How Our Lab Uses Business Intelligence (BI) to Slash TAT, Improve Service, Reduce Costs, and Boost Quality

David Michaelsen, MS, RP
General Manager of Toxicology
PAML Laboratories

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"Major change only works when followers realize your change has made their lives better and improved their productivity and performance."

- General Colin Powell

It Worked For Me – In Life and Leadership

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What Kind of Problems Are You Seeing

Demographic Error Rates

Throughput Issues

Repeat Testing

Delays

Turn Around Time Variances

FTE Increases

Specimen Arrival Times

. . . . . .

“You can’t manage what you don’t measure!”

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Challenges We Saw

- Concentrated Report-Writing Knowledge
- No End-User Interaction/Drill-Down
- Limited to Sunquest
- Manual/Challenging to Present Data
- Limited End-User Access to Previous Reporting/Analyses
- Time Consuming/ No Error Notification
- Difficult Understanding Data Elements

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BACKGROUND:

- PAML performs both Forensic and Clinical Toxicology
- Limits in our Laboratory Information System (LIS) forces us to use two different LIM systems
- Forensic testing uses different test codes from Clinical
- Pulling data is difficult when you try to merge the two systems

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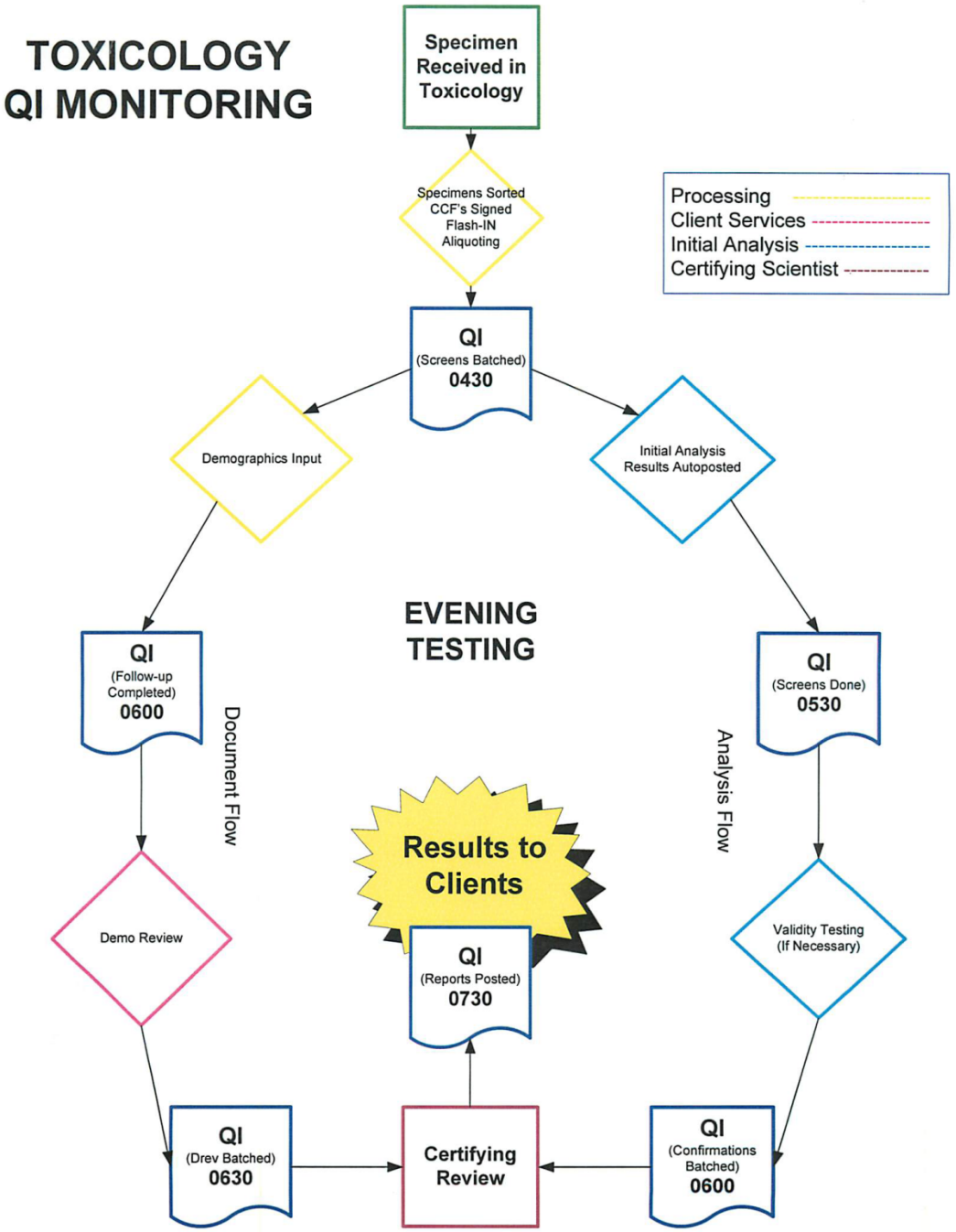
TOXICOLOGY QI MONITORING



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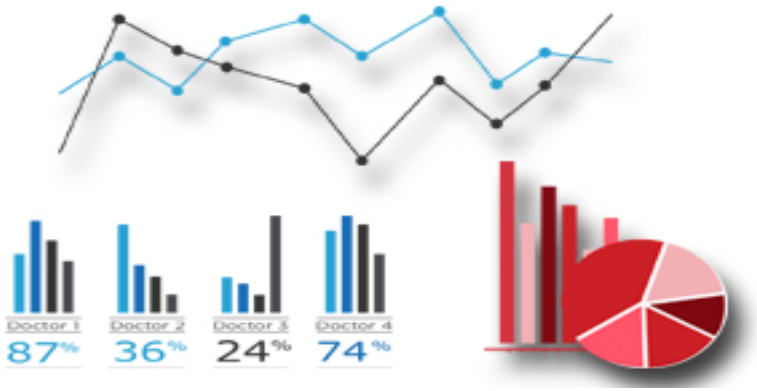
CHEMWARE
LABORATORY INFORMATION MANAGEMENT

