

**BIOSURVEILLANCE OF AVIAN INFLUENZA AND NEWCASTLE DISEASE VIRUSES WITHIN THE
BARDA REGION OF AZERBAIJAN**

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In Azerbaijan, the presence of H5N1 was first confirmed in February 2006 in wild birds found along the coast near Baku. Later that month, infections were detected in poultry on farms in the northeastern and southern parts of the country, with the first cases of human infection recorded in March [3]. By December 2006 the disease had spread throughout Azerbaijan, resulting in five fatalities from a total of eight human cases of H5N1. The outbreaks were ultimately traced to wild birds and domestic poultry in Gilazi and Bilasuvar [1, 2].

Given the lack of reports of H5N1 in Azerbaijan since 2006, the virus is not expected to be circulating widely in domestic poultry but its potential for incursion and human infection cannot be dismissed, and active surveillance for H5N1 continues. The current biosurveillance program tests only for seroprevalence of H5 and does not detect antigen directly, nor does it detect other highly pathogenic or potentially zoonotic strains (H7, H9), or the neuraminidase gene type.

Newcastle disease (ND) is a viral avian disease that causes symptoms ranging from overt illness to an asymptomatic carrier state. Chickens are particularly susceptible and may experience morbidity and mortality rates up to 100%. Newcastle disease is periodically detected in Azerbaijan, with the most recent outbreak reported to the OIE in 2009. Since ND and highly pathogenic avian influenza (HPAI) have similar clinical presentations, surveillance of domestic poultry in Azerbaijan should include differential testing [4].

This study will characterize the prevalence of influenza A and Newcastle disease infection and viral shedding in sampled populations; differentiate the two diseases; compare existing HI test reagents with OIE-standardized reagents, and identify particular notifiable and potentially zoonotic strains among influenza A-positive samples using internationally recognized molecular methods. Surveillance efforts will be streamlined to: optimize early detection of notifiable and/or zoonotic avian influenza virus (AIV) strains and Newcastle disease virus (NDV); target high-risk populations; and provide additional information about the ecology of avian viruses threatening domestic poultry in Azerbaijan. In addition, geographic information about the location of sampled birds will be collected for future analysis and use in GIS training.

Samples will be collected from poultry in Barda, which is surrounded by areas where H5N1 and ND cases have been recorded in the past. It is also home to a Zonal Veterinary Lab (ZVL), hosts the largest live animal market in Azerbaijan, and is close to a water reservoir and two national parks located on migratory flyways for wild bird species.

Swab samples will be collected from farmed poultry concurrently with blood sample collection for the existing H5 surveillance program. Additional samples will be collected from the poultry market at Barda, including those of environmental origin (surface swabs, swabs of feces), with tracheal and cloacal swabs collected directly from market birds when vendors allow. These environmental samples, which avoid the need to handle and sample birds directly, can be taken to demonstrate the presence of NDV and notifiable and other influenza A strains, and to monitor cleaning and disinfection in markets and other poultry facilities.

Pooled samples of the same epidemiologic unit (such as a household, flock, or village) of the same origin (tracheal, cloacal, or environmental) will be tested using PCR to pre-screen samples for the presence of influenza A and NDV. To reduce the number of tests run and the corresponding amounts of reagents used, only samples in influenza A-positive pools will be tested individually for the presence of H5, H7, H9, and N1. Approximately 400 blood samples collected and tested under the existing H5 surveillance program, with both positive and negative test results, will be retested for H5, H9, and Newcastle disease antibodies with OIE-standardized Newcastle HI reagents to provide direct comparison between OIE and currently available reagents.

This project will help to identify optimal surveillance strategies for rapid detection of HPAI and other avian diseases in Azerbaijan according to international guidelines. The application of modern molecular analytical techniques and standardized reagents, as well as the collection of geographic coordinates at surveillance sites, will expand both national and regional capabilities of the Republican Veterinary Laboratory (RVL) and ZVL.

References

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БІОМОНІТОРИНГ ГРИПУ ПТИЦІ ТА ХВОРОБИ НЬЮКАСЛА В БАРДИНСЬКОМУ РАЙОНІ, АЗЕРБАЙДЖАН

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Мета проекту – визначення оптимальної стратегії моніторингу з метою швидкого виявлення високопатогенного вірусу пташиного грипу та інших хвороб птахів в Азербайджані відповідно до міжнародних стандартів. У проекті будуть застосовані сучасні молекулярні методи аналізу та стандартизовані реагенти для біомоніторингу збудників на території Азербайджану.