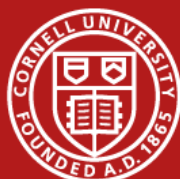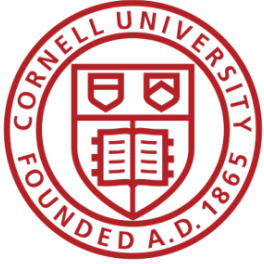# Preliminary Results of the Chemical Safety Information and Education Survey

Ellen Sweet, MS, CCHO
Cornell University
August, 2017

Outline

o Recent CHAS Survey History

o Strategic Planning

o 1st survey

o IPG

o Work with Cornell Survey Research Institute- Focus Groups & Survey

o Next Steps

Recent CHAS Survey Work

- 23 surveys since January 2007= ~ 2 per year

  - Prior to 2012 most of these were about divisional services and participation

- Institutional safety culture- 2 in 2010 to different audiences

- Most recent focused on understanding of chemical safety and methods of information searching

CHAS Strategic Planning

- 2015 workshop to develop goals to guide work within the division
- Goal to expand the educational programming offered by the Division and reach a wide variety of audiences
  - Workshops
  - On-line, self-paced tutorials
  - Webinars
  - Other platforms?

Initial Survey

- Collaboration between ACS CINF, CHAS, CHED divisions, along with the Committee on Chemical Safety;

- Common goal of learning about what the knowledge of chemical hazards is and what search practices are by those who we support;

- We discovered that we had more questions in the end and needed to dig deeper!

ACS Innovative Project Grant Awarded to CHAS and CINF

- Cornell Survey Research Institute (SRI)

- Focus groups

- 15 minute survey sent to Committee on Professional Training list of about 800, ACS certified chemistry bachelor's degree program chairs
  - Information Practices (IP)
  - Risk Assessment (RA)
  - Lessons Learned (LL)
  - Demographics (DM)

Focus Groups

- Focused on K-12 teachers and undergraduate students and teachers

- Outcome: ACS has opportunities to collaborate with associations that support these groups

- Current Efforts: Working with American Association of Chemistry Teachers to develop chemical safety training for K-12 teachers

Guiding Direction in Chemical Safety Knowledge

Purpose: Conduct survey to establish a baseline

Goals: Identify gaps in chemical and lab safety knowledge, and information practices

- Reusable tool
- Can be used across demographics
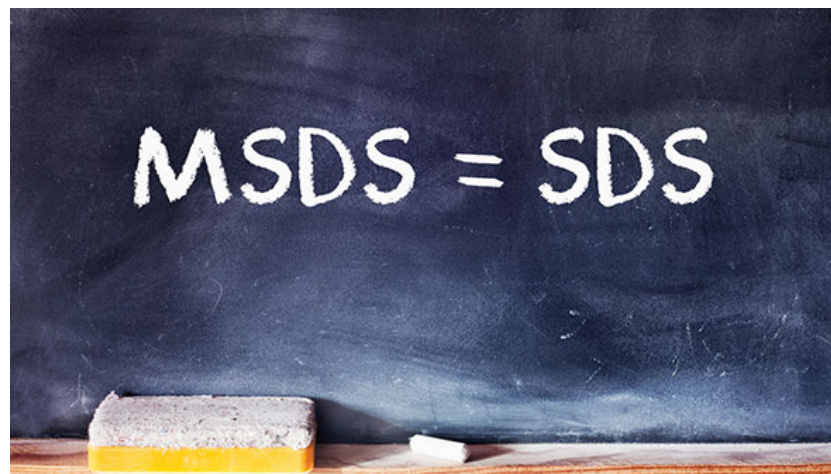
Survey Demographics

- 283 Responses

- Field of study was chemistry representing 6 ACS divisions

- 50% < 10 years lab experience > 50%

- 66% reported being involved in a lab accident

- 83% report witnessing a lab accident

Information Practices (IP4)

"Where do you primarily search for lab safety and hazard information?"

