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Professor, Technological Leadership Institute College of Science and Engineering
Adjunct Professor, Medical School
University of Minnesota
• Global infectious disease risk and preparedness
• Ebola virus disease
• Middle East respiratory syndrome coronavirus infection (MERS-CoV)
• Avian influenza
• Influenza vaccine effectiveness
• Chikungunya
• Other infectious disease issues
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Global Risks 2015
10th Edition
Statement for the Record

Worldwide Threat Assessment of the US Intelligence Community

Senate Armed Services Committee

James R. Clapper
Director of National Intelligence

February 26, 2015

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Critical Trends Converging

Several trends are converging that will probably increase the frequency of shocks to human security in 2015. Emerging infectious diseases and deficiencies in international state preparedness to address them remain a threat, exemplified by the epidemic spread of the Ebola virus in West Africa. Extremes in weather combined with public policies that affect food and water supplies will probably exacerbate humanitarian crises. Many states and international institutions will look to the United States in 2015 for leadership to address human security issues, particularly environment and global health, as well as those caused by poor or abusive governance.

Global trends in governance are negative and portend growing instability. Poor and abusive governance threatens the security and rights of individuals and civil society in many countries throughout the world. The overall risk for mass atrocities—driven in part by increasing social mobilization, violent conflict, and a diminishing quality of governance—is growing. Incidents of religious persecution also are on the rise. Legal restrictions on NGOs and the press, particularly those that expose government shortcomings or lobby for reforms, will probably continue.

Infectious Disease Continues To Threaten Human Security Worldwide

Infectious diseases are among the foremost health security threats. A more crowded and interconnected world is increasing the opportunities for human and animal diseases to emerge and spread globally. This has been demonstrated by the emergence of Ebola in West Africa on an unprecedented scale. In
PRESS RELEASE

World Bank Group President: World is ‘Dangerously Unprepared’ for Future Pandemics

January 27, 2015

Kim outlines vision for private, public sectors to work together to lessen risk

WASHINGTON, January 27, 2015— Saying the world was “dangerously unprepared” for future pandemics, World Bank Group President Jim Yong Kim today laid out a vision in which insurance companies, governments, multi-lateral organizations, corporations and international donors worked together to build a system that would help all countries prepare for potentially catastrophic health disasters.

“The Ebola outbreak has been devastating in terms of lives lost and the loss of economic growth in Guinea, Liberia and Sierra Leone,” Kim told an audience at Georgetown University. “We need to make sure that we get to zero cases in this Ebola outbreak. At the same time, we need to prepare for future pandemics that could become far more deadly and infectious than what we have seen so far with Ebola. We must learn the lessons from the Ebola outbreak because there is no doubt we will be faced with other pandemics in the years to come.”

Kim said that the World Bank Group has been working for several months with the World Health Organization, other United Nations agencies, academics, re-insurance company officials and others to work on a concept of developing a pandemic facility; discussions also were held in informal sessions at the World Economic Forum in Davos, Switzerland, last week.

He said he expects that a proposal will be presented in the coming months to leaders of developed and developing countries. While a proposal would likely involve a combination of bonds and insurance instruments, he said that in some ways, a future pandemic response facility was similar to a homeowner’s insurance policy.
• Global infectious disease risk and preparedness
• Ebola virus disease
• Middle East respiratory syndrome coronavirus infection (MERS-CoV)
• Avian influenza
• Influenza vaccine effectiveness
• Chikungunya
• Other infectious disease issues
EBOLA SITUATION REPORT

4 MARCH 2015
CORRIGENDUM AS OF 6 MARCH 2015

CASES/
DEATHS
(data up to 1 March 2015)

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<tr>
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**Total Cases**: 23,969
Figure 4: Geographical distribution of new and total confirmed cases

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.
Figure 5: Days since last confirmed case in Guinea, Liberia and Sierra Leone

Days Since Last Case
- 9 weeks +
- 6 - 9 weeks
- 3 - 6 weeks
- 1 - 3 weeks
- ≤ 1 week
- 0

Date as of:
- LR - 2015-03-01
- SL - 2015-03-01
- GI - 2015-03-01

1 March is counted as day 0.
Cases of Ebola Virus Disease in Guinea, Liberia, and Sierra Leone, March 25, 2014 - February 1, 2015

Source: Centers for Disease Control and Prevention.
EU Ebola conference airs response needs, long-term goals

Tough problems, like community resistance, persist in some Ebola outbreak nations, and another big response by the international community will be needed to get the countries back on their feet after the epidemic, speakers said today at an Ebola meeting in Brussels.

Leaders from African nations and their international partners involved in the Ebola response gathered at a 1-day conference sponsored by the European Union to get a fix on where the outbreak stands, what other steps are needed to get cases to zero, and what the long-term needs are for recovery.

Priorities: research, outreach, economic support

In her address to the group, Doctors without Borders (MSF) President Joanne Liu, MD, said that despite the fall in cases, the mortality rate in treatment centers is still staggering 50%, a sign that the global response is still failing patients. She called on global experts to develop a practical plan to keep research going for Ebola vaccines, drugs, and diagnostic tests, with the outcome focused on benefits for the outbreak nations.

MSF has been at the forefront of the response since last March and has teams involved in all three countries.

Though fear is part of the normal reaction to such a lethal outbreak, it is still hampering the response, manifested by failed community sensitization and continued attacks on aid workers after a year of battling the disease, especially in Guinea, Liu said. She added that Ebola is being used as a political wedge in some areas and efforts require urgent improvement.
Ebola levels on the rise in Guinea, Sierra Leone

Reflecting the tough challenge responders have in getting Ebola cases to zero, the number of confirmed infections increased in Guinea and Sierra Leone last week, with new cases popping up outside of known transmission chains and a number of Ebola detections found only after people died from the disease in their communities, the World Health Organization (WHO) said today in its weekly update on outbreak patterns.

Meanwhile, Liberia for the first time went a week without a confirmed case. The country reported only one confirmed case the week before.

