

ANNUAL REPORT 2014 - 2015

Innovation • Education • Quality Assessment • Continual Improvement

Clinical Microbiology Proficiency Testing

— Established 1982 —

Michael A Noble MD FRCPC, Chair and Managing Director
Esther Kwok BSc, RT, CLQM, Coordinator

ISO 9001:2008 Registration 2002

ISO/IEC 17043:2010 Registration 2015

ISO 9001:2008



ISO 9001
QMI-SAI Global

Certificate Number: CERT-0078728

ISO/IEC 17043:2010



Certificate Number 3749.01

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TABLE OF CONTENTS CMPT Annual Report 2014 - 2015

CMPT QUALITY POLICY AND MISSION STATEMENT.....	4
CMPT STAFF.....	4
CMPT COMMUNICATIONS	4
CHAIRMAN'S ANNUAL REPORT	5
Goals and Objectives 2014-2015	12
Goals and Objectives 2015-2016	12
COMMITTEE MEMBERS 2014-2015.....	13
CLINICAL BACTERIOLOGY PROGRAM	14
Clinical Bacteriology Histograms	15
WATER MICROBIOLOGY PROGRAM	23
Water Microbiology - Challenge Records for 2014	24
Water Microbiology Histograms	25
MYCOLOGY PROGRAM	31
ENTERIC PARASITOLOGY PROGRAM	33
TRICHOMONAS VAGINALIS ANTIGEN PROGRAM	34
SHIGA TOXIN PROGRAM	35
MOLECULAR TESTING PROGRAM	36
CMPT PROGRAMS' PARTICIPANTS' DISTRIBUTION.....	37

CMPT QUALITY POLICY AND MISSION STATEMENT

Innovation, Education, Quality Assessment, Continual Improvement

- We, at CMPT, are a university based, peer directed program, that provides Innovative External Quality Assessment for microbiology laboratories providing services for public and patient health.
- Our vision is to be recognized provincially, nationally, and internationally as a valued contributor of EQA innovation, education, and as passionate advocates for continued quality improvement in EQA for the benefit of healthcare, our participants, and our program.
- CMPT is committed to its Quality Management System, and regular review for continual improvement of its effectiveness.
- CMPT is committed to regulatory requirements of ISO 9001:2008 and ISO/IEC17043:2010.
- The CMPT Quality Policy is the framework for the regular establishment and review of quality objectives.
- CMPT is committed to regular review of the Quality Policy to ensure its suitability to the program.



Michael A. Noble, Chair
September, 2015

CMPT STAFF

The CMPT staff is committed to the highest standards of quality and professionalism. This dedicated team of administrative and technical staff provides support through all phases of the program.

Michael A. Noble, MD FRCPCChair and Managing Director
Esther Kwok, BSc, RT, CLQMCoordinator
Caleb Lee, MHA, BMLSc, CLQMHead Technologist
Suhanya Bhuvanendran, BMLSc, CLQMTechnologist and Web Manager
Veronica Restelli, MScEditor
Fion Sze On Yung, MLT BScTechnologist

As a program in the Department of Pathology and Laboratory Medicine, University of British Columbia, CMPT acknowledges and greatly appreciates the on-going support of the following individuals.

Mike Allard, MD, FRCPC, Professor and Acting Department Head.

Sandy Liu, Director, Human Resources and Administration.

CMPT COMMUNICATIONS

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CHAIRMAN'S ANNUAL REPORT 2014 - 2015

CMPT Program

UBC's Clinical Microbiology Proficiency Testing program, first created in 1983, has enjoyed over 30 years of experience and expertise and consistently lives its mission statement of Innovation, Education, Quality Assessment and Continual Improvement.

The past year (April 2014-March 2015) continued in this long standing tradition. We again have the opportunity to look back with pride in our successes.

CMPT Staff

As the chair and managing director of CMPT, I am so impressed with the skill, talent and effort of our staff. CMPT exists and is able to shine because of them. CMPT is a sum greater than its parts because of the commitment to our program of Esther Kwok, our coordinator, Caleb Lee, our senior technologist, Suhanya Bhuvanendran, technologist and web manager, and Veronica Restelli, our writer and editor and laboratory technologist. My hat is off to the whole group for pulling together.

Because of our successes, we have put ourselves in the position of increasing our staff; starting in June 2015, Fion Yung MLT BSc has joined us as a Research Technologist. We welcome Fion to our CMPT family.

CMPT Volunteers

CMPT is grateful for all the support we receive from our committee members and chairs and without them, it would be impossible for us to maintain our challenge selection process, our assessment system, and the high quality of our critiques and newsletter. As always, CMPT recognizes the invaluable role that our committee members contribute. We receive the benefit of their time, knowledge, and expertise. All is appreciated.

We have active committees for our Clinical Bacteriology, Mycology, and Enteric Parasitology programs, with all members being actively involved in programmatic review and critique development.

Our committee renewal process will continue on, but on a more regular basis, keeping in mind the importance of maintaining the right balance between experience and fresh ideas.

Management of CMPT Quality Management

External Review

Once again, CMPT was successfully audited by SAI Global and we maintained our certification to ISO 9001:2008. As a new version of ISO9001 is now available (ISO9001:2015), CMPT will seek certification against this last version of the standard if we decide to continue having our quality system ISO certified against this document.

