# DISASTER MEDICINE and PUBLIC HEALTH PREPAREDNESS

An Official Publication of the Society for Disaster Medicine and Public Health, Inc



#### IN THIS ISSUE:

Unplanned School Closure: Implications for Pandemic Influenza Preparedness
Attitudes and Perceptions of a "Dirty Bomb" Radiological Terror Event
Identification of Disaster-Vulnerable Communities By Use of Census Data

SPECIAL SECTION: EBOLA VIRUS AND PUBLIC HEALTH (PART 1)



CAMBRIDGE UNIVERSITY PRESS



# Office of the U.S. Surgeon General Division of the Civilian Volunteer Medical Reserve Corps





- Support local public health, while advancing the priorities of the U.S. Surgeon General by:
  - ✓ Promoting disease prevention
  - ✓ Improving health literacy
  - Eliminating health disparities
  - ✓ Enhancing public health preparedness
- Assist local hospitals and health departments with surge personnel needs
- Participate in mass prophylaxis and vaccination exercises and community disaster drills
- Train with local emergency response partners
- And much more...



Connect with your local MRC unit today! www.MedicalReserveCorps.gov

The Tower Building 1101 Wootton Parkway, Suite 200 Rockville, MD 20852 240.453.2839 • MRCcontact@hhs.gov



Volunteers Building Strong, Healthy, and Prepared Communities

# Disaster Medicine and Public Health Preparedness

**Editor-in-Chief** 

James J. James, MD, DrPH, MHA

Chief Executive Officer, Society for Disaster Medicine and Public Health, Inc., USA **Deputy Editor** 

David Markenson, MD, MBA

Chief Medical Officer Sky Ridge Medical Center Director, Center for Disaster Medicine New York Medical College

#### **Associate Editors**

#### Elizabeth Ablah, PhD, MPH

Associate Professor, University of Kansas-Wichita, School of Medicine

#### Daniel J. Barnett, MD, MPH

Assistant Professor, Department of Environmental Health Sciences, Johns Hopkins Bloomberg School of Public Health

### Charles W. Beadling, MD, FAAFP, IDHA, DMCC

Director, Center for Disaster and Humanitarian Assistance Medicine Uniformed Services University of the Health Sciences

#### Laura J. Cavanaugh, MD, FAAP

Pediatrician, Private Practice, USA

#### Jennifer L. Chan, MD, MPH

Assistant Professor, Department of Emergency Medicine, Northwestern Feinberg School of Medicine

#### Edbert B. Hsu, MD, MPH

Director of Training, Johns Hopkins Office of Critical Event Preparedness and Response

#### Stephanie Kayden, MD, MPH

Director, International Emergency Medicine Fellowship, Brigham and Women's Hospital

#### Frederick C. Nucifora Jr., DO, PhD, MHS

Department of Psychiatry and Behavioral Science, Johns Hopkins University School of Medicine

# Michael J. Reilly, DrPH, MPH, NREMT-P, CEM

Center for Disaster Medicine, New York Medical College

#### Rebecca Zukowski, PhD, RN

Associate Academic Dean and Nursing Division Chairperson, Mount Aloysius College

### Managing Editor

#### Alice O'Donnell

HJF, National Center for Disaster Medicine and Public Health Editorial support provided by the National Center for Disaster Medicine and Public Health

#### Copyeditor

Jennifer Holmes

#### **Editorial Board**

#### John Armstrong, MD, FACS

Associate Professor of Surgery, USF Health, University of South Florida

# Frederick M. Burkle Jr., MD, MPH, DTM, FAAP. FACEP

Senior Fellow, Harvard Humanitarian Initiative, Harvard School of Public Health

#### Cham E. Dallas, PhD

Director, Institute for Health Management in Mass Destruction Defense, University of Georgia & Medical College of Georgia

#### Linda C. Degutis, DrPH, MSN

Director, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention

#### Lewis R. Goldfrank, MD

Herbert W. Adams Professor and Chair, Department of Emergency Medicine, New York University Medical Director, New York City Poison Center

#### John L. Hick. MD

Associate Professor of Emergency Medicine, Hennepin County Medical Center, University of Minnesota

#### James G. Hodge, Jr., JD, LLM

Lincoln Professor of Health Law and Ethics Director, Public Helath Law and Policy Program, Sandra Day O'Connor College of Law, Arizona State University

#### Gabor Kelen, MD, FRCP(C), FACEP

Professor and Chair, Department of Emergency Medicine, Johns Hopkins University

#### Thomas D. Kirsch, MD, MPH, FACEP

Associate Professor, Director of the Center for Refugee and Disaster Response, The Johns Hopkins School of Medicine/Bloomberg School of Public Health