Overall, 132 newly confirmed cases were reported in the outbreak countries last week, compared with 99 reported the week before, the WHO said. The latest reports lift the region’s number of confirmed, probable, and suspected cases to 23,924, with the number of deaths rising to 9,792.

Worrisome trends in Guinea

Guinea reported 51 new cases, 16 more than the previous week. The hot spots were three neighboring areas in the western part of the country: Conakry, Coyah, and Forecariah. Two new confirmed cases were also reported in Macenta district, which had not reported a case for 4 weeks. Low levels of transmission were also seen in Lola district, an area that borders Ivory Coast.

The number of security incidents dropped from the previous week; four districts reported at least one, compared with nearly a third of Guinea’s 34 prefectures the week before.

Problems have been related to suspicions that responders are spreading Ebola. Aside from the risks posed to aid workers from violent attacks, community resistance has made it tough for workers to do two key steps that help curb the disease: identify sick people in the community and get them into isolation, and conduct contact tracing.
Liberia Ebola vaccine trial 'challenging' as cases tumble

Sat, Jan 24 2015

By Ben Hirschler

DAVOS, Switzerland (Reuters) - A steep fall in Ebola cases in Liberia will make it hard to prove whether experimental vaccines work in a major clinical trial about to start in the country, the head of the U.S. National Institutes of Health (NIH) said on Saturday.

The NIH might have to move some testing to neighboring Sierra Leone, while regulators could end up approving Ebola shots based on efficacy data from animal tests backed by only limited human evidence, Francis Collins told Reuters.

Liberia, once the epicenter of West Africa's deadly Ebola epidemic, has just five remaining confirmed cases of the disease, a senior health official has said.

The sharp decrease in cases is clearly good news, but it poses a problem for scientists from the NIH, GlaxoSmithKline and Merck, who want to enroll 27,000 people at risk of infection in the pivotal trials, Ellis said in Davos.
Recommendations for Accelerating the Development of Ebola Vaccines

REPORT & ANALYSIS
UN: Funds urgently needed to tackle Ebola obstacles

Two top officials leading the global Ebola response said today that the small increase in Ebola activity in the outbreak region isn’t surprising and that a fresh infusion of cash is needed now to continue funding key response activities such as contact tracing.

Yesterday the World Health Organization (WHO) reported that the number of confirmed cases was slightly up in all three hard-hit countries (Guinea, Liberia, and Sierra Leone) for the first time this year, following weeks of decline, especially in Liberia.

Speaking to reporters at a media briefing in Geneva, David Nabarro, MD, the United Nations’ special Ebola representative, said good progress is being made with the response, but, that “The outbreak is not yet under control” and still presents a great threat.

Funds needed ahead of rainy season

The international community has been generous with its donations to the massive response, said Nabarro, but the outbreak is at a crucial phase. Funds are needed now to exploit a 2-month window of opportunity for getting out into communities before the rainy seasons sets in, which is expected to bog down the response and make it difficult to reach rural areas reporting new cases.

Response leaders recently reassessed what they will need to battle the virus from January through June and identified a $1 billion gap. “Please continue that generosity, because the job is absolutely not finished,” Nabarro said.

He countered a Feb 3 BMJ report that suggested slow and incomplete international funding has hampered the response. “That’s not what I’ve seen in my six visits to the region,” he said, noting that between October and December, $850 million was spent in the region on the response, with about 75% of the UN’s request coming through by the end of the year.
UN seeks $900 million for phase 2 Ebola response

The global Ebola response is facing a funding shortfall as officials race to get the outbreak curve heading downward again ahead of the impending rainy season, top officials said last week in a plea to donors at the United Nations (UN) General Assembly.

Speaking to reporters in Geneva after the meeting, Bruce Aylward, MD, MPH, World Health Organization (WHO) assistant director-general in charge of Ebola outbreak response, said funds to keep the response going are falling faster than disease levels, He added that stalled progress in getting cases to zero is one of the most worrisome aspects of outbreak.

Though the first 4 weeks of 2015 were encouraging, with an overall steep drop in cases across the region, the past 4 weeks saw progress flatten, with 120 to 150 new confirmed cases reported each week. "This is not what you want to see with Ebola," he said. With cases still being reported in the capitals of each of the three affected West African countries, Aylward called the situation "deeply concerning."

David Nabarro, MD, the UN's special Ebola representative, said the epidemiologic detective work involved in case finding and contact tracing requires many people, and though the UN is committed to working closely with the affected countries, more resources are needed to get the job done.

The need for the UN-led Ebola mission for 2015 is $1.5 billion, and so far the group has raised only $600 million, for a $900 million gap, he said, adding that without full funding, it's difficult to keep hundreds of staff in the region. "At the moment, we're worried," Nabarro said.
Transmission of Ebola Viruses: What We Know and What We Do Not Know


Center for Infectious Disease Research and Policy, University of Minnesota, Minneapolis, Minnesota, USA; Division of Environmental and Occupational Health Sciences, University of Illinois at Chicago, Chicago, Illinois, USA; National Laboratory for Zoonotic Diseases and Special Pathogens, Public Health Agency of Canada, Winnipeg, Canada; The Galveston National Laboratory, University of Texas Medical Branch, Galveston, Texas, USA; National Institute of Health, Kinshasa, Democratic Republic of the Congo; Ministry of Health, Kinshasa, Democratic Republic of the Congo; Ministry of Health and Sanitation, Freetown, Sierra Leone; Department of Epidemiic and Pandemic Alert and Response, World Health Organization, Geneva, Switzerland; Department of Biological Sciences, Purdue University, Lafayette, Indiana, USA

ABSTRACT Available evidence demonstrates that direct patient contact and contact with infectious body fluids are the primary modes for Ebola virus transmission, but this is based on a limited number of studies. Key areas requiring further study include (i) the role of aerosol transmission (either in the vicinity of source patients), (ii) the role of environmental contamination and fomite transmission, (iii) the degree to which minimally or mildly ill persons transmit infection, (iv) how long clinically relevant infectiousness persists, (v) the role that “superspreading events” may play in driving transmission dynamics, (vi) whether strain differences or repeated serial passage in outbreaks settings can impact virus transmission, and (vii) what role syratic or domestic animals could play in outbreak propagation, particularly during major epidemics such as the 2013-2015 West Africa situation. In this review, we address what we know and what we do not know about Ebola virus transmission. We also hypothesize that Ebola viruses have the potential to be respiratory pathogens with primary respiratory spread.

