

Vaccines: The Week in Review
17 January 2011
Center for Vaccine Ethics & Policy

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A program of

- Center for Bioethics, University of Pennsylvania
<http://www.bioethics.upenn.edu/>
- The Wistar Institute Vaccine Center
<http://www.wistar.org/vaccinecenter/default.html>
- Children's Hospital of Philadelphia, Vaccine Education Center
<http://www.chop.edu/consumer/jsp/microsite/microsite.jsp>

This weekly summary targets news and events in global vaccines ethics and policy gathered from key governmental, NGO and industry sources, key journals and other sources. This summary supports ongoing initiatives of the Center for Vaccine Ethics & Policy, and is not intended to be exhaustive in its coverage. Vaccines: The Week in Review is now also posted in pdf form and as a set of blog posts at <http://centerforvaccineethicsandpolicy.wordpress.com/>. This blog allows full-texting searching of some 1,200 items.

Comments and suggestions should be directed to

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Director-General of the World Health Organization Dr Margaret Chan, at the launch of the **Global Plan for Artemisinin Resistance Containment** in Geneva, Switzerland, 12 January 2011, issued the following statement:

Protecting our best weapon in treating malaria

The report we are launching today sets out a high-level plan to protect our most potent weapon in treating malaria, the artemisinins. These medicines are the key ingredient of artemisinin-based combination therapy, or ACTs.

ACTs are the gold standard. They are the most effective treatment for falciparum malaria, the most deadly form of malaria.

Combination therapy is a deliberate strategy to delay the development of drug resistance, which inevitably happens when any antimalarial drug is widely, and especially, unwisely used.

ACTs deliver a two-punch attack on the malaria parasite. By combining drugs with different mechanisms of action and different time spans of activity, ACTs increase the likelihood that any parasites not killed by one drug will be killed by the second one. The usefulness of these therapies is now under threat.

Evidence of resistance to artemisinins was suspected on the Cambodia-Thailand border in 2008 and confirmed in 2009. Other suspected foci have been identified in the Greater Mekong subregion, but are not yet confirmed.

This part of the world is the historical epicentre for the emergence of drug-resistant malaria parasites. History tells us what to expect....

...We are launching a global plan at the start of 2011, but this does not mean that aggressive action has not already taken place. On the contrary.

Containment efforts began immediately on the Cambodia-Thailand border at the end of 2008, even before resistance was confirmed. Household coverage with treated bednets is nearly 100%.

Health facilities have been set up to diagnose and treat malaria. Services are open 24 hours a day, free of charge, and stocked with quality-assured ACTs. Intensive monitoring of therapeutic efficacy continues.

What the global plan aims to do is add another safeguard by extending vigilance and preventive measures to all endemic countries.

The emergence of artemisinin resistance has been a wake-up call. It gives us another compelling reason to step up existing control measures with the greatest sense of urgency.

The global plan spells out clearly what needs to be done. It is my sincere wish that the international community will seize this unprecedented opportunity.

Full statement at:

http://www.who.int/dg/speeches/2011/malaria_plan_20110112/en/index.html

The Global Fund to Fight AIDS, Tuberculosis and Malaria said its board re-appointed Professor Michel Kazatchkine as Executive Director for a further three-year-term.

Dr Tedros Adhanom Ghebreyesus, chair of the Board of the Global Fund and the Minister of Health of Ethiopia, commented, "I congratulate Professor Kazatchkine on his reappointment as Executive Director. He has led the Global Fund through a period of rapid growth that has enabled many countries to make major progress towards achieving the health-related Millennium Development Goals. The Board looks forward to working with him in the coming years as we continue our global effort to fight these major epidemics." The Global Fund noted that since its creation in 2002 it "has become a leading force in the fight against the three diseases. With approved funding of US\$21.7 billion for 140 countries, it is the main international financier for the three diseases, supporting more than half of those on antiretroviral treatment globally and providing around two-thirds of international funding for tuberculosis and malaria."

http://www.theglobalfund.org/en/pressreleases/?pr=pr_110111

WHO said that new evidence published in *Lancet Infectious Diseases* about a Kesho Bora study ("A better future", Swahili) found that "**giving HIV positive mothers a combination of 3 antiretroviral drugs (ARVs) during pregnancy, delivery and breastfeeding cuts HIV infections in infants by 43% by the age of 1 year and reduces transmissions during breastfeeding by 54%** compared with the previously recommended ARV drug regimen stopped at delivery." The balance of risks and benefits of continuing ARVs during breastfeeding was not known prior to this study which was conducted in five sites in Burkina Faso, Kenya, and South Africa and coordinated by WHO's Department of Reproductive Health and Research. WHO said this approach "offers new hope for mothers with HIV infection who cannot safely feed their babies with infant formula. It will improve the chances of infants remaining healthy and

free of HIV infection as breast milk provides optimal nutrition and protects against other fatal childhood diseases such as pneumonia and diarrhoea.”