#### William Lanier, MD

Professor of Anesthesiology, Mayo Clinic

#### Yasuhiro Otomo, MD, PhD

Director, Trauma and Acute Critical Care Medical Center Professor and Chairman, Tokyo Medical and Dental University Hospital of Medicine, Japan

#### Betty Pfefferbaum, MD, JD

Chairman, Department of Psychiatry and Behavioral Sciences, University of Oklahoma Health Sciences Center

#### Irwin Redlener, MD

Director, National Center for Disaster Preparedness, Columbia University

#### Charles L. Rice, MD

President, Uniformed Services University of the Health Sciences

#### Hou Shi-ke, MD

Institute for Disaster & Emergency Medicine of PAPF Affiliated Hospital of Logistic University, Tianiin City. China

#### W. Craig Vanderwagen, MD

RADM, US Public Health Service, retired Senior Partner, Martin, Blanck, and Associates

#### **Statistical Editors**

#### Guohua Li, MD, DrPH

M. Finster Chair in Anesthesiology and Epidemiology, Columbia University College of Physicians and Surgeons

#### Michael A. Stoto, PhD

Professor, Health Services Administration and Population Health, Georgetown University School of Nursing and Health Studies

#### **Chair of Global Committee**

#### Raymond E. Swienton, MD, FACEP

Co-director of EMS, Disaster Medicine and Homeland Security Section, University of Texas Southwestern

#### **Associate Board**

#### Erik Auf der Heide, MD, MPH, FACEP

Agency for Toxic Substances and Disease Registry, US Department of Health and Human Services

#### Joseph A. Barbera, MD

Co-director, Institute for Crisi, Disaster, and Risk Mangagement, The George Washington University

#### Donna F. Barbisch, DrHA, MPH

Director, Institute for Global and Regional Readiness

#### Steven M. Becker, PhD

Professor, College of Health Sciences Old Dominion University

#### Georges Benjamin, MD, FACP

Executive Director, American Public Health Association

#### John Brownstein, PhD

Associate Professor, Clinical and Public Health Informatics, Boston Children's Hospital

#### Arthur Cooper, MD, MS, FACS, FAAP, FCCM

Director of Trauma & Pediatric Surgical Services, Harlem Hospital Center

#### Asha Devereaux, MD, MPH

Chair, American College of Chest Physicians Disaster Response Network

#### Edward Eitzen, MD, MPH

Senior Partner, Biodefense and Public Health Programs, Martin, Blanck and Associates

#### Mikael Eliasson, MD, PhD

Strategic Marketing Leader, General Medicine, GE Healthcare

#### Joshua Epstein, PhD

Director, Center on Social and Economic Dynamics, The Brookings Institution

#### J. Christopher Farmer, MD, FCCM

Associate Dean, Critical Care Medicine, Mayo Clinic College of Medicine

#### Richard Garfield, RN, DrPH

Henrik H. Bendixen Professor of Clinical International Nursing, Columbia University

#### Jeffrey Hammond, MD, MPH

Clinical Professor of Surgery, Robert Wood Johnson Medical School

#### D.A. Henderson, MD, MPH

Center for Biosecurity, University of Pittsburgh Medical Center

#### David Joyner, MD

Vice Chairman/CMO, Salus Healthcare International

#### David Lakey, MD

Commissioner, Texas Department of State Health Services

#### E. Brooke Lerner, PhD

Department of Emergency Medicine, Medical College of Wisconsin

#### Jonathan Links, PhD

Director, Center for Public Health Preparedness, Johns Hopkins Bloomberg School of Public Health

# Craig H. Llewellyn, MD, MPH, MSTMH, FACPM

Emeritus Professor of Military Medicine, Emergency Medicine, Preventative Medicine & Surgery, Uniformed Services University School of Medicine

#### Darrell E. Lovins, DO, MPH, FACOFP

Associate Dean, Clinical Sciences, William Carey University

#### Anthony Macintyre, MD

Visiting Associate Professor, Institute for Crisis, Disaster, and Risk Management, The George Washington University

#### John Mutter, PhD

Professor of International and Public Affairs, The Earth Institute at Columbia University

#### Kobi Peleg, PhD, MPH

Director, Israel National Center for Trauma and Emergency Medicine

#### Cheryl Peterson, RN, MSN

Senior Policy Fellow, American Nurses Association

#### Steven J. Phillips, MD

Director, Specialized Information Services, Associate Director, National Library of Medicine, US Department of Health and Human Services

#### Louis Rowitz, PhD

Professor, Community Health Sciences, School of Public Health, University of Illinois at Chicago

#### Joseph Scanlon

Professor Emeritus and Director, Emergency Communications and Research Unit, Carleton University

#### R. Tom Sizemore III, MD

Principal Deputy Director, Office of Preparedness and Emergency Operations, US Department of Health and Human Services

#### Robert Ursano, MD

Professor/Chair, Department of Psychiatry, Uniformed Services University of the Health Sciences

#### Jeb Weisman, PhD

Director of Strategic Technologies, National Center for Disaster Preparedness, Columbia University

#### Kevin Yeskey, MD

Senior Advisor for Emergency Public Health, MDB, Inc.

