# PREHOSPITAL and DISASTER MEDICINE

Volume 30, Supplement 1, 2015





CAMBRIDGE UNIVERSITY PRESS

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

### **JOURNALS**

#### Now included in the Thomson Reuters Social Sciences Citation Index

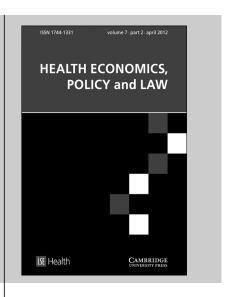
# Health Economics, Policy and Law

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



# 19<sup>th</sup> World Congress on Disaster and Emergency Medicine 21-24 April 2015 Cape Town, South Africa

#### **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£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 © 2015 by the World Association for Disaster and Emergency Medicine.

#### **EDITORIAL BOARD**

# Prehospital and Disaster Medicine

#### EDITOR-IN-CHIEF Samuel 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

# DEPUTY EDITORS David A. Bradt, MD, MPH

Royal Melbourne Hospital Melbourne, Australia

#### Geert Seynaeve, MD

Brussels, Belgium

#### Darren Walter

University Hospital of South Manchester Manchester, UK

#### ASSOCIATE EDITORS 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

#### **SECTION EDITOR**

Humanitarian Aff airs Frederick M. Burkle, MD, MPH, DTM

Senior Fellow and Scientist, Harvard Humanitarian Initiative Harvard University Cambridge, Massachusetts, USA Senior Public Policy Scholar Woodrow Wilson International Center for Scholars

#### EDITORIAL BOARD

#### Carol Amaratunga, PhD

Adjunct Professor School of Child and Youth Development University of Victoria Research Associate of the Justice Institute of British Columbia Canada

#### Paul Arbon, PhD

School of Nursing and Midwifery Flinders University Adelaide, South Australia

#### Frank Archer, MD

Monash University Melbourne, Australia

#### Jeffery Arnold, MD

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

#### Yaron Bar-Dayan, MD, MHA

Israeli Defense Forces Home Front Command Or-Yehuda, Israel

#### Joost Bierens, MD, PhD

Amsterdam, The Netherlands

#### Tareg Bey, MD

Department of Emergency Medicine University of California-Irvine, Irvine, California, USA

#### Richard A. Bissell, PhD

University of Maryland-Baltimore Baltimore, Maryland, USA

#### Felipe Cruz-Vega, MD

Office of Social Security Mexico City, Mexico

#### Robert A. De Lorenzo, MD, MSM, FACEP

Medical Corps United States Army San Antonio, Texas, USA

#### Claude de Ville de Goyet, MD

Brussels, Belgium

#### Judith Fisher, MD

Consultant Washington, DC, USA

#### Erik S. Gaull

George Washington University Washington, DC, USA

#### Michael Gunderson

President Integral Performance Solutions Lakeland, Florida, USA

#### Keith Hotlermann, MD

George Washington University Washington, DC, USA

#### Mark Johnson, MPA

Retired Chief of EMS Juneau, Alaska, USA

#### Mark Keim, MD

Center for Disease Control and Prevention Atlanta, Georgia, USA

#### Todd J. LeDuc, EMT-P

Deputy Fire Chief Broward Sheriff Fire Rescue Ft. Lauderdale, Florida, USA

#### Gloria Leon, PhD

Professor of Psychology University of Minnesota Minneapolis, Minnesota, USA

#### Graeme McColl

Emergency Management Team National Health Board Ministry of Health Christchurch, New Zealand

# Andrew Milsten, MD, MS, FACEP

University of Massachusetts Emergency Medicine Baltimore, Maryland, USA

#### Jerry Overton

President/CEO
Chairman
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

University of Pittsburgh Pittsburgh, Pennsylvania, USA

#### Leonid Roshal, MD

Institute of Pediatrics Academy of Medical Sciences Moscow, Russia

#### Don Schramm

University of Wisconsin-Madison Madison, Wisconsin, USA

#### Knut Ole Sundnes, MD

Baerum Hospital Oslo, Norway

#### Takashi Ukai, MD

Hyogo Emergency Medical Center Hyogo, Japan

#### Michael Van Rooyen, MD

Associate Professor, Harvard Medical School, Brigham and Women's Hospital Boston, Massachusetts, 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.

**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. 2015 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£717.00+VAT elsewhere. Individuals electronic only: US\$139.00 in the USA, Canada, and Mexico; UK£79+VAT elsewhere. Single Part: US\$121.00 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 2015. 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.