2018-2019 National Environmental Health Science and Protection Accreditation Council (EHAC) Undergraduate Programs Outcome Assessment Report

Compiled by
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I. Introduction:

This report details analysis of the data provided by former undergraduates of programs seeking reaccreditation during the 2018-2019 academic year and their supervisors.

II. Background:

EHAC Undergraduate Requirements Section VI. Reporting Obligations of Accredited and Pre-accredited Programs Part D. Program Outcomes Assessment Survey states that:

> "At the time of re-accreditation, the institution shall survey program graduates and employers via the Council's outcome assessment tool. All graduates since the last accreditation shall be in the pool of those to be surveyed. The completed tools shall be gathered by the institution and forwarded to the Executive Director of the Council six months prior to the annual meeting of the Council. The Council will supply a summary of the information gathered to all accredited programs on an annual basis.
>
> The purpose of this survey is to determine the adequacy of the accreditation process to the needs of the professional practice of environmental health. The information gathered by an institution through the outcome assessment process will not be used as part of the evaluation review for re-accreditation purposes for a given institution. The Council will use the compiled information from all institutions undergoing re-accreditation to evaluate and consider changes to the requirements of accreditation."

The outcome assessment tool consists of two surveys conducted via surveymonkey.com, one for current employees and the other for their supervisors. It is distributed to the reaccreditation candidate Program Directors for distribution to former students. The graduates then provide the survey link to their supervisors for survey completion.

III. Survey Context and Summary

EHAC's core mission is to accredit Environmental Health (EH) Programs that provide a scientifically rigorous and practical based education, which prepares graduates to enter the EH field "work force ready" and prepared to problem solve using critical thinking skills acquired during their university education. Toward this end, EHAC is continuously identifying strengths and weaknesses related to graduates successfully entering and progressing in the EH field of their choice. Survey responses from both graduates employed in the EH field (employees) and their supervisors assist EHAC in assessing and adapting Undergraduate Requirements and Graduate Guidelines for accreditation to the ever-evolving arena of Environmental Health.

Questions for both employees and their supervisors focus on assessing the adequacy and effectiveness of an employee's knowledge, skills and abilities related to their EH job, with employees conducting self-assessments and supervisors evaluating their current employees.

The following report provides a graphic representation of the results of the surveys with employees presented first, followed by their supervisors.

Table 1 presents the six EHAC accredited undergraduate programs reaccredited in 2019, the number of employee responses and their dates of graduation, and supervisor responses. There were 45 total undergraduate respondents to the survey. Forty-three of these respondents fully completed the surveys and those 43 are currently employed in EH related professions and are the focus of this report. Thirteen supervisors responded to the survey.

Table 1. 2018-2019 Outcome Assessment Respondents

Re-accreditation Applicants	Next Accreditation Review	Initial Accreditation Year	Graduating Classes Reflected	Number of Employee Respondents	Number of Supervisor Respondents
California State University – San Bernardino	2021 (conditional accred. period)	2004	2008, 2013, 2015, 2017, 2018	14	4
Central Michigan University	2021 (conditional accred. period)	2013	2014, 2015, 2017, 2018	12	5
Illinois State University	2025	1977		0	0
Indiana University - IUPUI	2025	2006	2013, 2014,2016	3	0
Texas Southern University	2025	2006	2006, 2011, 2013, 2014, 2015, 2016	9	0
University of Wisconsin - Oshkosh	2025	2013	2008, 2014, 2016, 2017, 2018	7	4
Totals				**45**	**13**
Respondents Employed in Environmental Health Field				43	13

IV. Employee Survey Results

A. Employee Skills

Listed below are core competencies in EH programs. Respondents were asked to choose the option that most closely describes their skill level.

Charts 1-3 present employee self-assessments of general job skills, interpersonal office skills and skills related to interpreting data. Overwhelmingly, employees rated themselves either very or most proficient among these categories. A few employees reported challenges in the areas of:

- Speaking and Writing Skills;
- Leadership Skills;
- Time Management;
- Project Planning and Management;
- Conducting a Statistical Analysis and Interpreting Data; and
- Applying Research Methods for Solving Problems.

Employees rated themselves most highly in the EH Specialty areas of Risk Management, Assessment and Communication (Chart 4), while a small number reported lack of proficiency in epidemiology, toxicology and risk management.

Chart 1.

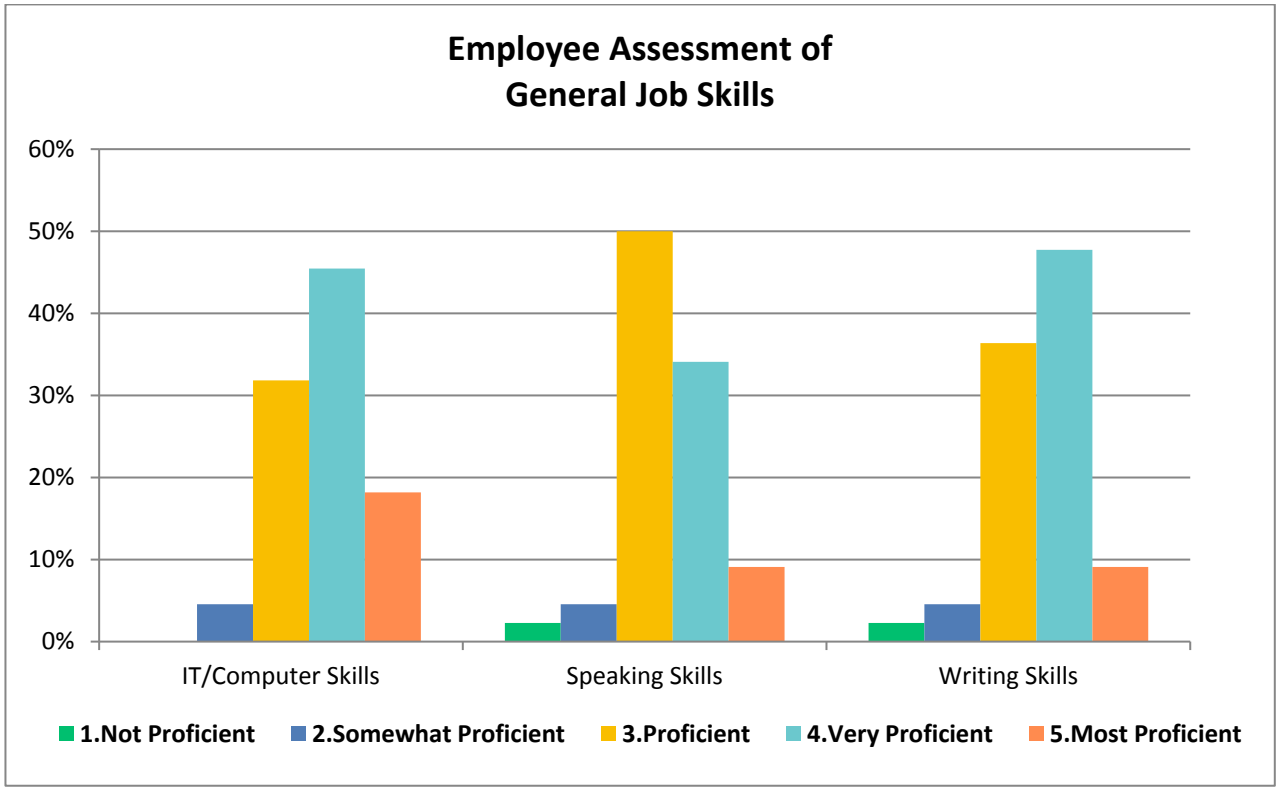


Chart 2.

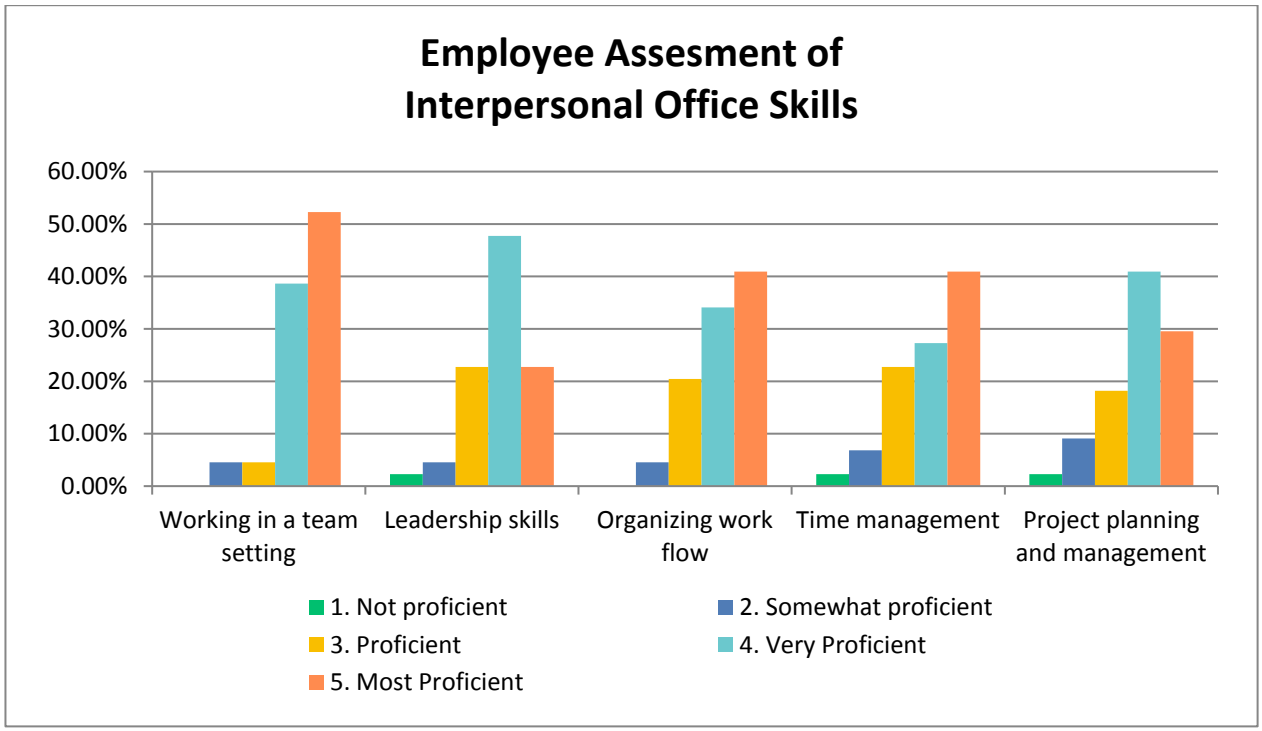


Chart 3.

