Montana Public Health and Human Services
Public Health And Safety Division

Workforce Assessment

Final Report

2013

Executive Summary

This report summarizes the findings from the Montana Public Health and Safety Division (PHSD) Workforce Assessment. The purpose of this assessment was to measure the competency of and determine the training and educational priorities for employees of the PHSD. One hundred twenty four PHSD employees received a competency assessment adapted from the *Core Competencies for Public Health Professionals* developed by the Council on Linkages between Academia and Public Health Practice. Three groups of PHSD employees– epidemiologists, Laboratory Services Bureau staff and data specialists, were administered separate surveys that measured a more targeted set of competencies relevant to these positions (see page 5 for more details). After a period of pilot testing, data collection took place over a two week period using SurveyMonkey.com, an online survey tool. Of the 189 PHSD employees recruited, 148 (78%) completed the survey.

Findings

Demographics

The majority of the respondents were female (77%) and over 40 years of age (70%). Only 6% of PHSD employees identified as a race other than white. In terms of education, 49% of employees indicated that their highest level of education was a bachelors degree, while 32% reported having a masters or doctoral degree. In the area of work experience, 51% of respondents reported working at the PHSD for 5 or more years and 65% reported five or more years experience in public health. Thirty percent of respondents reported that they plan to retire or leave the PHSD within the next five years

Results

Overall, PHSD employees rated themselves most proficient in the domains of Communication and Community Dimensions of Practice and least proficient in the domains of Public Health Sciences, Financial Planning and Management, and Leadership and Systems Thinking. In terms of importance to their job, the PHSD employees rated the Analytic and Assessment Skills, Communication and Community Dimensions of Practice domains highest and the domains of Cultural Competency, Public Health Sciences, Financial Planning and Management and Leadership and Systems Thinking as the least important to their jobs. Domains recommended as a focus for training based on relatively high importance and low proficiency for the overall PHSD staff include Policy Development and Program Planning, Community Dimensions of Practice and Analytic and Assessment Skills. This report outlines specific domains and competencies within those domains that should be the focus of training for the overall PHSD staff, as well as specifically for trainings targeted toward program staff, supervisors, upper management, epidemiologists, Laboratory Services Bureau staff and data specialists. This self assessment reveals a strong need for training as there was no domain in which more than one third of all PHSD staff rated themselves as "proficient". Based on these results, a competency-based training agenda for the PHSD can readily be developed.

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Background

In the past decade, it has become increasingly clear that having a competent public health workforce is essential to protecting the health and welfare of populations. Competency assessment and workforce development activities are so essential that the Public Health Accreditation Board requires that state and local health departments complete a workforce assessment and create a workforce development plan as part of the accreditation process.

To assist health departments in assessing their workforce competency, several national efforts have been undertaken to develop standardized competencies for the public health workforce. Most notably, the Council on Linkages between Academia and Public Health Practice has developed and recently updated its *Core Competencies for Public Health Professionals* along three tiers. The Council for State and Territorial Epidemiologists also developed a national set of epidemiology standards entitled *Competencies for Applied Epidemiologists in Governmental Public Health Agencies.* Both of these efforts group competencies into eight overall domains of public health practice skills:

1. Analytic and Assessment
2. Policy Development and Program Planning
3. Communication
4. Cultural Competency
5. Community Dimensions of Practice
6. Public Health Sciences
7. Leadership and Systems Thinking
8. Financial Planning and Management

These domains allow health departments to assess areas most important to achieving their organization's overall goals and objectives and in which employees most need training to improve their overall competency. The PHSD is committed to training and maintaining a competent workforce in order to best protect the health of Montanans. This report details the first step in the PHSD workforce development planning process, a survey to assess the competency of PHSD employees.

Methods

This Montana Public Health Workforce Assessment was adapted from the three tiers of the *Core Competencies for Public Health Professionals.* The Public Health System Improvement Office at the PHSD worked with a third party consulting firm to develop the instrument, and epidemiologists from PHSD gave input and feedback on the development of the tool. A pilot test of each assessment tool was administered before the survey was sent out to all PHSD employees. Feedback from pilot testers was incorporated into the final instruments.

Background continued

Methods continued

Six versions of the assessment were developed and administered:

-Tier 1: Program Staff
-Tier 2: Supervisors
-Tier 3: Upper Management
-Epidemiologists
-Laboratory Service Bureau
-Data Specialists

The final version of the assessment included 10 demographic questions followed by a self-assessment of competencies specific to each tier under the 8 domains. For each listed competency, employees were asked to rate their proficiency on a scale of 1 to 4 (1=None, 2=Aware, 3=Knowledgeable, 4=Proficient) and the importance of the competency to their current position on a scale of 1 to 4 (1=Not important at all, 2=Of minimal importance, 3=Somewhat important, 4=Very Important). Program staff were asked to rate a list of 66 competencies, Supervisors rated themselves on 68 competencies and Upper Management assessed 79 competencies. A skip pattern was built into the Program Staff survey so that employees indicating that their job title was "Administrative Assistant" or "Financial Specialist" were only asked to self-assess their competency in the "Financial Planning and Management" domain, which included 12 competencies. Based on the pilot testing, the estimated time to complete the online assessment was 30 minutes for Tiers 1, 2, and 3, the Laboratory Services Bureau, and data specialist assessments and one hour for epidemiologists.

Recruitment Procedures and Data Collection

The PHSD Bureau Chiefs provided a list of employee emails to the third party consulting firm and indicated which employees should receive which of the 6 assessments based on their job category and classification. An initial email sent from the Division Administrator describing the survey and including the link to the Survey Monkey electronic assessment was sent to introduce the survey. Follow up emails were sent to those employees who had not completed the survey after one and two weeks. Bureau Chiefs encouraged the completion of the survey among their employees. Data was analyzed using Microsoft Excel. Data from incomplete surveys were included in the calculations.

Background continued

Epidemiologist Assessment

All epidemiologists in the PHSD were administered an assessment based on the *Competencies for Applied Epidemiologists in Governmental Public Health Agencies*. This extensive set of competencies, developed by the Council of State and Territorial Epidemiologists, is organized along the same 8 domains as the *Core Competencies for Public Health Professionals*, allowing for continuity in the analysis of these competencies in comparison to the PHSD program staff, supervisors and upper management. However, since the *Competencies for Applied Epidemiologists in Governmental Public Health Agencies* are much more detailed and extensive than the *Core Competencies for Public Health Professionals,* epidemiologists were asked to self-assess 244 competencies, including 139 in the domain Analytic and Assessment Skills. The long length of the epidemiology assessment likely contributed to the lower survey completion rate among this group of staff.

Public Health Laboratory Assessment

A national set of public health laboratory competencies is currently being developed, but in lieu of a full set of competencies, we utilized the same competency areas as in the 2011 *National Laboratory Capacity Assessment*. In addition to demographic questions and a question regarding laboratory certification, each laboratory staff person was asked to self assess their proficiency in 38 areas of competency related to laboratory practice. They were also asked to rate each of the 38 competency areas in terms of importance to their current position using the same scale as the other assessment tools.

Data Specialists

In addition to demographic questions, data specialists were asked to rate themselves along 38 competencies in 4 domains taken from Tier 1 of the *Competencies for Applied Epidemiologists in Governmental Public Health Agencies.* To create the survey, competencies that were relevant to the data specialist job description were selected from the much more extensive list of Tier 1 competencies in this set. For each competency, data specialists self rated their proficiency and importance to job using the same scale as the other assessment tools.

Results: Demographics

Of the 189 surveys sent to PHSD employees, 159 responded and 148 completed the survey for a 78% completion rate overall. The analyses presented in this report include all responses, including surveys that were not completed.

Table 1. Response Rates

	Program Staff	Supervisors	Upper Management	Epidemiologists	Laboratory	Data Specialists	Overall
Responses	63	19	20	16	27	14	159
Number sent	75	26	23	16	31	18	189
Response rate	84%	73%	87%	100%	87%	78%	84%
Surveys completed	59	18	19	13	26	13	148
Completion rate (of surveys sent)	79%	69%	82%	81%	84%	72%	78%
Completion rate (of surveys started)	94%	94%	95%	81%	96%	93%	93%

Table 2. Demographics

	Response	Program Staff	Supervisors	Upper Management	Epidemiologists	Laboratory	Data Specialists	Overall
Sex	Male	13 (21%)	0 (0%)	4 (20%)	7 (44%)	8 (30%)	4 (31%)	36 (23%)
	Female	50 (79%)	19 (100%)	16 (80%)	9 (56%)	19 (70%)	9 (69%)	122 (77%)
Race	American Indian							5 (3%)
	White							146 (94%)
	Other							5 (3%)
Age	20-39	16 (25%)	6 (31%)	5 (25%)	11 (69%)	7 (26%)	2 (15%)	47 (30%)
	40-59	38 (60%)	11 (58%)	11 (55%)	3 (19%)	15 (56%)	7 (54%)	85 (54%)
	60+	9 (14%)	2 (11%)	4 (20%)	2 (13%)	5 (19%)	4 (31%)	26 (16%)

The majority of respondents were female, white and aged 40-59, though epidemiologists were younger overall and had a higher percentage of males in the cohort.

Results: Demographics

Table 3. Education: Highest degree

	Program Staff	Supervisors	Upper Management	Epidemiologists	Laboratory	Data Specialists	Overall
High school	7 (11%)	0 (0%)	3 (15%)	0 (0%)	0 (0%)	4 (33%)	14 (9%)
Associate's or Vocational Degree	13 (21%)	1 (5%)	0 (0%)	1 (6%)	0 (0%)	1 (8%)	16 (10%)
Bachelor's Degree	26 (41%)	15 (79%)	10 (50%)	0 (0%)	19 (70%)	7 (58%)	77 (49%)
Master's or Doctoral Degree	17 (27%)	3 (16%)	7 (35%)	15 (94%)	8 (30%)	0 (0%)	51 (32%)

Table 4: Field of Study (asked of respondents that indicated having a bachelor's degree or higher)*

Field	Program Staff	Supervisors	Upper Management	Epidemiologists	Laboratory	Data Specialists	Overall
Public Health	7 (20%)	4 (18%)	4 (22%)	10 (63%)	2 (6%)	0 (0%)	26 (20%)
Public Administration	2 (6%)	2 (9%)	2 (11%)	1 (6%)	1 (3%)	0 (0%)	8 (6%)
Nursing	2 (6%)	4 (18%)	1 (6%)	0 (0%)	0 (0%)	0 (0%)	7 (5%)
Business	5 (14%)	2 (9%)	1 (6%)	0 (0%)	0 (0%)	2 (22%)	10 (8%)
Science	6 (17%)	2 (9%)	3 (17%)	1 (6%)	22 (65%)	3 (33%)	27 (28%)
Social Work	0 (0%)	0 (0%)	2 (11%)	0 (0%)	0 (0%)	0 (0%)	2 (2%)
Mathematics or Statistics	1 (3%)	0 (0%)	0 (0%)	1 (6%)	0 (0%)	0 (0%)	2 (2%)
Medical lab science/Med Tech	0 (0%)	0 (0%)	0 (0%)	0 (0%)	9 (26%)	0 (0%)	9 (7%)
Other	12 (34%)	6 (32%)	5 (28%)	3 (19%)	0 (0%)	4 (44%)	30 (23%)

*Some respondents indicated degrees in more than one field

Degrees listed in the "Other" field: Education (5), Nutrition (3), Computer Science or Information Systems (3), Sociology (2), Home Economics (2), Political Science (2), Health Information Management (2) Community Health (2), Emergency Administration and Management, Consumer Science/Adult Education, Health and Human Performance, Community and Regional Planning, Clinical Science, Health Education, Human Geography, Child Development, Health Care Administration, Economics, Medicine, Human Resource Management

More than three quarter of PHSD employees have a bachelor's degree or higher, though only a 1 in 5 employees with a degree report that their field of study was in Public Health. (See Tables 3 and 4). The wide range of educational backgrounds in the PHSD is one indication of a need for standardized training.

Results: Demographics

Table 5. Bureau or Office

Bureau or Office	Program Staff	Supervisors	Upper Management	Epidemiologists	Laboratory	Data Specialists	Overall
Communicable	19 (31%)	5 (26%)	7 (37%)	3 (20%)	0 (0%)	3 (23%)	37 (24%)
Family and Community Health	15 (24%)	3 (16%)	7 (37%)	0 (0%)	0 (0%)	2 (15%)	27 (17%)
Chronic Disease	17 (27%)	11 (58%)	3 (16%)	7 (47%)	0 (0%)	4 (30%)	42 (27%)
Epidemiology and Scientific Support	0 (0%)	0 (0%)	1 (5%)	4 (27%)	0 (0%)	1 (8%)	6 (4%)
Financial Operations and Support	8 (13%)	0 (0%)	1 (5%)	0 (0%)	0 (0%)	2 (15%)	11 (7%)
Laboratory Services	2 (3%)	0 (0%)	0 (0%)	0 (0%)	27 (100%)	0 (0%)	29 (19%)
Public Health System Improvement	1 (2%)	0 (0%)	0 (0%)	1 (7%)	0 (0%)	1 (8%)	3 (2%)

Table 6. Experience: Years in the PHSD

Years at PHSD	Program Staff	Supervisors	Upper Management	Epidemiologists	Laboratory	Data Specialists	Overall
0 to 2	22 (35%)	6 (32%)	1 (5%)	6 (40%)	9 (33%)	4 (31%)	48 (31%)
3 to 4	15 (24%)	3 (16%)	3 (15%)	3 (20%)	4 (15%)	2 (15%)	30 (19%)
5 to 10	16 (25%)	6 (32%)	9 (45%)	4 (27%)	7 (26%)	3 (23%)	45 (29%)
More than 10	10 (16%)	4 (21%)	7 (35%)	2 (13%)	7 (26%)	4 (31%)	34 (22%)

