

## **Overview of Human Factors and Ergonomics Activities for Disaster Management Operations Related to COVID-19**

The current COVID-19 crisis presents unique challenges to Disaster Management and Public Health practitioners. The scale and magnitude of the current pandemic has created a set of conditions that are seldom seen in any previous response, including:

- The expected extended duration of the COVID-19 crisis (i.e. weeks and months, compared to days in other events such as tornadoes and Hurricanes),
- The amount (and lack) of critical resources required to bring the event to resolution; and the complexity of the technical response (e.g., working while maintaining social distancing),
- High numbers of responders becoming patients, prolonged operations within a dangerous high-stress environment; etc.),
- The presence of the crisis nationally, rather than just in regional areas.

Overall, COVID-19 creates a challenging environment for even the most seasoned emergency responder and disaster manager.

A number of Human Factors/Ergonomics research and activities have been conducted that can help mitigate these issues:

1. Development of methods to support resilient performance in emergency management. <sup>[1]</sup>
2. Guidelines for training and team decision making to prepare responders using simulation-based training. <sup>[1]</sup>
3. Methods for leveraging computer supported cooperative work (e.g., virtual teaming) to facilitate recovery of the communities. <sup>[2]</sup>
4. Development of tools and methods to support emergency response personnel. <sup>[3,4]</sup>
5. Recommendations and guidelines for efficient Human-Artificial Intelligence (AI) teaming and cooperation in pandemics. <sup>[5]</sup>
6. Design and implementation of alternative PPE methods for healthcare workers and first responders. <sup>[6]</sup>
7. Recommendations to improve health security and infection prevention during an ongoing pandemic. <sup>[7]</sup>

Human factors and ergonomics experts are available to support FEMA and state emergency response organizations as they confront this crisis.

### **About HFES**

With over 4,600 members, HFES is the world's largest nonprofit association for human factors and ergonomics (HF/E) professionals. HFES members include psychologists and other scientists, designers, and engineers, including researchers, practitioners, and federal agency officials, all of whom have a common interest in working to develop safe, effective, and practical human use of technology, particularly in challenging settings. HFES has a particularly strong expertise pertaining to the safe and effective use of medical technology, in order to ensure the safety of patients and healthcare workers.

## References

1. Son, C., Sasangohar, F., Neville, T. J., Peres, S. C., & Moon, J. (2020). Evaluation of work-as-done in information management of multidisciplinary incident management teams via Interaction Episode Analysis. *Applied Ergonomics*, *84*, 103031.
2. Rozman, T. (2020). Virtual Collaboration Tools for Project Managers: A Study of Human and Technological Factors. In *Handbook of Research on the Role of Human Factors in IT Project Management* (pp. 368-395). IGI Global.
3. Bitan, Y., Jaffe, E., & Donchin, Y. (2019, September). Designing Emergency Medical Response Bags for First Responders. In *Proceedings of the International Symposium on Human Factors and Ergonomics in Health Care* (Vol. 8, No. 1, pp. 264-264). Sage CA: Los Angeles, CA: SAGE Publications.
4. Tippey, K. G., Yovanoff, M., McGrath, L. S., & Sneeringer, P. (2019). Comparative Human Factors Evaluation of Two Nasal Naloxone Administration Devices: NARCAN<sup>®</sup> Nasal Spray and Naloxone Prefilled Syringe with Nasal Atomizer. *Pain and therapy*, *8*(1), 89-98.
5. Chacón, P. S., & Eger, M. (2019). Pandemic as a Challenge for Human-AI Cooperation.
6. Salehi, H., Pennathur, P. R., Da Silva, J. P., & Herwaldt, L. A. (2019). Examining health care personal protective equipment use through a human factors engineering and product design lens. *American journal of infection control*, *47*(5), 595-598.
7. Peters, A., Vetter, P., Guitart, C., Lotfinejad, N., & Pittet, D. (2020). Understanding the emerging coronavirus: what it means for health security and infection prevention. *Journal of Hospital Infection*.