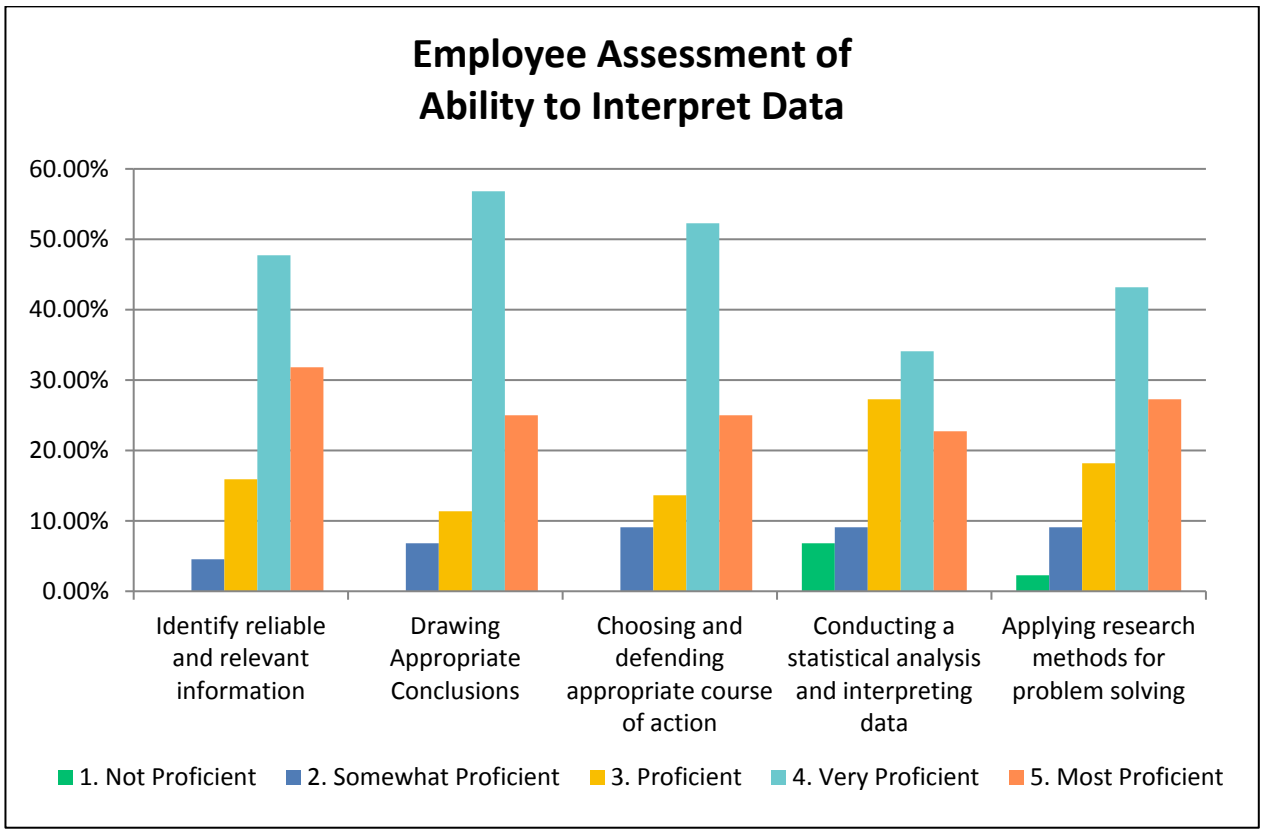
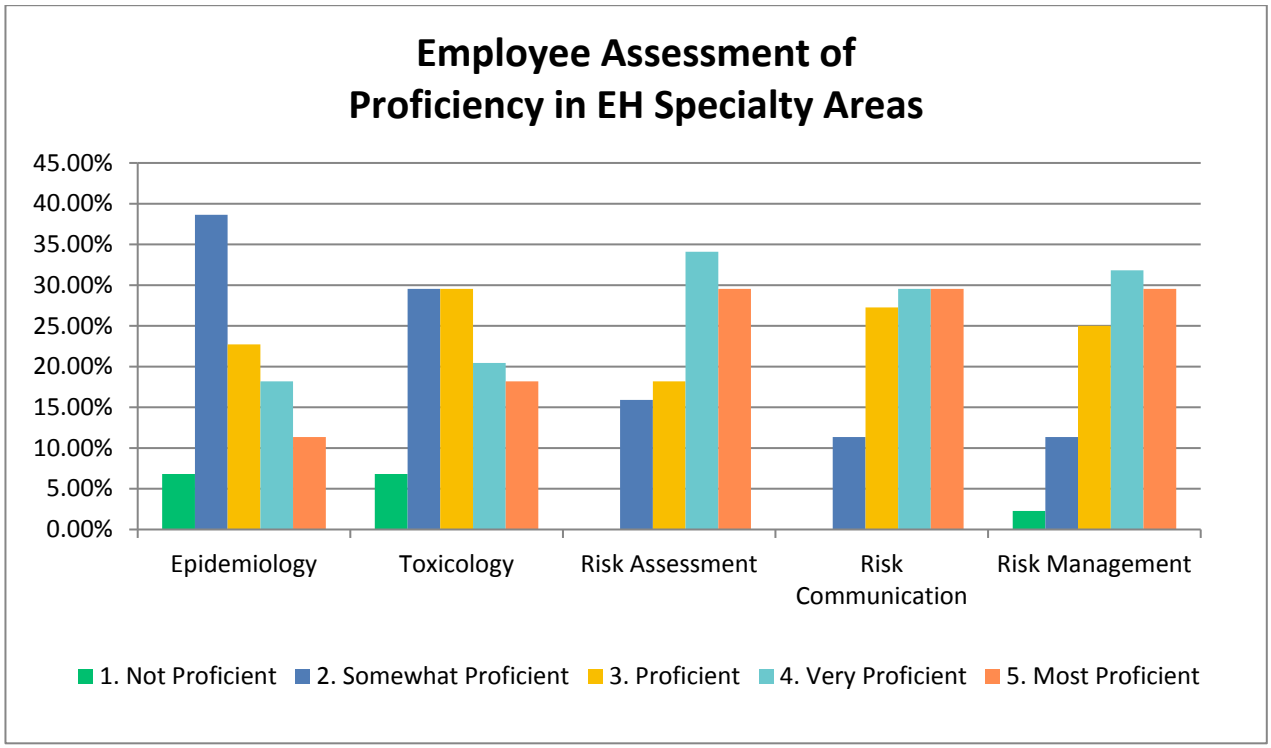


Chart 4.



B. Course Relevance

Employee respondents were asked to answer yes or no if their job requires knowledge in the following areas (Chart 5). The EH specialty areas cited as necessary by at least 50% of employees included:

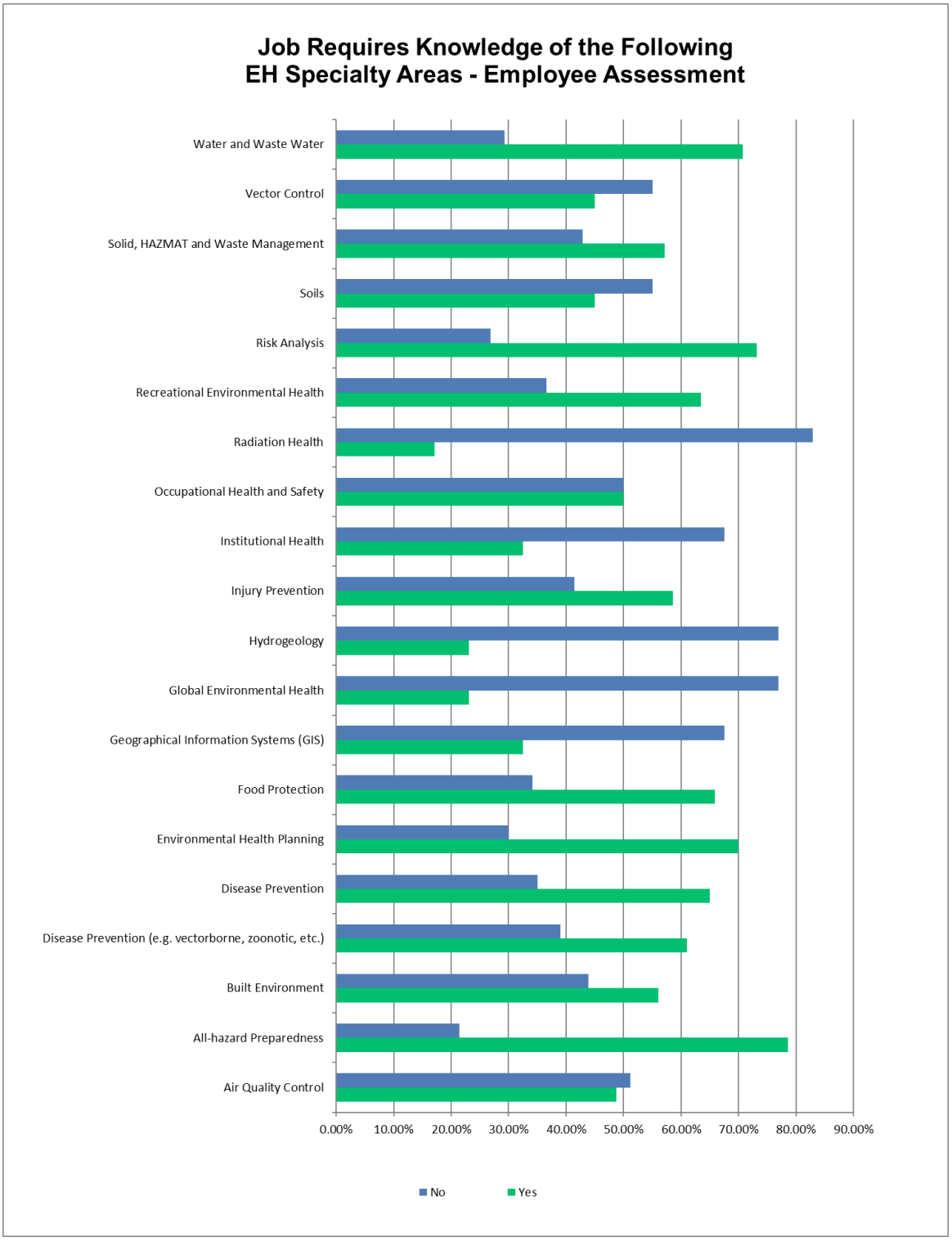
- All Hazard Preparedness;
- Built Environment;
- Disease Prevention (e.g. vectorborne, zoonotic, etc.);
- Disease Prevention;
- Environmental Health Planning;
- Food Protection;
- Injury Prevention;
- Occupational Health and Safety;
- Recreational Environmental Health;
- Risk Analysis;
- Solid and Hazardous Material and Waste Management; and
- Water and Wastewater Treatment.

Knowledge was less necessary in the following EH Specialty areas:

- Air Quality Control;
- Geographic Information Systems;

- Global Environmental Health;
- Hydrogeology;
- Institutional Health;
- Occupational Health and Safety;
- Radiation Health;
- Soils; and
- Vector Control.

Chart 5.


Job Requires Knowledge of the Following
EH Specialty Areas - Employee Assessment
Water and Waste Water
Vector Control
Solid, HAZMAT and Waste Management
Soils
Risk Analysis
Recreational Environmental Health
Radiation Health
Occupational Health and Safety
Institutional Health
Injury Prevention
Hydrogeology
Global Environmental Health
Geographical Information Systems (GIS)
Food Protection
Environmental Health Planning
Disease Prevention
Disease Prevention (e.g. vectorborne, zoonotic, etc.)
Built Environment
All-hazard Preparedness
Air Quality Control
0.00% 10.00% 20.00% 30.00% 40.00% 50.00% 60.00% 70.00% 80.00% 90.00%
No
Yes

C. Specialty Area Program Preparation

Employee respondents were asked to answer yes or no if they were well-prepared in the following EH specialty areas by their undergraduate programs. Chart 6 presents responses with more than 50% of employees reporting they were well prepared for more than half of the EH specialty areas provided in the survey. Specialty areas scoring the highest in graduate preparedness include:

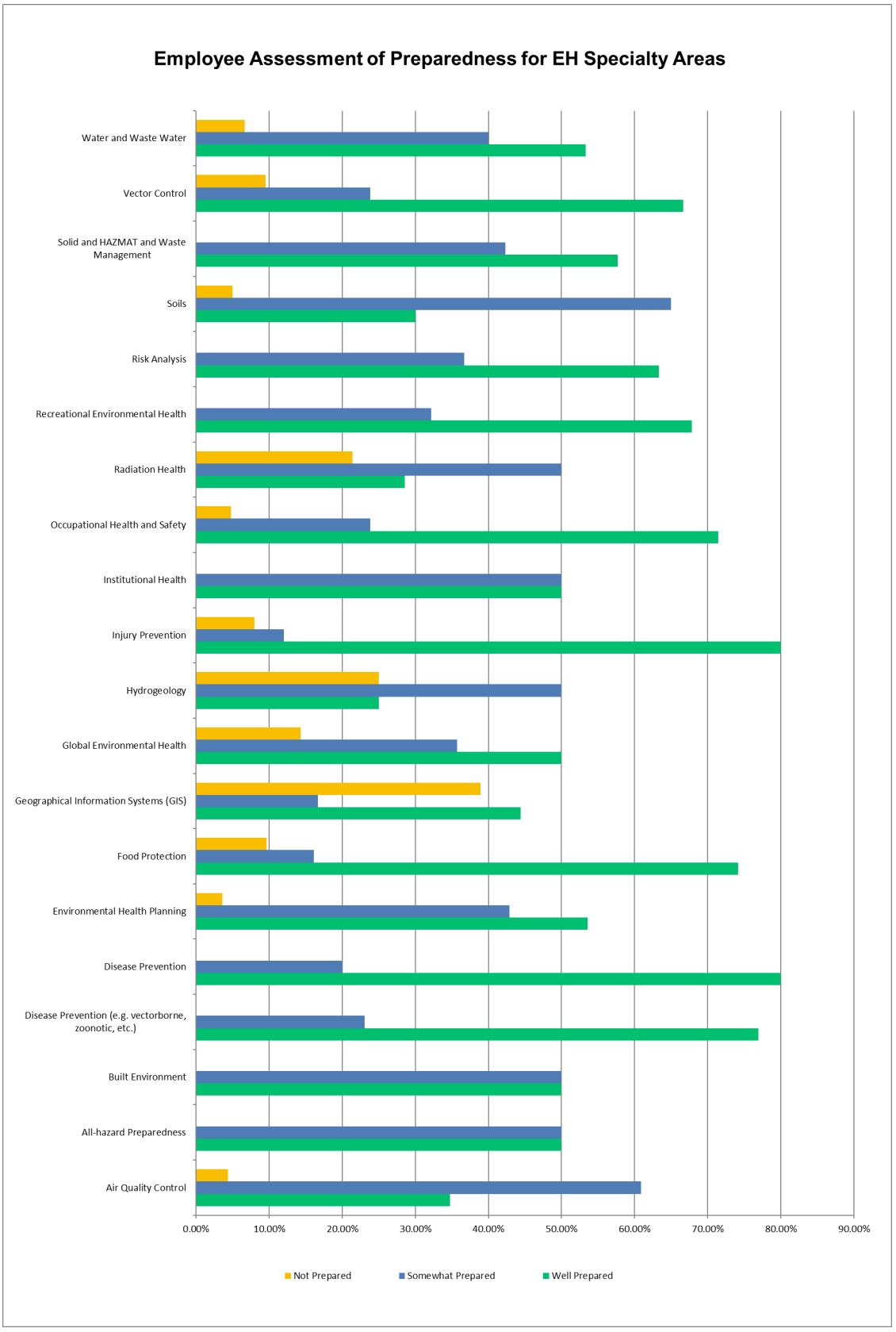
- Disease Prevention (e.g. vectorborne, zoonotic, etc.);
- Disease Prevention;
- Environmental Health Planning;
- Food Protection;
- Injury Prevention;
- Occupational Health and Safety
- Recreational Environmental Health;
- Risk Analysis;
- Solid and HAZMAT Waste Management;
- Vector Control; and
- Water and Wastewater Treatment.

