



THE INTERNATIONAL EMERGENCY MANAGEMENT SOCIETY - TIEMS

**Proceedings of the International Emergency Management Society
(TIEMS)**

27th TIEMS Annual Conference

Citizens and cities facing new hazards and threats

Edited by: Snjezana Knezic and Meen Bahadur Poudyal Chhetri

November 30 – December 4, 2020

**Proceedings of the International Emergency Management Society
(TIEMS)
27th TIEMS Annual Conference**

"Citizens and cities facing new hazards and threats"

November 30 – December 4, 2020
Virtual conference

Organised by:

TIEMS, The International Emergency Management Society
Address: Rue Des Deux Eglises 39, 1000 Brussels, Belgium.
Executive Office Postal Address is: Østvangveien 29, 0588 Oslo, Norway

Co-organized by:

Haut comité français pour la Résilience nationale (HCFRN), 162 rue du Faubourg Saint-Honoré, 75008, Paris

Editors:

Snjezana Knezic

University of Split, Faculty of Civil Engineering and Architecture, Split, Croatia

Meen Bahadur Poudyal Chhetri

President of Nepal Center for Disaster Management, Lalitpur, Nepal

Published by:

TIEMS, The International Emergency Management Society

Address: Rue Des Deux Eglises 39, 1000 Brussels, Belgium.

Executive Office Postal Address is: Østvangveien 29, 0588 Oslo, Norway.

ISBN: 978-94-90297-19-0

Year: 2020

Volume: 27

Responsibility for the accuracy of all statements in each paper rests solely with the author(s). Statements contained in the papers are not necessarily representative of, nor endorsed by The International Emergency Management Society (TIEMS).

Permission is granted to copy portions of this publication for personal use and for the use of students provided credit is given to the authors, conference and publication. Permission does not extend to other types of reproduction nor to copying for incorporation into commercial advertising nor for any other profit making purpose.

© 2020 TIEMS, The International Emergency Management Society

Designed by TIEMS

WELCOME ADDRESS

The French High Committee for National Resilience (www.hcfrn.org) welcomes participants to the TIEMS 2020 Virtual Conference – Citizens and Cities Facing New Hazards and Threats.

HCFRN is a non-profit organization which helps its members to improve the security, safety and resilience of public and private organizations, regarding the major risks and threats. It contributes to the protection of populations and to the objective of national resilience. It is a platform for exchanges between the Government, parliamentary assemblies, local authorities, companies and experts on issues relating to security, safety and organizational and structural resilience.

We are pleased to be partnering with The International Emergency Management Society (TIEMS) in presenting this conference and pursuing our common goal of a safer, more resilient world. The event should initially have taken place in Paris, but with the worldwide major health crisis we are living, the proposal to offer it using internet came as a natural development.

TIEMS and the HCFRN team are very proud to make it happen and I thank the 70 speakers from 25 countries who are talking during the five next days about their activities and research on COVID-19; Natural Hazards and Climate Change; AI, Cybersecurity and Climate Change; Smart Resilient Cities; and Economics Issues. We hope our large international virtual audience will find these presentations informative and inspiring.

Cities all over the world are on the frontline today to respond to the COVID-19 crisis by playing a key role to implement nation-wide measures and providing innovative strategies for recovery and resilience.

I would like to remind you that nearly 70% of the EU population lives in urban areas. Cities are main centers for all economic, social and cultural activities in Europe and create around 80% of the EU's gross domestic product.

We have learned and still learn a lot about resilience with this crisis. Major shocks aren't generally well prepared. It should be pointed out that there is on one hand the resilience you know well about and practice regularly as emergency management experts (risks and threats analysis, planning, mitigation, management, lessons learned) that is to say "operational resilience" which tackles the consequences, and on the other hand we have a wider resilience process "structural resilience" addressed to the causes, and we have to think about it more, in terms of preparedness, climate change, new form of technologies, new hazards, electric cars. Looking into deep dependencies is crucial when you think about exceptional risks. We hope this conference will help you think about the importance of both, and provide you a clear and objective insight on the various subjects. Have a nice conference week!

Christian Sommade, General Delegate
Haut comité français pour la résilience nationale (HCFRN)
Paris, France

Foreword from TIEMS President

The COVID19 pandemic has changed the world, and the world has been fighting for almost a year to stop this serious threat to the world's population. Everybody is waiting for a vaccine to reduce the risk and prevent more people to be the victims of this pandemic. Today the frightening numbers are that more than 58 mill people are infected and almost 1.4 mill have died by this deadly virus. And the "second wave" is spreading rapidly in Europe.

