The Compelling Display of Health & Safety Data to Achieve Desired Decision Making

THE UNIVERSITY of TEXAS
HEALTH SCIENCE CENTER AT HOUSTON

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Why Training on Data Presentation ?

- An interesting dilemma:
  - Almost all programs thrive on data
  - Virtually every important decision is based on data to some extent
  - Formal training in the area of compelling data presentations is rare for many professionals
  - The ability to compellingly display data is the key to desired decision making

Why Training on Data Presentation (cont.)?

- The safety profession is particularly awash in bad examples of data presentations!
- We've all endured them at some point in our careers!
  - *Commentary:* This may be the reason for repeated encounters with upper management who do not understand what their EH&S programs do.

Evolution of EH&S Measures and Metrics

- First step:
  - ultimate outcomes – OSHA 300 log, inspection non-compliance
- Second step:
  - EH&S activities prior to first order events – injuries and non-compliance

Evolution of EH&S Measures and Metrics (cont.)

- Third step:
  - Relating activities to larger institutional parameters – true metrics
- Fourth step:
  - The compelling display of relationships so that the desired decision by upper management becomes obvious

Achieving EH&S Data Display Excellence

- The presentation of complex ideas and concepts in ways that are
  - Clear
  - Precise
  - Efficient

- How do we go about achieving this?

Go to The Experts On Information Display

- Tukey, JW, *Exploratory Data Analysis*, Reading, MA 1977
- Tukey, PA, Tukey, JW Summarization: smoothing; supplemented views, in Vic Barnett ed. *Interpreting Multivariate Data*, Chichester, England, 1982
- Tufte, ER, *The Visual Display of Quantitative Information*, Cheshire, CT, 2001
- Tufte, ER, *Envisioning Information*, Cheshire, CT, 1990
- Williams, R *The Non-Designers Book: Design and Typographic Principles for the Visual Novice*. Berkley, CA, 1994
- Tufte, ER, *Visual Explanations*, Cheshire, CT, 1997

Recommendations

- Don’t blindly rely on the automatic graphic formatting provided by Excel or Powerpoint!
- Encourage the eye to compare different data
- Representations of numbers should be directly proportional to their numerical quantities
- Use clear, detailed, and thorough labeling

Recommendations (cont.)

- Display the variation of data, not a variation of design
- Maximize the data to ink ratio – put most of the ink to work telling about the data!
- When possible, use horizontal graphics: 50% wider than tall is usually best

Compelling Remark by Tufte

- “Visual reasoning occurs more effectively when relevant information is shown adjacent in the space within our eye-span”
- “This is especially true for statistical data where the fundamental analytical act is to make comparisons”
- The key point: “compared to what?”

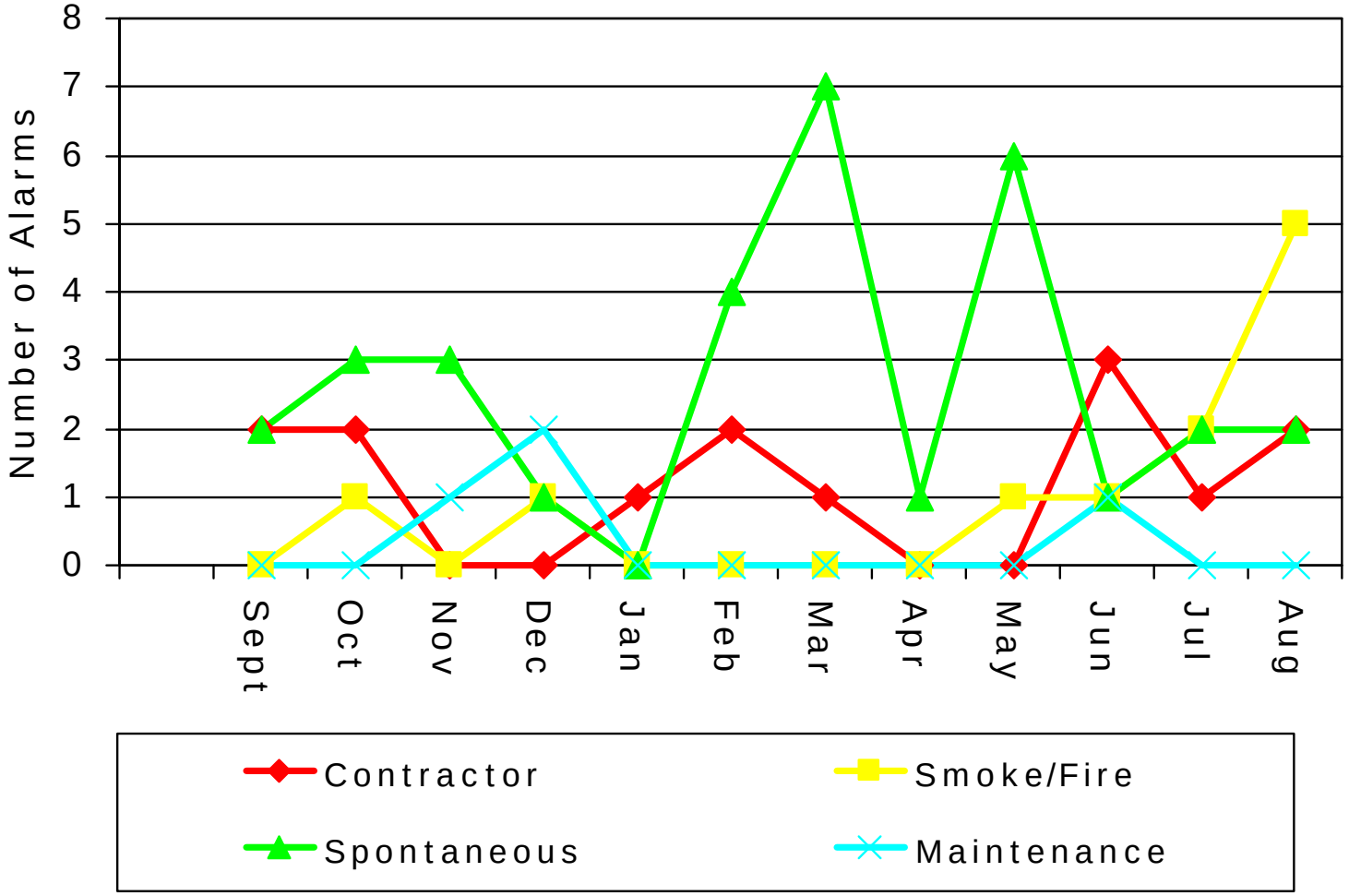
Four UTHSCH “Make Over” Examples

- Data we accumulated and displayed on:
  - Nuisance Fire Alarms
  - Workers compensation experience modifiers
  - First reports of injury
  - Corridor clearance

- But first, 2 quick notes:
  - The forum to be used:
    - The “big screen” versus the “small screen”?
    - In what setting are most important decisions made?

  - Like fashion, there are likely no right answers – individual tastes apply, but some universal rules will become apparent

Results of the Great UTHSC-H Nuisance Fire Alarm Challenge



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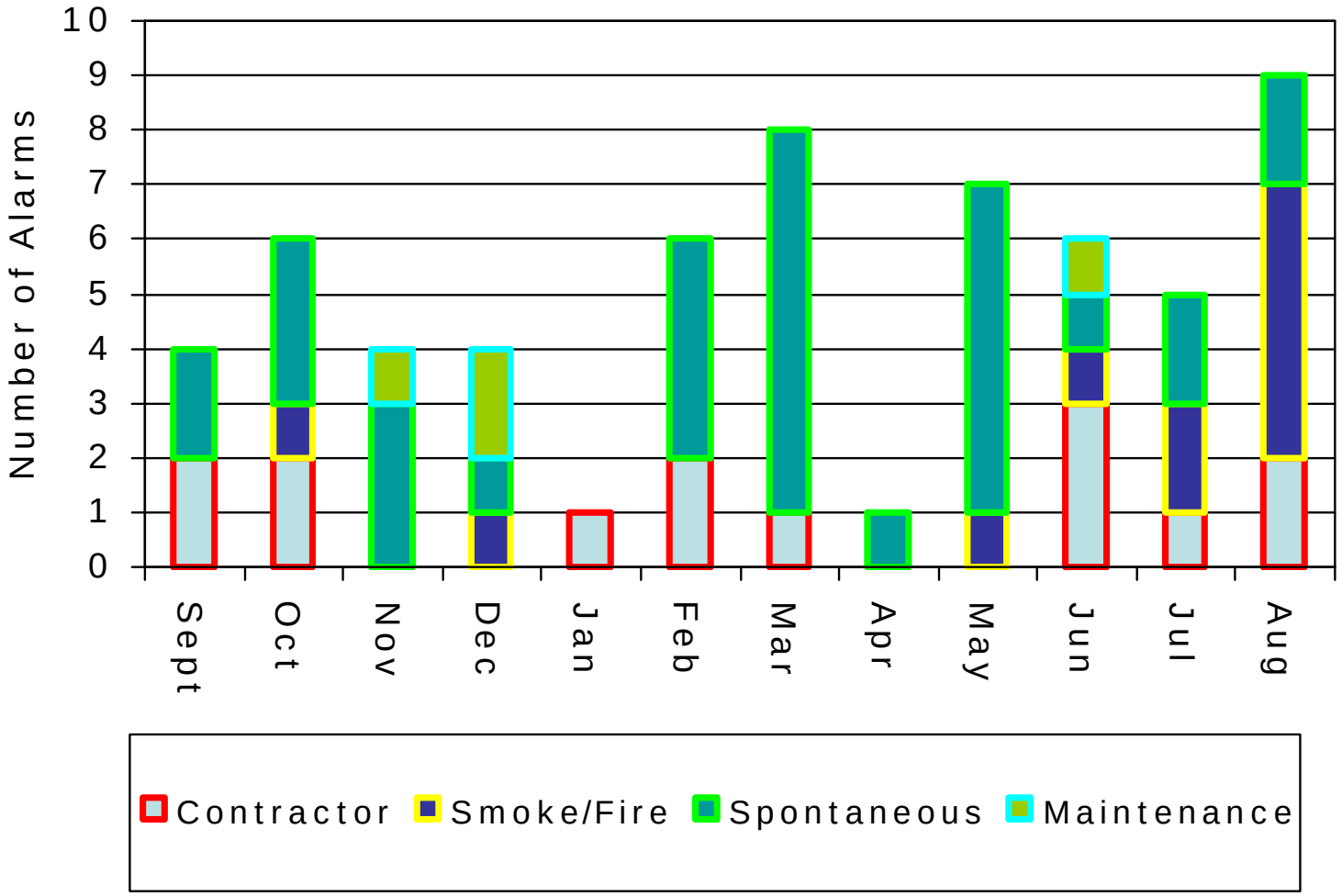

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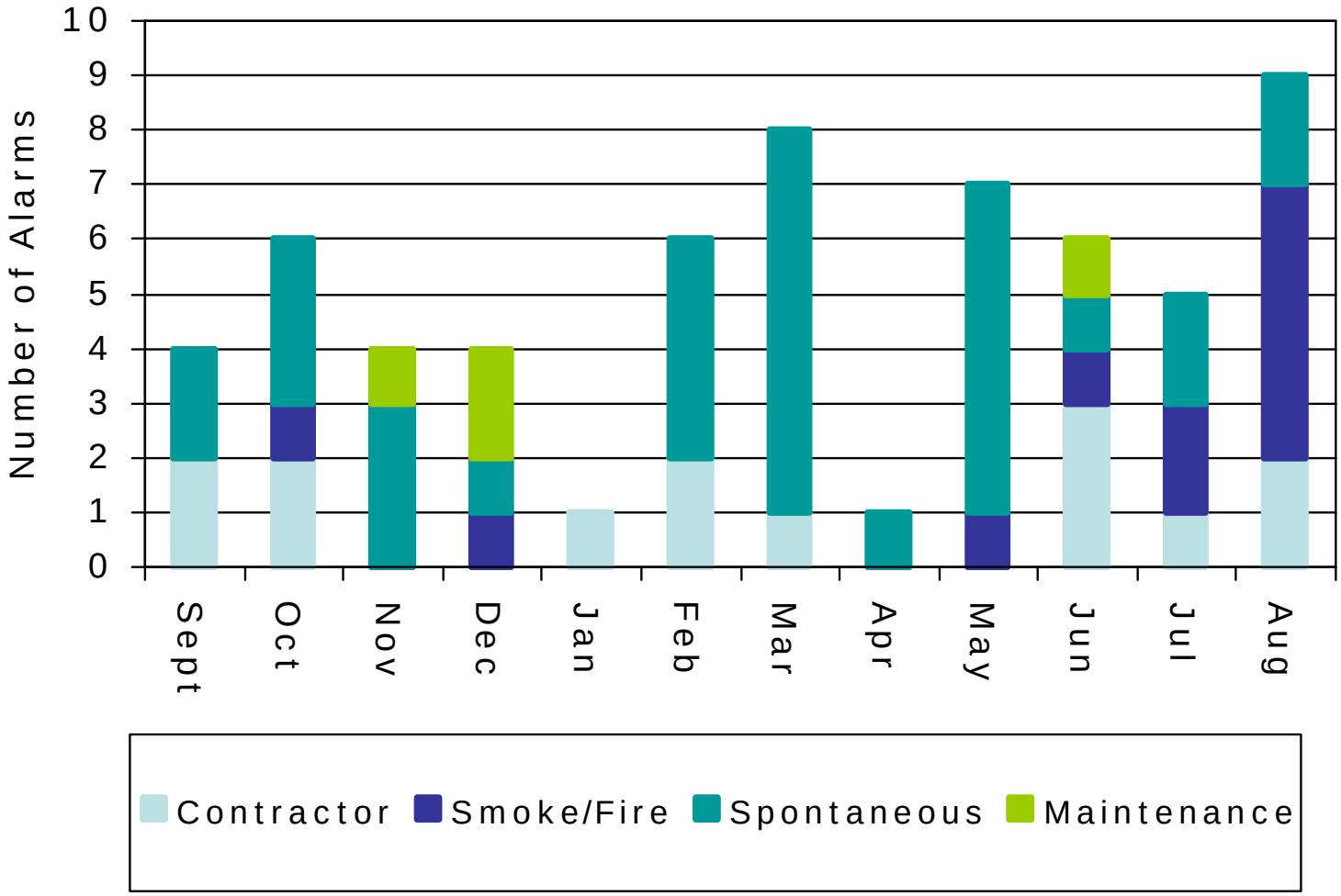

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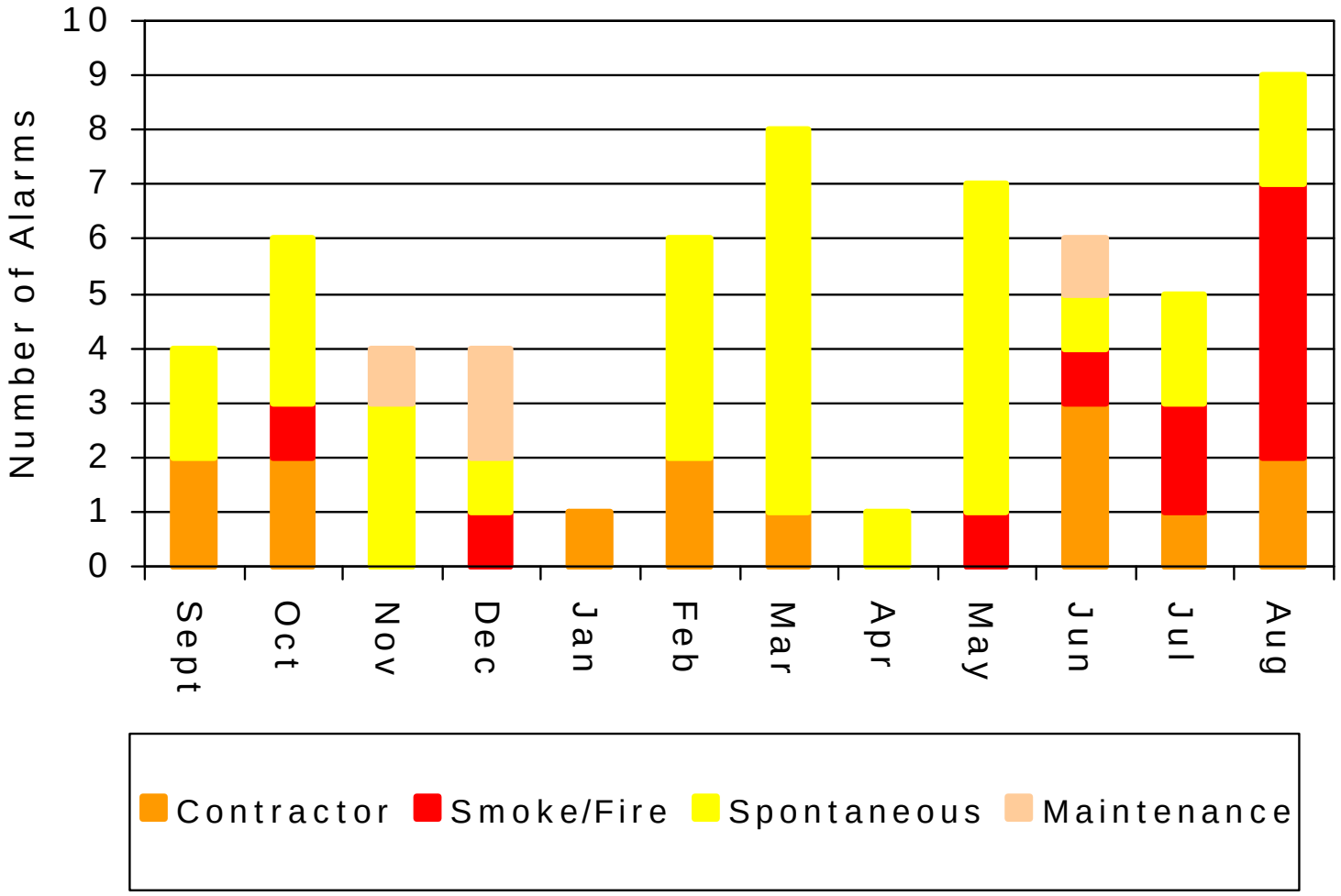

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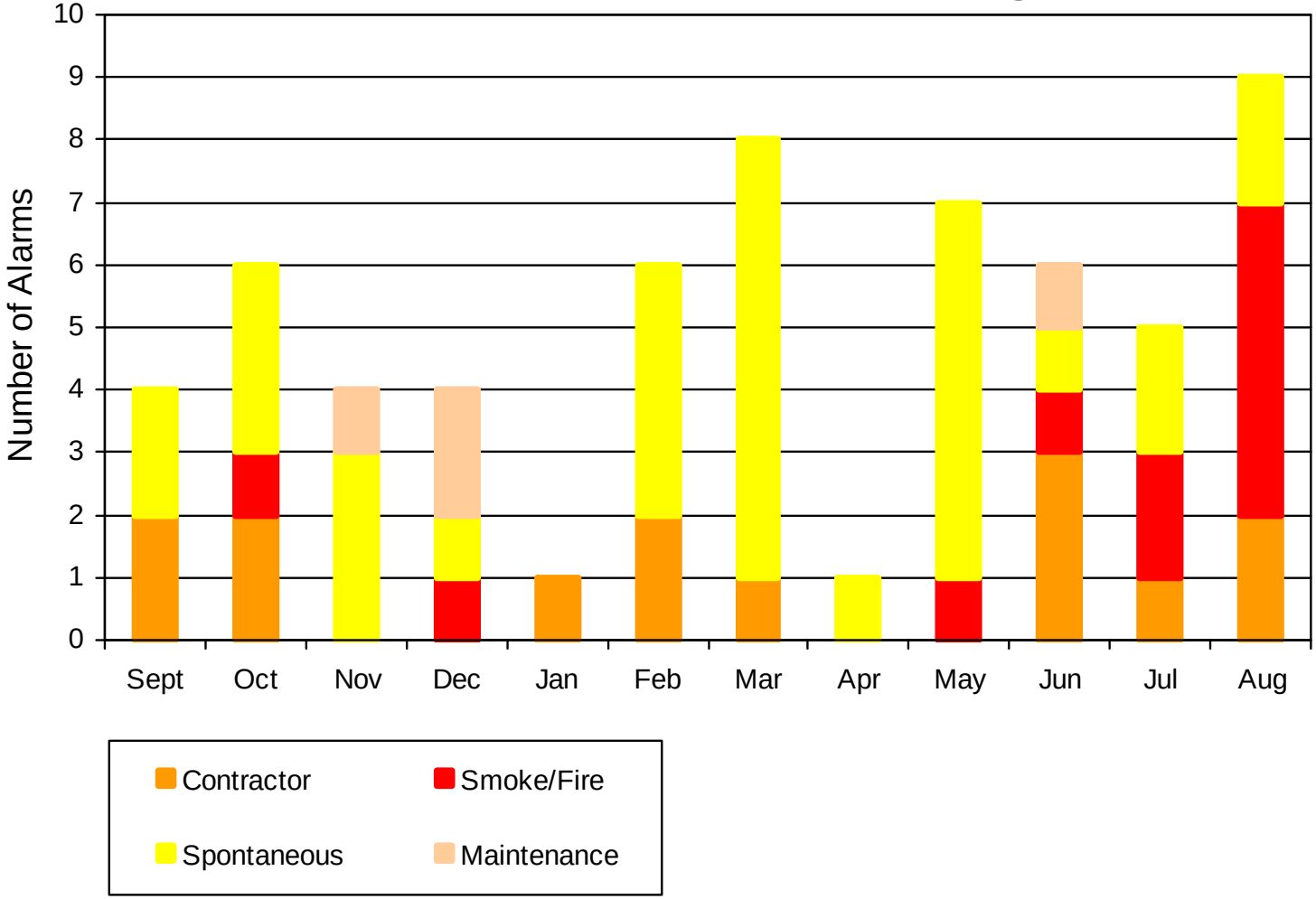

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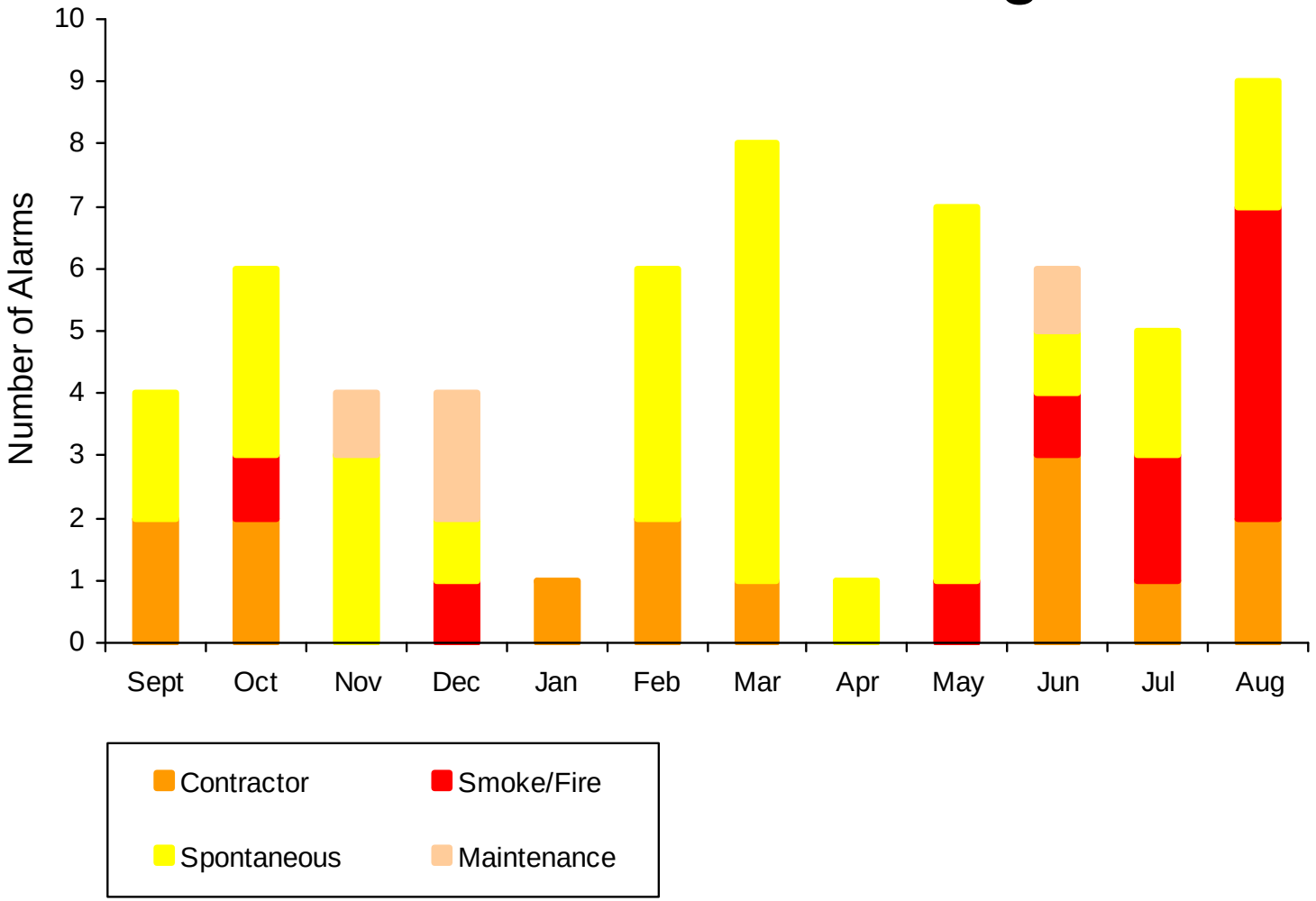

