Catching the common cold
Bruning, A.H.L.

Citation for published version (APA):
Bruning, A. H. L. (2017). Catching the common cold: Rapid detection and epidemiology of respiratory viruses

General rights
It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations
If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: http://uba.uva.nl/en/contact, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.
Acute respiratory tract infections are a leading cause of morbidity and mortality worldwide. Symptoms can be mild, for example those of the ‘common cold’, but severe complications such as pneumonia may develop. Respiratory viruses are thought to be responsible for the vast majority of respiratory tract infections. Rapid identification of these viruses is important for clinical patient management, public health surveillance, and infection prevention. In recent years, the diagnostic possibilities for the detection of respiratory viruses have advanced rapidly. There is a clear trend towards faster diagnostics. Increasing numbers of rapid tests designed for use at the point-of-care have been developed. The aim of this thesis is 1) to evaluate the use and diagnostic accuracy of rapid tests for respiratory viruses in the hospital setting and in primary health care; 2) to increase our insight in the epidemiology and clinical relevance of respiratory viruses.
CATCHING THE COMMON COLD

Rapid detection and epidemiology of respiratory viruses

Andrea Hubertina Lena Bruning
CATCHING THE COMMON COLD
Rapid detection and epidemiology of respiratory viruses

ACADEMISCH PROEFSCHRIFT

ter verkrijging van de graad van doctor
aan de Universiteit van Amsterdam
op gezag van de Rector Magnificus
prof. dr. ir. K.I.J. Maex
ten overstaan van een door het College voor Promoties ingestelde commissie,
in het openbaar te verdedigen in de Agnietenkapel
op vrijdag 12 mei 2017, te 14:00 uur

door

Andrea Hubertina Lena Bruning
egeboren te Maastricht
PROMOTIECOMMISSIE

Promotores
Prof. dr. M.D. de Jong | Universiteit van Amsterdam
Prof. dr. T.W. Kuijpers | Universiteit van Amsterdam

Copromotores
Dr. D. Pajkrt | Universiteit van Amsterdam
Dr. K.C. Wolthers | Universiteit van Amsterdam

Overige leden
Prof. dr. N.P. Juffermans | Universiteit van Amsterdam
Prof. dr. H.C.P.M. van Weert | Universiteit van Amsterdam
Prof. dr. H.L. Zaaijer | Universiteit van Amsterdam
Prof. dr. H.A. Moll | Erasmus Universiteit Rotterdam
Prof. dr. H.G.M. Niesters | Rijksuniversiteit Groningen
Dr. S.M.G. van der Sanden | AMC - UvA

Faculteit der Geneeskunde
"I love the doctors—they are dears;  
But must they spend such years and years  
Investigating such a lot  
Of illnesses which no one's got,  
When everybody, young and old,  
Is frantic with the common cold?  
And I will eat my only hat  
If they know anything of that!"

A.P. Herbert, 1936
CONTENTS

1. General introduction 9

PART I. RAPID DETECTION OF RESPIRATORY VIRUSES 23

2. Rapid tests for respiratory viruses: a systematic review and meta-analysis 25
3. Evaluation of a rapid antigen detection point-of-care test for respiratory syncytial virus and influenza in a pediatric hospitalized population in the Netherlands 63
4. Detection and monitoring of human bocavirus 1 infection by a new rapid antigen test 71
5. Rapid detection and monitoring of human coronavirus infections 79
6. Diagnostic performance and clinical feasibility of a point-of-care test for respiratory viral infections in primary health care 87

PART II. EPIDEMIOLOGY OF RESPIRATORY VIRUSES 103

7. A molecular epidemiological perspective of rhinovirus types circulating in Amsterdam from 2007 to 2012 105
8. Clinical, virological and epidemiological characteristics of rhinovirus infections in early childhood: a comparison between non-hospitalised and hospitalised children 127
9. Respiratory viruses in a primary health care facility in Amsterdam, the Netherlands 147
10. Summary 161
11. General discussion 169

APPENDICES 183

Nederlandse samenvatting 185
List of co-authors 191
Author contributions 193
PhD portfolio 195
List of publications 199
Acknowledgements 201
About the author 203