This has clearly shown the need for global cooperation and coordination are more important than ever before. By working together and sharing of experiences and exchange of views among the experts of different countries, we can learn from each other to develop better methods and systems and advocate for better policies in fighting pandemics and other emergencies, to be standardized and implemented all over the world.

TIEMS needed also to change the way we operate because of the pandemic, and TIEMS 2020 Annual Conference is virtual and performed on ZOOM. This is a new experience for TIEMS, but has also given new opportunities, namely that more people can attend, because of no expenses for travelling, and that the event will free of charge for participation. TIEMS annual conferences worldwide are platforms where all stakeholders can meet and exchange experiences and views and focus on different global and local important topics and issues in emergency and crisis management.

The COVID19 will be one of the most important topics to discuss, and 3 of 10 sessions are actually devoted to this topic. TIEMS 2020 Virtual Annual Conference in Paris, France, is TIEMS 27th Anniversary conference, and since I have been with the organization since its establishment in Washington DC. in 1993, it is with great pleasure to recognize that TIEMS has grown to a worldwide and "mature" and recognized worldwide organization.

TIEMS 2020 Virtual Annual conference will give all an opportunity to attend, because they can attend from their home place as long as they have a computer and internet available. This will therefore form a good meeting place on ZOOM between the locals and international experts, and give all the opportunity to learn from each other and exchange experiences and find better solutions, which can improve local and international preparedness for disastrous events, and build more resilient societies worldwide.

TIEMS local organizing committee, TIEMS France Chapter/The French High Committee for National Resilience (HCFRN), is the host of this conference, and the members of the organizing committee have done an excellent job for preparing the conference, and I like to thank them all for the commitment and dedication to make an excellent conference given the challenges the COVID19 has given them. Special thanks go to Jean – Paul Monet, Christian Sommade, Lauriane Abriat and Gilles Dusserre.

Both international and local presentations of high quality form up a comprehensive program comprising 10 sessions with keynotes, paper and poster presentations, workshops and panel debate, and the event is very international with contributions of speakers from 25 countries/territories. This virtual conference program will certainly make the 5 days TIEMS 2020 Virtual Annual conference on Zoom from Paris to a memorable event.

The papers will be included in TIEMS 2020 Annual Conference Proceedings, and some full papers will be peer reviewed and published in an international recognized journal. Many thanks go to Dr. Meen Chhetri, Chair of TIEMS Paper Review Committee, for reviewing all papers together with Dr. Thomas Robertson, and giving good advice to the authors, seeing to it that all papers are of high quality. Many thanks also go to Dr. Snjezana Knezic for assisting in paper review and putting together the conference proceedings.

Welcome all to TIEMS 2020 Virtual Annual Conference.

Oslo 22nd November 2020

K. Harald Drager
TIEMS President

Conference Chair

Kåre Harald DRAGER, President of The International Emergency Management Society
TIEMS (Norway)

Scientific Committee

- **Meen Bahadur Poudyal CHHETRI**, President of Nepal Center for Disaster Management, (Nepal), Chair
- **Christian DESPRÉS**, Director of Security Research at the French Ministry of Ecological Transition, Energies and Transportation, (France), reviewer
- **Gilles DUSSERRE**, Chief of the Master degree “International Disaster Management and Environmental Impact Damage” chez IMT Mines Ales, (France), reviewer
- **Young Jai LEE**, Professor, Dongguk University, South Korea
- **Serge GARRIGUES**, Gal (2S), former chief of staff of Paris Defense Zone, (France)
- **Snjezana KNEZIC**, Professor, University of Split, Faculty of Civil Engineering, Architecture and Geodesy (Croatia), reviewer
- **George MARKOWSKY**, Professor, Missouri University of Science and Technology, Chair of TIEMS Academy (USA)
- **Jean-Paul MONET**, TIEMS European Director (France)
- **Jean-Marc PICARD**, Professor at the Technological University of Compiègne (France)
- **Thomas ROBERTSON**, TIEMS Regional Director for North America (USA)
- **Anaïs SAINT-JONSSON**, Senior Lecturer at the Institute of Public Management and Territorial Governance (France), reviewer
- **Andre SAMBERG**, Professor of Practice, Security expert for the European Commission (Belgium)
- **Christian SOMMADE**, General Delegate of the French High Committee for the National Resilience (HCFRN or Resilience France)
- **Pierre SCHALLER**, Col. division chief, French National Fire academy, Ensosp (France)
- **Nizar TOULEIMAT**, European affairs manager for Smart Digital Systems applications to Security, LIST Institute, CEA
- **Laurent VERNEUIL**, Ag Professor at the Technical Institute of the Limoges University, Firefighter Officer & CBRNE Technical Advisor (France)
- **Roman TANDLICH**, Professor, Rhodes University, Grahamstown (South Africa)

