

Communicating with Data

September 17, 2015

Presenter: **Megan Davis**,
Accreditation Coordinator,
Washington State Department of Health

Today's Learning Objectives

1. Review the purpose of performance measures
2. Understand the importance of rules about the visual language of performance measures
3. Know why to remove unnecessary design elements to help readers focus on the content or message
4. Evaluate the quality of any chart/graph based on generally accepted criteria
5. Select the correct type of chart to use, based on the type of data available and the desired message
6. Practice cleaning up charts to clarify the message

What is a performance measure?

A performance measure is a *quantifiable* indicator that documents change in, or describes, a specific condition or attribute.

Quantifiable means you can:

- Count it
- Measure it

Performance measures provide a snapshot of past and current capabilities, and in some instances, a prediction of future capabilities.

Performance measures are primarily used for two purposes:

- To make comparisons
- To tell if performance is getting better, staying the same, or getting worse over time.

Evaluating the different parts of the system of work

Outcomes:
Organizational Benefits
User Benefits
Financial Stakeholder Benefits

Suppliers

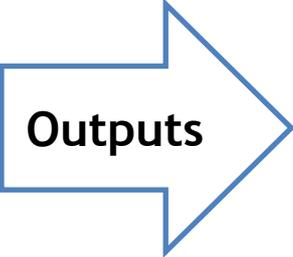
Inputs

Process

Outputs

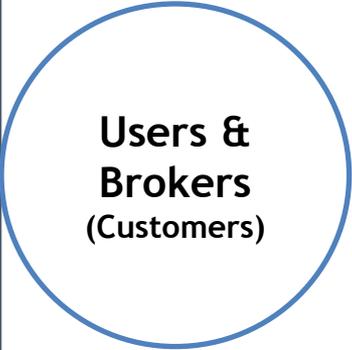
**Users &
Brokers
(Customers)**

Terminology Crosswalk & Examples



Outputs

Productivity counts - How many can the work unit make in a given time period?



Users & Brokers (Customers)

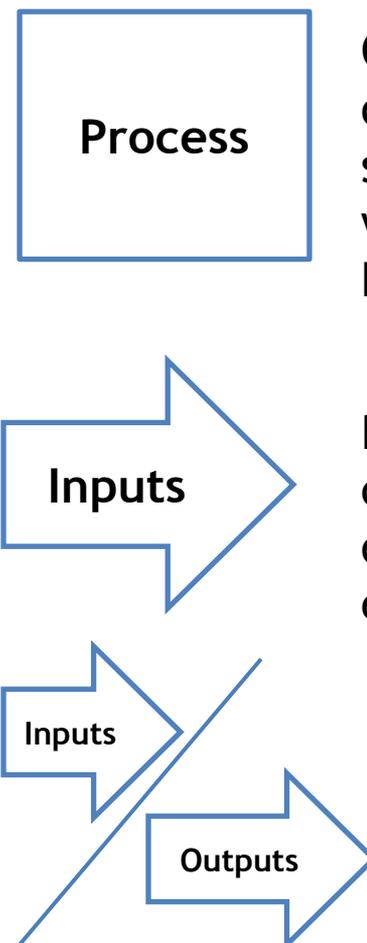
Customer behavior and opinions - How well do the outputs meet the needs of those that use them? Customer satisfaction ratings, comments & complaints (survey), compliance, returns/warranty claims, return customers/referrals, sales, etc.



Outcomes

Program effectiveness - How well is the organization accomplishing its purpose/mission? No direct control - Only influence. Increase/decrease/protect: Safety, health, environment, economic development, learning, mobility, etc.

Terminology Crosswalk & Examples



Process

Operational information about the work methods that create the outputs: How long does it take (Cycle time)? How much scrap/waste is generated? How many are made/get through without any errors the 1st time (Defects)? How big is the backlog? How much overtime is needed? Employee satisfaction

Inputs

Resources & information needed by the process. Budget \$, FTE counts, and workload measures of demand for service (Customer orders/requests, foot traffic, applications filed, phone calls/emails received, etc.)

Inputs

Outputs

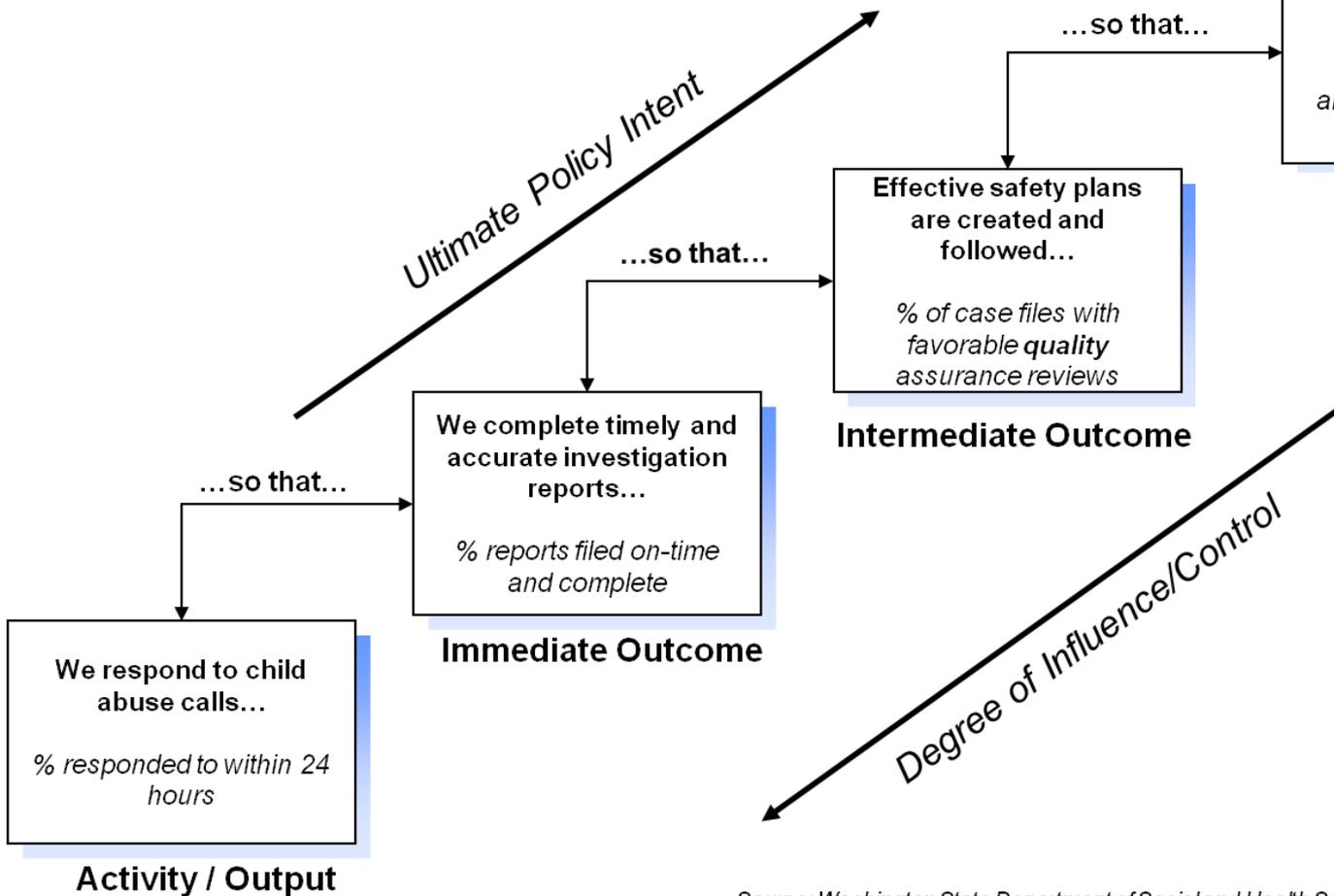
Efficiency: What is the cost per unit made?

Evaluating the effectiveness of strategy

Washington Department of Social and Health Services
Goal: Ensuring vulnerable children are safe

Ultimate Outcome

Children are safe.
% of children not re-abused within 6 months



Source: Washington State Department of Social and Health Services, Children's Administration

Charting Performance Measures

Quantitative information takes us away from assumption, feeling, guesswork, gut instinct, intuition, and bias, into the realm of reliable fact, based on measurable evidence.

The numbers have an important story to tell.

They help us make informed decisions.

Numbers convey very valuable messages.

We need to remember the importance of HOW we present our numbers.

Charting Performance Measures

Risks of poor charting & analysis:

- Poor communication with funders and the public.
- Jeopardizes all process improvement and performance management initiatives.
- Increases the risk of wasting resources by acting on every data point, or missing something significant.

Good charts lead to deeper conversations about important topics.

- Is performance getting better, worse, or staying about the same?
- What should we do about it?
- Did the process improvement work?

Decoration vs. Content

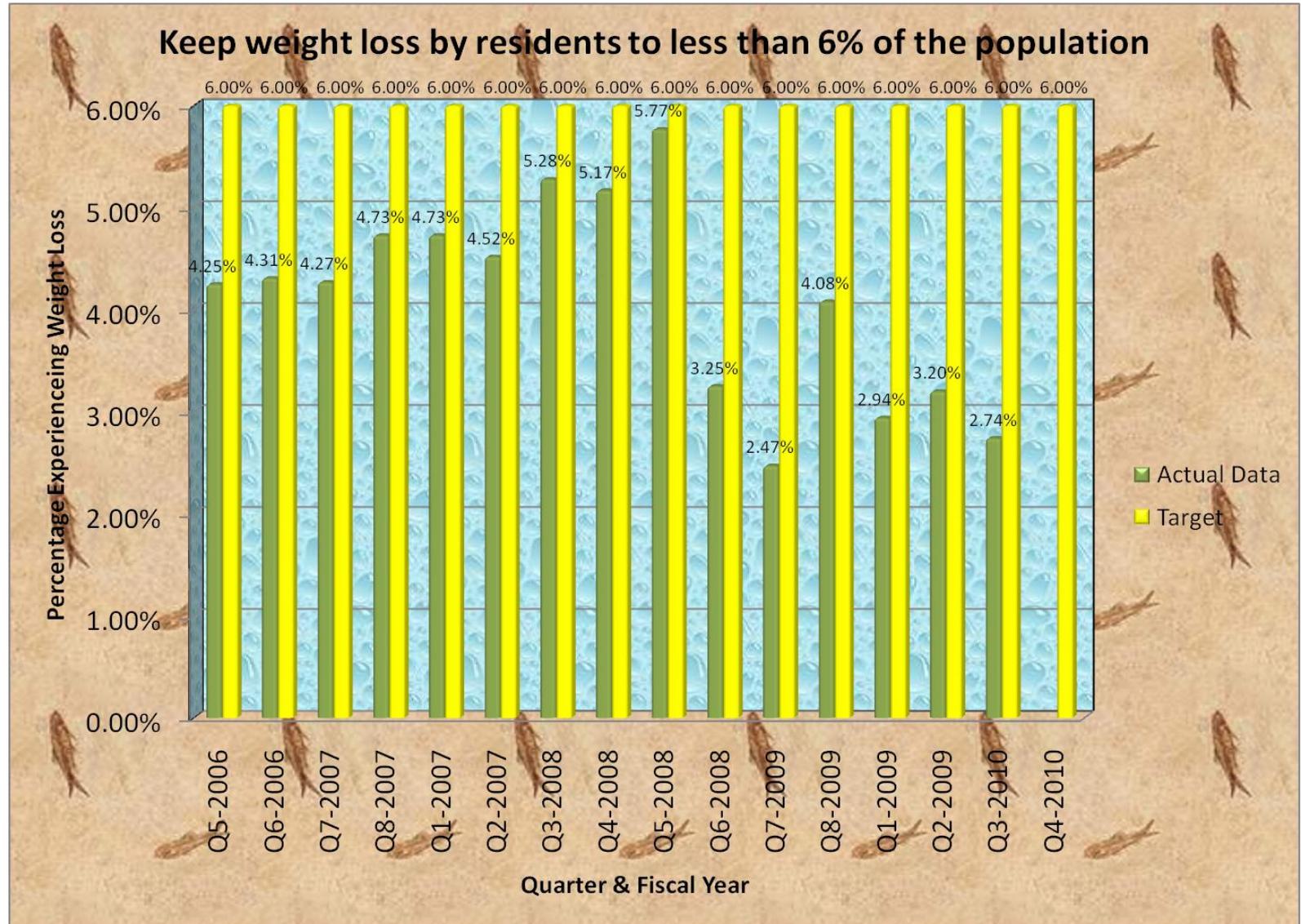
I HOPE everyone understands **my intent**. I do not
want to CRITICIZE anyone's *past* charting. Good
charts focus *the* reader's attention on **the** message and
DATA, **NOT** the *chart* itself.

