developing countries to get together back-to-back with that meeting would be considered when the meeting programme was developed.

32. Co-chair Jules de Kom summed up the achievements of the meeting against the planned objectives. It was concluded that the objectives had been met and participants were thanked for their contributions to the discussions. After thanking the Chulabhorn Research Institute for their hospitality, the meeting was closed.

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ANNEX 1

Meeting of the WHO Chemical Risk Assessment Sub-Network of developing Countries, Bangkok, Thailand, 2-4 December 2015

Meeting agenda

Day 1: Wednesday, 2 December 2015	
09:00 – 09:30	**Registration**
09:30 – 10:00	**Opening Session**
	Welcome (Mathuros Ruchirawat, CRI)
	Opening remarks (Kersten Gutschmidt, WHO)
	Introduction of Chairs
010:00 – 10:30	**Session on WHO CRA Network**
	The CRA Network (Richard Brown, WHO)
10:30 – 11:00	**COFFEE BREAK**
11:00 – 11:30	**Session on WHO CRA Network (continued)**
	The CRA Sub-Network (Jules de Kom, Suriname)
11:30-12:30	**Session on CRA in Developing Countries**
	Risk assessment capacities – Results from the WHO survey - 15 min (Kersten Gutschmidt, WHO)
	Brief country situation reports and case studies to trigger discussion on challenges, gaps and needs for CRA with limited resources and/or in small countries –
	Country experiences:
	Ghana - 15 min (Sam Adu-Kumi, Ministry of Environment, Ghana)
	Suriname - 15 min (Jules de Kom, Ministry of Health, Suriname)
	Discussion
12:30 – 13:30	**LUNCH**
13:30-15:00	**Session on CRA in Developing Countries (continued)**
	Thailand - 30 min (Nalinee Sripaung and Aurus Kongphanich, Ministry of Public Health, Thailand)
	Discussion
	Case studies:
	CRA of petroleum products - 15 min (Salmaan Hussain, National Society of Toxicology, Malaysia)
	CRA of pesticides - 15 min (Angelique Vickers, Pesticide Control Authority, Jamaica)

	Discussion
15:00 – 15:30	**COFFEE BREAK**
15:30 – 17:00	**Existing data for lower tier CRAs (in groups)**
	Introduction - 10 min (Kersten Gutschmidt, WHO)
	Break-out groups: Existing hazard and exposure information for lower tier CRAs - 40 min
	Plenary: Brief reporting from groups and discussion - 40 min
17:00	Close of day 1
	Day 2: Thursday, 3 December 2015
09:00 – 10:30	**Session on CRA tools for developing counties**
	OECD tools – Presentation and review, e.g. Emission Scenario Documents, exposure assessment tools, biocide documents and others (Takahiro Hasegawa, OECD, Paris)
10:30 – 11:00	**COFFEE BREAK**
11:00 – 12:30	**Session on CRA tools for developing countries (continued)**
	WHO Tools, including the WHO Human Health Risk Assessment Toolkit, International safety Cards, IOMC Toolbox for decision making in chemicals management and others - 60 min (Kersten Gutschmidt and Richard Brown, WHO)
	Assessment and management of industrial chemicals - 15 min (Alex Mangwiro, UNEP)
	Toolkit for the registration of pesticides - 15 min (Richard Brown, WHO)
12:30 – 13:30	**LUNCH**
13:30-15:00	**Session on capacity building**
	Chulabhorn Research Institute – Training on chemical risk assessment and management - 15 min (Mathuros Ruchirawat, CRI, Thailand)
	Demonstration of the electronic Distance Learning Training course for risk assessment (eDLT) - 15 min (Daam Settachan, CRI, Thailand)
	Post-graduate training on CRA in South Africa - 15 min (Mary Gulumian, Johannesburg, South Africa)
	Sharing information on training opportunities - 10 min (Richard Brown, WHO)
	Discussion
15:00 – 15:30	**COFFEE BREAK**
15:30 – 17:00	**Identification of project proposals for the CRA network (in groups)**
	Introduction into the exercise (Kersten Gutschmidt, WHO)