Local Organizing Committee

Haut comité français pour la résilience nationale - French High Committee for National Resilience "*Resilience France*", 162 rue du Faubourg Saint-Honoré, 75008 Paris, France
WWW.HCFRN.ORG



Resilience France takes part in the TIEMS 2020 virtual Conference organized from 30th November to 4th December. Resilience France is a non-profit organization which helps its members to improve the security, safety and resilience of public and private organizations, regarding the major risks and threats. It contributes to the protection of populations and to the objective of national resilience. It is a platform for exchanges between the Government, parliamentary assemblies, local authorities, companies and experts on issues relating to security, safety and organizational and structural resilience.

Christian Sommade is the General Delegate of Resilience France (HCFRN).

CONTENT

OPENING SESSION

Keynote:

Pierrick Fillon, DG RTD European Commission

Manop Sittidech, Mission of Thailand to the EU

Dalibor Drljača, University Clinical Centre of Rep. of Srpska

Strengthening international cooperation with EU

[Presentation](#)

Official opening:

K. Harald Drager, TIEMS President

TIEMS achievements and future plans

[Presentation](#)

SESSION 1: COVID-19

Keynote:

Guillaume Zagury

COVID kinetics and global impact

[Presentation](#)

Johnston Wong, Lina Lai, Candy Zhou

Health and Mental Health Emergency Responses in Wuhan to combat COVID-19

[Presentation](#)

Sandro Bologna, Simona Cavallini, Carmelo Di Mauro, Vittorio Rosato

How COVID19 pandemic is affecting Italy: impact, response and recovery

[Presentation](#)

SESSION 2: COVID-19

Maros Lacinak, Jozef Ristvej and Michaela Janosikova

Covid-19 as a New Challenge for Resilience of Future Cities

[Presentation](#)

[Poster](#)

Roman Tandlich

Biopolitical and public health implications of the COVID19 pandemic

George Markowysky

Modelling and Battling COVID-19

[Presentation](#)

Jean-Paul Monet, Chadli Hanane, Giraud Camille, Grégory Allione, Lamarca Claudie, Richard Frédéric, Pudlo Pierre

[COVID-19, how to anticipate and plan for emergency services? Lessons learnt from a French fire department Presentation](#)

Marie Bossard, Gilles Dusserre, Karine Weiss

[What makes hospital staff ready to manage the COVID-19 pandemic? A psycho-social approach Presentation](#)

SESSION 3: Disaster response

Guosheng Qu

[Capacity Buildings of INSARAG Recognized National Accreditation Process \(IRNAP\) in High Disaster Risk Countries Presentation](#)

Li Li, Zilong Yao,

[Research on nature disaster international rescue responding mechanism and development tendency Presentation](#)

Gao Na, Guosheng Qu

[Experience of CISAR management in IER Heavy reclassification in 2019](#)

Baijia Zhou, Qunlin Jia, Yu Zhang, Minhao Qu, Benshuai Liu, Tiangang Zhang, Mudi Yang

[Development of International USAR Coordination Exercises Simulator Based on INSARAG Methodology](#)

Jaroslav Pejcoch, Monika Kudrlova, Michal Vanecek, Rene Zavoral, Jan Pokorny

[Review of Organization Preparedness to Unpredicted Situation Presentation](#)

SESSION 4: COVID-19

Simona Cavallini

[How to reconsider impact profiling of biological events after COVID-19? Presentation](#)

Mark VanderWerf

[Pandemic Telemedicine Technology Response Plan and Technology Assessment Presentation](#)

SESSION 5: Natural hazards and climate change

Minghui Lyu, Huixia Zhao, Jing Fan

[*Preliminary Study on Benefit Evaluation of Disaster Prevention of Rainstorm Based on Integrated Disaster Risk Governance Model*](#)
[*Presentation*](#)

Christopher Dick-Sagoe, Kwame Nkrumah Hope, Peter Asare-Nuamah

[*Perceived impact of climate change and variability on livelihoods of smallholder farmers in Lesotho*](#)
[*Presentation*](#)

Pradit Nulay, Siraprapa Chartprasert, Tinnakorn Tatong

[*Community – Based Landslide Watch Networks in Thailand*](#)
[*Presentation*](#)

SESSION 6: IA, cybersecurity and IT

Juan Francisco Carias, Marta Iturriza, Saioa Arrizabalaga, Josune Hernantes

[*Cyber Resilience Awareness Training Cyber Ranges*](#)
[*Presentation*](#)

