Detection and Prediction Analysis of Featured Dataset of Infectious Diseases in Context of IoT: A Review

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Abstract: *Infection occurs due to pathogenic microorganisms such as bacteria, viruses, parasites and fungi. The disease spreads directly or indirectly from one person to another. The key part of this work resides in the weight and significance review for evaluating the infectious disease of each clinical parameter. There is, however, no parameter or parameters with limited effect in classification that is too distinct from the remainder. However, this research also noticed that the heartbeat may have a strong influence as part of a potential infectious mechanism for classification of an input sample. In addition, this paper also tested that in the majority of instances the acute respiratory infection is well established than the other two. In order to ensure optimal efficiency of the machine learning models, the next study recommendation is to expand the sample data base scale. Minor injuries can affect rest and home care, but some life-threatening injuries may require hospitalization. This vaccine can prevent many infections such as measles and water. Washing your hands well will help prevent most infections. The Internet of Things is perhaps today's most exciting technology problems. Several industry analysts say there have been estimates of more than 20 billion wired apps. Smartphones, handheld devices and other devices are around us and all use sensors. Today's devices play a huge part in our daily lives and the Internet of Things. This paper explores the detection and prediction Analysis of Featured Dataset of Infectious Diseases. Also, investigation initiated for the scope of the research for the IoT platform usability.*

Key Word: Infectious Diseases, Featured Dataset, Prevention Mechanisms

I. Introduction

The climate warming trend has been stepping up in recent decades. Over the last 12 years, the warmest 9 years in the world have occurred from 1850 to 2017, and the average annual temperature from 1880 to 201 has increased by about 0.97 ° C. Through growing duration, severity, surface temperatures (and related wear) and minor decreases, substantial shifts in global climate trends and related social effects are responsible for overall global weather. Except of the freezing rain cases. Global change becomes more extreme in high latitudes especially in winter, of prime significance for Canada. The average annual temperature in Canada has risen by 1.8 ° C during the last seventy years, and the average winter temperature has decreased by 3.4 ° C. The growth is bigger in the northwest. Since climate change not only influences temperatures but also weather levels, Canada typically struggles from droughts in the west and above-average east precipitation. Climate change due to known temperatures and precipitation affects the risk of transmission of infectious diseases. Climate change is a vector that mediates climate change suitability for diseases and reservoirs, such as ticks and mosquitoes, as well as reservoir groups (birds and birds), since mites and mosquitoes affect humans. Compensates for Teeth and Deer spreading).

Additionally, climate change impacts human and products transport trends. "Weather Refugees" are projected to raise the number of displaced people as adverse weather conditions endanger their livelihoods and livelihoods. Refugees usually have infections more common and come from different geographical areas where the schedule is different from the vaccination delivery, and can introduce these illnesses to Canada without realizing it. Environmental change often impacts tourism, as shifts in both homes and locations impact influences that inspire citizens to move and the risk of transmitting disease. The media and the contaminants that be transmitted accidentally by air, ground or sea. Consequently, the increased risk of climate change-related infectious diseases poses significant risks to public health, and the impact of these risks is being monitored, evaluated and forecast. Historically, the Department of Public Health has relied on mandatory notification systems to detect disease outbreaks, monitor the progression of disease, and report measures for prevention and mitigation. Current control schemes, however, are usually distinguished by recording and review of results, and the associated contact delays. Two approaches for risk management have been established and are being implemented to resolve the need for more effective real-time tracking of current problems and an urgent awareness of future safety impacts. Modelling the dangers. The aim of this review is to clarify these two risk management approaches and how to warn, monitor and reduce climate change and communicable disease prevention efforts in the public health sector.

1.1 Event-Driven Monitoring systems

Event-based surveillance system and technologies have proven more important than hospital test outcomes and conventional data sources for monitoring, which may be paired with existing surveillance networks to improve early detection of risks to public safety. Further public safety programs should be prepared and placed into action.