PAST EBOULA OUTBREAKS

Between the first recognized outbreak of Ebola virus disease (EVD) in 1976 and the onset of the 2013-2015 Ebola epidemic in West Africa, 24 outbreaks of EVD in approximately 18 countries had been reported by the World Health Organization (WHO) (1). One additional outbreak involving 69 cases occurred in the Democratic Republic of the Congo (DRC) between July and November 2014 (2). To date, five species of Ebola viruses have been identified; four from Africa (Zaire, Sudan, Bundibugyo, and Tai Forest) and one from the Philippines (Reston) (1, 3, 4). Most pre-2013 outbreaks were caused by Zaire ebola virus (EBOV) (14 outbreaks) or Sudan virus (SUDV) (7 outbreaks); Bundibugyo virus (BDBV) caused two outbreaks, and Tai Forest virus (TAFV) was identified in a single case from Côte d’Ivoire (1). Outbreaks caused by Reston virus (REOV) have occurred in nonhuman primates and pigs, with associated asymptomatic human infections (5).

Only seven outbreaks involved more than 100 reported cases. The maximum number of generations of human-to-human transmission for these outbreaks is unknown but is likely relatively low. One report estimated 15 generations of viral transmission during a 1976 SUDV outbreak (284 cases), which was the most that were identified (6). Investigators recorded four generations of spread during the EBOV outbreak in Kiwiwi, DRC (315 cases) (7).

Many experts have concluded that the extensive transmission documented in the 2013–2015 West Africa epidemic is due to societal factors (poverty, urban density, population migration patterns, and poor health care and public health infrastructure) rather than unique biological characteristics of the agent (8, 9). Limited data are available, however, regarding virus genomics (affecting phenotype/pathotype), patient viral loads, and certain epidemiological features for this unique EBOV strain. Furthermore, information about Ebola virus transmission in humans remains incomplete, given the relatively small number of outbreak investigations and cases recognized before 2013; as a result, additional questions remain (10). In this review, we explore what we know—and what we do not know—about Ebola virus transmission.

WHAT WE KNOW ABOUT EBOLA VIRUS TRANSMISSION IN HUMANS

Past outbreaks provide opportunities to examine human-to-human transmission of Ebola viruses. Spread within hospitals has been documented repeatedly, and outbreak amplification has occurred in health care settings for both EBOV and SUDV (6, 7, 11). Early outbreak investigations demonstrated the importance of parenteral transmission via needlestick injuries, although this has not been noted more recently (6, 11). In addition, investigators have shown that health care workers are at particularly high risk (6, 7, 11, 12). Use of barrier protection

Published 19 February 2013
Editor Michael J. Imperiale, University of Michigan
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Address correspondence to Michael T. Osterholm, mto@umn.edu.
• Global infectious disease risk and preparedness
• Ebola virus disease
• Middle East respiratory syndrome coronavirus infection (MERS-CoV)
• Avian influenza
• Influenza vaccine effectiveness
• Chikungunya
• Other infectious disease issues
Distribution of confirmed cases of MERS-CoV by first available date and place of probable infection, March 2012 – 06 March 2015 (n=1079)

Source: ECDC
Saudi Arabia reports 12 MERS cases; UAE adds 1

The winter pace of new MERS cases quickened yesterday and today with reports of a dozen more across Saudi Arabia, one of them fatal, and a fatal case in the United Arab Emirates (UAE).

In addition, in a statement about 10 previously reported Saudi cases, the World Health Organization (WHO) said three of the patients were from the same household, and the first of those to get sick owns a camel farm.

Twelve cases, eight cities

The 12 cases reported by the Saudi Ministry of Health (MOH) include 5 yesterday and 7 more today, scattered among eight cities, with four patients from Riyadh.

The five cases cited yesterday are in five different cities. One of the five patients died, two are healthcare workers, three are non-Saudis, and only one is older than 50.

The patient who died was a 73-year-old male expatriate in Jeddah who had preexisting disease, the MOH said. He had no exposure to animals or other MERS patients.

The two healthcare workers are a 48-year-old man in critical condition in Buraidah and a 31-year-old woman in stable condition in Khobar, both of them expatriates. Authorities are investigating whether the man had contact with other MERS patients in a healthcare setting, but neither patient was exposed to MERS patients in the community or to animals.

The other two patients, both Saudis, are a 27-year-old woman in stable condition in Unaizah and a 41-year-old man in Riyadh who is in critical condition. Both have preexisting diseases. Neither was exposed to animals or to MERS patients in the community, but in the man’s case officials are investigating possible contact with a MERS patient in a healthcare setting.
MERS count rises in Saudi Arabia, Germany, Qatar

The late-winter stream of MERS cases in Saudi Arabia continued with seven more reported over the past 3 days, while Germany reported a case imported from the United Arab Emirates (UAE) and Qatar cited its second case of the year.

The latest cases in Saudi Arabia included one reported by the Saudi Ministry of Health (MOH) Mar 7, two reported Mar 8, and four more noted today. Six patients are from Riyadh and one is from Hofuf in the eastern province; all but two of them are men. Four are in critical condition and three are stable. Their ages range from 37 to 61.

