TIP NO. 98-122-0720

SURVEILLANCE OF COVID-19 IN THE DEPARTMENT OF DEFENSE

PURPOSE

To summarize current Department of Defense (DOD) public health surveillance strategies for COVID-19.

FACTS

Health surveillance is the ongoing, systematic collection, analysis, and interpretation of health-related data, closely integrated with the timely dissemination of these data to those responsible for prevention and control. The purpose of conducting surveillance is to provide actionable public health information for leaders, public health personnel, and the public to guide decisions and policy.

Surveillance is characterized as active or passive with respect to how health information is obtained. Passive surveillance is less resource intensive but limited by the quality of available data. Active surveillance is more resource-intensive but can discern signals from noise. An effective surveillance program utilizes active surveillance to compliment passive methods. Multiple surveillance techniques, such as sentinel and syndromic surveillance, are employed along this spectrum.

The Defense Health Agency (DHA) and DOD public health agencies, to include the U.S. Air Force School of Aerospace Medicine (USAFSAM), the U.S. Army Public Health Center (APHC), and the Navy and Marine Corps Public Health Center (NMCPHC) use a number of data sources for COVID-19 surveillance, including reportable medical events (RMEs), laboratory records, medical encounter records, and reports from government agencies (e.g., Commander Critical Information Requests (CCIRs) and Centers for Disease Control and Prevention (CDC) reports).

Surveillance Data Sources:

RMEs:

- The Disease Reporting System internet (DRSi) is the primary passive surveillance system used by all branches of the military to track cases of COVID-19, along with other RMEs as defined by the Armed Forces Reportable Medical Events Guidelines and Case Definitions. Cases are typically reported to DRSi by Army Public Health Nurses (APHNs), epi-techs, preventive medicine physicians, and other public health professionals as they receive the information from their emergency rooms, laboratories, case managers, health departments, and other local sources.

- DRSi is the official source of RMEs from the U.S. Navy (USN), U.S. Marine Corps (USMC), the U.S. Coast Guard (USCG), U.S. Army and the US Air Force. The purpose of the DRSi is to implement DOD policies regarding the collection and timely reporting

of information on cases of selected medical events and environmental injuries. DRSi is one of several medical data collection and reporting systems that contribute to the Defense Medical Surveillance System (DMSS), maintained by the Armed Forces Health Surveillance Division (AFHSD).

- Application control and maintenance of DRSi are a joint operation between APHC, NMCPHC, and USAFSAM. Routine follow-up and surveillance are conducted daily by epidemiologists at APHC, NMCPHC, and USAFSAM. Installation public health professionals can request access to DRSi, depending upon their Service affiliation and/or unit they are supporting, given that (1) the system has no limit on the number of users it can support and (2) the ease of use from a system connected to the internet, DRSi has been successfully implemented in theater to support preventive medicine units. Additionally, DRSI utilization within medical treatment facilities (MTFs) using MHS Genesis has been successful. See Appendix 1.

- The COVID-19 case definition for DRSi was established by the Tri-Service Reportable Medical Event Working Group and then approved by the Defense Health Agency Control and Collaboration Working Group on 16 March 2020. A confirmed case is defined as any positive laboratory result for COVID-19 infection, irrespective of clinical signs and symptoms. Positive laboratory results include positive, presumptive positive, and confirmed results from any laboratory, including those labs performed outside of the Military Health System.

Electronic Medical Records:

- Armed Forces Health Longitudinal Technology Application (AHLTA). AHLTA is used to validate cases of COVID-19 submitted in DRSi. Medical records and laboratory results are reviewed to ensure that each case reported meets the COVID-19 case definition, and that all information entered in DRSi is accurate and up-to-date.

- MHS Genesis. MHS Genesis is the new electronic patient medical record that has been implemented at several military installations within the last 2 years; it is also used to ensure that each case reported meets the COVID-19 case definition and that all information entered in the medical event report is accurate and up to date. In addition, MHS Genesis lab information is now reported on a daily basis to the DHA for review and summarization by the public health services.

- Laboratory Data. The Navy's Epidemiology Data Center (EDC) sends a daily feed to all Service public health centers of all COVID-19 laboratory tests performed. This laboratory data is processed and maintained by the EDC using health level-7 (HL-7) messaging from records extracted through the Composite Health Care System (CHCS) microbiology and chemistry data tables.

