

Data Analytics in Pathology

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Brian Jackson, MD

Flexner Report (2010)

- Established science as foundation of medical training
- Created cultural divide between physicians (science) and administrators (business)



Role of the Clinical Laboratory

Historic: Run Tests

Future: Diagnose Patients

Ensuring Effective Diagnostics:

What Data and Metrics does the Clinical Enterprise Need?

Analogy: Managing a Company

Executive



Front line

	Quality	Revenue	Costs
Executive	Key rollup measure(s)	Sales	Total costs
	Defects by category	Market share Revenue by segment	Labor Supplies Depreciation
Front line	Defects by process	Revenue per sales rep	Detailed costs per department

Managing Diagnostics

	Quality	Patient Benefit	Costs
Executive	Overall health system reliability	Global benefit	Total cost to lab
	Per clinical practice unit	Benefit per test	Cost per test
Front line	Per test: <ul style="list-style-type: none"> • TAT • Accuracy • Process quality 	Benefit per case <ul style="list-style-type: none"> • Variation • Consistency with guidelines • Consistency w/expert opinion 	Cost per case

Executive



Front line

Managing Diagnostic Test Utilization

Executive



Front line

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Total Cost of Laboratory Operations

- Labor
- Reagents
- Instruments
- Facility overhead
 - Space, utilities, IT, etc.

Cost per Test

- Proper Approach
 - Labor, reagents, instruments, overhead
- Do not use 3rd party fee schedule!
- Do not use chargemaster!

Cost per Case

- Assumes you have valid costs at component level
- Overhead allocation is tricky
- Dependent on the clinical algorithms

How to Solve The **Cost Crisis** In Health Care

The biggest problem with health care isn't with insurance or politics. It's that we're measuring the wrong things the wrong way.
by Robert S. Kaplan and Michael E. Porter

Harvard Business Review Sept 2011

Managing Diagnostic Test Utilization

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Front line

Global Measures of Healthcare Quality?

Program	# Measures	# Diagnostic	# Lab
HEDIS	74	20	9
CMS ACO	33	13	4
Choosing Wisely	135	90	21

Patient Benefit per Test

- Function of how the test is used
 - NOT an intrinsic quality of the test itself
- Example: H pylori testing
 - Do stool Ag and breath test provide more patient value than serology?
 - Answer: Depends on the rate of endoscopy

