Memo：

1. 给出现在的分析报告；
2. 给出未来的预测；
3. 给出关于起源的建议。

敬爱的DEA/NFLIS Database：

非常感谢您和您的同事们所做出的工作。你们的数据为毒品问题的预防和管理提供了相当宝贵的资料。如今，毒品问题正变得越来越严重。从源头来看，毒品的供应不再仅限于传统的海洛因、吗啡等，氧可酮、氢可酮等镇定类药物的滥用正在逐渐成为毒品市场的主力军。这些药物由于医疗上的需要，在暂时没有更好替代品的情况下，很难被取代或者禁止使用。而没有被合理使用的药物大多流向了毒品市场，助长了吸毒行为在美国的蔓延。从需求端来看，吸毒行为本身就有很强的依赖性，一旦接触毒品，将会很难戒掉，并且极易复吸。同时，吸毒行为有极强的传播性，在家庭成员、公共娱乐场所之间传播迅速，给毒品的管理又增加了难度。

为此，我们建立了一个模型来模拟毒品的传播过程，基于您提供的毒品报告和大量社会经济数据，试图找到存在较大的毒品风险的地区和毒品供给的源头，为美国的毒品管理贡献自己的力量。，经过大量数据的模拟和分析，我们认为我们的模型已经能够较为精确地模拟现实中毒品传播。

Thank you and your colleagues very much for your work. Your data provide quite valuable information for the prevention and management of the drug problem. Nowadays, the drug problem is becoming more and more serious. From the perspective of source, the supply of drugs is no longer limited to traditional heroin, morphine, etc., and the abuse of sedatives such as oxycodone and hydrocodone is gradually becoming the main force in the drug market. Because of medical needs, these drugs are difficult to replace or ban in the absence of a better substitute. And most of the drugs that are not properly used go to the drug market, fueling the spread of drug use in the United States. From the demand side, drug taking behavior itself has a strong dependence, once exposed to drugs, it will be difficult to quit, and easy to relapse. At the same time, drug abuse is highly contagious, spreading rapidly among family members and public entertainment places, which increases the difficulty of drug control.

To this end, we established a model to simulate the spread of drugs. Based on the drug report and a large amount of socio-economic data you provided, we tried to find out the regions where there is a greater risk of drugs and the source of drug supply, so as to make our own contribution to drug management in the United States. After a large number of data simulation and analysis, we believe that our model has been able to more accurately simulate the actual drug transmission.

当下，在肯塔基，弗吉尼亚，西弗吉尼亚，俄亥俄和宾夕法尼亚州中，吸毒人数每年都在增长。毒品的种类也非常丰富。根据报告中的显示，共有70中不同种类的毒品，其中Heroin，Oxycodone和Hydrocodone是最为常见的三种。从2010年开始一直到2016年，毒品在五个州传播的速度正在加快。在吸毒人数较多的地区，吸毒行为一直在增长。而之前吸毒人数较少的县，也出现吸毒人数上升的势头。

基于我们的模型，我们预测在2020年，宾夕法尼亚州西部的Philadelphia及其周围的县和俄亥俄州东部的Hamilton及其周围县将会是毒品泛滥较为严重的地区。我们建议加强对于这两个地区的毒品管制，因为这将会得到更好的效果。对于这两个州而言，家庭环境都是影响毒品传播最主要的因素。例如单身男性人数越多，毒品的传播和扩散也越容易。我们建议当地政府做出相关努力，帮助单身男性建立自己的家庭，这会一定程度上有助于毒品的控制。文化背景也是一个和毒品传播息息相关的因素。我们发现，外来人口的增加会促进毒品的传播。我们建议在毒品的管理和检查中，适当把工作重心放在对于外来人口的检查上，可以明显提高管理工作的效率。

Currently, drug use is increasing every year in Kentucky, Virginia, West Virginia, Ohio and Pennsylvania. The variety of drugs is also very rich. According to the report, Heroin, Oxycodone and Hydrocodone were the most common of 70 different kinds of Heroin. From 2010 through 2016, the spread of drugs in five states is accelerating. In areas where drug use is high, drug use has been on the rise. Counties with previously low drug use also saw a rise.

Based on our model, we predict that in 2020, western Pennsylvania's Philadelphia and surrounding counties and eastern Ohio's Hamilton and surrounding counties will be the most heavily drug-ridden areas. We propose to strengthen drug control in these two regions, because it will achieve better results. For both states, the family environment is the most important factor affecting the spread of drugs. For example, the more single men there are, the easier it is for drugs to spread and spread. We suggest the local government make relevant efforts to help single men to set up their own families, which will contribute to drug control to some extent. Cultural background is also a factor closely related to the spread of drugs. We found that the increase of the alien population will promote the spread of drugs. We suggest that in the management and inspection of drugs, an appropriate focus on the inspection of the migrant population can significantly improve the efficiency of management.

我们还对于所有可能的毒品来源点进行遍历，发现宾夕法尼亚州的Philadelphia和俄亥俄州的Hamilton是最有可能的两个毒品来源地。我们有理由认为这两个县有很大的可能性存在毒贩的巢穴或者某个管控及其不严格的处方药供应点。在这两个县进行较为细致的排查和监督可以更加有效的减少毒品的供给。

但是，从曼昆在经济学原理中提出的毒品市场的例子中我们知道，降低毒品的供给虽然会减少毒品的成交量，但是会提高毒品价格，对于毒品市场规模的打击效果并不明显。而降低毒品的需求才能同时降低毒品的价格和成交量。所以我们认为反毒品机构工作的中心是和相关的社会福利机构合作，加强预防毒品的宣传工作。从家庭环境、文化背景和教育水平三个方面进行评估，找到最有可能产生毒品风波的地区，提前进行反毒宣传工作，以防毒品危机的爆发对社会稳定造成的威胁。

毒品的防控工作任重而道远，每个人都是反毒事业中的一员。用科学的方法参与反毒工作能够有效提高反毒工作的效率。如果我们的模型能为反毒机构的工作提供正面帮助的话，我们将会非常高兴。

Philadelphia, Pennsylvania, and Hamilton, Ohio, are the two most likely drug sources. There is reason to think that there is a strong possibility in both counties that there are drug dens or that there is a very lightly regulated supply of prescription drugs. Careful screening and monitoring in these two counties can more effectively reduce the supply of drugs.

However, from the example of drug market proposed by Mankiw in the ***Principle of Economics***,we know that although reducing the supply of drugs will reduce the transaction volume of drugs, it will increase the price of drugs, which has no obvious impact on the size of drug market. Reducing the demand for drugs would reduce both the price and the volume of drugs sold. Therefore, we believe that the work of the anti-drug agency is centered on the cooperation with relevant social welfare institutions to strengthen the publicity work on drug prevention. The assessment is made from the three aspects of family environment, cultural background and education level to find the areas most likely to produce drug disturbance and carry out anti-drug publicity work in advance to prevent the outbreak of drug crisis from threatening social stability.

There is still a long way to go in the prevention and control of drugs. Everyone is a member of the anti-drug cause. Participation in anti-drug work with scientific methods can effectively improve the efficiency of anti-drug work. We would be very pleased if our model could provide a positive contribution to the work of anti-drug agencies.