
Job Analysis Report for the Long-Term Care (LTC) Examination

Conducted on behalf of



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Prepared by:



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ACKNOWLEDGEMENTS

We would like to thank the many individuals who provided invaluable assistance throughout the conduct of the Certification Board of Infection Control and Epidemiology Job Analysis for the Long-Term Care examination.

Above all, we thank the many dedicated professionals who generously contributed their time and expertise. Over 1,700 individuals participated in different phases of the job analysis, including Task Force/Test Specifications Committee members, Survey Pilot Test participants, and Survey respondents.

At CBIC, Janet Glowicz, President, Sandra Callery, President-Elect, and Robert Kopchinski, Executive Director, provided outstanding guidance and coordination throughout this job analysis study.

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separately with this Report.*

EXECUTIVE SUMMARY

The Certification Board of Infection Control and Epidemiology (CBIC), an organization with the mission to “provide pathways to assess and maintain infection prevention competency”¹ commissioned a job analysis study from Prometric for the Long-Term Care (LTC) examination.

A job analysis is designed to obtain descriptive information about the tasks performed in a job and the knowledge needed to adequately perform those tasks. The purpose of this job analysis was to:

- develop and validate the listing of the tasks and knowledge related to work performed by Infection Preventionists in Long-Term Care;
- develop test specifications for the LTC examination; and,
- obtain useful information that can guide educational and professional development initiatives.

Conduct of the Job Analysis

The job analysis consisted of several activities: collaboration with subject matter experts to ensure representativeness of the tasks and knowledge; survey development; survey dissemination; compilation of survey results; and test specifications development. The successful outcome of the job analysis depended on the excellent information provided by Infection Preventionists in Long-Term Care in various phases of the study.

Survey Development

Survey research is an efficient and effective way to identify the tasks and knowledge that are important for Infection Preventionists in Long-Term Care. The tasks and knowledge included on the survey covered four domains of practice. Development of the survey was based on a draft of task and knowledge statements developed from a variety of resources and refined by a committee of subject matter experts appointed by CBIC.

Survey Content

The survey, disseminated between July and August 2021, consisted of five sections.

Survey Sections
Section 1: Background and General Information
Section 2: Tasks
Section 3: Knowledge
Section 4: Recommendation for Test Content
Section 5: Comments

¹ <https://www.cbic.org/CBIC/About-CBIC.htm> Retrieved on October 1, 2021

RESULTS

Survey Response Rate

The LTC Job Analysis Survey was disseminated using an open participation link emailed to Infection Preventionists in Long-Term Care. Based on the analysis of the survey responses, a representative group of Infection Preventionists in Long-Term Care completed the survey in sufficient numbers to meet the requirements for conducting statistical analysis. This is evidenced by review of the responses for each of the background and general information questions as well as confirmation by the Test Specifications Committee.

Survey Ratings

Participants were asked to rate the tasks and knowledge by the importance for an Infection Preventionist in Long-Term Care using a five-point scale (0 = Of no importance to 4 = Very important).

Content Coverage

Evidence was provided for the comprehensiveness of the content coverage within the domains. That is, if the tasks and knowledge within a domain are adequately defined, then it should be judged as being well covered. The majority of respondents indicated that the content within each task and knowledge domain was *well* or *very well* covered, thus supporting the comprehensiveness of the defined domains.

Test Specifications Development

In September 2021, a Test Specifications Committee convened to review the results of the job analysis and to create the test content outline that will guide the development of the LTC examination.

Summary

In summary, this study used a multi-method approach in identifying the tasks and knowledge that are important to the competent performance of certified Infection Preventionists in Long-Term Care. The job analysis process allowed for input from a representative group of Infection Preventionists in Long-Term Care and other stakeholders and was conducted within the guidelines of professionally sound practice. The results of the job analysis can be used by CBIC to develop the LTC examination and guide professional development initiatives.

RESULTS AT A GLANCE

WHO COMPLETED THE SURVEY

A total of 1,659 responses were used for analysis. The majority of respondents indicated that they are based in the United States of America. Most respondents work in an independent living facility or a skilled nursing facility.

TASKS IMPORTANCE RATINGS

All 106 task statements achieved high importance ratings. Respondents indicated that the survey covered the important tasks adequately to very well.

KNOWLEDGE IMPORTANCE RATINGS

All 72 knowledge statements achieved high importance ratings. Respondents indicated that the survey covered the important knowledge adequately to very well.

INTRODUCTION

The Certification Board of Infection Control and Epidemiology (CBIC), an organization with the mission to “provide pathways to assess and maintain infection prevention competency”² commissioned a job analysis study from Prometric for the Long-Term Care (LTC) examination.

The major purpose of this job analysis study was to identify the tasks and knowledge that are important for competent performance by certified Infection Preventionists in Long-Term Care. The development of the LTC examination is based on validated tasks and knowledge identified through the job analysis process.

This report describes the job analysis study including the:

- rationale for conducting the job analysis study;
- methods used to define tasks and knowledge;
- types of data analysis conducted and their results; and,
- results and conduct of the test specifications meeting.

Job Analysis Study and Adherence to Professional Standards

A job analysis study refers to procedures designed to obtain descriptive information about the tasks performed on a job and the knowledge, skills, or abilities requisite to the performance of those tasks. The specific type of information collected during a job analysis is determined by the purpose for which the information will be used.

For the purposes of developing certification examinations, a job analysis study should identify important tasks, knowledge, skills, or abilities deemed important by and for the professional role that is the subject of the certification. For CBIC, the professional role is Infection Preventionists in Long-Term Care.

The use of a job analysis study (also known as practice analysis, role and function study, or role delineation study) to define the test content domain(s) is a critical component in establishing the content validity of the credential it supports. Content validity refers to the extent to which the content covered by an examination is representative of the tasks and knowledge required to competently perform a job.

A well-designed job analysis study should include the participation of a representative group of subject matter experts who reflect the diversity within the profession. Diversity refers to regional or job context factors and to subject matter expert factors such as experience, gender, and race/ethnicity. Demonstration of content validity is accomplished through the judgments of subject matter experts. The process is enhanced by the inclusion of large numbers of subject matter experts who represent the diversity of the relevant areas of expertise.

² <https://www.cbic.org/CBIC/About-CBIC.htm> Retrieved on October 1, 2021

The *Standards for Educational and Psychological Testing*³ (2014) (*The Standards*) is a comprehensive technical guide that provides criteria for the evaluation of tests, testing practices, and the effects of test use. *The Standards* were developed jointly by the American Educational Research Association (AERA), the American Psychological Association (APA), and the National Council on Measurement in Education (NCME). The guidelines presented in *The Standards*, by professional consensus, have come to define the necessary components of quality testing. Consequently, a testing program that adheres to *The Standards* is more likely to be judged to be valid and defensible than one that does not.

As stated in Standard 11.13,

“The content domain to be covered by a credentialing test should be defined clearly and justified in terms of the importance of the content for credential-worthy performance in an occupation or profession. A rationale and evidence should be provided to support the claim that the knowledge or skills being assessed are required for credential-worthy performance in that occupation and are consistent with the purpose for which the credentialing program was instituted...Typically, some form of job or practice analysis provides the primary basis for defining the content domain...” (pp. 181-182)

The job analysis study for the LTC examination was designed to follow the guidelines presented in *The Standards* and to adhere to accepted professional practice.

³ American Educational Research Association, American Psychological Association, National Council on Measurement in Education (2014). *Standards for Educational and Psychological Testing*. Washington, DC: American Educational Research Association.

METHOD

The job analysis study for the LTC examination involved a multi-method approach that included meetings with subject matter experts and a survey. This section of the report describes the activities conducted for the job analysis study.

STEPS OF THE JOB ANALYSIS STUDY

1. Conduct of a planning meeting
2. Development of the survey
3. Dissemination of the survey
4. Analysis of the survey data
5. Development of the test specifications

First, subject matter experts identified the tasks and knowledge they believed were important to the work performed by Infection Preventionists in Long-Term Care. Then, a survey was developed and disseminated to Infection Preventionists in Long-Term Care. The purpose of the survey was to obtain verification (or refutation) that the tasks and knowledge identified by the subject matter experts are important to the work performed by Infection Preventionists in Long-Term Care.

Survey research functions as a “check and balance” on the judgments of the subject matter experts and reduces the likelihood that unimportant areas will be considered in the development of the test specifications. The use of a survey is also an efficient and cost-effective method of obtaining input from large numbers of subject matter experts and makes it possible for ratings to be analyzed separately by appropriate subgroups of respondents.

The survey results provide information to guide the development of test specifications and content-valid examinations. What matters most is that a credentialing examination covers the important knowledge needed to perform job activities.

The methodology used to conduct the job analysis is described in detail below and included the following steps:

1. Conduct of a Planning Meeting

On April 15, 2021, CBIC representatives and the Prometric staff responsible for conducting the job analysis study held a project planning meeting via web conference. During the planning meeting, the selection of the Task Force/Test Specifications Committee members, meeting dates, logistics, and survey delivery were the topics of discussion.

2. Development of the Survey

2.1. Conduct of the Job Analysis Task Force Meeting

The Job Analysis Task Force was comprised of a representative group of 13 Infection Preventionists in Long-Term Care and related stakeholders. A list of the Task Force members can be found in Appendix A1. A summary of Task Force member’s demographics appears in Table 1 below.

Table 1. *Summary of Task Force Members' Demographics*

CRC	Certifications	Years of Experience	Current Position	Highest Degree	Gender	Age	Race/Ethnicity	Location
1	RN, CIC, FAPIC	16	HAI/ AR Prevention Program Manager	MPH	F	51 - 60	Caucasian/ White	KY, USA
2	RN	18	Infection Preventionist	BSN	F	31 – 40	Caucasian/ White	ND, USA
3	CIC, RN	45+	Infection Preventionist	BSN	F	61+	Caucasian/ White	PA, USA
4	Nursing, CIC	25	Principal Consulting Epidemiologist	PhD	F	51 – 60	Caucasian/ White	NY, USA
5	RN, CIC	7	Infection Preventionist	MS	F	31 - 40	Caucasian/ White	ND, USA
6	RN, CIC	7.5	Infection Prevention Coordinator	MPH	F	31 – 40	Caucasian/ White	NY, USA
7	RN, CIC	8	Infection Prevention Consultation in LTC	BSN	M	31 – 40	Caucasian/ White	SD, USA
8	NHA	47	President	MS	M	61+	Caucasian/ White	FL, USA
9	CIC, PHN, RN-BC	38	Infection Preventionist	MSN	F	61+	Caucasian/ White	FL, USA
10	Nursing, CIC, CPHQ	26	Infection Preventionist	MPH & MSN	M	61+	Caucasian/ White	PA, USA
11	RRT, CPFT, CIC	14	Infection Preventionist/ RT	MS	F	51 – 60	Caucasian/ White	MN, USA
12	RN, CIC	11	Infection Control Practitioner	Diploma	M	41 - 50	Caucasian/ White	ON, CA
13	CIC, a-IPC, LBBP	2	Regional Infection Control Partner	MBBS (MD)	F	21 - 30	Other	ON, CA

Four remote Task Force meetings were conducted on May 18, 19, 26, and 28, 2021. The purpose of the meetings was to identify tasks and knowledge, important to the role performed by Infection Preventionists in Long-Term Care, in order to develop the survey content for validation by survey participants. The meeting agenda is available in Appendix A2.