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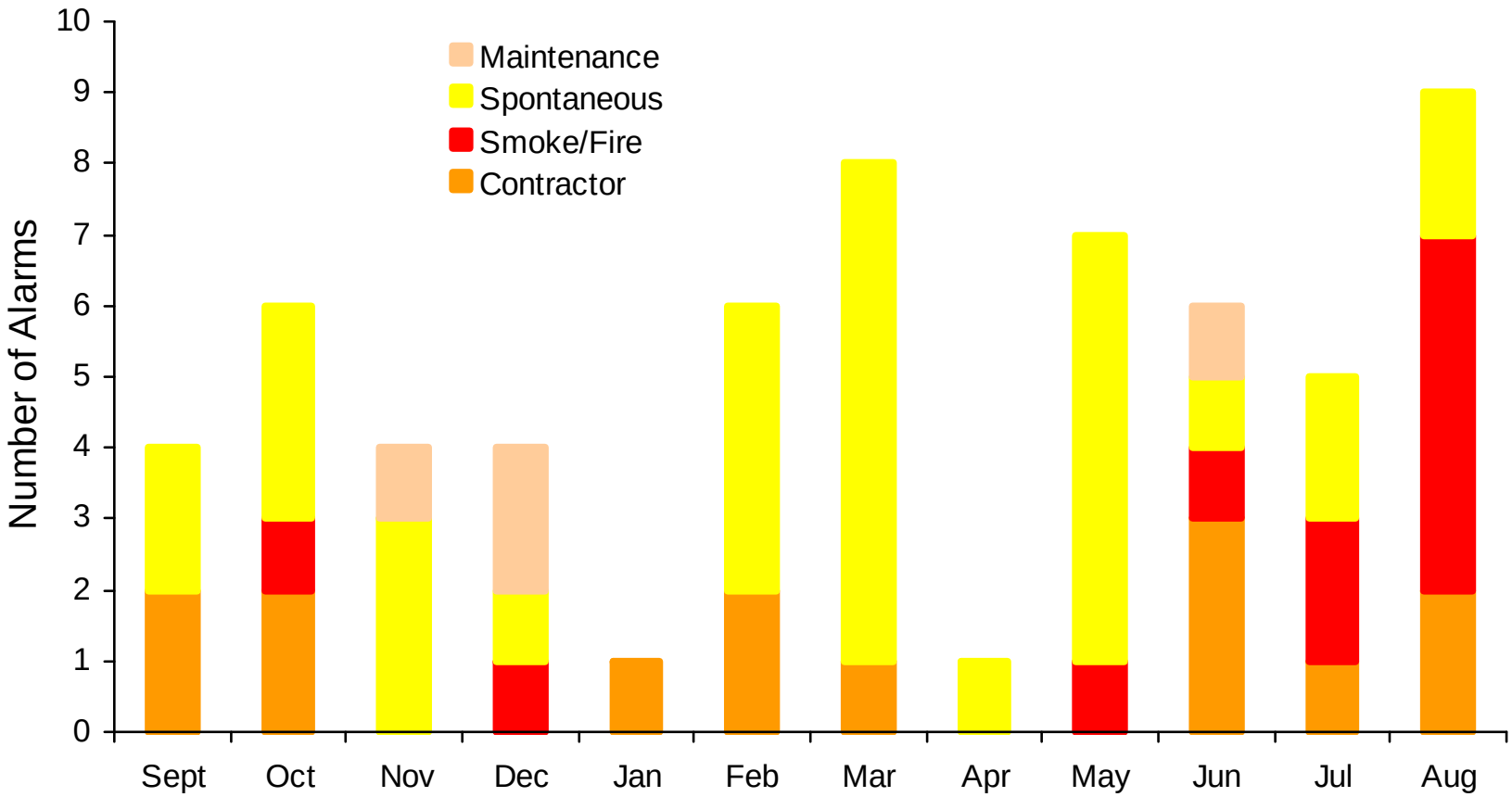
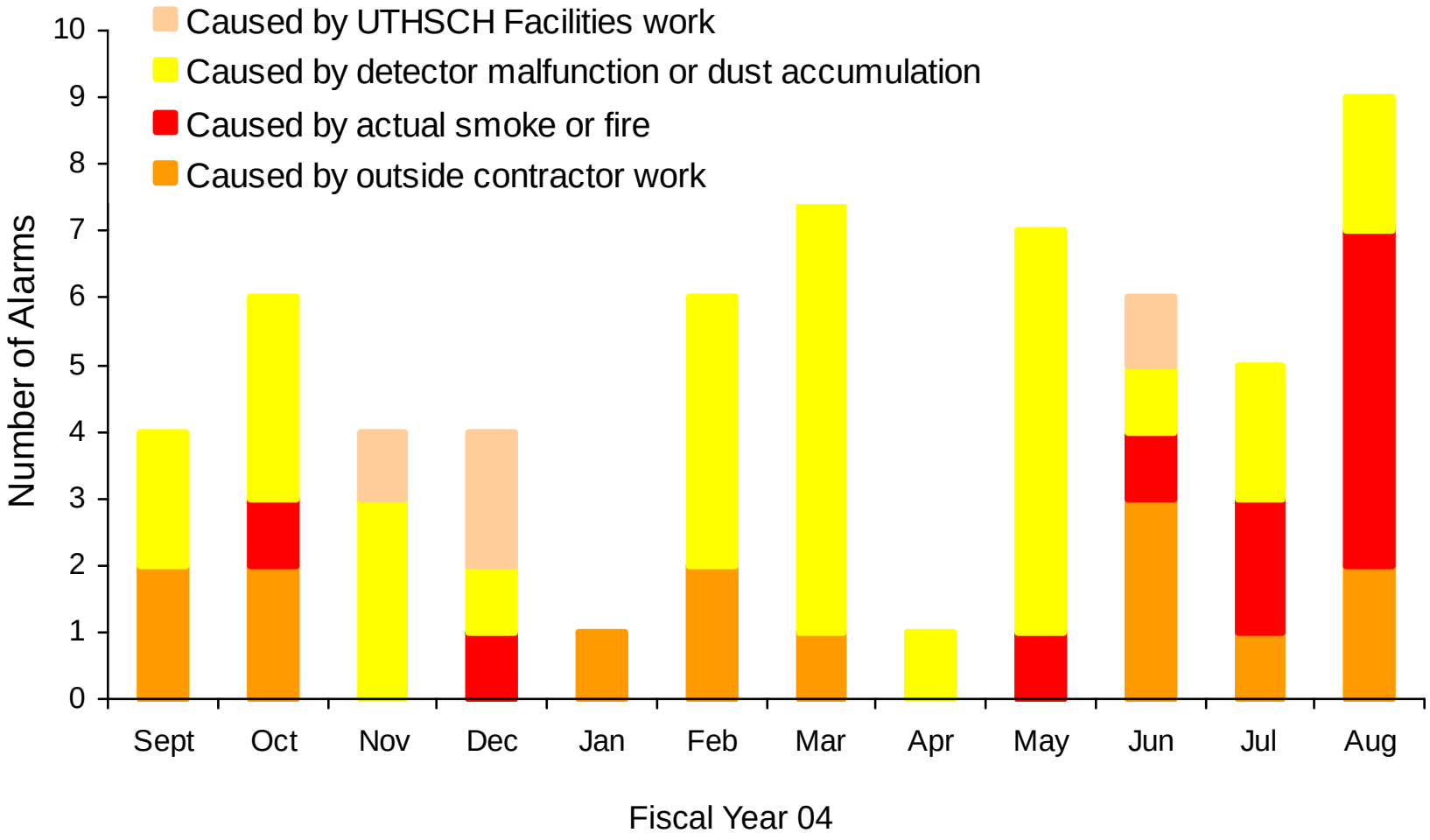
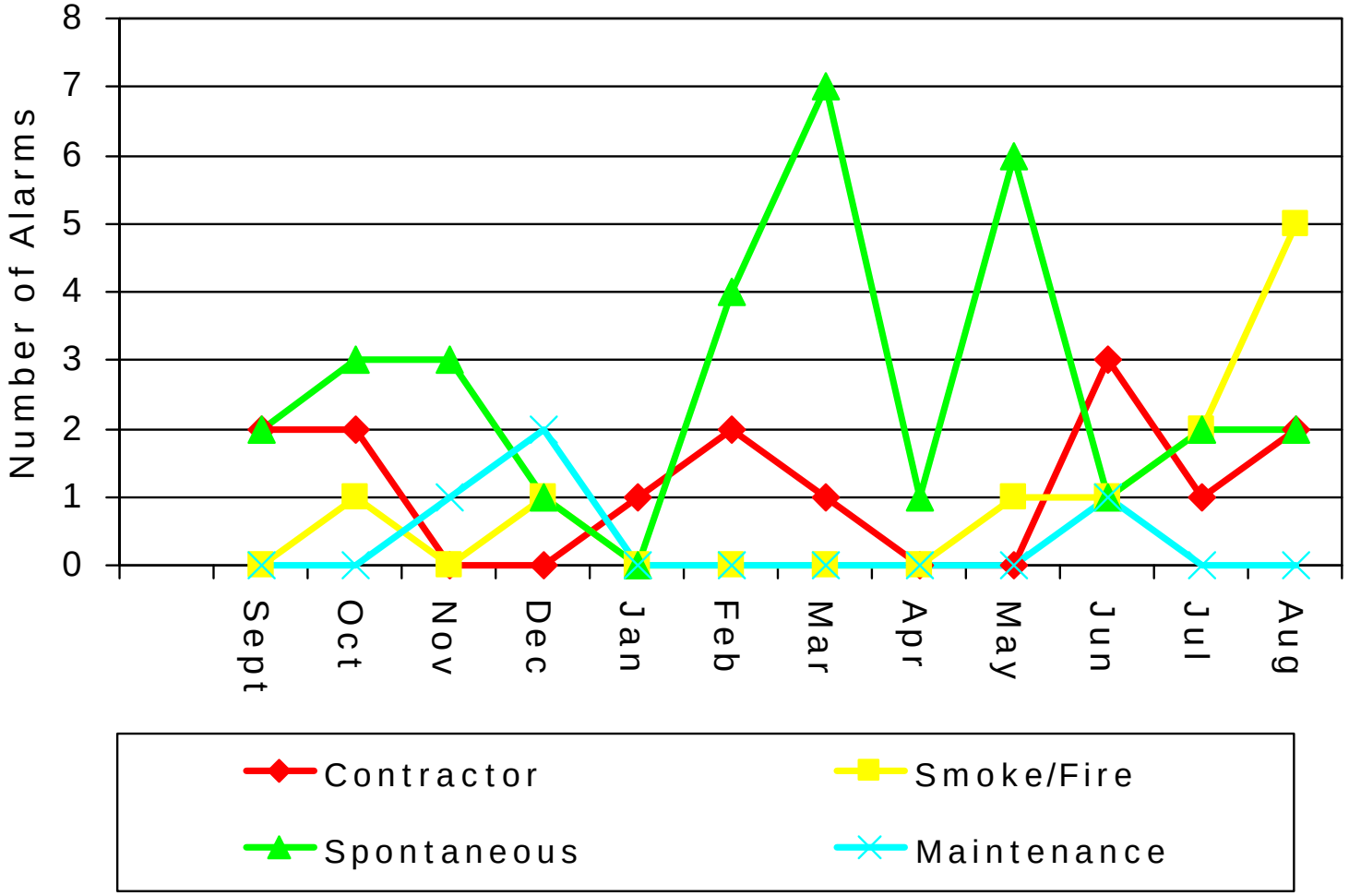


Results of the Great UTHSC-H Nuisance Fire Alarm Challenge (FY04)

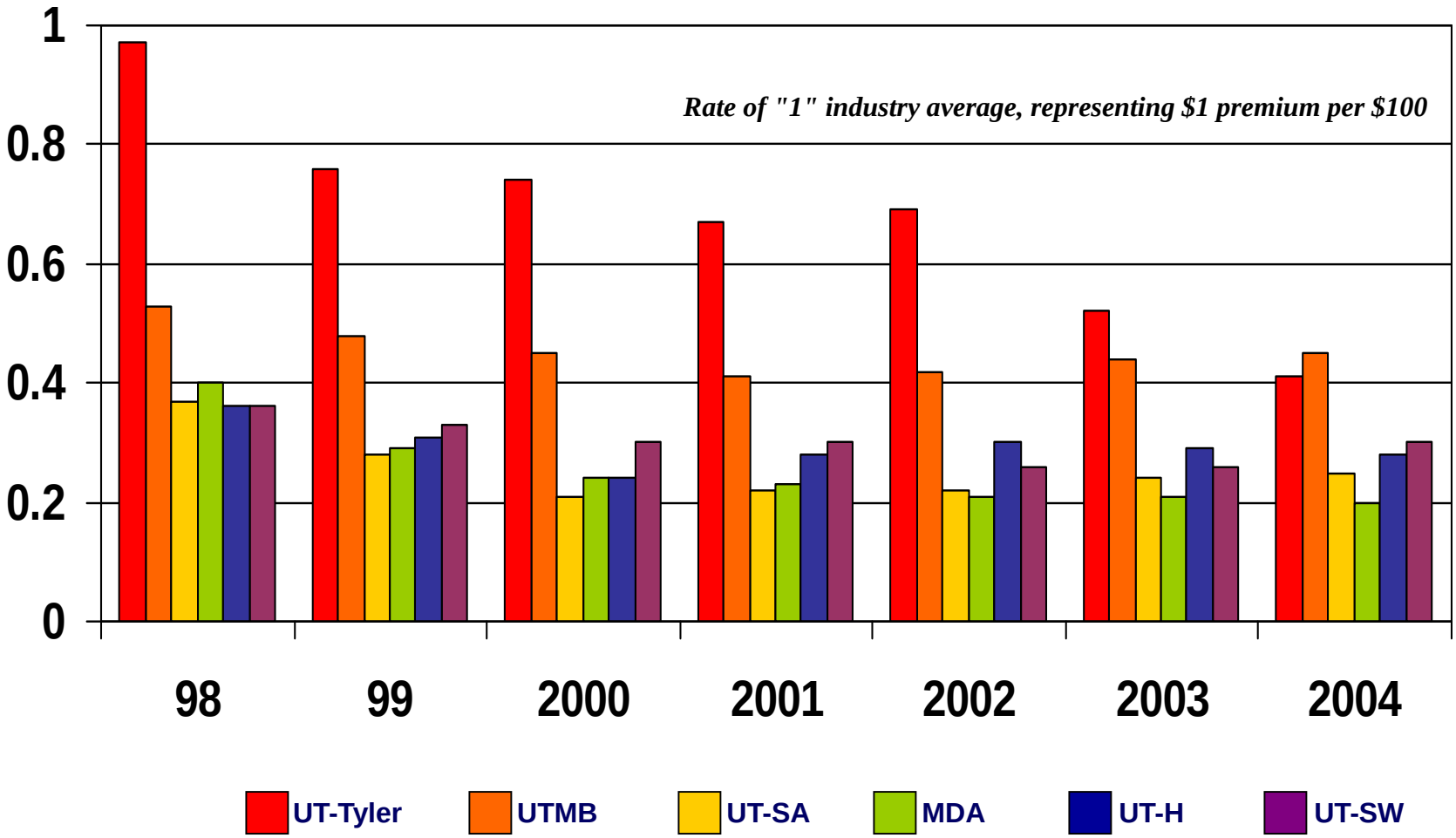


Results of the Great UTHSC-H Nuisance Fire Alarm Challenge



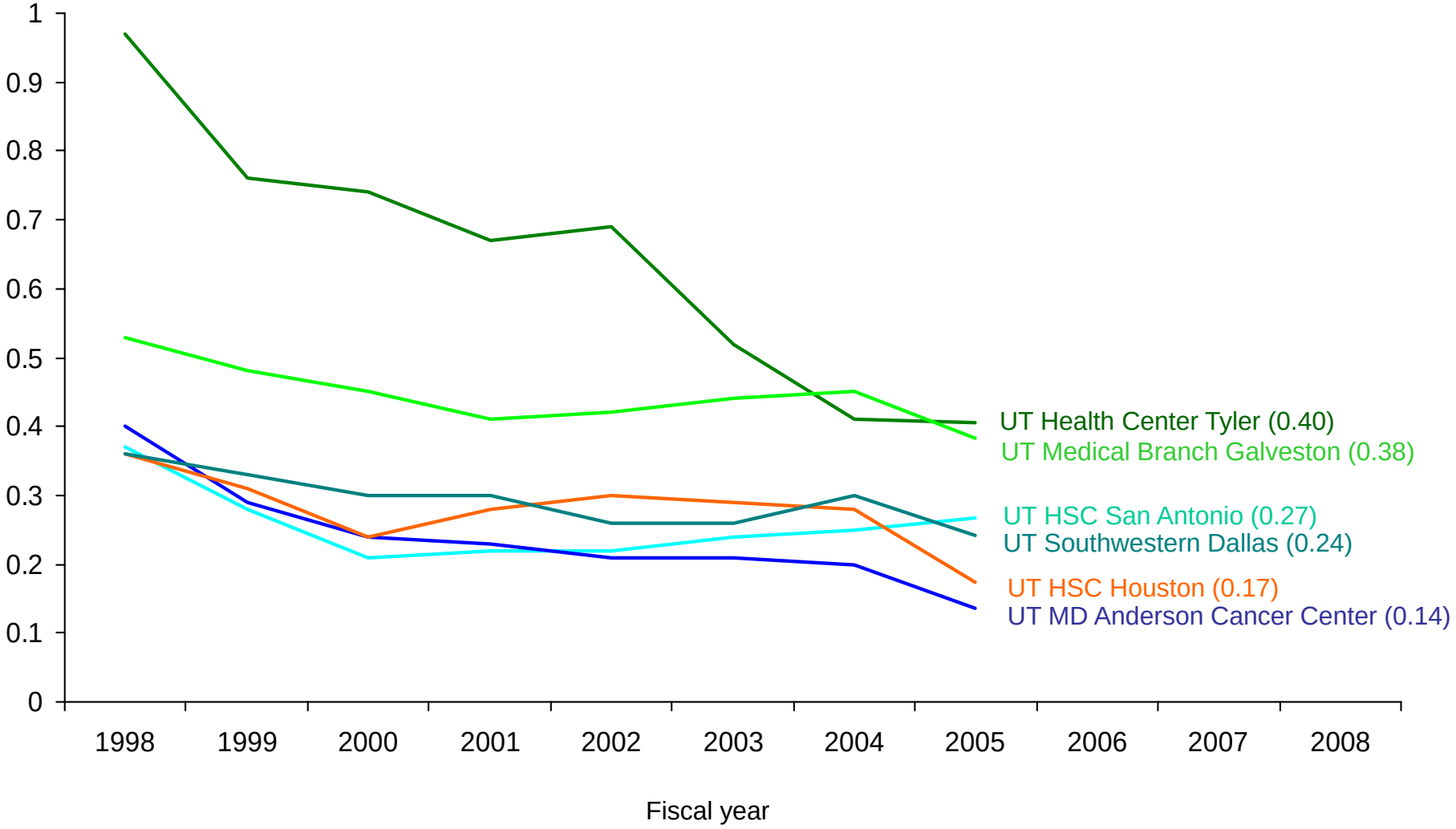
Employee Worker's Comp Experience Modifier

compared to other UT health components, FY 98-FY 04



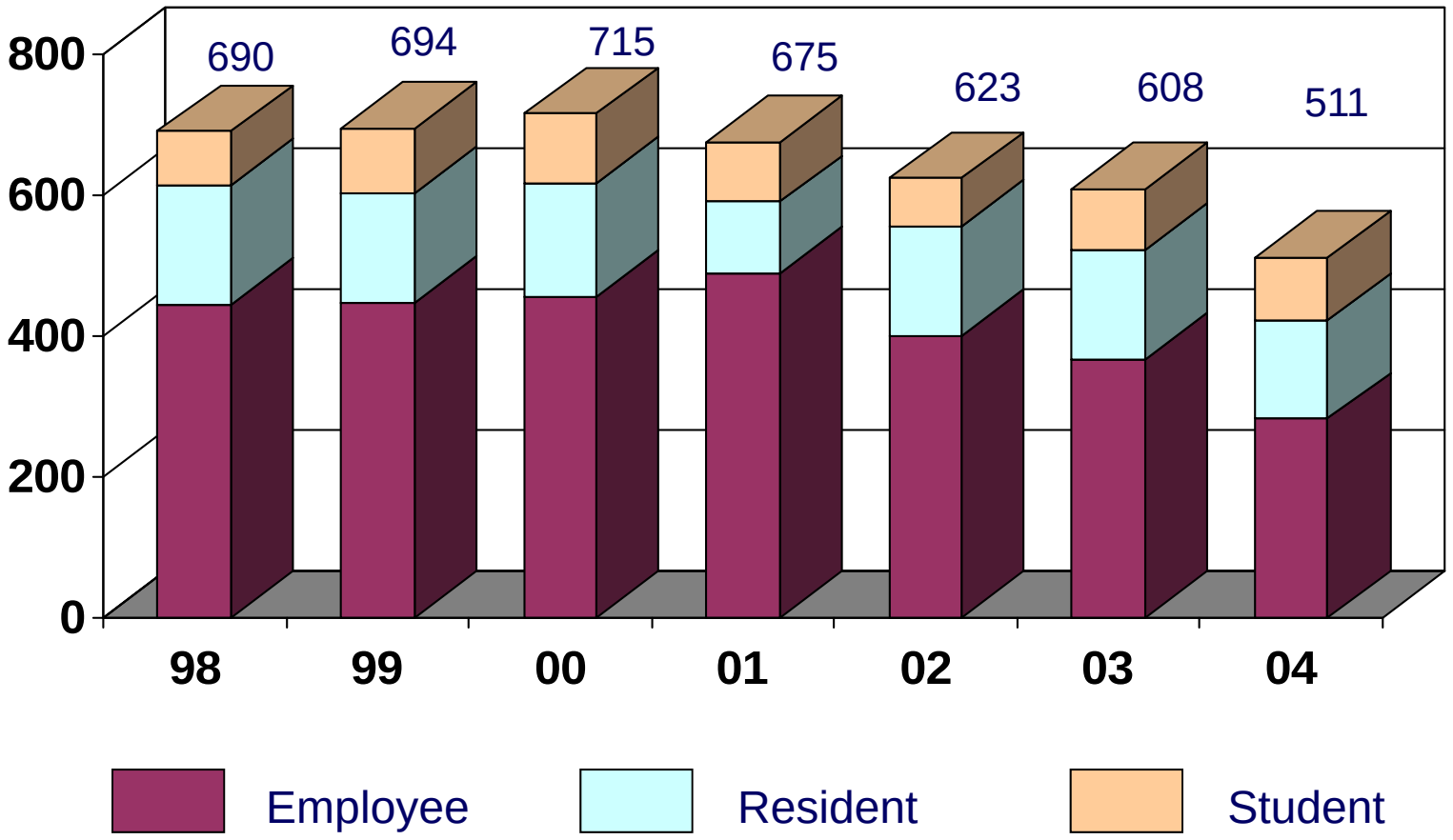
WCI Premium Adjustment for UTS Health Components

(discount premium rating as compared to a baseline of 1)