Importantly, consistent with our Quality Objectives for this year, we prepared for and had a complete and thorough audit by two independent representatives sent under the authority of the American Association for Laboratory Accreditation (A2LA) to assess our compliance with the international standard ISO/IEC 17043:2010 (*Conformity assessment - General requirements for proficiency testing*). The audit was undertaken in January 2015, and our certificate was provided in June. We look forward to our continued working relationship with A2LA.

Internal Audit

As part of the requirements for our external certification audit and accreditation audit, our internal audits were completed in the Spring of 2015.

One deficiency noted in one of our assessments was that some of our manuals contained a number of obsolete documents that should have been replaced and discarded to be in agreement with our controlled essential documents. That deficiency was immediately addressed.

Since May 2015, we have completed two additional document audits, each of which included an assessment of 15 percent procedure documents (randomly selected) to ensure that our files are current and up to date. No obsolete documents were identified, although one document was found to not include a page count. This was addressed immediately.

Our formal process of internal audits has been proven to be an invaluable method to ensure our Quality System remains intact and up to date.

Opportunities for Improvement Reported during 2013-2014

CMPT has maintained an ongoing opportunities for improvement (OFI) table since it was first registered. During the last year 44 additional OFIs were recorded. While this number would seem to suggest increasing problems, 20 of the OFIs

CHAIRMAN'S ANNUAL REPORT 2014 - 2015

were directly related to the two external audits. With those being accounted for, the number of remaining OFIs (24) is in line with past years. Without going into detail, almost all OFIs were due to single events, most attributed to clerical issues. There were two repeated clerical events. Taken as a group we have interpreted this as a symptom of a program with overwork issues. We have taken the step to address this through the hiring of an additional person, and re-allocating some of the clerical/information associated tasks.

At CMPT, we understand that information accuracy is a critical component of proficiency testing and trust. We do not under appreciate the importance of these slips/mistakes.

Two of our laboratory errors have indicated that one of our key pieces of equipment may have slipped out of proper calibration. We have arranged to have the unit addressed, and have taken it out of operation until the checks can be performed.

Two of the OFIs were related to our increasing performance of Preventative Action audits.

Quality System

As part of the ISO/IEC 17043 audit process our Strategic Quality Plan (SQP) was reviewed. Some minor revisions were required; while appearing small, the most significant revision was made to SQP009 (Purchasing Supplies and Equipment, Sub-contracting Services) because it introduced a risk assessment process into our selection of suppliers. To supplement the risk process, a new SQF11 form has been developed which applies the severity-occurrence analysis to assist in the selection of suppliers.

CMPT Resources

CMPT relies on the revenues generated through cost recovery, and our web site.

With respect to finances, CMPT has developed a successful financial plan and generated sufficient positive revenue in spite of continued laboratory consolidation resulting in fewer participant laboratories.

We continue to off-set the impacts of consolidation with the provision of additional services.

We have generated sufficient excess revenue to hire part time staff to address the continued indications of under-staffing.

Training, Competency, Proficiency

No staff required any new training, or competency assessment in 2014-2015. This will change next year with the inclusion of a new staff member.

Review of Continuing Education

CMPT is committed to providing opportunities for our staff to participate in education opportunities. All CMPT staff are encouraged to take advantage of the programs that the university has to offer.

Laboratory Safety

During the last 3 years, CMPT has formalized its safety processes significantly. Suhanya Bhuvanendran continues to serve as the CMPT Safety Officer. We have monthly safety audits that are recorded along with departmental peers using a CMPT developed on-line safety audit reporting tool for ease of completion, reporting, analysis, and referral.

In 2016 CMPT will need to ensure compliance with the new Canada Human Pathogens and Toxins Act.

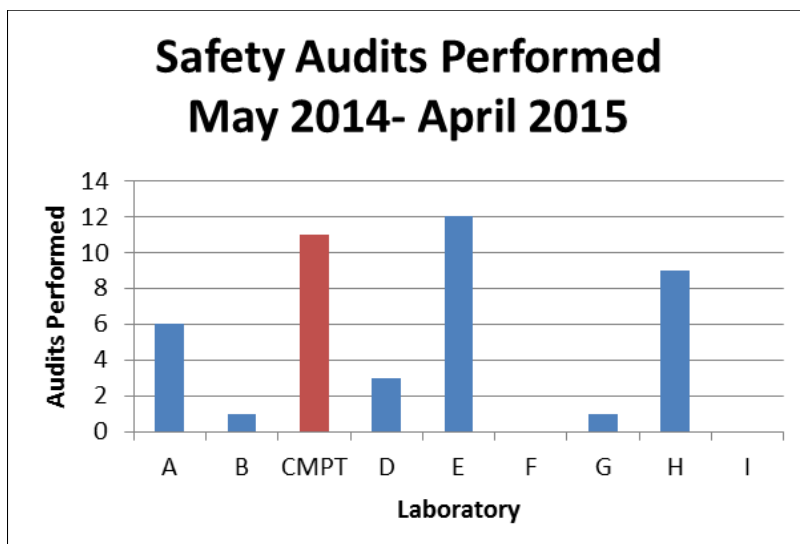


Figure 1. Safety Audits Performed by CMPT. Comparison with other laboratories in the department.