Activities conducted during the meeting included reviewing and, as needed, revising the major domains, tasks, and knowledge that are necessary for competent performance of Infection Preventionists in Long-Term Care. Survey rating scales and background and general information questions were presented, discussed, and revised as needed.

2.2. Survey Construction and Review Activities

2.2.1. Survey Construction

Upon completion of the Task Force Meeting, Prometric constructed a draft online survey. The survey covered the following task and knowledge domains:

1. Long-Term Care Settings
2. Management and Communication of the Infection Prevention Program
3. Identification of Infectious Diseases
4. Surveillance and Epidemiologic Investigation
5. Prevention and Control of Infectious and Communicable Diseases
6. Environment of Care
7. Cleaning, Disinfection, Sterilization of Medical Devices and Equipment
8. Antimicrobial Stewardship
9. Employee/Occupational Health

2.2.2 Survey Review by the Task Force Committee

Each Task Force member received a web link to the draft survey. The purpose of the review was to provide the Task Force with an opportunity to view their work and recommend any revisions.

Comments were compiled by Prometric and reviewed via web conference with CBIC and the Task Force members. Recommended refinements were incorporated, as appropriate, into the survey in preparation for a pilot test.

2.2.3. Survey Pilot Test

The purpose of the small-scale survey pilot test was to have Infection Preventionists in Long-Term Care, who had no previous involvement in the development of the survey, to review and offer suggestions to improve the survey.

The Task Force members nominated Infection Preventionists in Long-Term Care who were asked to participate in the survey pilot test. Survey pilot test participants were asked to review the survey for clarity of wording, ease of use, and comprehensiveness of content coverage. Comments were compiled by Prometric and reviewed via web conference with CBIC and the Task Force members. The survey was revised and finalized based on the review of the pilot test comments.

2.2.4. Final Version of the Survey

The final version of the online survey consisted of five sections: Section 1: Background and General Information; Section 2: Tasks; Section 3: Knowledge; Section 4: Recommendation for Test Content; and Section 5: Comments.

In Section 1: Background and General Information, survey participants were asked to provide general and background information about themselves and their professional activities.

In Section 2: Tasks and Section 3: Knowledge, survey participants were asked to rate the task and knowledge statements using the importance scales shown below.

Table 2. *Tasks Importance Scale*

Tasks
Importance: How important is performance of this task for an Infection Preventionist (IP) in Long-Term Care?
0 = Of no importance
1 = Of little importance
2 = Of moderate importance
3 = Important
4 = Very important

Table 3. *Knowledge Importance Scale*

Knowledge
Importance: How important is this knowledge to competent performance for an Infection Preventionist (IP) in Long-Term Care?
0 = Of no importance
1 = Of little importance
2 = Of moderate importance
3 = Important
4 = Very important

In addition, survey participants were asked to indicate how well the statements covered the tasks and knowledge within each domain. Respondents made their judgments using a five-point rating scale (1 = Very Poorly; 2 = Poorly; 3 = Adequately; 4 = Well; 5 = Very Well). A write-in area was provided for respondents to note any areas that were not covered within a specific domain.

In Section 4: Recommendation for Test Content, survey participants were asked to indicate the content weights that the nine knowledge areas below should receive on the examination.

1. Long-Term Care Settings
2. Management and Communication of the Infection Prevention Program
3. Identification of Infectious Diseases
4. Surveillance and Epidemiologic Investigation
5. Prevention and Control of Infectious and Communicable Diseases
6. Environment of Care
7. Cleaning, Disinfection, Sterilization of Medical Devices and Equipment
8. Antimicrobial Stewardship
9. Employee/Occupational Health

This was accomplished by distributing 100 percentage points across the nine knowledge areas. These distributions represented the allocation of examination items survey participants believed should be devoted to each knowledge area.

In Section 5: Comments, survey participants were provided the opportunity to comment on the following:

- What additional professional development and/or continuing education could you use to improve your performance in your current work role?
- How do you expect your work role to change over the next 5 years? What tasks will be performed and what knowledge will be needed to meet changing practice demands?

3. Dissemination of the Survey

Prometric provided the survey link to CBIC on July 7, 2021. CBIC disseminated an e-mail invitation with an open survey link to Infection Preventionists in Long-Term Care. Several reminder emails were sent to these Infection Preventionists in Long-Term Care encouraging participation in the survey. As an incentive to complete the survey, participants were offered the chance to enter a drawing to win a \$25 gift card. Appendix B contains a PDF export of the online survey text.

4. Analysis of the Survey Data

As previously noted, the purpose of the survey was to validate the tasks and knowledge that relatively large numbers of Infection Preventionists in Long-Term Care judged to be relevant (verified as important) to their work. This objective was accomplished through an analysis of the mean importance ratings for tasks and knowledge. The derivation of the test specifications from those statements verified as important by the surveyed professionals provides a substantial evidential basis for the content validity (content relevance) of credentialing examinations.

Based on information obtained from the survey, data analyses by respondent subgroups (e.g., job role) are possible when sample size permits. A subgroup category is required to have at least 30 respondents to be included in the subgroup analyses. This is a necessary condition to ensure that the mean value based upon the sample of respondents is an accurate estimate of the corresponding population mean value.

The following quantitative data analyses were produced:

- Means, standard deviations, and frequency (percentage) distributions for task statements and tasks content coverage ratings
- Means, standard deviations, and frequency (percentage) distributions for knowledge statements and knowledge content coverage ratings
- Means and standard deviations for test content (allocations by domain) recommendations
- Index of agreement values for designated subgroups

4.1 Criterion for Interpretation of Mean Importance Ratings

Because the purpose of the survey is to ensure that only validated task and knowledge statements are included in the development of the test specifications, a criterion (cut point) for inclusion needed to be established.

A criterion that has been used in similar studies is a mean importance rating that represents the midpoint between moderately important and important. For the importance rating scale used across many studies, the value of this criterion for a 5-point scale ranging from 0 = Of no importance to 4 = Very important is 2.50.

<i>Definition of Pass, Borderline, and Fail Categories for Task and Knowledge Importance Mean Ratings</i>	
	<u>Means</u>
Pass:	At or above 2.50
Borderline:	2.40 to 2.49
Fail:	Less than 2.40

This criterion is consistent with the intent of content validity. Therefore, Prometric recommended the value of this criterion should be set at 2.50. Accordingly, the task and knowledge statements were placed into one of three categories: Pass, Borderline, or Fail as determined by their mean importance ratings.

- The Pass Category contains those statements with mean ratings at or above 2.50 and are considered eligible for inclusion in the development of the test specifications.
- The Borderline Category contains those statements with mean ratings between 2.40 and 2.49. The Borderline Category is included to provide a point of discussion for the Test Specifications Committee to determine if the statement(s) warrant(s) inclusion in the test specifications.
- The Fail Category contains those statements with mean ratings less than 2.40. It is recommended that statements in the Fail Category be excluded from consideration in the test specifications.

If the Test Specifications Committee believes that a statement rated below 2.50 should be included in the test specifications and can provide compelling written rationales, those statements may be considered for inclusion. For example, although a professional activity or knowledge/skill may have a mean rating of less than 2.50, more than 50.00% of the respondents may have rated the statement as important or very important. In this instance, the Test Specifications Committee might recommend the inclusion of the statement. The written rationale would note that a majority of the survey respondents rated the statement as important.

5. Development of the Test Specifications

Prometric facilitated two remote meetings on September 8 and 10, 2021 to develop the LTC test specifications based on the job analysis results. A copy of the meeting agenda is provided in appendix A2. The meeting focused on:

- finalizing the tasks and knowledge that are important for inclusion based on the survey results;
- establishing the percentage test content weights for each area on the examination to guide test development activities; and
- establishing linkage between the tasks and knowledge.

RESULTS

Survey Responses

Of the 2,346 Infection Preventionists in Long-Term Care who took part in the survey 1,659 responses qualified for inclusion in the data analysis. Surveys with less than 55% completion rate were excluded from data analysis. The sample size used in this analysis was 1,659.

Based on the analysis of survey responses, a representative group of Infection Preventionists in Long-Term Care completed the survey in sufficient numbers to meet the requirements to conduct statistical analysis. This was evidenced by the distribution of responses for each of the background information questions and was confirmed through discussion with the Test Specifications Committee.

Demographic Characteristics of Survey Respondents

The profile of survey respondents can be found below. All responses to the background and general information section of the survey are provided in Appendix C1. Write-in responses to “Other” options are included in Appendices C2, C3, and C4. The results in the figures below reflect the 1,659-sample size used for analysis.

Figure 1. *Demographic Question 1. How many years have you worked in Infection Prevention?*

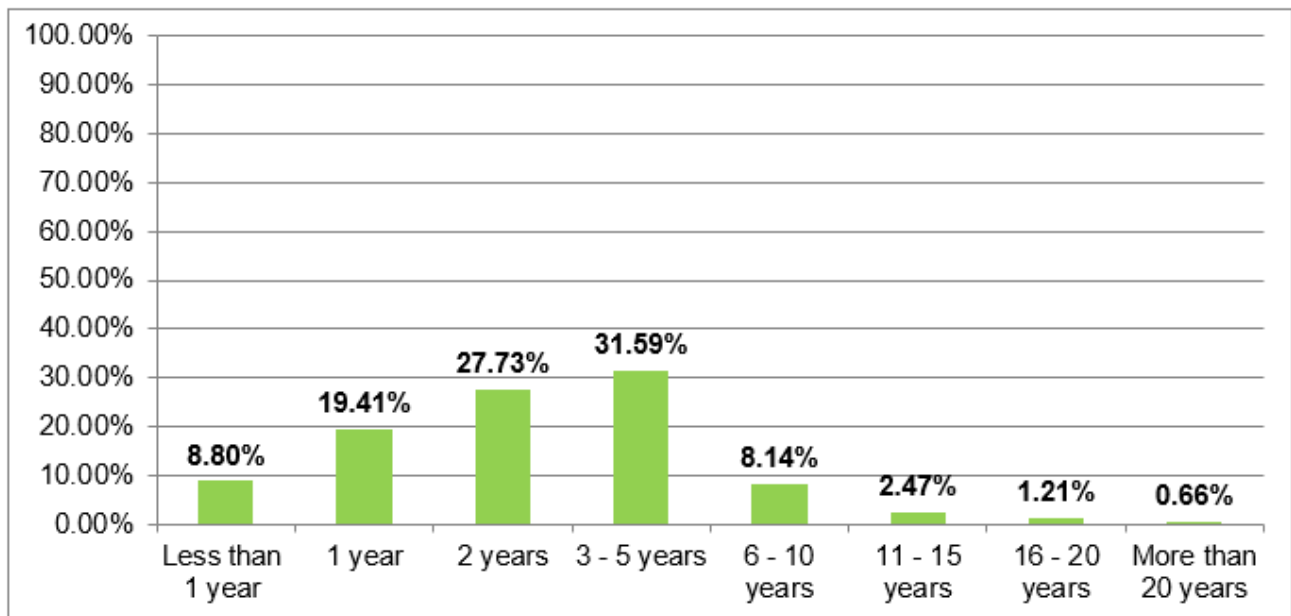


Figure 2. Demographic Question 2. What practice setting(s) specific to Long-Term Care do you cover? (Please select all that apply)