Results: Demographics
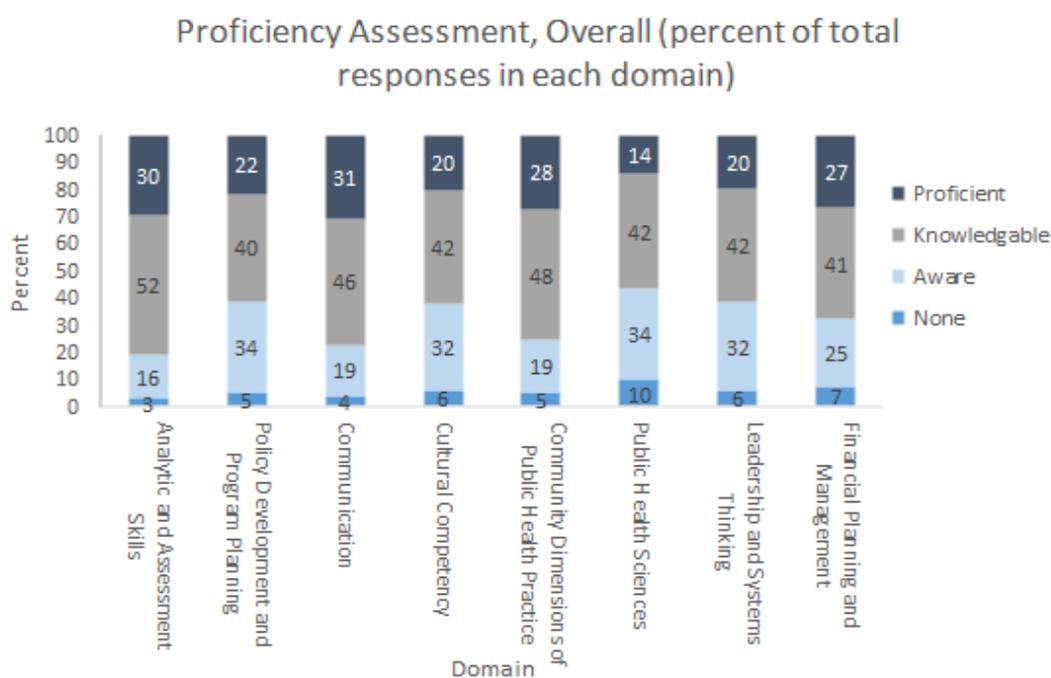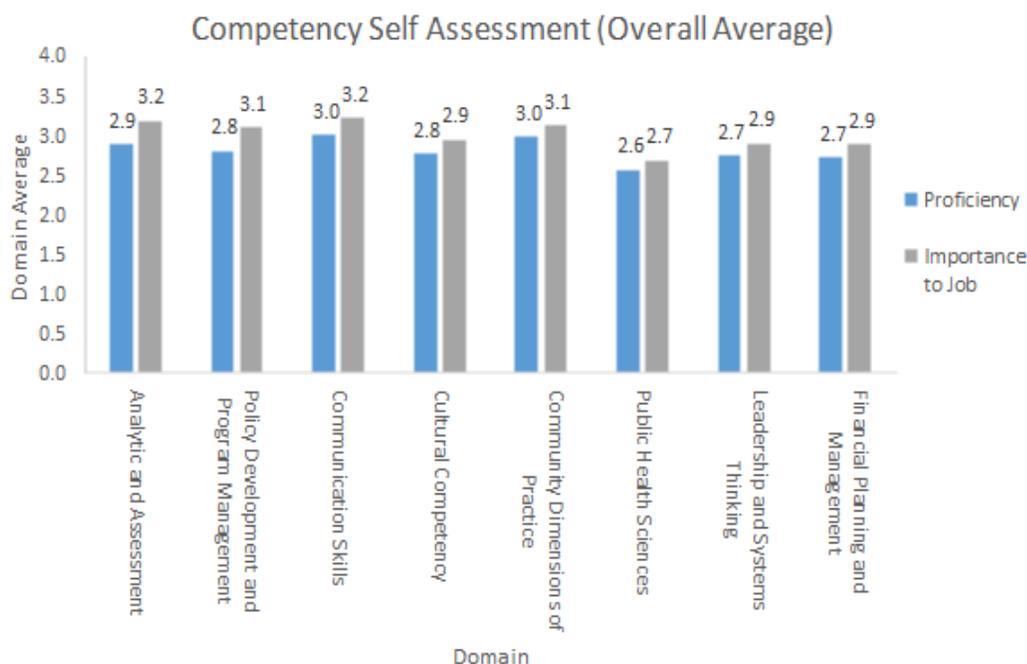
Table 7. Experience: Years in Public Health

Year in Public Health	Program Staff	Supervisors	Upper Management	Epidemiologists	Laboratory	Data Specialists	Overall
0 to 2	10 (17%)	2 (10%)	1 (5%)	1 (7%)	7 (26%)	4 (31%)	27 (18%)
3 to 4	14 (24%)	3 (16%)	2 (10%)	4 (27%)	3 (11%)	2 (15%)	28 (18%)
5 to 10	16 (28%)	5 (26%)	4 (20%)	6 (40%)	6 (22%)	3 (23%)	40 (26%)
More than 10	18 (31%)	9 (47%)	13 (65%)	4 (27%)	11 (41%)	4 (31%)	60 (39%)

Table 8. Years before retiring or leaving PHSD

Year before retiring	Program Staff	Supervisors	Upper Management	Epidemiologists	Laboratory	Data Specialists	Overall
0 to 5	18 (31%)	6 (32%)	5 (25%)	5 (33%)	8 (30%)	4 (31%)	47 (30%)
6 to 10	15 (25%)	2 (11%)	6 (30%)	2 (13%)	6 (22%)	3 (23%)	35 (22%)
More than 10	26 (44%)	11 (58%)	9 (45%)	8 (53%)	13 (48%)	6 (46%)	74 (47%)

Half of PHSD staff have 5 or more years experience at the PHSD and two thirds report having 5 or more years experience in public health. However 30% of PHSD staff plan to seek employment outside of the PHSD or retire in 0 to 5 years, indicating a large need for training as staff positions are rehired and oriented.

Results: Overall

Competency Self Assessment (Overall Average)

Domain Average

Domain	Proficiency	Importance to Job
Analytic and Assessment	2.9	3.2
Policy Development and Program Management	2.8	3.1
Communication Skills	3.0	3.2
Cultural Competency	2.8	2.9
Community Dimension of Practice	3.0	3.1
Public Health Sciences	2.6	2.7
Leadership and Systems Thinking	2.7	2.9
Financial Planning and Management	2.7	2.9

Proficiency Assessment, Overall (percent of total responses in each domain)

Percent

Domain	None	Aware	Knowledgable	Proficient
Analytic and Assessment Skills	3	16	52	30
Policy Development and Program Planning	5	34	40	22
Communication	4	19	46	31
Cultural Competency	6	32	42	20
Community Dimensions of Public Health Practice	5	19	48	28
Public Health Sciences	10	34	42	14
Leadership and Systems Thinking	6	32	42	20
Financial Planning and Management	7	25	41	27

All PHSD employees were asked to rate themselves based on competencies within 8 domains of public health practice. For each listed competency, employees were asked to rate their proficiency on a scale of 1 to 4 (1=None, 2=Aware, 3=Knowledgeable, 4=Proficient) and the importance of the competency to their current position on a scale of 1 to 4 (1=Not important at all, 2=Of minimal importance, 3=Somewhat important, 4=Very Important). On average, PHSD employees rated their proficiency lower than the competency's importance to their job, indicating a need for training in all domains. (Figure 1). In no domain were more than on third of response "Proficient" (Figure 2). In some domains, such as "Policy Development and Program Planning" and "Public Health Sciences" more than one third of employees responses in the domain were "1" or "2" indicating that a large proportion of employees were only aware of or had no knowledge of the competencies in that domain.
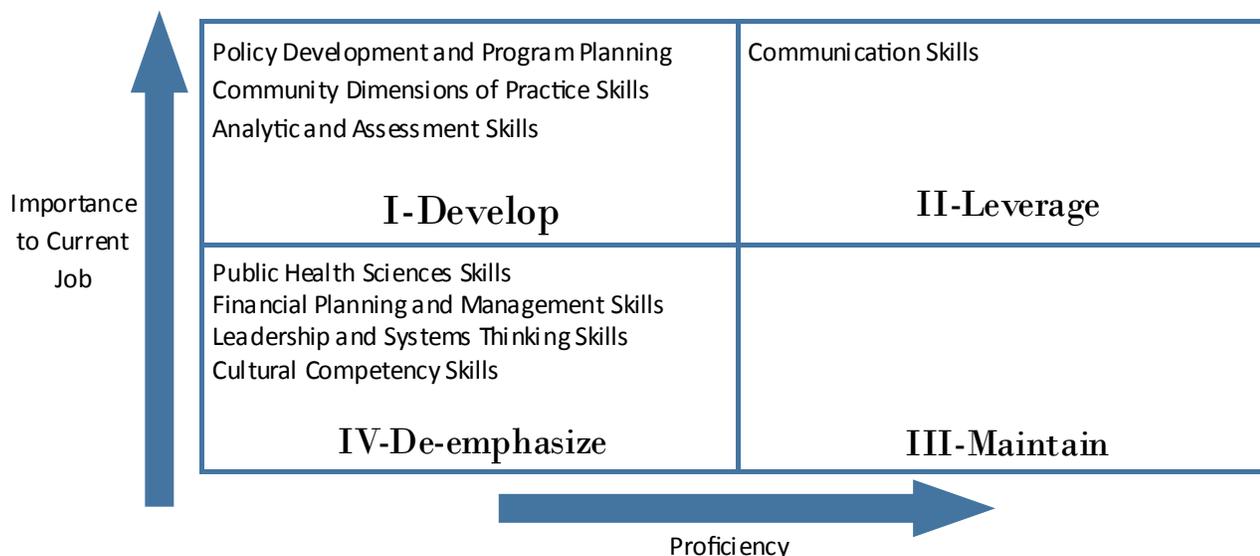
Results: Overall

If the average self assessment score for a domain was greater than or equal to 3.0, the domain was classified as "Higher Proficiency or Higher Importance". Domain averages of less than 3.0 were classified as "Lower Proficiency or Lower Importance." Based on these rankings, domains were put into the "Competency Prioritization Matrix" where "Develop"= Lower Proficiency but Higher Importance domains, "Leverage" = Higher Proficiency and Higher Importance Domains, De-emphasize = Lower Proficiency and Lower Importance domains and Maintain = Higher Proficiency but Lower Importance Domains. Domains in the "Develop" quadrant of the matrix should be a primary focus for training initiatives.

Competency Prioritization: Overall

Higher Proficiency Domains (≥ 3.0)	Lower Proficiency Domains (<3.0)
Communication Skills	Public Health Sciences Skills Financial Planning and Management Skills Leadership and Systems Thinking Skills Cultural Competency Skills Policy and Program Development Skills Analytic and Assessment Skills Community Dimensions of Practice Skills

| Higher Importance Domains (≥ 3.0)	Lower Importance Domains (<3.0)
Communication Skills Policy and Program Development Skills Analytic and Assessment Skills Community Dimensions of Practice Skills	Public Health Sciences Skills Financial Planning and Management Skills Leadership and Systems Thinking Skills Cultural Competency Skills

Competency Prioritization Matrix: Overall

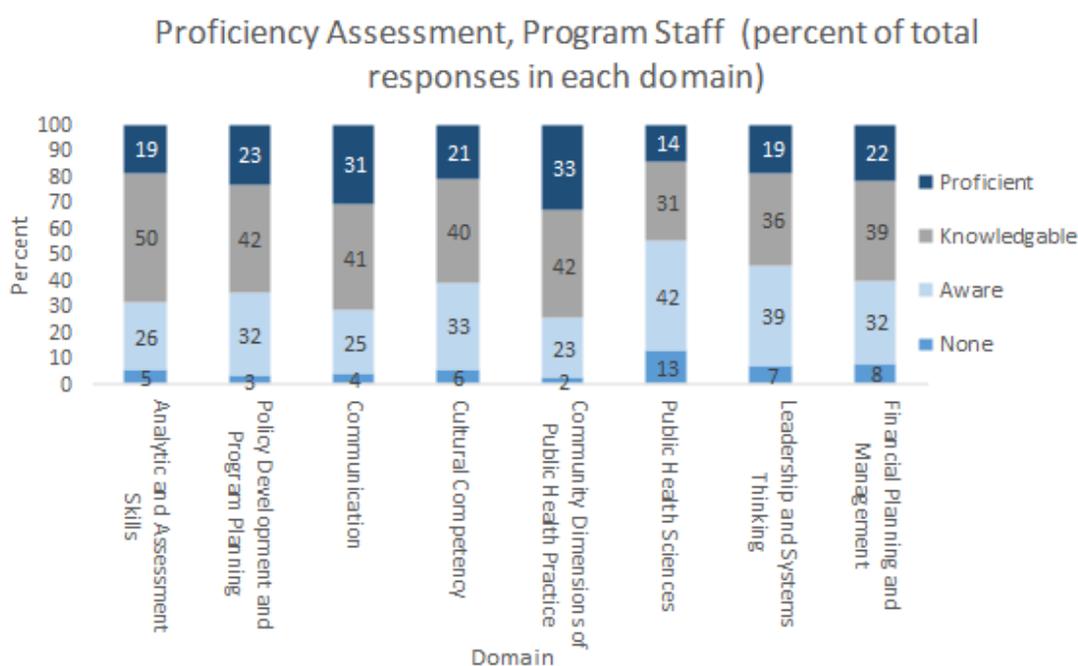| Importance to Current Job ↑		Proficiency →
Policy Development and Program Planning Community Dimensions of Practice Skills Analytic and Assessment Skills **I-Develop**		Communication Skills **II-Leverage**
Public Health Sciences Skills Financial Planning and Management Skills Leadership and Systems Thinking Skills Cultural Competency Skills **IV-De-emphasize**		 **III-Maintain**

Results: Program Staff

Program staff rated their overall proficiency in each domain lower than or equal to the average for all PHSD employees in every domain except Policy Development and Program Management and Community Dimensions of Public Health Practice.