- Safety Data Sheet = a trusted source
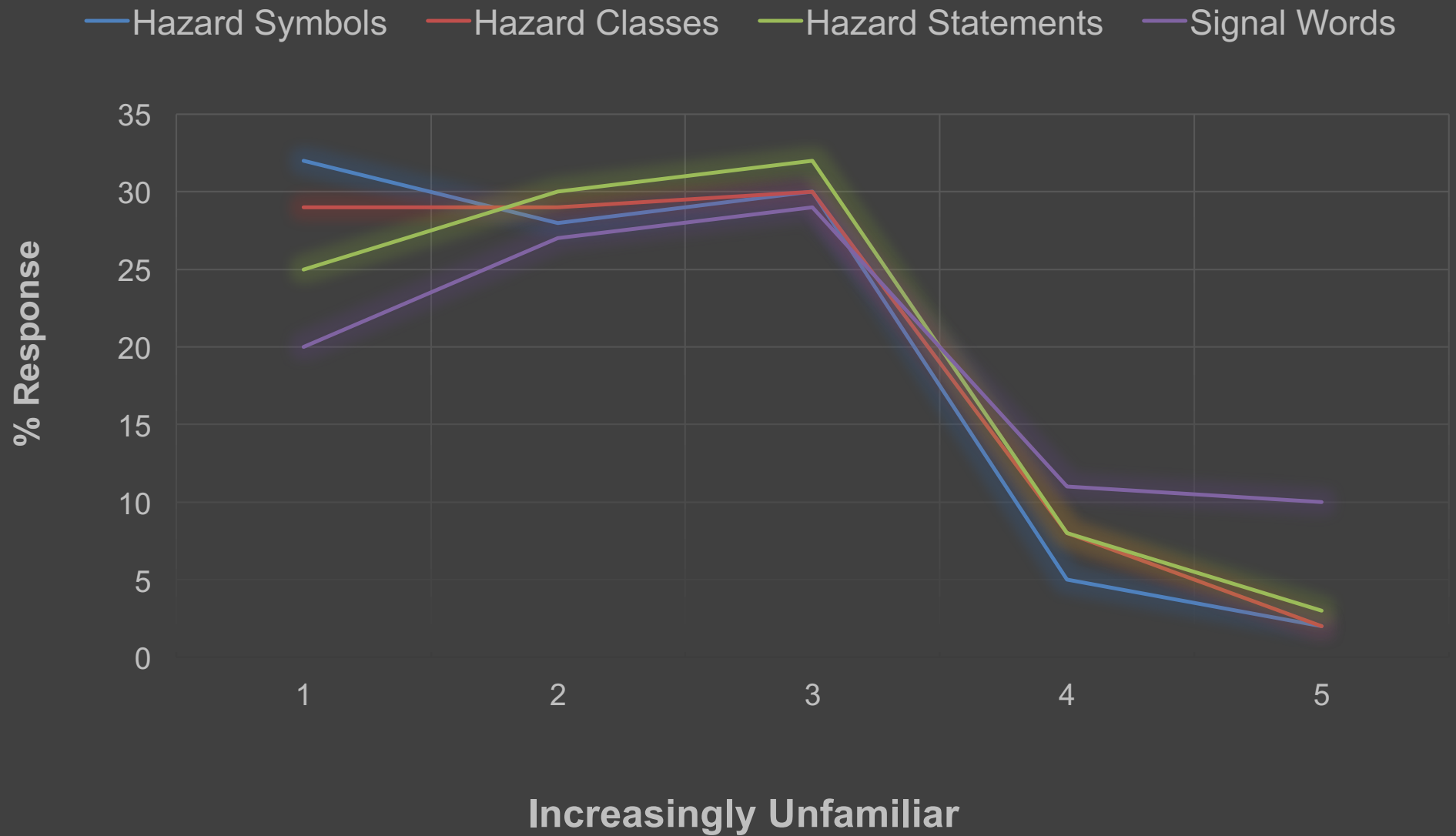
Most Useful Sections of Safety Data Sheets (IP7)

Tier 1 (>80%)

- Section 2- Hazards
- Section 7- Handling and Storage

Tier 2 (40-50%)

- Section 8- Exposure Controls/Personal Protection
- Section 10- Stability and Reactivity
- Section 13- Disposal Considerations

Information Practices (IP5)

"Describe how you decide if the safety information you find is valid?"