sunquest



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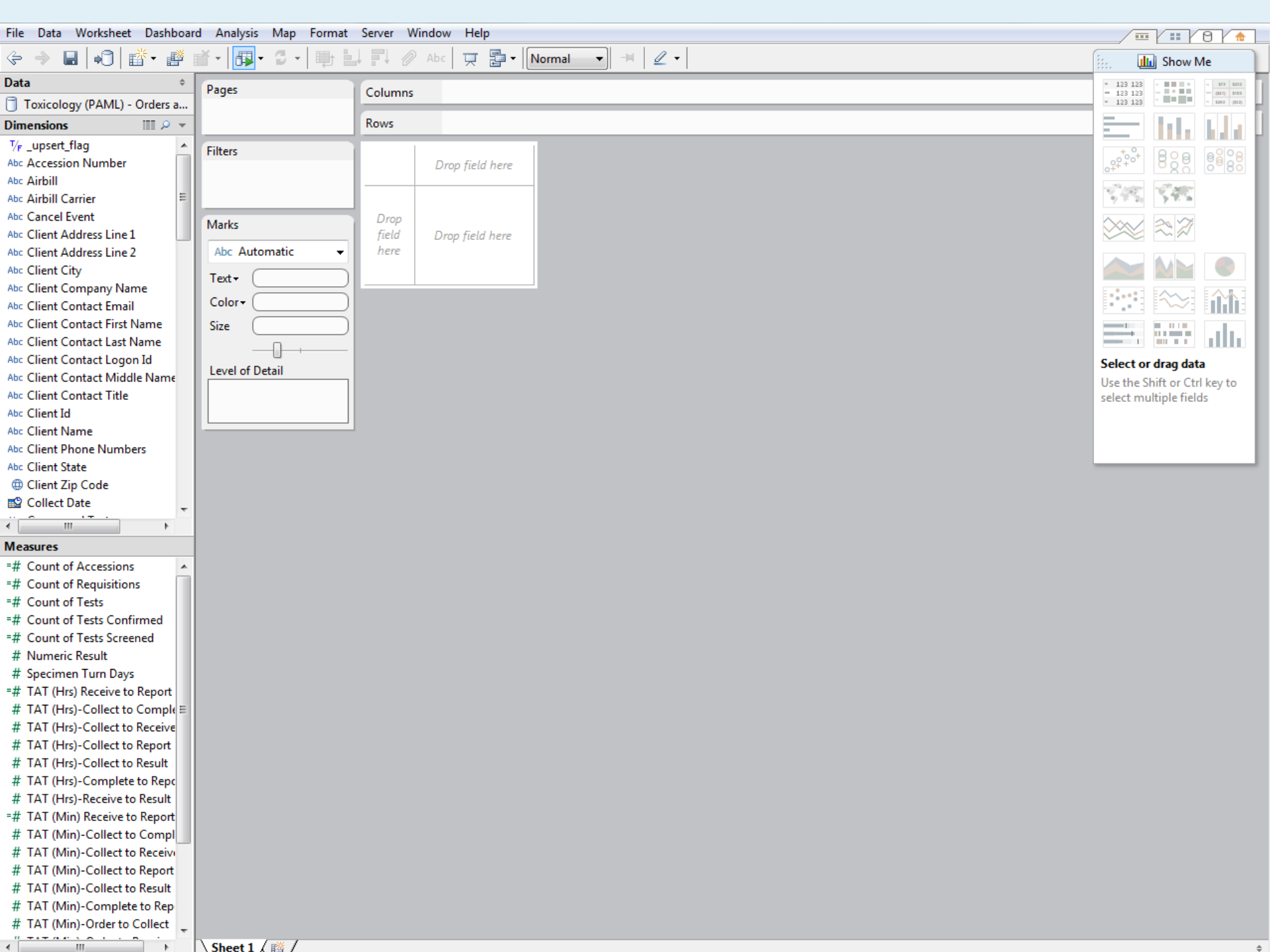
File Data Worksheet Dashboard Analysis Map Format Server Window Help
Normal
Show Me
Data
Toxicology (PAML) - Orders a...
Dimensions
_upsert_flag
Accession Number
Airbill
Airbill Carrier
Cancel Event
Client Address Line 1
Client Address Line 2
Client City
Client Company Name
Client Contact Email
Client Contact First Name
Client Contact Last Name
Client Contact Logon Id
Client Contact Middle Name
Client Contact Title
Client Id
Client Name
Client Phone Numbers
Client State
Client Zip Code
Collect Date
Measures
Count of Accessions
Count of Requisitions
Count of Tests
Count of Tests Confirmed
Count of Tests Screened
Numeric Result
Specimen Turn Days
TAT (Hrs) Receive to Report
TAT (Hrs)-Collect to Comple
TAT (Hrs)-Collect to Receive
TAT (Hrs)-Collect to Report
TAT (Hrs)-Collect to Result
TAT (Hrs)-Complete to Repo
TAT (Hrs)-Receive to Result
TAT (Min) Receive to Report
TAT (Min)-Collect to Compl
TAT (Min)-Collect to Receiv
TAT (Min)-Collect to Report
TAT (Min)-Collect to Result
TAT (Min)-Complete to Rep
TAT (Min)-Order to Collect
Pages
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Marks
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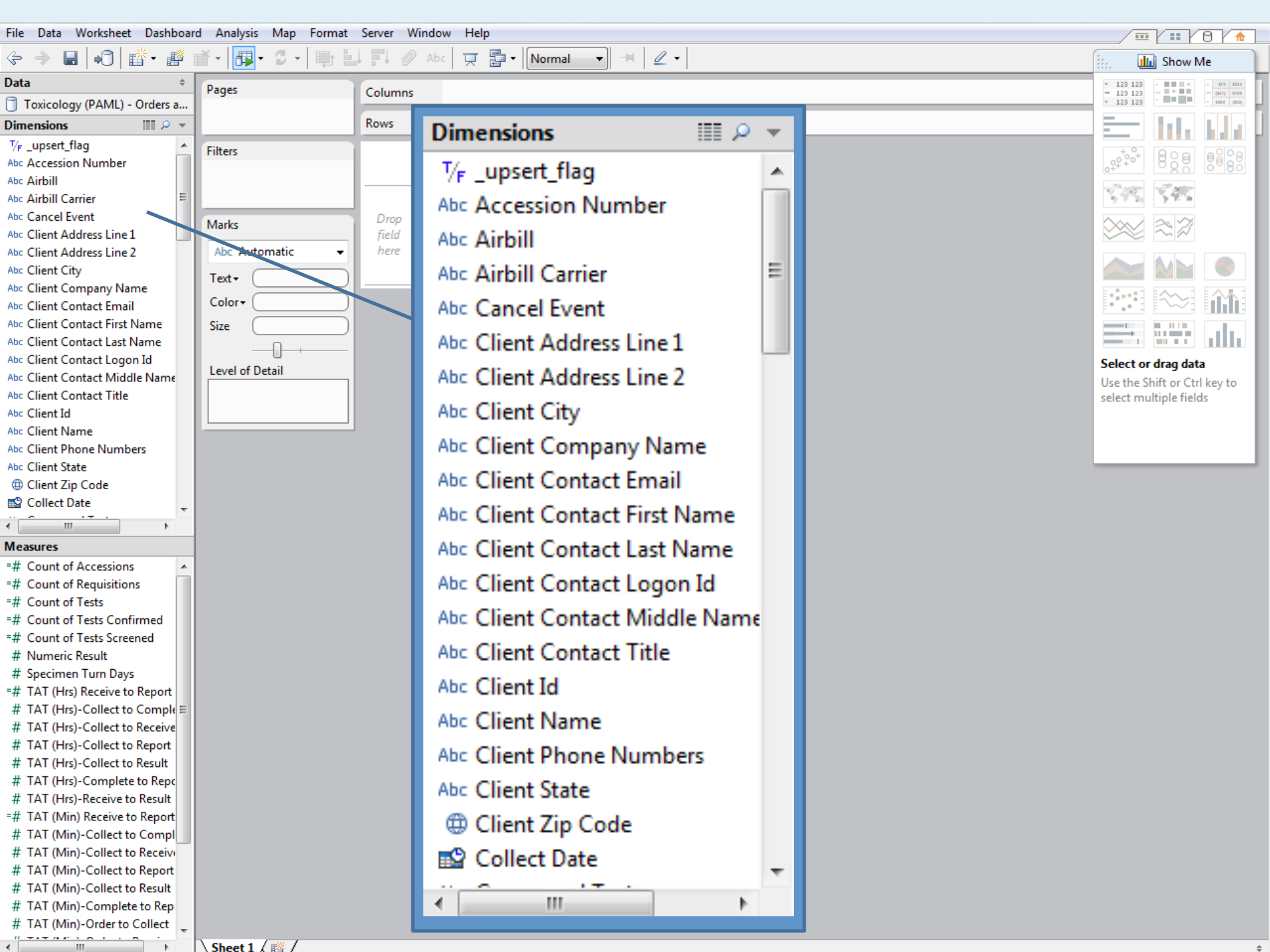
Rows
Drop field here
Drop field here
Drop field here
Select or drag data
Use the Shift or Ctrl key to select multiple fields
Sheet 1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Text
Color
Size
Level of Detail
Columns
Rows
Drop field here
Dimensions
_upsert_flag
Accession Number
Airbill
Airbill Carrier
Cancel Event
Client Address Line 1
Client Address Line 2
Client City
Client Company Name
Client Contact Email
Client Contact First Name
Client Contact Last Name
Client Contact Logon Id
Client Contact Middle Name
Client Contact Title
Client Id
Client Name
Client Phone Numbers
Client State
Client Zip Code
Collect Date
Select or drag data
Use the Shift or Ctrl key to select multiple fields
Sheet 1

File Data Worksheet Dashboard Analysis Map Format Server Window Help

Normal

Show Me

Select or drag data

Use the Shift or Ctrl key to select multiple fields

Data

Toxicology (PAML) - Orders a...

Dimensions

_upsert_flag
Accession Number
Airbill
Airbill Carrier
Cancel Event
Client Address Line 1
Client Address Line 2
Client City
Client Company Name
Client Contact Email
Client Contact First Name
Client Contact Last Name
Client Contact Logon Id
Client Contact Middle Name
Client Contact Title
Client Id
Client Name
Client Phone Numbers
Client State
Client Zip Code
Collect Date

Measures

Count of Accessions
Count of Requisitions
Count of Tests
Count of Tests Confirmed
Count of Tests Screened
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TAT (Hrs)-Collect to Comple
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TAT (Min)-Collect to Report
TAT (Min)-Collect to Result
TAT (Min)-Complete to Rep
TAT (Min)-Order to Collect

Pages

Filters

Marks

Automatic

Text

Color

Size

Level of Detail

Columns

Rows

Drop field here

Sheet 1

Measures

Count of Accessions
Count of Requisitions
Count of Tests
Count of Tests Confirmed
Count of Tests Screened
Numeric Result
Specimen Turn Days
TAT (Hrs) Receive to Report
TAT (Hrs)-Collect to Comple
TAT (Hrs)-Collect to Receive
TAT (Hrs)-Collect to Report
TAT (Hrs)-Collect to Result
TAT (Hrs)-Complete to Repo
TAT (Hrs)-Receive to Result
TAT (Min) Receive to Report
TAT (Min)-Collect to Compl
TAT (Min)-Collect to Receiv
TAT (Min)-Collect to Report
TAT (Min)-Collect to Result
TAT (Min)-Complete to Rep
TAT (Min)-Order to Collect

File Data Worksheet Dashboard Analysis Map Format Server Window Help

Normal | Show Me

Data

Toxicology (PAML) - Orders and Res...
Toxicology (PAML) - Schedule Data ...

Dimensions

- _upsert_flag
- Accession Number
- Airbill
- Airbill Carrier
- Cancel Event

Measures

- Average Daily Count of Accessions
- Average Daily Count of Tests
- Count of Accessions
- Count of Requisitions
- Count of Tests
- Count of Tests Confirmed
- Count of Tests Screened
- FTE Requirement
- Numeric Result
- Specimen Turn Days
- TAT (Hrs) Receive to Report
- TAT (Hrs)-Collect to Complete
- TAT (Hrs)-Collect to Receive
- TAT (Hrs)-Collect to Report
- TAT (Hrs)-Collect to Result
- TAT (Hrs)-Complete to Report
- TAT (Hrs)-Receive to Result
- TAT (Min) Receive to Report
- TAT (Min)-Collect to Complete
- TAT (Min)-Collect to Receive
- TAT (Min)-Collect to Report
- TAT (Min)-Collect to Result
- TAT (Min)-Complete to Report
- TAT (Min)-Order to Collect
- TAT (Min)-Order to Receive
- TAT (Min)-Order to Result
- TAT (Min)-Receive to Result

Parameters

- TAT Goal in Hours (Negative Tests)
- TAT Goal in Hours (Positive Tests)
- Tests Per FTE

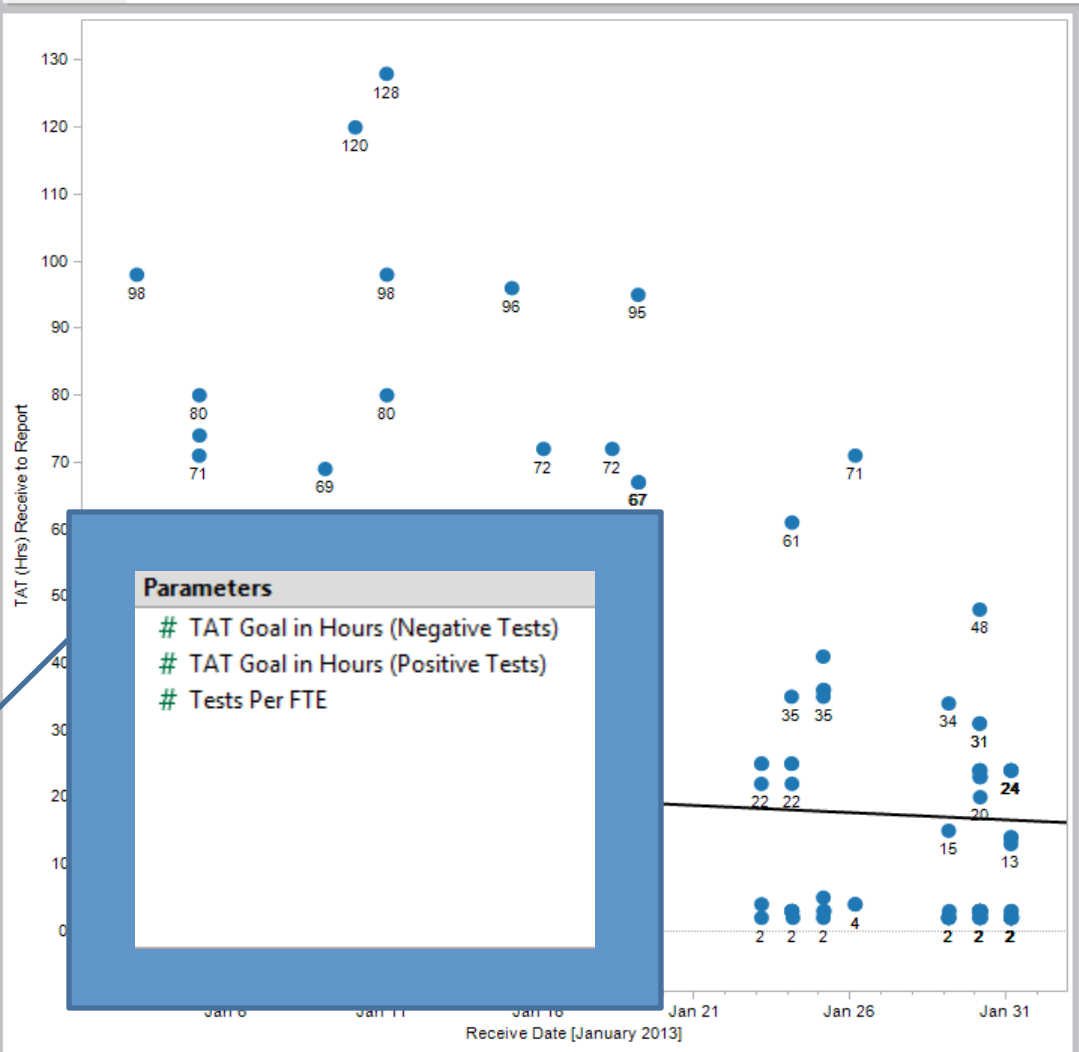
Pages

Filters
- MY(Receive Date): J..
- Test Result: N
- Client Name: Tulali..
- MIN(TAT (Hrs) Rec..