Number of pages: 4

Publication date: 14 January 2011

Languages: English

WHO reference number: WHO/RHR/11.01

http://whqlibdoc.who.int/hq/2011/WHO_RHR_11.01_eng.pdf

The MMWR for January 14, 2011 / Vol. 60 / No. 1, includes:

- [Local Health Department Costs Associated with Response to a School-Based Pertussis Outbreak --- Omaha, Nebraska, September--November 2008](#)
 - [Progress in Immunization Information Systems --- United States, 2009](#)
 - [Updated Recommendations for Use of Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis \(Tdap\) Vaccine from the Advisory Committee on Immunization Practices, 2010](#)
 - [Notices to Readers: Changes to the National Notifiable Infectious Disease List and Data Presentation --- January 2011](#)
- <http://www.cdc.gov/mmwr/pdf/wk/mm6001.pdf>

Journal Watch

[Editor's Note]

Vaccines: The Week in Review continues its weekly scanning of key journals to identify and cite articles, commentary and editorials, books reviews and other content supporting our focus on vaccine ethics and policy. ***Journal Watch* is not intended to be exhaustive, but indicative of themes and issues the Center is actively tracking.** We selectively provide full text of some editorial and comment articles that are specifically relevant to our work. Successful access to some of the links provided may require subscription or other access arrangement unique to the publisher. Our initial scan list includes the journals below. If you would like to suggest other titles, please write to David Curry at david.r.curry@centerforvaccineethicsandpolicy.org

Annals of Internal Medicine

January 4, 2011; 154 (1)

<http://www.annals.org/content/current>

[Reviewed last week; No relevant content]

Clinical Infectious Diseases

Volume 52 Issue 3 February 1, 2011

<http://www.journals.uchicago.edu/toc/cid/current>

[Reviewed last week]

Emerging Infectious Diseases

Volume 17, Number 1–January 2011

<http://www.cdc.gov/ncidod/EID/index.htm>

Expedited posting

Mann P, O'Connell E, Zhang G, Llau A, Rico E, Lequen FC.

Alert system to detect possible school-based outbreaks of influenza-like illness.

Emerg Infect Dis. 2011 Feb; [Epub ahead of print]

Abstract

To evaluate the usefulness of school absentee data in identifying outbreaks as part of syndromic surveillance, we examined data collected from public schools in Miami-Dade County, Florida, USA. An innovative automated alert system captured information about school-specific absenteeism to detect and provide real-time notification of possible outbreaks of influenza-like illness.

Human Vaccines

Volume 7, Issue 1 January 2011

<http://www.landesbioscience.com/journals/vaccines/toc/volume/6/issue/12/>

[Reviewed earlier]

JAMA

January 12, 2011, Vol 305, No. 2, pp 123-212

<http://jama.ama-assn.org/current.dtl>

Original Contributions

Herpes Zoster Vaccine in Older Adults and the Risk of Subsequent Herpes Zoster Disease

Hung Fu Tseng, Ning Smith, Rafael Harpaz, Stephanie R. Bialek, Lina S. Sy, Steven J. Jacobsen

Abstract

Context Approximately 1 million episodes of herpes zoster occur annually in the United States. Although prelicensure data provided evidence that herpes zoster vaccine works in a select study population under idealized circumstances, the vaccine needs to be evaluated in field conditions.

Objective To evaluate risk of herpes zoster after receipt of herpes zoster vaccine among individuals in general practice settings.

Design, Setting, and Participants A retrospective cohort study from January 1, 2007, through December 31, 2009, of individuals enrolled in the Kaiser Permanente Southern California health plan. Participants were immunocompetent community-dwelling adults aged 60 years or older. The 75 761 members in the vaccinated cohort were age matched (1:3) to 227 283 unvaccinated members.

Main Outcome Measure Incidence of herpes zoster.