Just one healthcare worker, a 37-year-old foreigner in Riyadh, is among the seven patients. None of them were exposed to animals or to other MERS-CoV (Middle East respiratory syndrome coronavirus) patients in community settings before their illnesses, but possible exposure in healthcare settings is under investigation in four cases.
Geographical distribution of confirmed MERS-CoV cases and place of probable infection, worldwide, as of 06 March 2015 (n=1079)

Source: ECDC
The MERS Transmission Model
First Confirmed Cases of Middle East Respiratory Syndrome Coronavirus (MERS-CoV) Infection in the United States, Updated Information on the Epidemiology of MERS-CoV Infection, and Guidance for the Public, Clinicians, and Public Health Authorities — May 2014

On May 14, 2014, this report was posted as an MMWR Early Release on the MMWR website (http://www.cdc.gov/mmwr).

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MERS

• More data gaps than knowledge
  • Transmission
  • Prevention
  • Treatment
• Similar to SARS but different
• Air travel has changed significantly
• Global infectious disease risk and preparedness
• Ebola virus disease
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Human infection with avian influenza A(H7N9) virus – China

Disease outbreak news
26 February 2015

On 23 February 2015, the Department of Health, Hong Kong Special Administrative Region (SAR), China notified WHO of 1 additional laboratory-confirmed case of human infection with avian influenza A(H7N9) virus.

Details of the case are as follows

A 61-year-old man from Hong Kong SAR developed symptoms on 16 February and consulted a private doctor on the same day. He was admitted to hospital on 20 February. The patient travelled to Zhangmutou, Dongguan, Guangdong, from 6 to 8 February and from 14 to 15 February. He visited a wet market on 14 February and bought two slaughtered chickens. Based on the available information, it is considered that the patient was infected outside Hong Kong. Currently, he is in critical condition.

The Centre for Health Protection, Hong Kong is tracing the contacts of the patient.

WHO continues to closely monitor the H7N9 situation and conduct risk assessment. So far, the overall risk associated with the H7N9 virus has not changed.

WHO advice

WHO advises that travellers to countries with known outbreaks of avian influenza should avoid poultry farms, or contact with animals in live bird markets, or entering areas where poultry may be slaughtered, or contact with any surfaces that appear to be contaminated with faeces from poultry or other animals. Travellers should also wash their hands often with soap and water. Travellers should follow good food safety and good food hygiene practices.
Cases of H7N9 Influenza in China by Week of Onset (Feb 23, 2015)

608 Total Cases: 152 Deaths
Date of Onset Missing for 30 Cases
Date of Onset for Deceased Cases Missing for 70 Cases

Source: WHO, Flutrackers, news reports
Nineteen more H7N9 cases reported in China

Nineteen new H7N9 avian influenza cases have been reported in seven of China's provinces over the past 3 days, though basic epidemiologic details are known for only six of them, according to official reports, including health department notices translated and posted by FluTrackers, an infectious disease news message board.

Nine of the cases are from Zhejiang province. Three of the case-patients are a 57-year-old man in Changshang County and two men, 49 and 76, from Jinhua. The illness in the older man was first reported in the Chinese media in late February; he has now died from his infection.

Six other H7N9 infections in Zhejiang province were noted in an update today from Hong Kong's Centre for Health Protection (CHP), though no other details were available other than that the illness onsets for a batch of 19 cases, some previously known, occurred in the past 5 weeks.

Today's CHP report—based on information from mainland health authorities—also included six other H7N9 cases that hadn't been reported before, though no epidemiologic information was included. They included 3 cases from Jiangsu province, 2 cases from Hunan province, and 1 case from Guizhou province.
Location of H7N9 Influenza in China (3/7/15)*

*626 total cases/153 deaths

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*CIDRAP*
Infection of Poultry with H7N9 Influenza Virus

- Study conducted to evaluate the possible route of transmission in poultry
  - Minnesota CEIRS group worked with SEPRL/USDA

- Study Design
  - Chickens, quail and pigeons infected with A/Anhui/1/2013 H7N9 $10^2 - 10^6$ EID$_{50}$ given intranasally; evaluated on Day 2 and 4
  - Specimens collected via OP or CS and evaluated via real time RT PCR using H7 specific primers
  - Contact transmission studies also performed
CT Values from Infected Poultry Day 4 Post Infection

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<td>31</td>
<td>neg</td>
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<tr>
<td>10^6</td>
<td>Chicken</td>
<td>10/11</td>
<td>24</td>
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- CT value ≤ 29 is strongly positive for H7 HA
- CT value 30-37 moderate levels of H7 HA
- CT value 38-40 low levels of H7 HA
Canadian officials announced today that a British Columbia resident who recently returned from China is recovering from an H7N9 avian flu infection, marking the first known case in North America.

In a statement, the Public Health Agency of Canada (PHAC) said the risk to others is very low, because evidence suggests that the virus does not spread easily from person to person.

A public health official in British Columbia said the patient is a woman and that a man who traveled with her was also sick recently, according to a Canadian Press (CP) report today. The official, Bonnie Henry, MD, said additional testing is under way to find out if the man also was infected.

The PHAC said the infected patient, who was not identified, didn't get sick until after arriving in Canada. The person was not hospitalized and is now recovering in "self-isolation," the agency said. Her companion also was not hospitalized and is recovering, according to the CP report.
H5N2, H5N8 avian flu viruses surface in US

US authorities today reported finding wild birds in Washington state infected with two different highly pathogenic avian influenza (HPAI) viruses, H5N2 and H5N8, raising questions about possible connections with recent H5N2 outbreaks across the border in Canada and with an Asian H5N8 strain that is now hitting European poultry farms.

In reports to the World Organization for Animal Health (OIE), the US Department of Agriculture (USDA) said H5N2 was found in a wild pintail duck, while H5N8 was found in a captive wild gyrfalcon that was fed on hunter-killed birds. Both birds were in Whatcom County, Washington, which borders the Abbotsford area of British Columbia, the site of recent H5N2 outbreaks in poultry.

Also today, Italy became the fourth European country in the past few weeks to report an H5N8 outbreak in poultry, with an outbreak on a turkey farm, and Germany reported a second poultry H5N8 outbreak at a site distant from its first H5N8 event.
USDA confirms high-path H5N1 in Washington state

Editor’s note: This story was updated on Jan 22 with new information from the APHIS.