I hope everyone understands my intent. I do not want to criticize anyone's past charting. Good charts focus the reader's attention on the message and data, not the chart itself.

Basic style guide principles

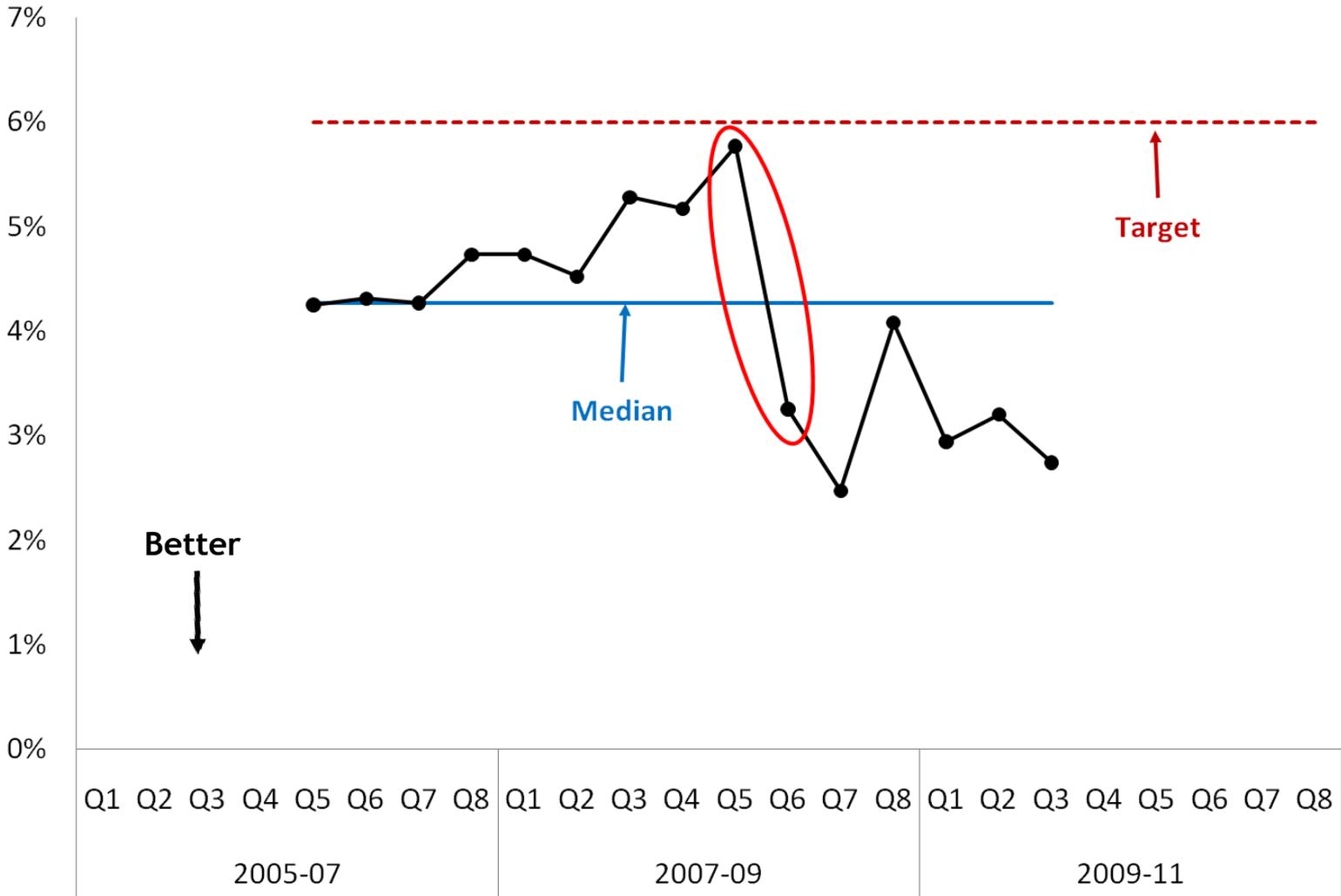
- Less is more - try to eliminate any non-value adding visual elements.
(grid lines, backgrounds, borders, unnecessary labels)
- Don't rely heavily on colors or color schemes.
 - Reds & greens - color blindness
 - Photo copy (black and white) compatibility
 - Colors have diverse cultural meanings
- Avoid 3-D charts.
- Try to avoid using pie charts.
- Make your titles easy to read - no jargon or acronyms.
- Show variation and differences, don't hide them.
- Just because Excel can do it, does not mean you should.

Do you see what I see?



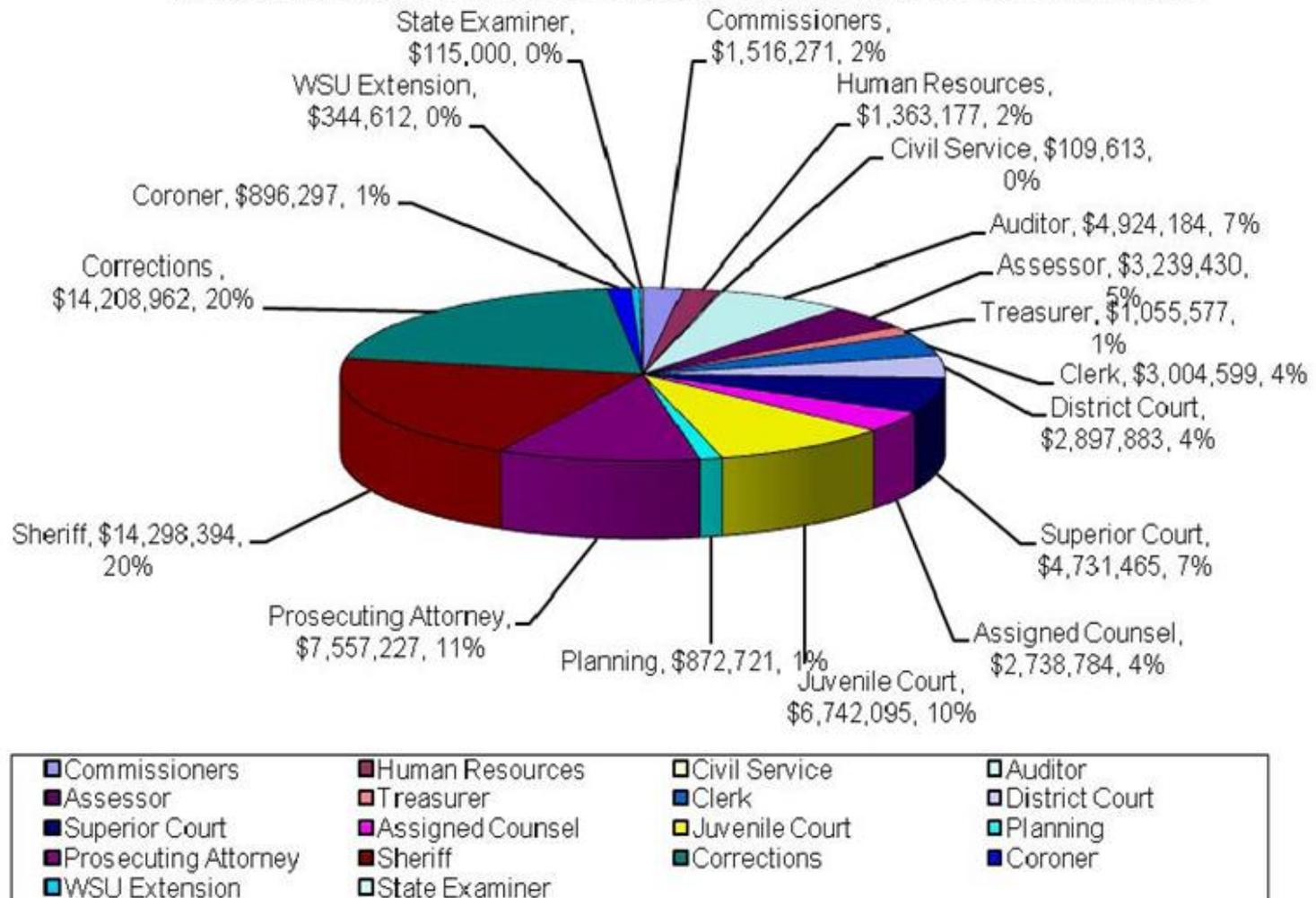
Now, do you see what I see?