Competency Self Assessment (Program Staff Average)

Domain	Proficiency	Importance to Job
Analytic and Assessment	2.8	3.0
Policy Development and Program Management	2.9	3.1
Communication Skills	3.0	3.1
Cultural Competency	2.8	3.0
Community Dimensions of Practice	3.1	3.2
Public Health Sciences	2.5	2.4
Leadership and Systems Thinking	2.7	2.6
Financial Planning and Management	2.7	2.8
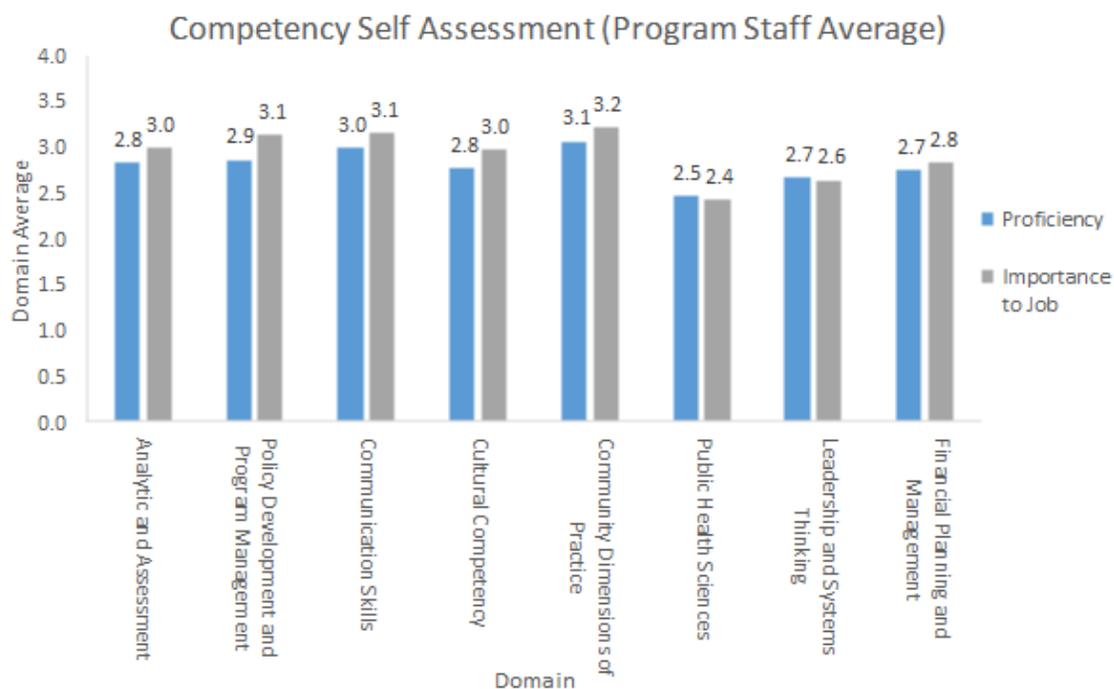
In the domains of Public Health Sciences, Leadership and Systems Thinking and Financial Planning and Management, more than 40% of competencies were rated as "Aware" or "None" for proficiency.

## Proficiency Assessment, Program Staff (percent of total responses in each domain)

Domain	Proficient	Knowledgable	Aware	None
Analytic and Assessment Skills	19	50	26	5
Policy Development and Program Planning	23	42	32	3
Communication	31	41	25	4
Cultural Competency	21	40	33	6
Community Dimensions of Public Health Practice	33	42	23	2
Public Health Sciences	14	31	42	13
Leadership and Systems Thinking	19	36	39	7
Financial Planning and Management	22	39	32	8

Results: Program Staff

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Competency Prioritization: Program Staff

Higher Proficiency Domains (≥ 3.0)	Lower Proficiency Domains (<3.0)
Communication Skills Community Dimensions of Practice Skills	Public Health Sciences Skills Financial Planning and Management Skills Leadership and Systems Thinking Skills Cultural Competency Skills Policy Development and Program Management Analytic and Assessment Skills

Higher Importance Domains (≥ 3.0)	Lower Importance Domains (<3.0)
Analytic and Assessment Skills Policy Development and Program Management Communication Skills Cultural Competency Community Dimensions of Practice Skills	Public Health Sciences Skills Financial Planning and Management Skills Leadership and Systems Thinking Skills

Competency Prioritization Matrix: Program Staff

Importance to Current Job ↑	Policy Development and Program Management Analytic and Assessment Skills Cultural Competency **I-Develop**	Communication Skills Community Dimensions of Practice **II-Leverage**
	Public Health Sciences Skills Financial Planning and Management Skills Leadership and Systems Thinking Skills **IV-De-emphasize**	 **III-Maintain**
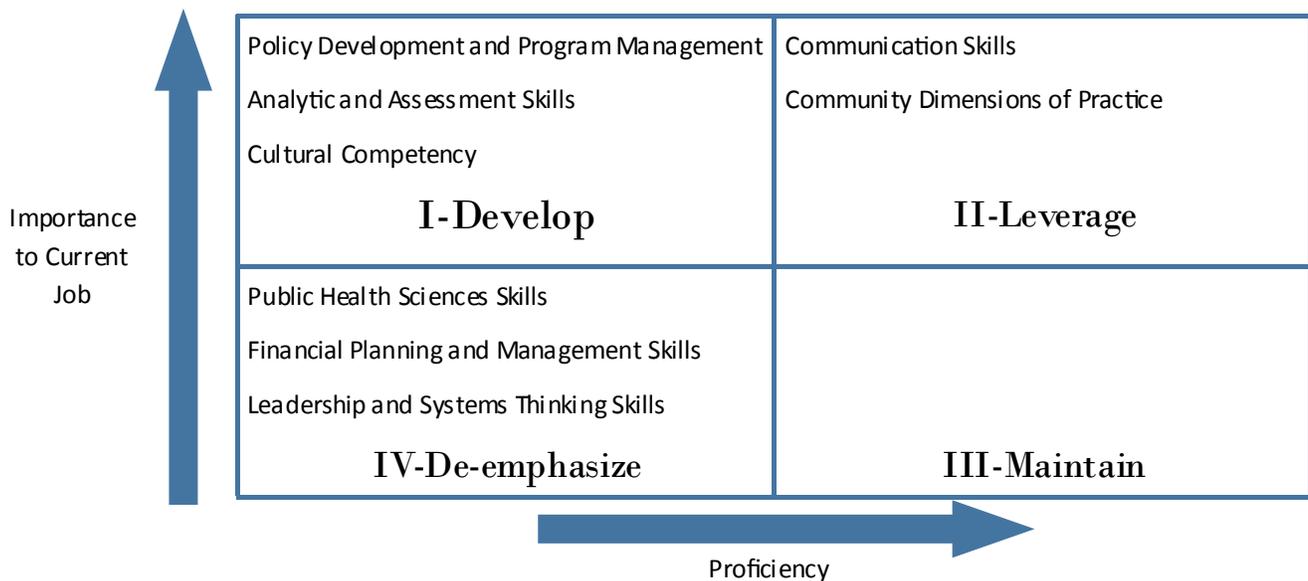
Proficiency →

Highest and lowest rated competencies, by domain: Program Staff

Domain	Highest rated competencies (proficiency)	Lowest Rated Competencies (proficiency)
Analytic and Assessment Skills	1. Use information technology to collect, store and retrieve data 2. Identify sources of public health data and information 3. Adhere to ethical principles in the collection, maintenance, use and dissemination of data and information	1. Collect quantitative and qualitative community data (e.g. risks and benefits to the community, health and resource needs) 2. Describe the public health applications of quantitative and qualitative data 3. Identify gaps in data sources
Policy Development and Program Management	1. Participate in the program planning process 2. Incorporate policies and procedures into program plans and structures 3. Gather information relevant to specific public health policy issues	1. Demonstrate the use of public health informatics practices and procedures 2. Explain the expected outcomes of policy options (e.g. health, fiscal, administrative, legal, ethical, social, political) 3. Describe public health laws and regulations governing public health programs
Communication Skills	1. Communicate in writing and orally, in person, and through electronic means, with linguistic and cultural proficiency 2. Solicit community-based input from individuals and organizations 3. Apply communication and group dynamic strategies (e.g. principled negotiation, conflict resolution, active listening and risk communication) in interactions with individuals and groups	1. Identify the health literacy of population served 2. Convey public health information using a variety of approaches (e.g. social networks, media, blogs) 3. Participate in the development of demographic, statistical, programmatic and scientific presentations
Cultural Competency	1. Incorporate strategies for interacting with persons from diverse backgrounds 2. Recognize the role of cultural, social, and behavioral factors in the accessibility, availability, acceptability & delivery of public health services 3. Respond to diverse needs that are the result of cultural differences	1. Participate in the assessment of the cultural competence of the public health organization 2. Describe the need for a diverse public health workforce 3. Describe the dynamic forces that contribute to cultural diversity
Community Dimensions of Practice	1. Maintain partnerships with key stakeholders 2. Collaborate with community partners to promote the health of the population 3. Identify stakeholders	1. Gather input from the community to inform the development of public health policy and programs 2. Identify community assets and resources
Public Health Sciences	1. Retrieve scientific evidence from a variety of text and electronic sources 2. Describe the scientific evidence related to a public health issue, concern or intervention 3. Discuss limitations of research findings (e.g., limitations of data sources, importance of observations and interrelationships)	1. Relate public health science skills to the Core Public Health Functions and Ten Essential Services of Public Health 2. Identify the basic public health sciences (including biostatistics, epidemiology, environmental health sciences, health sciences administration, and social and behavioral sciences) 3. Partner with other public health professionals in building the scientific base of public health
Leadership and Systems Thinking	1. Use individual, team and organizational learning opportunities for personal and professional development 2. Participate in the measuring, reporting, and continuous improvement of organizational performance 3. Describe how public health operates within a larger system 4. Participate in mentoring and peer review or coaching opportunities	1. Describe the impact of changes in the public health system, and larger social, political, economic environment on organizational practices 2. Identify internal and external problems that may affect the delivery of Essential Public Health Services 3. Participate with stakeholders in identifying key public health values and a shared public health vision as guiding principles for community action
Financial Planning and Management	1. Adhere to the organization's policies and procedures 2. Apply basic human relations skills to internal collaborations, motivation of colleagues and resolution of conflicts 3. Report program performance	1. Describe the local, state and federal public health and health care systems 2. Demonstrate public health informatics skills to improve program and business operations 3. Contribute to the preparation of proposals for funding from external sources

Results: Financial Specialists and Administrative Assistants

Among the program staff surveyed, 25 indicated that their job category was *Administrative Assistant (n=13)* or *Financial Specialist (n=12)*. For respondents who indicated that these were their job categories, the survey included a skip pattern so they were assessed only on the competencies listed under the "Financial Planning and Management" domain. Below are the results of that assessment. Interestingly, on average the financial managers and administrative assistants rated the "Financial Planning and Management" competencies lower in both proficiency and importance compared to their other program staff counterparts.

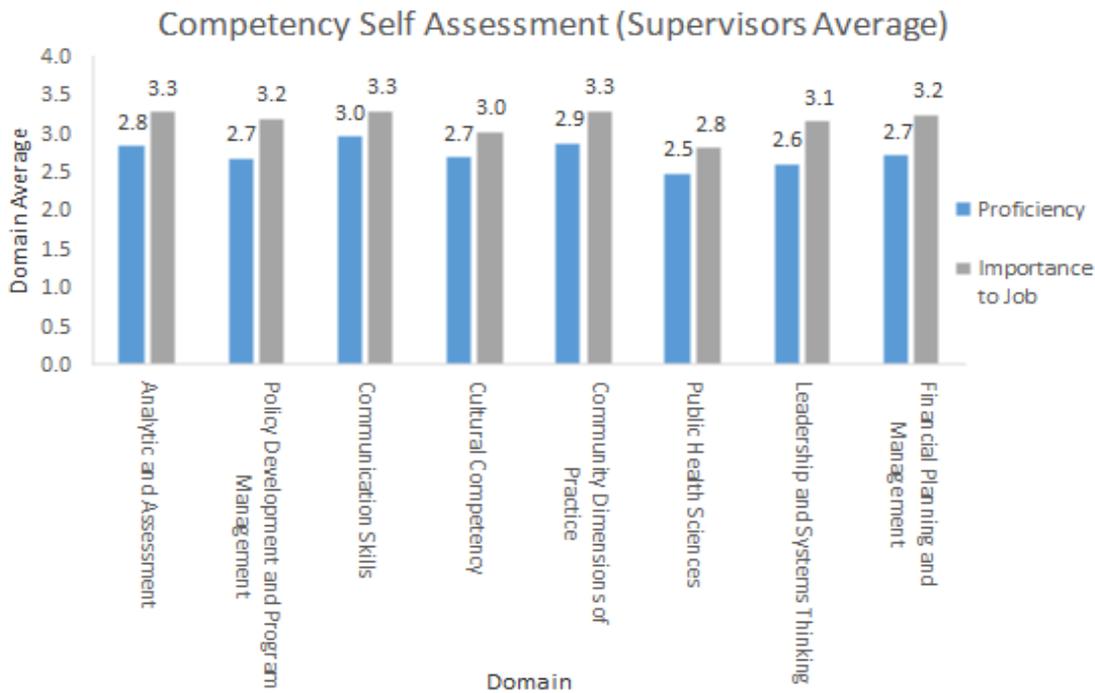**Competency Self Assessment: Financial Specialists and Administrative Assistants vs Other Program Staff**

	Average (Proficiency)	Average (Importance to Job)	Difference	Range (Individual proficiency)
Financial Planning and Management (Financial Specialists and Administrative Assistants)	2.3	2.4	-0.1	1.4-3.5
Financial Planning and Management (Program Staff)	2.7	3.2	-0.5	1.6-4.0

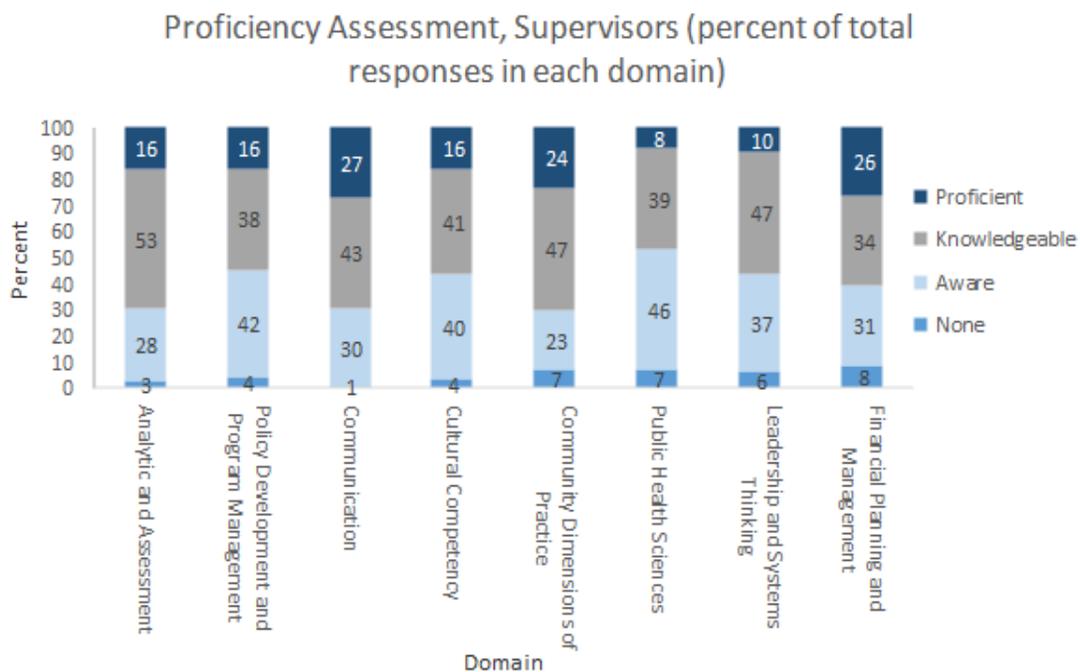**Competency Prioritization: Financial Specialists and Administrative Assistants**

Domain	Highest rated competencies (proficiency)	Lowest Rated Competencies (proficiency)
Financial Planning & Management	1. Adhere to the organization's policies and procedure 2. Apply basic human relations skills to internal collaborations, motivation of colleagues and resolution of conflicts	1. Contribute to the preparation of proposals for funding from external source 2. Describe the local, state and federal public health and health care system 3. Demonstrate public health informatics skills to improve program and business operation 4. Translate evaluation report information into program performance improvement action steps

Because both the proficiency and importance averages for the financial specialists and administrative assistant were low, this set of competencies may not fully represent the work done and competencies needed by this group of PHSD employees. A focus group or some other sort of assessment may be helpful in elucidating this group's training needs.