Highly pathogenic avian influenza (HPAI) H5N1 has been detected for the first time in a US bird, in Washington state, according to a report filed by John Clifford, DVM, deputy administrator with the Animal and Plant Health Inspection Service (APHIS) of the US Department of Agriculture (USDA).

The report, posted yesterday by the World Organization for Animal Health (OIE), details a novel H5N1 virus found in a wild green-winged teal in Whatcom County that resulted from reassortment between a Eurasian (EA)-type H5N8 virus and North American avian influenza strains.

The virus was detected in a hunter-killed bird as part of increased avian flu surveillance in wild birds, according to the report. Whole-genome sequencing placed it in EA H5 clade 2.3.4.4.
H5N8 virus surfaces on California turkey farm

The highly pathogenic H5N8 avian influenza virus has been found on a California turkey farm, marking its first incursion into US commercial poultry after several recent appearances in wild birds and at least one backyard poultry flock in western states.

The virus was found in turkeys from a ranch in Stanislaus County in California's Central Valley, the US Department of Agriculture (USDA) announced Jan 24. "This is the first finding of HPAI [highly pathogenic avian influenza] in commercial poultry during the ongoing disease incident in the Pacific Flyway," the USDA's Animal and Plant Health Inspection Service (APHIS) said.

The agency added that no human cases have been reported anywhere to date and there is no threat to public health.

Virus detected via surveillance
The turkey farm is a Foster Farms facility. In a statement, the company said it detected the virus through its ongoing avian flu surveillance, adding that it has stepped up its poultry biosecurity
WHO warns about influenza co-circulation, bird outbreaks

The World Health Organization (WHO) today sounded an alarm about a number of signals that suggest that influenza strains, especially avian ones, are co-circulating and swapping genetic material at an unprecedented level.

In a statement today, the WHO said the world needs to be concerned about the diversity and spread of avian flu viruses in wild and domestic birds, factors that could give rise to more novel strains and threaten livelihoods, the food supply, and even human health.

The group said it is also concerned about several phenomena occurring alongside avian flu detections in birds, including genetic drift in the seasonal H3N2 virus that may have rendered this year’s Northern Hemisphere flu vaccine less effective, continuing H7N9 infections in China, and a spurt of H5N1 illnesses in Egypt.

Against that backdrop, several countries in the past 3 days have reported more highly pathogenic avian influenza (HPAI) in wild birds and poultry to the World Organization for Animal Health (OIE). They include the United States, Taiwan, Hungary, Myanmar, and Vietnam, and the strains include H5N8, H5N1, H5N2, and H5N3.
In big jump, H5N2 virus hits Minnesota turkey farm

A highly pathogenic avian influenza H5N2 virus has struck a turkey farm in west-central Minnesota, marking its first appearance in the Mississippi Flyway after surfacing in the Pacific Northwest in recent months, the US Department of Agriculture (USDA) announced late yesterday.

"It is the same strain of avian influenza that has been confirmed in backyard and wild birds in Washington, Oregon, and Idaho as part of the ongoing incident in the Pacific flyway," the USDA said in a statement.

The virus hit a turkey breeder replacement flock in Minnesota’s Pope County, the USDA said. State Veterinarian Bill Hartmann, DVM, MS, said nearly all of the 15,000 turkeys in one barn on the farm died, the Associated Press (AP) reported last night.

State officials quarantined the farm and planned to destroy the remaining turkeys there, according to the USDA and the Minnesota Board of Animal Health (MBAH). The risk to humans is considered low, since no human H5N2 cases have ever been reported, officials said.
Avian flu in South Korea, Taiwan prompts massive culling

South Korea and Taiwan have destroyed more than 2.7 million poultry in recent weeks and months in efforts to halt highly pathogenic avian influenza (HPAI) outbreaks of the H5N8 and H5N2 varieties, according to reports posted yesterday by the World Organization for Animal Health (OIE).

In addition, South Vietnam has reported another H5N1 avian flu outbreak, and low-pathogenicity avian flu (LPAI) H7N7 recently struck a turkey farm in Germany, according to media and OIE reports.

The latest outbreaks prolong a string of avian flu episodes that have surfaced this winter in Asia, Europe, North America, and Africa. Last week the World Health Organization said the diversity and geographic extent of recent avian flu outbreaks are greater than at any time since the debut of modern surveillance methods.

South Korea cites 65 H5N8 outbreaks
A South Korean report posted by the OIE yesterday describes 65 H5N8 outbreaks dating all the way from late last September to late January and involving about 2.6 million poultry. The report profiles 22 stand-alone outbreaks and "outbreak clusters" including from 2 to 13 individual incidents.
**Editor's note:** This story was revised on Mar 10, 2015, to clarify information about the control and surveillance zones around the Minnesota farm affected by H5N2.

H5N2 avian influenza—which surfaced in the US Pacific Northwest in December and in Minnesota last week—has now struck at least one turkey farm in Missouri, according to reports yesterday.

The Missouri Department of Agriculture (MDA) reported that avian flu hit a turkey farm in Asbury, a town near the southwestern corner of the state, and that preliminary tests indicated avian flu at a facility at Fortuna, in central Missouri's Moniteau County.

A state official told the Associated Press (AP) that the virus on the Asbury farm was the same highly pathogenic H5N2 strain that has been confirmed in Washington, Oregon, Idaho, and Minnesota, said an AP story yesterday.

**USDA sending team to assist**

The MDA said in a statement that it was following
Missouri's second H5N2 outbreak in turkeys confirmed

A second outbreak of highly pathogenic H5N2 avian influenza in turkeys has been confirmed in Missouri, on a farm halfway across the state from the first outbreak.

The second incident involves a farm housing 21,000 turkeys in the Moniteau County town of Fortuna in the central part of the state, the Missouri Department of Agriculture (MDA) said in a statement late yesterday. A day earlier, the agency had said preliminary test results indicated an outbreak there.