Keep weight loss by residents to less than 6% of the population



Good intentions gone bad

2010 GENERAL FUND ADOPTED EXPENDITURES BY DEPARTMENT



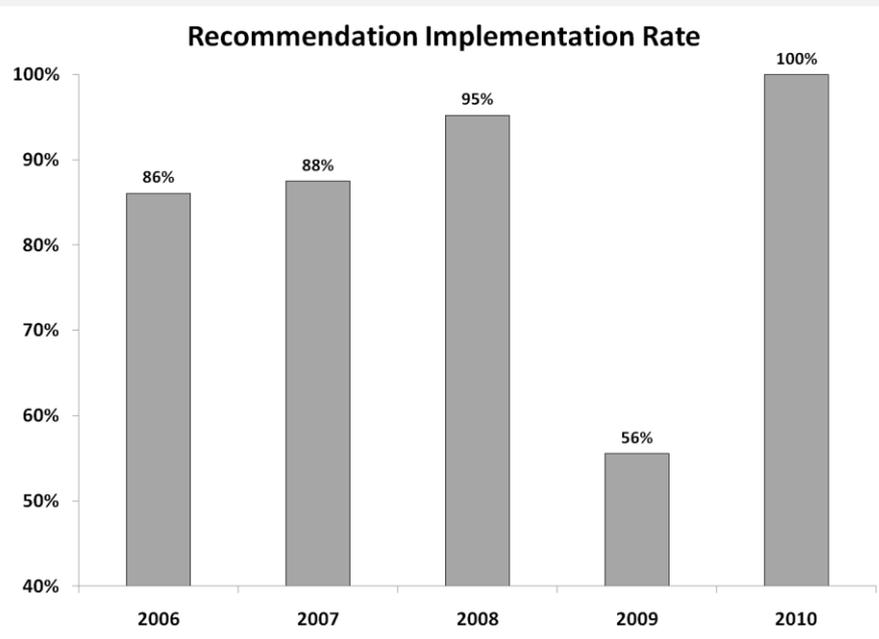
Show the numbers

2010 General Fund Adopted Expenditures by Department		
Department	Adopted Expenditures	%
Sheriff	\$ 14,298,394	20.2%
Corrections	\$ 14,208,962	20.1%
Prosecuting Attorney	\$ 7,557,227	10.7%
Juvenile Court	\$ 6,742,095	9.5%
Auditor	\$ 4,924,184	7.0%
Superior Court	\$ 4,731,465	6.7%
Assessor	\$ 3,239,430	4.6%
Clerk	\$ 3,004,599	4.3%
District Court	\$ 2,897,883	4.1%
Assigned Counsel	\$ 2,738,784	3.9%
Commissioners	\$ 1,516,271	2.1%
Human Resources	\$ 1,363,177	1.9%
Treasurer	\$ 1,055,577	1.5%
Coroner	\$ 896,297	1.3%
Planning	\$ 872,721	1.2%
WSU Extension	\$ 344,612	0.5%
State Examiner	\$ 115,000	0.2%
Civil Service	\$ 109,613	0.2%
Totals	\$ 70,616,291	100%

Two kinds of data, charts, and analysis - Don't mix & match

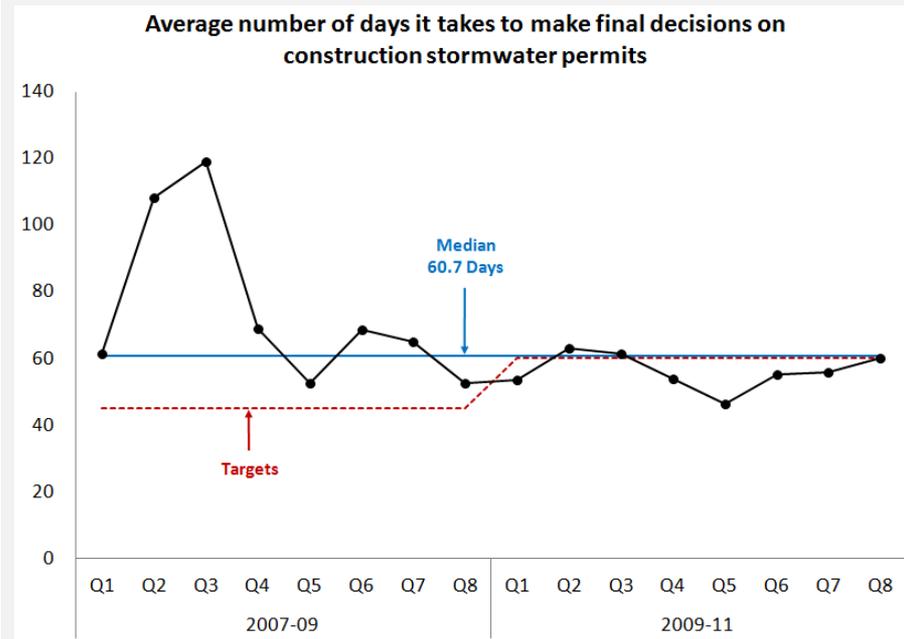
Enumerative (Descriptive)

- Pie charts & bar charts
- 7 or fewer data points
- Purpose is to display comparisons in quantity and size



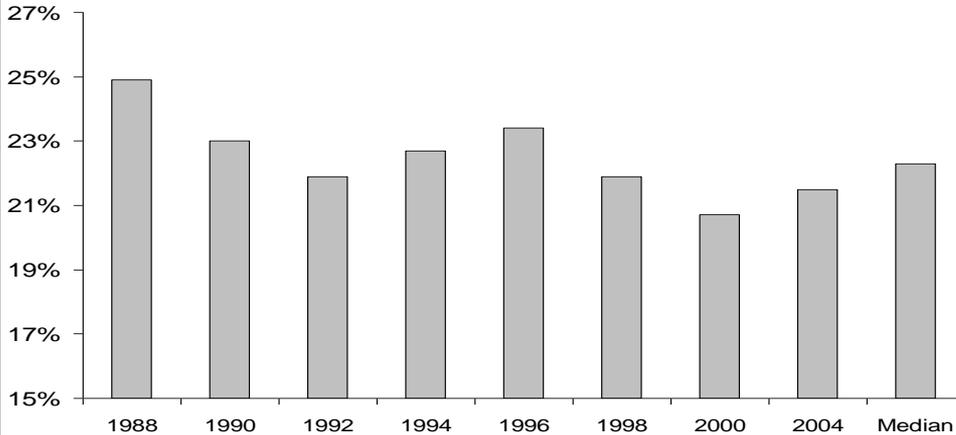
Analytical

- Run charts & Control charts
- 8 or more data points
- Purpose is to display data over time and predict future performance levels



What's wrong here?

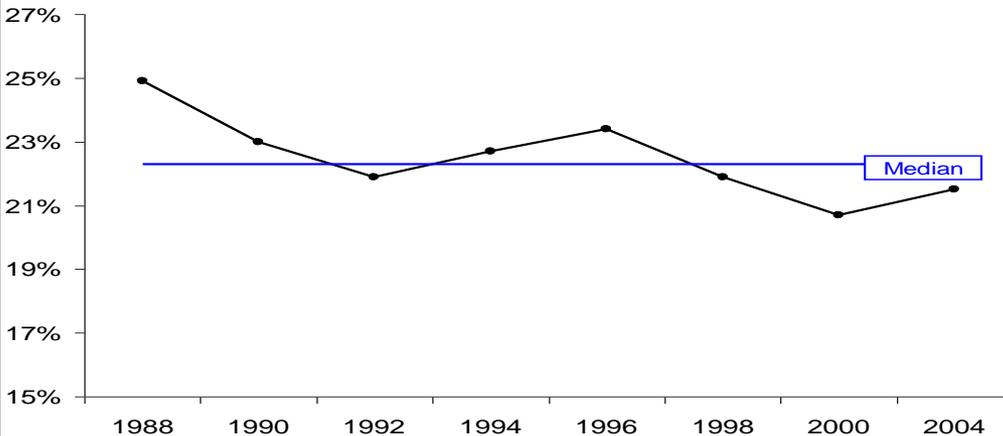
Percent of Adults Using Tobacco



Wrong:

Using an enumerative tool (Bar Chart) to display analytical data

Percent of Adults Using Tobacco

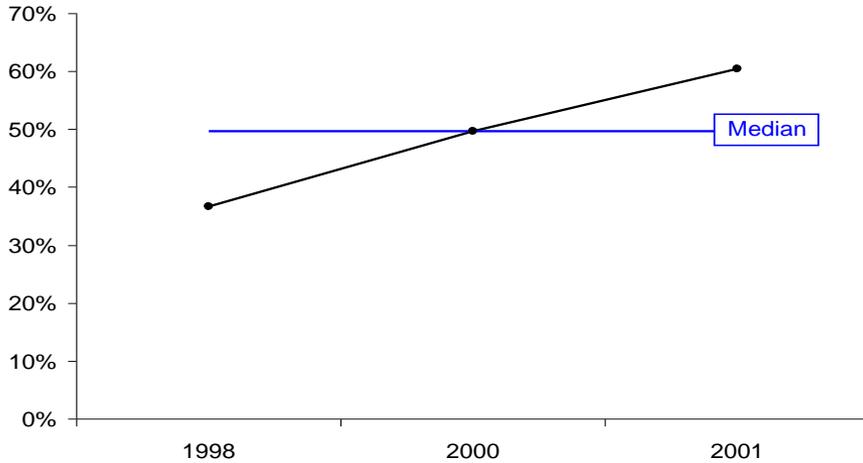


Right:

Using an analytical tool (Run Chart) to display analytical data

What's wrong here?

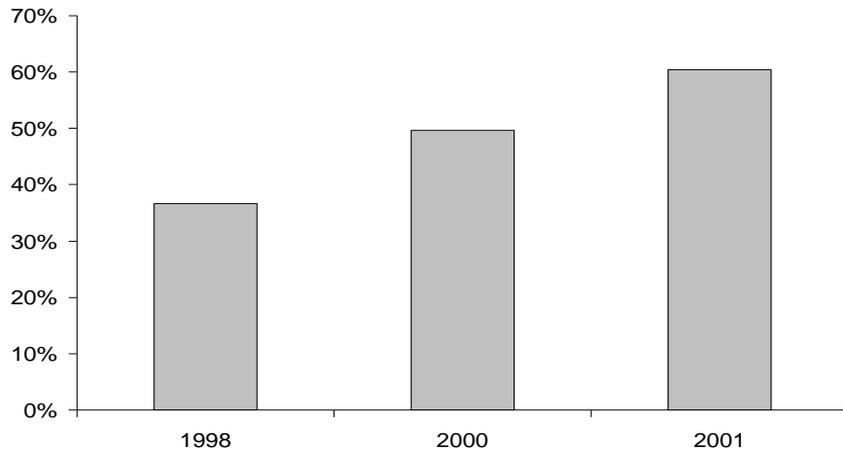
Percent of Households with Internet Connection



Wrong:

Using an analytical tool (Run Chart) to display enumerative data

Percent of Households with Internet Connection



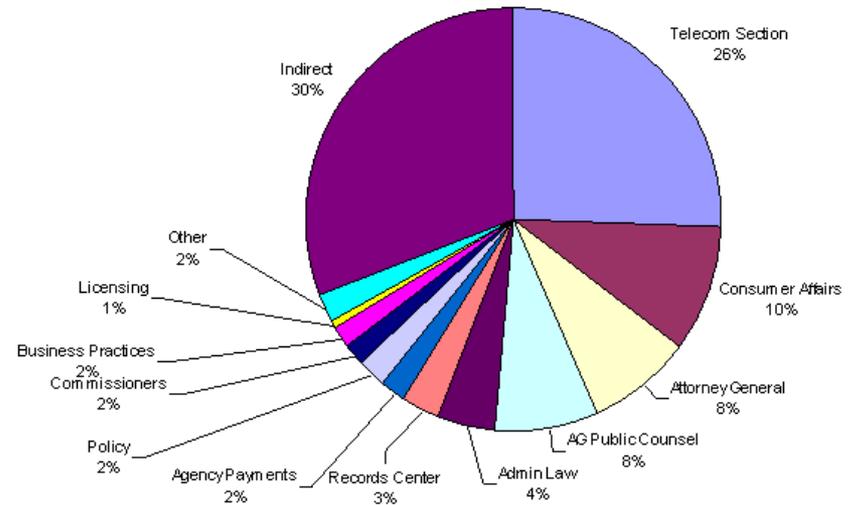
Right:

Using an enumerative tool (Bar Chart) to display enumerative data

Rookie Mistakes to Avoid

Expenditures on Telecom Regulation, By Section
July-December 2003

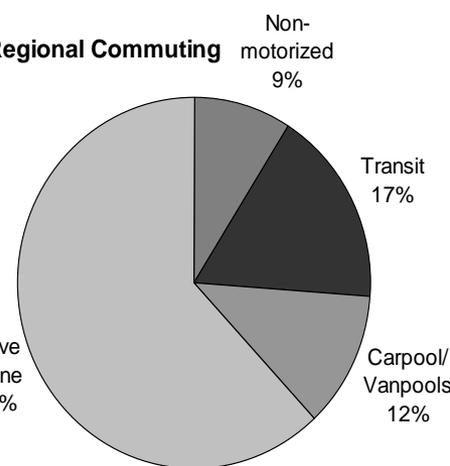
Total Expenditures (6 months) - \$2.5 million



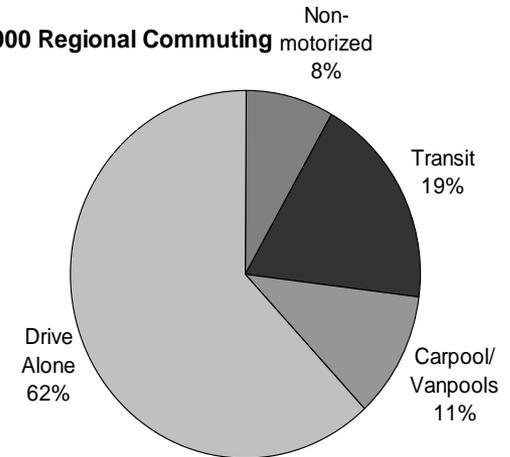
Pie charts with too many slices
(Pinwheel of Miscommunication)

and

1990 Regional Commuting



2000 Regional Commuting



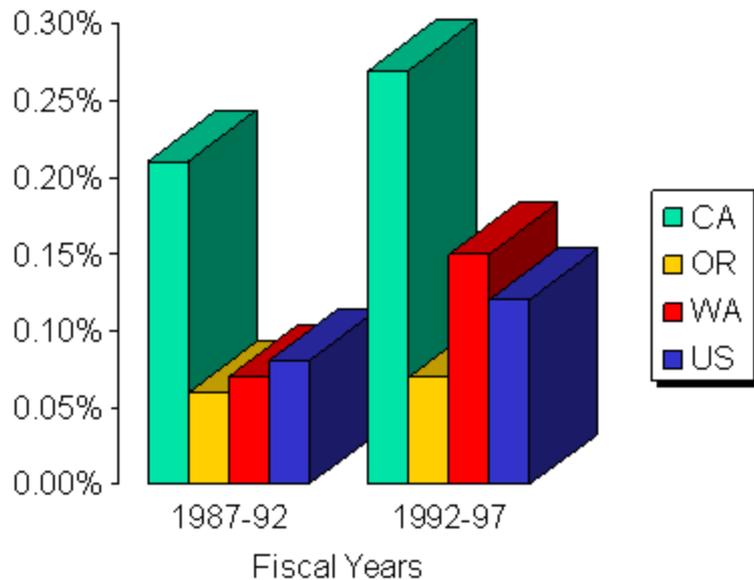
Making comparisons with pie charts
(When the slices are close to the same size)

Rookie Mistakes to Avoid (continued)

Using 3-D because it looks cool

What's the value?

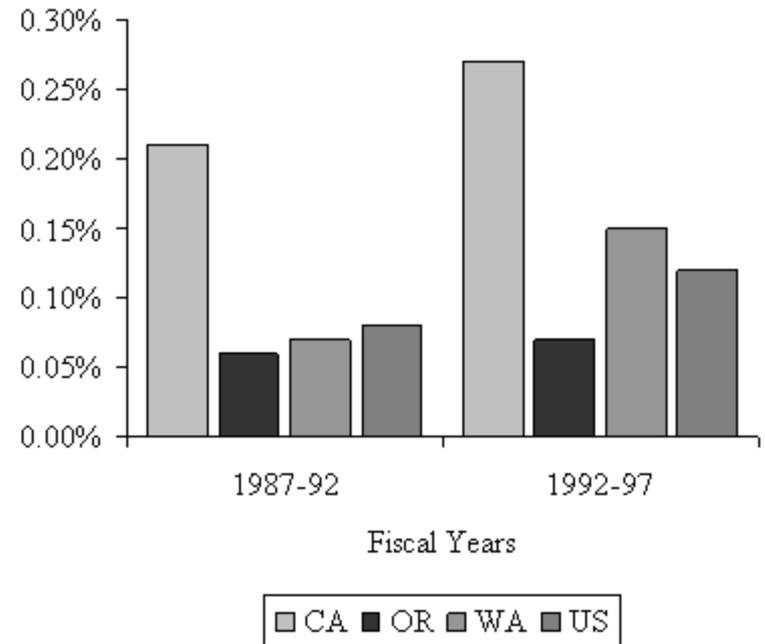
Percentage of Ag Land Converted to Urban Development



Overuse of color

- Cultural awareness
- Color blindness
- Reprinting

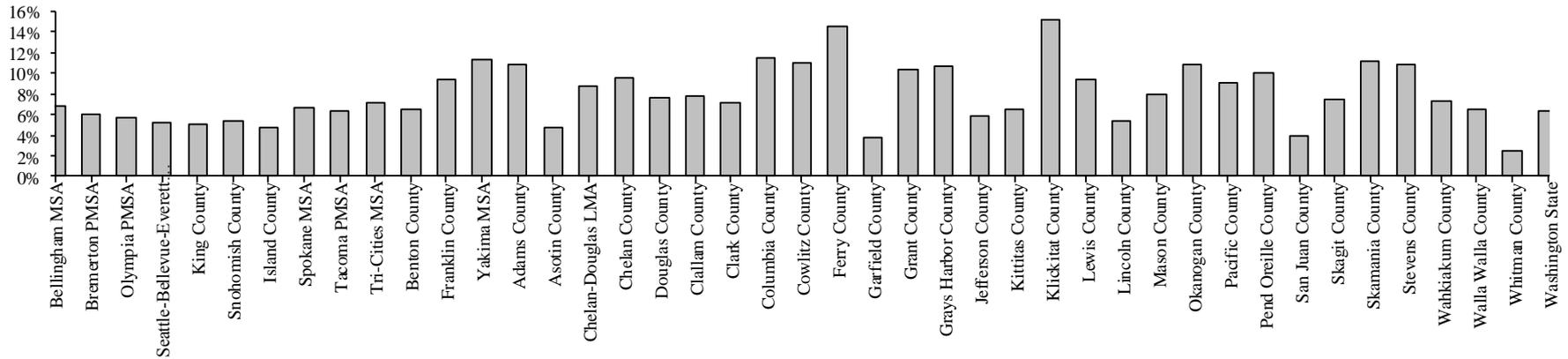
Ag Land Converted to Urban Development



Rookie Mistakes to Avoid (continued)

Long lists are better as a table; Consider putting the data in descending order

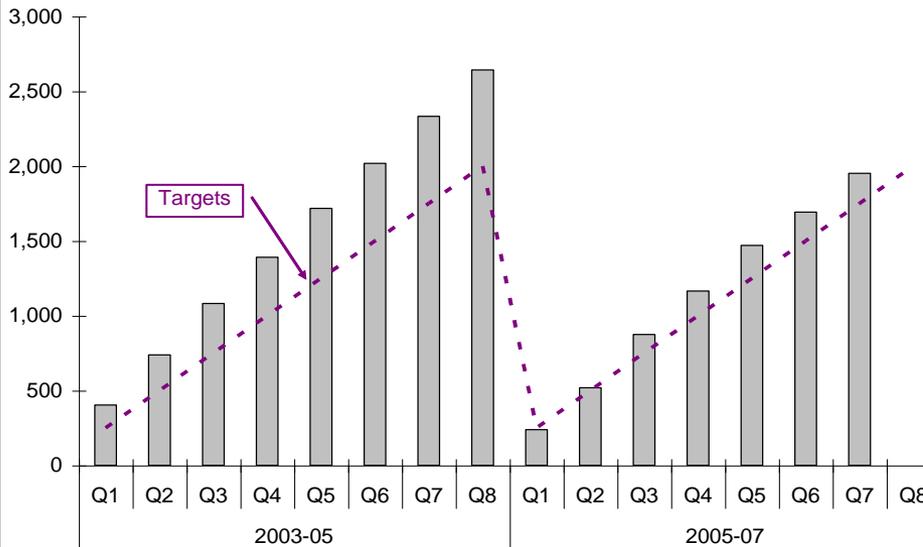
Washington State Resident Civilian Labor Force (2001 Annual Average by State and County)



Washington State Resident Civilian Labor Force (2001 Annual Average by State and County)							
Geographical Area	Unemployment Rate	Geographical Area	Unemployment Rate	Geographical Area	Unemployment Rate	Geographical Area	Unemployment Rate
Klickitat	15.1%	Pend Oreille	10.1%	Tri-Cities MSA	7.2%	Snohomish	5.4%
Ferry	14.5%	Chelan	9.5%	Clark	7.1%	Lincoln	5.3%
Columbia	11.4%	Franklin	9.4%	Bellingham MSA	6.8%	Seattle-Bellevue-Everett PMSA	5.2%
Yakima MSA	11.3%	Lewis	9.4%	Spokane MSA	6.6%	King	5.1%
Skamania	11.1%	Pacific	9.0%	Benton	6.5%	Asotin	4.8%
Cowlitz	11.0%	Chelan-Douglas LMA	8.8%	Kittitas	6.5%	Island	4.7%
Stevens	10.9%	Mason	7.9%	Walla Walla	6.5%	San Juan	4.0%
Adams	10.8%	Clallam	7.8%	Tacoma PMSA	6.4%	Garfield	3.7%
Okanogan	10.8%	Douglas	7.6%	Bremerton PMSA	6.0%	Whitman	2.5%
Grays Harbor	10.6%	Skagit	7.4%	Jefferson	5.8%		
Grant	10.3%	Wahkiakum	7.3%	Olympia PMSA	5.7%	Washington State	6.4%