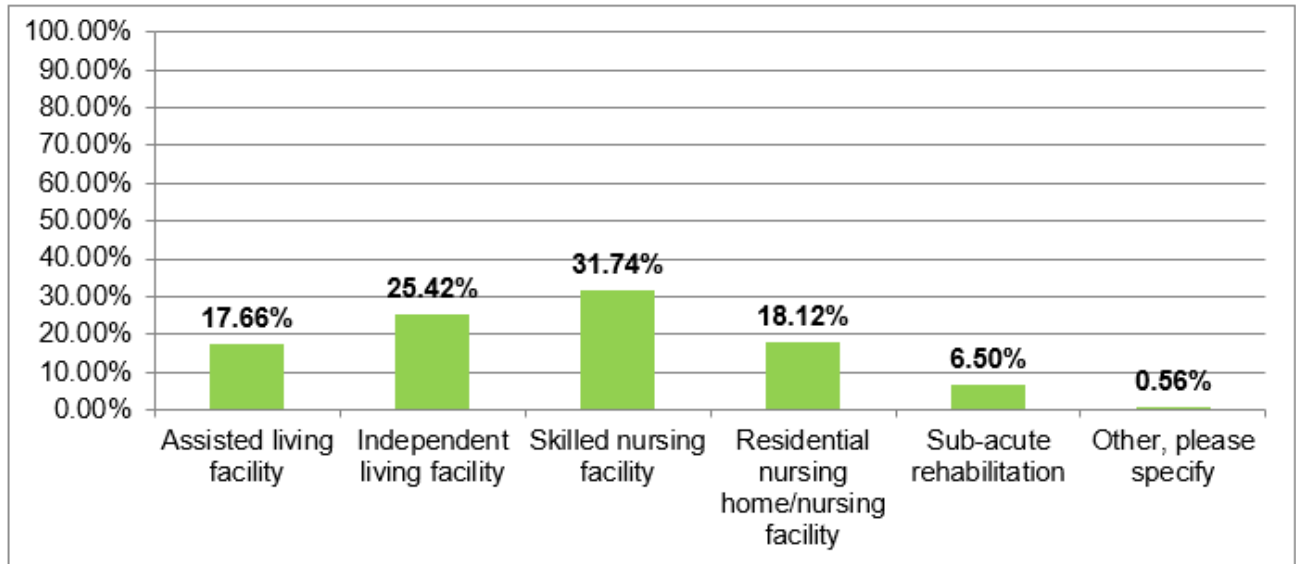


Figure 3. Demographic Question 3. What is the licensed bed capacity of your primary practice setting?

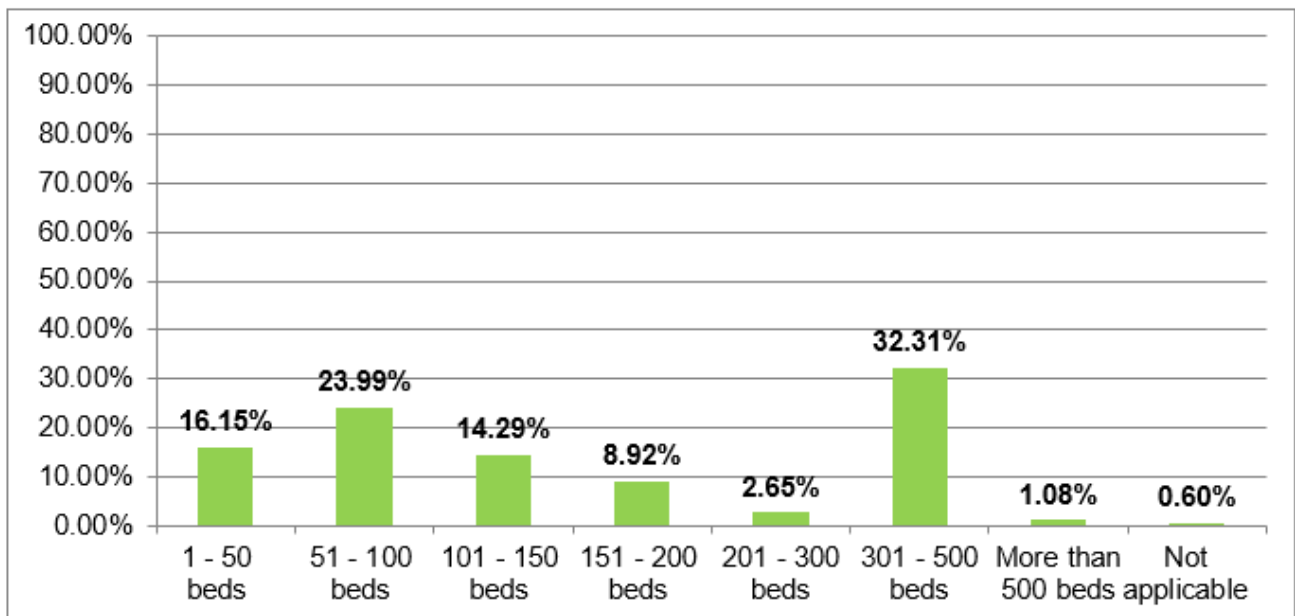


Figure 4. Demographic Question 4. If your job has additional responsibilities outside of Infection Prevention, what are your other responsibilities? (Please select all that apply)

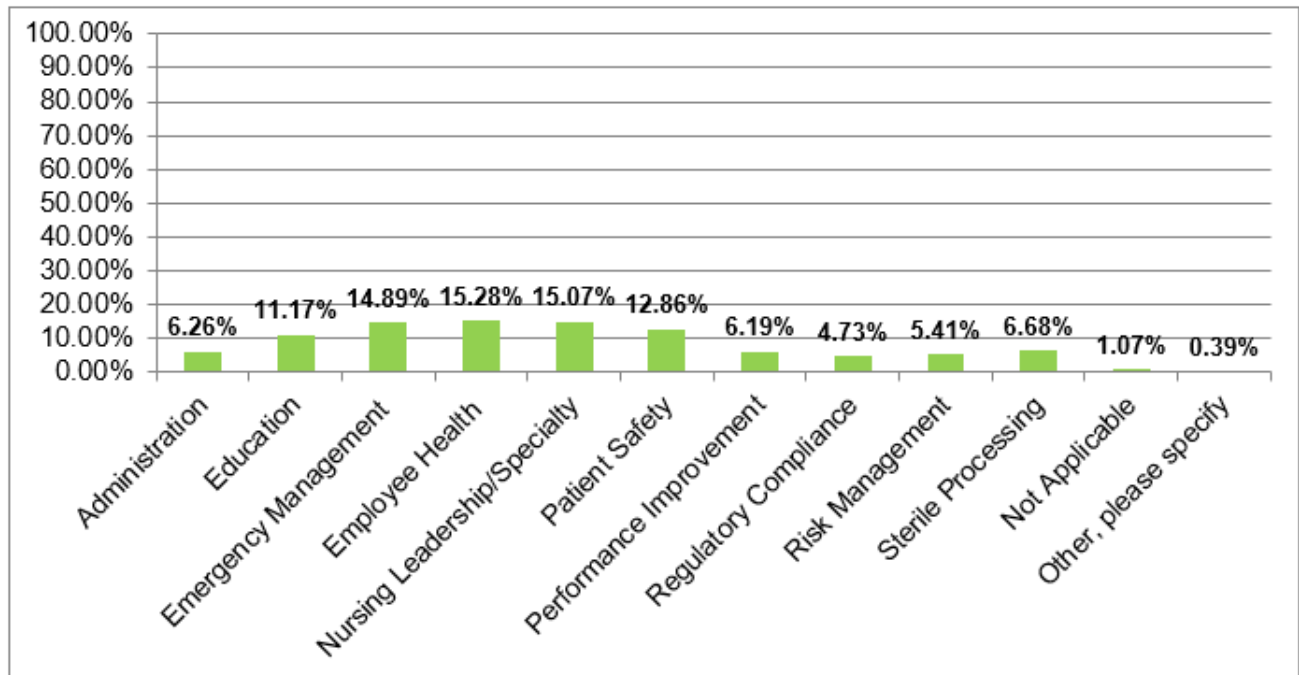


Figure 5. Demographic Question 5. Which of the following specialty care service(s) are provided within your facility? (Please select all that apply)

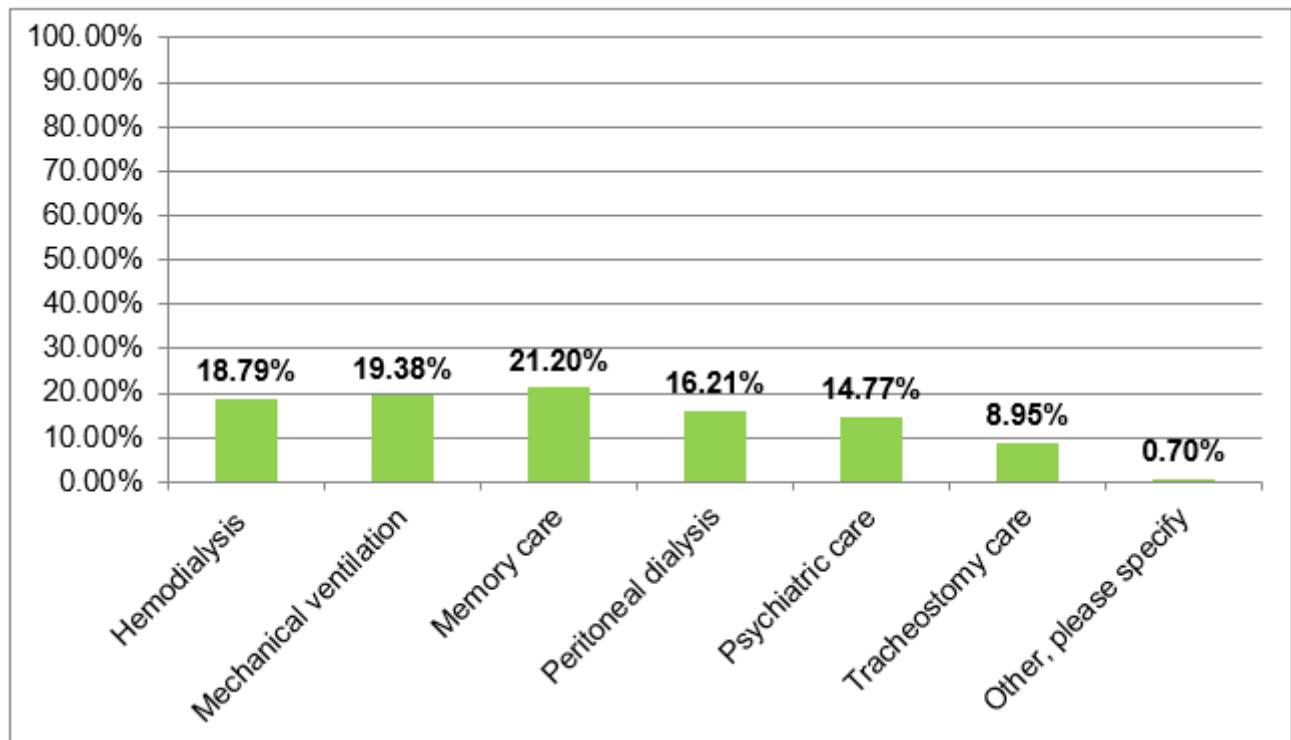


Figure 6. Demographic Question 6. How many Infection Preventionists (IPs) are employed by your facility?

