



Universiteit  
Leiden  
The Netherlands

## Generating epidemiological evidence for controlling emerging infectious disease outbreaks

Ewijk, C.E. van

### Citation

Ewijk, C. E. van. (2026, May 8). *Generating epidemiological evidence for controlling emerging infectious disease outbreaks*. Retrieved from <https://hdl.handle.net/1887/4303338>

Version: Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/4303338>

**Note:** To cite this publication please use the final published version (if applicable).

# **Generating epidemiological evidence for controlling emerging infectious disease outbreaks**

Katja van Ewijk

The research described in this thesis was performed at the National Institute for Public Health and the Environment (RIVM), Bilthoven, the Netherlands; and the Public Health Service Amsterdam, the Netherlands.

Design en kunstwerk bookcover: Nicoline Frederique – Atelier Ink Amsterdam  
[www.ink-amsterdam.nl](http://www.ink-amsterdam.nl)

Lay-out: Arul Raja | [www.ridderprint.nl](http://www.ridderprint.nl)

Print: [www.ridderprint.nl](http://www.ridderprint.nl)

ISBN: 978-94-6537-233-4

Copyright 2026 © Katja van Ewijk

All rights reserved. No part of this thesis may be reproduced, stored or transmitted in any form or by any means without prior written permission of the copyright author.

# Generating epidemiological evidence for controlling emerging infectious disease outbreaks

Proefschrift

ter verkrijging van

de graad van doctor aan de Universiteit Leiden,

op gezag van rector magnificus prof. dr. S. de Rijcke,

volgens besluit van het college voor promoties

te verdedigen op vrijdag 8 mei 2026

klokke 13.00 uur

door

Catharina Else van Ewijk

geboren te Amsterdam

in 1989

Promotor: Prof. Dr. S. van den Hof

Copromotoren: Dr. S.J.M. Hahné (Rijksinstituut voor Volksgezondheid en Milieu)

Dr. M.J. Knol (Rijksinstituut voor Volksgezondheid en Milieu)

Promotiecommissie: Prof. Dr. J.G. van der Bom

Prof. Dr. A. Timen (Radboud Universitair Medisch Centrum)

Prof. Dr. M.F. Schim van der Loeff (Amsterdam Universitair Medisch Centrum)

Prof. Dr. C.J.P.A. Hoebe (Universiteit Maastricht)

Prof. Dr. P.C.J.L. Bruijning-Verhagen (Universitair Medisch Centrum Utrecht)

# TABLE OF CONTENTS

|                  |                                                                                                                                                                                                                          |     |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Chapter 1</b> | General introduction                                                                                                                                                                                                     | 9   |
| <b>Part I</b>    | <b>COVID-19</b>                                                                                                                                                                                                          | 25  |
| <b>Chapter 2</b> | Epidemiological and genomic analysis of SARS-CoV-2 Delta variant superspreading event in a nightclub, the Netherlands, June 2021.<br><i>Emerging Infectious Diseases</i> . 2022 May; 28(5)                               | 27  |
| <b>Chapter 3</b> | COVID-19 outbreak in an elderly care home: very low vaccine effectiveness and late impact of booster vaccination campaign.<br><i>Vaccine</i> . 2022 Nov 2; 40 (46)                                                       | 53  |
| <b>Chapter 4</b> | Vaccine effectiveness against SARS-CoV-2 infection during the Delta period, a nationwide study, adjusting for chance of exposure, the Netherlands, July to December 2021.<br><i>Eurosurveillance</i> . 2022 Nov; 27 (45) | 71  |
| <b>Chapter 5</b> | Innate Immune Response after BNT162b2 COVID-19 vaccination associates with reactogenicity.<br><i>Vaccine X</i> . 2024 Dec 4; 22                                                                                          | 95  |
| <b>Part II</b>   | <b>Mpox</b>                                                                                                                                                                                                              | 125 |
| <b>Chapter 6</b> | Mpox outbreak in the Netherlands, 2022: public health response, characteristics of the first 1000 cases and the protection of the first-generation smallpox vaccine.<br><i>Eurosurveillance</i> . 2023 Mar 23; 28 (12)   | 127 |
| <b>Chapter 7</b> | Estimated incubation period for mpox cases confirmed in the Netherlands, May 2022.<br><i>Eurosurveillance</i> 2022 Jun 16; 27 (24)                                                                                       | 157 |
| <b>Chapter 8</b> | Acceptance and timeliness of post-exposure vaccination against mpox in high-risk contacts, Amsterdam, the Netherlands, May-July 2022.<br><i>Vaccine</i> . 2023 Nov 13; 41 (47)                                           | 167 |

|                   |                      |     |
|-------------------|----------------------|-----|
| <b>Chapter 9</b>  | General discussion   | 189 |
| <b>Appendices</b> |                      |     |
|                   | Summary              | 218 |
|                   | Samenvatting         | 221 |
|                   | Portfolio            | 225 |
|                   | List of publications | 228 |
|                   | Curriculum Vitae     | 231 |
|                   | Acknowledgement      | 232 |