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EXECUTIVE SUMMARY

The World Health Organization (WHO) convened a two-day workshop on 20 and 21 February 2019 to bring together institutions from developing and industrialized countries with expertise in and expert knowledge of methodologies and systems for the identification of emerging risks to human health from chemicals. The workshop was hosted by RIVM at Bilthoven in The Netherlands and was attended by 48 participants from 32 countries. Two-thirds of the participants were from member institutions of the WHO Chemical Risk Assessment Network (“the Network”) and the remainder were from other institutions having systems or expertise relating to the identification of emerging risks from chemicals. An Organizing Committee of Network participants assisted with development of the workshop.

The workshop discussed a mapping report of existing methodologies and systems, which was based on a literature review and the results of a stakeholder survey completed by 30 institutions from the Network or institutions involved with relevant networks or surveillance mechanisms. The report was compiled by staff at Public Health England (PHE) prior to the workshop. During the workshop, presentations were also made about methods to detect emerging risks, examples of existing systems and networks, country experiences, and projects and case studies. Posters describing the work of participating institutions were also discussed.

Group discussions were held to define and identify the goals, scope, actors and methodologies for the Network. Workshop participants also discussed the future development, activities and role of the Network in identifying emerging risks to human health. There was agreement on the need to undertake manageable pieces of work and build up gradually, and to develop a pilot scheme first. Objectives for the Network were identified that included the development of activities to share information with the wider community, including the methodologies and systems mapping report and the report of this workshop. A task group will also further develop key definitions and a description of the concept of what the Network wants to do. The latter will also involve the provision of training and the development of resources and activities.

DAY 1: WEDNESDAY, 20 FEBRUARY 2019

Welcome

Ms Carolyn Vickers, WHO, Switzerland, welcomed everyone to this WHO Chemical Risk Assessment Network Workshop on Emerging Risks 2019 and introduced Dr Jan Roels, National Institute for Public Health and the Environment (RIVM), who welcomed participants on behalf of the host institution.

Dr Roels welcomed all, stated that it was an honour to hold this event at the RIVM premises in Bilthoven in The Netherlands, and presented an overview of the history and activities of RIVM.

Established in 1909, RIVM (translated as the National Institute for Public Health and the Environment) is an agency of the Ministry for Health, Welfare and Sport and exists as three domains covering infectious disease, public health and environmental safety. The institute conducts research and performs tasks to inform and promote both public health and a healthy and safe environment. The institute is scientifically independent by statute.

Dr Roels described the core values, vision and strategic programme of RIVM and discussed the complications and challenges facing the organisation today. A new building is currently being constructed and he hoped to meet (again) there in the future. The presentation culminated with a short video illustrating the work of RIVM.
Introduction

Ms Vickers welcomed everyone to the workshop and described the scale of the impact of chemicals on public health, the rationale for the Network and the scope and aims of the workshop.

In summarising what is known about emerging risks and the public health impact of chemicals, Ms Vickers reported that, in November 2018, the WHO released an update on the Public Health Impact of Chemicals: Knowns and Unknowns (https://www.who.int/publications/i/item/WHO-FWC-PHE-EPE-16.01-eng). It was estimated that 1.6 million lives were lost to the small number of selected chemicals for which we have data. This figure is considered an underestimate given the many chemicals that exist and to which exposure occurs, often daily, for which there is insufficient data. This represents a challenge to the health sector.

Ms Vickers asked participants to consider and discuss:

- How can we work together to get data to better understand the negative impacts of chemicals on health?
- How can we better predict what chemicals may be a problem, before these impacts occur?
- How can we act faster when a problem has been identified?

One of the objectives of the Network is to “assist in the identification of emerging risks to human health from chemicals”. This workshop aims to discuss how the Network should address this objective; in particular, in identifying possible collaboration activities for Network Participants to take forward in the future.

The objectives of the workshop were to:

1. Consider the WHO report on methodologies and systems for the identification of emerging risks to human health from chemicals, as well as share experiences in implementing systems.
2. Assess whether the identified systems are adequate for identifying emerging risks to human health from chemicals.
3. Propose an operational definition of emerging risks for future work of the Network.
4. Identify possible collaboration activities for Network participants to take forward in the future.
5. Discuss ways to make the identification of emerging risks of chemicals and the process of knowledge and expertise exchange more efficient.

Ms Vickers thanked PHE for the methodologies and systems mapping report.

In addition to Network members, Ms Vickers acknowledged the attendance of non-member institutions that had been invited for their expertise in emerging risks and thanked them for participating. Non-members who were eligible were also invited to join the Network.

The proposed outputs of the workshop included an informal meeting report for participants and members; a short, published summary to inform others about the workshop and its outcomes (for the public website); and a
decision on whether to publish an updated version of the mapping report in some form, and possibly an article in the peer review literature.

Ms Vickers also described how this workshop would contribute to the activities in the WHO Chemicals Road Map (https://www.who.int/publications/i/item/WHO-FWC-PHE-EPE-17.03), which sets out actions where the health sector has a lead or important supporting role to play in the sound management of chemicals in the context of the Sustainable Development Goals (SDG). In particular, the SDG Target 3.9 is to reduce deaths and illness from hazardous chemicals and air, water and soil pollution and contamination.

Ms Vickers thanked the host, RIVM; the Ministry of Health, Germany, for financial support; the National Institute of Environmental Health Sciences (NIEHS), United States of America (USA), for contributing resources for the workshop; and the Organizing Committee members who worked very hard to prepare the workshop.

Ms Vickers introduced colleagues Dr Richard Brown, Dr Evelyn Kortum and Mr Carmen Savelli from the WHO Secretariat, Switzerland, and Ms Joy Lee from MDB, Inc., USA, who assisted in organising and facilitating the smooth running of the event.

Dr Theo Vermeire, RIVM, The Netherlands, and Dr Chris Weis, NIEHS, USA, were proposed and elected Co-Chairs of the meeting. Dr Haydn Cole, PHE, The United Kingdom of Great Britain and Northern Ireland (UK), was elected Rapporteur.

