

LABORATORY BIOSAFETY MANUAL
FOURTH EDITION
AND
ASSOCIATED MONOGRAPHS

DECONTAMINATION AND WASTE MANAGEMENT



World Health
Organization

LABORATORY BIOSAFETY MANUAL
FOURTH EDITION
AND
ASSOCIATED MONOGRAPHS

DECONTAMINATION AND WASTE MANAGEMENT



World Health
Organization

Decontamination and waste management

(Laboratory biosafety manual, fourth edition and associated monographs)

ISBN 978-92-4-001135-9 (electronic version)

ISBN 978-92-4-001136-6 (print version)

© World Health Organization 2020

Some rights reserved. This work is available under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 IGO licence (CC BY-NC-SA 3.0 IGO; <https://creativecommons.org/licenses/by-nc-sa/3.0/igo>).

Under the terms of this licence, you may copy, redistribute and adapt the work for non-commercial purposes, provided the work is appropriately cited, as indicated below. In any use of this work, there should be no suggestion that WHO endorses any specific organization, products or services. The use of the WHO logo is not permitted. If you adapt the work, then you must license your work under the same or equivalent Creative Commons licence. If you create a translation of this work, you should add the following disclaimer along with the suggested citation: "This translation was not created by the World Health Organization (WHO). WHO is not responsible for the content or accuracy of this translation. The original English edition shall be the binding and authentic edition".

Any mediation relating to disputes arising under the licence shall be conducted in accordance with the mediation rules of the World Intellectual Property Organization (<http://www.wipo.int/amc/en/mediation/rules/>).

Suggested citation. Decontamination and waste management. Geneva: World Health Organization; 2020 (Laboratory biosafety manual, fourth edition and associated monographs). Licence: [CC BY-NC-SA 3.0 IGO](#).

Cataloguing-in-Publication (CIP) data. CIP data are available at <http://apps.who.int/iris>.

Sales, rights and licensing. To purchase WHO publications, see <http://apps.who.int/bookorders>. To submit requests for commercial use and queries on rights and licensing, see <http://www.who.int/about/licensing>.

Third-party materials. If you wish to reuse material from this work that is attributed to a third party, such as tables, figures or images, it is your responsibility to determine whether permission is needed for that reuse and to obtain permission from the copyright holder. The risk of claims resulting from infringement of any third-party-owned component in the work rests solely with the user.

General disclaimers. 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 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 and dashed 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 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 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 WHO be liable for damages arising from its use.

Design and layout Paul Bloxham

Contents

| | |
|---|-----------|
| Acknowledgements | iv |
| Glossary of terms | vi |
| Executive summary | ix |
| SECTION 1 Introduction | 1 |
| SECTION 2 Methods of decontamination | 3 |
| 2.1 Cleaning and hand hygiene | 5 |
| 2.2 Chemical disinfection | 6 |
| 2.3 Gaseous disinfection | 14 |
| 2.4 Heat disinfection | 16 |
| 2.5 Sterilization | 21 |
| 2.6 Biological and chemical indicators | 21 |
| SECTION 3 Waste management and decontamination of waste products | 25 |
| 3.1 Considerations for waste management | 25 |
| 3.2 Decontamination of liquid waste | 32 |
| 3.3 Decontamination of solid waste | 34 |
| SECTION 4 Methods of inactivation | 37 |
| 4.1 Inactivation of specimens | 37 |
| References | 42 |
| Further information | 46 |

Acknowledgements

Principal coordinator

Dr Kazunobu Kojima, World Health Organization, Switzerland

Scientific contributors

Mr Allan Bennett (Team lead), Public Health England (WHO Collaborating Centre for Applied Biosafety and Training), United Kingdom of Great Britain and Northern Ireland

Dr Alan Beswick, Health and Safety Laboratory, United Kingdom of Great Britain and Northern Ireland

Ms Marianne Heisz, Public Health Agency of Canada (WHO Collaborating Centre for Biosafety and Biosecurity), Canada

Mr Peter Hoffman, Public Health England (WHO Collaborating Centre for Applied Biosafety and Training), United Kingdom of Great Britain and Northern Ireland

Dr Stéphane Karlen, Institute of Virology and Immunology, University of Bern, Switzerland

Dr Catherine Makison Booth, Health and Safety Laboratory, United Kingdom of Great Britain and Northern Ireland

Dr Paul Meechan, Centers for Disease Control and Prevention (WHO Collaborating Centre for Biosafety and Biosecurity), United States of America

Ms Heather Sheeley, Public Health England (WHO Collaborating Centre for Applied Biosafety and Training), United Kingdom of Great Britain and Northern Ireland

Dr Kathrin Summermatter (Deputy team lead), Institute for Infectious Diseases, University of Bern, Switzerland

Project management

Ms Lisa Stevens, World Health Organization, France

Ms Rica Zinsky, World Health Organization, Switzerland

Reviewers

Dr David Holmes, Centers for Disease Control and Prevention (WHO Collaborating Centre for Biosafety and Biosecurity), United States of America

Technical editing

Ms Fiona Curlet

Financial support

Development and publication of this document have been made possible with financial support from the Global Partnership Program, Global Affairs Canada, the Biosecurity Engagement Program, United States Department of State and the Defense Threat Reduction Agency, US Department of Defense.

Glossary of terms

Available chlorine: A measure of the amount of chlorine available in hypochlorite compounds and other disinfectant chemicals, used as a source of chlorine, when compared with that of pure gaseous chlorine.

Biological agent: A microorganism, biological toxin, protein (prions) or human endoparasite either naturally occurring or genetically modified, which may have the potential to cause infection, allergy, toxicity or otherwise create a hazard to human health.

Biological indicator: Test system containing viable biological agents providing a specified resistance to a specific sterilization process.

Biological safety cabinet (BSC): An enclosed, ventilated working space designed to provide protection to the operator, the laboratory environment and/or the work materials for activities where there is an aerosol hazard. Containment is achieved by segregation of the work from the main area of the laboratory and/or through the use of controlled, directional airflow mechanisms. Exhaust air is passed through a high-efficiency particulate air (HEPA) filter before recirculating into the laboratory or into the building's heating, ventilation and air conditioning system. There are different classes (I, II and III) of BSCs that provide different levels of containment.

Biosafety: Containment principles, technologies and practices that are implemented to prevent unintentional exposure to biological agents or their inadvertent release.

Biosecurity: Principles, technologies and practices that are implemented for the protection, control and accountability of biological materials and/or the equipment, skills and data related to their handling. Biosecurity aims to prevent their unauthorized access, loss, theft, misuse, diversion or release.

Clean: Visually free of soil and below specified levels of analytes.

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_24178

