



Uncovering the Hidden Costs of the Opioid Crisis

Financial Modeling & Planning for Resource Allocation

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Project FORESIGHT

- Forensic Science Initiative at West Virginia University
- Link objectives to activity
- Maximize correctly processed cases for a given budget
- Consider forensic laboratories from an “industry” perspective



RTI International and WVU

- Request from RTI International to investigate the effect of opioids and synthetic drugs on:
- Forensic laboratories expenses and turnaround times
- Expense (dollars and time) to first responders (e.g., K-9 units prepared with naloxone for drug sniffing dogs)
- Public health training to first responders
- Drain on laboratory resources with funds diverted to drug chemistry, toxicology ante mortem, toxicology post mortem
- Drug case backlog and effect on court system
- Cost to jails and prisons



Justice Delayed is Justice Denied
William E. Gladstone, 1842

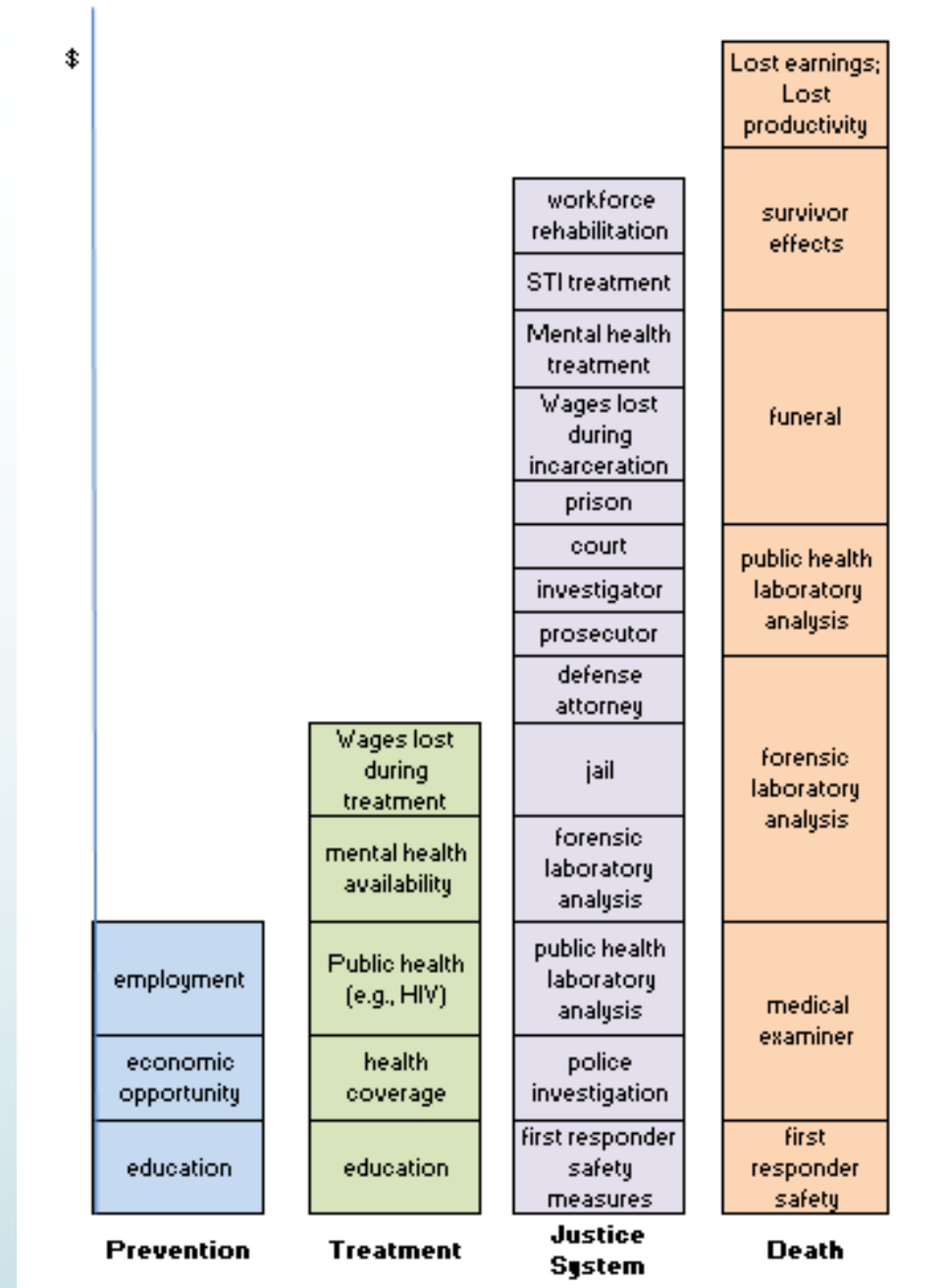
West Virginia attorney general donates funding to ease crime lab backlog



