2021-2022 National Environmental Health Science and Protection Accreditation Council (EHAC) Undergraduate Degree Programs Outcome Assessment Report

Compiled by
Executive Director Leslie Mitchell

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I. Introduction

This report details analysis of the data provided by former undergraduates of programs seeking reaccreditation during the 2021-2022 academic year and a number of their supervisors.

II. Background

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

> "At the time of reaccreditation, 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 reaccreditation purposes for a given institution. The Council will use the compiled information from all institutions undergoing reaccreditation 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.

Table 1 presents the EHAC accredited undergraduate degree programs going through the 2021-2022 reaccreditation process, the number of employee responses and their dates of graduation, and the number of supervisor responses. There were forty-nine total employee respondents to the survey. Forty-two of these respondents are currently employed in EH related professions, two respondents are in graduate school and five respondents are employed in a field other than Environmental Health. All responses provided are included in this report. Twenty-one supervisors participated in the survey and their responses are included in this report, as well.

Table 1. 2021-2022 Outcome Assessment Respondents

Re-accreditation Applicants	Next Accreditation Review	Initial Accreditation Year	Graduating Classes Reflected	Number of Employee Respondents (working in the EH field)	Number of Supervisor Respondents
Baylor University	2022	2010	2015, 2016, 2017, 2020, 2021	9	2
Colorado State University	2022	1993	2013, 2015, 2016, 2017, 2018, 2019, 2020	37	19
Ohio University	2022	1992	2018, 2019, 2021	3	0
Totals				**49**	**21**

IV. Employee Survey Results

A. Employee Skills

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

- Public Speaking;
- Information Technology/Computer Skills;
- Time Management;
- Project Planning and Management;
- Leadership Skills; and
- Conducting a Statistical Analysis and Interpreting Data.

Employees rate themselves most highly in the EH specialty areas of risk assessment, communication, and management, followed by toxicology and epidemiology (Chart 4). Some respondents also reported challenges in the areas of epidemiology and toxicology. Five to ten percent of respondents from the EH specialty areas non applicable to their EH jobs.

Chart 1.

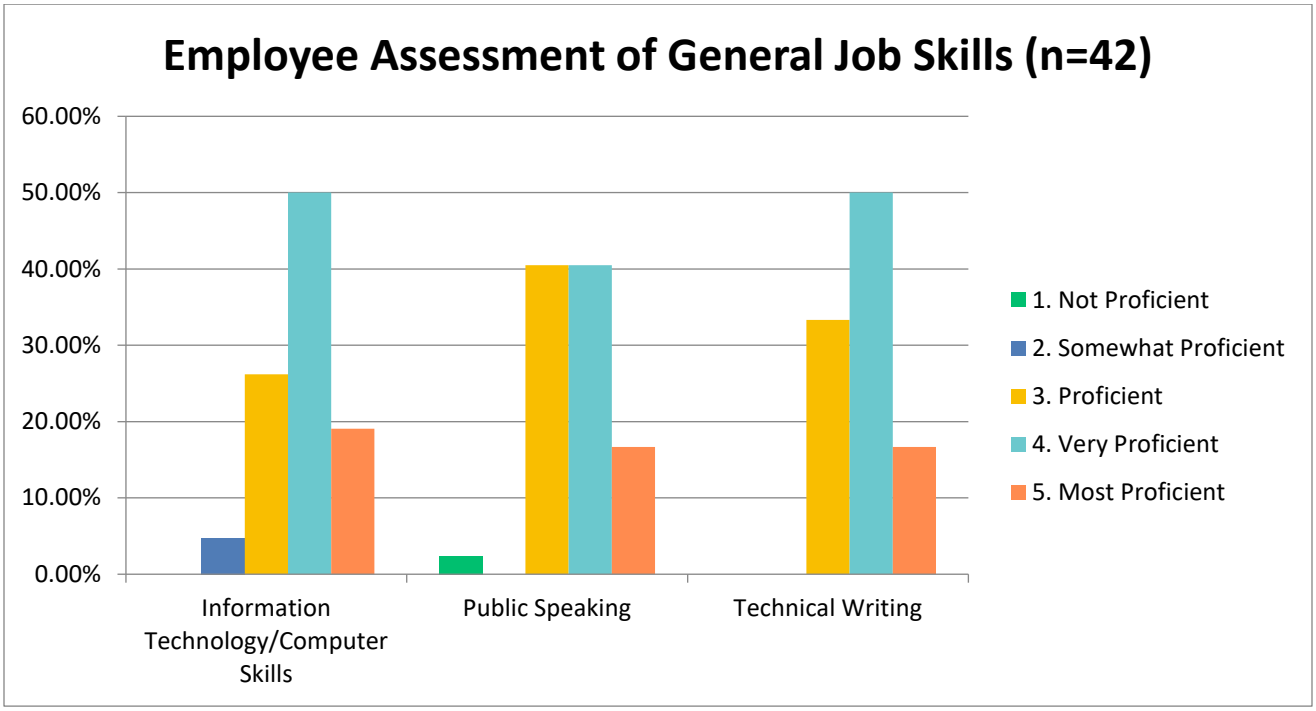


Chart 2.

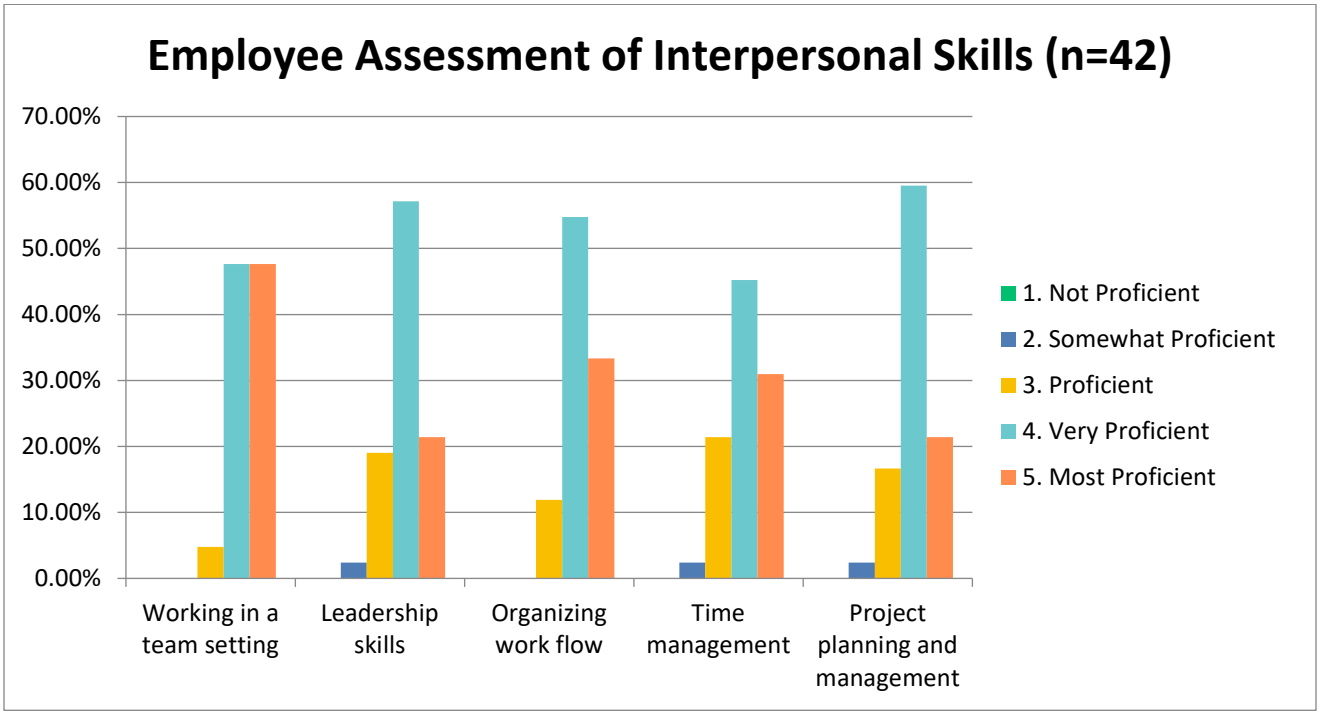


Chart 3.

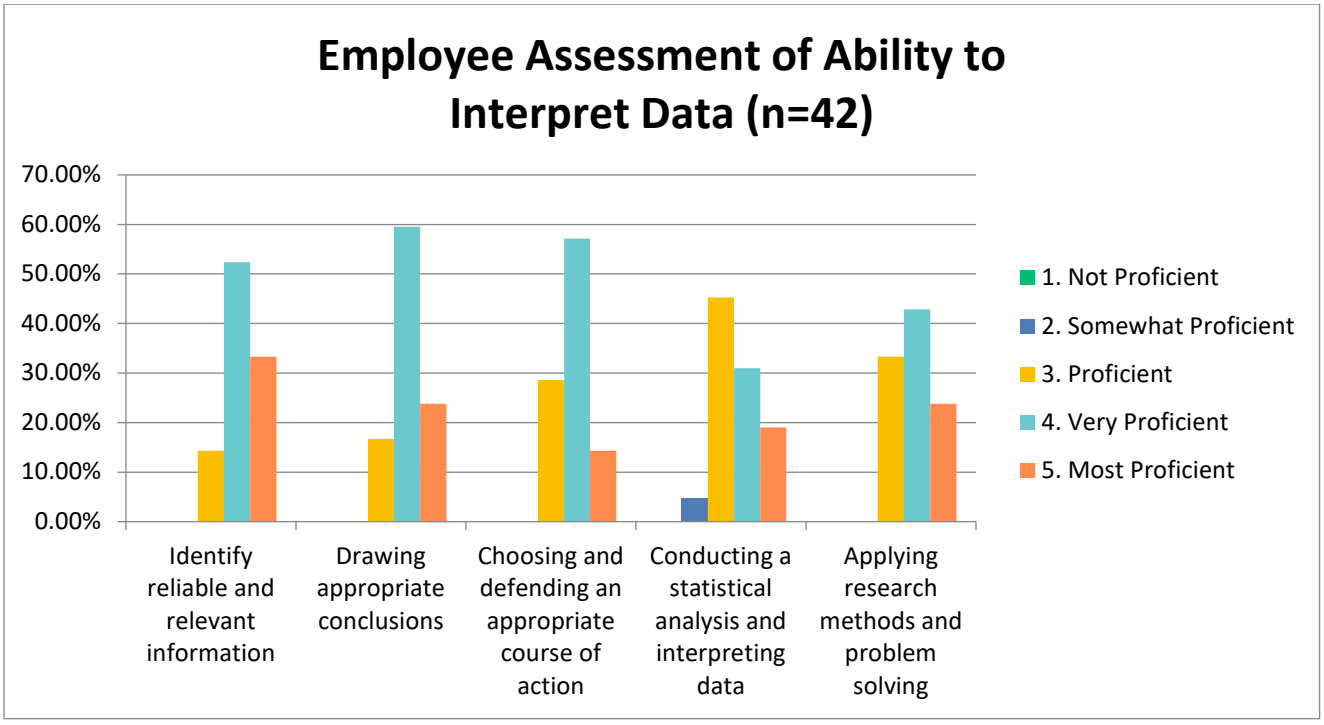
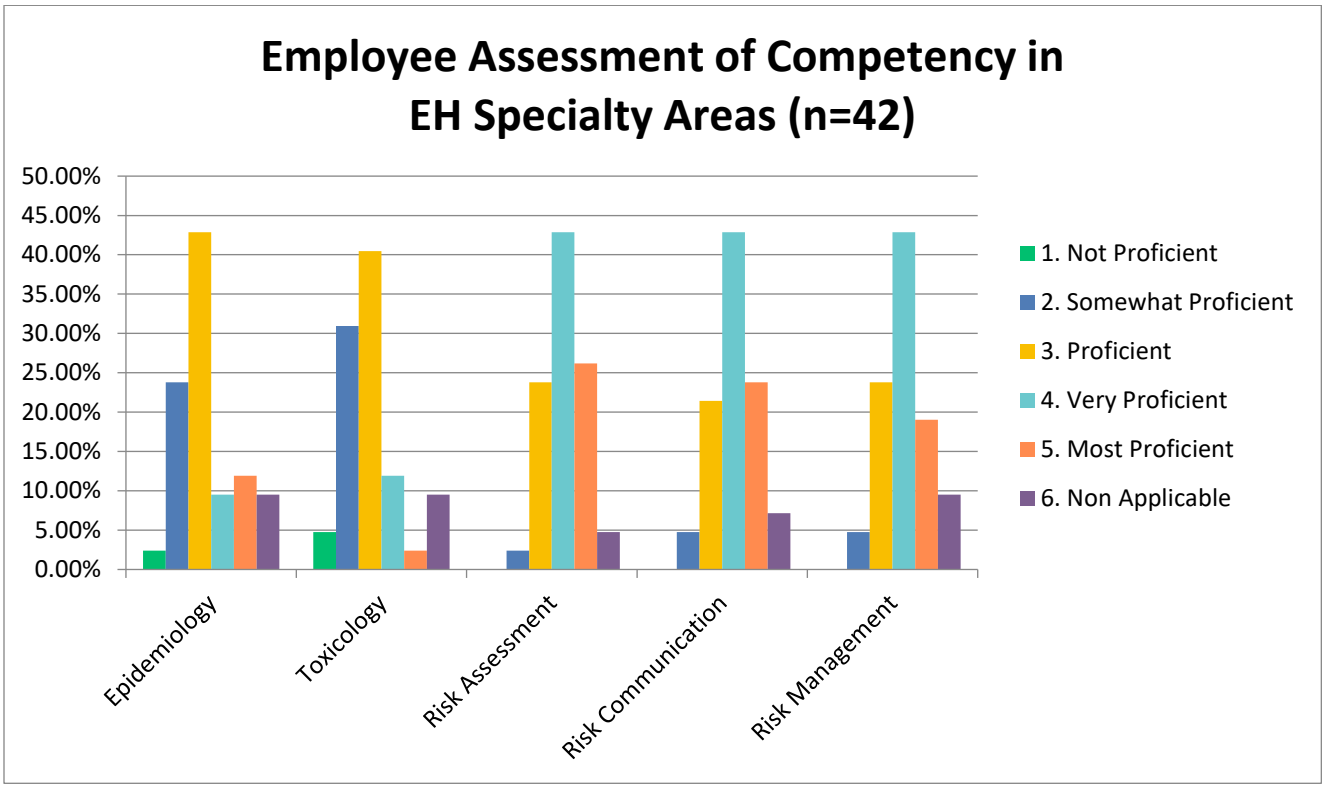