Holmes et al. BDM Health Services Research
2010, 10:344

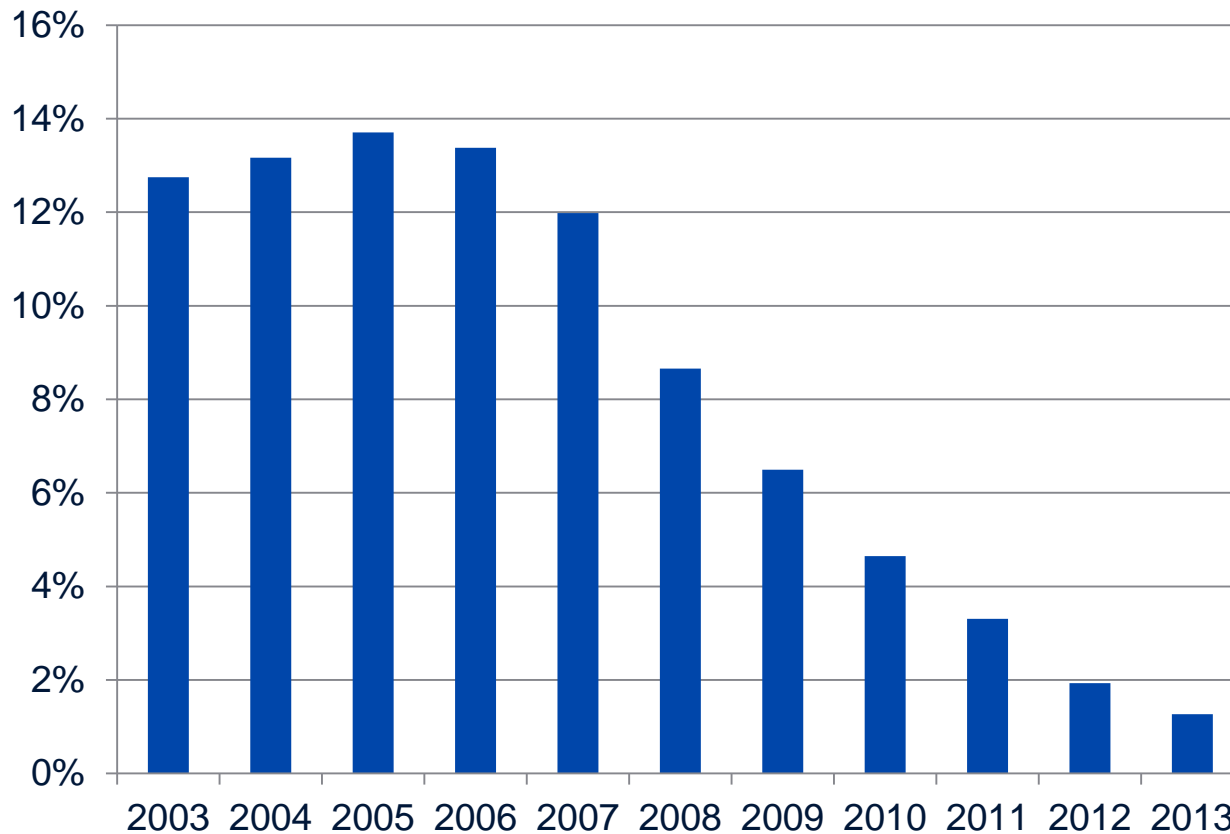
Patient Benefit (of a Test) per Case

- Outcomes
 - Generally not practical in this setting.
- Normative (Evidence Based Medicine)
 - Guidelines
 - Other clinical literature
 - Local expert opinion
- Non-normative/Descriptive
 - Variation