Results Herpes zoster vaccine recipients were more likely to be white, women, with more outpatient visits, and fewer chronic diseases. The number of herpes zoster cases among vaccinated individuals was 828 in 130 415 person-years (6.4 per 1000 person-years; 95% confidence interval [CI], 5.9-6.8), and for unvaccinated individuals it was 4606 in 355 659 person-years (13.0 per 1000 person-years; 95% CI, 12.6-13.3). In

adjusted analysis, vaccination was associated with a reduced risk of herpes zoster (hazard ratio [HR], 0.45; 95% CI, 0.42-0.48); this reduction occurred in all age strata and among individuals with chronic diseases. Risk of herpes zoster differed by vaccination status to a greater magnitude than the risk of unrelated acute medical conditions, suggesting results for herpes zoster were not due to bias. Ophthalmic herpes zoster (HR, 0.37; 95% CI, 0.23-0.61) and hospitalizations coded as herpes zoster (HR, 0.35; 95% CI, 0.24-0.51) were less likely among vaccine recipients.

Conclusions Among immunocompetent community-dwelling adults aged 60 years or older, receipt of the herpes zoster vaccine was associated with a lower incidence of herpes zoster. The risk was reduced among all age strata and among individuals with chronic diseases.

Commentaries

Ethical Allocation of Preexposure HIV Prophylaxis

Lawrence O. Gostin,

Susan C. Kim

JAMA. 2011;305(2):191-192.doi:10.1001/jama.2010.1975

[First 150 words per JASMA convention]

Civil society–led movements transformed global AIDS action from deep skepticism about extending antiretroviral (ARV) treatment in low- and middle-income countries to a historic scaling up of treatment toward universal access. During its first phase (2003-2008), the US President's Emergency Plan for AIDS Relief (PEPFAR)—the largest national commitment to combat a single disease—supported treatment for more than 2 million people, care for more than 10 million people, and prevention of mother-to-child transmission in 16 million pregnancies. 1 The Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), a unique international financing institution, has committed \$19.3 billion in 144 countries to support large-scale prevention, treatment, and care, with most resources devoted to AIDS treatment. 2

The AIDS movement, however, is at an inflection point due to the interplay of key health and economic determinants—the global financial downturn, tight foreign aid budgets, and intense resource competition. Even with historic global engagement, human ...

Journal of Infectious Diseases

Volume 203 Issue 3 February 1, 2011

<http://www.journals.uchicago.edu/toc/jid/current>

[Reviewed last week]

The Lancet

Jan 15, 2011 Volume 377 Number 9761 Pages 179 - 270

<http://www.thelancet.com/journals/lancet/issue/current>

Series

Continuing challenge of infectious diseases in India

T Jacob John, Lalit Dandona, Vinod P Sharma, Manish Kakkar

Summary

In India, the range and burden of infectious diseases are enormous. The administrative responsibilities of the health system are shared between the central (federal) and state

governments. Control of diseases and outbreaks is the responsibility of the central Ministry of Health, which lacks a formal public health department for this purpose. Tuberculosis, malaria, filariasis, visceral leishmaniasis, leprosy, HIV infection, and childhood cluster of vaccine-preventable diseases are given priority for control through centrally managed vertical programmes. Control of HIV infection and leprosy, but not of tuberculosis, seems to be on track. Early success of malaria control was not sustained, and visceral leishmaniasis prevalence has increased. Inadequate containment of the vector has resulted in recurrent outbreaks of dengue fever and re-emergence of Chikungunya virus disease and typhus fever. Other infectious diseases caused by faecally transmitted pathogens (enteric fevers, cholera, hepatitis A and E viruses) and zoonoses (rabies, leptospirosis, anthrax) are not in the process of being systematically controlled. Big gaps in the surveillance and response system for infectious diseases need to be addressed. Replication of the model of vertical single-disease control for all infectious diseases will not be efficient or viable. India needs to rethink and revise its health policy to broaden the agenda of disease control. A comprehensive review and redesign of the health system is needed urgently to ensure equity and quality in health care. We recommend the creation of a functional public health infrastructure that is shared between central and state governments, with professional leadership and a formally trained public health cadre of personnel who manage an integrated control mechanism of diseases in districts that includes infectious and non-infectious diseases, and injuries.

The Lancet Infectious Disease

Jan 2011 Volume 11 Number 1 Pages 1 - 72

<http://www.thelancet.com/journals/laninf/issue/current>

[Reviewed last week]

Nature

Volume 469 Number 7329 pp131-260 13 January 2011

http://www.nature.com/nature/current_issue.html

[No relevant content]

Nature Medicine

January 2011, Volume 17 No 1

<http://www.nature.com/nm/index.html>

[Reviews last week; No relevant content]

New England Journal of Medicine

January 13, 2011 Vol. 364 No. 2

<http://content.nejm.org/current.shtml>

Perspective

The Age-Old Struggle against the Antivaccinationists

Gregory A. Poland, M.D., and Robert M. Jacobson, M.D.