Marks
Circle
Label
Color
Size
Level of Detail

Columns: Receive Date
Rows: ATTR(TAT (Hrs) Rec..

Title: Outlier of Negative Result TATs



Client Name
(All)
PROV S DIVISION UR
`American Nursing C
1 800 Asphalt LLC/FN
1st Choice Charters/
3 Bar S/VMCU
3 K Trucking/OM
3 Kings Environment
3 Rivers Potato Serv
3W Trucking/THW
4 C ranch/DOT/ADFA
4 Corners Organic In
4 F's Transportation
4 G Plumbing & Hea

MY(Receive Date)
(All)
Null
July 2004
August 2004
January 2005
July 2005
September 2005
December 2009
December 2010
September 2011
January 2012
February 2012
March 2012
April 2012
May 2012

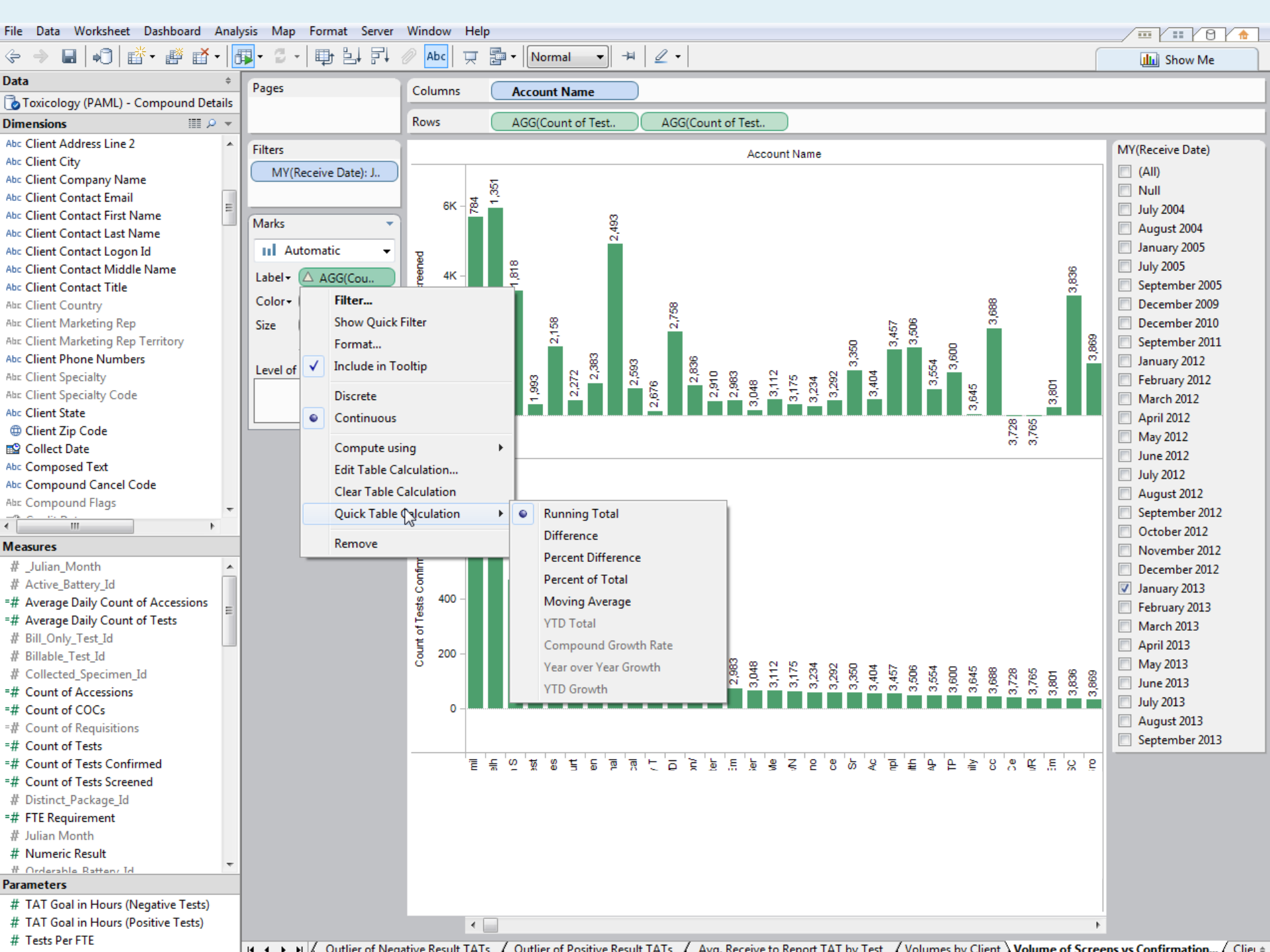
Summary

Count:	225
ATTR(TAT (Hrs) Receive t...	
Sum:	4,466
Average:	19.85
Minimum:	2
Maximum:	128
Median:	6.00

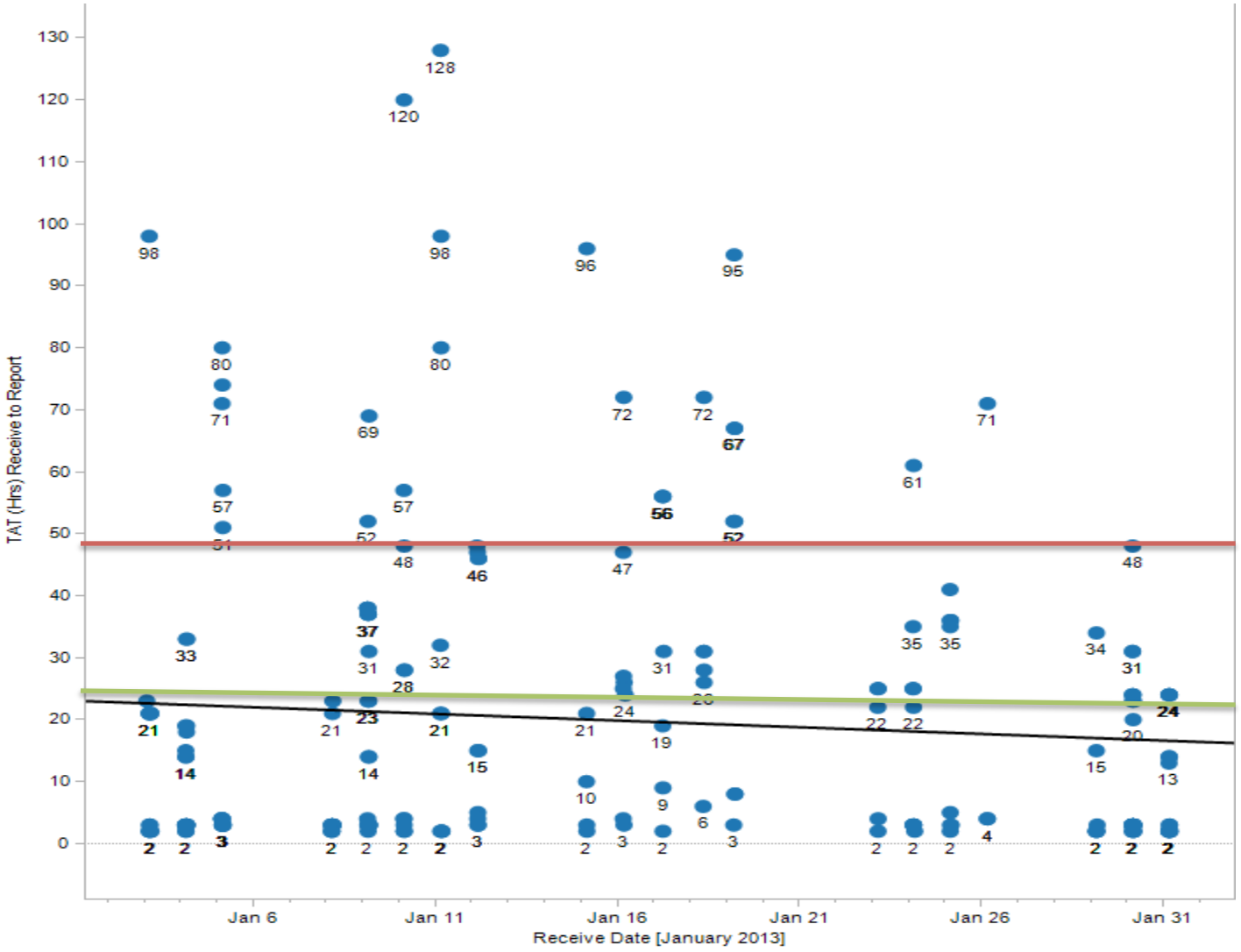
Caption
The plot of TAT (Hrs) Receive to Report as an attribute for Receive Date. The data is filtered on Receive Date (MY), Test Result, Client Name and minimum of TAT (Hrs) Receive to Report. The Receive Date (MY) filter keeps January 2013. The Test Result filter keeps N. The Client Name filter

% of Negative Results Meeting TAT G... | % of Positive Results Meeting TAT Go... | **Outlier of Negative Result TATs** | Outlier of Positive Result TATs | Volumes by Client | Client

