Notes about Viability and Risk *~ShelB Rindahl* *June 4, 2020*

Viability describes the ability of an organism to live and reproduce, or a plan or process to work successfully. In infection control, it usually describes how long microbes can remain infectious waiting for hosts , or whether they can still complete their life cycle after abuse or exposure to harmful agents or hostile environments. For example, the CDC stated that SARS-CoV2 might remain viable on a variety of surfaces for hours to days. This article is to explain where they got those numbers, why they aren't more specific, and what those numbers can be used for.

When the CDC and many news articles shared early coverage about Sars-CoV2, all of their statements referenced the same two major studies. The first appeared in the New England Journal of Medicine, and the second was in the Lancet. These are respected publications, but because information needed was urgent, both articles were still in preprint status. This means they weren't finished with the peer reviews that lend credibility to scientific articles. Both of these studies shared findings about the viability of SARS-CoV2 on various surface types over time. The first compared the virus to SARS of the past and recovered infectious virus for up to 3 days, establishing plausible transmission on fomites. The second study added handling and environmental variables and recovered infectious virus until the 7th day. In both studies, SARS-CoV2 didn't last as long on the porous surfaces, and lasted longest on steel and plastic. Two studies aren't enough to rely on to give super specific advice about surfaces and their times because variables about those were not covered in the focus of the study. To ensure their advice can be trusted, CDC must use words carefully. They know many people will use their published viability recommendation to set quarantine times, and so their statement says "hours to days." This doesn't mean that science finds no value in the patterns seen in less hospitable surface materials or textures. It means that those areas need more study, focused on their details and potential variables, before scientists of good character will trust them to give advice that might influence health decisions and outcomes.

Viability usually helps us choose what handling risk tier we'll engage (without making any promises). The risk level may be reduced first after drying completely, and again after a few hours, especially on porous surfaces. Grocers and essential suppliers were also advised to close overnight for cleaning too, even if they were usually 24-hour facilities. Health workers have also been advised to try to delay 24 hours after a known exposure before cleaning a patient's room. While we can't publish these presumptive risk tiers as safer times to reissue any instruments, they may help us choose our own quarantine times before we work. As with UV-C use on some surfaces, the actual load reduction cannot be graded or billed, but employee comfort level in handling parts is supported from the perspective that every bioburden reduction helps.

Even if CDC could be able to offer viabilities per material, instruments are marvels of mixed parts and alloys. There are also many germs that make people sick, and none die on timers. We don't always have to wait to handle work, if we can keep our contaminated hands and items out of the mouth and face, any more than we have to quarantine our dirty dishes at home. Informed respect of viability, sensible and defensible cleaning and disinfection, and diligent professional, personal, and instrumental hygiene habits all work together to reduce our infectious risks.