

Canadian Institute of Public Health Inspectors (CIPHI)
Board of Certification Oral Examination Development Project
Part 1 Report
Robert Hart, March 31, 2005

Table of Contents

1. Introduction
 2. Summary Findings
 - 2.1 Job Characteristics Identification & Examination Content Guide
 - 2.2 Defensible Passing Score
 3. Summary Recommendations
 4. Report
 - 4.1 Job Characteristics Identification & Examination Content Guide
 - 4.1.1 Survey Results – Work Areas
 - 4.1.2 Survey Results – Expected Competency Questions
 - 4.1.3 Recommendations and Overview of Exam Content Guide
 - 4.2 Defensible Passing Score
 - 4.2.1 Survey Results
 - 4.2.2 Recommendations
 5. Towards Part 2 of the Project
- Appendix A Exam Content Guide
- Appendix B Public Health Inspector Entry Level Competency Survey

1. INTRODUCTION

The Board of Certification (BOC) has commissioned a report to provide information and recommendations related to the development of the oral component of the certification process for public health inspectors (PHIs). This report provides the required outputs for Part 1 of the project, namely:

1. the identification of the job characteristics of an entry level public health inspector
2. the development of a guide for determining the content of the exam
3. the determination of a defensible passing score for the exam

2. SUMMARY FINDINGS

2.1 Job Characteristics Identification & Examination Content Guide

A survey of health departments suggests there is generally a high degree of similarity in entry-level PHI job characteristics across Canada. As well, the bulk of work relates to the “traditional” environmental health activities of food safety, water quality, fixed premises inspections, and communicable disease control.

Employers of entry-level PHIs require individuals with relatively in-depth content knowledge related to traditional environmental health activities/legislation and general familiarity with other less traditional issues. As well, they expect entry-level PHIs to demonstrate a median level of independent investigative and decision-making skill, with above-median communication skills.

Based on these findings, the Oral Examination Content Guide (**Appendix A**) was developed.

2.2 Defensible Passing Score

A survey of certifying organizations revealed a large degree of variation in the manner in which certification is carried out. Those organizations surveyed that make use of specific passing scores required minimums ranging from 60% to 95%. Other organizations make use instead of rated scoring systems based on the performance of the examinee cohort and/or the difficulty of a particular exam. Of note was the fact that a majority of organizations favour written exams over oral due to concerns about scoring validation with the latter.

3. SUMMARY RECOMMENDATIONS

Based on the information provided in this report, it is recommended that

- the Examination Content Guide referred to above be used as the basis for the development of the oral exam questions related to Part 2 of this project,
- an entry-level job characteristics survey be conducted every three years in order to ensure that the Content Guide remains valid,
- the minimum passing score for the oral exam be raised to 65% to bring it to the median level observed among other certifying bodies,
- future consideration be given to the possibility of converting the oral exam certification process to a written exam process.

4. REPORT

4.1 Job Characteristics Identification & Examination Content Guide

In order to assess entry-level PHI job characteristics, a survey (attached as **Appendix B**) of health departments across Canada was undertaken. The survey was distributed to health departments via provincial branch executive officers and directly to Canada Forces and First Nations agencies involved in environmental health.

The work area component of the survey was based on the BOC *Report on Practicum*. This document provides an extensive overview of the range of environmental health activities that could be undertaken by an entry-level PHI. It was condensed in the survey to allow for ease of completion, but all of the potential work areas were represented.

Entry-level expected competency was measured in the survey by six questions designed to probe for expected content knowledge, decision-making/investigative skills, and ability to communicate effectively.

In total, 29 completed surveys were received: 19 from Ontario, three from British Columbia, two from Saskatchewan and one each from Alberta, Manitoba, Newfoundland, Nova Scotia, and Canada Forces.

4.1.1 Survey Results – Work Areas:

Table A provides an overview of the results by work area. In looking at the results, it will be noted that there is some variation in the work area distribution between majority urban and majority rural health departments. Rural departments for example spend more time on water quality issues, while urban departments inspect more fixed premises. On balance however, such variation did not affect the structure of the Exam Content Guide (discussed below).

There were concerns however that the large proportion of responses from Ontario might have biased the results toward work areas/activities in that province. However, with the exception of water quality, no significant variation in reporting was noted between the Ontario responses and the other responses grouped separately together. A brief discussion of each work area now follows:

Air Quality

Median percentage = 5

Range: 0 – 20 (only six responders reported percentages exceeding 5)

Investigation of indoor air quality and enforcement of tobacco legislation, in nearly equal proportion, were the top two activities reported. Some health departments also reported education activities within this work area.

Waste Management

Median percentage = 5

Range: 0 – 25 (only seven responders reported percentages exceeding 5)

Investigation and management of private sewage disposal systems was the most reported activity in this area with all other activities reported approximately equally, but much less frequently.