- Experience- Common sense or "I don't"

- Trust- Reputable source or due to education and training

- Check a 2nd source

  - Check with Colleagues- oral tradition

  - Search for what others are doing

  - PubChem protocol

Secondary Sources

Secondary SDS, 8

Other, 79
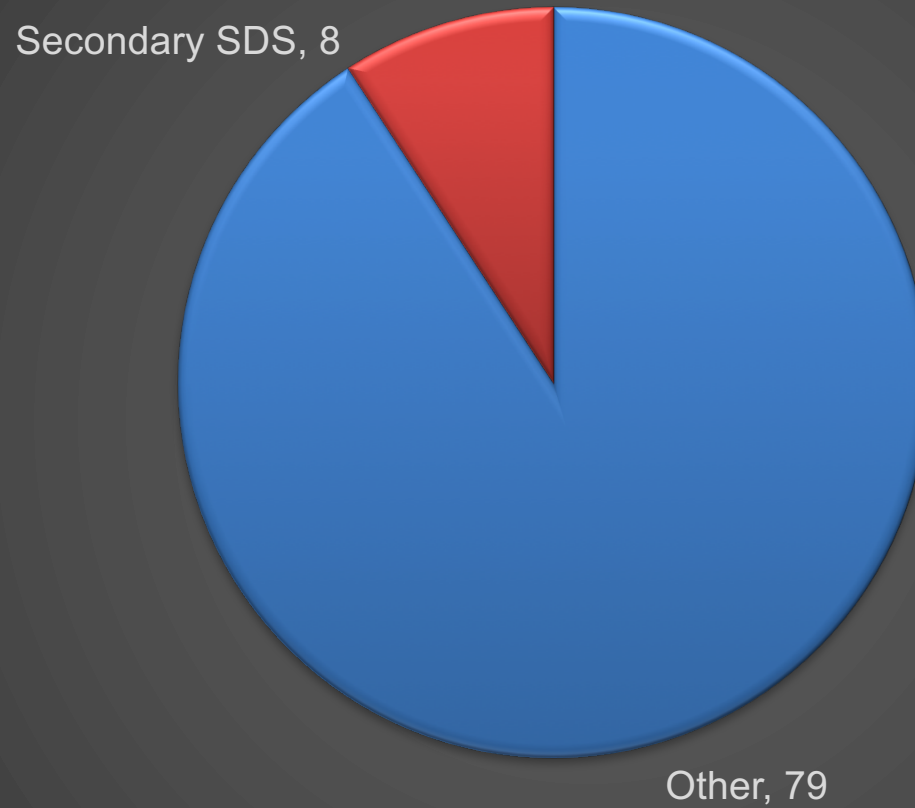
Other Secondary SDS

Risk Assessment Tools

This does not include completing a Job Hazard Analysis.

- SDS
- published procedures on similar work
- safety information from chemical supplier
- Internet searches on specific chemical safety information
- Consultation with colleagues
- Verbal review of laboratory practices
- Other

Specific Comments

- Date of publication= GHS?
- "i am old enough to find most of the "safety" info to be over generalized, and often misleading or inaccurate in some fashion"
- "my research advisor warns me of any hazards. I take any precaution serious"
- Green Chemistry is less hazardous
- "it's an msds, it should be accurate, if a bit over the top on some topics"

Information Management Tool Suggestions

- "Interactive web interface"

  -searchable database, notebook, or app that has hyperlinks, is shareable, and has specific features

- Tutorials/ modules/ videos/ lists/ posters

- Easy, clear, and from a trusted, reputable source

- Lab specific methods

  -binders, safety minutes in meetings, in-house training
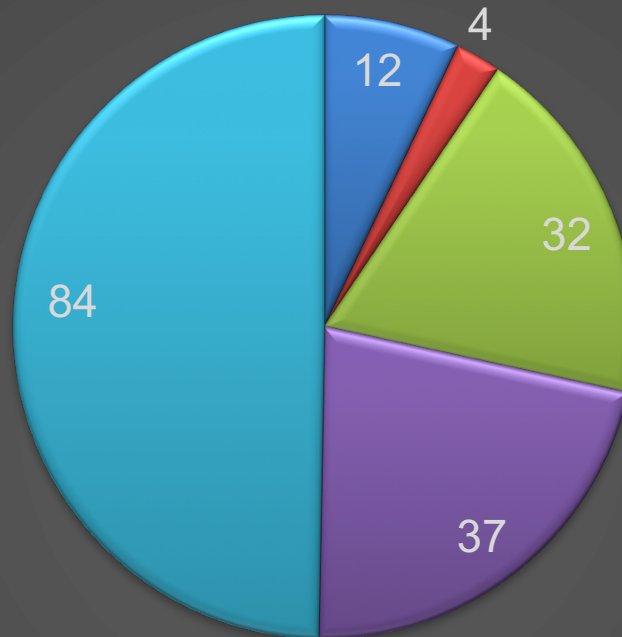
Information Management Tool cont.