- “West Virginia Attorney General Patrick Morrisey has given \$1 million from monies taken in from health-care-related court settlements to the West Virginia State Police to help attack a backlog of cases in the State Police crime lab.”

► (Rusty Marks, *The Exponent Telegram*, 10/3/2017)

Measuring Opportunity Costs





Project FORESIGHT

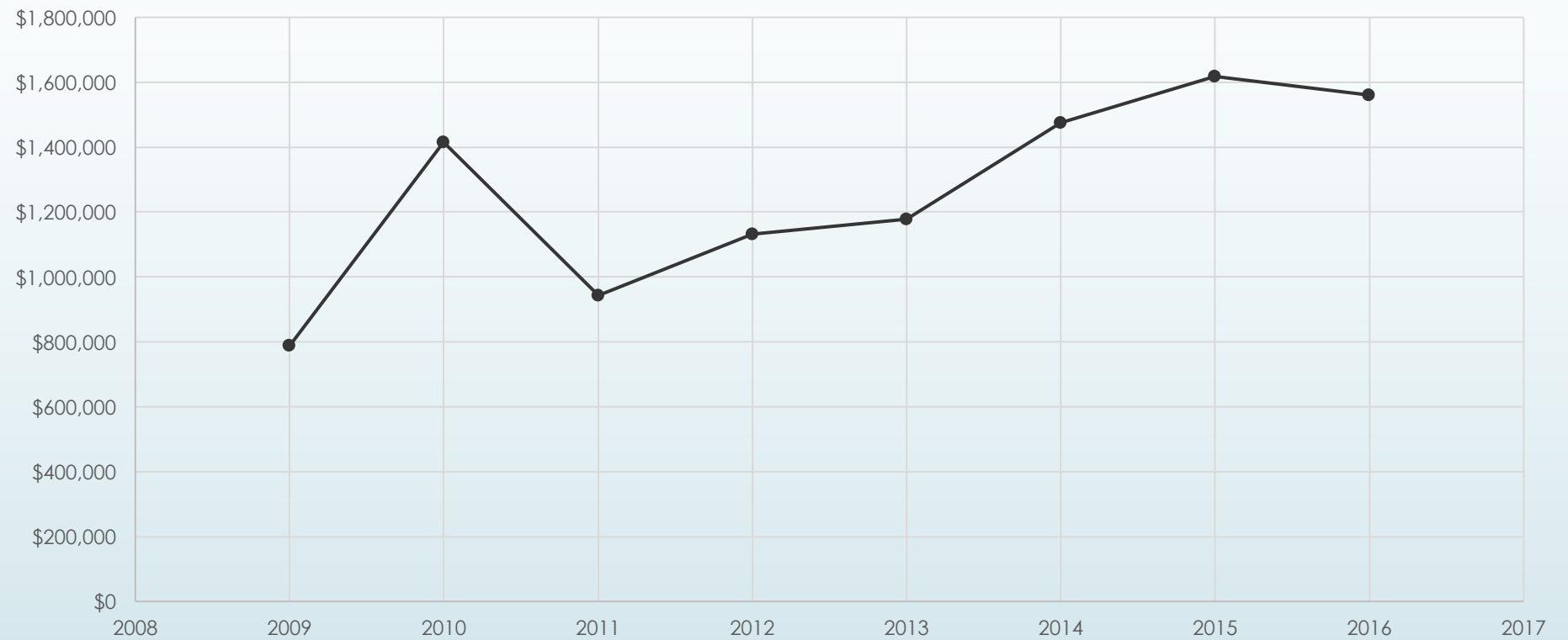
- Laboratory Data connecting
 - Casework by area of investigation (cases, items, samples, tests, reports)
 - Expenditures (personnel, capital, consumables, overhead, etc.)
 - Human resource deployment by area of investigation
- Voluntary participation
- Consistent definitions as defined by original laboratory participants
- Counting examples



