

Informatics to Promote Health Resilience to Climate Change and Pandemics

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Abstract. The increasing adverse health effects of Climate change and pandemics create the need for people and communities to develop Resilience, ie “the ability to prepare and plan for, absorb, recover from, and more successfully adapt to actual or potential adverse events”. Modern information and Communications Technologies (ICTs) have great potential to strengthen resilience. The challenge is to harness this potential in systematic and innovative ways to promote, support and sustain resilience. In this workshop participants will discuss strategies and ideas to address this challenge and help shape the emerging discipline of Resilience Informatics.

Keywords. Climate change, Pandemics, Resilience, Resilience Informatics

1. Introduction

Pandemics and climate change have profound adverse effects on public health. The effects of these stressors, especially climate change, are expected to increase in severity. Therefore, there is a corresponding need for people, communities, and health systems to develop Resilience to these stressors. The US National Academies of Science defines Resilience as “the ability to prepare and plan for, absorb, recover from, and more successfully adapt to actual or potential adverse events” [1]. Modern information and Communications Technologies (ICTs) have great potential to strengthen resilience. The challenge is to harness this potential in systematic and innovative ways to promote, support and sustain resilience. Due to the enormous diversity of people, communities, cultures and geographies there is no “one size fits all” solution.

Resilience Informatics (RI), is an emerging discipline defined as the “the application of informatics techniques to materially improve and promote the ability of people, communities, and organizations, to effectively cope with natural and man-made stressors.” [2] Modern informatics systems include an array of powerful technologies such as the Internet of Things, environmental sensors, Artificial Intelligence/Machine Learning, mobile Health, no/lo-code systems development, Augmented/Virtual Reality, Big data, social media, among others. The ubiquitous worldwide availability of very

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powerful Information and Communications technologies such as smartphones, including in Low Middle Income Countries, is highly encouraging as a platform for RI tools. However, there is no “one-size-fits-all” solution. For example, RI systems that are useful in European cities may have limited or no usefulness in Fiji islands, due to cultural, geographic, availability of technology infrastructure, and many other factors.

2. Aim

The Aim of this workshop is to gather and discuss a multiplicity of thoughts and ideas relevant to Resilience Informatics from a diverse group of international attendees. It is relevant to all interested in strategies for developing and promoting resilience.

3. Rationale

Since Resilience Informatics is an emerging discipline, multiple future cutting-edge dimensions exist that need to be researched in detail. These include community participation paradigms using social media, capacity and workforce development, tailoring to geographic, linguistic and cultural contexts, availability of infrastructure.

4. Outcome

At the conclusion of the workshop participants will have gained an appreciation of how diverse informatics tools and systems can promote, sustain, and support global Resilience to stressors such as pandemics and the health effects of climate change.

5. Programme

The workshop will be highly interactive with audience participation actively encouraged by the presenters. It will begin with brief (5 minute) introductions to Resilience and Resilience informatics by the 4 presenters. They will describe important factors in the design of RI systems including drivers of resilience, behavior change in people and communities, and a systematic 6-component framework for developing RI systems. This will be followed by open discussions. The workshop will conclude with a brief summary by the lead presenter assisted by colleagues.

6. Brief biographies

6.1. M. Sriram Iyengar, MS, PhD, Associate Professor, Internal Medicine, Univ Arizona College of Medicine, Phoenix

Prof Iyengar is a biomedical informatician whose research spans mHealth, Big Data, Machine Learning, Gen AI, Systems Biology. His latest interest is Resilience

Informatics. His paper on this topic [2]c received a best paper (3rd place) award at Medinfo 2023. He is the author or co-author of over 85 peer-reviewed publications and presentations. He has conducted funded research in Colombia, India, Brasil, Panama, Fiji., and the US. His career includes large academic medical centers (University of Texas, Houston, University of Arizona) and NASA Johnson Space Center.

6.2. Arletty Pinel, MD, Research Scientist, PGES, Panama

Dr. Arletty Pinel is a global health expert with recognized expertise supporting programs in over 100 countries. A visionary, she has more than twenty years innovating in digital transformation for health systems strengthening in most regions of the world. This has led her to be an internationally recognized authority in translational innovation bridging health, social development, and technology globally.

6.3. Wuleta Lemma, PhD, MPhil, MPH, Investigating Scientist, Instituto Universitário de Lisboa, Portugal

Dr. Wuleta Lemma is an Investigating Scientist at ISCTE-Instituto Universitário de Lisboa-CEI in Portugal, and a Senior Digital Health Consultant to The World Bank. Dr. Lemma has achieved a 28-year career profile, worked in more than 20 countries, and launched health system transformation programs in many developed and developing countries. Dr. Lemma's areas of proficiency include machine learning, health care administration, and pandemic monitoring, which supports global health security.

6.4. Jose F Florez-Arango, MD, PhD, Assistant Professor, Weill-Cornell Medical Center, New York

Jose F Florez-Arango is a Medical Doctor (MD) a PhD on Health Informatics. He was a Fulbright scholar and has experience in emergency medicine, prehospital care and emergency management, tropical diseases, global health, and telemedicine. As an Informatician, his previous experience includes clinical decision support systems, development of health information systems based-on international standards, mHealth, human-computer interaction, human factors, and interoperability.

References

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