- "Safety is about having your brain on, first and foremost, and then having training and knowledge about safety."

- "...chemical safety component to reaxys/scifinder."

- "An extention onto the lab supply bank (chematix) that allows the user to include any hazard or personal experience."

- "... part of SciFinder."

Information Management Tool Summary

"I find Safety Data Sheets very cryptic and without much useful information. They always refer to "local laws" for disposal, which is not helpful at all, because local laws are impossible to find. Their advice for exposure to chemicals seems too extreme for some very common chemicals which makes one doubt the advice given for chemicals that are less common. We really need **accurate** information about how to dispose of all chemicals and information about **exposure to reasonable amounts of a chemical** (the amount and concentration one might encounter in a teaching lab) in a format that is **easy** to find and **easy** to understand!"
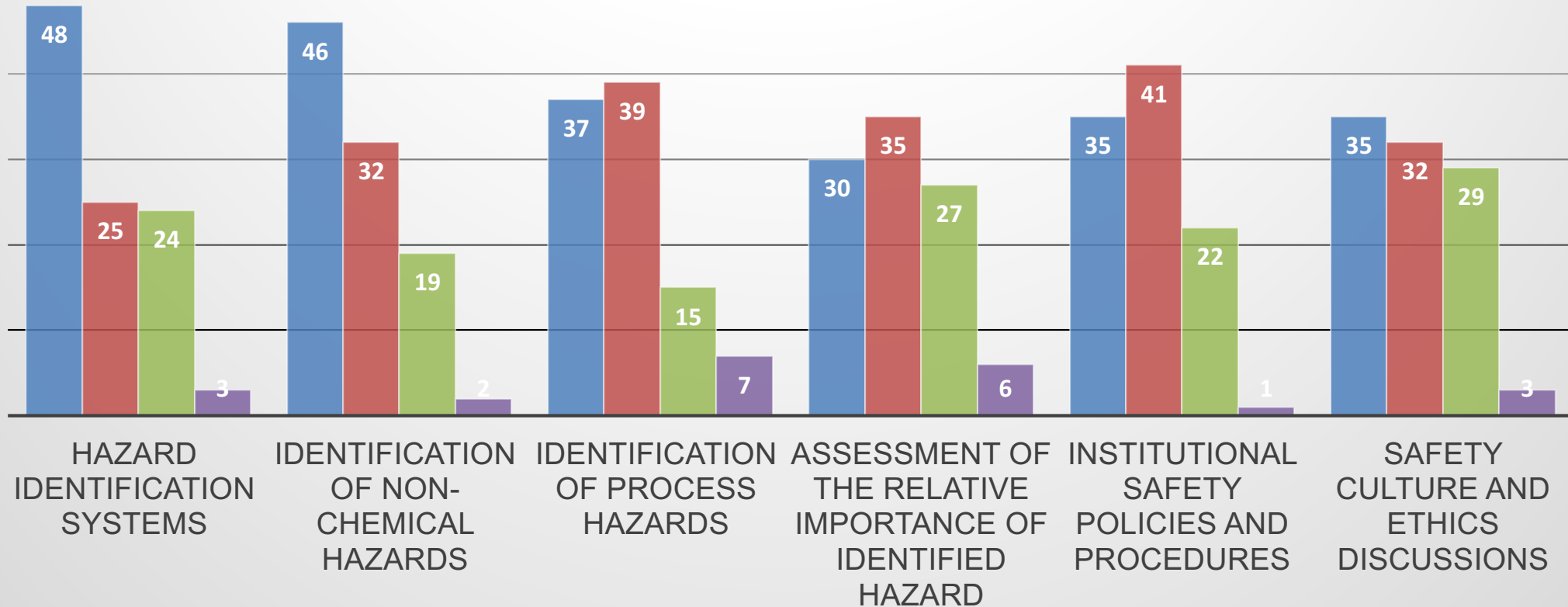
Risk Assessment

- Chemicals of highest concern
  - Explosives
  - Unknown reactivity

- Medium concern
  - Corrosives
  - Known reactivity or toxicity
  - Environmentally hazardous

Not on the fume hood sash!