	CRA Network projects: Objectives and scope - 10 min (Richard Brown, WHO) *Break-out groups*: Brainstorming of project proposals *Expected output:* List of proposed projects to be implemented by the CRA network (Template – Project identification). *Comment:* Group to submit identified project.
17:00	Close of day 2
Day 3: Friday, 4 December 2015	
09:00 – 10:30	**Formulation of project proposals for the CRA network (in groups)** Introduction into the day – Projects identified the day before (Chair) *Break-out groups*: Formulation of project proposals (Template – Project formulation) *Expected output:* A number of one-page project.
10:30 – 11:00	**COFFEE BREAK**
11:00 – 12:00	**Formulation of project proposals for the CRA network (in groups)(continued)**
12:00 – 12:30	**Review of project proposals in plenary** *Plenary:* Present and discus project proposals prepared by break-out groups. (to be continued)
12:30 – 13:30	**LUNCH**
13:30 – 15:00	**Review of project proposals in plenary (continued)** Continue to present and discuss project proposals prepared by break-out groups. Prioritize projects. Expressions of interest by institutions to contribute to the implementation of proposed projects. (to be continued)
15:00 – 15:30	**COFFEE BREAK**
15:30 – 16:00	**Review of project proposals in plenary (continued)** Continue to prioritize projects. Expressions of interest to contribute to the implementation of proposed projects by institutions.
16:00 – 16:30	**Final session** Conclusions and recommendations - 15 min (Chair) Next steps – 15 min (WHO)
16:30	Closure of day 3 and the meeting

ANNEX 2

Meeting of the WHO Chemical Risk Assessment Sub-Network of developing Countries, Bangkok, Thailand, 2-4 December 2015

List of participants

INSTITUTIONS

Sam ADU-KUMI, Environmental Protection Agency, Accra, GHANA

Adedeji A. AKINWUMI, National Agency for Food and Drug Administration and Control (NAFDAC), Lagos, NIGERIA

Hamadi DEKHIL, National Agency of Sanitary and Environmental Control of Products, Tunis TUNISIA

Jules DE KOM, Ministry of Health, Paramaribo, SURINAME

Premendra D. DWIVEDI, CSIR-Indian Institute of Toxicology Research, Lucknow, INDIA

Rita ENDANG, National Agency of Drug and Food Control (NADFC), Jakarta, INDONESIA

Nana GABRIADZE, National Center for Disease Control and Public Health, Tbilisi, GEORGIA

Mary GULUMIAN, WHO Collaborating Centre for Occupational Health at the National Institute for Occupational Health (NIOH), Johannesburg, SOUTH AFRICA

Salmaan H. INAYAT-HUSSAIN, Malaysian Society of Toxicology, Kuala Lumpur MALAYSIA

Almas KENESSARY, Human Health Risk Assessment Laboratory, Kazakh National Medical University, Almaty, KAZAKHSTAN

Aurus KONGPHANICH, Food and Drug Administration, Nonthaburi, THAILAND

Amornrat LEENANITHIKUL, Food and Drug Administration, Nonthaburi, THAILAND

Taelo LETSELA, Africa Institute, Pretoria, SOUTH AFRICA

Samwel V. MANYELE, Government Chemist Laboratory Agency (GCLA), Dar-es-Salaam, UNITED REPUBLIC OF TANZANIA

Ditso Collet MOTSEWABENG, Environmental and Occupational Health Division, Chemicals Management Unit, Gaborone, BOTSWANA

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Kyi Lwin OO, Occupational and Environmental Health Division, Department of Health, Ministry of Health, MYANMAR

Preecha PREMPREE, Bureau of Occupational and Environmental Disease
Department of Disease Control, Nonthaburi, THAILAND

