Management of Health Care Personnel Exposed to HCV

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Module 6: Treatment of Key Populations and Unique Situations
Lesson 5: Management of Health Care Personnel Exposed to HCV

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Background

Health care personnel (HCP) are at risk for a variety of infectious pathogens following exposure to blood or body fluids.[1,2] Exposure to hepatitis C virus (HCV) is a well-recognized occupational risk for HCP, particularly following exposure to HCV-positive blood.[3] The following lesson outlines 2020 guidance from the Centers for Disease Control and Prevention (CDC) on the management of health care personnel potentially exposed to HCV.[3]

Definition of Health Care Personnel

The CDC defines HCP as all paid and unpaid persons providing health care or working or training in health care settings, who have reasonably anticipated risks for exposure to infectious materials, including blood or body fluids, contaminated medical supplies and equipment, or contaminated environmental surfaces.[4] Health care personnel may include, but are not limited to the following (in alphabetical order):

- Autopsy personnel
- Contractual staff not employed by the health care facility
- Dental personnel
- Emergency medical service personnel
- Laboratory personnel
- Nurses
- Nursing assistants
- Persons not directly involved in patient care but potentially exposed to blood and body fluids.(e.g., housekeeping, laundry, security, maintenance, and volunteers)
- Pharmacists
- Physicians
- Students and trainees
- Technicians
- Therapists

Sharps-Related Injuries

There are an estimated 385,000 sharps-related injuries each year among HCP working in hospitals in the United States.[5,6,7] Although this equates to more than 1,000 injuries per day, it is likely an underestimate, as it does not include sharps-related injuries sustained in other health care settings, such as nursing home facilities, clinics, and at an individual's home. Although data suggest the rate of hospital-based percutaneous

exposures declined markedly following the 2001 Needlestick Safety and Prevention Act (and following changes in safety standards implemented by the Occupational Safety and Health Administration [OSHA]), 2022 data from 40 U.S. hospitals reported to the Exposure Prevention Information Network (EPINet) reveal that occupational needlestick and sharp object injuries exposures remain common, with 29.2 injuries per 100 average daily census days among reporting hospitals (Figure 1).[3,4,8] Percutaneous exposure is particularly common among trainees, with an estimated 18% of trainees sustaining a percutaneous exposure annually, most often from needles intended for intramuscular or subcutaneous injections or from suture needles.[4,9,10,11,12,13] Mucosal exposures are also common and occur in approximately 22% of trainees per year, but only 17% of those with a mucosal exposure reported the exposure to occupational health.[4]

Risk of HCV Following Occupational Exposure

Occupational transmission of HCV has been well described, with risk estimates ranging from 0 to 10% following percutaneous exposure.[3,14] Prior CDC estimates suggested that anti-HCV seroconversion occurred at an average rate of 1.8% following percutaneous exposure to blood from an HCV-positive source.[2] A more recent, longitudinal study of 885 HCP exposed to anti-HCV-positive blood found the estimated risk of HCV transmission to be 0.2%.[6] In this same study, the risk of HCV infection was 0% among 458 HCP with mucocutaneous exposure to anti-HCV-positive blood.[6] Although HCV RNA has been detected in different body fluids, including saliva, semen, and vaginal secretions, the titer of HCV is consistently higher in serum, and challenge studies in chimpanzees have shown that a sufficient infectious titer is needed to transmit HCV.[15,16,17,18,19] As such, exposure to serum from a source person with HCV is felt to confer the highest risk for transmission, with studies suggesting that transmission is highest following exposure to a contaminated hollow-bore needle or a deep penetrating injury from a scalpel.[3,14,19,20]

Approach to Managing Occupational Exposures to HCV

Determining the Type and Nature of the Exposure

As part of the initial evaluation for occupational exposure to HCV, it is important to understand the details of the type of exposure (e.g., percutaneous, mucous membrane, contact with non-intact skin) and the body fluid(s) involved in the exposure. This information helps to stratify the risk of acquiring HCV from the exposure, as well as identify exposures that are unlikely to pose any real threat of HCV transmission.