Results: Supervisors

Competency Self Assessment (Supervisors Average)

Domain	Proficiency	Importance to Job
Analytic and Assessment	2.8	3.3
Policy Development and Program Management	2.7	3.2
Communication Skills	3.0	3.3
Cultural Competency	2.7	3.0
Community Dimensions of Practice	2.9	3.3
Public Health Sciences	2.5	2.8
Leadership and Systems Thinking	2.6	3.1
Financial Planning and Management	2.7	3.2

PHSD supervisors were more likely than program staff and the overall PHSD employees to report a gap between average proficiency and average importance to current job in the competencies within each domain, indicating a larger felt need for trainings.

Proficiency Assessment, Supervisors (percent of total responses in each domain)

Domain	Proficient	Knowledgeable	Aware	None
Analytic and Assessment	16	53	28	3
Policy Development and Program Management	16	38	42	4
Communication	27	43	30	1
Cultural Competency	16	41	40	4
Community Dimensions of Practice	24	47	23	7
Public Health Sciences	8	39	46	7
Leadership and Systems Thinking	10	47	37	6
Financial Planning and Management	26	34	31	8

Supervisors were also more likely to report that they were only "Aware" of the listed competencies with more than 40% of the competencies in three domains compared to only 1 domain for Program Staff and no domains for PHSD staff overall.
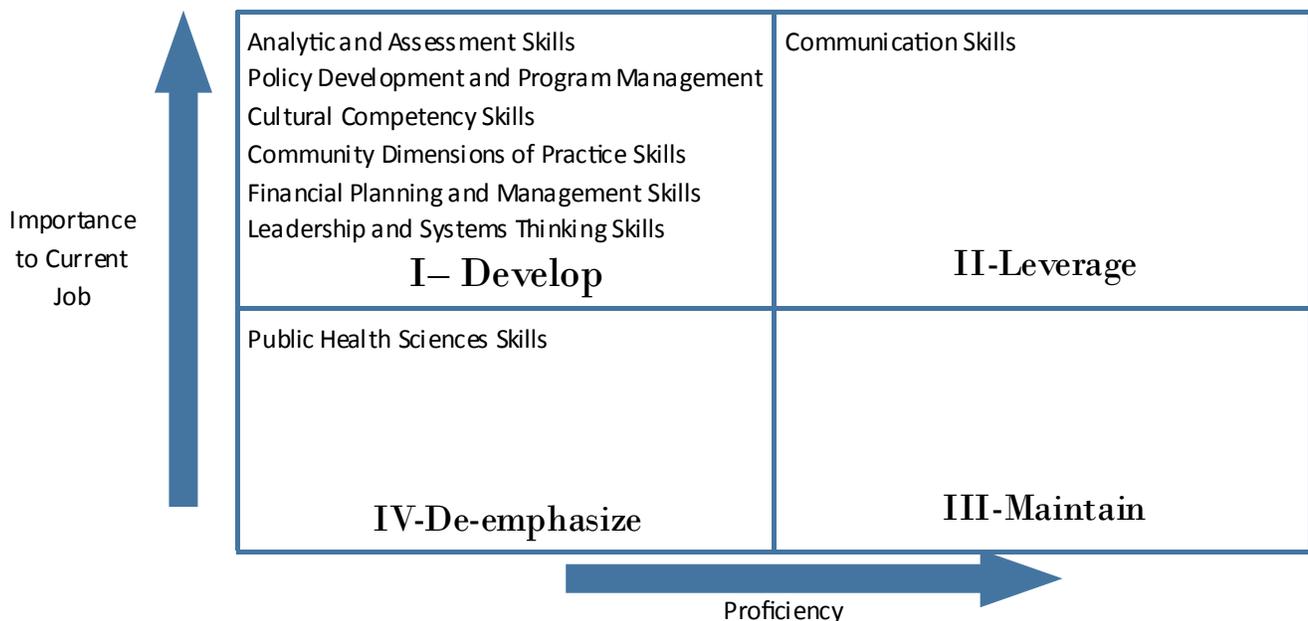
Results: Supervisors

Competency Prioritization: Supervisors

Higher Proficiency Domains (≥ 3.0)	Lower Proficiency Domains (<3.0)
Communication Skills	Analytic and Assessment Skills Policy Development and Program Management Cultural Competency Skills Community Dimensions of Practice Skills Financial Planning and Management Skills Leadership and Systems Thinking Skills Public Health Sciences Skills

Higher Importance Domains (≥ 3.0)	Lower Importance Domains (<3.0)
Analytic and Assessment Skills Policy Development and Program Management Communication Skills Cultural Competency Skills Community Dimensions of Practice Skills Financial Planning and Management Skills Leadership and Systems Thinking Skills	Public Health Sciences Skills

Competency Prioritization Matrix: Supervisors

	Analytic and Assessment Skills Policy Development and Program Management Cultural Competency Skills Community Dimensions of Practice Skills Financial Planning and Management Skills Leadership and Systems Thinking Skills I– Develop	Communication Skills II-Leverage
Importance to Current Job ↑	Public Health Sciences Skills IV-De-emphasize	 III-Maintain

→ Proficiency

Because of the larger gap between supervisors' self-rated proficiency and importance to their job, six out of the eight domains fall into the "Develop" quadrant of the Competency Prioritization Matrix.
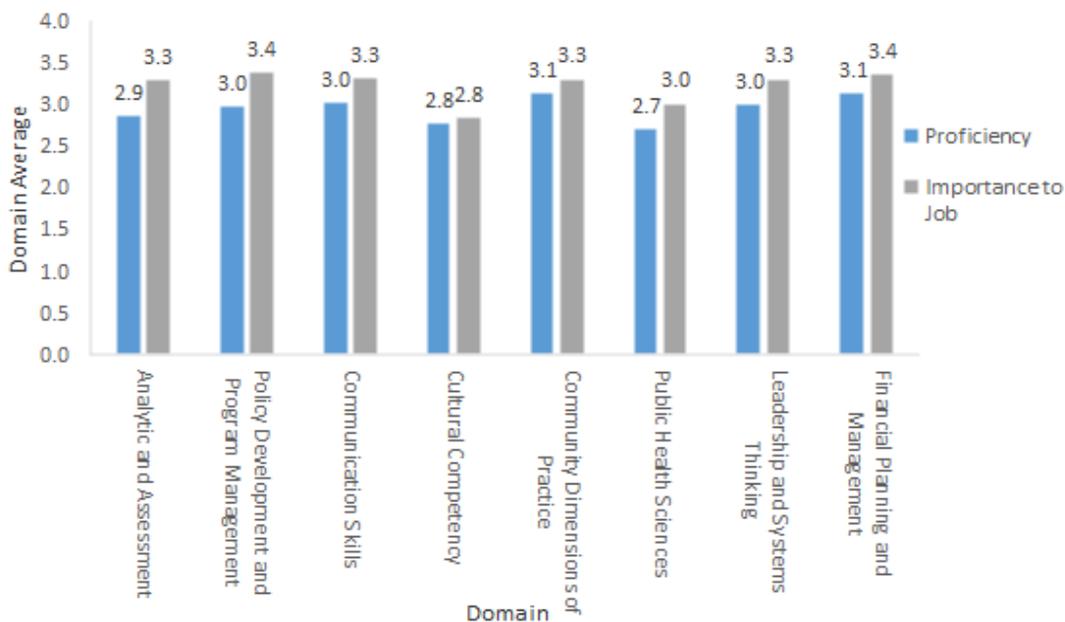
Highest and lowest rated competencies: Supervisors

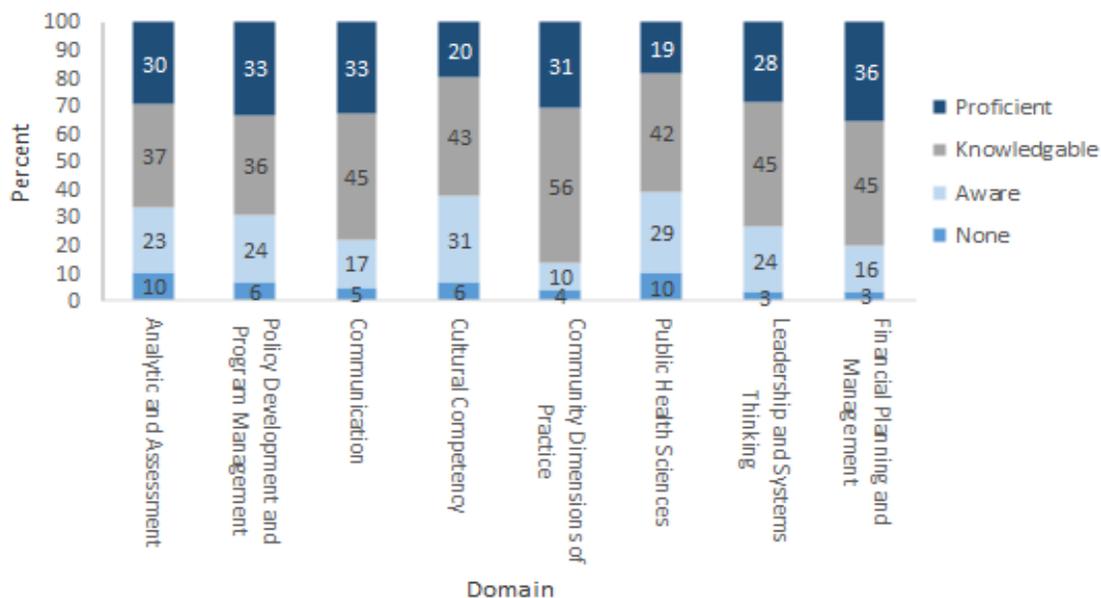| Domain	Highest rated competencies (proficiency)	Lowest Rated Competencies (proficiency)
Analytic and Assessment Skills	1. Reference sources of public health data and information 2. Use methods and instruments for collecting valid and reliable quantitative and qualitative data 3. Use information technology to collect, store and retrieve data	1. Make community-specific inferences from quantitative and qualitative community data 2. Identify gaps in data sources 3. Examine the integrity and comparability of data
Policy Development & Program Management	1. Manage public health programs consistent with public health laws and regulations 2. Develop plans to implement policies and program 3. Analyze information relevant to specific public health policy issue	1. Incorporate public health informatics practices 2. Describe the implications of policy 3. Develop policies for organizational plans, structures, and programs 4. Determine the feasibility and expected outcomes of policy options
Communication Skills	1. Communicate in writing and orally, in person, and through electronic means, with linguistic and cultural proficiency 2. Solicit input from individuals and organizations 3. Present demographic, statistical, programmatic and scientific information for use by professional and lay audience	1. Assess the health literacy of population served 2. Use a variety of approaches to disseminate public health information (e.g. social networks, media, blogs 3. Apply communication and group dynamic strategies in interactions with individuals and group
Cultural Competency	1. Incorporate strategies for interacting with persons from diverse background 2. Consider the role of cultural, social, and behavioral factors in the accessibility, availability, acceptability and delivery of public health service 3. Describe the need for a diverse public health workforce	1. Assess public health programs for their cultural competence 2. Explain the dynamic forces that contribute to cultural diversity 3. Respond to diverse needs that are the result of cultural difference
Community Dimensions of Practice	1. Establish linkages with key stakeholders 2. Maintain partnerships with key stakeholder 3. Facilitate collaboration and partnerships to ensure participation of key stakeholder	1. Negotiate for the use of community assets and resources 2. Use community input when developing public health policies and programs 3. Use group processes to advance community involvement
Public Health Sciences	1. Contribute to building the scientific base of public health 2. Retrieve scientific evidence from a variety of text and electronic source 3. Discuss the scientific foundation of the field of public health	1. Relate public health science skills to the Core Public Health Functions and Ten Essential Services of Public Health 2. Conduct a comprehensive review of the scientific evidence related to a public health issue, concern, or intervention 3. Determine the limitations of research findings
Leadership and Systems Thinking	1. Promote individual, team and organizational learning opportunities 2. Contribute to the measuring, reporting, and continuous improvement of organizational performance 3. Participate with stakeholders in identifying key values and a shared vision as guiding principles for community action	1. Analyze internal and external problems that may affect the delivery of Essential Public Health Service 2. Modify organizational practices in consideration of changes in the public health system, and the larger social, political, and economic environment 3. Incorporate systems thinking into public health practice
Financial Planning and Management	1. Manage programs within current and forecasted budget constraints 2. Use evaluation results to improve performance 3. Develop strategies for determining budget priorities based on federal, state and local financial contribution 4. Develop a programmatic budget	1. Implement the judicial and operational procedures of the governing body and/or administrative unit that oversees the operations of the public health organization 2. Apply public health informatics skills to improve program and business operations 3. Interpret the interrelationships of local, state and federal public health and health care systems for public health program management 4. Interpret the organizational structures, functions and authorities of local, state, and federal public health agencies for public health program management

Results: Upper Management

Competency Self Assessment (Upper Management Average)

Domain Average (y-axis: 0.0 to 4.0)

Domain	Proficiency	Importance to Job
Analytic and Assessment	2.9	3.3
Policy Development and Program Management	3.0	3.4
Communication Skills	3.0	3.3
Cultural Competency	2.8	2.8
Community Dimensions of Practice	3.1	3.3
Public Health Sciences	2.7	3.0
Leadership and Systems Thinking	3.0	3.3
Financial Planning and Management	3.1	3.4

On average, the PHSD upper managers rated the competencies within the domains higher in terms of important to their job compared with the other tiers. Relative to the supervisors, the upper managers had smaller gaps between their self-rated proficiency and importance, indicating a smaller felt need for training in most domains.

