



## Extended Research Article

# Using natural experiments to evaluate population health interventions: a framework for producers and users of evidence

Peter Craig,<sup>1\*</sup> Mhairi Campbell,<sup>1</sup> Manuela Deidda,<sup>2</sup>  
Ruth Dundas,<sup>1</sup> Judith Green,<sup>3</sup> Srinivasa Vittal Katikireddi,<sup>1</sup>  
Jim Lewsey,<sup>2</sup> David Ogilvie,<sup>4</sup> Frank de Vocht<sup>5,6</sup>  
and Martin White<sup>4</sup>

<sup>1</sup>MRC/CSO Social and Public Health Sciences Unit, School of Health and Wellbeing, University of Glasgow, Glasgow, UK

<sup>2</sup>Health Economics and Health Technology Assessment, School of Health and Wellbeing, University of Glasgow, Glasgow, UK

<sup>3</sup>Wellcome Centre for Cultures and Environments of Health, University of Exeter, Exeter, UK

<sup>4</sup>MRC Epidemiology Unit, University of Cambridge, Cambridge, UK

<sup>5</sup>Population Health Sciences, Bristol Medical School, University of Bristol, Bristol, UK

<sup>6</sup>NIHR Applied Research Collaboration West, Bristol, UK

\*Corresponding author [Peter.Craig@glasgow.ac.uk](mailto:Peter.Craig@glasgow.ac.uk)

Published March 2025  
DOI: 10.3310/JTYW6582

## Plain language summary

Using natural experiments to evaluate population health interventions:  
a framework for producers and users of evidence

Public Health Research 2025; Vol. 13: No. 3  
DOI: 10.3310/JTYW6582

NIHR Journals Library [www.journalslibrary.nihr.ac.uk](http://www.journalslibrary.nihr.ac.uk)

## Plain language summary

Governments and other organisations often make changes, for example bringing in new laws, new taxes or changes in the way health care is organised. Changes like these, which are not made by researchers, can be called 'natural experiments'. As long as some people are affected by a change and some are not, researchers may be able to study the health effects of the changes anyway. We call this 'natural experimental evaluation'.

There is already some guidance on how to conduct this type of research, but methods are advancing constantly and this study needed to update the guidance in a new framework. The researchers formed a writing group to do this, made up of people with skills and experience in doing evaluations of natural experiments. The researchers also held workshops and consulted online with a wider group of experts, including people who use the findings of natural experimental evaluations to help decisions about making public policy. This wider group advised on what should be included in the framework. The writing group was assigned to write the final framework.

In this framework, the researchers explain key words and phrases. They also explain why it is important to have a broad definition of a natural experiment. The researchers outline key aspects to bear in mind when designing an evaluation. These include identifying the best opportunities for evaluations, understanding natural experiments within their real-world context, using a variety of research methods, obtaining data, involving stakeholders and various other practical issues. The researchers provide an overview of research methods that can be used, including quantitative, qualitative and economic methods and combinations of these methods. They also provide advice about combining evidence from more than one study. The framework will help people design and use evaluations of natural experiments so they can provide good scientific evidence, but also be as useful as possible for making decisions about how to protect and improve the health of populations.

ISSN 2050-439X (Online)

A list of Journals Library editors can be found on the [NIHR Journals Library website](#)

*Public Health Research* (PHR) was launched in 2013 and is indexed by Europe PMC, NCBI Bookshelf, DOAJ, INAHTA, Ulrichsweb™ (ProQuest LLC, Ann Arbor, MI, USA) and MEDLINE.

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

Editorial contact: [journals.library@nihr.ac.uk](mailto:journals.library@nihr.ac.uk)

The full PHR archive is freely available to view online at [www.journalslibrary.nihr.ac.uk/phr](http://www.journalslibrary.nihr.ac.uk/phr).

## Criteria for inclusion in the *Public Health Research* journal

Manuscripts are published in *Public Health Research* (PHR) if (1) they have resulted from work for the PHR programme or, commissioned/managed through the Methodology research programme (MRP), 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 and Care Research (NIHR), is the leading UK funder of public health research, evaluating 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.

For more information about the PHR programme please visit the website: <https://www.nihr.ac.uk/explore-nihr/funding-programmes/public-health-research.htm>

## This article

This issue of the Public Health Research journal series contains a project commissioned by the Medical Research Council's (MRC) Population Health Sciences Group (PHSG). Jointly funded by the MRC and NIHR, the work updated and extended the MRC guidance on using natural experiments to evaluate population health interventions.

PHSG is responsible for developing the MRC's strategy for research to improve population health. NIHR's mission is to improve the health and wealth of the nation through research. As population level interventions in community and clinical settings become more important, and as science advances and innovates, both funding partners agreed that updating the existing framework was timely and needed.

The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The Public Health research (PHR) programme editors and publisher have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the draft document. However, they do not accept liability for damages or losses arising from material published in this article.

This article presents independent research. The views and opinions expressed in this publication are those of the authors and do not necessarily reflect those of the MRC, the NIHR, NETSCC, the PHR programme or the Department of Health and Social Care. 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, the MRC, NETSCC, the PHR programme or the Department of Health and Social Care.

This article was published based on current knowledge at the time and date of publication. NIHR is committed to being inclusive and will continually monitor best practice and guidance in relation to terminology and language to ensure that we remain relevant to our stakeholders.

Copyright © 2025 Craig *et al.* This work was produced by Craig *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health and Social Care. This is an Open Access publication distributed under the terms of the Creative Commons Attribution CC BY 4.0 licence, which permits unrestricted use, distribution, reproduction and adaptation in any medium and for any purpose provided that it is properly attributed. See: <https://creativecommons.org/licenses/by/4.0/>. For attribution the title, original author(s), the publication source – NIHR Journals Library, and the DOI of the publication must be cited.

Published by the NIHR Journals Library ([www.journalslibrary.nihr.ac.uk](http://www.journalslibrary.nihr.ac.uk)), produced by Newgen Digitalworks Pvt Ltd, Chennai, India ([www.newgen.co](http://www.newgen.co)).