
**Final Report for the 2017 Outbreak of Highly
Pathogenic Avian Influenza (HPAI)/Low
Pathogenicity Avian Influenza (LPAI)
in the Southeastern United States**

August 8, 2017

Public Version

***Veterinary Services
Surveillance, Preparedness, and Response Services
Animal and Plant Health Inspection Service***



**United States
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Agriculture**

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Executive Summary

Incident Overview

After the 2014–2015 outbreak of highly pathogenic avian influenza (HPAI) in the United States, as well as the Indiana HPAI/low pathogenicity avian influenza (LPAI) outbreak in 2016, the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) and poultry producers remained on high alert for HPAI in 2017. In early March, based on the appearance of clinical signs, a Tennessee commercial broiler breeder flock in Lincoln County was suspected to have HPAI. On March 3, 2017, samples from that farm were presumptive positive for the H7 influenza subtype at a National Animal Health Laboratory Network (NAHLN) laboratory. At this time, HPAI response activities in Tennessee were initiated immediately, with State and Federal agreement, as the presumptive positive case definition for HPAI had been met. The next day, the National Veterinary Services Laboratories (NVSL) confirmed HPAI on the premises. The virus was subsequently identified as H7N9 of North American wild bird lineage (unrelated to Asian H7N9 viruses). Surveillance in commercial and backyard premises began immediately. Four days later, on March 8, 2017, NVSL confirmed LPAI H7N9 in a neighboring Tennessee county, again in a commercial broiler breeder flock. In total, between March 4 and March 25, 2017, 14 premises were identified with confirmed H7 or confirmed H7N9 infection. In total, HPAI was confirmed on 2 premises—the index case and a second commercial broiler breeder flock, both in Lincoln County. The remaining 12 premises had confirmed or presumptive LPAI: 6 commercial premises and 6 backyard flocks.

There were no additional H7/H7N9 HPAI or LPAI detections in commercial or backyard flocks after March 25, 2017. Wild bird surveillance on and around the Infected Premises did not yield any positive H7 avian influenza (AI) results. The HPAI Infected Premises were depopulated rapidly, as were 9 of the 12 LPAI Infected Premises. One LPAI infected backyard premises conducted targeted euthanasia; additionally, two other LPAI infected backyard premises with no clinical signs did not depopulate. These three premises underwent intensified surveillance to be released from quarantine. In all, nearly 253,000 birds were depopulated as part of these HPAI and LPAI detections in the southeastern United States.

This 2017 incident enabled yet another region in the United States to exercise their AI preparedness and response procedures; for APHIS, it offered a refresher of AI response and the ability to practice the improved processes and procedures that have been implemented since 2014–2015. This successful HPAI/LPAI response in the southeast United States was largely based on the lessons learned by APHIS, States, and the poultry industry in the prior AI incidents.

Summary of Response Activities

In response to the HPAI detections, the State Animal Health Officials in Tennessee and Alabama, alongside APHIS Veterinary Services (VS), took the lead in coordinating the response. A unified State-Federal Incident Command was established for Tennessee and Alabama, the region where the HPAI detections and HPAI Control Areas were located. For the LPAI detections in Kentucky and Georgia, these State Animal Health Officials led the LPAI response effort in their respective States. Additional VS personnel supported activities—as requested by State Animal Health Officials—in response to the LPAI detections.

The response to the outbreak included the following activities at the national and/or field levels:

- Planning and conducting disease surveillance.
- Collecting samples and diagnostic testing.
- Planning and carrying out epidemiological investigations and tracing.
- Managing information from the field to the national level.
- Coordinating and communicating with State, local, and industry stakeholders.
- Providing guidance on personal protective equipment and responder health and safety and ensuring safety officers were in the field.
- Providing guidance and supervision on biosecurity measures.
- Conducting quarantine and movement control activities.
- Supporting continuity of business and issuing permits for the HPAI Control Area.
- Providing information and documentation for regionalization for international trade.
- Conducting and providing resources and guidance for mass depopulation and euthanasia.
- Safeguarding animal welfare during response operations.
- Offering subject matter expertise for disposal.
- Providing guidance and options for cleaning and disinfection (virus elimination).
- Managing logistics through the National Veterinary Stockpile.
- Implementing revised financial procedures for appraisal and indemnity and providing support for compensating HPAI-infected poultry owners and contract growers.
- Providing overall incident management, support, and objectives.

APHIS contractors supported depopulation efforts, using foam, on both HPAI Infected Premises. On LPAI premises that depopulated, the company or producer typically led depopulation efforts with the assistance of State personnel, as required by the situation. A variety of methods were used for these LPAI premises, including foam, KEDS, cervical dislocation, and CO₂. Ventilation shutdown was not implemented during this outbreak.

In terms of disposal, premises that depopulated birds used on-site burial (12 of 12). The 11 Infected Premises (9 LPAI; 2 HPAI) that depopulated in full also conducted cleaning and disinfection activities (also known as virus elimination): 7 applied wet disinfectant, 2 conducted heat treatment, 1 elected to fumigate, and 1 underwent an extended fallow period. The previously-infected HPAI premises were approved to restock on June 4, 2017: all premises were approved to conduct restocking by June 16, 2017.

Organizational Response

A unified Incident Command was established in Nashville on March 4, 2017, comprised primarily of personnel from Surveillance, Preparedness, and Response Services (SPRS) District 2 and the Tennessee Department of Agriculture. Because the HPAI Control Area boundary also included part of Madison County, Alabama, personnel from the State of Alabama also joined the unified Incident Command. Other APHIS personnel also supported SPRS District 2 responders in the unified Incident Command, both on-site and virtually, with activities like surveillance, finance/administration, and epidemiology for the HPAI Infected Premises and LPAI Infected Premises associated with the HPAI detections. SPRS District 2 personnel supported activities associated with the LPAI Infected Premises in Kentucky and Georgia; these States were not part of the unified Incident Command.

The National Incident Coordination Group (ICG) was immediately ramped up when the presumptive positive case definition for HPAI was met; this group was prepared to support unified Incident Command operations. At the height of the response, the ICG consisted of approximately 20 people devoting significant time for the HPAI/LPAI outbreak in the southeastern United States.

End of Outbreak and Cost

The HPAI Control Areas were released on April 11, 28 days after NVSL had confirmed the second HPAI infection. Response operations, including virus elimination, environmental sampling, and restocking approvals were completed throughout late spring. The final Infected Premises quarantine (an LPAI backyard premises) was released on June 16, 2017. For the 2017 H7N9 incident, the total commitments for indemnity on the HPAI premises, as well as obligations for overall response operations, was approximately \$2.79 million. In 2017, indemnity funds were provided by APHIS for depopulated birds on HPAI Infected Premises; compensation was also provided to HPAI Infected Premises for virus elimination activities. In this incident, LPAI Infected Premises that made the decision to depopulate—in coordination with State officials—did not receive APHIS indemnity funds for depopulated birds or compensation for virus elimination activities.

Contents

Handling Instructions	iii
Acknowledgments.....	iii
Executive Summary	v
Section 1. Background	1
Purpose.....	1
Nature of Disease	1
Prior Outbreaks in the United States	1
The Foundation of Preparedness	2
Section 2. Characteristics of the 2017 H7 Southeastern Outbreak	3
Scope of the Outbreak.....	3
Disease Incidence	6
Subtyping and Pathotyping	8
Viral Traits	10
Introduction & Transmission	10
Section 3. Overview of Response Effort.....	10
Regulatory Intervention	10
Financial Resources.....	11
Economic & Trade Impact.....	11
Personnel.....	12
Section 4. Incident Management	12
Overview	12
National Incident Coordination Group and APHIS Multiagency Coordination Group	14
APHIS Multiagency Coordination Group.....	14
National Incident Coordination Group	14
APHIS VS National Incident Management Teams & Deployments.....	17
APHIS Personnel Deployments.....	17
Contractors	19
Section 5. Incident Coordination Group Response and Support Activities	20
Overview	20
Reporting and Communicating Information	20
Deployment/Personnel Management.....	21
Policy and Guidance	21
Health and Safety	23
Section 6. Highlights of Response Activities	23
Overview	23
Surveillance and Epidemiology.....	25

Surveillance Around HPAI Infected Premises	25
Surveillance Around LPAI Infected Premises	25
Incident Coordination Group and Unified Incident Command Activities	25
Diagnostics	29
Quarantine, Movement Control, and Continuity of Business	29
State Quarantines and Unified Control Areas	29
Movement Control and Continuity of Business	30
Depopulation	32
Disposal.....	33
Virus Elimination (Cleaning and Disinfection)	35
Biosecurity	36
Health and Safety	37
Appraisal & Compensation.....	37
Indemnity for Birds Destroyed	37
Compensation for Response Activities	37
Logistics	38
Restocking.....	38
Information Management & Reporting	39
Communications.....	40
Section 7. Preparedness and Future Planning.....	40
Section 8. Conclusion.....	41
Section 9. Abbreviations	44
Section 10. List of Appendices	46

Tables

Table 1. HPAI Outbreaks in the United States.....	2
Table 2. List of Affected Premises	9
Table 3. Premises Sampled and Number of Accessions as Surveillance for the 2017 HPAI Detections	26
Table 4. Premises Sampled and Number of Accessions as Surveillance for the 2017 LPAI Detections	28

Figures

Figure 1. Affected Counties in the 2017 H7 Outbreak	4
Figure 2. HPAI and LPAI H7/H7N9 Detections in the Southeastern United States, by Flock Type	4

Figure 3. Approximate Number of Birds Affected in the Southeastern United States, by State and Production Type.....5

Figure 4. Birds Affected in the Southeastern United States, by Production Type5

Figure 5. All Detections by Flock Type and by NVSL Confirmation Date.....7

Figure 6. Epidemiological Curve by Earliest Known Date of Infection.....8

Figure 7. NVSL Confirmed Results for All Premises (Subtype & Pathotype)9

Figure 8. Overview of USDA APHIS Organizational Structure for Incident13

Figure 9. Details of the USDA APHIS Organizational Structure for Incident.....14

Figure 10. Total Number of APHIS Personnel Assigned to the National ICG at APHIS Hub or Home Location, by Organizational Unit15

Figure 11. National Incident Coordination Group Structure During 2017 H7 Incident16

Figure 12. Total Number of APHIS and State Personnel Deployed per Day17

Figure 13. Total Number of APHIS Personnel Deployed to the Field by Organizational Unit ...18

Figure 14. Total APHIS Deployments, by Appointment Type18

Figure 15. Contractor Support for Response Operations for HPAI Infected Premises19

Figure 16. A Guide to Help You Understand the Response Process.....24

Figure 17. Number of Premises Sampled (First HPAI Control Area & Surveillance Zone).....27

Figure 18. Number of Premises Sampled (Second HPAI Control Area & Surveillance Zone)....27

Figure 19. Length of Quarantine on All Premises (Frequency Count).....30

Figure 20. Number of Permitted Movements During Incident by State of Destination (Control Area in Place; Three-Day Increments).....31

Figure 21. Number of Permitted Movements by Item and Permit Class32

Figure 22. Time in Days to Depopulation from NVSL Confirmation (Frequency Count).....33

Figure 23. Primary Disposal Method for Carcasses & Materials34

Figure 24. Time in Days to Disposal Complete from NVSL Confirmation (Frequency Count) .34

Figure 25. Disinfection Method Used.....35

Figure 26. Time to Virus Elimination/C&D Complete (in Days)36

Figure 27. Restock Approval Date for All Premises39

Figure 28. Time in Days to Restock Approval from NVSL Confirmation Date.....39

Figure 29. 2017 AI Outbreak in Southeastern United States with Disease Status41

Figure 30. 2017 Overall Timeline.....42

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Section 1. Background

Purpose

This document presents an overview of the 2017 high pathogenicity avian influenza (HPAI)/low pathogenicity avian influenza (LPAI) outbreak in the southeastern United States. It focuses on the characteristics of the outbreak, organizational structure employed in the response, activities of the Incident Coordination Group (ICG), and summary highlights of the field response measures. It is not an After Action Report, nor does it systemically identify corrective actions. Please see the *U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) After Action Report for the 2017 Outbreak of HPAI/LPAI in the Southeastern United States* for this information. The 2017 HPAI/LPAI incident response was largely based on the lessons learned in the 2014–2015 HPAI outbreak as well as the 2016 HPAI/LPAI outbreak in Indiana.

Nature of Disease

Avian influenza is an infectious disease of birds including poultry, such as chickens and turkeys. At times, it can be fatal. Influenza A viruses are broadly categorized based on a combination of two groups of proteins on the surface of the influenza A virus: hemagglutinin or “H” proteins, of which there are 16 (H1-H16), and neuraminidase or “N” proteins, of which there are 9 (N1-N9). Many different combinations of “H” and “N” proteins are possible. Waterfowl are natural reservoirs for avian influenza viruses, but most infections of wild birds are asymptomatic.

Common LPAI signs in poultry include decreased food and water consumption, coughing, sneezing, and decreased egg production. HPAI infections may also cause sudden death, lack of energy, the production of soft or deformed eggs, swelling (of head, eyelids, comb, wattles, and/or hocks), purple discoloration (of wattles and/or comb), nasal discharge, loss of coordination, and/or diarrhea. Transmission of HPAI typically occurs through direct contact with infectious respiratory secretions and feces. Viral spread via indirect contact with contaminated equipment and supplies (also known as fomites) is common. Avian influenza viruses can also infect other mammals such as pigs and cats, and *rarely*, humans.

In poultry, surveillance for avian influenza is conducted using a flock-based approach. Based on the severity of illness in chickens and the genetic features of the virus, the disease is classified as either HPAI or LPAI. Any HPAI and all H5 and H7 subtypes from poultry are reportable. This is because H5 and H7 subtypes have the potential to change from LPAI to HPAI during infections in domestic poultry, as seen during this outbreak.

Prior Outbreaks in the United States

While avian influenza (AI) is common in birds worldwide, some countries also have endemic HPAI in their poultry. However, in the United States—and other countries considered to have developed veterinary infrastructure and advanced animal agriculture industries—HPAI is not frequently detected in commercial poultry. A summary of HPAI outbreaks in the United States is provided in Table 1. Additionally, serious H7N2 and H5N2 LPAI outbreaks in the United States

in 2002 and 2007 resulted in the destruction of 4 million and 25,600 commercial birds respectively.

Table 1. HPAI Outbreaks in the United States

Year(s)	Strain	Locations	Impact
1924	H7	East Coast live bird markets	Not available
1927	Unknown	NJ	Not available
1983–84	H5N2	Northeastern U.S.	17 million chickens, turkeys, and guinea fowl destroyed
2004	H5N2	TX	Destruction of 1 flock
2014–15	H5N8, H5N1 (wild bird only), H5N2	AR, CA, IA, ID, IN, KS, KY, MI, MN, MO, MT, ND, NE, NM, NV, OR, SD, UT, WA, WI, WY (includes wild bird detections)	50.5 million commercial birds affected (including Dangerous Contacts)
2016	H7N8	IN (related LPAI cases were also detected in IN)	>400,000 commercial birds affected (including Dangerous Contacts)
2017	H7N9	TN (related LPAI cases were detected in AL, GA, and KY)	>249,000 commercial birds affected

The Foundation of Preparedness

APHIS continuously prepares for significant animal disease incidents. With the response to the 2014–2015 outbreak, the timely response in Indiana, and because USDA APHIS, States, and industry have been anticipating additional HPAI cases, all stakeholders were informed and ready for an immediate and effective response in 2017.

In the wake of the 2014–2015 HPAI outbreak, Veterinary Services (VS) personnel worked to revise and update HPAI plans and procedures. When the Indiana outbreak occurred, work was continuing on corrective actions identified in the prior outbreak, applying lessons learned to improve policy and processes at both the APHIS VS National Incident Management Team (NIMT) and ICG levels. Additionally, the *Foreign Animal Disease Preparedness and Response Plan (FAD PReP) Highly Pathogenic Avian Influenza Response Plan: The Red Book* had been revised in 2015 (and was undergoing a revision as this outbreak occurred), and the *HPAI Preparedness and Response Plan*, first released in the fall of 2015, was updated in January 2016.¹

At the culmination of the 2014–2015 outbreak, one of the most important actions was to revise and streamline the existing, cumbersome indemnity and appraisal process. Revised appraisal and indemnity procedures were rolled out to relevant parties as the Indiana outbreak occurred, and publicly in February 2016. Highlights of these revisions included the following: only one form was required to be signed prior to depopulation, the method for all payments was simplified, producers received a flat-rate payment for virus elimination activities, and indemnity can be

¹ An updated *HPAI Response Plan: The Red Book* was released in May 2017. It is available from www.aphis.usda.gov/fadprep.

split, as applicable, between the owner and the grower (via an interim rule in 9 *Code of Federal Regulations* [CFR] 53).

Throughout 2016 and into early 2017, the HPAI National ICG remained active; VS NIMTs also met routinely—including conference calls by section (e.g., planning, operations)—to improve procedures, processes, and clarify roles and responsibilities. Both groups continued to work diligently on the corrective actions identified in the *Corrective Action Plan Tracker* and after action reports. For example, position descriptions were revised and distributed for the VS NIMTs; additional work was completed to ensure the contracting process is both efficient and transparent. The two previous HPAI outbreaks, which included the HPAI/LPAI incident in Indiana, left APHIS and stakeholders well prepared to manage the HPAI/LPAI outbreak in the southeastern United States successfully.²

Section 2. Characteristics of the 2017 H7 Southeastern Outbreak

Scope of the Outbreak

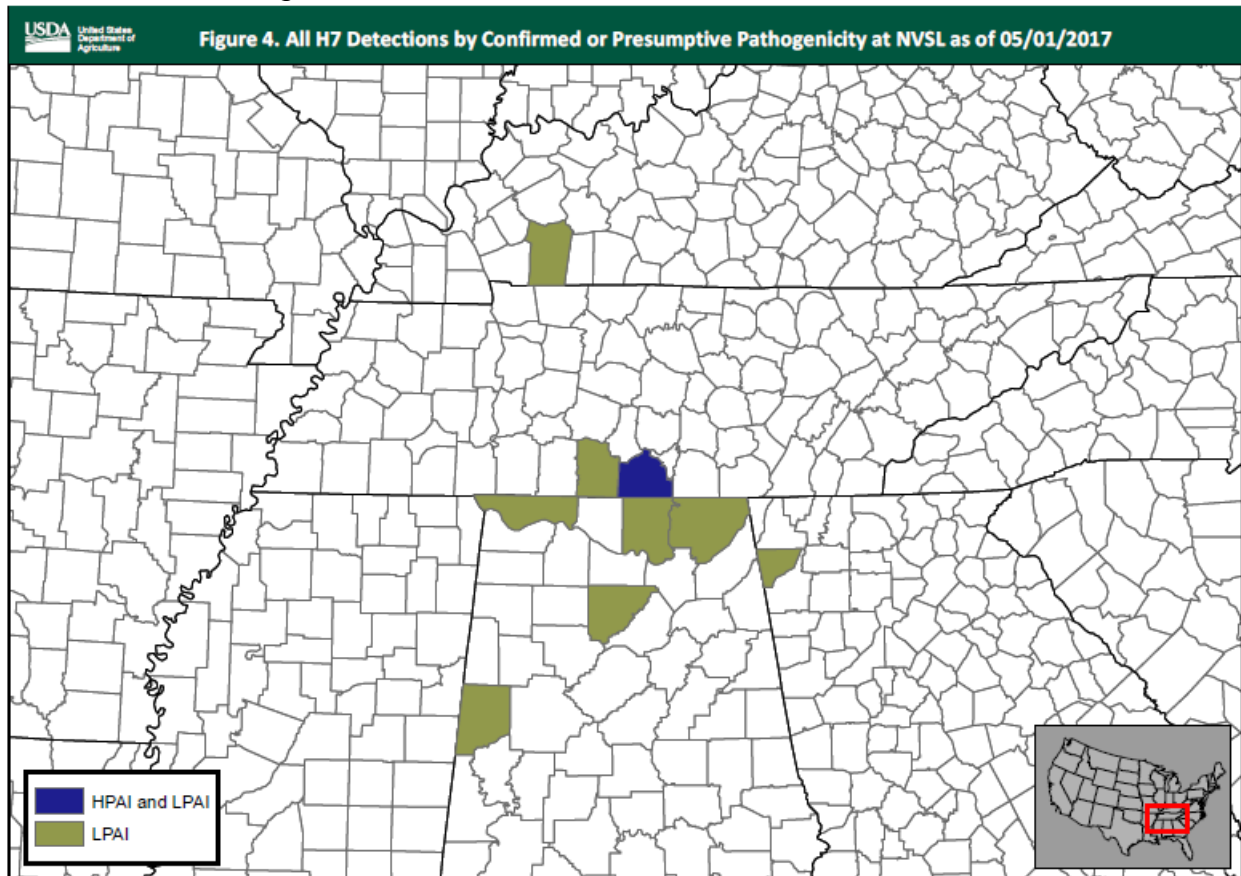
The 2017 outbreak of the H7/H7N9 virus of North American lineage was limited to four States in the southeastern United States: Tennessee, Alabama, Kentucky, and Georgia. Lincoln County, Tennessee was the only location with HPAI detections (2 HPAI Infected Premises) (Figure 1). Both of the HPAI detections were in commercial broiler breeder flocks.

