COVID-19 using Cognos

The COVID-19 pandemic, also known as the coronavirus pandemic, is an ongoing global pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It was first identified in December 2019 in Wuhan, China. The World Health Organization declared the outbreak a Public Health Emergency of International Concern on 30 January 2020, and later a pandemic on 11 March 2020. As of 8 April 2021, more than 133 million cases have been confirmed, with more than 2.89 million deaths attributed to COVID-19, making it one of the deadliest pandemics in history. Symptoms of COVID-19 are highly variable, ranging from none to life-threatening illness. The virus appears to spread quickly among people, and more continue to be discovered over time about how it applies. The virus can cause a range of symptoms, ranging from mild illness to pneumonia. Signs of the disease are fever, cough, sore throat, and headaches. In severe cases, difficulty in breathing and deaths can occur. The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes, so it is essential that you also practice respiratory etiquette. The virus spreads mainly through the air when people are near each other. It leaves an infected person as they breathe, cough, sneeze, or speak and enters another person via their mouth, nose, or eyes. It may also spread via contaminated surfaces. People remain contagious for up to two weeks and can spread the virus even if they are asymptomatic. Recommended preventive measures include social distancing, wearing face masks in public, ventilation and air-filtering, hand washing, covering one's mouth when sneezing or coughing, disinfecting surfaces, and monitoring and selfisolation for people exposed or symptomatic. Several vaccines have been developed and widely distributed since December 2020. Current treatments focus on addressing symptoms, but work is underway to develop therapeutic drugs that FINAL PROJECT REPORT: SPATIAL ANALYSIS OF COVID-19 3 inhibit the virus. The pandemic has resulted in significant global social and economic disruption, including the largest global recession since the Great Depression. It has led to widespread supply shortages exacerbated by panic buying, agricultural disruption and food shortages, and decreased emissions of pollutants and greenhouse gases. Numerous educational institutions and public areas have been partially or fully closed, and many events have been cancelled or postponed. Misinformation has circulated through social media and mass media. The pandemic has raised issues of racial and geographic discrimination, health equity, and the balance between public health imperatives and individual rights. This pandemic is the defining global health crisis of our time and the most significant challenge we have faced since World War Two. Source of the Data. An electronic health record (EHR) is the systematized collection of patient and population electronically stored health information in a digital format. These records can be shared across different health care settings. Records are shared through network-connected, enterprise-wide information systems or other information networks and exchanges. EHRs may include a range of data, including demographics, medical history, medication and allergies, immunization status, laboratory test results, radiology images, vital signs, personal statistics like age and weight, and billing information. The Electronic Health Record (EMR) software was specifically created to fully accommodate all aspects of clinical workflow, including storage, retrieval, and modification of digital patient records plus prescription writing, clinical annotation, ordering laboratory and imaging tests and viewing test results. The

Electronic-health-record software aids in interoperability for patient record sharing between physicians, hospitals and pharmacies and offers a very mature EMR solution. EMR helps with continuity of care by connecting all members of the care team throughout the healthcare cycle FINAL PROJECT REPORT: SPATIAL ANALYSIS OF COVID-19 4 which improves care quality. If all members of a patient's care team can connect about a patient's health (from primary care doctor, to specialist, and beyond); consequently, hospital readmissions are reduced leading to better value. Utilizing a certified, interoperable electronic medical record system enables continuity of care, which provides practices with a means to thrive within a valuebased care model and enables practices to receive reimbursement. Data Cleaning and Methodology: Data cleaning is a critical step before loading data into any decision support system or GIS for spatial analysis. In this project, we received the data from 3 different Electronic-Medical-Record systems. We standardized the master data in our data file before loading the file into Microsoft Power BI software for analysis. For example, one system identifies the data as Medi-Cal while in another system, it is defined as Medicaid. Similarly, discharge disposition, patient type, patient financial class, point of origin and all other data set attributes are made consistent and streamlined across all the systems for spatial analysis. Data: The data were collected for the Spatial Analysis of COVID-19 from a hospital group located across 3 counties, Orange, Riverside and San Bernardino in Southern California over the period from March 2020 to March 2021. Data are extracted from 3 different Electronic Health Records (EHRs) and each EHR is the standard in a couple of hospitals. The organization maintains the master data for record purposes. The data comprise around 42,000 records of patient data. Patient details are masked as per HIPPA rules. Spatial analysis is based on Zip code of the patient location. The patients are from different demographics racially, financially, and ethnically. The data comprise patients from different cities FINAL PROJECT REPORT: SPATIAL ANALYSIS OF COVID-19 5 in these counties with multiple ailments who came to hospital for treatment referred by doctors and service providers from different origins. The data collected are categorized based on the following: In-patients (IP) or Outpatients (OP), Patient's age, and Patient's gender. The point of origin of patients may be from another hospital, service provider, hospice, clinical referral, court/ law enforcement agency, transfer from Skilled Nursing Facility (SNF), or transfer from a surgical center. Based on a patient's payment method and health insurance policy, financial payments are categorized as: Medicaid, Medicare, Medical, M Self-pay, Commercial health insurances, Capitation Senior-HMO, Charity Care, Workman's Compensation, Hard-ship Program, Government/County, Medicare-Senior, or Tricare. Based on how, where and when the patients are discharged, patient data are categorized as follow: Home/Self, IP to other acute hospital, Skilled nursing facility, Children's hospital, Cancer hospital, Assisted Living/ Intermediate Care Facility, or Left against medical advice. Covid testing data are collected as total tests performed, and covid-testing. results categorized as as Positive, Recovered, or Death. For Data Analysis, the software packages of Microsoft Power BI, ArcGIS Pro, ArcGIS Insights and Tableau are used. Dashboards are created in Power BI using the data. Maps are created using ArcGIS Pro for visual analysis and presentation of the data.