1.2 Artificial intelligence applications

Artificial data-processing intelligence technologies have revolutionized the capacity of EBS programs to rapidly and reliably identify risks (such as outbreaks). Free access Internet data is "disorganized" and implies news reports, forums, messages, etc. Provides a story which describes the incident. Text, amounts, and dates are not arranged into database templates such as. Used for automated analysis and simulation of danger incidents.

But to collect and create knowledge on what occurred, when it occurred, when it happened, and what the entity is, you need to use open-source data. EBS utilizes NLP approaches for managing and interpreting tales from cases. The development of natural language is a science area devoted to studying the human discourse. The first technique uses a sublingual approach, utilizing syntax and trends to view and identify terminology, syntax, and disorganized narrative connotations. EBS includes predefined words and synonyms, and a list of words matching them in the source of the results. Similar to standard literature reviews, the taxonomic grouping involves a quest for associated words Articles related to wellbeing may be found. The sublingual approach to recognition through the EBS framework of health-related data is successful, but has its disadvantages. The distinction cannot be readily generalized, so with a disease that needs to be studied, so revised as vocabulary progresses and new findings regarding the disease can be made. NLP has built a strong framework for the usage of Machine Learning (ML) approaches in this regard.

Machine learning is a branch of artificial intelligence that utilizes algorithms and mathematical equations without clear guidance to execute complex tasks. Actually, it focuses on habits and thought. EBS gathers internet data from open access (feeds and online queries) and processes this data across a collection of sub-methods and ML methods. ML methods are used to perform more complex tasks, analysis of syntaxes, semance, formalism and practicality. And speech. For example, you can use ML methods to determine the differences between items that are not related to health (for example, “Beaver Fever” refers to Justin Bieber’s passionate supporters) and discuss the project in which the infection occurred. You can also use machine learning methods to distinguish date and location ambiguity. For use in essays addressing social history, past and present affairs. We are now designing modern LD software. For example, build disease details for use in epidemic studies and risk models on a publicly accessible set of epidemiological lines (set of infected individuals and relevant information: health status, ethnicity, location, initiation, hospitalization); the data form’s managed events may be checked and recorded if required. Additionally, additional data analysis to inform the current and projected impact of health threats can be performed.

1.3 Use of IoT Sensor

Typically, a sensor is a device capable of detecting changes in an environment. Sensors are useless, but will play an important role when used in electronic systems. Sensors measure physical phenomena (temperature, pressure, etc.) and convert them into electrical signals. There are three characteristics should be the basis for a good sensor.

- This would be wise to the calculation of the phenomena.
- Don't be prone to any bodily situations.
- The measured phenomenon is not adjusted during the measurement process.

A number of sensors can be used to calculate almost all nearby physical properties. Popular sensors which are commonly used in daily life include thermometers, pressure sensors, light sensors, accelerometers, gyroscopes, acceleration sensors, gas sensors and more. There are other attributes you can use to identify the sensor, but the most important are:

Range: The sensor will calculate the maximum and the minimal phenomenon.

Sensitivity: the smallest change in a measurement parameter which indicates a difference in the output signal.

Accuracy: The least difference the sensor can identify in the phenomena.

1.4 Risk Modelling

The expanded types of data used in computational approaches are a significant development in risk management. Infectious disease risk modeling is the process of identifying and characterizing individual or population factors that increase disease prevalence (age, incidence, etc.). Statistical logic is a solid and useful method of modeling the risk, including the analysis of regression. The first example is predicting the number of medical visits reported for influenza-like illnesses, including spine Flu which Trends search engine data. Use the resulting model to predict the number of seasonal flu cases for the next week or next.

The accuracy of the prediction has improved for Explanatory variables. In addition to open-source Internet data, it contains other explanatory variables describing the presence, movement, and distribution of pathogens (such as climate and meteorological data from satellite imagery) that can improve regression models for the risk of infection.