Specialty EH areas showing the highest percent of employees that were least prepared include:

- Geographical Information Systems (GIS);
- Hydrogeology;
- Global Environmental Health; and
- Radiation Health.

These EH specialty areas coincide with those knowledge areas reportedly *not* required by the employee's job.

Chart 6.


Employee Assessment of Preparedness for EH Specialty Areas
Water and Waste Water
Vector Control
Solid and HAZMAT and Waste Management
Soils
Risk Analysis
Recreational Environmental Health
Radiation Health
Occupational Health and Safety
Institutional Health
Injury Prevention
Hydrogeology
Global Environmental Health
Geographical Information Systems (GIS)
Food Protection
Environmental Health Planning
Disease Prevention
Disease Prevention (e.g. vectorborne, zoonotic, etc.)
Built Environment
All-hazard Preparedness
Air Quality Control
0.00%
10.00%
20.00%
30.00%
40.00%
50.00%
60.00%
70.00%
80.00%
90.00%
Not Prepared
Somewhat Prepared
Well Prepared

D. Employee Workplace Data:

Chart 7 presents job sectors for employees of the six schools surveyed. As previously mentioned, 43 respondents are currently employed in the Environmental Health field. More than 70% of the graduates are employed at local or federal government agencies. The remaining respondents are employed at private companies or corporations, at non-profit organizations or they are teaching.

Chart 8 shows the distribution of those employees who are employed by local, state or the federal government. Just over 50% of respondents work at local or state health departments while less than 10 % of employees work at the US Public Health Service and Centers for Disease Control (CDC). The remaining 40% of respondents reported "other" government agencies and these included:

- Certified Unified Program Agency;
- Los Angeles Unified School District;
- State of Wisconsin Department of Agriculture Trade and Consumer Protection;
- City of Houston, Houston Permitting Center;
- Tribal Environmental Department;
- Port Houston Authority; and
- Local Air Quality District.

Chart 9 presents EH areas of employment for respondents. The majority of respondents have found employment within the food protection and solid and Hazardous Waste Management professions.

Approximately thirty percent of employees report making $40 to $50,000 per year as shown in Chart 10, while just over 70% of employee salaries range from less than $20,000 to greater than $70,000 per year.

Chart 7.

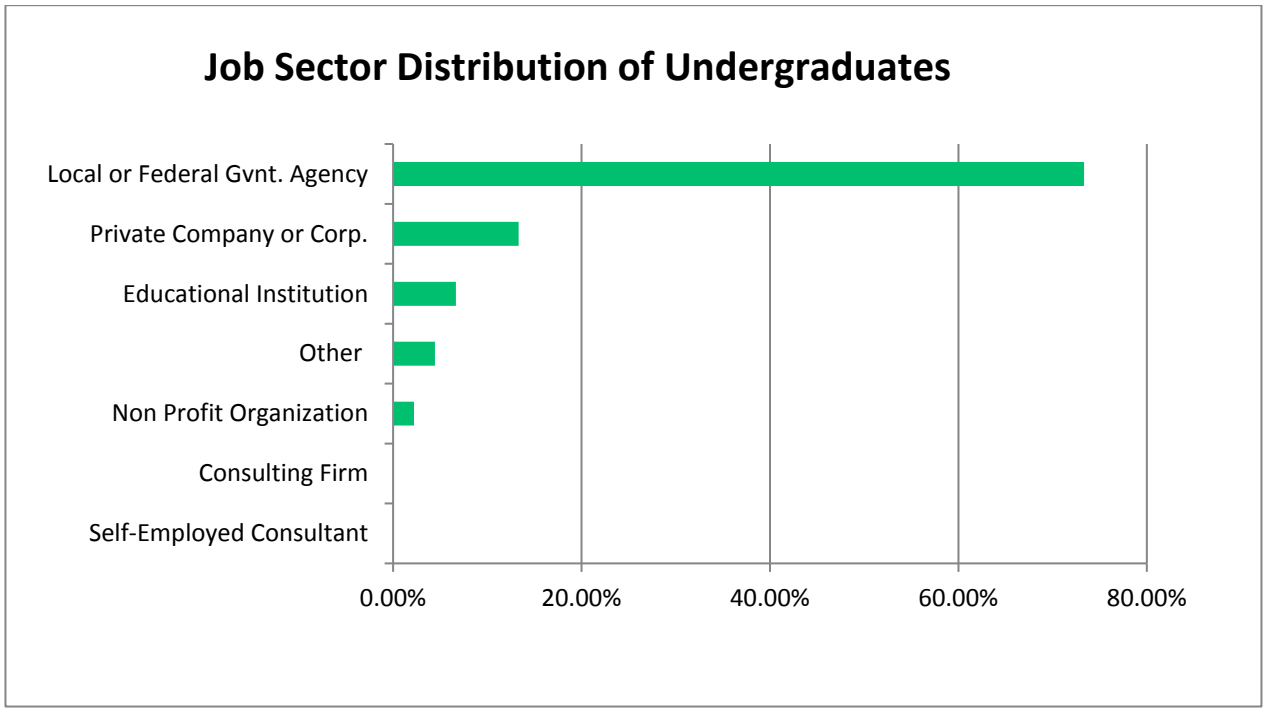


Chart 8.

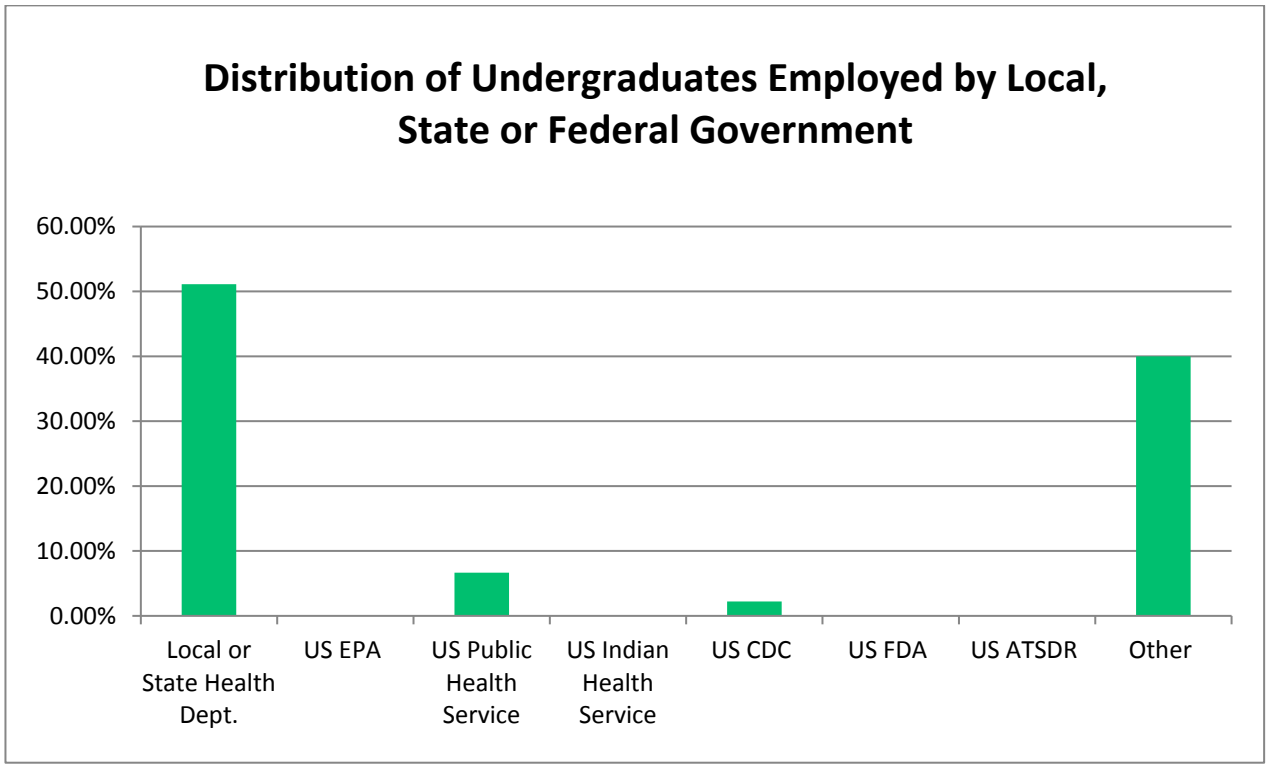


Chart 9.

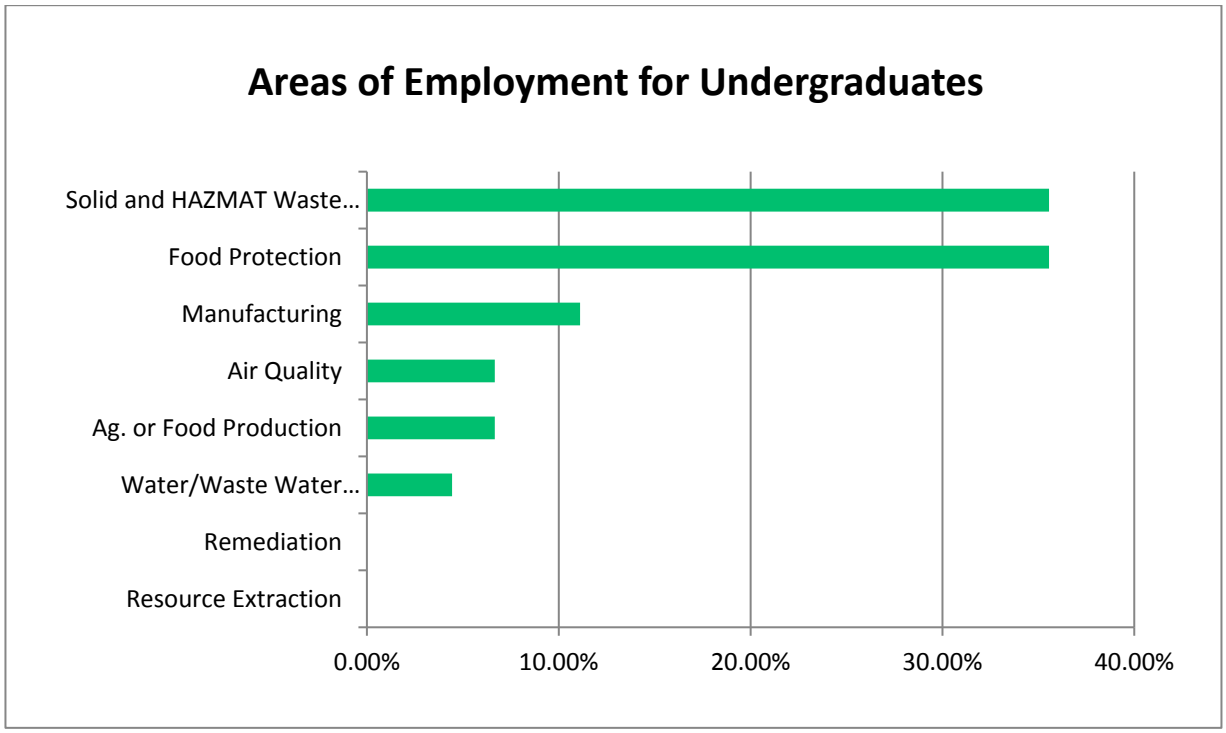
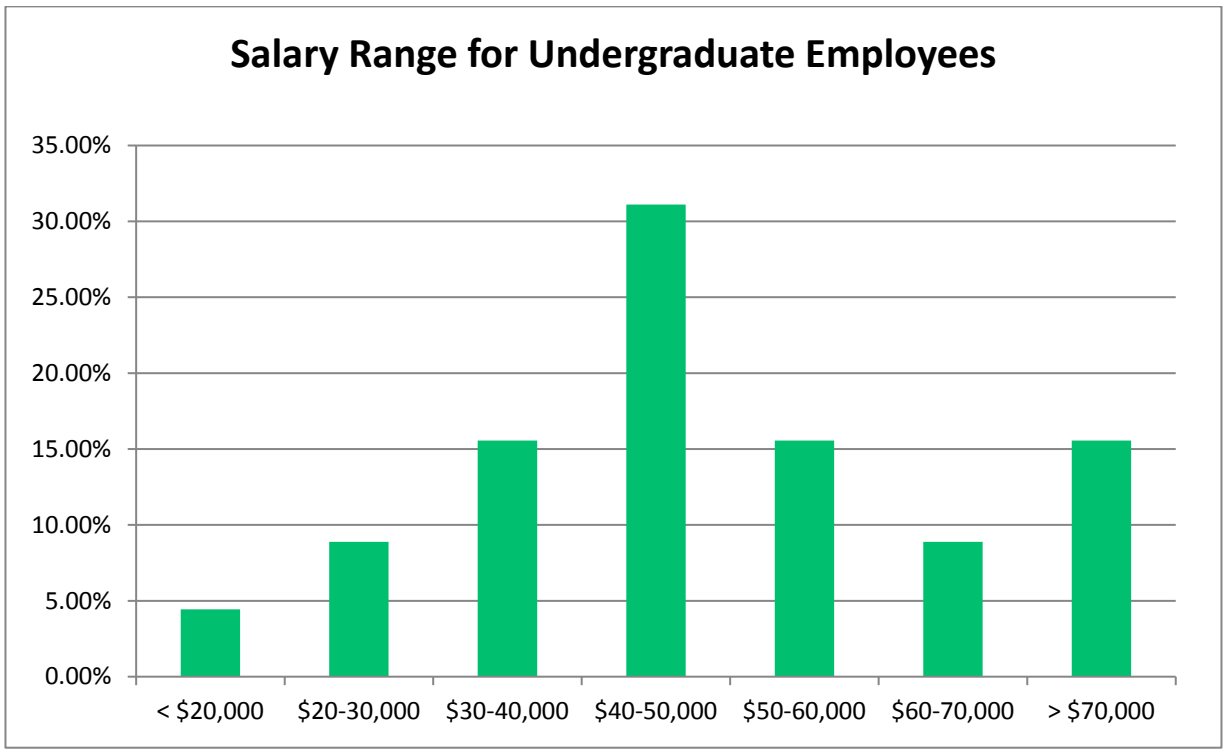


Chart 10.