In total, as seen in Figure 2, there were 2 confirmed HPAI detections and 12 LPAI detections (8 presumptive LPAI; 4 confirmed LPAI).³ Of the 14 premises, 8 were commercial flocks and 6 were backyard producers (Figure 2): all commercial premises affected were broiler breeder flocks. On the 14 affected premises, approximately 253,000 birds were depopulated, or succumbed to the virus in the case of the HPAI premises (Figure 3). Nearly 99 percent of these birds were in commercial broiler breeder flocks (Figure 4). There were no Dangerous Contact Premises identified in this outbreak.

² This incident is sometimes referred to as a “mixed HPAI/LPAI” incident. For both this incident (2017) and Indiana (2016), this “mixing” refers *only* to the response effort, which requires the management of both HPAI infected flocks (and premises) and LPAI infected flocks (and premises) as part of a single incident. Both the 2016 and 2017 incidents were LPAI introductions into poultry followed by a single event of a mutation to HPAI. There were not “mixed” infections where HPAI and LPAI were found, simultaneously, in a flock.

³ In this outbreak, samples from some Infected Premises did not contain enough virus (specifically, viral RNA) to establish pathogenicity (e.g., LPAI or HPAI). As such, on some premises, the N-type and/or the pathotype (or pathogenicity) could not be determined. Where no virus or sequence could be recovered and the flock lacked clinical signs (e.g., did not meet the HPAI case definition), the flock status remained “presumptive LPAI.” All Infected Premises were confirmed at NVSL by either PCR, antibody testing, or sequence data. More information on the Infected Premises’ statuses can be found in Table 2.

Figure 1. Affected Counties in the 2017 H7 Outbreak



Note: Map produced during the incident by the USDA APHIS VS Center for Epidemiology and Animal Health.

Figure 2. HPAI and LPAI H7/H7N9 Detections in the Southeastern United States, by Flock Type

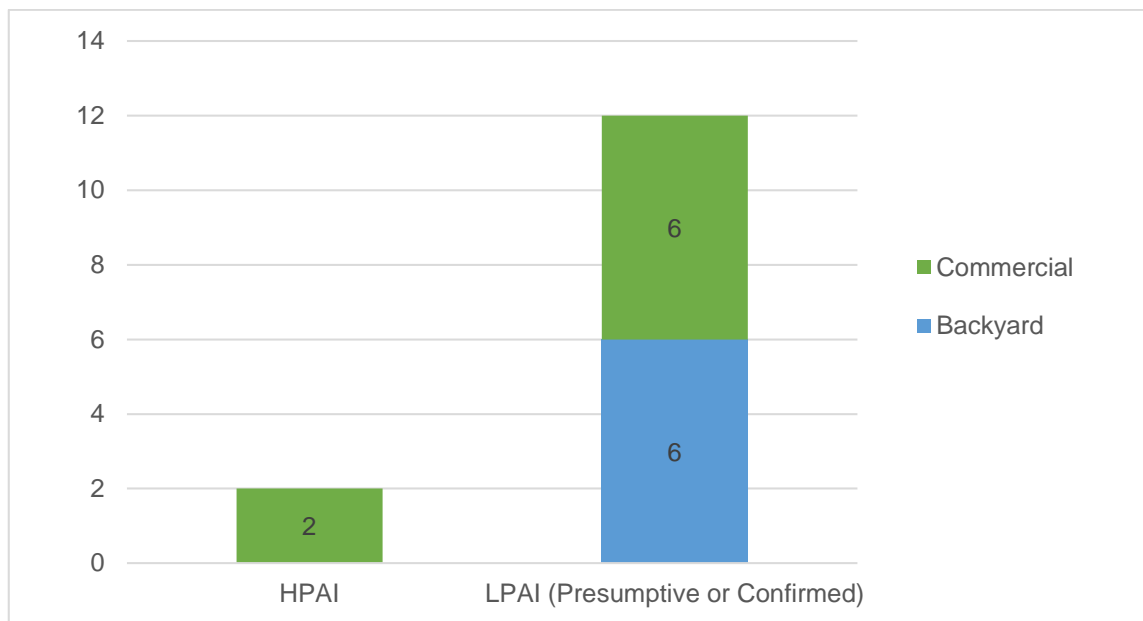


Figure 3. Approximate Number of Birds Affected in the Southeastern United States, by State and Production Type

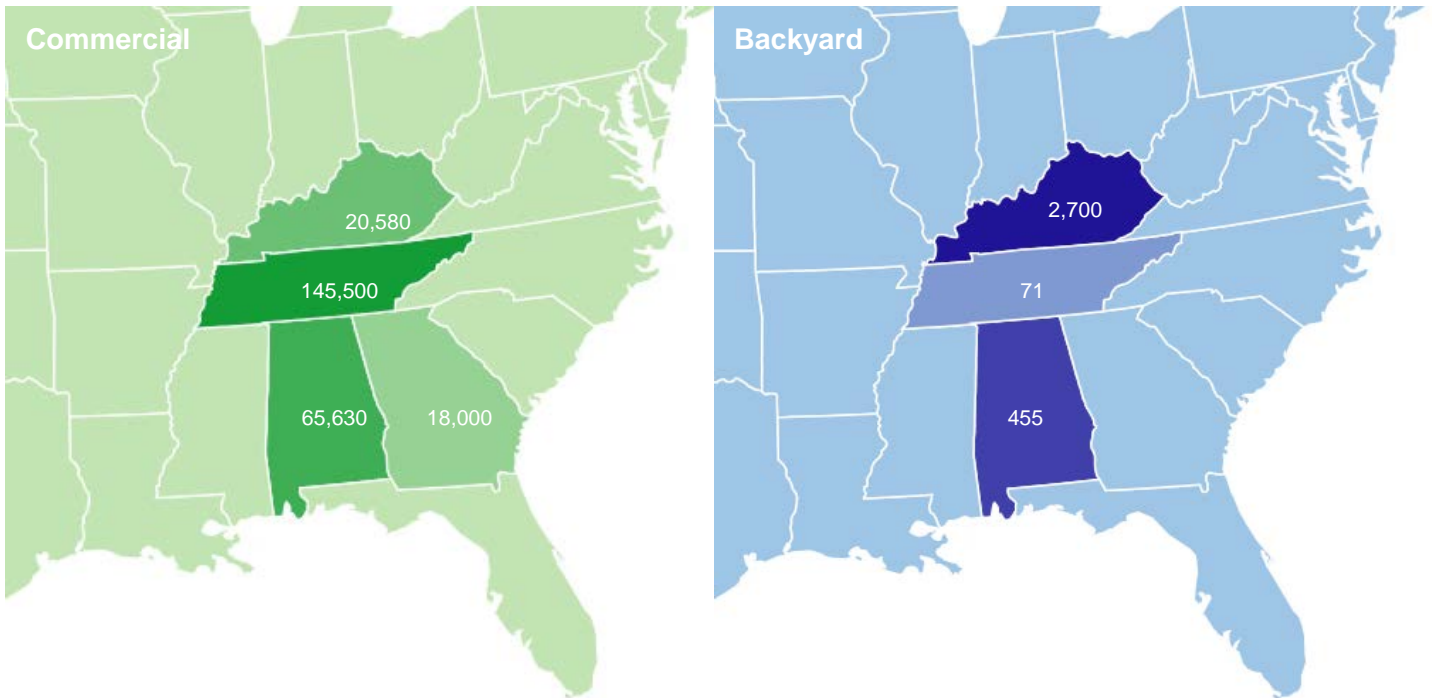
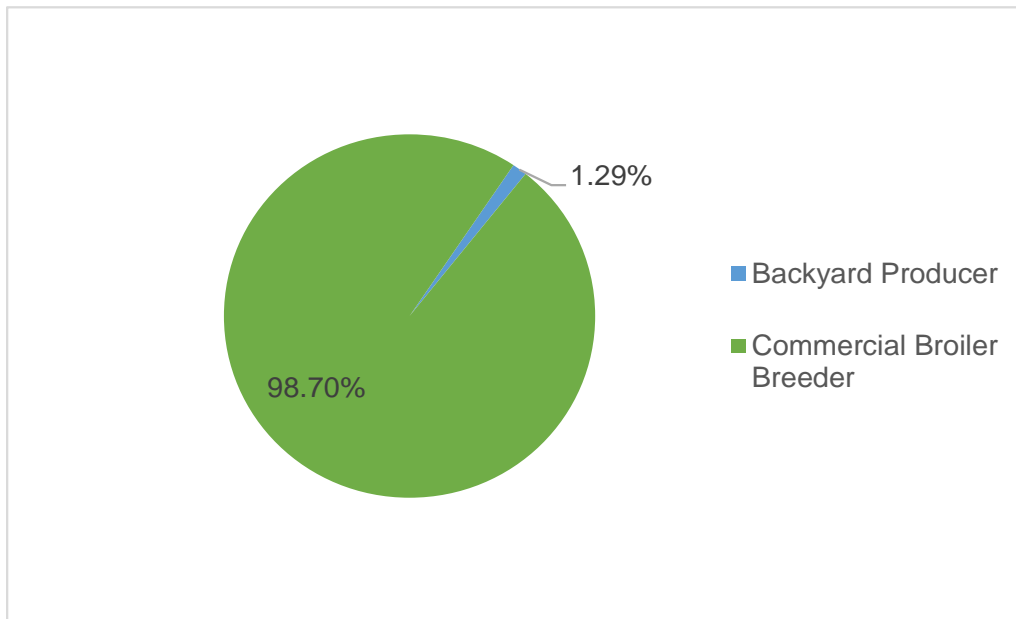


Figure 4. Birds Affected in the Southeastern United States, by Production Type



Disease Incidence

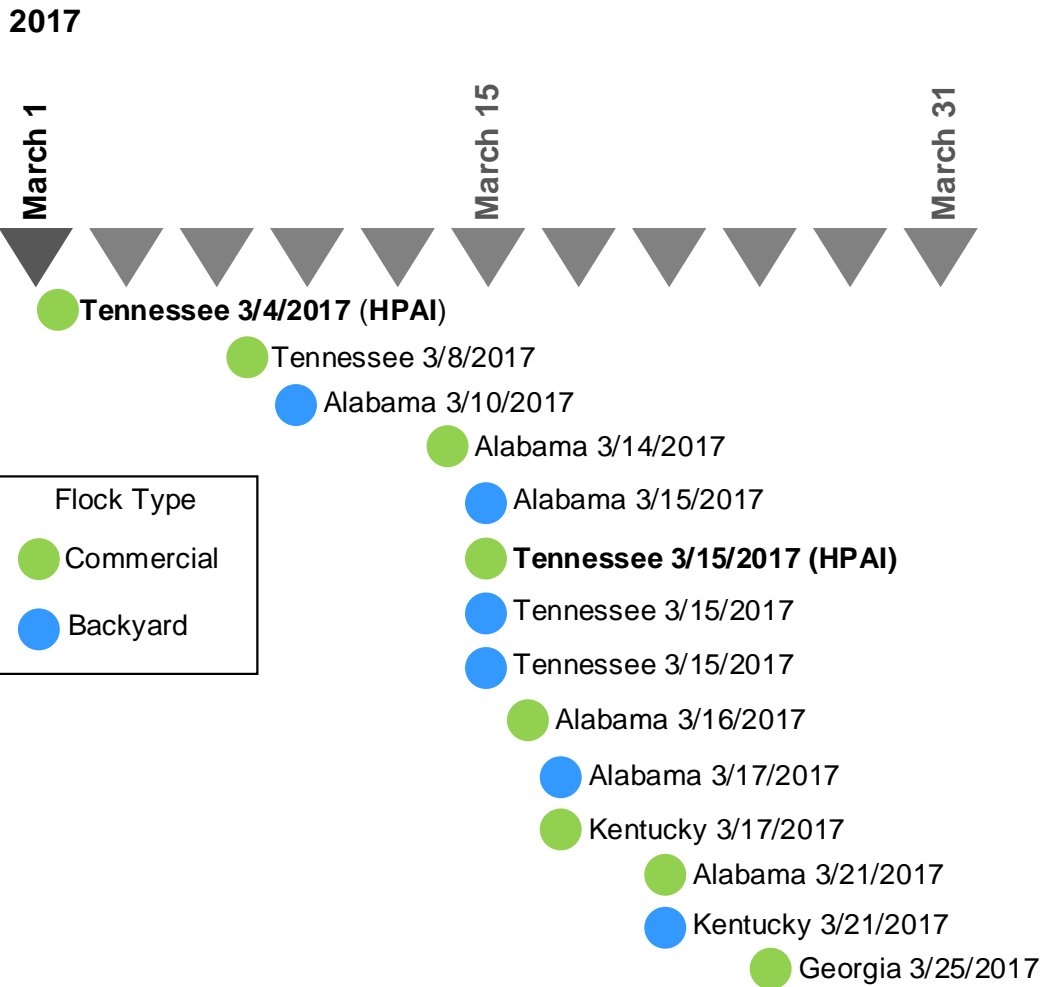
In early March, based on the appearance of clinical signs, the index Tennessee flock in Lincoln County was suspected to have HPAI. The presumptive positive case definition for HPAI was met on March 3; HPAI was confirmed by APHIS National Veterinary Services Laboratories (NVSL) on March 4, 2017. The index flock consisted of 74,000 commercial broiler breeder birds. Surveillance sampling in the 10 kilometer Control Area (Infected Zone and Buffer Zone) began almost immediately when the HPAI presumptive positive case definition was met. This Control Area was primarily in Tennessee, but also overlapped into the State of Alabama.

Four days later, in a neighboring county, NVSL confirmed an LPAI infection in another commercial broiler breeder flock. In total, between March 4, 2017 and March 15, 2017, there were 6 additional presumptive or confirmed LPAI detections in Alabama (3 detections) and Tennessee (3 detections). Additionally, on March 15, 2017, again in Lincoln County, Tennessee, a second premises was confirmed with HPAI. This premises was within the original HPAI Control Area (10 kilometers) of the first detection.⁴ Between March 16, 2017 and March 25, 2017, there were additional presumptive and confirmed H7 LPAI detections—6 in total; of these, 3 were additional H7 detections in Alabama, as well as 2 in Kentucky and a single detection in Georgia. Of the LPAI premises that were detected in Alabama (6 premises) and Tennessee (3 premises), 3 of these detections were in backyard premises in the HPAI Control Area (2 in Tennessee and 1 in Alabama).

There were no further HPAI findings. This timeline is illustrated in Figure 5 (HPAI cases are noted in parentheses).

⁴ Molecular and epidemiologic evidence suggests this site was infected due to lateral spread of the virus from the first HPAI Infected Premises.

Figure 5. All Detections by Flock Type and by NVSL Confirmation Date⁵

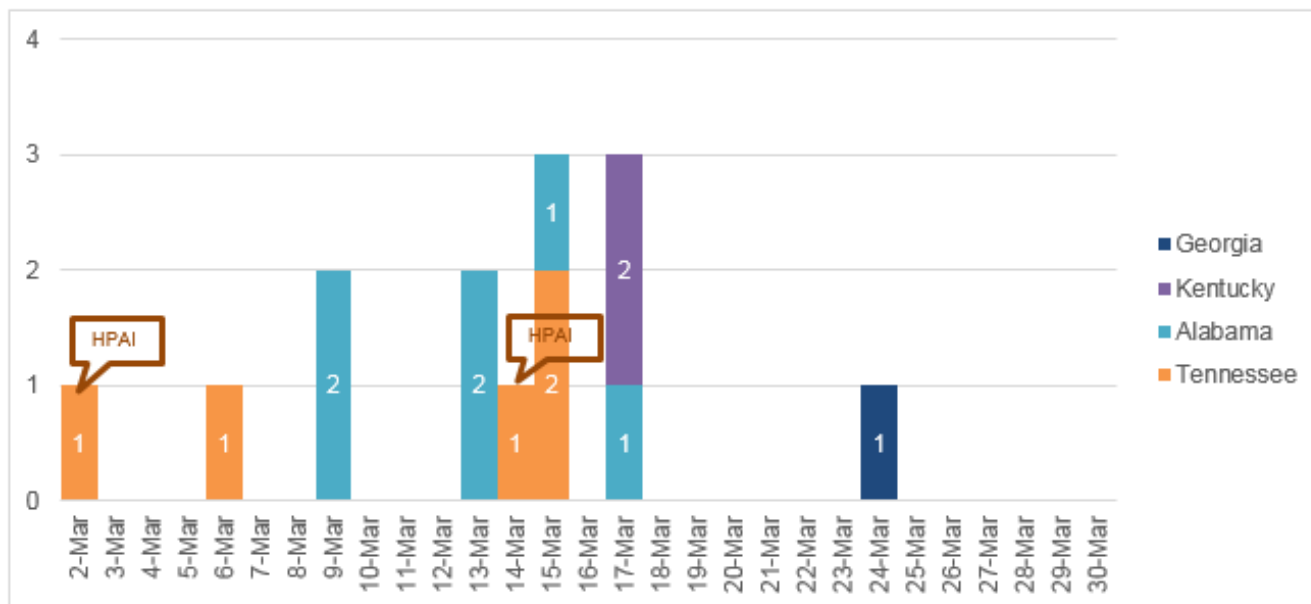


The complete epidemiological curve for this incident is pictured in Figure 6, which shows detection by earliest known date of infection, as recorded in the Emergency Management Response System 2.0 (EMRS2). This may be the date clinical signs were observed, a suspect positive based on the *Case Definition for H5/H7 Avian Influenza (AI)*, or first presumptive positive result date at a NAHLN laboratory. Further information is available in Appendix 7.⁶

⁵ NVSL confirmation date is the first date of a confirmatory test result from NVSL. As noted in Table 2, pathogenicity was not confirmed in some of the detections.

⁶ Please note that not all appendices noted in this document are publicly available. Publicly available appendices are posted at www.aphis.usda.gov/fadprep.

Figure 6. Epidemiological Curve by Earliest Known Date of Infection



Subtyping and Pathotyping

In this outbreak, samples from some Infected Premises did not contain enough virus (specifically, viral RNA) to conduct full subtype and pathotype (e.g., LPAI or HPAI) testing. As such, on some premises, the N-type and/or the pathotype (or pathogenicity) could not be determined. Where no virus or sequence could be recovered and the flock lacked clinical signs (e.g., did not meet the HPAI case definition), the flock status remained “presumptive LPAI.” All Infected Premises were confirmed at NVSL by either polymerase chain reaction (PCR), antibody testing, or sequence data. Table 2 provides a full list of the confirmatory test results from NVSL and associated dates for these results.

Of the 12 presumptive or confirmed LPAI Infected Premises, NVSL was unable to confirm pathogenicity on 8 premises. As such, these flocks are considered “presumptive LPAI” based on the lack of clinical signs (which would indicate an HPAI infection). NVSL was able to sequence and confirm LPAI on 4 premises: 2 commercial premises in Alabama and Tennessee and 2 backyard premises in Alabama.