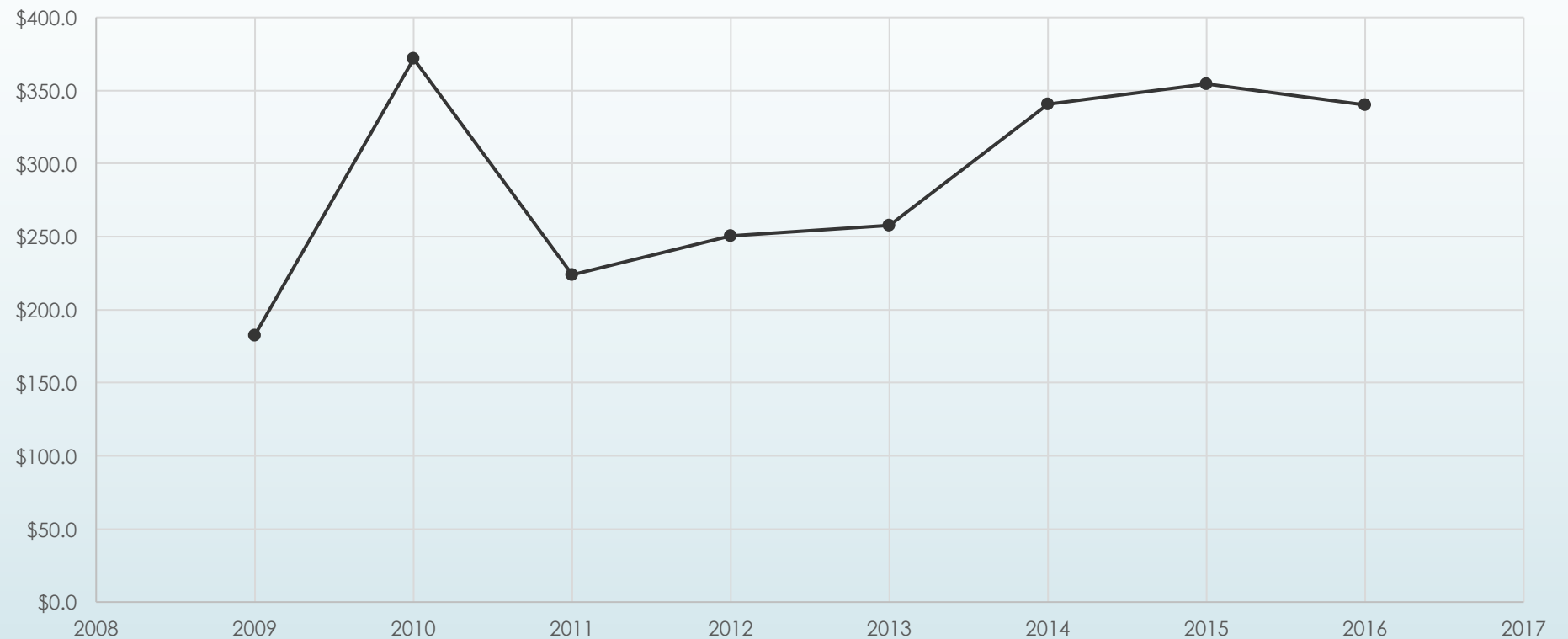
FORESIGHT Participation

- Annual submissions from FY2005 - FY2016
- 139 laboratories in FY2016; 116 U.S.
- Over 700 submissions over the life of the project
- Dramatic increase expected with FORESIGHT 2020
- <http://business.wvu.edu/centers/forensic-business-studies/foresight>

