



# **GLOBAL ANALYSIS OF HEALTH CARE WASTE IN THE CONTEXT OF COVID-19**

**STATUS, IMPACTS  
AND RECOMMENDATIONS**



**GLOBAL  
ANALYSIS  
OF HEALTH  
CARE WASTE  
IN THE  
CONTEXT  
OF COVID-19**

**STATUS, IMPACTS  
AND RECOMMENDATIONS**



Global analysis of healthcare waste in the context of COVID-19:  
status, impacts and recommendations

ISBN 978-92-4-003961-2 (electronic version)

ISBN 978-92-4-003962-9 (print version)

**© World Health Organization 2022**

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**).

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.** Global analysis of healthcare waste in the context of COVID-19: status, impacts and recommendations. Geneva: World Health Organization; 2022. 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.

Publication design by Blossom.

# CONTENTS

ACKNOWLEDGEMENT viii ▶

ACRONYMS xi ▶

SUMMARY xii ▶

# 1

BACKGROUND  
AND CONTEXT

click on the chapter  
title, numbers and  
arrows to navigate  
through sections

# 2

WASTE VOLUMES AND  
PRACTICES ASSOCIATED  
WITH COVID-19

2.1 Global status of healthcare  
waste management  
**4** ▶

2.2 Healthcare waste associated  
with COVID-19  
**5** ▶

2.3 UN shipments of PPE for  
COVID-19  
**9** ▶

click on the arrows  
to navigate the report

▶

vi

◀

▶

▶

# 3

## INNOVATIVE SOLUTIONS FOR IMPROVING ENVIRONMENTAL SUSTAINABILITY OF SAFE HEALTHCARE WASTE MANAGEMENT

3.1 Reduction in amount of unnecessary PPE through safe and rational use  
**16 ▶**

3.2 Use of smaller quantities of, and more sustainable, packaging  
**17 ▶**

3.3 Development and use of safely reusable gloves, aprons and masks  
**18 ▶**

3.4 Use of PPE made with a greater proportion of renewable, biobased or recyclable materials  
**19 ▶**

3.5 Reverse logistics and centralized treatment of waste using non-burn technologies  
**20 ▶**

3.6 More local and regional production, and just-in-time shipments  
**21 ▶**

# 4

## RECOMMENDATIONS

4.1 Global  
**24 ▶**

4.2 National  
**25 ▶**

4.3 Facility  
**29 ▶**

# 5

## CONCLUSION

## REFERENCE AND ANNEXES

References  
**33 ▶**

Annex 1  
Methodology  
**38 ▶**

Annex 2  
Calculation of PPE volume  
**39 ▶**

Annex 3  
Pyramid of glove use  
**40 ▶**

Annex 4  
Global indicators of waste segregation and treatment  
**43 ▶**

Annex 5  
Case studies of implementing healthcare waste recommendations  
**44 ▶**

## ACKNOWLEDGEMENTS

This report was written by **Maggie Montgomery** and **Arabella Hayter** (WHO Water, Sanitation, Hygiene and Health Unit), and **Joyce Klu** and **Ute Pieper** (expert consultants). Strategic direction was provided by **Bruce Gordon** (Coordinator, WHO Water, Sanitation, Hygiene and Health Unit). Technical editing was done by Biotex.

Special thanks are extended to **Connie McDonough-Thaye** for providing and analysing data on waste volumes and to the following partners for their technical contributions and review: Health Care without Harm, the United Nations Development Programme (UNDP), the United Nations International Children's Fund (UNICEF), the Global Fund, the International Solid Waste Association (ISWA), the International Finance Corporation (IFC), the United Nations Industrial Development Organization (UNIDO), and members of the following WHO teams: Infection Prevention and Control, Emergencies, Medical Devices and Immunizations.

WHO gratefully acknowledges the financial support provided by Public Health Agency of Canada, United Kingdom Foreign Commonwealth and Development Office (FCDO).

In particular, the authors would like to thank the following who provided case studies, conducted technical review and offered other insights to the report:

**Andrés Aguirre Martínez**, Hospital Pablo Tobón Uribe, Colombia

**Benedetta Allegranzi**, WHO, Switzerland

**Belynda Amankwa**, UNDP, Ghana

**Maureen Amutuhair**, Ministry of Health, Uganda

**Selimcan Azizoglu**, UNDP, Turkey

**April Baller**, WHO, Switzerland

**Emily Bancroft**, VillageReach, United States of America

**Prakash Bohara**, Terre des hommes, Nepal

**John Brogan**, HELVETAS Swiss Intercooperation, Switzerland

**Juliet Bryant**, Global Fund, Switzerland

**Eileen Burke**, Global Fund, Switzerland

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\\_23375](https://www.yunbaogao.cn/report/index/report?reportId=5_23375)