- DMSS. DMSS is a relational database with multiple sources feeding information into tables containing information related to the health of U.S. Military Service members. These data sources include, but are not limited to: Defense Manpower Data Center

(DMDC), Military Entrance Processing Command (MEPCOM), Defense Health Services System (DHSS), Defense Enrollment Eligibility Reporting System (DEERS), Armed Forces Medical Examiner System (AFMES), DRSi, Pharmacy Data Transaction Service (PDTS), Pharmacoeconomic Center (PEC), and Theater Medical Data Store (TMDS). The Armed Forces Health Surveillance Division (AFHSD) uses this system to generate their master line list of COVID-19 cases, which is shared with APHC, USAFSAM, and NMCPHC.

- Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE). ESSENCE is part of the Comprehensive Health Surveillance (CHS) enterprise, a collection of DOD surveillance systems. This data includes International Classification of Disease (ICD)-10) diagnoses and laboratory results, which are grouped into syndromes, such as influenza-like illness (ILI). This system also contains a specific syndromic group for COVID-19.

- Case Reports. Individual case reports, including CCIRs, serious incident reports (SIRs), executive summaries (EXSUMs), and reports from civilian entities (laboratories, state and local health departments as well as the CDC) are sent to DOD health agencies each day.

Surveillance Programs:

- Febrile Respiratory Illness (FRI) Program. The FRI Program, run by the Naval Health Research Center (NHRC), monitors pathogen-specific FRI among DOD basic trainees. Roughly 20 respiratory pathogens, including 4 types of coronavirus, are tested from submitted samples on a weekly basis. While NHRC has COVID-19 testing capabilities, the tests are not currently incorporated in FRI surveillance due to limited testing kits, which are currently restricted for use on provider-submitted samples from symptomatic patients. Line level FRI data are routinely furnished to the AFHSB.

- Acute Respiratory Disease (ARD) Surveillance Program. The ARD Surveillance Program is an active surveillance system monitoring ARD and streptococcal disease burden among symptomatic Army basic trainees. The program is managed by APHC, and relies on weekly data collection by ARD surveillance program staff at each of the basic training sites. Weekly company-level febrile ARD/streptococcal infections have been tracked since 1966. In March 2020, the program was expanded to capture afebrile infections. Given that ARD data are delayed up to 1 week, the data may help identify potential clusters or outbreaks of infection that are relevant but doesn't currently have the detail needed to support case validation.

