Week 3 Discussion 1: Discrete Random Variables and Continuous Random Variables. In discussing variables in health-related research it is important to understand the differences between discrete random variables and continuous random variables. According to information from Centers for Disease Control and Prevention. (2012, May 18), discrete random variables are values that are integers while continuous random variables can hold any value within a certain range. In terms of using these variables in health-related data discrete random variables may be used by epidemiologists in calculating the number of people who were exposed to a specific risk factor such as smoking or drinking alcohol. Continuous random variables will be used to calculate conditions or fatalities that happen within a specific period of time, this may include infant mortality rates (Centers for Disease Control and Prevention., 2012, May 18). Continuous variables may be used in order to describe certain health conditions and discrete variables can be used in quantifying data on health measures. Probability is also an important factor when discussing health-related statistics, however, it is important to understand the differences between binomial and normal probability distributions. Based on information from Sullivan, L. (2018), binomial probability can be used when an experiment has two different outcomes while normal probability is used in order to calculate the likelihood that a specific event may occur, this may include the event that an individuals will screen positive for a disease during the study or experiment (p. 70-75). Binomial probability can be used when using discrete variables as they may include multiple categories within each variable, while it is best to use normal probability distribution when using continuous random variables for which there may only be one important distribution in the data set (Viti, A., Terzi, A., and Bertolaccini, L., 2015). The 68-95-99.7 rule or empirical rule is used in normal distribution to describe the range in which a value falls in relation to the mean. It dictates that 68% of all values will fall within one standard deviation from the mean, 95% of values will fall within 2 standard deviations of the mean, and 99.7% of values will fall within 3 standard deviations of the mean (Sullivan, L., 2018, p.79). You can anticipate that a continuous variable with a normal distribution will always fall between the mean – 3 standard deviations or the mean + 3 standard deviations with the total area of a curve in a probability distribution being 1 when can then find out where a variable lies within a normal distribution (Sullivan, L., 2018, p.79-80). References Centers for Disease Control and Prevention. (2012, May 18). Principles of Epidemiology: Lesson 4, Section 1|Self-Study course SS1978|CDC. Centers for Disease Control and Prevention. Retrieved January 16, 2023, from https://www.cdc.gov/csels/dsepd/ss1978/lesson4/section1.html Sullivan, L. (2018). Essentials of Biostatistics in Public Health (3rd ed.). Jones & Bartlett Learning. Viti, A., Terzi, A., & Bertolaccini, L. (2015). A practical overview on probability distributions. Journal of thoracic disease, 7(3), E7–E10. https://doi.org/10.3978/j.issn.2072-1439.2015.01.37