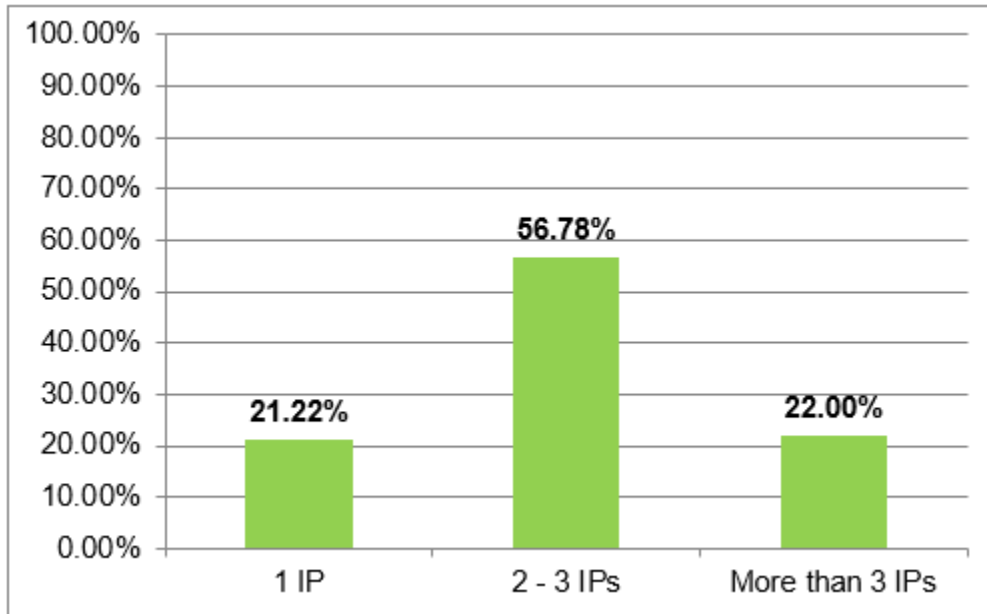


Figure 7. Demographic Question 7. On average, how many hours per week do you spend performing Infection Prevention activities?

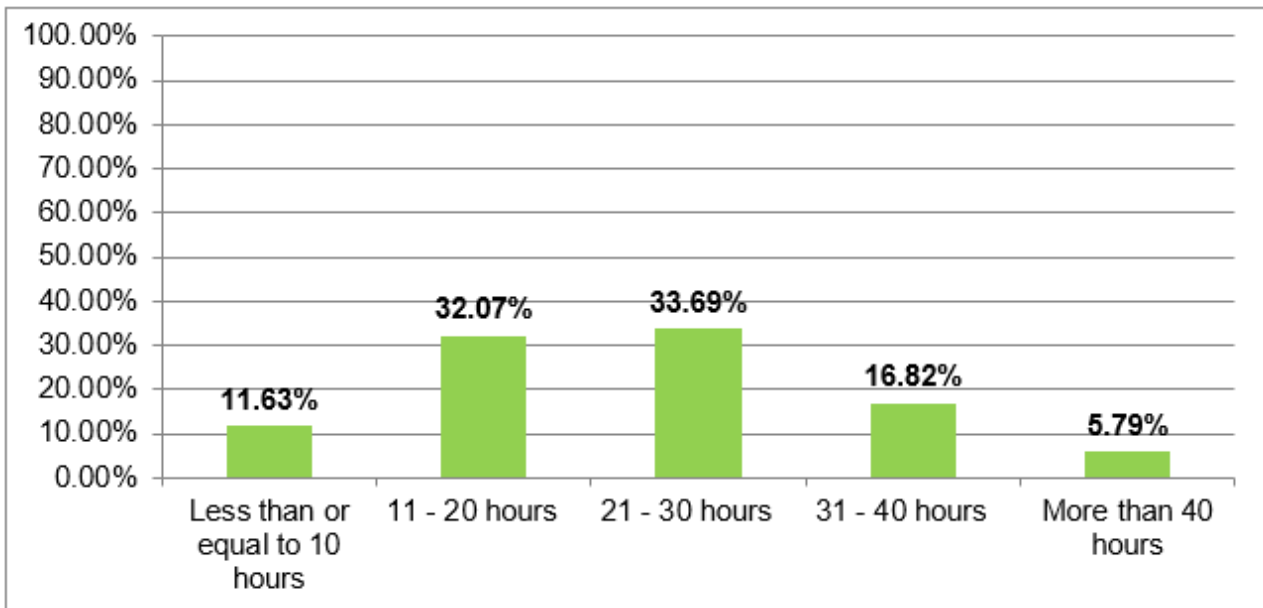


Figure 8. Demographic Question 8. Do you currently hold the credential Certified in Infection Control (CIC) by the Certification Board of Infection Control and Epidemiology (CBIC)?

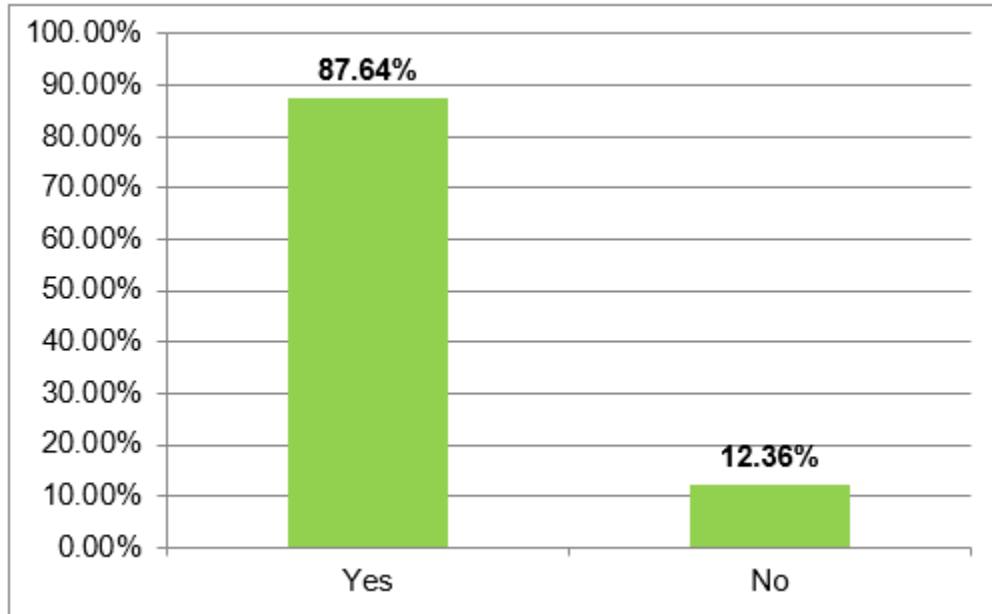


Figure 9. Demographic Question 8a. How long have you been certified?

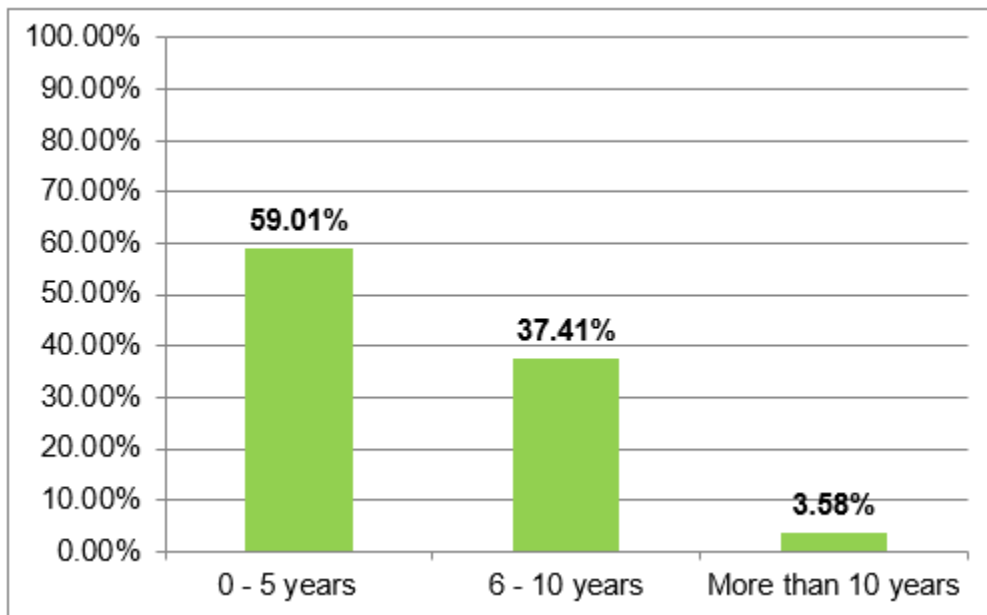


Figure 10. Demographic Question 8b. If you are not currently Certified in Infection Control (CIC) by the Certification Board of Infection Control and Epidemiology (CBIC), do you plan on becoming certified?

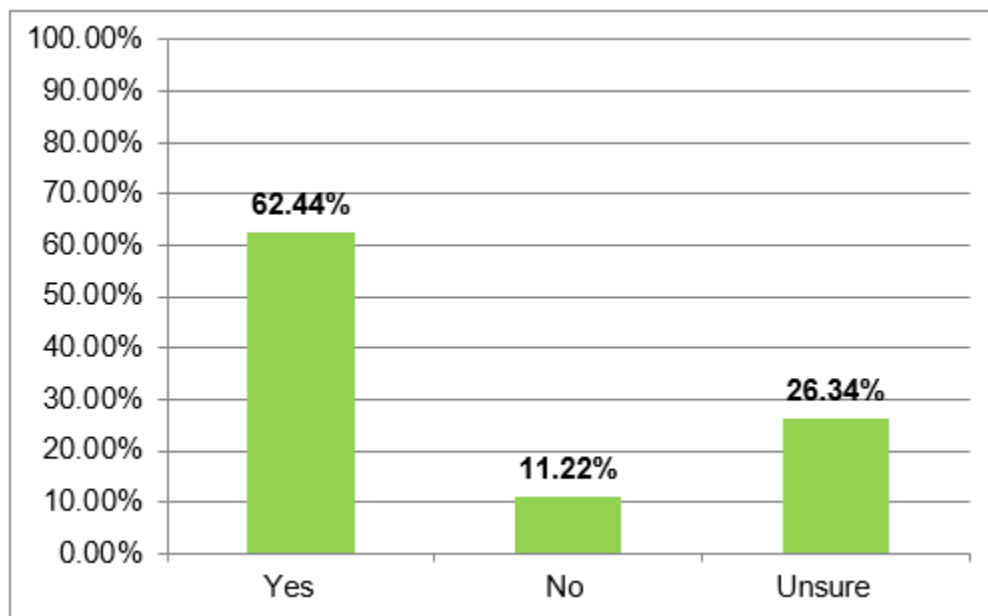


Figure 11. Demographic Question 8c. If you are not certified, what is the primary reason you are not certified?