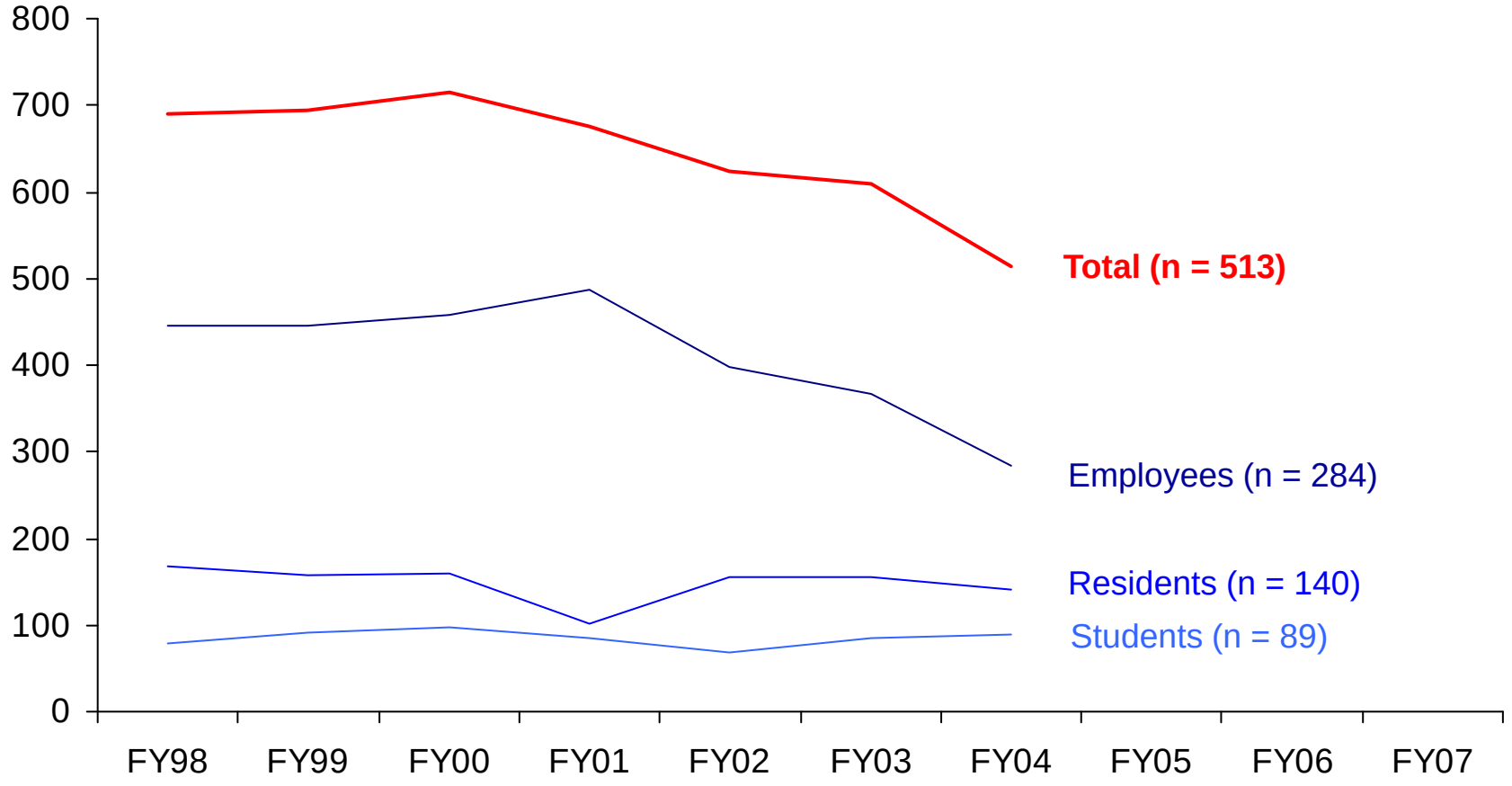


Losses – Personnel

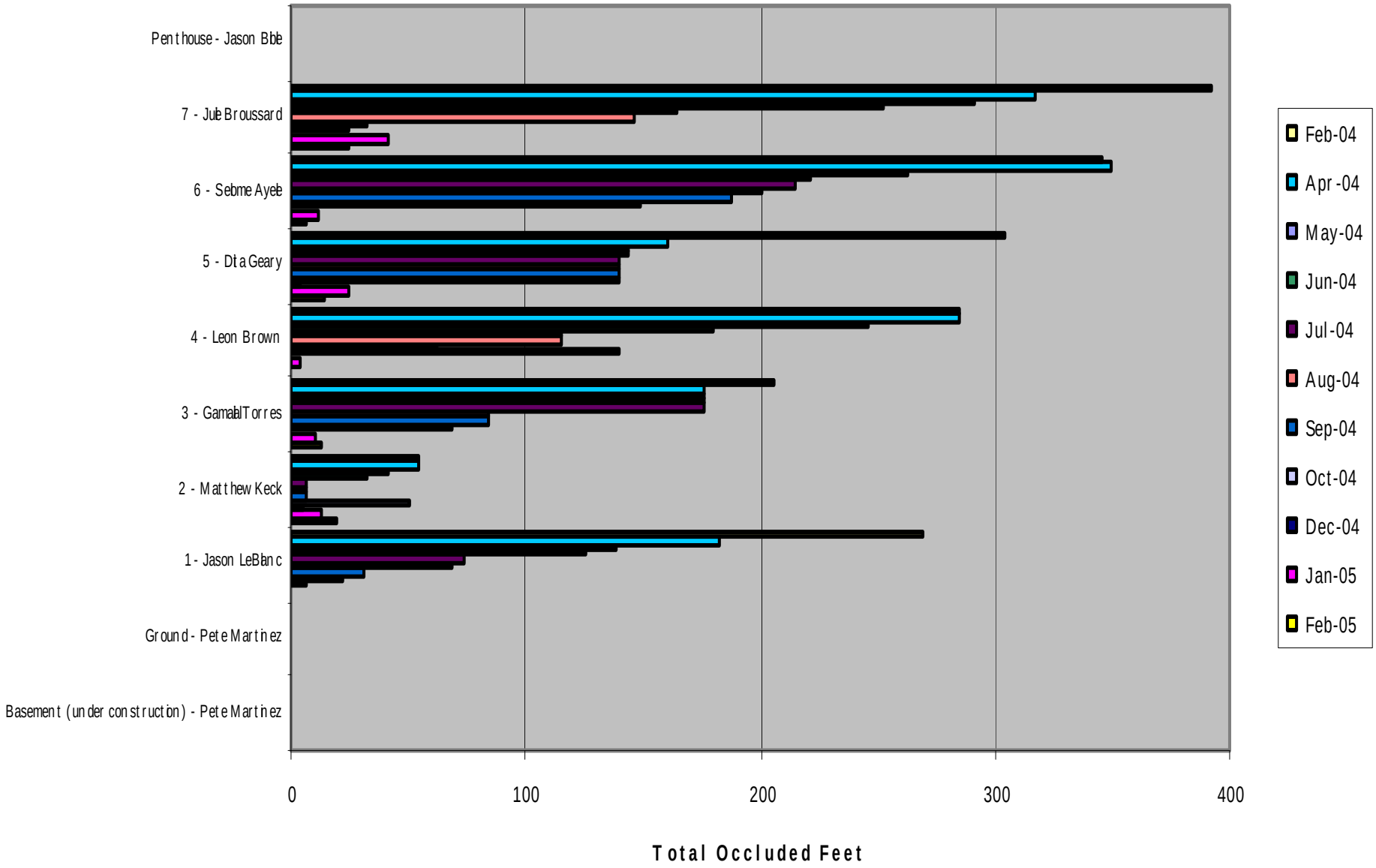
Reported Injuries by Population



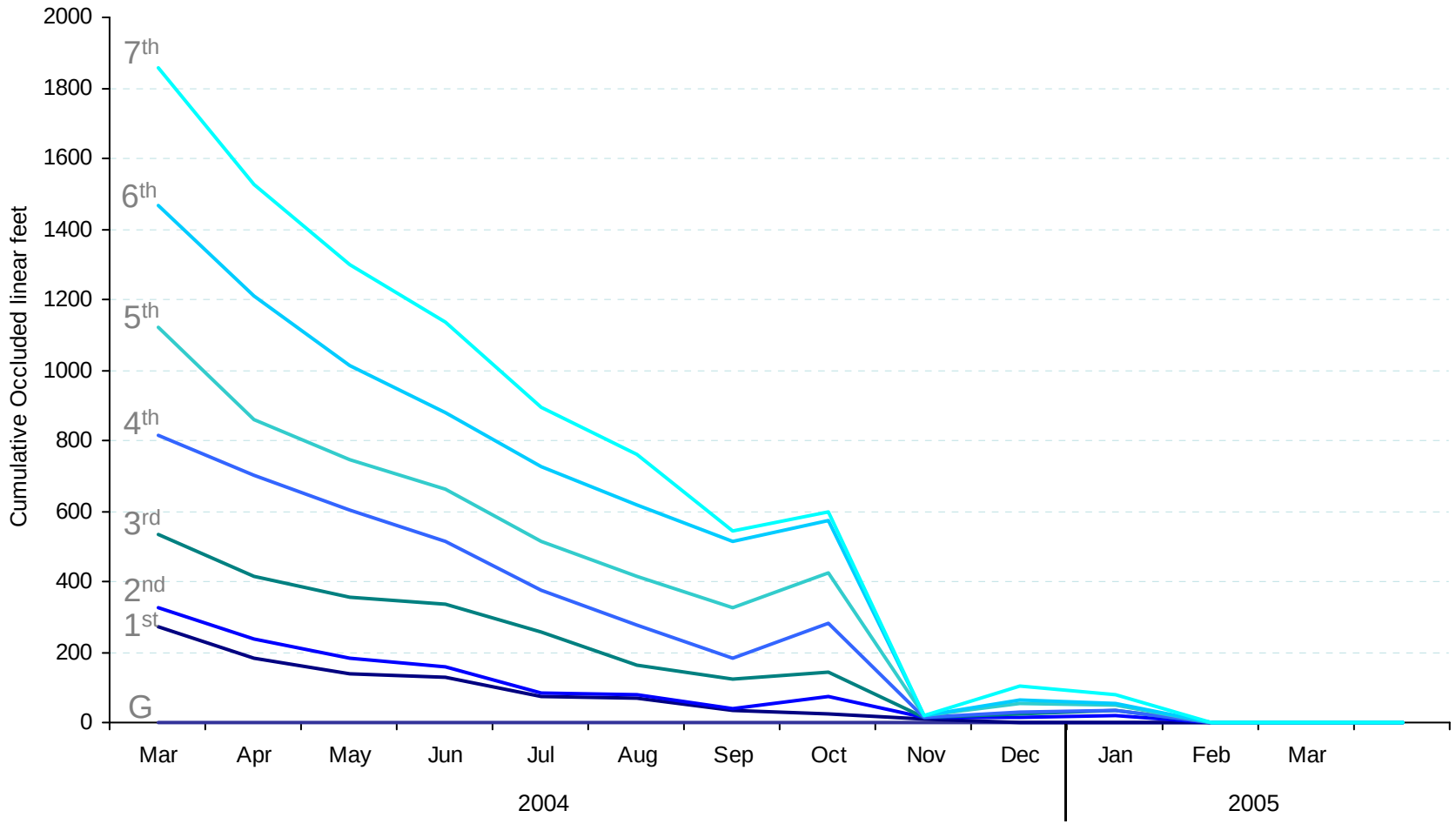
Number of First Reports of Injury, by Population Type



Medical School Building Hallway Occlusion (2004)



MSB Corridor Blockage in Cumulative Occluded Linear Feet, by Month and Floor (building floor indicated at origin of each line)



Important Caveats

- Although the techniques displayed here are powerful, there are some downsides to this approach
  - Time involved to create assemble data and create non-standard graphs may not mesh with work demands
  - Relentless tinkering and artistic judgment
- Suggested sources for regular observations to develop an intuitive feel for the process
  - Suggested consistent source of good examples:
    - Wall Street Journal
  - Suggested consistent source of not-so-good examples:
    - USA Today “char-toons”

Summary

- The ability to display data compellingly is the key to desired decision making
- Always anticipate “compared to what?”
- Maximize the data-to-ink ratio – e.g. eliminate the unnecessary
- Think about what it is you’re trying to say
- Show to others unfamiliar with the topic without speaking – does this tell the story we’re trying to tell?

Your Questions at This Point?

The University of Texas
Health Science Center at Houston

Now Let's Look at
Some Other Examples

COLLABORATIVE LABORATORY INSPECTION PROGRAM (CLIP)

- During October 2005, 80 Principle Investigators for a total of 316 laboratory rooms were inspected
- A total of 30 CLIP inspections were performed

PI Inspections:

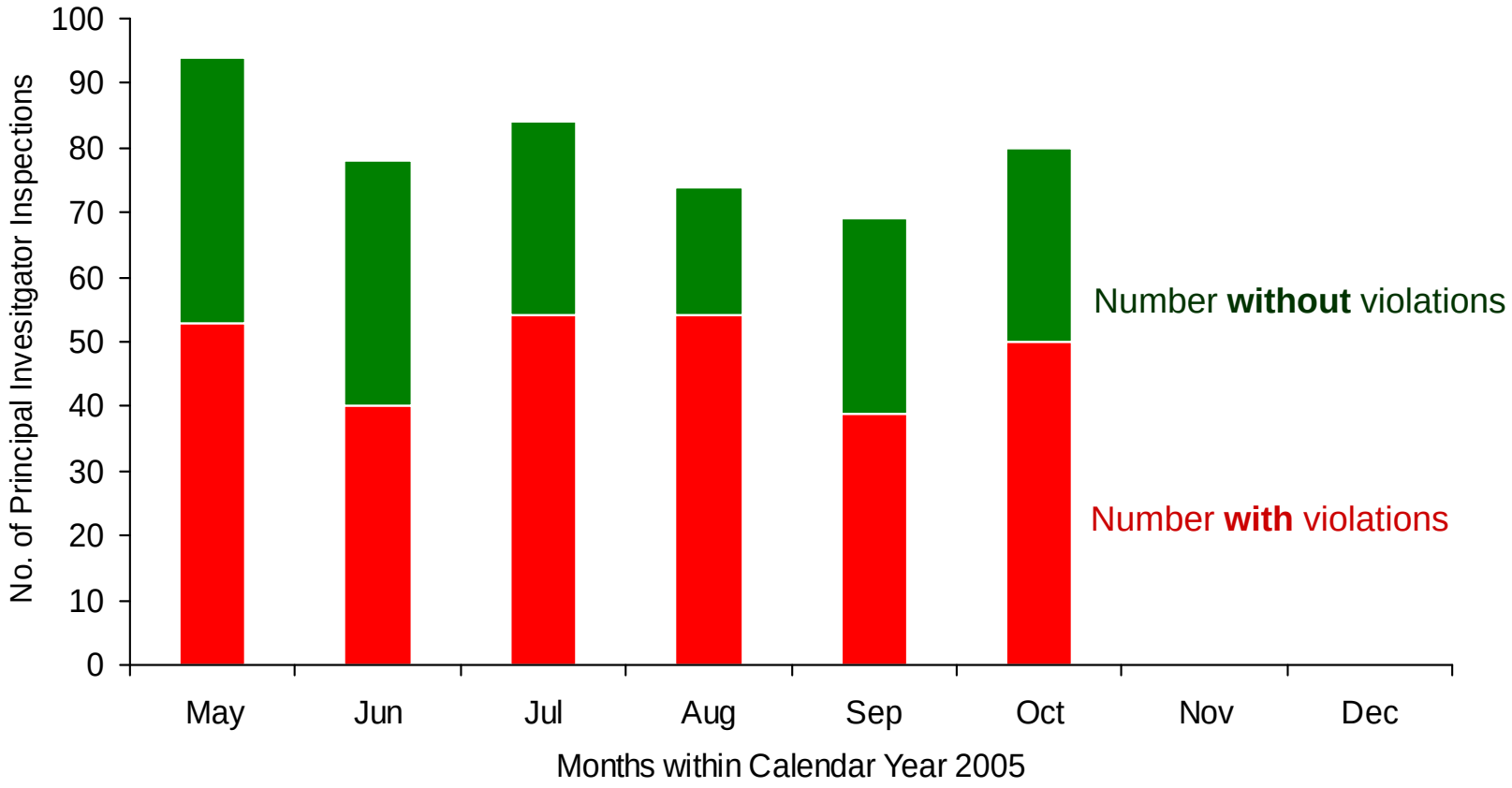
	Total PI's	#Without Lab Violations	# With Lab Violations	%Without Lab Violations	%With Lab Violations
May 2005	94	53	41	56.38	43.62
June 2005	78	40	38	51.28	48.72
July 2005	84	54	30	64.29	35.71
August 2005	74	54	20	72.97	27.03
September 2005	69	39	30	56.52	43.48
October 2005	80	50	30	62.50	37.50

Comprehensive Laboratory Inspection Program (CLIP) Activities and Outcomes, 2005

Month in Year 2005	Number of Principle Investigators Inspected	Inspections Without Violations	Inspections With Violations
May	94	53 (56 %)	41 (44%)
June	78	40 (51%)	38 (49%)
July	84	54 (64%)	30 (36%)
August	74	54 (73%)	20 (27%)
September	69	39 (56%)	30 (44%)
October	80	50 (62%)	30 (38%)

2005 Collaborative Laboratory Inspection Program (CLIP)

Inspection Activities and Compliance Findings



2005 Collaborative Laboratory Inspection Program (CLIP)

Inspection Activities and Compliance Findings

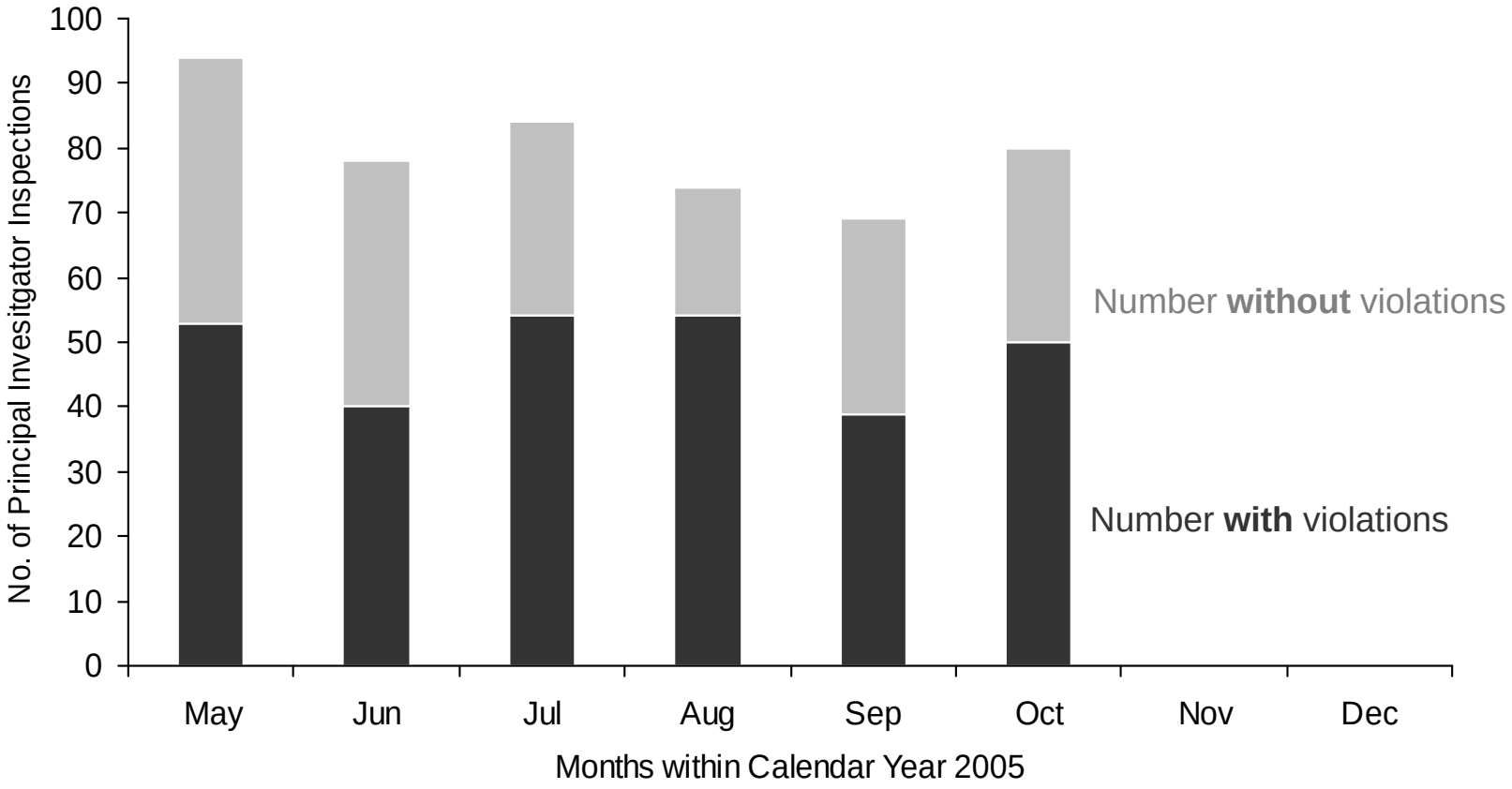


Figure 3. Receipt of Radioactive Material

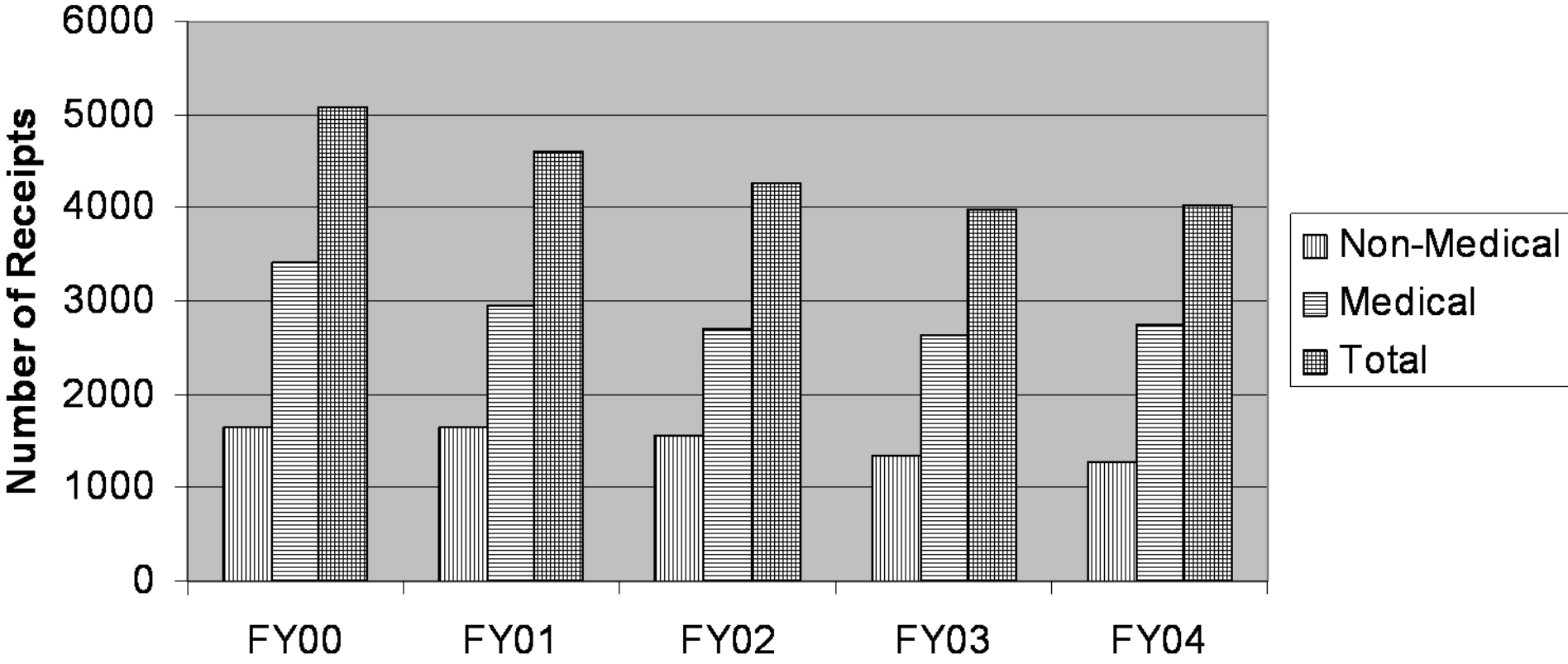
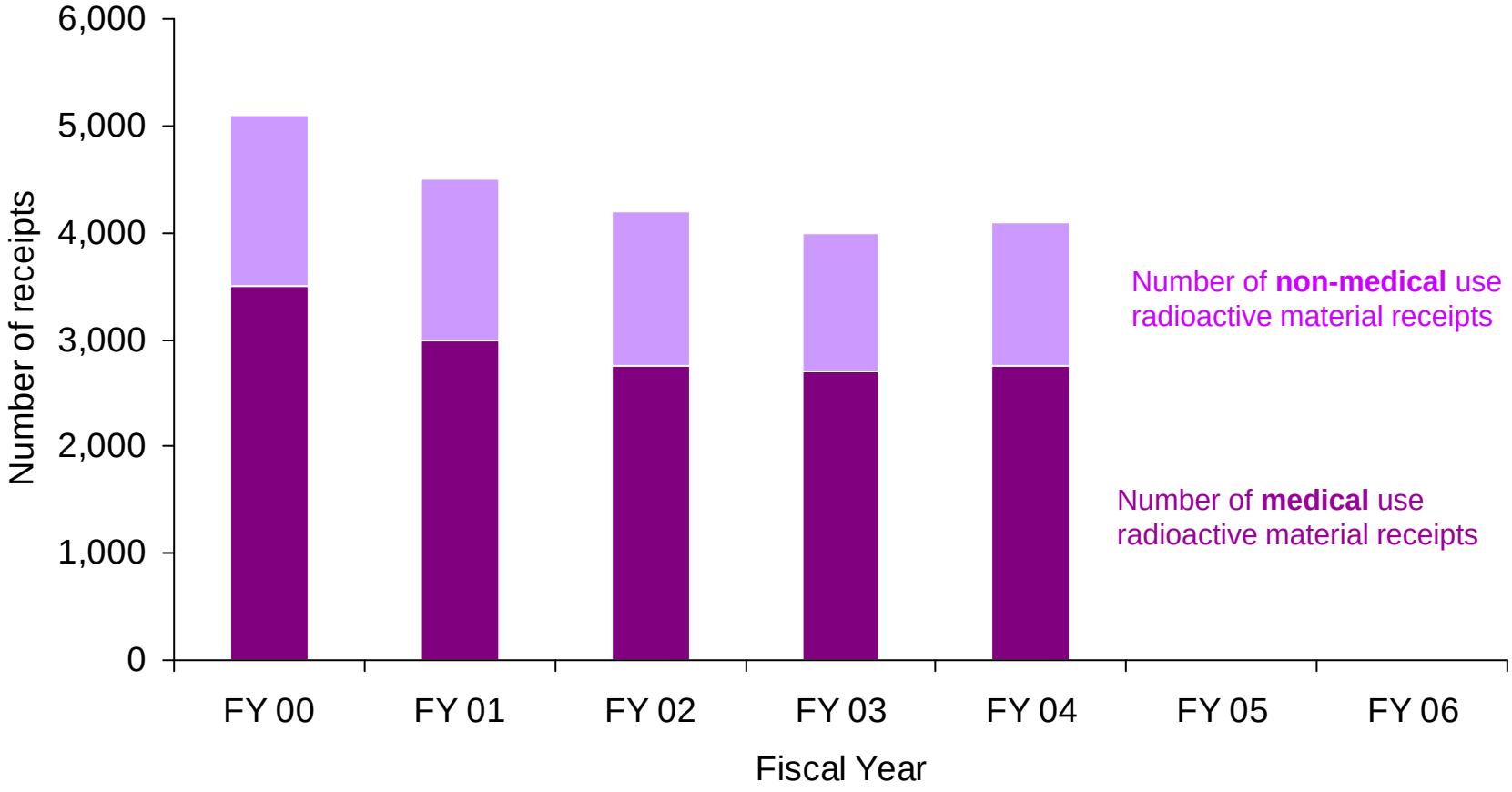