Water Quality

Median Percentage Ontario = 20 Median Percentage All Others = 5

Range: 0 – 35

Issues pertaining to private and municipal/communal drinking water systems were the most frequently reported activities. Recreational water activities and education were commonly reported but less so than the former. As previously mentioned Ontario health departments reported a larger proportion of time (15%) devoted to water quality. This is a result of the water quality strategies introduced in Ontario following the Walkerton outbreak. This regional variation is allowed for in the Exam Content Guide.

Food Safety

Median Percentage = 45

Range: 22 – 90

With few exceptions, this was the major work area for most health departments. Those reporting proportions of 80% or more were primarily large, almost exclusively urban centres. Inspection activities ranked highest, although activities related to education and HACCP (in both food processing and food service) were also significantly reported.

Fixed Premise Inspections (non-food)

Median Percentage = 15

Range: 4 – 30

Public swimming pool and childcare inspections were reported most frequently. Personal service settings followed with seasonal premises such as summer camps and migrant farm worker housing ranking lower, but still significantly.

Land Management

Median Percentage = 1

Range: 0 – 10 (only one health department reported a percentage above 5)

Health departments reported little time devoted to this area. The time that was spent related primarily to planning application review. The one health department reporting 10% of time in land management advised that non-PHI personnel carry out this work.

Communicable Disease Control

Median Percentage = 10

Range: 1 – 25

The primary activity under communicable disease control was rabies investigation, followed by individual enteric case management. While not significant, it was noted in the results that Ontario health departments did report slightly higher activity ratings for communicable disease than did the other provinces as a whole. This appears to be a result of PHIs not being involved in rabies investigations in some provinces.

Other Activities

Median Percentage = 5

Range: 0 – 13 (25 respondents reported less than or equal to 5%)

Other Activities was used as a “catch-all” category in order to condense the survey for ease of response. In general, health departments reported a

low level of activity in the activities listed. Emergency response preparedness scored highest, followed by occupational health issues.

4.1.2 Survey Results – Expected Competency Questions

Section 3 of the survey posed six questions to health departments that were designed to screen for expected content knowledge, decision making capacity, investigative and communication skills.

The charts in **Table B** illustrate the responses to these questions. No significant variation was noted in relation to regional or urban/rural responses.

Knowledge of Legislation

The majority of respondents expected entry-level PHIs to have a moderate to thorough understanding of relevant legislation. This suggests that exam questions, when dealing with legislation, should probe for responses that demonstrate a sound, though not highly detailed, understanding of relevant statutes.

Enforcement Decisions

In general, respondents did not expect entry-level PHIs to make major enforcement decisions on their own. One respondent who provided additional written comments suggested that entry-level PHIs must, in many regards, be guided in their decision-making by the policies of the agency for which they work.

This result suggests that situational questions should test for an understanding of the key issues of the situation and the range of logical solutions that could be applied to them. As well, the response, “I would ask my manager” may be the proper response to some questions.

Investigative Skill

Although some respondents expected entry level PHIs to be able to conduct independent investigations, the majority were looking for a basic to moderate level of ability in this area.

Investigative questions should therefore test for an understanding of basic principles. However, the candidate should also be able to demonstrate the practical application of these principles in a reasonably simple (but not too simple) situation.

Communication

Respondents desire a high level of communication skill in entry-level PHIs. The expectation is that a PHI can both communicate complex issues and function in a potentially confrontational situation.

Therefore, exam questions, regardless of topic area, should often include aspects that test for communication skills at this level.

Knowledge of Enterics

A high level of knowledge of enteric disease is expected of entry-level PHIs. This response might seem surprising given the relatively low proportion of time that health departments reported for communicable disease work (see above). However, the result acknowledges that often the majority of work carried out by health departments is related to enteric disease prevention.

Questions related to enteric illness should therefore screen for *a reasonably specific understanding of both etiology and its relationship to public health interventions.*

Knowledge of Non-Communicables

The majority of respondents split their expectations between a basic-moderate and moderate-thorough understanding of non-communicable disease issues. This suggests that questions regarding these issues should test for a level of understanding that at least approaches that expected for enteric disease.

4.1.3 Recommendations:

Based on the results of the job characteristics survey, it is recommended that the BOC adopt the Exam Content Guide (Appendix A) as the template for setting oral exams.

As well, it is recommended that the job characteristic's survey be conducted every three years in order to ensure that the Content Guide remains relevant.