To provide further clarity on the confirmatory results, Figure 7 illustrates the statuses for the Infected Premises in this 2017 outbreak. In terms of reporting, the date of the first confirmatory test result from NVSL is the “confirmed positive date”; other test results may become available after the first confirmatory test (e.g., a H5 or H7 PCR confirms infection; virus isolation results may be available at a later date).⁷

⁷ Thanks to the NVSL Diagnostic Virology Laboratory, Avian Section, for assistance in collating the confirmatory tests on all premises throughout the outbreak.

Figure 7. NVSL Confirmed Results for All Premises (Subtype & Pathotype)

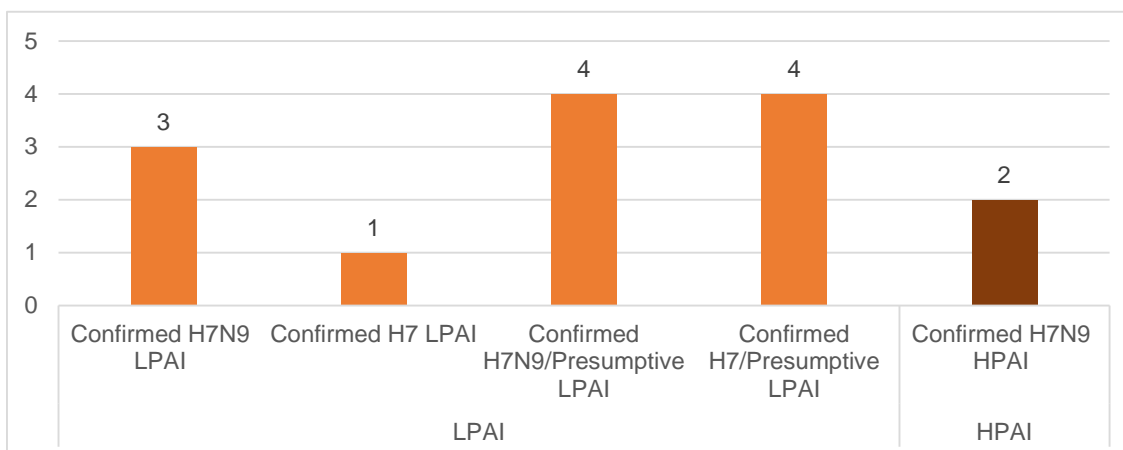


Table 2. List of Affected Premises

State	County	Approximate Flock Size	Flock Type	H-Type	N-Type	Confirmatory Status	Date of First Confirmation	Pathotype Confirmation
Alabama	Cullman	23,874	Commercial Broiler Breeder	H7	N9	Confirmed Antibody + Sequence	3/21/17	Confirmed LPAI
Alabama	Jackson	312	Backyard Producer	H7	N9	Confirmed HA and NA Sequence	3/15/17	Confirmed LPAI
Alabama	Lauderdale	16,931	Commercial Broiler Breeder	H7	Unknown	Confirmed Antibody	3/14/17	Presumptive LPAI
Alabama	Madison	77	Backyard Producer	H7	Unknown	Confirmed PCR	3/10/17	Presumptive LPAI
Alabama	Madison	66	Backyard Producer	H7	Unknown	Confirmed HA Sequence	3/17/17	Confirmed LPAI
Alabama	Pickens	24,825	Commercial Broiler Breeder	H7	N9	Confirmed PCR + Antibody	3/16/17	Presumptive LPAI
Georgia	Chattooga	18,000	Commercial Broiler Breeder	H7	N9	Confirmed PCR + Antibody	3/25/17	Presumptive LPAI
Kentucky	Christian	20,580	Commercial Broiler Breeder	H7	N9	Confirmed PCR + Antibody	3/17/17	Presumptive LPAI
Kentucky	Christian	2,700	Backyard Producer	H7	N9	Confirmed Antibody	3/21/17	Presumptive LPAI
Tennessee	Giles	16,500	Commercial Broiler Breeder	H7	N9	Confirmed HA and NA Sequence	3/8/17	Confirmed LPAI
Tennessee	Lincoln	15	Backyard Producer	H7	Unknown	Confirmed PCR	3/15/17	Presumptive LPAI
Tennessee	Lincoln	56	Backyard Producer	H7	Unknown	Confirmed PCR	3/15/17	Presumptive LPAI
Tennessee	Lincoln	55,000	Commercial Broiler Breeder	H7	N9	Confirmed HA and NA Sequence	3/15/17	Confirmed HPAI
Tennessee	Lincoln	74,000	Commercial Broiler Breeder	H7	N9	Confirmed HA and NA Sequence	3/4/17	Confirmed HPAI

Viral Traits

Partial and full genetic sequences of the HPAI and LPAI viruses recovered are highly similar, excluding the insertion at the cleavage site which was responsible for the mutation from H7N9 LPAI to H7N9 HPAI. These H7N9 viruses are of North American wild bird lineage and not related to the H7N9 virus that is circulating throughout Asia. No cases of the North American lineage H7N9 virus have been reported in humans, including during this incident. Due to the zoonotic potential of influenza A viruses, personnel were monitored for influenza-like illness (ILI). H7N9 viruses of North American lineage have been previously detected in wild birds in the United States.

Introduction & Transmission

USDA APHIS, in collaboration with APHIS Wildlife Services (WS) and the affected States, collaborated to conduct epidemiologic, genetic, and wildlife investigations to evaluate the factors associated with the introduction and transmission of the H7N9 viruses during the 2017 outbreak. Based on molecular and epidemiological evidence, it appears that there was lateral spread between the first and second HPAI Infected Premises. In terms of LPAI, the information suggests that there were multiple, independent introductions of the H7N9 LPAI viruses.⁸

Unlike previous outbreaks, the movement of equipment and trucks on to and off the farm did not appear to be a significant risk for virus introduction. In 2017, risk factors included the presence of rodents or other wild mammals and waterfowl, condition of the poultry housing, and gaps in biosecurity protocols (specifically, allowing entry of the virus from the environment into barn structures). H7 influenza A viruses are known to circulate in low pathogenicity forms among wild waterfowl. Testing of more than 400 samples from wild birds and small mammals around the first HPAI Infected Premises did not detect the H7N9 virus. Notably, the introduction of the virus was likely several weeks prior to its detection, which may explain why the virus was not detected during these surveillance activities. However, other wild bird surveillance efforts recovered a highly similar virus (all eight gene segments) from a blue-winged teal from Wyoming in September 2016. This detection allowed for further genetic analysis, informing the timing of the introduction of the virus into poultry.⁹

Section 3. Overview of Response Effort

Regulatory Intervention

Under the Animal Health Protection Act and Code of Federal Regulations 9 CFR 53, USDA APHIS has the authority to respond to and eradicate foreign animal diseases (FADs) in the United States. Accordingly, USDA APHIS responded to the case of HPAI, working in close

⁸ USDA APHIS. 2017. Epidemiological and Other Analyses of HPAI/LPAI Affected Poultry Flocks: June 26, 2017 Report. *USDA APHIS STAS Center for Epidemiology and Animal Health*. https://www.aphis.usda.gov/animal_health/animal_dis_spec/poultry/downloads/epi-ai.pdf.

⁹ USDA APHIS. 2017. Epidemiological and Other Analyses of HPAI/LPAI Affected Poultry Flocks: June 26, 2017 Report. *USDA APHIS STAS Center for Epidemiology and Animal Health*. https://www.aphis.usda.gov/animal_health/animal_dis_spec/poultry/downloads/epi-ai.pdf.

coordination with Tennessee to eradicate the disease. Because the HPAI Control Area extended beyond Tennessee boundaries, the State of Alabama joined with USDA APHIS and Tennessee as part of the unified State-Federal Incident Command (IC) to respond to the HPAI detections, as well as to the LPAI detections in Tennessee and Alabama that were related to the initial HPAI findings. A unified Incident Command Post (ICP) was established in Nashville, Tennessee. Additional APHIS personnel supported Surveillance, Preparedness, and Response (SPRS) District 2 responders in the unified Incident Command, both on-site and virtually, with activities like surveillance, finance/administration, and epidemiology. Full VS NIMTs were not mobilized during this incident.

Kentucky and Georgia managed their LPAI Infected Premises with support from USDA APHIS VS SPRS District 2 and District 3 personnel, as requested/needed. Per 9 CFR 56, LPAI response—including the disposition of Infected Premises—is under the jurisdiction and authority of the States; States request assistance from USDA APHIS as needed.

For policy guidance and resource coordination, the National ICG at APHIS headquarters was ramped up. Due to the size and scope of the incident, an APHIS Multiagency Coordination (MAC) Group was not stood-up but remained on-call for issues that required resolution. Additionally, the VS Executive Team (VSET) handled any issues that were elevated from the ICG.

Financial Resources

As of June 29, 2017, the commitments and obligations for this incident were nearly \$2.79 million. This includes the amount paid to HPAI affected producers for depopulated birds (indemnity), as well as obligations for other response activities. HPAI Infected Premises received flat-rate payments for virus elimination; these payments are also included in this total. For HPAI depopulated birds, USDA APHIS paid approximately \$1.18 million in indemnity payments to flock owners and growers for the 2017 southeastern United States outbreak.

USDA APHIS also reimbursed States through supplemental agreements for activities conducted in response to the LPAI detections, including surveillance, and where applicable, specific depopulation and disposal activities. LPAI premises that depopulated and conducted virus elimination did not receive APHIS compensation for these activities. The overall cost of this outbreak was significantly less than in the 2016 Indiana outbreak due to the type of birds affected, flock size, and outbreak characteristics.¹⁰

Economic & Trade Impact

In 2017, major chicken producing (broiler and egg) States were affected by LPAI. The rapid control and containment of the HPAI infection helped to minimize trade restrictions; many

¹⁰ USDA APHIS. 2016. Presentation: Final Report for the 2016 HPAI Outbreak in the United States. *USDA APHIS National Preparedness and Incident Coordination*. https://www.aphis.usda.gov/animal_health/emergency_management/downloads/hpai/finaloutbreakreport_shortppt.pdf.

countries chose a regionalization approach. Notably, some countries still are imposing restrictions from previous HPAI outbreaks in the United States.

Approximately 11 countries did impose restrictions on poultry and/or poultry products from the entire United States. In addition, approximately 23 countries placed State-level restrictions; most trading partners—including Canada and Mexico—imposed restrictions at the county or Control Area level. Such regionalization decisions helped to significantly limit the economic impact of this incident. VS National Import Export Services continues to work with trading partners on the removal of trade restrictions implemented as a result of HPAI and LPAI infections in the United States.

Personnel

In this 2017 outbreak, the unified Incident Command was staffed with primarily VS SPRS District 2 personnel. Full VS NIMTs were not rotated in for the incident. The height of response operations came after the second HPAI detection, the week of March 15–21. During this week, on average, there were 75 personnel deployed on any given day. Again, on average, this included approximately 30 APHIS personnel, 23 State personnel, and approximately 22 contractors. Notably, as many as 46 contractors were deployed on a single day that week to conduct response activities on the second HPAI Infected Premises. An additional 5–20 personnel were assigned to work part- or full-time as part of the ICG either remotely or at APHIS hubs. All APHIS personnel were demobilized from the unified Incident Command by April 14, 2017.

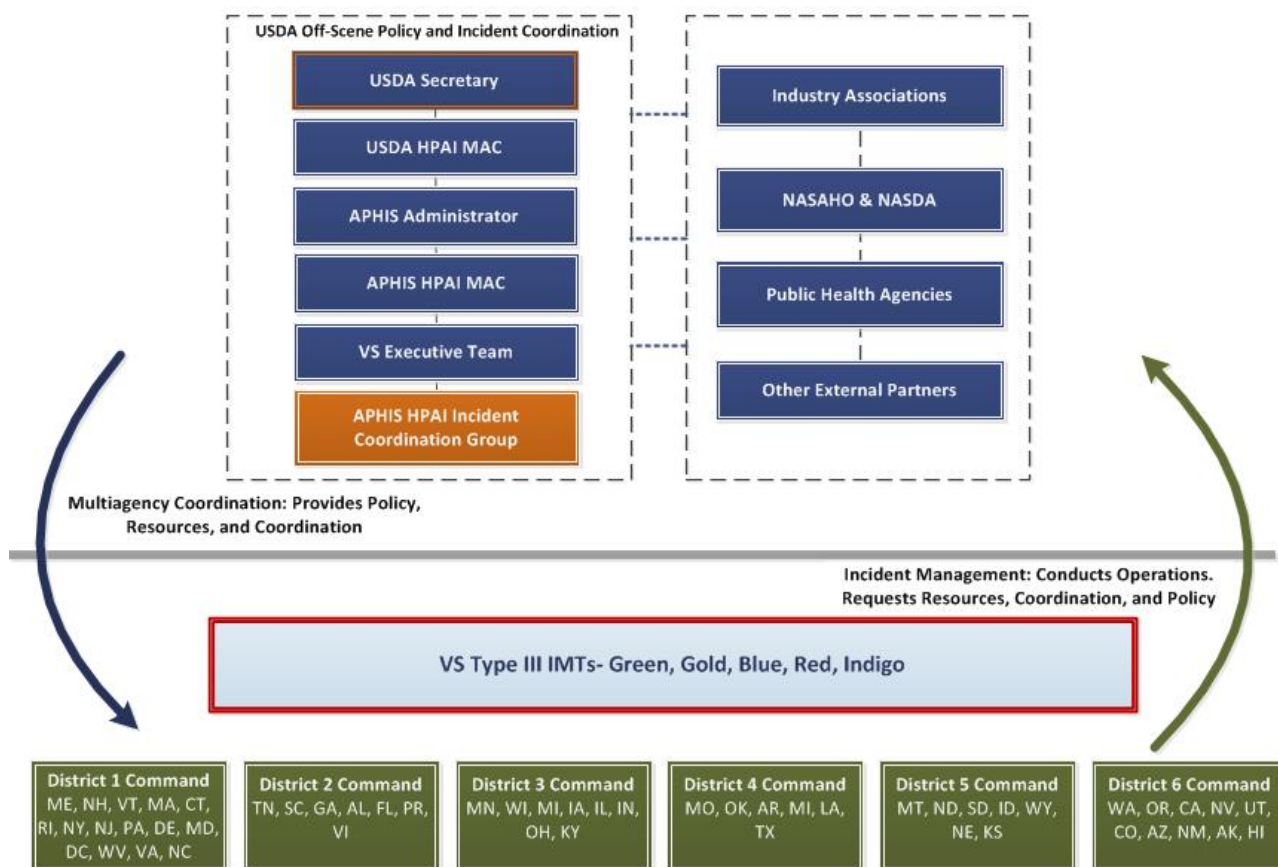
[Section 4](#) provides additional information on the organizational structure for both field responders and headquarters personnel.

Section 4. Incident Management

Overview

Effective incident management was critical to respond to and eradicate HPAI. Figure 8 illustrates the overview of the incident management structure from 2017 (this same structure was used in 2016). This HPAI incident was managed through use of the National Incident Management System (NIMS), to include the Incident Command System (ICS), which enables a scalable and flexible approach throughout the response.

Figure 8. Overview of USDA APHIS Organizational Structure for Incident



Note: NASAHO = National Assembly of State Animal Health Officials, NASDA = National Association of State Departments of Agriculture.

In the 2017 HPAI/LPAI outbreak in the southeastern United States, the Office of the Secretary was kept closely informed. The APHIS Administrator also received routine briefings. Because of the limited size and scope of this incident, the APHIS MAC Group was not fully activated, though members stood by to address any requests that were elevated from the VSET. The VSET was responsible for strategic policy and procedures and provided assistance as requested by the HPAI ICG. The HPAI ICG played the largest role in incident coordination and resource requests.

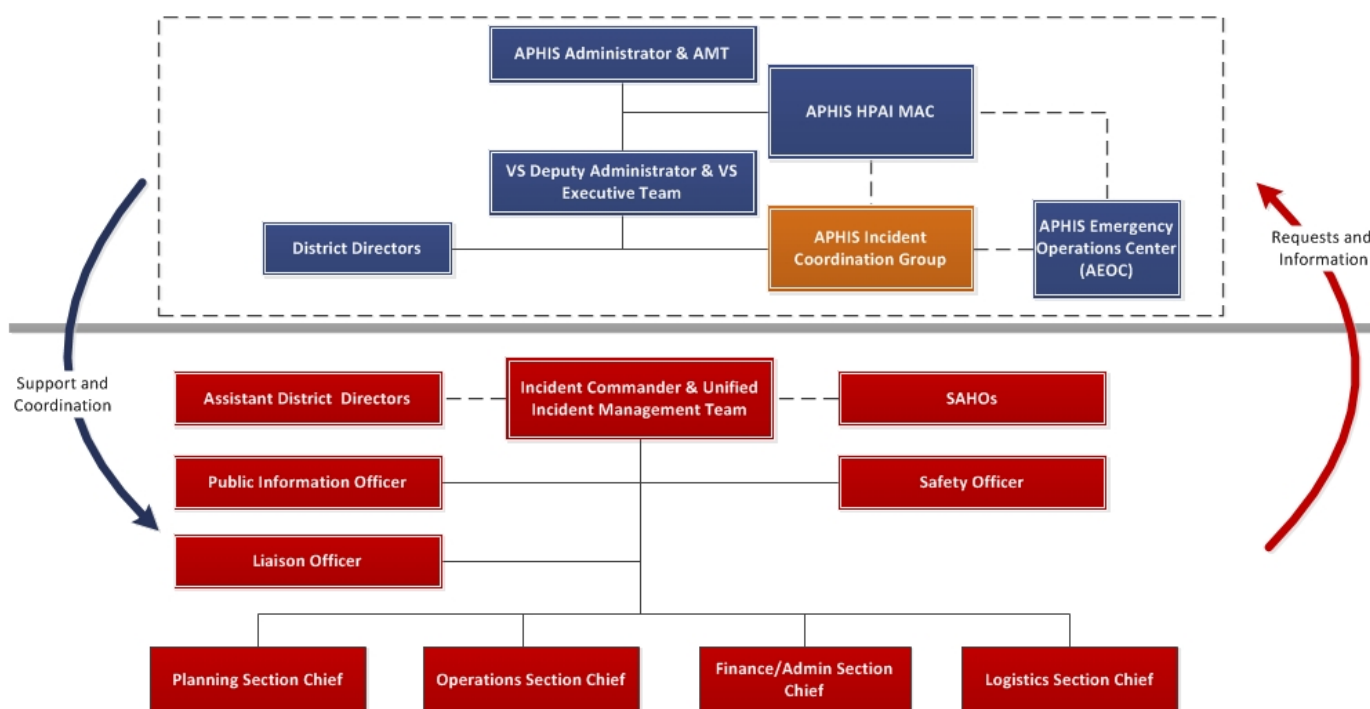
At appropriate levels and opportunities, these groups interfaced with industry associations, NASAHO and NASDA, public health agencies (including the U.S. Centers for Disease Control and Prevention [CDC] and State agencies), and other external partners. The U.S. Chief Veterinary Officer (CVO) (the VS Deputy Administrator), or designee, routinely briefed NASAHO on incident updates via teleconference.

At the field or operational level, District 2 personnel filled the role of an IMT and deployed to the ICP in Nashville, TN. VS NIMTs remained on-call in the event that the response needed to be scaled up, but were not fully deployed in this incident. The IMT and unified Incident Command routed requests for policy guidance, coordination, and additional resources through the National ICG.

National Incident Coordination Group and APHIS Multiagency Coordination Group

A core HPAI ICG remained active since the 2014–2015 HPAI outbreak through the 2016 (and now 2017) incidents. To support the HPAI/LPAI response efforts and the unified Incident Command, additional staff were activated to the HPAI ICG immediately at the first HPAI detections. Other personnel were standing by to provide support and address requests as required by the incident. The VS Deputy Administrator (the U.S. CVO) and VSET provided additional, higher-level policy, resource, and coordination support as required. These structures are shown in blue in Figure 9.

Figure 9. Details of the USDA APHIS Organizational Structure for Incident



Note: SAHO = State Animal Health Official.