Chart 4.



B. Course Relevance

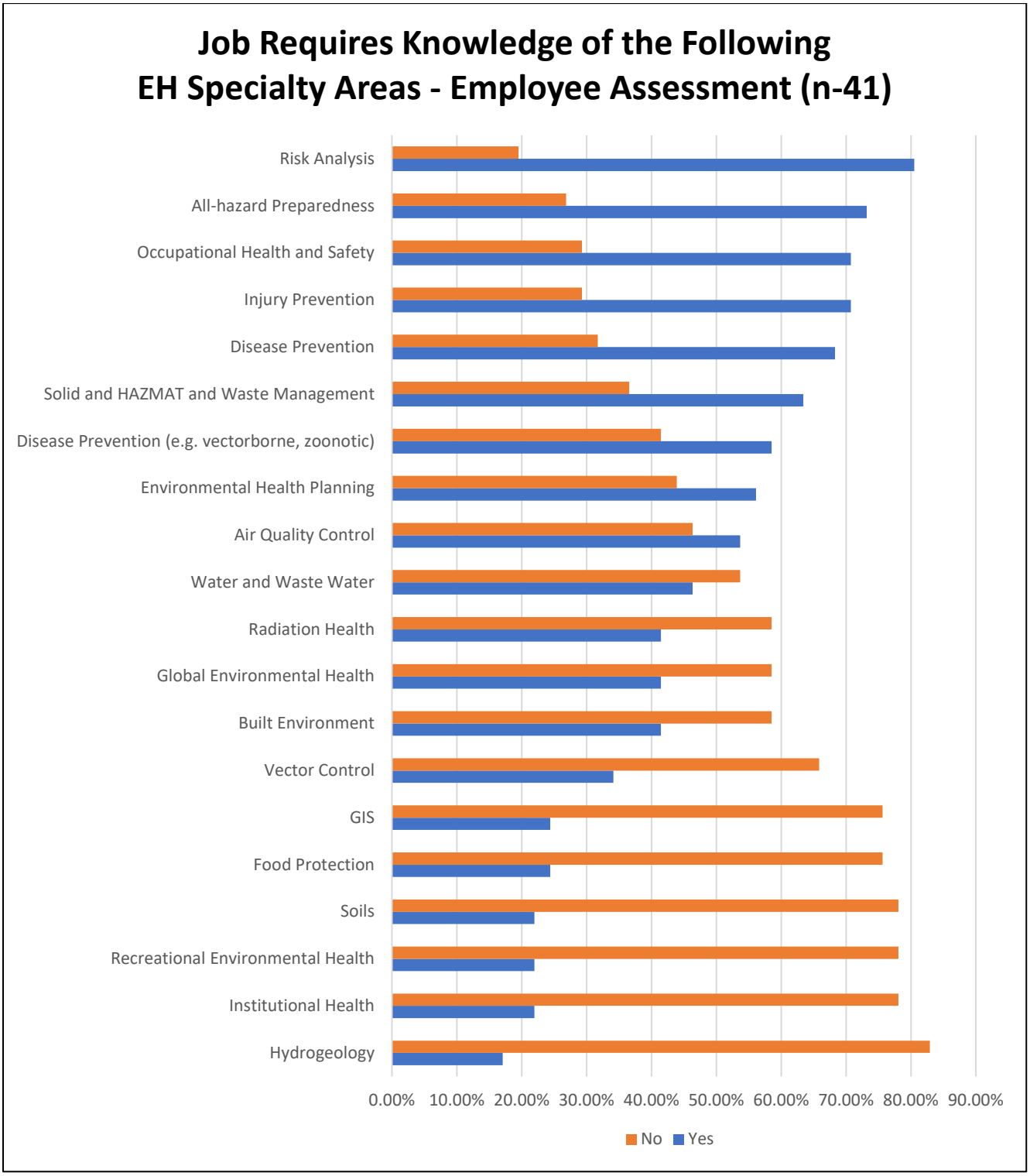
Employee respondents were asked to answer "Yes" or "No" if their job requires knowledge in the following EH specialty areas (Chart 5). The EH specialty areas cited as necessary by at least 50% of employees included (listed from most cited to least):

- Risk Analysis;
- All-hazard Preparedness;
- Occupational Health and Safety;
- Injury Prevention;
- Disease Prevention;
- Solid and Hazardous Material ad Waste Management;
- Disease Prevention (e.g. vectorborne, zoonotic, etc.);
- Environmental Health Planning; and
- Air Quality Control.

Knowledge is reported less necessary and cited by less than 50% of survey respondents in the following EH Specialty areas (Chart 6):

- Hydrogeology.
- Institution Health; and
- Recreational environmental Health;
- Soils;
- Food Protection
- Geographical Information Systems (GIS);
- Vector Control;
- Built Environment;
- Global Environmental Health;
- Radiation Health
- Water and Waste Water;

Chart 5.


Job Requires Knowledge of the Following
EH Specialty Areas - Employee Assessment (n-41)
Risk Analysis
All-hazard Preparedness
Occupational Health and Safety
Injury Prevention
Disease Prevention
Solid and HAZMAT and Waste Management
Disease Prevention (e.g. vectorborne, zoonotic)
Environmental Health Planning
Air Quality Control
Water and Waste Water
Radiation Health
Global Environmental Health
Built Environment
Vector Control
GIS
Food Protection
Soils
Recreational Environmental Health
Institutional Health
Hydrogeology
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 employee responses. Specialty areas in which 50% of more employees rated themselves well prepared include (listed from most cited to least):

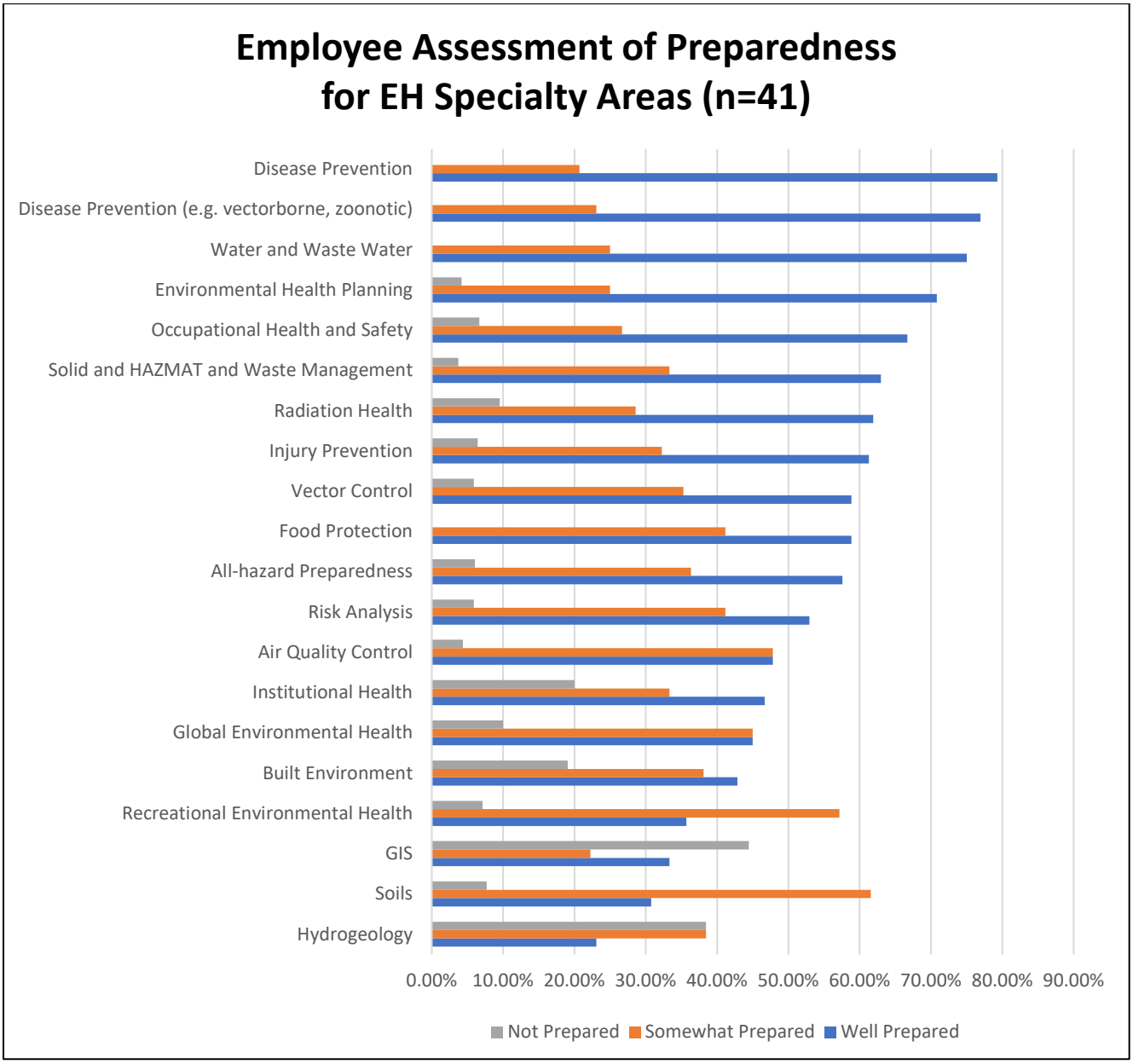
- Disease Prevention;
- Disease Prevention (e.g. vectorborne, zoonotic, etc.);
- Water and Waste Water;
- Environmental Health Planning;
- Occupational Health and Safety
- Solid, HAZMAT and Waste Management;
- Radiation Health;
- Injury Prevention
- Vector Control;
- Food Protection;
- All Hazards Preparedness;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

Specialty EH areas showing the highest percent of employees reporting they are not prepared include:

- GIS;
- Hydrogeology;
- Institutional Health; and
- Built Environment.

Note that the above EH specialty areas in which graduates are *least* prepared coincide with those knowledge areas reportedly *least* required by the employee's job.

Chart 6.



D. Employee Workplace Data

Chart 7 presents job sectors for graduates of reaccrediting degree programs. As previously mentioned, 42 respondents are currently employed in the Environmental Health field. Employee employment sectors include private company or corporations, local or federal government agencies and educational institutions, and consulting firms.

Chart 8 shows the distribution of those employees who are employed by local, state or the federal government. One employee works for the United States Public Health Service and eight employees

work for local or state health departments. As previously mentioned, the majority of employee respondents report working at private companies or corporations .