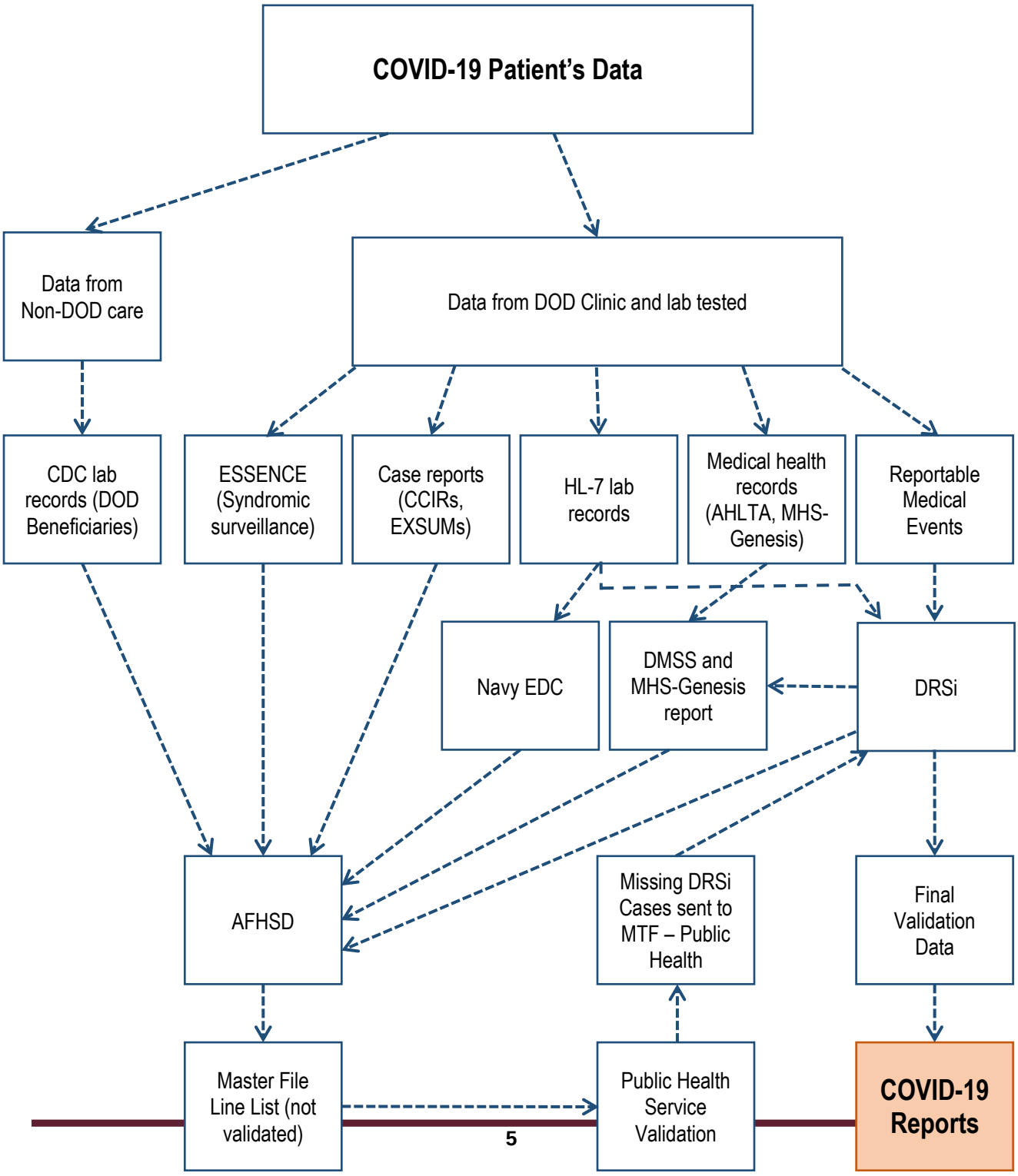
COVID-19 Surveillance Process:

Data from DRSi, HL-7, ESSENCE, and individual case reports are validated by AFHSD and combined into a "Master Positive File." This file is used for reporting of cases through DOD/DHA chains of command.

The Master Positive File is sent to the Service public health centers for review and validation. Information in the file that is not currently in the DRSi is validated and submitted to the respective MTF for entry into DRSi.

Data entered into DRSi is used to develop the Army COVID-19 Surveillance Reports and the AFHSD COVID-19 Surveillance Reports.

Figure 1. COVID-19 Surveillance Data Flowchart



Validity and Completeness Checks:

APHC conducts validity checks of all data reported to DRSi from Army installations. This quality control process ensures the information in the DRSi record matches the case definition; ensures completeness and accuracy using AHLTA record reviews, including addition of cases identified from the AFHSB master file; and direct follow-up with the reporting MTF to report all cases of COVID-19.

APHC epidemiologists review hospitalized cases of COVID-19 daily to ensure the DRSi record is accurate and up-to-date.

AFHSB conducts validity checks using both ESSENCE and DMSS data. Each system is compared to the DRSi data on a daily basis. Any cases identified that are not listed in DRSi are returned to the Services for immediate data entry to DRSi.

Advantages and Disadvantages of the Surveillance System:

Advantages:

- Data from all DOD sources are searched to ensure maximum case capture of COVID-19 patient data for the DOD population.
- Data validation is conducted to the highest degree possible using all available data sources.
- Summary reports are accurate given that data are confirmed during multiple points throughout the process.

Disadvantages:

- There is a lag time ranging from 1 to 3 days for reports to be confirmed in the system due to the time between onset, testing, testing confirmation, and DRSi entry.
- Given the dynamic nature of the pandemic, information regarding reporting may change, which in turn affects surveillance processes.
- Not all patients' tested in non-DOD facilities are captured using this process. This is because lab records, RME records, or even medical records may not be generated or may not be transmitted back to a military MTF to be entered. Capturing these cases requires liaison between MTF public health assets and civilian organizations.

Appendix 1: Patient Data Flowchart for DRSi