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Emerging Pandemic Threats Program

Exercise Kulinda Afya

Desk Top Exercises

11 August 2014
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Infectious Disease Risk Assessment and Management (IDRAM) Partners

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USAID (www.usaid.gov) is the lead U.S. Government agency that works to end extreme global poverty and enable resilient, democratic societies to realize their potential. Through its emerging pandemic threats programme, USAID has been the primary funder of the IDRAM Initiative from its beginning in 2012.

FHI 360 (www.fhi360.org) is a non-profit human development organization dedicated to improving lives in lasting ways. Its work is grounded in research and science, strengthened by partnerships and focuses on building the capacity of individuals, communities and countries to succeed. FHI 360 has co-developed the assessment toolkits that have underpinned the IDRAM Initiative.

Ecology & Environment (www.ene.com) is a global network of professionals and industry leaders in 85 engineering and scientific disciplines working together to develop and deliver solutions that promote environmental sustainability. Ecology and Environment co-developed the assessment toolkits that have underpinned the IDRAM initiative.

The Australia-Africa Mining Industry Group (www.aamig.com) Founded in May 2011 "AAMIG" represents Australian and Australian-based exploration, mining, service and supply companies active in Africa. AAMIG aims to support member companies and enhance their Social Licence to Operate, with a key focus on stakeholder engagement, sustainable community development, human rights and governance. AAMIG is committed to supporting a "Team Australia" approach in regard to Australia's engagement with Africa, which includes building meaningful relationships between the mining industry and governments, not-for-profits and academia.

The Emerging Pandemic Threats Program and the IDRAM Initiative

Three-quarters of new human infectious diseases are believed to have emerged from animal reservoirs. Environmental and social changes that affect how people, pets, livestock and wildlife interact can create conditions that threaten human populations with diseases such as avian influenza, viral haemorrhagic fevers (Ebola and Marburg) and SARS. Disease outbreaks can lead to pandemics, with potential significant local, regional and global economic, security and development impacts.

Activities around extractive industry operations in disease hotspots can bring humans and animals into closer contact. This can potentially modify virus transmission patterns at the human–animal interface.

The Emerging Pandemic Threats Program

The speed with which these diseases can emerge and spread presents serious public health, economic, and development concerns. It also underscores the need for the development of comprehensive disease detection and response capacities, particularly in geographic areas where disease threats are likely to emerge. Recognizing this need, the U.S. Agency for International Development (USAID) has launched an Emerging Pandemic Threats (EPT) program that seeks to aggressively pre-empt or combat diseases that could spark future pandemics.

The EPT program emphasizes early identification of and response to dangerous pathogens in animals before they can become significant threats to human health. Using a risk-based approach, the EPT program builds on USAID's successes in disease surveillance, training, and outbreak response to focus on geographic areas where these threats are most likely to emerge. These efforts are critical to the sustainability of long-term pandemic prevention and preparedness. The EPT program draws on expertise from across the animal- and human-health sectors to build regional, national, and local capacities for early disease detection, laboratory-based disease diagnosis, rapid disease response and containment, and risk reduction. These efforts target a limited number of geographic areas, known as "hot spots," where new disease threats have emerged in the past. The EPT program focuses on "hot spots" in the Congo Basin of East and Central Africa, the Mekong region and other "hot spots" in Southeast Asia, the Amazon region of South America, and the Gangetic Plain of South Asia.

The Infectious Disease Risk Assessment and Management (IDRAM) initiative

Chatham House is facilitating interaction between the extractive industry (oil and gas, mining, timber) and international development and finance institutions, national government stakeholders and science leaders to address this important and complex challenge. Sectors and constituencies that do not often come together are encouraged to identify a sense of common purpose and incentives for meaningful dialogue.

The initiative facilitates a collegial, open and transparent environment and platform where key organizations and constituencies can work productively towards common understanding of and solutions to a complex global challenge.

Key stakeholders are involved to build consensus and common frameworks and tools around the risk management of infectious diseases associated with extractive industry activities. This will lead to a policy discussion and framework for addressing and mitigating these risks at a global level.