225 marks 1 row by 1 column SUM of ATTR(TAT (Hrs) Receive to Report): 4,466


File Data Worksheet Dashboard Analysis Map Format Server Window Help
Normal
Show Me
Data
Toxicology (PAML) - Compound Details
Dimensions
Client Address Line 2
Client City
Client Company Name
Client Contact Email
Client Contact First Name
Client Contact Last Name
Client Contact Logon Id
Client Contact Middle Name
Client Contact Title
Client Country
Client Marketing Rep
Client Marketing Rep Territory
Client Phone Numbers
Client Specialty
Client Specialty Code
Client State
Client Zip Code
Collect Date
Composed Text
Compound Cancel Code
Compound Flags
Measures
_Julian_Month
Active_Battery_Id
Average Daily Count of Accessions
Average Daily Count of Tests
Bill_Only_Test_Id
Billable_Test_Id
Collected_Specimen_Id
Count of Accessions
Count of COCs
Count of Requisitions
Count of Tests
Count of Tests Confirmed
Count of Tests Screened
Distinct_Package_Id
FTE Requirement
Julian Month
Numeric Result
Parameters
TAT Goal in Hours (Negative Tests)
TAT Goal in Hours (Positive Tests)
Tests Per FTE
Pages
Columns
Account Name
Rows
AGG(Count of Test..
AGG(Count of Test..
Filters
MY(Receive Date): J..
Marks
Automatic
Label
AGG(Cou..
Color
Size
Level of
Filter...
Show Quick Filter
Format...
Include in Tooltip
Discrete
Continuous
Compute using
Edit Table Calculation...
Clear Table Calculation
Quick Table Calculation
Remove
Running Total
Difference
Percent Difference
Percent of Total
Moving Average
YTD Total
Compound Growth Rate
Year over Year Growth
YTD Growth
Account Name
Count of Tests Confirmed
6K
4K
400
200
0
784
1,351
1,818
1,993
2,158
2,272
2,383
2,493
2,593
2,676
2,758
2,836
2,910
2,983
3,048
3,112
3,175
3,234
3,292
3,350
3,404
3,457
3,506
3,554
3,600
3,645
3,688
3,728
3,765
3,801
3,836
3,869
MY(Receive Date)
(All)
Null
July 2004
August 2004
January 2005
July 2005
September 2005
December 2009
December 2010
September 2011
January 2012
February 2012
March 2012
April 2012
May 2012
June 2012
July 2012
August 2012
September 2012
October 2012
November 2012
December 2012
January 2013
February 2013
March 2013
April 2013
May 2013
June 2013
July 2013
August 2013
September 2013
Outlier of Negative Result TATs
Outlier of Positive Result TATs
Avg. Receive to Report TAT by Test
Volumes by Client
Volume of Screens vs Confirmation...

Client Negative Result TAT Report



48 hrs

24 hrs

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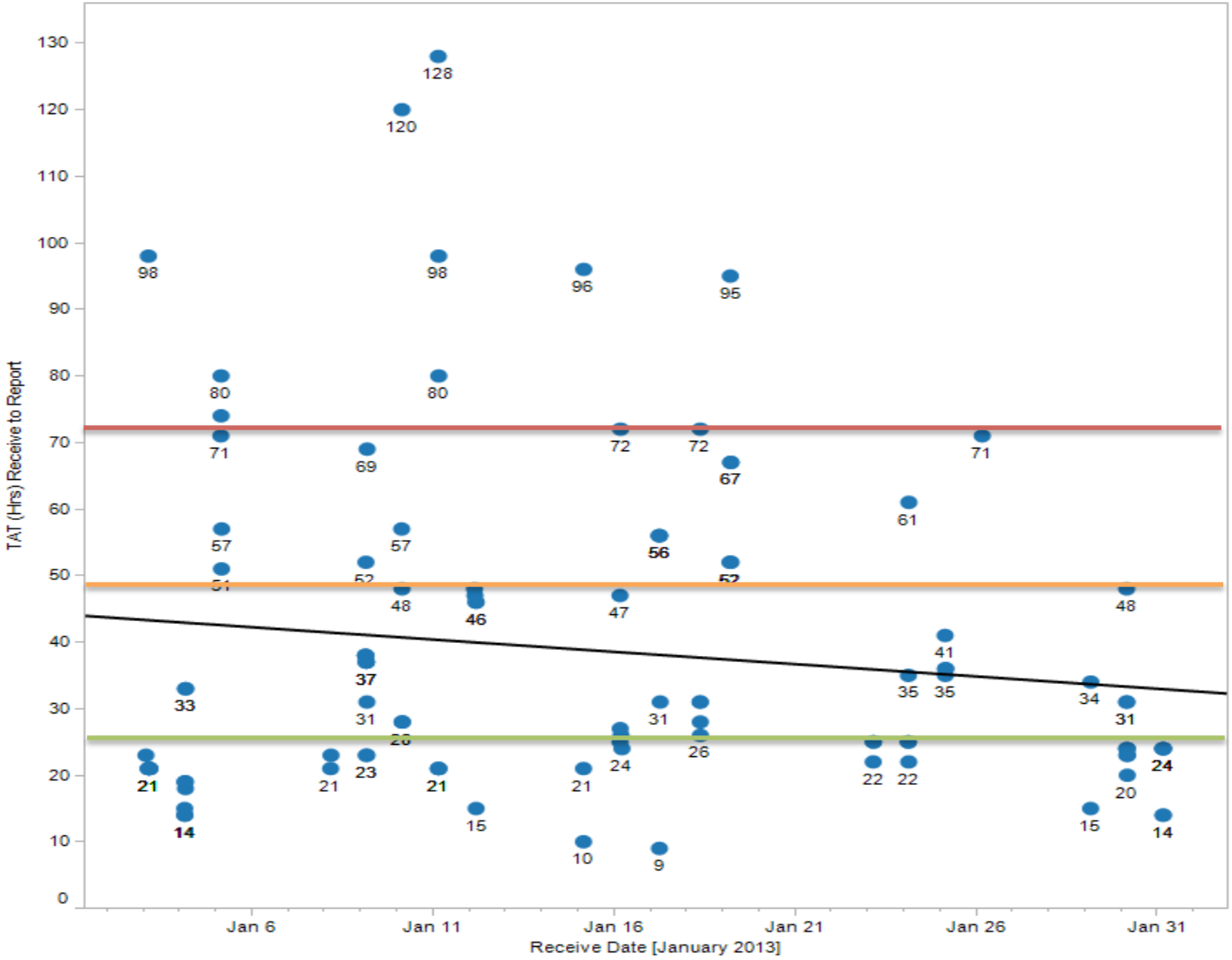
Client Positive Result TAT Report



72 hrs

48 hrs

24 hrs

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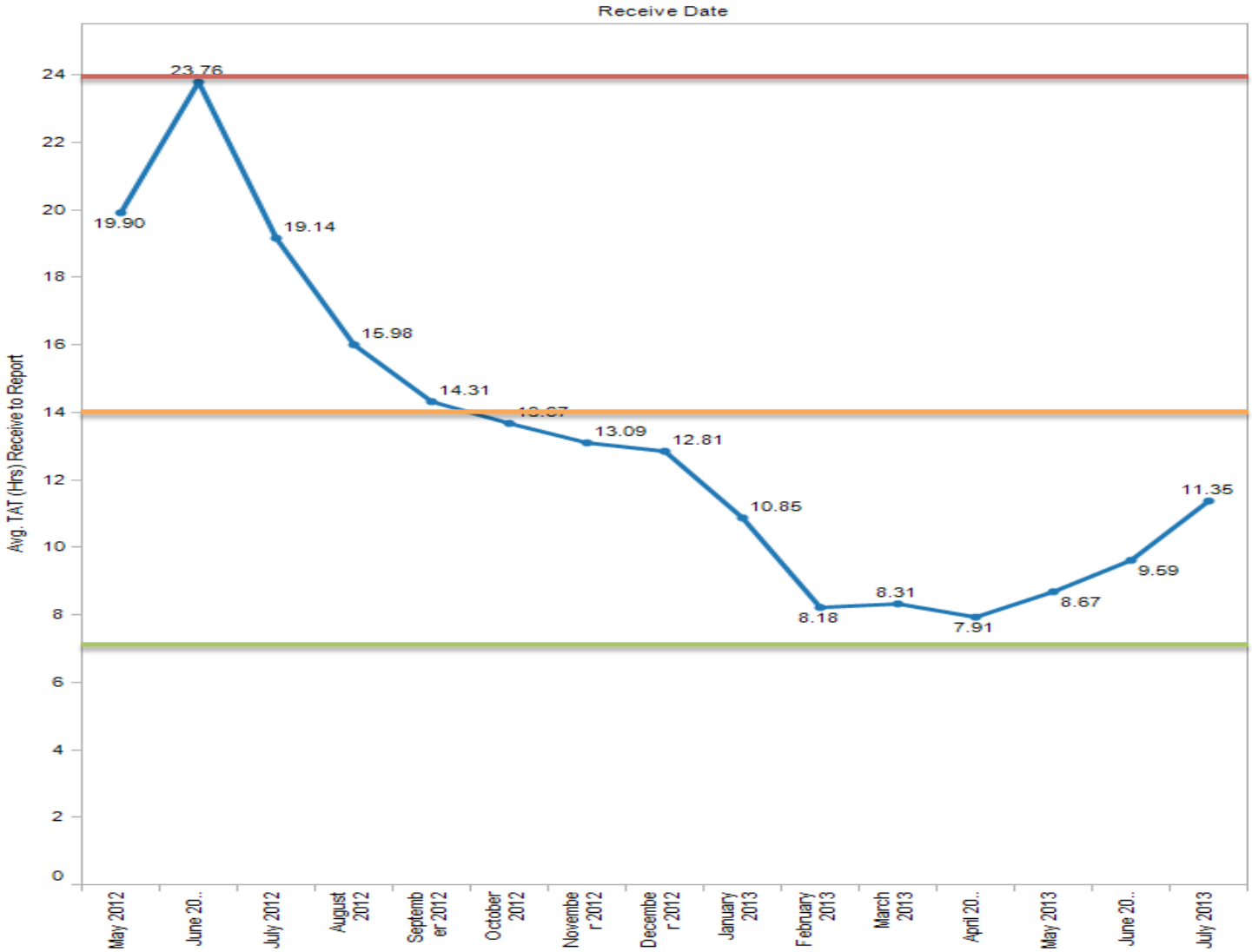
Forensic Negative Turn Around Time from Receipt (AVG)