II. Research Background

Mayfield et al. (2018), Leptospirosis is a zoonotic disease that causes more than 60,000 deaths each year and is spread by interaction with contaminated urine from mammal hosts to humans. Targeted approaches are problematic because of the number of potential hosts and diverse environmental influences linked to transmission. In a Fijian case study, they employed spatial Bayesian networks to demonstrate that proximity to livestock and insecurity in rural contrast with urban areas influence the risk of infection differently. This paper highlights the importance of the generators of leptospirosis in Fiji and the relationship between animal toxicity and other environmental and socio-demographic influences. They also affirm earlier findings that relate the risk of poverty to leptospirosis.

Wong et al. (2019), Data from public health monitoring has significantly improved since the beginning of the 21st century, owing to the development of IT and communications technologies and data collection mechanisms that now exist. The purpose of this paper is to illustrate the possibilities gained by the use of Artificial Intelligence (AI) methods for reliable disease-oriented monition. In combination with credible AI data management systems, it is anticipated that massive study of infectious diseases and surveillance data can efficiently help government officials, healthcare professionals and medical practitioners in their potential response to disease.

Gómez-Pulido et al. (2020), Changing and developing such factors in health may be proof promoting the detection in infectious diseases. Some of the patient factors can be tracked for a time of this form of disease. A prediction model can be built from the previously saved registers. This model will provide the possibility that the disease will grow from the results. This prediction models can be created by machine learning algorithms, which can identify samples of clinical parameters to predict whether an infectious disease is formed. The forecast models are historically compiled and processed from the patient's registers. This thesis illustrates the usage of computer training methods for the classification of samples of multiple infectious diseases. They also discussed how various clinical criteria might be categorized, and might allow the medical personnel to track those criteria carefully. This research demonstrates some ML-based expertise in classifying samples for three kinds of infectious diseases. Due to the number of patients, measurement instruments, medical training staff, and the nature of infection among other considerations, the actual setting in which the samples were gathered conditions the classification outcomes. However, the review is useful and provides an interesting point of departure for more analysis.

Yadav et al. (2020), They work on the latest coronavirus pandemic (COVID-19) in this article. COVID-19 is a disorder that is viral that causes significant lung injury. COVID-19 induces infectious disease of numerous humans around the globe and has destroyed them. However, this virus is reported as a pandemic by the WHO and all countries are attempting to monitor and block the dissemination of coronavirus across territories. The key objective of this work is to solve 5 various tasks such as I) II) Evaluating nation by nation the development trends and mitigation forms. III) How the outbreak stops, predicting. IV) Study of the virus transfer rate. V) Correlating the atmospheric patterns and the coronavirus. How good the mitigation performs, how many incidents have been stopped by this mitigation, an idea of how many people can heal from the outbreak from old drugs, and how long it will take for this pandemic to end, to realize and determine how easily or how fast it is to mitigate the spread of this epidemic. In this work, the assisted vectors often use improved classification precision instead of a basic regression thread. They are tested and correlated on standard accessible data sets with other well-known regression models. The encouraging findings show both quality and precision in their supremacy. Keywords: Basic linear regression, Vector help regression models, Pearson, successful events, retries, novel coronavirus, COVID-19, simple linear regression.

García-Díaz et al. (2020), Entomology is an unstructured and textual mining process to offer useful public health knowledge to health authorities and decision makers. The introduction of this previously unimaginable digital data base has opened up a new means of enhancing public health services, contributing to improved communications and better systems for diagnosis. However, it is not easy to grasp the unstructured Internet and the difficulty of the area of infectious diseases. In comparison, it is much more challenging to accurately utilize this knowledge while working with languages other than English, which have not had any of the more popular tools for natural language analysis. They seek to address these holes by introducing an ontology-based, nostalgic review to assess views of the general population on infectious diseases articulated in Spanish by a case study of tweets related to the Zika, Dengue and Chikungunya viruses. First, they use ontologies to model the world of infectious diseases with terms such as threats, effects, methods of dissemination and medicines. The interaction between these concepts is then evaluated to decide to what extent one definition affects other concepts. This new knowledge is added later on in order to construct on statistic and linguistic characteristics a sentiment analysis model focused on aspect. This is achieved by the usage of profound curriculum codes. Their idea is accessible on a web-based website, with the consumer being able to look at the feeling about each concept and examine how each concept has an effect on the feelings of the others.