Employees report working primarily in manufacturing, water and waste water treatment, food protection and solid and HAZMAT waste management, as shown in Chart 9. However, the "other" category reflects the highest number of responses. "other" EH work areas include:

- Campus Safety, Health, Environment;
- Climate and Health;
- Education – Environmental Compliance;
- Emergency Medicine;
- Emergency Planning and Management;
- Entertainment;
- Environmental Consulting;
- Epidemiology (not EH);
- GIS;
- Health and Safety;
- Industrial Hygiene;
- Hazardous Waste;
- Epidemiology;
- Risk Analysis;
- Accident Investigations;
- Property Damage and Insurance;
- Laboratory Safety;
- Occupational Health;
- Occupational Health and Safety;
- Pathogens;
- Pharma;
- Pharmaceutical R&D;
- Public Health;
- R&D Labs and Manufacturing;
- Residential Housing;
- Pools;
- Body Art;
- Syringe Access;
- State and Fed Compliance;
- Warehouse/Transportation; and
- Zoonotic Pathogens.

Salary data shows that twenty-two employees report making more than $50,000 per year and twenty-seven employees make less than $50,000 per year (Chart 10).

Chart 7.

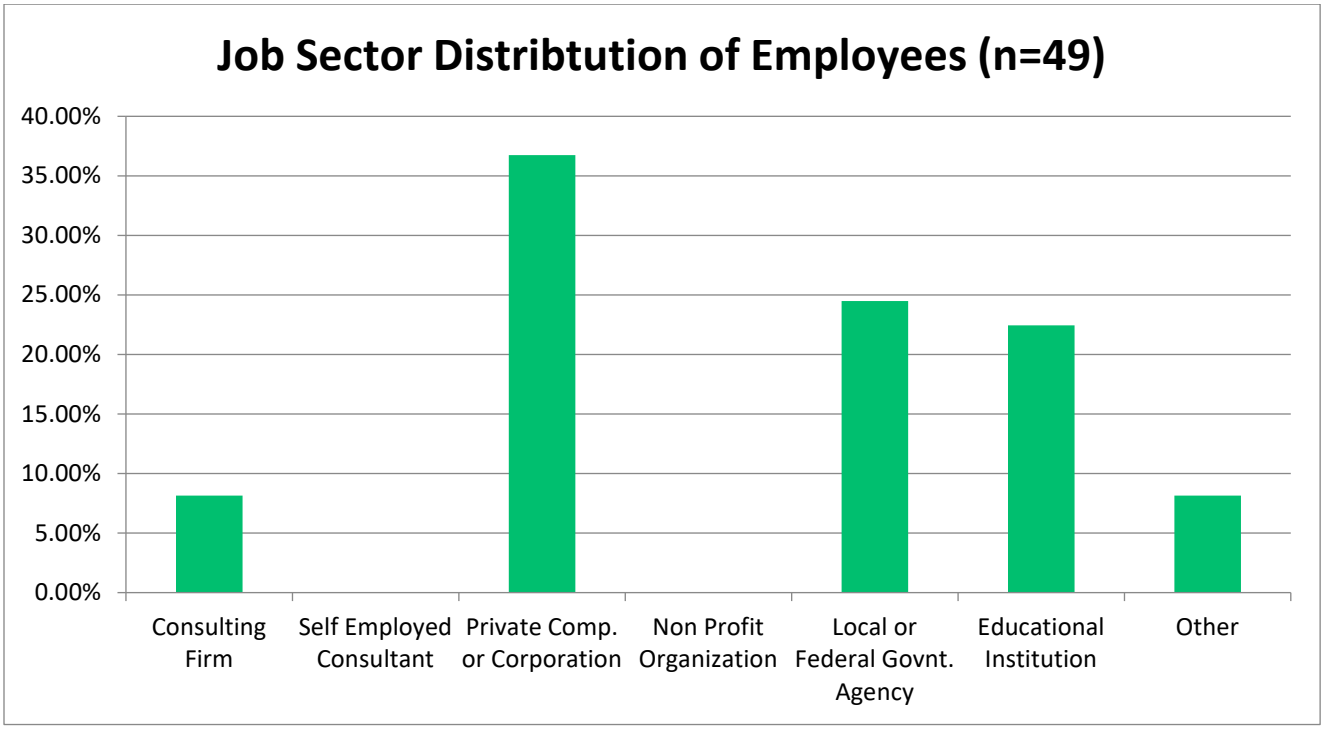


Chart 8.

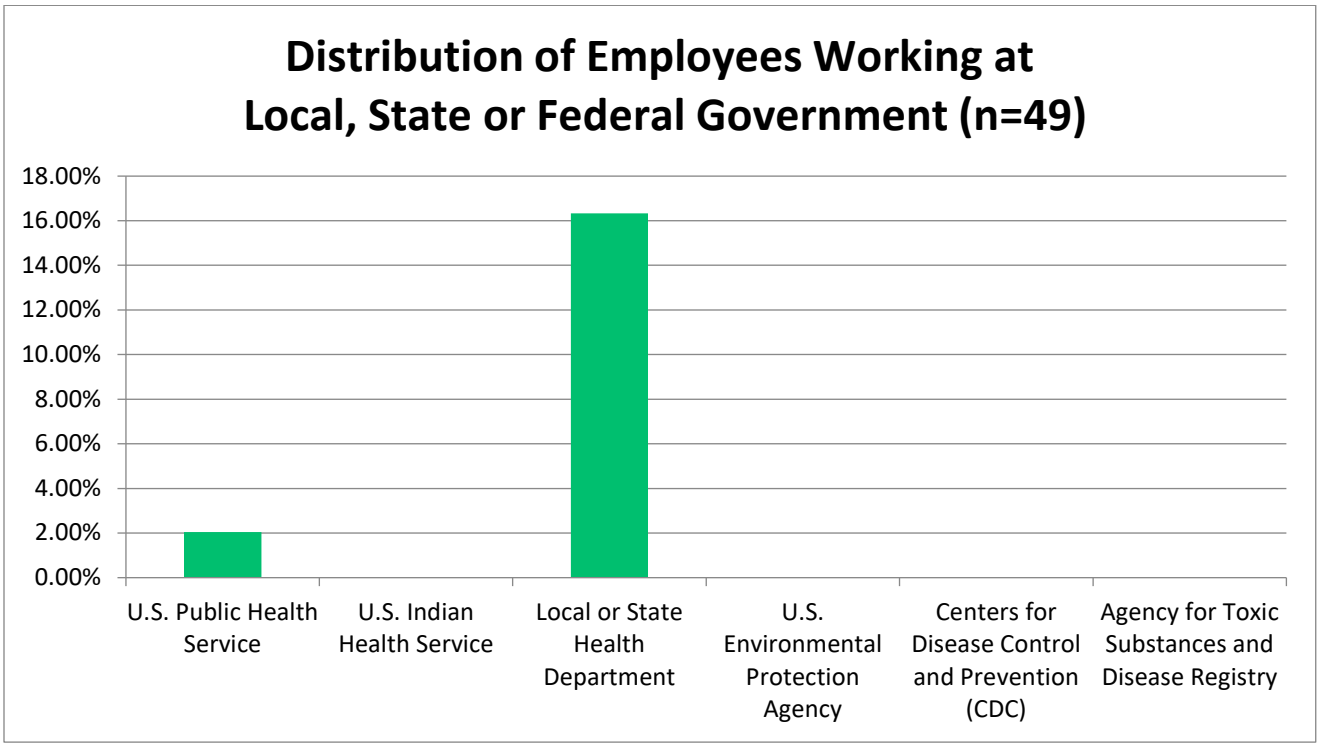


Chart 9

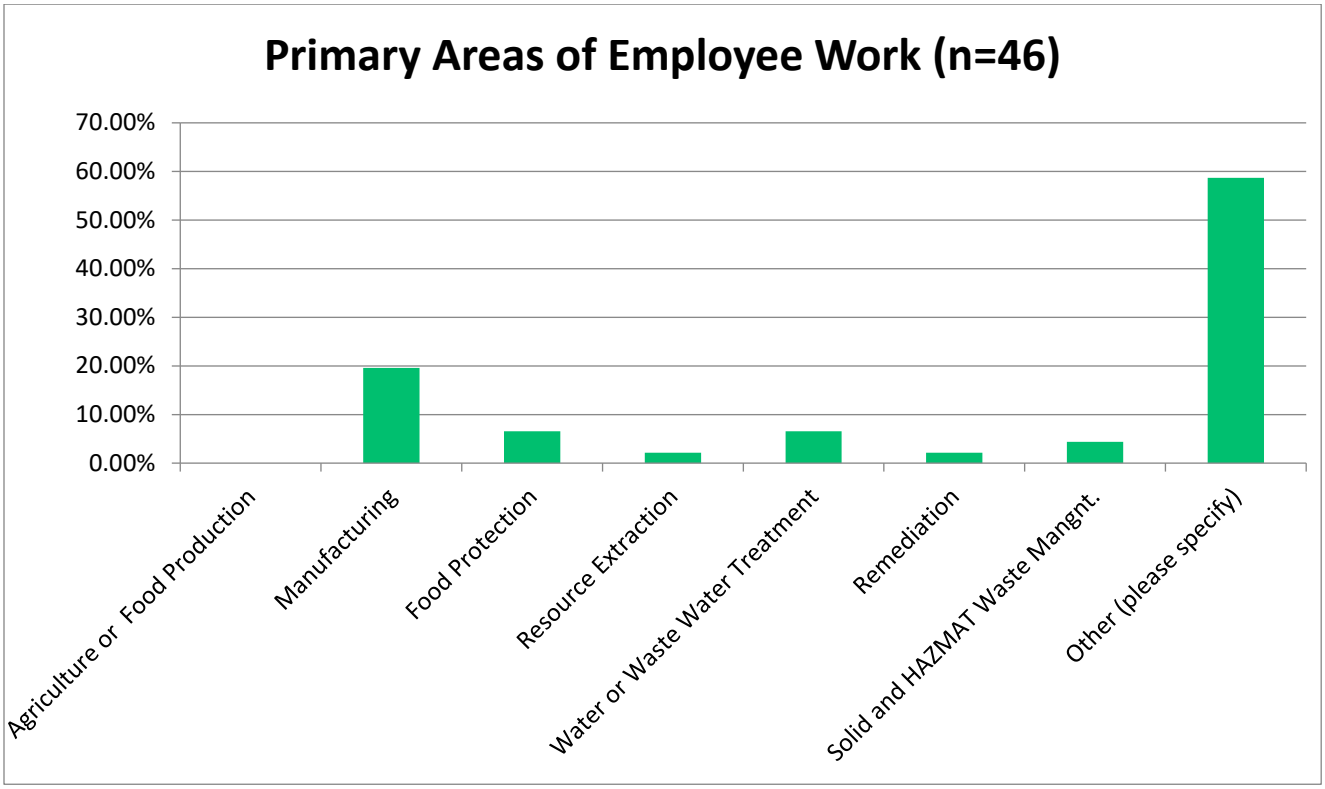
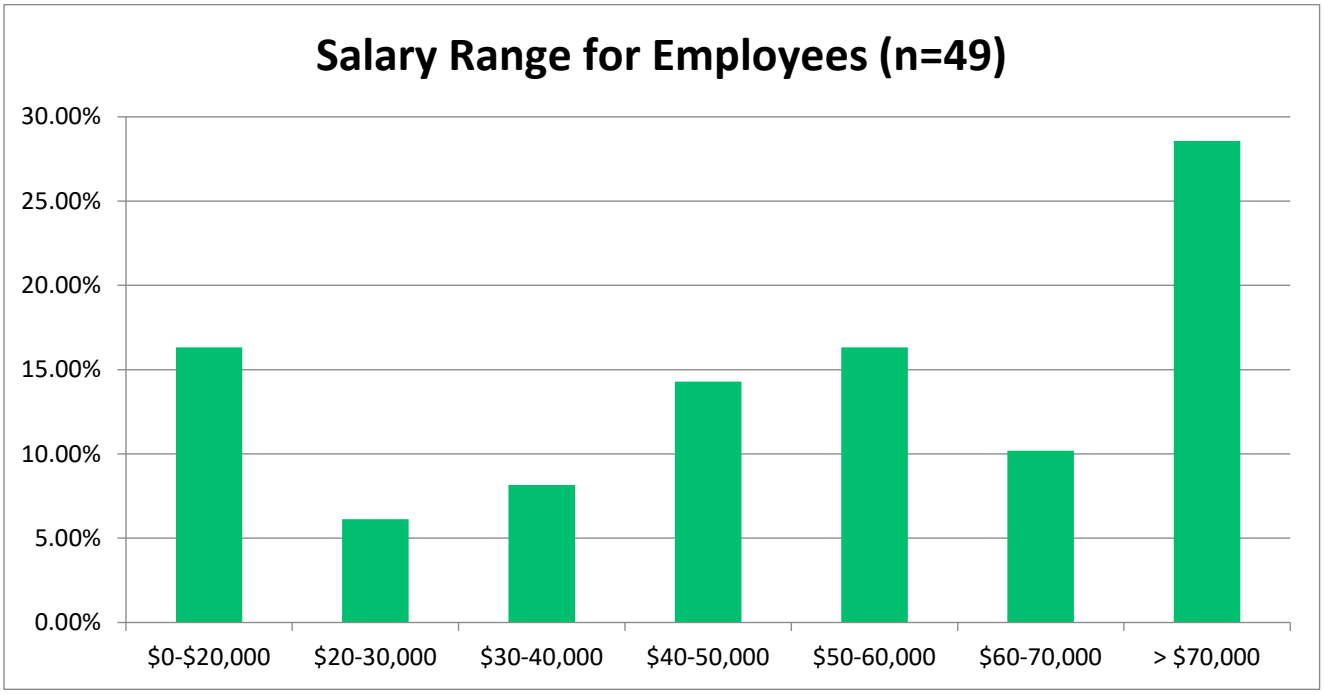


Chart 10



E. Employee Data on Continuing Education and Professional Development

Table 2 shows the graduate degrees that have been achieved or are being pursued by employees.