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Executive summary

Exercise Kulinda Afya (Swahili for 'Protect our health') comprises two exercises: Kulinda Afya I was run in Lubumbashi, Democratic Republic of Congo on the 11 August 2014. Kulinda Afya II was run at the Africa Down Under Conference in Perth, Australia on the 4 and 5 September 2014.

Exercise Kulinda Afya is an element of the infectious disease risk assessment and management (IDRAM) initiative which is part of USAID's Emerging Pandemic Threats programme.

The exercises were designed by Public Health England's Emergency Response Department assisted by colleagues from USAID, Ecology and Environment, FHI360, International SOS and Chatham House.

The aim of the Kulinda Afya Exercises was to raise awareness of the risks presented by an infectious zoonotic disease outbreak among representatives of the extractive industries and examine ways of avoiding or mitigating that risk. They are part of a suite of information designed to help organisations plan to counter the threat posed by emerging infectious diseases.

Twenty-eight people attended the exercise in Lubumbashi, representing: the provincial health authorities in Katanga, the University of Lubumbashi, Freeport-McMoRan Copper & Gold (Tenke Fungurume Mine), Tiger Resources (Kipoi Mine), MMG (Kinsevere Mine) and Mawson West (Kapulo and Dikulushi Mine).

Thirty-nine people representing mining companies, government and NGOs attended the two workshops at the Africa Down Under Conference.

The main findings of the exercises were that the response to an infectious disease outbreak would be enhanced by:

- Increased coordination between health representatives at a regional level, the extractive industries and the provincial representatives of non-governmental organisations.
- Increased engagement and health education between the extractive industries and the communities around the mining sites, with particular emphasis on the mitigation of risks posed by zoonotic diseases.
- Sharing of resources such as equipment to assist in the isolation and quarantining of patients including the proper Personal Protective Equipment and access to laboratory testing of samples between the extractive industries and the provincial health authorities.

1. Introduction

This report describes the design, delivery and findings of Exercise Kulinda Afya I and II which were run in Lubumbashi, Democratic Republic of Congo (DRC) on the 11 August 2014 and at the Africa Down Under Conference in Perth, Australia on the 4 and 5 September 2014.

Public Health England's Emergency Response Department designed the exercise as part of the infectious disease risk assessment and management (IDRAM) initiative headed by the Royal Institute for International Affairs at Chatham House. IDRAM is part of USAID's Emerging Pandemic Threats Program.

USAID, Environment and Ecology, FHI360, International SOS, Chatham House and Public Health England contributed to the development and delivery of Exercise Kulinda Afya. A summary of the findings from both exercises is at **Appendix A**.

2. Aim and objectives

2.1 Aim

The overall aim for the project was: "to raise awareness of the issue of zoonotic diseases among the extractive industries".

For each exercise the aim was modified to suit the the audience. Exercise Kulinda Afya I's aim was: to raise awareness of how to coordinate the response to an infectious zoonotic disease outbreak amongst senior field staff of the extractive industries and local government and health officials in Katanga province.

For Exercise Kulinda Afya II the aim was: to raise awareness among the mining industry of the implications of a major zoonotic disease outbreak and how to coordinate a response.

2.2 Objectives

- a) To raise awareness of emerging infectious diseases of zoonotic origin
- b) To encourage interaction between the companies and local officials in a health response
- c) To gather feedback about the Exercise

3. Scenario

The scenario for Exercise Kulinda Afya was based on an outbreak of viral haemorrhagic fever, Marburg Virus in the southernmost province of a fictional central African state: the Democratic African Republic.

The Marburg virus is the causative agent of Marburg haemorrhagic fever, a disease with a case fatality ratio of up to 88%. Marburg and Ebola viruses are the two members of the *Filoviridae* family (filovirus). Though caused by different viruses, the two diseases are clinically similar. Both diseases are rare and have the capacity to cause dramatic outbreaks with high fatality rates. Case fatality rates in Marburg haemorrhagic fever outbreaks have ranged from 24% to 88%. Fruit bats of the Pteropodidae family, are considered to be natural hosts of Marburg virus which is transmitted to people from fruit bats and spreads among humans through human-to-human transmission. No antiviral treatment or vaccine is currently available.¹

In the scenario the disease affected the workers of Copper Mine 1 and residents of Kata City, the provincial capital which abuts the mine. Initially the cause of the illness could not be determined, it was then confirmed as Marburg virus. The government had imposed a travel ban meaning that mine staff could not be evacuated from the country. Eighty people were infected of whom 30 died.