Eckhardt et al. (2020), in the 21st century, ongoing socioeconomic, political and environmental transition places more people at risk of life-threatening chronic and acute infections than ever. In order to overcome this burden new diagnostic, prophylactic, therapeutic and curative techniques have been established, but the very complicated connexon between pathogens and its hosts remains a fundamental aspect. Standard, reductive approaches to the analysis of this dynamic frequently neglect the scope to truly model this relationship's dual and co-dependent existence, thus minimizing translation success. Latest developments in broad scale computational omit techniques and integrative analytical frameworks contribute to a modern framework on how they recognize and model the pathogenic interactions of host on translational applications. Systemic biology approaches in the study of infectious diseases. The foundation for a system biology approach to infectious disease was illustrated here in three sections: finding, gathering and evaluating the omics data; representing iterative simulation, combining and viewing of complex datasets; and implementing understanding, and hypothesizing translation outcomes.

Tadesse et al. (2020), Rapid detection of infectious diseases is important during a pandemic phase. Unique responsive and precise diagnostic guarantees like quick point-of - care and susceptibility tests are promised Ramans (SERS). Surface-enhanced Spectroscopy SERS employs inelastic light scattering, which is improved by orders of magnitude, leading to the association of incident photons with molecular nanostructures. Although SERS offers a spectral fingerprint for the study, clinical translation has fallen short due to difficulties in terms of spectral accuracy, spectral comprehension difficulty and insufficiency, sensitivity and inefficient workflow from the selection of patients to the acquisition of spectral study. They highlight recent, complementary developments that resolve certain limitations, including

(1) label-free SERS substrates architecture and spectral signal and interpretability data processing algorithms that are important for broad-based pathological screening research,

(2) the creation of new aptors and affinity agents, such as aptamers and polymers, which are important for determination of presence or absences. The creation of low-cost, point-of - care optical SERS hardware is also addressed. In order to accelerate the diagnoses of infectious diseases and vaccine production, they concentrate on SERS for viral and bacterial identification. The SERS accuracy, sensitivity and speeds can be converted effortlessly from the laboratory bench to patient bed, accelerate diagnosis in the treatment stage, customized drugs, and precision health with developments in SERS substrates, computer learning and microfluidics and bioprinting.

Sun et al (2020), In an outbreak such as Coronavirus disease 2019 (COVID-19) with concern about how machine learning should be used in clinical practice. A worldwide public health epidemic arose from the COVID-19 pandemic. In several international airports border protection initiatives have been introduced, such as symptom monitoring and wellbeing questionnaires. Recent investigations and experience have shown, however, that many infected travelers can slip through thermographic fever-based screening due to false negatives. The most common symptoms of infectious diseases are vital signs, particularly body temperature. A new, non-contact, vital sign measurement method has been developed to diagnose infection, focused on contactless multiple critical sign monitoring and thus superior to fever screening [4]. Multiple systems link to the IoT infectious disease surveillance network is the most successful method for optimizing efficiency. This could enable operators to anticipate infectious disease outbreaks until they can.

Shearer et al. (2020), Through formally combining the performance from the scenario and action research with the pandemic response strategy, the pandemic response capability would be enhanced. They suggested a model for decision-making that is incorporated into a larger framework of decision support which recognizes the social and political climate in which decisions are taken. In this method, they build on well-established theoretical methods utilized in decision-making (i.e., decision models) and suggest that a wider framework of support for decision-making can be built utilizing the concepts of decision science.

Sugawara et al. (2018), In Japan, the total number of influenzas and varicella patients and people who have been prescribing those medicines have been recorded since 2009 based on prescriptions from outside medicines. The number of prescription-filled patients on neuraminidase inhibitors, herpes virus products, antibiotic remedies, anti-pyretic analgesics and multi-ingredient cold prescriptions is estimated every morning by this method. In addition, it can detect "unexplained" inflammatory diseases which are not described by other surveillance systems as infectious diseases. Infectious diseases such as "unexplained" could arise, and re-emerging, from infection, including attacks on bioterrorism which, at least in early outbreaks, are currently difficult to diagnose. This research analyzed programmed for the identification of "unexplained" infectious diseases through PS knowledge to determine the possible advantages of the method. For the first time in a day of week, holidays and days after holidays the number of patients prescribed the associated medications has been limited to established respiratory illnesses, time patterns and dummies.