APHIS Multiagency Coordination Group

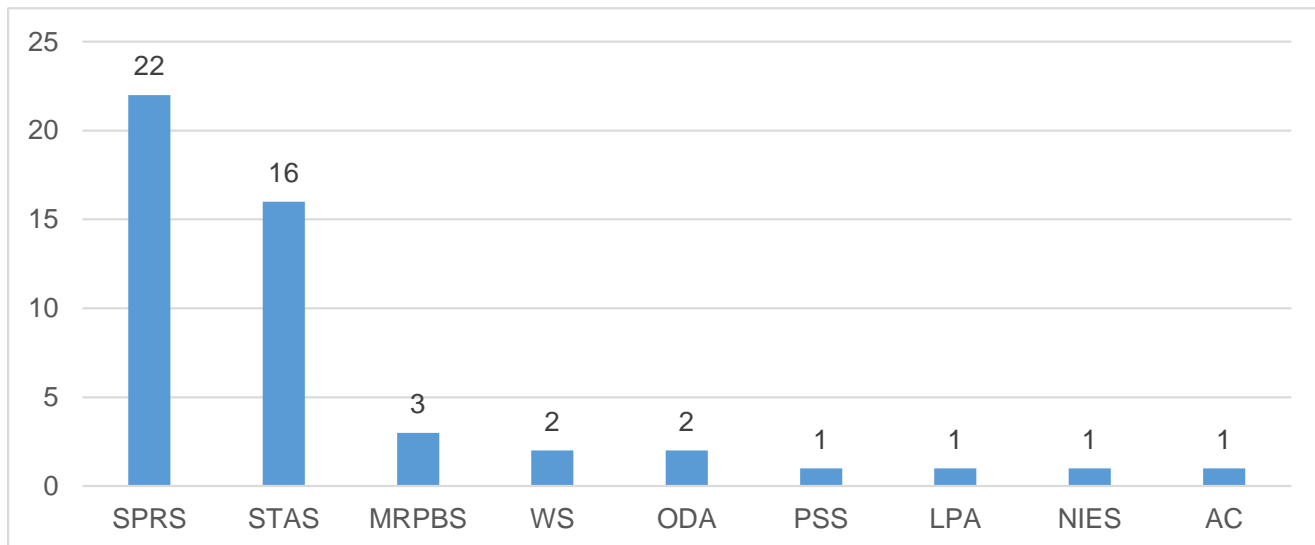
The APHIS HPAI MAC Group was created during the 2014–2015 HPAI outbreak to provide immediate leadership and authority for resolving issues during the incident and to develop needed policies and processes for the future. In 2017, the APHIS HPAI MAC Group—consisting of senior-level representatives and subject-matter experts from across the agency—was on-call to provide cross-unit leadership and direction. The small size and scope of the incident minimized the need for full MAC Group activation.

National Incident Coordination Group

Immediately scaled up with the first HPAI-detection, the ICG’s primary purpose was to support the APHIS VS NIMTs in acquiring resources and formulating policy options. The ICG included APHIS employees at the Riverdale, Ft. Collins, Ames, and Raleigh hubs in addition to other virtual personnel. The ICG personnel came primarily from SPRS and Science, Technology, and

Analysis Services (STAS) (Figure 10). Other units throughout APHIS also supported the response. Personnel typically were assigned for the duration of the entire HPAI/LPAI incident.

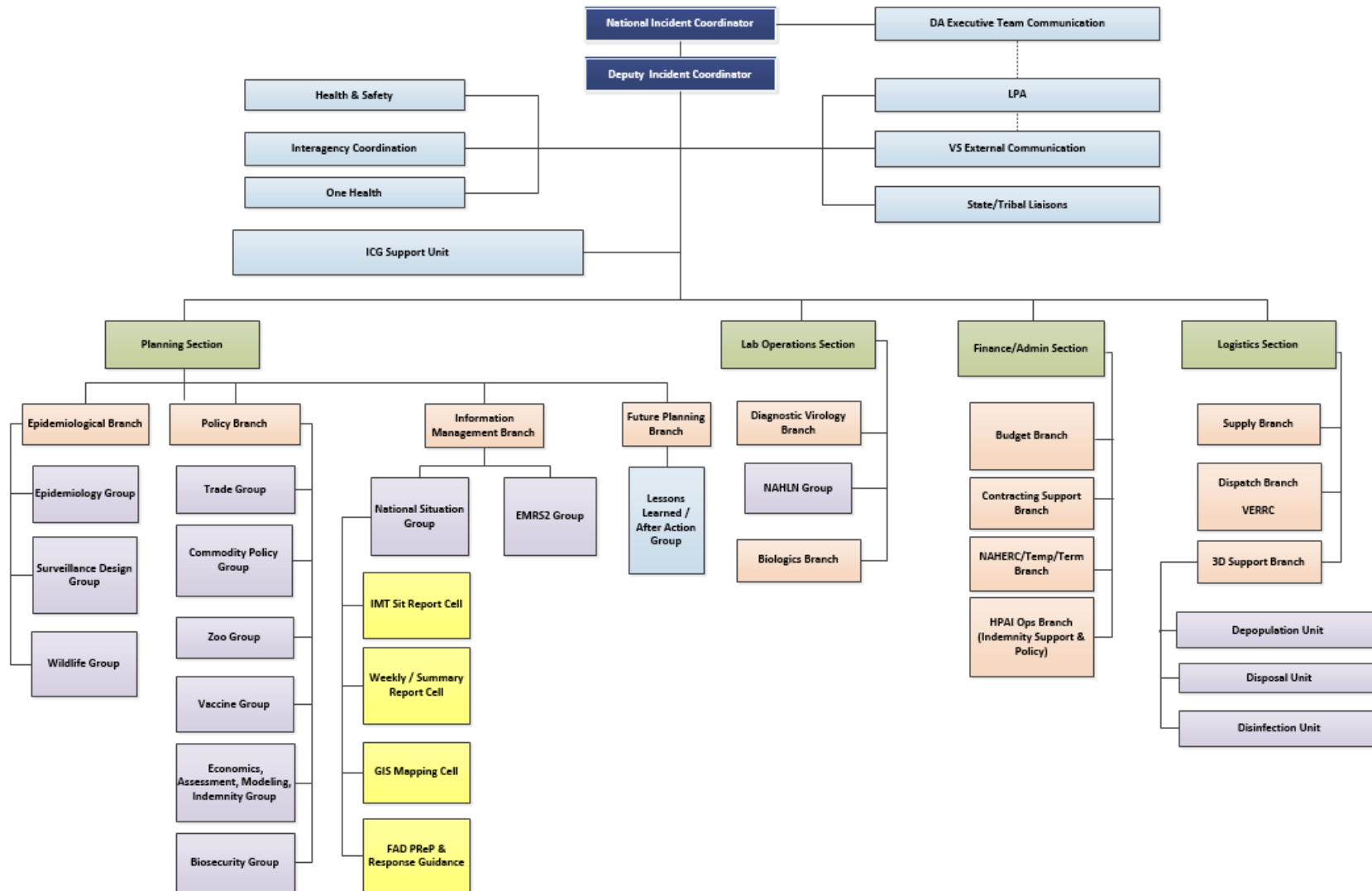
Figure 10. Total Number of APHIS Personnel Assigned to the National ICG at APHIS Hub or Home Location, by Organizational Unit



Note: MRPBS = Marketing and Regulatory Programs Business Services, ODA = Office of VS Deputy Administrator, PSS = Program Support Services, NIES = National Import Export Services, AC = Animal Care. These organizational affiliations were accurate at time of assignment to the National ICG.

The ICG supported requests from the unified Incident Command for policy clarification, coordinated epidemiological investigations and analyses, facilitated indemnity payment processing, harmonized information management activities, provided support for contracting, developed daily and weekly situation reports and maps, and informed stakeholders about the response efforts. ICG command and control was accomplished via regular meetings and completion of Coordination Plans (Appendix 10). Figure 11 illustrates the ICG structure for the 2017 southeastern HPAI/LPAI outbreak; all ICG structures are flexible and scalable to the specific incident.

Figure 11. National Incident Coordination Group Structure During 2017 H7 Incident

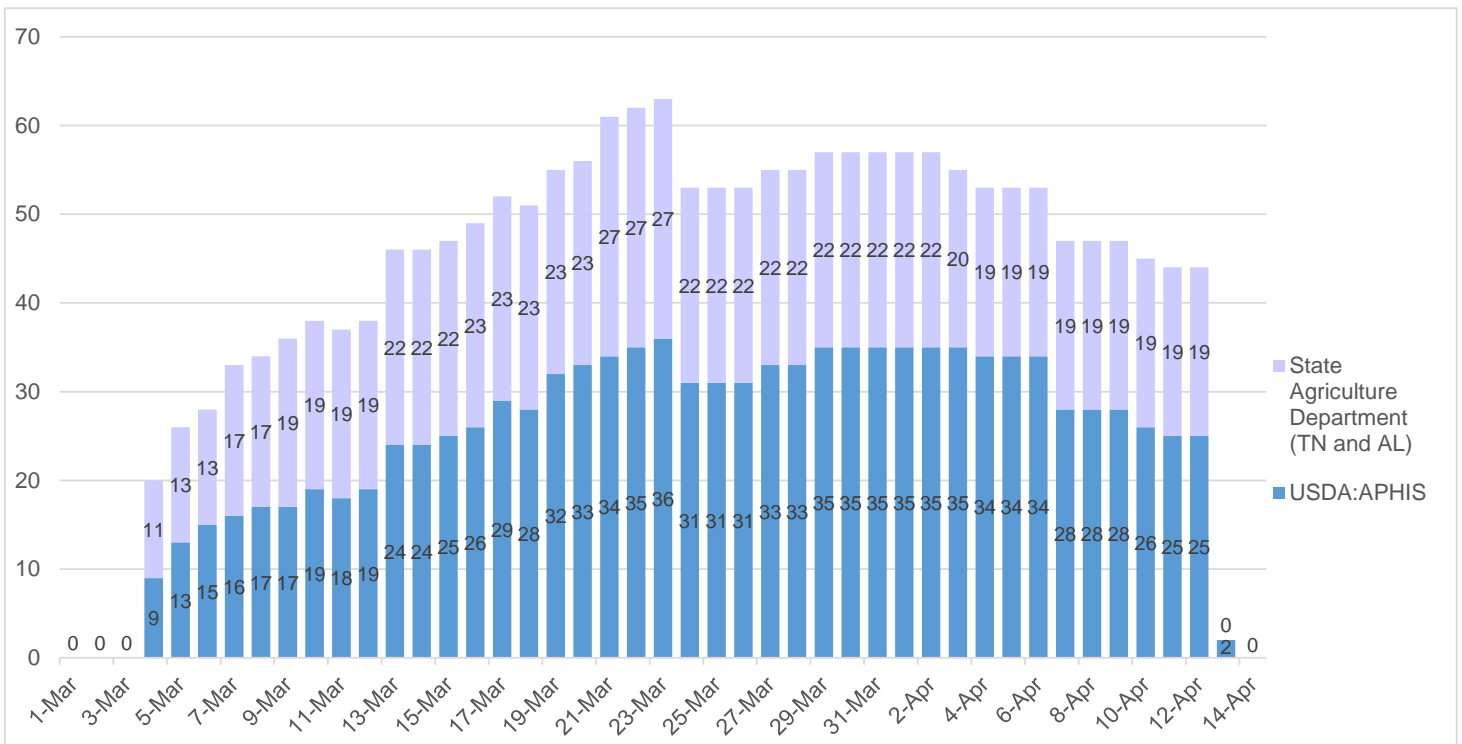


Note: DA = Deputy Administrator; GIS = geographic information system; 3D = depopulation, disposal, disinfection; OPS = operations; NAHERC = National Animal Health Response Corps; VERRC = Volunteer Emergency Ready Response Corps.

APHIS VS National Incident Management Teams & Deployments

Due to the size and scale of the incident, as well as the rapid availability of skilled personnel from SPRS District 2, a VS NIMT was not deployed to the incident, though one remained on call if required. As soon as possible after the presumptive positive case definition for HPAI had been met, a unified Incident Command was established with SPRS District 2 personnel and individuals representing the Tennessee Department of Agriculture.¹¹ When the HPAI Control Area was established and included part of Alabama, personnel from Alabama immediately joined the unified Incident Command structure. The organizational structure of the unified Incident Command was consistent with NIMS/ICS. This partial VS IMT worked alongside State responders to execute field activities, including depopulation, disposal, and virus elimination on the HPAI-infected premises. The unified ICP was staffed between approximately March 4, 2017 and April 12, 2017.

Figure 12. Total Number of APHIS and State Personnel Deployed per Day



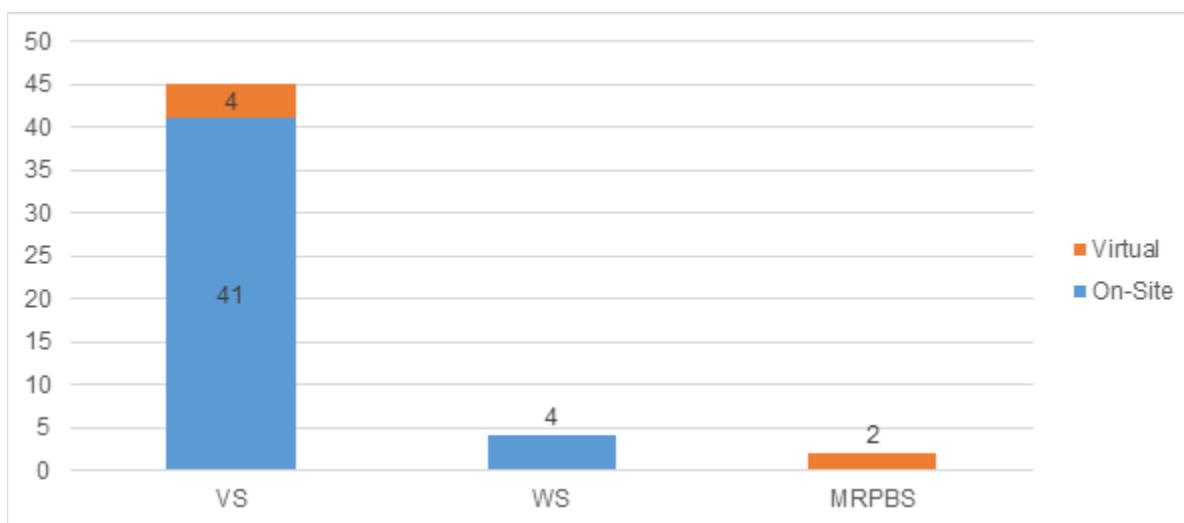
APHIS Personnel Deployments

APHIS personnel deployed in over 25 different positions; the most frequently deployed positions were Surveillance Group Members (9 deployments), followed by Epidemiologists (5 deployments). In total, there were 51 APHIS deployments—45 on-site and 6 virtual deployments. There were 29 on-site deployments of personnel from the States of Tennessee (19 deployments) and Alabama (10 deployments). The total number of deployments—broken out by

¹¹ In addition, the State of Tennessee also deployed an individual from the Division of Forestry, which is also in the Tennessee Department of Agriculture.

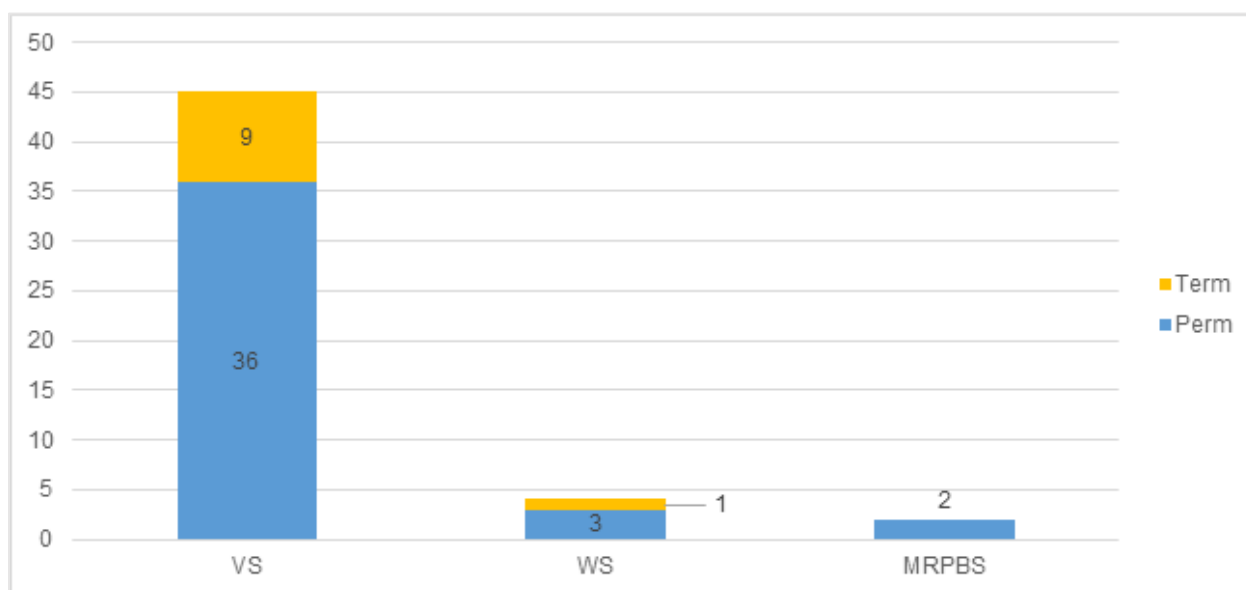
virtual and on-site—for APHIS organizational units is provided in Figure 13. These data apply only to staffing of the unified Incident Command to manage the mixed HPAI/LPAI incident in Tennessee in Alabama. These data do not include individuals working on LPAI in other States, including Kentucky or Georgia, where a unified Incident Command was not established. A final deployment report for this incident is provided in Appendix 8.

Figure 13. Total Number of APHIS Personnel Deployed to the Field by Organizational Unit



As a result of the 2014–2015 outbreak, APHIS hired a significant number of term personnel to augment its preparedness and improve response capabilities. In 2017, term-hires again supported response operations for the HPAI/LPAI cases in Tennessee and Alabama. Figure 14 shows the split between term-hires and permanent APHIS employees in terms of deployments.

Figure 14. Total APHIS Deployments, by Appointment Type

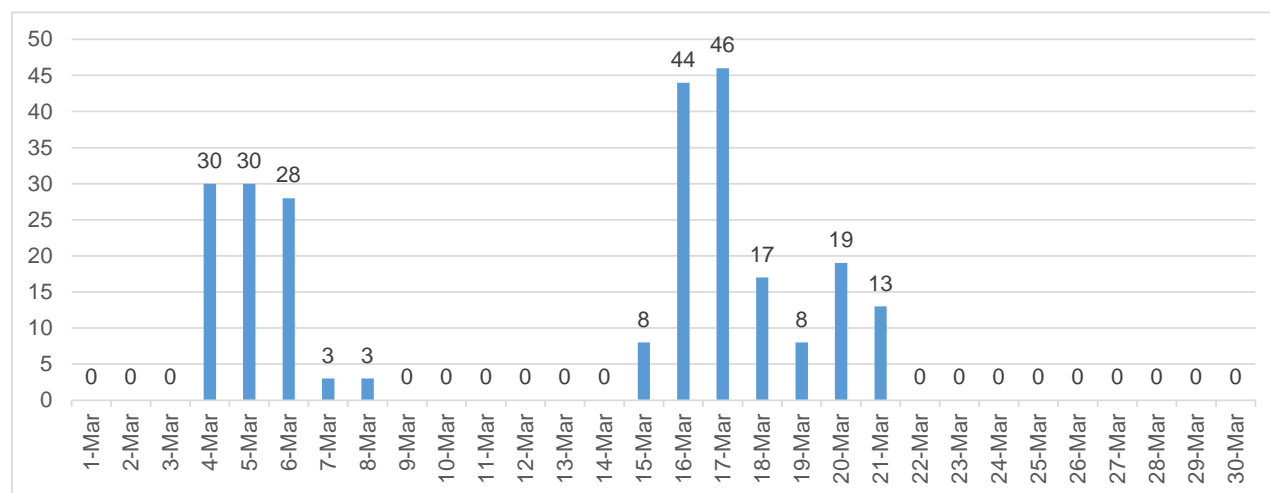


Of the 45 total VS deployments, 41 (91 percent) were from SPRS. Of these 41 SPRS deployments, 34 were District 2 personnel (83 percent); District 2 took the lead in responding through the unified Incident Command to control and contain the outbreak.