E. Employee Data on Continuing Education and Professional Development

Table 2. below details the types of degrees completed by employees after earning an Undergraduate degree in Environmental Health:

Table 2. Post Undergraduate Education

Number of Graduates that have Completed Post-Baccalaureate Degrees	Types of Degrees Awarded
5	Master of Science in Health Informatics Environmental Policy and Management Public Administration Radiation Health Physics

F. Professional Recognition

The following were listed as specific professional awards received by 10 respondents (Table 3.):

Table 3. Awards Received

Competent Person - Excavation
Congressional award for student of distinction
Registered Environmental Health Specialist (REHS)
CPR; OSHA 10-hour
ICS-100 ICS-200 ICS-300 IS-700
2015, 2016 Environmentally Friendly Green Award from the Area Director, USPHS Achievement Medal and Staff EHS of the year 2017
Thurgood Marshall College fund - Fellow, Houston Livestock Show and Rodeo – Scholar, National Science Foundation - Fellow , Texas Academy of Science - Award Recipient
2017 Biowatch Award for Field operations
Nuclear regulatory commission training, Source retrieval

G. Credentials Achieved:

The following were listed as specific credentials earned by 36 respondents (Table 4):

Table 4. Credentials Earned

Certification Achieved	**Number of Graduates**
40 HR and 8 HR HAZWOPER	2
40HR Hazwoper certification	3
Asbestos Building Inspector. 40-Hour Hazwoper Training Lead Safety R,R,P First Aid Certified	1
Associate Safety Professional, Certified Safety Professional, Associate in Risk Management	1
CA Registered Environmental Health Specialist	3

Certified Pool Operator	2
Certified Safety Professional & Associate Safety Professional	1
CPR/AED/First Aid Certified	2
EPA Watershed Academy, Natural Shoreline Partnership professional training and certification, MSUE Facilitative Leadership	1
Food protection, on site sewage treatment and disposal, infection control, and certified pool and spa operator	1
Foodborne Illness Outbreak Environmental Assessments, 21st Century Diversity and Inclusion	1
Measurement verification, pesticide use enforcement	1
Nebraska Asbestos Inspector- Licensed, Certified Method 9 Observer	1
OSHA 10-hour	1
OSHA 30 hr	1
REHS Certified Rabies observer, HACCP Training, FEMA Preparedness training,	1
Registered Environmental Health Specialist (REHS)	9
Aquatic Facility Operator, Certified Playground Safety Inspector, ServSafe Food Manager, Instructor and Proctor	1
Wisconsin Lead Risk Assessor	1
Registered Sanitarian Certificate	1
Sustainable Comprehensive Water Management Programs Course (phigenics)	1

H. Professional Organizations

Forty-three employee respondents indicated involvement in the professional organizations listed in Table 5. below:

Table 5. Professional Organizations

Professional Organization and Position (if any)	**Number of Graduates**
AIH	2
California Environmental Health Association	5
California Environmental Health Association (CEHA) - Member and Chapter President	1
California Environmental Health Association (CEHA) Citrus Chapter - Board Representative	1
Conference of Radiation Control Program Directors	1
Florida Environmental Health Association	1
Galveston Biowatch Team - Lead Field operator	1
Michigan Environmental Health Association - Executive Board Member	1
Michigan Environmental Health Association - Member	8
National Environmental Health Association	10
Nebraska Environmental Health Association- Former Secretary	1

Nevada Environmental Health Association Member.	1
Partnership for Saginaw Bay Watershed - Board member	1
Registered Environmental Health Trainee	1
Saginaw Basin Land Conservancy - Board member	1
SEHA, member only	1
Society of Toxicology - Texas Academy of Science Society of Environmental Toxicology	1
Chemistry Emerging Researchers National Association of Black Geoscientists	1
USPHS Commissioned Officer Association - Member	1
Wisconsin Environmental Health Association - member only	1
Wisconsin Environmental Health Association and Neenah Special Events Taskforce member	1
Wisconsin Environmental Health Association- Previous Member - Past Education Committee President	1

V. Supervisor Survey Results

Supervisors of graduates from 2019 reaccrediting programs were asked to assess the skills and preparedness of their employees. Thirteen supervisors responded to the survey and their responses are presented below along with information related to their job sector and primary areas of work.

A. Supervisor Employment

Charts 11 and 12 present data related to the area of supervisor employment and therefor showing similar distributions to that of the employee respondents. More than 70% of respondents work for a local or federal government agency (Chart 11). The “other” category included a Tribal Agency supervisor.

Chart 13 also shows data similar to those of employees, with the food protection and solid and hazardous waste management categories at the top of the employment area list. Supervisors heavily used the “other” category for job area descriptions and these areas included public health, education, on-site water supply and wastewater, public swimming pools, recreational licensing and enteric and respiratory illnesses.

Chart 11.

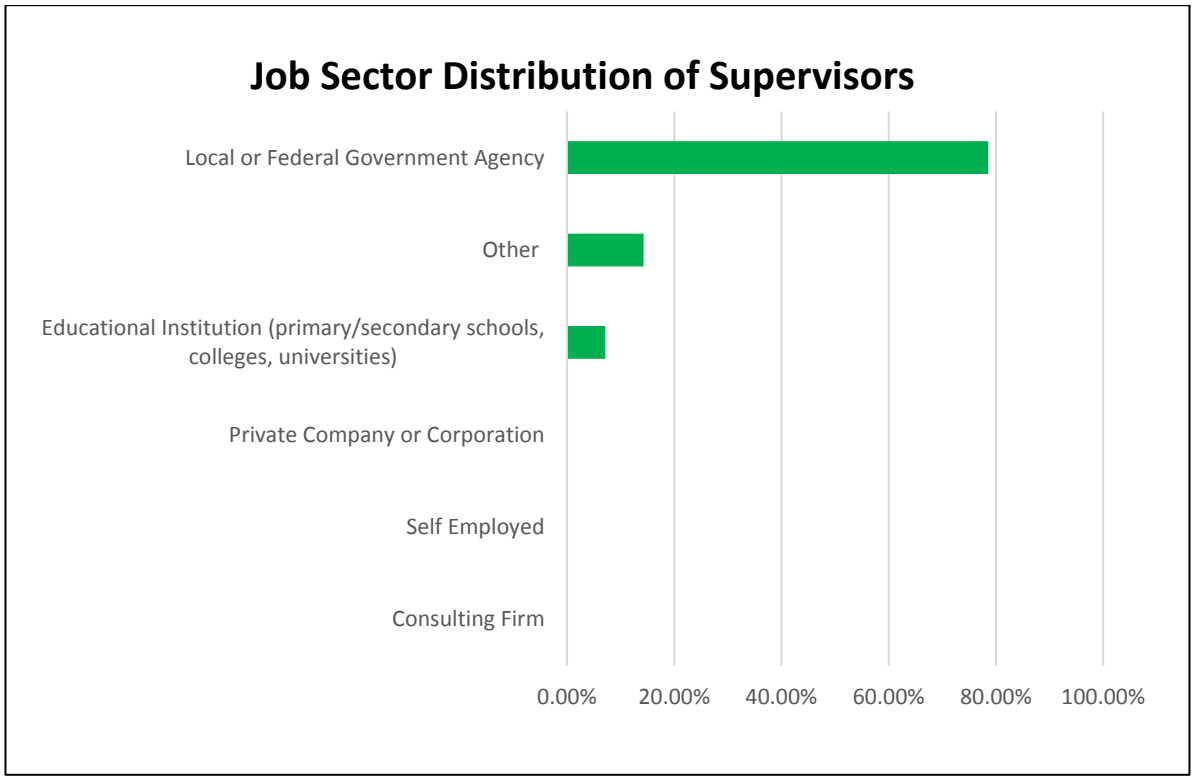


Chart 12.

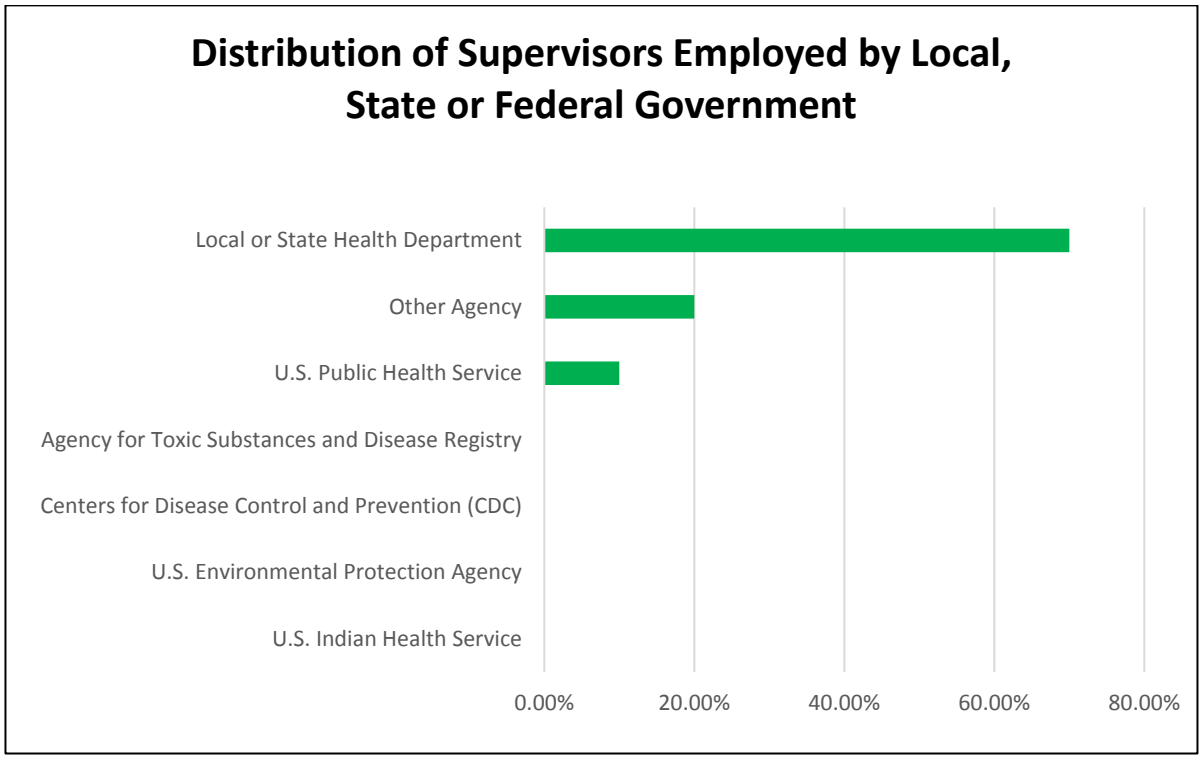
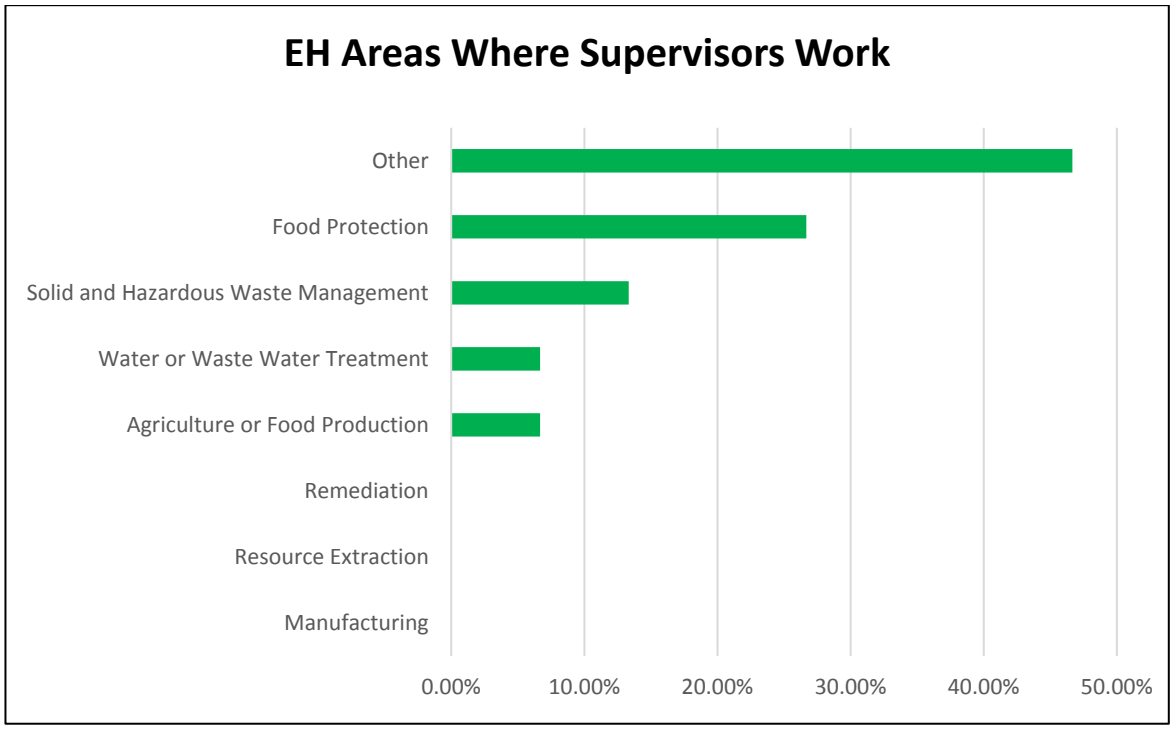


Chart 13.