Beerappa RAVICHANDRAN, Regional Occupational Health Centre(s)
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Clemens RUEPERT, WHO Collaborating Centre for Occupational and Environmental Epidemiology and Toxicology at IRET, Heredia, COSTA RICA

Zeinab Abdel-aal SALEH SALAMA, National Research Centre, Giza, EGYPT

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Nalinee SRIPAUNG, Bureau of Occupational and Environmental Diseases Department of Disease Control, Nonthaburi, THAILAND

Angelique Fiona VICKERS, Pesticides Control Authority, Kingston, JAMAICA

Rachid WAHABI, Division de l'hygiène du milieu, Rabat, MOROCCO

Karma WANGDI, Department of Public Health, Thimphu, BHUTAN

INTERNATIONAL ORGANISATIONS

Takahiro HASEGAWA, Environment, Health and Safety Division, Organisation for Economic Co-operation and Development (OECD), Paris, FRANCE

Alex MANGWIRO, Basel, Rotterdam and Stockholm Convention Secretariat (UNEP/BRS), Geneva, SWITZERLAND

Kakuko NAGATANI-YOSHIDA, United Nations Environment Programme, Bangkok
THAILAND

WHO SECRETARIAT

Richard BROWN, World Health Organization, Geneva, SWITZERLAND

Kersten GUTSCHMIDT, World Health Organization, Geneva, SWITZERLAND

Lesley ONYON, World Health Organization, Regional Office for South East Asia, New Delhi, INDIA

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ANNEX 3

Proposed projects, including expressions of interest by institutions to lead and/or participate in projects:

Project 1: **Improved WHO Chemical Risk Assessment Network Training Database**
Outline: Establish working group to review the existing Chemical Risk Assessment Network training database; propose action to make it more inter-active and more useful for developing countries.
Output: Revised and inter-active database
Expressed interest to lead: Environmental Protection Agency (Ghana)
Expressed interest to participate: Pesticide Control Authority (Jamaica), EOHD (Botswana)[i], NADFC (Indonesia)[ii], NIOH-ICMR (India)[iii], DDC[iv] (Thailand), Africa Institute (South Africa)

Project 2: **Training Fellowships**
Outline: Establish a fellowship programme for sub-network institutions to attend the annual CRI training course on risk assessment and management in Bangkok.
Output: 5 to 7 fellowships per year (for the first two years)
Expressed interest to lead: CRI (Thailand)[v]
Expressed interest to participate: NA

Project 3: **In-country Training**
Outline: The well-established training course on risk assessment and management by the CRI will be delivered face-to-face in selected developing countries.
Output: Two courses over two years
Expressed interest to lead: CRI (Thailand)[vi]
Expressed interest to participate: NA

Project 4: **Training Webinars/ Continuing Education Course (CEC)/Satellite Workshops**
Outline: Conduct a survey to identify training topics and organize training events, including webinars, continuing education courses and satellite workshops in conjunction with conference. Potential topics include exposure assessment, environmental epidemiology, Artisanal and Small-scale Gold Mining (ASGM), heavy metals, biomonitoring, air pollutants, health effects of dietary trans fats, food contaminants, Health Impact Assessment, lead monitoring, exposure and risk modeling, risk perception, risk communication, etc.
Output: Series of webinars and other events focusing on the needs of Sub-Network members
Expressed interest to lead: WHO (?), e.g. to identify topics and to follow-up with partners to organize events.
Expressed interest to participate: WHO CC (South Africa)[vii] to organize webinar on risk assessment models, i.e. provide an overview of existing models and discuss application in developing countries.