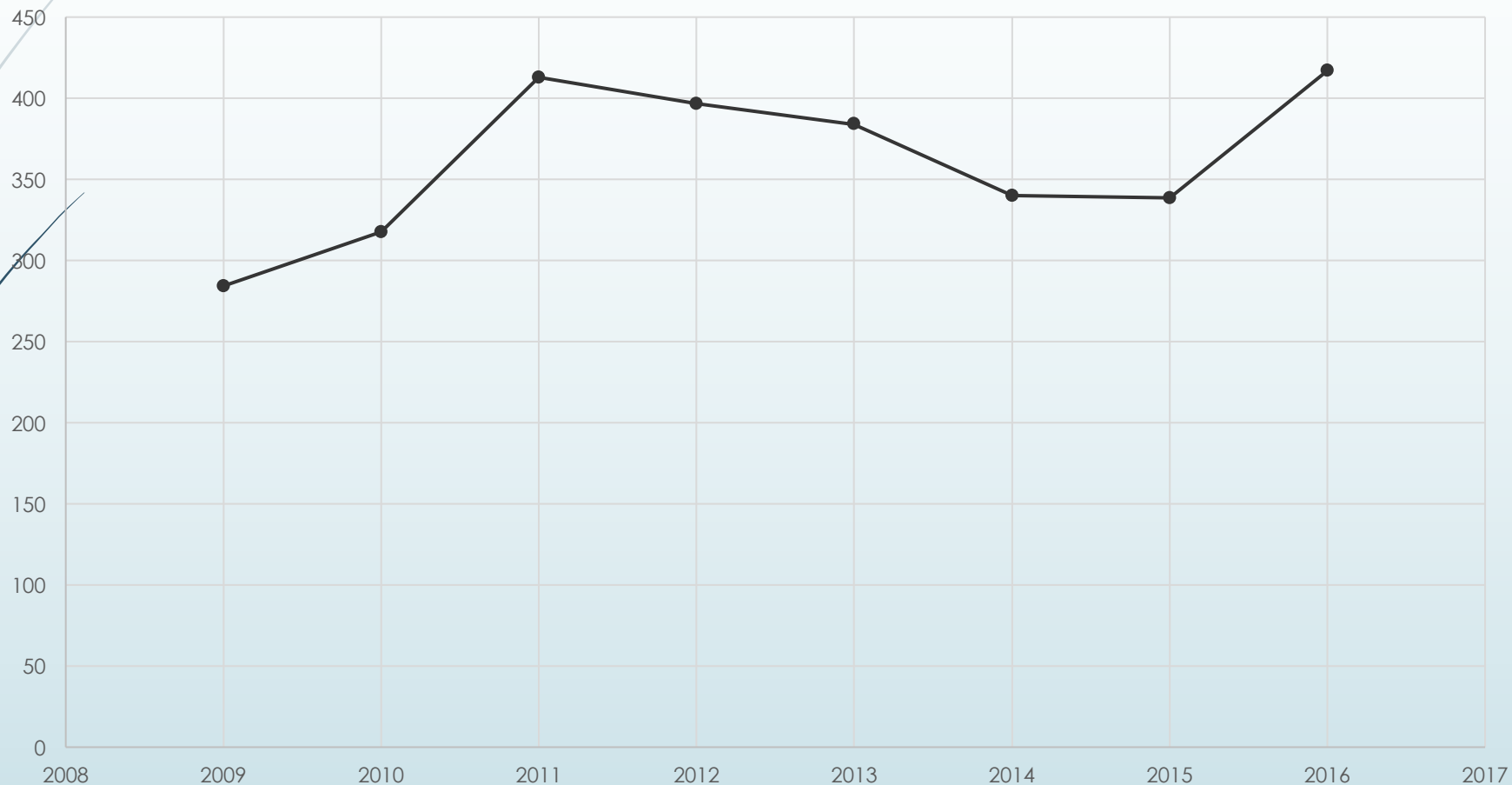
Drugs—Controlled Substances Median Laboratory has 98% growth in total expenses from FY 2009 to 2016