Contractors

Additional incident support to both the NIMT and ICG was provided by contractors. Part-time personnel supported the ICG; APHIS-hired contractors worked to support the unified Incident Command personnel in the field, providing services and materials relating to depopulation and disposal of the HPAI-infected flocks (Figure 15).¹² Contractors were deployed to assist in field operations related to both the first and second HPAI premises in Lincoln County, Tennessee. LPAI premises that depopulated did so with their own resources (company or contracted); APHIS-hired contractors did not support these operations.

Figure 15. Contractor Support for Response Operations for HPAI Infected Premises



As in the 2016 Indiana HPAI/LPAI outbreak, and in the 2017 HPAI/LPAI outbreak, producers of the HPAI-Infected Premises received a flat-rate payment for virus elimination activities which again reduced the number of contracts executed by USDA for response efforts. This flat-rate payment is paid directly to the producer; the producers then decide how this work should be completed, typically by conducting the work themselves or directly contracting with a company to have these services provided. LPAI premises that conducted virus elimination did not receive compensation from APHIS.

¹² Figure 15 only includes contractors hired by the SPRS Logistics Center/National Veterinary Stockpile (NVS) for the HPAI Infected Premises.

Section 5. Incident Coordination Group Response and Support Activities

Overview

The ICG worked with Federal, State, local, academic, and industry partners during the outbreak to control and eradicate HPAI. The ICG supported and provided policy guidance to the APHIS personnel working in the field as part of the unified Incident Command. This list is not exhaustive, but provides an overview of the many tasks that the ICG completed during the incident:

- Planned disease surveillance.
- Facilitated communication regarding sampling requirements and diagnostic test flow.
- Planned and carried out epidemiological investigations and tracing.
- Managed information from the field to the national level.
- Coordinated and communicated with State, local, and industry stakeholders.
- Provided guidance on PPE and responder health and safety, and ensuring Safety Officers were in the field.
- Provided guidance on biosecurity measures.
- Supported continuity of business and issued permits for the HPAI Control Area.
- Provided information and documentation for regionalization for international trade.
- Safeguarded animal welfare during response operations.
- Offered subject matter expertise for disposal.
- Provided guidance and options for C&D (virus elimination).
- Supported logistics, as required, through the NVS.
- Implemented revised financial procedures for appraisal and indemnity and provided support for compensating poultry owners and contract growers.
- Delivered overall incident management, support for the unified Incident Command, and short- and medium-term response objectives.

Reporting and Communicating Information

The APHIS MAC, ICG, and the unified Incident Command were in close communication from the outset of the event. ICG leaders stayed in close contact with State partners at the ICP, as well as representatives from the affected poultry companies, especially during the first few weeks. Many personnel involved in the response were responsible for data entry, analysis, and reporting. Communication of this information both internally and externally was critical for effective coordination and communication.

At the ICG level, the following were conducted/completed at routine intervals:

- Conference calls between the ICG Deputy Incident Coordinator and the unified Incident Commanders (daily at first, then bi-weekly).
- Conference calls between the ICG, APHIS co-Incident Commander, and affected States (daily, moving to every other day and then weekly).
- ICG HPAI Status Reports to APHIS staff, Administrator, and to NASAHO (daily initially, then weekly).

- Stakeholder announcements and/or GovDelivery notices (as needed).
- Reports distributed widely to States and USDA (weekly and then as needed):¹³
 - National Situation Report (example in Appendix 2a, last report in Appendix 2b)
 - National Infected Premises List (final list in Appendix 3)
 - Map for State and APHIS Officials of all H7 HPAI/LPAI (example in Appendix 4a, final map in Appendix 4b)
 - National Incident Maps (final mapbook in Appendix 5)
 - National Control and Containment Maps (final maps in Appendix 6)
 - Epidemiological Curve (final curve in Appendix 7)
 - Deployment Report (for APHIS Personnel) (final report in Appendix 8)
 - Permit and Movement Report (final report in Appendix 9).
- Incident Action Plans (IAPs) and corrective action reports (weekly) (Appendix 10).

At the unified Incident Command level, the following were completed as specified:

- VS SitReps (daily at first, then as needed)¹⁴
- IAPs (daily)
- Other ICS specific forms, like incident logs (daily).

Deployment/Personnel Management

Personnel were requested and deployed using APHIS Dispatch. APHIS personnel at the unified ICP used EMRS2 to create a resource request that is submitted to APHIS Dispatch personnel for entry and fulfillment through the Emergency Qualifications System (EQS). APHIS Dispatch distributes a daily record, from EQS, showing personnel currently at the incident or ICG, those that have been demobilized, and those that are scheduled to mobilize in the future. Records are also kept in EMRS2, including for State personnel in the unified Incident Command structure. Reconciliation between the two systems was conducted daily, or as needed, as the response progressed.

Policy and Guidance

The *HPAI Response Plan: The Red Book* provided overarching guidance for the response effort;¹⁵ many more specific policy documents concerning specific activities and lessons learned have been developed since 2015. These national-level policies were developed by the ICG and had been distributed widely to States and stakeholders. These policy guidance documents are posted publicly at www.aphis.usda.gov/fadprep. Response and policy documents available include the following (current as of June 2017):

¹³ Appendices are not publicly available unless posted at www.aphis.usda.gov/fadprep.

¹⁴ The unified Incident Command created their own Situation Report each day that was reviewed by VS Poultry Staff. This situation report provided operational details and information about response activities on all the HPAI/LPAI Infected Premises. These reports contained sensitive information that is not appropriate for wide distribution; a template of this report is available upon request.

¹⁵ The new *HPAI Response Plan: The Red Book* was released in May 2017, after the conclusion of most of the 2017 response activities, to encompass any additional information learned in the 2017 outbreak.

- Avian Sample Collection for Influenza A and Newcastle Disease
- Cleaning and Disinfection Basics: Virus Elimination
- Contact Premises
- Control Area Release
- Example Restocking Form
- Financing the Response: State/Tribal Information
- General Resources and Information
- H5/H7 Avian Influenza Case Definition
- HPAI Response Goals
- Initial Contact Epi Report
- Landfill Disposal Guidance—Recommended Waste Acceptance Practices for Landfills
- Mortality Composting Protocol for AI Infected Flocks (and Job Aids)
- New State Checklist
- Overview of the HPAI Control Area Permitting Process
- Overview of the EMRS2 Customer Permit Gateway
- Personal Protective Equipment (PPE) Recommendations for HPAI Responders
- Post C&D Environmental Sampling Guide
- Stamping-Out and Depopulation Policy
- Surveillance of Backyard Flocks Around Infected Premises
- Surveillance Sampling for Commercial Premises in Control Area
- Testing Requirements for Movement from the Control Area
- Timeline, Eligibility, and Approval for Restocking
- Use of the Antigen Capture Immunoassay
- Using Heat Treatment for Virus Elimination
- Ventilation Shutdown Evidence and Policy.

New finance and administration policies were implemented during the 2016 Indiana outbreak and used again in the 2017 southeastern United States outbreak. These guidance documents institutionalized the revised appraisal and indemnity procedures that had been streamlined and improved based on lessons learned. As in 2016, only one form was required from the HPAI Infected Premises prior to depopulation. Additionally, as specified in the Interim Rule published in February 2016,¹⁶ APHIS split indemnity payments between owners and growers in the 2017 outbreak.

Financial response and policy guidance available at www.aphis.usda.gov/fadprep includes the following documents:

- Finance and Administration Processes
 - Overview of Finance and Administration Procedures
 - Details for Bird and Egg Appraisal and Indemnity Procedures
 - Details for Virus Elimination Financial Processes
 - Details for Materials Destroyed Financial Processes
 - Appraisal and Indemnity Request Forms

¹⁶ Docket No. APHIS-2015-00061.

https://www.aphis.usda.gov/newsroom/federal_register/hpai_indemnity_rule.pdf.

- Poultry Owner
- Contract Grower
- Appraisal and Indemnity Request Procedures
 - Contract Grower Worksheet for Meat Birds
 - Contract Grower Worksheet for Layers
 - DUNS and SAM.

Health and Safety

APHIS proactively supported personnel to mitigate health and safety issues through the establishment of Safety Officers embedded within the unified Incident Command; there was also a Health & Safety Unit in the ICG. This Unit, staffed by individuals from VS Safety, Health, and Environmental Protection (SHEP), finalized health and safety protocols, provided guidance to Safety Officers in the field, and assisted with communication to other agencies during the incident. VS SHEP coordinated closely and followed any applicable guidance laid out by the APHIS Emergency Management Safety and Security Division (EMSSD). During the response, the Health & Safety Unit were responsible for the following tasks:

- Reviewing procedures to create site-specific health and safety plans.
- Reviewing health and safety plans of Federal contractors.
- Working with the unified Incident Command, EMSSD, and One Health on appropriate communication and documentation for ILI monitoring for responders.


Section 6. Highlights of Response Activities

Overview

To effectively respond to and recover from the HPAI outbreak, APHIS staff, industry, academic partners, State officials, and contractors worked together to illustrate the following 10 steps per Infected Premises, as outlined in Figure 16.¹⁷ The next sections highlight the key points of critical response activities that were conducted during the outbreak.

¹⁷ A higher resolution copy of this figure, suitable for printing, can be found here: https://www.aphis.usda.gov/publications/animal_health/2015/poster-hpai-guide-to-understanding-the-process.pdf.

Figure 16. A Guide to Help You Understand the Response Process



Highly Pathogenic Avian Influenza

A Guide To Help You Understand the Response Process

1 Detect

You see unusual signs of illness or sudden deaths in your flock. You report it to your private or State veterinarian. Samples are taken and tested. You find out your flock is positive for HPAI.

2 Quarantine

USDA and State personnel come to your farm. We assign you a caseworker, who will be your main point of contact on site, answer your questions, and guide you through the needed paperwork. We will also place your operation under quarantine, meaning only authorized workers are allowed in and out, and movement restrictions for poultry, poultry products, and equipment go into effect. We contact neighboring poultry farms and start testing their birds to see if they've been affected, too.

3 Appraise

We work with you to create a flock inventory. This lists how many birds you have, what species they are, their age, and other key details that will help us give you 100 percent of fair market value for your birds.

4 Depopulate

Infected flocks are depopulated as quickly as possible—ideally within 24 hours of the first HPAI detection—to get rid of the virus.

5 Compensate

You receive your first indemnity payment early on in the response process. We also pay you a standard amount for virus elimination activities (cleanup work).

6 Manage Disposal

USDA will help you dispose of the dead birds safely. Disposal methods include composting, burial, incineration, rendering, or landfilling. The options you'll have depend on several things: what type of farm you have, the specific conditions there, State and local laws, and what you prefer.

7 Eliminate Virus

The next step is to wipe out all traces of the virus at your property. To kill the virus, thoroughly clean and disinfect the barn, equipment, and all affected areas of your farm. You can do this work yourself or hire contractors to handle it.

8 Test


As soon as you're ready, let your caseworker know you're finished with cleanup. Your site must then stay empty for at least 21 days. During this time, we'll return to collect and test environmental samples. We need to confirm that your property is completely virus-free.

9 Restock

Once USDA and the State both approve, you can restock your facilities and start production again. State officials will release your farm from quarantine after all required testing and waiting periods are done.

10 Maintain Biosecurity

After restocking, you'll need to continue maintaining the highest biosecurity standards to keep the virus from coming back. For biosecurity tips, go to www.aphis.usda.gov/publications and download the factsheet "Prevent Avian Influenza at Your Farm."



How Long Does the Process Take?

Ideally, this entire process could be completed in as soon as 60–120 days. However, the timeframe varies depending on many things (for example, flock size, depopulation and disposal methods used, test results, farm's location). We're committed to restoring production as fast as we can while also protecting poultry health.

USDA is an equal opportunity provider and employer.

Questions?

Talk with your caseworker or the State or Federal officials responding to the disease event in your area.

For general information and contacts, visit

www.usda.gov/avian_influenza.html
www.aphis.usda.gov/fadprep

Animal and Plant Health Inspection Service • APHIS 91-05-005 • Issued September 2015

Surveillance and Epidemiology

Surveillance Around HPAI Infected Premises

A 10 km Control Area was established around the HPAI Infected Premises where the index case was found. When the second HPAI case was detected, a second Control Area was established. The two HPAI Infected Premises were geographically in close proximity; as such, the two HPAI Control Areas were nearly matching—the overall area was marginally increased.

A Surveillance Zone—in the Free Area—was also established in a 20 km circle around each of the HPAI Infected Premises (10 km beyond the HPAI Control Area). Sampling of all commercial poultry premises in the Surveillance Zone and Control Area, starting with those premises in the Control Area, was undertaken as a top priority as soon as HPAI was detected. Surveillance was also conducted on backyard premises in both the HPAI Control Areas and Surveillance Zones.

Surveillance Around LPAI Infected Premises

For LPAI Infected Premises, Control Areas were *not* established. Instead, a 10 km Surveillance Zone (in the Free Area) was established around commercial LPAI Infected Premises; a 3 km Surveillance Zone was established around backyard LPAI Infected Premises. Appendix 4 provides a map showing the Surveillance Zones that were established during the outbreak.

It is important to note that regular notifiable AI surveillance is carried out as part of the National Poultry Improvement Plan (NPIP) for participating producers, who can opt-in to the program. The NPIP H5/H7 Clean and Monitored programs qualify flocks with at least 11 or 30 birds that show negative serology tests at certain intervals (90 or 180 days, usually) and/or before movements off a premises can occur, including movements of birds to slaughter and disposal. NPIP surveillance provided (and continuously provides) additional confidence that H5/H7 viruses were not circulating in the area.

Incident Coordination Group and Unified Incident Command Activities

Surveillance and epidemiological activities were coordinated by the unified Incident Command and ICG. At the ICG level, response activities focused on supporting requests for surveillance design guidance from the unified Incident Command as well as from States with only LPAI infections. Guidance for conducting surveillance activities around HPAI Infected Premises was provided in two documents developed by the ICG in previous HPAI outbreaks: *Surveillance of Backyard Flocks Around Infected Premises* and *Surveillance Sampling for Commercial Premises in Control Area* (both are available at www.aphis.usda.gov/fadprep). These documents served as a framework for conducting surveillance activities in the 2017 outbreak. ICG personnel also developed epidemiological questionnaires to understand outbreak characteristics, identify risk factors, and examine how the H7N9 virus was transmitted throughout the outbreak. A report summarizing these epidemiological analyses was posted on June 26, 2017.¹⁸

¹⁸ USDA APHIS. 2017. Epidemiological and Other Analyses of HPAI/LPAI Affected Poultry Flocks: June 26, 2017 Report. *USDA APHIS STAS Center for Epidemiology and Animal Health*. https://www.aphis.usda.gov/animal_health/animal_dis_spec/poultry/downloads/epi-ai.pdf.

At the ICP, epidemiologists coordinated the survey and interview process in the field to gather information from each premises. As part of the epidemiological investigation, all movements onto and off of Infected Premises (known as trace-backs and trace-forwards) were identified and evaluated for the possibility of HPAI transmission. In terms of surveillance, unified Incident Command personnel conducted diagnostic sampling for disease detection. The ICG and unified Incident Command both incorporated personnel with expertise in wildlife to coordinate wild bird (and wild mammal) surveillance sampling and analyze the role of wild birds in the outbreak/transmission.

*Surveillance Data*¹⁹

Surveillance included active surveillance of both backyard and commercial premises, as well as pre-slaughter testing, pre-movement testing, voluntary surveillance by poultry production companies, and sick-bird calls. All diagnostic testing illustrated here was completed using the real-time reverse transcription polymerase chain reaction (rRT-PCR) test at an approved NAHLN laboratory unless otherwise specified.²⁰

For surveillance related to the HPAI incident, including all sources of surveillance mentioned above, Table 3 provides information on the number of backyard and commercial premises sampled and the number of accessions submitted to the laboratory. Most of these were captured in the Laboratory Messaging System (LMS), though a handful of tests early in the outbreak were entered manually in EMRS2.²¹ Table 3 includes surveillance in the HPAI Control Areas and HPAI Surveillance Zones as well as other surveillance that occurred outside of the zones per the reasons mentioned (e.g. pre-movement testing, sick bird calls, voluntary testing by companies).

*Table 3. Premises Sampled and Number of Accessions as Surveillance for the 2017 HPAI Detections*²²

Premises State	Premises	Accessions
Alabama	16	47
Tennessee	93	261
Total	109	308

Door-to-door interviews were conducted throughout the HPAI Control Areas to identify and sample potential backyard premises. In total, personnel sampled over 90 backyard premises with poultry for surveillance or as a result of a sick bird call (both inside and outside of the HPAI

¹⁹ These data were collected and recorded in EMRS2.

²⁰ On commercial premises, oropharyngeal swabs were collected from pools of 5 or 11 clinically ill or dead birds. In backyard flocks, oropharyngeal swabs were collected from 5 clinically ill or dead birds (if available) per each species on the premises.

²¹ Table 3 captures all accessions, including those electronically messaged via LMS from testing laboratories and those that were not messaged (but were manually entered into EMRS2).

²² Table 3 does *not* include diagnostic testing on any HPAI Infected Premises or LPAI Infected Premises in the HPAI Control Areas (which would also include environmental sampling). Accessions were used as a proxy for the number of sampling events that occurred at each premises; NVSL accessions for confirmatory testing are included (only 3 accessions in total).

Control Area). Notably, because the two HPAI premises were located in close proximity, the second HPAI detection increased the total size of the Control Areas very marginally.

Figure 17 and Figure 18 show the number of premises that were sampled (had a laboratory accession) per zone for both HPAI Control Areas. All Infected Premises (HPAI and the 3 LPAI-Infected Premises that were associated with the HPAI incident) have been excluded from these figures.²³

Figure 17. Number of Premises Sampled (First HPAI Control Area & Surveillance Zone)

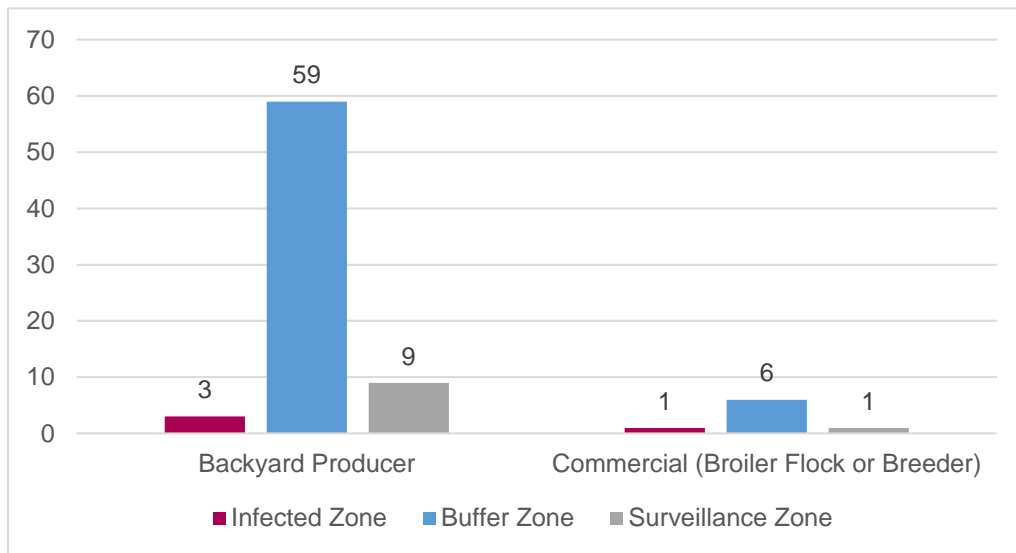
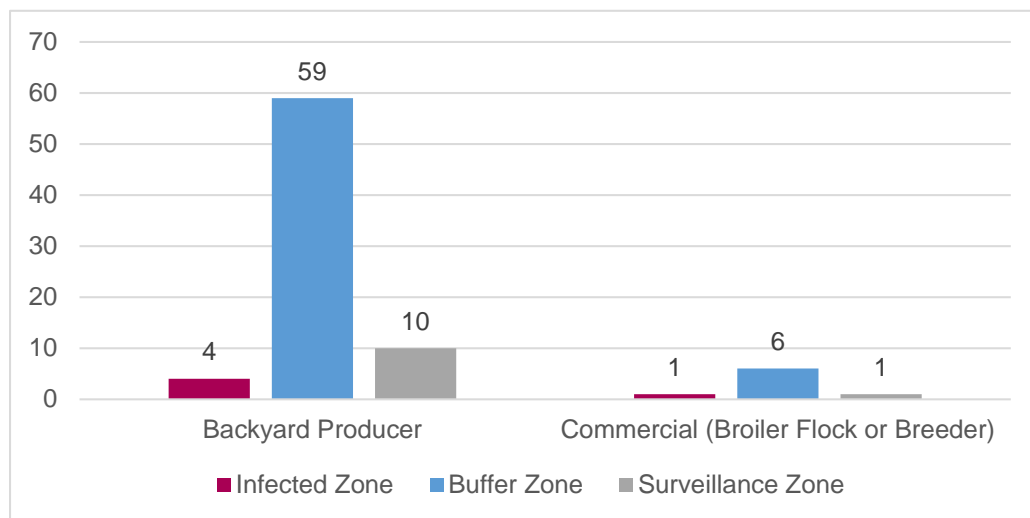


Figure 18. Number of Premises Sampled (Second HPAI Control Area & Surveillance Zone)



²³ For the first HPAI Control Area, three additional premises subsequently became infected within that Control Area (1 HPAI; 2 LPAI). These premises were located in the Infected Zone (1) and Buffer Zone (2).