#### Global Committee

#### Michael Christian, MD, FRCP(C)

Department of Medicine, University of Toronto, Canada

#### Herman Delooz, MD. PhD. FCCM, FCEM (dist)

Research Group on Disaster Medicine, Free University of Brussels

#### Natalia Gudzenko, MD

Laboratory for Cancer Epidemiology, Research Center for Radiation Medicine, Ukraine

#### Kegin Rao, MD, MPH

Director, National Center for Health Statistics and Information, Ministry of Health, China

#### Alessandra Rossodivita. MD EMDM

San Raffaele Hospital Scientific Foundation, Milan, Italy

#### Nobhojit Roy, MD, MPH

Bhabha Atomic Research Center Hospital, Mumbai, India

# Disaster Medicine and Public Health Preparedness

FEBRUARY 2015 Vol 9/No 1

#### On the Cover

1 The Monrovia Medical Unit: Caring for Ebola Health Care Workers in Liberia Paul Reed and Scott Giberson

#### Editorial

3 Looking Back, Looking Forward James J. James

#### **Brief Report**

Evaluation of an Unplanned School Closure in a Colorado School District: Implications for Pandemic Influenza Preparedness

Frie F. Free Verlik A. Zhetavara, Jeanetta J. Bairery Hangilean Co., Jianuary Shi, Amer Haisenin and Lieu A.

Erin E. Epson, Yenlik A. Zheteyeva, Jeanette J. Rainey, Hongjiang Gao, Jianrong Shi, Amra Uzicanin, and Lisa Miller

#### Original Research

- Attitudes and Perceptions of Urban African Americans of a "Dirty Bomb" Radiological Terror Event: Results of a Qualitative Study and Implications for Effective Risk Communication Sarah Bauerle Bass, Judith R. Greener, Dominique Ruggieri, Claudia Parvanta, Gabriella Mora, Caitlin Wolak, Rebecca Normile, and Thomas F. Gordon
- 19 Identification of Disaster-Vulnerable Communities by Use of Census Data Prior to the Great East Japan Earthquake Aya Ishiguro, Yuriko Togita, Mariko Inoue, Takayoshi Ohkubo, and Eiji Yano

#### **Ebola Special Section**

29 Ebola Virus and Public Health (Part 1) Charles W. Beadling, Frederick M. Burkle Jr, Kristi L. Koenig, and Trueman W. Sharp

#### Introduction

31 Ebola Virus and Public Health Charles W. Beadling, Frederick M. Burkle Jr, Kristi L. Koenig, and Trueman W. Sharp

#### Editorial

The Ebola Epidemic and Translational Public Health James J. James

#### Special Reports

- A Primer on Ebola for Clinicians
  Eric Toner, Amesh Adalja, and Thomas Inglesby
- 38 Triage Management, Survival, and the Law in the Age of Ebola Frederick M. Burkle Jr and Christopher M. Burkle

#### Commentaries

- 44 Operationalizing Public Health Skills to Resource Poor Settings: Is This the Achilles Heel in the Ebola Epidemic Campaign? Frederick M. Burkle Jr
- 47 Global and Domestic Legal Preparedness and Response: 2014 Ebola Outbreak James G. Hodge Jr
- 51 Hubris: The Recurring Pandemic Tom Koch

- 57 Ebola Triage Screening and Public Health: The New "Vital Sign Zero"
- Journalists and Public Health Professionals: Challenges of a Symbiotic Relationship Pauline Lubens
- 64 The Ebola Threat: China's Response to the West African Epidemic and National Development of Prevention and Control Policies and Infrastructure Hao-Jun Fan, Hong-Wei Gao, Hui Ding, Bi-Ke Zhang, and Shi-Ke Hou
- 66 Mapping Medical Disasters: Ebola Makes Old Lessons, New Tom Koch

#### **Brief Reports**

- 74 Ebola Virus Disease: Preparedness in Japan
  - Yugo Ashino, Haorile Chagan-Yasutan, Shinichi Egawa, and Toshio Hattori
- 79 Favipiravir: A New Medication for the Ebola Virus Disease Pandemic Takashi Nagata, Alan K. Lefor, Manabu Hasegawa, and Masami Ishii

