PREHOSPITAL and DISASTER MEDICINE

Volume 29, Number 6

December 2014







The Official Journal of the World Association for Disaster and Emergency Medicine

JOURNALS

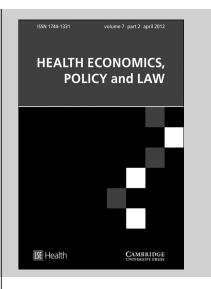
Now included in the Thomson Reuters Social Sciences Citation Index

Health Economics, Policy and Law

Published in association with LSE Health

Editor-in-Chief Adam Oliver, London School of Economics and Political Science, UK

International trends highlight the confluence of economics, politics and legal considerations in the health policy process. Health Economics, Policy and Law (HEPL) provides a forum for inter-disciplinary health policy studies, and will be of use to academics, policy makers, health care managers and professionals. HEPL is international in scope, publishing both theoretical and applied work, with articles on all aspects of health policy. HEPL is particularly interested in publishing innovative ideas that promise to contribute to improving health and healthcare policy. Considerable emphasis is placed on rigourous conceptual development and analysis, and on the presentation of empirical evidence that is relevant to the policy process. Review articles and debate sections bring readers in touch with current research developments and issues.



Health Economics, Policy and Law is available online at: http://journals.cambridge.org/hep

To subscribe contact Customer Services

in Cambridge: Phone +44 (0)1223 326070 Fax +44 (0)1223 325150 Email journals@cambridge.org

in New York:

Phone (845) 353 7500 Fax (845) 353 4141 Email subscriptions_newyork@cambridge.org

Free email alerts

Keep up-to-date with new material – sign up at journals.cambridge.org/register

For free online content visit: http://journals.cambridge.org/hep



VOLUME 29, NUMBER 6

DECEMBER 2014

Table of Contents

Editorial Ebola: Who is Responsible for the Political Failures?
Original Research DISASTER HEALTH AND MEDICINE Factors Associated with the Intention of Health Care Personnel to Respond to a Disaster
Hospital Disaster Response Using Business Impact Analysis
Using Mixed Methods to Assess Pediatric Disaster Preparedness in the Hospital Setting
EMERGENCY MEDICAL SERVICES The Use of FAST Scan by Paramedics in Mass-casualty Incidents: A Simulation Study
Evaluating Cold, Wind, and Moisture Protection of Different Coverings for Prehospital Maritime Transportation–A Thermal Manikin and Human Study
Swedish Ambulance Managers' Descriptions of Crisis Support for Ambulance Staff After
Potentially Traumatic Events
The Impact of Precipitation on Land Interfacility Transport Times
Integration of Energy Analytics and Smart Energy Microgrid into Mobile Medicine Operations for the 2012 Democratic National Convention Peter W. McCabill, MD; Erin E. Noste, MD; A.J. Rossman; David W. Callaway, MD, MPA
MASS-GATHERING MEDICINE Comparison of Prediction Models for Use of Medical Resources at Urban Auto-racing Events
Debra Lee, MD; Michael G. Millin, MD, MPH; Richard A. Bissell, PhD; Richard L. Alcorta, MD Streamlining of Medical Relief to Areas Affected by the Great East Japan Earthquake with the "Area-based/Line-linking Support System"

Atsushi Hozawa, MD, PhD; Sae Ochi, MD, MPH, PhD; Shigeki Kushimoto, MD, PhD

December 2014

Comprehensive Review

Does Disaster Education of Teenagers Translate into Better Survival Knowledge, Knowledge of Skills,	
and Adaptive Behavioral Change? A Systematic Literature Review	. 629
Tudor A. Codreanu, MD, MSc(Med), MSc(DisMed); Antonio Celenza, MClinED, FACEM, FCEM;	
Ian Jacobs, PhD, W.Aust., FRCNA, FACAP, FERC	

Brief Report

Securing the Second Front: Achieving First Receiver Safety and Security through Competency-based Tools 643 Jamal Jones, BS; Judith Staub, BS; Andrew Seymore, BS; Lancer A. Scott, MD, FACEP