III. Use of IoT to Detect and Control Infectious Disease

Infection identification is by nature a follow-up operation that involves knowledge that interpretation in real time to deter its dissemination. Quickly responding on reliable knowledge will have a significant social and economic effect on people's lives around the globe. Often it includes monitoring in distant parts of the world other individuals, health services and ecosystems.

3.1 System to trace of infectious Disease

With the advent of big data analytics in the Internet of Things and healthcare, it is now possible to collect data from locations that were previously or manually not performed. For example, smart thermometers provide real-time data to global medical systems. Table Analyzer instantly analyzes patient samples, and uses remote disease monitoring tools to share data in real time. Tools for the monitoring of diseases such as Health Map and Epic aster integrate data on the Internet of Things with demographic data, GIS data, information on land use and social media transfer. Resources for identifying new threats to public health, such as Zika and H1N1.

Since the Internet of Things is a network of integrated networks, computers, or objects with sensors that can be directly linked to gather data without having a larger Web. Ultimately, these details may be connected to larger networks for real-time disease monitoring, as well as convergence with regional scientific data structures for predictive modeling and non-proliferation implementation.

3.2 The role of IoT in monitoring and responding to public health events

An interesting example of how the Internet of Things can change life is the Clinical Education Center at the Johns Hopkins Global Health Center. Here, connect devices are used to increase patient engagement, allowing doctors and nurses to share information about the study and allow real-time clinicians. Johns Hopkins invited researchers from across the globe to submit a protocol to research the tuberculosis impacts on pregnant mothers. The tablet interface allowed by the app enables researchers to incorporate visual illustrations and provide a detailed image of patients for every touch, including medical reports and treatments. Medicines and other clinical details, and the social determinants and graphics statistics. It also enhances the engagement and involvement of the participants by presenting health details so patients can view and monitor success towards health objectives.

Public health organizations can leverage the experience of organizations like Johns Hopkins to take advantage of devices that support the Internet of Things and enable Connected Health to manage crises in public health. Health care systems can use IoT device networks with growing doubts to get more centralized data and determine the source of epidemics. If an outbreak is identified, the same network can be used or improved to provide the drugs, medical devices, and other diagnostic tools that are necessary.

3.3 Implementing effective infection prevention mechanisms

There is no evidence-based approach to monitor infection owing to the absence of easily accessible data on research theories. Medical systems can easily overcome that challenge with the advent of the Internet of Things technology. Medical experts may interpret information dependent on the illness that arose by collecting data from distant locations and presenting it, combined with data from other outlets, to the global health network. Based on this analysis, you can use your IoT data to suggest and define the safeguards as to whether the control measures proposed are in place. With new and relevant technologies, the role of the Internet of Things in connected health and preventing the spread of infectious diseases continues to grow. But to be successful, they need proper preparation and execution utilizing appropriate platforms and resources of technology. Identifying and preventing the spread of infectious diseases is now more important than ever thanks to technologies which help the Internet of Things.

3.4 Fascinating IoT developments in infectious disease management

3.4.1 Making predictions about flu season

Medical practitioners nationwide brace for the flu season each autumn. Many times, hard to schedule, some new IoT devices can provide information about flu that is otherwise difficult to access. For example, a smart thermometer paired with a symptom monitoring device can be used to transmit specific data to the user's doctor, such as average body temperature of a patient or flu symptoms. Physicians may use this data to assess the danger of influenza in a hospital and whether the drug is effective. Additionally, because this sort of data was gathered secretly, in certain areas of the world, public health practitioners may be able to better forecast the flu. Such form of data will provide more detailed warnings for the outbreak than conventional approaches. In one study, three weeks before the preceding method, smart thermometers were expected.