4. Exercise format

4.1 Both exercises were discussion-based and followed the same format. However, because they ran for a different amount of time and were aimed at different audiences the format for each exercise differed. This is described in Sections 6 and 7.

4.2 In both Ex Kulinda Afya I and II participants were divided into groups and presented with the scenario and a set of questions designed to encourage and guide discussion. A member of the exercise team acted as a facilitator for each group.

¹ World Health Organization : Marburg Haemorrhagic Fever Fact Sheet – November 2012 - http://www.who.int/mediacentre/factsheets/fs_marburg/en/ accessed on 15 September 2014

4.3 The facilitators helped guide the discussion and provided subject matter expertise if required. During the exercises the groups reported the results of their discussions in plenary sessions. A list of the participants is at **Appendix B**.

5. Exercise evaluation

5.1 Data capture.

5.1.1 The same evaluation methodology was used for both exercises. Information for the exercise evaluation in this report is drawn from the following sources.

- a) Participant feedback provided during the exercise plenary sessions. The feedback from the groups has been summarised and is contained in Appendix A.
- b) Participant feedback provided in writing at the end of the exercise. In the feedback participants were asked to record one recommendation about the manner in which to deal with an outbreak of an infectious disease. Some provided more than one recommendation.
- c) Facilitators' notes.

5.1.2 A summary of the recommendations is in a table at Appendix A.

6. Exercise Kulinda Afya I (Lubumbashi, DRC)

6.1 Kulinda Afya I: Exercise Format

6.1.1 Exercise Kulinda Afya I was a one day table-top exercise based on an outbreak scenario. The scenario was divided into four sessions, each describing a different stage of the outbreak. Participants were asked to consider a series of questions with each piece of new information. The discussions were guided by a facilitator from the exercise staff.

- a) Session one described the outbreak of an unknown illness which was affecting eight mine workers and 15 locals. Participants were asked to consider their initial response to a limited outbreak of an unknown disease.

b) Session two described how the number of patients had increased. Participants discussed how their response to the outbreak might now change in light of these developments. They were also asked to consider whether they had adequate resources to cope with an outbreak which required the isolation of patients.

c) In session three the disease was confirmed as Marburg virus. Participants were asked to consider how their strategy, particularly their communication with the public, might change following the confirmation that the disease was Marburg Fever.

d) In session four participants were asked to consider how they might develop their existing arrangements to respond to a future outbreak.

6.1.2 Three plenary sessions were held during the exercise to allow the groups to share their conclusions. For the first two plenary sessions the groups were asked to share what they considered to be the most important factors in developing their outbreak response. In the final plenary session the groups were asked to consider what the key factors in mitigating the risks posed by future outbreaks.

6.1.3 The exercise was conducted in French and English. Translation from French to English was provided by International SOS staff assisting with the exercise. In each group there was a person who could speak both French and English who could translate if required.

6.1.4 The exercise started at 9am with a briefing on the programme for the day and the aim and objectives for the exercise. There were plenary sessions after session one, sessions two and three and session four. The programme was altered to allow for a 10 minute briefing about Marburg virus.

6.2 Kulinda Afya I: Participant Groups

6.2.1 The exercise was attended by members of the provincial health authorities, provincial animal health authorities, the School of Public Health at the University of Lubumbashi, International SOS, Freeport-McMoRan Copper & Gold (Tenke Fungurume Mine), Tiger Resources (Kipoi Mine), MMG (Kinsevere Mine) and Mawson West (Dikulushi Mine). The local representatives of the World Health Organization (WHO) and United Nations Children's Fund (UNICEF) were invited but were unable to attend.

6.2.2 Participants were divided into four groups based on the location of their work places. Each group contained representatives from a mining company and human and

animal health experts. A facilitator from the exercise staff was assigned to each table for the exercise. A list of the exercise participants is at **Appendix C**.