N Engl J Med 2011; 364:97-99 January 13, 2011

[Free full-text]

Since the introduction of the first vaccine, there has been opposition to vaccination. In the 19th century, despite clear evidence of benefit, routine inoculation with cowpox to protect people against smallpox was hindered by a burgeoning antivaccination movement. The result was ongoing smallpox outbreaks and needless deaths. In 1910, Sir William Osler publicly expressed his frustration with the irrationality of the antivaccinationists by offering to take 10 vaccinated and 10 unvaccinated people with him into the next severe smallpox epidemic, to care for the latter when they inevitably succumbed to the disease, and ultimately to arrange for the funerals of those among them who would die (see the Medical Notes section of the Dec. 22, 1910, issue of the Journal). A century later, smallpox has been eradicated through vaccination, but we are still contending with antivaccinationists.

Since the 18th century, fear and mistrust have arisen every time a new vaccine has been introduced. Antivaccine thinking receded in importance between the 1940s and the early 1980s because of three trends: a boom in vaccine science, discovery, and manufacture; public awareness of widespread outbreaks of infectious diseases (measles, mumps, rubella, pertussis, polio, and others) and the desire to protect children from these highly prevalent ills; and a baby boom, accompanied by increasing levels of education and wealth. These events led to public acceptance of vaccines and their use, which resulted in significant decreases in disease outbreaks, illnesses, and deaths. This golden age was relatively short-lived, however. With fewer highly visible outbreaks of infectious disease threatening the public, more vaccines being developed and added to the vaccine schedule, and the media permitting widespread dissemination of poor science and anecdotal claims of harm from vaccines, antivaccine thinking began flourishing once again in the 1970s.

Little has changed since that time, although now the antivaccinationists' media of choice are typically television and the Internet, including its social media outlets, which are used to sway public opinion and distract attention from scientific evidence. A 1982 television program on diphtheria–pertussis–tetanus (DPT) vaccination entitled “DPT: Vaccine Roulette” led to a national debate on the use of the vaccine, focused on a litany of unproven claims against it. Many countries dropped their programs of universal DPT vaccination in the face of public protests after a period in which pertussis had been well controlled through vaccination² — the public had become complacent about the risks of the disease and focused on adverse events purportedly associated with vaccination. Countries that dropped routine pertussis vaccination in the 1970s and 1980s then suffered 10 to 100 times the pertussis incidence of countries that maintained high immunization rates; ultimately, the countries that had eliminated their pertussis vaccination programs reinstated them.² In the United States, vaccine manufacturers faced an onslaught of lawsuits, which led the majority of them to cease vaccine production. These losses prompted the development of new programs, such as the Vaccine Injury Compensation Program (VICP), in an attempt to keep manufacturers in the U.S. market.

The 1998 publication of an article, recently retracted by the Lancet, by Wakefield et al.³ created a worldwide controversy over the measles–mumps–rubella (MMR) vaccine by claiming that it played a causative role in autism. This claim led to decreased use of MMR vaccine in Britain, Ireland, the United States, and other countries. Ireland, in particular, experienced measles outbreaks in which there were more than 300 cases, 100 hospitalizations, and 3 deaths.⁴

Today, the spectrum of antivaccinationists ranges from people who are simply ignorant about science (or “innumerate” — unable to understand and incorporate concepts of risk and probability into science-grounded decision making) to a radical fringe element who use deliberate mistruths, intimidation, falsified data, and threats of violence in efforts to prevent the use of vaccines and to silence critics.

Antivaccinationists tend toward complete mistrust of government and manufacturers, conspiratorial thinking, denialism, low cognitive complexity in thinking patterns, reasoning flaws, and a habit of substituting emotional anecdotes for data.⁵ Their efforts have had disruptive and costly effects, including damage to individual and community well-being from outbreaks of previously controlled diseases, withdrawal of vaccine manufacturers from the market, compromising of national security (in the case of anthrax and smallpox vaccines), and lost productivity.²

The H1N1 influenza pandemic of 2009 and 2010 revealed a strong public fear of vaccination, stoked by antivaccinationists. In the United States, 70 million doses of vaccine were wasted, although there was no evidence of harm from vaccination. Meanwhile, even though more than a dozen studies have demonstrated an absence of harm from MMR vaccination, Wakefield and his supporters continue to steer the public away from the vaccine. As a result, a generation of parents and their children have grown up afraid of vaccines, and the resulting outbreaks of measles and mumps have damaged and destroyed young lives. The reemergence of other previously controlled diseases has led to hospitalizations, missed days of school and work, medical complications, societal disruptions, and deaths. The worst pertussis outbreaks in the past 50 years are now occurring in California, where 10 deaths have already been reported among infants and young children.