Initial Wound Care

Immediate care to the exposure site should occur, including the following measures.[4]

- For any wound or areas of the skin that have come into contact with blood and/or body fluids, thoroughly wash with soap and water.
- If the exposure involves mucous membranes, thoroughly flush the mucous membranes with water.
- If the exposure involves one or more eyes, irrigate the eye(s) with clean water, saline, or sterile irrigation solution.
- For percutaneous injuries, do not squeeze the injury site.
- For percutaneous injuries, do not scrape or scrub the wound.
- Do not apply antiseptic solutions or caustic agents, such as bleach, to percutaneous or mucous membranes involved in the exposure.

Determining the HCV Status of the Source Patient

Following an occupational exposure in HCP, efforts should be made to test the source patient for HCV, ideally within 48 hours of the exposure.[2,3] The 2020 CDC guidance on the management of HCP potentially exposed to HCV outlines two options for HCV testing of source patients (Figure 2).[3]

- **Option A**: Option A uses a nucleic acid test (NAT) to detect HCV RNA in the source patient; this is the preferred method, and it is strongly preferred in situations where the source patient is known or suspected to have recent activities placing them at increased risk for HCV acquisition (i.e., injection drug use in the past 4 months), or in situations when the source patient's risk for HCV cannot be assessed. The HCV RNA levels are detectable by NAT as early as 1 to 2 weeks following exposure to HCV.
- **Option B**: Option B tests the source patient for antibodies to HCV (anti-HCV), followed by HCV RNA testing if they screen positive for anti-HCV.

This preference for up-front HCV RNA testing is based on the rising incidence of acute HCV in the United States and the associated risk of exposure to source patients who have early HCV infection or are in the window period of infection (defined as negative anti-HCV and positive HCV RNA)(Figure 3).[3,21,22] If option B is pursued, all source patients who test positive for anti-HCV should subsequently undergo a NAT for HCV RNA, ideally using a reflex test or the same laboratory sample.[3,23] Source patients who test positive for HCV RNA should be referred to care, with new cases reported to the local health jurisdiction, unless they have already been diagnosed with HCV and are engaged in care.[3] If a source patient's HCV RNA is positive but below the limit of quantitation (i.e., less than 15 IU/mL), they should be considered to have active HCV infection.[3,24] As discussed in more detail below, recommendations for follow-up HCV testing of exposed HCP depend on the source patient's HCV status. Follow-up testing is recommended for the HCP if the source patient is found to be HCV RNA positive, the source patient is anti-HCV positive with an unknown HCV RNA result, or the source patient's HCV status is unknown.[3]

Determining the HCV Status of the Health Care Personnel

Health care personnel potentially exposed to HCV should undergo baseline testing for anti-HCV, preferably within 48 hours of exposure. Baseline testing of the HCP serves to identify HCP with pre-existing HCV infection and should be done concurrently with baseline testing of the source patient.[3] Health care personnel who screen anti-HCV positive should undergo a NAT for HCV RNA, ideally via reflexive testing of the same plasma sample.[3,23] Health care personnel who test positive for HCV RNA should be referred to care for pre-existing HCV infection.[3]

Postexposure Prophylaxis

Postexposure prophylaxis (PEP) with direct-acting antivirals (DAAs) following occupational exposure to HCV is not recommended.[3] This guidance is based on several factors, including (1) the low risk of HCV infection following percutaneous or mucocutaneous exposure, (2) the efficacy of DAAs in curing acute and chronic HCV infection, (3) the high cost of DAA therapy, and (4) lack of data supporting the use and duration of DAAs for HCV PEP.[2,3,6,14]

Monitoring Health Care Personnel after Occupational Exposure

Indications for Follow-up Testing of HCV RNA-Negative Health Care Personnel

After experiencing an occupational exposure, HCP should have baseline testing for HCV, and if the HCV RNA is negative, the HCP should undergo follow-up HCV testing based on the results of the source patient's HCV testing (Figure 4).[3] Follow-up testing of the HCP is recommended if:

1. The source patient is HCV RNA positive, or
2. The source patient has an unknown HCV RNA status.

HCV Testing of HCV RNA-Negative Health Care Personnel

For HCP who have an indication for follow-up HCV testing, the following recommendations should be followed:

- **Follow-Up HCV Testing at 3 to 6 Weeks**: Initial follow-up testing is recommended using a NAT for HCV RNA at 3 to 6 weeks after exposure.[3] If the HCP is positive for HCV RNA during follow-up testing, they should be referred to care for treatment of acute HCV.[3]
- **Follow-Up HCV Testing at 4 to 6 Months**: If the HCP tests negative for HCV RNA at 3 to 6 weeks after the exposure, they should undergo a final test for anti-HCV at 4 to 6 months, with subsequent or reflexive HCV RNA testing if anti-HCV positive. In general, no additional follow-up is needed for HCP who remain anti-HCV negative at 4 to 6 months postexposure. The recommendation to test exposed HCP for anti-HCV at 4 to 6 months postexposure is new in the 2020 CDC guidelines for the management of HCP potentially exposed to HCV and based on the possibility of intermittent periods without viremia during acute infection, a phenomenon that has previously been described, including among patients who incur occupational exposures and those who progress to chronic HCV infection.[3,25,26,27,28,29]
- **HCV Testing in HCP with Baseline Positive Anti-HCV**: For HCP known to be anti-HCV positive but HCV RNA negative at baseline, the testing at 4 to 6 months after the exposure should use the NAT for HCV RNA, rather than testing for anti-HCV.[3]
- **HCV Testing in HCP with Suspected Acute HCV**: If an HCP develops a syndrome compatible with acute HCV, they should be tested for HCV RNA at any point following exposure, regardless of prior follow-up testing results.[3]
- **HCV Testing for HCP with an Immunocompromising Condition or Liver Disease**: If an HCP has an immunocompromising condition or underlying liver disease, there is a possibility of delayed seroconversion after HCV acquisition. For these individuals, at the follow-up testing at 4 to 6 months after the exposure, consideration should be given to testing for HCV RNA in addition to the standard anti-HCV testing.[3,24]

Management of Persons who Seroconvert to HCV

Health care personnel who test HCV RNA positive following an occupational exposure should be referred for treatment.[3,30] Given that DAAs are highly efficacious in curing both chronic and acute HCV, the AASLD-IDSA HCV Guidance recommends early identification and treatment of HCV, including treatment of acute infection, in a “test and treat” fashion.[30] Currently, there are no differences in treatment recommendations (e.g., DAAs used, duration of therapy) for acute and chronic HCV.[30] There are, however, emerging data that suggest shortened courses of DAAs may be effective in treating acute HCV.[30,31]

Summary Points

- Sharps-related injuries are common among United States health care personnel.
- Percutaneous exposure to blood from an HCV-positive source patient confers the highest risk for HCV infection in the occupational setting.
- Prior CDC estimates suggested that anti-HCV seroconversion occurred at an average rate of 1.8% following percutaneous exposure; however, newer longitudinal data indicate that HCV transmission occurs at an even lower rate (0.2%) following percutaneous exposure to a blood from a source patient who is anti-HCV positive.
- The source patient should be tested for either HCV RNA (preferred method) or anti-HCV followed by reflexive HCV RNA if positive (alternative method) within 48 hours of an occupational exposure.
- The HCP should undergo anti-HCV testing within 48 hours of an occupational exposure to assess for preexisting HCV infection.
- Follow-up testing of HCP is recommended if the source patient is HCV RNA positive or has an unknown HCV RNA status, including cases where the source patient cannot be tested.
- Initial follow-up testing for HCP should be performed using a NAT for HCV RNA at 3 to 6 weeks postexposure.
- If the HCV NAT is negative at 3 to 6 weeks, a final test for anti-HCV at 4 to 6 months postexposure is recommended for HCP.
- If the HCP tests positive for HCV RNA, they should be referred for treatment of acute HCV.

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Figures

Figure 1 Incidence of Needlestick and Sharp Object Injuries, International Safety Center, EPINet Report, 2010-2022

Source: International Safety Center. 2022 EPINet Report for Needlestick and Sharp Object Injuries.

