

Assessing the impact and cost-effectiveness of needle and syringe provision and opioid substitution therapy on hepatitis C transmission among people who inject drugs in the UK: an analysis of pooled data sets and economic modelling

Lucy Platt,^{1*} Sedona Sweeney,¹ Zoe Ward,²
Lorna Guinness,¹ Matthew Hickman,² Vivian Hope,³
Sharon Hutchinson,⁴ Lisa Maher,⁵ Jenny Iversen,⁵
Noel Craine,⁶ Avril Taylor,⁷ Alison Munro,⁸
John Parry,³ Josie Smith⁶ and Peter Vickerman²

¹Faculty of Public Health and Policy, London School of Hygiene and Tropical Medicine, London, UK

²School of Social and Community Medicine, University of Bristol, Bristol, UK

³Centre for Infectious Disease Surveillance and Control, Public Health England, London, UK

⁴School of Health and Life Sciences, Glasgow Caledonian University, Glasgow, UK

⁵Viral Hepatitis Epidemiology and Prevention Program, Kirby Institute, University of New South Wales, Sydney, NSW, Australia

⁶Health Protection Division, Public Health Wales, Cardiff, UK

⁷School of Media Society and Culture, University of the West of Scotland, Paisley, UK

⁸School of Social Science, University of the West of Scotland, Paisley, UK

*Corresponding author lucy.platt@lshtm.ac.uk

Declared competing interests of authors: Lorna Guinness reports grants from the London School of Hygiene and Tropical Medicine during the conduct of the study. Matthew Hickman is a member of the Public Health Research Funding Board. Sharon Hutchinson reports grants from the National Institute for Health Research during the conduct of the study and personal fees from AbbVie Inc. and Gilead Sciences, Inc., outside the submitted work. Avril Taylor reports grants from NHS National Services Scotland during the conduct of the study. Alison Munro reports personal fees from Janssen UK outside the submitted work. John Parry reports grants from the London School of Hygiene and Tropical Medicine during the conduct of the study.

Published September 2017

DOI: 10.3310/phr05050

Plain English summary

NSP and OST for hepatitis C

Public Health Research 2017; Vol. 5: No. 5

DOI: 10.3310/phr05050

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

Plain English summary

Almost half of people who inject drugs (PWID) have the hepatitis C virus (HCV), so preventing transmission is crucial to reduce inequalities in health. The provision of clean injecting equipment through needle and syringe programmes (NSPs) and opioid substitution therapy (OST) are the primary interventions by which to reduce HCV infection among PWID in the UK. We undertook a study to assess how effective both interventions are in preventing new cases of HCV infection and to examine the cost-effectiveness (i.e. value for money) of NSPs. To estimate effectiveness, we conducted a review of international evidence and analysed existing data that measure service use and HCV infection. We collected data on the costs of running NSPs. We applied findings to mathematical models to estimate the effect on the spread of HCV infection if we withdrew or increased the interventions, and assessed how cost-effective they are. Use of OST reduces the chances of being infected with HCV infection by 37–60%, having a clean needle or syringe for each injection reduces the chance of infection by 20–76%, and OST and having a clean needle or syringe in combination reduces the chance of infection by 35–87%. We found NSPs to be cost-effective and money saving in many settings: maintaining services could save up to £5.4M in HCV infection treatment costs, as well as improving quality of life. Findings from the mathematical modelling predict that removing either or both NSPs and OST would result in an increase in HCV infections over the next 15 years. Increasing participation in NSPs in line with OST could reduce new HCV infections by half.

Public Health Research

ISSN 2050-4381 (Print)

ISSN 2050-439X (Online)

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

Editorial contact: journals.library@nihr.ac.uk

The full PHR archive is freely available to view online at www.journalslibrary.nihr.ac.uk/phr. 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 *Public Health Research* journal

Reports are published in *Public Health Research* (PHR) if (1) they have resulted from work for the PHR programme, and (2) they are of a sufficiently high scientific quality as assessed by the reviewers and editors.

Reviews in *Public Health Research* are termed 'systematic' when the account of the search, appraisal and synthesis methods (to minimise biases and random errors) would, in theory, permit the replication of the review by others.

PHR programme

The Public Health Research (PHR) programme, part of the National Institute for Health Research (NIHR), evaluates public health interventions, providing new knowledge on the benefits, costs, acceptability and wider impacts of non-NHS interventions intended to improve the health of the public and reduce inequalities in health. The scope of the programme is multi-disciplinary and broad, covering a range of interventions that improve public health. The Public Health Research programme also complements the NIHR Health Technology Assessment programme which has a growing portfolio evaluating NHS public health interventions.

For more information about the PHR programme please visit the website: <http://www.nets.nihr.ac.uk/programmes/phr>

This report

The research reported in this issue of the journal was funded by the PHR programme as project number 12/3070/13. The contractual start date was in October 2013. The final report began editorial review in May 2016 and was accepted for publication in December 2016. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The PHR 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 PHR 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 PHR programme or the Department of Health.

© Queen's Printer and Controller of HMSO 2017. This work was produced by Platt *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).

Public Health Research Editor-in-Chief

Professor Martin White Director of Research and Programme Leader, UKCRC Centre for Diet and Activity Research (CEDAR), MRC Epidemiology Unit, Institute of Metabolic Science, School of Clinical Medicine, University of Cambridge; Visiting Professor, Newcastle University; and Director, NIHR Public Health Research Programme

NIHR Journals Library Editor-in-Chief

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

NIHR Journals Library Editors

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

Professor Andrée Le May Chair of NIHR Journals Library Editorial Group (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

Dr Tessa Crilly Director, Crystal Blue Consulting Ltd, UK

Dr Eugenia Cronin Senior Scientific Advisor, Wessex Institute, UK

Dr Peter Davidson Director of the NIHR Dissemination Centre, University of Southampton, UK

Ms Tara Lamont Scientific Advisor, NETSCC, UK

Dr Catriona McDaid Senior Research Fellow, York Trials Unit, Department of Health Sciences, University of York, UK

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

Professor Geoffrey Meads Professor of Wellbeing Research, University of Winchester, UK

Professor John Norrie Chair in Medical Statistics, University of Edinburgh, 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 Jonathan Ross Professor of Sexual Health and HIV, University Hospital Birmingham, 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

Professor Martin Underwood Director, Warwick Clinical Trials Unit, Warwick Medical School, University of Warwick, 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: journals.library@nihr.ac.uk