CHAIRMAN'S ANNUAL REPORT 2014 - 2015

Review of Programs

Proficiency Testing

EQA is the core activity of CMPT. The changing landscape of medical laboratories in terms of size, number, and scope has encouraged us to be ever vigilant for opportunities in EQA innovation, to which we have responded with increased variety of samples and programs. We continue to extend research and development for new assays with the view to improve products and expand the variety of clinically relevant challenges.

Importantly, we have been working with our web designer and have created a method that allows us to send out results letters electronically rather than as a paper copy. This provides an opportunity for much faster access to information. This new modality will be extended and enhanced in the coming year.

CMPT Committees and Working Groups

Clinical Bacteriology

Mycology Plus

Enteric Parasitology

Water Bacteriology

International Training

CMPT has long recognized the importance of ensuring EQA proficiency based on realistic samples, not only in Canada, but also in developing regions around the world. Over the last decade we have provided educational PT training for delegates from more than 10 countries.

In 2014-2015 we did not have any visitors for extended training, but some discussions are underway for 2016 and 2017.

Proficiency Testing Assistance

CMPT regularly receives requests from different programs to provide benefit and experience such as administrative expertise or the provision of specialized samples that are stable and can travel for extended time and distances. CMPT views the landscape of EQA, both national and international, as an opportunity for collaboration for the betterment of healthcare and patient safety.

Dr. Noble has been invited to put his name forward to become the chair of the EQALM Working Committee for Microbiology PT/EQA. (EQALM is the European based international PT/EQA or-

ganization which includes PT/EQA through Western Europe, North and South America.

CMPT Quality Indicators

Clinical Bacteriology Appeal Resolution

This year CMPT had 6013 graded challenges in the Clinical Bacteriology surveys. CMPT received 9 requests for committee appeal of the assigned grade. This represented 0.14 percent of grades. Committee discussed all requests. Of the 9 appeals, 4 (44.4%) were resolved in support of the request, (Table 1).

Ungraded samples

Over the years, CMPT sample grading has become increasingly complex. In this past year, 6013 out of 7447 (80.7%) challenge samples sent were graded. The most common reason for a challenge to be ungraded was because the laboratory reported that it does not normally process the type of sample presented.

There were no rejected samples for Quality Control reasons in 2014 - 2015 (Table 2).

Customer Satisfaction Surveys

In 2014-2015, CMPT performed a satisfaction survey focussed on our appeals process.

Respondents were from all provinces, in proportion consistent with our participant distribution. Overall we had a response of approximately 35%, low by CMPT standards, but sufficient to accept the sample as valid.

Of interest, only about 65% of the respondents were aware that CMPT has always had an appeals process for those who would like a second opinion on a submitted challenge. That response was consistent with 42% indicating they knew that their laboratory had submitted an appeal, with 44% definitely aware that their appeal had resulted in a change of grading assessment.

Twenty-nine percent (29%) were not aware their laboratory had previously submitted an appeal.

With respect to response time, clarity, and explanations within the appeal, CMPT appeal letters were rated 3.5 out of 5.

In response to the question "*Based on your experience or experiences with CMPT, how would you assess the CMPT Appeals Process on a 10-point scale ranging from Open and Fair to Negatively Biased and Unfair.*" CMPT was rated 7.33 out of 10.

CHAIRMAN'S ANNUAL REPORT 2014 - 2015

We understand that not every laboratory will submit an appeal, but we are disappointed that over a third of laboratories were unaware that they could appeal. This is something that we need to work on. On a positive note, those participants that were aware considered our appeals process to be unbiased and fair.

www.CMPT.ca

CMPT website has grown dramatically since its early years as a small home-grown awareness centre. Today it is a content rich, high utilization site loaded with both current and archived critiques and newsletters, and also it is the cornerstone access point for entering EQA information and challenge results.

In our survey of last year, while 60% said that they visit and work at the site 3 or 4 times a year, and an additional 36% are on line with CMPT at least once or twice every month, while others visit the site at least once a week.

Last year's survey also noted that the ease of navigation in our website is rated low. In 2015-16 we will put resources into improving the appearance and performance of www.cmpt.ca.

CMPT Composite Satisfaction Score

Each year CMPT combines the information from the surveys with other factors (contacts, complaints, consultations) and derives a weighted Composite Score Satisfaction (CSS). In the weighting negative comments, lost contracts and complaints are weighted greater than positive counterparts. We have been monitoring this indicator for now 12 years. In 2014-15, CMPT had new contracts and no complaints or lost con-

Table 2. Ungraded samples for Quality Control reasons	
Year	Ungraded samples
2000 - 2001	0
2001 - 2002	3
2002 - 2003	3
2003 - 2004	3
2004 - 2005	3
2005 - 2006	3
2006 - 2007	4
2007 - 2008	3
2008 - 2009	1
2009 - 2010	2
2010 - 2011	0
2011 - 2012	0
2012 - 2013	3
2013 - 2014	0
2014 - 2015	0

tracts, however, as discussed, our survey on the appeals process had a neutral response with few comments, positive or negative. While the CSS remains lower than in earlier times, it continues to be within our acceptable range (86-97) (Figure 2). The lower value may reflect either poor survey topic selection or perhaps some creeping fatigue to CMPT surveys. Because the same

Table 1. Appeals Submitted - Clinical Bacteriology Surveys

Year	Graded Challenges	Appeal	Support request	Affirm committee
2004-5	6378	11		
2005-6	6378	21		
2006-7	x	20		
2007-8	x	31		
2008-9	x	15		
2009-10	x	13		
2010-11	6067	15	6	9
2011-12	6726	13	2	11
2012-13	6325	12	4	8
2013-14	6300	17	6	11
2014-15	6013	9	4	5

CHAIRMAN'S ANNUAL REPORT 2014 - 2015

survey structure has been used for 13 years, we would not likely make any changes without considerable review and analysis.