Special Reports

Mass-gathering Health Research Foundational Theory: Part 1 - Population Models for Mass Gatherings648 Adam Lund, MD, MEd, FRCPC; Sheila A. Turris, RN, PhD; Ron Bowles, EMA II, PhD; Malinda Steenkamp, PhD; Alison Hutton, RN, PhD; Jamie Ranse, RN, FRCNA, FACN; Paul Arbon, RN, PhD

Sheila A. Turris, NP, PhD; Adam Lund, MD, MEd, FRCPC; Alison Hutton, RN, PhD; Ron Bowles, EMA II, PhD; Elizabeth Ellerson, MPH; Malinda Steenkamp, PhD; Jamie Ranse, RN, FRCNA, FACN; Paul Arbon, RN, PhD

Editorial Office

World Association for Disaster and Emergency Medicine (WADEM), Madison, Wisconsin USA

> Editor-in-Chief Samuel J. Stratton, MD, MPH

> > Managing Editor Ellen Johnson, MS

Editorial Assistant Deidra A. Dean

Publisher Cambridge University Press 32 Avenue of the Americas New York, NY 10013-2473 USA Prehospital and Disaster Medicine (ISSN 1049-023X) is published bimonthly in the months of February, April, June, August, October, December, by Cambridge University Press for the World Association for Disaster and Emergency Medicine. Prehospital and Disaster Medicine incorporates the Journal of the World Association for Emergency and Disaster Medicine and the Journal of Prehospital Medicine.

Editorial Information: All manuscripts must be submitted through the Journal's online submission platform, ScholarOne Manuscripts: http://mc. manuscriptcentral.com/pdm.

2015 Subscription Information: Institutions print and electronic: US\$659.00 in the USA, Canada, and Mexico; UK£402.00+VAT elsewhere. Institutions electronic only: US\$486.00 in the USA, Canada, and Mexico; UK£297.00+VAT elsewhere. Individuals print and electronic: US\$191.00 in the USA, Canada, and Mexico; UK£117.00+VAT elsewhere. Individuals electronic only: US\$139.00 in the USA, Canada, and Mexico; UK£117.00+VAT elsewhere. Individuals electronic only: US\$139.00 in the USA, Canada, and Mexico; UK£79.00+VAT elsewhere. Single Part: US\$121.00 in the USA, Canada, and Mexico; UK£79.00+VAT elsewhere. Prices include postage and insurance. Airmail or registered mail is extra. Back volume prices are available upon request. Claims of non-receipt or damaged issues must be filed within three months of cover date.

Comprehensively indexed by the National Library of Medicine (MEDLINE), Cumulative Index to Nursing and Allied Health (CINAHL) and Health Star Cumulative Index. The database is available online via BRS, Data-Star, and DIA-LOG, and on CD-ROM through CD Plus, Compact Cambridge and Silver Platter. Abstracts and search capability available on the Internet at http://journals.cambridge.org/PDM.

Copyright \circledast 2014 by the World Association for Disaster and Emergency Medicine.

Cover Artwork

Red Crowned Crane, Morning 7, photograph by Jim Stewart

Jim Stewart is an associate professor in the Department of Pathology and Lab Medicine at the University of Wisconsin (Madison, Wisconsin USA). He photographs nature scenes around the world during his travels with his wife as Natural Focal Point Photography.

Natural Focal Point Photography is a husband and wife photography team, sharing a passion for photography and an appreciation for nature, wildlife, and beautiful vistas. They enjoy taking pictures of the things they encounter on their travels. They especially enjoy seeing and capturing images of all types of wildlife. While searching and waiting for wildlife photo opportunities, their subject is the surrounding vistas and scenes of where ever they happen to be. Whether it's fall foliage, flowers, mountains, seashores, prairies, marshes, waterfalls, lakes, or stream edges, they enjoy capturing the view. They have been photographing nature for about seven years. Their work can be viewed at http:// www.naturalfocalpoint.com/.