6.3 Kulinda Afya I: Evaluation

6.3.1 The groups reported that the medical system in Katanga province and the DRC had in place arrangements that would enable the authorities to respond to an outbreak such as that described in the exercise scenario. However, the existing health system suffered from a paucity of resources and capacity.

6.3.2 The groups also reported that the procedures in place in the mining facilities represented at the exercise would have been adequate to guard against and deal with the risks presented by the scenario. There was also agreement that the systems for providing health information and education to the employees of the mining facilities were in place. However, the relationship between the mining facilities and the local community may benefit from development as would the relationship between the mining facilities and the regional health authorities.

6.4 Kulinda Afya I: Feedback from Session One

6.4.1 The response to an outbreak would benefit from enhanced inter-sectoral collaboration.

a) In response to the scenario in the first session, two groups spoke about the need to develop a multi-discipline response committee or team to deal with the outbreak. This committee should include not only the local authorities, health and animal health representatives, but also representatives of mining companies, locally based NGOs and community representatives. This committee would facilitate the investigation and definition of cases, the collection of samples from humans and animals and education of the community.

Recommendation: A working group should be established to consider approaches to a joint response in the event of an outbreak.

6.4.2 There is benefit in providing health education and information to the local community as well as mine employees.

a) All the groups reported that there was benefit in developing engagement with the local community. While mine employees are educated about the risk of outbreak, the communities in which the majority of the employees live may not be as well informed. Protecting the health of these communities also reduces the risk of exposing employees to infectious diseases in the

event of an outbreak. Having access to information from the community would also assist the authorities in assessing the resources required to tackle an outbreak.

Recommendation: That relationships be developed with community leaders such as: the media, religious leaders, schools and primary care providers such as health clinics so that they are able to help disseminate information to the local community.

6.5 Kulinda Afya I: Feedback from Session Two

6.5.1 Conducting an outbreak risk assessment would assist with the development of an integrated response

a) One group reported that the financial and resource implications of an outbreak such as that described in the exercise scenario needed to be properly scoped. This would ensure that a response could be adequately resourced, or that the gaps that existed in the provision of equipment (for the isolation of patients and for the correct personal protective equipment for example) could be addressed. All groups reported that there were currently insufficient resources to cope with the requirement to isolate large numbers of patients. One group highlighted the lack of transport and logistic resources.

Recommendation: That a joint outbreak risk assessment detailing the impact on local communities and mining facilities be conducted and resource gaps identified.

6.5.2 A communications toolkit containing prepared messages would assist with the rapid dissemination of accurate information

a) All groups reported that there was a need for accurate information to be disseminated to the public. This would form an integral role in preventing the further spread of the disease. This would form part of the education of the public.

Recommendation. That a communications “toolkit” be developed to allow for the rapid dissemination of advice to the public and responders.

6.6 Kulinda Afya I: Feedback from Session Three

6.6.1 In session three the groups reiterated the need for an inter-sectorial response committee and the need to educate the community about the risks posed by the outbreak and how to protect themselves.

6.6.2 One group highlighted the need to establish a method for screening people who thought they might be at risk. In this scenario this would have been those who may have come into contact with bats.

Recommendation: A medical risk assessment and response plan should incorporate the requirement to communicate with the public and a method for screening large numbers of human and animal samples.

6.7 Kulinda Afya I: Feedback from Session Four

In the final session of the exercise the groups were asked to report key changes they would implement in order to develop the existing arrangements to a zoonotic disease outbreak.

Recommendation: Mining companies should develop outbreak plans

Recommendation: An outbreak risk assessment should be conducted allowing communities and companies to be better prepared for an outbreak and identify potential shortfalls in capabilities and resources.

Recommendation: Inter-sectorial collaboration should be developed to respond to an outbreak.

Recommendation: Animal health and public health professionals should work more closely so that the animal health experts could inform their counterparts about potential issues

6.8 Kulinda Afya I: Written feedback from the participants

6.8.1 In their written feedback the participants were asked to list the main learning and key issues identified during their participation in the exercise. Table 1 summarises the issues highlighted by the participants.