Proficiency Assessment, Upper Management (percent of total responses in each domain)

Percent (y-axis: 0 to 100)

Legend: Proficient, Knowledgable, Aware, None

Domain	Proficient	Knowledgable	Aware	None
Analytic and Assessment	30	37	23	10
Policy Development and Program Management	33	36	24	6
Communication	33	45	17	5
Cultural Competency	20	43	31	6
Community Dimensions of Practice	31	56	10	4
Public Health Sciences	19	42	29	10
Leadership and Systems Thinking	28	45	24	3
Financial Planning and Management	36	45	16	3

In 30% or more of the competencies in 5 of the 8 domains, upper managers rated themselves as proficient, more than any of the other tiers surveyed.
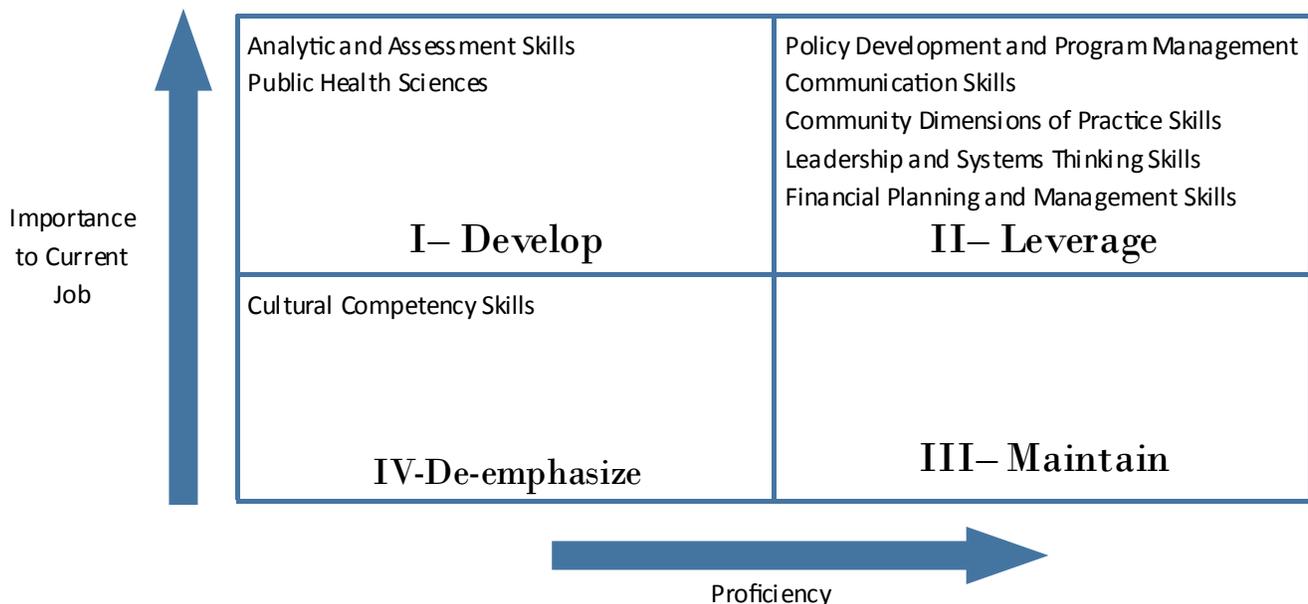
Results: Upper Management

Competency Prioritization: Upper Management

Higher Proficiency Domains (≥ 3.0)	Lower Proficiency Domains (<3.0)
Policy Development and Program Management Communication Skills Community Dimensions of Practice Skills Leadership and Systems Thinking Skills Financial Planning and Management Skills	Analytic and Assessment Skills Cultural Competency Skills Public Health Sciences

Higher Importance Domains (≥ 3.0)	Lower Importance Domains (<3.0)
Analytic and Assessment Skills Policy Development and Program Management Communication Skills Community Dimensions of Practice Skills Public Health Sciences Leadership and Systems Thinking Skills Financial Planning and Management Skills	Cultural Competency Skills

Competency Prioritization Matrix: Upper Management

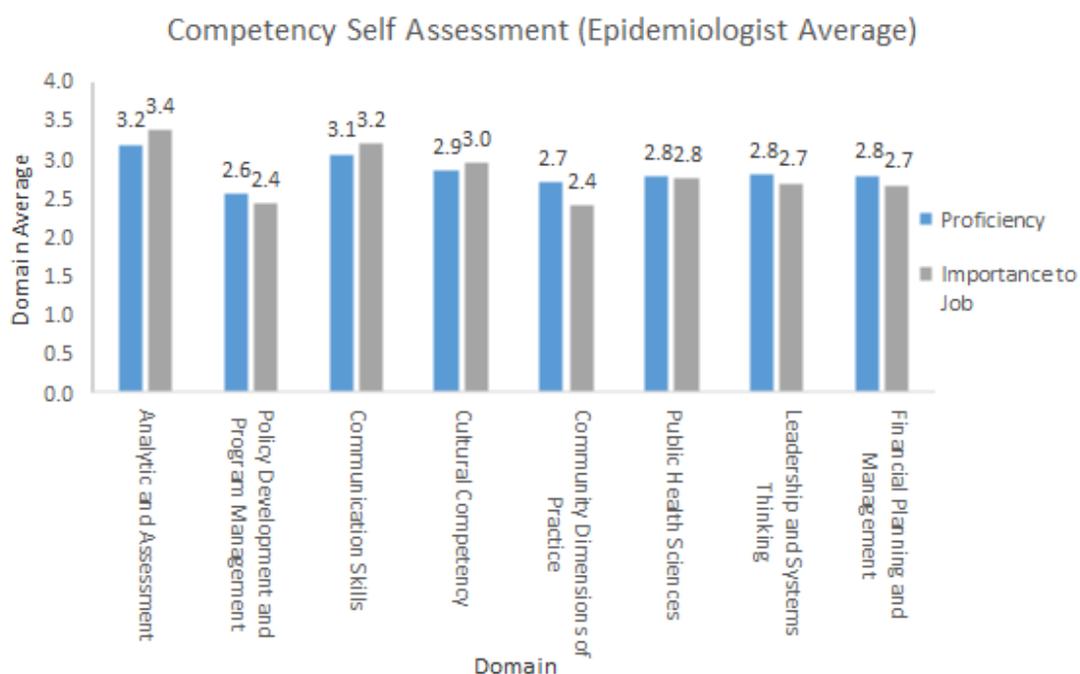| Importance to Current Job ↑	Analytic and Assessment Skills Public Health Sciences I– Develop	Policy Development and Program Management Communication Skills Community Dimensions of Practice Skills Leadership and Systems Thinking Skills Financial Planning and Management Skills II– Leverage
	Cultural Competency Skills IV-De-emphasize	III– Maintain

Proficiency →

Because upper managers were more likely to rate the competencies within the domains highly in both "proficiency" and "importance to job", the majority of the domains fall into the "Maintain" category for this tier.
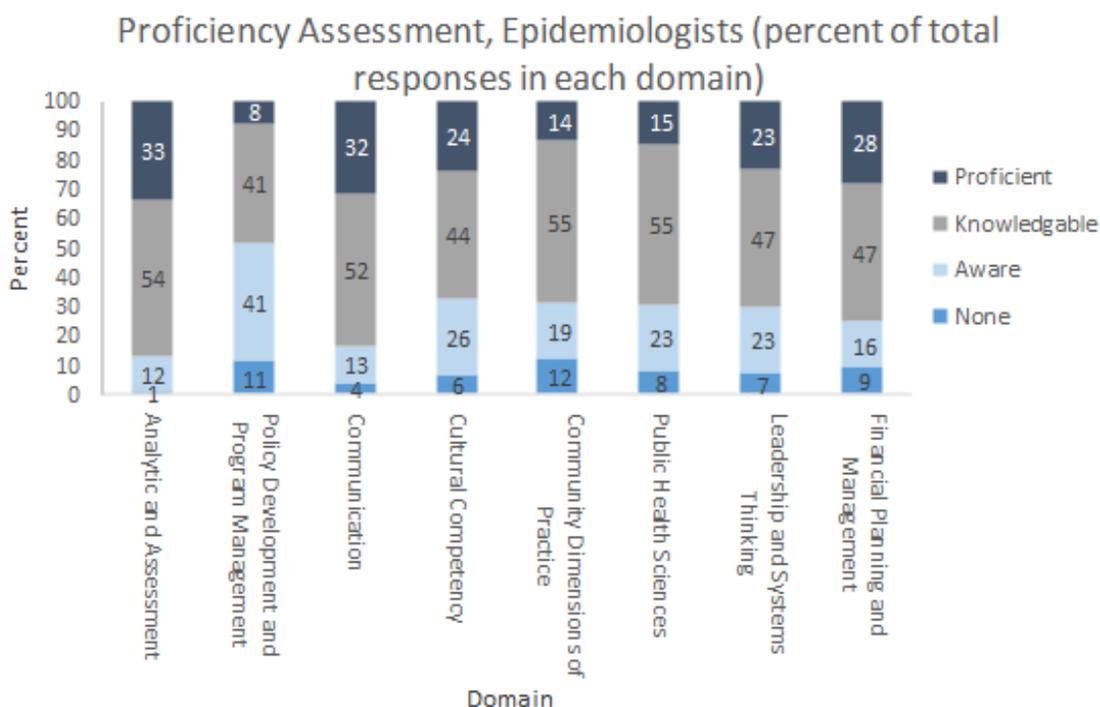
Highest and lowest rated competencies: Upper Management

Domain	Highest rated competencies (proficiency)	Lowest Rated Competencies (proficiency)
Analytic and Assessment Skills	1. Evaluate variables that measure public health conditions 2. Identify the resources to meet community needs 3. Expand access to public health data and information 4. Use information technology to collect, store and retrieve data	1. Determine community-specific trends from quantitative and qualitative community data 2. Rectify gaps in data sources 3. Critique methods and instruments for collecting valid and reliable quantitative and qualitative data 4. Evaluate the integrity and comparability of data
Policy Development & Program Management	1. Evaluate the integrity and comparability of data 2. Implement plans and programs consistent with policies 3. Evaluate information relevant to specific public health policy issues	1. Oversee public health informatics practices 2. Critique selected policy options using data and information 3. Integrate emerging trends of the fiscal, social, and political environment into public health strategic planning
Communication Skills	1. Ensure that the public health organization seeks input from other organizations and individuals 2. Communicate in writing and orally, in person, and through electronic means, with linguistic and cultural proficiency 3. Apply communication and group dynamic strategies	1. Ensure that the health literacy of populations served is considered throughout all communication strategies 2. Ensure a variety of approaches are considered and used to disseminate public health information 3. Interpret demographic, statistical, programmatic and scientific information for use by professional and lay audience
Cultural Competency	1. Ensure that there are strategies for interacting with persons from diverse backgrounds 2. Ensure the consideration of the role of cultural, social, and behavioral factors in the accessibility, availability, acceptability and delivery of public health services 3. Respond to diverse needs that are the result of cultural differences	1. Ensure the public health organization's cultural competence 2. Assess the public health organization for its cultural competence 3. Assess the dynamic forces that contribute to cultural diversity
Community Dimensions of Practice	1. Maintain partnerships with key stakeholders 2. Establish linkages with key stakeholders 3. Defend public health policies, programs and resource	1. Evaluate the effectiveness of community engagement strategies on public health policies, programs and resource 2. Ensure community input when developing public health policies and program 3. Negotiate for the use of community assets and resources through MOUs and other formal and informal agreement
Public Health Sciences	1. Integrate a review of the scientific evidence related to a public health issue, concern, or intervention into the practice of public health 2. Apply the basic public health sciences to public health policies and program 3. Incorporate the Core Public Health Functions and Ten Essential Services of Public Health into the practice of public health sciences	1. Contribute to building the scientific base of public health 2. Establish partnerships with academic and other organizations to expand the public health science base and dissemination of research finding 3. Critique the scientific foundation of the field of public health
Leadership and Systems Thinking	1. Promote mentoring, peer advising, coaching or other personal development opportunities for the public health workforce, including yourself 2. Partner with stakeholders to determine key values and a shared vision as guiding principles for community action 3. Advocate for individual, team and organizational learning opportunities within the organization 4. Ensure the measuring, reporting, and continuous improvement of organizational performance	1. Ensure organizational practices are in concert with changes in the public health system, and the larger social, political, and economic environment 2. Integrate systems thinking into public health practice 3. Resolve internal and external problems that may affect the delivery of Essential Public Health Services
Financial Planning and Management	1. Ensure that programs are managed within current and forecasted budget constraints 2. Defend a programmatic and organizational budget 3. Apply basic human relations skills to the management of organizations, motivation of personnel, and resolution of conflicts	1. Integrate public health informatics skills into program and business operations 2. Establish a performance management system 3. Manage the implementation of the judicial and operational procedures of the governing body and/or administrative unit that oversees the operations of the public health organization

Results: Epidemiologists

Competency Self Assessment (Epidemiologist Average)

Legend: Proficiency, Importance to Job

Domains (x-axis): Analytic and Assessment; Policy Development and Program Management; Communication Skills; Cultural Competency; Community Dimensions of Practice; Public Health Sciences; Leadership and Systems Thinking; Financial Planning and Management

Values (Proficiency, Importance to Job):
- Analytic and Assessment: 3.2, 3.4
- Policy Development and Program Management: 2.6, 2.4
- Communication Skills: 3.1, 3.2
- Cultural Competency: 2.9, 3.0
- Community Dimensions of Practice: 2.7, 2.4
- Public Health Sciences: 2.8, 2.8
- Leadership and Systems Thinking: 2.8, 2.7
- Financial Planning and Management: 2.8, 2.7

PHSD epidemiologists rated Analytic and Assessment and Communication Skills highly for both proficiency and importance to their jobs. Other domains rated more highly by other staff, such as policy development, program management and community dimensions of practice were rated as much less important by epidemiologists.