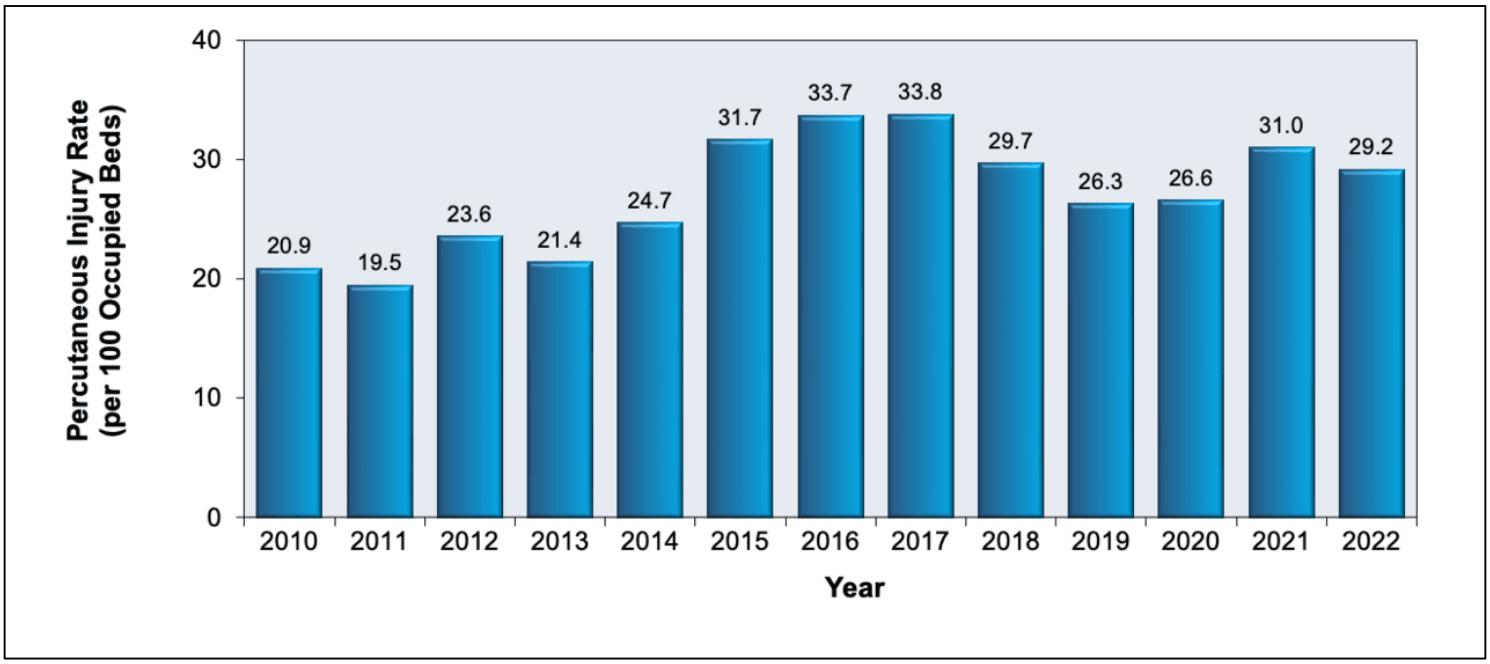

Figure 2 Testing of Source Patients Care after Potential Exposure of Health Care Personnel to Hepatitis C Virus — CDC Guidance, United States, 2020*

* Testing of the source patient should be performed as soon as possible (preferably within 48 hours) after exposure.
For source patients that test positive for HCV RNA by NAT, they should be referred for care. Exposed HCP of these patients should receive follow-up HCV testing.

Source: Moorman AC, de Perio MA, Goldschmidt R, et al. Testing and Clinical Management of Health Care Personnel Potentially Exposed to Hepatitis C Virus - CDC Guidance, United States, 2020. MMWR Recomm Rep. 2020;69:1-8.