- 53% report **little** concern for chemicals with unknown toxicity

LAB SAFETY EDUCATION
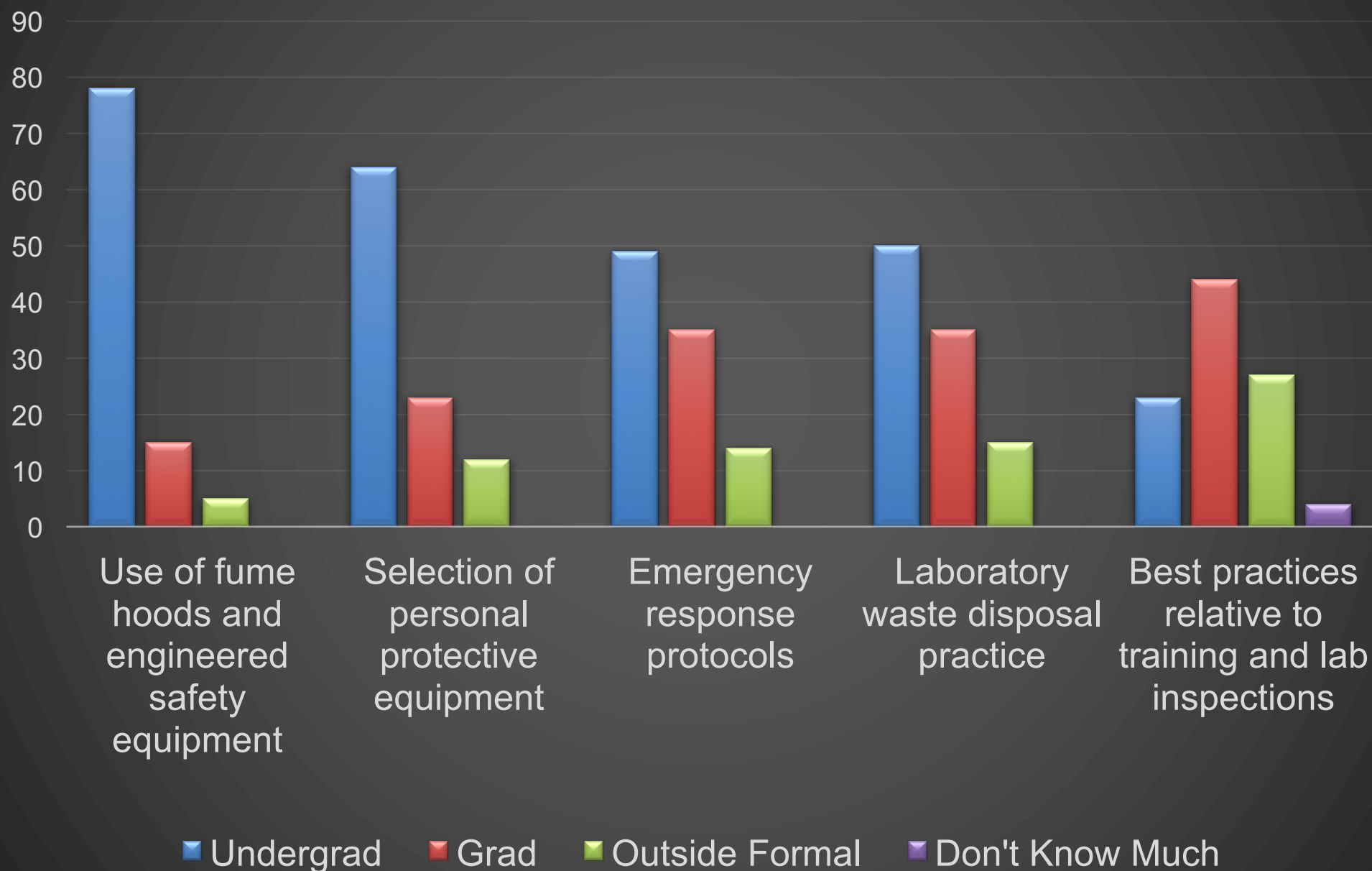
Institutional Safety Services