B. Supervisor Rating of Employee Skills

Thirteen supervisors responded to questions regarding the skill levels of employees. Charts 14-16 present supervisor estimates of employee acumen related to job skills, interpersonal skills, skills related to interpreting data, as well as employee proficiency in EH specialty areas.

Supervisors reported high proficiency levels related to IT/Computer skills and technical writing, with public speaking skills showing the lowest proficiency ratings overall (Chart 14).

Interpersonal skills and skills related to interpreting and reporting data were generally rated "somewhat" proficient or higher by supervisors (Charts 15 and 16), with some challenges cited for leadership skills, choosing and defending an appropriate course of action, conducting a statistical analysis and interpreting data, and applying research methods and problem solving.

Where applicable, supervisors reported strong skills in Risk Assessment, Epidemiology, Toxicology and Risk Communication and Management. The most challenging areas for employees, according to supervisors, were Risk Assessment and Risk Communication (Chart 17).

Chart 14.

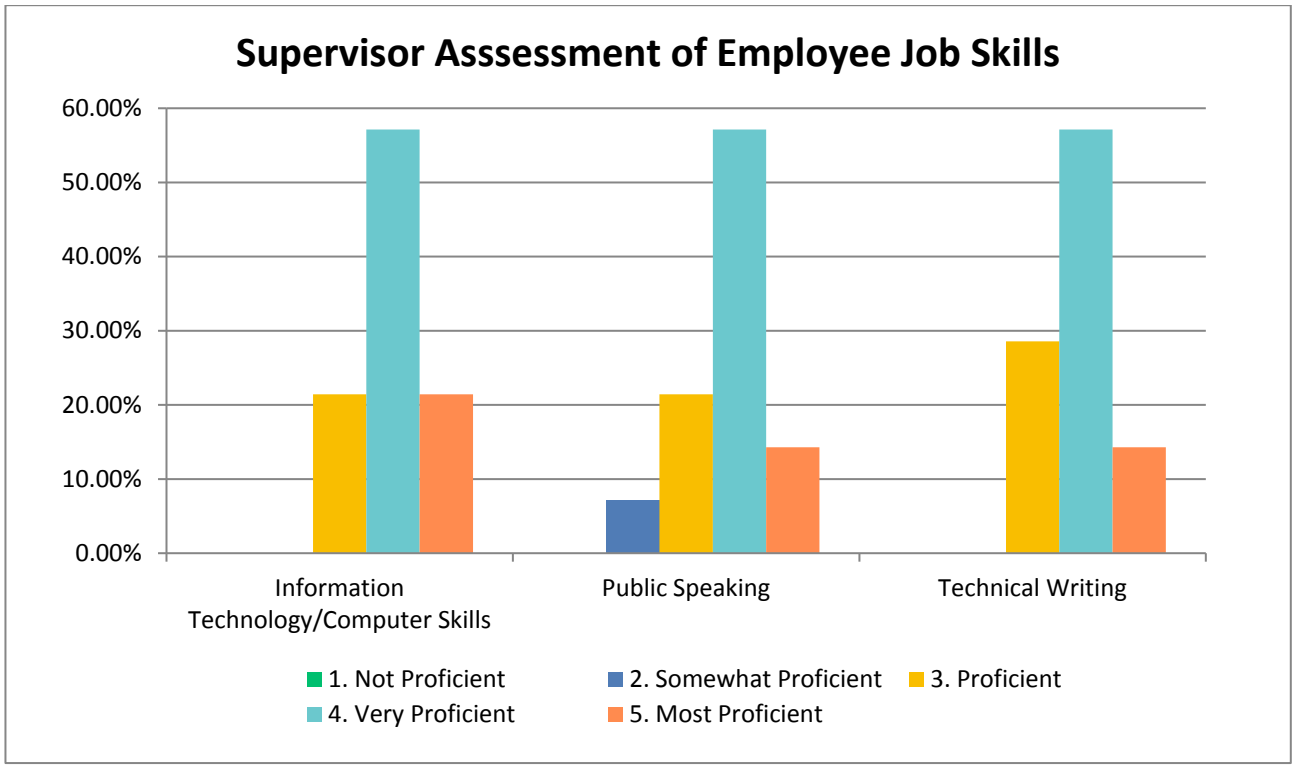


Chart 15.

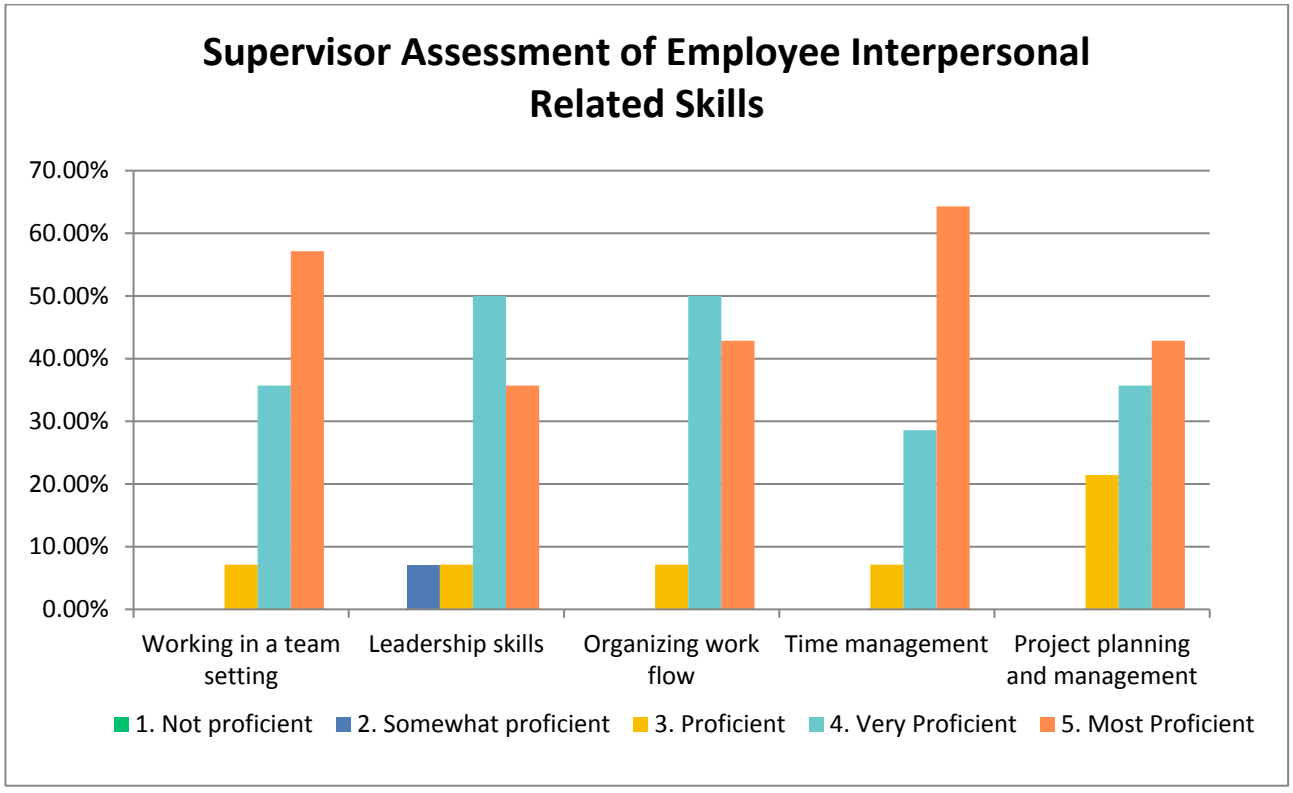


Chart 16.

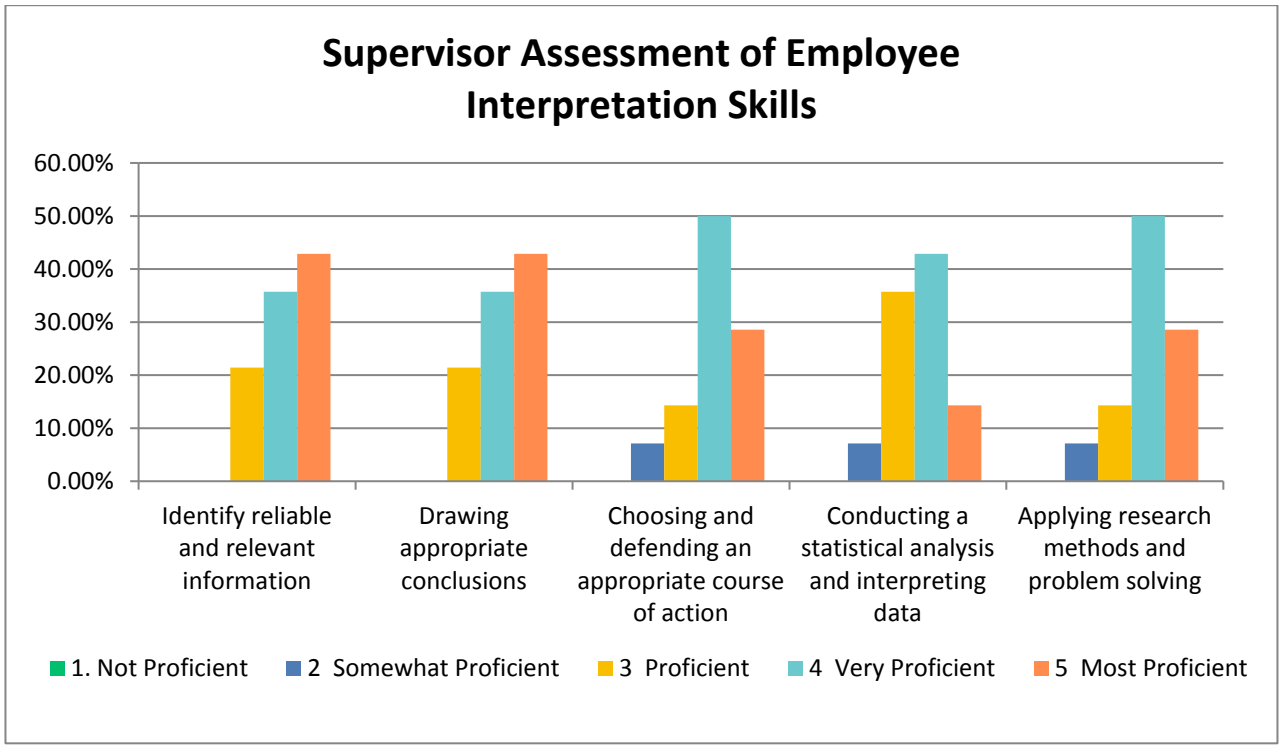
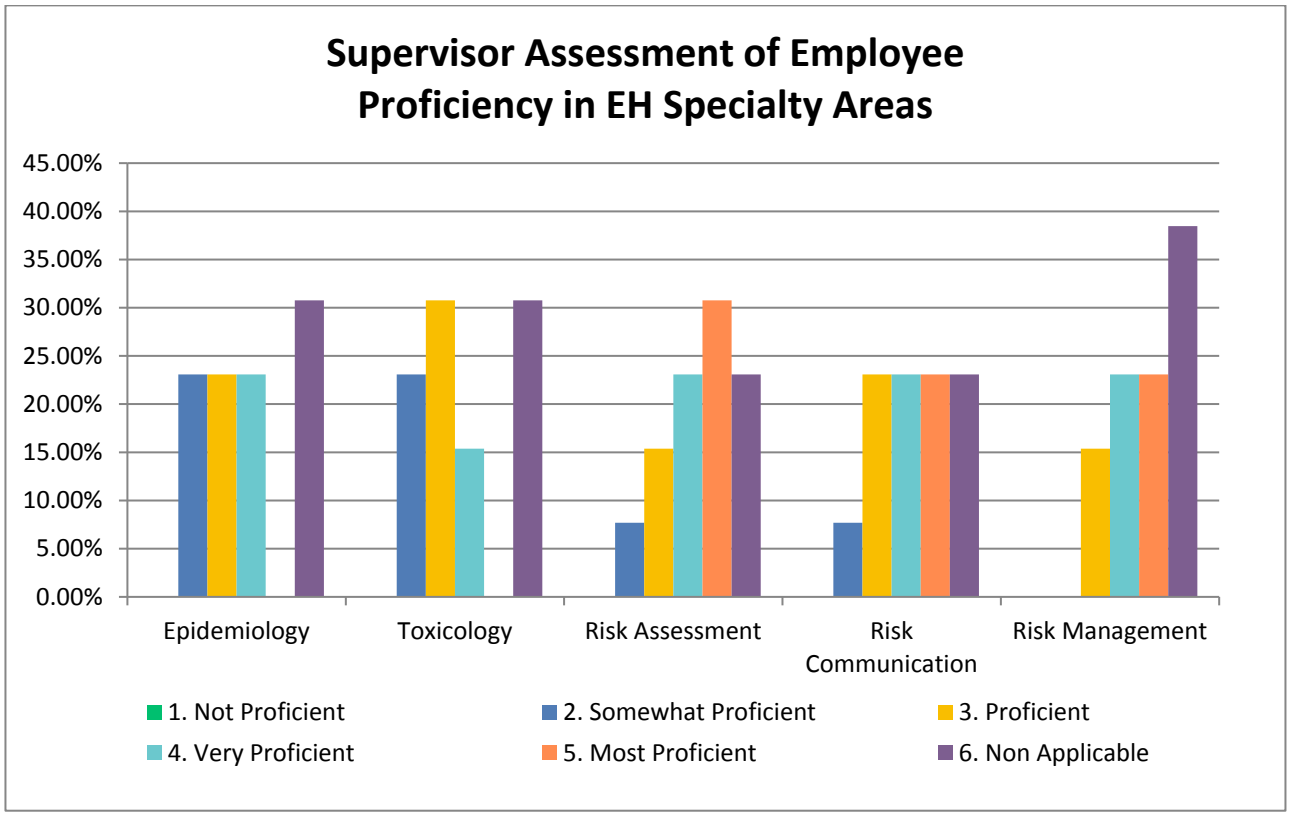


Chart 17.