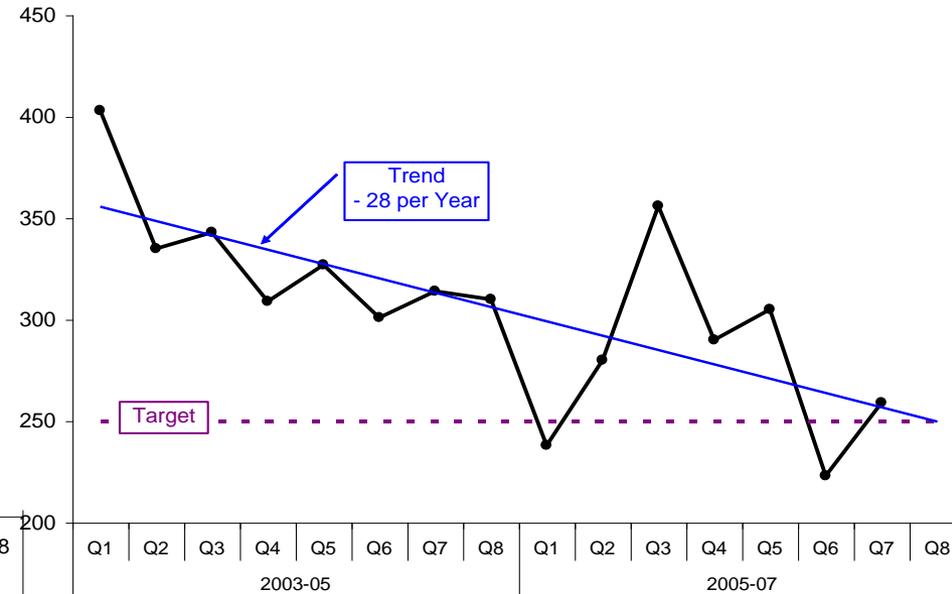
Rookie Mistakes to Avoid (continued)

SE09 - Number of State Environmental Policy Act Assistance Actions (Cumulative)



Cumulative

SE09 - Number of State Environmental Policy Act Assistance Actions



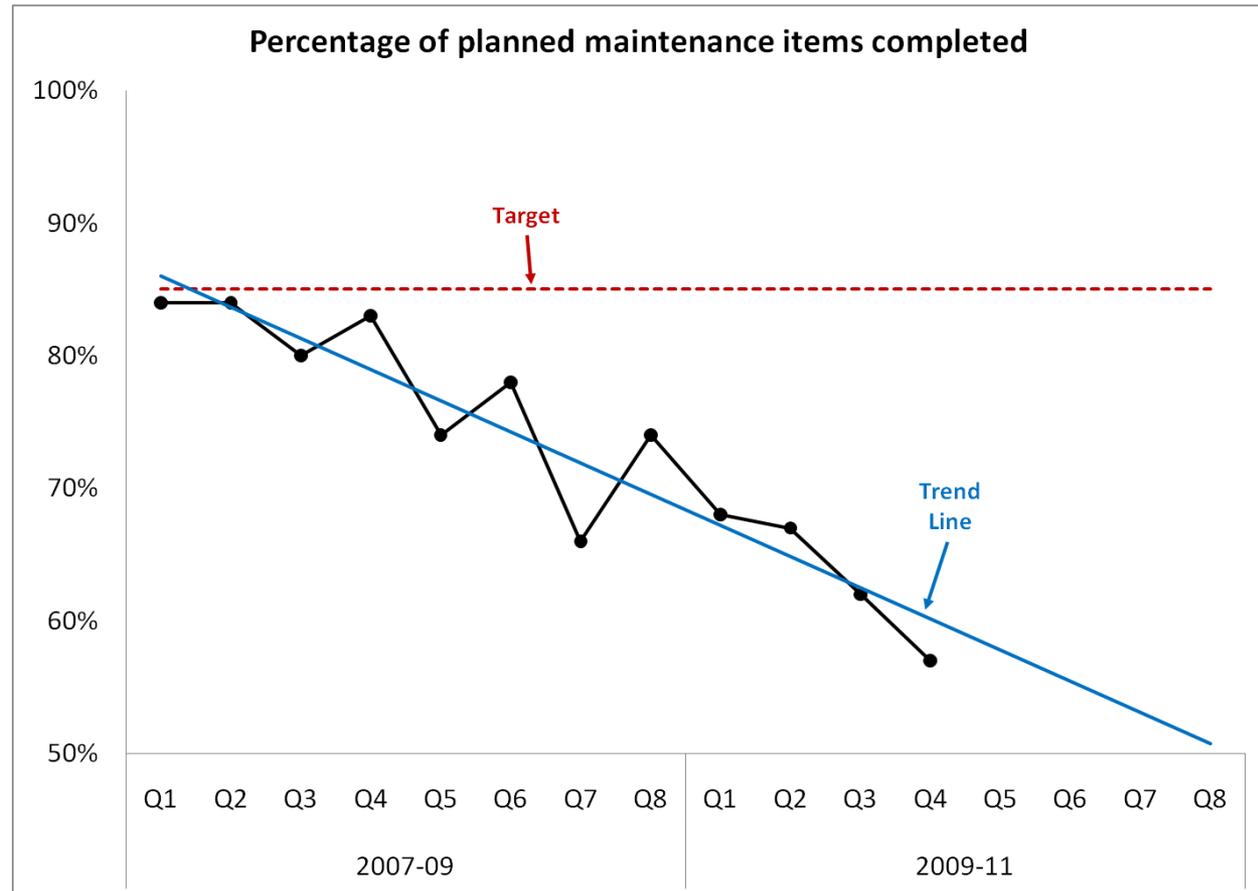
Non-cumulative

- The target was exceeded almost every quarter
- The data resets every biennium

- Even though the target was exceeded in almost every quarter, there is an undesirable decreasing trend in the data
- Unless something is changed, future results are likely to continue the downward slide

What makes a performance measure “good?”

- Relevance
 - Purpose
 - Control/Influence
- Context
 - History
 - Targets
- Understandable
 - Titles
 - Graphics
- Timely
- Reliability



Criteria-based performance measure questions

Relevance

- How does this measure fit into the organization's purpose, goals, priorities, and strategies?
- So what? Is this true, but useless information?

Context

- Is up or down desirable?
- How does current performance compare with past?
- Is there enough data to tell a story?
- Is there a goal, target, or specification they want to achieve?
- Are they capable of meeting or exceeding the target?

Understandable

- Do I understand what they are talking about?
- Can I tell if performance is getting better, worse, or staying about the same?

Timeliness

- Is the data fresh enough to make a management decision today?

Reliability

- Could someone else replicate this data?

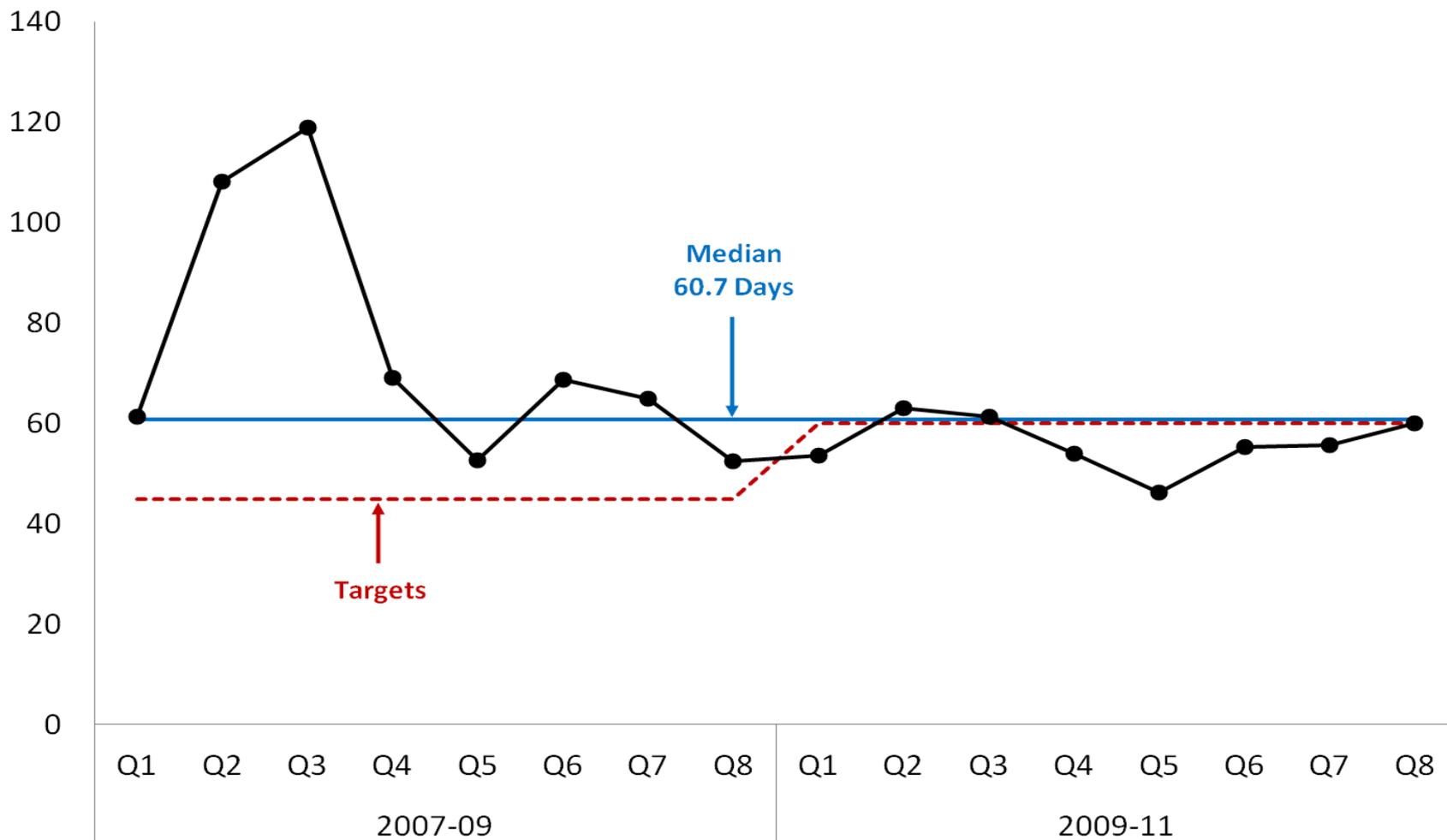
Practice Evaluating a Measure

Ratio of the net present value of the savings (after discounts and cost of issuance) compared to the total par value of the bond issue