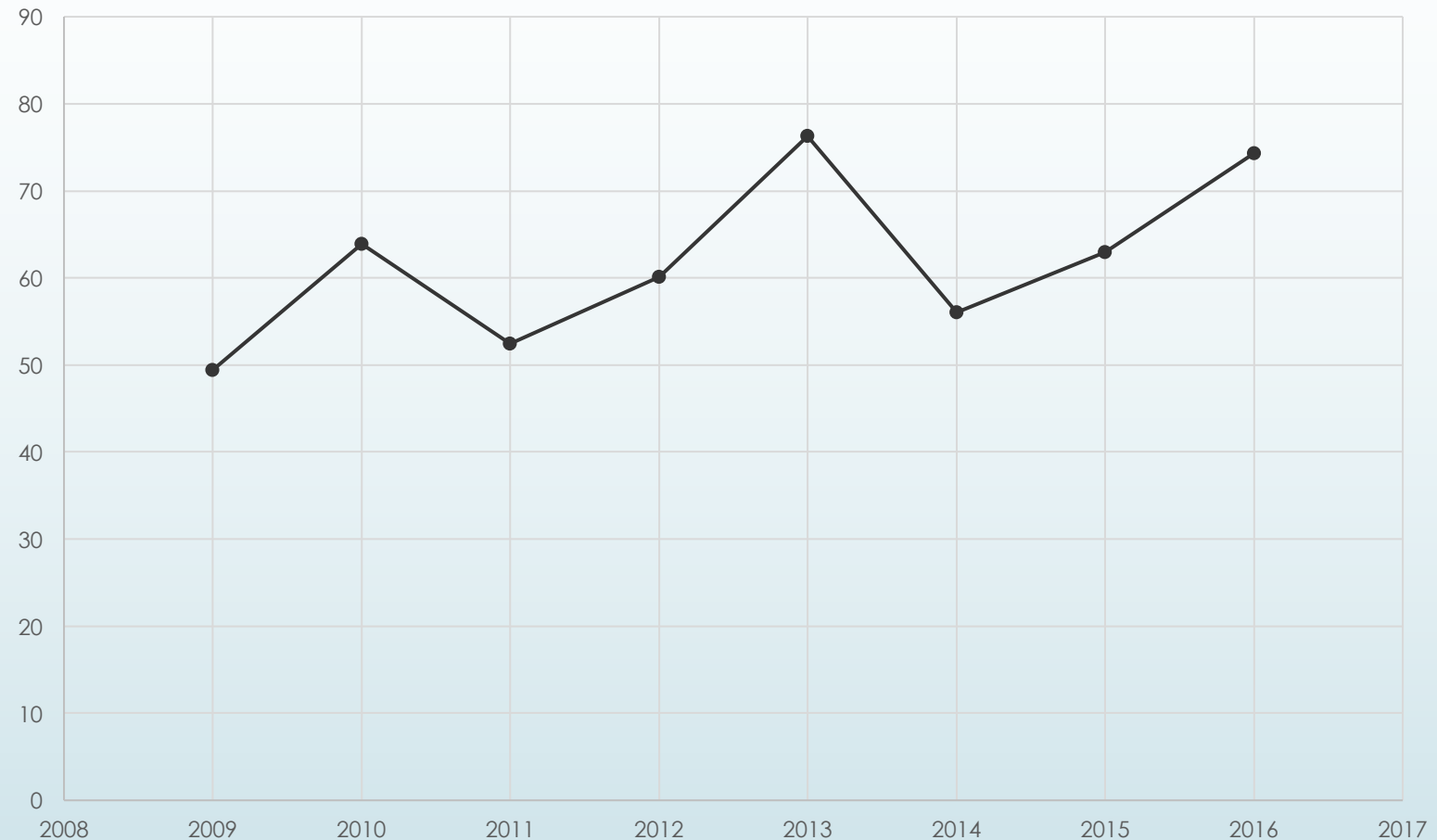
Drugs—Controlled Substances Median Laboratory has 86% growth in the average cost to process a case from FY 2009 to 2016



Drugs—Controlled Substances Median Laboratory has 47% growth in productivity (Cases/FTE) from FY 2009 to 2016



Drugs—Controlled Substances Average Turnaround Time has grown 50% from FY 2009 to 2016