Table 1: Summary of written feedback from participants

	Main learning / Key issue	Number of participants who highlighted this out 25
Ser	(a)	(b)
1	The development of an inter-sectoral outbreak response methodology or plan	13
2	The importance of educating the community around mining sites about health risks	8
3	Assessing and/or preparing adequate resources in mining companies and communities to respond to an outbreak	6
4	Improved information flow between mining companies and the community	5
5	Improved information flow between mining companies and the provincial and national authorities	4
6	The conduct of an outbreak risk assessment	4

7. Exercise Kulinda Afya II

7.1 Kulinda Afya II: Exercise Format

7.1.1 Exercise Kulinda Afya II was run twice at the Africa Down Under Conference on the 4 and 5 September 2014. The exercise lasted 90 minutes. It was divided into two sessions.

a) The first session described the outbreak of Marburg Fever and asked participants to consider how they would respond to it. A short film simulating a news broadcast was developed for the exercise. This was used to present the scenario to the participants. Questions concentrated on existing health response arrangements and how mining companies might work with government institutions and fellow companies to improve the quality of this response.

b) Before the second session participants were briefed on the feedback from the exercise conducted in the Democratic Republic of Congo. They were then asked to discuss ways in which the current response mechanisms could be developed.

7.2 Kulinda Afya II: Participant Groups

4.6.1 Participants were drawn from the Africa Down Under delegates. Over the two days 38 people attended the exercise. They represented mining companies, government offices, universities, Non-Governmental Organisations and consultancies. A list of the participants and the organisations they represented is at **Appendix B**.

7.3 Kulinda Afya II: Evaluation

7.3.1 The lessons identified from Ex Kulinda Afya II broadly reflected the themes that were reported as areas for development from the first exercise. There was agreement that mining companies had arrangements in place to mitigate the risks and effects of some illnesses in the areas in which they operate. However these arrangements tended to be narrowly focused on the risks to mining sites and staff. The group discussions suggested that current arrangements could be enhanced by improved cross-sector cooperation particularly in the areas of:

7.3.2 The development and extension of health education and information to the communities around mining sites.

a) Feedback from the first exercise suggested that protecting the health of communities surrounding mining sites would, by extension, contribute to protecting the health of mining staff. It was acknowledged that in many cases education programmes already existed which concentrated on protecting mining staff predominantly from malaria and HIV AIDS. One of the groups suggested extending existing health education programmes for the community to include the risks presented by zoonotic diseases. Developing links with the health authorities and NGOs working locally could provide useful outreach tool to contribute to any education or healthcare programmes.

b) Enhancing existing relationships with the local public health and animal health experts could mitigate the risk of a disease outbreak affecting mine workers and their communities. This could be achieved by developing enhanced disease surveillance and intelligence gathering to include information about zoonotic diseases.

c) Participants stressed the importance of collaborating with and involving the communities in the development of any initiative that might affect them; whether this is an educational activity or

a part in the outbreak response plan. Communities may have culturally acceptable and relevant ideas or systems already in place that could be included in the development of programmes.

Recommendation: Mining companies and their service organisations should broaden the focus of existing health education programmes - or consider creating health education programmes where none exists - in the local community to include the threat presented by disease outbreaks and the prevention of zoonotic disease outbreaks.

Recommendation. That mining companies work with communities, local authorities, NGOs and other organisations to implement disease surveillance programmes to the benefit of their own response arrangements.

7.3.3 The development of response plans within mining companies to include planning for and responding to a disease outbreak.

a) Participants reported that they had plans for responding to emergencies but that for the most part these plans did not include the response to a disease outbreak. Plans that existed around the risk of a disease outbreak concentrated on exiting the disease area rather than considering the response in a business continuity context. It was reported that in some cases in West Africa during the current outbreak this approach was flawed. Exit strategies did not take into account the potential for loss of trust and goodwill between the mining companies and communities and government. Participants also acknowledged that to be most effective as a decision making tool, outbreak plans needed to be living documents which could be responsive and adaptable to changing situations.

