

natureOUTLOOK

INFLUENZA

19 September 2019 / Vol 573 / Issue No 7774



Cover art: Antoine Doré

Editorial

Herb Brody, Richard Hodson, Elizabeth Batty, Nick Haines

Art & Design

Mohamed Ashour, Andrea Duffy, Denis Mallet, Wesley Fernandes

Production

Nick Bruni, Karl Smart, Ian Pope, Kay Lewis

Sponsorship

Marlene Stewart, Claudia Danci

Marketing

Nicole Jackson

Project Manager

Rebecca Jones

Creative Director

Wojtek Urbanek

Publisher

Richard Hughes

VP, Editorial

Stephen Pincock

Managing Editor

David Payne

Magazine Editor

Helen Pearson

Editor-in-Chief

Magdalena Skipper

For a disease that can resemble the common cold, influenza packs a powerful — and sometimes lethal — punch. As many as half-a-million people around the world die annually from flu. The culprit is a virus that mutates to evade our immune systems, leaving vaccines and therapies scrambling to keep up. In some years, a mutation creates a pathogen that is particularly nasty, resulting in pandemic flu. Last year marked 100 years since the 1918 ‘Spanish flu’ pandemic, which killed at least 50 million people worldwide. In 2009, another pandemic swept across the world at frightening speed, and in 2017–18 so-called seasonal flu (not considered a pandemic) hit hard in the United States.

Vaccines are the first line of defence against flu. Researchers have made it a top priority to develop a vaccine that protects against as many strains of the virus as possible (see page S50). And because speed is of the essence in mounting a response to flu, new methods are being pursued to speed up vaccine production (S60). If prevention fails, there is only a limited arsenal of antiviral drugs to treat flu, although researchers are working to develop more (S54). But it is a never-ending battle, as the wily virus mutates its way to resistance (S53).

Treatment, of course, depends on diagnosis. For individual patients, molecular tests can now give conclusive results more quickly than older methods, but adoption of the new tests has been slow, partly because of their high cost (S56). On a public-health level, it is important to know when and where an outbreak is under way — a task made easier by information technology (S58). And because some of the most dangerous flu viruses make the leap from animals to humans, researchers are studying how to monitor the disease on farms and in wild bird populations (S62).

We are pleased to acknowledge the financial support of Sanofi Pasteur in producing this Outlook. As always, *Nature* retains sole responsibility for all editorial content.

Herb Brody

Chief supplements editor

CONTENTS

S50 PREVENTION

A shot for all seasons

The hunt for a universal flu vaccine

S53 Q&A

Resistance in the wild

Josef Järhult discusses how flu viruses develop drug resistance in rivers

S54 THERAPEUTICS

A bigger arsenal

More antiviral drugs are on the way

S56 DIAGNOSTICS

A sticking point for rapid flu tests?

Rapid molecular tests have slow uptake

S58 SURVEILLANCE

The social forecast

Tackling flu requires accurate predictions of its spread

S60 VACCINES

Breaking out of the egg

The race for faster vaccine production

S62 AGRICULTURE

Flu on the farm

Farm animals are a major source of influenza pandemics

Nature Outlooks are sponsored supplements that aim to stimulate interest and debate around a subject of interest to the sponsor, while satisfying the editorial values of *Nature* and our readers' expectations. The boundaries of sponsor involvement are clearly delineated in the *Nature Outlook* Editorial guidelines available at go.nature.com/e4dwzw

CITING THE OUTLOOK

Cite as a supplement to *Nature*, for example, *Nature* Vol. XXX, No. XXXX Suppl., Sxx–Sxx (2019).

VISIT THE OUTLOOK ONLINE

The *Nature Outlook Influenza* supplement can be found at www.nature.com/collections/influenza-outlook. It features all newly commissioned content as well as a selection of relevant previously published material that is made freely

available for 6 months.

SUBSCRIPTIONS AND CUSTOMER SERVICES

Site licences (www.nature.com/libraries/site_licences): Americas, institutions@natureny.com; Asia-Pacific, <http://nature.asia/jp-contact>; Australia/New Zealand, nature@macmillan.com.au; Europe/ROW, institutions@nature.com; India, npgindia@nature.com. Personal subscriptions: UK/Europe/ROW, subscriptions@nature.com; USA/Canada/Latin America, subscriptions@us.nature.com; Japan, <http://nature.asia/jp-contact>; China, <http://nature.asia/china-subscribe>; Korea, www.natureasia.com/ko-kr/subscribe.

CUSTOMER SERVICES

Feedback@nature.com

Copyright © 2019 Springer Nature Ltd. All rights reserved.