Table 2.

Master Degree Being Pursued	Degree Program	Projected Graduation Date
Master	Environmental Health	Dec-21
Master	Public Health	May-22
Master	Public Health	2022
Master	Emergency Preparedness and Disaster Management	
Master	Public Administration	Soon
Not reported	Hydrology and Water Security	
Not reported	International Regulatory Affairs	

F. Professional Recognition

Employees report attaining the following professional certifications:

Table 3.

Professional Recognitions
Company Recognition Award (Fiscal Year 2021)
5 years of working at UNC
Certificate of appreciation for service during the COVID-19 Pandemic by Mayor Michael B. Hancock's office Certificate of appreciation for service during the COVID-19 Pandemic by the City and County of Denver Department of Public Safety
Exemplary performance reviews
2 You Peaked employee recognition awards
2020 President's Award Recipient
ASP
Internal - ESH Excellence Award
Disney Quarterly Award Recipient for Engineering Services
Best overall abstract in Bureau of International Osteopathic Medicine poster competition 2021

G. Credentials Achieved

Employees report achieving the following professional credentials:

Table 4

Certifications	Total
40 Hour HAZWOPER	1
Advanced Radioactive Material Shipping	1
Asbestos O&M	1
CDL with HAZMAT Endorsement	1
CDPHE Hazardous Waste Generator	3
Certified Safety Professional (CSP)	1
City and Counties of Denver Green Belt Certification for Innovations in the Workplace	1
Colorado Department of Public Health and Environment - Asbestos Inspector and Management Planner	1
Confined Space Certificate	1
Construction Health & Safety Technician (CHST)	1
CPR/AED/Mental Health	1
Current Candidate for REHS Exam	1
First Aid Certified Red Cross Instructor	1
First Aid IS 51, ICS 100, 200, 700	1
GHS & OSHA Hazardous Communication	1
HAZMAT Certificate	1
Health Physics Technician	1
IATA	2
Lead RRP Management 404	1
Lock Out Tag Out and other Security Related Certifications	1
OSHA 500, 501	1
REHS	1
Servsafe Certification	1
Special Government Employee (SGE)	1
Sports & Special Event Incident Management	1
Various Health and Safety Certification and Instructor Certifications	1
Water Treatment Licenses	1

V. Supervisor Survey Results

Supervisors of employees/graduates of 2021-2022 reaccrediting programs were asked to assess the skills and preparedness of their employees. Twenty-one 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. Supervisors working for private companies or corporations, educational institutions, local or federal government agencies, and consulting firms responded to the survey. Supervisors working for private companies or corporations represented the majority of respondents followed by those working in government agencies. Chart 12 shows those supervisors working for government agencies fall most within local or state health departments.

Chart 13 shows data somewhat similar to those of employees, with water or waste water management, food protection, manufacturing, and remediation categories at the top of the employment area list behind the "other" category. The "other" category for job area descriptions included:

- Public Health;
- Occupational Safety and Health;
- Academic Research;
- City and County Government (corrections, human services, facilities);
- Institutional Environmental Health;
- Retail (furniture handling and warehousing);
- University EHS;
- EH, Regulatory Compliance for School Districts;
- Transportation;
- Oil and Gas; and
- Laboratory Safety – chemical and biological.

Chart 11

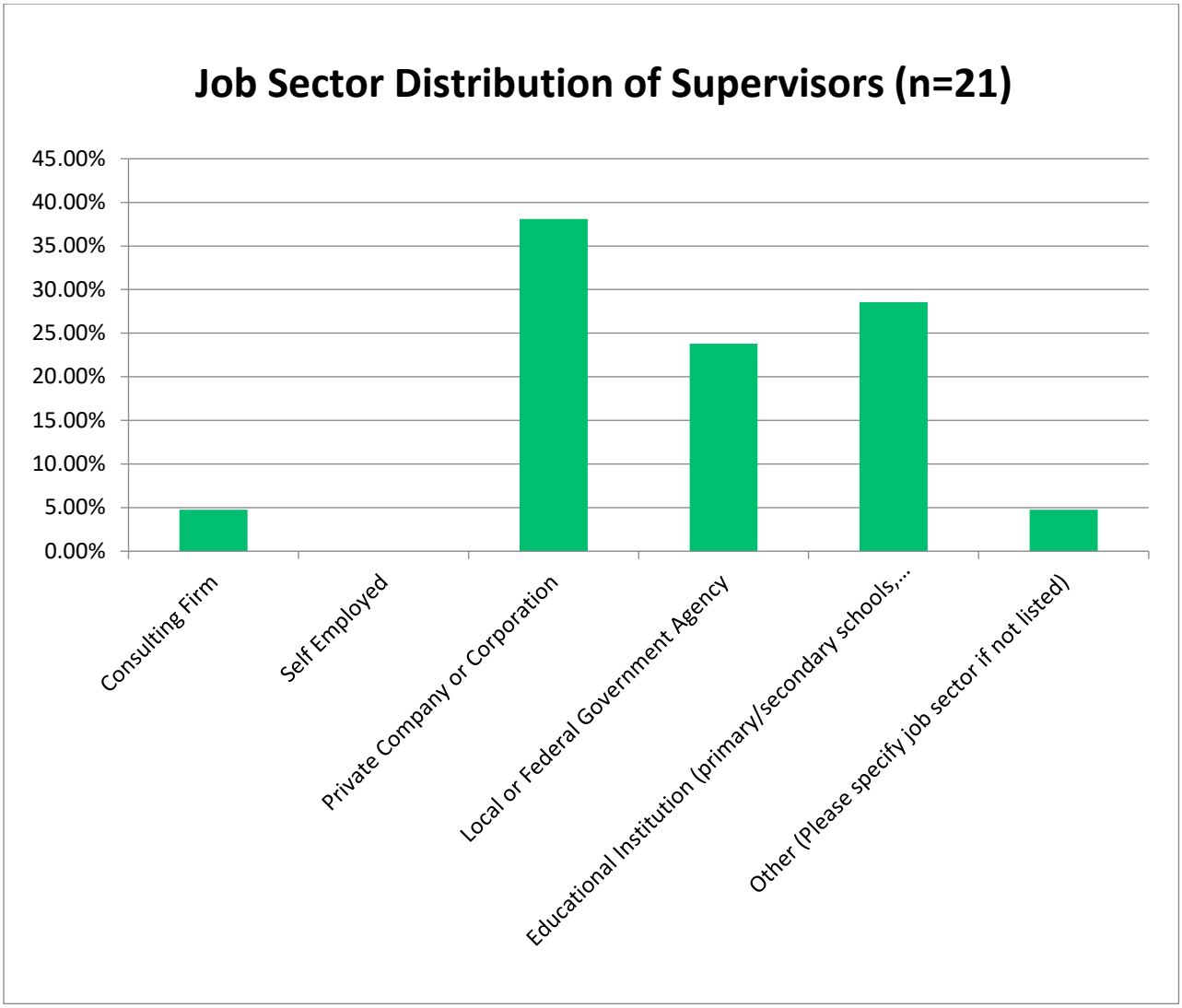

Job Sector Distribution of Supervisors (n=21)
45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
Consulting Firm
Self Employed
Private Company or Corporation
Local or Federal Government Agency
Educational Institution (primary/secondary schools,...
Other (Please specify job sector if not listed)

Chart 12.

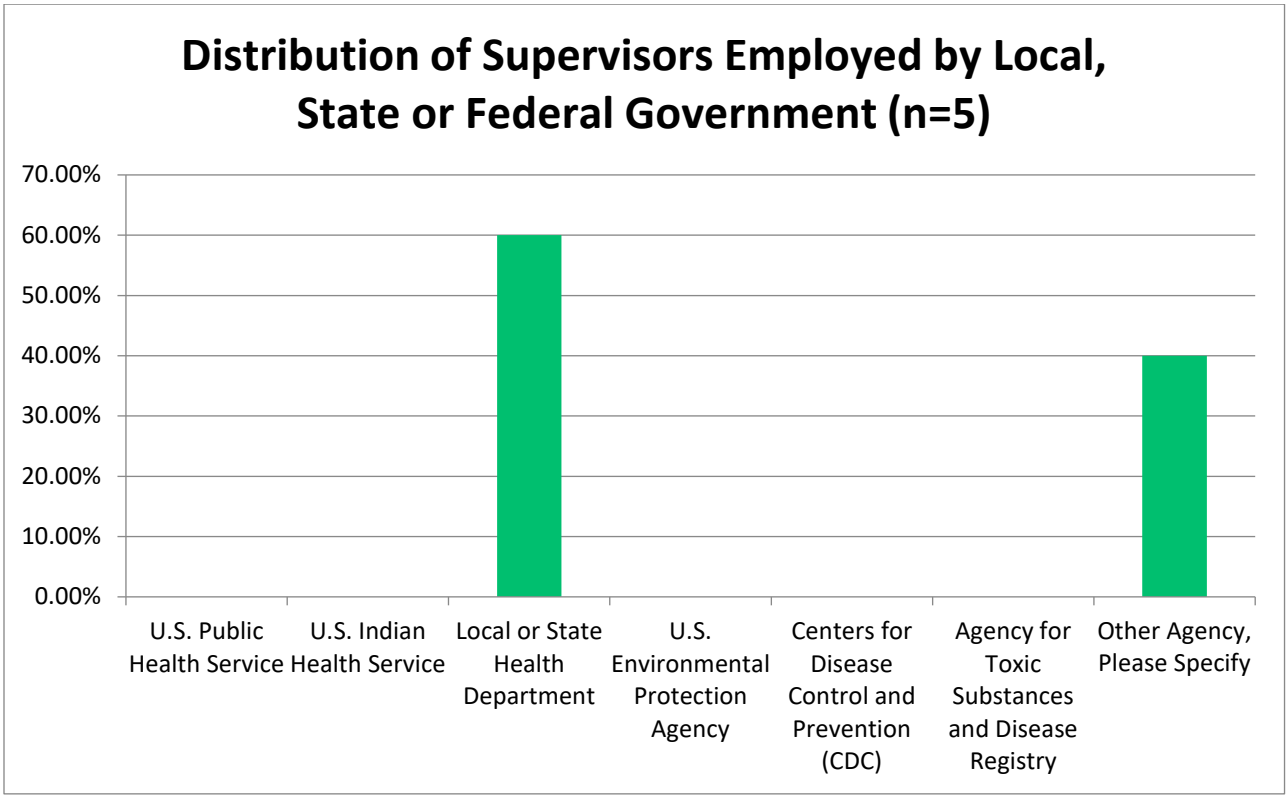
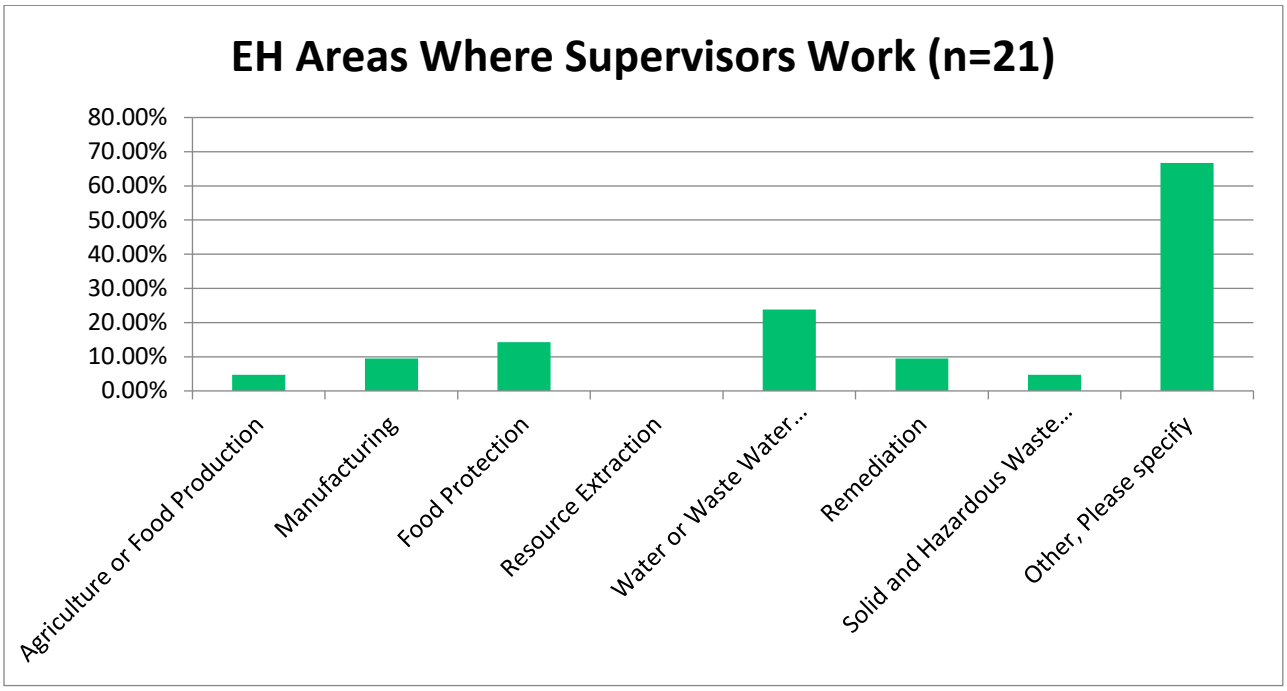


Chart 13.