December 2014

EDITORIAL BOARD Prehospital and Disaster Medicine

EDITOR-IN-CHIEF Samuel J. Stratton, MD, MPH

University of California-Los Angeles Los Angeles, California, USA

EMERITUS EDITOR-IN-CHIEF Marvin L. Birnbaum, MD, PhD

University of Wisconsin-Madison Madison, Wisconsin, USA

MANAGING EDITOR Ellen Johnson, MS

SECTION EDITORS Emergency Medical Services Darren Walter, FRCS(Ed) FCEM, FIMC University Hospital South Manchester Manchester, UK

Humanitarian Affairs Frederick M. Burkle, MD, MPH. DTM Harvard Humanitarian Initiative Harvard University Cambridge, Massachusetts, USA

Mass Gathering Medicine Paul Arbon, PhD School of Nursing and Midwifery Flinders University Adelaide, South Australia

Nursing Elaine Daily, RN, BSN, FCCM, FAHA Madison, Wisconsin, USA

Oceania Graeme McColl Christchurch, New Zealand

Psychosocial Gloria Leon, PhD University of Minnesota Minneapolis, Minnesota USA

ASSOCIATE EDITORS David A. Bradt, MD, MPH Royal Melbourne Hospital Melbourne, Australia

Wolfgang F. Dick, MD, PhD Mainz, Germany

Kimball Maull, MD, FACS Department of Surgery Hamad General Hospital Doha, Qatar

Steven Rottman, MD University of California-Los Angeles Los Angeles, California, USA

Geert Synaeve, MD Brussels, Belgium

EDITORIAL BOARD Carol Amaratunga, PhD

School of Child and Youth Development University of Victoria Research Association of the Justice Institute of British Columbia Victoria BC, Canada

Frank Archer, MD Department of Community Emergency Health & Paramedic Practice Monash University Melbourne, Australia

Jeffrey Arnold, MD Department of Emergency Medicine Santa Clara Valley Medical Center San Jose, California, USA

Yaron Bar-Davan, MD, MHA Israeli Defense Forces Home Front Command Or-Yehuda, Israel

Joost Bierens, MD, PhD Amsterdam, The Netherlands

Tareg Bey, MD Saudi Arabia

Richard A. Bissell, PhD Center for Emergency Education and Disaster Research University of

Maryland-Baltimore Baltimore, Maryland, USA

Felipe Cruz-Vega, MD Office of Social Security Mexico City, Mexico

Robert A. DeLorenzo, MD, MSM, FACEP Medical Corps United States Army San Antonio, Texas, USA

Claude de Ville de Goyet, MD Brussels, Belgium

Judith Fisher, MD Washington, DC, USA

Erik S. Gaull George Washington University Washington, DC, USA

Michael Gunderson Integral Performance Solutions Lakeland, Florida, USA

Pinchas Halpern, MD Critical Care and Emergency Medicine Tel Aviv University Tel Aviv, Israel

Keith Holtermann, MD George Washington University Washington, DC, USA

Mark Johnson, MPA Juneau, Alaska, USA

Mark Keim, MD Centers for Disease Control and Prevention Atlanta, Georgia, USA

Todd J. LeDuc, EMT-P Broward Sheriff Fire Rescue Ft. Lauderdale, Florida, USA

Lidia Mayner, PhD School of Nursing and Midwifery Flinders University Adelaide, South Australia

Andrew Milsten, MD, MS, FACEP University of Massachusetts **Emergency Medicine**

Worcester, Massachusetts, USA

Jerry Overton IAED Emergency Clinical Advice System & Standards Board Salt Lake City, Utah, USA

Paul Paris, MD

Center for Emergency Medicine University of Pittsburgh Pittsburgh, Pennsylvania, USA

Lynda Redwood-Campbell, MD, MPH

Department of Family Medicine McMaster University Hamilton, Ontario, Canada

Edward Ricci, PhD

Behavioral and Community Health Sciences University of Pittsburgh Pittsburgh, Pennsylvania, USA

Leonid Roshal, MD

Institute of Pediatrics Academy of Medical Sciences Moscow, Russia

Don Schramm Disaster Management Center University of Wisconsin-Madison Madison, Wisconsin, USA

James M. Shultz, PhD Center for Disaster & Extreme Event Preparedness University of Miami Miami, Florida, USA

Wayne Smith, BSC, MBChB, EMDM, FCEM(SA)

