



World Health
Organization



UNEP
United Nations
Environment Programme

State of the Science of

Endocrine Disrupting Chemicals 2012

Summary for Decision-Makers

Edited by
Åke Bergman
Jerrold J. Heindel
Susan Jobling
Karen A. Kidd
R. Thomas Zoeller

IOMC

INTER-ORGANIZATION PROGRAMME FOR THE SOUND MANAGEMENT OF CHEMICALS

A cooperative agreement among FAO, ILO, UNDP, UNEP, UNIDO, UNITAR, WHO, World Bank and OECD

This publication was developed in the IOMC context. The contents do not necessarily reflect the views or stated policies of individual IOMC Participating Organizations.

The Inter-Organisation Programme for the Sound Management of Chemicals (IOMC) was established in 1995 following recommendations made by the 1992 UN Conference on Environment and Development to strengthen co-operation and increase international co-ordination in the field of chemical safety. The Participating Organisations are FAO, ILO, UNDP, UNEP, UNIDO, UNITAR, WHO, World Bank and OECD. The purpose of the IOMC is to promote co-ordination of the policies and activities pursued by the Participating Organisations, jointly or separately, to achieve the sound management of chemicals in relation to human health and the environment.

WHO Library Cataloguing-in-Publication Data

State of the science of endocrine disrupting chemicals 2012 / edited by Åke Bergman, Jerrold J. Heindel, Susan Jobling, Karen A. Kidd and R. Thomas Zoeller.

1.Endocrine disruptors. 2.Environmental exposure. 3.Animals, Wild. 4.Endocrine system. 5.Hormone Antagonists I.Bergman, Åke. II.Heindel, Jerrold J. III.Jobling, Susan. IV.Kidd, Karen. V.Zoeller, R. Thomas. VI.World Health Organization. VII.United Nations Environment Programme. VIII.Inter-Organization Programme for the Sound Management of Chemicals.

© United Nations Environment Programme and the World Health Organization, 2013

This Summary Report (UNEP job number: DTI/1554/GE) is based on the main report "State of the Science of Endocrine Disrupting Chemicals - 2012" ISBN: 978-92-807-3274-0 (UNEP) and 978 92 4 150503 1 (WHO) (NLM classification: WK 102).

All rights reserved.

This publication can be obtained from the United Nations Environment Programme (UNEP) (e-mail: unep.tie@unep.org) or from WHO Press, World Health Organization, 20 Avenue Appia, 1211 Geneva 27, Switzerland (tel.: +41 22 791 3264; fax: +41 22 791 4857; e-mail: bookorders@who.int). Requests for permission to reproduce or translate this publication – whether for sale or for noncommercial distribution – should be addressed to UNEP (e-mail: unep.tie@unep.org) or to WHO Press, at the above address (fax: +41 22 791 4806; e-mail: permissions@who.int).

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of UNEP or WHO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement. The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by UNEP or WHO in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters. All reasonable precautions have been taken by UNEP or WHO to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall UNEP or WHO be liable for damages arising from its use.

This document is not a formal publication of the United Nations Environment Programme and the World Health Organization and the views expressed therein are the collective views of the international experts participating in the working group and are not necessarily the views of the organizations.

UNEP promotes environmentally sound practices globally and in its own activities. This publication is printed on 100% recycled paper, using vegetable-based inks and other eco-friendly practices. Our distribution policy aims to reduce UNEP's carbon footprint.

State of the Science of

Endocrine Disrupting Chemicals 2012

Summary for Decision-Makers

An assessment of the state
of the science of endocrine disruptors
prepared by a group of experts
for the United Nations Environment Programme
and World Health Organization.

Edited by
Åke Bergman
Jerrold J. Heindel
Susan Jobling
Karen A. Kidd
R. Thomas Zoeller



1972-2012:
Serving People
and the Planet

Contents

Preface	v
1. Introduction	1
2. Key concerns	2
3. Endocrine systems and endocrine disruption	4
4. Endocrine disruptors and human health	7
5. Why should we be concerned?—Human disease trends	8
6. Endocrine disruptors and wildlife health	10
7. Why should we be concerned?—Population effects in wildlife	11
8. Sensitive periods for endocrine disruptor action—Windows of exposure	12
9. Occurrence of and exposures to endocrine disruptors	14
10. The tip of the iceberg	18
11. Testing for EDCs	19
12. Lessons from the past	20
13. Main conclusions and advances in knowledge since 2002	22
14. Concluding remarks	27
15. References	29

Preface

This *Summary for Decision-Makers*, together with the main document, *State of the Science of Endocrine Disrupting Chemicals—2012*, presents information and key concerns for policy-makers on endocrine disruptors as part of the ongoing collaboration between the World Health Organization (WHO) and the United Nations Environment Programme (UNEP) to address concerns about the potential adverse health effects of chemicals on humans and wildlife. The main messages from the three chapters of the main document are presented as well.

We live in a world in which man-made chemicals have become a part of everyday life. It is clear that some of these chemical pollutants can affect the endocrine (hormonal) system, and certain of these endocrine disruptors may also interfere with the developmental processes of humans and wildlife species. Following international recommendations in 1997 by the Intergovernmental Forum on Chemical Safety and the Environment Leaders of the Eight regarding the issue of endocrine disrupting chemicals (EDCs), WHO, through the International Programme on Chemical Safety (IPCS), a joint programme of WHO, UNEP and the International Labour Organization, developed in 2002 a report entitled *Global Assessment of the State-of-the-Science of Endocrine Disruptors*.