Proficiency Assessment, Epidemiologists (percent of total responses in each domain)

Legend: Proficient, Knowledgable, Aware, None

Domain	None	Aware	Knowledgable	Proficient
Analytic and Assessment	1	12	54	33
Policy Development and Program Management	11	41	41	8
Communication	4	13	52	32
Cultural Competency	6	26	44	24
Community Dimensions of Practice	12	19	55	14
Public Health Sciences	8	23	55	15
Leadership and Systems Thinking	7	23	47	23
Financial Planning and Management	9	16	47	28

87% of the competencies under Analytic and Assessment skills and 84% of the competencies under "Communication Skills" were rated as "Proficient" or Knowledgeable" indicating that epidemiologists feel well-trained in these areas.
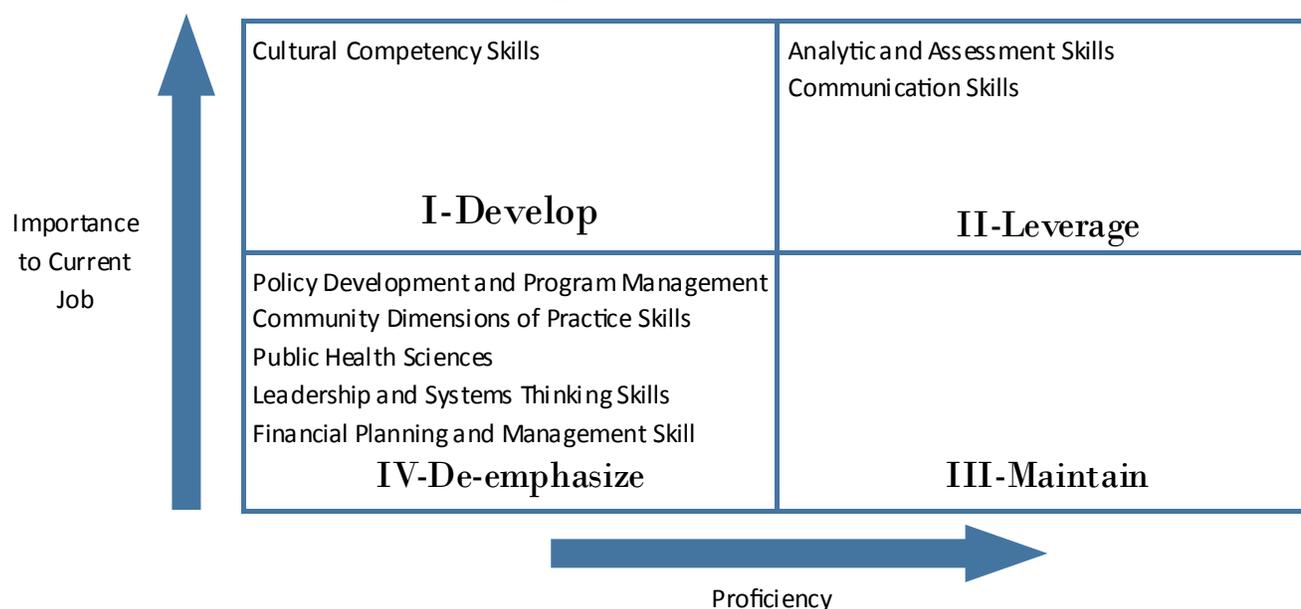
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Results: Epidemiologists

Competency Prioritization: Epidemiologists

Higher Proficiency Domains (≥ 3.0)	Lower Proficiency Domains (<3.0)
Analytic and Assessment Skills Communication Skills	Policy Development and Program Management Cultural Competency Skills Community Dimensions of Practice Skills Public Health Sciences Leadership and Systems Thinking Skills Financial Planning and Management Skills

Higher Importance Domains (≥ 3.0)	Lower Importance Domains (<3.0)
Analytic and Assessment Skills Communication Skills Cultural Competency Skills	Policy Development and Program Management Community Dimensions of Practice Skills Public Health Sciences Leadership and Systems Thinking Skills Financial Planning and Management Skills

Competency Prioritization Matrix: Epidemiologists

Importance to Current Job ↑	Cultural Competency Skills **I-Develop**	Analytic and Assessment Skills Communication Skills **II-Leverage**
	Policy Development and Program Management Community Dimensions of Practice Skills Public Health Sciences Leadership and Systems Thinking Skills Financial Planning and Management Skill **IV-De-emphasize**	**III-Maintain**

Proficiency →

Because epidemiologists were more likely to rate domains as "Lower Importance" even though they also rated their proficiency as lower, the majority of the domains fall into the "De-emphasize" quadrant for this tier.

Highest and lowest rated competencies: Epidemiologists

Domain	Highest rated competencies (proficiency)	Lowest Rated Competencies (proficiency)
Analytic and Assessment Skills	1. Compute frequencies and descriptive statistics 2. Define the data elements to be collected or reported 3. Maintain original data, but transform data as needed for specific analyses	1. Assess need for special analyses, including survival analyses, cost-effectiveness/cost benefit/cost utility analyses 2. Apply principles of investigation for endemic/sporadic illness or disease clusters vs. acute outbreaks 3. Develop assessment of the potential impact on the public's health from alternative interventions 4. Link any recommended behavioral interventions with risk communication and risk reduction methods 5. Incorporate etiologic principles into development of disease prevention and control strategies
Policy Development and Program Management	1. Demonstrate understanding of public health policies and policy development from an epidemiologic perspective 2. Provide epidemiologic and evidence-based information and data in the development of new policies, including data that demonstrate the need for change in existing policies 3. Adhere to rules and laws applying to government employees and funding sources regarding lobbying	1. Demonstrate ability to use designated channels to influence policy decisions made by entities other than the public health agency 2. Participate in creating decision memos that outline policy alternatives and facilitate scientifically sound decision-making 3. Support development of policies relating to epidemiologic activities 4. Advise in the development of draft policy language to support necessary epidemiologic actions and activities
Communication Skills	1. Demonstrate ability to explain or teach basic epidemiologic principles to non-epidemiologists and lower-level epidemiologist 2. Respond to public queries about epidemiologic data or related issues	1. Participate in the development of the design and content of Web-based communication 2. Use effective educational and behavioral techniques and technological tools to promote public health 3. Prepare manuscripts for scientific publication
Cultural Competency	Describe population by race; ethnicity; culture; societal, educational, and professional backgrounds; age; gender; religion; disability; and sexual orientation Use standard categories when defining special populations	1. Conduct investigations using languages and approaches tailored to population 2. Use knowledge of specific sociocultural factors in the population to interpret findings
Community Dimensions of Practice	1. Provide technical assistance to communities and outside partners with respect to surveillance, epidemiologic data, and evaluation 2. Identify partners and stakeholders necessary for epidemiologic investigation	1. Use strategies for reaching populations and individuals who traditionally may not have had the opportunity to participate in priority-setting processes 2. Use community-specific participation strategies in the planning, implementation, and evaluation of epidemiologic investigations when indicated 3. Clarify the roles of partners and stakeholders in the epidemiologic investigation
Public Health Sciences	1. Combine data and information from multiple sources to create new information to support public health decision-making 2. Relate basic etiologic processes for human diseases to subject matter areas of interest (e.g., infectious diseases, chronic diseases) 3. Describe the role and influence of sociobehavioral factors (including community, political, social, family, and individual behavioral factors) in health risks and health status	1. Implement necessary specimen collection, storage, and transportation measures 2. Lead the development of integrated, costs-effective, public health informations systems that are consistent with a larger information architecture 3. Incorporate etiologic principles into development of disease prevention and control strategies
Leadership and Systems Thinking	1. Support the epidemiologic perspective in the agency strategic planning process 2. Demonstrate knowledge of performance measure	1. Establish mentoring, peer advising, coaching and other personal development opportunities for the public health workforce 2. Lead process to develop new performance measures if necessary
Financial Planning & Management	1. Maintain accurate records	1. Assist in developing a fiscally sound budget that will support the activities defined in the operational plan and is consistent with the financial rules of the agency

Results: Epidemiologists

The epidemiologists were given a much longer survey based on the CSTE's *Competencies for Applied Epidemiologists in Governmental Public Health Agencies*. This set of competencies not only features the competencies under the 8 domains used in the Council on Linkages *Core Competencies for Public Health Professionals*, but also includes subdomains under each of these domains. These subdomains were included the assessment of the PHSD epidemiologists. The average results are the subdomains are below.

Competency Self-assessment: Subdomain averages for epidemiologists

Subdomain	Average (Proficiency)	Average (Importance to Job)	Difference	Range (Individual proficiency)
Analytic and Assessment Skills				
Identify public health problems pertinent to the population	3.4	3.8	-0.4	2.9-4.0
Conduct surveillance activities	3.3	3.4	-0.1	2.6-4.0
Investigate acute and chronic conditions or other adverse outcomes	3.1	2.8	0.2	1.8-4.0
Apply principles of good ethical/legal practice to surveillance	3.1	3.3	-0.2	1.9-4.0
Manage data from surveillance, investigations, or other sources	3.2	3.5	-0.3	2.4-4.0
Analyze data from an epidemiological investigation or study	3.3	3.7	-0.4	2.7-4.0
Summarize results of the analysis and draw conclusions	3.1	3.3	-0.1	2.2-3.9
Recommend evidence-based interventions and control measures	2.8	2.8	0.0	1.9-3.7
Evaluate Programs	3.3	3.1	0.1	1.8-4.0
Public Health Sciences Skills				
Use current knowledge of causes of disease to guide practice	2.8	2.8	0.0	1.8-3.8
Use laboratory resources to support epidemiologic activities	2.1	2.4	-0.3	1.0-3.3
Apply principles of informatics and manage information systems	3.0	3.2	-0.2	2.3-3.8
Communication Skills				
Prepare written and oral reports and presentations	3.2	3.4	-0.2	2.1-4.0
Risk and interpersonal communication and use of communication	2.8	2.8	0.0	1.8-3.8
Community Dimensions of Practice Skills				
Provide epidemiologic input into programs and planning	2.7	2.3	0.3	1.0-3.6
Participate in the development of partnerships	2.7	2.4	0.3	1.0-4.0

Results: Laboratory

Using the same categories as the 2011 *National Laboratory Capacity Assessment,* each non-administrative/ financial Laboratory Services Bureau staff person was asked about 38 potential areas of competency related to laboratory practice. For each the 38 categories, they were asked three questions:

1. Which of the following formal academic or professional courses have you taken? This would include educational courses you have attended or taken over the course of your career (i.e., seminars, webinars, trainings or teleconferences). The lab staff were asked to indicate "Yes" or "No" to this training question.

2. Next they were asked to rate their level of proficiency in each area on a scale of 1-4 (1=None, 2=Aware, 3=Knowledgeable, 4=Proficient)

3. Finally for each area of competency, staff were asked to rate the importance of the competency to their current position on a scale of 1 to 4. 1=Not important at all, 2=Of minimal importance, 3=Somewhat important, 4=Very Important).

The tables on the following pages summarize these 38 areas, representing averages for the Public Health Laboratory Staff and the Environmental Health Laboratory staff separately. The tables shows the percentage of public health laboratory staff and environmental health laboratory staff who indicate they had received training in each area, the average proficiency and importance scores for each competency area and the difference between the two scores-representing a "training gap" if the number is negative.

For the "Proficiency" and "Importance to Job" scores, we selected an average score of 3.0 or higher as indicating high importance or high proficiency and an average score of 2.9 or lower as indicating low importance or low proficiency. For workforce development purposes, areas where staff self-report low proficiency but high importance are competency areas to "develop" or target for training.

Results: Demographics

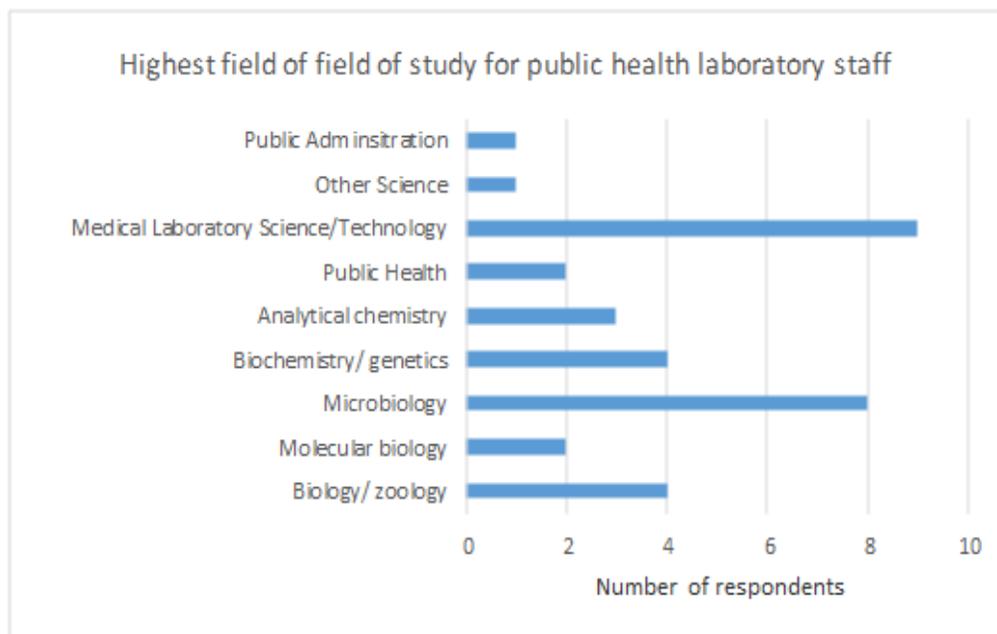**Chart 1. Highest Field of Study for Public Health Laboratory only**

Highest field of field of study for public health laboratory staff

Table 9. Licensures and certifications currently held by laboratory staff

	Number certified	Percent of all respondents certified
National generalist certification such as Medical Laboratory Scientist, Medical	14	52%
Technologist, Environmental Laboratory Technologist (ASCP BOC, AMT, AAB, ISCLT, NREP)	3	11%
National specialist certification, such as Microbiology, Molecular Biology or Analytical	5	19%
Chemistry (ABMM, ABMLI, NRCM, AAB, ASCP BOC)	0	0%
Licensure by a state entity to practice laboratory science	15	56%
Other lab licenses or certifications	7	26%
I do not currently hold any licenses or certifications	3	11%

For both of these questions, Laboratory Service Bureau staff were instructed to select all that applied, so multiple degrees and/or certifications and licensures were selected by some staff. Almost all staff in the bureau indicated that their degree was in a scientific field, including around half who indicated that they studied medical laboratory science or technology or microbiology. All but three respondents from the lab indicated that they hold one or more licenses or certifications.