In the face of such a legacy, what can we do to hasten the funeral of antivaccination campaigns? First, we must continue to fund and publish high-quality studies to investigate concerns about vaccine safety. Second, we must maintain, if not improve, monitoring programs, such as the Vaccine Adverse Events Reporting System (VAERS) and the Clinical Immunization Safety Assessment Network, to ensure coverage of real but rare adverse events that may be related to vaccination, and we should expand the VAERS to make compensation available to anyone, regardless of age, who is legitimately injured by a vaccine. Third, we must teach health care professionals, parents, and patients how to counter antivaccinationists' false and injurious claims. The scientific method must inform evidence-based decision making and a numerate society if good public policy decisions are to be made and the public health held safe. Syncretism between the scientific method and unorthodox medicine can be dangerous.

Fourth, we must enhance public education and public persuasion. Patients and parents are seeking to balance risks and benefits. This process must start with increasing scientific literacy at all levels of education. In addition, public-private partnerships of scientists and physicians could be developed to make accurate vaccine information accessible to the public in multiple languages, on a range of reading levels, and through various media. We must counter misinformation where it is transmitted and consider using legal remedies when appropriate.

The diseases that we now seek to prevent with vaccination pose far less risk to antivaccinationists than smallpox did through the early 1900s. Unfortunately, this means that they can continue to disseminate false science without much personal risk, while putting children, the elderly, and the frail in harm's way. We can propose no Oslerian challenge to demonstrate our point but have instead a story of science and contrasting

worldviews: on the one hand, a long history of stunning triumphs, such as the eradication of smallpox and control of many epidemic diseases that had previously maimed and killed millions of people; on the other hand, the reality that none of the antivaccinationists' claims of widespread injury from vaccines have withstood the tests of time and science. We believe that antivaccinationists have done significant harm to the public health. Ultimately, society must recognize that science is not a democracy in which the side with the most votes or the loudest voices gets to decide what is right.

1. Wolfe RM, Sharp LK. Anti-vaccinationists past and present. *BMJ* 2002;325:430-432
2. Gangarosa EJ, Galazka AM, Wolfe CR, et al. Impact of anti-vaccine movements on pertussis control: the untold story. *Lancet* 1998;351:356-361
3. Wakefield AJ, Murch SH, Anthony A, et al. Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children. *Lancet* 1998;351:637-41. [Retraction, *Lancet* 2010;375:445.]
4. McBrien J, Murphy J, Gill D, Cronin M, O'Donovan C, Cafferkey MT. Measles outbreak in Dublin, 2000. *Pediatr Infect Dis J* 2003;22:580-584
5. Jacobson RM, Targonski PV, Poland GA. A taxonomy of reasoning flaws in the anti-vaccine movement. *Vaccine* 2007;25:3146-3152

Source Information

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The Pediatric Infectious Disease Journal

January 2011 - Volume 30 - Issue 1 pp: A9-A10,1-94,e1-e17

<http://journals.lww.com/pidj/pages/currenttoc.aspx>

[Reviewed earlier]

Pediatrics

January 2011 / VOLUME 127 / ISSUE 1

<http://pediatrics.aappublications.org/current.shtml>

[Reviewed earlier]

Pharmacoeconomics

January 1, 2011 - Volume 29 - Issue 1 pp: 1-86

<http://adisonline.com/pharmacoeconomics/pages/currenttoc.aspx>

[Reviewed last week]

Pharmacoeconomics & Outcomes News

January 8, 2011 - Volume - Issue 619 pp: 1-11

<http://adisonline.com/pecnews/pages/currenttoc.aspx>

[Reviewed last week]

PLoS Medicine

(Accessed 16 January 2011)

http://medicine.plosjournals.org/perlserv/?request=browse&issn=1549-1676&method=pubdate&search_fulltext=1&order=online_date&row_start=1&limit=10&document_count=1533&ct=1&SESSID=aac96924d41874935d8e1c2a2501181c#results
Estimates of Pandemic Influenza Vaccine Effectiveness in Europe, 2009–2010: Results of Influenza Monitoring Vaccine Effectiveness in Europe (I-MOVE) Multicentre Case-Control Study

