Laboratory Safety Awareness, Practice, Attitude, and Perception of Tertiary Laboratory Workers in Hong Kong: A Pilot Study

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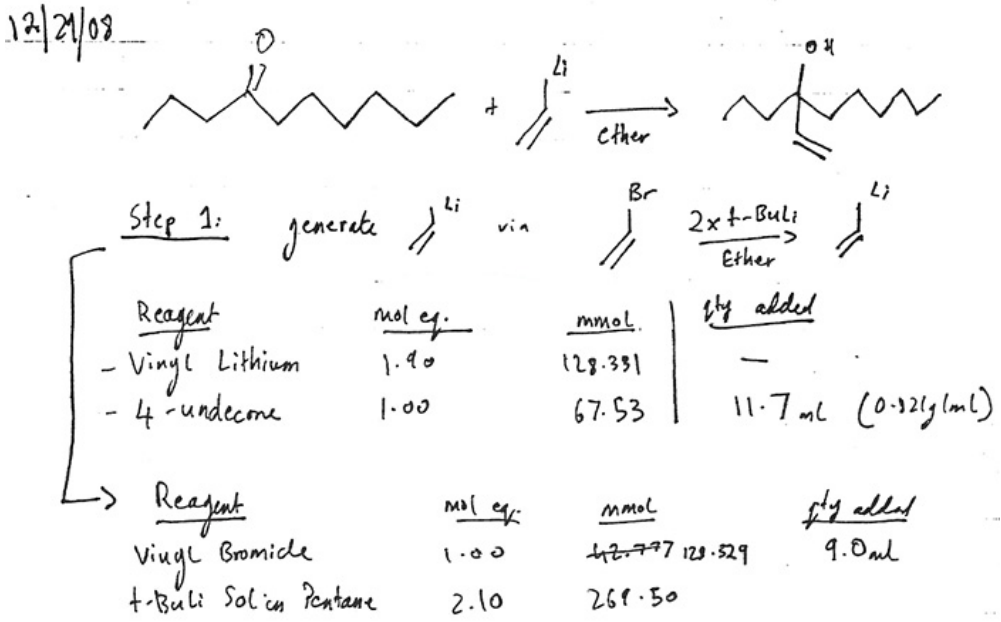
Laboratory Safety, Why ?

12/21/08



UCLA chemist to stand trial for safety violations linked to Sheri Sangji death

1 May 2013 Rebecca Trager

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The chemist who supervised a research assistant who died from injuries sustained in a University of California, Los Angeles (UCLA) lab more than four years ago will go on trial in connection with her death. The case could set a precedent whereby university researchers could be held liable for unsafe laboratory practices.

Patrick Harran supervised Sheri Sangji, the UCLA research assistant who died in early 2009. Her death was the result of serious burns received while working on her own in Harran's organic chemistry lab with a pyrophoric *t*-butyl lithium solution.

Sheri Sangji was killed in a tragic accident at UCLA. Her supervisor at the time, Patrick Harran, is facing a criminal trial © Naveen Sangji

The California Division of Occupational Safety and Health found that the incident was caused by inadequate training, and criminal charges were brought against both the university and Harran. UCLA settled the charges in July 2012 after agreeing to comprehensive corrective safety measures and also establishing a $500,000 (£322,000) scholarship in Sangji's name at University of California, Berkeley, school of law.

Meanwhile, on 26 April Harran was ordered to stand trial on three criminal counts of violating occupational health and safety laws that led to Sangji's death. Harran will return to court on 9 May for arraignment, and he faces up to four-and-a-half years in prison if convicted.

Laboratory Safety Culture Survey, Why ?

NEWS IN FOCUS

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An international poll provides a lens into lab workers' attitudes to workplace welfare.

WORKPLACE

Safety survey reveals lab risks

Questionnaire suggests researchers not as safe as they feel.

BY RICHARD VAN NOORDEN

Scientists may have a false sense of security about the safety of their laboratories, according to early results from the first international survey of researchers' workplace attitudes and practices.

Some 86% of the roughly 2,400 scientists who responded said that they believe their labs are safe places to work. Yet just under half had experienced injuries ranging from animal bites to chemical inhalation, and large fractions noted frequent lone working, unreported injuries and insufficient safety training on specific hazards (see 'A question of safety').

"Understanding this disparity will be key to positively changing safety culture," says James Gibson, head of environmental health and safety at the University of California, Los Angeles (UCLA). The university's Center for Laboratory Safety, a research initiative set up in March 2011, commissioned the study as part of a wave of US-led efforts to examine safety culture following the shocking death of a 23-year-old research assistant, Sheharbano Sangji. She received horrific burns in a UCLA lab fire four years ago (see *Nature* http://doi.org/dnws3n; 2009), and her supervisor, organic chemist Patrick Harran, may face a criminal trial over her death. Other incidents, including a second lab death, at Yale University in New Haven, Connecticut, in 2011 (see *Nature* 472, 270–271; 2011), have added to the concerns.

The study "is the most comprehensive attempt at gathering data on attitudes to safety that I've seen — and one more piece of information in a growing body of reports that point to the need to improve the culture around safety in our academic laboratories," says Dorothy Zolandz, director of the US National Academies Board on Chemical Sciences and Technology. Nature Publishing Group, the publisher of *Nature*, helped to launch the survey, as did the firm BioRAFT, which provides software for safety compliance and receives investment from Digital Science, a sister company to Nature Publishing Group. UCLA's Center for Laboratory Safety plans to analyse the data more closely later this year, but shared early results with *Nature*.

PART AND PARCEL

Some of the anonymized survey participants — who were mostly from the United States and United Kingdom, but also hailed from Europe, China and Japan — felt that any injuries they sustained were 'just part of the job. "Was scratched by a monkey," one scientist wrote. "It's bound to happen in that line of work, no matter how careful you are." Another was bitten while extracting venom from rattlesnakes; a third reported being sprayed on the face and hands with sulphuric acid, leading to US$3,000 of dermatology treatments. The most common injuries were minor — cuts, lacerations and needle pricks — but 30% of respondents said they had witnessed at least one 'major' lab injury, something that required attention from a medical professional. More than one-quarter of junior researchers said that they had experienced an injury that they hadn't reported to their supervisor.

Yet the overwhelming majority of respondents asserted that their labs were safe places to work, that they had received sufficient safety training to minimize injury and that appropriate safety measures had been taken to protect employees. This level of comfort is similar to that found in other, smaller surveys, says Ralph Stuart, secretary of the American Chemical Society's health and safety division (which has conducted its own surveys on the matter).