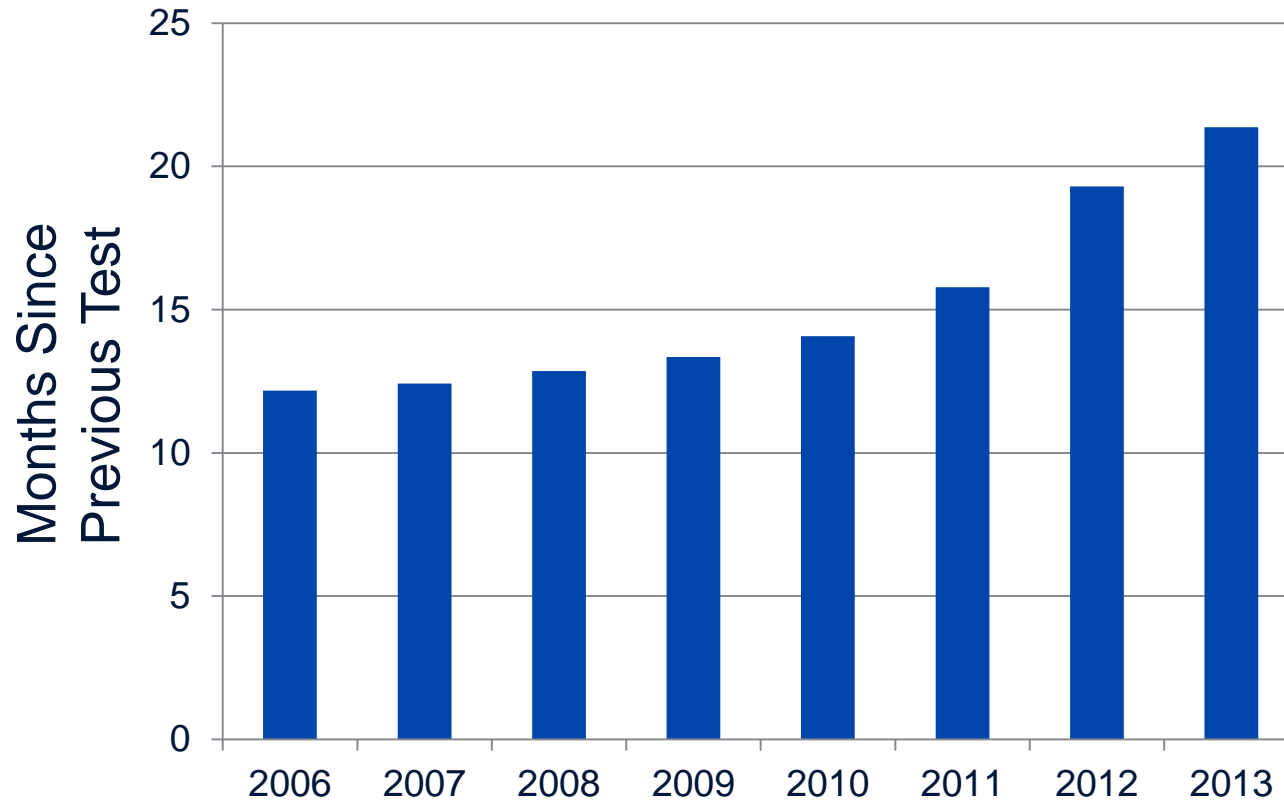
Diagnostic Testing Guidelines

Useful where available,
but extremely incomplete

HPV: Tests on Patients <21 years old



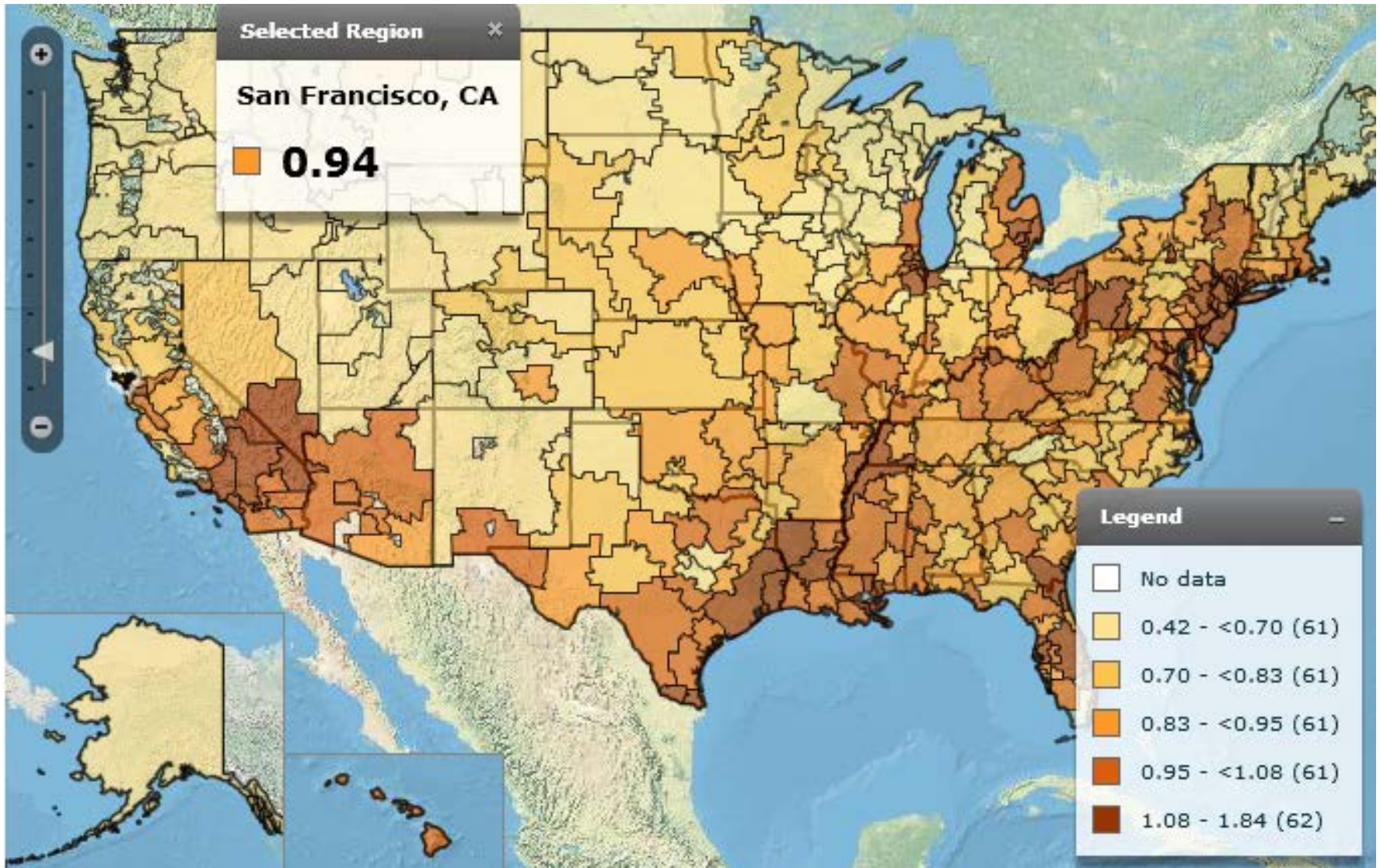
HPV: Median Repeat Interval Following Negative Result