In related news, federal officials said the H5N2 strain found on a Minnesota turkey farm last week matches an isolate from a wild duck in Washington state, and a Wisconsin center will be testing wild birds in the Midwest for the virus.

Missouri outbreaks
The first outbreak was in Asbury, in Jasper County near the state's southwestern corner, and involved a flock of 30,100 turkeys, the agency said. That outbreak was announced Mar 8.
• Global infectious disease risk and preparedness
• Ebola virus disease
• Middle East respiratory syndrome coronavirus infection (MERS-CoV)
• Avian influenza
• Influenza vaccine effectiveness
• Chikungunya
• Other infectious disease issues
CDC's flu warning raises questions about vaccine match

The Centers for Disease Control and Prevention (CDC) warned yesterday that the profile of influenza viruses currently circulating, with A/H3N2 predominant, suggests a risk for a rough ride this winter, especially since about half of the H3N2 viruses don't match up with the corresponding strain in this year's vaccine.

CDC Director Tom Frieden, MD, MPH, observed that seasons dominated by H3N2 viruses are generally worse than other seasons, and warned that the mismatch between the vaccine and circulating strains may portend lower vaccine effectiveness (VE) than usual. Consequently, he emphasized that antiviral medications are an important second line of defense, especially for patients at risk for flu complications.

At a press conference, Frieden said the vaccine may still yield some protection against H3N2, despite the mismatch. At the same time, he cautioned that it's still early in the season and flu is highly unpredictable, so anything could happen.

In response to the CDC advisory, some flu experts raised questions about the wisdom of focusing public
Early-season estimate finds flu vaccine only 23% effective

A preliminary analysis indicates that this year's flu vaccine, which is not well matched to the predominant circulating flu strain, is only 23% effective in protecting people, the Centers for Disease Control and Prevention (CDC) announced today.

The agency said the finding, which is well below the typical overall flu vaccine effectiveness (VE) of around 60%, illustrates the importance of antiviral treatment for those at risk for flu complications and also points up the need for better flu vaccines. The findings were published in the Jan 16 issue of Morbidity and Mortality Weekly Report.

Two experts who were involved in the study said that although the relationship between vaccine match and effectiveness in general is not very clear, in this case the low VE probably is related to the mismatch, given that about two-thirds of circulating H3N2 viruses are "drifted" from the H3N2 component of the vaccine.
UK, Canada add to bad news on this year's flu vaccine

Researchers brought more bad news today on the performance of this winter’s flu vaccine—which does not match well with the dominant circulating strain—saying it has shown no significant effectiveness in preventing flu in the United Kingdom or in preventing flu-related hospitalizations in Canada.

The British team estimated the vaccine’s effectiveness in preventing medically attended flu at just 3.4%, while the Canadian group put its effectiveness for preventing flu-linked hospitalizations in the negative range: −16.8%. The findings were published in today's *Eurosurveillance*.

Those mid-season estimates are similar to another Canadian estimate released last week but lower than a US estimate issued in mid-January. The estimate a week ago from the Canadian Sentinel Physician Surveillance Network put the vaccine effectiveness (VE) at −8%. And on Jan 15 the US Centers for Disease Control and Prevention reported a mid-season VE estimate of 23%. Both estimates pertained to flu in outpatients, not hospital patients.

A more typical VE estimate for seasonal flu vaccines is in the 50% to 60% range, at least in healthy, working-age adults, with lower numbers in the elderly. Health officials have attributed the vaccine’s poor performance this winter to a mismatch with circulating influenza A/H3N2 viruses, which are overwhelmingly dominant this season. About two-thirds of H3N2 viruses from US patients have differed from the H3N2 strain in the vaccine.
New estimate puts current flu vaccine's effectiveness a bit lower
The latest estimate of the overall effectiveness of this year's seasonal influenza vaccine puts it at just 19% (95% confidence interval [CI], 7%-29%), slightly lower than the 23% reported in mid-January, the Centers for Disease Control and Prevention (CDC) reported yesterday.

The CDC said the updated estimate of vaccine effectiveness (VE) against H3N2 viruses, the heavily dominant subtype this winter, is 18% (95% CI, 6%-29%). This is similar to the earlier estimate (22%) and confirms reduced protection against H3N2 viruses this season, the agency added.

About two thirds of circulating H3N2 viruses have not been well matched to the H3N2 in the vaccine this winter. The CDC said the estimated VE is about a third of what is expected when the vaccine is well matched to the dominant circulating viruses, though a number of other factors also influence VE.

The estimate of VE against influenza B this winter is 45% (95% CI, 14%-65%), which is similar to the VE seen when vaccine and circulating viruses are well matched, the CDC said. The earlier VE estimate did not include a separate estimate for type B because of low numbers of cases.

In practical terms, the overall VE of 19% means "the flu vaccine reduced a person's risk of having to seek medical care at a doctor's office for flu illness by 19%," the CDC observed.

Mar 2 CDC statement on flu VE
Jan 15 CIDRAP News story on earlier CDC estimate
ACIP drops preference for nasal-spray flu vaccine in kids

Faced with new data that conflict with older findings, the US Advisory Committee on Immunization Practices (ACIP) today voted to drop its advice that the nasal-spray influenza vaccine should be preferred over injectable vaccines for children from 2 through 8 years old.

The committee’s action was prompted by findings that the intranasal vaccine was not effective against influenza A/H1N1 in children in 2013-14 and that it—like other flu vaccines—has not worked well against A/H3N2 in children this season, the Centers for Disease Control and Prevention (CDC) said in a press release.

The ACIP, which shapes the CDC’s vaccine guidance, ” recommends that children 6 months and older get annual influenza vaccine with no preference stated for either the nasal spray vaccine or the flu shot,” the CDC said. The committee vote was 14-0, with one abstention.