But more specific questions in the survey reveal that safety standards are often not adhered to. Only 60% said they had received safety training on specific hazards or agents ▶

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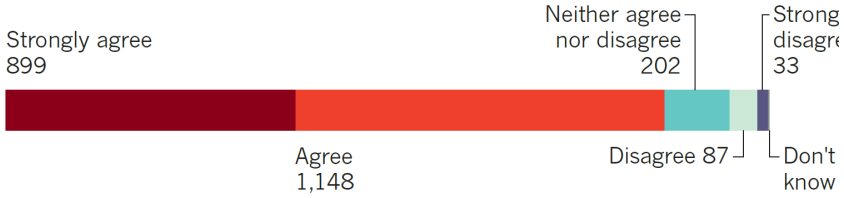
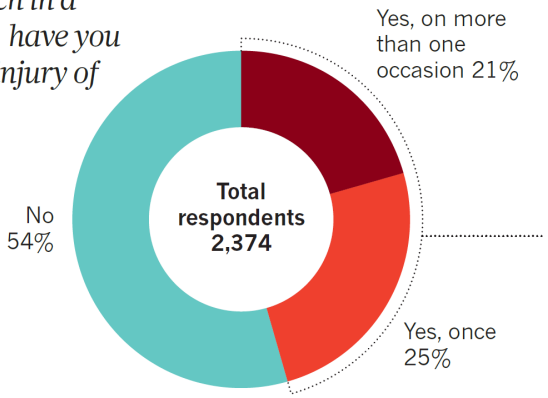
A QUESTION OF SAFETY

A survey of almost 2,400 scientists shows that although most believe their laboratories to be safe, about half have experienced injuries in the workplace. It also shows that junior and senior researchers have very different views of potentially hazardous practices.

1 *To what extent do you agree or disagree with the following statement? "I feel that my lab is a safe place to work."*



3 *In the time that you've been conducting research in a laboratory setting, have you ever sustained an injury of any kind?*

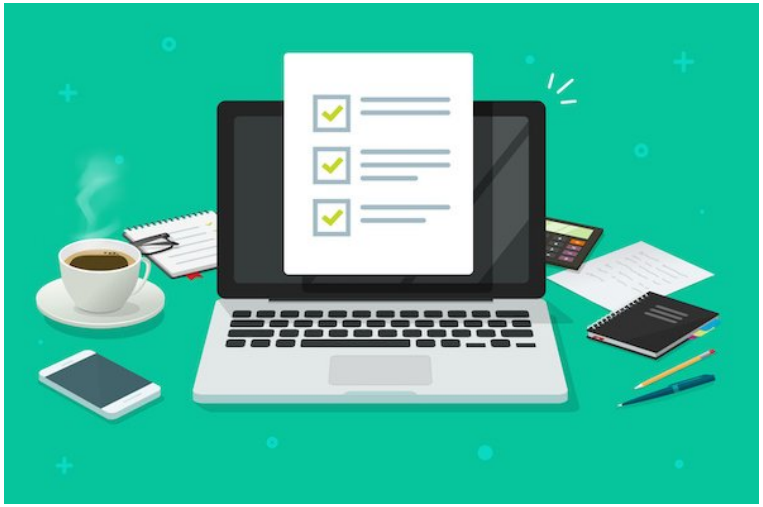


Laboratory Safety Culture Survey in HK, Why ?

This Survey

Questions in 2012 Survey as a reference

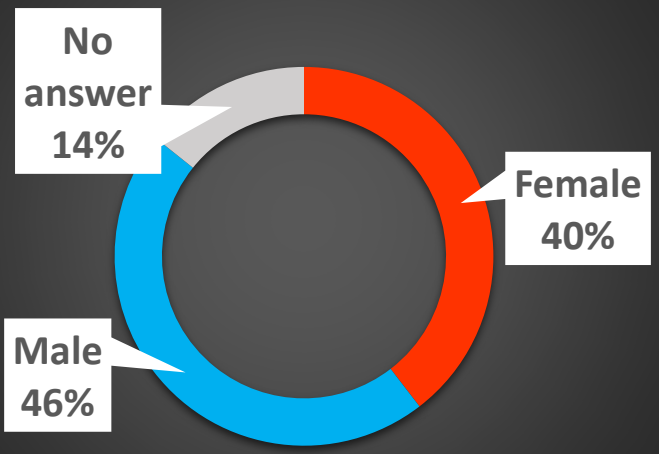
Additional questions on GHS, PPE…etc.