Ongoing laboratory performance

CMPT regularly monitors category performance. Over the last 14 years we have seen great stability with Category A laboratories, but the record for smaller laboratories has been less stable. Over the last 3 years we have seen definite improvement in the performance of smaller laboratories (Figure 3). This does not appear to be regional. We cannot account for the improvement, but we are very supportive of the new pattern of improvement.

CMPT Presentations and Publications

- *Risk Management in the Medical Laboratory: Reducing Risk through Application of Standards.* CSMLS Annual Conference (Labcon) Saskatoon Sask. June 2014
- *Clinical Impact of Quality Control (1).* Bio-Rad Workshop. Hong Kong PR China. July 2014.
- *Clinical Impact of Quality Control (2).* Bio-Rad Workshop. Beijing PR China. July 2014.
- Noble MA. *Proficiency Testing for the Ability to Assess and Report Urine Colony Counts.* European Association for EQA (EQALM) Toulouse France October 2014.
- Restelli V, Noble MA 2014. *Performance of Canadian clinical laboratories processing throat culture proficiency testing surveys.* Accreditation and Quality Assurance. (2014) 19:445–450; (Published online: 15 October 2014)
- Michael A Noble, Robert Martin. 2014. Editorial - *Making Great Strides in Medical Laboratory Quality.* African Journal for Laboratory Medicine. V3 N2 pg2-3.
- *Proficiency Testing of MALDI-TOF MS. New Technologies Workshop.* Jingmen Hubei Province, China. May 2015.
- *Quality and the Medical Laboratory: Understanding Errors and their Solutions.* Department of Pathology and Laboratory Medicine General Pathology Academic Half Day. June 2015

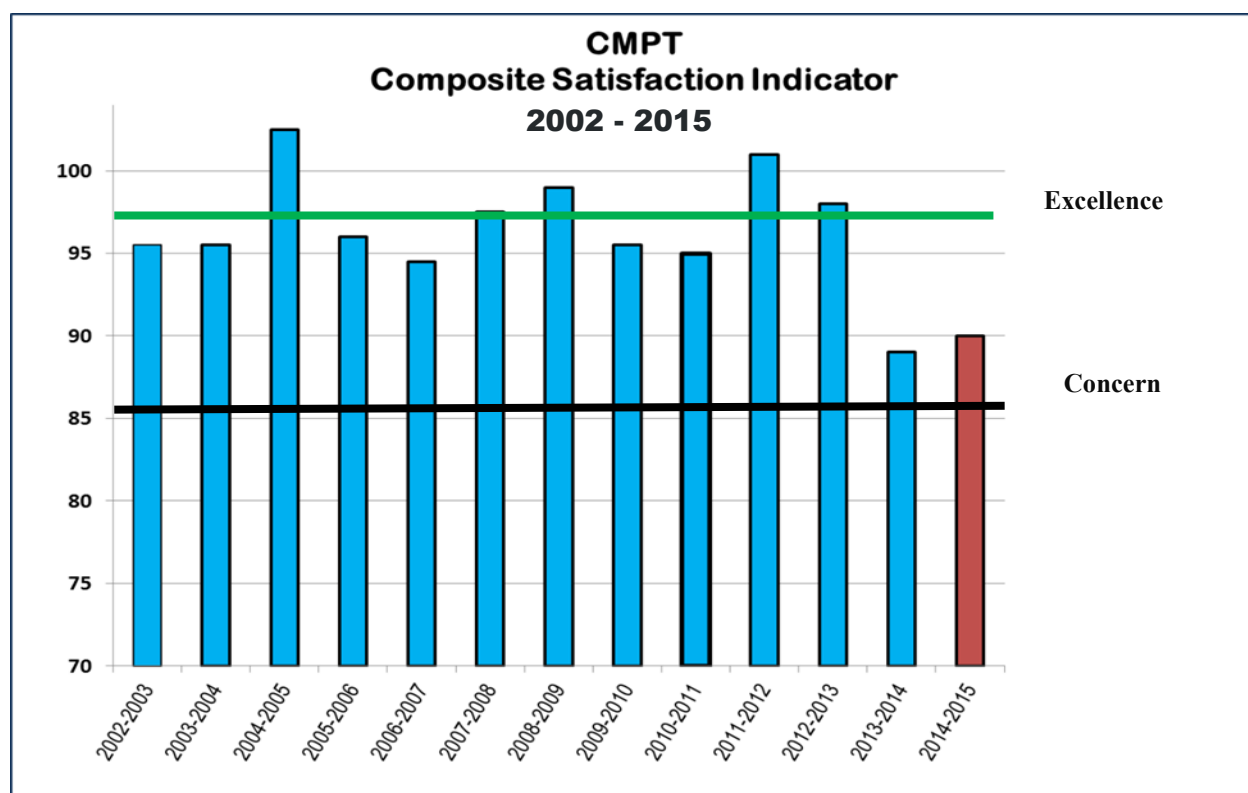


Figure 2. CMPT Composite Satisfaction Indicator 2002 to 2015.