B. Supervisor Rating of Employee Skills

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 moderate to high proficiency levels for all Information skills categories. with technical writing and public speaking categories showing minor challenges. (Chart 14). Interpersonal skills and skills related to interpreting and reporting data were generally rated "proficient" or higher by supervisors (Charts 15 and 16), with some challenges cited for the leadership, time management, project planning categories, and organization of work flow as well as conducting a statistical analysis and interpreting data, applying research methods and problem solving, and choosing and defending an appropriate course of action.

Where applicable, supervisors reported strong skills in EH specialty areas, including risk assessment, communication and management, followed by toxicology and epidemiology (Chart 17).

Chart 14.

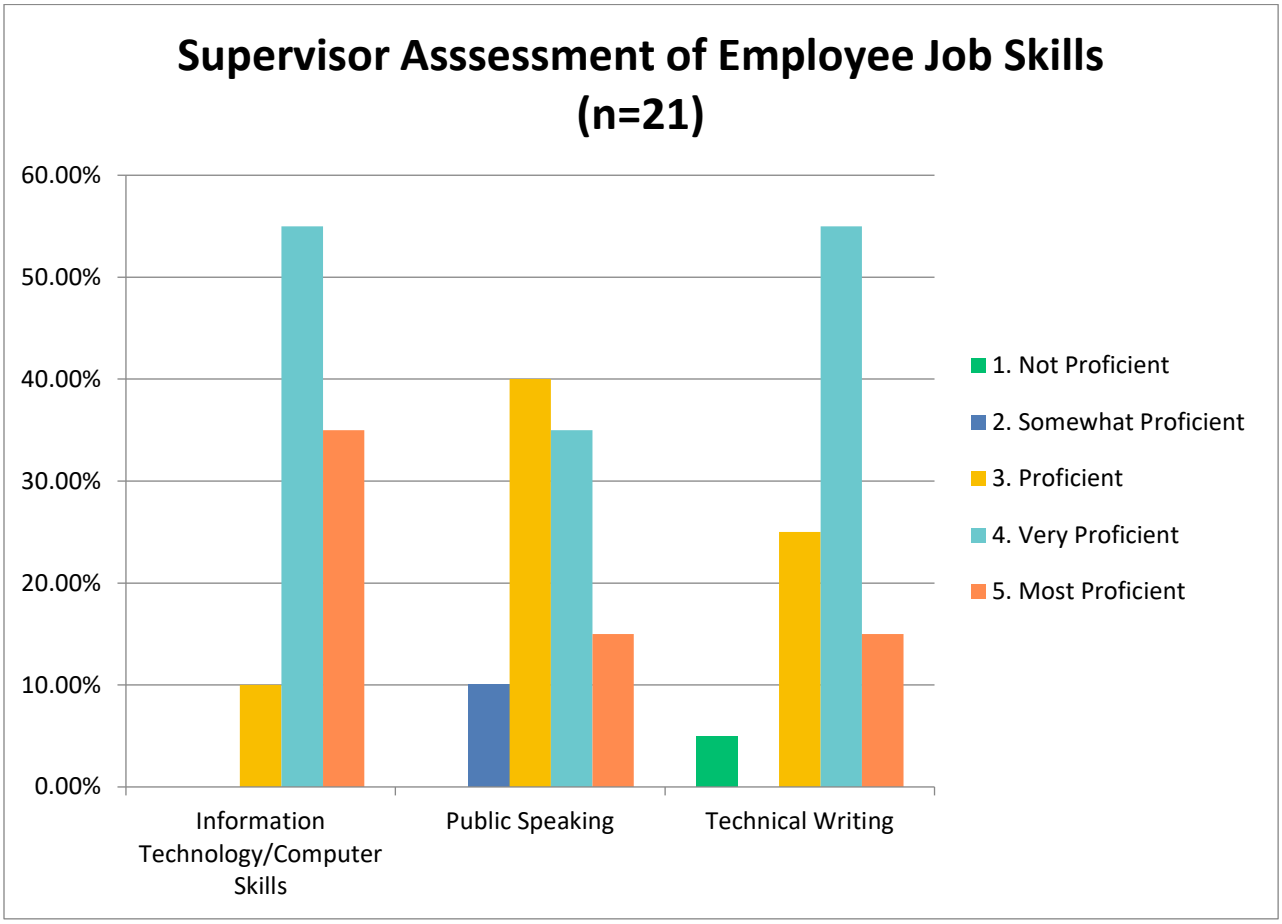


Chart 15.

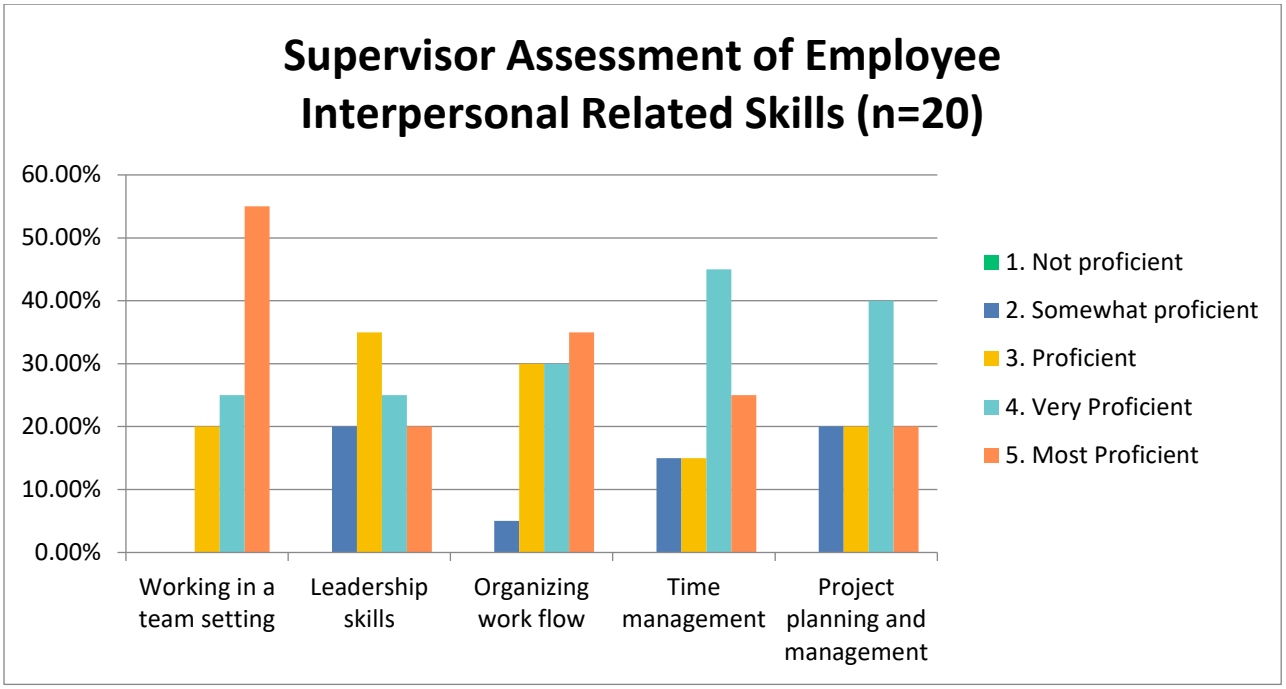


Chart 16.

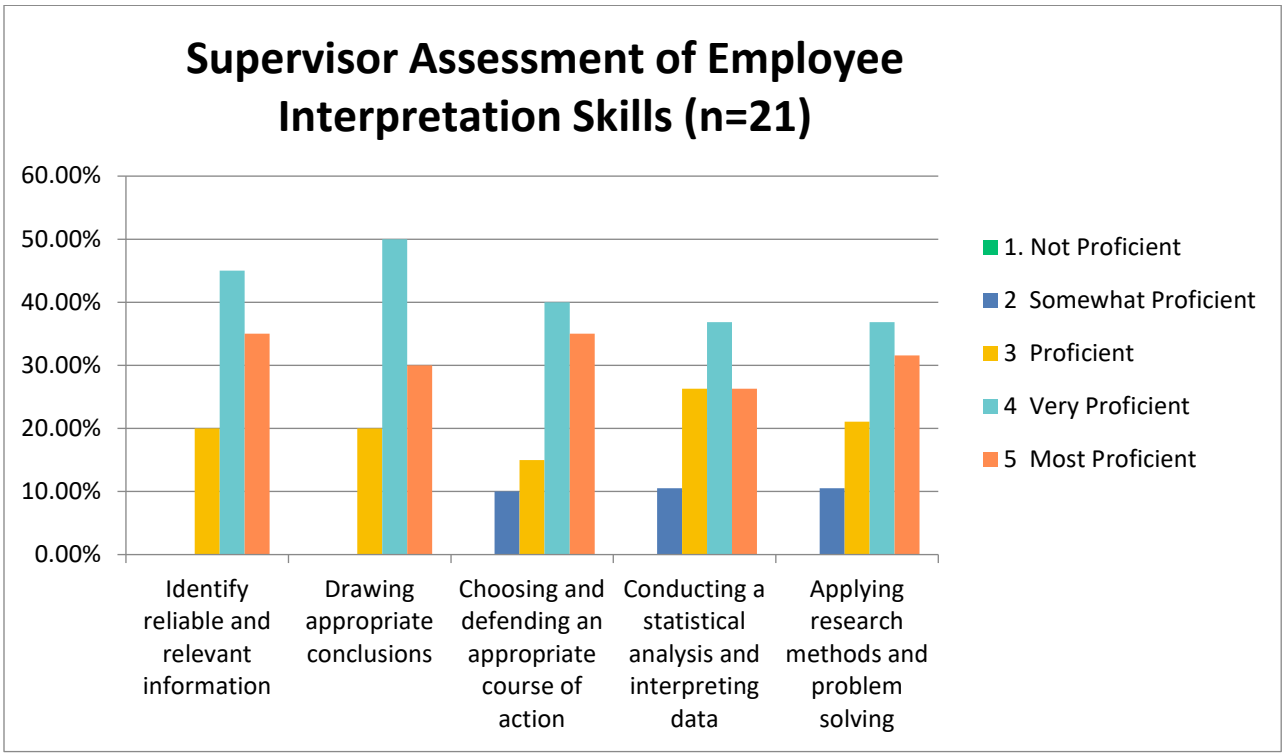
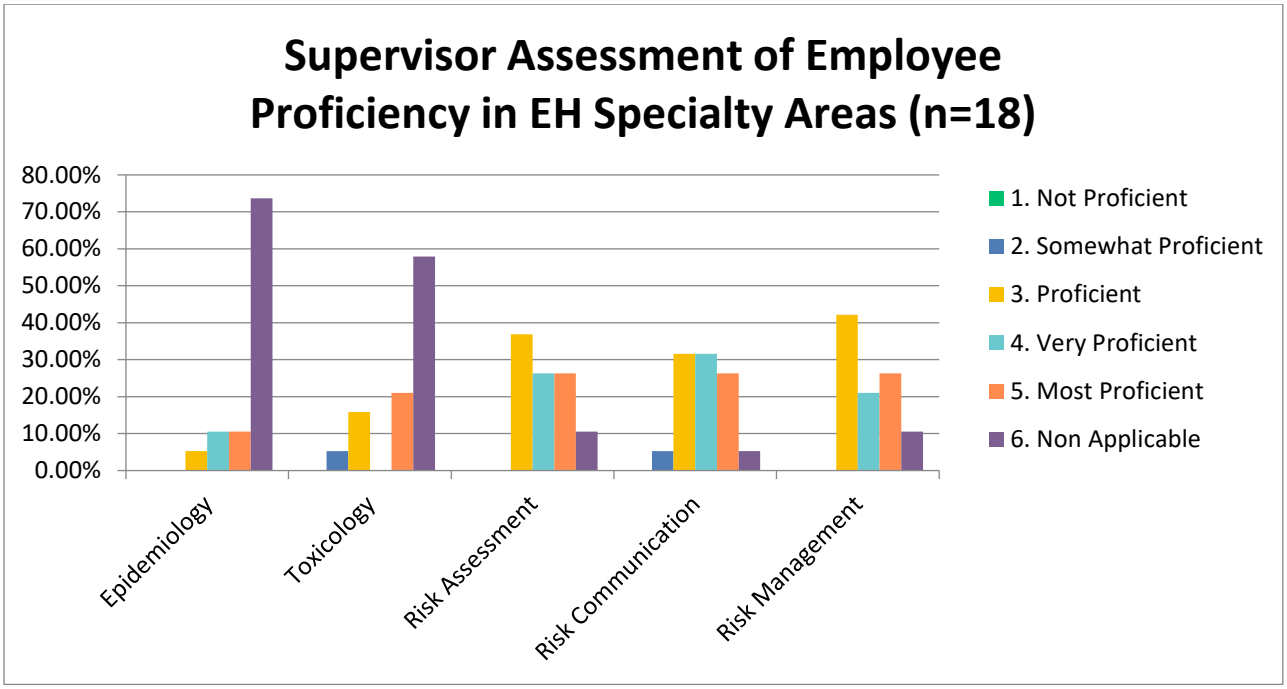


