



# GNSI DECISION BRIEF:

## Who Will Rebuild Ukraine's Public Health and Disease Research Laboratories?

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### Introduction

Amid the devastating war in Ukraine, a parallel battle rages on – that against infectious diseases. The COVID-19 pandemic starkly underlined the vital importance of global health surveillance for emerging and re-emerging human and animal pathogens. This challenge has become even more acute in war-torn regions like Ukraine, where healthcare infrastructure is under siege. For viruses with pandemic potential, such as the influenza virus, worldwide surveillance initiatives are essential in tracking the virus's movement and spread among both animals and humans. Such monitoring serves dual purposes. Firstly, it guides the formulation of the yearly vaccine, ensuring it remains effective against prevailing strains. Secondly, it alerts livestock farmers in advance, enabling the timely rollout of mitigation measures. Moreover, discerning whether a disease outbreak is of natural origin, or an intentional release becomes critical. To achieve this, the global community must share transparent and timely information through a robust network of laboratories with cutting-edge biotechnological capabilities. The war's ramifications have severely impacted these efforts. Yet, the stakes are too high to let these facilities fade away. This situation leads to the ultimate question: Who will step up to rebuild Ukraine's public health and disease research laboratories?

### Ukraine and Infectious Disease Research

Ukraine has played a pivotal role in monitoring emerging diseases such as avian influenza, African Swine Fever, measles, HIV, and tuberculosis (TB). Located at the nexus of migratory bird pathways and ecological zones between Europe and Asia, it is uniquely positioned to oversee the movement and emergence of zoonotic diseases (high threat diseases that can jump from animals to humans) affecting both human health and agriculture. Ukraine's border with Russia, a nation known for its limited disease-related information sharing and its inherited Soviet bioweapons program, adds further significance to Ukraine's monitoring role.

Following the dissolution of the Soviet Union, Ukraine became a central meeting point for Eastern European and Caucasus nations to coordinate public health endeavors, such as avian influenza surveillance. Benefiting from substantial US and EU research

funding, Ukraine has frequently been the venue where regional researchers and clinicians convene to exchange data and partake in scientific training. Countries in the region were collaboratively developing a program to monitor zoonotic diseases, including rabies, highly pathogenic avian influenza (HPAI), African swine fever (ASF), and Crimean Congo hemorrhagic fever.

### Impact of the War on Public Health in Ukraine

The war has stressed the public health system, veterinary services, and limited scientific research in Ukraine. The main threats are lack of infrastructure and scientific personnel (professional development) support. Scientists in Ukraine have been chronically underpaid and their institutes and research underfunded. A significant amount of health and disease research in Ukraine has been historically supported by the United States Department of Defense and the National Institutes of Health in collaboration with US-based scientists. As such, the war has halted many ongoing surveillance and epidemiological research projects, researcher training programs, and has frozen the associated funds. With the physical damage to infrastructure and the electrical grid, laboratory support for clinical, veterinary and research projects have been strained; Ukrainian clinical scientists have gone so far as using car batteries to run scientific equipment for accurate clinical diagnosis of infections. But effective surveillance isn't just about tracking; it's about understanding. To truly grasp the dynamics of natural outbreaks, it's imperative to diagnose infections accurately. That said, many Ukrainian scientists have continued working under difficult working and personal conditions, both inside and outside the country, in their struggle to protect human and animal health and achieve victory in the war.

### Zoonotic Diseases

Since the invasion of Ukraine, intensive surveillance and research into the emergence of high threat, zoonotic diseases has been diminished. One clear example is the highly pathogenic avian influenza (HPAI). This disease has affected poultry and wild birds in Ukraine in multiple waves since 2005, with outbreaks often centered around the wetlands near Crimea and the Azov Sea, specifically in the Kherson, Mykolaiv, Odesa, and Zaporizhzhia oblasts (provinces). On the other hand, African swine fever has

posed a nationwide challenge since 2012, resulting in significant economic losses for swine production. The Russian occupation of areas such as Kherson and Zaporizhzhia, coupled with direct threats to neighboring oblasts, has rendered surveillance for both HPAI and ASF almost unfeasible. Moreover, veterinary research institutes in Kharkiv, Kyiv, and Odesa have been partly shuttered and US/EU-funded monitoring programs on HPAI and ASF halted. The diminished state of research into these high threat, zoonotic diseases, may adversely affect food production while potentially creating conditions that could lead to human outbreaks.