CHAIRMAN'S ANNUAL REPORT 2014 - 2015

- Noble M.A. 2015. Chapter 12. *Prevention of Laboratory-Acquired Infections*. Manual of Clinical Microbiology, 11th Edition. Edited by: James H. Jorgensen, Michael A. Pfaller, et. al. American Society for Microbiology, Washington DC. 2015

CMPT and Strategic Planning

CMPT continues to function consistent to its Mission and Vision statements. Our long term objectives continue as iterated in our Vision statement (see above). In order to continue to meet our expectations, the following issues have been identified that need to be addressed over the shorter term: workload, financial resources, space, sample supply chain, partnerships, research, and committee structure.

Workload

There have been continued decreases in laboratory participants, but not to the level that this has reduced workload. CMPT continues to be very busy maintaining existing programs, and working on research and development, and focusing on our quality needs and expectations. Some of our programs have become more complex, in particular antibiotic susceptibility testing. Strategies are in place to make this more straightforward, without reducing the value and effectiveness of the quality assessment program.

Importantly, as mentioned previously we are aware that CMPT may have carried an excessive workload which has resulted in increased error rate. We have addressed this in part through increased staff. Equally important, working through our website developer, we have created a procedure that will allow us to no longer send out paper report forms which will be replaced by electronic reports. Once instituted this should result in less clerical load, and save time, effort and finances.

Financial resources

As laboratories, in many provinces, continue to consolidate, the number of laboratories participating in CMPT Clinical Bacteriology program continues to reduce. This is particularly true of the category C and C1 laboratories. The decrease in the number of participants has some impact of the financial stability of CMPT, however, through good fiscal management and the efforts of all our staff, we have been able to control this.

Although we recognize that we cannot control laboratory consolidation, it is important that CMPT continues to be recognized as an added-value program provincially, nationally and internationally. We have been working towards that goal assisting other proficiency testing programs; which has supported our revenue stream.

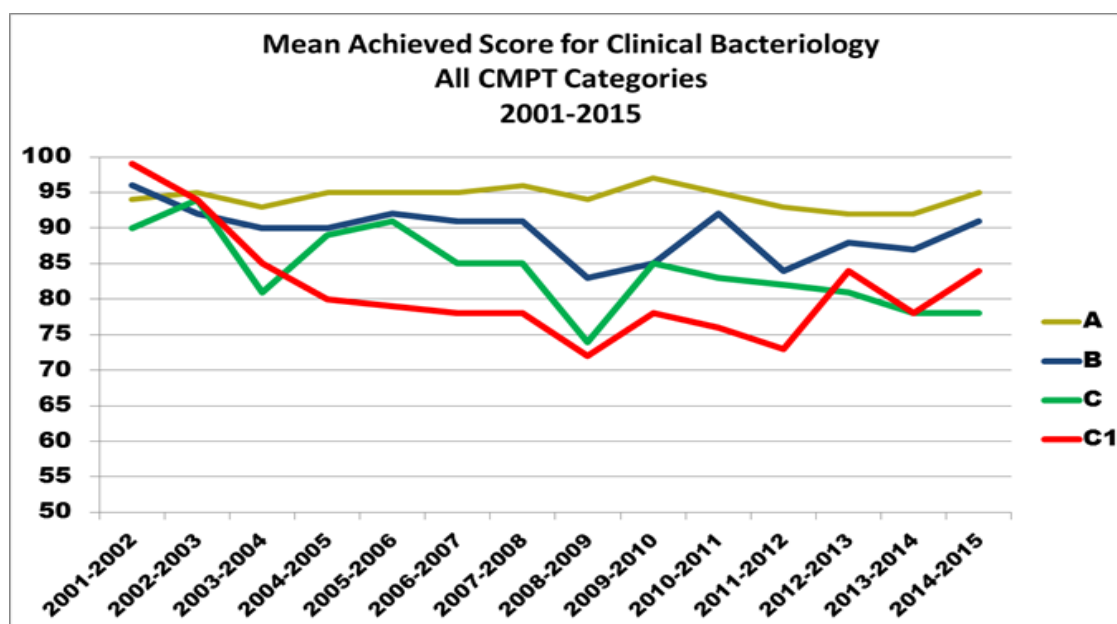


Figure 3. Historic overall performance of CMPT's participant laboratories per category.

CHAIRMAN'S ANNUAL REPORT 2014 - 2015

Space

Our facility on the UBC Campus continues to be an efficient and effective space providing closer contact with the department and with UBC safety.

Equipment

With increasing financial stability, CMPT has been making strides in improving our equipment. Last year, we were able to purchase a new dedicated Biological Safety Cabinet and a new centrifuge. During the next year, we will focus on improving our photographic capabilities to improve both communication and documentation.

Enteric sample suppliers

All EQA programs across North America, and increasingly those in Europe have had difficulties in finding sufficient samples to provide enteric parasite assessments. Some have found a solution by using circulated photographs.

CMPT has worked hard at maintaining its program based on true samples. We have identified new suppliers of sample materials which have the potential to sustain our program.

Partnerships

CMPT currently benefits from its partnership with our sister programs, the Program Office for Laboratory Quality Management, and the Canadian Immunohistochemistry Quality Control program.

CMPT has developed new partner relationships with Canadian EQA Laboratories (CEQAL), the Oneworld Accuracy network, and with the Department of Global Health, University of Washington.