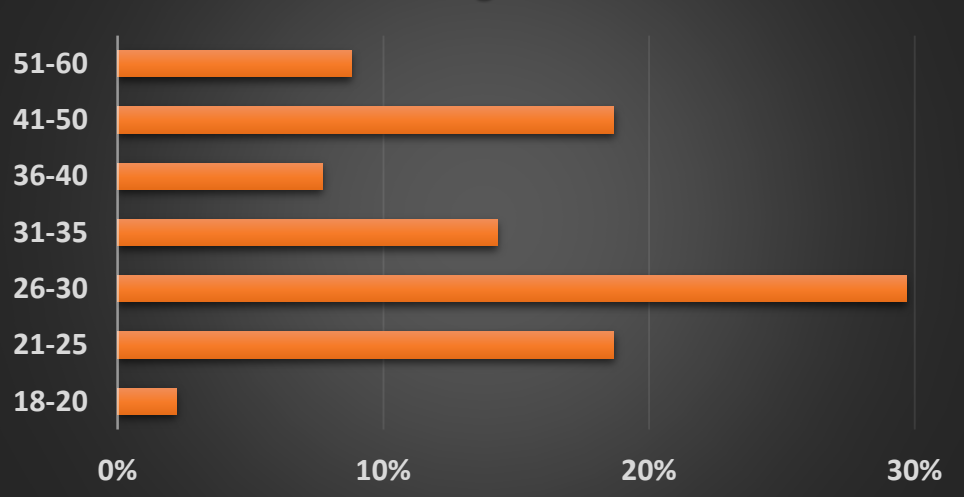


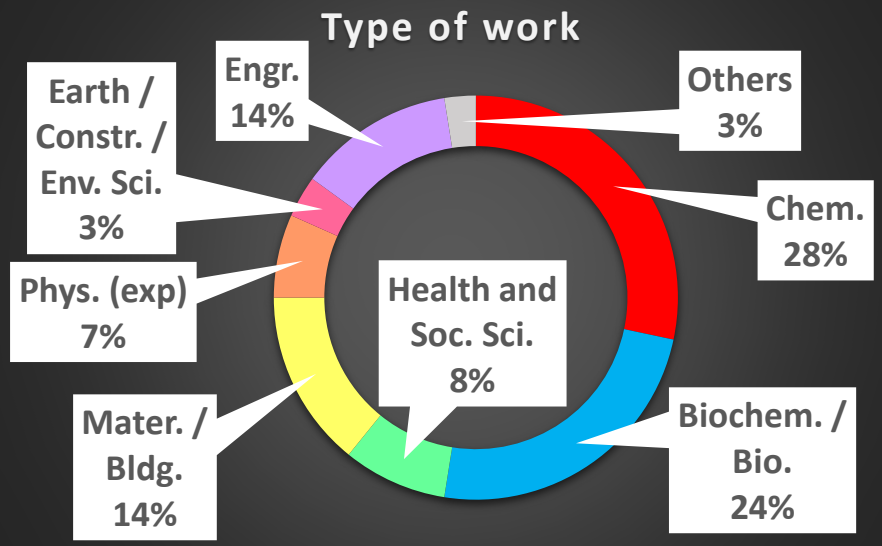
- Use of ANOVA, χ^2 test, *t*-test according to Likert scale for comparison between groups within this survey
  - Gender, age (>30 or <=30), type of lab work, job title, seniority (<5 yrs or >= 5 yrs) and time spent in lab (<=40 hrs or >40 hrs)
- Compare with 2012 Survey