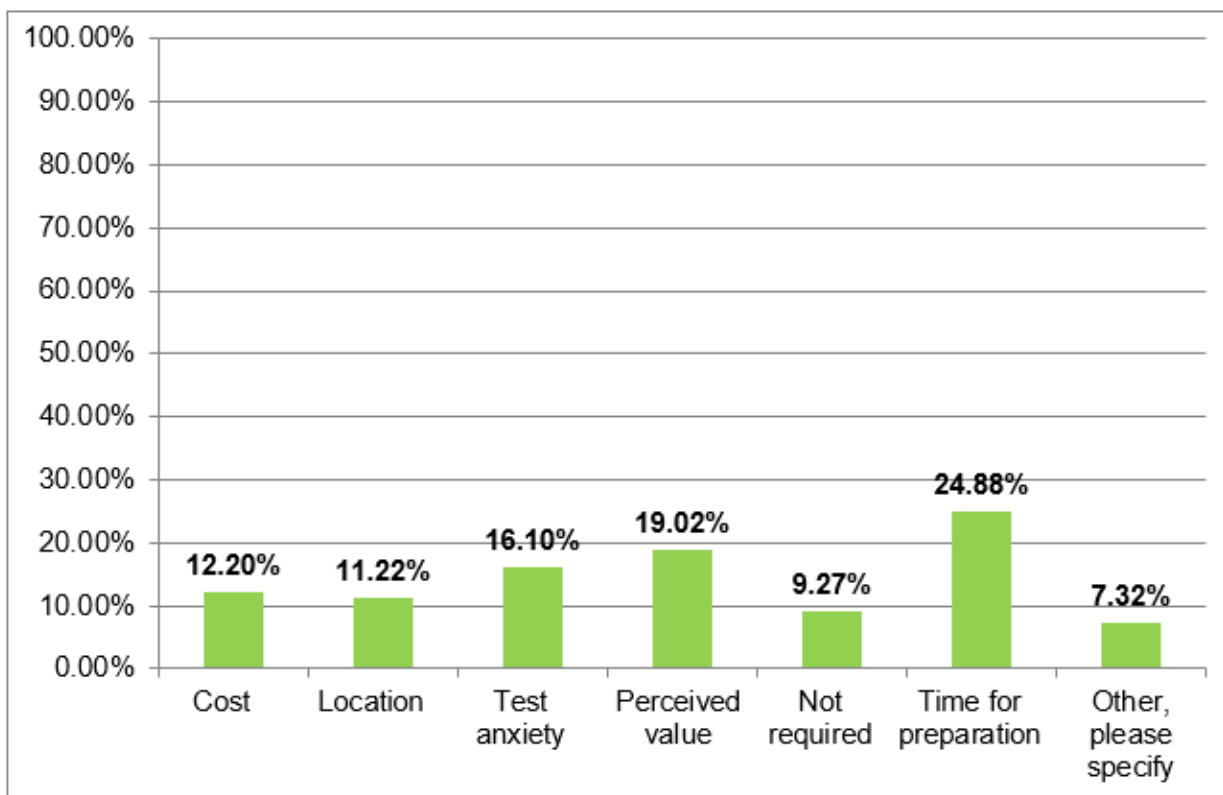


Figure 12. Demographic Question 9. Does your primary employer require the Infection Preventionist (IP) to have a specialized Infection Prevention credential/certificate?

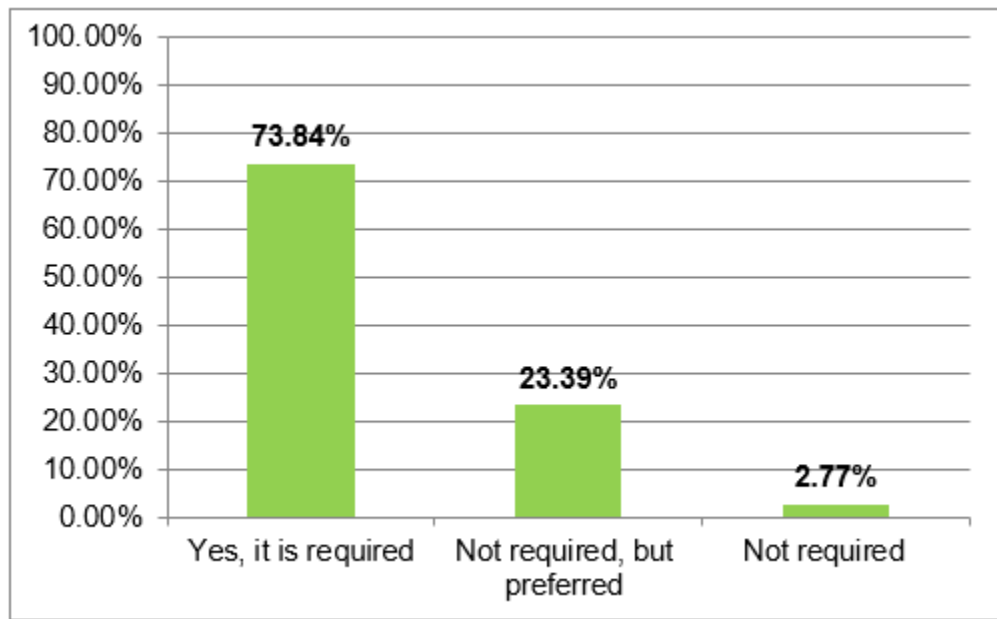


Figure 13. Demographic Question 10. Do you hold other credential(s) that are relevant to Infection Prevention (e.g., a-IPC, CPHQ, WOCN)?

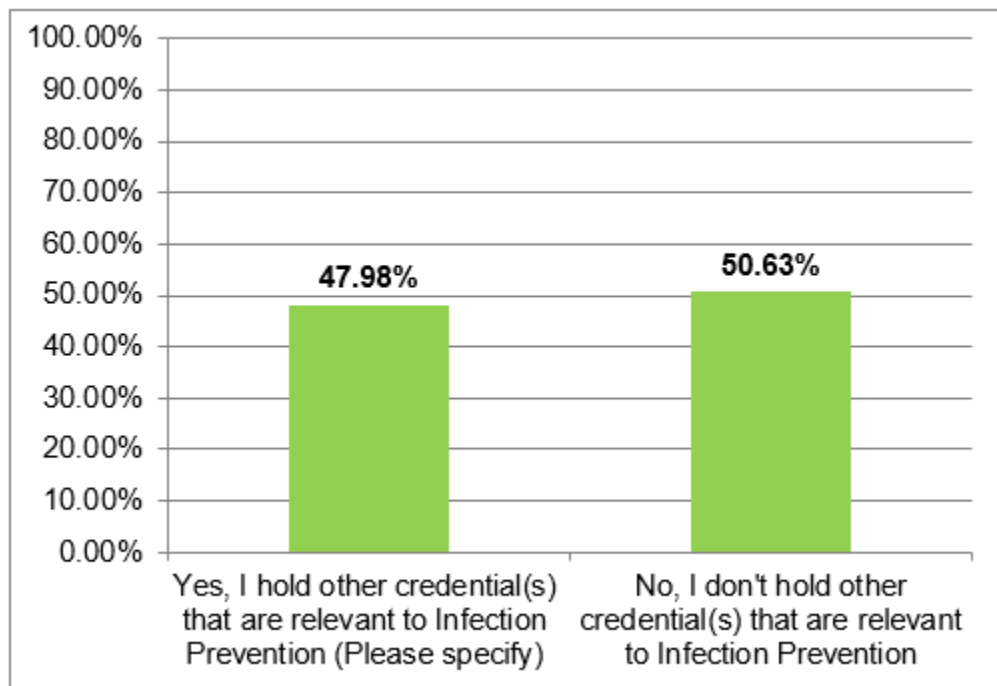


Figure 14. Demographic Question 11. Do you hold other certificate(s) that are relevant to Infection Prevention (e.g., CDC NH IP training course, IPAC Canada)?

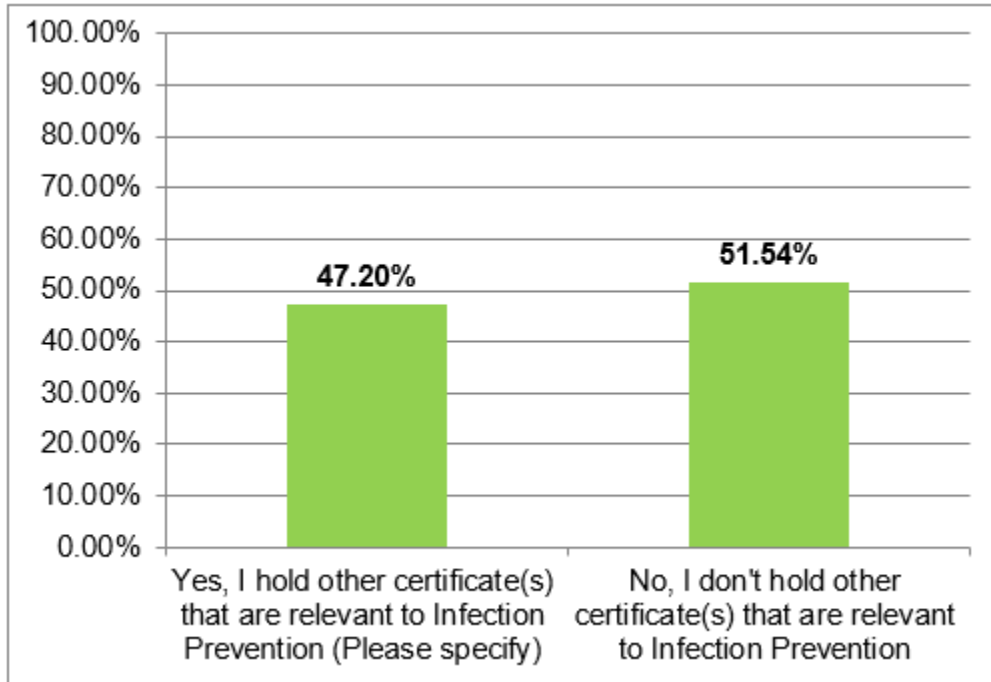


Figure 15. Demographic Question 12. Would you consider obtaining a credential by the Certification Board of Infection Control and Epidemiology (CBIC) specific to Long-Term Care?

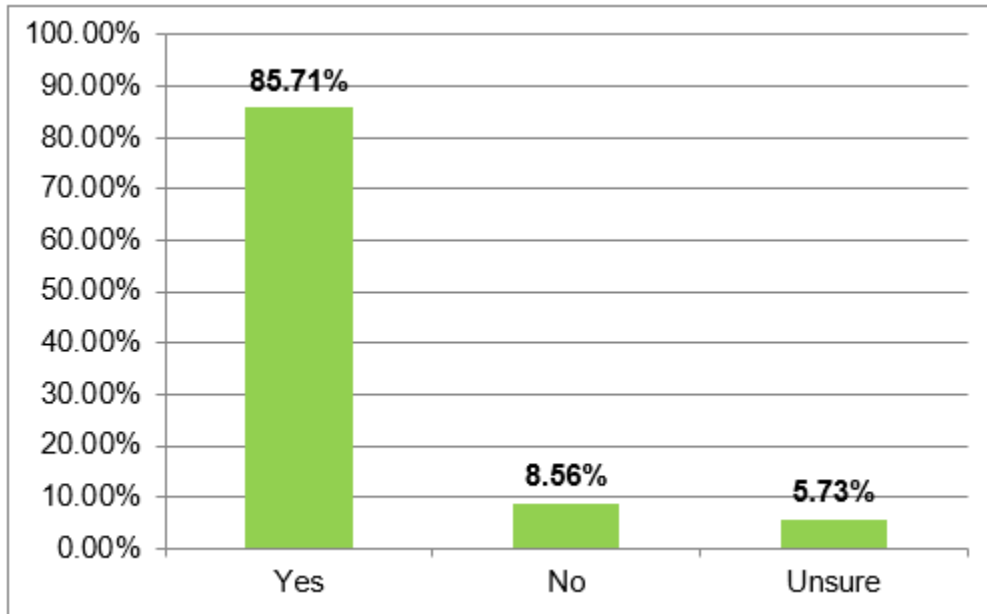


Figure 16. Demographic Question 13. Which of the following best describes your highest level of education completed?

