Practical Training Exercise: Analyzing and Managing Risks in Life Sciences Research

CSTSP has developed 10 practical training exercises based on life sciences research that has been done in the broader Middle East and North Africa region. All of these are available here, on the website, or on a USB drive. You can obtain a USB version by contacting CSTSP’s Associate Director, Kavita Berger at kberger@aaas.org.

The purpose of these exercises is to use a high-quality, published research article from the broader Middle East or North Africa to explore and analyze potential risks and risk management strategies in life sciences research.

Participants will learn how to identify, assess, manage, and communicate a wide range of risks during the design, conduct, and communication of research. By the end of each exercise, they should able to apply what they learn to their own research activities, the laboratory work of their staff and students, or research they review. Each exercise includes a common risk analysis framework and a case study that is based on actual research conducted in the region. Each case study is different and is designed to help teach the risk analysis framework in a realistic and appropriate manner, as well as to facilitate its application to participants’ scientific activities.

The ten case studies are:

1. **Acute Febrile Illness in Egypt by Afifi et al.** This case study is based on an article that analyzes the effectiveness of hospital based surveillance in Egypt for cases of Acute Febrile Illness (AFI). This case study has been designed to promote dialogue on and train participants doing research risk analysis that considers how to work with existing public health functions to monitor population; and do research on infectious diseases.

2. **DNA repair in Tunisia by Ben Salah et al.** This case study is based on an article that analyzes the effect of gene polymorphisms on DNA repair. This case study has been designed to train participants in doing research risk analysis and prompt discussion on the ethical considerations related to data-sharing, privacy, and communication; strategies and solutions for carrying out ethical research involving sensitive populations (such as minorities); and security risks and issues related to data sharing and availability.

3. **FMD in Egypt by Ahmed et al.** This case study is based on an article that analyzes a foot and mouth disease (FMD) outbreak in Egypt. This case study has been designed to train participants in doing research risk analysis promote dialogue that considers the importance of global monitoring systems in preventing and controlling zoonotic disease
outbreaks, biosafety and biosecurity when dealing with highly pathogenic zoonotic diseases, dual use or misuse potential of FMD, and animal subject safety.

4. **H5N1 in Egypt by El-Zoghby et al.** This case study is based on an article that analyzes the effectiveness of the H5N1 poultry vaccination program and vaccines used in Egypt’s national H5N1 surveillance program. This case study has been designed to train participants doing research risk analysis and promote dialogue on the ethical dilemmas and socioeconomic concerns related to H5N1 and other livestock vaccination campaigns, biorisk and safety issues associated with working with highly pathogenic infectious diseases and research animals, and the ethical and security implications of research that has the potential to be useful for both malicious and beneficial purposes (referred to as dual use potential).

5. **H5N1 in Pakistan by Siddique et al.** The case study is based on an article that analyzes the H5N1 virus that was isolated during an outbreak in Pakistan (2012). This case study has been designed to train participants in doing research risk analysis and promote dialogue on the biorisk implications of working with highly pathogenic infectious diseases and research animals; the ethical and security implications of work involving zoonotic pathogens; and strategies for developing successful and secure research partnerships.

6. **Hepatitis A (HAV) in Tunisia by Letaief et al.** This case study is based on an article that analyzes the prevalence of Hepatitis A (HAV) among Tunisian school children. This case study has been designed to train participants in doing research risk analysis and promote dialogue on the safety implications of working with infected human samples; ethical concerns with involving young children in research; and appropriate uses of epidemiology survey techniques.

7. **Hepatitis B (HBV) in Pakistan by Ali et al.** This case study is based on an article that analyzes the prevalence of HBV infection in Waziristan, a war-torn region of Pakistan. The case study has been designed to train participants in doing research risk analysis and promote dialogue on the biosafety risks associated with human samples and human pathogens; risk management strategies and ethical dilemmas in carrying out research in violence-prone settings; and human safety and security risks, including risks to researchers in high-conflict areas and risks to human subjects who are infected with a disease that has negative social stigmas.

8. **Rotavirus and Norovirus in Yemen by Kirby et al.** This case study is based on an article that analyzes the prevalence of rotavirus and norovirus infections in young Yemeni children. This case study has been designed to train participants in doing research risk analysis and promote dialogue on the biosafety risks of working with infected human samples, strategies for successful researcher-hospital collaboration and international collaboration, and ethical concerns related to research involving young children.

9. **Stem Rust in Pakistan by Ejaz et al.** This case study is based on an article that analyzes genetic variation in rust resistance genes in Pakistani wheat varieties. This case study has been designed to train participants in doing research risk analysis and promote dialogue on the biosecurity risks involved with highly pathogenic plant fungi; security implications of working with subject matter or materials that have both malicious
and beneficial uses (dual use); environmental and economic risks of plant pathogen research; and appropriate experimental design in a relatively low-risk experiment.

10. **Typhoid Fever in Pakistan by Farooqui et al.** This case study is based on an article that analyzes an outbreak of suspected typhoid fever in a rural village in Pakistan. This case study has been designed to train participants in identifying, assessing, managing, and communicating biological risks associated with human sample collection; human pathogens; ethical and safety considerations in environmental epidemiology; disadvantaged and/or low-literacy human subjects; and strategies for ethical, safe, and secure collaborations between NGOs and non-academic partners.

**Practical Exercise Authors:**

The following individuals have been involved with developing this framework and the accompanying case studies. Feel free to contact any of them if you have any questions about or recommendations on the case studies:

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