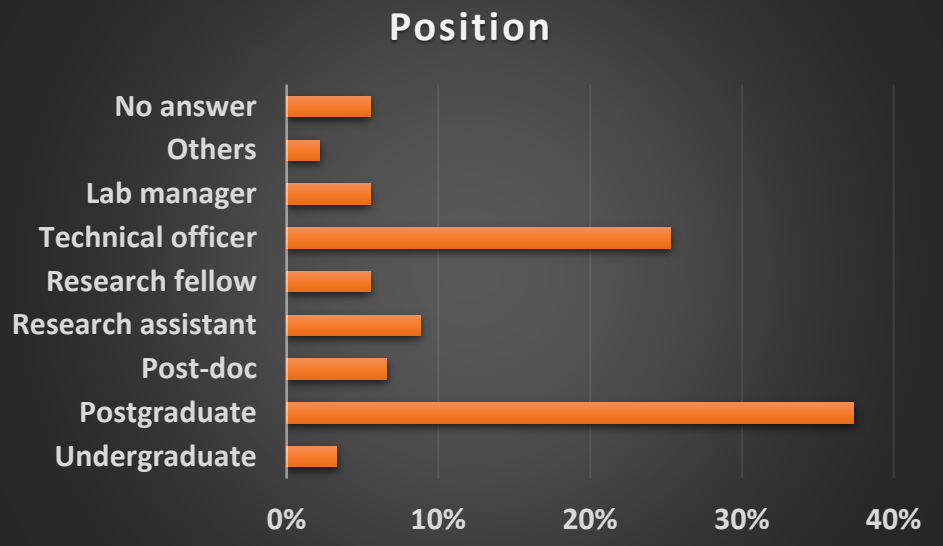
Demographic Data

n = 91



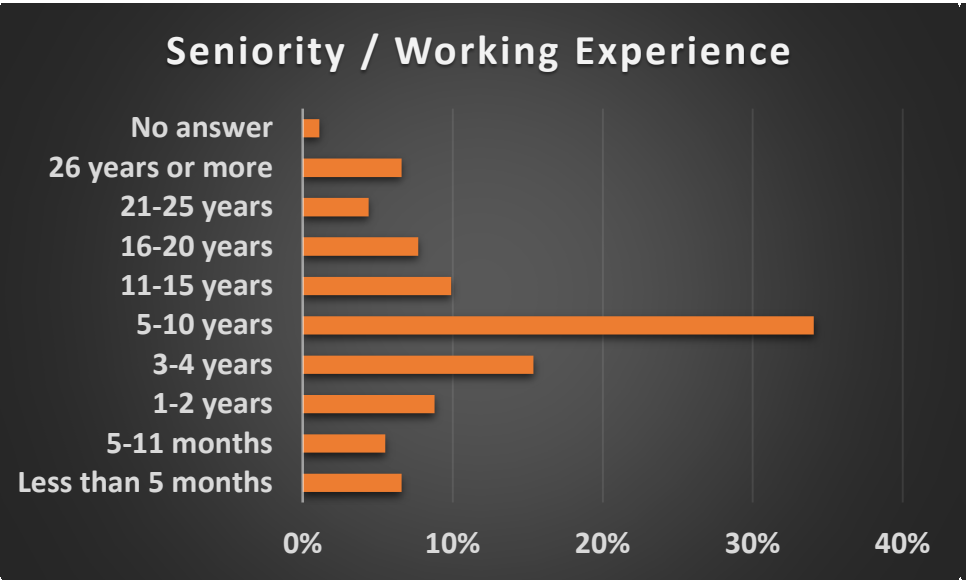


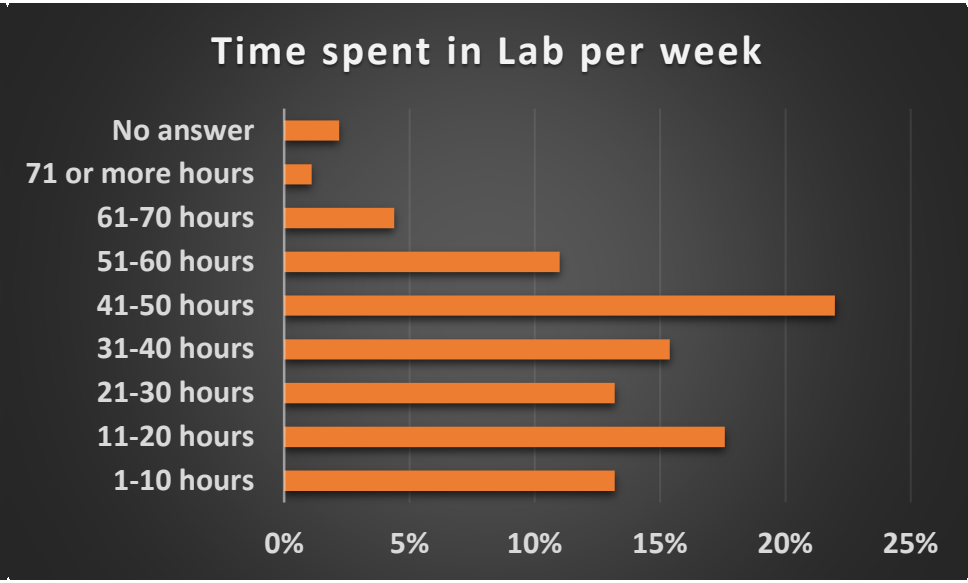




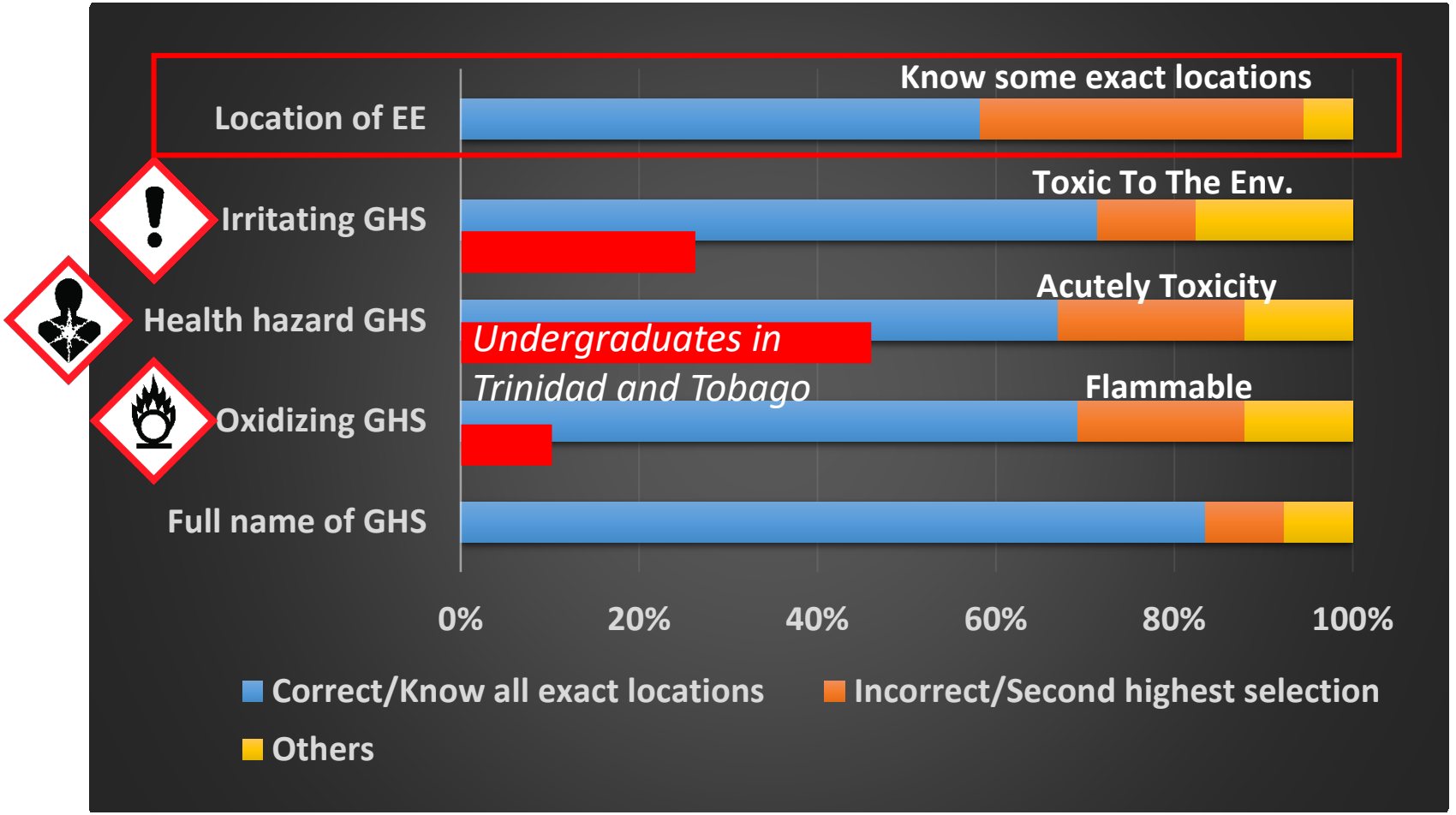
Demographic Data

n = 91



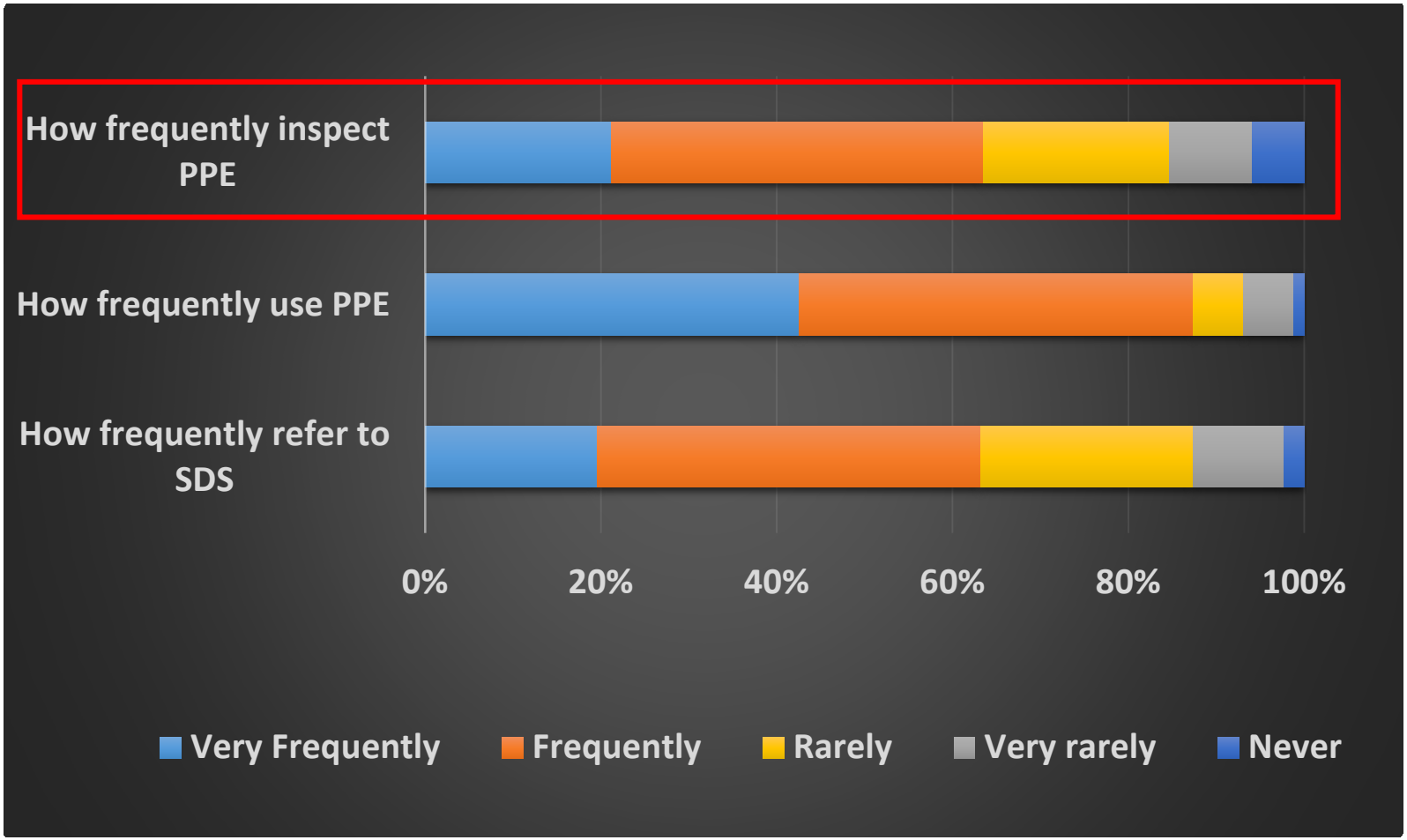