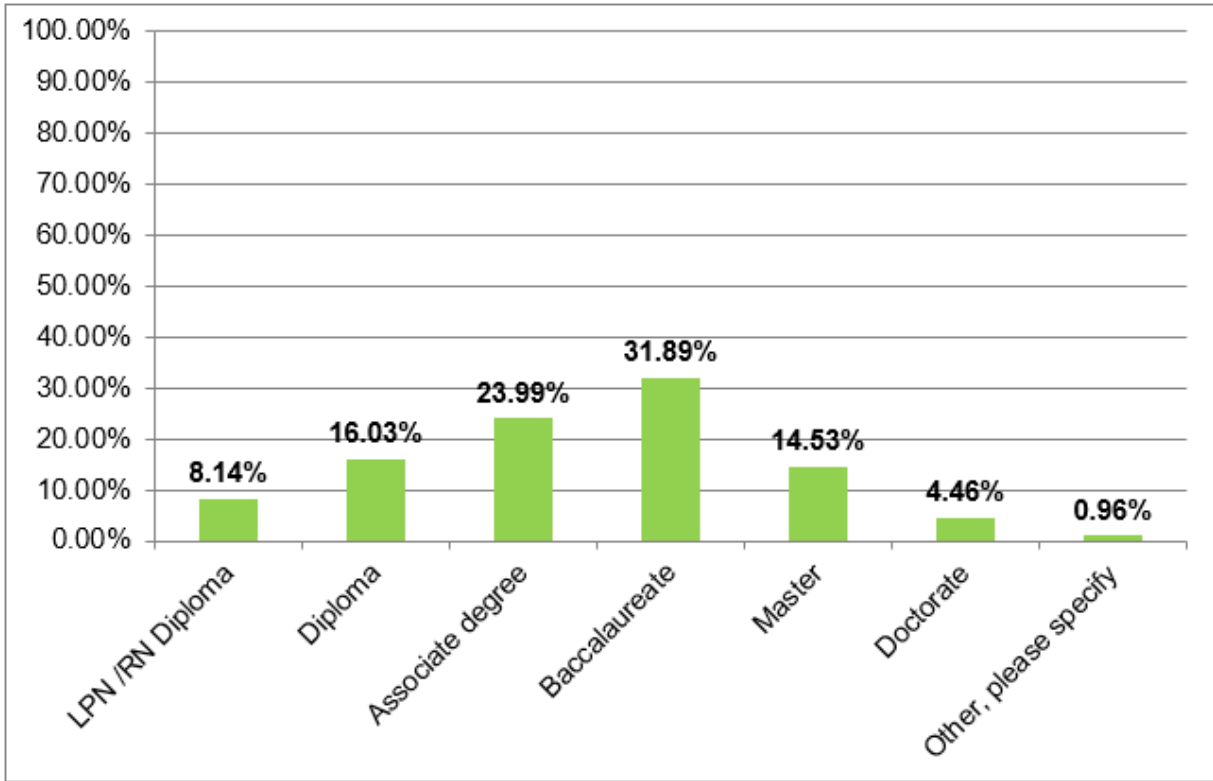


Figure 17. Demographic Question 14. Which of the following best describes your professional background?

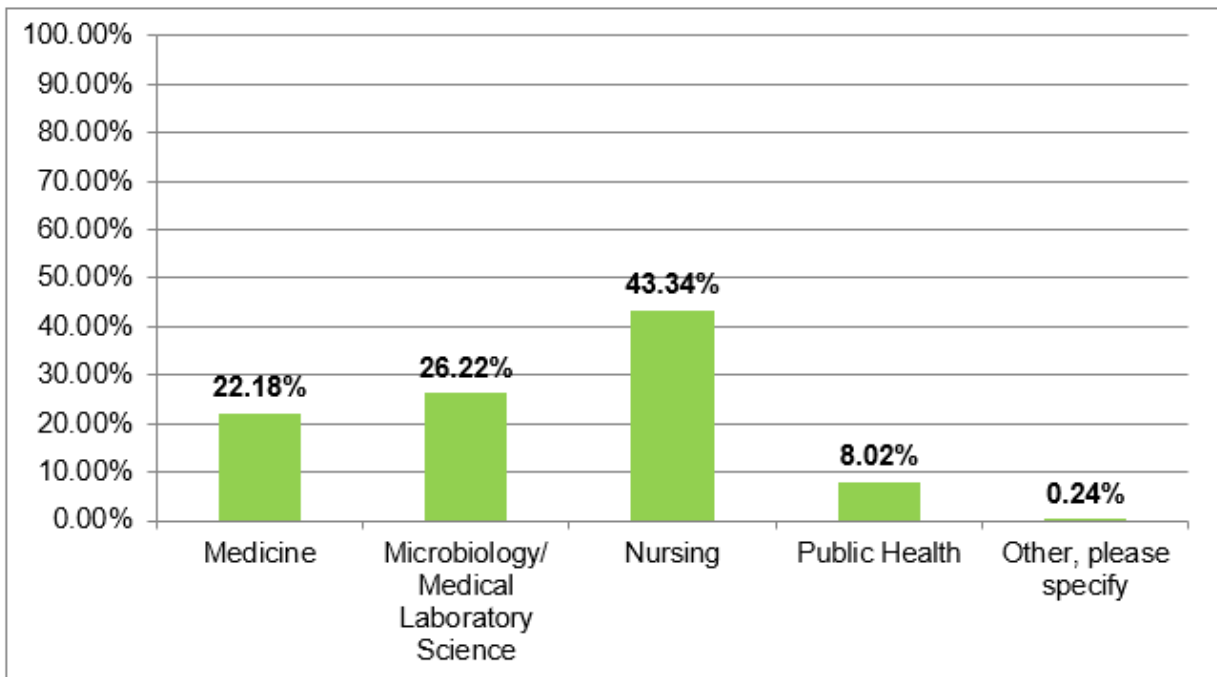


Figure 18. Demographic Question 15. In what country do you primarily work?

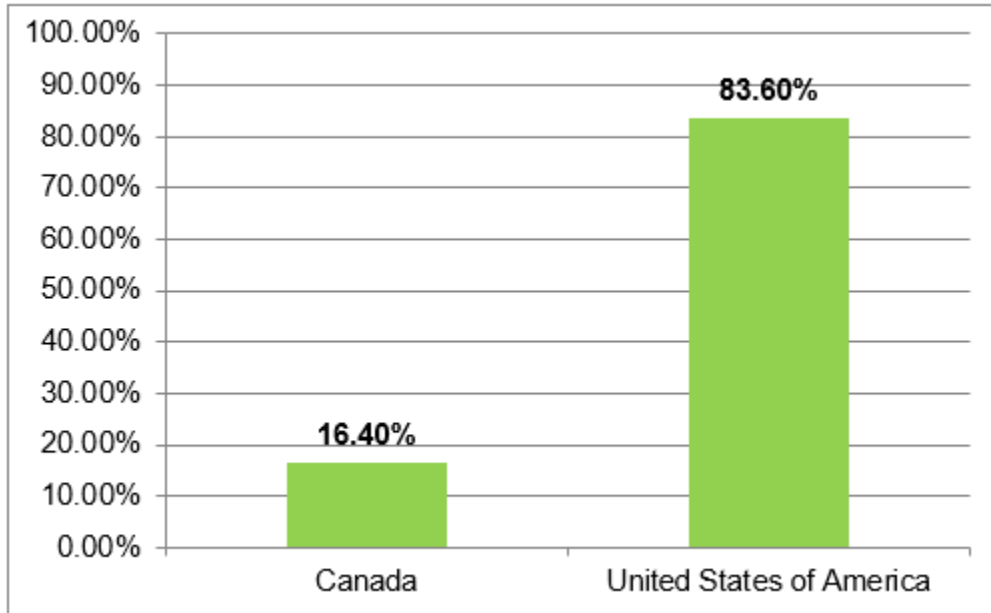
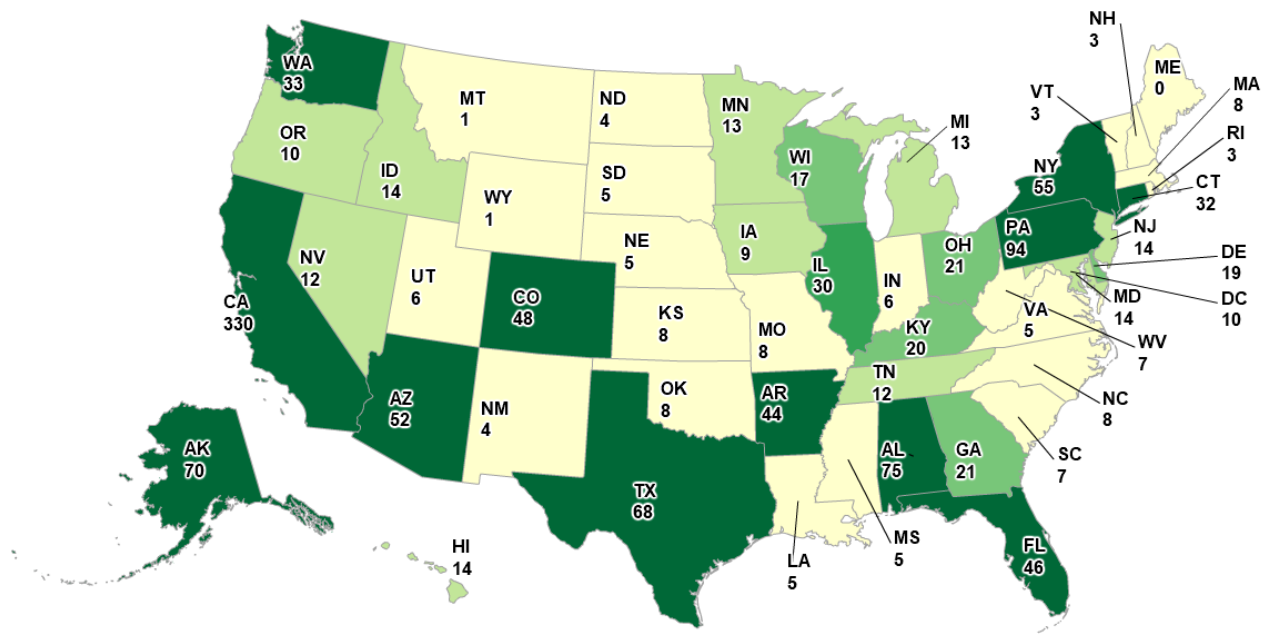


Figure 19. Demographic Question 15a. In what state/territory do you primarily work? (Please select one from the drop-down menu)⁴



⁴ Responses related to the following six territories are not captured in Figure 13: American Samoa, Federated States of Micronesia, Guam, Mariana Islands, Puerto Rico, and U.S. Virgin Islands. For a full list of all responses to demographic question 15a, please refer to Appendix C1.

