FS No. 040-0524

Novel Respiratory Viruses

What is a virus?

A virus is a microscopic organism made of genetic material, such as DNA or RNA, surrounded by a protein coating. To replicate, viruses need to enter host cells. Once inside, it can kill or damage those infected cells. While there are thousands of viruses, only a few infect humans and cause disease.[1-4]

Viruses are spread through various means, primarily through inhaling infectious airborne droplets or particles from an infected person. Other routes of transmission include consuming contaminated food or water, touching surfaces with the virus, sexual contact with someone who is infected, transmission from mother to fetus, or bites from infected insects or animals.[1-3]

Examples of diseases caused by viruses include the common cold, the flu, COVID-19, measles, smallpox, and AIDS. Humans develop immunity (protection against infection) against viral diseases when the body's immune system is primed naturally (from exposure to the virus through infection and disease), or through vaccination.[1-3]

What is a novel respiratory virus?

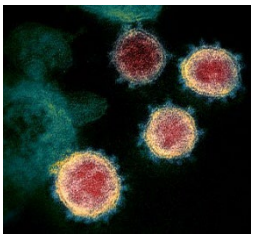
A **novel respiratory virus (NRV**) is an airborne virus that human populations do not have well-established immunity against. NRVs may cause acute disease and are most likely to arise where different host species are in close contact, creating opportunities for viruses to mix.[3, 4]

Newly emerging infectious diseases result from viruses due to genetic changes in viruses (mutations), changes in exposures, such as travel, geographic relocations, and ecologic transformations, and inadequate use of interventions (vaccines, hygiene).[3,4] Examples include:

- Newly identified viruses: SARS-CoV-1 (2003), MERS-CoV (2012), SARS-CoV-2 aka COVID-19 (2019)
- Viruses not previously recognized in a location or population: H1N1 (2009, U.S.)
- Viruses returning to a location or population after an extended period of time: H1N1 (1977)
- Re-emergence of variants of known respiratory viruses: e.g., influenza A, H3N2 (2023)
- Emergence of new virus strains that evade current medical countermeasures (e.g., vaccines)

What is the threat to the force?

Respiratory diseases degrade the readiness of the U.S. Armed Forces by reducing the number of available Service members, increasing training time, and increasing the military medical burden. NRVs can have a greater impact on the threat to the Force than common diseases because there are less interventions available and there is less human population immunity. For example, in 2022, over half of the respiratory disease diagnoses among Service members were due to the NRV SARS-CoV-2. In addition—


NIH.gov source

- Military populations living or training in close quarters are at high risk of contracting respiratory diseases because of sustained high stress combined with the potential for repeated exposures.[5]
- NRVs can indirectly or directly affect the Force through the impacts of "social distancing," a common public health response to NRVs for epidemic control.[4]

How does the DoD prepare for a NRV?

At the local level, Commanders ensure that—


DVIDS source

- Force health protection measures are executed (e.g., social distancing, vaccinations) and integrated with Public Health Emergency Management response plans and agreements.[6]
- Medical providers are properly documenting Reportable Medical Event cases in the military's Disease Reporting System internet (DRSi).[7]

At a strategic level, oversight of NRV threats is managed by the Defense Health Agency (DHA), which optimizes diagnosis, testing, treatment, vaccination[8], and provides—

- Global military medical surveillance of known and emerging diseases and NRVs.[9]
- DoD pandemic stockpile of personal protective equipment and antiviral medications.
- The Defense Medical Readiness Training Institute to train Public Health Emergency Officers and Medical Emergency Managers for NRV preparedness at the local installation level.

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How does the DoD identify and characterize a novel respiratory virus (NRV)?

The DoD relies on Public Health Surveillance to identify and understand NRVs. This involves the systematic collection, analysis, and interpretation of health-related data.

