

---

# PHN

## PUBLIC HEALTH NUTRITION

---

Volume 21

---

Number 18

---

December 2018

---

Available online at  
[cambridge.org/phn](http://cambridge.org/phn)

# Public Health Nutrition

Volume 21, 2018 ISSN: 1368–9800

Eighteen issues per year

## Aims and Scope

*Public Health Nutrition* provides an international forum for the publication and dissemination of research and scholarship in the form of peer-reviewed original papers and reviews, and for discussion in the form of editorials, commentaries, and correspondence, with a specific focus on nutrition-related public health.

The scope of *Public Health Nutrition* encompasses nutrition and nutrition policy at a population level, including work on assessment of nutritional status and nutritional environments, communication of nutrition-related information, implementation of programs and interventions, and sustainability of dietary patterns, food systems and supplies. We welcome papers that:

- Address assessment, monitoring, and surveillance of nutritional status or the quality of nutritional environments
- Describe the development and evaluation of methodology for assessment, monitoring, and surveillance in population-based samples
- Identify and analyse behavioural, social, cultural, environmental, economic, and political determinants of nutrition-related public health, and dietary and nutritional factors as determinants of health outcomes

- Build intelligence about the development, implementation, and evaluation of interventions and community nutrition programs and efforts
- Describe, discuss, debate and influence nutrition-related public policies
- Serve to build capacity for effective public health nutrition action, including workforce development and educational issues
- Develop perspectives and models to study diet and nutrition as related to the environment and sustainability.

We prefer papers that are innovative and contribute new knowledge to the literature. Papers should be succinct (ie, usually well under 5000 words not including the abstract, references, tables, figures and acknowledgements). Short communications (<2000 words) are welcome. We publish research, scholarship, and discussions that take a population and preventive approach. In addition to original contributions, ideas and suggestions for topics for debate are also welcome. We publish special issues.

*Public Health Nutrition* is available on the Internet at: [journals.cambridge.org/phn](http://journals.cambridge.org/phn)