C. Specialty Area Requirements of Jobs

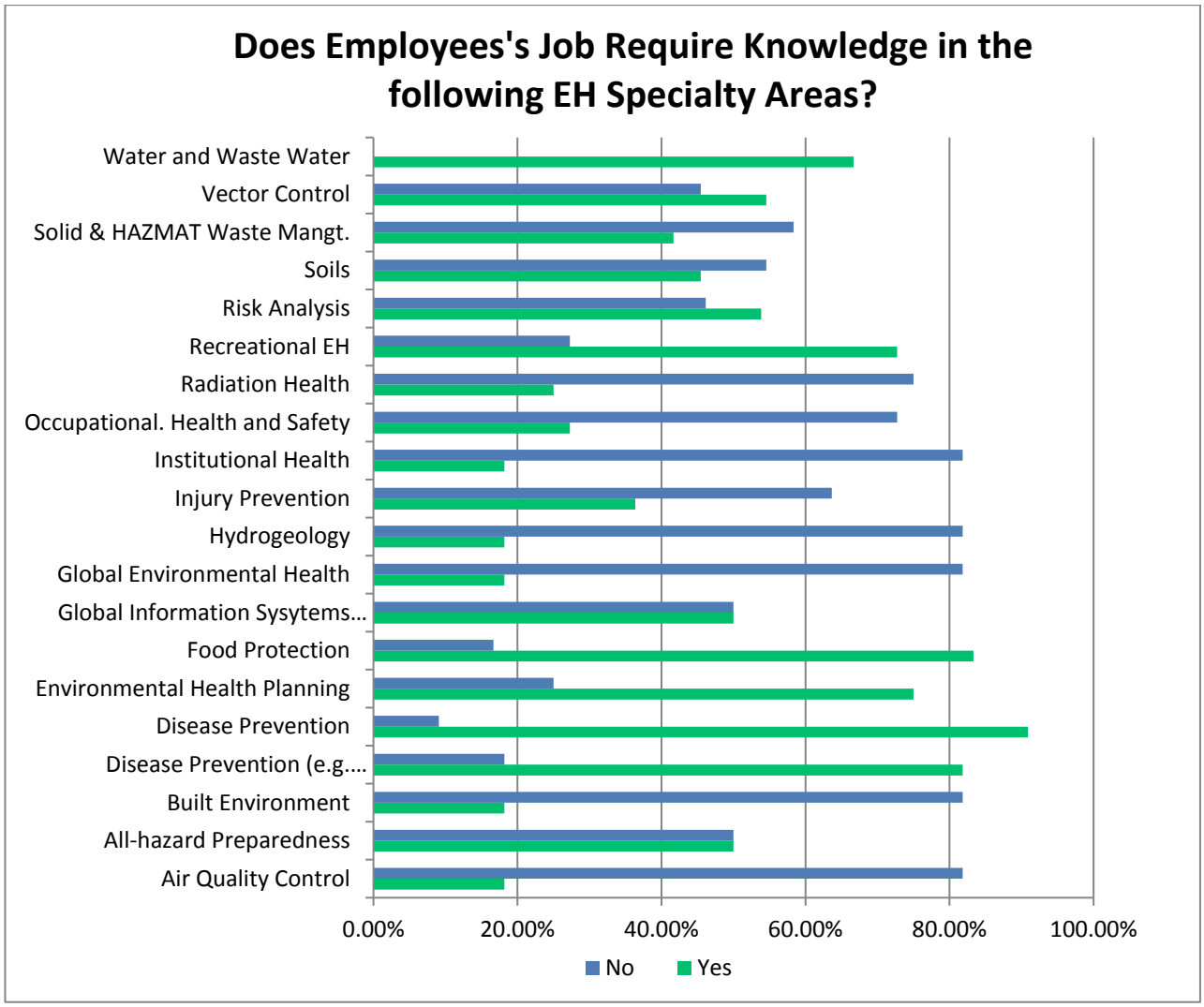
Supervisors were asked to answer yes or no if the employee's job requires knowledge in the following core competencies. Chart 18 shows that fifty percent or more supervisors cited the following required knowledge areas for their employees (required knowledge areas also cited by employees are starred):

- All Hazard Prepardness;
- Disease Prevention (e.g. vectorborne, zoonotic, etc.)*;
- Disease Prevention*;
- Environmental Health Planning*;
- Food Protection*;
- Geographic Information Systems (GIS);
- Recreational Environmental Health*;
- Risk Analysis*;
- Vector Control*; and
- Water and Wastewater Treatment*.

Specialty EH areas that supervisors reported as *not* requiring employee knowledge included (unrequired knowledge areas also cited by employees are starred):

- Air Quality Control*;
- All Hazards Preparedness;
- Built Environment;
- Geographical Information Systems (GIS)*;
- Global Environmental Health*;
- Hydrogeology*;
- Injury Prevention;
- Institutional Health*;
- Occupational health and Safety;
- Radiation Health*;
- Soils; and
- Solid and HAZMAT Waste Management.

Chart 18.



D. Program Preparation

Supervisors were asked to answer yes or no if employees were well-prepared in the following specialty areas. All supervisors rated employees as ”somewhat” or “well prepared”. EH specialty areas scoring the highest in preparedness include (areas of a high level of preparedness coinciding with employee job preparation rankings are starred):

- Disease Prevention (e.g. vectorborne, zoonotic, etc.)*;
- Disease Prevention*;
- Environmental Health Planning*;
- Food Protection*;
- Geographic Information Systems;
- Injury Prevention*;
- Occupational Health and Safety*;
- Recreational Environmental Health*; and

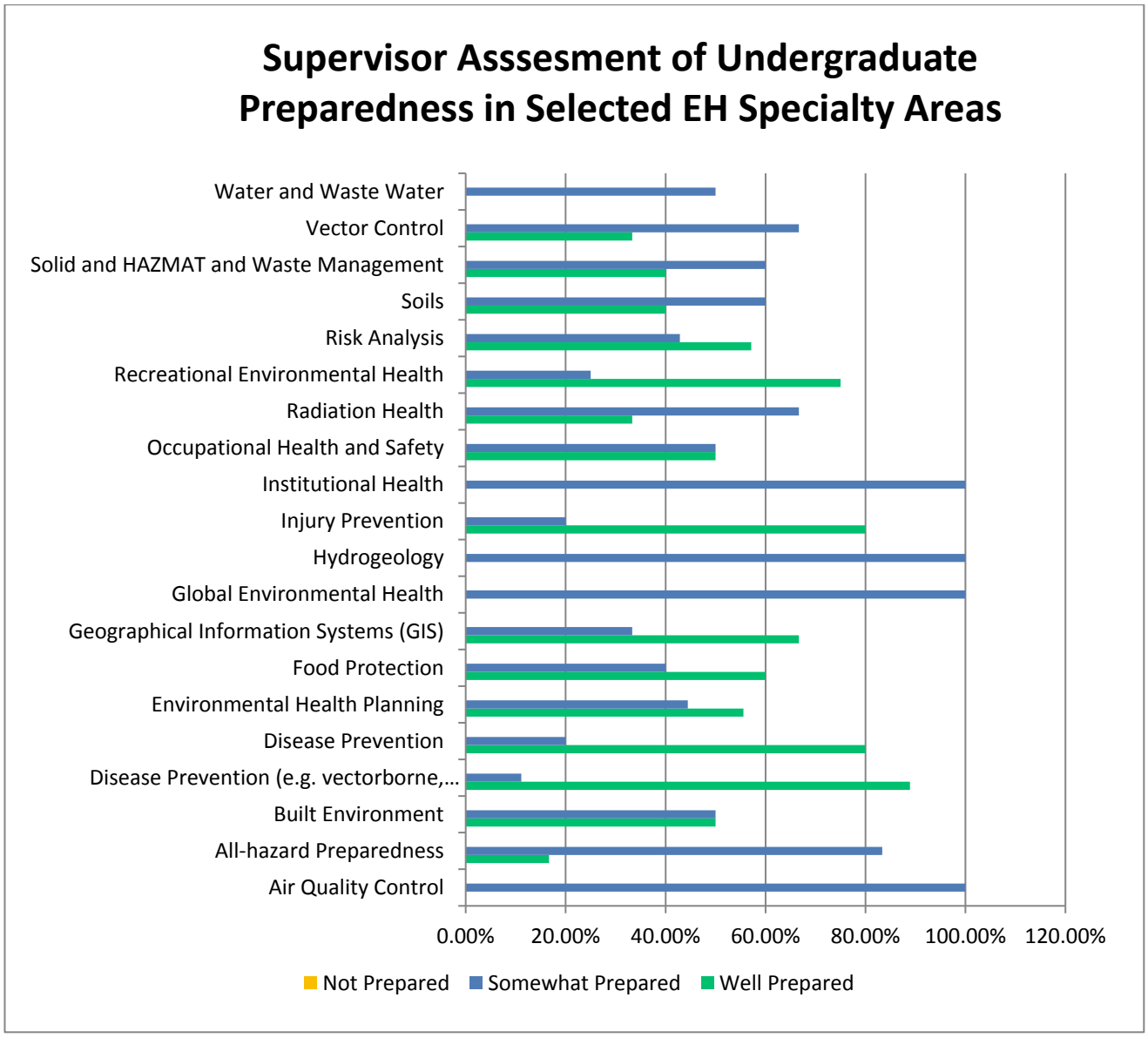
- Risk Analysis*.

Specialty EH areas for which the highest percent of employees that were least prepared according to supervisors included (areas of less preparedness coinciding with employee preparation rankings are starred)

- Air Quality Control;
- All-hazard Preparedness;
- Built Environment'
- Global Environmental Health*;
- Hydrogeology*;
- Institutional Health;
- Occupational Health and Safety;
- Radiation Health*;
- Soils;
- Solid and HAZMAT Waste Management; and
- Vector Control; and
- Water and Wastewater Treatment.

Like the employer ratings previously discussed, the EH specialty areas where employees were least prepared coincide with those knowledge areas reportedly *not* required by the employee's job.

Chart 19.



E. Additional Specialty Areas Knowledge Needed

Five of 13 supervisor respondents indicated the following specific "other" specialty areas as necessary for their jobs (Table 6).

Table 6. "Other" Necessary Specialty Areas suggested by Supervisors

Outreach and education; political and multi-jurisdictional communication; grant management; environmental policy review; organization; etc.
Human health education topics, and communicable disease that may not relate to the environment.

I believe a glacial geology class would be very beneficial to students entering this particular job in this particular part of the country (Michigan, upper Midwest).
Management of building water systems

VI. Narrative and Discussion

EHAC accredits EH academic programs in order to create a cadre of educational institutions that produce EH employees who are well prepared academically and have the fundamental and practical skills to successfully enter and thrive in the EH field. EHAC's primary mission is to enhance the education and training of students in EH science and protection by ensuring that students receive premium quality education and training from an EHAC accredited institution of higher education.

A. EH Specialty Area Preparedness

The aggregation of supervisor and employee assessments regarding preparedness shows employees are graduating with an overall favorable preparedness level for their current jobs (Charts 20 and 21). The majority of all supervisor ratings of employee preparedness fell within the "somewhat" to "well" prepared categories, with similar self-ratings by former students. Highest levels of preparedness were reported by both employees and supervisors for the following specialty areas:

- Built Environment;
- Disease Prevention (e.g. vectorborne, zoonotic, etc.);
- Disease Prevention;
- Injury Prevention;
- Food Protection;
- Environmental Health Planning;
- Global Information Systems (GIS);
- Recreational Environmental Health;
- Risk Analysis;
- Occupational Health and Safety;
- Solid and HAZMAT Waste Management; and
- Wastewater and Water Supply Treatment.