Chemical Safety Awareness Data



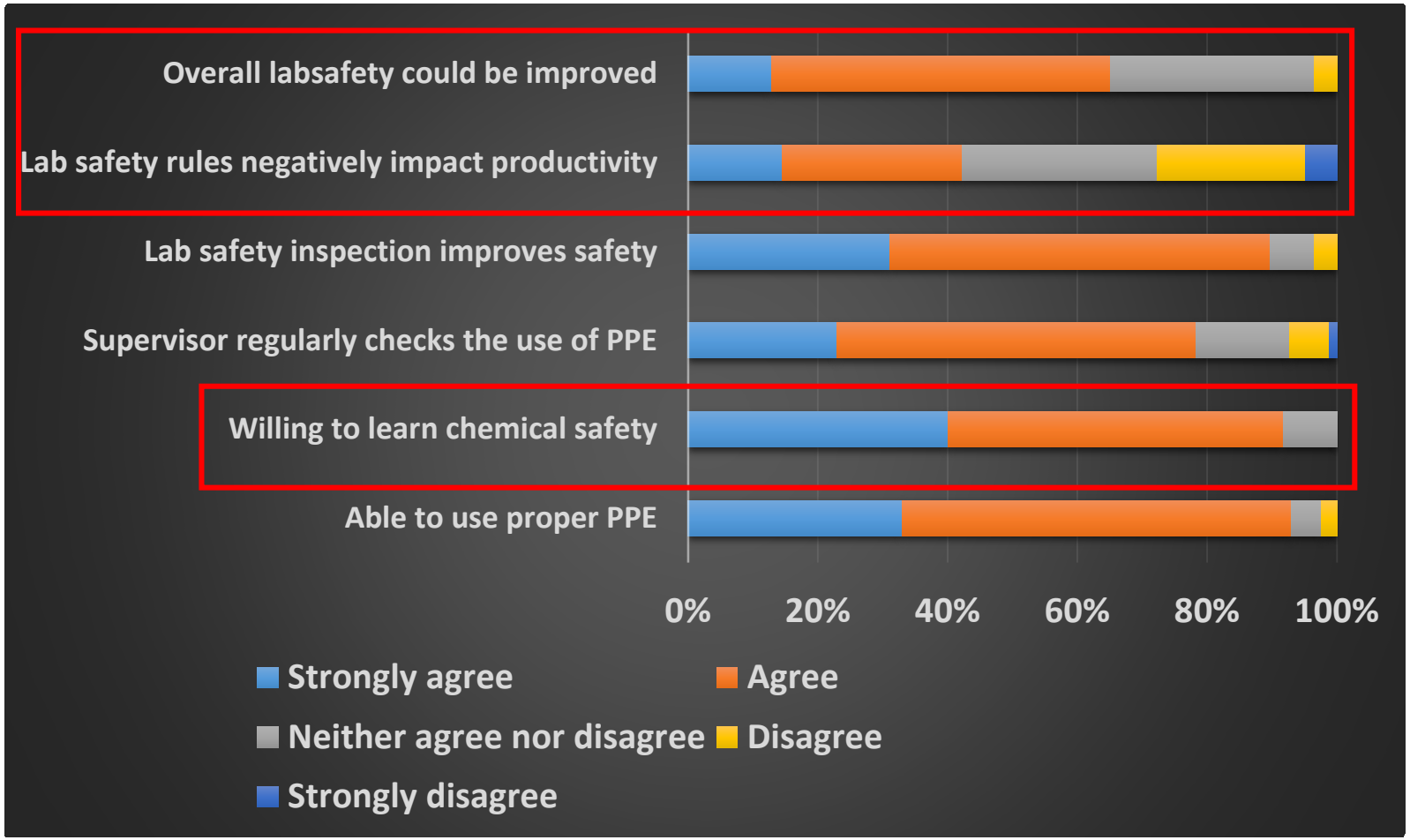
Work long vs short
$p = 0.004$

Laboratory Safety Practices Data



Age >30
vs <=30
p = 0.056

Laboratory Safety Attitude and Perception Data



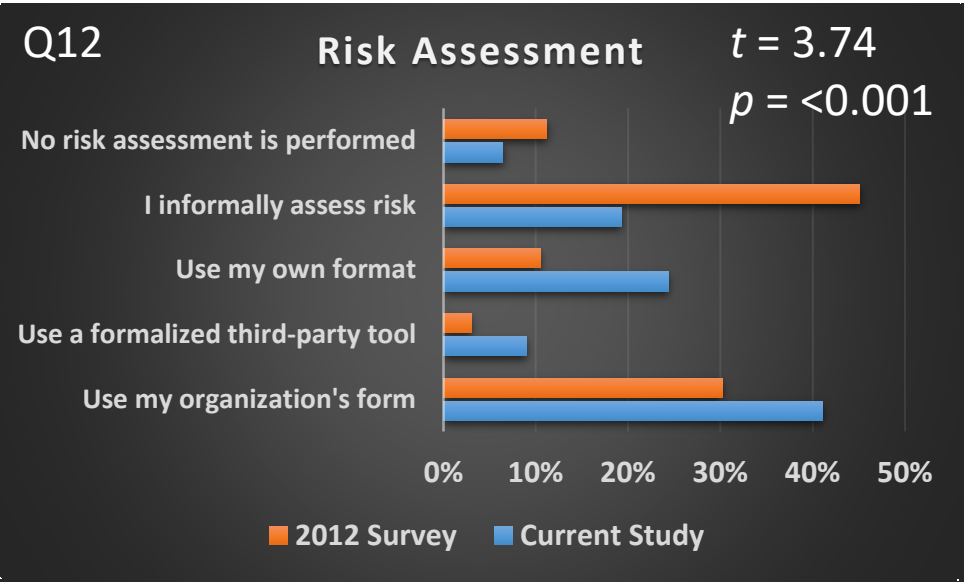