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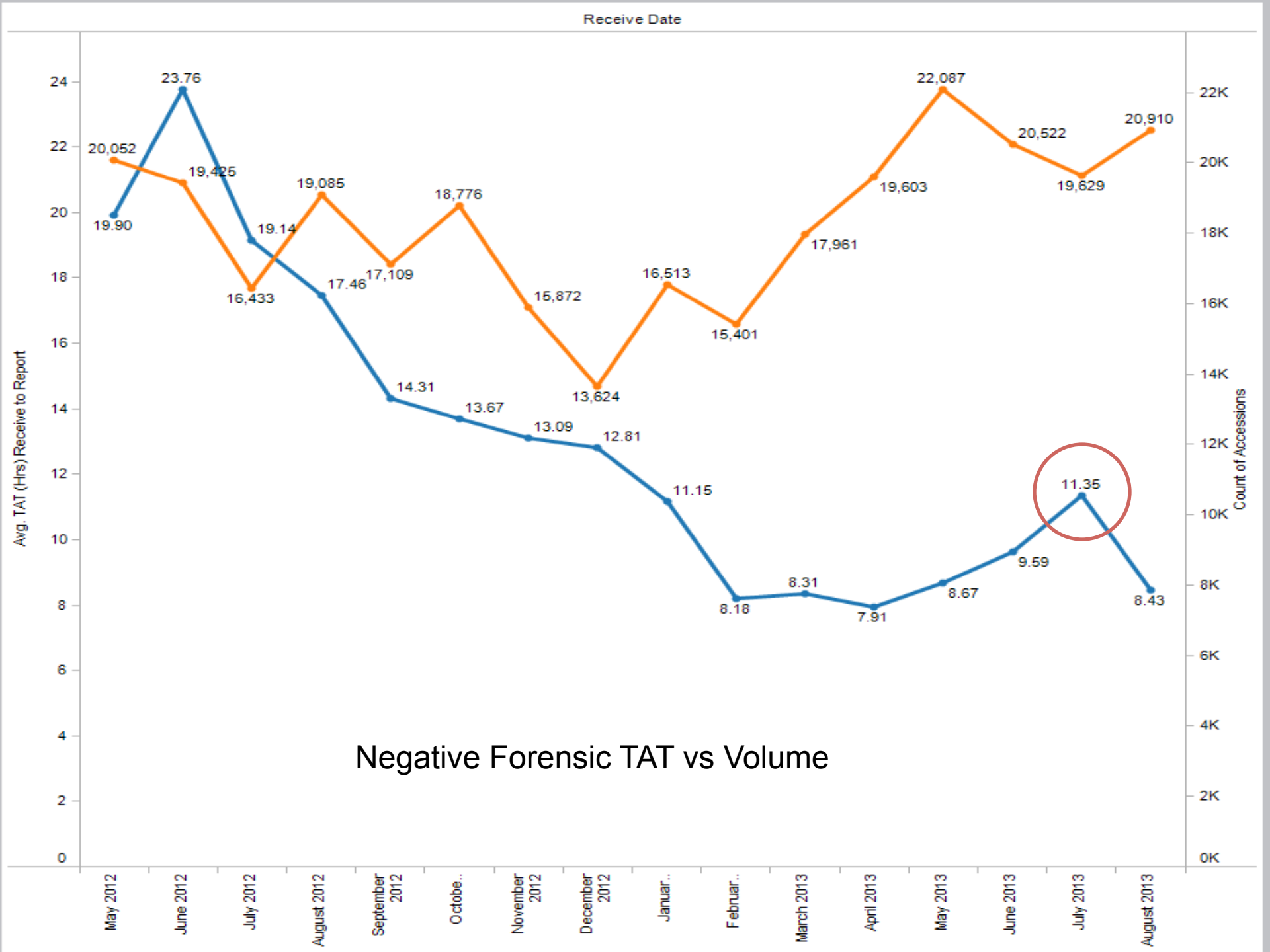


Negative Forensic TAT vs Volume

Pages

Columns MY(Receive Date)

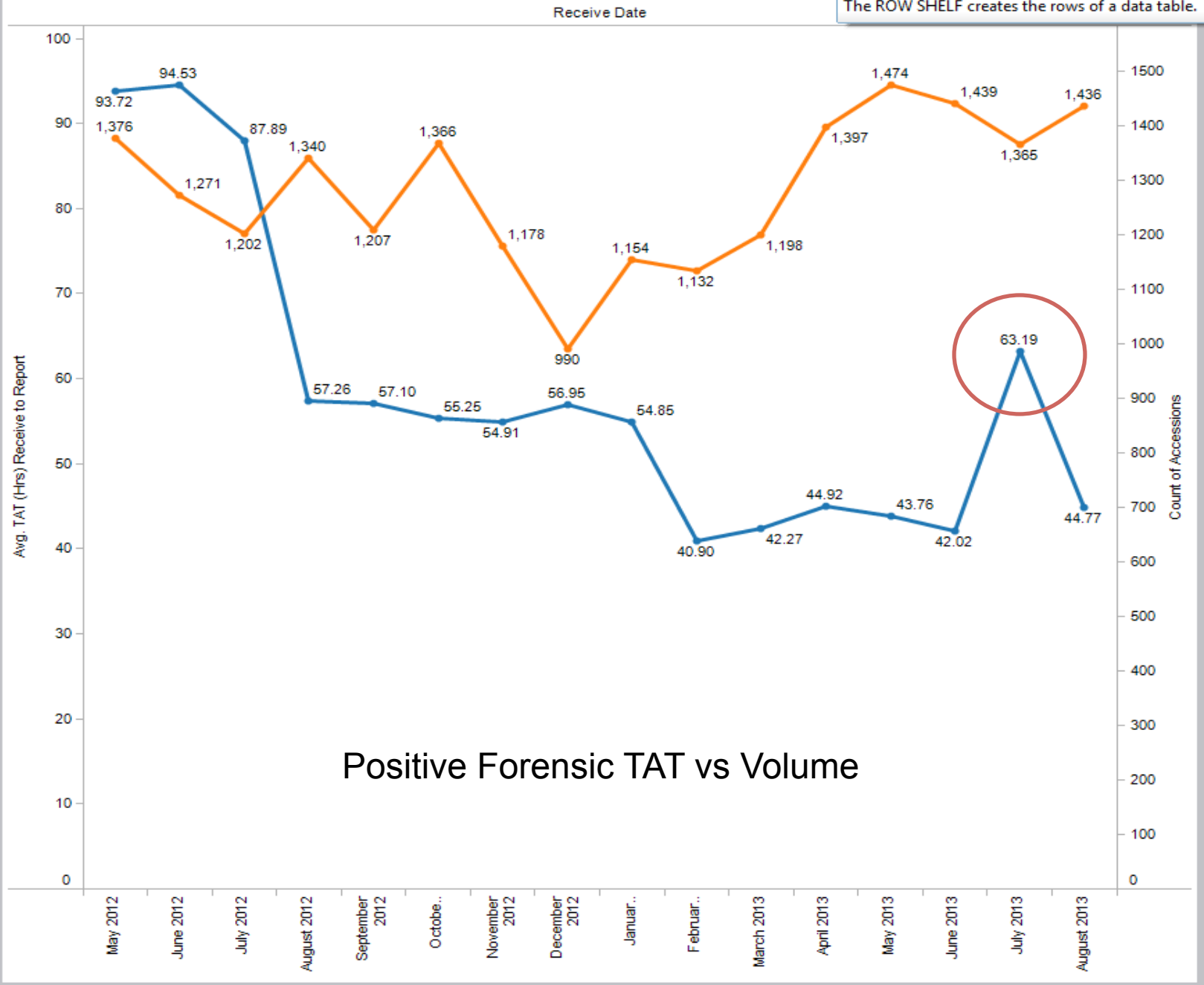
Rows AVG(TAT (Hrs) Rec.. AGG(Count of Acce..

Filters
- MY(Receive Date)
- Orderable Code (B..
- Schedule Procedur..
- Test Result: P

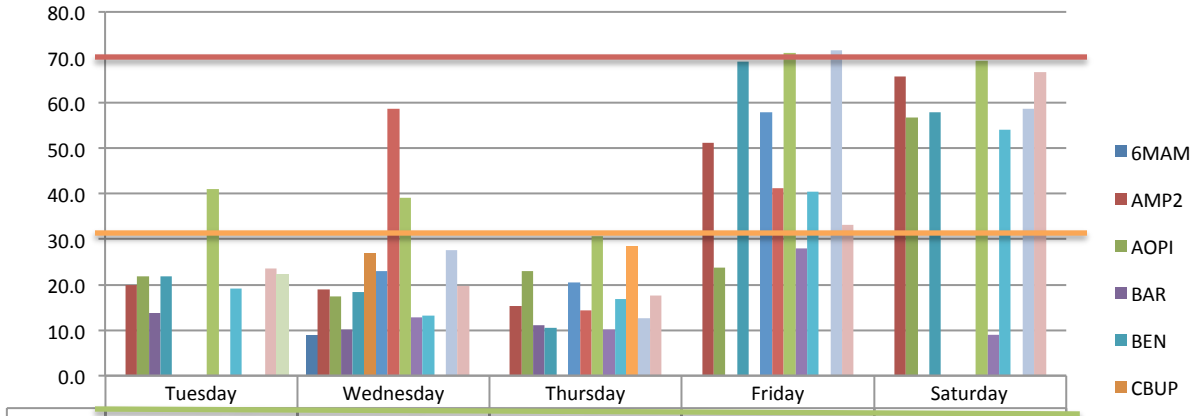
Marks
- Automatic
- Path
- Label
- Color Measure Na..
- Size
- Level of Detail

Measure Names
- Avg. TAT (Hrs) Receive t..
- Count of Accessions

The ROW SHELF creates the rows of a data table.



GC/MS TAT by Analyte



	Tuesday	Wednesday	Thursday	Friday	Saturday
6MAM		8.9			
AMP2	19.8	18.9	15.2	51.3	65.8
AOPI	21.9	17.4	22.9	23.7	56.8
BAR	13.8	10.2	11.0		
BEN	21.9	18.4	10.6	68.9	57.8
CBUP		27.0			
COC1		22.9	20.5	57.9	
MD+L		58.6	14.4	41.2	
MDMA	41.1	39.0	30.7	71.0	69.3
MTD		12.7	10.1	28.0	9.0
OPI2	19.2	13.2	16.8	40.5	54.1
PCP			28.5		
SOMA		27.6	12.6	71.5	58.6
THC	23.6	19.7	17.6	33.2	66.8
TRAM	22.4				