3.4.2 Reducing the time to diagnoses

Sometimes not be aware that you are infected because there are no symptoms or you may not be aware that the symptoms indicate an infection. This allows them to spread their illness to the community simply by living a daily life. One direction that the Internet of Things will contribute to reduce this unintentional distribution is to make it possible to detect cases early.

In Uganda, providers using wireless systems running on IoT SIM cards and the global IoT communication platform diagnose tuberculosis cases in just three days. Using the previous method, patients had to wait for the results to show up for about two months. Such development does not avoid the detection of sickness in the person; however, it can deter the individual from spreading disease to anyone without recognizing the infection.

3.4.3 Enhancing care for people with Ebola

Even people familiar with the disease often hear about Ebola. This is a disease that is transmitted when humans come into direct contact with infected animals, and Ebola hemorrhagic fever quickly spreads throughout people. In the Guinea Outbreak, the death rate was 68.5%. Caregivers are trained before contacting an Ebola patient, but they still make mistakes. For example, the first American condition was a nurse treating an Ebola patient in hospital. Wearable smart devices can also improve the quality of care while maintaining this protection. For example, Ebola is a difficult disease for a variety of reasons. One of the reasons is that doctors cannot use traditional diagnostic tools such as thermometers and stethoscopes to treat patients with this condition. Currently, there are IoT devices that work like Smart Band Aid. It is related to the patient's shear of basic measurements of heart rate, body temperature and oxygen saturation. Then the device measures the deviation from these preliminary statistics. The data transmission capabilities of the system allow physicians to track patients remotely, such as the control center near the outbreak-related "hot zone" This system helps careers to recognize the disease within a particular region with all patients wearing the mask. There is no one solution to protect careers from contracting Ebola. However, rigorous measurement of vital signs can be a step in the right direction to maintain safety measures without sacrificing the quality of care the patient receives. The Internet of Things encourages health treatment by improved control of patients. This is extremely relevant in handling people that are strongly infectious.

3.4.4 Ending the spread of water contamination

Legionella is the Legionella bacteria associated with pneumonia. It affects up to 5 per cent of bacteria-exposed people. It seldom spreads outside of the respiratory system, affecting the heart, kidneys, and other important body parts. Legionella bacteria enjoy warmth and flourish in conditions like hot tubs and refrigeration towers. The latter received less coverage as it often dominates the environment and the social landscape. Yet this do not find it is harmful to bear the bacteria. Testing legionella bacteria in the refrigeration tower isn't easy. A cocktail of harmful chemicals is widely used for treatment to destroy any Legionella bacteria that might be present. These chemicals, however, can contaminate soil and groundwater, and put human health at risk. The application of electric current to destroy bacteria requires modern techniques. Entities use this method usually connect technologies with IoT measurement devices. This can track your cooling tower 's overall efficiency and ensure your sterilization technology is working as expected. In irregular situations it may even warn the tower operators. The data gathered from IoT systems offers constant knowledge, which allows us more able to easily find issues. It may be anxious to see the first indication that this alleviates the Legionella epidemic.

3.4.5 Helping disease experts weigh in remotely

After the infection occurs, the situation becomes a battle to control time. However, to understand the extent of the disease, it is often necessary to send a sample for testing. When outbreaks occur in remote locations, the time taken to analyze these samples and to receive expert information can be catastrophic. However, by using a digital pathology microscope that supports the Internet of Things, the process is much faster without technology, by sending data to a pathologist who can reach 100 miles or even thousands of miles, researchers can prototype and bridge the gap between pathologists and doctors on site away from collecting samples. His research team decided to redesign a commercial microscope to provide Internet of Things functionality, rather than building one from scratch. In the end, they made three relatively simple changes. The learning curve of pathology was short because the microscope resembled the familiar range. As always, you can check the slides and move the sample section to learn more about the area of interest.