#### Concepts in Disaster Medicine

- 82 Ebola Outbreak Response: The Role of Information Resources and the National Library of Medicine Cynthia B. Love, Stacey J. Arnesen, and Steven J. Phillips
- 86 Identify, Isolate, Inform: A 3-pronged Approach to Management of Public Health Emergencies Kristi L. Koenig

#### Responder Tools

Sign Me Up: Rules of the Road for Humanitarian Volunteers During the Ebola Outbreak Ryan Wildes, Stephanie Kayden, Eric Goralnick, Michelle Niescierenko, Miriam Aschkenasy, Katherine M. Kemen, Michael Vanrooyen, Paul Biddinger, and Hilarie Cranmer

#### Letters to the Editor

- 90 Operationalizing Public Health Skills to Resource Poor Settings Sim Sai Tin and Viroj Wiwanitkit
- 91 Reply to Tin and Wiwanitkit Frederick M. Burkle Jr
- 92 Ebola and the Limited Effectiveness of Travel Restrictions Morenike Folayan and Brandon Brown

#### CONTACT INFORMATION

NCDMPH 11300 Rockville Pike, Suite 1000 Rockville, MD 20852 P- 240-833-4429 F: dmphpiournal@gmail.com

Edited from the Offices of the National Center for Disaster Medicine and Public Health (NCDMPH) located at the Uniformed Services University of the Health Sciences (USUHS) under a cooperative enterprise agreement between USUHS and The Society for Disaster Medicine and Public Health. The views expressed in each article are those of the author and do not necessarily reflect the official policy or position of NCDMPH, USUHS, the Department of Defense, or the United States Government.

#### **Manuscript Submission and Instructions for Authors**

May be found online at http://mc.manuscriptcentral.com/dmp

#### **DMPHP Reprints & Permissions**

#### Article Reprints/E-prints Inquiry

For use by commercial entities or educational institutions:

#### special\_sales@cambridge.org

Permissions Inquiry

For rights and permissions inquiries, please visit www.cambridge.org/about-us/

#### Advertising

For details about advertising rates and opportunities in Disaster Medicine and Public Health Preparedness, or to request a media pack, please contact M. J. Mrvica Associates, 2 West Taunton Avenue, Berlin, NJ 08009; Phone: 856-768-9360; Fax: 856-753-0064: Fmail: mimryica@mryica.com.

#### **Subscription Rates and Service**

**Subscription Information** Disaster Medicine and Public Health Preparedness (ISSN: 1935-7893; EISSN: 1938-744X) is published bi-monthly by Cambridge University Press, 32 Avenue of the Americas, New York, New York 10013. Copyright © 2015 by the Society for Disaster Medicine and Public Health, Inc.

#### **Annual Subscription Rates**

Annual institutional print and electronic subscription rates: US \$600.00 in the USA, Canada and Mexico; UK £375.00 + VAT elsewhere. Institutional electronic rates only: US \$460.00.00 in the USA, Canada and Mexico; UK £287.00 + VAT elsewhere. Prices include surface postage and insurance.

Information on Disaster Medicine and Public Health Preparedness and all other Cambridge journals is available at http://www.cambridge.org/. Full text for this journal may be found at http://journals.cambridge.org/.

When citing this journal, please abbreviate as Disaster Med Public Health Preparedness

#### Indexed in MEDLINE

Disaster Medicine and Public Health Preparedness participates in the Health InterNetwork Access to Research Institute Initiative (HINARI), which provides free or very-low-cost online access to major journals in biomedical and related social sciences to local, nonprofit institutions in developing countries. Please visit www.who.int/hinari for more information.

#### Copyright ©2015 Society for Disaster Medicine and Public Health, Inc.

All rights reserved. No part of this publication may be reproduced, in any form or by any means, electronic, photocopying or otherwise, without permission in writing from Cambridge University Press, except when permission is obtained through a bona fide copyright clearinghouse, such as the Copyright Clearance Center (USA) or the Copyright Licensing Agency (UK). For further information please visit http://us.cambridge.org/information/rights/ or http://www.cambridge.org/uk/ information/rights/.

Periodicals postage paid at New York, NY, and additional mailing offices. Return Postage Guaranteed. **Postmaster:** Send address changes in the USA and Canada to: *Disaster Medicine and Public Health Preparedness*, Cambridge University Press, Journals Fulfillment Dept., 100 Brook Hill Drive, West Nyack, NY 10994-2133.