The Guide is summarized as follows:

- Exams consist of ten questions, each marked out of ten for a total possible score of 100 (recommendations for the minimum passing score are discussed below). **Note: a maximum duration for the exam needs to be established by the BOC in relation to the number of questions.**
- Awarding marks for specific, discreet responses will assist in the standardization of the exam and should address many of the concerns associated with examiner bias. (Standardization will be considered in detail in Part 2 of the project.)
- 40% (four questions) of the exam content pertains to food. While the results of the survey could justify a higher food safety content, this would have reduced the capacity to include sufficient questions in other work areas.
- The remaining 60% of the exam content is divided equally (15%, representing one or two questions) among Fixed Premises Inspections, Communicable Disease Control, Water Quality and Non-Communicable Disease Control
- Non-Communicable Disease Control is a compilation of the work areas where reported activity was at or below 5% (air quality, waste management, land management and “other”).
- Communicable Disease Control content exceeds the reported median of 10% in the survey in order to accommodate the response to the competency question pertaining to “knowledge of enterics”.
- The option of one or two questions in a given area allows for some adjustment in these proportions in response to any known regional variation. For example, in Ontario, two questions might be asked about water quality. In another province, only one water question might be asked with an additional question included in another area.
- The Guide acknowledges that a certain amount of overlap of content areas is unavoidable. For example, a question that asks a candidate to describe the key elements of a childcare inspection (Fixed Premises) will likely touch as well on Communicable Disease Control. This is viewed as a positive rather than a negative in that it underscores the inter-relatedness of much of environmental health work.

4.2 Defensible Passing Score

In order to determine a suitable, defensible passing grade for the oral exam, a survey of a range of organizations involved in certification/registration was undertaken. **Table C** of this report lists the agencies contacted. As well as international environmental health associations, it will be noted that professions ranging from fitness trainers to lawyers are represented.

4.2.1 Survey Results:

The results of the survey indicate that organizations go about certification in a variety of different ways. Options range from the exclusive use of written multiple choice exams to some combination of practical, written and oral exams. Written exams were the most common choice among organizations. The main reason cited for using written exams was the relative ease with which questions could be standardized and scoring validated. For these reasons, the American Society of Veterinary Science this year replaced its oral certification process for surgeons with a written exam.

Certification grading techniques also vary widely. Some organizations, like CIPHI, make use of fixed grades for exams. Among those surveyed, minimum passing scores ranged from 60% to 95% (mean = 69%; median = 65%). The thinking behind fixed scoring is that the examination content is standardized and the passing score screens for the minimum acceptable performance level of a candidate in his/her profession.

Others organizations use graded scoring based on models developed by Angoff and others. Such models allow for the adjustment of scores within an examinee cohort based on how well (or poorly) the cohort performed (roughly synonymous with “bell-curving”). In addition, models are also developed to account for the fact that one version of an exam may be more or less difficult than another. This is usually done by convening a panel of content experts to compare new exams with an index and determine the corresponding score that represents the minimum acceptable performance level of a candidate.

4.2.2 Recommendations:

The results of the survey present two issues for consideration: the use of fixed vs. graded exam scoring and the use of oral vs. written exams.

Fixed vs. Graded Scoring:

While the intent of the BOC’s revision of the oral certification process is to improve standardization, the use of graded scoring does not appear feasible or necessarily desirable at this time.

Methods to adjust scores relative to the performance of an examinee cohort are definitely undesirable. The BOC's goal is to certify individuals who demonstrate entry-level public health inspector competency. This goal should not be compromised because a particular cohort performed badly in a particular instance.

Extensive methods to adjust the scores for different sets of questions, based on difficulty, would be desirable. However, organizations that employ these methods generally have large membership bases and resources with which to do so. Currently this capability is beyond the scope of CIPHI. However, in Part 2 of this project, feasible recommendations for improved standardization based on Angoff methods will be presented.

Therefore, it is recommended that the BOC continue with a fixed score for the oral exam and that this score be raised to 65% to bring it to the median observed among other certifying bodies.

Oral vs. Written Exams:

The consideration of oral vs. written exams is not specifically a component of the BOC's oral certification project. However, the somewhat unexpected findings of the agency survey warrant some discussion of this issue.

Written exams appear to provide significant advantage over oral ones in terms of standardization. They eliminate concerns of scoring bias among examination panel members and between different examination panels. As well, all candidates are faced with the same set of questions in a written exam, meaning that the level of difficulty (at least for that exam) is equal for all. Finally, the ability to include a greater number of questions in a written exam can allow for a finer assessment of a candidate's content knowledge.

However, a transition from oral to written exam would require time to consider. Currently there is a perception that an oral exam measures characteristics of a candidate that can not be gauged by a written format. Whether the oral exam actually does and should evaluate such characteristics needs to be determined before major revisions to the process are undertaken.

Therefore, it is recommended that the BOC continue with the oral exam component of the certification process, but that future consideration be given to the possibility of converting the oral examination process to a written one.

5. TOWARDS PART 2 OF THE PROJECT

The results of Part 1 of the project provide the necessary basis for developing an initial bank of 300 questions for the oral exam. As well, the information acquired through the survey of other certifying organizations has provided guidance on standardizing the exam process.

Respectfully submitted,

Robert Hart, B Sc., C.P.H.I. (c)