Toxicology ante mortem

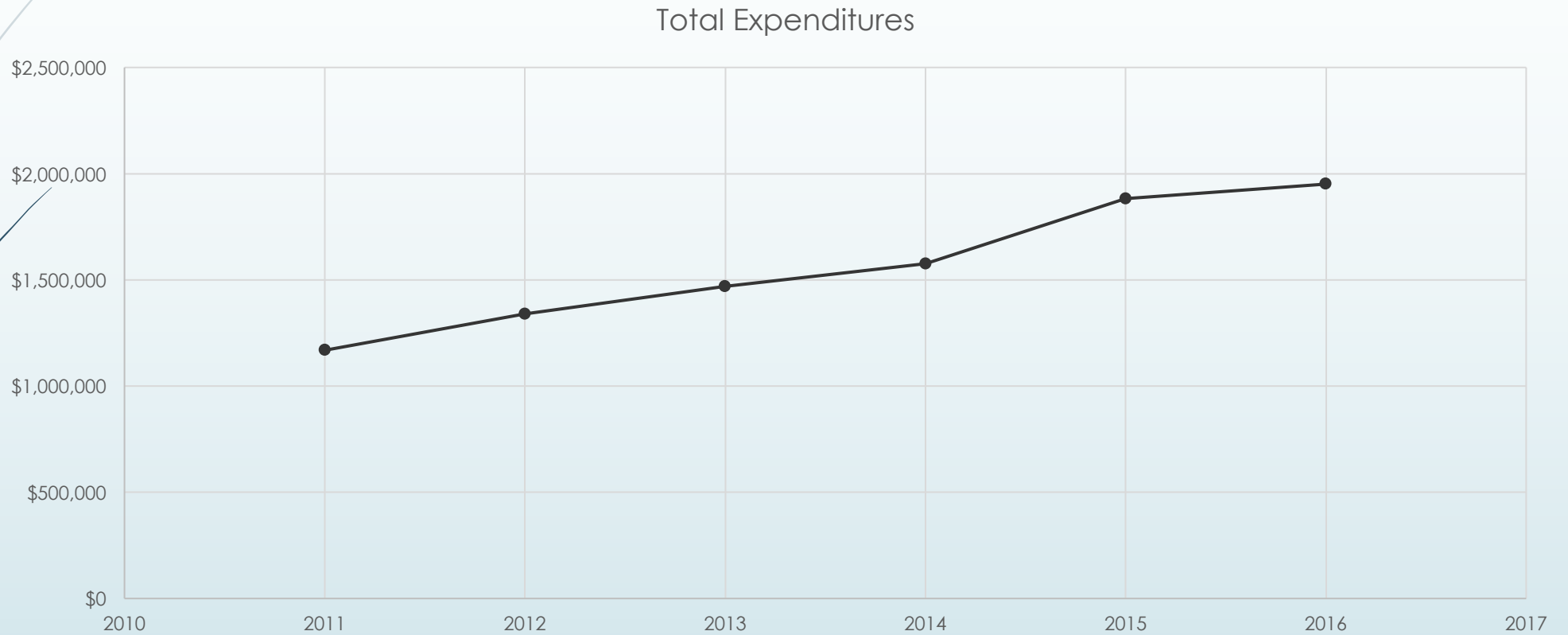
- Similar results occur in other investigative areas such as Toxicology ante mortem and Toxicology post mortem
- For Toxicology ante mortem from 2008 to 2015
 - Total expenses have grown 157%
 - Cost per case has grown 19%
 - Productivity has grown 29%
 - Average TAT has grown 143%