Fig. 3. Receipts of Radioactive Materials



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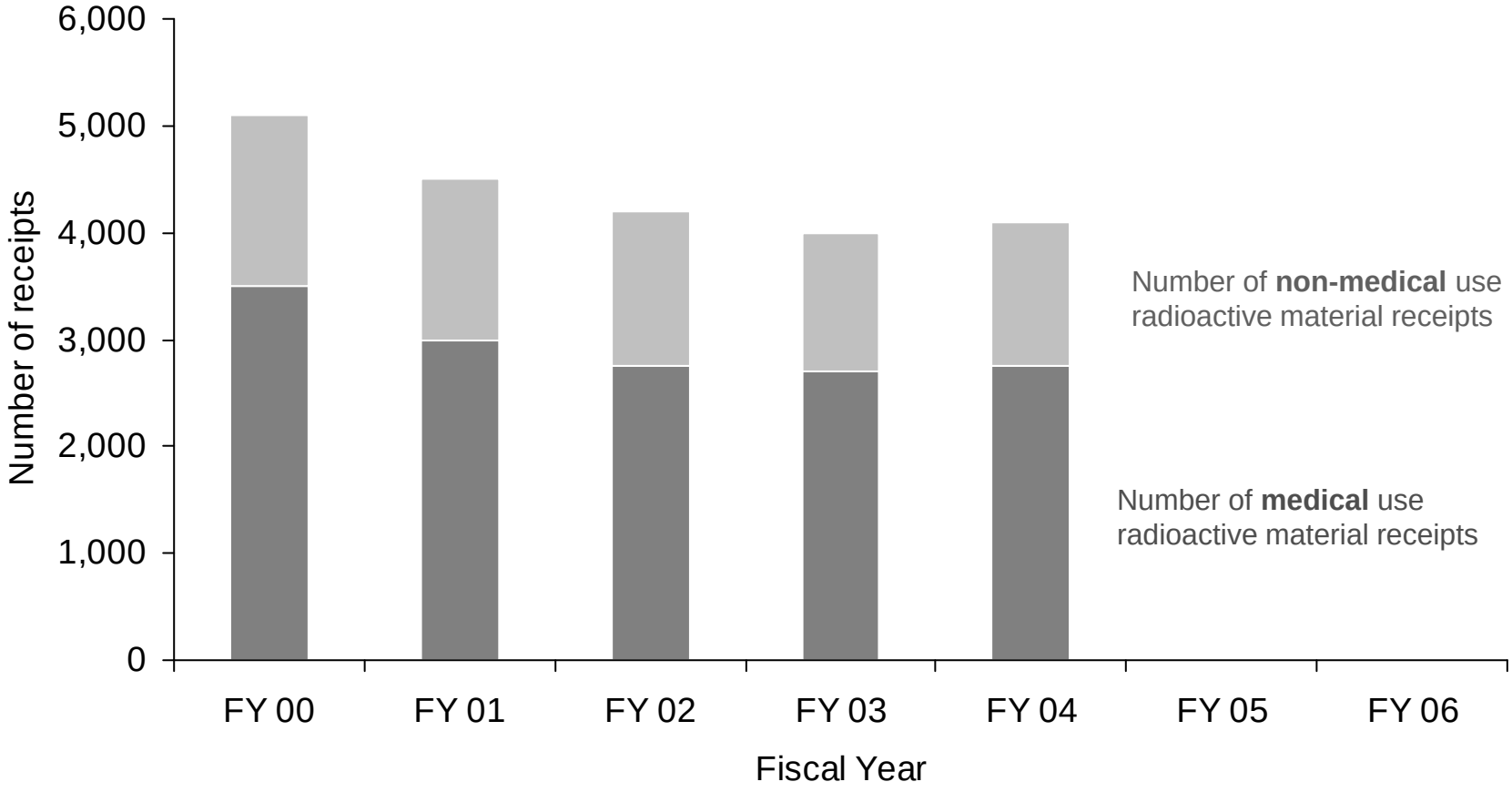
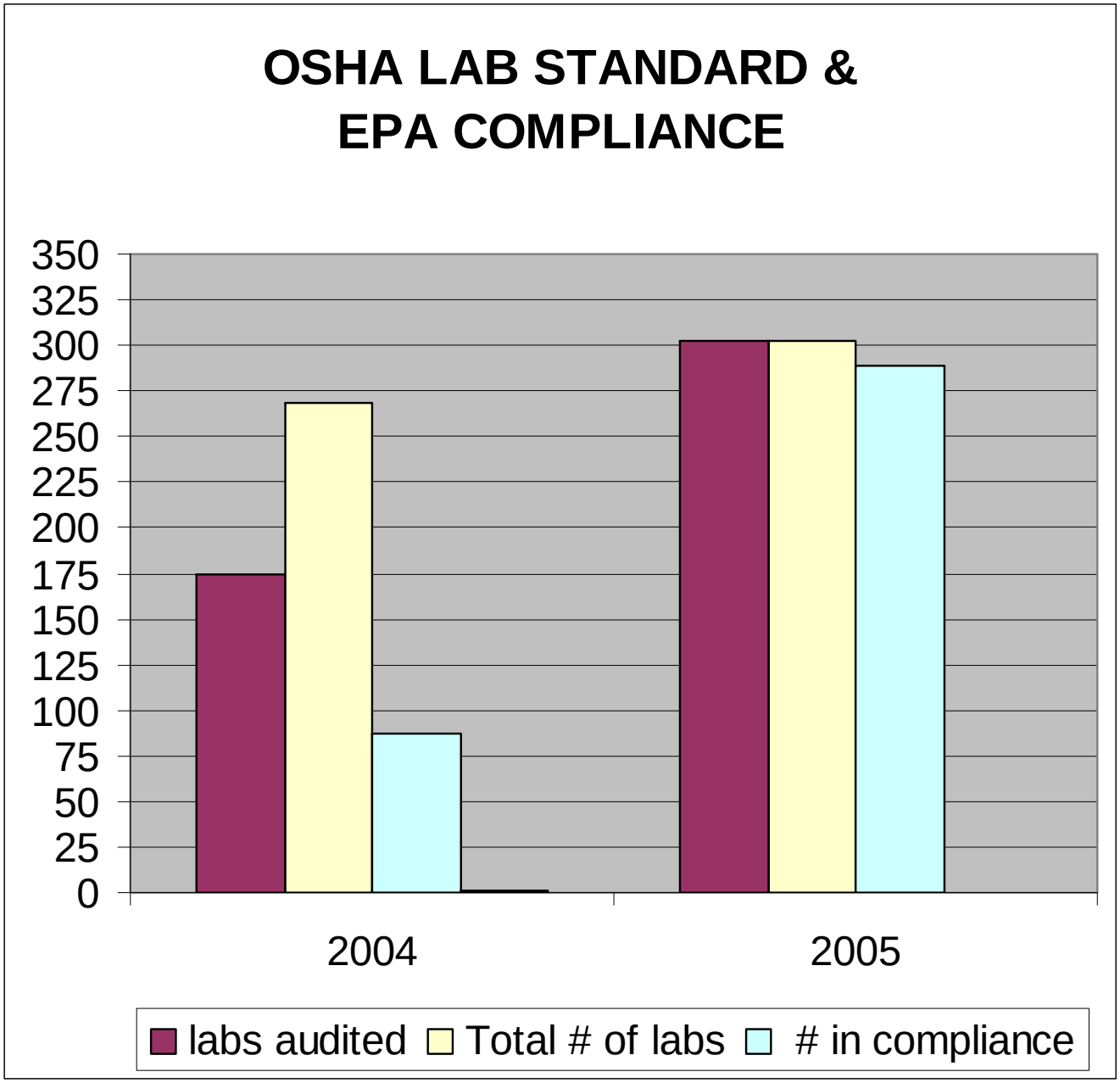
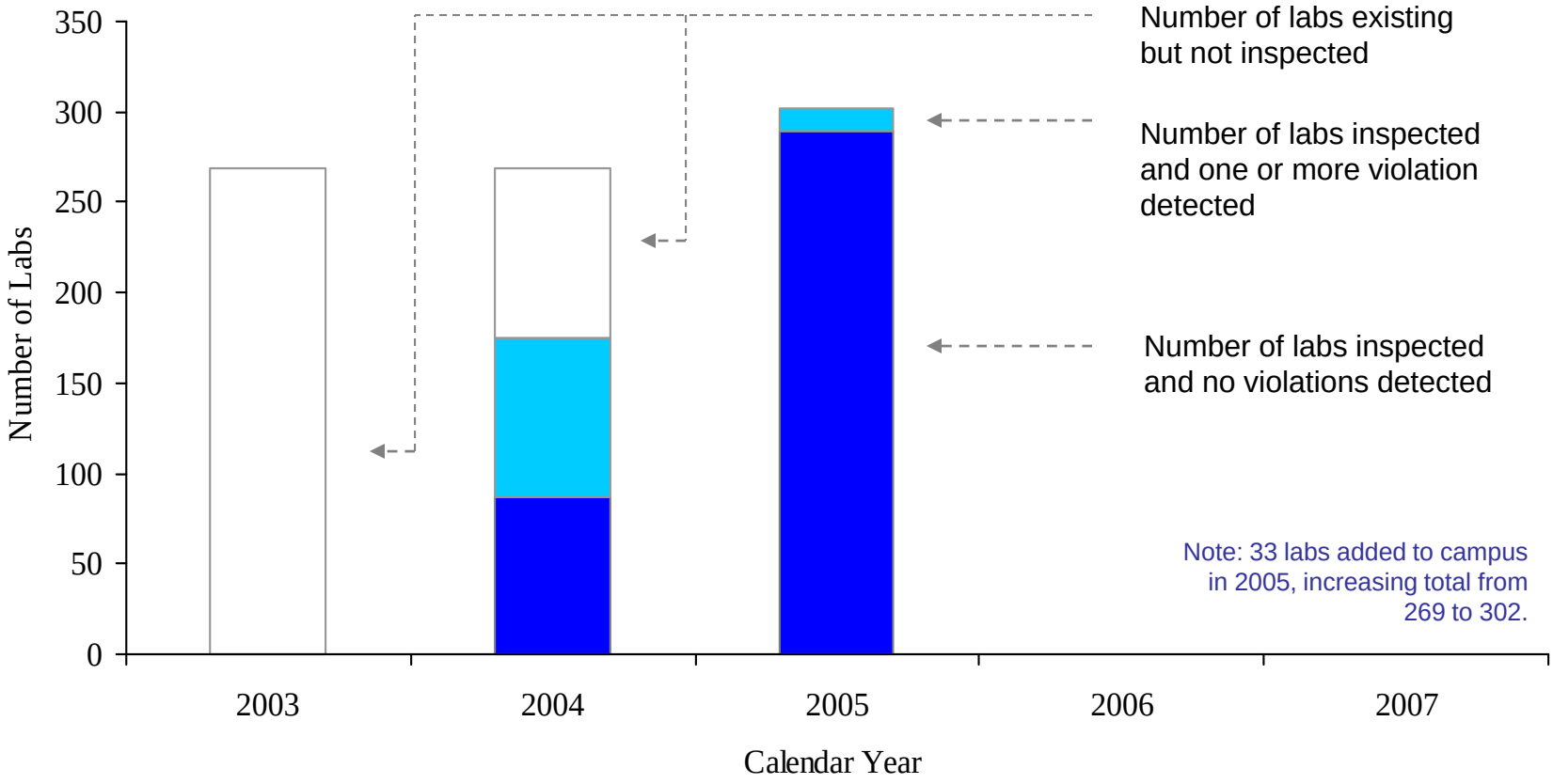
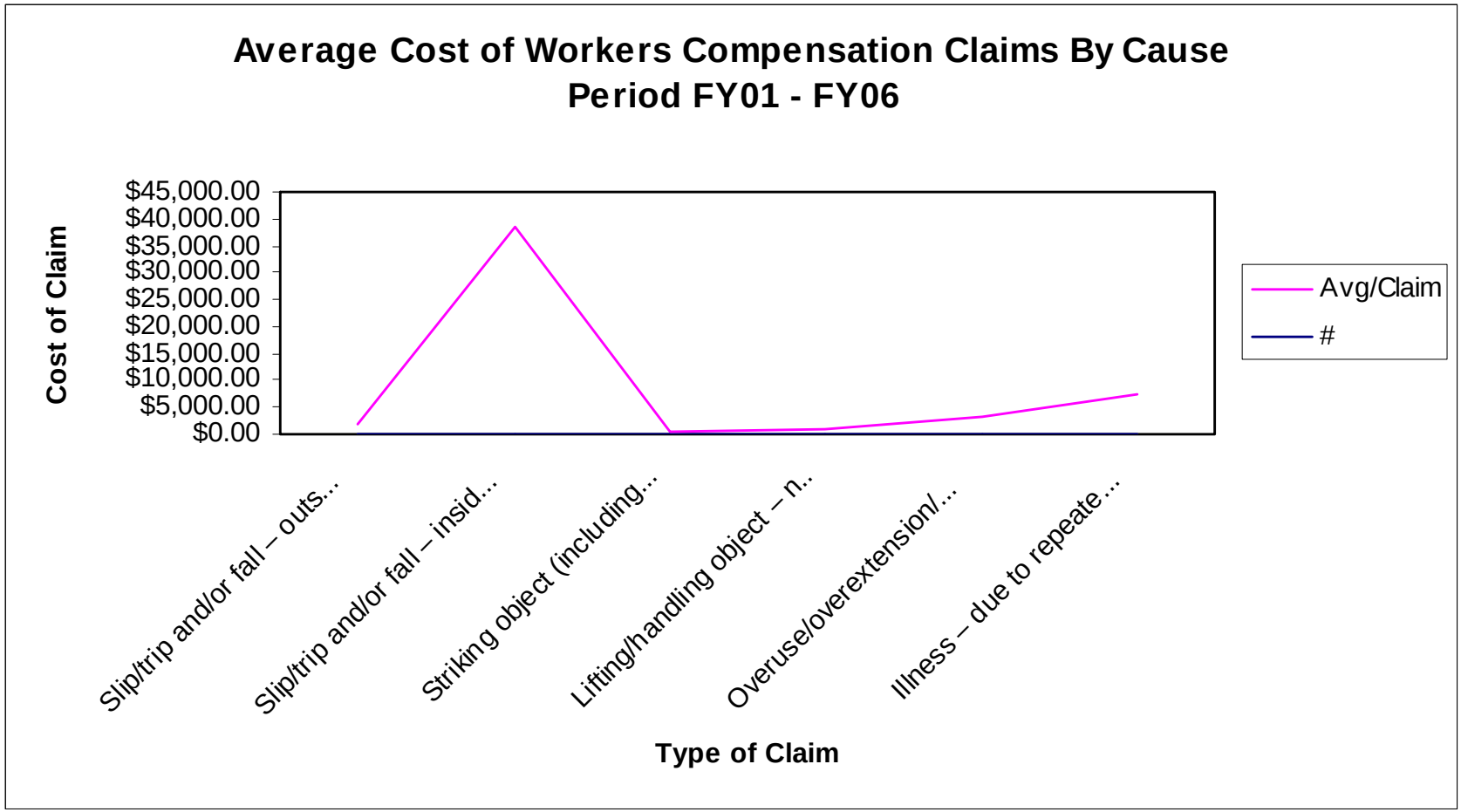


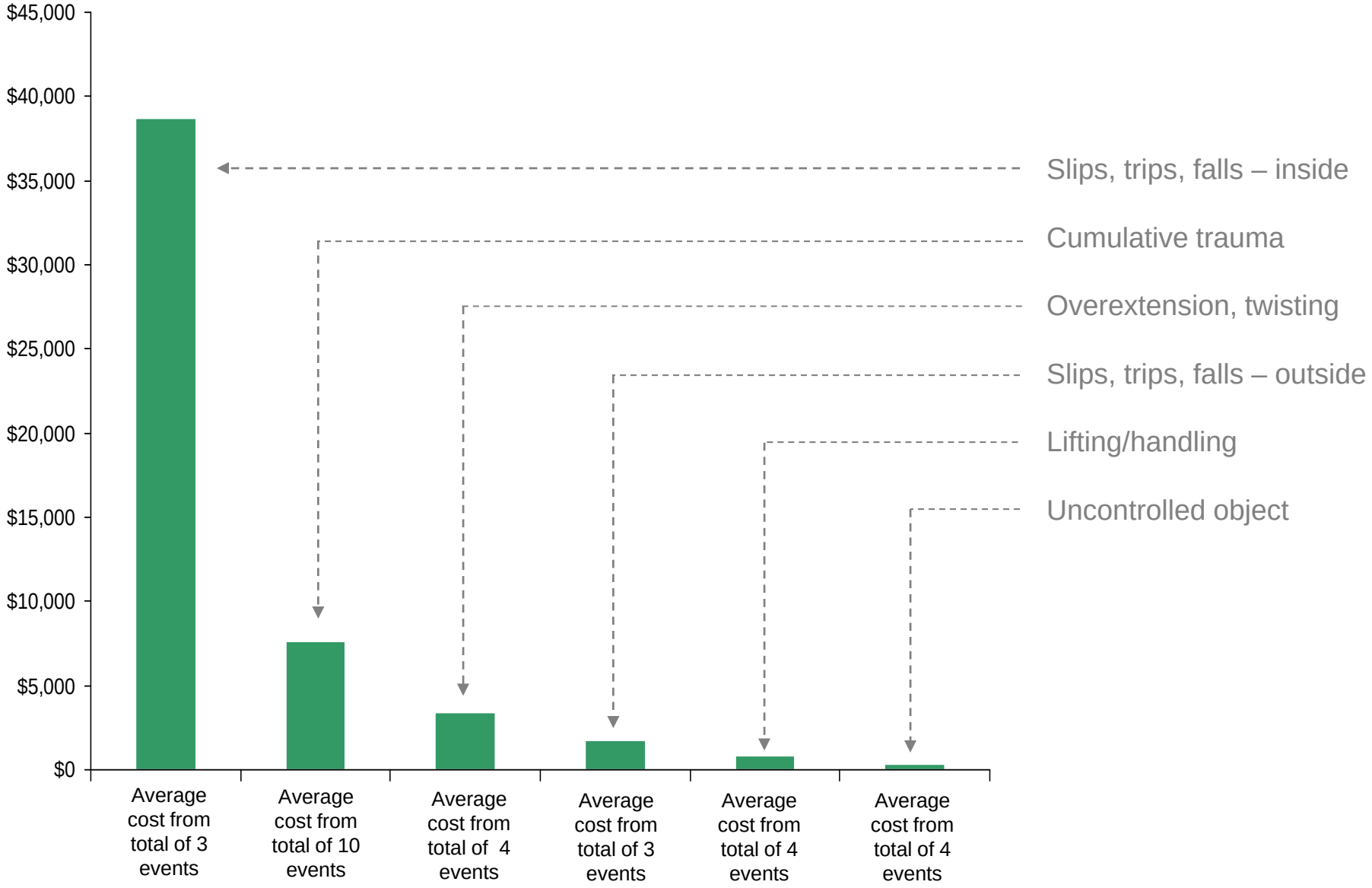

OSHA LAB STANDARD &
EPA COMPLIANCE
350
325
300
275
250
225
200
175
150
125
100
75
50
25
0
2004
2005
labs audited
Total # of labs
in compliance

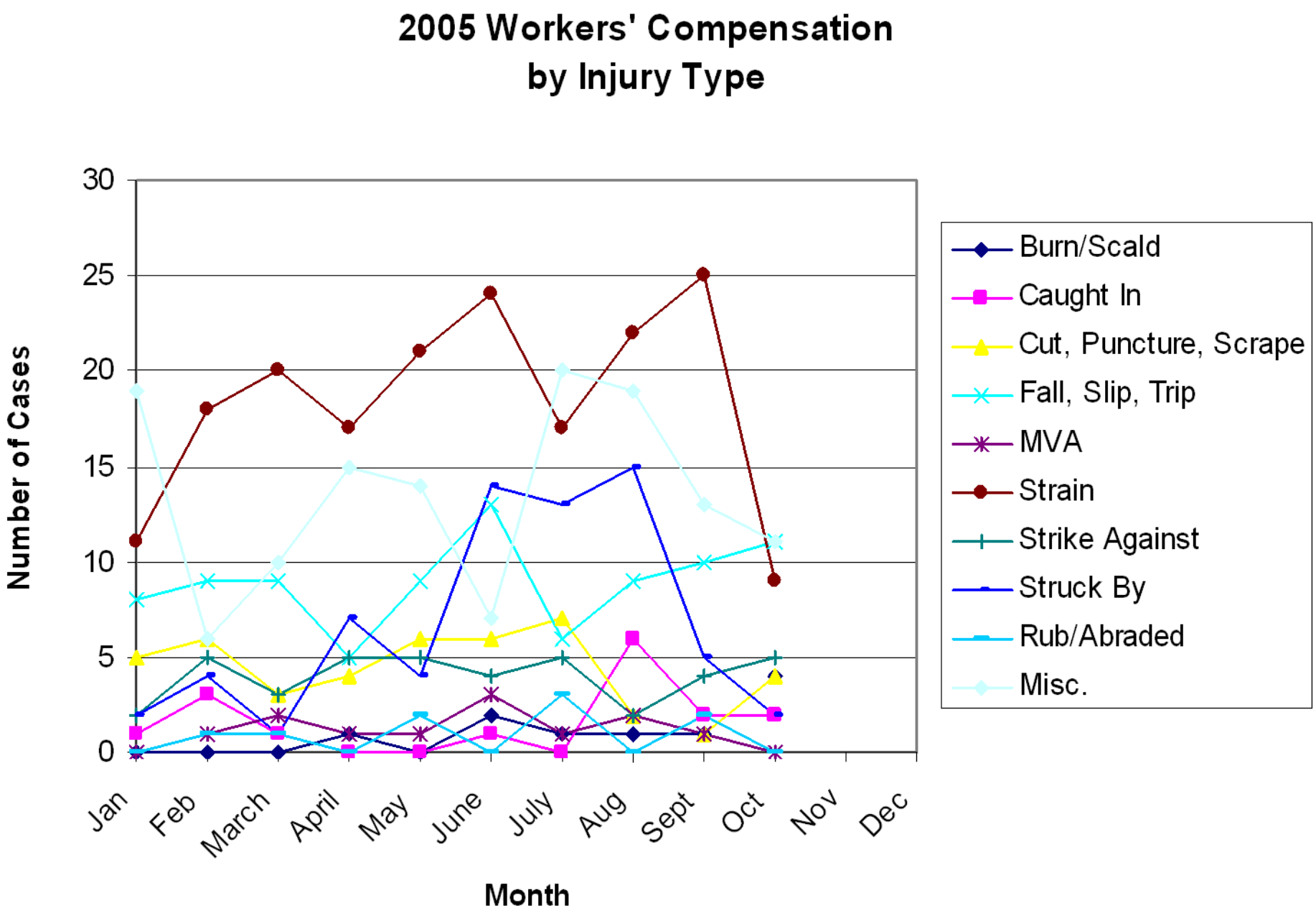
Results of University EH&S Lab Inspection Program, 2003 to 2005