Recommendation: That mining companies include an outbreak management plan in their suite of business continuity plans and / or emergency response plans.

7.3.4 The development and extension of cross-sectorial working.

a) On both days the groups discussed how organisations from different sectors could work together to improve the response to an outbreak. The groups reported that there were areas in which governments and the mining sector were already collaborating. The following examples were given: In Ghana the Chamber of Mines has set up a cross-government working group which includes participation from the mining companies in response to the current Ebola outbreak. Other delegates reported that there is an Ebola Working Group active in West Africa. The role of national governments and international bodies, the identity of lead agencies and responsibilities in combating the current outbreak were not well understood by the mining companies. The

outbreak in West Africa ceased to be an isolated health emergency and became a full-scale social and security emergency the wide-ranging consequences of which had not been considered in any of the participants' business continuity plans. The role of embassies should also be examined as they might be in a position to provide additional support to their nationals alongside that provided by the host country.

Recommendation: Existing cross-sectorial working groups should be mapped and their activities recorded so that they can be emulated or recreated in preparation for future outbreaks.

7.3.5 Pooling and sharing of resources.

a) The organisations attending the exercise did not have adequate medical facilities to cope with the level of care needed in the exercise scenario. They lacked: the requisite numbers of medical staff trained to deal with the scenario, laboratory facilities to test samples and proper personal protective equipment (PPE). It is possible that these resources could be available through the government in the countries in which companies are operating. Mining companies would be able to work together and with local government by providing a stockpile of equipment such as PPE and materiel necessary for isolating patients.

Recommendation: Mining companies could develop relationships with the regional and national health authorities in the countries in which they are operating to allow them to access health resources.

Recommendation: Mining companies could develop a stockpile of PPE which they could share between themselves and the local community as required.

7.4 Kulinda Afya II: Written feedback from the participants

7.4.1 Twenty-three participants provided written feedback at the end of the exercise. They were asked to list the main learning and key issues identified during their participation in the exercise. Table 2 summarises the issues highlighted by the participants.

Table 2: Kulinda Afya II - Summary of written feedback from participants

	Main learning / Key issue	Number of participants who highlighted this out 23
Ser	(a)	(b)
1	Improved planning for an outbreak in collaboration with government, health authorities, NGOs and the local community	14
2	The development of an outbreak management plan which is part of the business continuity plans of the organisation	11
3	Working with the local community through stakeholder engagement and health education to include them in the outbreak planning	7
4	Develop plans to share resources between mining companies, government, communities and other organisations	4
5	Develop communications with stakeholders	2
6	Build an awareness of the risk presented by zoonotic diseases	1

8. Development of the exercise

8.1 All the participants who completed feedback on the exercise. 100% “agreed” or “strongly agreed” that the exercise had “achieved its stated aim”.

8.2 The participants highlighted the following areas in which the Exercise Kulinda Afya I could be improved.

- The introductory material could have been sent to participants in advance to give them more time to properly assess the scenario.
- More time was needed to fully address the issues raised by the exercise scenario.

8.3 The participants highlighted the following ways in which Exercise Kulinda Afya II could be improved.

- a) Provide a case study highlighting how similar outbreaks had been dealt with.
- b) Allow more time for the exercise.
- c) Ensure that there is more participation from government representatives.

9. Summary

9.1 The aim and objectives of Exercise Kulinda Afya were achieved. Representatives from public health and animal health worked alongside colleagues from mining companies, academia, NGOs and government representatives to consider some of the issues posed by an outbreak of zoonotic disease. The feedback was largely consistent between Exercise Kulinda Afya I run in August in the Democratic Republic of Congo and Exercise Kulinda Afya II run in Perth in September.

9.2 During their discussions the participants suggested a number of ways in which they felt the response to an outbreak could be developed:

- a) They emphasised the need for increased collaboration between the companies, communities and provincial health authorities in responding to an outbreak.
- b) They reported that more emphasis should be put on developing the relationship between the mining companies and surrounding communities when considering an outbreak response and noted that developing health education and communication with communities may contribute to protecting the health of mine employees.
- c) Participants also acknowledged that there is a shortage of resources for dealing with a zoonotic disease outbreak and suggested how they could better share the resources currently available.