Example Laboratory—Opioid Crisis Region

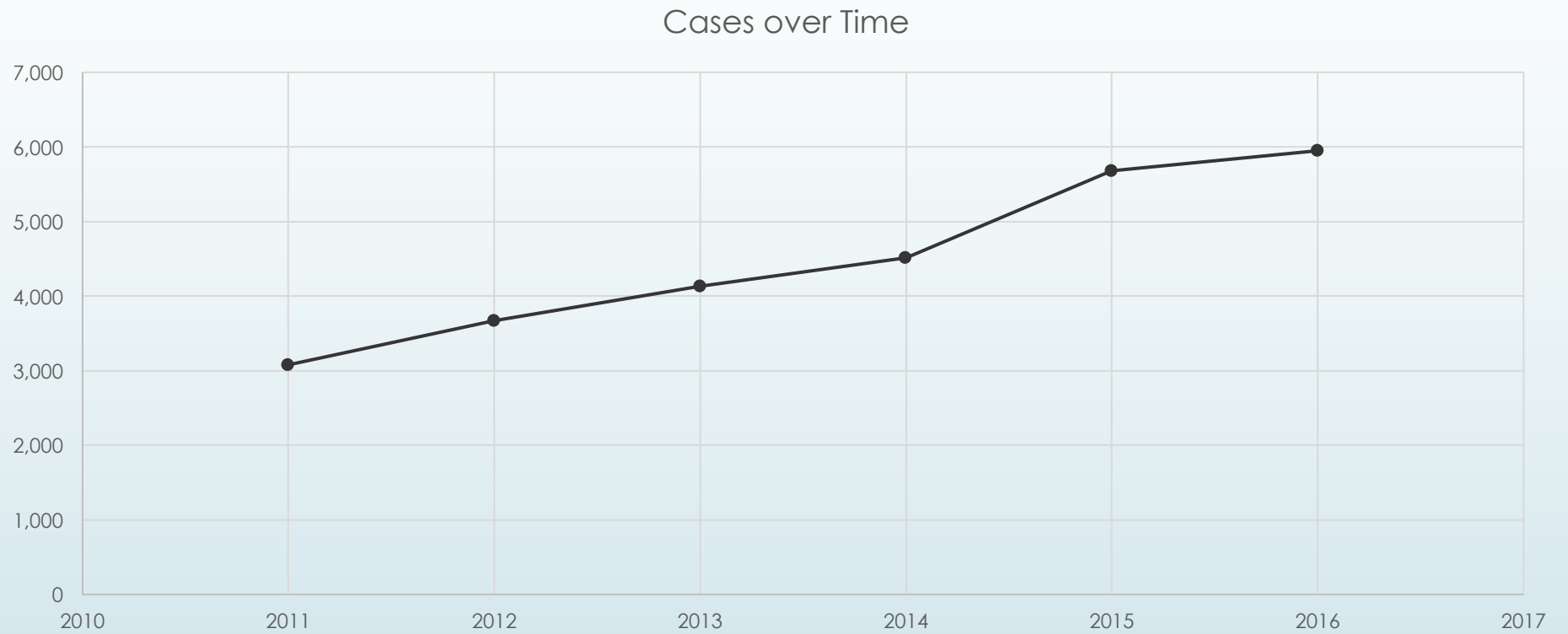
- Consider the plight of a laboratory in a region with a severe opioid problem
- At first glance, the performance appears to go against expectations
- Consider Cases processed for a given budget or its inverse, Cost/Case