Percent of Public Health Laboratory and Environmental Health Laboratory staff that report having taken a professional or academic course in the listed competency areas*

Competency Area	Have taken professional or academic course in this area (percent)- PH Lab	Have taken professional or academic course in this area (percent)- Environmental Lab
Analytical chemistry	90.0	83.3
Bacteriology laboratory or practicum	100.0	50.0
Biochemistry	80.0	83.3
Bioinformatics	16.7	0.0
Biostatistics/public health statistics	57.9	0.0
Chemistry	95.0	83.3
Clinical, medical, pathogenic bacteriology	95.0	50.0
Communication	95.0	60.0
Emergency preparedness and response	85.7	83.3
Environmental chemistry	33.3	40.0
Environmental science/environmental health	38.9	60.0
Environmental/water microbiology	16.7	60.0
Epidemiology	47.4	0.0
Ethics	85.0	66.7
General laboratory practice	100.0	60.0
Health behavior/health education	61.9	40.0
Immunology	95.2	50.0
Informatics	27.8	40.0
Laboratory design, workflow and operations	77.8	20.0
Laboratory instrumentation/instrumental analysis	95.0	50.0
Laboratory safety and security	95.2	66.7
Leadership and Management	57.9	25.0
Microbiology	100.0	80.0
Molecular biology and molecular diagnostics	68.4	25.0
Professionalism	61.1	0.0
PH administration, management theory and practice	11.1	0.0
PH emergency/disaster preparedness and response	81.0	33.3
PH information management systems for data handling/communications	33.3	20.0
Public health laboratory management	22.2	0.0
Public health law	11.1	0.0
Public health policy in state and federal government	16.7	0.0
Quality Management System	100.0	40.0
Research	55.0	50.0
Surveillance	38.9	0.0
Virology	73.7	50.0
Virology laboratory or practicum	61.1	50.0
Workforce Training	50.0	20.0
Writing (grant proposals, scientific publications)	47.4	50.0

*There are large differences between the reported training percentages for PH vs Environmental Health staff. The differences in training and job duties for these two groups is the primary reason they were separated for analysis.

Average proficiency, importance to job and difference between proficiency and importance for all competency areas, Public Health Laboratory Staff

Competency Area	Proficiency (Average)	Importance to Job (Average)	Difference
Analytical chemistry	2.9	2.4	0.5
Bacteriology laboratory or practicum	3.0	3.1	-0.1
Biochemistry	2.7	2.4	0.3
Bioinformatics	1.8	2.0	-0.3
Biostatistics/public health statistics	2.0	2.1	-0.1
Chemistry	3.0	2.5	0.5
Clinical, medical, pathogenic bacteriology	2.9	3.1	-0.2
Communication	3.2	3.6	-0.4
Emergency preparedness and response	2.8	3.0	-0.2
Environmental chemistry	1.9	1.9	0.0
Environmental science/environmental health	2.0	1.7	0.2
Environmental/water microbiology	1.7	1.6	0.1
Epidemiology	2.1	2.5	-0.4
Ethics	3.3	3.1	0.2
General laboratory practice	3.8	3.8	0.0
Health behavior/health education	2.6	2.2	0.5
Immunology	3.0	2.7	0.3
Informatics	2.0	2.3	-0.2
Laboratory design, workflow and operations	2.5	3.0	-0.5
Laboratory instrumentation/instrumental analysis	3.1	3.2	0.0
Laboratory safety and security	3.5	3.5	0.0
Leadership and Management	2.6	2.9	-0.3
Microbiology	3.1	3.2	0.0
Molecular biology and molecular diagnostics	2.9	2.9	0.0
Professionalism	3.3	3.5	-0.2
Public health administration, management theory and practice	1.9	2.3	-0.4
Public health emergency/disaster preparedness and response	2.6	3.0	-0.3
Public health information management systems for data handling/	2.2	2.8	-0.6
Public health laboratory management	2.0	2.4	-0.4
Public health law	1.5	2.0	-0.5
Public health policy in state and federal government	1.7	2.2	-0.5
Quality Management System (lab quality assurance, mission evaluation,	3.1	3.4	-0.3
Research	2.4	2.0	0.4
Surveillance	2.3	2.7	-0.4
Virology	2.7	2.5	0.2
Virology laboratory or practicum	2.5	2.3	0.2
Workforce Training	2.6	2.7	-0.1
Writing (grant proposals, scientific publications)	2.2	2.3	-0.1

Average proficiency, importance to job and difference between proficiency and importance for all competency areas, Environmental Health Laboratory Staff

Competency Area	Proficiency (Average)	Importance to Job (Average)	Difference
Analytical chemistry	3.8	4.0	-0.2
Bacteriology laboratory or practicum	1.6	2.2	-0.6
Biochemistry	2.5	1.7	0.8
Bioinformatics	1.0	1.5	-0.5
Biostatistics/public health statistics	1.4	1.2	0.2
Chemistry	4.0	4.0	0.0
Clinical, medical, pathogenic bacteriology	1.6	1.2	0.4
Communication	3.0	3.5	-0.5
Emergency preparedness and response	2.7	2.8	-0.2
Environmental chemistry	3.0	3.2	-0.2
Environmental science/environmental health	3.0	3.3	-0.3
Environmental/water microbiology	3.3	3.8	-0.5
Epidemiology	1.6	1.4	0.2
Ethics	3.3	3.5	-0.2
General laboratory practice	4.0	3.7	0.3
Health behavior/health education	2.0	1.8	0.2
Immunology	1.8	1.0	0.8
Informatics	2.0	2.6	-0.6
Laboratory design, workflow and operations	2.7	2.7	0.0
Laboratory instrumentation/instrumental analysis	3.7	3.5	0.2
Laboratory safety and security	3.0	2.8	0.2
Leadership and Management	2.8	2.3	0.5
Microbiology	2.4	1.8	0.6
Molecular biology and molecular diagnostics	1.6	1.2	0.4
Professionalism	2.8	2.8	0.0
Public health administration, management theory and practice	1.2	1.2	0.0
Public health emergency/disaster preparedness and response	2.7	2.7	0.0
Public health information management systems for data handling/ communications	2.4	2.4	0.0
Public health laboratory management	1.4	1.2	0.2
Public health law	1.4	1.6	-0.2
Public health policy in state and federal government	1.8	2.2	-0.4
Quality Management System (lab quality assurance, mission evaluation, improvement & regulatory requirements)	3.3	3.2	0.2
Research	2.8	1.8	1.0
Surveillance	1.4	1.6	-0.2
Virology	1.4	1.2	0.2
Virology laboratory or practicum	1.2	1.0	0.2
Workforce Training	1.8	1.8	0.0
Writing (grant proposals, scientific publications)	2.2	1.3	0.8

Results: Laboratory

Competency Prioritization: Public Health Laboratory

Higher Proficiency Domains (≥ 3.0)	Lower Proficiency Domains (<3.0)
Immunology Bacteriology laboratory or practicum Laboratory instrumentation/instrumental analysis Microbiology Quality Management System (lab quality assurance, mission evaluation, improvement & regulatory requirements) Communication Ethics Professionalism Laboratory safety and security General laboratory practice	Public health law Environmental/water microbiology Public health policy in state and federal government Bioinformatics Environmental chemistry Public health administration, management theory and practice Environmental science/environmental health Biostatistics/public health statistics Informatics Public health laboratory management Epidemiology Public health information management systems for data handling/communications Writing (grant proposals, scientific publications) Surveillance Research Laboratory design, workflow and operations Virology laboratory or practicum Leadership and Management Health behavior/health education Public health emergency/disaster preparedness and response Workforce Training Biochemistry Virology Emergency preparedness and response Analytical chemistry Clinical, medical, pathogenic bacteriology Molecular biology and molecular diagnostics

Results: Laboratory

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Competency Prioritization: Public Health Laboratory (continued)

Higher Importance Domains (≥ 3.0)	Lower Importance Domains (<3.0)
Laboratory design, workflow and operations Public health emergency/disaster preparedness and response Emergency preparedness and response Clinical, medical, pathogenic bacteriology Bacteriology laboratory or practicum Ethics Laboratory instrumentation/instrumental analysis Microbiology Quality Management System (lab quality assurance, mission evaluation, improvement & regulatory requirements) Professionalism Laboratory safety and security Communication General laboratory practice	Environmental/water microbiology Environmental science/environmental health Environmental chemistry Research Public health law Bioinformatics Biostatistics/public health statistics Health behavior/health education Public health policy in state and federal government Public health administration, management theory and practice Informatics Writing (grant proposals, scientific publications) Virology laboratory or practicum Public health laboratory management Biochemistry Analytical chemistry Chemistry Epidemiology Virology Surveillance Immunology Workforce Training Public health information management systems for data handling/communications Leadership and Management Molecular biology and molecular diagnostics

Competency Prioritization Matrix: PH Laboratory

Laboratory design, workflow and operations Public health emergency/disaster preparedness and response Emergency preparedness and response Clinical, medical, pathogenic bacteriology	Bacteriology laboratory or practicum Ethics Laboratory instrumentation/instrumental analysis Microbiology Quality Management System (lab quality assurance, mission evaluation, improvement & regulatory requirements) Professionalism Laboratory safety and security Communication General laboratory practice
I– Develop	**II-Leverage**
Environmental/water microbiology Environmental science/environmental health Environmental chemistry Research Public health law Bioinformatics Biostatistics/public health statistics Health behavior/health education Public health policy in state and federal government Public health administration, management theory and practice Informatics Writing (grant proposals, scientific publications) Virology laboratory or practicum Public health laboratory management Biochemistry Analytical chemistry Chemistry Epidemiology Virology Surveillance Workforce Training Public health information management systems for data handling/communications Leadership and Management Molecular biology and molecular diagnostics	Immunology
	III-Maintain

Importance to Current Job

Proficiency

Results: Laboratory

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Competency Prioritization: Environmental Health Laboratory

Higher Proficiency Domains (≥ 3.0)	Lower Proficiency Domains (<3.0)
Environmental science/environmental health Environmental chemistry Laboratory safety and security Communication Environmental/water microbiology Ethics Quality Management System (lab quality assurance, mission evaluation, improvement & regulatory requirements) Laboratory instrumentation/instrumental analysis Analytical chemistry Chemistry General laboratory practice	Bioinformatics Public health administration, management theory and practice Virology laboratory or practicum Public health law Biostatistics/public health statistics Public health laboratory management Virology Surveillance Epidemiology Molecular biology and molecular diagnostics Clinical, medical, pathogenic bacteriology Bacteriology laboratory or practicum Public health policy in state and federal government Immunology Workforce Training Health behavior/health education Informatics Writing (grant proposals, scientific publications) Public health information management systems for data handling/communications Microbiology Biochemistry Laboratory design, workflow and operations Public health emergency/disaster preparedness and response Emergency preparedness and response Research Professionalism Leadership and Management

Results: Laboratory

Competency Prioritization: Environmental Health Laboratory (continued)

Higher Importance Domains (≥ 3.0)	Lower Importance Domains (<3.0)
Environmental chemistry Quality Management System (lab quality assurance, mission evaluation, improvement & regulatory requirements) Environmental science/environmental health Communication Ethics Laboratory instrumentation/instrumental analysis General laboratory practice Environmental/water microbiology Analytical chemistry Chemistry	Virology laboratory or practicum Immunology Public health administration, management theory and practice Biostatistics/public health statistics Public health laboratory management Virology Molecular biology and molecular diagnostics Clinical, medical, pathogenic bacteriology Writing (grant proposals, scientific publications) Epidemiology Bioinformatics Public health law Surveillance Biochemistry Health behavior/health education Microbiology Research Workforce Training Bacteriology laboratory or practicum Public health policy in state and federal government Leadership and Management Public health information management systems for data handling/communications Informatics Laboratory design, workflow and operations Public health emergency/disaster preparedness and response Professionalism Emergency preparedness and response Laboratory safety and security

Competency Prioritization Matrix: Environmental Lab

II-Leverage

Environmental science/environmental health
Environmental chemistry
Communication
Environmental/water microbiology
Ethics
Quality Management System
Laboratory instrumentation/instrumental analysis
Analytical chemistry
Chemistry
General laboratory practice

I– Develop

IV-De-emphasize

Virology laboratory or practicum
Immunology
Public health administration, management theory and practice
Biostatistics/public health statistics
Public health laboratory management
Virology
Molecular biology and molecular diagnostics
Clinical, medical, pathogenic bacteriology
Writing (grant proposals, scientific publications)
Epidemiology
Bioinformatics
Public health law
Surveillance
Biochemistry
Health behavior/health education
Microbiology
Research
Workforce Training
Bacteriology laboratory or practicum
Public health policy in state and federal government
Leadership and Management
Public health information management systems for data handling/
communications
Informatics
Laboratory design, workflow and operations
Public health emergency/disaster preparedness and response
Professionalism
Emergency preparedness and response
Laboratory safety and security

III-Maintain

Laboratory safety and security

Importance to Current Job

Proficiency

Results: Laboratory

Competency areas where less than 50% of Public Health Laboratory staff report training

Public health administration, management theory and practice

Public health law

Bioinformatics

Public health policy in state and federal government

Environmental/water microbiology

Public health laboratory management

Informatics

Public health information management systems for data handling/communications

Environmental chemistry

Surveillance

Environmental science/environmental health

Writing (grant proposals, scientific publications)

Epidemiology

Competency areas where less than 50% of Environmental Health Laboratory staff report training

