

Epidemiology and Disease Transmission

In Leviticus Chapter 13 GOD instructs Moses and Aaron on how to recognize leprosy and the need to isolate those with the infection to prevent further transmission of the disease throughout the community. The instructions are an expression of God's grace, and his concern for the physical health and wellbeing of his people. The protocol is a revelation from the omnipotent creator. God knew leprosy would be a public health problem. He knew the people under the right circumstances would be susceptible to infection with the bacterium, *Mycobacterium leprae*. He knew the organism could be transmitted from person-to-person, and how the infectious disease would manifest. GOD revealed the infectious and non-infectious stages of the disease and appointed the priests, divinely appointed mediators between God and men, to monitor and manage surveillance and isolation. God was involved in the healing process through men that applied knowledge, wisdom and skill given by God.

Two other biblical accounts of leprosy include Naaman in 2 Kings 5, and the 10 lepers in Luke 17. Naaman was instructed by Elisha the prophet to dip in the Jordan River 7 times for his healing. In Luke 17, Jesus immediately healed 10 lepers that shouted their request for Jesus to heal them as they stood afar off.

Throughout his Word, the sovereign GOD has shown that he can heal miraculously, or through the application of what he reveals to and through His creation (Isaiah 38:1-5; 2, Proverbs 6:6).

During this current Covid-19 pandemic, Christ's church above all should be a conduit for God's love and divine protection. Seeking spiritual guidance and comfort through prayer is paramount (James 1:5; Philippians 4:6-7). However, we must embrace that this will involve watching and seeking scientific and medical understanding given to us by GOD as we employ our GOD given gifts for research and experimentation (Proverbs 6:6, Ephesians 2:10, Isaiah 38:21). We must also abide by the public health guidelines put in place to protect the health and wellbeing of our love ones, surrounding communities, and the world for the glory of GOD.

EPIDEMIOLOGY

Epidemiology is the study of the occurrence and distribution of health-related diseases or events in specified populations, including the study of determinates influencing such states, and the application of this knowledge to control the health problems (1). For infectious diseases, the purpose of these studies is the implementation of a strategy that will control the spread

and possibly eliminate the occurrence of the disease. For Covid-19 success of the current plan is heavily reliant on compliance to the current protective measures put into place.

COVID-19

Covid-19 is short for Coronavirus Disease of 2019. It was named by the World Health Organization (WHO) in February of 2020, and it is caused by the respiratory pathogen Coronavirus SARS-CoV-2 (**S**evere **A**cute **R**espiratory **S**yndrome **C**oronavirus **S**erotype **2**). The spread of SARS-CoV-2 started in Wuhan, China in late 2019. Covid-19 is a pandemic, because since 2019 it has spread across the world.

Within our population we are the reservoir for SARS-CoV-2 and like other respiratory viruses it is primarily spread person-to-person by respiratory droplets. These droplets can be released when a person talks, sings, coughs, or sneezes and can travel up to 2 meters, so a distance greater than 2 meters should be maintained between individuals to reduce the risk of transmission.

As a disease, Covid-19 can manifest as a mild respiratory infection (like the common cold) and is marked by cough, fever, muscle aches, tiredness, diarrhea, nausea, and a loss of taste. However, infection can also lead to a severe pneumonia, respiratory failure and even death (3). Persons with mild disease can recover at home while those with more moderate or severe symptoms require hospitalization for observation and supportive care.

Those at risk for a more complicated course, are the elderly, the overweight, and those that have chronic lung disease, cardiovascular disease, high blood pressure, or diabetes (4-8). Therefore, attempts to limit the exposure of these individuals to the virus should be the most intentional and stringent.

DISEASE TRANSMISSION

Disease transmission has to do with the mode or vehicle by which an infectious agent is spread to a susceptible host. Modes of transmission can be direct (e.g. person-to-person, respiratory secretions, sexual contact) or indirect (occurs through contact with an insect, inanimate object, or contaminated water). Understanding where a pathogen grows and conditions that optimize its transmission informs what public health measures will be employed to prevent spread within a population.

As mentioned previously, direct person to person spread through respiratory droplets appears to be the most efficient mode of transmission for SARS-CoV-2. However, it is important to

mention that the virus can remain viable on cardboard, stainless steel, and plastic for days, and contact with these surfaces could play a role in transmission and warrants the practice of good respiratory hand-respiratory hygiene (9,10).

Controlling transmission of respiratory viruses can be difficult because people are the reservoir for the pathogen and the vector by which it spreads. For example, as a contrast, spread of a food-borne pathogen can be mitigated through measures that don't modify daily routines (e.g. improved water sanitation measures, removal of a contaminated food lot from supermarket shelves). But, breaking the cycle of transmission of a respiratory virus interferes with daily activities like how we interact with one another, at home and at work, and involves taking on precautionary measures that are at best a bit inconvenient and at worst can lead to equally detrimental consequences like barriers to receiving care for other health conditions and creating phenomenon of economic hardship (2).

Like, SARS-CoV-2, influenza virus and other coronaviruses are spread person-to-person, but people become infectious, and a vector for transmitting disease when they have symptoms. This makes it easy to identify those that need to be isolated to keep other from getting sick. Control of SARS-CoV-2 is challenging because people can be infectious one to three days before symptoms present (pre-symptomatic), and those that carry the virus but may never have symptoms can transmit the virus as well. In fact, recent epidemiological studies suggest that up to 40-50% of cases may have been contracted from people that were pre-symptomatic or who never presented as being ill [9-12].

CALL TO ACTION

As we endeavor to develop an effective drug and vaccine to treat and possibly eliminate Covid-19, we must use the protective tools and measures we have to control the spread of SARS-CoV-2. Being compliant with government issued control measures will facilitate a decrease in incidence of mild disease, lessen the possibility of over-whelming our health care services, and protect the more vulnerable of our population from the risk of a severe Covid-19 course of infection that could lead to death.

Protection measures we currently have at our disposal include, wearing a face mask, washing our hands regularly, practicing physical distancing, and if the weather permits holding social gatherings outside and in less confined spaces. In other words, the church's response to the Covid-19 pandemic (as with everything) needs to be Biblical, and this includes being informed on what God has revealed through his Word and through careful scientific investigations and studies conducted by men. Furthermore, as we see in different parts of the Bible, these investigations and the implementation of what is discovered should involve the Children of

GOD. God is sovereign and can work in mysterious and various ways. He can heal people miraculously, protect through the implementation of public health measures, or heal through medical intervention (medicine).

The first step in enduring any trial is to have consistent communication with God and to continue to rejoice knowing HE is always in control (James 1:5). If we ask in faith God will guide us with HIS wisdom, and we need not fear because we know that HE is always in control. For each of us, GOD has determined our days (Psalms 138) so although we will be careful and adopt behaviors that will protect ourselves and others (Leviticus 13), we are confident that the work HE has begun in us he will complete. Also, it bears mentioning that no matter what Christ has secured for us an inheritance that is unfading, unfailing and undefiled (I Peter 1:4). Believers have a blessed hope that should shine as a bright light in the darkness of COVID-19 in all we do and say (Matthew 5:16).

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