Keynote: Methodologies for the Identification of New or Emerging Risks of Chemicals

Dr Lya Soeteman-Hernandez, RIVM, The Netherlands, provided an overview of the principles of hazard identification, risk assessment and proposed definitions for the workshop, such as emerging issues, emerging risks, signal detection, foresight and horizon scanning. Case examples illustrated the differences between reactive surveillance systems (e.g. poison centres) and proactive systems, such as foresight and horizon scanning, that attempt to identify potential threats or forecast risk by utilizing expert opinion and adopting new technology. Dr Soeteman-Hernandez also described the process involved in identifying new or emerging risks from chemicals and the stages of signal detection, signal evaluation and prioritization, proceeding to risk management options. Recent examples of the identification of new hazards included e-cigarette liquids and toy “slime” products. In addition, Dr Soeteman-Hernandez provided an overview of existing early warning collaborative networks that operate for sectors such as food, occupational health and the environment, along with examples of The Netherlands’ participation in international collaborative networks (MODERNET, INNERY and NORMAN).
In closing, Dr Soeteman-Hernandez encouraged knowledge sharing, adding that an active interdisciplinary network of people and an effective communication infrastructure are essential for a successful signalling system.

Following the presentation, participants discussed the meaning of the term “increasing susceptibility” within the proposed definition of emerging risk. Examples of increasing susceptibility provided by participants included skin sensitization, asthma affected by air quality, increasing information about genetic susceptibility and increasing retirement age (older working population).

**Breaks and Posters**

During the breaks, workshop attendees were able to view posters provided by participating institutions of the Network that described the general activities undertaken by the institutions and activities and partnerships specifically related to emerging risks to health from chemicals.

**Results of the Mapping Exercise and Survey**

Dr Weis introduced Dr Cole to present the results of the mapping report of methodologies and systems operating to identify emerging risks to human health from chemicals. The report was used to identify and invite potential workshop participants that were not members of the Network and was distributed to the workshop participants prior to the event to facilitate discussion. Dr Weis added that the workshop also aimed to provide a forum to gather further information about methodologies and systems not yet covered.

Dr Cole described the design rationale of the mapping report, which comprised a report of a literature review and results from a stakeholder survey and presented a summary of the findings.

The identified systems and methodologies were grouped and described by general method type/description (e.g. surveillance, alert system, networks), and mapped by the sector in which the method had been applied (e.g. human health, environment, food). Many of the systems employed more than one method (e.g. sharing surveillance data amongst collaborative networks). Example scenarios of communication (or lack of) between sectors in order to identify emerging risks to health were provided but no system/network was identified that communicated with, or utilized data from, all the sectors in order to identify an emerging risk from chemicals or perform a risk assessment. As such, trends or non-specific early warning signs may be missed.
Early detection and identification of new and/or emerging risks to human health from chemicals is essential in order to implement timely measures to reduce or eliminate the risk. The ability to detect events, health effects, risks to health or the presence of chemicals is reliant on surveillance systems. The data captured by different forms of surveillance such as indicator-based, event-based and syndromic surveillance systems was described, and examples were provided of their application in detecting events and emerging risks. Examples included media surveillance tools, the National Toxic Substance Incident Program (US), the Triple S project and systems operated by PHE’s real-time syndromic surveillance team. Systems and methods that included risk assessments, models, collaborative networks, expert committees, alert networks, databases and research projects were also discussed, with illustrative examples.

Legislation and regulation, while not itself a method to identify emerging risk, was an important mechanism to prevent or reduce exposure and risk or act as a driver for establishing monitoring systems.

The systems that detect or identify emerging risks to health from chemicals were divided into two main categories: systems to 1) detect human health effects or the presence of chemicals in humans and 2) detect/identify chemicals in sources or pathways relating to human exposure (sectors), such as the environment or food. Additional processes may operate to connect the two or to estimate the risk/impact to health caused by a chemical in the absence of specific health evidence.

Healthcare facilities and poison centre facilities perform a key surveillance role by detecting health effects. These facilities are common worldwide but are very unevenly distributed and there are differences in resources, surveillance and reporting capability. Despite this important role, only 46% of WHO Member States operate a poison centre.

Biomonitoring programmes for characterising exposure to chemicals were described that assess potential risk to health from chemicals in the absence of visible health effects. Surrogate in vitro toxicity tests to assess individual chemicals or complex mixtures of chemicals for their effect on specific molecular targets and/or biological pathways have been developed.

Systems to identify emerging risks to health were identified across a wide range of sectors encompassing the various potential source and exposure pathways. The sectors included occupational health, food, non-
food consumer products, waste, animal health, illicit drugs, the chemical industry and the environment (air, water, soil). Furthermore, examples were given of systems that account for changes in environmental factors on potential human exposure and risk to health from chemicals, such as climate change and building design.

A stakeholder survey was conducted to canvass opinion and identify methods for identifying emerging risks to health from chemicals amongst agencies/institutions from different countries. A total of 30 valid survey responses were obtained from institutions located in 25 countries. Survey responses were received from institutions in at least one Member State from each of the WHO regions. Responses to the survey were mostly from high and upper-middle income countries.

Forty-four percent of the country respondents reported that a national program or institute for identifying emerging risks to human health from chemicals existed in their country. The programs reported were within the environment, health (biomonitoring), occupational health and non-food consumer product sectors.

The sectors in which, in the opinion of survey responders, systems were considered the most effective in identifying emerging risks to health from chemicals were food and water, followed by occupational health. The chemical and manufacturing industries received the least votes. In general, the environment and occupational health sectors scored highly as being effective, the most easily adapted and sectors that individuals were most interested in learning more about. Systems undertaking non-routine analysis of samples to detect potentially emerging chemical hazards were the least common amongst the respondents.

The presence of national legislation did not always mean that a system to monitor for the presence of chemicals or perform surveillance for health effects also existed to assess compliance.

The most notable opportunity identified from the results of the survey was that of creating an international emerging chemical surveillance/identification network that collates information from the widest possible range and sources of data, to increase the sensitivity of detection and awareness. However, implementation of a uniform system across all regions is currently limited by large differences in national capabilities and resources. The only system widely available in all countries is the healthcare system, though with large differences in capabilities and resources, and this could serve as a starting point for development. It is important that systems do not focus solely on the detection of health effects and that investment is spread to include the various sectors and other methods identified. In addition, such a system must also be practicable and sustainable.

Sharing data and experiences could be improved. Adopting existing systems or sharing data could improve detection or response to emerging risks from chemicals within countries that do not currently possess such capacity.
Country Examples
Dr Weis introduced a session of presentations from three speakers that provided case examples of emerging issues or risks to health from chemicals in their representative countries.

Example 1
Signalling in South Africa – A Poison Information Centre Perspective
Dr Cindy Stephen, Red Cross War Memorial Children’s Hospital, Cape Town, South Africa, started the session with an overview of chemical regulations and the experiences of a poison information centre in South Africa, accompanied by three different examples of poisoning.