Appendix A – Table of Recommendations

serial	Kulinda Afya I - Recommendations
1	A working group should be established to consider approaches to a joint response in the event of an outbreak.
2	That relationships be developed with community leaders such as: the media, religious leaders, schools and primary care providers such as health clinics so that they are able to help disseminate information to the local community.
3	That a joint outbreak risk assessment detailing the impact on local communities and mining facilities be conducted and resource gaps identified.
4	That a communications “toolkit” be developed to allow for the rapid dissemination of advice to the public and responders.
5	A medical risk assessment and response plan should incorporate the requirement to communicate with the public and a method for screening large numbers of human and animal samples.
6	Mining companies should develop outbreak plans.
7	An outbreak risk assessment should be conducted allowing communities and companies to be better prepared for an outbreak and identify potential shortfalls in capabilities and resources.
8	Inter-sectorial collaboration should be developed to respond to an outbreak.
9	Animal health and public health professionals should work more closely so that the animal health experts could inform their counterparts about potential issues

serial	Kulinda Afya II - Recommendations
1	Mining companies, and their service organisations should broaden the focus of existing health education programmes - or consider creating health education programmes where none exists - in the local community to include the threat presented by disease outbreaks and the prevention of zoonotic disease outbreaks.
2	That mining companies work with communities, local authorities, NGOs and other organisations to implement disease surveillance programmes to the benefit of their own response arrangements
3	That mining companies include an outbreak management plan in their suite of business continuity plans and / or emergency response plans
4	Existing cross-sectoral working groups should be mapped and their activities recorded so that they can be emulated or recreated in preparation for future outbreaks
5	Mining companies could develop relationships with the regional and national health authorities in the countries in which they are operating to allow them to access health resources.
6	Mining companies could develop a stockpile of PPE which they could share between themselves and the local community as required

Appendix B– Exercise Participants

Kulinda Afya I - Participants

	Organisation	First Name	Last Name	Role
	(a)	(b)	(c)	(d)
	Group A			
1	Provincial Ministry of Health	Prof Kabyla	Ilunga	Medical Advisor
2	University of Lubumbashi	Prof Francoise	Malonga Kaj	Head of the School of Public Health
3	Provincial Ministry of Agriculture and Fisheries	Dr	Kakudji	Head of veterinary services
4	Kapolowe Medical Zone	Dr Thierry	Mwandwe	Health Zone Doctor
5	Kapolowe veterinary services	Kaozi	Baruani	Inspector of veterinary services
6	Tiger Congo	Pauline	Voga	Social manager
	Group B			
7	Provincial Ministry of Health	Evariste	Tshal	Veterinary Consultant
8	University of Lubumbashi	Henry	Mundongo	Researcher School of Public Health
9	Provincial Ministry for conservation and the environment	Dieudonné	Kalwa Kalo	Provincial Coordinator
10	Kipushi Medical Zone	Dr. Delille	Lumbala	Kipushi Medical Zone Doctor
11	Kipushi Veterinary Services	Dr. Yves Iwena	Mahingu	Inspector of Veterinary Services
12	MMG Kinsevere	Alan	Tatton	HSEC Manager
13	MMG Kinsevere	Dr. Philippe	Filipa	Medical Doctor
	Group C			
14	Provincial Medical Inspector	Dr. Pascal	Geri Madragule	Epidemiologist
15	Pweto Medical Zone	Dr. Kikunda	Ghuislain	Health Zone Doctor
16	Pweto Veterinary Services	Dr. Nkungwa	Kalili Kapambwe	Inspector of Veterinary Services
17	Kilwa Medical Zone	Dr. Lwabola	Numbi Jean	Health Zone Doctor
18	Kilwa Veterinary Services	Kapita	Leya	Inspector of Veterinary Services
19	Kundelungu National Park	Jean	Mululwa	Wildlife conservation
20	Anvil Mining Congo	Ann	Shaw	Service Manager