The DHA-Public Health (DHA-PH) uses multiple data sources, analytic methods, and reporting tools to conduct routine surveillance. This includes monitoring military health outcomes in clinical systems as well as the DRSi, laboratory data, and wastewater analysis. With these sources, DHA-PH can continually monitor and communicate NRV detection, trends, and events of military relevance worldwide.[9]

The DRSi is a medical surveillance source where specified Reportable Medical Event (RME) conditions, such as novel influenza cases, must be reported. RMEs are similar to the Centers for Disease Control and Prevention (CDC) "Nationally Notifiable Diseases." All military treatment facilities (MTFs) must document RMEs in the DRSi.[7] The RME case definitions[7] ensure consistent reporting and support local contact-tracing efforts. All MTFs must report RMEs accurately, completely, and promptly since effective DRSi surveillance depends on what is reported.

Many RMEs require laboratory confirmation. The DHA global laboratory surveillance network helps rapidly detect and characterize NRVs with respiratory testing of Service members, beneficiaries, and other populations (**Figure 1**).

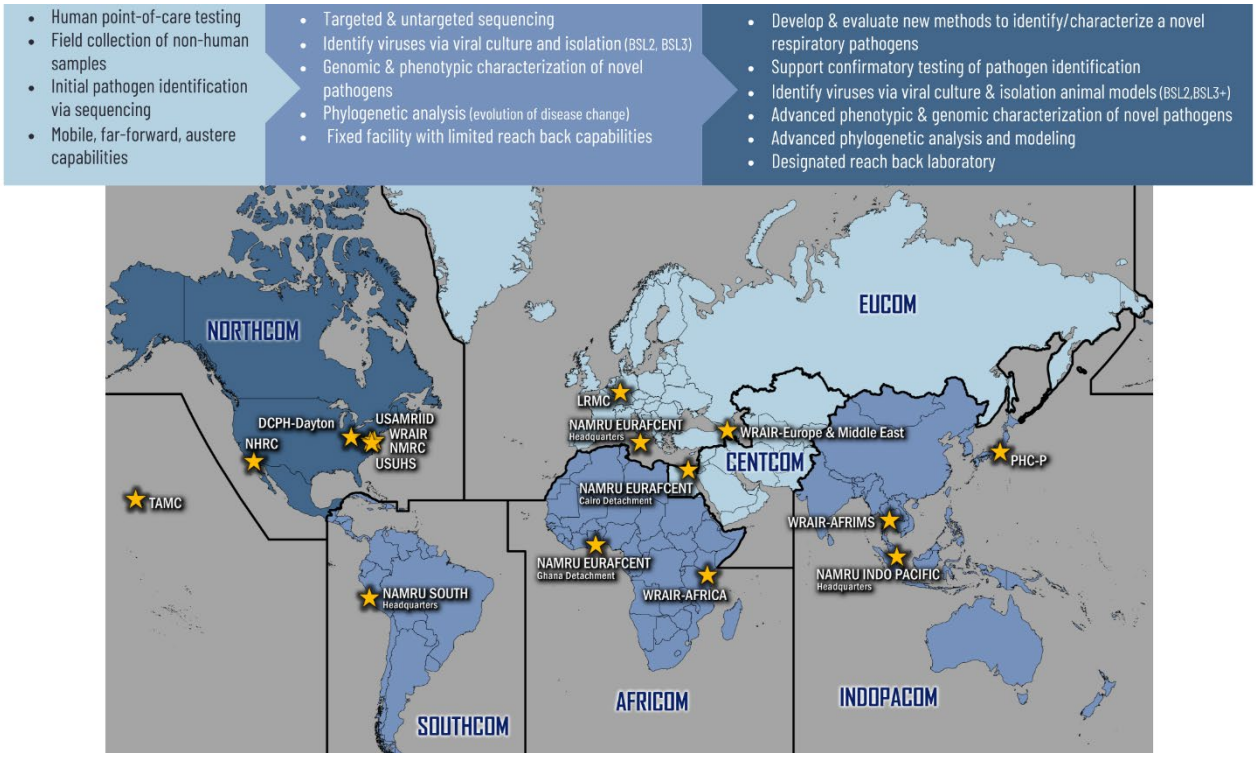

Figure 1. Map of DHA-PH Global Laboratory Surveillance Network and Tiers of Testing

Key Information Sources

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