CMPT continues to meet and work with the international EQA community around the world.

Research

CMPT has over the years been able to engage in a continued program of internally funded research and development that has resulted in our becoming leaders in the production of clinically realistic challenge samples in bacteriology and toxin testing, mycology, and water bacteriology. Lead by Caleb Lee, we have developed strategies that have significantly extended the shelf and transport life of samples and developed more realistic sample simulations. These programs will continue.

Committee structure

CMPT is highly appreciative of all the people that so generously volunteer their time and expertise. Last year, CMPT started on a program to change the membership in several of its committees. Committees with a long time stable membership provide great value in continuity of philosophy and style, but, at the same time, can impede the introduction of newer and fresher ideas. The new committee members are making great contribution and their participation is much appreciated.

www.CMPT.ca and Publications

CMPT's website has become the program's primary communication centre for data entry, preliminary results, critiques, newsletters, and the annual report. Our recent satisfaction survey focused on the value of this site.

Of some interest, we note that many of the people who visit CMPT.ca do so only 3 to 4 times per year, mainly in conjunction with data entry or finding critiques. Non-CMPT members also visit the site resulting in a very high number of page views. These are interested people from around the world seeking information about our program and our services. While these viewers do not increase our membership or our finances, they do increase our international recognition and prestige.

Our challenge critiques are seen as high value and quality, and for that I thank all our committee members, who serve as writers along with our editor who maintains the style and consistency.

The cornerstone of CMPT's value as a continuing education provider is its publications. While our CMPT critiques continue to thrive, we have some ground to make up with CMPT Connections and the Annual Report.

CMPT Connections is viewed by us as a program and science information sharing publication that can extend beyond our challenge critiques. During the past year we have had articles on our international visitors, including our international EQA trainees and Dr. Pei Wang, a visiting scientist from China. In addition, Ms. Denise Sitter provided an excellent article vehicle on the importance of colony count in urine samples, Ms. Kathryn Bernard contributed an article on proficiency testing on bacterial identification by MALDI-TOF MS, and Suhanya Bhuvanendran provided two articles on laboratory safety.

CHAIRMAN'S ANNUAL REPORT 2014 - 2015

Goals and Objectives

As part of our Quality Management System, CMPT sets its goals and objectives for the upcoming year and well as reviews its success with the previous goals. Since our inception we have only failed to meet on annual objective.

GOALS and OBJECTIVES 2014 - 2015

P14_1	Begin revamp of www.CMPT.ca to improve data entry and navigation	Satisfactory – Ongoing
P14_2	Purchase new microscope photography apparatus to improve time and focus issues	Did not occur
P14_3	Pursue new Antibiotic Resistance Screen program	Successful Completed
P14_4	Generate at least one manuscript preparation and publication	Successful Completed
Q14_1	Continue with ISO9001 certification with view to prepare for ISO9001:2015	Successful Completed
Q14_2	Prepare for ISO17043:2010 accreditation by American Association for Laboratory Accreditation (A2LA)	Successful Completed

GOALS and OBJECTIVES 2014 - 2015

P15_1	Purchase new microscope photography apparatus to improve time and focus issues (carry over)
P15_2	Continue with revamp of www.CMPT.ca
P15_3	Augment Continuing Education Credits program
P15_4	Introduce an Enteric screening program.
P15-5	Complete training and competency of new staff member.
Q15_1	Continue with ISO9001 certification with ISO9001:2015
Q15_2	Continue with ISO17043:2010 accreditation

Signed



Michael A Noble, Chair, CMPT

September 3, 2015

COMMITTEE MEMBERS 2014 - 2015

Committee members volunteer their time and are essential for selecting challenges, assessing results, and producing the critiques. The efforts contributed by each committee member are critical to the function of CMPT and are very much appreciated.

Water Microbiology Program

Brian Auk, BScBCCDC/BCPHMRL, Vancouver, BC
Chris Enick, BScExova, Surrey, BC

Mycology Program

Robert Rennie, PhD FCCM, D(ABMM)University of Alberta Hospital, Edmonton, AB
Romina Reyes, MD FRCPCLifeLabs, Burnaby, BC
Jeff Fuller, FCCM, (D)University of Alberta Hospital, Edmonton, AB

Enteric Parasitology Program

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Clinical Bacteriology Program

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Tammie Wilcox-Carrier, ARTMoncton Hospital, Moncton, NB
Titus Wong, MDVancouver General Hospital, Vancouver, BC

CLINICAL BACTERIOLOGY PROGRAM

CMPT acknowledges, with appreciation, the valuable and essential advisory and technical support of the Clinical Bacteriology Advisory Committee.

Program Overview

Clinical bacteriology surveys are shipped 4 times per year. Each survey can consist in up to seven different types of samples depending on the category of the laboratory and the challenges to which they are subscribed.

Only category A laboratories receive all samples, category B, C, and C1 laboratories receive samples according to their capabilities.

For a more comprehensive Program Overview, please visit:

http://www.cmpt.ca/programs_clinbact/clin_bacteriology_overview_program.htm

Clinical Bacteriology program 2014 - 2015

In 2014- 2015, **87** laboratories participated in the clinical bacteriology program, **76** in the Supplemental Gram Smear program, and **60** in the *Clostridium difficile* program.