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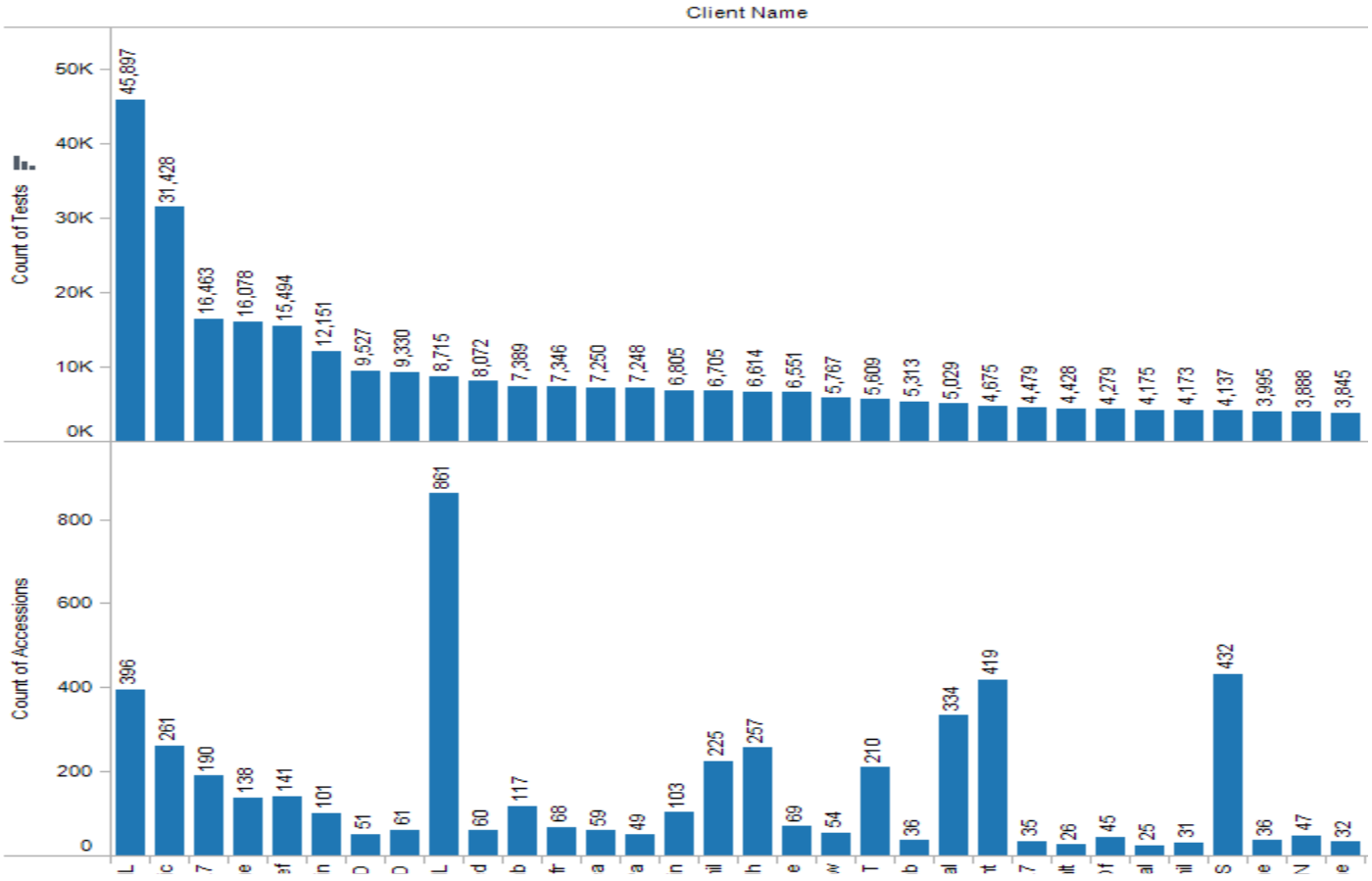
Count of Tests vs Accessions



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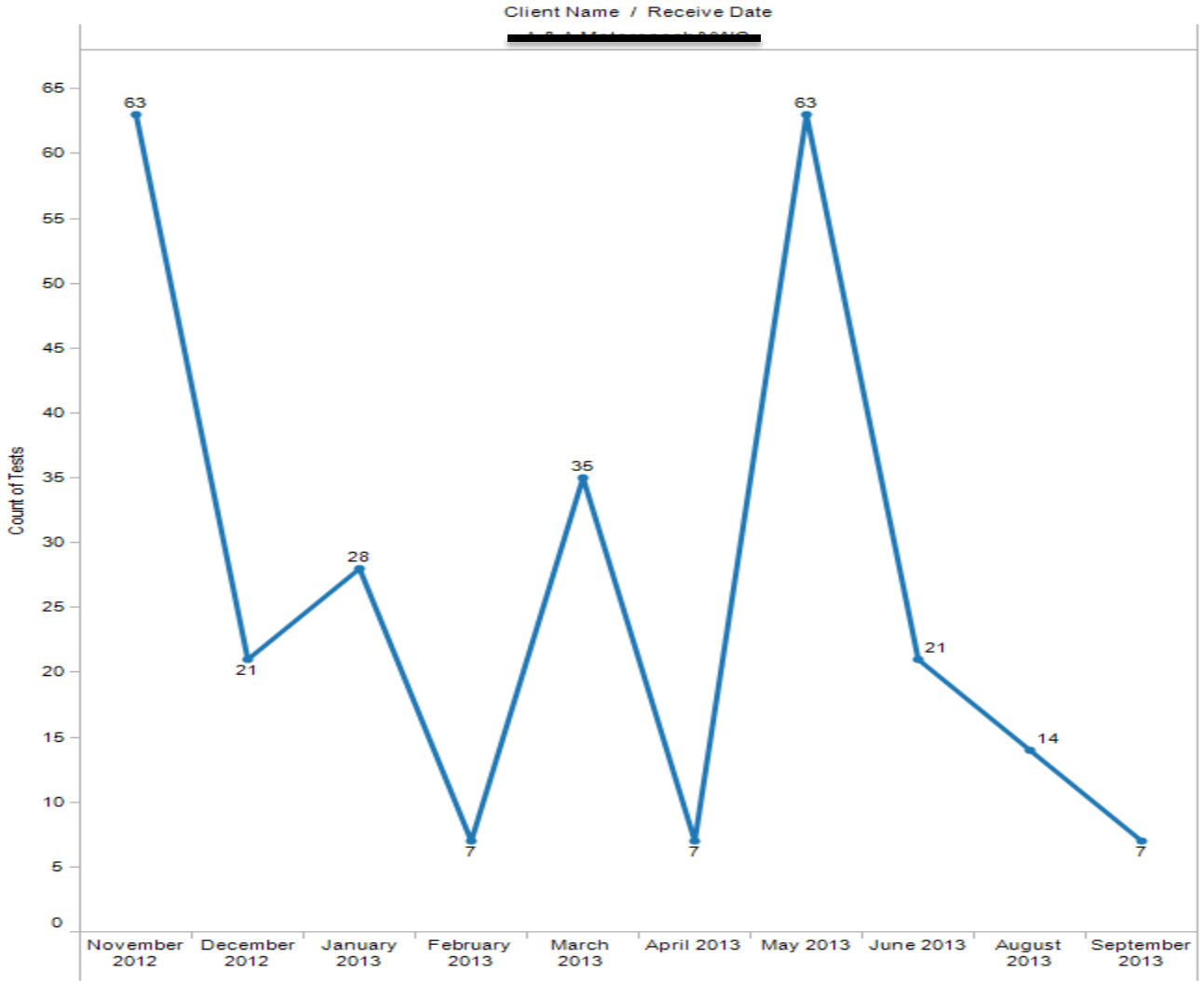
Monthly Volume by Client



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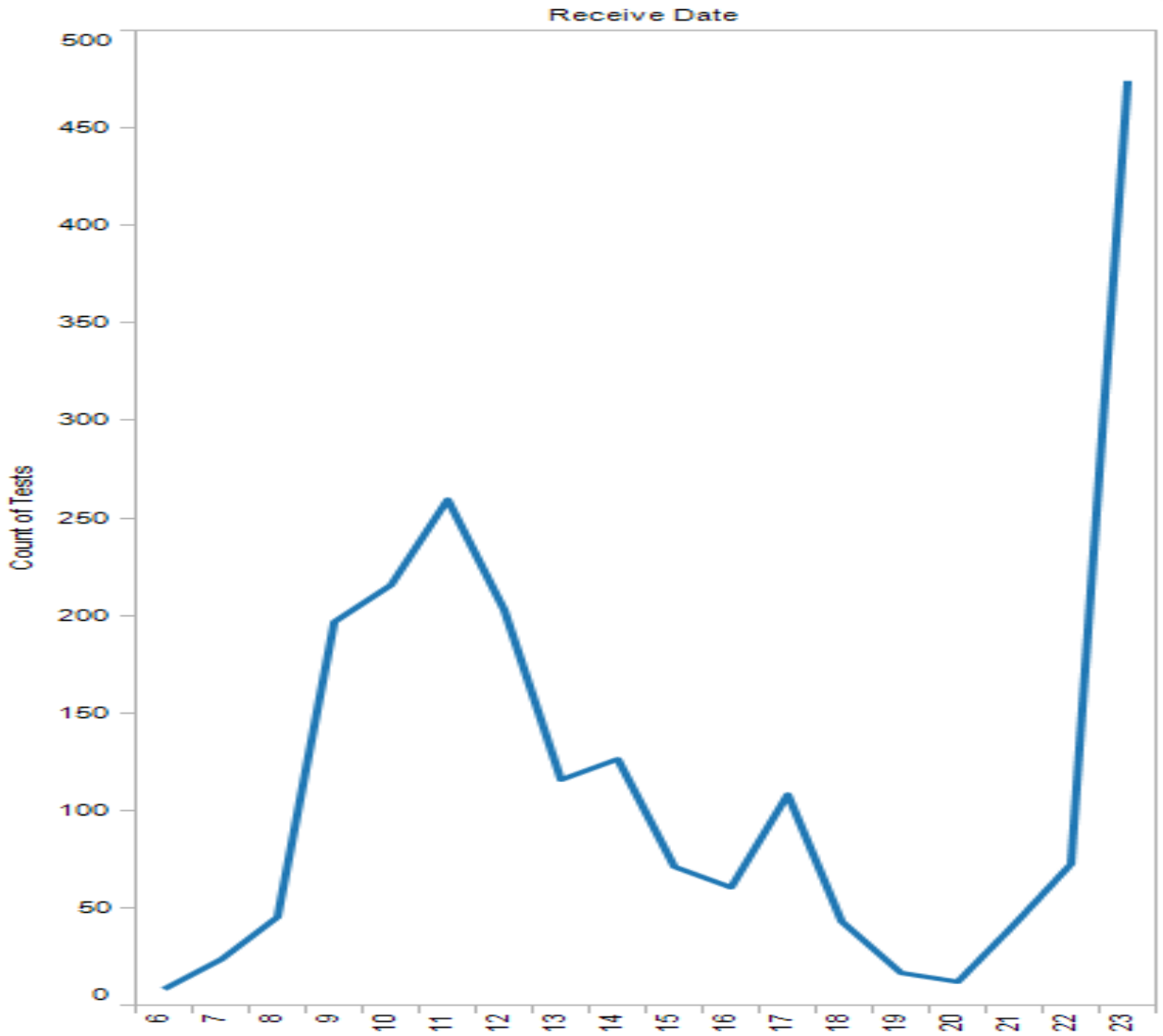
Workload by Compound Code (ACET)