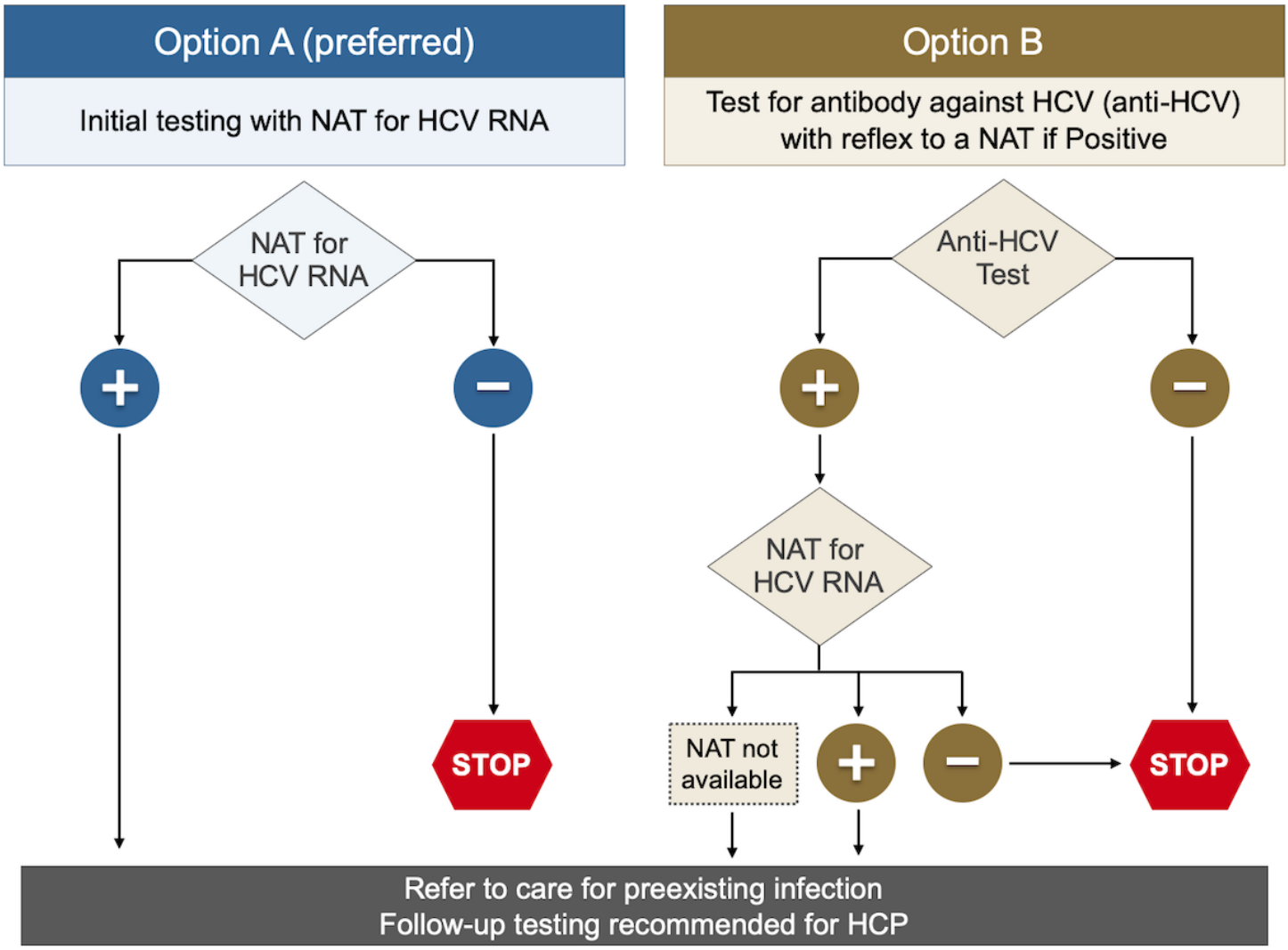

Figure 3 Estimated Number of Acute Hepatitis C Cases, United States, 2010–2021

Source: Centers for Disease Control and Prevention (CDC). Hepatitis C Surveillance 2021. Published August 2023.

