Real-time modelling of a pandemic influenza outbreak

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Declared competing interests of authors: none

Published October 2017
DOI: 10.3310/hta21580

Plain English summary

Modelling of a pandemic influenza outbreak
Health Technology Assessment 2017; Vol. 21: No. 58
DOI: 10.3310/hta21580

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In the event of an outbreak of pandemic influenza in England, Public Health England (PHE) has the role of providing up-to-the-moment epidemic assessments to policy-makers. To do this, PHE has to make sense of epidemic surveillance data, which are typically incomplete, biased and/or contaminated, and use them to make statements about the present epidemic situation and its likely future path, including an estimation of the burden placed on the NHS and an assessment of the efficacy of proposed interventions.

This is the role of real-time epidemic modelling. A mathematical representation of the ongoing epidemic is developed and used in combination with available epidemic data to produce estimates of key epidemic features and the epidemic trajectory.

The work in this project has enhanced PHE’s capacity for carrying out real-time modelling by:

1. Adapting an existing epidemic model to produce region-specific epidemic forecasts, increasing its utility to policy-makers. Hypotheses regarding how to most appropriately encapsulate transmission of disease within and between regions were assessed both on their fit to data and on their ease of implementation.
2. Developing algorithms, building on the latest developments in statistical computation to allow epidemic analyses to be updated in a timely fashion as the epidemic unfolds.
3. Establishing a system for analysis of a future pandemic in accordance with data scheduled to be available under PHE’s strategy for pandemic surveillance, incorporating software and training of key PHE staff.
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The journal is indexed in NHS Evidence via its abstracts included in MEDLINE and its Technology Assessment Reports inform National Institute for Health and Care Excellence (NICE) guidance. HTA research is also an important source of evidence for National Screening Committee (NSC) policy decisions.

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This report

The research reported in this issue of the journal was funded by the HTA programme as project number 11/46/03. The contractual start date was in October 2012. The draft report began editorial review in September 2016 and was accepted for publication in January 2017. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The HTA 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 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 HTA 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 HTA programme or the Department of Health.

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