In the first HPAI Control Area and Surveillance Zone, 79 total premises were sampled: there were 71 backyard producers and 8 commercial broiler premises (7 production; 1 breeder) that were sampled (Figure 17). In the second HPAI Control Area and Surveillance Zone (which overlaps significantly with the first HPAI Control Area), there were 81 total premises from which samples were collected during the outbreak: 73 backyard producers and 8 commercial broiler premises (7 production; 1 breeder) (Figure 18). Obviously, most of these farms were the same (Figures 17 and 18 are not mutually exclusive). Between the 2 Control Areas for the HPAI Infected Premises, there were a total of 82 premises sampled (based on laboratory accessions) as a part of HPAI surveillance activities: 16 in Alabama (1 commercial, 15 backyard) and 66 in Tennessee (59 backyard, 7 commercial).

Backyard premises in the Control Area were typically tested twice. While commercial flocks were typically tested at least three times and often more, the number of testing events varied significantly based on the location of the flock to the existing HPAI Infected Premises and discretion of the unified Incident Command on the need for repeated testing for specific flocks. Because the second HPAI detection was over a week after the first HPAI detection, some premises, particularly commercial premises, experienced an extended sampling and testing regimen.

On the LPAI side of the incident, for LPAI Infected Premises, surveillance was conducted in Tennessee, Alabama, Kentucky, and Georgia (shown below in alphabetical order). Table 4 shows the summary of the number of premises sampled and number of laboratory accessions that were submitted as part of the LPAI surveillance activities. Again, this includes both the number of premises sampled and number of accessions from the Surveillance Zones surrounding the LPAI Infected Premises as well as other surveillance that occurred outside of the zones per the reasons mentioned (e.g. pre-movement testing, traces, sick bird calls, voluntary testing by company). Most of these results were also messaged via LMS.²⁴

*Table 4. Premises Sampled and Number of Accessions as Surveillance for the 2017 LPAI Detections*²⁵

Premises State	Premises	Accessions
Alabama	222	469
Georgia	10	30
Kentucky	54	136
Tennessee	149	324
Total	435	959

²⁴ Table 4 captures all accessions, including those electronically messaged via LMS from testing laboratories and those that were not messaged (but were manually entered into EMRS2).

²⁵ This does not include diagnostic testing on any LPAI Infected Premises (which would also include environmental sampling). It also does not include testing around the LPAI premises that were associated with the 2 HPAI Infected Premises in Lincoln County, Tennessee (these 3 backyard LPAI Infected Premises were in the HPAI Control Areas). Accessions were used as a proxy for the number of testing events that occurred at each premises; NVSL accessions for confirmatory testing are included (only 3 accessions in total).

Diagnosics

Laboratory services were a major component of the response effort, for both initial diagnostics and surveillance activities. The *Stamping-Out and Depopulation Policy* provides guidance for presumptive positive HPAI premises; in this outbreak, the HPAI-Infected Premises were depopulated as soon as the presumptive positive case definition criteria had been met. In accordance with the *H5/H7 Avian Influenza Case Definition*, State officials—in cooperation with APHIS—determined whether LPAI-Infected Premises were also depopulated (9 of 12 depopulated completely; 1 premises conducted targeted euthanasia).

Laboratory services in support of the incident were divided between the APHIS NVSL and State operated, USDA APHIS approved and proficiency tested NAHLN laboratories. At NVSL, there are three elements addressed for confirmation of flock status: 1) the HA-subtype, which is ‘presumptive’ based on the NAHLN lab result and ‘confirmed’ based upon the NVSL result; 2) the virus pathotype, which is ‘presumptive’ based upon the clinical presentation of the flock compared to the *H5/H7 Avian Influenza Case Definition*, and ‘confirmed’ based upon the HA cleavage site sequence at NVSL, and 3) the NA-subtype. As mentioned, in this 2017 outbreak, some Infected Premises did not contain enough virus (specifically, viral RNA) to establish the pathotype (e.g. LPAI or HPAI).

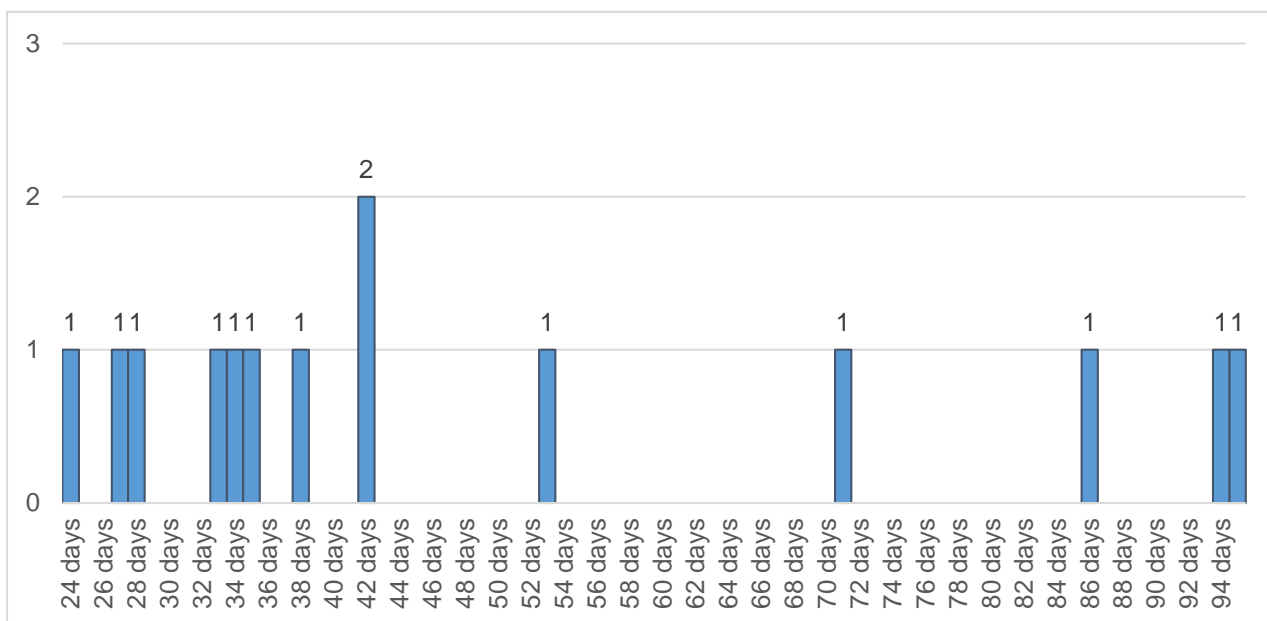
NAHLN laboratories were utilized for the initial presumptive positive diagnosis, subsequent surveillance sampling, as well as initial environmental testing (NVSL performed confirmatory testing on all environmental samples that were PCR-positive). NAHLN laboratory capacity was critical in rapidly determining the status of premises and conducting surveillance activities.

Quarantine, Movement Control, and Continuity of Business

State Quarantines and Unified Control Areas

State quarantines were rapidly placed on premises; some States quarantined premises as soon as a suspect case definition was met. In this outbreak, in specific situations, States also quarantined premises in addition to the Infected Premises—for example, premises that were located in proximity to an HPAI Infected Premises. The date the State quarantine was first placed on the Infected Premises was recorded in EMRS2: the average length of the premises quarantine was 50 days. Quarantines were placed for more extended periods on the HPAI Infected Premises—94 days, on average. For LPAI-Infected Premises, quarantine was released on average in 50 days. The last quarantine was released in Kentucky on June 16, 2017. Figure 19 illustrates the length of the quarantines placed on premises during the outbreak.

Figure 19. Length of Quarantine on All Premises (Frequency Count)



Two regulatory Control Areas were established around the HPAI Infected Premises under the jurisdiction of the unified Incident Command. The regulatory Control Areas during the 2017 HPAI/LPAI incident in the southeastern United States lasted 38 days for the first Infected Premises and 28 days for the second HPAI Infected Premises.²⁶ Both Control Areas were released on April 11, 2017. The first Control Area was placed on March 4; the second on March 14, 2017. Release of the Control Area requires specific criteria be met (spelled out in the policy document *Control Area Release*), including that all birds on Infected Premises in the Control Area are depopulated and disposal is completed (or compost piles set; composting was not used in the 2017 outbreak). Required surveillance must be completed; release can occur prior to the date in which restocking is approved. Due to the absence of new HPAI detections, these activities were rapidly conducted and enabled the Control Areas to be quickly released in Tennessee.

Movement Control and Continuity of Business

In the regulatory Control Areas, established around the HPAI Infected Premises, permits were required for movements into, within, and out of the Control Areas. Items permitted during the outbreak included those for both continuity of business (e.g., products, based on the Secure Food Supply Plans) and for movement control (e.g., the movement of feed or manure) to prevent the spread of AI to non-infected premises.

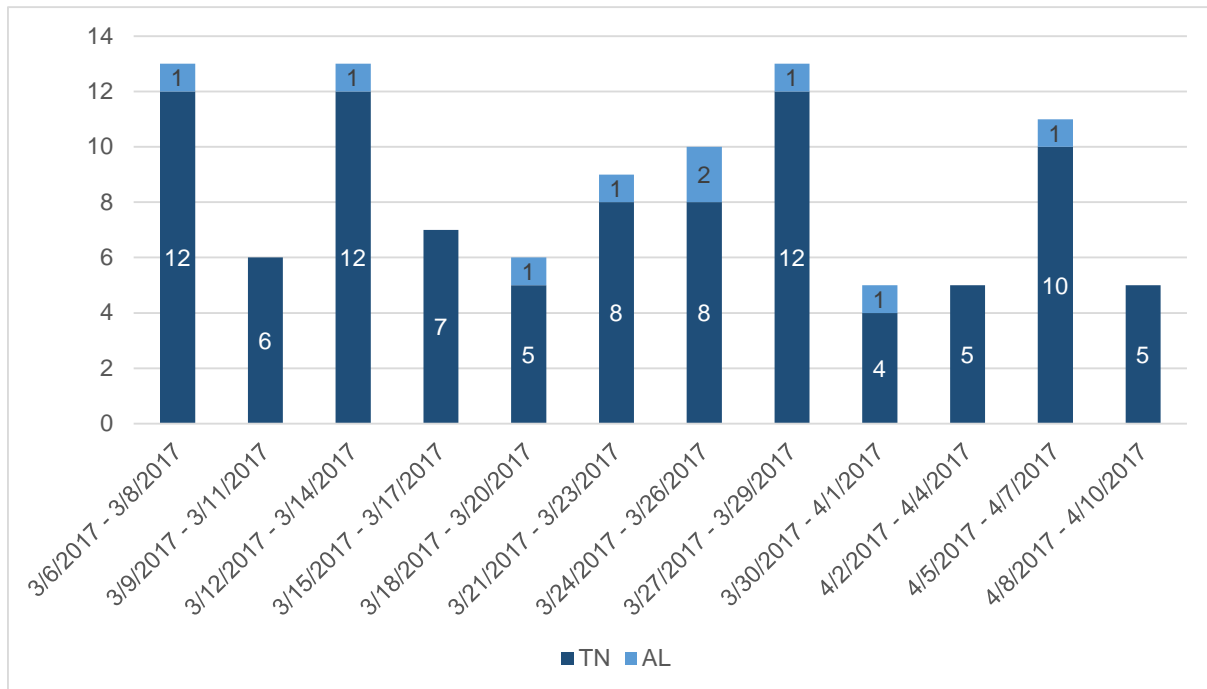
In this outbreak, permits were issued using EMRS2 and the EMRS2 Customer Permit Gateway. There were not a significant number of permits issued due to the location of the HPAI Infected Premises and the needs of surrounding premises for permitted movement. There were 19 total permits issued, 17 from the State of Tennessee and 2 from the State of Alabama. The first permit

²⁶ For reference, the HPAI Control Area in Indiana (2016) was also released after 38 days.

was approved on March 5, 2017; the last permit was approved on April 6, 2017. There were no tracked conveyances during this outbreak.²⁷ These 19 permits resulted in 103 distinct movements. The first movement occurred on March 6, 2017; the last movement occurred on April 10, 2017.

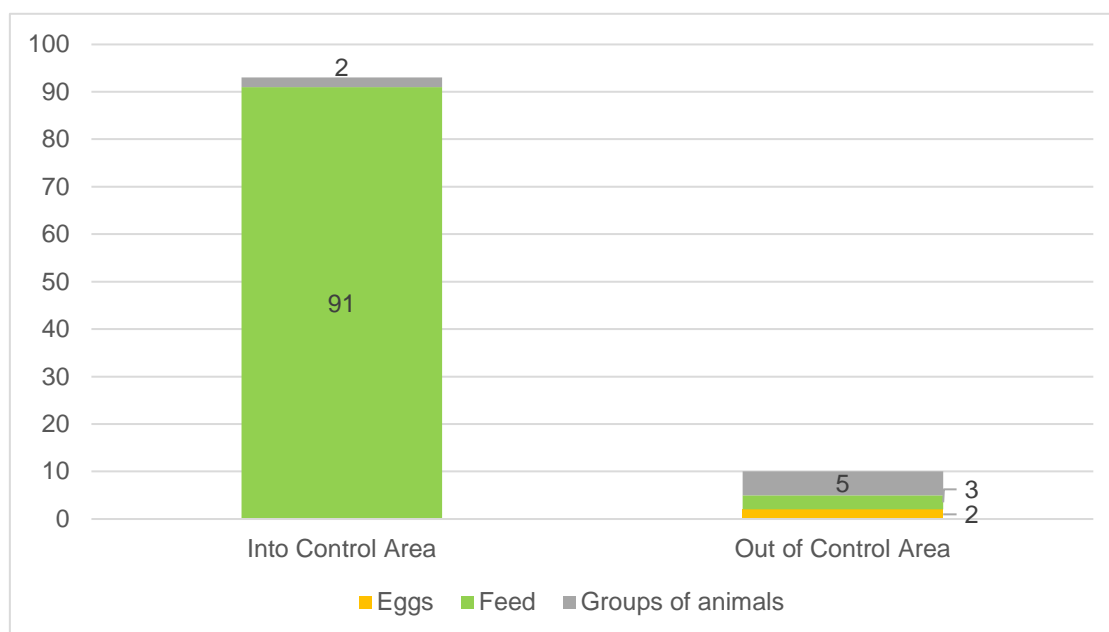
Figure 20 illustrates the number of permitted movements during the course of the incident by the State of Destination. Figure 21 shows the number of permitted movements by item permitted by permit class.

Figure 20. Number of Permitted Movements During Incident by State of Destination (Control Area in Place; Three-Day Increments)



²⁷ In EMRS2, tracked conveyances—which are negligible-risk products moved from Food Safety Inspection Service facilities—are separately reported as the unified Incident Command may not require those movements to be permitted.

Figure 21. Number of Permitted Movements by Item and Permit Class



Of these movements, the most common reason for movement was to move an item directly to a farm (93 movements or 90 percent of movements). There were also movements direct to hatchery (2 movements), direct to slaughter (5 movements), and into commerce (3 movements). Most of the movements (101 movements or 98 percent) originated in Tennessee.

Depopulation

Depopulation (also known as stamping-out) was an immediate priority during this outbreak to prevent the spread of disease. Depopulation measures were undertaken immediately on the HPAI Infected Premises and on 9 of 12 of the LPAI Infected Premises. Ventilation shutdown was not used in the 2017 HPAI/LPAI outbreak.²⁸ The HPAI Infected Premises were depopulated using foam with the assistance of APHIS-hired contractors (coordinated by the SPRS Logistics Center/NVS).

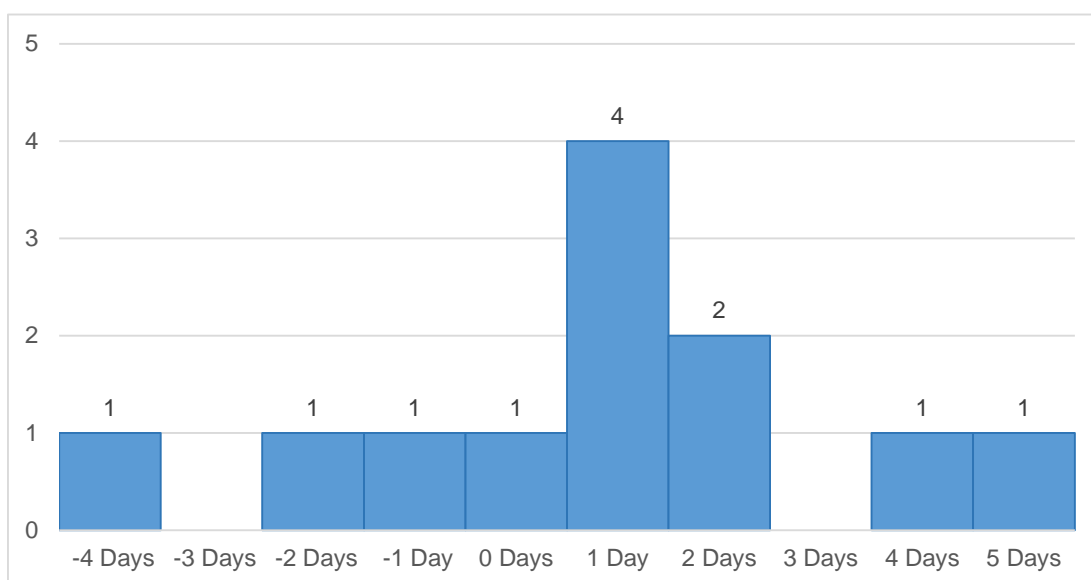
Due to the location and characteristics of specific LPAI-infected backyard premises, State officials elected not to depopulate these flocks and instead conducted repeated surveillance testing over the duration of their quarantines. On one premises, the entire flock was not depopulated, but specific birds were euthanized based on diagnostic testing and epidemiological evidence. Of the 12 total LPAI Infected Premises, 9 depopulated in full; 1 euthanized specific birds; 2 conducted no depopulation or euthanasia. A variety of methods were used on these LPAI premises, including foam, KEDS, cervical dislocation, and CO₂. Of the commercial LPAI Infected

²⁸ After the delays experienced in the 2014–2015 HPAI outbreak, APHIS had developed a new policy prior to the 2016 HPAI/LPAI outbreak in Indiana entitled *Ventilation Shutdown Evidence & Policy*, which states that the use of ventilation shutdown may be considered as an alternative, on a premises by premises basis, with close coordination and collaboration by State and APHIS officials to meet the goal of depopulation within 24 hours (established in the document *Stamping-Out and Depopulation Policy*). These policies are available on www.aphis.usda.gov/fadprep.