Charles Boisvert, Stephanie Libby

[*Designing Effective Data Visualisations for Environmental Crisis Awareness: the Importance of Local Data*](#)
[*Presentation*](#)

Selene Cerna, Christophe Guyeux, Céline Chevallier, Guillaume Royer-Fey

[*Artificial intelligence to assist and optimize fire brigade services*](#)
[*Presentation*](#)

Thomas Robertson

[*Applying Artificial Intelligence to Emergency and Disaster Management*](#)
[*Presentation*](#)

SESSION 7: Smart resilient cities

Brian Holecek Oam Cem

[*The Terrible Twins
Presentation*](#)

Yukako Komasa, Shinzo Kimura

[*What to do when facing the uncertainty? Implications from the seven years of health protection practices at schools in the affected area of Fukushima Daiichi nuclear power plant accident
Presentation*](#)

Manomita Das

[*Prospects and challenges of implementing Early Warning Systems in urban areas of developing nations: A practitioner's perspective
Presentation*](#)

Vincenzo Cuomo, Francesco Soldovieri, Frederic Bourquin, Nour-Eddin El Faouzi, Jean Dumoulin

[*The necessities and the perspectives of the monitoring/surveillance systems for multi-risk scenarios of urban areas including COVID-19 pandemic
Presentation*](#)

SESSION 8: Smart resilient cities

Josef Leitmann

[*Promoting Resilience to Shocks and Stresses in Secondary Cities
Presentation*](#)

Katelynn Kapalo, Joseph Bonnell, Joseph LaViola

[*Evaluating User Experience Considerations for Emergency Responders in the Age of Smart Cities*](#)

Joe Gorman

[*IMPETUS: A research and innovation project addressing urban safety
Presentation*](#)

SESSION 9: Natural hazards and climate change

Keynote:

Desiree Beekharry

Is there such as a thing as «a new norm»?

[Presentation](#)

Rennifer Madondo, Siviwe Shwababa, Roman Tandlich

[Fire disaster management in South Africa: look at statistics and impacts](#)

Snjezana Knezic, K. Harald Drager, Georgios Eftychidis, Brigitte Slot

[Analysis of wildfire response governance in Europe](#)

[Presentation](#)

Cherdsak Virapat

[Adaptive Management on Earthquake and Natural Disaster Management for Community Awareness and Resilience in Chittagong City, Bangladesh](#)

[Presentation](#)

Jin Yan

[Brief Introduction of the Work of Receiving and Reporting Natural Disaster Information](#)

Vittorio Rosato, Maurizio Pollino, Antonio Di Pietro, Alberto Tofani, Luigi La Porta

[Enhancing Resilience against natural events through ordinary times strategies](#)

SESSION 10: Economics issues

Keynote:

Dave Waterhouse, François Delorme

The economic impact of a Fire Department's operational activities

[Presentation](#)

Jean-Paul Monet, Hanane Chadli-Mauricio, Nouhaila Amir, Ambre Carlavan, Dorian Goninet, Camille Giraud, Cassandra Alessandri, Grégory Allione

[Value for money: economic view on emergency services \(I\), how protection produces value](#)

[Presentation](#)

Hanane Chadli Maurico, Jean-Paul Monet, Grégory Allione, Cassandra Alessandri, Dorian Goninet

[Value for money: economic view on emergency services \(II\), how protection produces value - Housing building case](#)

[Presentation](#)

Ambre Carlavan Jean-Paul Monet, Pascal Bergé, Grégory Allione, Cassandra Alessandri, Dorian Goninet

[*Value for money: economic view on emergency services \(IV\), how protection produces value - Saved lives case*](#)

[*Presentation*](#)

Nouhaila Amir, Jean-Paul Monet, Grégory Allione, Cassandra Alessandri, Dorian Goninet

[*Value for money: economic view on emergency services \(III\), how protection produces value - Forest case*](#)

[*Presentation*](#)

FULL PAPERS NOT PRESENTED

Bea Reyes, Cheska Joi Vergara, GJT Atienza

[*Geomorphic Characterization of Bulakan, Bulacan and Its Implications to the Proposed Land Use Development*](#)

Shifu Zhang, Yu Zhang, Yuhan Yang, Yuwen Mao, Hong Xu

[*The Introspection about System Construction of Emergency Equipment in China*](#)

Stine Skaufel Kilskar, Matthieu Branlat, Tor Olav Grøtan, Jannicke Fiskvik

[*Making Sense of the Many Understandings of Cyber Resilience*](#)

TQC WORKSHOP

[*TIEMS - Qualifications - Certifications*](#)

Sandro Bologna

[*TQC Examination Guide*](#)

Meen Poudyal Chhetri

[*SENDAI Recommendations and requirements*](#)