Chart 17.



C. Specialty Area Requirements of Jobs

Supervisors were asked to answer "Yes" or "No" if the employee's job requires knowledge in a number of EH relevant core competencies. Chart 18 shows that fifty percent or more supervisors cite the following required knowledge areas for their employees (required knowledge areas also cited by employees are starred (Chart 5):

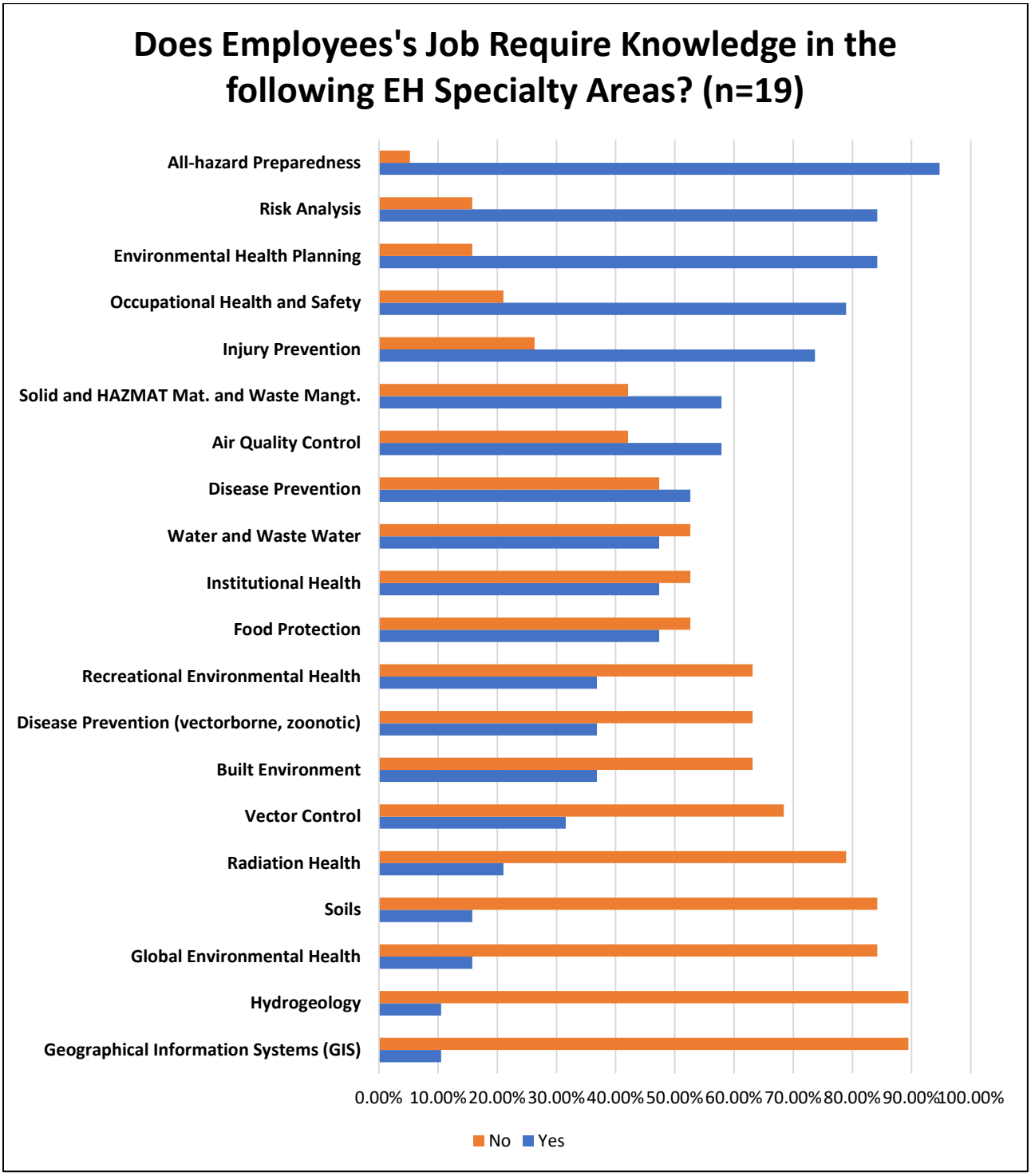
- All Hazard Prepardness*;
- Risk Analysis*;
- Environmental Health Planning*;
- Occupational Health and Safety*;
- Injury Prevention*;
- Solid and HAZMAT Materials and Waste Management*;
- Air Quality Control*; and
- Disease Prevention*.

Specialty EH areas that 50% or more supervisors reported as *not* requiring employee knowledge included (unrequired knowledge areas also cited by employees are starred (Chart 5)):

- Global Information systems (GIS)*;
- Hydrogeology*;
- Global Environmental Health;
- Soils*;

- Radiation Health*;
- Vector Control*;
- Built Environment*;
- Disease Prevention (vector borne, zoonotic, etc.);
- Recreational Environmental Health*;
- Food Protection*;
- Institutional Health*; and
- Water and Waste Water*.

Chart 18.


Does Employees's Job Require Knowledge in the following EH Specialty Areas? (n=19)
All-hazard Preparedness
Risk Analysis
Environmental Health Planning
Occupational Health and Safety
Injury Prevention
Solid and HAZMAT Mat. and Waste Mangt.
Air Quality Control
Disease Prevention
Water and Waste Water
Institutional Health
Food Protection
Recreational Environmental Health
Disease Prevention (vectorborne, zoonotic)
Built Environment
Vector Control
Radiation Health
Soils
Global Environmental Health
Hydrogeology
Geographical Information Systems (GIS)
0.00% 10.00% 20.00% 30.00% 40.00% 50.00% 60.00% 70.00% 80.00% 90.00% 100.00%
No
Yes

D. Program Preparation

Supervisors were asked to answer “Yes” or “No” if employees were “well prepared” in the following EH relevant specialty areas. All supervisors rated employees as ”somewhat” or “well prepared” with the exception of those categories not applicable to job descriptions (Chart 19). EH work areas scored well prepared by 50% of more of the supervisor respondents include: (those work areas scored similarly by employees are starred (Chart 6)):

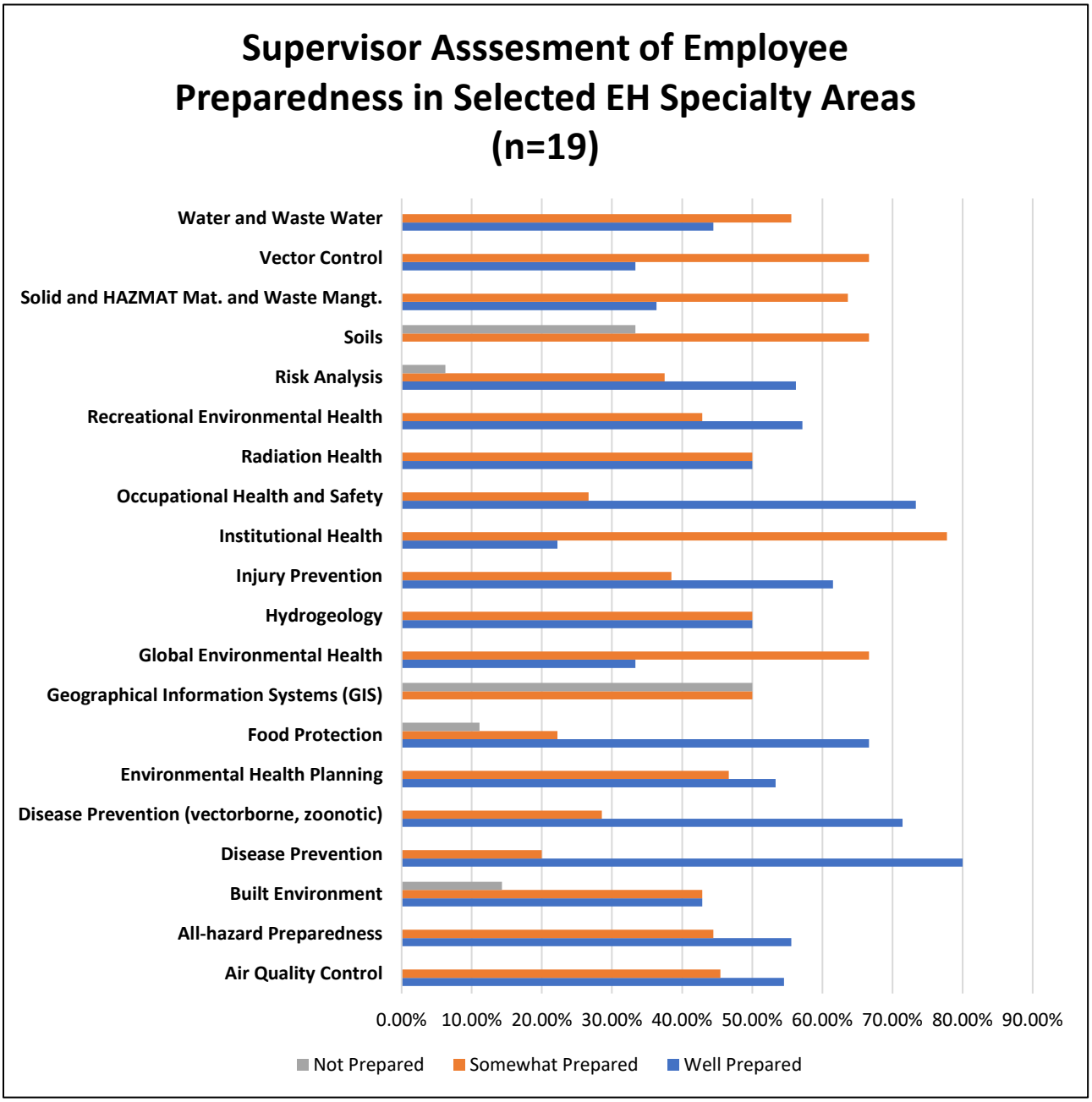
- Disease Prevention*;
- Occupational Health and safety*;
- Disease Prevention (vector borne, zoonotic, etc.)*;
- Food Protection*;
- Injury Prevention*;
- Recreational Environmental Health;
- Risk Analysis*;
- All-hazard Preparedness*;
- Air Quality Control;
- Environmental health planning*;
- Radiation Health*; and
- Hydrogeology.

Specialty areas showing high percentages of supervisors reporting that employers are not prepared include:

- Geographic Information Systems (GIS);
- Soils;
- Built Environment;
- Food Protection; and
- Risk Analysis.

Like the employer ratings previously discussed, and with exception of risk analysis, the EH specialty areas where employees were *least* prepared coincide with those knowledge areas reportedly *least* required by the employee’s job by both Supervisors and Employees.

Chart 19.



E. Additional Specialty Areas Knowledge Needed

Six of twenty-one supervisor respondents indicated the following specific "other" specialty areas as necessary for employee jobs (Table 6).