Example Laboratory—Opioid Crisis Region



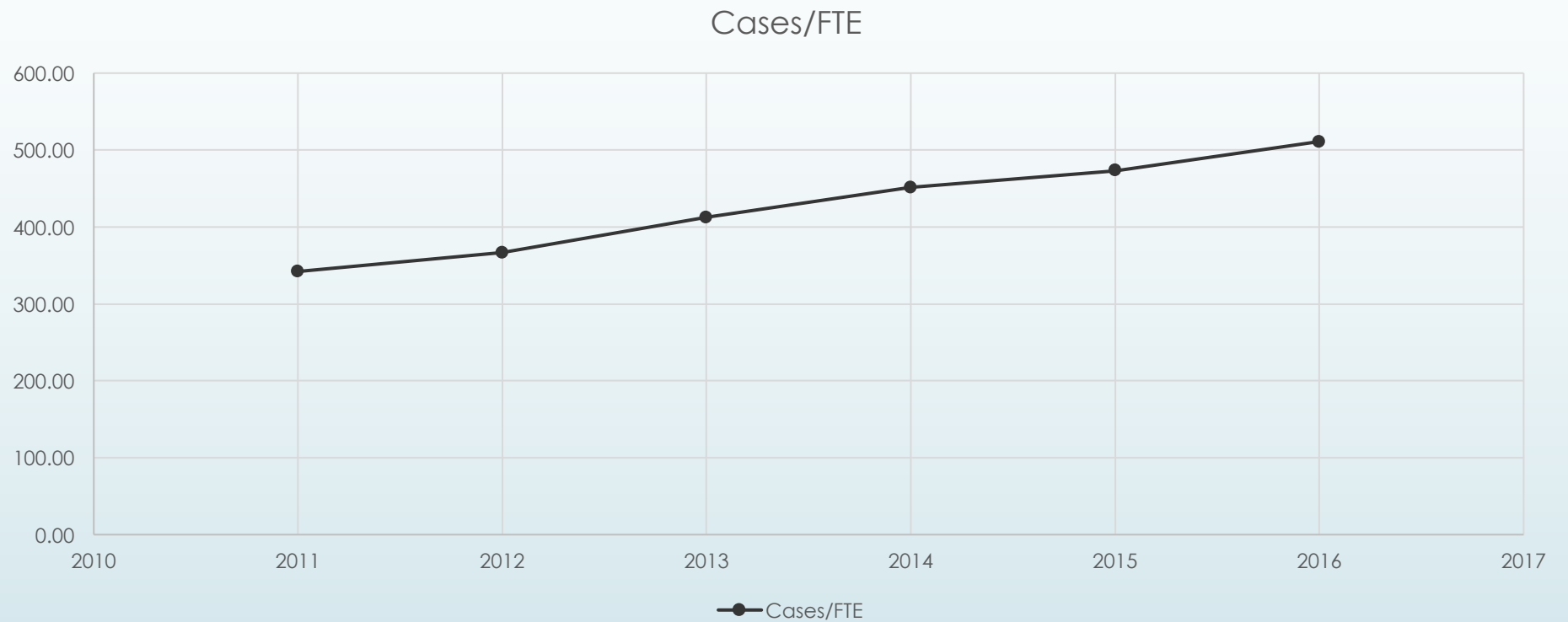
Average costs are falling, but total costs are rising

Example Laboratory—Opioid Crisis Region



Caseload has nearly doubled

Example Laboratory—Opioid Crisis Region



Productivity has risen nearly 50%



Opportunity Costs—What does \$1 million to reduce drug chemistry backlog mean?

- Laboratory analysis for 749 sexual assault cases
- 13,514 additions to CODIS, the DNA database
- Inpatient treatment for 50 – 167 patients with addictions
- Outpatient treatment for 100 – 200 patients with addictions
- Feed 362 seniors for one year
- Promise scholarships for 211 students for a year
- Send 132 pre-school children to Head Start for one year

Published Research



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Publications in the Business of Forensics

[National versus Local Production: Finding the Balance between Fiscal Federalism and Economies of Scale](#), *Public Finance Review*, pages 1-23, William P. McAndrew, 2017.

Abstract: Public finance and public choice economists have contrasting views on the determinants of public sector size. This article makes a unique contribution to this literature by exploring an integer count of output, rather than the commonly used dollar approximation of output, using data that are homogeneous across the levels of government, where a unit of observation is not a governing body, but rather a service provider. Specifically, this article explores the counteracting effects of fiscal federalism and economies of scale using data from the National Institute of Justice with an application of data envelopment analysis and stochastic frontier analysis. I determine that provision of forensic science services at the national level rather than local level does not lead to higher relative cost, and national production may be relatively more efficient. In general, however, neither locally nor nationally operated laboratories are operating at an efficient scale, a potential argument for privatization, insourcing, or outsourcing.

[Project FORESIGHT and Return on Investment: Forensic Science Laboratories and Public Health Laboratories](#), *Forensic Science Policy and Management: An International Journal* 8(1-

<http://business.wvu.edu/centers/forensic-business-studies/foresight/publications>



Further Research

- Proposed projects
 - Determination of the Social Cost to the Justice System from Opioids
 - Includes Crime laboratories, first responders, public health laboratories
 - Offers detail for cost-benefit alternatives
 - Similar analysis for emerging drugs
 - Policies and procedures
 - Emergency preparedness