

Measuring prevalence, reliability and variation in high-risk prescribing in general practice using multilevel modelling of observational data in a population database

Bruce Guthrie,^{1*} Ning Yu,^{2,3} Douglas Murphy,¹
Peter T Donnan¹ and Tobias Dreischulte²

¹Quality, Safety and Informatics Research Group, Population Health Sciences Division, Medical Research Institute, University of Dundee, Dundee, UK

²Tayside Medicine Unit, NHS Tayside, Dundee, UK

³Institute of Epidemiology and Health, Faculty of Population Health Sciences, University College London, London, UK

*Corresponding author

Declared competing interests of authors: Professor Peter Donnan is a member of the New Drugs Committee of the Scottish Medicines Consortium and reports grants from GSK, grants from Lundbeck, grants from Gilead and grants from Otsuka outside the submitted work.

Published October 2015

DOI: 10.3310/hsdr03420

Plain English summary

High-risk prescribing in general practice

Health Services and Delivery Research 2015; Vol. 3: No. 42

DOI: 10.3310/hsdr03420

NIHR Journals Library www.journalslibrary.nihr.ac.uk

Plain English summary

High-risk prescribing is the prescribing of drugs to people particularly vulnerable to side effects of those drugs because of their age, the conditions they have or other drugs they are taking. High-risk prescribing is not always inappropriate because in some people the expected benefits will outweigh the potential risks. The study found that high-risk prescribing is common and that both practices and general practitioners (GPs) vary significantly in how often they start high-risk prescriptions of anti-inflammatory painkillers such as ibuprofen. There is more variation between GPs than between practices, suggesting that decisions to start high-risk anti-inflammatory painkillers are largely determined by individual GP decisions rather than the way the practice is organised. However, high-risk prescribing at GP level cannot be easily measured using existing electronic data and it is not possible to identify GPs with above average high-risk prescribing by targeting practices with above average high-risk prescribing. Between 2004 and 2009, high-risk prescribing, measured using 17 indicators, fell from use in about 1 in 12 people particularly vulnerable to drug side effects to use in about 1 in 20, but this was largely because of falling use of anti-inflammatory painkillers in these people rather than because all types of high-risk prescribing reduced. The main implication of the study is that prescribing safety improvement is likely to be better implemented in all practices rather than trying to target practices or GPs with above average high-risk prescribing. Research is needed to better understand why high-risk prescribing varies so much and to develop and evaluate ways of improving it.

Health Services and Delivery Research

ISSN 2050-4349 (Print)

ISSN 2050-4357 (Online)

This journal is a member of and subscribes to the principles of the Committee on Publication Ethics (COPE) (www.publicationethics.org/).

Editorial contact: nihredit@southampton.ac.uk

The full HS&DR archive is freely available to view online at www.journalslibrary.nihr.ac.uk/hsdr. Print-on-demand copies can be purchased from the report pages of the NIHR Journals Library website: www.journalslibrary.nihr.ac.uk

Criteria for inclusion in the *Health Services and Delivery Research* journal

Reports are published in *Health Services and Delivery Research* (HS&DR) if (1) they have resulted from work for the HS&DR programme or programmes which preceded the HS&DR programme, and (2) they are of a sufficiently high scientific quality as assessed by the reviewers and editors.

HS&DR programme

The Health Services and Delivery Research (HS&DR) programme, part of the National Institute for Health Research (NIHR), was established to fund a broad range of research. It combines the strengths and contributions of two previous NIHR research programmes: the Health Services Research (HSR) programme and the Service Delivery and Organisation (SDO) programme, which were merged in January 2012.

The HS&DR programme aims to produce rigorous and relevant evidence on the quality, access and organisation of health services including costs and outcomes, as well as research on implementation. The programme will enhance the strategic focus on research that matters to the NHS and is keen to support ambitious evaluative research to improve health services.

For more information about the HS&DR programme please visit the website: <http://www.nets.nihr.ac.uk/programmes/hsdr>

This report

The research reported in this issue of the journal was funded by the HS&DR programme or one of its preceding programmes as project number 10/2000/29. The contractual start date was in October 2011. The final report began editorial review in May 2014 and was accepted for publication in October 2014. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The HS&DR editors and production house have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the final report document. However, they do not accept liability for damages or losses arising from material published in this report.

This report presents independent research funded by the National Institute for Health Research (NIHR). The views and opinions expressed by authors in this publication are those of the authors and do not necessarily reflect those of the NHS, the NIHR, NETSCC, the HS&DR programme or the Department of Health. If there are verbatim quotations included in this publication the views and opinions expressed by the interviewees are those of the interviewees and do not necessarily reflect those of the authors, those of the NHS, the NIHR, NETSCC, the HS&DR programme or the Department of Health.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Guthrie *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Published by the NIHR Journals Library (www.journalslibrary.nihr.ac.uk), produced by Prepress Projects Ltd, Perth, Scotland (www.prepress-projects.co.uk).

Health Services and Delivery Research Editor-in-Chief

Professor Ray Fitzpatrick Professor of Public Health and Primary Care, University of Oxford, UK

NIHR Journals Library Editor-in-Chief

Professor Tom Walley Director, NIHR Evaluation, Trials and Studies and Director of the HTA Programme, UK

NIHR Journals Library Editors

Professor Ken Stein Chair of HTA Editorial Board and Professor of Public Health, University of Exeter Medical School, UK

Professor Andree Le May Chair of NIHR Journals Library Editorial Group (EME, HS&DR, PGfAR, PHR journals)

Dr Martin Ashton-Key Consultant in Public Health Medicine/Consultant Advisor, NETSCC, UK

Professor Matthias Beck Chair in Public Sector Management and Subject Leader (Management Group), Queen's University Management School, Queen's University Belfast, UK

Professor Aileen Clarke Professor of Public Health and Health Services Research, Warwick Medical School, University of Warwick, UK

Dr Tessa Crilly Director, Crystal Blue Consulting Ltd, UK

Dr Peter Davidson Director of NETSCC, HTA, UK

Ms Tara Lamont Scientific Advisor, NETSCC, UK

Professor Elaine McColl Director, Newcastle Clinical Trials Unit, Institute of Health and Society, Newcastle University, UK

Professor William McGuire Professor of Child Health, Hull York Medical School, University of York, UK

Professor Geoffrey Meads Professor of Health Sciences Research, Faculty of Education, University of Winchester, UK

Professor John Norrie Health Services Research Unit, University of Aberdeen, UK

Professor John Powell Consultant Clinical Adviser, National Institute for Health and Care Excellence (NICE), UK

Professor James Raftery Professor of Health Technology Assessment, Wessex Institute, Faculty of Medicine, University of Southampton, UK

Dr Rob Riemsma Reviews Manager, Kleijnen Systematic Reviews Ltd, UK

Professor Helen Roberts Professor of Child Health Research, UCL Institute of Child Health, UK

Professor Helen Snooks Professor of Health Services Research, Institute of Life Science, College of Medicine, Swansea University, UK

Professor Jim Thornton Professor of Obstetrics and Gynaecology, Faculty of Medicine and Health Sciences, University of Nottingham, UK

Please visit the website for a list of members of the NIHR Journals Library Board:
www.journalslibrary.nihr.ac.uk/about/editors

Editorial contact: nihredit@southampton.ac.uk