Figure 20. Demographic Question 15b. In what province/territory do you primarily work? (Please select one from the drop-down menu)

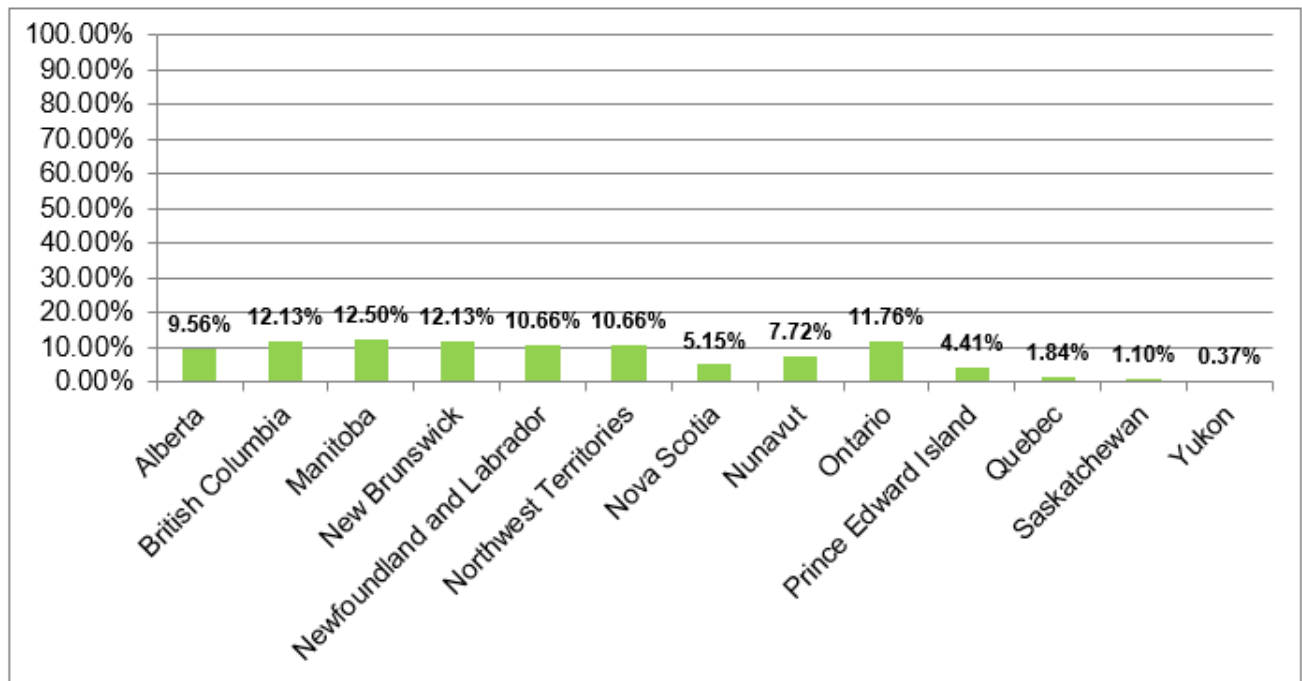


Figure 21. Demographic Question 16. Optional Question: With what gender do you most closely identify?

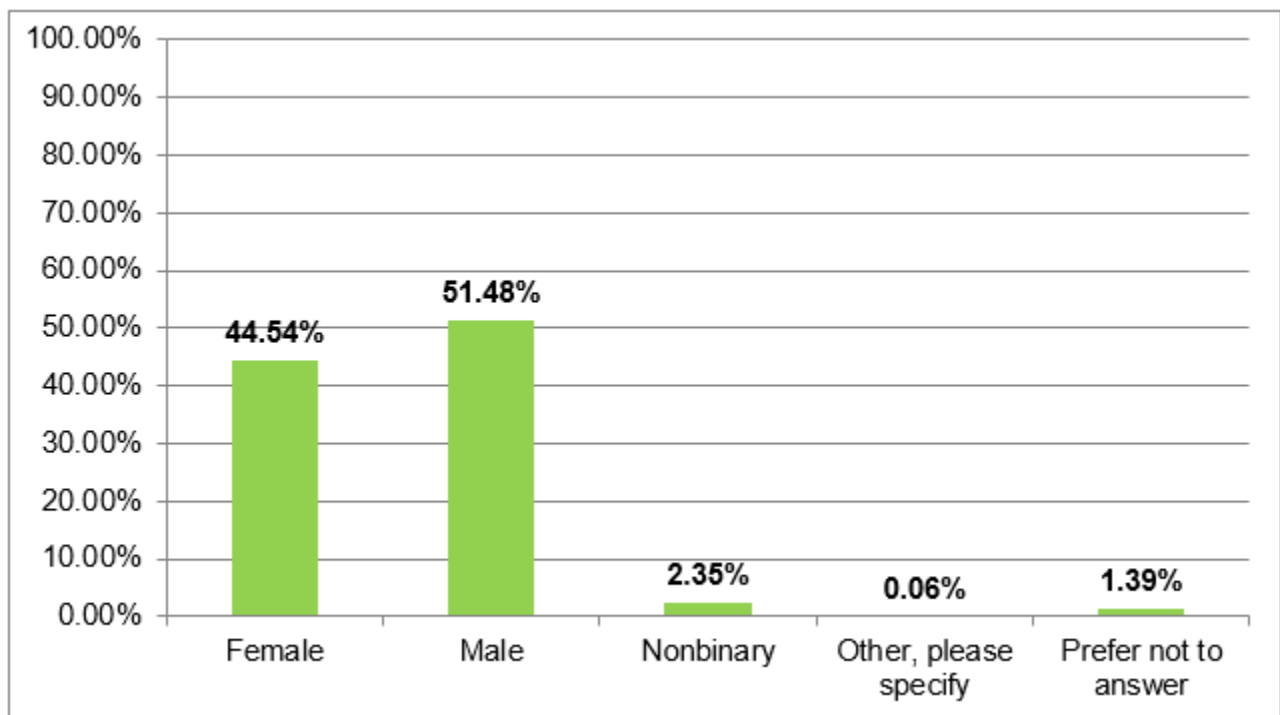


Figure 22. Demographic Question 17. Optional Question: What is your age?

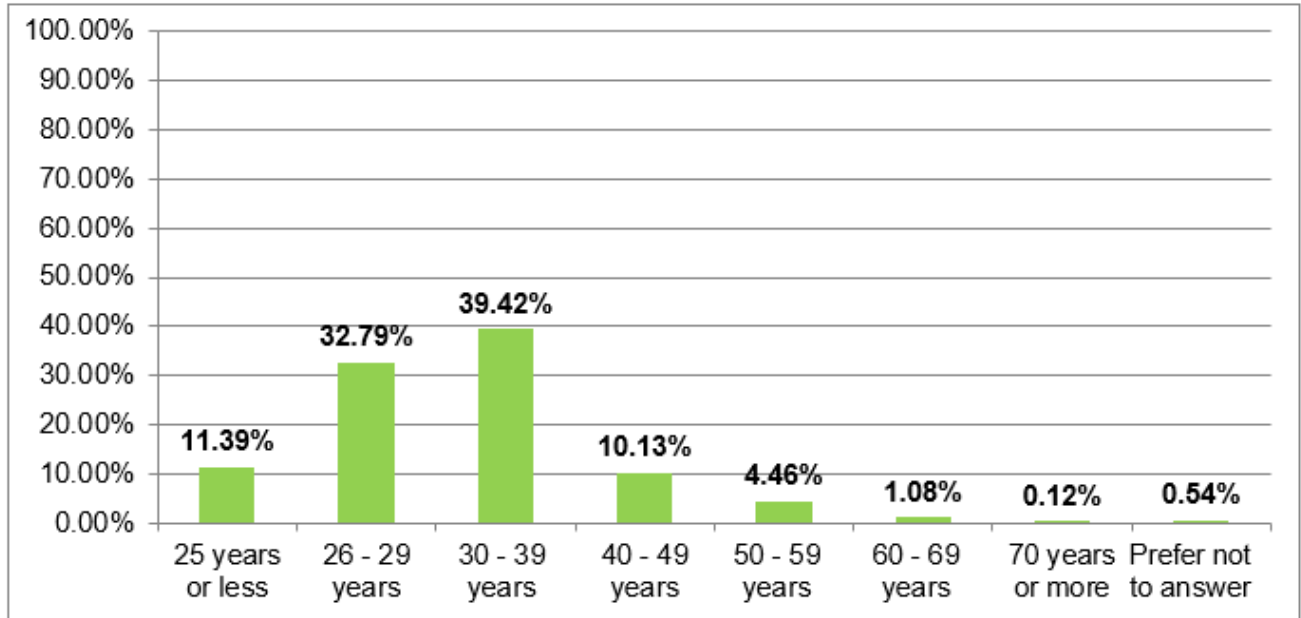
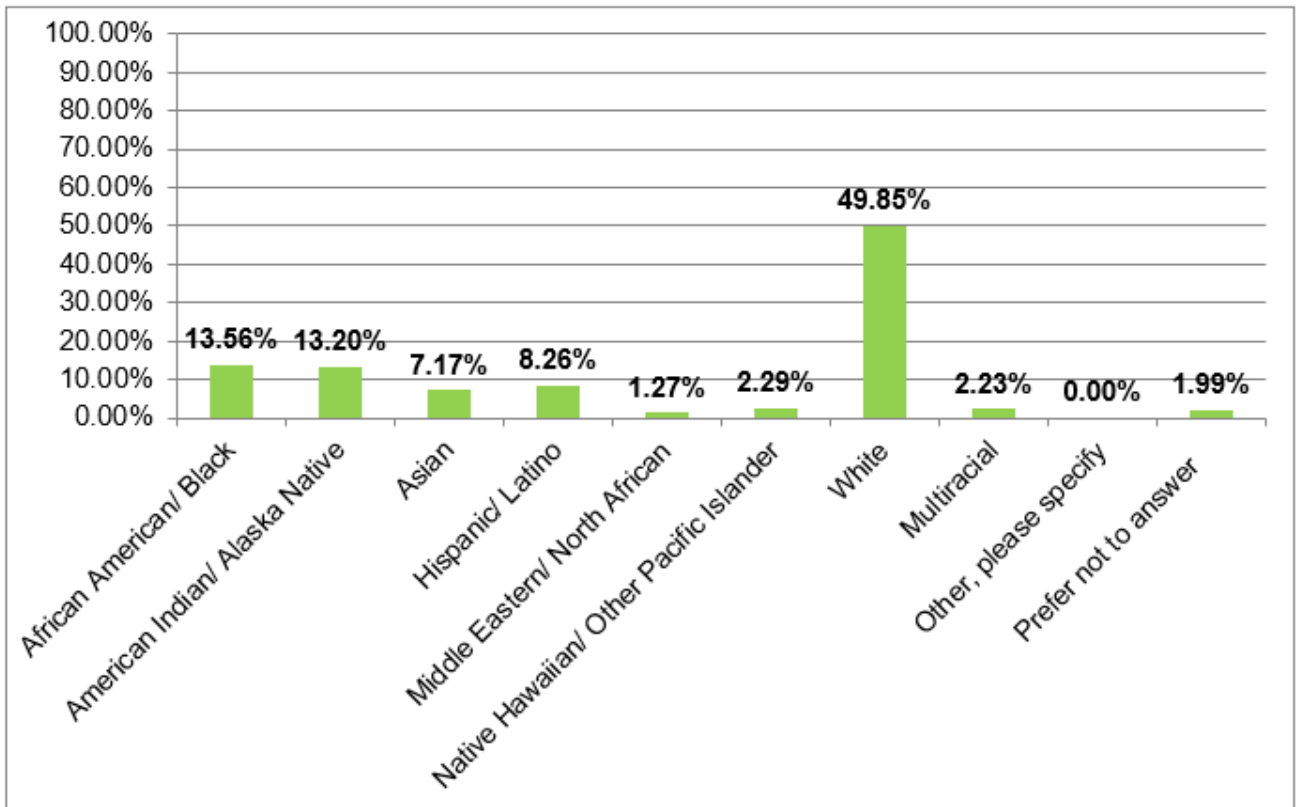


Figure 23. Demographic Question 18. Optional Question: With what race/ethnicity do you most closely identify?