Project 5: **Survey to Identify Priority Chemicals**
Outline: Develop questionnaire survey, collate and analyze data, produce inventory of priority chemicals. Identify existing information for risk assessment for identified chemicals.
Output: List of priority chemicals; facilitated access to relevant information
Expressed interest to lead on priority chemicals in North African (Francophone?) countries: NASECP (Tunisia)[viii], DHM (Morocco)[ix]
Expressed interest to lead on HHPs in sub-Saharan African (Anglophone?) countries: GCLA (Tanzania)[x], Africa Institute (South Africa)

Expressed interest to participate: OEH (Myanmar)[xi], Department of Public Health (Bhutan), FDA[xii] and DDC[xiii] (Thailand), EOHD (Botswana)[xiv]

Project 6: **Case Studies**
Outline: Develop case studies to share experience on risk assessment and subjects of common interest, including ASGM, health impacts of oil and gas operations, and others to be identified. Case studies can also feed into *Project 4*, i.e. webinars and other events can be organized around the case studies.
Output: Case studies posted on the Chemical Risk Assessment Network webpage (and training events, see *Project 4*)
Expressed interest to lead on case study on ***oil and gas****:* Malaysian Society of Toxicology
Expressed interest to lead on case study on ***pharmaceutical pollutants in water****:* NASECP (Tunisia)[xv], DHM (Morocco)[xvi]
Expressed interest to participate in case study on ***mining***: HHRAL (Kazakhstan)[xvii], Public Health Institute (Mongolia), NAFDAC (Nigeria)[xviii]

Project 7: **Protocols for Prevention, Preparedness and Response to Chemical Incidents**
Outline: Development of protocols based on the WHO Manual for the Public Health Management of Chemical Incidents, e.g. for rapid risk assessment and chemical incidents surveillance. The objective is to increase core capacities under the IHR (2005) in small and resource-poor developing countries.
Output: Protocols relevant to small developing countries
Expressed interest to lead: Ministry of Health (Suriname)
Expressed interest to participate: CSIR (India)[xix], GCLA (Tanzania)[xx], Environmental Protection Agency (Ghana), NAFDAC (Nigeria)[xxi], Department of Public Health (Bhutan), Public Health Institute (Mongolia)

Project 8: **Poison Prevention and Treatment in Low Resource Context**
Outline: Conduct survey to identify information needs. Develop strategy for poison information in low resource and "remote" context aimed at population with low education and medical professionals (not very familiar with chemical poisonings).
Output: Strategy paper
Expressed interest to lead: NADFC (Indonesia)[xxii]
Expressed interest to participate: GCLA (Tanzania)[xxiii], DCPH (Georgia)[xxiv], (Myanmar)[xxv], Environmental Protection Agency (Ghana), Department of Public Health (Bhutan), Public Health Institute (Mongolia), Africa Institute (South Africa), EOHD (Botswana)[xxvi]

Project 9: **Biomonitoring**
Outline: Literature review of existing biomonitoring methodologies suitable for supporting risk assessments in resource poor developing countries.
Output: Document
Expressed interest to lead: WHO CC (Costa Rica)[xxvii]
Expressed interest to participate: National Research Institute (Egypt), GCLA (Tanzania)[xxviii] , OEH (Myanmar)[xxix], NAFDAC (Nigeria)[xxx], NASECP (Tunisia)[xxxi], NIOH-ICMR (India)[xxxii], CSIR (India)[xxxiii]

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[ii] National Agency of Drug and Food Control, Indonesia
[iii] Regional Occupational Health Centre(s), NIOH-ICMR, Bangalore, India
[iv] Bureau of Occupational and Environmental Diseases, Department of Disease Control, Thailand
[v] Chulabhorn Research Institute, Thailand
[vi] Chulabhorn Research Institute, Thailand
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[viii] National Agency of Sanitary and Environmental Control of Products, Tunisia
[ix] Division de l'hygiène du milieu, Morocco
[x] Government Chemist Laboratory Agency (GCLA), Tanzania
[xi] Occupational and Environmental Health Division, Department of Health, Ministry of Health, Myanmar
[xii] Food and Drug Administration, Thailand
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