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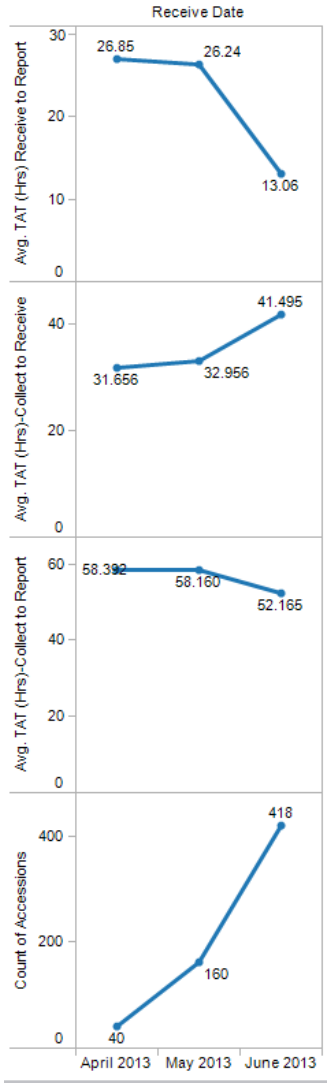
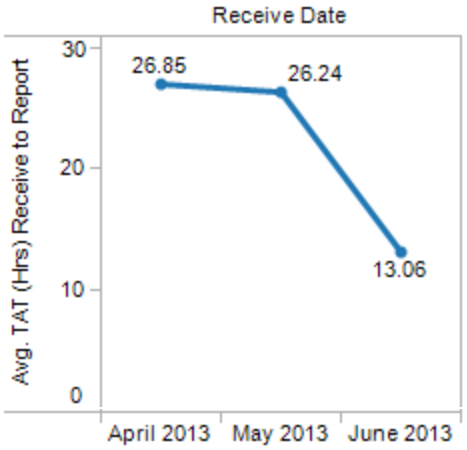
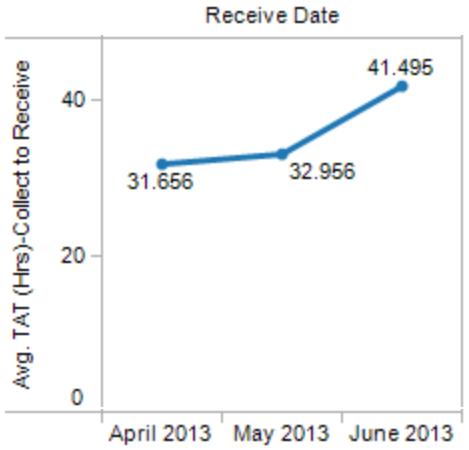
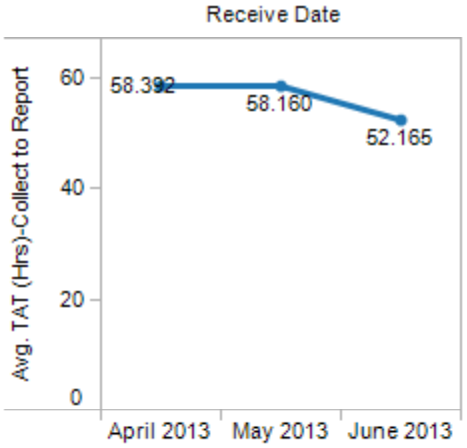
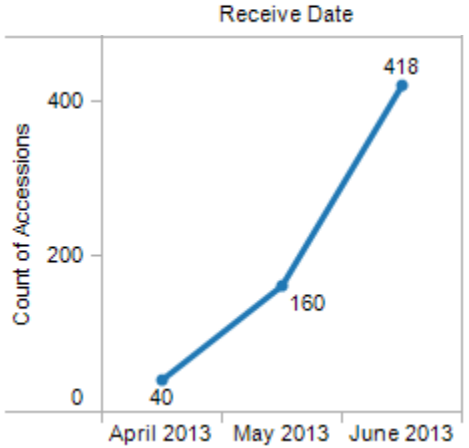
Comparing Indicators











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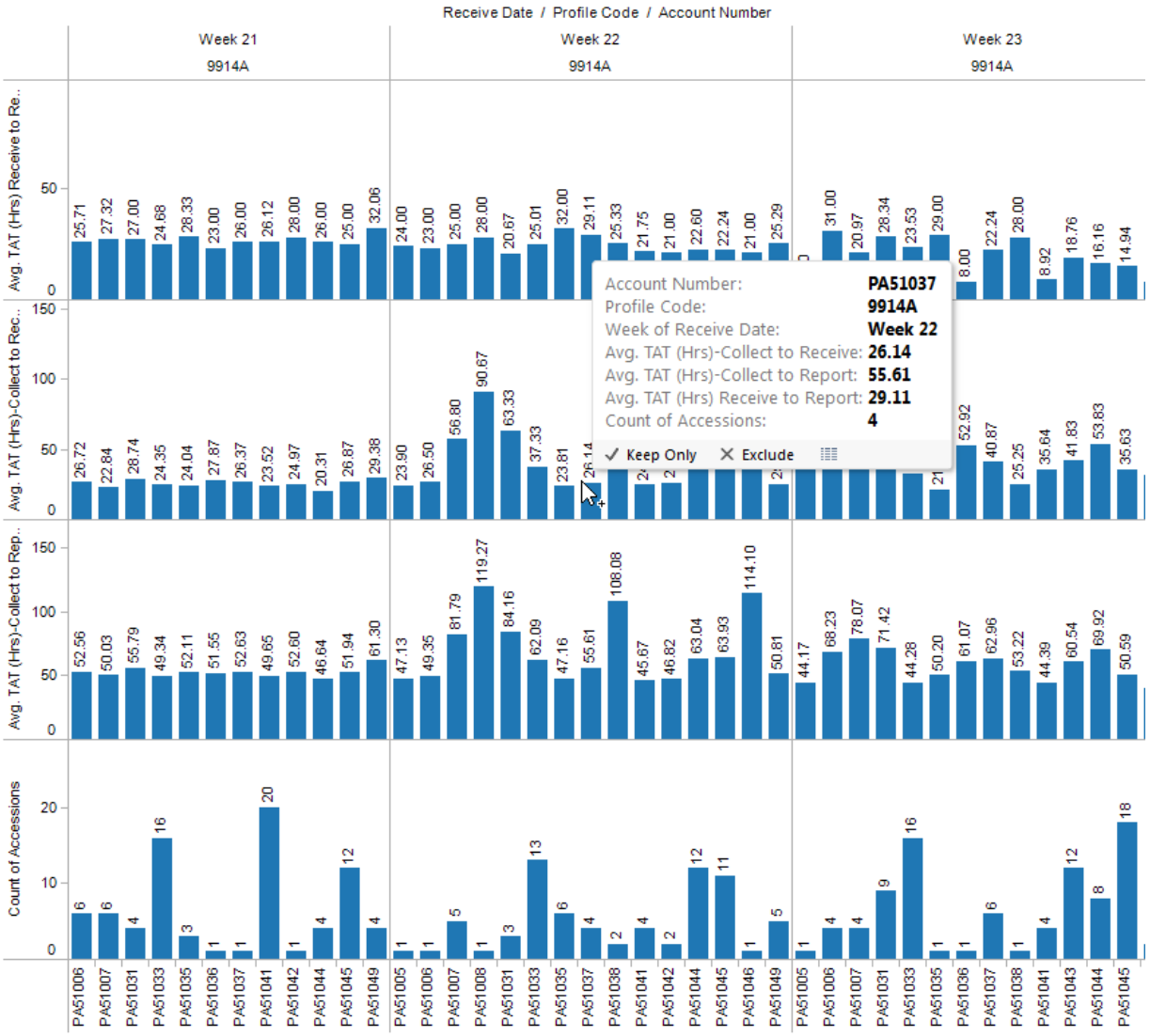
Bells and Whistles



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File Data Worksheet Dashboard Analysis Map Format Server Window Help

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Data

Toxicology (PAML) - Compound Details

Toxicology (PAML) - Orders and Result...

Dimensions

- _upsert_flag
- Accession Number
- Airbill
- Airbill Carrier
- Cancel Event
- Client Address Line 1
- Client Address Line 2
- Client City
- Client Company Name
- Client Contact Email
- Client Contact First Name
- Client Contact Last Name
- Client Contact Logon Id
- Client Contact Middle Name
- Client Contact Title
- Client Id
- Client Name
- Client Phone Numbers
- Client State
- Client Zip Code
- Collect Date

Measures

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- TAT (Hrs)-Collect to Result
- TAT (Hrs)-Complete to Report
- TAT (Hrs)-Receive to Result
- TAT (Min) Receive to Report
- TAT (Min)-Collect to Complete
- TAT (Min)-Collect to Receive

Parameters

- TAT Goal in Hours (Negative Tests)
- TAT Goal in Hours (Positive Tests)
- Tests Per FTE

Pages

Columns: HOUR(Receive Date)

Rows: AGG(FTE Requirem..

Filters

- HOUR(Receive Date)
- MY(Receive Date): J..
- WEEKDAY(Receive ..
- Test Code: THC5

Marks

Automatic

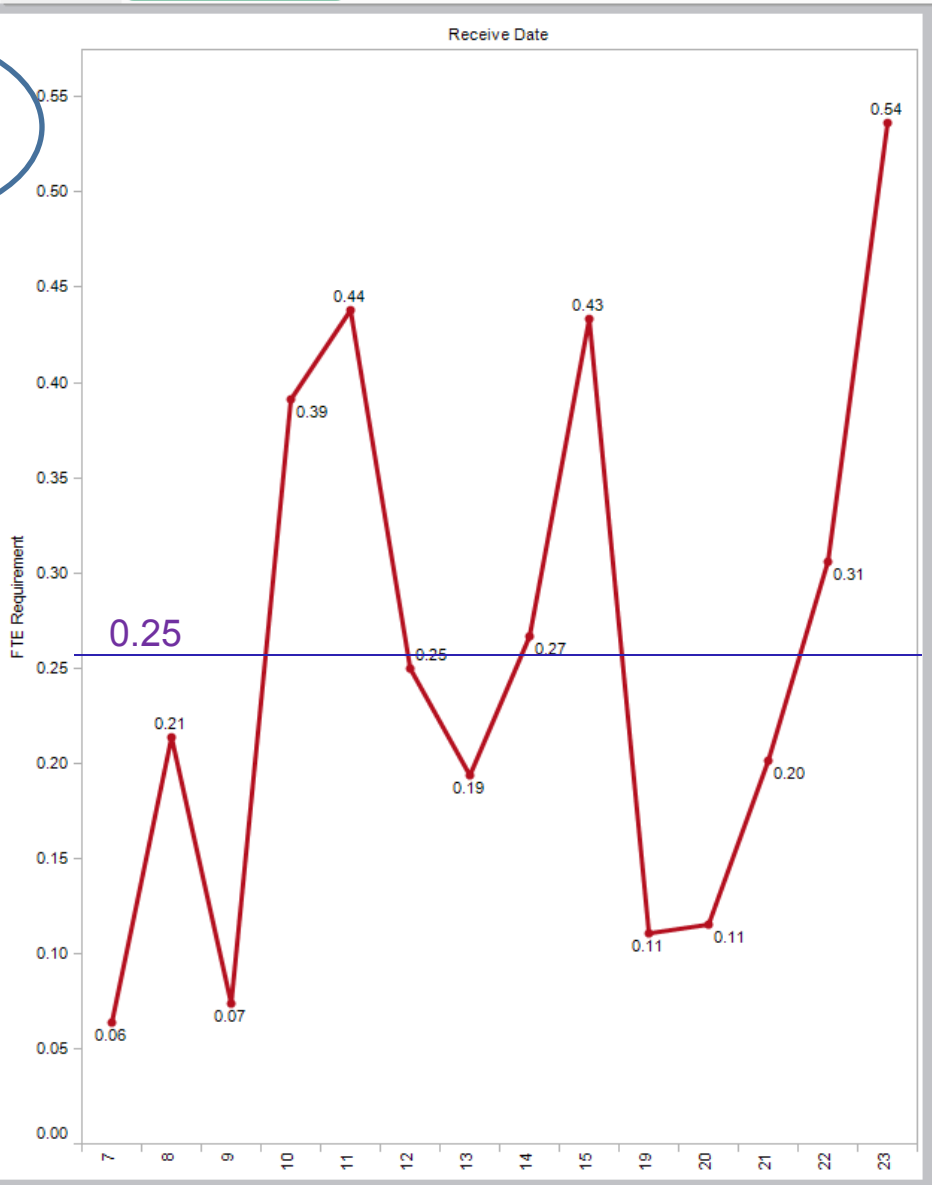
Path

Label

Color

Size

Level of Detail



WEEKDAY(Receive Date)