Work long vs short
$p = 0.018$

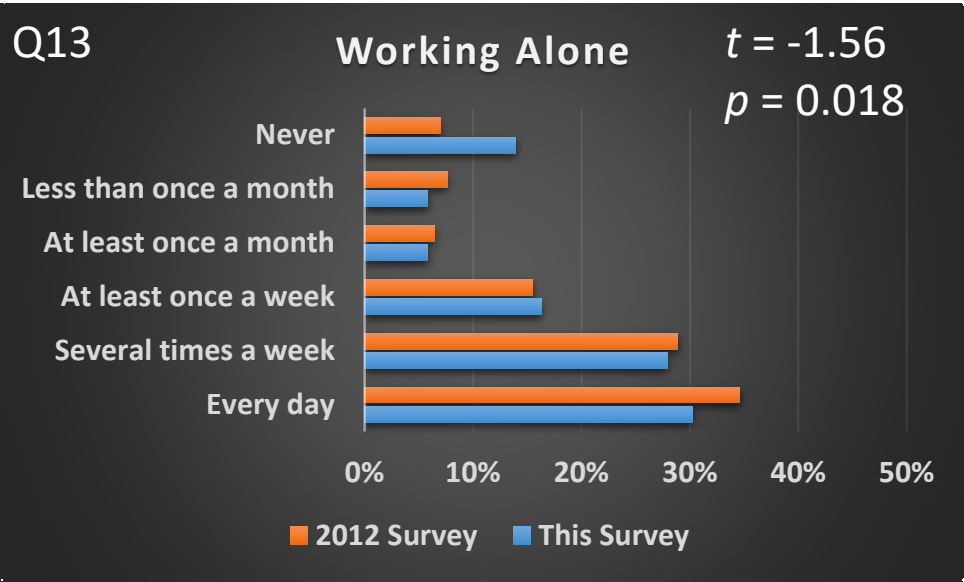
$p = 0.002$

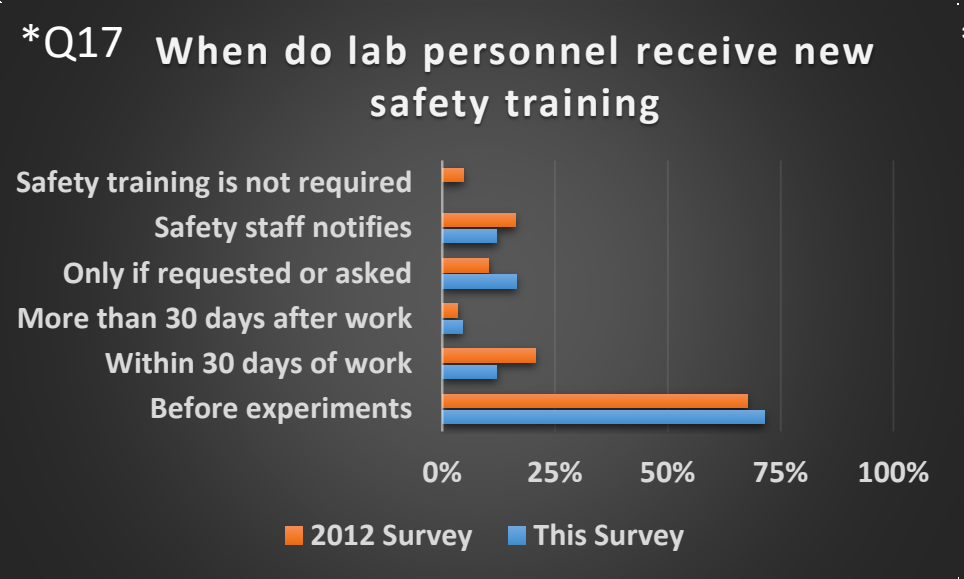
F vs M
$p = 0.051$

*Allow multiple answers

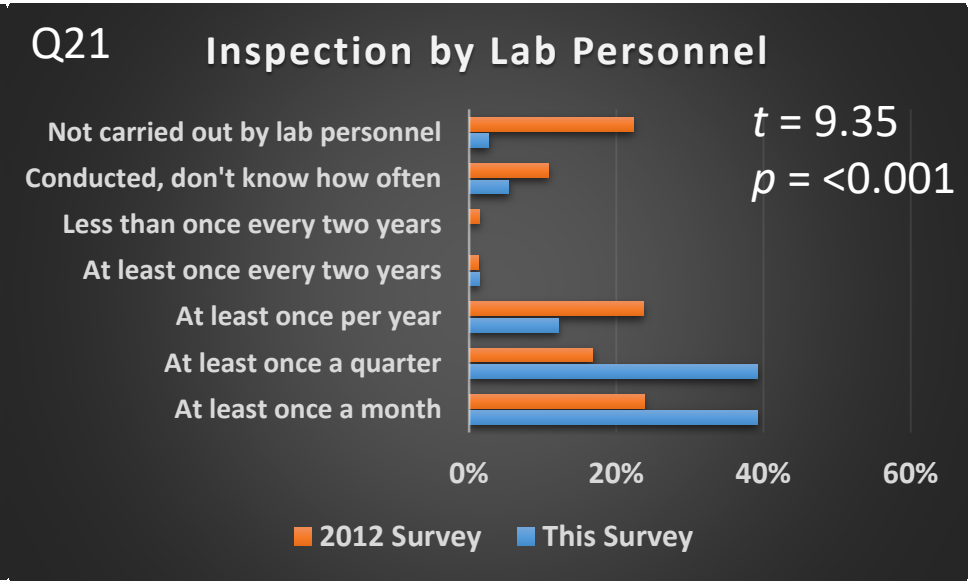
Comparison with 2012 Survey (Laboratory Safety Practices)