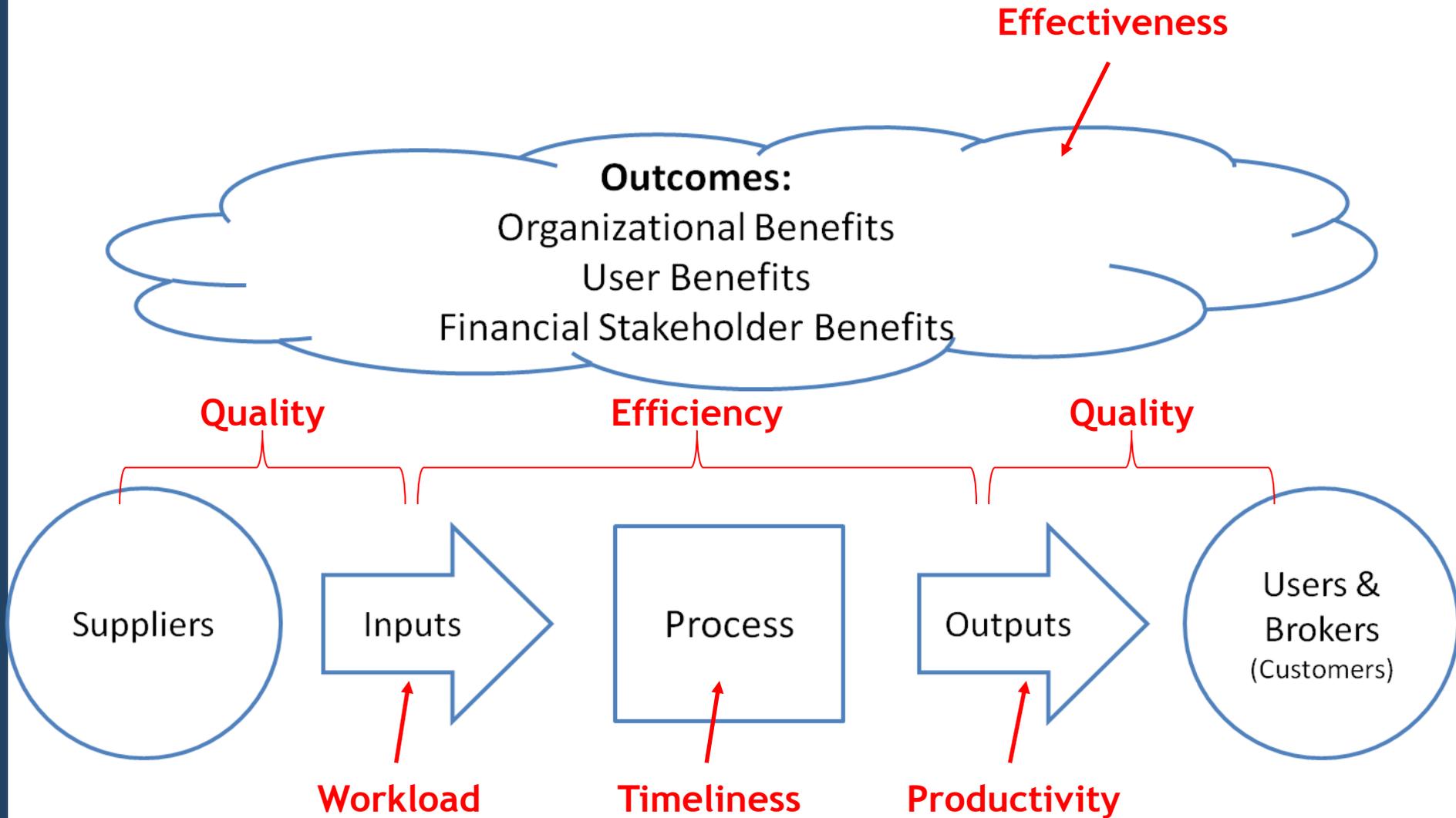


Practice Evaluating a Measure

Average number of days it takes to make final decisions on construction stormwater permits



Relevance - Matching messages to interests



Relevance - Who cares about what?

Interested Parties	Measurement Perspectives
Managers & Supervisors	
Budget Officers	
Coworkers	
Customers	
Legislators	
Public/Press	
Senior Leadership	

Choosing the *right* chart to get the *right* message across



Basic style guide principles

- Less is more - eliminate non-value adding visual elements. (grid lines, backgrounds, borders, unnecessary labels)
- Don't rely heavily on colors or color schemes.
 - Reds & greens - color blindness.
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- Avoid 3-D charts.
- Try to avoid using pie charts.
- Make your titles easy to read - no jargon or acronyms.
- Show variation and differences, don't hide them.
- Just because Excel can do it does not mean you should.
- Never - ever -- manage by average alone.

Two kinds of data, charts, and analysis

Enumerative (Descriptive)

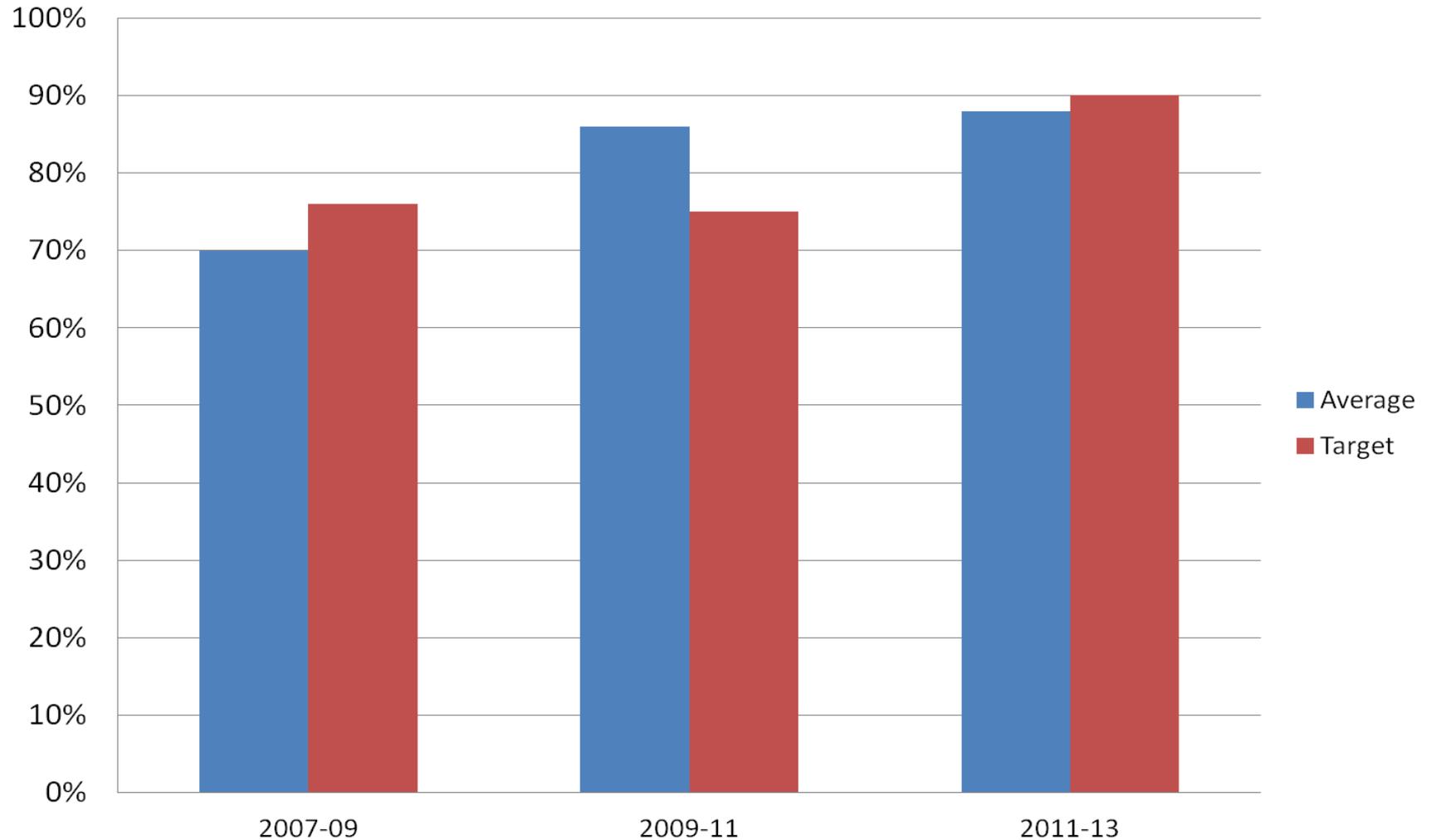
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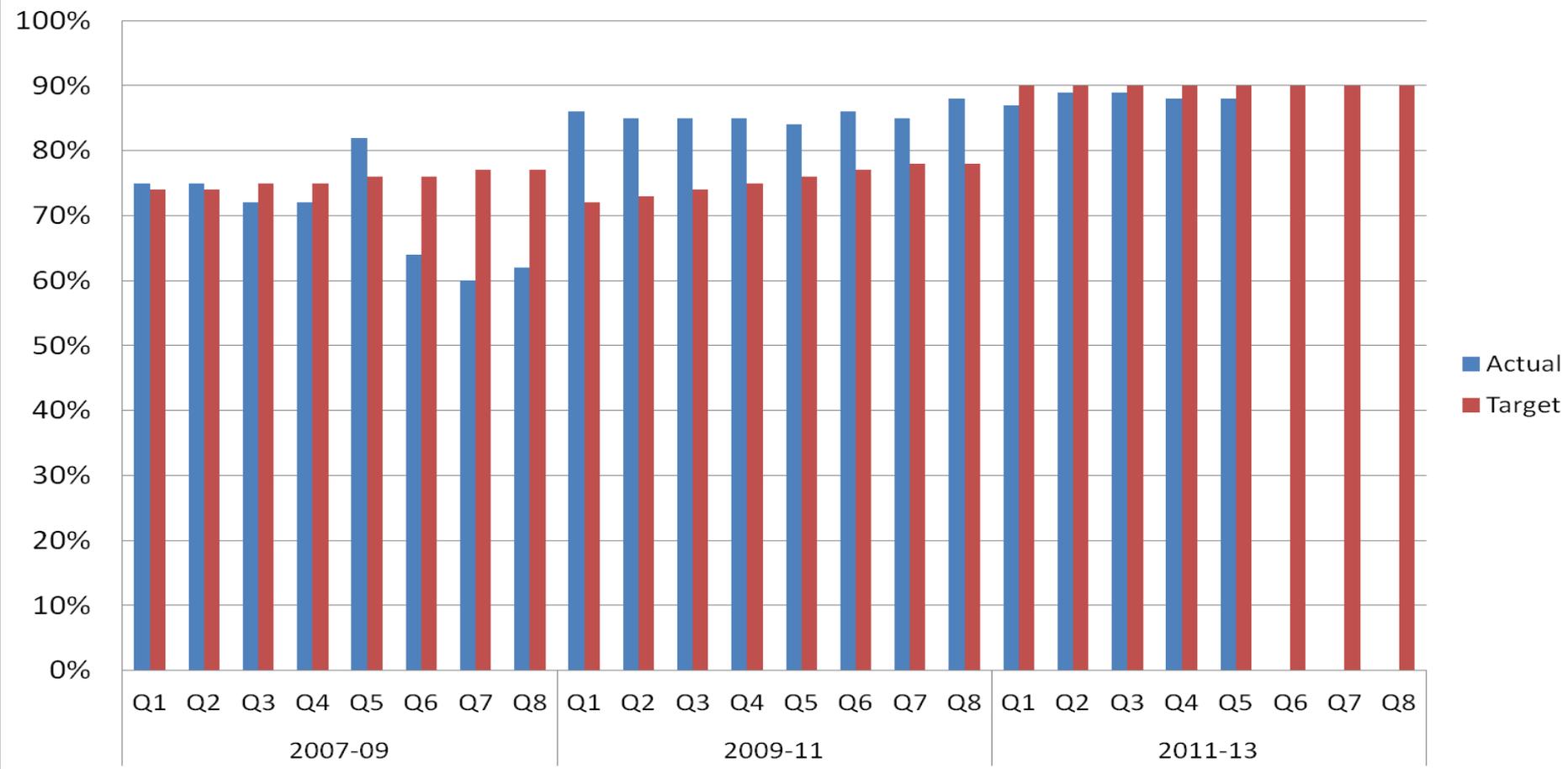
What would you fix?