- (All)
- Null
- Sunday
- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday

MY(Receive Date)

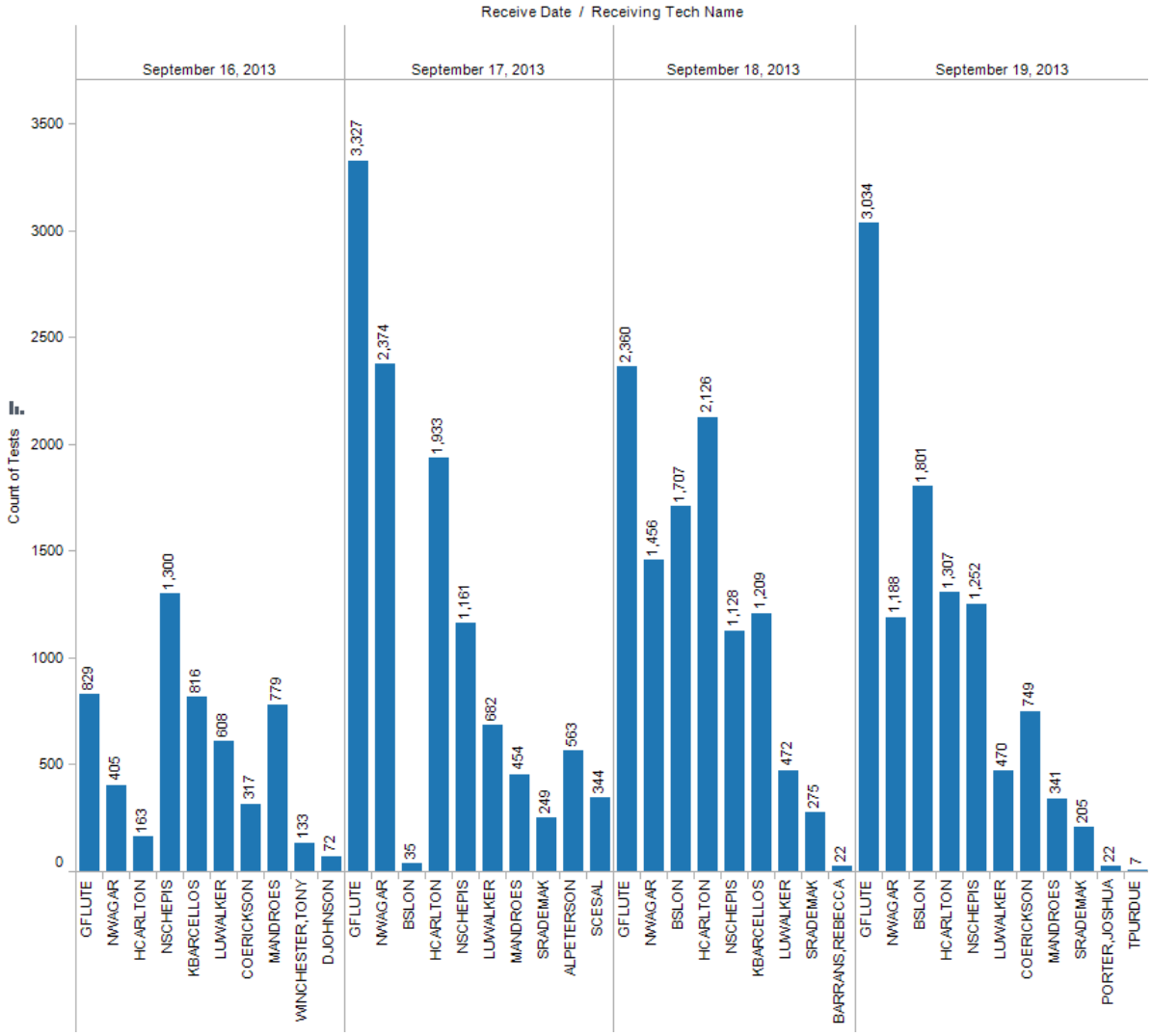
- July 2005
- September 2005
- December 2009
- December 2010
- September 2011
- January 2012
- February 2012
- March 2012
- April 2012
- May 2012
- June 2012
- July 2012
- August 2012
- September 2012
- October 2012
- November 2012
- December 2012
- January 2013
- February 2013
- March 2013
- April 2013
- May 2013
- June 2013
- July 2013
- August 2013
- September 2013

Tests Per FTE: 150

Detailed Client Volume | Workload by Compound Code | Workload by Compound Class | **Staffing Analysis** | Productivity By Receiving Tech | Productivity by Resulting Te

14 marks 1 row by 14 columns SUM of AGG(FTE Requirement): 3.59

Workload by Individual



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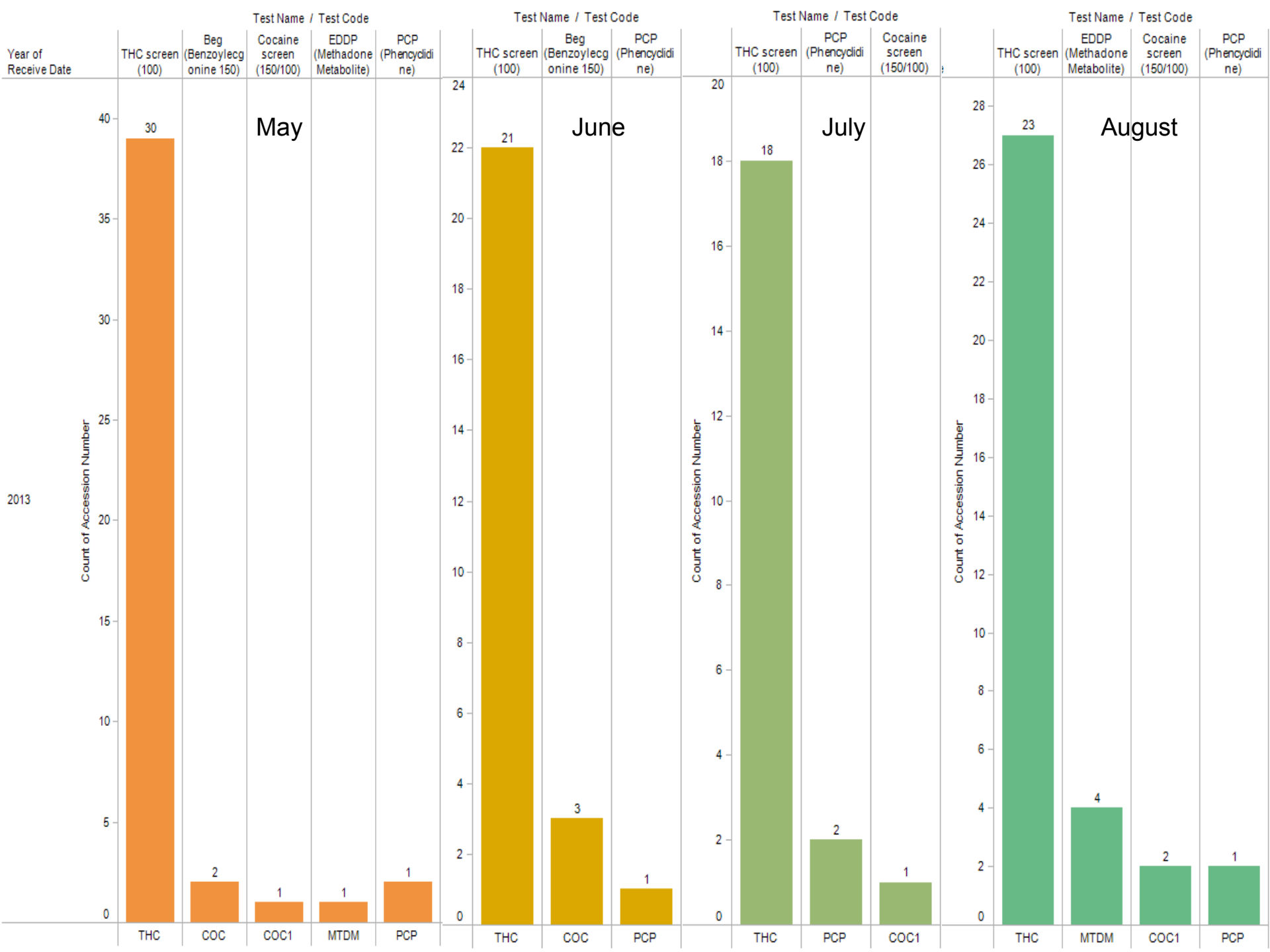
Test Name / Test Code
Year of Receive Date
THC screen (100)
Beg (Benzoylecgonine 150)
Cocaine screen (150/100)
EDDP (Methadone Metabolite)
PCP (Phencyclidine)
2013
Count of Accession Number
May
30
2
1
1
THC
COC
COC1
MTDM
PCP
June
21
3
1
THC
COC
PCP
July
18
2
1
THC
PCP
COC1
August
23
4
2
1
THC
MTDM
COC1
PCP

Applications

Operational	• Workload/Volumes • Turnaround Times • Productivity
Client/Physician	• Client Practice Patterns/Utilization • Reporting Package/Test Results • Client Volume/Revenue Monitoring
Clinical/ Quality	• QA/QC, HEDIS Quality Measures • Outlier Reduction • Regulatory Reporting/Compliance

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Our Goals

- Intuitive Ad-Hoc Analytics in the Hands of Users at all Levels
- Actionable Data: Drill-down and Alerts
- Instant and Informative Visualization
- Easy Sharing of Data
- Integration with Other Systems
- Delivered with Low IT Burden/Cost

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“Leaders must be problem solvers. If you are not solving problems, you are no longer leading.”

- General Colin Powell

It Worked For Me – In Life and Leadership

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