

# *Using Statistics to Solve the National Opioid Crisis*

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We participated in the 2019 Mathematical Contest in Modeling with Junyan Duan '19. The three of us analyzed a problem about the illegal use of opioids, which is currently a national crisis in America. Thus, it is essential to create a statistical model that considers not only the spread of opioid abuse but also possible and feasible origins of the system. The model should also take the socio-economic conditions that might affect drug use into consideration. We use existing data from Pennsylvania, Ohio, Kentucky, Virginia, and West Virginia from 2010 to 2017 to parameterize a mathematical model of illegal drug use report. Moreover, we model the cause of the spread of the opioids. We use a statistical regression model to predict the future scenario without any intervention. Using this method, we find out that without any interference the start place of the possible illegal opioids use will continuously affect the nearby counties. Then we propose three approaches to optimize the eradication of illicit drug use considering educational factor, family factor, and marital status factor.

**Date: Wednesday October 9, 2019**

**Time: 7:00 pm**

**Place: Park 328**