Premises (6 of 12), companies completed their own depopulation activities on 5 premises; on 1 premises State personnel also assisted with the depopulation efforts.

Figure 22 illustrates the amount of time it took to depopulate the 12 premises that conducted depopulation activities. The average time from NVSL confirmation to depopulation for all premises was less than 24 hours (.83 days). This is a reduction in average time from the 2016 Indiana outbreak. **Please note that depopulation can be conducted when the presumptive positive case definition for HPAI has been met, based on State and Federal agreement.** Therefore, in some cases, depopulation may occur prior to NVSL confirmation. The first HPAI Infected Premises had completed depopulation within 1 day of NVSL confirmation, while the second HPAI Infected Premises completed depopulation approximately 2 days after NVSL confirmation.

Figure 22. Time in Days to Depopulation from NVSL Confirmation (Frequency Count)



Note: NVSL confirmation date is when a “confirmed status” was placed on the premises in EMRS2, based on a positive diagnostic test result at NVSL. For this outbreak, this was the date of the first confirmatory result from NVSL. “Negative” times in this graph are a result of depopulation being conducted based on a presumptive diagnosis, based on State and Federal agreement.

Disposal

Effective disposal is a key component of a successful response to an FAD outbreak. As shown in Figure 23, all premises—including the 2 HPAI Infected Premises—that conducted depopulation activities used burial as their method of disposal.

Figure 23. Primary Disposal Method for Carcasses & Materials

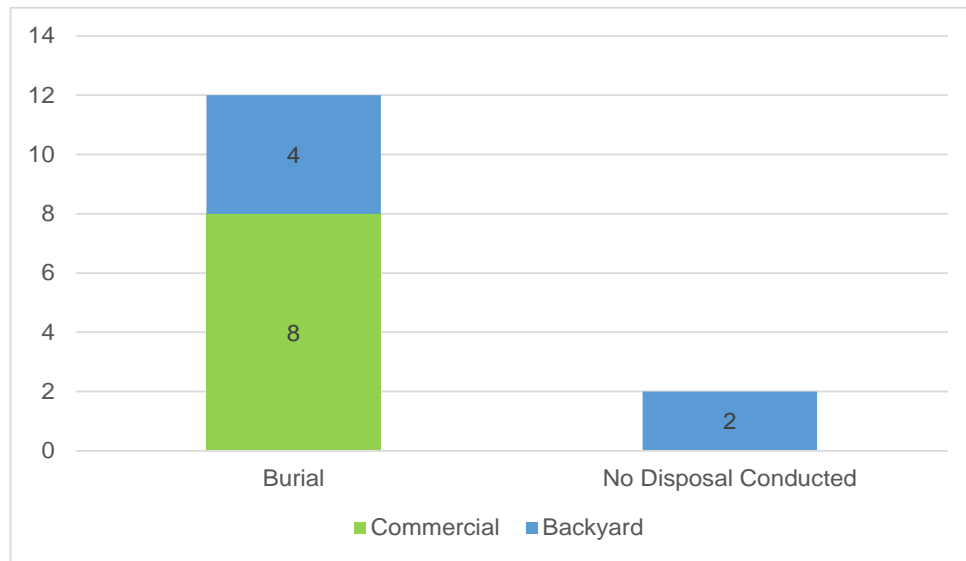
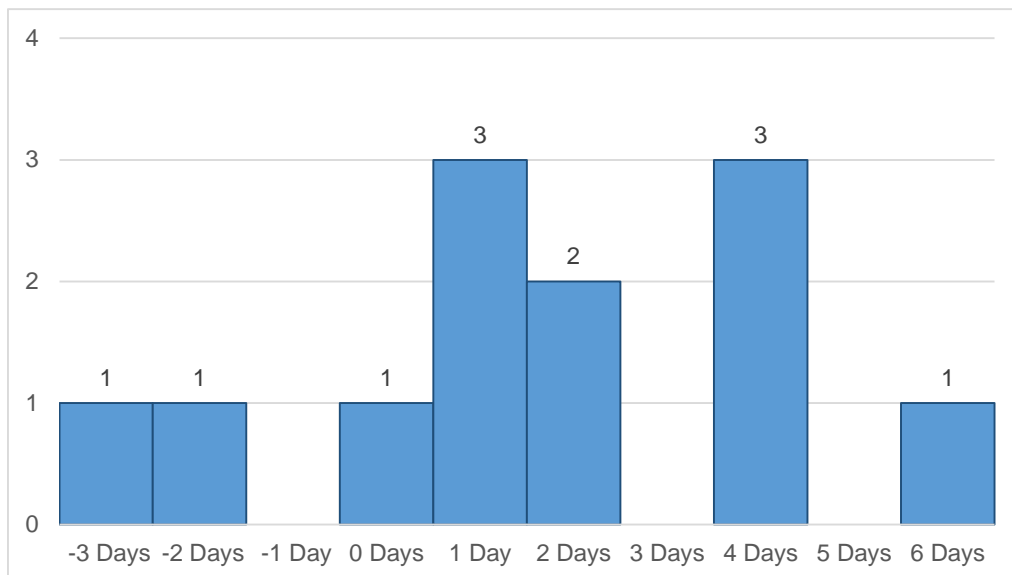


Figure 24 illustrates the time, in days, it took premises to complete disposal from NVSL confirmation. In this outbreak, the time it took premises to complete disposal activities was shortened, in comparison to prior outbreaks, due to the selection of burial (rather than composting) as the disposal method. Please note, completion of disposal date indicates that all carcasses and other high-risk material was buried. Disposal of other materials, such as feed, may have taken additional time to complete.

Figure 24. Time in Days to Disposal Complete from NVSL Confirmation (Frequency Count)



Note: NVSL confirmation date is when a “confirmed status” was placed on the premises in EMRS2, based on a positive diagnostic test result at NVSL. For this outbreak, this was the date of the first confirmatory result from NVSL. “Negative” times in this graph are a result of depopulation being conducted based on a presumptive diagnosis, based on State and Federal agreement.

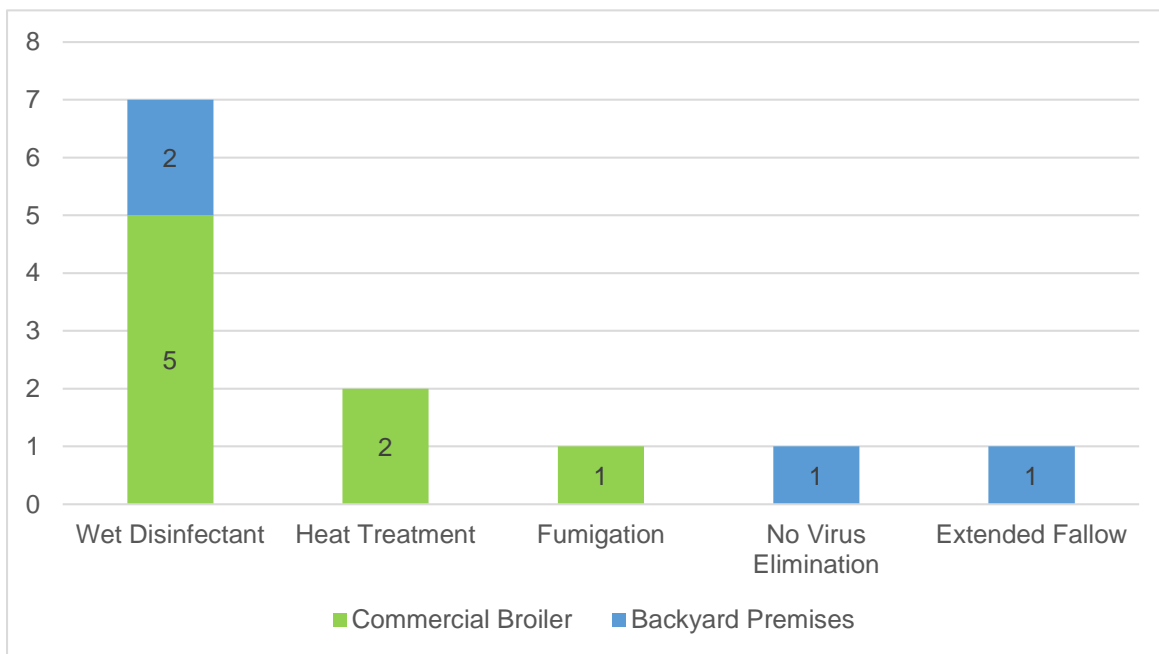
On average, it took premises only 1.8 days from NVSL confirmation to complete disposal. The HPAI Infected Premises averaged 3.4 days to completion; the LPAI Infected Premises averaged 1.5 days. In part, the delay on one of the Infected Premises was due to severe weather which limited outdoor activities. The 8 commercial Infected Premises (HPAI and LPAI) completed disposal on average in 1.7 days; it took the backyard Infected Premises only marginally longer, on average, at 1.9 days.

Virus Elimination (Cleaning and Disinfection)

The HPAI virus can survive for extended periods in organic material and under certain environmental conditions. As such, virus elimination activities were important for the response. As in Indiana 2016, the HPAI Infected Premises were provided with a flat-rate payment for virus elimination on the premises. The flat-rate payment is based on the number of birds and production type; the producers then elected to conduct virus elimination in whatever manner they felt was most effective (in terms of both eliminating the virus and cost). The policy guidance document *Cleaning & Disinfection Basics (Virus Elimination)* outlines the options—including heat treatment—for cleaning and disinfection to eliminate HPAI virus from a previously Infected Premises. It also prescribes guidance for fallowing premises. More information about flat-rate payments is available [here](#). LPAI Infected Premises that conducted virus elimination did not receive flat-rate payments from APHIS.

In the 2017 outbreak, premises primarily opted to apply wet disinfectant to complete their virus elimination, as seen in Figure 25. Both HPAI Infected Premises used wet disinfectant. In the case of a single backyard premises, State officials determined that the premises did not need to conduct virus elimination (same premises that only conducted selective euthanasia).

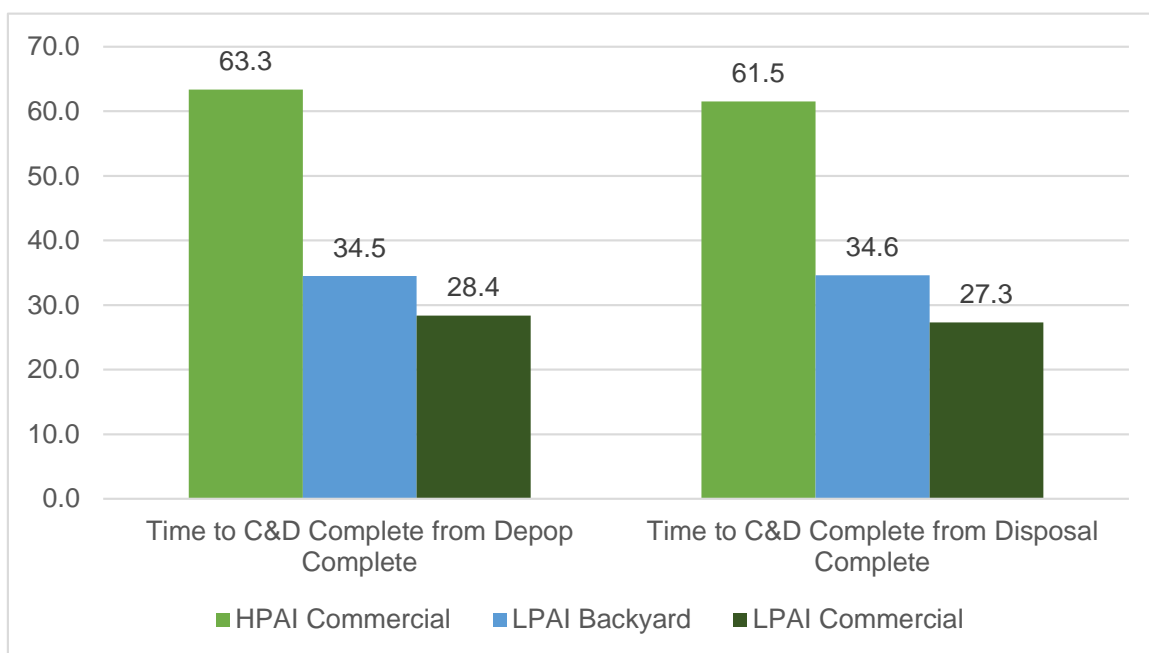
Figure 25. Disinfection Method Used



It took the HPAI Infected Premises 65 days on average to complete virus elimination activities after NVSL confirmation of HPAI on the premises. On average, all premises completed virus elimination activities in 37 days of NVSL confirmation. This average was 38 days for commercial premises (range of 26 to 70 days) and 37 days for backyard premises (range of 4 to 72 days).

After depopulation was complete, it took premises on average 36 days to finish virus elimination activities. After disposal was complete, it took premises on average 36 days to finish these activities. The similarity in these time frames is directly related to the fact that disposal was performed rapidly, by burial, after depopulation in this incident. The average number of days from depopulation to virus elimination and disposal to virus elimination is broken out by premises type (HPAI and LPAI; backyard and commercial) in Figure 26.

Figure 26. Time to Virus Elimination/C&D Complete (in Days)



Biosecurity

Following concerns about a lack of stringent farm biosecurity measures being a contributing factor to the spread of HPAI during the 2014–2015 outbreak, many new biosecurity materials were developed for the poultry industry to support implementation of revised biosecurity recommendations, which are available from www.poultrybiosecurity.org. Site managers were assigned to premises specifically to monitor and audit biosecurity as response operations were underway.

The release of the Interim Rule in February 2016 confirmed the USDA APHIS focus on biosecurity, requiring that all owners and contractors, unless specifically exempted, provide a statement that, at the time of detection of HPAI in their facilities, they had in place and were following a biosecurity plan aimed at keeping HPAI from spreading to commercial premises.

The 2017 HPAI/LPAI outbreak affected commercial broiler breeder flocks—a flock type that had not been affected in prior HPAI outbreaks. Unlike in 2014–2015 and 2016, lateral spread between farms did not appear to be a significant risk factor during the 2017 outbreak. However, other biosecurity issues, including breaches in protocol, did appear to be risk factors that could bring viruses inside poultry barns from the environment.²⁹

Health and Safety

In addition to the ICG activities already discussed, Safety Officers participated in the unified Incident Command structure to ensure the proper use of PPE and facilitate appropriate health and safety measures. USDA APHIS also coordinated with CDC on the One Health aspect of the event, which included ILI monitoring. While this North-American lineage H7N9 virus has never been reported in humans, response workers were closely monitored. CDC and APHIS have coordinated to develop occupational guidance and protocols for monitoring responders for influenza like illness during and after mobilization. USDA also shared virus sequencing results with CDC.

Appraisal & Compensation

Indemnity for Birds Destroyed

As a result of the challenges during the 2014–2015 outbreak, new finance and administration processes were defined (and are available at www.aphis.usda.gov/fadprep). These new procedures, discussed in [Section 5](#), are consistent with the 24-hour depopulation goal in that only one form must be completed before depopulation started on a premises; this *Appraisal and Indemnity Request Form* enabled the poultry owners and growers to agree to accept fair market value for depopulated birds. As in the 2016 HPAI/LPAI outbreak, these processes were again implemented in the 2017 outbreak.

During or after depopulation, owners/growers and case managers gathered information and original records to work on the Contract Grower worksheet (if applicable) and VS 1-23 Form so that payment for birds could be processed quickly. Then the Flock Plan and Financial Plan were completed so that full reimbursement for all response activities could be processed. Indemnity payments for the 2 HPAI Infected Premises were rapidly distributed. Owners and growers of LPAI-infected flocks that made the decision to depopulate, in coordination with State officials, were not indemnified by APHIS in the 2017 outbreak.

Compensation for Response Activities

APHIS-hired contractors (through the SPRS Logistics Center/NVS) conducted disposal activities on the HPAI-Infected Premises. Flat-rate payments were distributed to HPAI-Infected Premises for virus elimination activities. Based on current LPAI regulations, LPAI Infected Premises that

²⁹ USDA APHIS. 2017. Epidemiological and Other Analyses of HPAI/LPAI Affected Poultry Flocks: June 26, 2017 Report. *USDA APHIS STAS Center for Epidemiology and Animal Health*. https://www.aphis.usda.gov/animal_health/animal_dis_spec/poultry/downloads/epi-ai.pdf.

elected to depopulate and subsequently completed disposal and virus elimination activities were not compensated by APHIS for these activities.

Logistics

The SPRS Logistics Center and the NVS led logistics for the 2017 HPAI/LPAI outbreak at the ICG-level, and also deployed personnel to the ICP to support deployed equipment. NVS responded to support requests through the unified Incident Command, coordinating and documenting contractor support for depopulation and disposal. NVS also contracted access to necessary supplies and equipment for response activities.

As in previous outbreaks, the 2017 outbreak again demonstrated that foam depopulation units are fickle and prone to breaking down. As such, the NVS continues to work on and exercise solutions that enable the use of multiple, redundant approaches that may improve the timeliness of depopulation efforts.

Restocking

For previously HPAI Infected Premises, approved to restock means that

- the premises/flocks are 21 days post completion of C&D/virus elimination,
- environmental sampling has been completed with no signs of HPAI,
- requirements have been met per the USDA Flock Plan and State Quarantine Notice/Hold Order, AND
- State and APHIS officials have approved the restock in writing (typically termed the restock approval letter).

On previously LPAI Infected Premises, based on the States' LPAI Response Plan, a restock approval letter may also be issued from the State indicating that the premises can restock. However, in this outbreak, for all of the LPAI-infected backyard premises, the State elected to use the quarantine release notice to both release quarantine and approve restocking on the premises.³⁰ This was also the case for one commercial LPAI premises.

The HPAI-Infected Premises were approved to restock on June 6, 2017. On average, this was 87 days after NVSL confirmed HPAI on the premises. Figure 27 shows the restock approval date for all premises, both HPAI and LPAI. The first premises approved to restock was a previously LPAI-infected commercial premises on April 6, 2017. The last premises approved to restock was a previously LPAI-infected backyard premises, which was on June 16, 2017. The average time to restock approval from NVSL confirmation was 48 days, with a range from 23 to 92 days (Figure 28).

³⁰ In the case of the three LPAI backyard premises that either did not depopulate at all or conducted selective euthanasia, these premises were also prohibited from adding birds to their premises during their intensified surveillance activities. Quarantine release (which played a dual purpose as restock approval) allowed these premises to again add birds to their flocks.