- Fire Safety
- Ergonomics
- Injury Treatment (First Aid)
- Disinfection

- Biology
- Hydraulics
- Incident Investigation
- Use of Response Equipment
- Database Use

VI. Narrative and Discussion

EHAC accredits EH academic programs in order to create a cadre of educational institutions that produce EH graduates 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 that were reported by 50% or more employees and supervisors include the following specialty areas:

- Disease Prevention;
- Occupational Health and Safety;
- Disease Prevention (vectorborne, zoonotic);
- Food Protection;
- Injury Prevention;
- Risk Analysis;
- All-hazard Preparedness;
- Environmental Health Planning; and
- Radiation Health.

Chart 20.

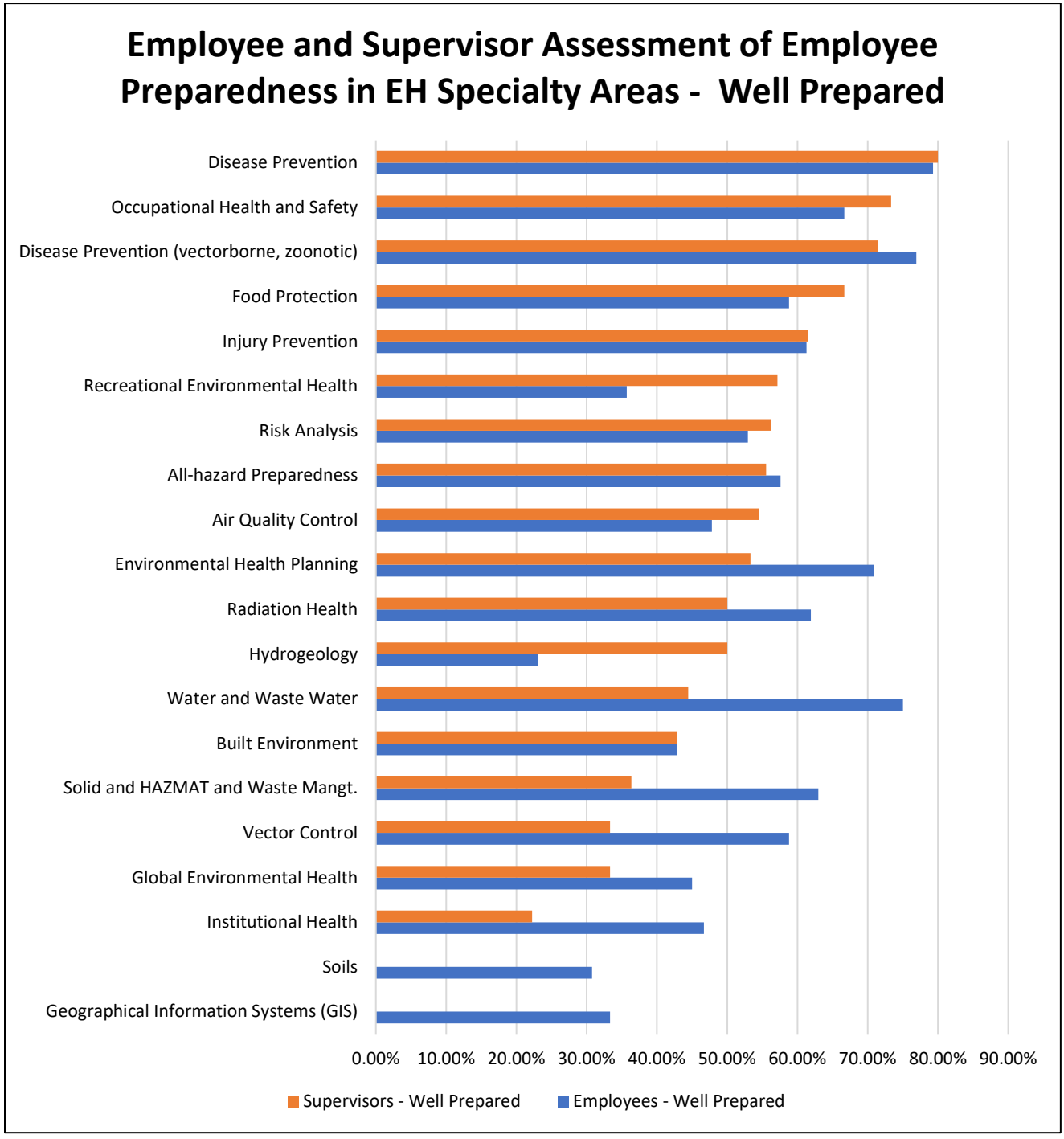
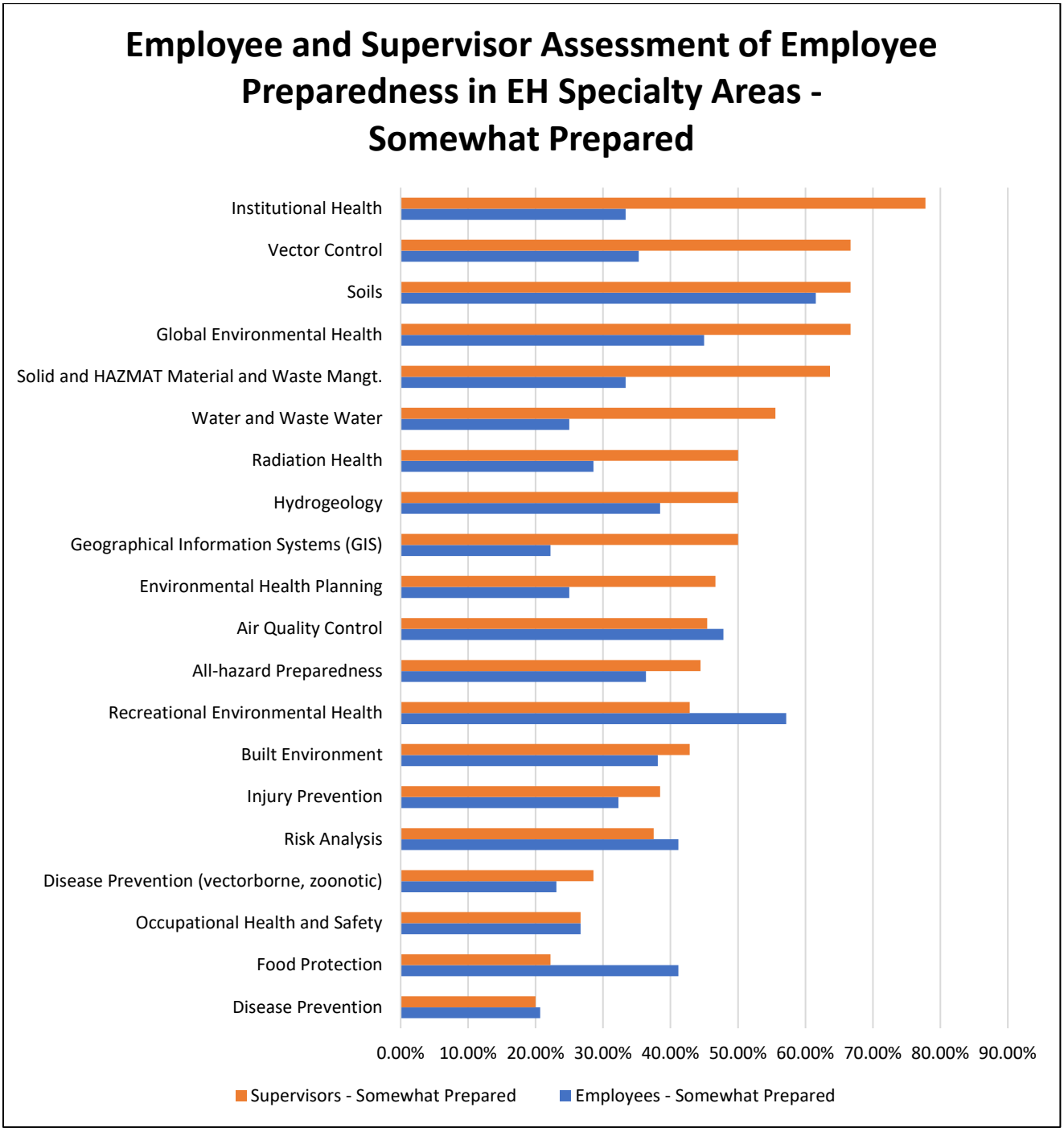

Employee and Supervisor Assessment of Employee Preparedness in EH Specialty Areas - Well Prepared
Disease Prevention
Occupational Health and Safety
Disease Prevention (vectorborne, zoonotic)
Food Protection
Injury Prevention
Recreational Environmental Health
Risk Analysis
All-hazard Preparedness
Air Quality Control
Environmental Health Planning
Radiation Health
Hydrogeology
Water and Waste Water
Built Environment
Solid and HAZMAT and Waste Mangt.
Vector Control
Global Environmental Health
Institutional Health
Soils
Geographical Information Systems (GIS)
0.00% 10.00% 20.00% 30.00% 40.00% 50.00% 60.00% 70.00% 80.00% 90.00%
Supervisors - Well Prepared
Employees - Well Prepared

Chart 21.


Employee and Supervisor Assessment of Employee Preparedness in EH Specialty Areas - Somewhat Prepared
Institutional Health
Vector Control
Soils
Global Environmental Health
Solid and HAZMAT Material and Waste Mangt.
Water and Waste Water
Radiation Health
Hydrogeology
Geographical Information Systems (GIS)
Environmental Health Planning
Air Quality Control
All-hazard Preparedness
Recreational Environmental Health
Built Environment
Injury Prevention
Risk Analysis
Disease Prevention (vectorborne, zoonotic)
Occupational Health and Safety
Food Protection
Disease Prevention
0.00% 10.00% 20.00% 30.00% 40.00% 50.00% 60.00% 70.00% 80.00% 90.00%
Supervisors - Somewhat Prepared
Employees - Somewhat Prepared

B. Job Skills Assessments

Chart 22 shows similar satisfaction levels of both employees and supervisors regarding employee skill levels in different EH job areas. Supervisors tended to rate employee skill a bit higher than the employees themselves. There was closest agreement and highest rating by both groups on the following skills:

- Working in a Team Setting;
- Identifying Reliable and Relevant Information; and
- Organizing Workflows.

Supervisors and employees found agreement in the following EH specialty areas, which were given a rating of "Very Proficient" (Chart 23):

- Project Planning and Management;
- Choosing and Defending an Appropriate Course of Action;
- Time Management;
- Applying Research Methods;
- Conducting a Statistical Analysis/Interpreting Data;
- Drawing Appropriate Conclusions;
- Identifying Reliable and Relevant Information;
- Technical Writing;
- Information Technology/Computer Skills; and
- Public Speaking.

Chart 22.