	Organisation	First Name	Last Name	Role
21	Anvil Mining Congo	Dr.	Okoko	Medical Doctor
22	Anvil Mining Congo	Paul	Mapan	Financial Manager
	Group D			
23	Provincial medical Inspectorate	Dr. Ilunga	Ngoy	Head of Emergencies
24	Fungurume Medical Zone	Dr. Nathan	Kanabwingi	Medical Zone Doctor
25	Fungurume Veterinary Services	Katumbwe	Mwange	Veterinary Services Inspector
26	Upemba National Park	Jean	Kabogo	Conservationist
27	Tenke Fungurume Mining	Charles	Rose	Manager Environment Health and Safety
28	Tenke Fungurume Mining	Dr. Edouard	Swana	Public Health Advisor

Kulinda Afya II - Participants

	Organisation	First Name	Last Name	Role
	(a)	(b)	(c)	(d)
	4 September 2014			
1	AAMIG	Bill	Turner	Chairman
2	Australian High Commission - Ghana	Joanna	Adamson	High Commissioner - Ghana
3	CSA Global Pty Ltd	Stan	Wholley	Director of Operations
4	Curtin University	Linda	Selvey	Director Epidemiology & Biostatistics
5	DRC Eiti	Jean-Jacques	Kayembe	Technical Expert
6	Earth Systems	Mirey	Lopez	Senior Environmental Scientist
7	ECOWAS	Kolawole	Sofola	Principle Programme Officer
8	Golden Phoenix Resources Ltd	Maree	Laffan	CEO & Managing Director
9	IM4DC	Richard	Slattery	Deputy Director, Operations
10	INHEMACO	Albert	de Frey	CEO
11	International SOS	Andrew	Ebringer	Medical Director
12	International SOS	Simon	White	Consultant
13	International SOS	Roger	Cook	Regional Security Director
14	Jane Goodall Institute Australia	Natalie	Houghton	CEO
15	Mawson West Ltd	Natasha	King	HR Manager
16	MMG Ltd	Andrew	Patterson	Chief Consultant International Relations
17	MonuRent Holdings Ltd	Tim	Callaghan	Managing Director - Nigeria
18	MonuRent Holdings Ltd	Dan	Hoppe	Chief Operating Officer
19	Newcrest Mining Ltd	Brad	Sampson	General Manager West Africa
20	Tenke Fungurume	Francine	Kitobo	Government Relations Coordinator
21	Tiger Resources Ltd	Charles	Carron Brown	Chief Operating Officer
22	University of Sydney	Kathryn	Currow	Adjunct Associate Professor
23	University of Sydney - Children's Hospital Westmead	Dr Robert	Tynan	Development Manager - Paediatrics & Child Health,
24	University of Western Australia	Leanne	Bicknell	Risk Management Officer
25	WA Department of Health	Dr Andy	Robertson	Deputy Chief Health Officer

	Organisation	First Name	Last Name	Role
26	WA Health	Dr Paul	Armstrong	Director - Communicable Diseases Centre
	5 September 2014			
27	AAMIG	Annie	Halsted	Program Manager
28	International SOS	Beth	King	Program Manager
29	Gryphon Minerals Ltd	Candice	Donnelly	Compliance Officer & Company Secretary
30	RSC Mining & Mineral Exploration	Craig	Wright	Chief Operating Officer
31	Murdoch University	David	Doepel	Chair - Africa Research Group
32	Polyglot	Gerald	Bot	Director
33	Tawana Resources Ltd	Len	Kolff	Managing Director
34	Mawson West Ltd	Natasha	King	HR Manager
35	SIPA Resources Ltd	Pegi	De Angelis	Board Member - Native Title Liaison & Drafting/GIS Support
36	AngloGold Ashanti	Rex	Brommecker	SVP Exploration
37	DSD	Terence	Wong	Senior Business Development Officer Europe, Middle East & Africa
38	Azumah Resources Ltd	Vitus	Ngaanuma	WA Gold Project
39	Australian Embassy in Zimbabwe	Matthew	Neuhaus	Ambassador

Acknowledgements

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Osman Dar	Locum Consultant Public Health	Public Health England
Andrew Black	Exercise Manager	Public Health England

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Bill Repard	Executive Chairman	Paydirt Media Pty. Ltd.
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