Average Cost of Workers Compensation Claims By Cause
Period FY01 - FY06
Cost of Claim
$45,000.00
$40,000.00
$35,000.00
$30,000.00
$25,000.00
$20,000.00
$15,000.00
$10,000.00
$5,000.00
$0.00
Slip/trip and/or fall – outs...
Slip/trip and/or fall – insid...
Striking object (including...
Lifting/handling object – n..
Overuse/overextension/...
Illness – due to repeate...
Type of Claim
Avg/Claim
#

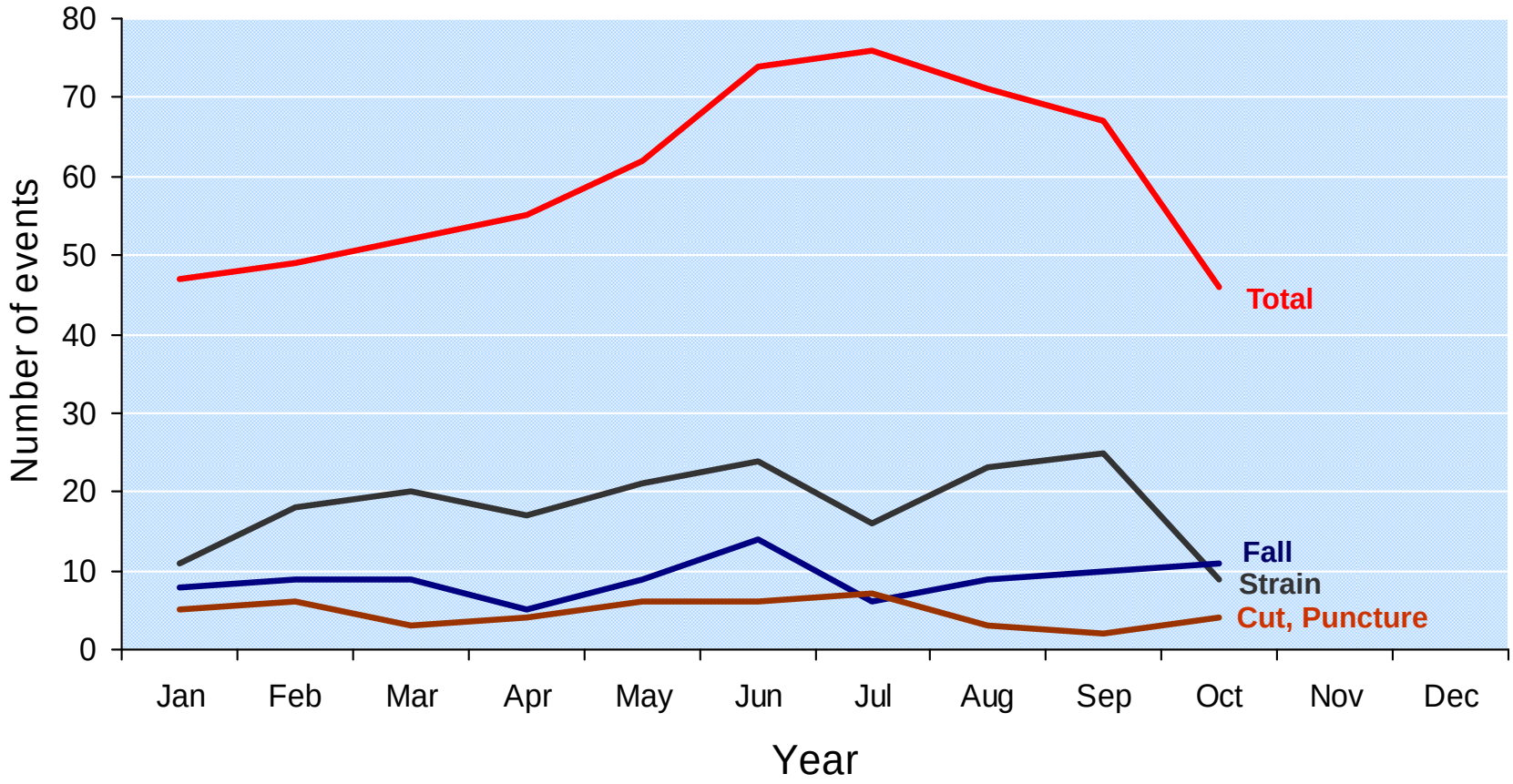
Average Cost of Workers Compensation Claims, by Cause, for Period FY01 - FY06

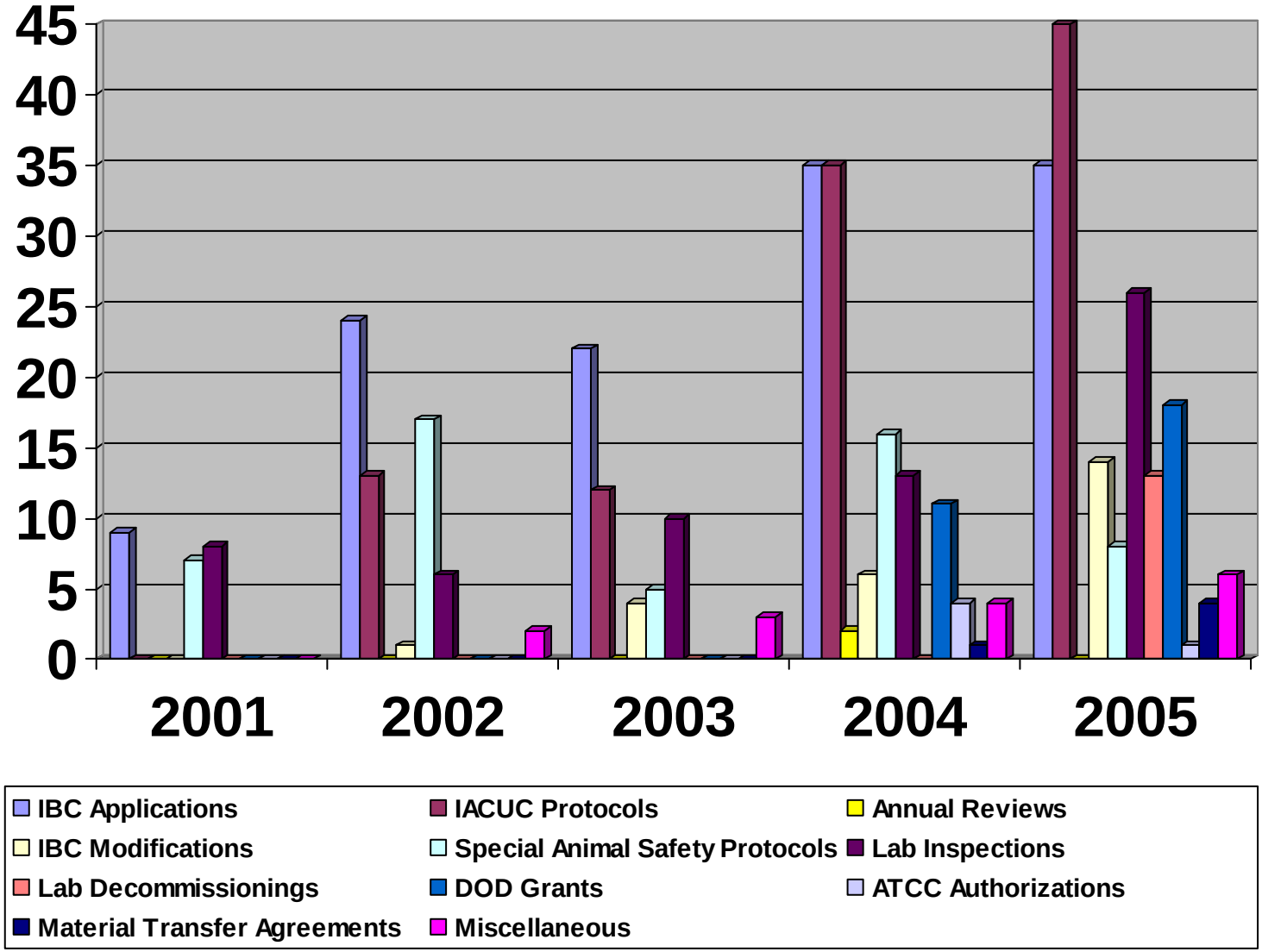



2005 Workers' Compensation
by Injury Type
Number of Cases
30
25
20
15
10
5
0
Jan
Feb
March
April
May
June
July
Aug
Sept
Oct
Nov
Dec
Month
Burn/Scald
Caught In
Cut, Puncture, Scrape
Fall, Slip, Trip
MVA
Strain
Strike Against
Struck By
Rub/Abraded
Misc.

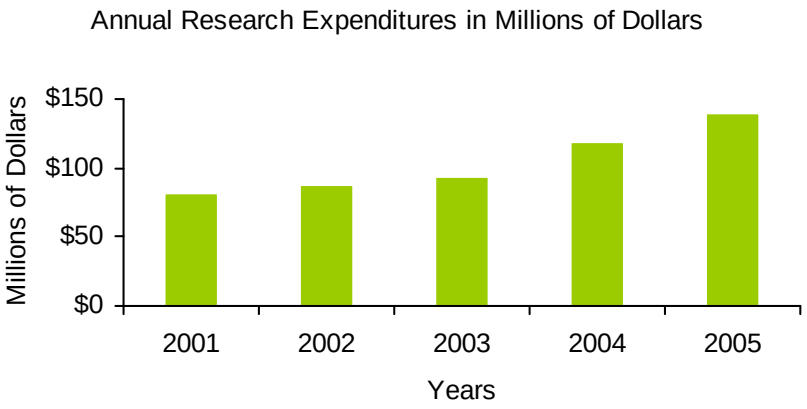
2005 Total Number of Monthly Workers Compensation Claims

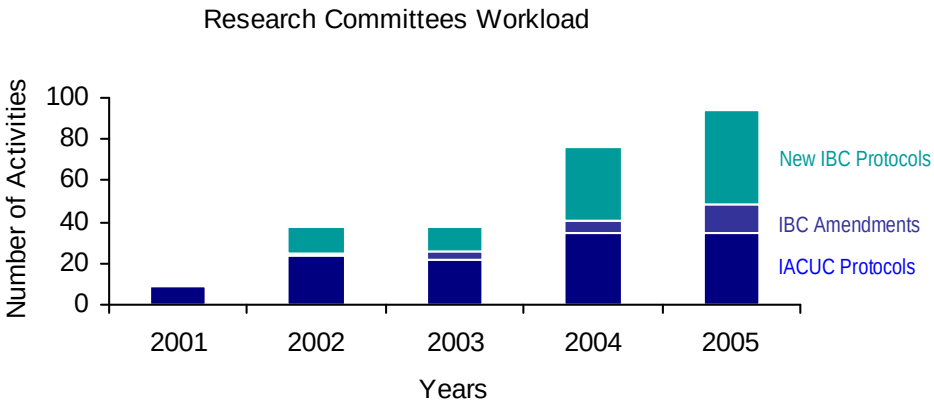
inclusive of the three most frequent identifiable classes of injuries

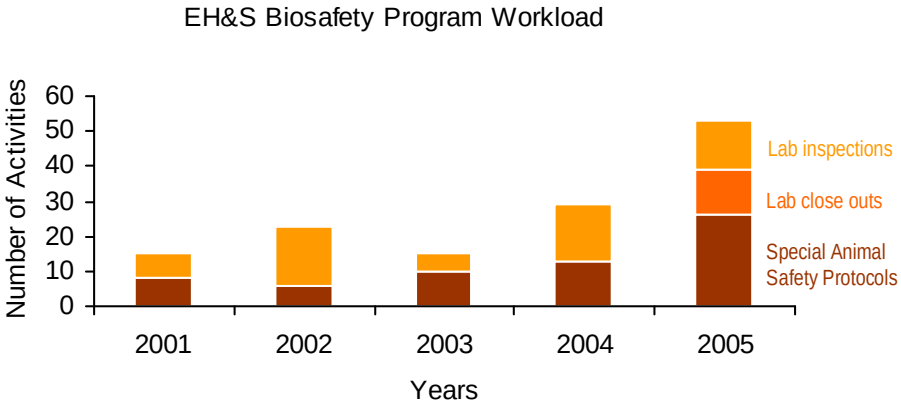


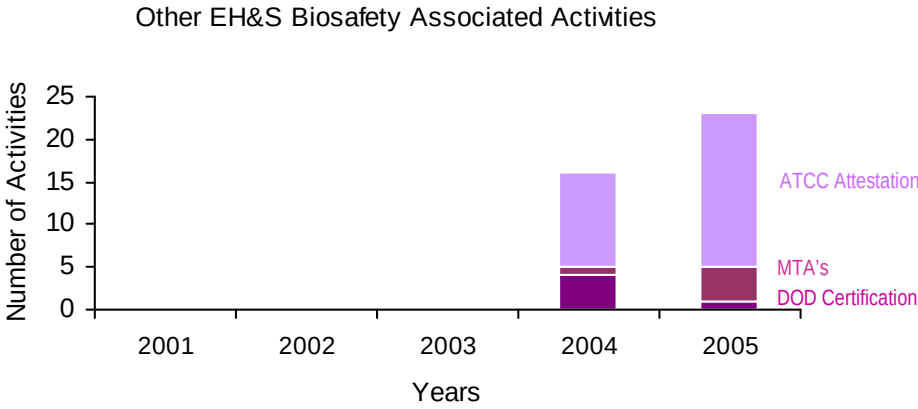

45
40
35
30
25
20
15
10
5
0
2001
2002
2003
2004
2005
IBC Applications
IACUC Protocols
Annual Reviews
IBC Modifications
Special Animal Safety Protocols
Lab Inspections
Lab Decommissionings
DOD Grants
ATCC Authorizations
Material Transfer Agreements
Miscellaneous

Growth in U of L Research Enterprise and Concurrent Growth in Committee and EH&S Workload, 2001 to 2005