Task and Knowledge Overall Ratings

The following provides a summary of survey respondents' ratings of the tasks and knowledge. All task and knowledge statements achieved high means (at or above 2.50), thereby validating their importance to competent performance for Infection Preventionists in Long-Term Care.

Tasks

Means, standard deviations, and frequency (percentage) distributions for the task ratings included on the survey are provided in Appendices D1 and D2. All 106 (100%) of the tasks achieved high importance (> 2.50).

Knowledge

Means, standard deviations, and frequency (percentage) distributions for each knowledge statement included on the survey are presented in Appendices E1 and E2. All 72 (100%) knowledge statements passed the >2.50 threshold for frequency.

Subgroup Analyses of Task and Knowledge Ratings

The index of agreement is a measure of the extent to which subgroups of respondents agree on which task and knowledge statements are important. Using the mean importance ratings for tasks and knowledge, indices of agreement were computed:

- If the subgroup means are above the critical importance value (mean ratings at or above 2.50), then they are in agreement that the content is important.
- If the subgroup means are below the critical importance value (mean ratings less than 2.50), then the subgroups are in agreement that the content is considered less important.
- By contrast, if one subgroup's (for example, female) mean ratings are above the critical importance value and another subgroup's (for example, male) means are below the critical importance value then the subgroups are in disagreement as to whether the content is important.

The index of agreement provides a method of computing the similarity in judgments between groups that is more tailored to the purpose of a job analysis than the correlation coefficient. Although the correlation coefficient measures the relationship between the full range of possible ratings, the index of agreement focuses on whether two groups agree that the content should (or should not) be included in an examination. As one of the major purposes of this job analysis is to identify appropriate test content, the agreement index provides a statistical method to address this question at the subgroup level. Furthermore, the agreement index requires only 30 respondents per subgroup for computation, whereas the correlation coefficient requires at least 100 respondents per subgroup to provide a reliable measure of agreement.

An illustrative example for two groups on a survey with 100 knowledge statements shows how the index is computed. If two groups passed the same 96 knowledge statements and failed the same 2 knowledge areas (out of the 100 total knowledge areas in the survey), the consistency index would be computed as: $Agreement = [(96 + 2)/100] = 0.98$. Values of 0.80 or less are considered to disagree and therefore additional mean analysis is necessary. If required, the additional analysis will be considered by the Test Specifications Committee to make a decision about whether to include the statements identified as having differences in the final test specifications.

Agreement coefficients were calculated for subgroups based on each of the following background questions:

- 1. How many years have you worked in Infection Prevention?
- 3. What is the licensed bed capacity of your primary practice setting?
- 6. How many Infection Preventionists (IPs) are employed by your facility?
- 7. On average, how many hours per week do you spend performing Infection Prevention activities?
- 8. Do you currently hold the credential Certified in Infection Control (CIC) by the Certification Board of Infection Control and Epidemiology (CBIC)?
- 8a. How long have you been certified?
- 8b. If you are not currently Certified in Infection Control (CIC) by the Certification Board of Infection Control and Epidemiology (CBIC), do you plan on becoming certified?
- 8c. If you are not certified, what is the primary reason you are not certified?
- 9. Does your primary employer require the Infection Preventionist (IP) to have a specialized Infection Prevention credential/certificate?
- 10. Do you hold other credential(s) that are relevant to Infection Prevention (e.g., a-IPC, CPHQ, WOCN)?
- 11. Do you hold other certificate(s) that are relevant to Infection Prevention (e.g., CDC NH IP training course, IPAC Canada)?
- 12. Would you consider obtaining a credential by the Certification Board of Infection Control and Epidemiology (CBIC) specific to Long-Term Care?
- 13. Which of the following best describes your highest level of education completed?
- 14. Which of the following best describes your professional background?
- 15. In what country do you primarily work?
- 15a. In what state/territory do you primarily work? (Please select one from the drop-down menu)
- 15b. In what province/territory do you primarily work? (Please select one from the drop-down menu)
- 16. Optional Question: With what gender do you most closely identify?
- 17. Optional Question: What is your age?
- 18. Optional Question: With what race/ethnicity do you most closely identify?

The majority of subgroups were perfectly aligned for importance of both task and knowledge statements reaching high index of agreement coefficients between 0.80 and 1.0. The subgroups of respondents and the respective agreement coefficients are provided in Appendix F.

The subgroups calculated for demographic questions 13, 15, 15b, and 17 had an index of agreement coefficient lower than 0.80 and required further analysis. A detailed subgroup analysis of the tasks and knowledge associated with the four questions with low indices of agreement was presented to the committee at the Test Specifications meeting. After reviewing the data and discussing the results, the committee decided that all task and knowledge statements associated with these four demographic questions should be included in the final list of tasks and knowledge. The detailed analysis per subgroup for the tasks and knowledge can be found in Appendices G1 to G4 and H1 to H4 respectively.

Content Coverage Ratings

Survey participants were asked to indicate how well the statements within each of the task and knowledge domains covered important aspects of that area. These responses provide an indication of the adequacy (comprehensiveness) of the survey content.

The five-point rating scale for adequacy of content coverage was: 1 = Very Poorly, 2 = Poorly, 3 = Adequately, 4 = Well, and 5 = Very Well. The means, standard deviations, and frequency (percentage) distributions for the task and knowledge ratings are provided in Appendix I. The means for the task and knowledge domains exceeded the >2.50 threshold, which provides supportive evidence that the tasks and knowledge were comprehensive and well covered on the survey.

Survey respondents were provided the opportunity to write in tasks or knowledge that they believe should be included in the listing of important tasks and knowledge. These comments can be found in Appendices J1 and J2. At the Test Specifications meeting, the committee reviewed the content coverage comments to determine whether there are any important statements not covered on the survey that should be included in the test specifications. All comments were determined to be covered elsewhere among the statements or to be insufficiently important for the level for which the comment was provided.

Test Content Recommendations

In survey Section 4: Recommendations for Test Content, participants were asked to assign a percentage weight to each knowledge domain. The sum of percentage weights was required to equal 100. This information guided the Test Specifications Committee in making decisions about how much emphasis the domains should receive on the test content outline. The mean weights across all survey respondents are available in Appendix K1.

Write-In Comments

Many survey respondents provided responses to the open-ended questions about professional development and continuing education needs. These comments can be found in Appendix L.

DEVELOPMENT OF THE TEST SPECIFICATIONS

Two remote test specifications meetings for the LTC examination were conducted on September 8 and 10, 2021. A list of the Test Specifications Committee members can be found in Appendix A1. The meeting agenda is provided in Appendix A2.

The steps involved in the development of the test specifications included:

- presentation of the job analysis project and results to the Test Specifications Committee;
- identification of the tasks and knowledge to be included on the LTC test specifications;
- review of survey respondents' content coverage write-in comments;
- development of the test content weights for the examination; and
- linkage of tasks and knowledge.

Presentation of the Job Analysis Results to the Test Specifications Committee

The first activity in the test specifications development was to provide the Test Specifications Committee with an overview of the job analysis activities and to present the results of the study.

Task and Knowledge Statements to be Included on the Test Specifications

The Test Specifications Committee reviewed the task and knowledge results to make final recommendations about the areas that should be included on the LTC examination. The survey results served as the primary source of information used by the Test Specifications Committee members to make test content decisions.

All 106 tasks achieved mean ratings at or above 2.50 (Pass category) and were included on the LTC test specifications. A list of all task statement means, standard deviations, and frequency percentage distributions and can be found in Appendix D2.

All 72 knowledge areas achieved high importance ratings (>2.50) and were included on the LTC test specifications. A list of all knowledge statement means, standard deviations, and frequency percentage distributions are provided in Appendix E2.

Review of the Content Coverage Write-In Comments

Survey respondents were given the opportunity at the end of each domain to write-in tasks and/or knowledge statements that they believe should be included in the listing of important tasks and knowledge. The write-in comments were reviewed by the Test Specifications Committee and considered when producing the final list of tasks and knowledge.

Development of the Test Content Weights

The Test Specifications Committee participated in an exercise that required every member to individually assign a percentage weight to each of the knowledge domains. Weights were then entered into a spreadsheet and shown to the committee. The committee members were able to compare the test content weights derived from the survey responses to their own estimates. This resulted in an extended discussion among the committee members regarding the optimal percentages for the examination.

Table 4 presents the test content weights recommended by the Test Specifications committee, including the percentage content weights by domain and the target number of questions for the LTC examination. This information can also be found in Appendix K2. The complete test specifications is presented in Appendix M.

Table 4. *Test Content Weights Recommended for the LTC Examination*

Content Areas	Number of Knowledge Statements	TS Committee Percentage Recommendations	Number of Examination Items
1. Long-Term Care Settings	8	10%	15
2. Management and Communication of the Infection Prevention Program	16	11%	16
3. Identification of Infectious Diseases	7	12%	18
4. Surveillance and Epidemiologic Investigation	16	16%	24
5. Prevention and Control of Infectious and Communicable Diseases	8	16%	24
6. Environment of Care	5	12%	18
7. Cleaning, Disinfection, Sterilization of Medical Devices and Equipment	2	10%	15
8. Antimicrobial Stewardship	6	7%	11
9. Employee/Occupational Health	4	6%	9
Total	72	100%	150

Linkage of Tasks and Knowledge

Linking tasks and knowledge verifies that each knowledge area included on an examination is related to the competent performance of important professional activities. As such, linking documents the content validity of the professional activities included in the test specifications.

Linking does not require the production of an exhaustive listing; rather, task-knowledge links are developed to ensure that each knowledge area is identified as being related to the performance of at least one, or in most cases several, important tasks.

Linking also provides guidance for item-writing activities. When item writers develop questions for specific knowledge areas, they have a listing of tasks that relate to the knowledge. This provides context for developing examination questions and assists the item writers in question design. The linkage of tasks and knowledge is provided in Appendix N.

SUMMARY AND CONCLUSIONS

The job analysis study for the LTC examination was conducted to:

- identify and validate tasks and knowledge important to the work performed by Infection Preventionists in Long-Term Care;
- create test specifications that will be used to develop the LTC examination; and,
- identify professional development/continuing education needs relevant to the work role of Infection Preventionists in Long-Term Care.

The tasks and knowledge were developed through an iterative process involving the combined efforts of CBIC, Prometric, and subject matter experts. The tasks and knowledge were entered into a survey and subjected to verification/refutation through dissemination to Infection Preventionists in Long-Term Care. Survey participants were asked to rate the importance of specific tasks and knowledge.

The results of the study support the following:

- All of the tasks and knowledge that were verified as important through the survey provide the foundation of empirically derived information from which to develop the test specifications for the LTC examination.
- Evidence was provided in this study that the comprehensiveness of the content within the tasks and knowledge domains was well covered.

In summary, the study used a multi-method approach to identify the tasks and knowledge important to the work performed by Infection Preventionists in Long-Term Care. The results of the study can be used to develop the LTC examination.