IV. Research Methodology

The IoT device, as mentioned above, contains sensors that capture disease data and can be divided into 70-30 ratios to train and check the data collection. Various features, such as age, ethnicity and other medical criteria, come from studies used for diagnosis.

a. Modeling of data

This stage reflects the inputs in the logical approach. Data is gathered using the repository UCI machine learning.

b. Treatment of Missing Values

At this level, noise cancelation and data normalization are used as a priori model where all features from the vector to the field of the device are normalized.

c. Data Analysis

To change the data collection, a limited number of machine learning methods are employed.

d. Construct the model for IoT

Finally, the modeling need for constructing the modules run over the IoT. The custom framework should perform the task of detecting and forecasting infectious diseases through Internet of Things sensors.

V. Conclusion

Conclusive remark for this paper illustrated that some species can trigger disease under certain conditions. Any diseases may spread across individuals. Insects and other species some of them and may invade other species by consuming contaminated food and water or exposure to live creatures. Infection-dependent signs and symptoms typically include fever and weariness. Minor injury could impact rest and home treatment but could involve hospitalization for any life-threats injuries. This vaccination will eliminate diseases including measles and water in several respects. Well washing your hands tends to avoid certain diseases. Maybe today's Internet of Things is the most fascinating technical challenge. More than 20 billion wired applications are calculated by numerous market researchers. We're all surrounded by smartphones, mobile computers and other devices. In our everyday lives and the Internet of Things electronics today play an important role. This article discusses the study of the characteristic dataset of infectious diseases and their analysis. The project also began for the IoT platform usability scope of research.

References

Eckhardt, M., Hultquist, J. F., Kaake, R. M., Hüttenhain, R., & Krogan, N. J. (2020). A systems approach to infectious disease. *Nature Reviews Genetics*, 1-16.

García-Díaz, J. A., Cánovas-García, M., & Valencia-García, R. (2020). Ontology-driven aspect-based sentiment analysis classification: An infodemiological case study regarding infectious diseases in Latin America. *Future Generation Computer Systems*, *112*, 641-657.

Gómez-Pulido, J. A., Romero-Muelas, J. M., Gómez-Pulido, J. M., Sequera, J. L. C., Moreno, J. S., Polo-Luque, M. L., & Garcés-Jiménez, A. (2020, May). Predicting Infectious Diseases by Using Machine Learning Classifiers. In *International Work-Conference on Bioinformatics and Biomedical Engineering* (pp. 590-599). Springer, Cham.

Mayfield, H. J., Smith, C. S., Lowry, J. H., Watson, C. H., Baker, M. G., Kama, M., ... & Lau, C. L. (2018). Predictive risk mapping of an environmentally-driven infectious disease using spatial Bayesian networks: A case study of leptospirosis in Fiji. *PLoS neglected tropical diseases*, *12*(10), e0006857.

Shearer, F. M., Moss, R., McVernon, J., Ross, J. V., & McCaw, J. M. (2020). Infectious disease pandemic planning and response: Incorporating decision analysis. *PLoS medicine*, *17*(1), e1003018.

Sugawara, T., Ohkusa, Y., Kawanohara, H., & Kamei, M. (2018). Prescription surveillance for early detection system of emerging and reemerging infectious disease outbreaks. *Bioscience trends*, *12*(5), 523-525.

Sun, G., Trung, N. V., Hiep, P. T., Ishibashi, K., & Matsui, T. (2020). Visualisation of epidemiological map using an Internet of Things infectious disease surveillance platform. *Critical Care*, *24*(1), 1-2.

Tadesse, L. F., Safir, F., Ho, C. S., Hasbach, X., Khuri-Yakub, B., Jeffrey, S. S., & Dionne, J. (2020). Toward rapid infectious disease diagnosis with advances in surface-enhanced Raman spectroscopy. *The Journal of Chemical Physics*, *152*(24), 240902.

Wong, Z. S., Zhou, J., & Zhang, Q. (2019). Artificial intelligence for infectious disease big data analytics. *Infection, disease & health*, *24*(1), 44-48.

Yadav, M., Perumal, M., & Srinivas, M. (2020). Analysis on novel coronavirus (COVID-19) using machine learning methods. *Chaos, Solitons & Fractals*, *139*, 110050.