

Bi-State Math Colloquium

Who: Michael Black

When: Thursday, October 10, 4:00 pm

Where: Ottensman 122, UW-Platteville

An introduction to the history and development of
group or pooled testing

In the 4 years after the bombing of Pearl Harbor, the US military put almost 12 million men in uniform. As part of the build-up process, all new men needed to be screened to determine their fitness for service. Part of this screening involved testing for various diseases, including syphilis. During World War II, the US military not only organized fighting men, but also organized teams of scientists, economists and mathematicians. One group of economists noticed that screening each individual for syphilis was inefficient. In 1943, Robert Dorfman published a paper suggesting that instead of screening individually, samples from several men could be “pooled” and the pooled sample could be tested for syphilis. If the pooled sample was negative, testing was done, if the test was positive each individual sample would be tested to see which individual caused the pooled sample’s positive test.

After this paper, the idea of group testing disappeared from the public eye for over 10 years, until Sterrett (1957) proposed that the number of retests needed to identify positive individuals could be reduced. After his proposal, others suggested additional retesting strategies and the discipline of “pooled” or “group” testing was developed.

In this talk, we will look at the development of pooled testing to identify positive individuals, a math “riddle” also developed during WWII that uses pooled testing techniques for its solution, and show how the results of pooled testing can be used in estimating the percent of trait positive individuals in a population.

Michael Black recently graduated from the University of Nebraska Lincoln with a Ph.D. in Statistics. Before going back to school, he worked almost 7 years as an actuary. He is interested in probability, especially low probability high cost events and what we consider coincidences. He is married with four children. Currently he reads travel and survival books, but he is also well versed in classic science fiction. If asked, he will deny ever having worked for secret government agencies.