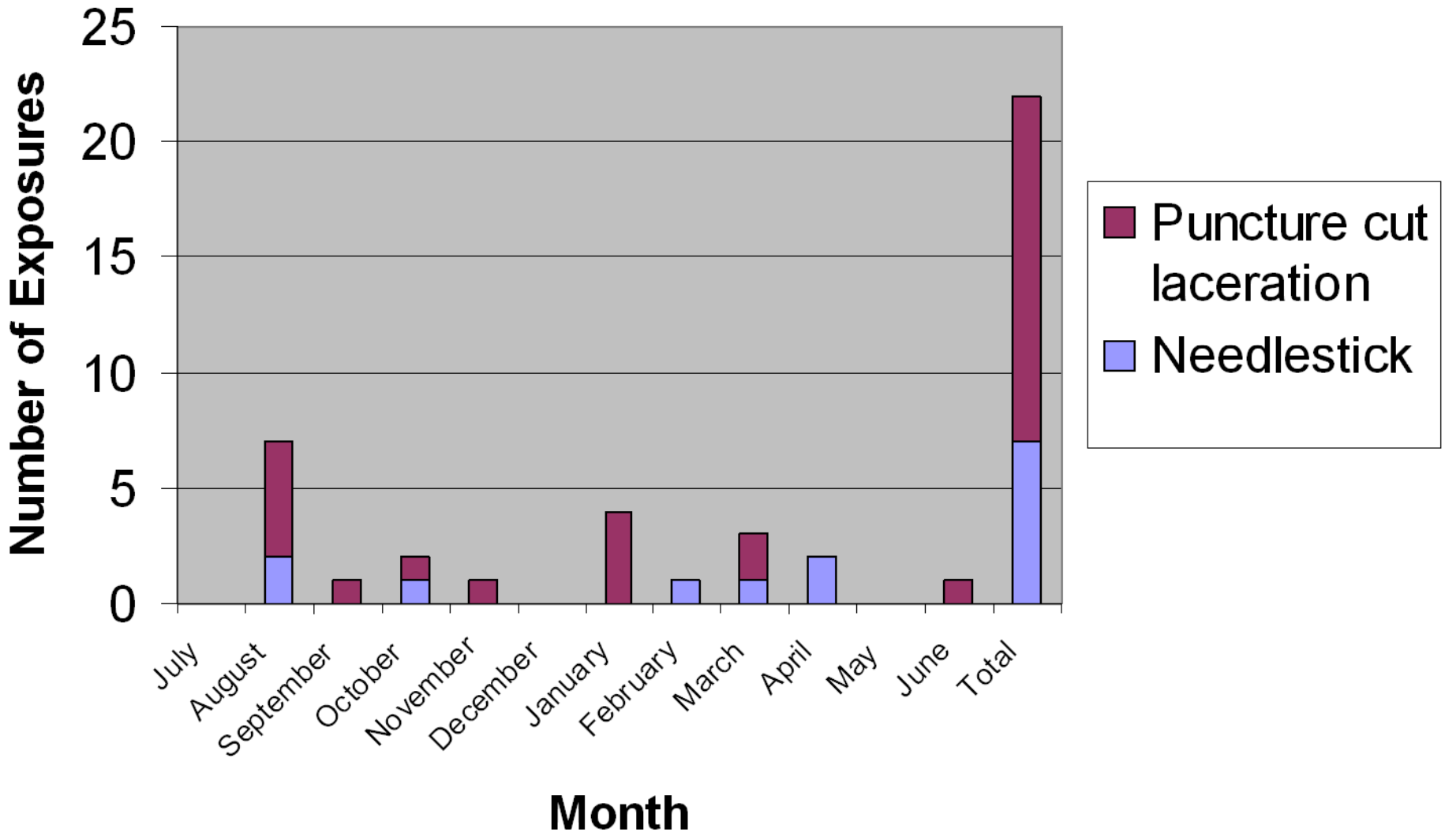


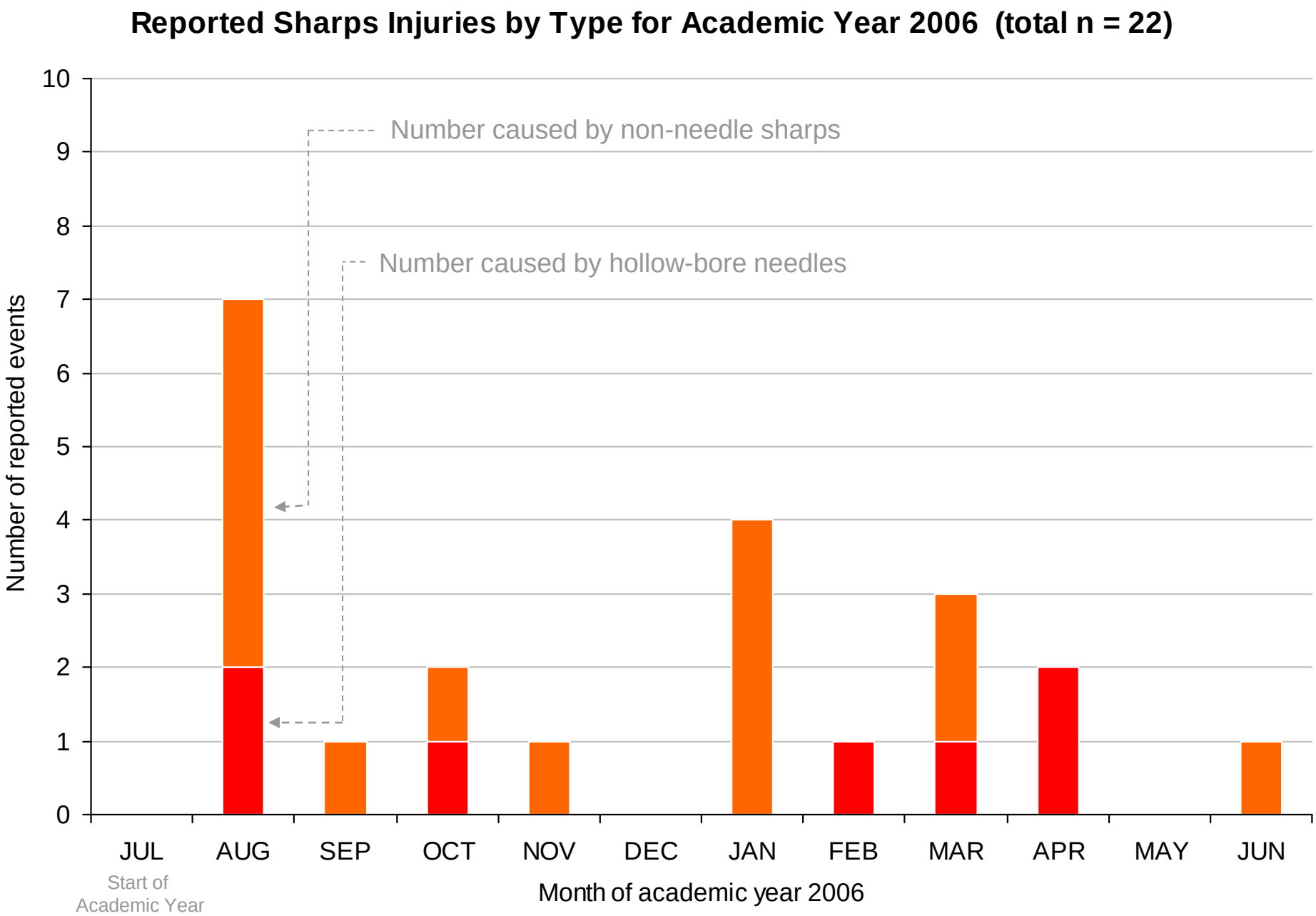


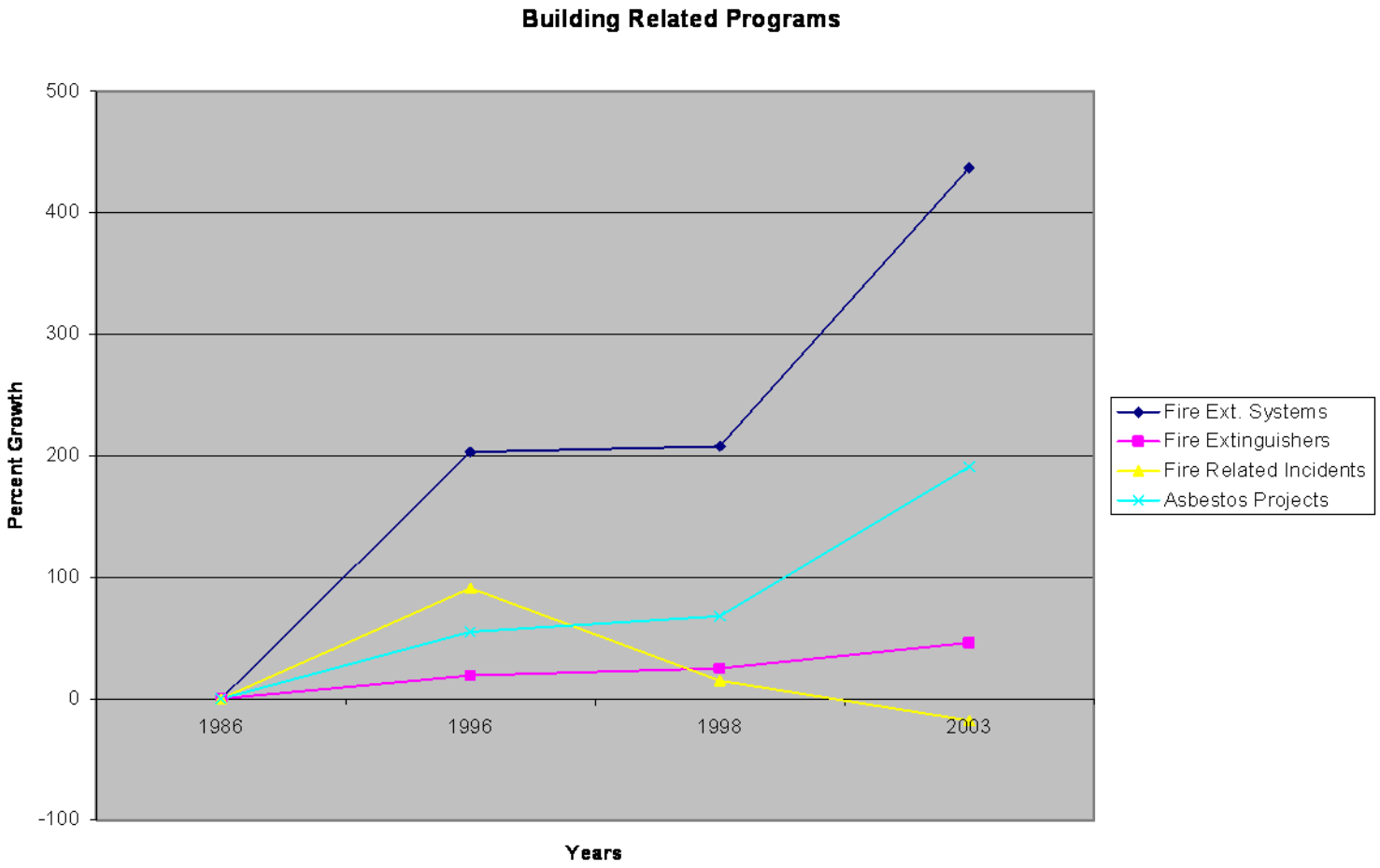




2006 Dental Injuries by Type

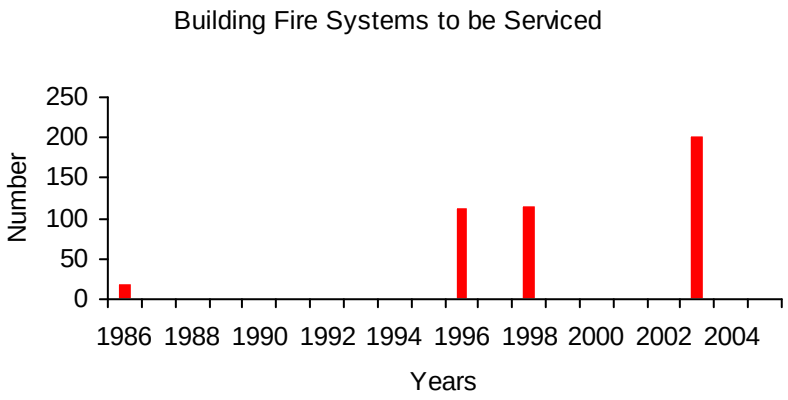


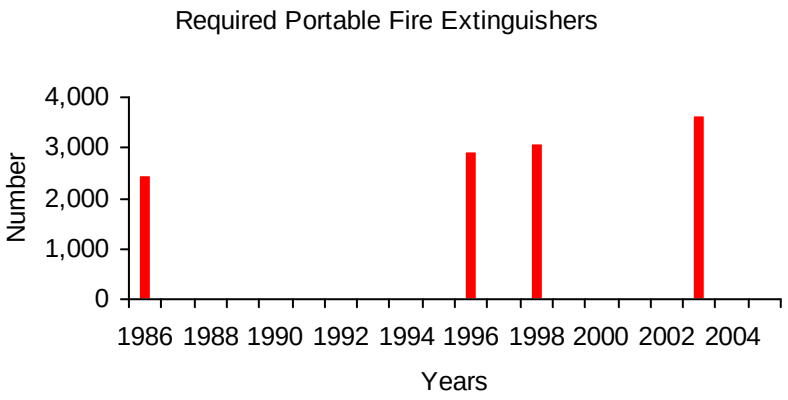

Reported Sharps Injuries by Type for Academic Year 2006 (total n = 22)
Number caused by non-needle sharps
Number caused by hollow-bore needles
Number of reported events
0
1
2
3
4
5
6
7
8
9
10
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
Start of Academic Year
Month of academic year 2006

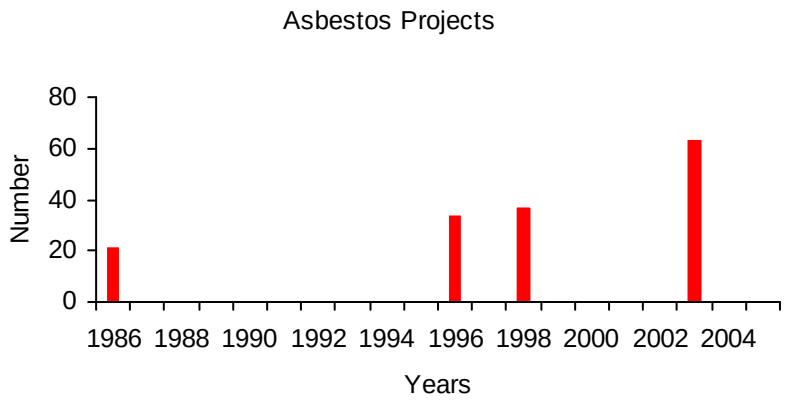


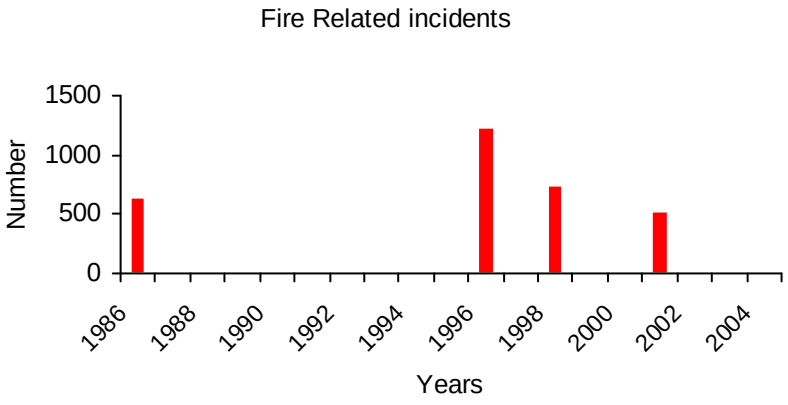
	Fire Extinguisher Systems	Fire Extinguishers	Fire Related Incidents	Asbestos Projects
1986	0	0	0	0
1996	203	19	91	55
1998	208	25	15	68
2003	437	46	-18	191