Percent of complaints against Healthcare Professionals completed within set timelines



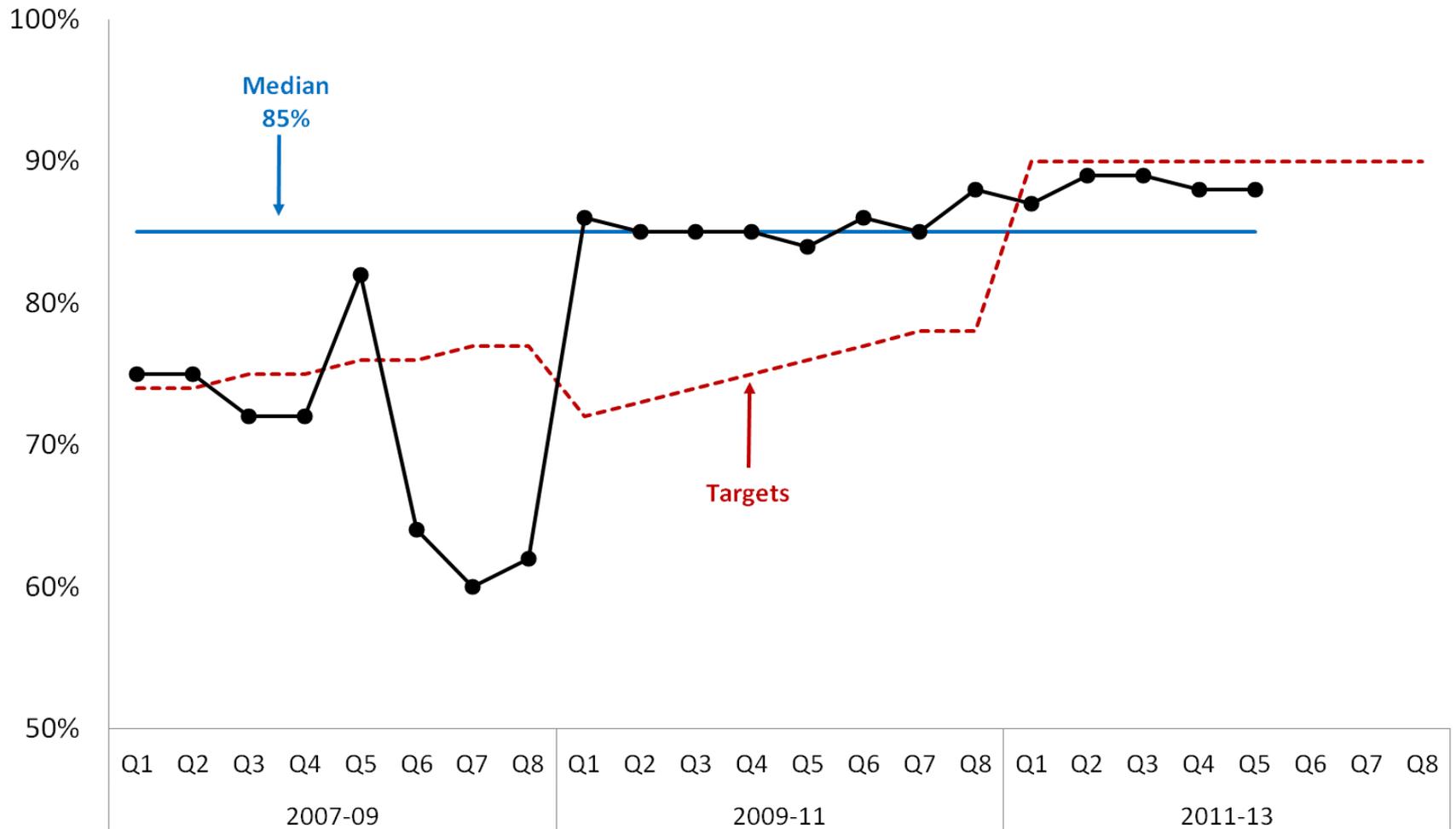
Now, what would you fix?

Percent of complaints against Healthcare Professionals completed within set timelines



Now, what do you see?

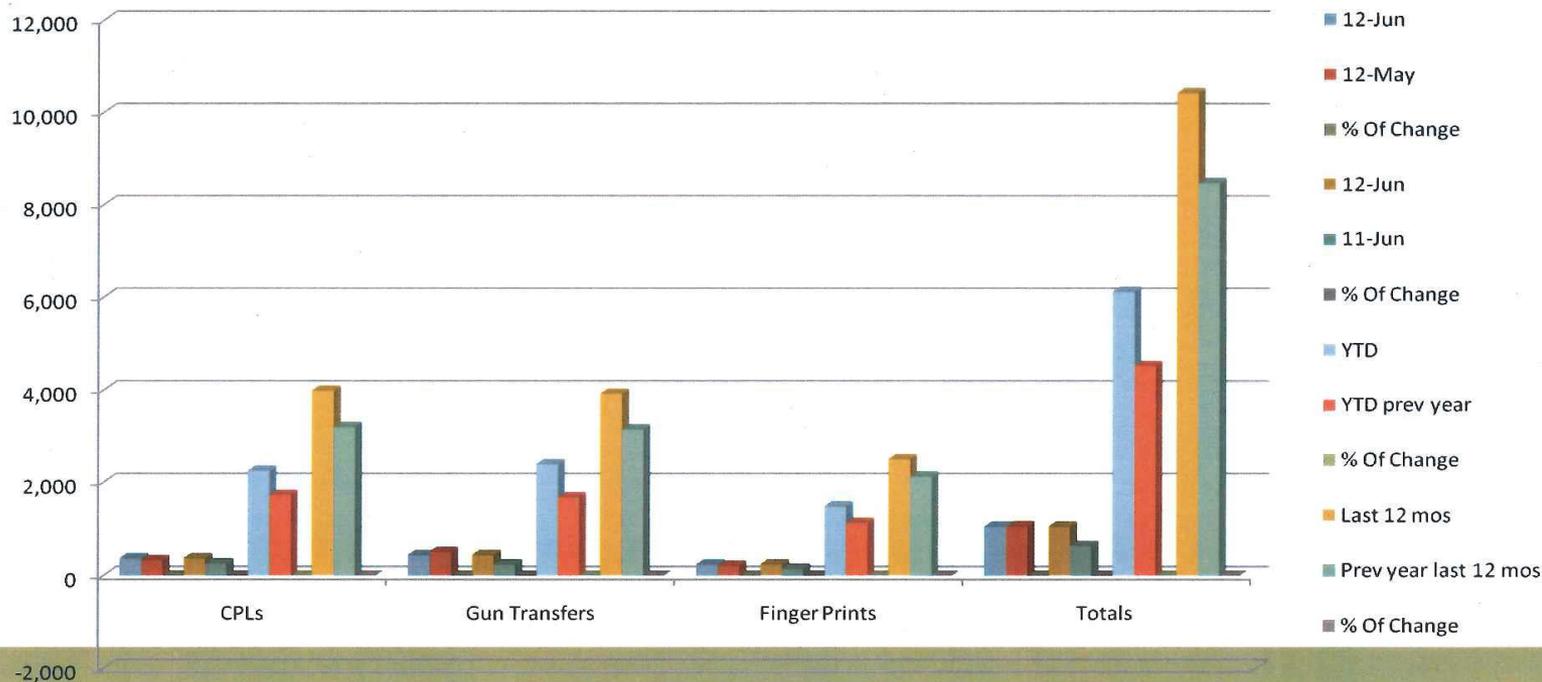
Percent of complaints against Healthcare Professionals completed within set timelines