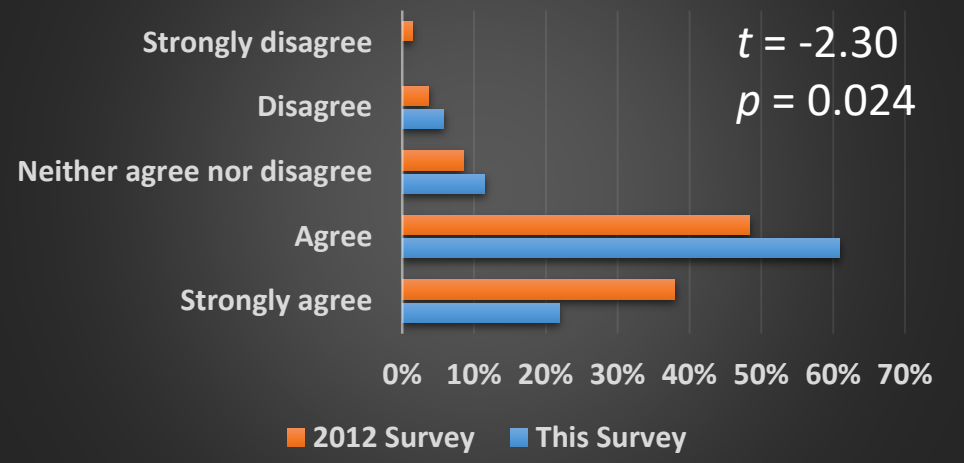


Comparison with 2012 Survey (Laboratory Safety Practices)



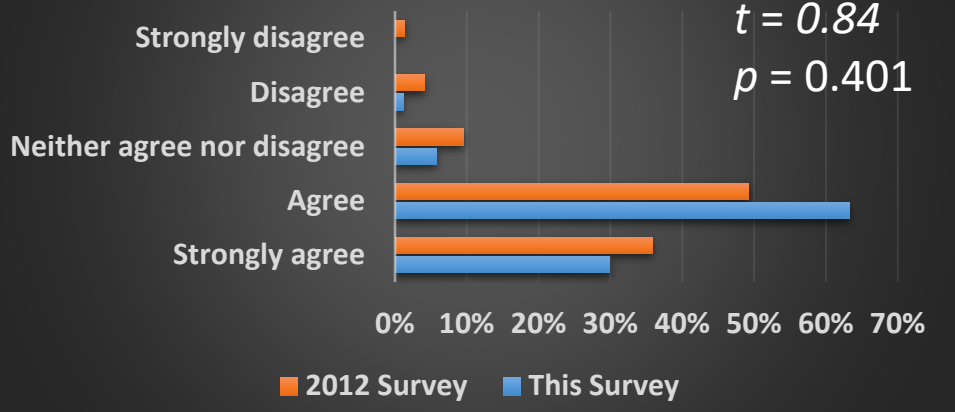
Comparison with 2012 Survey (Laboratory Safety Attitude and Perception)