| Category	Completely adequate	Somewhat	Somewhat inadequate	Completely inadequate	Don't know
SUPPORT FOR SAFETY CULTURE AND ETHICS CONCERNS	38	38	13	4	7
EHS AND INSTITUTIONAL REVIEW BOARD OVERSIGHT	30	28	12	6	23
SAFETY PRACTICES OVERSIGHT	38	42	12	4	3
SAFETY LEADERSHIP	39	37	16	4	3
EMERGENCY RESPONSE	43	33	8	2	12
EMERGENCY PLANNING	41	41	8	1	7
WASTE DISPOSAL	69	21	5	2	2
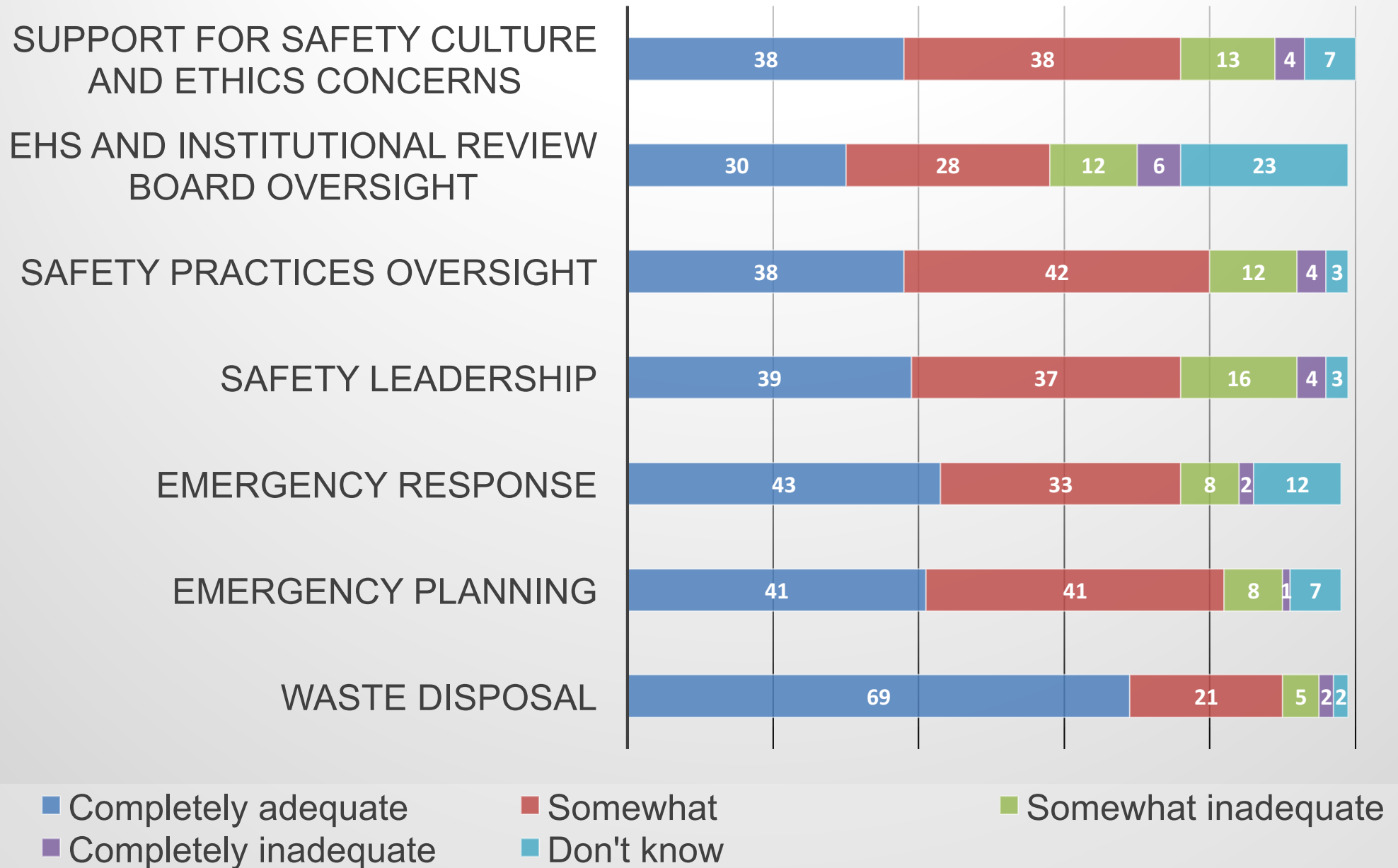
Lessons Learned (LL)