Let's understand and clean up this chart

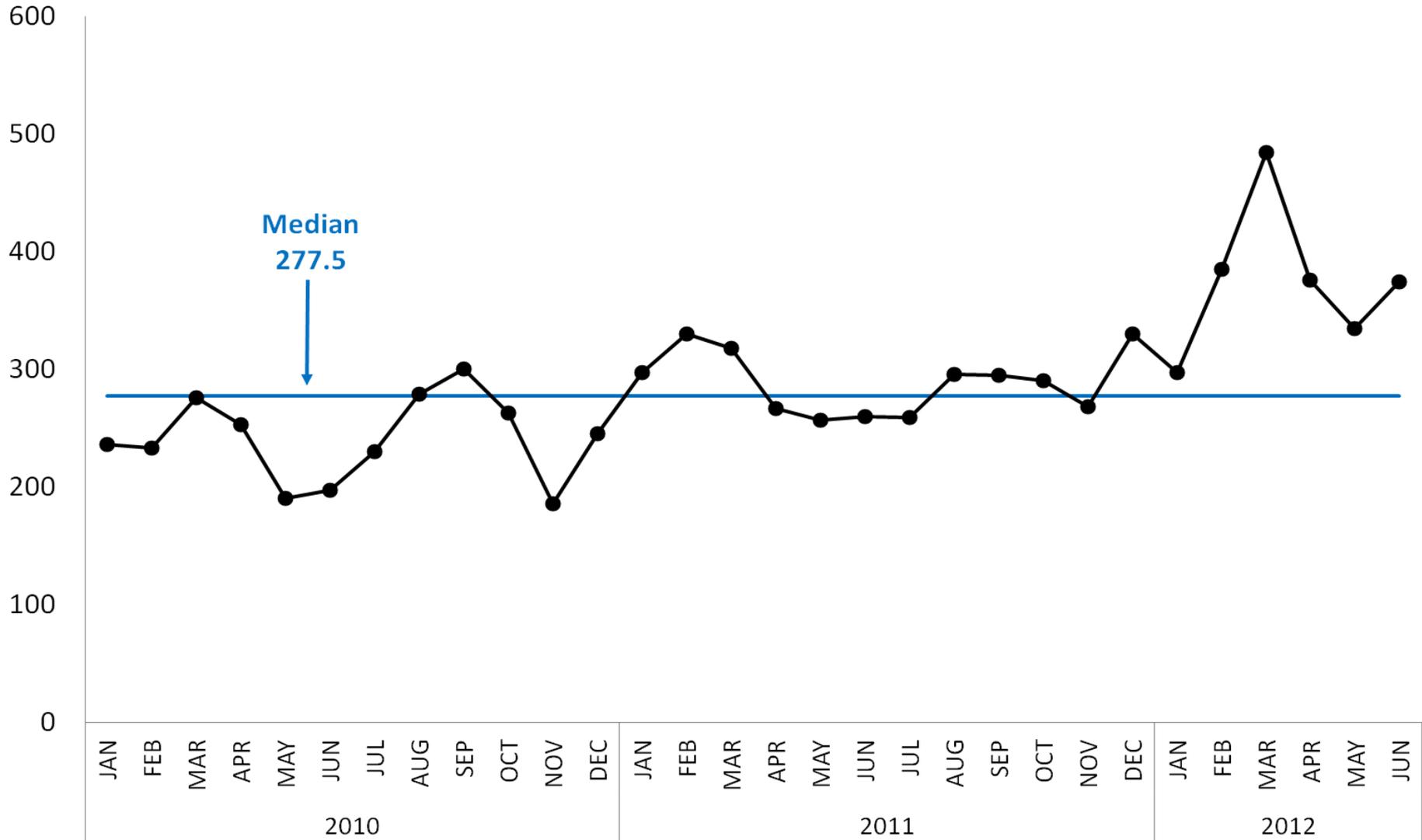
Front Desk Activity

	12-Jun	12-May	% Of Change	12-Jun	11-Jun	% Of Change	YTD	YTD prev year	% Of Change	Last 12 mos	Prev year last 12 mos	% Of Change
CPLs	374	335	11.6%	374	260	43.8%	2,251	1,729	30.2%	3,989	3,197	24.8%
Gun Transfers	445	510	-12.7%	445	241	84.6%	2,394	1,675	42.9%	3,924	3,145	24.8%
Finger Prints	237	213	11.3%	237	145	63.4%	1,476	1,133	30.3%	2,509	2,124	18.1%
Totals	1,056	1,058	-0.2%	1,056	646	63.5%	6,121	4,537	34.9%	10,422	8,466	23.1%

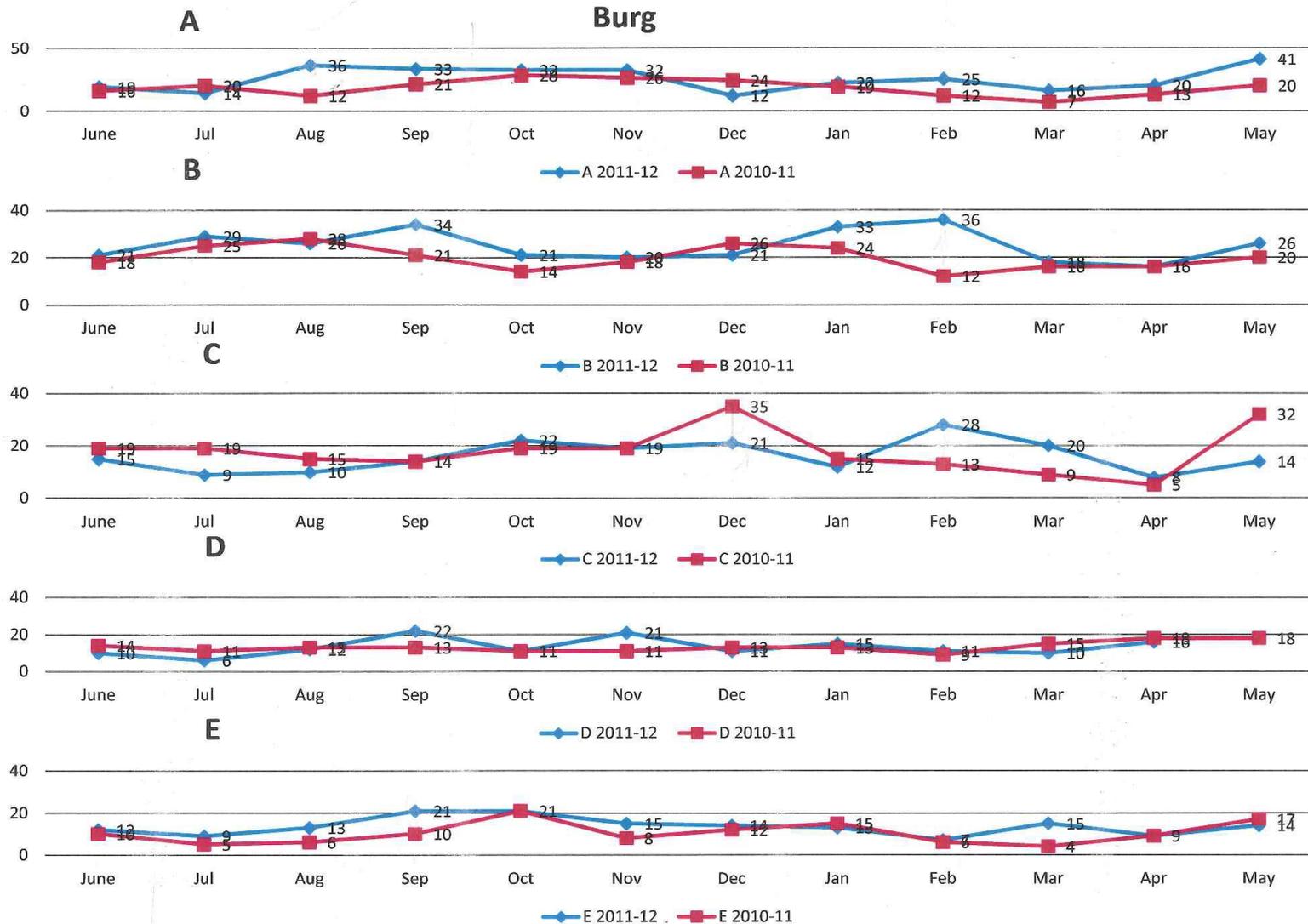


Now, let's analyze the data...

Number of concealed pistol licenses issued per month

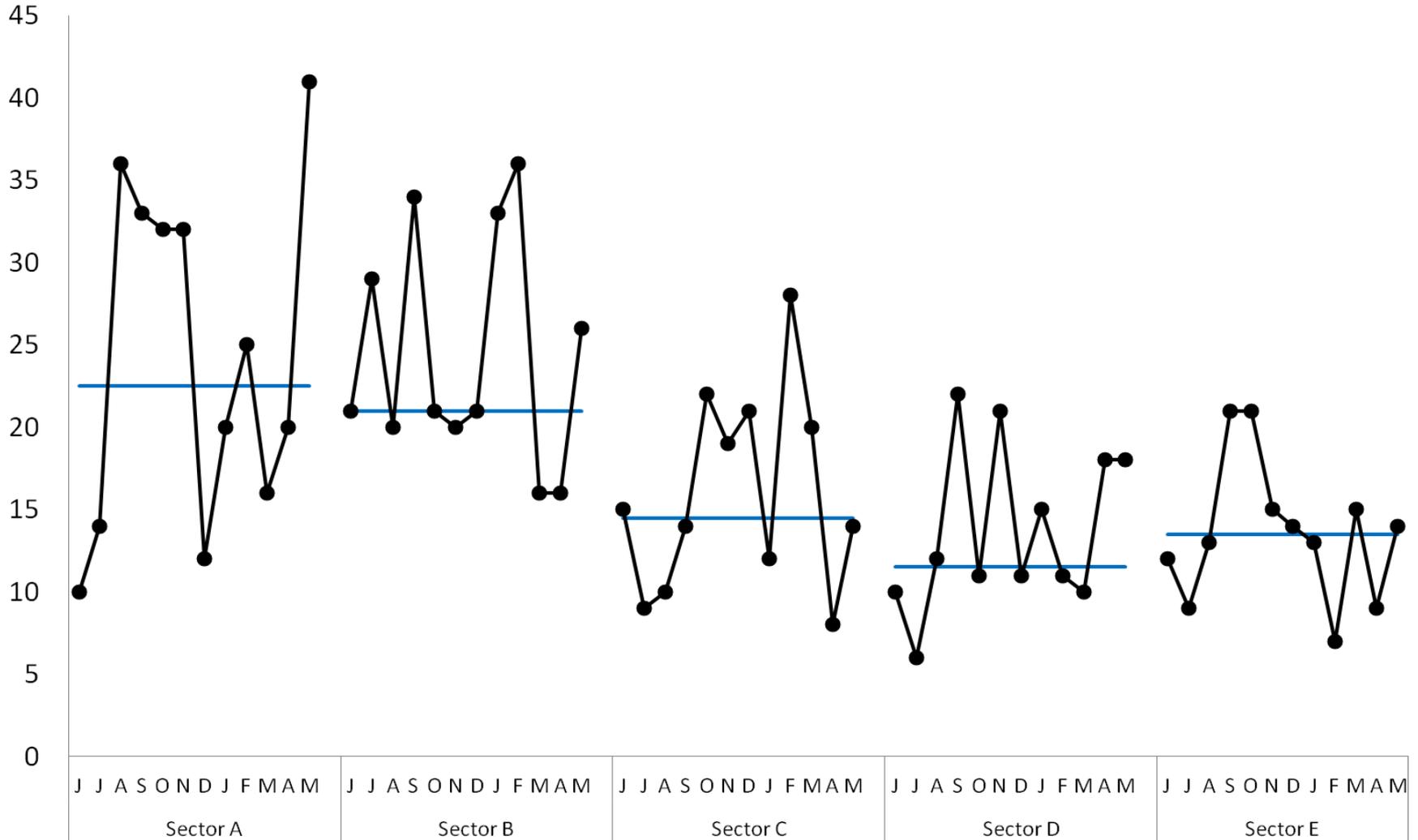


Let's understand and clean up this chart



Now, let's analyze the data...

Number of burglaries per month by sector (FY 2011-12)



Review of Learning Objectives

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What questions do you have?



Additional readings and references

Communicating with Data, T.S. Marshall, 1990.

Understanding Data, T.S. Marshall, 1990.

The Leader's Handbook, Peter Scholtes, 1998.

The Visual Display of Quantitative Information, Eduard R. Tufte, 2001.

Show me the numbers, S. Few, 2004 (available online as a free e-book).

http://courses.washington.edu/info424/2007/readings/Show_Me_the_Numbers_v2.pdf

A Performance Management Framework for State and Local Government, National Performance Management Advisory

Commission, 2010. <http://www.nasbo.org/publications-data/reports/performance-management-framework-state-and-local-government-measurement-an>