

VOLUME 111 NUMBER 3 DECEMBER 1993

Epidemiology and Infection

Epidemiology and Infection

INTERNATIONAL ADVISORY BOARD

R. M. Anderson (London)	J. C. de Jong (Bilthoven)	S. Palmer (Cardiff)
R. D. Barry (Australia)	A. P. Kendal (Denmark)	D. J. Platt (Glasgow)
P. S. Brachman (Atlanta)	J. B. Kurtz (Oxford)	B. Rowe (London)
M. Chernesky (Canada)	D. H. Lloyd (London)	R. Swanepoel (South Africa)
M. Degré (Oslo)	S. Logan (London)	R. S. Tedder (London)
L. Devriese (Belgium)	R. R. Marples (London)	E. J. Threlfall (London)
R. G. Finch (Nottingham)	T. J. Marrie (Canada)	H. E. Tillett (London)
R. J. Gilbert (London)	C. Martin-Bourgon (Madrid)	J. P. Vandenbroucke (Leiden)
P. D. Griffiths (London)	O. H. Meurman (Turku)	P. J. Wilkinson (Pirbright)
Anna Hambræus (Uppsala)	Elizabeth Miller (London)	M. Woodward (Aldershot)
D. J. Hampson (Australia)	P. P. Mortimer (London)	
T. Humphrey (Exeter)	J. S. Oxford (London)	

Epidemiology and Infection publishes reports of research and original findings in subjects related to infectious diseases. Particular emphasis is given to the epidemiology, prevention and control of such diseases, but the field covered is broad and includes the microbiological, virological, immunological, clinical and social aspects of infectious diseases of man and animals.

© Cambridge University Press 1993

PERMISSIONS

Copying: This journal is registered with the Copyright Clearance Center, 27 Congress Street, Salem, Mass. 01970. Organizations in the USA who are also registered with the C.C.C. may therefore copy material (beyond the limits permitted by sections 107 and 108 of US copyright law) subject to payment to C.C.C. of the per-copy fee of \$5.00. This consent does not extend to multiple copying for promotional or commercial purposes. Code 0950-2688/93 \$5.00 + .00.

ISI Tear Sheet Service, 3501 Market Street, Philadelphia, Pennsylvania 19104, USA, is authorized to supply single copies of separate articles for private use only.

Organizations authorized by the Copyright Licensing Agency may also copy material subject to the usual conditions.

For all other use, permission should be sought from Cambridge or the American Branch of Cambridge University Press.

SUBSCRIPTIONS

Epidemiology and Infection (ISSN 0950-2688) is published annually in two volumes of three parts in February, April, June, August, October and December.

The subscription price of volumes 110 and 111, 1993, is £147 net (USA, Canada and Mexico US \$279) (post free); single parts are available at £27 net (USA, Canada and Mexico US \$49 per year) plus postage. Back volumes are also available. Orders, which must be accompanied by payment, may be sent to any bookseller or subscription agent or to the publisher: Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU, or in the USA, Canada and Mexico to Cambridge University Press, Journals Department, 40 West 20th Street, New York, NY 10011-4211. Japanese prices for institutions (including ASP delivery) are available from Kinokuniya Company Ltd, P.O. Box 55, Chitose, Tokyo. Second class postage paid at New York, NY, and at additional mailing offices. POSTMASTER: send address changes in USA, Canada and Mexico to *Epidemiology and Infection*, Cambridge University Press, 110 Midland Avenue, Port Chester, New York, NY 10573-9864.

Claims for missing issues should be made immediately on receipt of the subsequent issue.

EPIDEMIOLOGY AND INFECTION

VOLUME 111 NUMBER 3 DECEMBER 1993

EDITED BY

J. R. PATTISON

University College London Medical School, London WC1E 6JJ

D. BAXBY

University of Liverpool, Liverpool L69 3BX

J. G. CRUICKSHANK

Public Health Laboratory, Exeter, Devon EX2 5AD

M. H. HINTON

Department of Veterinary Medicine, Bristol BS18 7DV

C. R. MADELEY

University of Newcastle upon Tyne NE1 4LP

W. C. NOBLE

United Medical and Dental Schools, London SE1 7EH

MANAGING EDITOR

P. MORGAN-CAPNER

Royal Preston Hospital, Preston PR2 4HG

 **CAMBRIDGE**
UNIVERSITY PRESS

Published by the Press Syndicate of the University of Cambridge
The Pitt Building, Trumpington Street, Cambridge CB2 1RP
40 West 20th Street, New York 10011-4211, USA
10 Stamford Road, Oakleigh, Melbourne 3166, Australia

© Cambridge University Press 1993

Printed in Great Britain by the University Press, Cambridge