Figure 27. Restock Approval Date for All Premises

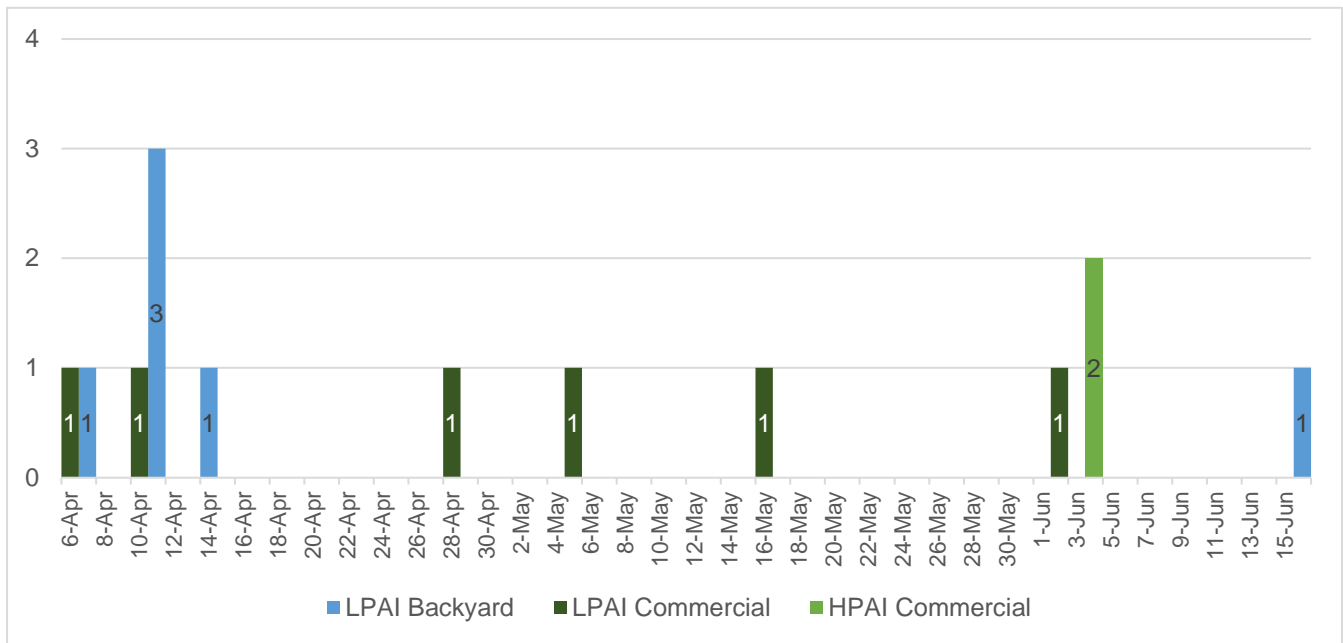
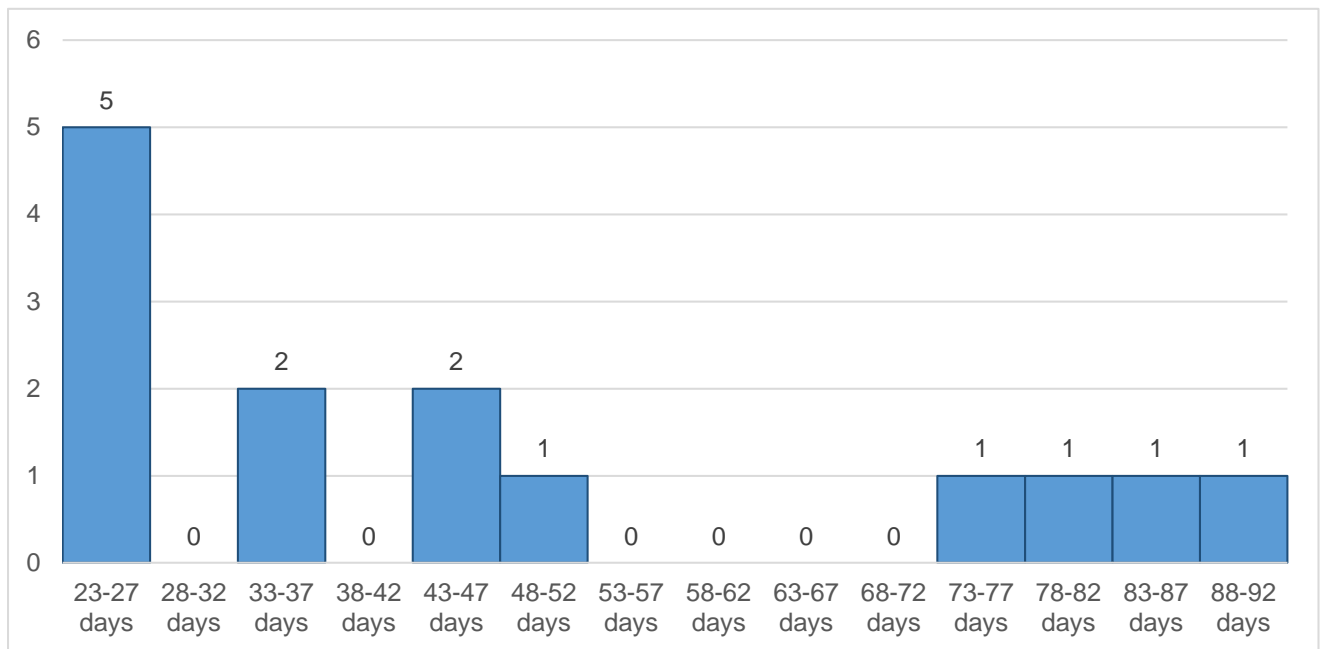


Figure 28. Time in Days to Restock Approval from NVSL Confirmation Date



Information Management & Reporting

Data integrity, timeliness of entry, and accuracy continued to be a priority for both the ICG and deployed APHIS personnel. EMRS2 Specialists were immediately deployed virtually and in-person to support the data-entry and reporting requirements of the outbreak. Previously developed HPAI data standards were incredibly helpful for the HPAI-related data entry; these

also provided a framework for LPAI-related data entry, where such data were different from those required for the HPAI detections (primarily diagnostics).

The 2017 outbreak continued to use the EMRS2 Tally Sheet that was developed during the 2016 HPAI/LPAI outbreak in Indiana. It contained data to be entered in nearly real-time as the response was ongoing. Data entered into the Tally Sheet can be changed at any time and is intended to be the best preliminary information currently available. At routine intervals, the full EMRS2 database is checked against the EMRS2 Tally Sheet data, and all inconsistencies are resolved through processes defined by the ICG Situation Unit.

During the 2017 outbreak, all incident reporting, including the production of distributed maps, were directly created using data entered into EMRS2. This includes both the unified Incident Command Situation Reports, the Weekly Situation Reports (Appendix 2), and other incident related reports.

Communications

Public information and outbreak communication was coordinated by APHIS Legislative and Public Affairs (LPA) and the affected States. A virtual Joint Information Center (JIC) was established between APHIS LPA and the State of Tennessee to manage communications regarding the HPAI detections. LPA personnel were integrated into the ICG and coordinated closely with the unified Incident Command to support consistent messaging from APHIS and the affected States. Stakeholders were kept informed during the response through stakeholder announcements, conference calls, and updates to the APHIS AI page.

Section 7. Preparedness and Future Planning

The 2017 HPAI/LPAI outbreak in the southeastern United States affected different States and a new industry when compared with either the 2014–2015 HPAI or 2016 HPAI/LPAI outbreaks. Importantly, this enabled new States to practice and implement their response plans and offered another opportunity for APHIS to refine its processes for HPAI and mixed HPAI/LPAI response. Like in 2016, HPAI was quickly controlled, contained, and eradicated.

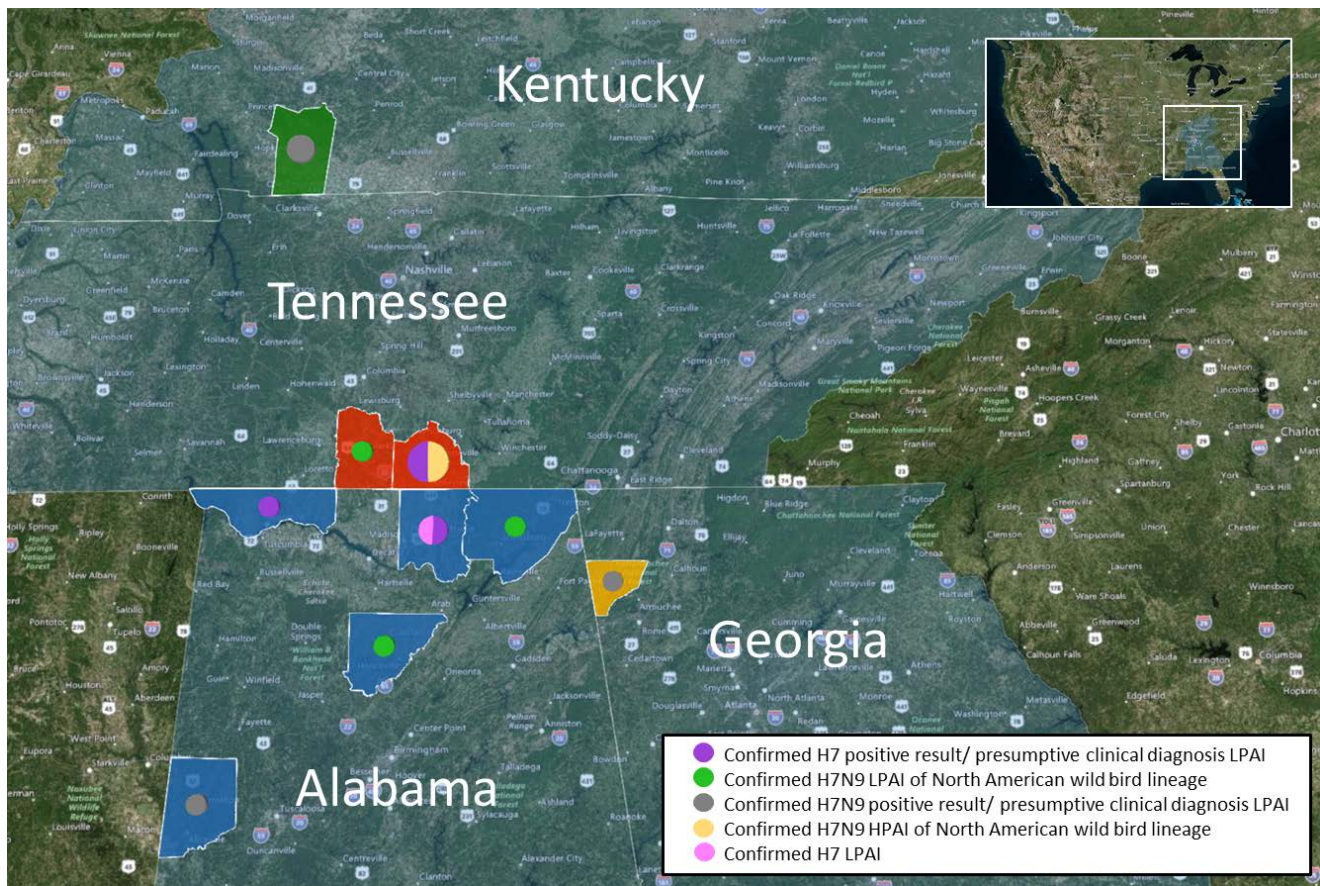
Due to ongoing HPAI transmission worldwide, the APHIS, States, and the entire poultry industry remains on guard for a reoccurrence of HPAI in late 2017 and early 2018. APHIS continues to review existing policy guidance to incorporate additional lessons learned; the documents available on www.aphis.usda.gov/fadprep continue to be updated and clarified as needed. In addition, work continues on EMRS2Go, a mobile application which will significantly streamline field activities, including surveillance, by reducing data entry requirements. Initiatives to ensure all NAHLN laboratories can message diagnostic results to EMRS2 continue. VS NIMTs meet routinely to discuss position descriptions, procedural improvements, and corrective actions that need to occur based on prior outbreaks.

While preparedness for HPAI has significantly improved in the last three years, the threat of another HPAI outbreak means that APHIS, States, and stakeholders continue to work on critical issues for the future. Further information on APHIS activities based on lessons-learned can be found in the *USDA APHIS After Action Report* for this incident.

Section 8. Conclusion

The 2017 HPAI/LPAI incident in the southeastern United States was restricted in size and scope. Only a single county, Lincoln County, Tennessee was affected by HPAI. In total, 9 counties were affected in 4 States. There were 14 Infected Premises (12 LPAI; 2 HPAI). Of the 12 LPAI Infected Premises, 4 were confirmed LPAI; 8 were presumptive LPAI. Figure 29 geographically illustrates the 2017 southeastern United States outbreak region which includes NVSL confirmed disease status.

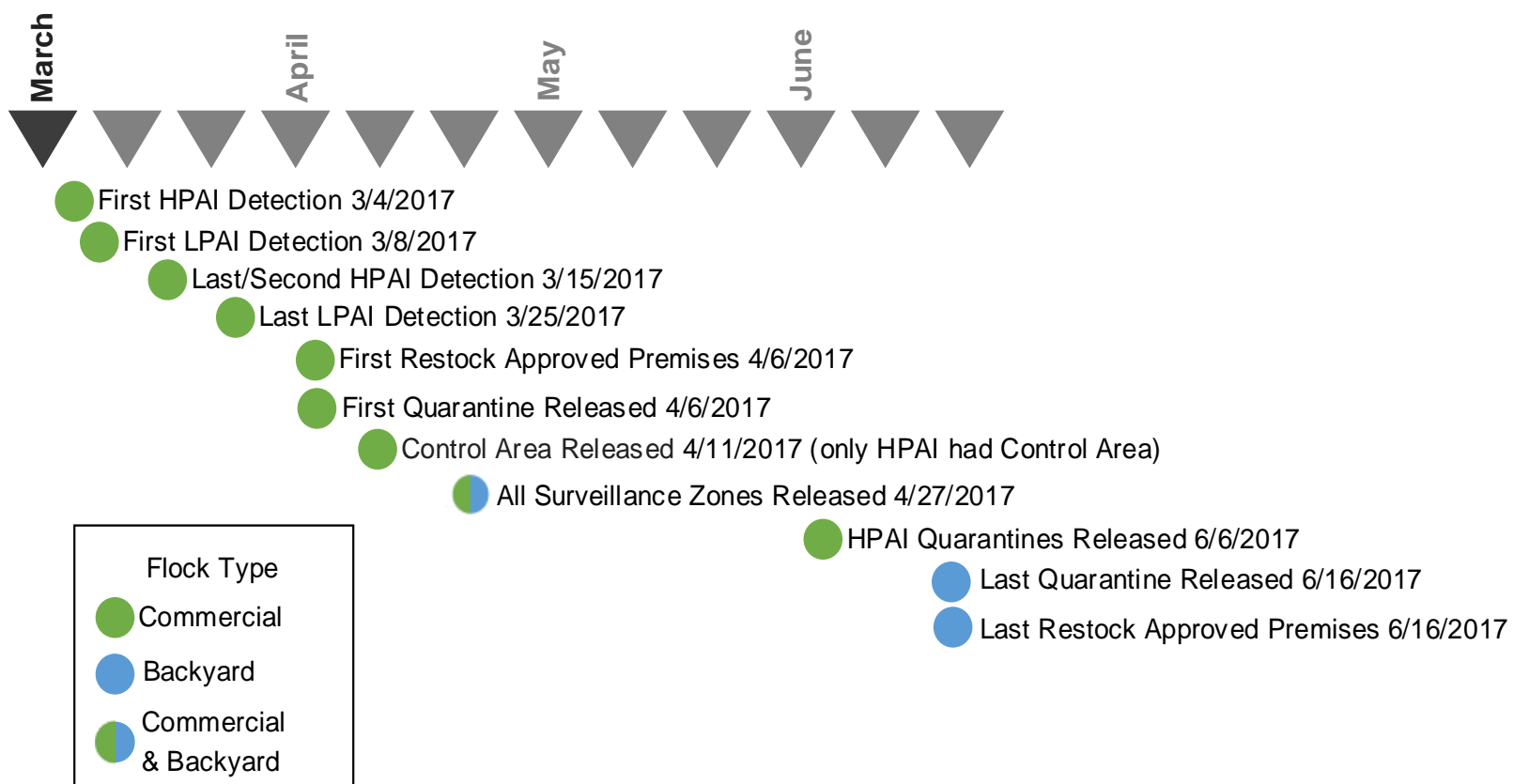
Figure 29. 2017 AI Outbreak in Southeastern United States with Disease Status



In all, approximately 253,000 birds were affected or depopulated during the response effort. The limited spread of HPAI limited the economic impact of the outbreak. Figure 30 provides an overview of key events during the outbreak, from the first NVSL confirmation to the last premises to gain restock approval. All quarantines were released on June 16, 2017, the same day the final LPAI commercial premises was approved to restock.

Figure 30. 2017 Overall Timeline

2017



Note: NVSL confirmation date is when a “confirmed status” was placed on the premises in EMRS2, based on a positive diagnostic test result at NVSL. For this outbreak, this was the date of the first confirmatory result from NVSL.

The success of the 2017 response is largely due to the lessons learned in 2014–2015 and particularly in the mixed HPAI/LPAI 2016 incident. The response was effective at detecting HPAI Infected Premises, depopulating these premises rapidly, and conducting timely response activities. SPRS District 2 personnel were able to manage the incident without the deployment of a VS NIMT, and effectively coordinated and integrated with the States of Tennessee and Alabama in a unified Incident Command structure. At the ICG level, the continuation of an HPAI ICG throughout 2016 and into 2017 resulted in rapid collaboration and efficient support of the unified Incident Command. Information management processes continued to improve, and financial procedures were again implemented in a timely and efficient manner.

While this outbreak was small in scale, there were still unique challenges. Ongoing areas for improvement include the following:

- Confirming sufficient numbers of personnel are medically cleared and fit-tested, and that this information is readily available.
- Ensuring NAHLN laboratories can electronically message diagnostic test results to LMS to automatically integrate with other data in EMRS2.
- Rapid deployment of personnel and functioning equipment.
- Streamlining epidemiological investigations.
- Clarifying procedures for LPAI detections in a mixed HPAI/LPAI incident.

USDA APHIS has identified strengths and areas for improvement during the response, which will be released in the *USDA APHIS After Action Report* for this incident. USDA APHIS continues to prepare for HPAI and other FADs.

Section 9. Abbreviations

Abbreviation	Term
AC	Animal Care
AI	avian influenza
APHIS	Animal and Plant Health Inspection Service
C&D	cleaning and disinfection
CDC	U.S. Centers for Disease Control and Prevention
CEAH	Center for Epidemiology and Animal Health
CFR	<i>Code of Federal Regulations</i>
3D	depopulation, disposal, and disinfection
DA	Deputy Administrator
DC	Dangerous Contact
EMRS2	Emergency Management Response System 2.0
EMSSD	Emergency Management Safety and Security Division
FAD	foreign animal disease
FAD PReP	Foreign Animal Disease Preparedness and Response Plan
GIS	geographic information system
HPAI	high pathogenicity avian influenza
IAP	Incident Action Plan
ICG	Incident Coordination Group
ICP	Incident Command Post
ICS	Incident Command System
ILI	influenza-like illness
JIC	Joint Information Center
LMS	Laboratory Messaging System
LPA	Legislative and Public Affairs
LPAI	low pathogenicity avian influenza
MAC	Multiagency Coordination
MRPBS	Marketing and Regulatory Program Business Services
NAHLN	National Animal Health Laboratory Network
NASAHO	National Assembly of State Animal Health Officials
NASDA	National Association of State Departments of Agriculture
NIES	National Import Export Services
NIMS	National Incident Management System
NIMT	National Incident Management Team
NPIP	National Poultry Improvement Plan
NVS	National Veterinary Stockpile
NVSL	National Veterinary Services Laboratories
ODA	Office of the Deputy Administrator
OPS	operations
PCR	polymerase chain reaction

Abbreviation	Term
PPE	Personal Protective Equipment
PSS	Program Support Services
rRT-PCR	real-time reverse transcription-polymerase chain reaction
SAHO	State Animal Health Official
SHEP	Safety, Health, and Environmental Protection
SPRS	Surveillance, Preparedness, and Response Services
STAS	Science, Technology, and Analysis Services
USDA	U.S. Department of Agriculture
VS	Veterinary Services
VSET	VS Executive Team
WS	Wildlife Services

Section 10. List of Appendices

This section contains a list of appendices; all of these appendices are not publicly available. Publicly available appendices are posted at www.aphis.usda.gov/fadprep.

Appendix 1. Abbreviations for the Appendices

Appendix 2a. H7 Avian Influenza National Situation Report (March 31, 2017)

Appendix 2b. Last H7 Avian Influenza National Situation Report (May 11, 2017)

Appendix 3. Final List of Infected Premises from 2017 Outbreak (May 31, 2017)

Appendix 4a. HPAI and LPAI H7 2017 Map for State and APHIS Officials (March 26, 2017)

Appendix 4b. Final HPAI and LPAI H7 2017 Map for State and APHIS Officials (June 22, 2017)

Appendix 5. Final Mapbook Weekly Report (May 1, 2017)

Appendix 6. Final National Control & Containment Map (June 4, 2017)

Appendix 7. Epidemiology Curve (March 30, 2017)

Appendix 8. Final Summary Deployment Report (May 4, 2017)

Appendix 9. Final Permitting and Movement Report (April 11, 2017)

Appendix 10. Incident Coordination Group Coordination Plan (April 7, 2017)