HISTOGRAMS 2014 - 2015

About the histograms

All histograms have been converted to a single format, which is the percent achievable score. For each laboratory, the sum of all challenges performed and graded was calculated, either as a total for all challenges, or within a specific category, such as "bacterial identification".

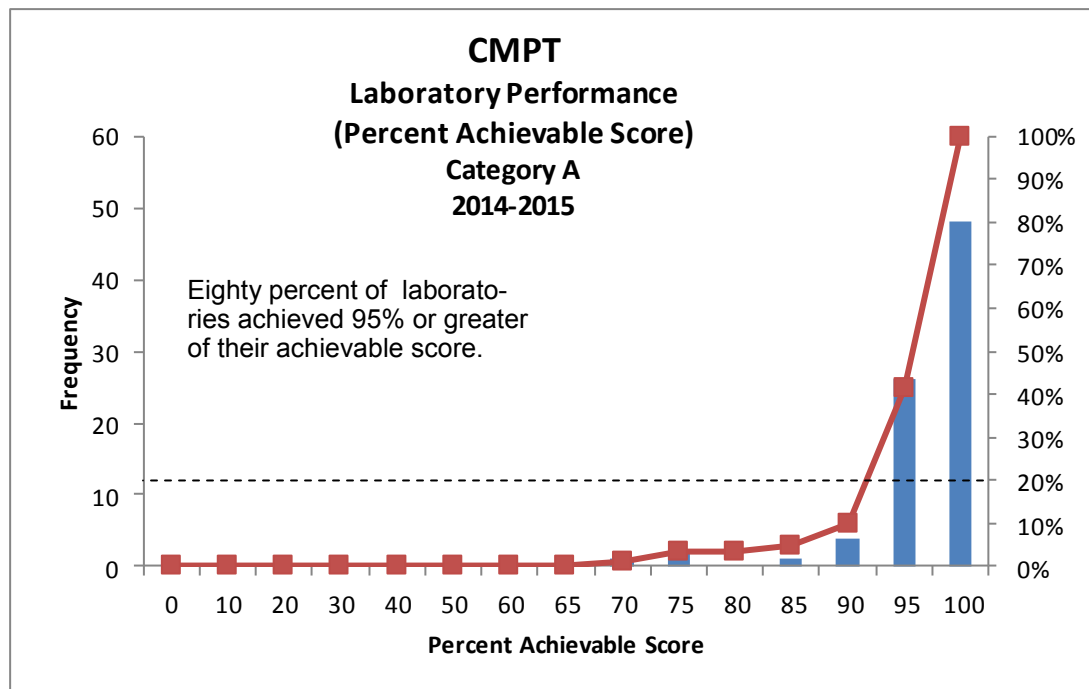
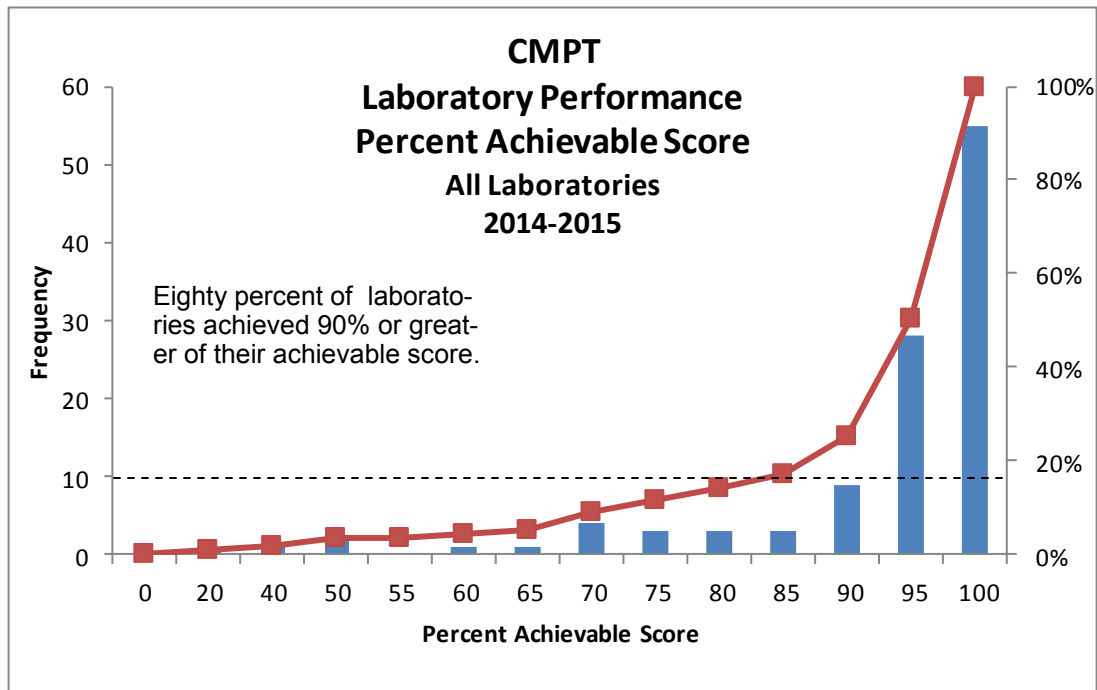
The total achievable score, that is the score the laboratory would have obtained if they received a grade of 4/4 for each graded challenge was calculated. Challenges that were ungraded were excluded. The percent achievable score was calculated as (total achieved score/total achievable score) X100.