Q22 My lab is a safe place to work



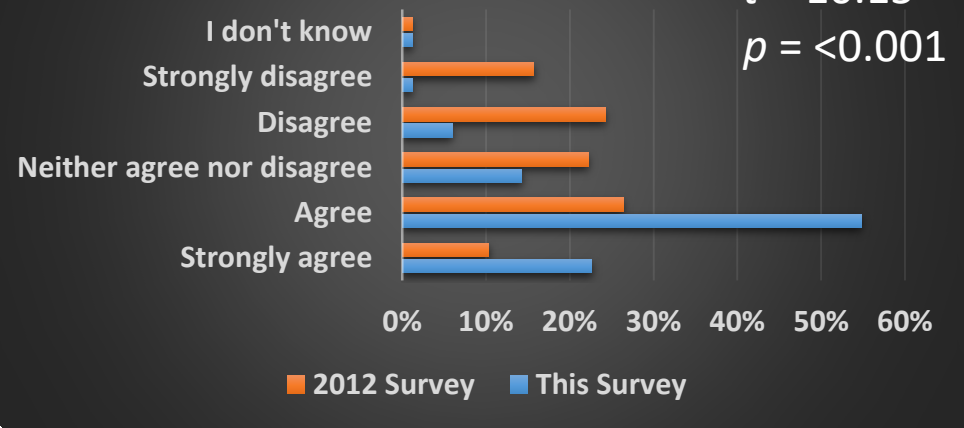
t = -2.30
p = 0.024

Q24 Safety measures have been taken to protect employees



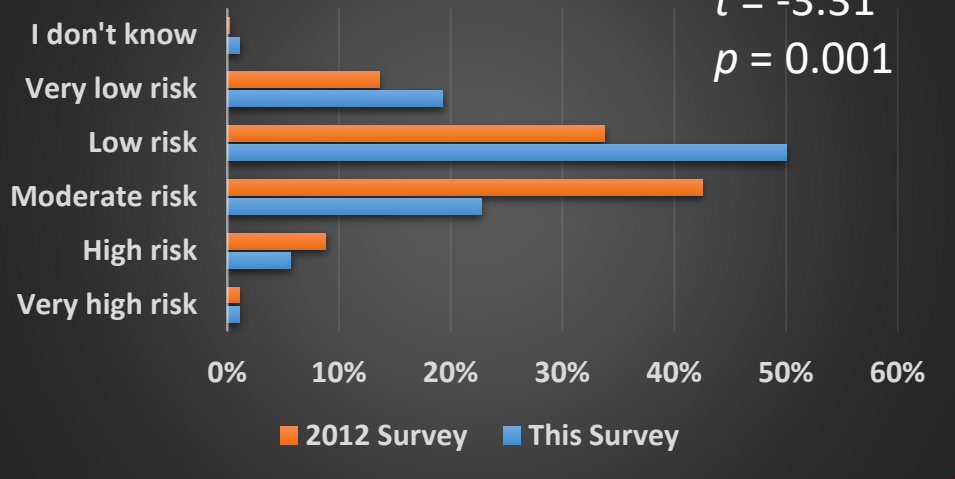
t = 0.84
p = 0.401

Q29 Supervisor regularly checks the use of safety equipment



t = 10.15
p = <0.001

Q33 Level of risk of my lab work

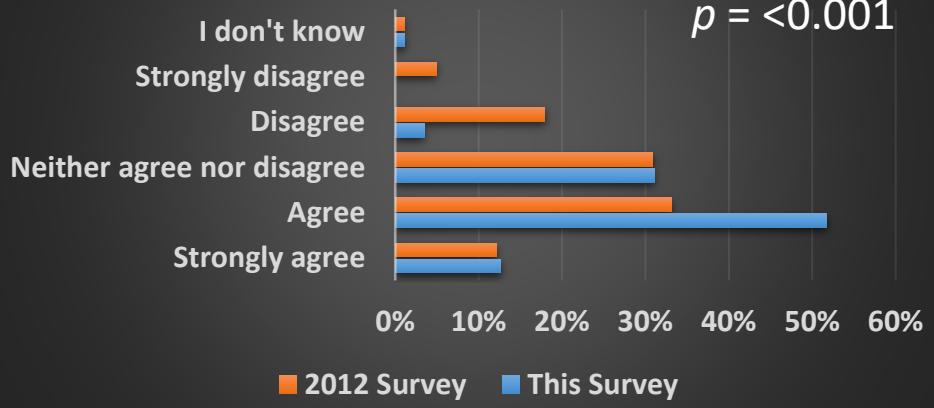


t = -3.31
p = 0.001

Comparison with 2012 Survey (Laboratory Safety Attitude and Perception)

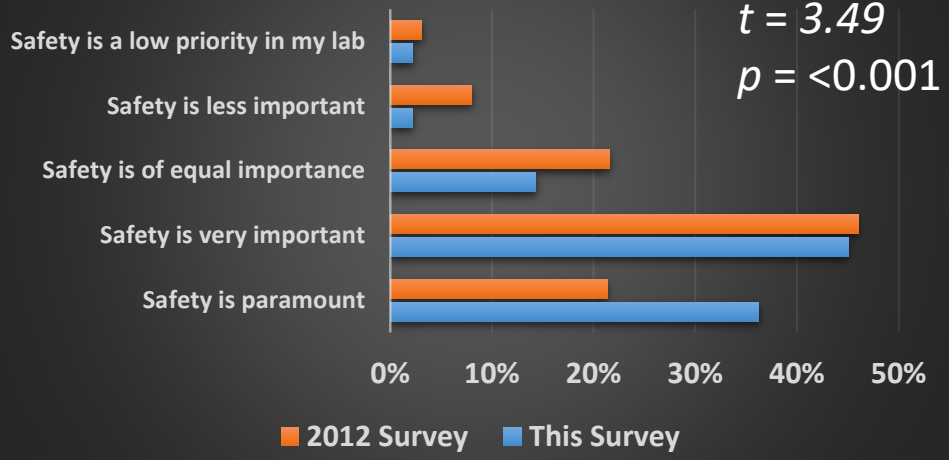
Q32 **Overall safety in lab could be improved**

$t = 5.52$
$p = <0.001$



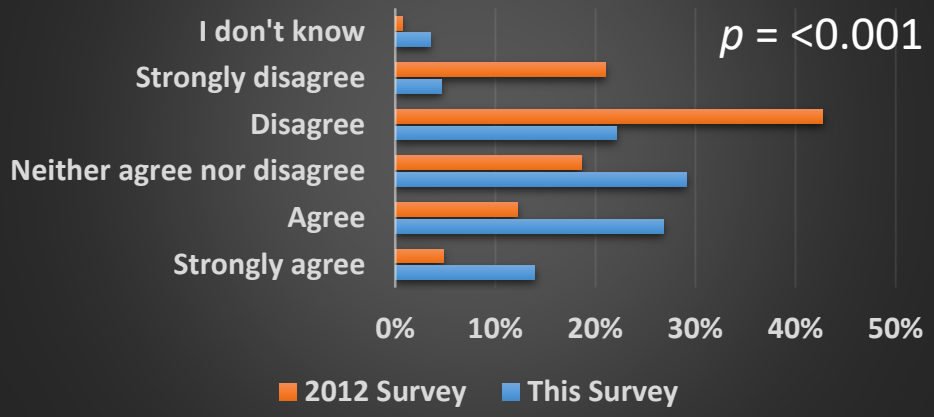
Q34 **Priority of lab safety**

$t = 3.49$
$p = <0.001$



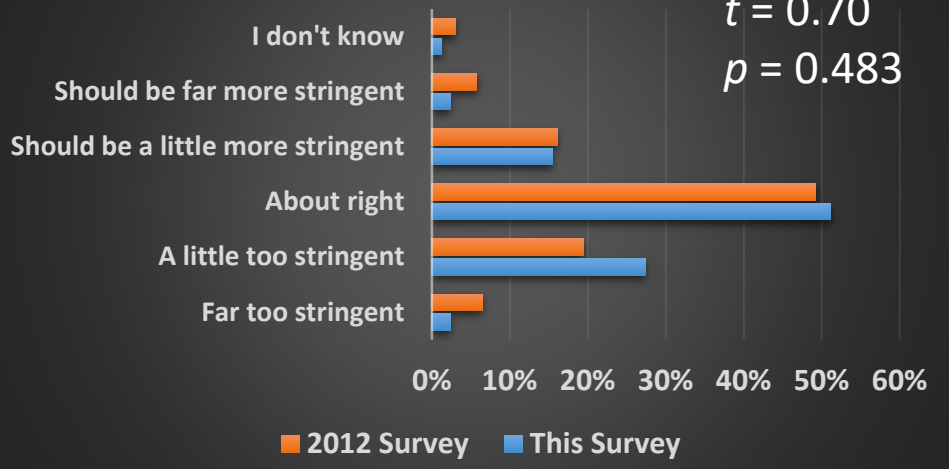
Q31 **Lab safety rules negatively impact my lab productivity**

$t = 7.18$
$p = <0.001$



Q35 **Tightness of safety procedures**

$t = 0.70$
$p = 0.483$



Conclusion

Better than 2012 Survey

- Risk Assessment
- H&S inspection
- PI involvement
- Higher safety expectation (better safety culture?)

Similar to 2012 Survey

- Timing to receive new safety training
- Relying on institution's H&S staff on training and inspection
- Sufficient safety measures
- Feeling safe to work in lab
- Feeling on tightness of safety procedures

Conclusion

Possible improvement

- Arouse learning interest in male lab worker
- Promote PPE inspection training for young lab worker
- Promote the use of SDS
- Continue early training to lab worker

Potential problem

- Using informal risk assessment tools
- Working alone
- False sense of safety
- Negative feeling on safety rule
- Safety is not valued

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