The first example described an increasing incidence of poisoning due to “street pesticides”. These are pesticides intended for the industrial market that have been decanted into smaller containers and sold for domestic use as cheaper alternatives to commercial domestic insecticides. National data indicated a rise in cases reported to the Department of Environmental Health for the period 2016-2017. An ayurvedic “natural acne cure” product that contained lead that caused poisoning illustrated the potential for “traditional/natural treatment” to pose emerging risks to health. Mercury poisoning due to occupational exposure and environmental contamination, as the result of an industrial legacy, was also presented. Dr Stephen described how the signals were detected and summarized that while legislation is often present in South Africa, the country lacks the systems and resources to enforce it effectively.

Example 2
Emerging Risks Identified Through Surveillance
Professor Raquel Duarte-Davidson, PHE, UK, provided examples of emerging risks identified through surveillance from the UK.

Professor Duarte-Davidson introduced the work of PHE and its role in commissioning the UK National Poisons Information Service (NPIS). The NPIS advises health professionals in the UK and national and international agencies on suspected poisonings or exposures to a wide range of substances, and it conducts surveillance. The NPIS electronic information system “Toxbase” is a first line resource for the provision of clinical management advice.

She provided two examples in which poison centre surveillance data identified emerging risks to health. The first example described the identification of poisoning cases caused by new-to-market household liquid laundry detergent capsules. The patients were mostly children due to the attractive appearance of the capsules and the fact that the substance may not have been recognized as potentially harmful by the parent/guardian. International cooperation also facilitated the identification of the same issue within other countries. Consequently, a voluntary product stewardship programme was established in Europe, requiring that safety
measures be implemented to reduce the visibility of, and restrict access to, the capsules by children. Furthermore, implementation of the Classification, Labelling and Packaging of Substances and Mixtures Regulations in 2015 required that hazard warnings be placed on packaging.

During 2013, the NPIS observed an increase in episodes of systemic 2,4-dinitrophenol (DNP) toxicity reported in telephone enquiries to the service. DNP is an industrial chemical (not licensed as a medicine) that was sold predominantly online and taken to promote weight reduction or by body builders for “body sculpting”. This information was shared with responsible agencies and published, which resulted in warnings to the public and the crime unit targeting the illegal internet sale of DNP aggressively. However, while a temporary decline in cases was observed, a downward trend has not been maintained.

Example 3

Endocrine Disruptors as an Emergent Hazard: The Role of the Health Sector in the Regulation of Chemicals Management

Dr Alena Drazdova, Ministry of Health, Belarus, presented the role of the health sector in the regulation of chemicals management in Belarus and described works to develop a chemical registry. Dr Drazdova also described a project to assess the prevalence of potential endocrine disrupting chemicals and diseases to identify knowledge gaps and needs.

Dr Drazdova began with a summary of the chemical industry in Belarus, the main production sectors, regulation and the incidence of occupational disease in the chemical industry. In response to the technical regulation of the Eurasian Economic Union (EAEU) TR EAEU 041/2017, a unified chemical registry is being developed in cooperation with Eastern European partners Armenia, Belarus, Kazakhstan, Kyrgyzstan and the Russian Federation. This registry aims to harmonize with the main components of the European Union (EU)’s REACH and CLP Directives and contains information on chemicals, including the status of their prohibition, restriction or permission of their use in the customs territory of the EAEU. Any chemical that is not included in the unified registry is considered new and is subject to the notification procedure via the authorized body of the EAEU member state. Development of the registry and the registration process requires input from a range of state agencies, such as the Ministries of Health, Emergency Situations, Environment, Labour and Social Protection.

Research has been undertaken to determine the presence, turnover and evaluation of chemicals potentially possessing the properties of endocrine disruptors, their presence in consumer goods and preliminary estimates of the level of exposure of the population of Belarus. In addition, a network for facilitating the exchange of information between organisations on chemicals influence on human health (carcinogens and endocrine disruptors) has been established. An action plan for the prevention of diseases potentially caused or associated with endocrine disruptors will be developed.
Panel Discussion

The development of a unified chemical registry in the EAEU stimulated a discussion about how to acquire precise information about chemicals and mixtures from the chemical industry (e.g. full composition of products, lists of ingredients). The experience of some participants was that it can be very difficult to acquire this confidential information and, as such, strong regulations are required. There are also difficulties in collecting and sorting chemical information databases, as some chemicals have many uses.

It was reported that an amendment to the European Union Classification, Labelling and Packaging of Substances and Mixtures CLP Regulation (Article 45) requires manufacturers to provide uniform information, formula and composition of products (or product identifier). This change is welcomed as it will enable a better emergency medical response. Commercial interest is also protected, as the information will only be shared between industry and health responders/poison centres. However, it was argued that full disclosure of all ingredients, not just those above a threshold concentration, would be required for emerging risk activities. The provision of chemical information does already occur in the UK, with information available for approximately 80% of products, but it is currently voluntary. It is considered unlikely that the information acquired via Article 45 would be available to non-EU Member States.

In South Africa, no regulation exists that requires manufacturers to disclose chemical composition/hazard information, but they are asked to share information on a voluntary basis, in return for which they can use the poison information centre phone number on their labels. Substances are ordered on the information sheets by relative toxicity. Anyone that uses the poison information service “Afritox” must agree not to divulge information to others and it is only to be used for treatment. Other regional differences were also highlighted, such as potential differences of opinion or classification between countries about what constitutes an emerging risk. An example used to illustrate this point was that polychlorinated biphenyls are considered an emerging issue in developing countries but may not be considered “emerging” in developed countries.

Suggestions for improving data availability and disclosure included
whether countries could mirror the EU CLP Regulation that legislates for the provision of safety data sheets that contain composition, when concentration thresholds are exceeded.

Ongoing issues common to most, if not all, regions were that there is little information available about the composition of articles (e.g. non-food products) and that regulations have not always been effective in preventing health risks from products sold online in the international market, particularly when new products come to market in a region.

Several potential information sharing opportunities were identified.

World Cafe Group Discussion 1

The afternoon session consisted of world café style group discussions to define and identify the goals, scope, actors and signalling methodologies for the Network. The participants formed five groups that rotated through five discussion questions and were assisted by facilitator and volunteer rapporteurs. Following the discussion period, the participants reconvened and the rapporteurs presented the results.

The questions to the participants were:

■ Question 1: Do the following proposed definitions of emerging risk and emerging issue adequately address emerging threats to human health?

- Emerging risk refers to an effect resulting from a newly identified hazard to which an exposure may occur or from new or increased exposure and/or susceptibility to a known hazard.

- Emerging issue is a potential risk that has very recently been identified and for which the available data to conduct a risk assessment is very limited.