## International Editorial Board

### Editor-in-Chief

**Dr. Marilyn Tseng**, *California Polytechnic State University, USA*

### Deputy Editors

**Dr Kaleab Baye**, *Addis Ababa University, Ethiopia*

**Professor Sandra Capra**, *University of Queensland, Australia*

**Professor Hélène Delisle**, *University of Montreal, Canada*

**Professor Salome H. Kruger**, *North-West University, South Africa*

**Dr Carl Lachat**, *Gent University, Belgium*

**Dr Stefanie Vandevijvere**, *Scientific Institute of Public Health, Belgium*

### Editors for Systematic Reviews and

#### Meta-analyses

**Professor Dominique Roberfroid**, *Prince Leopold Institute of Tropical Medicine, Belgium*

**Dr Amin Salehi-Abarougai**, *Sahlgrenska University of Medical Sciences, Iran*

**Dr Amin Salehi-Abarougai**, *Sahlgrenska University of Medical Sciences, Iran*

### Statistical Editors

**Ms Zulfa Abrahams**, *Human Sciences Research Council, South Africa*

**Dr Flávia Barbosa**, *Nutrition Institute, Brazil*

**Dr Vassiliki Bountziouka**, *Institute of Child Health, UCL, UK*

**Mr Fabio Gomes**, *National Cancer Institute, Brazil*

**Dr Graham Horgan**, *Rowett Institute, University of Aberdeen, UK*

**Dr Eva Maria Navarrete Munoz**, *CIBER of Epidemiology and Public Health, Spain*

**Dr Eva Maria Navarrete Munoz**, *CIBER of Epidemiology and Public Health, Spain*

**Dr Eva Maria Navarrete Munoz**, *CIBER of Epidemiology and Public Health, Spain*

### Associate Editors

**Dr Geeta Appannah**, *Universiti Putra Malaysia, Malaysia*

**Dr Kathryn Backholer**, *Baker IDI Heart and Diabetes Institute, Australia*

**Dr. Sonia Blaney**, *Université de Moncton, Canada*

**Dr Maxine Bonham**, *Monash University, Australia*

**Dr Maree Brinkman**, *Katholieke Universiteit Leuven, Belgium*

**Dr Maree Brinkman**, *Katholieke Universiteit Leuven, Belgium*

**Dr Maree Brinkman**, *Katholieke Universiteit Leuven, Belgium*

**Dr Mona Calvo**, *U.S. Food and Drug Administration, USA*

**Dr Karen Charlton**, *University of Wollongong, Australia*

**Dr Colleen Doak**, *Vrije University, The Netherlands*

**Dr Shauna Downs**, *Rutgers School of Public Health, USA*

**Dr Isabel Drake**, *Lund University, Sweden*

**Dr. Elizabeth Dunford**, *The George Institute for Global Health, Australia*

**Professor Mieke Faber**, *Medical Research Council, South Africa*

**Professor Ted Greiner**, *Hanyang University, South Korea*

**Dr. Muriel Gubert**, *University of Brasilia, Brazil*

**Dr Sophie Hieke**, *European Food Information Council, Belgium*

**Professor Michelle Holdsworth**, *University of Sheffield, UK*

**Dr Alexis Hure**, *University of Newcastle, Australia*

**Prof. Stephanie Jilcott Pitts**, *East Carolina University, USA*

**Dr Irmgard Jordan**, *University of Giessen, Germany*

**Prof. Tilakavati Karupaiah**, *Taylor's University, Malaysia*

**Dr Bridget Kelly**, *University of Wollongong, Australia*

**Dr. Gina Kennedy**, *Bioviversity International, Italy*

**Dr Jessica Kiefte-de Jong**, *Leiden University College, The Netherlands*

**Dr Cindy Leung**, *University of California, USA*

**Dr Carla Lopes**, *University of Porto, Portugal*

**Dr Joreintje Mackenbach**, *VU University Medical Center, The Netherlands*

**Dr. Catherine Mah**, *Dalhousie University, Canada*

**Professor Alida Melse**, *Wageningen University, The Netherlands*

**Asst. Professor Leia Minaker**, *University of Waterloo, Canada*

**Asst. Professor Leia Minaker**, *University of Waterloo, Canada*

**Asst. Professor Leia Minaker**, *University of Waterloo, Canada*

**Asst. Professor Leia Minaker**, *University of Waterloo, Canada*

**Asst. Professor Leia Minaker**, *University of Waterloo, Canada*

**Asst. Professor Leia Minaker**, *University of Waterloo, Canada*

**Asst. Professor Leia Minaker**, *University of Waterloo, Canada*

**Asst. Professor Leia Minaker**, *University of Waterloo, Canada*

**Asst. Professor Leia Minaker**, *University of Waterloo, Canada*

**Asst. Professor Leia Minaker**, *University of Waterloo, Canada*

**Asst. Professor Leia Minaker**, *University of Waterloo, Canada*

**Asst. Professor Leia Minaker**, *University of Waterloo, Canada*

**Asst. Professor Androniki Naska**, *University of Athens Medical School, Greece*

**Dr Mary Nicolaou**, *AMC, University of Amsterdam, The Netherlands*

**Dr Punam Ohri-Vachaspati**, *Arizona State University, USA*

**Dr Nasrin Omidvar**, *Shahid Beheshti University of Medical Sciences, Iran*

**Professor Nina Overby**, *University of Agder, Norway*

**Dr Emma Patterson**, *Centre for Epidemiology and Social Medicine, Sweden*

**Professor Lisa Pawloski**, *George Mason University, USA*

**Ms Catherine Pereira**, *University of the Western Cape, South Africa*

**Dr Dora Romaguera-Bosch**, *Imperial College London, UK*

**Professor Una MacIntyre**, *University of Pretoria, South Africa*

**Dr Koutatsu Maruyama**, *Ehime University, Japan*

**Professor Marjanne Senekal**, *University of Cape Town, South Africa*

**Dr. YoonJu Song**, *Catholic University of Korea, South Korea*

**Dr Anne Marie Thow**, *University of Sydney, Australia*

**Dr Aida Turrini**, *Agricultural Research Council, Italy*

**Dr. Lana Vanderlee**, *University of Waterloo, Canada*

**Dr Anniza van de Villiers**, *South African Medical Research Council, South Africa*

**Dr Wendy Van Lippevelde**, *University of Gent, Belgium*

**Dr Alison Ventura**, *California Polytechnic State University, USA*

**Professor Jesus Vioque**, *Universidad Miguel Hernandez, Spain*

**Dr Christina Vogel**, *University of Southampton, UK*

**Dr Christina Vogel**, *University of Southampton, UK*

**Dr Christina Vogel**, *University of Southampton, UK*

**Dr Christina Vogel**, *University of Southampton, UK*

**Dr Christina Vogel**, *University of Southampton, UK*

**Dr Christina Vogel**, *University of Southampton, UK*

**Dr Christina Vogel**, *University of Southampton, UK*

**Dr Christina Vogel**, *University of Southampton, UK*

**Dr Christina Vogel**, *University of Southampton, UK*

**Dr Christina Vogel**, *University of Southampton, UK*

**Dr Christina Vogel**, *University of Southampton, UK*

**Dr Christina Vogel**, *University of Southampton, UK*

**Dr Christina Vogel**, *University of Southampton, UK*

**Dr Christina Vogel**, *University of Southampton, UK*

**Dr Christina Vogel**, *University of Southampton, UK*

## The Nutrition Society

The society has as its objective the advancement of the scientific study of nutrition and its application to the maintenance of human and animal health.

Particulars of The Nutrition Society and application forms for membership are available from the Honorary Secretary,

The Nutrition Society, 10 Cambridge Court, 210 Shepherds Bush Road, London W6 7NJ, UK.

Telephone +44 (0)20 7602 0228, Fax +44 (0)20 7602 1756

The Nutrition Society home page is at: <http://www.nutrition-society.org>