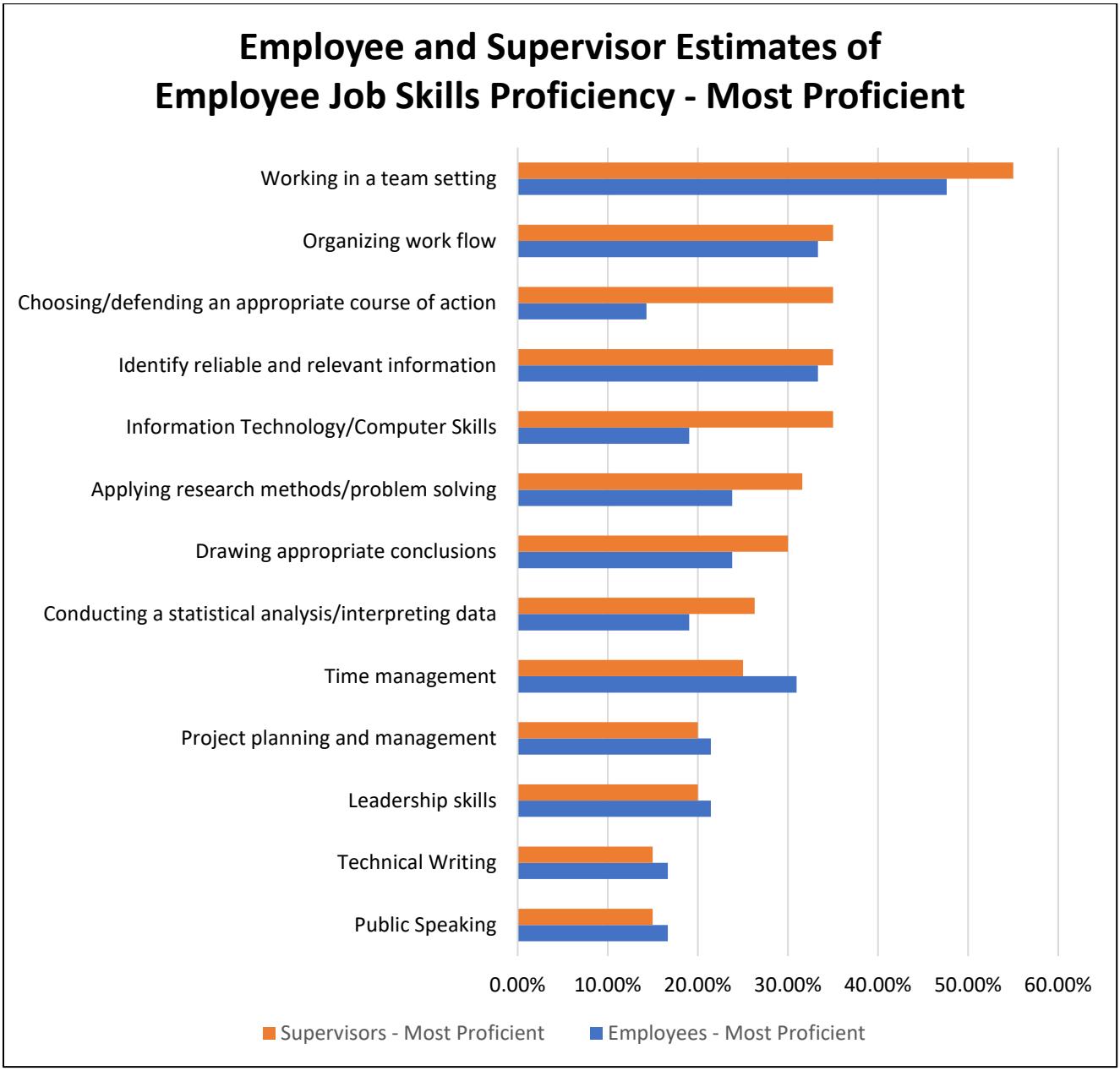
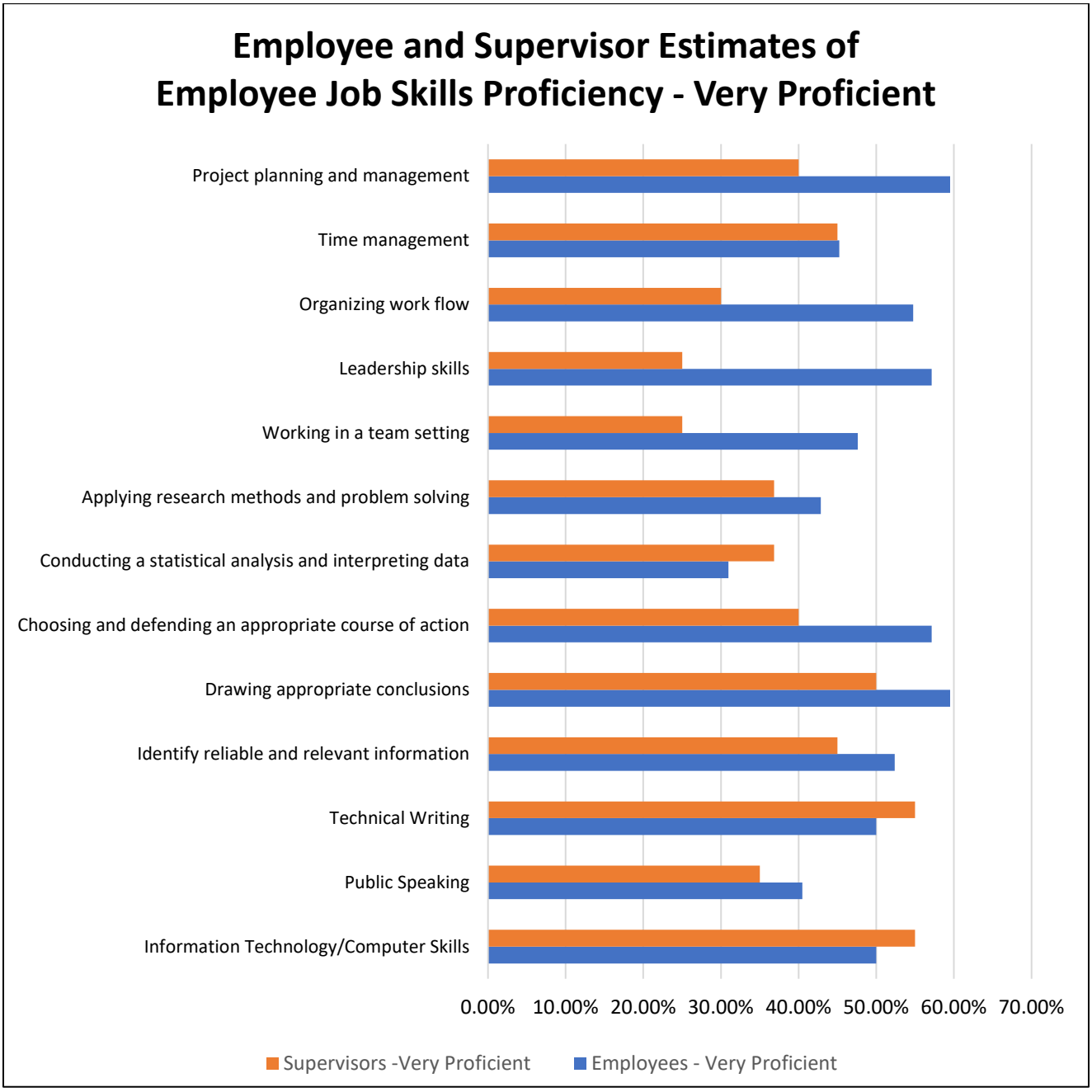

Employee and Supervisor Estimates of
Employee Job Skills Proficiency - Most Proficient
Working in a team setting
Organizing work flow
Choosing/defending an appropriate course of action
Identify reliable and relevant information
Information Technology/Computer Skills
Applying research methods/problem solving
Drawing appropriate conclusions
Conducting a statistical analysis/interpreting data
Time management
Project planning and management
Leadership skills
Technical Writing
Public Speaking
0.00%
10.00%
20.00%
30.00%
40.00%
50.00%
60.00%
Supervisors - Most Proficient
Employees - Most Proficient

Chart 23.



C. Proficiency Levels in EH Specialty Areas

Lastly, employee and supervisor ratings of employee proficiency levels in EH specialty areas found similarities, as well. Generally, supervisors found employees "Most Proficient " in EH Specialty Areas while employees largely rate themselves as "Very Proficient" (Charts 24 and 25). There is some disagreement between supervisors and employees regarding the applicability of

epidemiology and toxicology to job descriptions, with some employees finding these topics applicable, while most supervisors found little applicability for the topics.

Chart 24.

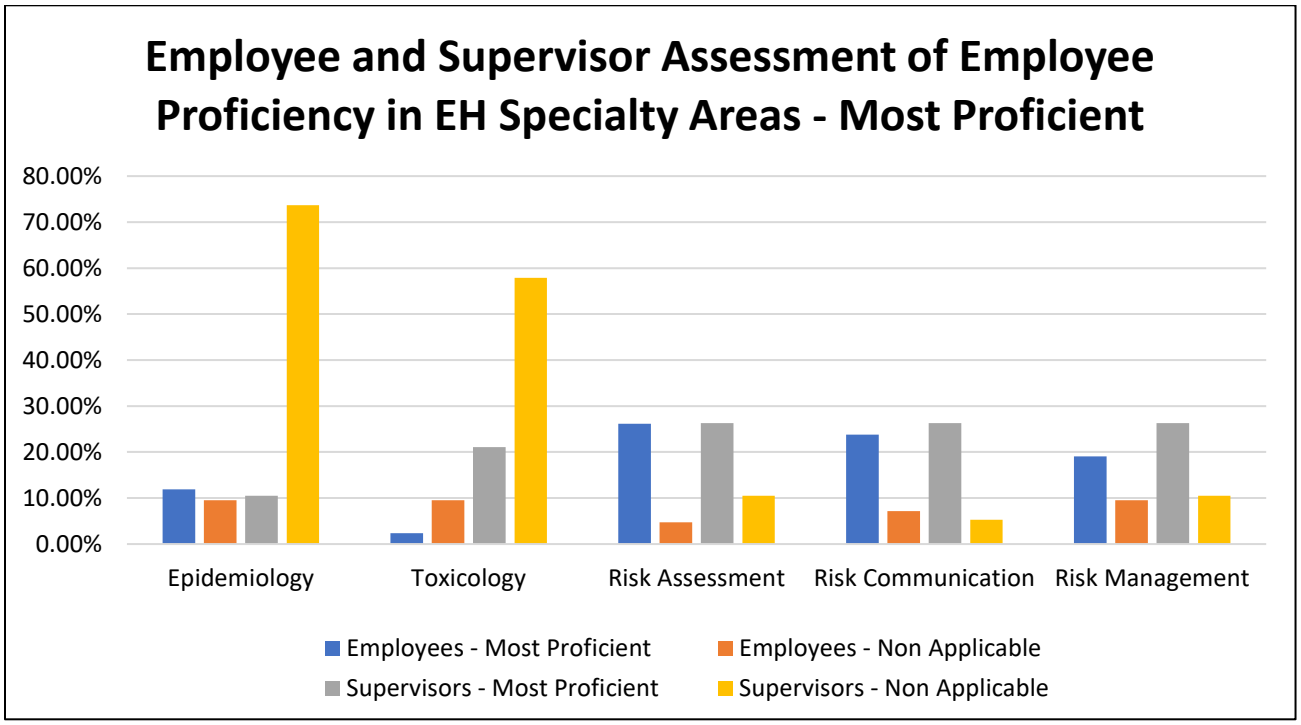
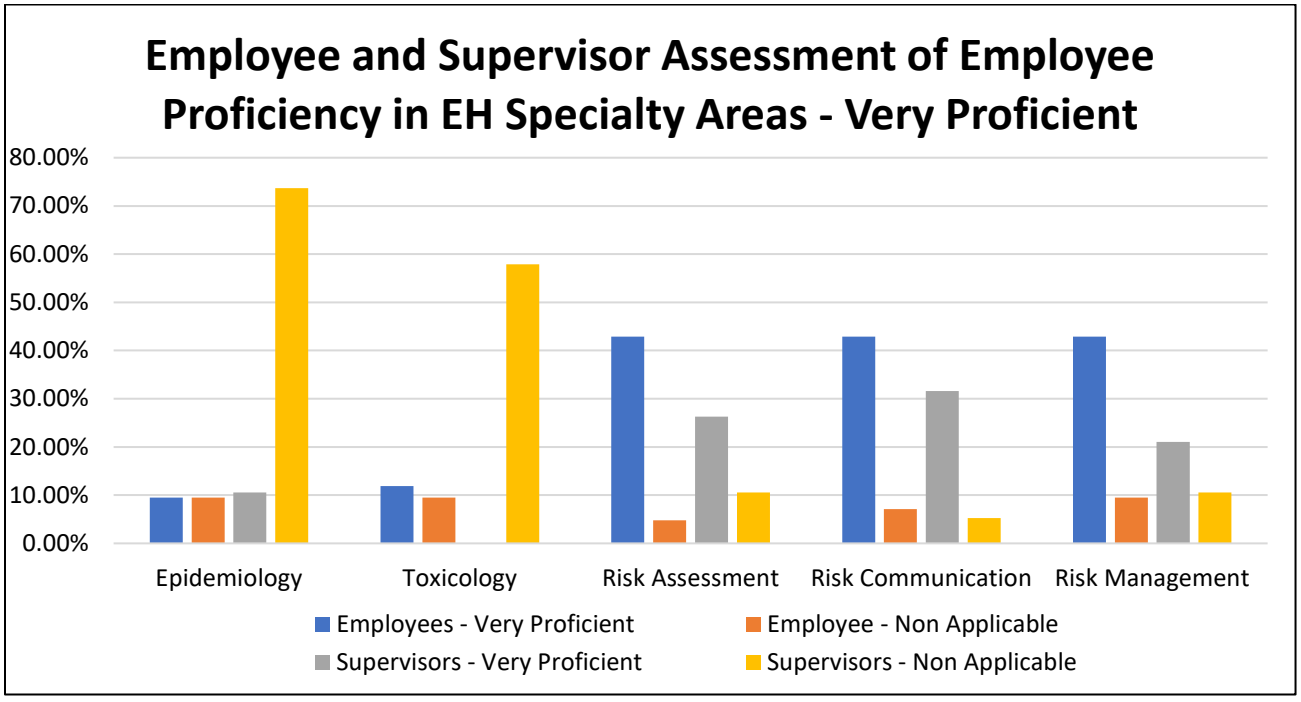



Chart 25.