### *The Rise of Multi-Drug Resistant TB*

Ukraine has suffered a high TB burden for decades. The spread of multi-drug resistant (MDR) TB in Ukraine has been exacerbated by interruption of people in TB treatment programs upon displacement from conflict areas. The intensive clinical care and laboratory testing needed to effectively treat TB, identify and limit MDR-TB strains, and follow up with epidemiological investigation has been severely impacted, particularly in Kharkiv and oblast that have suffered direct invasion. Moreover, many TB patients are HIV positive; treatment interruption in HIV care also impacts the immune defenses of these patients. The WHO, along with other US and EU-based organizations have assisted in rebuilding public health system despite the conflict. The epidemiological situation regarding both MDR-TB emergence and HIV/AIDS in Ukraine, and other human diseases such as respiratory virus infections (COVID-19, influenza, measles), is dire and represents a severe public health threat.

### **Identifying Natural vs Intentional Outbreaks**

Disease research can be dual purpose – the same techniques used to produce a vaccine or therapeutic can be utilized to create bioweapons or toxins. Despite the dangers of disease research, laboratory capacity and a skilled workforce is necessary for protecting human and animal health. Those same scientists are key to protecting against and responding to the intentional release of harmful biological agents. The war has caused Ukraine to lose its pool of highly trained personnel, which, in turn, threatens its ability to train the next generation of scientists, veterinarians and physicians.

To efficiently counteract both these threats, a nation requires a cadre of dedicated and professional scientists. This trained force acts as the first line of defense, analyzing, interpreting,

and responding to any biological threat. Ukraine stands on the precipice of a significant setback. It faces the potential exodus of its best scientists, and, potentially, the inability to train the next generation of scientists, veterinarians, and physicians. This scenario emphasizes the dire need for international collaboration and investment to ensure Ukraine retains its vital human capital in the realm of public and veterinary health.

### **Rebuilding and Sustaining Disease Surveillance and Research**

The imperative to rebuild Ukraine's public and veterinary health infrastructure has never been more pressing. To establish a resilient and sustainable health framework that can withstand current and future challenges, a concerted international effort is paramount. The US, EU, and their allied partners must helm this initiative, laying down a blueprint that underscores the importance of multi-year funding. If they do not, an opportunity arises for a strategic competitor like China to step in. Financial backing alone will not suffice. Incorporating measurable professional training programs is crucial to ensuring a steady influx of skilled personnel into the healthcare system. Those scientists and researchers need to work in secure laboratories with the capacity to tackle emerging health threats.

Furthermore, the bureaucratic obstacles of corruption and mismanagement, which have impeded efficient healthcare delivery, must be systematically addressed. Universities will play a pivotal role in shaping future generations of healthcare professionals. Enhancing educational programs and bolstering resources for these institutions ensures a robust pipeline for the future, guaranteeing sustained excellence in public and veterinary health.

Given the immediate threats and the potential long-term impact on regional and global health, it is essential to initiate these initiatives without delay, leveraging existing frameworks and capitalizing on previous efforts. In doing so, the international community would not just be aiding Ukraine, they would be fortifying a vital bulwark in the global health defense system. The international community's responsibility does not end at resolving the conflict. It is imperative to rejuvenate a healthcare system vital not just for Ukraine, but for the global community. Our collective safety hinges on a unified effort, especially in combating infectious diseases that recognize no borders.

## Decision Points

- Should the United States be more involved in training and retaining highly trained scientific personnel in the Ukraine?
- Should the UN, WHO and US look for ways to extend stability through disease surveillance programs in conflict zones around the world?
- What can/should International Organizations like the UN, NATO, and the WHO along with International Non-Government Organization do to minimize the impact of infectious disease outbreaks in conflict zones?
- In future conflicts, how can the United States ensure that research laboratories and facilities containing disease samples and other biohazards remain secure?
- How does the United States safeguard its forces and citizens from disease outbreaks during future great power conflicts? For example, the impact of the Spanish Flu on the military during and following World War I.
- If the West chooses not to lead the rebuilding of Ukraine's Public Health and Disease Research system, does that present an opportunity for a strategic competitor, like China, to intervene and enhance its influence in Ukraine and Eastern Europe?

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