Public health administration, management theory and practice

Public health law

Bioinformatics

Public health policy in state and federal government

Public health laboratory management

Surveillance

Epidemiology

Biostatistics/public health statistics

Professionalism

Public health information management systems for data handling/communications

Workforce Training

Laboratory design, workflow and operations

Leadership and Management

Molecular biology and molecular diagnostics

Public health emergency/disaster preparedness and response

Informatics

Environmental chemistry

Health behavior/health education

Quality Management System (lab quality assurance, mission evaluation, improvement & regulatory requirements)

Results: Laboratory

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Competency areas with highest proficiency/importance average difference (>-0.2), Public Health Laboratory

Public health information management systems for data handling/communications
Public health law
Public health policy in state and federal government
Laboratory design, workflow and operations
Public health administration, management theory and practice
Epidemiology
Surveillance
Public health laboratory management
Communication
Leadership and Management
Public health emergency/disaster preparedness and response
Quality Management System (lab quality assurance, mission evaluation, improvement & regulatory requirements)
Bioinformatics

Competency areas with highest proficiency/importance average difference (>-0.2),
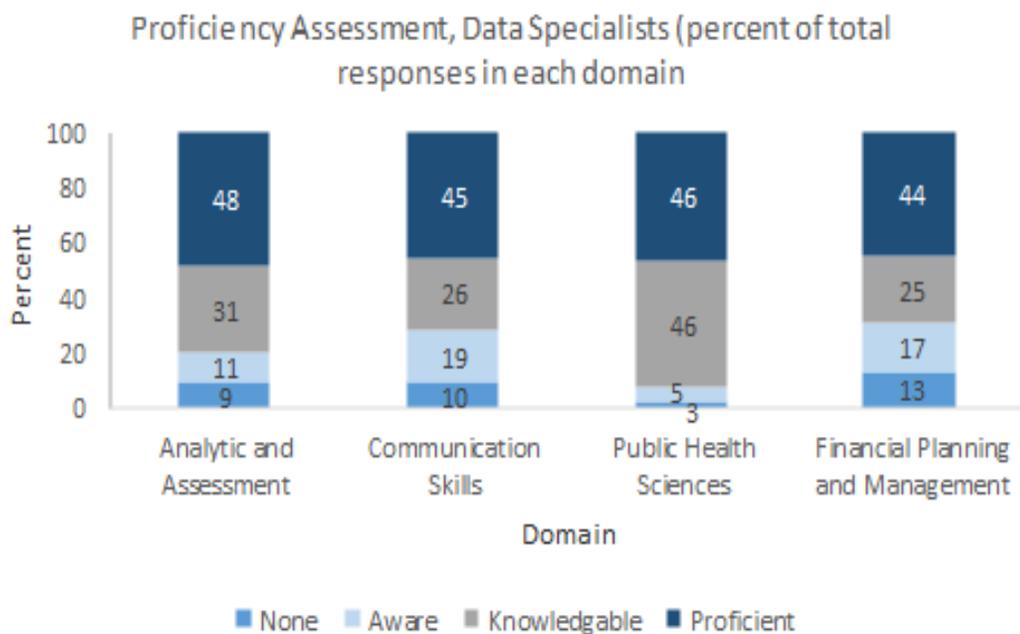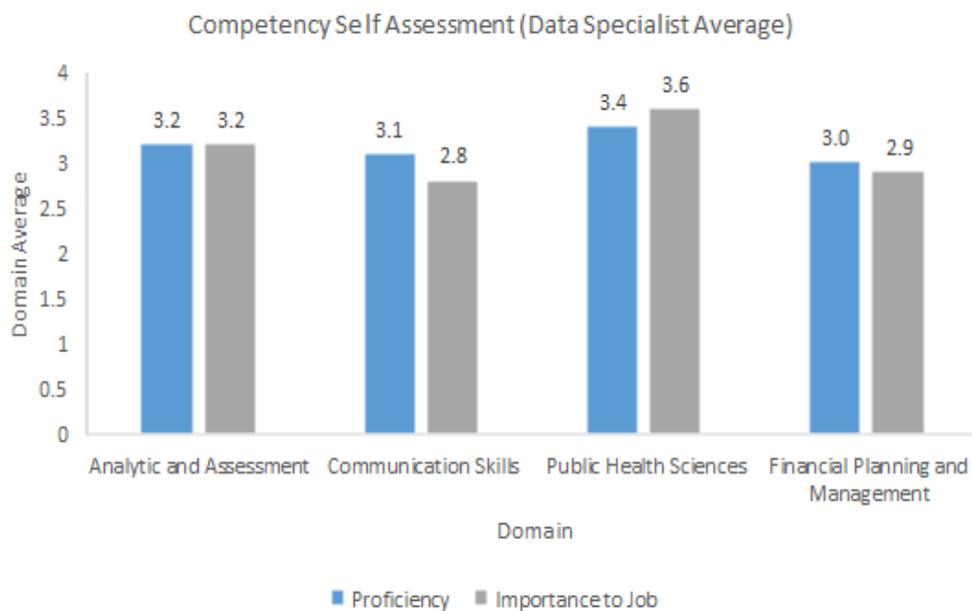Environmental Health Laboratory

Informatics
Bacteriology laboratory or practicum
Communication
Bioinformatics
Environmental/water microbiology
Public health policy in state and federal government
Environmental science/environmental health

Because no competency areas fell into the "Develop" domain for the Environmental Health Lab, the domains in the "De-emphasize" domain with a larger "training gap" difference between importance and proficiency averages will be the focus for developmental training for the environmental lab personnel.

Results: Data Specialists

Data specialists were administered a survey with 38 of the Tier 1 competencies from the *Competencies for Applied Epidemiologists in Governmental Public Health Agencies*. They were asked to assess competencies in four domains: Analytic and Assessment, Communication, Public Health Sciences and Financial Planning and Management skills.

Competency Self Assessment (Data Specialist Average)

Domain	Proficiency	Importance to Job
Analytic and Assessment	3.2	3.2
Communication Skills	3.1	2.8
Public Health Sciences	3.4	3.6
Financial Planning and Management	3.0	2.9

Proficiency Assessment, Data Specialists (percent of total responses in each domain

Domain	None	Aware	Knowledgable	Proficient
Analytic and Assessment	9	11	31	48
Communication Skills	10	19	26	45
Public Health Sciences	3	5	46	46
Financial Planning and Management	13	17	25	44

Results: Data Specialists

Competency Prioritization: Data Specialists

Higher Proficiency Domains (≥ 3.0)	Lower Proficiency Domains (<3.0)
Analytic and Assessment Skills Communication Skills Public Health Sciences Financial Planning and Management Skills	

Higher Importance Domains (≥ 3.0)	Lower Importance Domains (<3.0)
Analytic and Assessment Skills Public Health Sciences	Communication Skills Financial Planning and Management Skills

Competency Prioritization Matrix: Data specialists

	Analytic and Assessment Skills Public Health Sciences
I-Develop	**II-Leverage**
	Communication Skills Financial Planning and Management Skills
	III-Maintain

Importance to Current Job
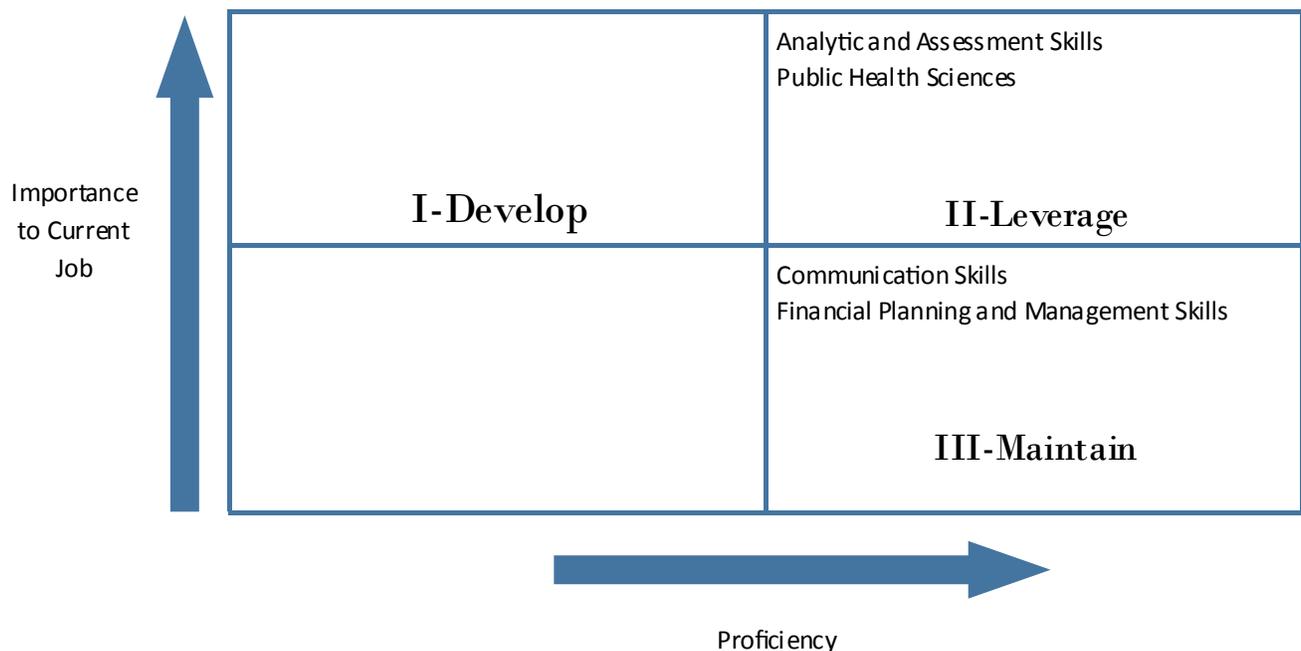
Proficiency

Data specialists rated themselves relatively highly in all domains. The lowest domain average for proficiency was "Financial Planning and Management Skills" and the only domain with a "training gap" (average importance > average proficiency) was "Public Health Sciences."

Conclusion: Training Agenda

From these results, the following domains are recommended for training, as they fell into the "Develop" quadrant in the Competency Prioritization Matrix. The lowest rated competencies within each domain are also included in the table as potential areas of focus for developed trainings.

Training agenda for PHSD Overall and by Tier

Tier	Overall
Domain to Develop	Analytic and Assessment Skills, Community Dimensions of Practice and Policy Development and Program Planning
Tier	Program Staff
Domain to Develop	Policy Development and Program Management
Lowest rated competencies	1. Demonstrate the use of public health informatics practices and procedures 2. Explain the expected outcomes of policy options (e.g. health, fiscal, administrative, legal, ethical, social, political) 3. Describe public health laws and regulations governing public health programs
Domain to Develop	Analytic and Assessment
Lowest rated competencies	1. Collect quantitative and qualitative community data 2. Describe the public health applications of quantitative and qualitative data 3. Identify gaps in data sources
Domain to Develop	Cultural Competency
Lowest rated competencies	1. Participate in the assessment of the cultural competence of the public health organization 2. Describe the need for a diverse public health workforce 3. Describe the dynamic forces that contribute to cultural diversity
Tier	Supervisors
Domain to Develop	Analytic and Assessment Skills
Lowest rated competencies	1. Make community-specific inferences from quantitative and qualitative community data 2. Identify gaps in data sources 3. Examine the integrity and comparability of data
Domain to Develop	Policy Development and Program Management
Lowest rated competencies	1. Incorporate public health informatics practices 2. Describe the implications of policy 3. Develop policies for organizational plans, structures, and programs 4. Determine the feasibility and expected outcomes of policy options
Domain to Develop	Cultural Competency
Lowest rated competencies	1. Assess public health programs for their cultural competence 2. Explain the dynamic forces that contribute to cultural diversity 3. Respond to diverse needs that are the result of cultural difference
Domain to Develop	Community Dimensions of Practice Skills
Lowest rated competencies	1. Negotiate for the use of community assets and resources 2. Use community input when developing public health policies and programs 3. Use group processes to advance community involvement
Domain to Develop	Leadership and Systems Thinking
Lowest rated competencies	1. Analyze internal and external problems that may affect the delivery of Essential Public Health Service 2. Modify organizational practices in consideration of changes in the public health system, and the larger social, political, and economic environment 3. Incorporate systems thinking into public health practice
Domain to Develop	Financial Planning and Management
Lowest rated competencies	1. Implement the judicial and operational procedures of the governing body and/or administrative unit that oversees the operations of the public health organization 2. Apply public health informatics skills to improve program and business operations

Conclusion: Training Agenda

Training agenda for PHSD overall and by Tier, continued

Tier	Upper Management
Domain to Develop	Analytic and Assessment
Lowest rated competencies	1. Determine community-specific trends from quantitative and qualitative community data 2. Rectify gaps in data sources 3. Critique methods and instruments for collecting valid and reliable quantitative and qualitative data 4. Evaluate the integrity and comparability of data
Domain to Develop	Public Health Sciences
Lowest rated competencies	1. Contribute to building the scientific base of public health 2. Establish partnerships with academic and other organizations to expand the public health science base and dissemination of research finding 3. Critique the scientific foundation of the field of public health
Tier	Epidemiologists
Domain to Develop	Cultural Competency
Lowest rated competencies	1. Conduct investigations using languages and approaches tailored to population 2. Use knowledge of specific sociocultural factors in the population to interpret findings
Tier	Public Health Laboratory
Domain to Develops	1. Laboratory design, workflow and operations 2. Public health emergency/disaster preparedness and response 3. Emergency preparedness and response 4. Clinical, medical, pathogenic bacteriology
Tier	Data Specialists
Lowest rated domain	Financial Planning and Management
Lowest rated competencies	1. Work with other epidemiology project team members of varied backgrounds and education 2. Support collaborative relationships with key personnel in other agencies relevant to the particular epidemiologic activity
Lowest rated domain	Communication
Lowest rated competencies	1. Respond to public queries 2. Prepare summary reports and memoranda for use within the agency

The above table should not be interpreted as the entire training agenda for the PHSD. As stated in the previous pages, in many of the domains, the overall average for "Importance to Job" was higher than the average for "Proficiency" indicating a felt need for training in all domains. And in all domains, there are competencies that are rated low for proficiency and individuals whose average was less than 2. Thus ongoing and individualized assessment must take place to properly train the PHSD workforce to effectively conduct its work and achieve organizational objectives.