Marta Valenciano, Esther Kissling, Jean-Marie Cohen, Beatrix Oroszi, Anne-Sophie Barret, Caterina Rizzo, Baltazar Nunes, Daniela Pitigoi, Amparro Larrauri Cámara, Anne Mosnier, Judith K. Horvath, Joan O'Donnell, Antonio Bella, Raquel Guiomar, Emilia Lupulescu, Camelia Savulescu, Bruno C. Ciancio, Piotr Kramarz, Alain Moren Research Article, published 11 Jan 2011

doi:10.1371/journal.pmed.1000388

Abstract

Background

A multicentre case-control study based on sentinel practitioner surveillance networks from seven European countries was undertaken to estimate the effectiveness of 2009–2010 pandemic and seasonal influenza vaccines against medically attended influenza-like illness (ILI) laboratory-confirmed as pandemic influenza A (H1N1) (pH1N1).

Methods and Findings

Sentinel practitioners swabbed ILI patients using systematic sampling. We included in the study patients meeting the European ILI case definition with onset of symptoms >14 days after the start of national pandemic vaccination campaigns. We compared pH1N1 cases to influenza laboratory-negative controls. A valid vaccination corresponded to >14 days between receiving a dose of vaccine and symptom onset. We estimated pooled vaccine effectiveness (VE) as 1 minus the odds ratio with the study site as a fixed effect. Using logistic regression, we adjusted VE for potential confounding factors (age group, sex, month of onset, chronic diseases and related hospitalizations, smoking history, seasonal influenza vaccinations, practitioner visits in previous year). We conducted a complete case analysis excluding individuals with missing values and a multiple multivariate imputation to estimate missing values. The multivariate imputation ($n = 2902$) adjusted pandemic VE (PIVE) estimates were 71.9% (95% confidence interval [CI] 45.6–85.5) overall; 78.4% (95% CI 54.4–89.8) in patients <65 years; and 72.9% (95% CI 39.8–87.8) in individuals without chronic disease. The complete case ($n = 1,502$) adjusted PIVE were 66.0% (95% CI 23.9–84.8), 71.3% (95% CI 29.1–88.4), and 70.2% (95% CI 19.4–89.0), respectively. The adjusted PIVE was 66.0% (95% CI –69.9 to 93.2) if vaccinated 8–14 days before ILI onset. The adjusted 2009–2010 seasonal influenza VE was 9.9% (95% CI –65.2 to 50.9).

Conclusions

Our results suggest good protection of the pandemic monovalent vaccine against medically attended pH1N1 and no effect of the 2009–2010 seasonal influenza vaccine. However, the late availability of the pandemic vaccine and subsequent limited coverage with this vaccine hampered our ability to study vaccine benefits during the outbreak period. Future studies should include estimation of the effectiveness of the new trivalent vaccine in the upcoming 2010–2011 season, when vaccination will occur before the influenza season starts.

Science

14 January 2011 vol 331, issue 6014, pages 117-248

<http://www.sciencemag.org/current.dtl>

Reports**Suppression of Avian Influenza Transmission in Genetically Modified Chickens**

Jon Lyall, Richard M. Irvine, Adrian Sherman, Trevelyan J. McKinley, Alejandro Núñez, Auriol Purdie, Linzy Outtrim, Ian H. Brown, Genevieve Rolleston-Smith, Helen Sang, and Laurence Tiley

Science 14 January 2011: 223-226.[D

Abstract

Infection of chickens with avian influenza virus poses a global threat to both poultry production and human health that is not adequately controlled by vaccination or by biosecurity measures. A novel alternative strategy is to develop chickens that are genetically resistant to infection. We generated transgenic chickens expressing a short-hairpin RNA designed to function as a decoy that inhibits and blocks influenza virus polymerase and hence interferes with virus propagation. Susceptibility to primary challenge with highly pathogenic avian influenza virus and onward transmission dynamics were determined. Although the transgenic birds succumbed to the initial experimental challenge, onward transmission to both transgenic and nontransgenic birds was prevented.

Science Translational Medicine

12 January 2011 vol 3, issue 65

<http://stm.sciencemag.org/content/current>

[No relevant content]

Vaccine

Volume 29, Issue 4 pp. 613-864 (17 January 2011)

<http://www.sciencedirect.com/science/journal/0264410X>

[Reviewed earlier]