While Supervisor utilized the "somewhat" prepared category more heavily than employees, the two groups found general agreement in the following EH specialty areas (Charts 22 and 23).

- Air Quality Control;
- Global Environmental Health;
- Hydrogeology;
- Institutional Health;
- All-hazard Preparedness;

- Built Environmental;
- Disease Prevention;
- Environmental Health Planning; and
- Radiation Health;
- Soils;
- Solid and HAZMAT Waste Management
- Wastewater and Water Treatment;
- Risk Analysis; and
- Recreational Environmental Health.

Chart 20.

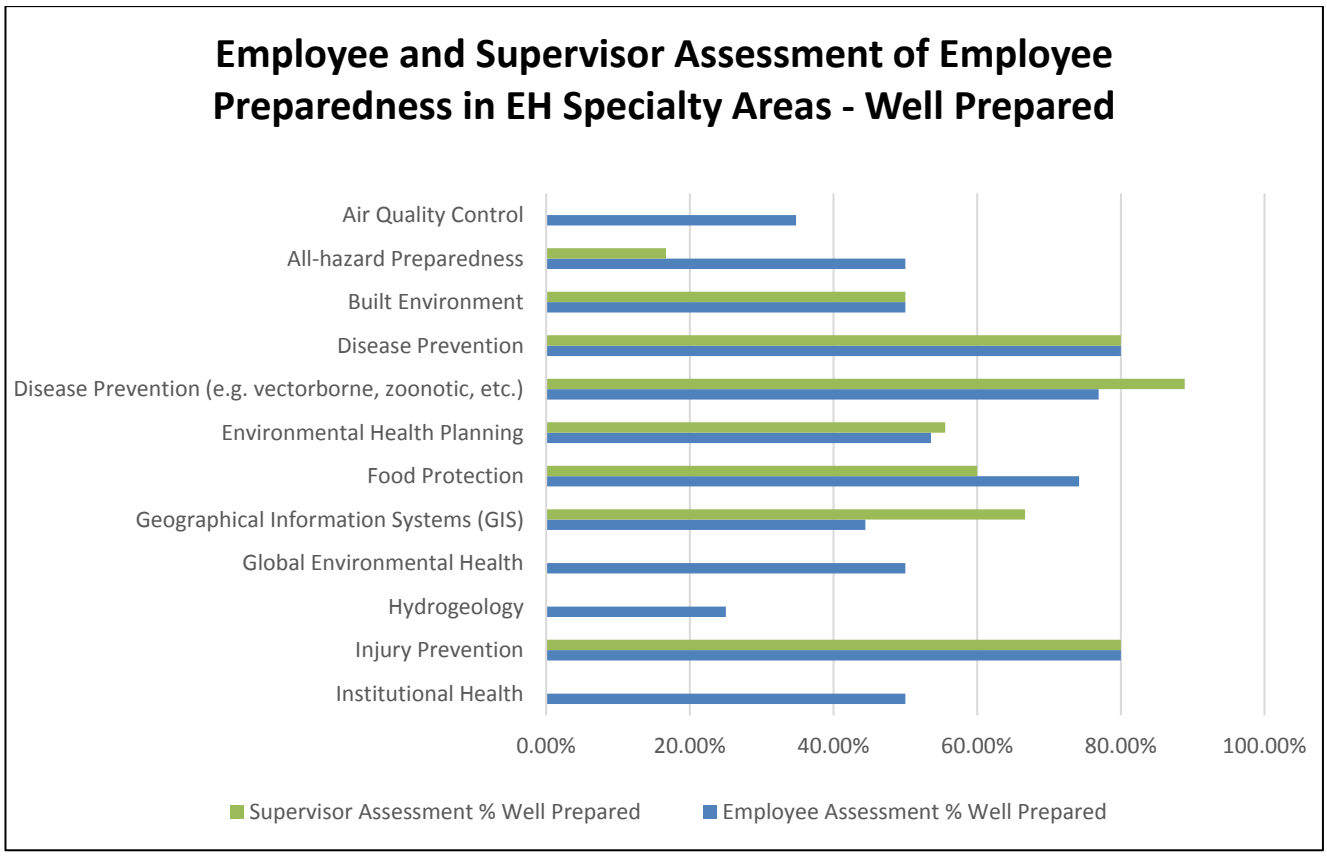


Chart 21.

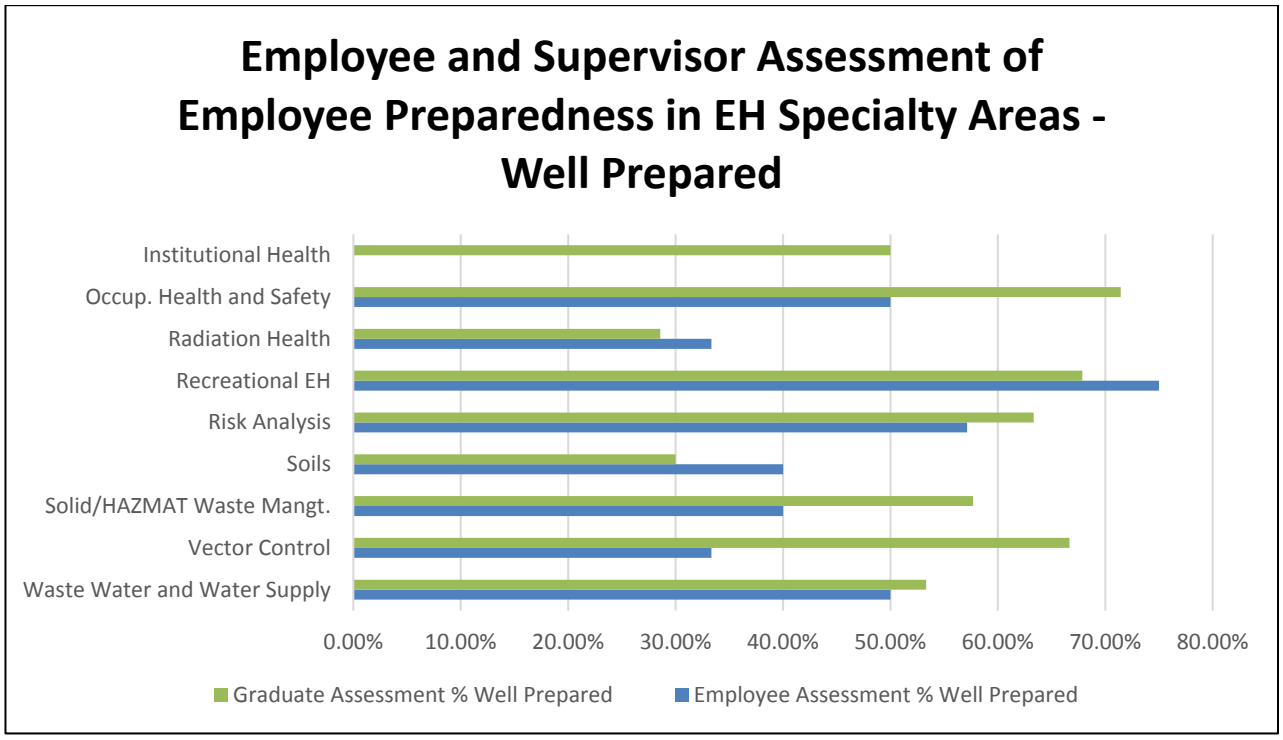


Chart 22.

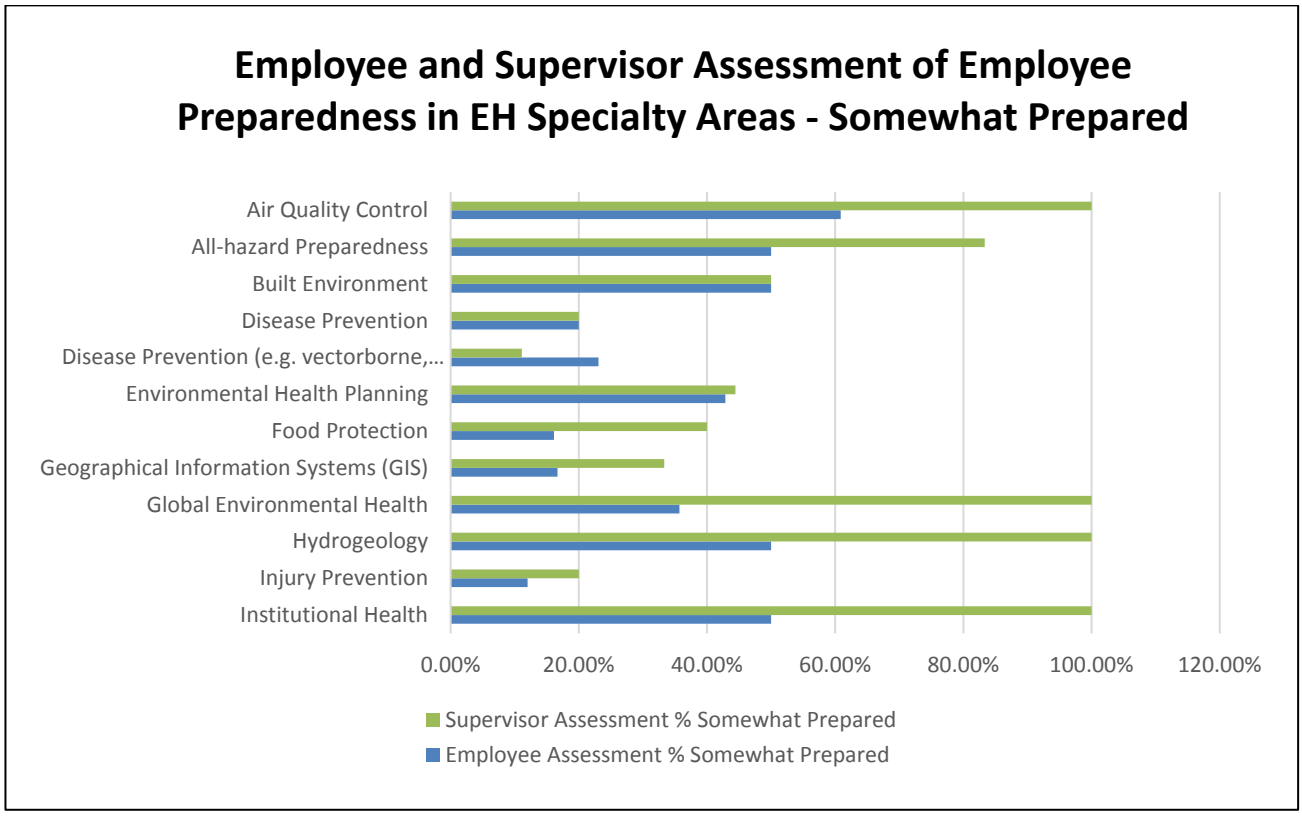
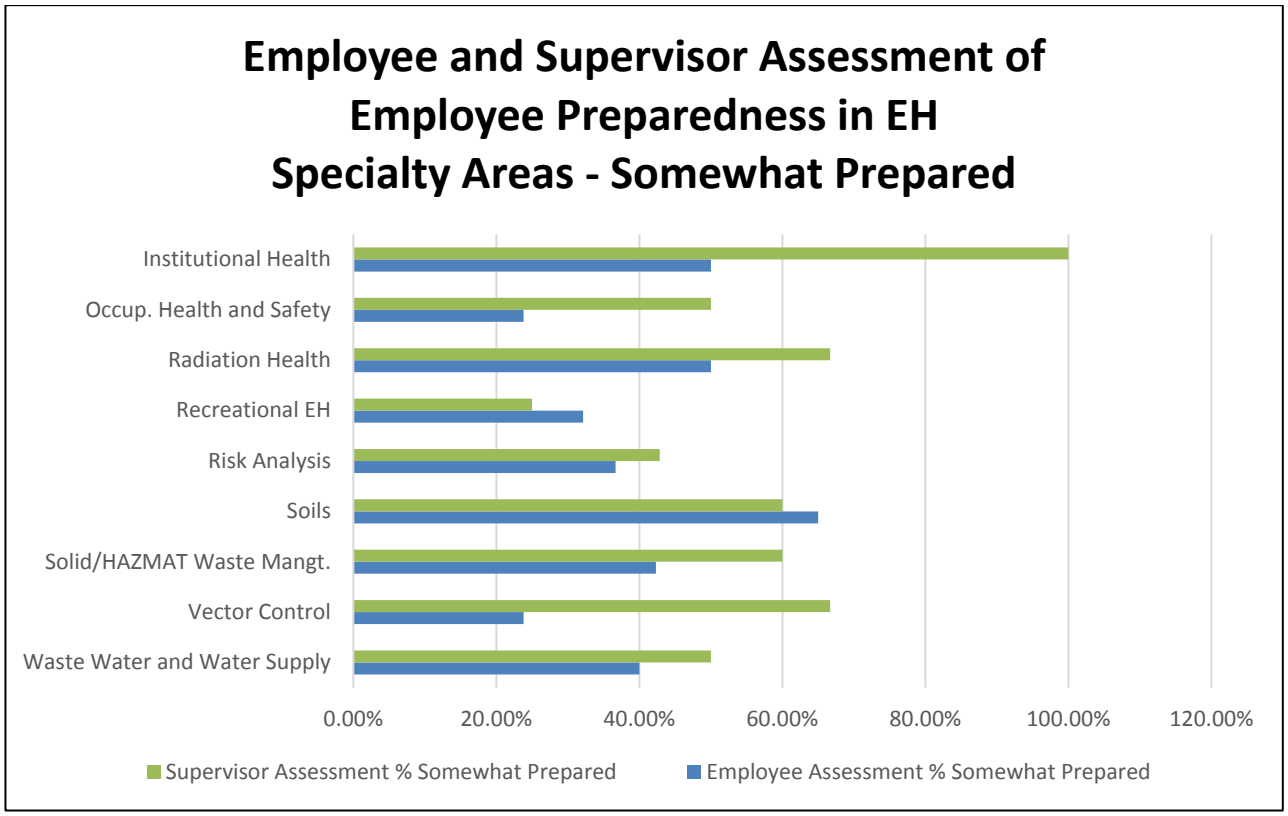


Chart 23.



