Conclusion. We have demonstrated the feasibility of implementing large-scale, saliva-based cCMV screening program within one hospital system. Universal screening detected twice as many infected infants than would have targeted screening based on newborn hearing screen and growth parameters.

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950. Evidence for Cross-species Influenza A Virus Transmission within Swine Farms, China

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Background. Our understanding of the risk factors for swine influenza A virus transmission between humans and pigs is sparse.

Methods. Beginning in 2015, we used a One Health approach and serial sampling to prospectively study 299 swine workers and 100 controls, their 9000 pigs, and six pig farm environments in China for influenza A viruses (IAVs) using molecular, culture, and immunological techniques. Study subjects were closely monitored for influenza-like illness (ILI) events.

Results. Upon enrollment, swine workers had higher serum neutralizing antibody titers against swine H1N1 and higher nasal wash total IgA and specific IgA titers against swine H1N1 and H3N2 viruses. Over a period of 12 months, IAVs were detected by qRT-PCR in 52 (12%) of 432 environmental swabs, 275 (7.6%) of 3600 pig oral secretion, 25 (5.8%) of 432 water, 24 (5.5%) of 432 aerosol, and 20 (4.6%) of 432 fecal-slurry specimens. Five (15.6%) of 32 subjects with ILI events had nasopharyngeal swab specimens that were positive for IAV and 17 (53%) demonstrated 4-fold rises in neutralization titers against a swine virus. Reassorted Eurasian avian-like swine H1N1, pdm09(H1N1)-like virus, and swine-like H3N2 viruses were identified in pig farms. The H1N1 viruses were nearly genetically identical with the human H1N1 viruses isolated from the subjects with ILI.

Conclusion. There was considerable evidence of A(H1N1)pdm09-like, swine H1N1 and swine H3N2 viruses reassorting and circulating within the pig farms and crossing species. These data suggest that stronger surveillance for novel influenza virus emergence within swine farms is imperative.

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951. Causes of In-hospital and Post discharge Mortality Among Patients Hospitalized with Laboratory-Confirmed Influenza, Influenza Hospitalization Surveillance Network, 2014–2015

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Background. Influenza results in an estimated 12,000–56,000 deaths annually in the USA. While in-hospital deaths are well characterized, less is known about deaths that occur after discharge among those hospitalized with influenza.

Methods. We identified patients hospitalized with laboratory-confirmed influenza who died during hospitalization or within 30 days after discharge during the 2014–2015 influenza season for 11 Influenza Hospitalization Surveillance Network sites. We matched cases to the National Center for Health Statistics Electronic Death Registration System and abstracted cause and location of death from death certificates. We compared clinical characteristics between those who died during hospitalization and those who died after hospital discharge using χ^2 tests.

Results. Among 795 patients with laboratory-confirmed influenza who died, 370 (47%) died during hospitalization, and 425 (53%) died within 30 days after discharge. Eighteen (2%) were 0–17 years and 652 (82%) were ≥65 years. Common causes of death listed in any position on the death certificate included influenza (35%), other respiratory causes (50%), cardiovascular disease (37%), and sepsis (15%). Among those who died after discharge, 207 (49%) died within 7 days, 86 (20%) within 8–14 days, and 132 (31%) within 15–30 days post discharge. Patients who died after discharge were more likely to be ≥65 years (88 vs. 74%) or admitted from a nursing home (48 vs. 36%), but were less likely to be admitted to an intensive care unit (30 vs. 68%) or receive a pneumonia diagnosis (46 vs. 62%) than patients who died during hospitalization (all $P < 0.001$). There were no significant differences in sex, race, underlying conditions, vaccination rates, or time from symptom onset to hospitalization. Patients who died in hospital were more likely to have influenza listed as a cause of death (55 vs. 21%, $P < 0.01$).

Conclusion. Over half of deaths among patients hospitalized with laboratory-confirmed influenza occurred after discharge. Patients who died after discharge were older and less likely to have influenza listed as a cause of death. Deaths that occur after an influenza-related hospitalization represent an important and under-characterized contribution to the burden of seasonal influenza.

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952. Estimating Risk to Humans Exposed to Highly Pathogenic Avian Influenza Outbreaks in the United States, 2014–2017

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Background. In the USA, poultry outbreaks of highly pathogenic avian influenza viruses (AI) caused by H5 and H7 viruses have raised concern about the risk of infections in humans. Based on data from Asian lineage H5 and H7 AI, which sporadically transmit from poultry to humans, CDC currently recommends active daily monitoring of persons exposed to H5 and H7 AI viruses, including those who wear personal protective equipment (PPE).

Methods. Persons exposed to HPAI-infected birds or contaminated environments in the USA were actively monitored during exposure and for 10 days post-exposure for illness, during 2014–2017. Some exposed persons were monitored on-site by USDA or contract safety officers, company staff, or state health officials. State health department staff monitored people during the 10-day post-exposure period. Persons reporting any respiratory illness or conjunctivitis were swabbed for molecular influenza testing. Preliminary results are presented.

Results. From 2014 to 2017, 270 detections in poultry/wild birds were reported and at least 606 persons were potentially exposed to AI virus by exposure to birds, carcasses, or environment. Most exposed persons wore PPE. No human infections with AI viruses were detected.

Conclusion. The risk of transmission of these H5 and H7 AI viruses to humans was low. These preliminary data offer evidence to change the recommendations for monitoring in persons exposed to these viruses. If final data support these findings, self-monitoring by workers with reporting to health departments if symptoms develop, rather than active monitoring by public health personnel, could be considered. However, it will be important to reconsider and update recommendations as the viruses evolve. Furthermore, risk of infection likely varies by exposure and those without PPE should be actively monitored.

Year	HPAI virus	No. of detections reported	Estimated no. birds destroyed	No. of persons exposed	No. HPAI positive/no. of ill and tested	Percent ill of all exposed (95% exact binomial confidence interval)
December 2014–June 2015	H5N2	241	15,639,861	103	0/5	0 (0–0.02)
	H5N8	22	254,669	56		
	H5N1	2	0	3		
	H5			*2*		
				164		
2016	H7N8	1	42,600	319	0/20	0 (0–0.01)
	H5N2	1	0	Missing	Missing	
2017	H7N9	2	127,956	123	0/1	0 (0–0.03)
	H5N2	1	0	Missing	Missing	

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