The definition of emerging risk was generally accepted, but some requested that the scale of the risk be considered and communicated within the definition on the basis of expert opinion. Similarly, the potential for differences in what may be perceived as a risk in one region/country compared to another was raised.

The definitions were perceived by some as generalized and not specific to chemicals and, as such, could be taken out of context. Wording to define the chemical element would be useful.

Different opinions were expressed toward the inclusion and definition of an emerging issue. The term “emerging issue” was suggested as being vague and some suggested defining emerging risk only, as the inclusion of emerging issue as well could lead to confusion. The definition of an emerging issue as a potential risk was questioned, with suggestions that the word “risk” should be replaced with “effect”, “hazard” or “chemical characteristic”. Furthermore, it was suggested that the definition should be adjusted to account for societal concerns, as follows: Emerging issue is a potential effect/hazard/chemical characteristic that has very recently been identified or perceived as a public health hazard, and for which the available data to conduct a risk assessment is very limited. The inclusion of the term “public health hazard” was not favoured by all. The argument
against its use was that it was too severe a term and that it should be reserved for “more significant” public health events and/or “stronger signals” only and not used in the context of an emerging situation. Further consideration or clarification of the use of the term “public health hazard” may be required if differences exist in interpretation.

If definitions of both emerging risk and emerging issue are to be used, it was suggested that emerging issue be stated first, followed by emerging risk.

**Question 2: Why is it important to signal? Who should be informed and follow up? What are the obstacles and difficulties?**

- There was agreement across all the groups that it was important to have a process in place to be able to use signals to raise an alert, but the discussions did not elaborate on this point. The other questions were discussed in more detail.

- On the question of who should be informed and follow up, there was consensus that signals need to be directed accurately to the appropriate body, agency or institution and that this should be via a focal point, while adhering to principles of good communication and coordination. The signalling systems should be able to handle both incoming and outgoing signals; in other words, the signalling system should send its own signals and also appropriately pass on signals received via others. Signals should be administered carefully so that they are not distorted (amplified or reduced).

- The use of the focal point for evaluation/filtering and appropriate distribution of signals was supported by some, but others raised concern that signals/signal distribution should not be pre-evaluated or filtered. Where filtering or risk assessment was supported and applied to signals, the use of appropriately trained staff was important to determine what was “normal” and what was “abnormal”.

- Potential obstacles and difficulties raised included the multi-factorial nature of signals, such as differences in regional and cultural characteristics or relevance of signals. Other threats to a signalling system/network included false or questionable signals raised by faults, error, generated by intentional disruptive acts (hacking), inherent assumption, misinformation (e.g. spreading of unfounded information, intentionally or otherwise), and disinformation (deliberate intent to spread false information). These threats could potentially be countered, and surveillance could be enhanced, by the use of artificial intelligence screening tools.
Question 3: Discuss examples of issues and risks in and outside the scope. Identify scoping criteria.

Most of the debates were over which issues should be within the scope of the Network rather than out of scope and there were differences in opinion in classifying some issues. There remained a need to differentiate between country-specific issues and those affecting the wider Network community. It was acknowledged that the Network would need to prioritize activities due to resources, but a concern was raised that prioritization could result in signals (and hence a risk) being missed, particularly for latent effects/late onset disease.

In summary, the suggestions were as follows:

**Suggestions for issues which should be within the scope of Network activities:**

- Illicit/recreational drugs
- Pesticides and biocides, including mixtures
- Electronic cigarettes
- Microplastics
- Nanomaterials (in the absence of accepted risk assessment processes)
- Waste, including electronic waste, life-cycle management
- Factors affecting susceptibility
- Immunotoxicity
- Increased exposures to known hazards
- Replacement chemicals (an example of bisphenol A in infant feed bottles was provided)
- Climate change, leading to increased exposure and/or susceptibility
- Food chain accumulation
- Vaccinations, where the effect is due to an adjuvant or other chemical additive
- Sharing information on hazards
- Exposure route information
- Methodologies to identify signals
- Lack of adequate (commercial) product information and labelling
- Commercial products released/actions taken without awareness of consequences
- Network should have a role in monitoring trends in the private sector
Issues considered outside the scope of Network activities:

- Issues not related to chemicals
- Deliberate actions (e.g. self-harm, terrorist events) where other actors are more relevant
- Food-related illness, depending on circumstances and reach
- Loss of species as indicators
- Response to acute emergencies (though long-term follow-up could be in scope)

It was noted that a distinction needed to be made between Network activities and local response.

Issues with no majority support for either in or out:

- Matters that reach the political agenda
- Socially driven issues – social media, media-driven, “fake news”
- Populations living in close proximity to industry (issues relating to urban planning)
- Low heat tobacco products
- Chemicals for which no hazard information is currently available

Question 4: Who should signal emerging issues and who should evaluate them?

The groups outlined the need for the identification of actors at the national and international level. Methods proposed for operating at the national level included a coordinating centralized system and a national focal point, of which the latter would be a government ministry (e.g. Ministry of Health, Environment or Agriculture). In addition, a hub that facilitates participation of multiple stakeholders, such as poison centres, civil society, non-governmental organisations, trade unions, or medical staff, was proposed. The view was that the Network should collaborate with other international organizations, noting that other international networks also exist, especially for food safety.

There was no dominant group opinion on who should evaluate or if any evaluation should be performed prior to signal dissemination. Some participants suggested the Network should evaluate the signals. However, where evaluation was supported it was proposed that the evaluating body should be independent, and the evaluation should not be performed by the same body as the signal generator. It was also suggested that countries should invest in systems to look for signals, as more could be done.

Some participants felt a clearer definition of a signal was still required.
Question 5: How can we identify and evaluate emerging issues and risks? What criteria are important in the prioritisation of signals? What are the obstacles and difficulties?

The establishment of common principles for identification and evaluation criteria and a template or prescribed format were considered key to effectively identifying and evaluating emerging issues and risks. Suggestions for how emerging issues and risks could be identified and evaluated comprised proactive and reactive approaches that included surveillance that gathers data from a wide variety of sources (e.g. health practitioners/poison centres, human biomonitoring/health assessment, occupational health platforms, consumer portals). In addition, it was proposed that observations or surveillance data different from the “normal” baseline should be collected and assessed. However, the definition of and how to establish what constitutes a normal baseline was not discussed further.

Proactive identification of risks through a knowledge-based predictive approach (rather than reacting to observations) included using expert committees, assessment of both academic and industrial literature, follow-up of emerging technologies and related developments and identification of trends in use of chemicals and occurrence of chemicals in the environment. A multiple stakeholder approach was considered important, and having programmes prepared in advance was considered important for both the identification and the evaluation of issues and risks.