- Sometimes they look for root-causes of accidents that include:

  - Operating irregularities that led to the event

  - Unexpected reactions

- 50% reported that their organization gathers and utilizes LL from lab safety incidents

  - But fewer found LL information helpful when developing an SOP

- 43% reported that LL should include root-causes and have the chemists involved in gathering this information

"Do you have any additional information you would like to share with us?" (DM8)
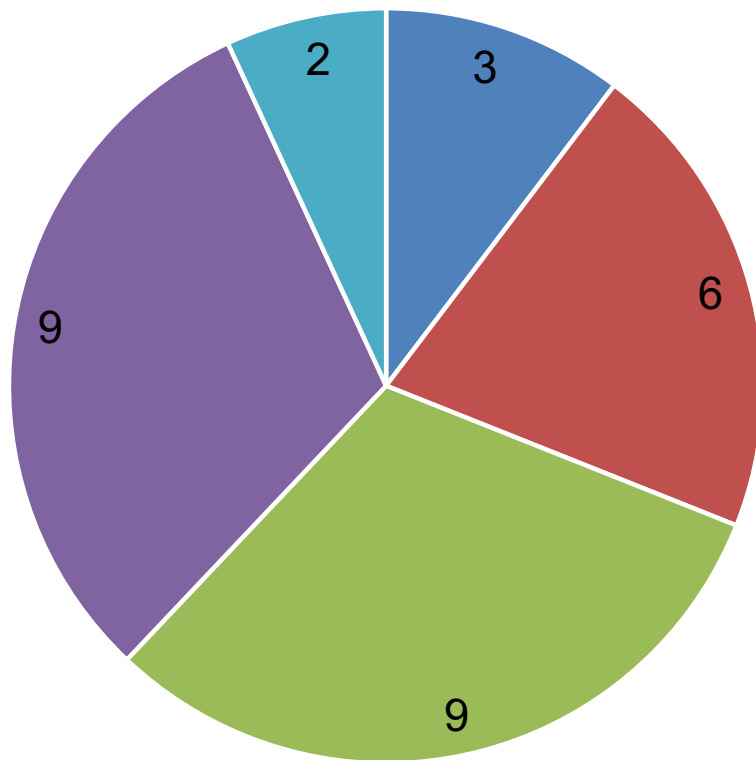
- Lab Management Issues
- Accident Details
- Cause of Accident
- Institutional Safety Culture
- Other

Next Steps

- Work with SRI to fully report on focus group and survey results

- Identify common responses of high importance

- Recruit other audiences to compare practices between different groups and over time

Acknowledgements

- ACS Committee on Professional Training
- Initial survey team
- CINF division for sharing the grant with CHAS
- Leah McEwen, Cornell Librarian
- Ralph Stuart, Chemical Hygiene Officer, Keene State College
- Cornell Survey Research Institute
- Patrick Murphy, Cornell Economics Major
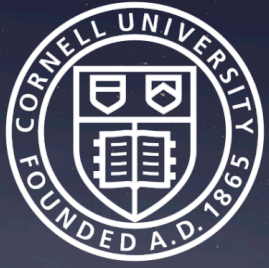
Questions?

Best Practices in Selecting & Presenting Safety Training Content

- In the spring of 2016 the ACS divisions of CINF and CHAS received an Innovative Project Grant. The purpose of this is to develop reusable focus group and survey instruments to ascertain the understanding of chemical hazards of students, staff and faculty at the various levels of education and the current chemical safety information tools that are being used by these academic laboratory populations. The intent is to develop training and education platforms in order to provide them with the understanding of and the tools they need to effectively use and communicate to students this chemical safety information so that they can conduct their work. This talk will discuss the 2 instruments we developed and the preliminary findings of the tools and training opportunities that the ACS should create for its members.