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Statistics Teaching Resources Related to the Coronavirus

The following materials include content that is related to the COVID-19 pandemic and was curated in January 2021. They are suitable for use in an on-level Statistics or AP® Statistics course, and in some cases, in a mathematics course that includes probability and statistics content.

This collection includes resources developed by BFW statistics authors Daren Starnes and Josh Tabor, as well as resources developed by other statistics educators that have been vetted by our author team. Each resource includes a description of the intended student learning outcomes. Teachers are encouraged to preview individual resources to ensure appropriateness of the subject matter and difficulty level before using them with their students.

Textbook alignments to *The Practice of Statistics* (TPS) 4th, 5th, 6th, and Updated 6th editions and *Statistics and Probability with Applications* (SPA) 3rd and 4th editions are provided.

Restaurant Spending and COVID-19   (PDF for students)   (PDF for teachers)
By Daren Starnes and Martin Sternstein
Description: In this handout, students will investigate the relationship between the change in restaurant spending in a given state and the increase in new COVID-19 cases in that state over the next three weeks using a scatterplot, correlation, and linear regression.
Textbook alignment: TPS Chapter 3 (all editions); SPA 3e Chapter 2; SPA 4e Chapter 3

COVID-19 Testing   (PDF for students)   (PDF for teachers)
By Daren Starnes
Description: In this handout, students will analyze the implications of false positive and false negative results in antibody testing for COVID-19 using tree diagrams or two-way tables, the general multiplication rule, and conditional probability.
Textbook alignment: TPS Chapter 5 (all editions); SPA 3e Chapter 4; SPA 4e Chapter 5

Batch Testing   (PDF for students)   (PDF for teachers)
By Josh Tabor and Allan Rossman
Description: In this handout, students will investigate the potential benefits of batch testing for diseases like COVID-19 by using probability rules (addition, multiplication, complement) to help create the probability distribution of a discrete random variable, and expected values to determine when batch testing is advantageous.
Textbook alignment: TPS Chapters 5,6 (all editions); SPA 3e Chapters 4,5; SPA 4e Chapters 5,6

Vaccines, Confidence Intervals, and Relative Risk   ([PDF for students](#))   ([PDF for teachers](#))
By Josh Tabor
Description: In this handout, students will use data from the Moderna vaccine trial to create a confidence interval for a difference in proportions and make a conclusion based on the interval. Students will then be introduced to the concept of relative risk and guided to create a confidence interval for relative risk. *Note*: This handout is based on the 2009 International AP® Statistics Exam Investigative Task.
Textbook alignment: TPS 4e/5e/6e Chapter 10; Updated TPS 6e Chapter 8;
SPA 3e Chapter 9; SPA 4e Chapter 10

Treating Serious Cases of COVID-19   ([PDF for students](#))   ([PDF for teachers](#))
By Daren Starnes
Description: In this handout, students will use a test for a difference in proportions to analyze results from a clinical trial in the United Kingdom that tested the effectiveness of dexamethasone in reducing deaths for hospitalized COVID-19 patients.
Textbook alignment: TPS 4e/5e/6e Chapter 10; Updated TPS 6e Chapter 9;
SPA 3e Chapter 9; SPA 4e Chapter 10

Covid-19 and Blood Type   ([PDF for students](#))   ([PDF for teachers](#))
By Josh Tabor
Description: In this handout, students translate percentages from a news article into the observed and expected number of people of each blood type who tested positive for Covid-19 in Denmark. Then students perform a chi-square test for goodness of fit to determine if the distribution of blood type for those who test positive is different from the distribution of blood type in the population.
Textbook alignment: TPS 4e/5e/6e Chapter 11; Updated TPS 6e Chapter 12;
SPA 3e Chapters 10; SPA 4e Chapters 11

[What Does 95% Effective Mean? Teaching the Math of Vaccine Efficacy](#)
By Dashiell Young-Saver
The New York Times
Dec. 13, 2020
Description: In this lesson, students use statistics, probability and math to understand how big a breakthrough the new coronavirus vaccine is and what it might mean for the pandemic.
([PDF for students](#))

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For more information on using *The Practice of Statistics* and/or the S*tatistics and Probability with Applications* programs please contact your [BFW Representative](#) or visit the [BFW catalog](#).