The criteria that were considered important in the prioritisation of signals were the number of signals, the nature of the signal (environment, animal, health), the data source, severity of effect and plausibility. It was suggested that priority be given to signals that affect human health. However, it was also argued that a more holistic approach, such as the One Health paradigm that includes environment, animal and human health, would be more informative. It is also important not to disregard signals that are not (currently) considered a priority or of major value to the community. Human exposure, including biomonitoring data, was considered an important data source of high priority. Chemical criteria such as high production volumes, toxicity and environmental persistence and accumulation were also considered important.

The obstacles raised by the groups were inadequate communication and sharing and that latent or chronic exposure health effects (including in utero) may not be present or detected (or attributed a cause) by health practitioners. Keeping up with technological developments and lack of information about new chemicals, products, exposures and processes were also common issues. Legislation was considered to lag behind technological or commercial developments.
An argument was raised for storing signals indefinitely and that signals should not be deleted from any proposed system database so that potential long-term issues or risks would not be missed or considered insignificant. Furthermore, reviewing missed signals could provide a useful learning and improvement exercise.

Reported challenges in prioritizing signals included a lack of expertise in how to analyse and interpret signals and how to establish baselines or benchmark risk. As such, training and development in identifying and evaluating issues and risks (e.g. how to recognize a signal) were proposed as opportunities for improving international capability. Concerns included the scale of the issue and the amount of data assessment, which might be time consuming and require many resources. Existing assessment infrastructure and procedures may be insufficient to deal with the large amount of data and wide sources of signal information. It was suggested that country context is also an important consideration for addressing emerging risk, so harmonization may not always be practical.
Co-Chairs: Objective of the Day
Dr Weis welcomed the participants to the second day and opened the meeting. Dr Weis asked participants for practical recommendations that could move the Network forward and to identify challenges that hinder working together. In addition, how could the WHO assist participants to work better together?

Keynote: The Role of the Network in Identifying Emerging Risks
Dr Vermeire described how the vision of an emerging risk network developed from the previous Network meeting in Parma in 2017 and how an emerging risk network complements and addresses the objectives of the Network. The overall objective of the Network is to improve chemical risk assessment globally through fostering and facilitating interaction between institutions on chemical risk assessment issues and activities. In addition, specific objectives of the Network include providing a forum for scientific and technical exchange, promoting best practices and assisting in the identification of emerging risks to human health from chemicals.

Dr Vermeire summarized the progress of the first day, such as identifying elements needed for a successful system, the nature and type of existing systems and the terms agreed, or needs remaining, from the discussion questions.

Dr Vermeire focussed on some of the conclusions that had been reached during the world café discussions on the first day of the workshop. Regarding definitions of emerging risk and emerging issue, the definition of emerging risk had been generally accepted by workshop participants. However, the definition of emerging issue had been changed from the original proposal during the course of the discussions to a potential effect/hazard/chemical characteristic that has very recently been identified, or perceived as a public health hazard, and for which the available data base to conduct a risk assessment is very limited. This change had been proposed by participants in part to account for societal concerns, that different countries and regions may perceive issues differently. Dr Vermeire elaborated that emerging risks are not only a technical challenge, but also involve dealing with uncertainty at the political and societal level, acceptance of risks versus benefits, and trust in risk assessment systems and organisations. From the discussions on the first day, issues that were not considered by participants to be included within the Network’s scope of emerging risk included deliberate actions, substances possessing no hazard information, low heat tobacco products and loss of species as indicators.
The identification of emerging risks requires proactive and reactive approaches. Proactive approaches include “brainstorming” to identify the emerging issues of principal concern, followed by the introduction of procedures to detect and characterize their development. Reactive approaches are based on the identification of indicators of change and the monitoring of these to detect emerging issues.

Explaining the objectives of the second day, Dr Vermeire asked participants to contribute to discussions to define their expectations of the Network and to define the role of their organisation in how they could get involved. In addition, Dr Vermeire asked participants to consider the process for signalling and evaluation and how to link/establish communication between the various systems from different sectors (e.g. poison centres, occupational illness databases, environmental analysis, national initiatives).

The presentation stimulated a lot of positive discussion. Opinion on some items that were considered either within or outside the scope of the Network from the previous day's discussion still differed. It was argued that the omission from scope of chemicals for which no hazard information existed was incorrect, on the basis that it is still possible to assess the risk to health or environment in the absence of certain specific hazard information. Physical properties, structural alerts, genotoxic adduct formation, bioaccumulation potential and other indicators where chemicals share similar properties with known hazards could be used to estimate risk. Also, rapid screening technologies exist (in vitro methods), and adverse outcome pathways. Conversely, such approaches may not always be available or possible. As a process for identifying and prioritising issues it was suggested that consideration should be given to a “top-down” approach of reviewing case studies and teasing out the main issues. A suggestion was made to include biotoxins within the scope.

There is large diversity in capability amongst countries and there are different issues/priorities. If knowledge and capacity is a problem, the Network would need to take steps to facilitate the provision of advice and/or training. Offers of support were provided in areas such as the provision of training webinars for capacity building and assistance from an existing environmental surveillance network.

Further discussion on the definition of a signal occurred and, with a view to acquiring the range of opinion, participants were asked to write down what they consider to be an appropriate definition of a signal. It was agreed that a task group should be established to clearly define the term “signal”, along with other defined areas to take forward for positive outcomes soon. The difficulty in defining a signal was that the area was so broad. However, some argued that striving for a definition may be unnecessary and that the focus should be on data collection, which is what signals are. The consensus of the participants was that there could potentially be significant consequences if signals are missed.
Wider opportunities for the Network were identified during the discussion. The International Health Regulations (IHR) 2005 require a multi-hazard approach to risk management (including chemicals) and assessment of a country’s core capacity to deal with events (principally aimed at, but not limited to, acute events and potentially covering any unusual or unexpected occurrence(s) with the potential to cause adverse health effects). When assessed, capability for dealing with chemical events is often the lowest score. As such, this presents an opportunity to link the work of the WHO Chemical Risk Assessment Network with the IHR network.

It was suggested that the Network could investigate whether an infrastructure/management system already existed for infectious disease, and whether it could be adopted for chemicals. Links to the Africa ChemObs project, a project to build capacity for health and environmental surveillance and information management relating to chemicals in nine African countries (https://www.unenvironment.org/explore-topics/chemicals-waste/what-we-do/environment-health-and-pollution/africa-chemobs-project), were also suggested.