Growth in Occupational Safety Responsibilities 1986 to 2003

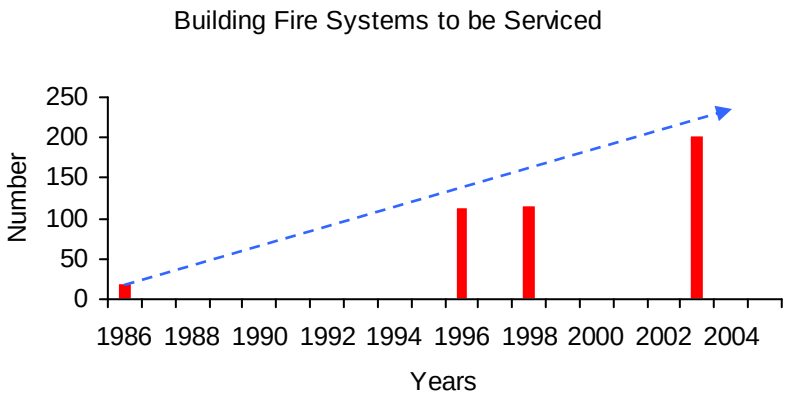


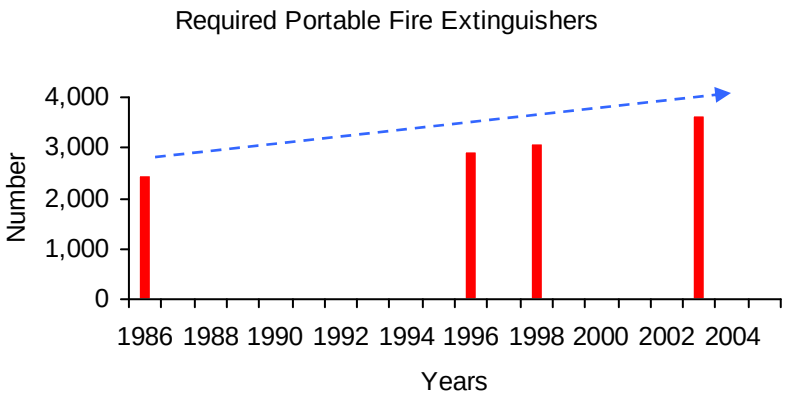


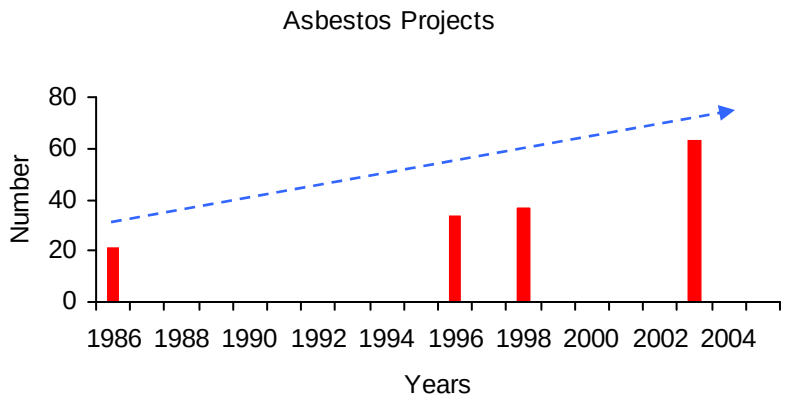




Growth in Occupational Safety Responsibilities 1986 to 2003







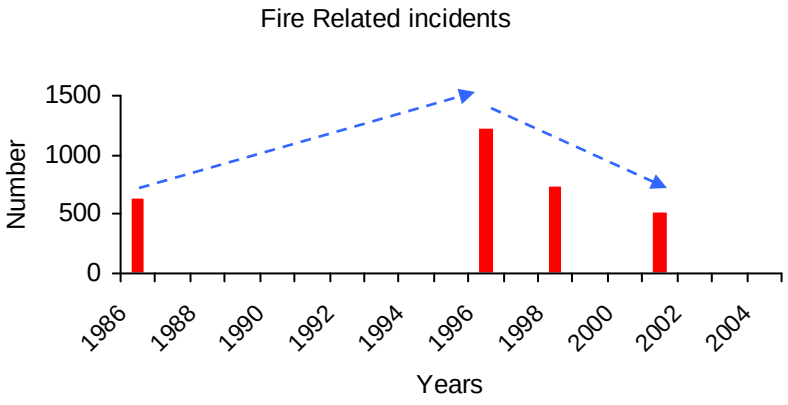


Figure 1: Laboratory Waste verses Total Waste Generated

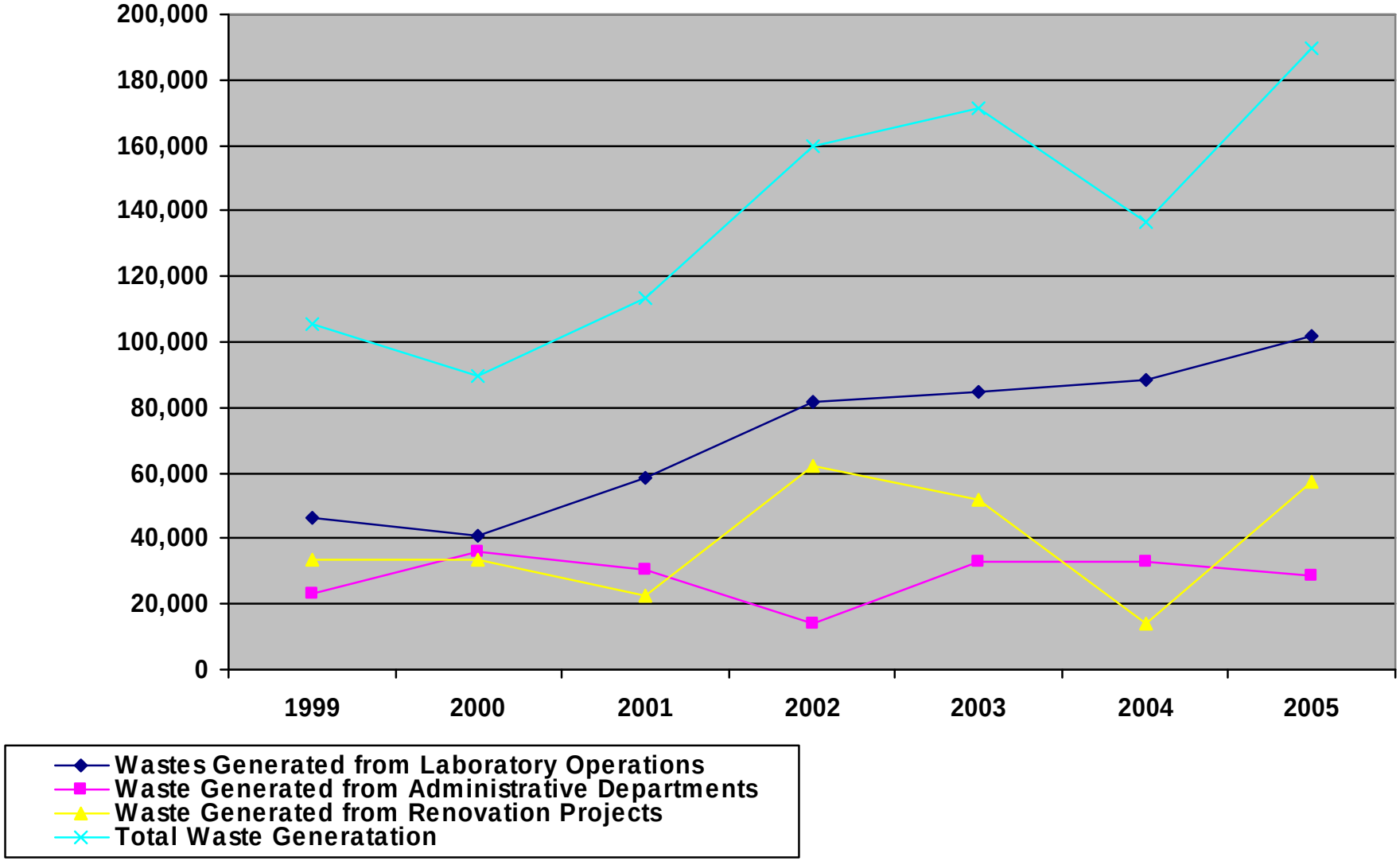


Figure 1: Hazardous Waste Generation in Pounds by Type of Institutional Activity

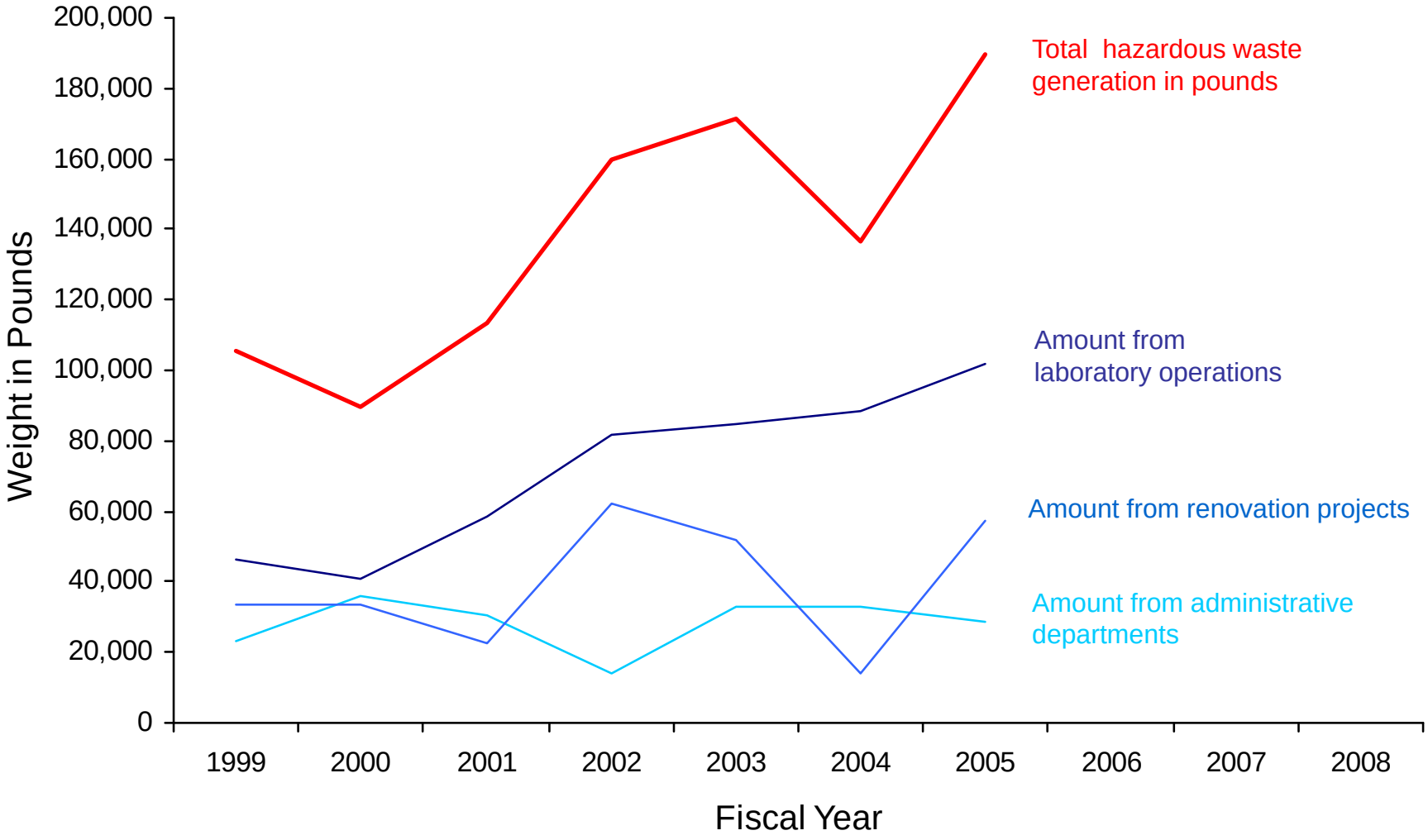


Figure 1: Laboratory Waste verses Total Waste Generated

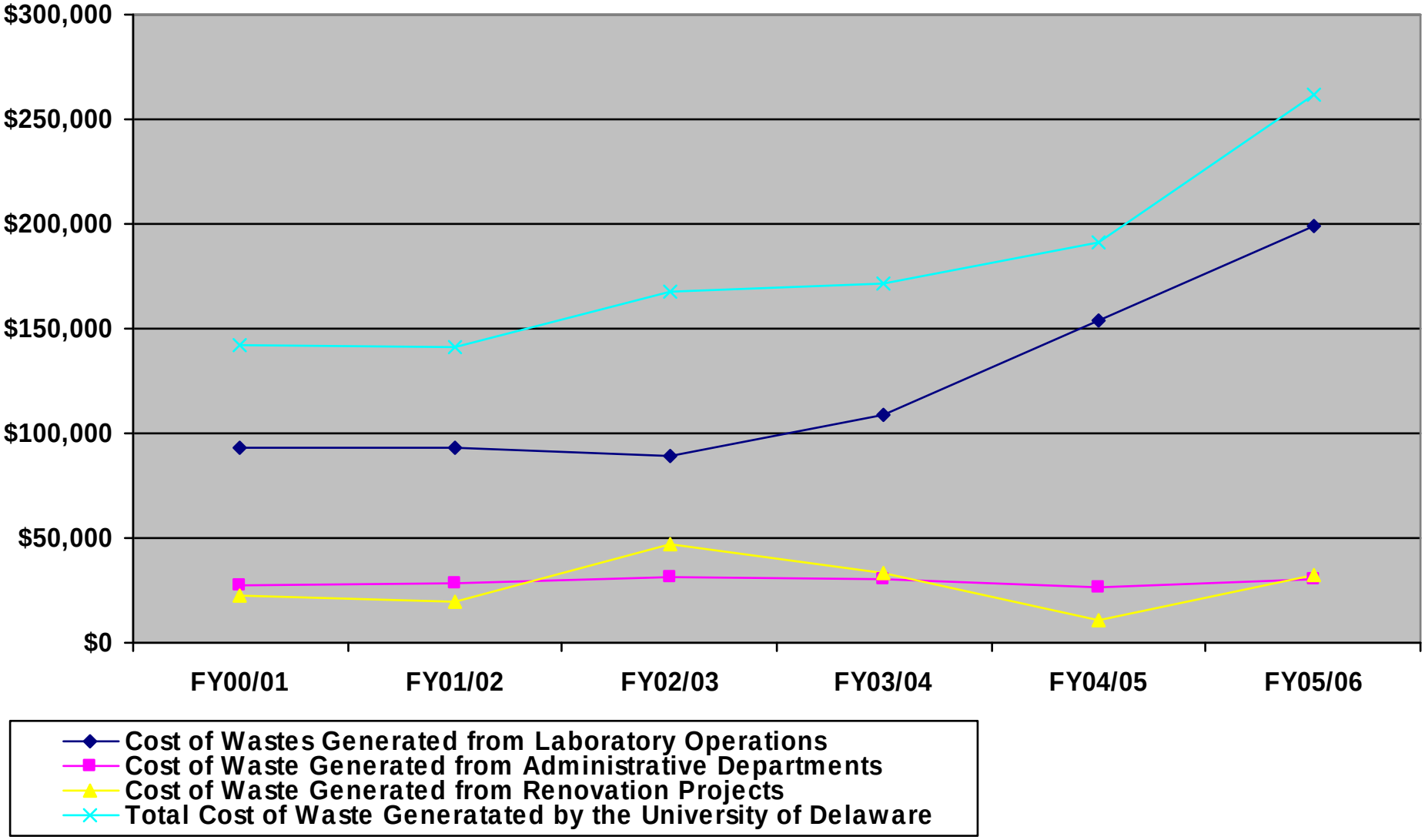
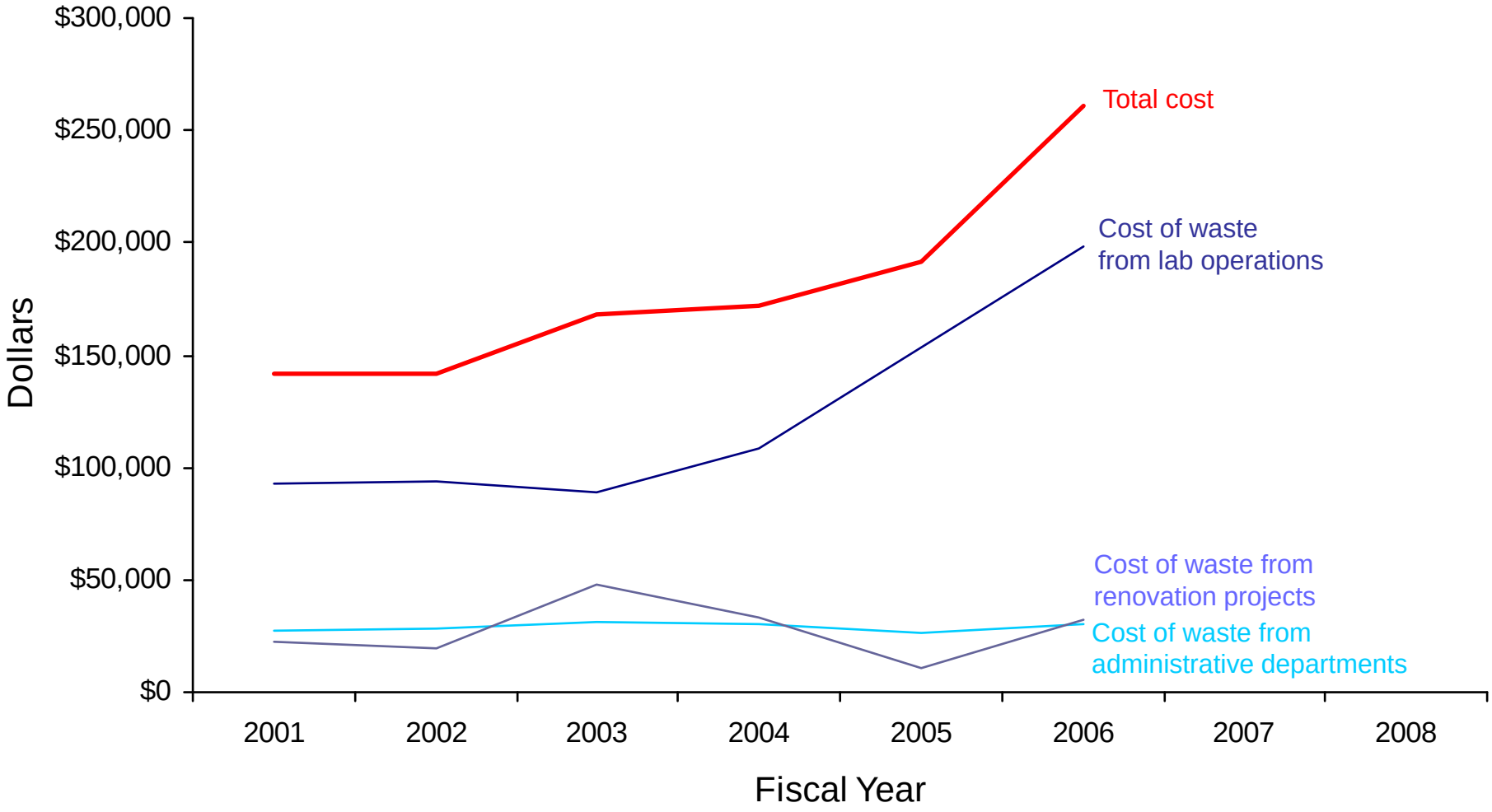
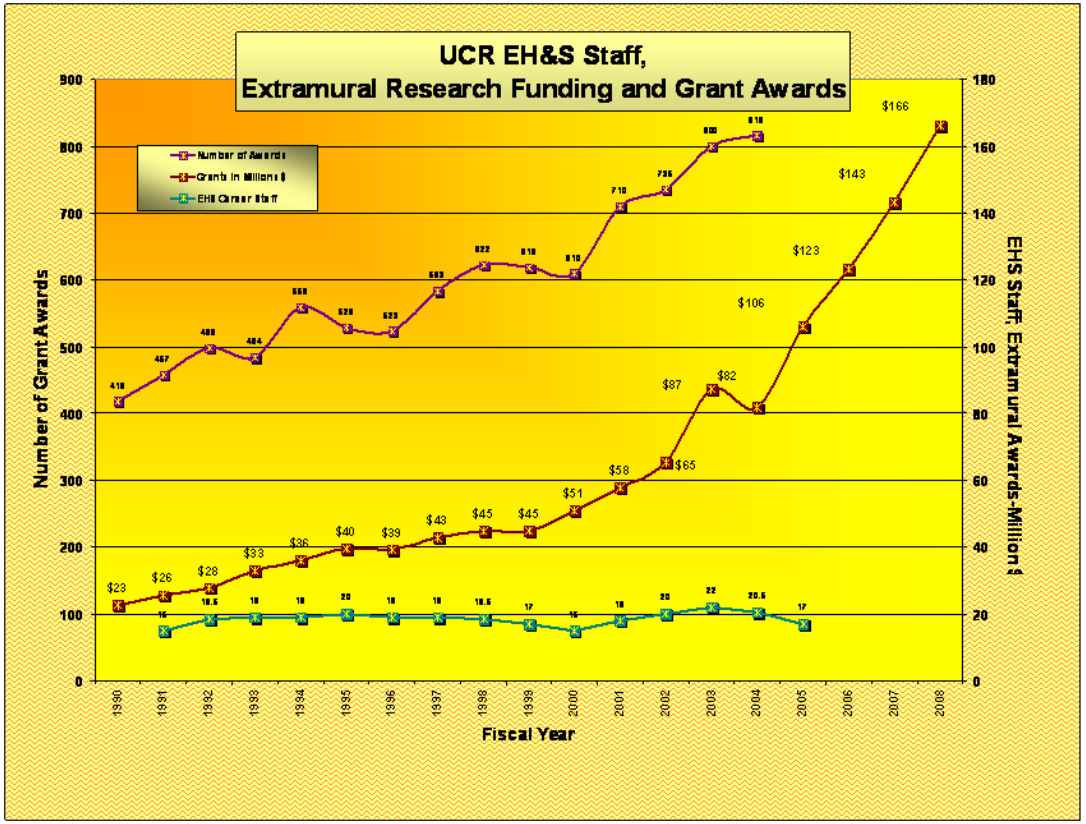
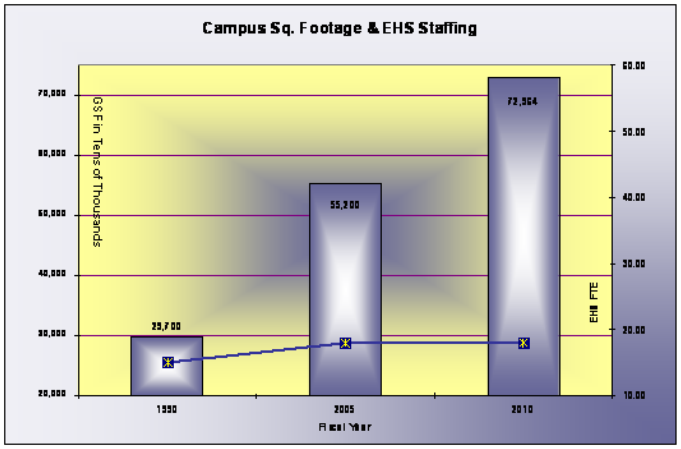
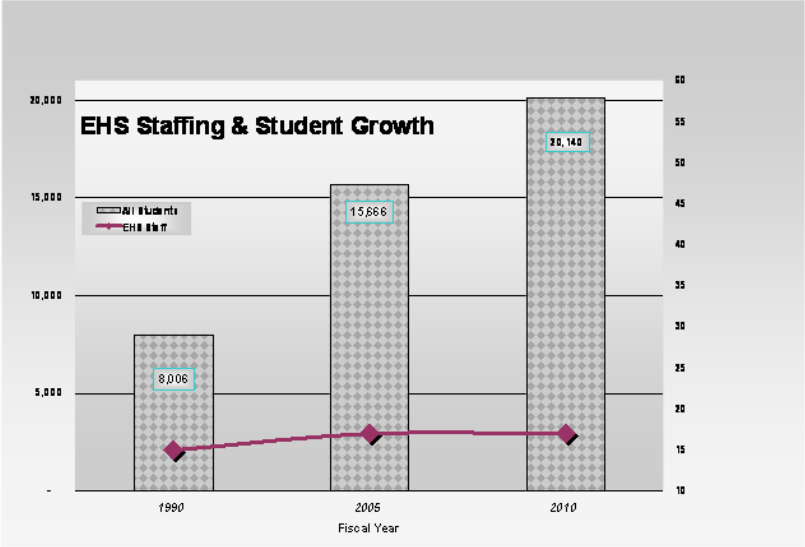


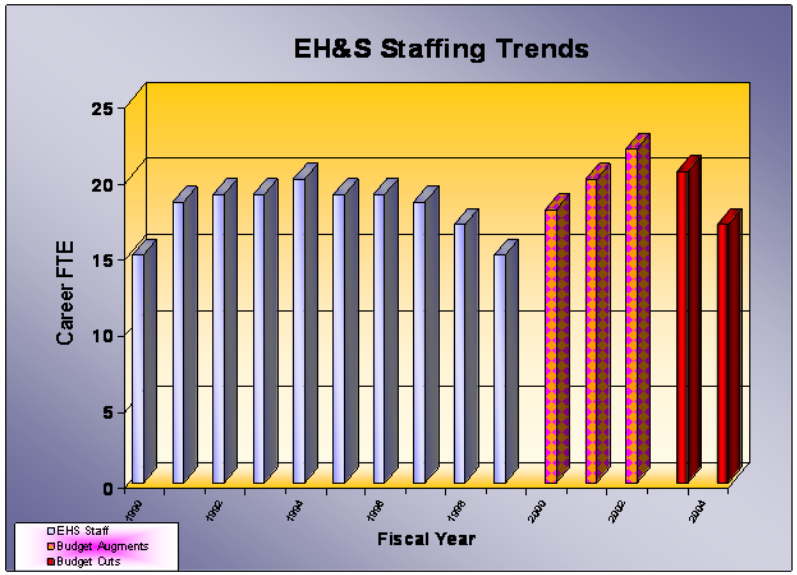
Figure 2: Annual Hazardous Waste Disposal Cost by Type of Institutional Activity



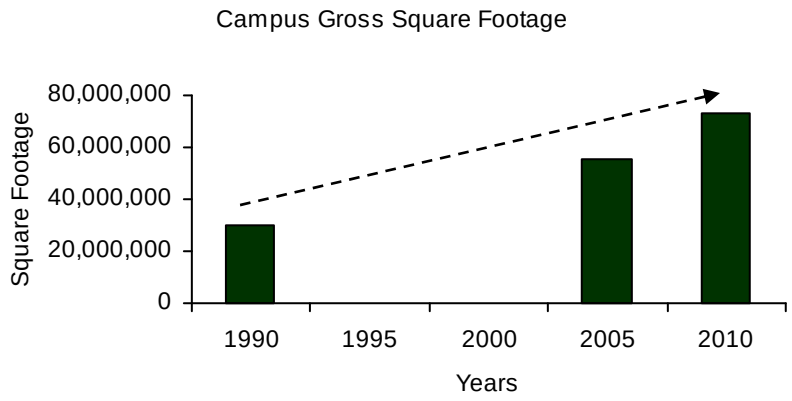

UCR EH&S Staff,
Extramural Research Funding and Grant Awards
Number of Awards
Grants in Millions $
EHS Career Staff
Number of Grant Awards
EHS Staff, Extramural Awards-Million $
Fiscal Year
$23
$26
$28
$33
$36
$40
$39
$43
$45
$45
$51
$58
$65
$87
$82
$106
$123
$143
$166

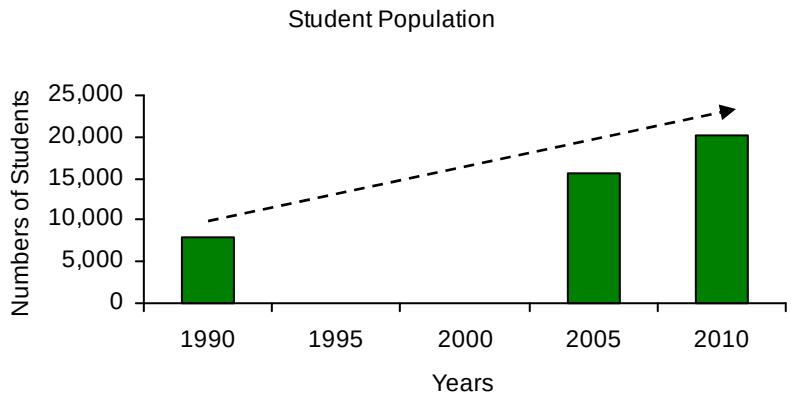

Campus Sq. Footage & EHS Staffing
GSF in Tens of Thousands
EHS FTE
29,700
55,200
72,364
1990
2005
2010
Fiscal Year

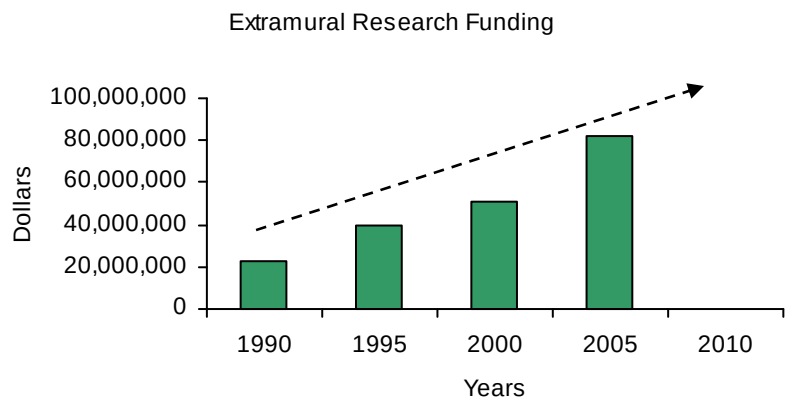

EHS Staffing & Student Growth
All Students
EHS Staff
8,006
15,666
20,140
1990
2005
2010
Fiscal Year

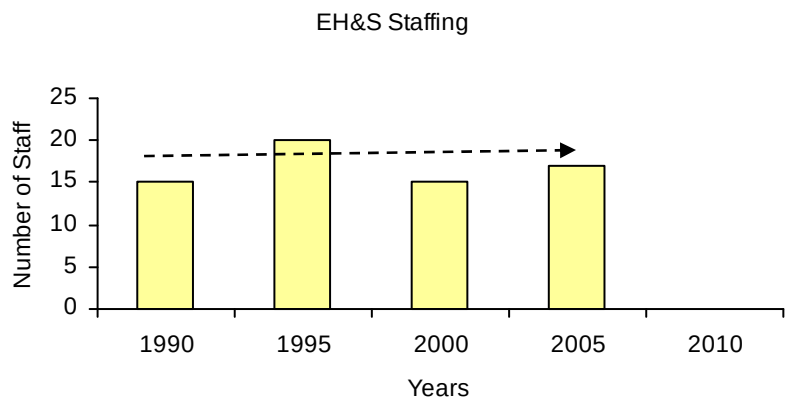

EH&S Staffing Trends
Career FTE
Fiscal Year
EHS Staff
Budget Augments
Budget Cuts

UCR Campus Growth Indicators Compared to EH&S Staffing









nts Switch to Generic F

the drug-switch-
leaders note that
generally require
several kinds of
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that," says Sindi
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is year. She says
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heir help in sev-
amazingly tre-
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all the shots.
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g role as limited
primarily an ini-
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ertain cases that
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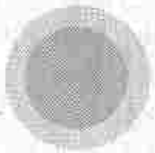
Drug Dollars

Epilepsy Foundation contribution ranges for some drug companies:



$500,000 - $999,999
Eisai
GlaxoSmithKline
UCB

$100,000 - $499,999
Abbott Laboratories
Novartis Pharmaceuticals
Ortho-McNeil Neurologics*
Pfizer

$25,000-$49,999
PhRMA (trade group)

*Subsidiary of Johnson & Johnson

Source: Epilepsy Foundation

was too small to have a tangible impact on patients.

Coming up with the kind of evi-

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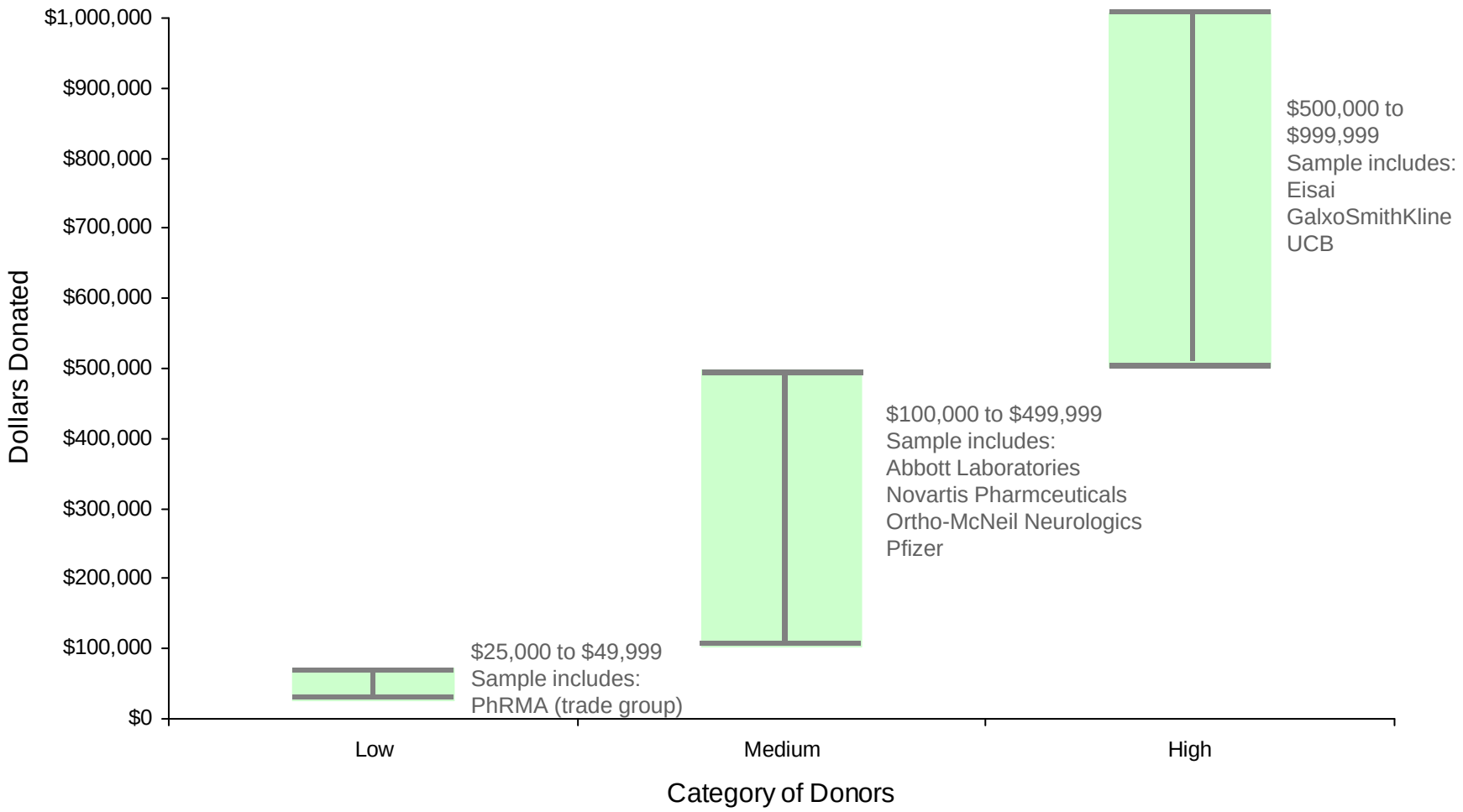
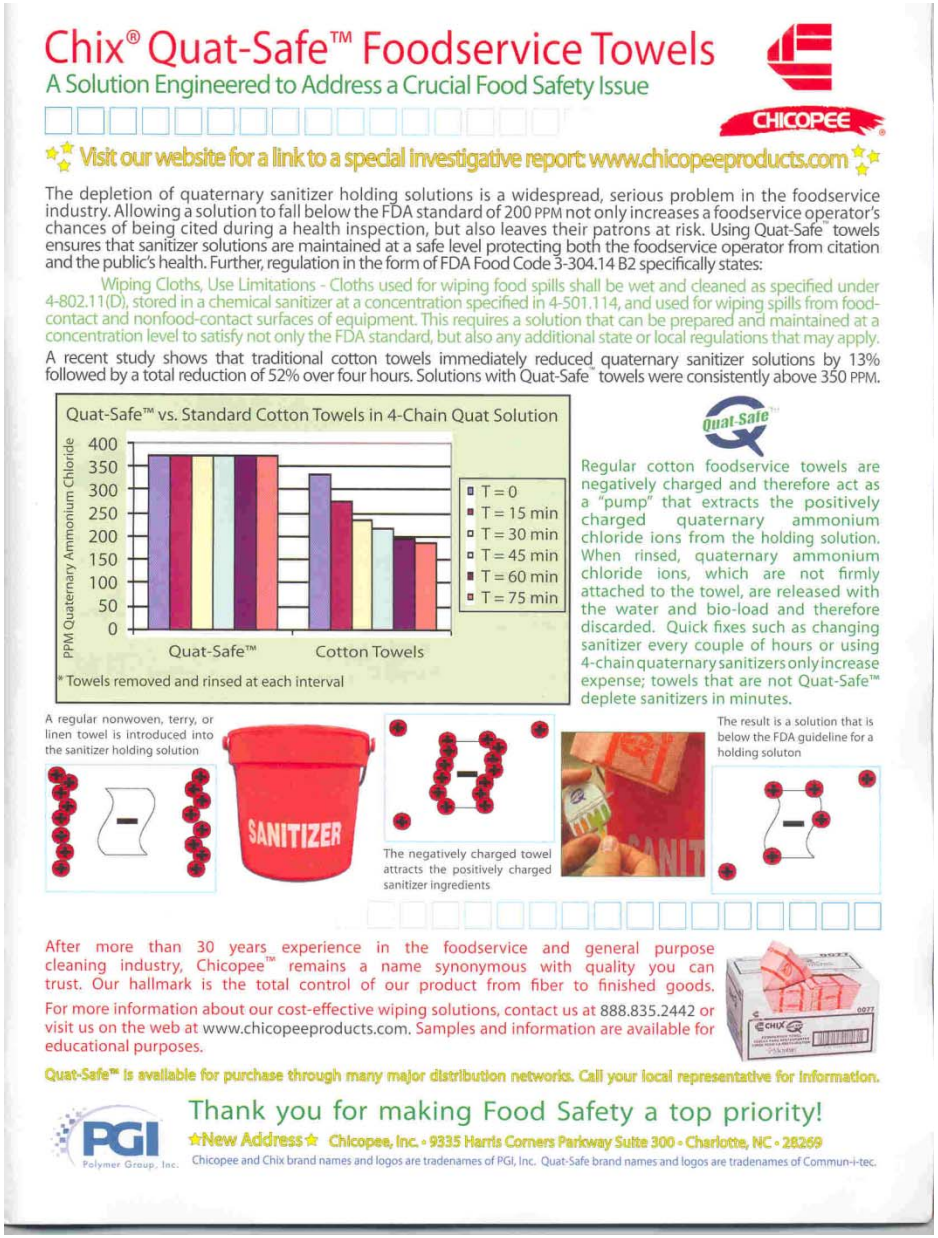
2006 Epilepsy Foundation Range of Donations by a Sampling of Drug Companies





Chix® Quat-Safe™ Foodservice Towels

A Solution Engineered to Address a Crucial Food Safety Issue

CHICOPEE

Visit our website for a link to a special investigative report: www.chicopeeproducts.com

The depletion of quaternary sanitizer holding solutions is a widespread, serious problem in the foodservice industry. Allowing a solution to fall below the FDA standard of 200 PPM not only increases a foodservice operator's chances of being cited during a health inspection, but also leaves their patrons at risk. Using Quat-Safe™ towels ensures that sanitizer solutions are maintained at a safe level protecting both the foodservice operator from citation and the public's health. Further, regulation in the form of FDA Food Code 3-304.14 B2 specifically states:

Wiping Cloths, Use Limitations - Cloths used for wiping food spills shall be wet and cleaned as specified under 4-802.11(D), stored in a chemical sanitizer at a concentration specified in 4-501.114, and used for wiping spills from food-contact and nonfood-contact surfaces of equipment. This requires a solution that can be prepared and maintained at a concentration level to satisfy not only the FDA standard, but also any additional state or local regulations that may apply.

A recent study shows that traditional cotton towels immediately reduced quaternary sanitizer solutions by 13% followed by a total reduction of 52% over four hours. Solutions with Quat-Safe™ towels were consistently above 350 PPM.

Quat-Safe™

Regular cotton foodservice towels are negatively charged and therefore act as a "pump" that extracts the positively charged quaternary ammonium chloride ions from the holding solution. When rinsed, quaternary ammonium chloride ions, which are not firmly attached to the towel, are released with the water and bio-load and therefore discarded. Quick fixes such as changing sanitizer every couple of hours or using 4-chain quaternary sanitizers only increase expense; towels that are not Quat-Safe™ deplete sanitizers in minutes.

A regular nonwoven, terry, or linen towel is introduced into the sanitizer holding solution

SANITIZER

The negatively charged towel attracts the positively charged sanitizer ingredients

The result is a solution that is below the FDA guideline for a holding soluton

After more than 30 years experience in the foodservice and general purpose cleaning industry, Chicopee™ remains a name synonymous with quality you can trust. Our hallmark is the total control of our product from fiber to finished goods.

For more information about our cost-effective wiping solutions, contact us at 888.835.2442 or visit us on the web at www.chicopeeproducts.com. Samples and information are available for educational purposes.

Quat-Safe™ is available for purchase through many major distribution networks. Call your local representative for information.

PGI Polymer Group, Inc.

Thank you for making Food Safety a top priority!

New Address Chicopee, Inc. • 9335 Harris Corners Parkway Suite 300 • Charlotte, NC • 28269

Chicopee and Chix brand names and logos are tradenames of PGI, Inc. Quat-Safe brand names and logos are tradenames of Commun-i-tec.