B. Job Skills Assessments

Chart 24 (Most Proficient) shows similar satisfaction levels of both graduates and supervisors regarding employee skill levels in different EH job skills areas. Again, the majority of employees and supervisors rated job skills at "very" or "most" proficient. Supervisors and employees agreed that preparedness levels were high "most proficient" for:

- Working in a Team Setting;
- Organizing Workflow;
- Project Planning and Management;
- Choosing and Defending Appropriate Course of Action;
- Applying Research Methods and Problem Solving; and
- IT/Computer Skills.

Supervisors and employees found agreement in the following EH specialty areas, which were given a rating of "Very Proficient" (Chart 25):

- IT/Computer Skills;
- Technical Writing;
- Choosing and Defending an Appropriate Course of Action;
- Applying Research Methods and Problem Solving;

- Leadership skills;
- Working in a Team Setting;
- Project Planning and Management; and
- Time Management.

Chart 24.

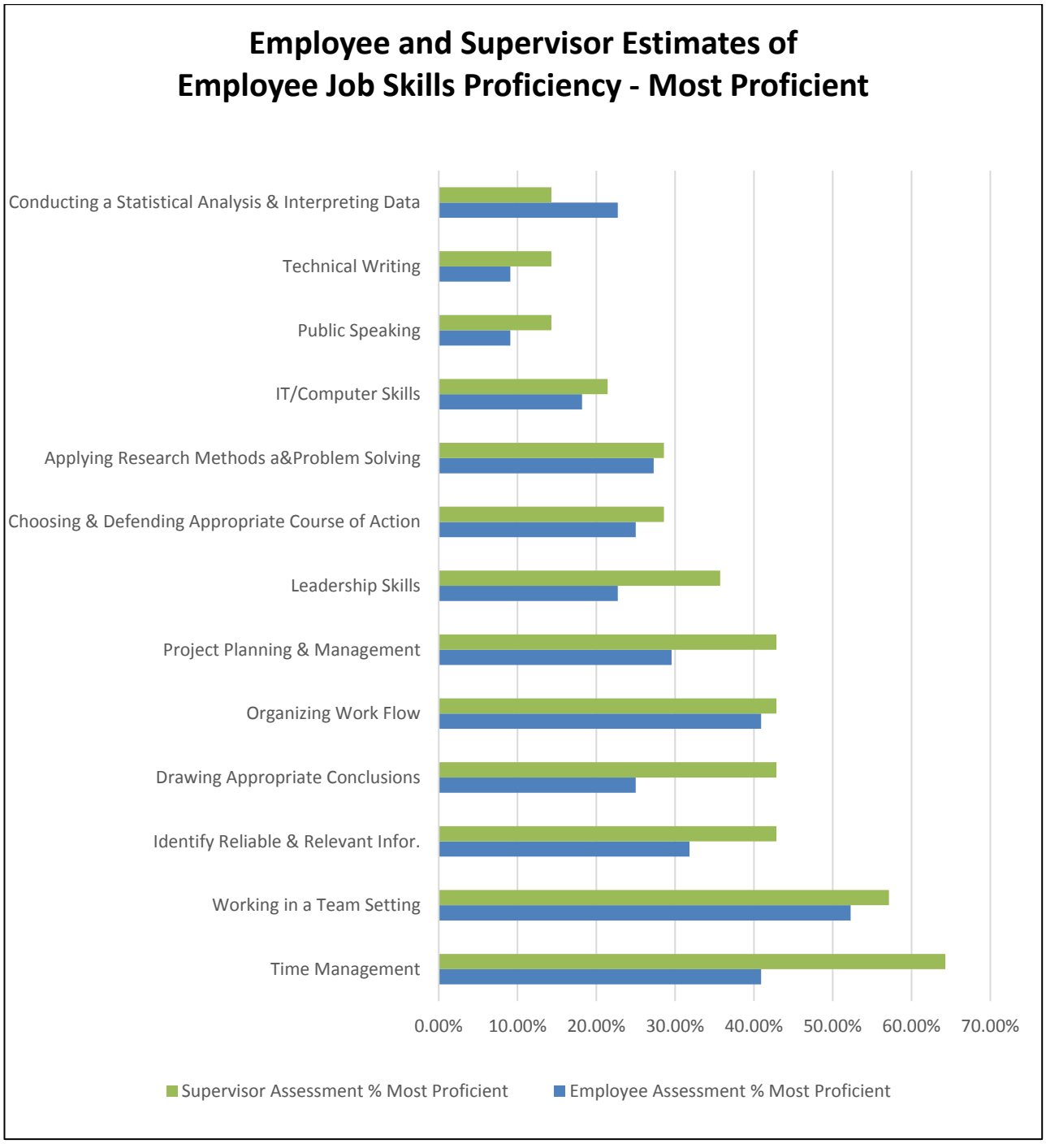
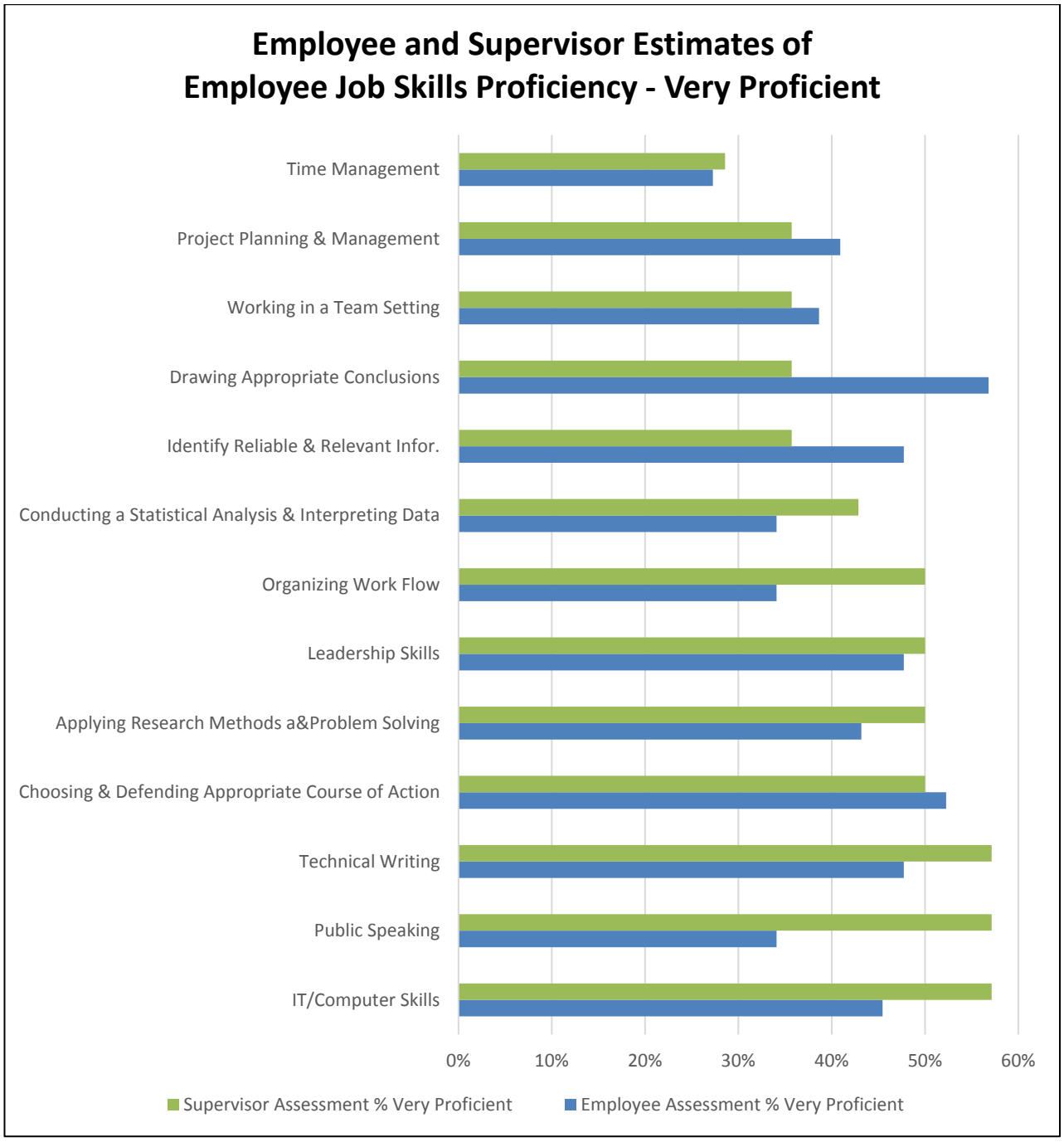

Employee and Supervisor Estimates of
Employee Job Skills Proficiency - Most Proficient
Conducting a Statistical Analysis & Interpreting Data
Technical Writing
Public Speaking
IT/Computer Skills
Applying Research Methods a&Problem Solving
Choosing & Defending Appropriate Course of Action
Leadership Skills
Project Planning & Management
Organizing Work Flow
Drawing Appropriate Conclusions
Identify Reliable & Relevant Infor.
Working in a Team Setting
Time Management
0.00%
10.00%
20.00%
30.00%
40.00%
50.00%
60.00%
70.00%
Supervisor Assessment % Most Proficient
Employee Assessment % Most Proficient

Chart 25.



C. Proficiency Levels in EH Specialty Areas

Lastly, employee and supervisor ratings of employee proficiency levels in EH specialty areas found similarities, as well. While 20-40% of supervisors found some of these EH specialty areas inapplicable to their employees, those citing relevancy gave favorable ratings to their employees across the board (Charts 26 and 27).

Chart 26.

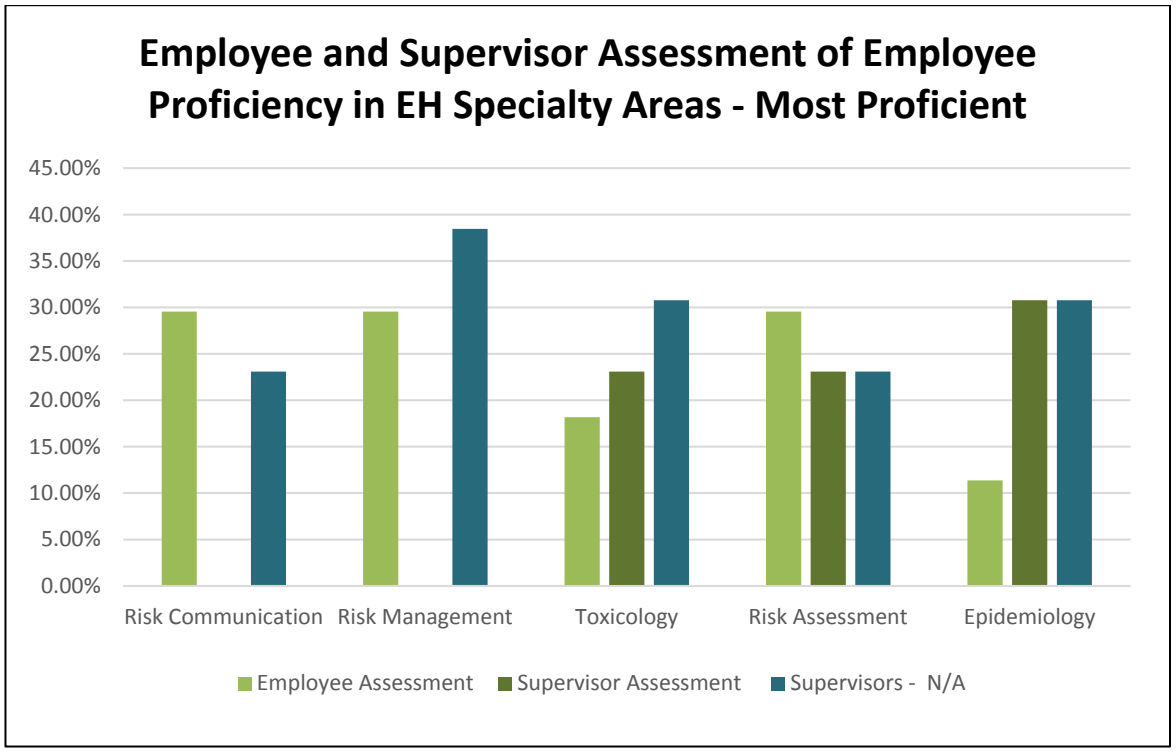


Chart 27.