**Emerging Risks in the Context of Food Safety**

Professor George Kass, European Food Safety Authority (EFSA), Italy, described work on emerging risks in the food sector. EFSA was established in 2002 in response to a series of food crises in the 1990s to be a source of scientific advice and communication on risks associated with the food chain. EFSA is the reference body for risk assessment of food and feed in the European Union and its work covers the entire food chain, from field to fork. This work includes emerging risk, as the legislation that established EFSA also specifies that the authority shall establish monitoring procedures for systematic searching for, collecting, collating and analysing information and data with a view to the identification of emerging risks in the fields within its mission. Preparing for future risk assessment challenges is also included in EFSA’s strategy for 2020. EFSA works with 28 EU Member States and cooperates with international partners from outside of the EU.

The EFSA definition of emerging risk is, “An emerging risk to human, animal and/or plant health is understood as a risk resulting from a newly identified hazard to which significant exposure may occur or from an unexpected new or increased significant exposure and/or susceptibility to a known hazard”. This definition was adopted in 2007 and is still considered valid nowadays, as it also takes environmental impacts into consideration.

Professor Kass described the various works performed in the area of emerging risk. The scientific committee of EFSA defines the strategy for risk assessment and emerging risk activities, particularly the identification of priority emerging issues. EFSA facilitates regular consultations to identify potential issues and provide recommendations for future activities through two active emerging risks networks: the Emerging Risks Exchange Network (EREN) for Member States and the Stakeholder Consultative Group on Emerging Risk, which incorporates the private sector. EFSA also undertakes research projects to identify drivers of change, vulnerabilities and develop methodologies.
Professor Kass described how EFSA identified changes or attempted to anticipate change, along with assessing the implications of the changes on managing risk. Examples that illustrated how changes in food preparation trends and the supply of foods to new markets had resulted in foodborne illness included uncooked beetroot and shitake mushrooms, respectively.

Professor Kass described several active projects that focus on emerging risks, including:

- Guidance on the risk and assessment of chemical mixtures and combined toxicity of multiple chemicals under an initiative called MixTox. In addition, the development of tools for modelling human and ecological risk assessment for single and multiple chemicals.
- Analysis of the food chain to identify key vulnerabilities and drivers of future emerging risks (AQUARIUS project).
- Development of a procedure for the identification of potential emerging chemical risks in the food and feed chain for substances registered under the REACH Regulation (REACH2 project). This procedure considers environmental exposure, bioaccumulation, biodegradation and toxicity in the risk assessment.
- Climate change as a driver of emerging risks for food safety (CLEFSA project).
- Emerging Risk Identification Support tool (ERIS), a literature text mining tool.

In summarising what activities had worked for EFSA, Professor Kass raised the importance of expertise for the identification of relevant issues and filtering of signals, networks for sharing information (without creating unnecessary scares) and focussed monitoring/follow-up activities.

Following the presentation, Mr Savelli briefly described the International Food Safety Authorities Network (INFOSAN). Through INFOSAN, countries receive assistance in managing food safety risks (including those arising from chemicals in food), ensuring rapid sharing of information during food safety emergencies to stop the international spread of contaminated food. This network, with a joint secretariat provided by the Food and Agriculture Organization of the United Nations (FAO) and WHO, hosts a dedicated website for members to share information. Mr Savelli also provided an example of how the network assisted in identifying and alleviating concern when a fake news story about plastic rice was circulating in the media.
World Cafe Group Discussion 2

A second session of world café style group discussions was conducted to discuss the role of the Network. The questions to the participants were:

- **Question 1:** How do you see the role of the Network, as a whole, in signalling and evaluating emerging issues and risks? Should the Network be involved, what are the needs and gaps to be addressed? Will the Network be comprehensive enough for this task?

A wide range of expectations of the roles of the Network were expressed. Suggestions from the groups were that the Network should amplify signals and facilitate and/or coordinate information sharing, tools and experiences; identify risks; evaluate; and connect with other experts and resources (laboratories, networks). Furthermore, it was considered important that the Network supports all participants and that it does not duplicate existing systems or networks. It was proposed (albeit not supported by all) that the Network could establish regional, cooperative satellite groups to enable regional specific issues or signals to be addressed.

A need to develop capacity through intelligence gathering (engagement of experts, technological solutions, laboratories) and training and development activities was identified. Training, procedures and guidelines were considered a priority, particularly to develop a common understanding of what a signal is and how it can be identified. Likewise, supporting the development of or adapting system methodologies for application in countries that don’t already have such systems was considered important.

The Network should define a list of priorities, expectations (of participants) and strategy that should be practicable and which could be communicated through a road map or “step-by-step” approach. The group outlined the importance of developing a Network activity following the workshop to capture the ideas which have been proposed.

Potential risks to the Network included the commitment and participation of members and stakeholders. The role of governments in the Network, such as a whether there would be a potential requirement to participate and, conversely, the potential for filtering or censorship of signals was also raised. It was too early to say whether the Network would be comprehensive enough for the task at this stage, but participants were optimistic and expectations were high.

Following the report of the discussion, Ms Vickers clarified that government participation or involvement was not a condition, prerequisite or mandatory in this instance, albeit support for the goals of the Network and national participants are welcomed.
Question 2: Discuss your possible role as Network partner in signalling and evaluating emerging issues/risks.

While keeping in mind differences between regions, participants described their possible roles in sharing data and information, knowledge and expertise, protocols and systems, laboratory facility provision, training provision and in-depth investigation of cases. Partners could assist the Network in evaluating signals and assist in taking further actions, if necessary. The “plastic rice” rumour was used to illustrate this point, as an example where an existing network was able to alleviate a potential concern by sharing accurate information. Participants identified existing systems and relationships with networks that operated signalling systems (WHO networks, MODERNET, NORMAN, EREN, IHR, etc.) that could be harnessed. A proposal that harmonization of data through poison centres could be undertaken was raised. However, concern was expressed that it would be difficult to change existing databases to fit a different or new system.

Participants offered to bring more knowledge about the specific obstacles and problems that exist in their countries or regions to inform the Network. In addition, partners could identify and maintain relationships with key national and international stakeholders to increase communication and signal detection capability.

Participants identified that some sectors/sources of chemicals are better characterized and understood than others and, as such, there were opportunities for partners to undertake assessment works in these areas.

It was suggested that in some countries emerging risks are not considered important or are low priority and that there was a need (and opportunity) for experts to engage in advocacy, raising awareness and capacity building as well as dissemination of information about the Network.