Journal of Environmental Health, September 2006, page 49

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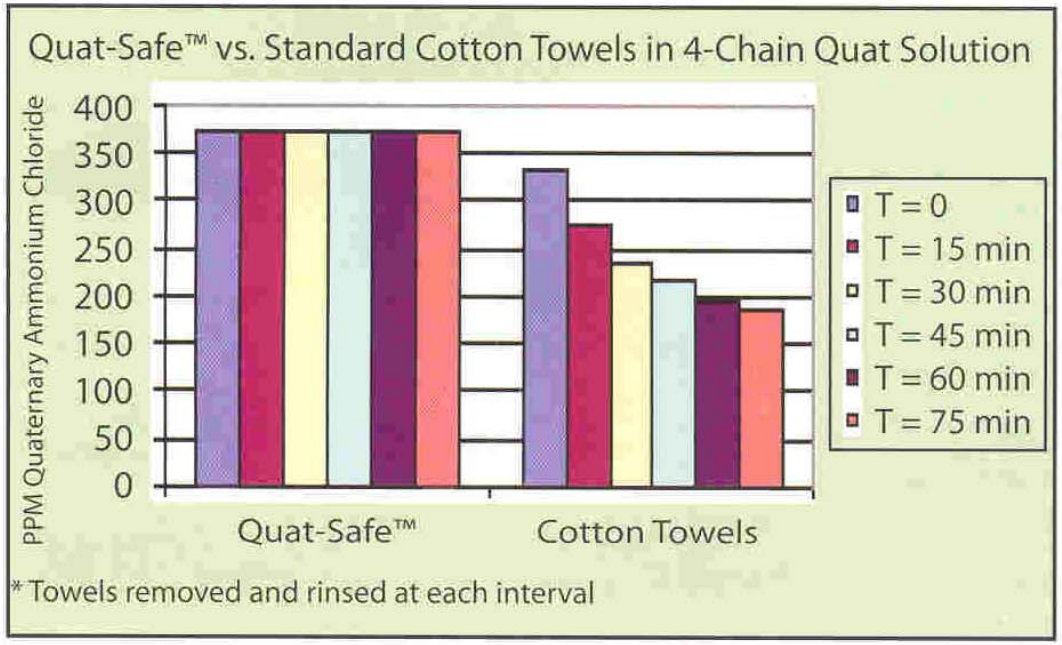

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A regular nonwoven, terry, or linen towel is introduced into

The result is a solution that is

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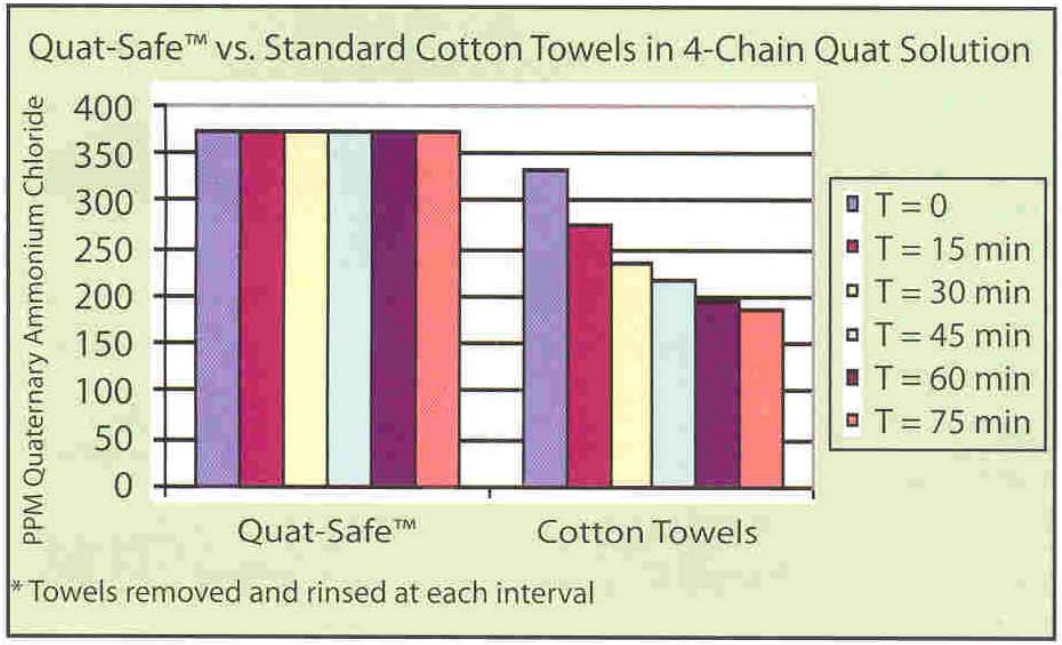

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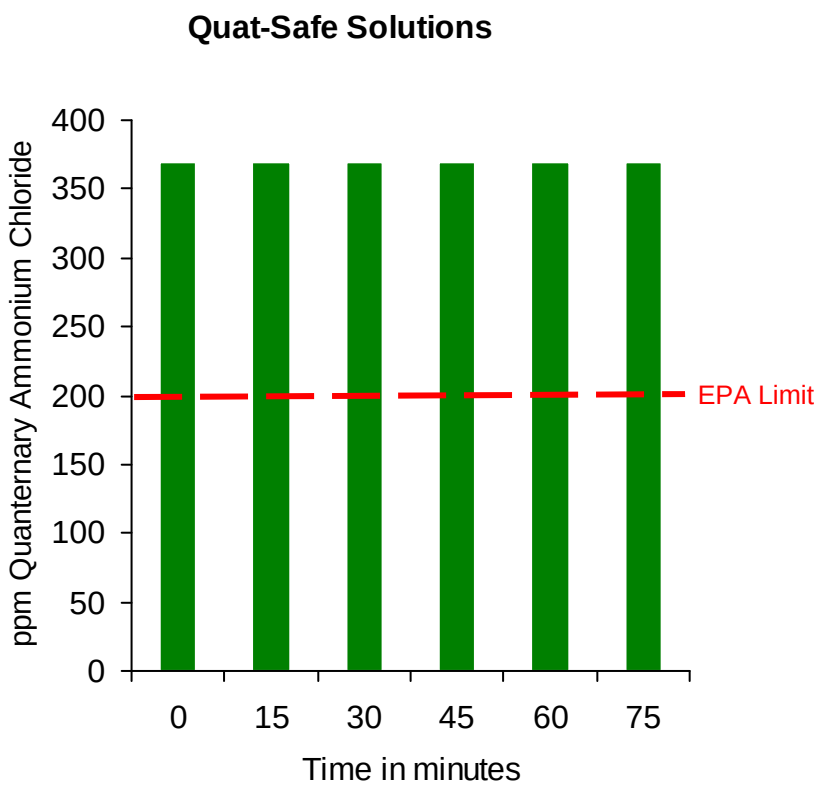
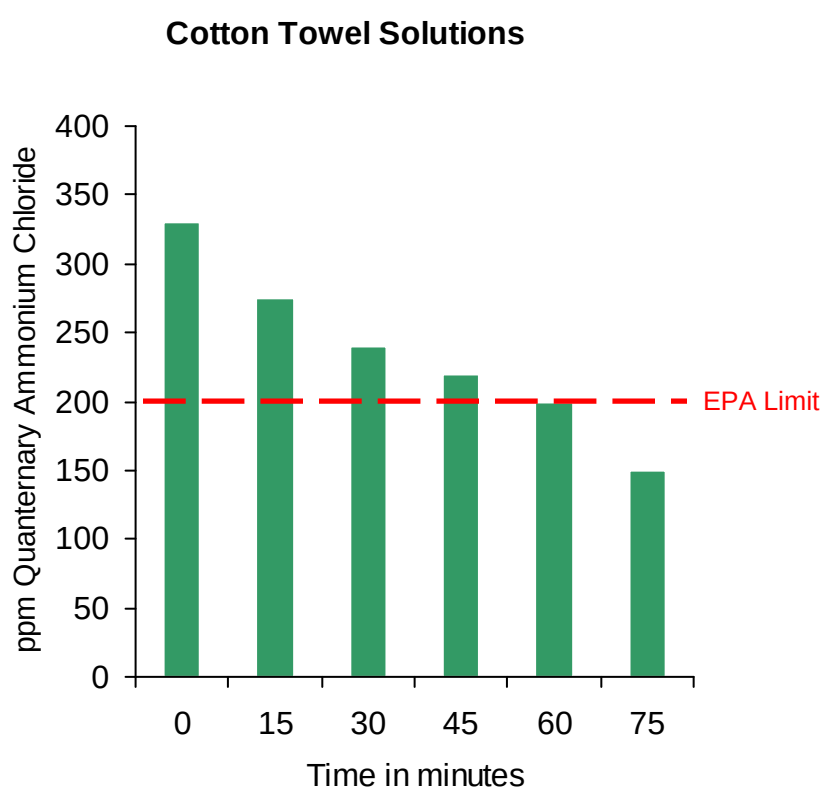
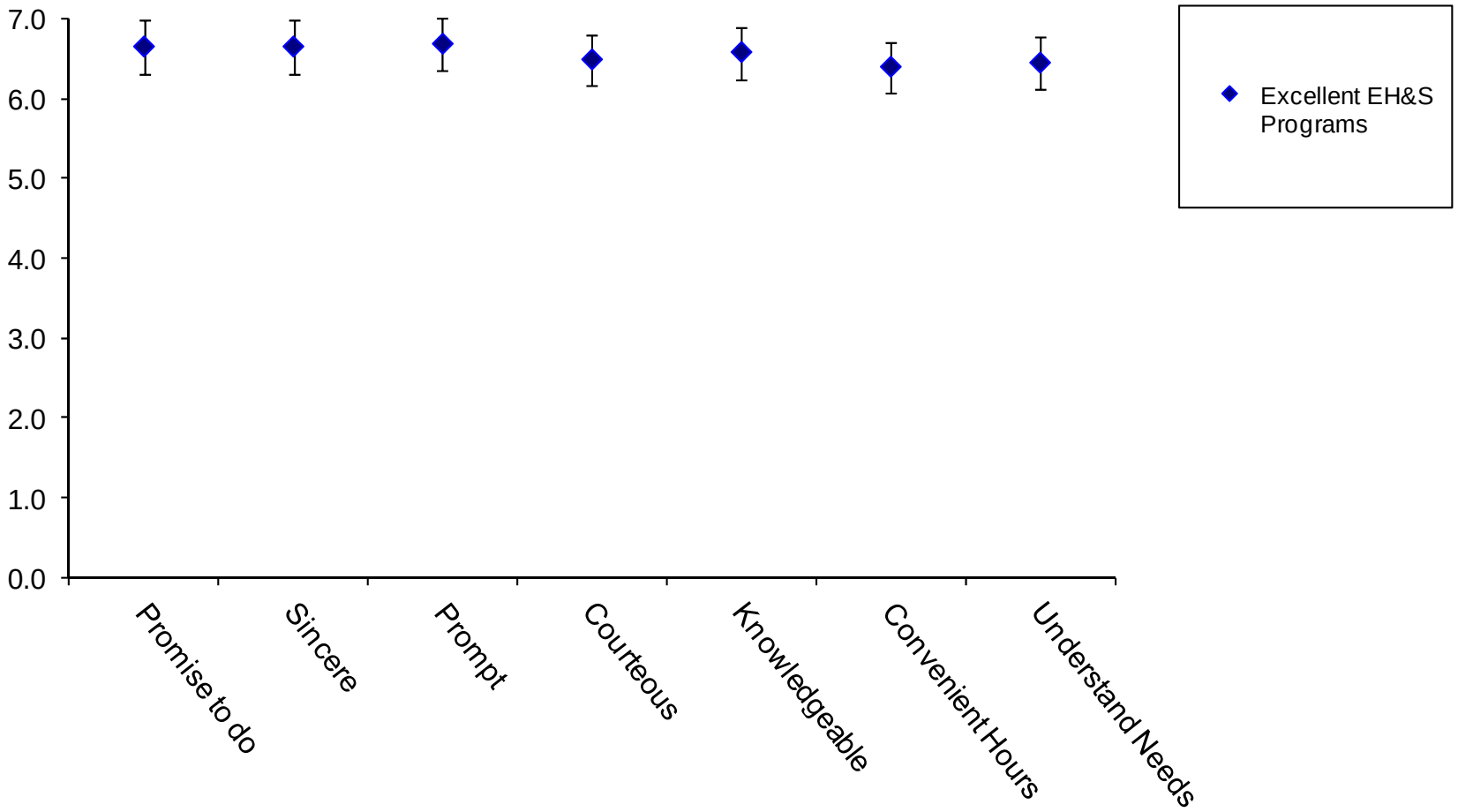
Quat-Safe and Cotton
Food Service Towel Quanternary Ammonium Chloride Solution Concentration Compared Over Time*





*Towels removed and rinsed at each interval

Figure 1. UTHSCH laboratory personnel rating of the importance of certain service characteristics of "excellent" environmental health & safety programs, compared to their rating of the level of service currently being provided by UTHSCH EH&S.



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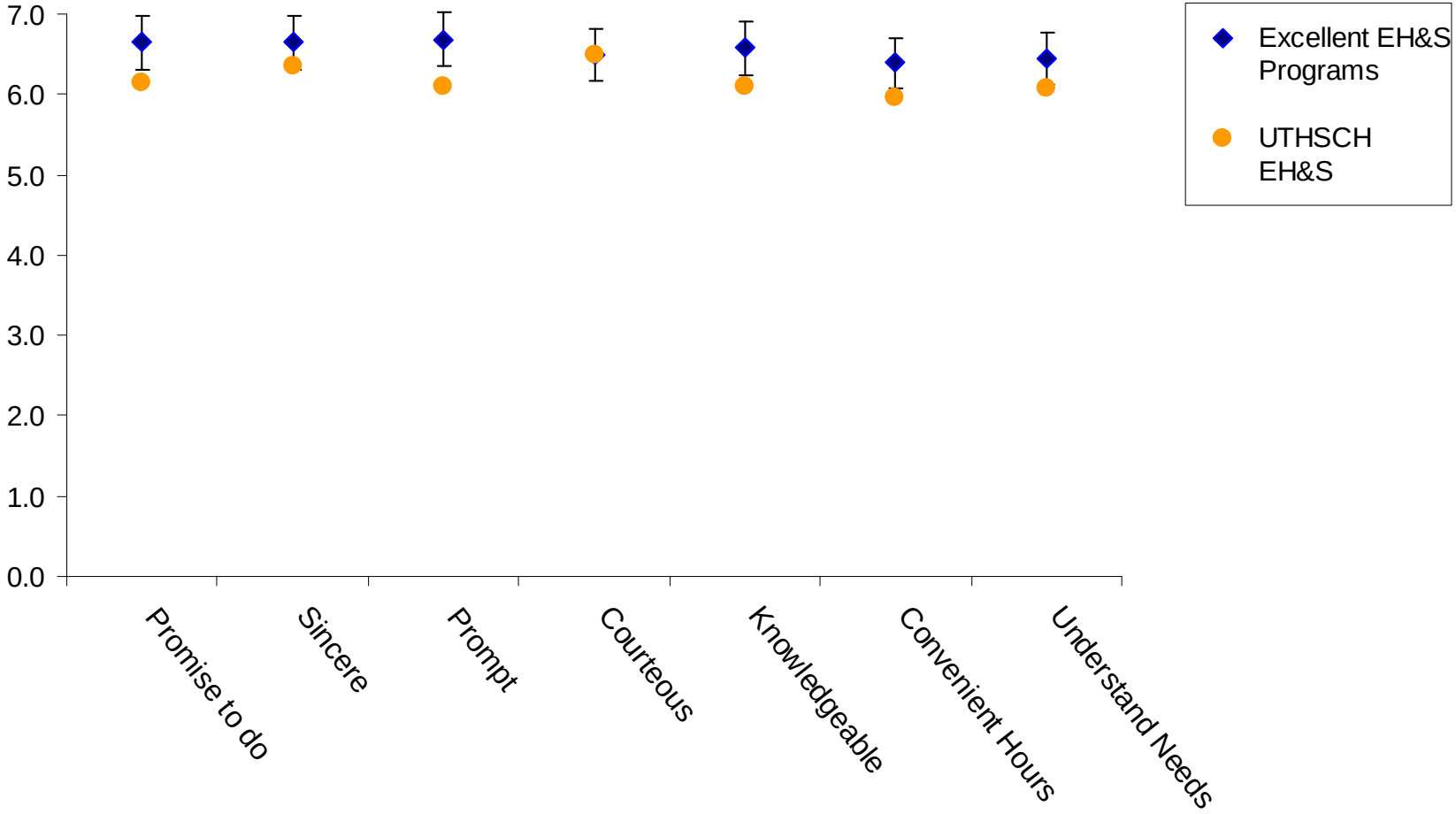
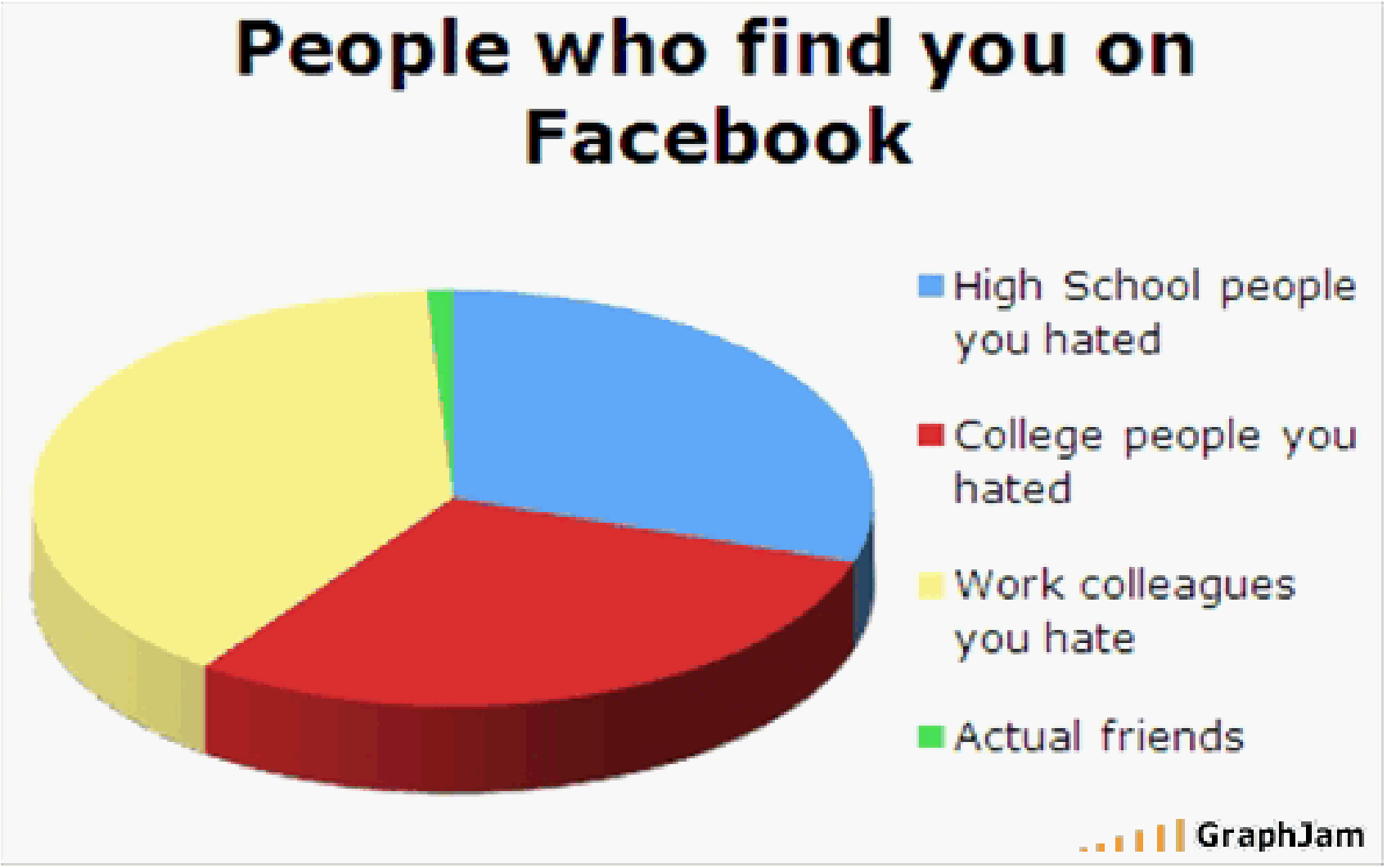
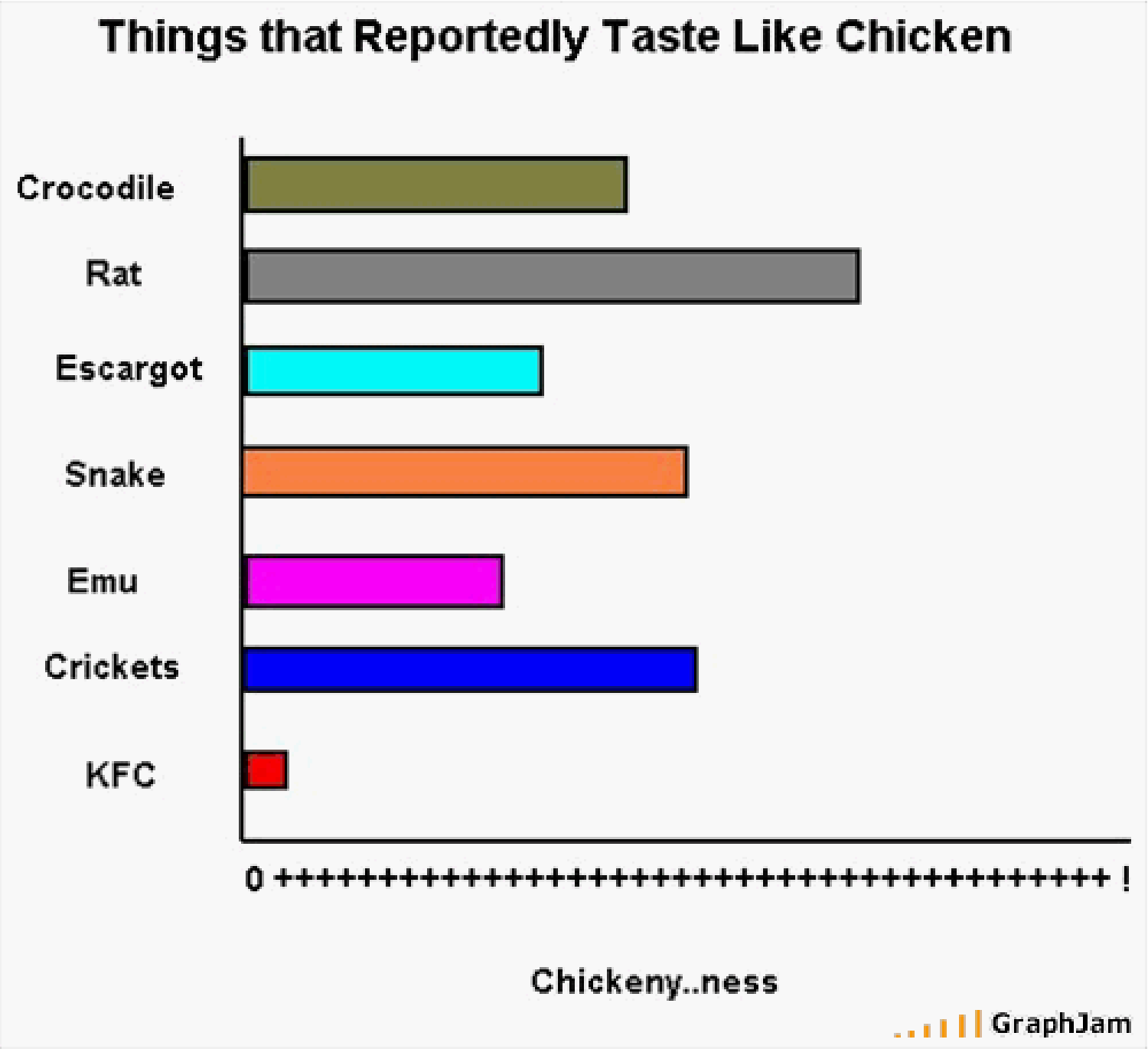



People who find you on Facebook
High School people you hated
College people you hated
Work colleagues you hate
Actual friends
GraphJam

PRESTIGE
YOUR INTENDED CAREER PATH
WHY YOU DRINK
YOUR ACTUAL CAREER PATH
BIRTH
TIME
DEATH
GraphJam

WHERE DO ALL MY SOCKS GO ?
Number of Socks
When dryer is started
When dryer is finished
GraphJam


Things that Reportedly Taste Like Chicken
Crocodile
Rat
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Emu
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