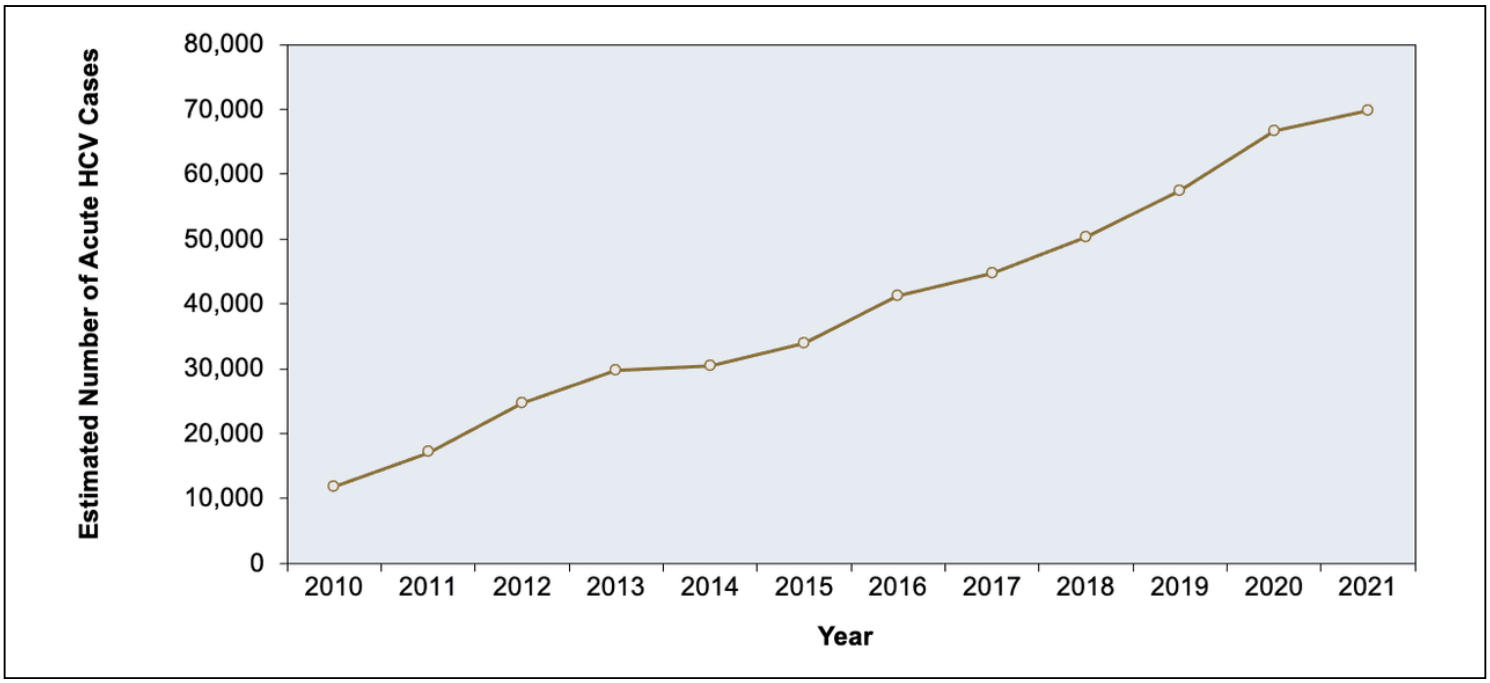

Figure 4 Testing of Health Care Personnel after Potential Exposure to Hepatitis C Virus, CDC Guidance, United States, 2020

*Baseline testing of HCP for anti-HCV with reflex to a NAT for HCV RNA if positive should be done as soon as possible (preferably within 48 hours) after the exposure and may be simultaneous with source-patient testing.

Source: Moorman AC, de Perio MA, Goldschmidt R, et al. Testing and Clinical Management of Health Care Personnel Potentially Exposed to Hepatitis C Virus - CDC Guidance, United States, 2020. MMWR Recomm Rep. 2020;69:1-8.