There were differences in opinion on whether the Network should help in executing actions. The majority opinion was that the Network could fulfil an important positive role in strengthening and evaluating signals, to which national bodies would then need to decide whether to respond to the signal or not.

The discussion did raise some potential hurdles to contribution, most notably differences between regions and/or nations in capacity, resources, national infrastructure and legislation. Political sensitivity and concern that data may be censored in the national interest was also raised. A confidentiality agreement was suggested as a potential solution to this issue.
Question 3: How can the process of signalling in the Network be most efficiently organized? What is required?

The participants noted that the Network was a network of organizations, not individuals, and proposed that the Network should add value to existing systems by collecting and distributing signals at an international level.

Two routes were proposed for processing signals. The first involved direct reporting of signals to the International Programme on Chemical Safety, which would then post an alert, evaluation comment or distribute the information directly to national focal points. The second involved distribution inside the country to appropriate agencies via the national focal point. Alternatively, this could be undertaken by a central WHO Collaborating Centre or multiple regional WHO Collaborating Centres or existing national infrastructures. A universal standard, reporting template and protocol would be required to harmonize the information gathered and transmitted. Reports should also include what has been done in response to the reported signal. Mixed opinions were expressed regarding national organisations filtering or selecting signals prior to submission.

Information collection and distribution should be facilitated by an IT-based system. In addition, a signal database should include a search function to sort and filter signals according to sector or keywords. Use of a graphical interface to display the locations of emerging risks and/or signal reports was also suggested. Some suggested inclusion of social media as a signal source and as a notification platform. However, others expressed a desire to limit the audience to professional audiences only. Network security was considered important to prevent malicious activities and potential generation of false signals.

WHO Chemical Risk Assessment Network activities could also be complemented by a communication strategy, expert committee (and list of experts for different types of signal), discussion forum, regular member contacts, training as well as a process for system “memory” to monitor and continuously assess signals.

Institutional, resource and financial commitment is required from partners in order to provide a practicable and sustainable system. Given the Network is currently a small volunteer entity, it is important to set achievable tasks and manage expectations.
Question 4: How can evaluation of signals be organized in the Network? What is required?

The Network could potentially cover many areas of emerging risks, but not all areas may be relevant or of interest to all parties, practicable or sustainable. Evaluation of signals through a coordinating WHO Collaborating Centre and network of regional centres was proposed. Regional centres could also identify local/regional priorities. Participants agreed that a “one-size” approach may not fit all and that the Network may wish to proceed with a pilot project in the first instance. This would require a data platform, a process for sharing, identification of signals, signal classification criteria and a signal validation process as a first step prior to evaluation of signals.

An assessment of previous real-world examples/cases could be performed to understand what could work. An example was provided that described the EFSA’s approach to assessing risks (what, why, how). Likewise, work to understand what the existing barriers to collection, communication and sharing of data amongst countries have been and how they can be overcome would also be beneficial. The potential of political/policy sensitivities to impact sharing and silence or filter signals was also raised.

Other items raised by the groups included reporting and evaluation of mitigation and risk reduction measures.

Question 5: If signals are identified/evaluated by the Network, how could these be followed up?

The feedback from the group discussions was that previous examples of signal follow-up could be studied to design a follow-up strategy and should consider categorization of sector, type of hazard, scale of the problem and the urgency. The follow-up activities should be assigned ownership and include short- and long-term objectives and a communication plan. Collecting information on existing systems/methods was considered a good place to start.

Suggestions for assessing and managing follow-up activities included a repository of signals and measures undertaken, signal receipt and confirmation of dissemination to national bodies or other networks (e.g. EFSA, EREN). Consideration should also be given to how to build infrastructure and establish (better) connections with each other. Case studies would also be useful in assisting developmental activities.

Follow-up activities included assessment by expert committee, further monitoring and validation works, regular meetings and research projects. A suggestion was raised that follow-up activities within the EU could potentially be undertaken by the European Chemicals Agency or REACH forum for discussing chemicals.

The discussions raised a question about the role and remit of the Network with respect to follow-up activities. Ms Vickers advised that the role of the Network should be agreed and then disseminated. If the Network decides on its priorities, then the WHO could possibly draw on experts to participate. The Network is flexible but is dedicated to risk assessment, not risk management.
Main Conclusions and Next Steps, Co-Chairs and WHO

Dr Weis thanked all for their contributions, enthusiastic participation and discussion and stated that the workshop Organizing Committee will take note of all the information and review the tasks which need to be undertaken to follow up from the workshop, including a work plan for new activities for the Network. Items that have come to the fore include a need to establish definitions, particularly for “signal”. There is also a need to identify what other networks have systems for identifying signals and what lessons can be learned from them (e.g. disease networks and what works, what doesn’t).

Dr Vermeire also thanked everyone for the positive contributions, adding that the Network needed to maintain momentum and keep focussed. The workshop Organizing Committee will review outcomes of the meeting and prioritize items to take forward. The aim is not to duplicate other areas/systems. Dr Vermeire summarized some of the items discussed and the general agreements. In particular, there is agreement over the main definition of emerging risk and, on the whole, signal. However, there remain differences in the “finer points” of what is classified as a signal or an issue. Work is required on forward- and backward-looking methods and connecting to other networks to better inform the big picture. There was agreement on the need to start to undertake manageable pieces of work and build gradually. The Network will also aim to develop a pilot scheme, which received support from participants. The benefit of the Network is that it is a global network, which we should utilize.

Ms Vickers declared that the purpose of the workshop was discussion, for which it had been successful, and thanked all for their input. Ms Vickers then described objectives for the Network, stating that the WHO would like to convene a task group to describe the concept of what the Network wants to do on this issue and define the related role of the Network. The task group should consider what is feasible, bearing in mind that the Network is flexible but is dedicated to risk assessment, not risk management (risk management is set in the national context). Some systems have already been identified to inform us how the Network should approach the issue.

The outputs of the meeting will include a short summary for the website and an informal meeting report for participants. An information sharing platform will be established and documents will be made available there (e.g. SharePoint).

For the longer term, the 2020 Network meeting should include progress so far. Further development of the systems report should be undertaken to incorporate new evidence and produce a peer reviewed report.

Ms Vickers also asked the participants for volunteers to assist in achieving the objectives of the Network on this issue and developing related activities. Workshop participants that were not already members of the Network were asked to consider joining, if eligible.

In response to a question on whether the Network would offer training, Ms Vickers commented that training provision should be a development aim and considered a short-term target.
CLOSING REMARKS

In closing, Ms Vickers thanked RIVM for their hospitality and the provision of a great venue.