The committee left its annual flu vaccine recommendations otherwise unchanged, advising that nearly everyone more than 6 months old get an annual flu shot.
• Global infectious disease risk and preparedness
• Ebola virus disease
• Middle East respiratory syndrome coronavirus infection (MERS-CoV)
• Avian influenza
• Influenza vaccine effectiveness
• Chikungunya
• Other infectious disease issues
Aedes albopictus Female
World Distribution of the
*Aedes albopictus* Mosquito

![Map showing the world distribution of the *Aedes albopictus* mosquito]

- Green: Presence of *A. albopictus* before 1980
- Orange: Areas invaded by *A. albopictus* since 1980

Aedes aegypti
Aedes aegypti Distribution in the Americas
CHIKUNGUNYA (52): CARIBBEAN (SAINT MARTIN) ALERT

A ProMED-mail post
http://www.promedmail.org
ProMED-mail is a program of the
International Society for Infectious Diseases
http://www.isid.org

Date: Fri 6 Dec 2013
Source: The Daily Herald [edited]

In St Martin, 2 cases of chikungunya [virus infection], a dengue-like sickness, have been confirmed following testing at the specialist laboratory in Marseille that returned positive results to Agence Regional de Sante (ARS [Regional Health Agency]) on 5 Dec 2013.

The disclosure was made by ARS Director-General Patrice Richard on Friday [6 Dec 2013] at a press conference in the Prefecture attended by Prefet Philippe Chopin, President of the Collectivity Aline Hanson, Dutch-side [St Maarten] Minister of Public Health Cornelius de Weever and specialist epidemiologists.

Richard said family doctors, for about 2 weeks, have been reporting cases of people showing suspected signs of chikungunya, and not dengue [virus infections]. There is no current evidence that chikungunya is on the Dutch side [of the island]. The virus can be imported by travelling from a risk country.

The 2 confirmed cases originated in French Quarter. In addition, there are currently 4 "probable" cases and 30 "suspected" cases, 15 of which are in the Oyster Pond area. In technical terms, "suspected" means just the signs are manifested while "probable" is a diagnostic test that calculates the likelihood that chikungunya [virus] has been contracted, according to epidemiologists.

ARS is awaiting more results of other cases from the Marseille laboratory.

"Chikungunya is in the Pacific islands, in Asia, in India, but never until now in the Caribbean islands," noted epidemiologist Marion Petit-Sinturel. "It's the 1st time we have located transmission here in St Martin."

ARS Director Pascal Godefroy said the situation is likely to change quickly as results come in. "This could be the beginning of an epidemic since we are already in a dengue epidemic," he said.

Minister de Weever acknowledged that "mosquitoes don't stop at the border," and assured the full cooperation of Dutch-side health authorities.
<table>
<thead>
<tr>
<th>Country/Territory</th>
<th>Week</th>
<th>Autochthonous transmission cases</th>
<th>Imported cases</th>
<th>Incidence Rate</th>
<th>Deaths</th>
<th>Population X 1000</th>
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<tr>
<td></td>
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<td>Suspected</td>
<td>Confirmed</td>
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## Number of Reported Cases of Chikungunya Fever in the Americas, by Country or Territory
### Cumulative cases
#### Epidemiological Week / EW 9 (Updated as of 6 March 2015)

<table>
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<tr>
<th>Country/Territory</th>
<th>Week</th>
<th>Autochthonous transmission cases</th>
<th>Imported cases</th>
<th>Incidence Rate</th>
<th>Deaths</th>
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<tr>
<td></td>
<td></td>
<td>Suspected</td>
<td>Confirmed</td>
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<td><strong>Southern Cone</strong></td>
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<td>Argentina</td>
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<td><strong>Subtotal</strong></td>
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<td><strong>Non-Latin Caribbean</strong></td>
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<td>Week 44</td>
<td>1,838</td>
<td>835</td>
<td>1,818.4</td>
<td>0</td>
</tr>
<tr>
<td>Dominica</td>
<td>Week 5</td>
<td>3,598</td>
<td>173</td>
<td>5,165.8</td>
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</tr>
<tr>
<td>Grenada</td>
<td>Week 46</td>
<td>3,870</td>
<td>26</td>
<td>2,814.5</td>
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<tr>
<td>Guyana</td>
<td>Week 2</td>
<td>5,310</td>
<td>105</td>
<td>676.9</td>
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</tr>
<tr>
<td>Jamaica</td>
<td>Week 7</td>
<td>1,669</td>
<td>87</td>
<td>63.1</td>
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<tr>
<td>Montserrat</td>
<td>Week 4</td>
<td>117</td>
<td>14</td>
<td>2,620.0</td>
<td>5</td>
</tr>
<tr>
<td>Saint Kitts and Nevis</td>
<td>Week 53</td>
<td>627</td>
<td>28</td>
<td>1,284.3</td>
<td>0</td>
</tr>
<tr>
<td>Saint Lucia</td>
<td>Week 52</td>
<td>645</td>
<td>238</td>
<td>541.7</td>
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<tr>
<td>Saint Vincent and the Grenadines</td>
<td>Week 2</td>
<td>1,245</td>
<td>173</td>
<td>1,376.7</td>
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<tr>
<td>Sint Maarten (Dutch part)</td>
<td>Week 52</td>
<td>470</td>
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<td>1,175.0</td>
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<tr>
<td>Suriname</td>
<td>Week 43</td>
<td>1,210</td>
<td>14</td>
<td>224.5</td>
<td>1</td>
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<tr>
<td>Trinidad and Tobago</td>
<td>Week 3</td>
<td>303</td>
<td>3</td>
<td>22.6</td>
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</tr>
<tr>
<td>Turks and Caicos Islands</td>
<td>Week 44</td>
<td>19</td>
<td>7</td>
<td>39.6</td>
<td>0</td>
</tr>
<tr>
<td>Virgin Islands (UK)</td>
<td>Week 47</td>
<td>347</td>
<td>47</td>
<td>1,231.3</td>
<td>0</td>
</tr>
<tr>
<td>Virgin Islands (US)</td>
<td>Week 4</td>
<td>1,625</td>
<td>279</td>
<td>1,813.3</td>
<td>2</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
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<td></td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>183</td>
</tr>
</tbody>
</table>