The Strategic Approach to International Chemicals Management (SAICM) was established by the International Conference on Chemicals Management (ICCM) in February 2006, with the overall objective to achieve the sound management of chemicals throughout their life cycle so that, by 2020, chemicals are used and produced in ways that minimize significant adverse effects on human health and the environment.

SAICM recognizes that risk reduction measures need to be improved to prevent the adverse effects of chemicals on the health of children, pregnant women, fertile populations, the elderly, the poor, workers and other vulnerable groups and susceptible environments. It states that one measure to safeguard the health of women and children is the minimization of chemical exposures before conception and through gestation, infancy, childhood and adolescence.

SAICM also specifies that groups of chemicals that might be prioritized for assessment and related studies, such as for the development and use of safe and effective alternatives, include chemicals that adversely affect, inter alia, the reproductive, endocrine, immune or nervous systems. A resolution to include EDCs as an emerging issue under SAICM was adopted in September 2012 by ICCM at its third session.

EDCs represent a challenge, as their effects depend on both the level and timing of exposure, being especially critical when exposure occurs during development. They have diverse applications, such as pesticides, flame retardants in different products, plastic additives and cosmetics, which may result

in residues or contaminants in food and other products. Therefore, EDCs may be released from the products that contain them.

The protection of the most vulnerable populations from environmental threats is a key component of the Millennium Development Goals. As the challenge in meeting the existing goals increases, with work under way in developing countries to overcome traditional environmental threats while dealing with poverty, malnutrition and infectious disease, emerging issues should be prevented from becoming future traditional environmental threats. Endocrine disruption is a challenge that must continue to be addressed in ways that take into account advances in our knowledge.

UNEP and WHO, in collaboration with a working group of international experts, are taking a step forward by developing these documents on endocrine disruptors, including scientific information on their impacts on human and wildlife health and key concerns for decision-makers and others concerned. The well-being of future human and wildlife generations depends on safe environments.

From late 2010 until mid-2012, the working group developed, contributed to and revised sections of the main document during three separate meetings, as well as through teleconferences. Professor Åke Bergman led the working group and facilitated the development of this summary with the editors in coordination with the working group, UNEP and WHO.

The following international scientific experts were part of the working group that developed the documents:

- Georg Becher, Norwegian Institute of Public Health, Norway
- Åke Bergman, Stockholm University, Sweden (Leader)
- Poul Bjerregaard, University of Southern Denmark, Denmark
- Riana Bornman, Pretoria Academic Hospital, South Africa
- Ingvar Brandt, Uppsala University, Sweden
- Jerrold J. Heindel, National Institute of Environmental Health Sciences, USA
- Taisen Iguchi, National Institutes of Natural Sciences, Okazaki, Japan
- Susan Jobling, Brunel University, England
- Karen A. Kidd, University of New Brunswick, Canada
- Andreas Kortenkamp, University of London and Brunel University, England
- Derek C.G. Muir, Environment Canada, Canada

- Roseline Ochieng, Aga Khan University Hospital, Kenya
- Niels Erik Skakkebaek, University of Copenhagen, Denmark
- Jorma Toppari, University of Turku, Finland
- Tracey J. Woodruff, University of California at San Francisco, USA
- R. Thomas Zoeller, University of Massachusetts, USA

The UNEP/WHO Secretariat for this project included:

- Marie-Noel Bruné Drisse, Department of Public Health and Environment, World Health Organization, Geneva, Switzerland
- Carlos Dora, Department of Public Health and Environment, World Health Organization, Geneva, Switzerland
- Ruth A. Etzel, Department of Public Health and Environment, World Health Organization, Geneva, Switzerland
- Agneta Sundén Bylehn, Division of Technology, Industry and Economics, Chemicals Branch, United Nations Environment Programme, Geneva, Switzerland
- Simona Surdu, Department of Public Health and Environment, World Health Organization, Geneva, Switzerland

Editorial assistance was provided by Susan Jobling, and reference processing was performed by Ioannis Athanassiadis, Åke Bergman and Hans von Stedingk. Further editorial assistance was provided by Kathy Prout (WHO) and Marla Sheffer. John Bellamy assisted with the design of drawings and

figures and the layout of the two documents. Nida Besbelli, consultant to the UNEP Secretariat, provided organizational support and assisted with the finalization of references, tables, and lists of abbreviations and species. A list of chemicals, including abbreviations/common names and Chemical Abstracts Service registry numbers, was provided by Derek C.G. Muir and Åke Bergman. A list of species discussed in the summary and main documents was prepared by Nida Besbelli, Åke Bergman, Poul Bjerregaard and Susan Jobling. Further contributions and reviews were received from Heli Bathija (WHO), Timothy J. Kasten (UNEP), Desiree Montecillo Narvaez (UNEP), Maria Neira (WHO) and Sheryl Vanderpoel (WHO).

The working group members, scientific experts and contributors of text served as individual scientists and not as representatives of any organization, government or industry. All individuals who participated in the preparation of these documents served in their personal capacity and were required to sign a Declaration of Interest statement informing the Responsible Officer if, at any time, there was a conflict of interest perceived in their work. Such a procedure was followed, and no conflicts of interest were identified.

The development and publication of the two documents were supported by funds provided to UNEP by the Norwegian government, the Swedish Environment Ministry, the Swedish Research Council (FORMAS) and the Swedish Environmental Protection Agency. Further support was provided to WHO by the United States National Institute of Environmental Health Sciences (NIEHS) through cooperative agreement 1 U01 ES02617. The contents of the documents are solely the responsibility of the contributors and do not necessarily represent the official views of the NIEHS.

预览已结束，完整报告链接和二维码如下：

https://www.yunbaogao.cn/report/index/report?reportId=5_9291