Division of Emergency Medicine University of Cape Town Cape Town, South Africa

Knut Ole Sundnes, MD **Baerum Hospital** Solo, Norway

Takashi Ukai, MD Hyogo Emergency Medical Center

Hyogo, Japan

Michael Van Rooven, MD

Harvard Humanitarian Initiative and Department of Emergency Medicine, Brigham and Women's Hospital Boston, Massachusetts, USA

Richard Zoraster, MD, MPH Kaneohe, Hawaii, USA

Aims and Scope: The mission of *Prehospital and Disaster Medicine* (PDM) is the distribution of information relevant to the practice of out-of-hospital and in-hospital emergency medical care, disaster health, and public health and safety. PDM provides an international forum for the reporting and discussion of scientific studies, both quantitative and qualitative, that have relevance to the above practices. The major objectives are: (1) the improvement of the types and quality of the care delivered to patients with perceived medical emergencies and to victims of multi-casualty accidents or disasters, including the public health and safety aspects of such events; and (2) the prevention and/or mitigation of the occurrence of such events and of the effects of these events upon the human population and environment.

Editorial Office: Prehospital and Disaster Medicine, 3330 University Avenue, Suite 130, Madison, Wisconsin 53705, USA. Telephone: (+1) (608) 819-6604; Facsimile (+1) (608) 819-6055; E-mail: pdm@wadem.org

Publishing, Production, and Advertising Office: Cambridge University Press, 32 Avenue of the Americas, New York, NY 10013-2473, United States; USAdSales@cambridge.org.

Subscription Offices: (for USA, Canada, and Mexico) Cambridge University Press, 32 Avenue of the Americas, New York, NY 10013-2473, United States; (for UK and elsewhere) Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU, UK.

2015 Subscription Information: *Prehospital and Disaster Medicine* (Print ISSN 1049-023X; Electronic ISSN 1945-1938) is published bimonthly in the months of February, April, June, August, October, and December by Cambridge University Press, 32 Avenue of the Americas, New York, NY 10013-2473, United States/Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU, UK for the World Association for Disaster and Emergency Medicine. 2014 Annual subscription rates: Institutions print and electronic: US\$659.00 in the USA, Canada, and Mexico; UK£402.00+VAT elsewhere. Institutions electronic only: US\$486.00 in the USA, Canada, and Mexico; UK£297.00+VAT elsewhere. Individuals print and electronic: US\$191.00 in the USA, Canada, and Mexico; UK£117.00+VAT elsewhere. Individuals electronic only: US\$139.00 in the USA, Canada, and Mexico; UK£74.00+VAT elsewhere. Prices include postage and insurance. Airmail or registered mail is extra. Back volume prices are available upon request.

Submissions: All manuscripts must be submitted through the Journal's online submission platform, ScholarOne Manuscripts, at http://mc.manuscriptcentral.com/pdm. Please review the Author Instructions and Author Checklist available online before finalizing a submission.

Indexing: National Library of Medicine (MEDLINE), Cumulative Index to Nursing and Allied Health (CINAHL), and Heath Star Cumulative Index.

© World Association for Disaster and Emergency Medicine 2014. 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. Policies, request forms, and contacts are available at: http://www.cambridge.org/rights/permissions/permission. htm. Permission to copy (for users in the United States) is available from Copyright Clearance Center Transactional Reporting Service, 222 Rosewood Drive, Danvers, MA 01923, USA. http://www.copyright.com, email: info@copyright.com.

Printed in United States of America on acid-free paper.

Postmaster: Send address changes in the USA and Canada to *Prehospital and Disaster Medicine*, Subscription Department, Cambridge University Press, 100 Brook Hill Drive, West Nyack, NY 10994-2133, USA.

Periodical postage rate paid at New York, NY and additional mailing offices.

Call for Artwork

The cover design of *Prehospital and Disaster Medicine* calls for a photograph of relevant artwork.

If you have access to artwork that you think may be appropriate, please submit a high-resolution .TIF or .EPS file to:

Ellen Johnson, Managing Editor E-mail: eswenson@wadem.org

All submissions will be evaluated by a panel of judges. Items not selected will be returned to the sender.