Population X 1000

<table>
<thead>
<tr>
<th>Country/Territory</th>
<th>Week</th>
<th>Autochthonous transmission cases</th>
<th>Imported cases</th>
<th>Incidence Rate</th>
<th>Deaths</th>
<th>Population X 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Southern Cone</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>266,230</td>
</tr>
<tr>
<td><strong>Non-Latin Caribbean</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>964,341</td>
</tr>
</tbody>
</table>
Chikungunya, countries or areas at risk

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: World Health Organization
Map Production: Health Statistics and Information Systems (HSI)
World Health Organization

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• Global infectious disease risk and preparedness
• Ebola virus disease
• Middle East respiratory syndrome coronavirus infection (MERS-CoV)
• Avian influenza
• Influenza vaccine effectiveness
• Chikungunya
• Other infectious disease issues
Measles – WHO European Region

Disease outbreak news
6 March 2015

Between 1 January 2014 and 1 March 2015, WHO received notification of over 23 000 cases of measles in the WHO European Region. The most affected country is Kyrgyzstan with over 7 000 cases reported in just the first seven weeks of 2015. Significant numbers of measles cases have also been reported in Bosnia and Herzegovina, Croatia, Georgia, Germany, Italy, Kazakhstan, Russian Federation and Serbia.

Measles virus D8 has been the most commonly identified circulating genotype.

WHO advice

Based on the current situation and available information, WHO encourages Member States to scale up vaccination against measles across age groups at risk. This will help putting an end to the several outbreaks currently hitting countries of the European Region and preventing similar outbreaks in the future.

At the same time, all countries need to maintain a very high routine measles vaccination coverage so that similar outbreaks will not happen again in the Region, and measles can be eliminated once and for all.
CDC sounds alarm about early measles spike

The 84 measles cases from 14 states reported to federal officials in January alone already exceed the total reported from some whole years, prompting a warning from the US Centers for Disease Control and Prevention (CDC) that Americans should be vaccinated and that clinicians be on guard for detecting and preventing the disease.

At a media briefing today, Anne Schuchat, MD, assistant surgeon general and director of the CDC's National Center for Immunization and Respiratory Diseases, said most of the cases are part of a multistate outbreak linked to a Disney theme park in California that started in late December. "This worries me," she said, airing concerns that a disease that was considered eliminated in the United States in 2000 is now at risk of becoming endemic again.

The surge in infections this month follows a banner year for the disease in 2014, during which more than 600 measles cases were reported in the United States, the most in 20 years.
Four measles outbreaks push US cases to 170

Sixteen more measles cases were reported to the US Centers for Disease Control and Prevention (CDC) last week, lifting the national total to 170 cases so far this year, about three fourths of them part of a large ongoing multistate outbreak linked to Disneyland in California.

Though 17 states and the District of Columbia have reported measles cases this year, 89% of the cases are from four outbreaks, with California and its link to the Disney outbreak having the most cases. Three other states—Illinois, Nevada, and Washington—have outbreaks under way that aren’t linked to the Disney outbreak.

**Disneyland outbreak total grows**

Seven more infections have been linked to the Disney outbreak, lifting that total to 140, the CDC said. However, 15 of those cases were reported from late December when the outbreak first began and aren’t included in the 170 total cases for this year.
Superbug outbreak extends to Cedars-Sinai hospital, linked to scope

Four people have been infected with a superbug linked to a contaminated medical scope, Cedars-Sinai has discovered, and 67 others may have been exposed. (Frederic J. Brown / AFP/Getty Images)
Two more hospitals report scope-related 'superbug' infections

A second Los Angeles hospital and one in Hartford, Conn., reported drug-resistant "superbug" infections linked to contaminated duodenoscopes, Reuters reported yesterday.

Cedars-Sinai Medical Center in Los Angeles reported four infections with carbapenem-resistant Enterobacteriaceae (CRE) and said 67 more patients were at risk. Two weeks ago the UCLA Ronald Reagan Medical Center in Los Angeles reported seven CRE infections, two of them fatal, linked to the fiber-optic instrument.

A hospital in Hartford, meanwhile, reported at least five duodenoscope-linked infections involving drug-resistant Escherichia coli. A Hartford Courant story yesterday identified the hospital as Hartford Hospital and said officials were notifying 281 additional patients of possible exposure.

Rocco Orlando III, MD, chief medical officer of Hartford HealthCare, said that the endoscopies that led to potential exposures in the past several months are of a type reserved for very ill patients and were not general endoscopies, the Courant reported.

The FDA, meanwhile, updated its alert on the type of duodenoscopes involved in the outbreak.

Mar 4 Reuters report
Mar 4 Hartford Courant story
Mar 4 FDA updated alert
Deadly superbug-related scopes sold without FDA approval

By Elizabeth Cohen, Senior Medical Correspondent

Updated 5:20 AM ET, Thu March 5, 2015

Antibiotic-resistant bacteria 17 photos

Carbapenem-resistant enterobacteriaceae (CRE)
Wild Poliovirus & cVDPV\(^1\) Cases\(^2\) 2015
01 January – 03 March

- Wild poliovirus type 1 \(N = 14\)
- cVDPV type 2 \(N = 0\)

Endemic country

\(^1\)cVDPV is associated with \(\geq 2\) AFP cases or non-household contacts. VDPV2 cases with \(\geq 6\) (\(\geq 10\) for type1) nucleotides difference from Sabin in VP1 are reported here.\(^2\)Excludes viruses detected from environmental surveillance.

Data in WHO HQ as of 03 March 2015
“If you don’t know where you’re going, any road will get you there.”

- Lewis Carroll
“Are these the shadows of the things that Will be, or are they shadows of things that May be, only?”

Ebenezer Scrooge