Ms Vickers also thanked the Co-Chairs, Organising Committee, WHO Secretariat, Rapporteur and participants and wished everyone a good onward journey.

ACKNOWLEDGEMENT

The WHO Secretariat is grateful to RIVM for hosting the event, to the Ministry of Health of Germany for supporting the travel of a number of the participants, to NIEHS for making logistical support available through a contractor, to the Organizing Committee for their work in putting together this successful workshop and to PHE for their support in conducting the original review and preparing this summary report of the workshop.
ANNEX 1—WHO CHEMICAL RISK ASSESSMENT NETWORK WORKSHOP ON IDENTIFYING EMERGING RISKS FROM CHEMICALS

RIVM, Bilthoven, Netherlands, 20-21 February 2019

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WHO CHEMICAL RISK ASSESSMENT NETWORK WORKSHOP on Identification of Emerging Risks to Human Health from Chemicals

BILTHOVEN, NL
20–21 February 2019

Hosted by
RIVM National Institute for Public Health and the Environment

National Institute for Public Health and the Environment
Ministry of Health, Welfare and Sport
SCOPE & OBJECTIVES

Background
The overall objective of the WHO Chemical Risk Assessment Network is to improve chemical risk assessment globally through fostering and facilitating interaction between institutions on chemical risk assessment issues and activities. One specific objective of the Network in the field of chemical risk assessment is to assist in the identification (signaling) of emerging risks to human health from chemicals.

There are two parallel and complementary approaches that may be used to identify emerging issues:

- A proactive approach: this requires ‘brain storming’ sessions to identify the emerging issues of principal concern followed by the introduction of procedures to detect and characterize their development.
- A more reactive approach based on the identification of indicators of change and the monitoring of these to detect emerging issues.

Both approaches require the participation of both scientists and stakeholders across the globe.

Scope
In the context of this workshop, the identification of emerging risks is limited to chemicals, chemical technology and risks to human health. The emerging risk should obey the criteria of the definition below: new hazard, new or increased exposure, new or increased susceptibility. For example, pharmacovigilance is out of scope for this workshop, but novel psychoactive substances are in scope.

Key Definitions
Emerging issue: An issue that has very recently been identified and for which the available data base to conduct a risk assessment is very limited.

Emerging risk: An emerging risk refers to an effect resulting from a newly identified hazard to which an exposure may occur or from new or increased exposure and/or susceptibility to a known hazard.

Signals/signaling: Tools, methods, or processes used for the identification of emerging issues and risks pertaining to actual or potential chemical hazards.

Horizon scanning: This aims to spot signals, watch trends and make sense of the future. This includes, for example, forecasting trends in the use of new chemicals and new applications of chemicals based on the development of new technologies.

Foresight: expert approaches or consultations, where a team of qualified specialists works together to identify important future threats in recent technological developments.

Next Steps
An international workshop on this topic is planned for 20-21 February 2019 to bring together institutions with expertise in and expert knowledge of methodologies and systems for the identification of emerging risks to human health from chemicals. A mapping of existing methodologies and systems was conducted prior to the workshop in order to inform workshop discussions on possible Network activities in this field. This mapping exercise includes mainly information from developed countries and the workshop will provide a forum to gather further information about methodologies and systems not yet covered. The mapping report provides the basis for discussions at the workshop.
OBJECTIVES OF THE WORKSHOP

The objectives of the workshop are to:

1. Consider the WHO report on methodologies and systems for the identification of emerging risks to human health from chemicals as well as share experiences in implementing systems.
2. Assess whether the identified systems are adequate for the purpose of identification of emerging risks to human health from chemicals.
3. Propose an operational definition of emerging risks for future work of the Network.
4. Identify possible collaboration activities for Network participants to take forward in the future.
5. Discuss ways to make the identification of emerging risks of chemicals and the process of knowledge and expertise exchange more efficient.

EVENING—
TUESDAY, 19 FEB 2019

18:00 – 20:00 Social Mixer
Castle Oudaen, Oudegracht 99, Utrecht—
https://www.oudaen.nl

Provisional Programme

DAY 1 MORNING—
WEDNESDAY, 20 FEB 2019

WEDNESDAY OVERALL TOPIC: Understanding the scope and ongoing work

8:30 – 9:00 Registration
9:00 – 9:15 Welcome
   WHO and RIVM
9:15 – 9:35 Introduction
   Carolyn Vickers, WHO Secretariat
9:35 – 10:00 Keynote: Methodologies for the Identification of New or Emerging Risks of Chemicals
   Lya Soeteman-Hernandez, RIVM, The Netherlands
10:00 – 10:30 Break and Posters
10:30 – 11:15 Results of Mapping Exercise and Survey
   Haydn Cole, Public Health England, UK
11:15 – 12:45 Country Examples
   Facilitator: Chris Weis, National Institute of Environmental Health Sciences, USA
   Panel:
   Alena Drazdova, Scientific Practical Centre of Hygiene, Belarus
   Domyung Paek, Seoul National University, Republic of Korea
   Cindy Stephen, Red Cross War Memorial Children’s Hospital, South Africa
12:45 – 13:45 Lunchbreak and Posters
DAY 1 AFTERNOON—
WEDNESDAY, 20 FEB 2019

13:45 – 14:00 Co-Chair: Instructions for Organisation of the Afternoon Discussions
14:00 – 15:30 World Café 1: Definitions, Goals, Scope, Actors, Signaling Methodology
15:30 – 16:00 Break and Posters
16:00 – 17:00 Reporting Back from World Café 1
17:00 – 17:15 Co-Chair’s Summary and Programme for Thursday

DAY 2—
THURSDAY, 21 FEB 2019

THURSDAY OVERALL TOPIC:
How can the Network add value to identifying emerging risks from chemicals?

9:00 – 9:10 Co-Chairs: Objective of the Day
9:10 – 9:50 Keynote: The Role of the Network in Identifying Emerging Risks
   Theo Vermeire, RIVM, The Netherlands
9:50 – 10:15 Emerging Risks in the Context of Food Safety
   George Kass, EFSA, Italy
10:15 – 10:45 Break
10:45 – 11:00 Co-Chair: Instructions for Organisation of the World Café
11:00 – 12:30 World Café 2: The Role of the Network
12:30 – 13:30 Lunch and Posters
13:30 – 14:30 Reporting Back from World Café 2
14:30 – 15:00 General Discussion
15:00 – 15:45 Break
15:45 – 16:30 General Discussion, continued
16:30 – 16:45 Co-Chairs and WHO: Main Conclusions and Next Steps
16:45 – 17:00 Closure