Measuring Variation

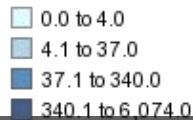
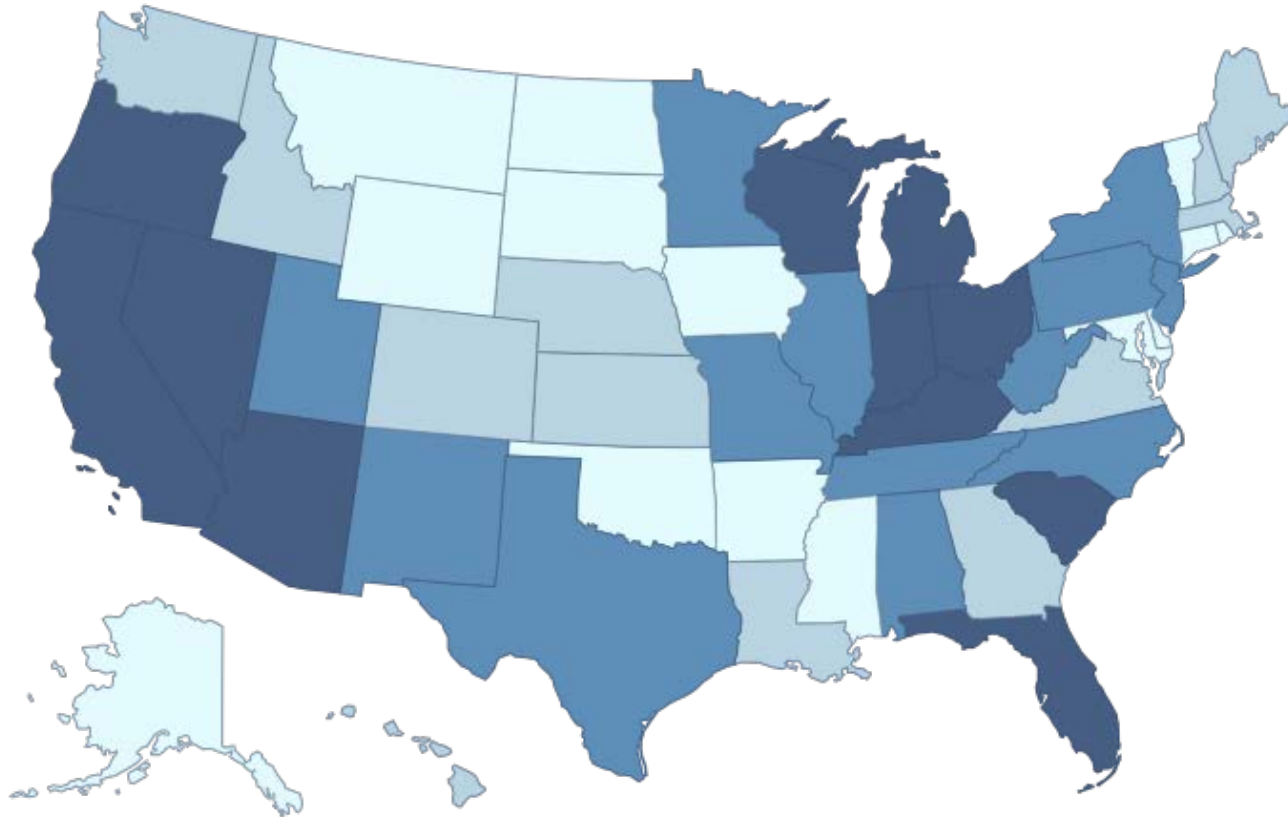
- Available across full spectrum of tests and settings
- Non-judgmental (Validity harder to question)
- Decades of experience (esp. Dartmouth)

Hospital Care Intensity www.dartmouthatlas.org



NMR Lipoprofile

Volume Index (normalized by ARUP volume)



Whole Blood Drug of Abuse Screens

- Hospital represented 0.3% of ARUP's reference work
- Ordered ~95% of ARUP's whole blood drug screens
 - ~\$70K/year
- Why?

Measuring Variation

- Comparison group needs to be “reasonably” valid
- Can benchmark on multiple levels
 - Physician group
 - Hospital
 - Health system
 - Geographic region
- Use raw volumes, not CPT, charges or costs

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Where Do We Have Good Metrics Today?

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Executive



Front line

Where Are the Opportunities?

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Laboratory Medicine