How to read the histograms

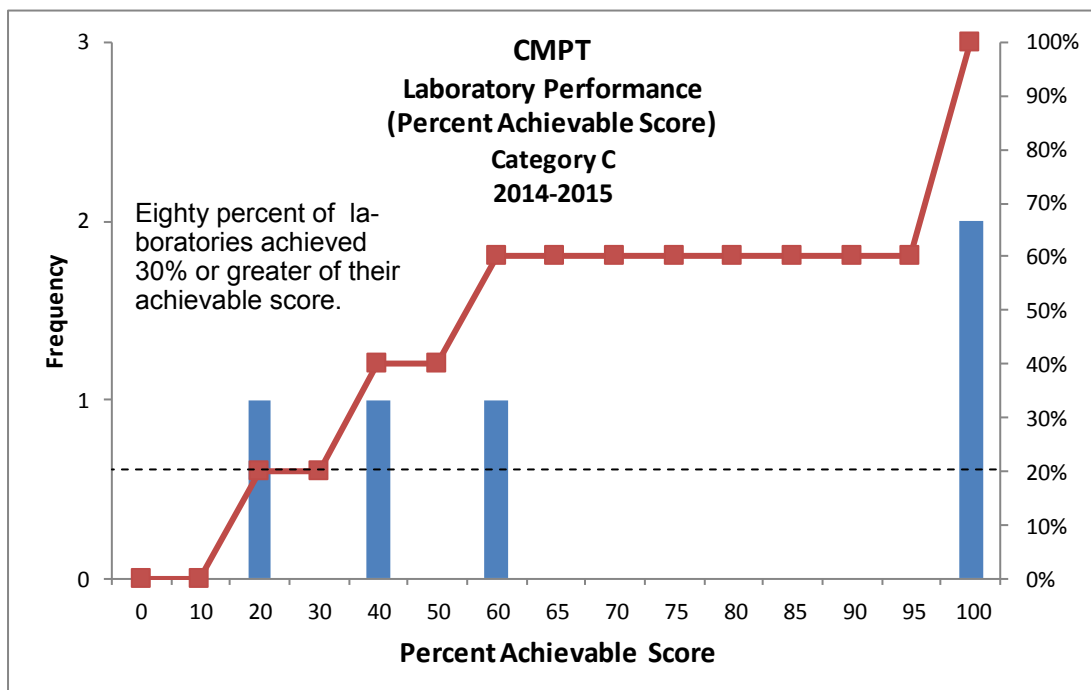
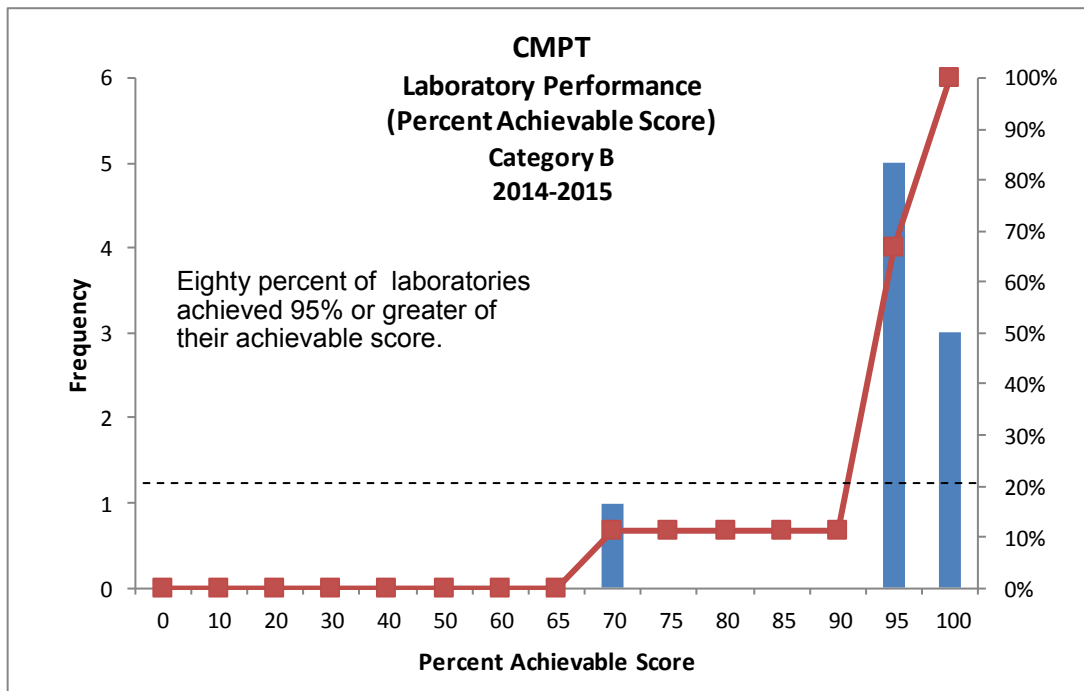
The number of laboratories achieving a specific grade is indicated by the height of the columns over the Percent Achievable Score, and is read on the LEFT side scale of the chart (frequency).

The Cumulative Scoring is indicated by the connected box-line that starts low on the left and rises to the right, and is read on the RIGHT side scale of the chart. The cumulative column indicates the percentage of laboratories that received an acceptable grade on the challenge.

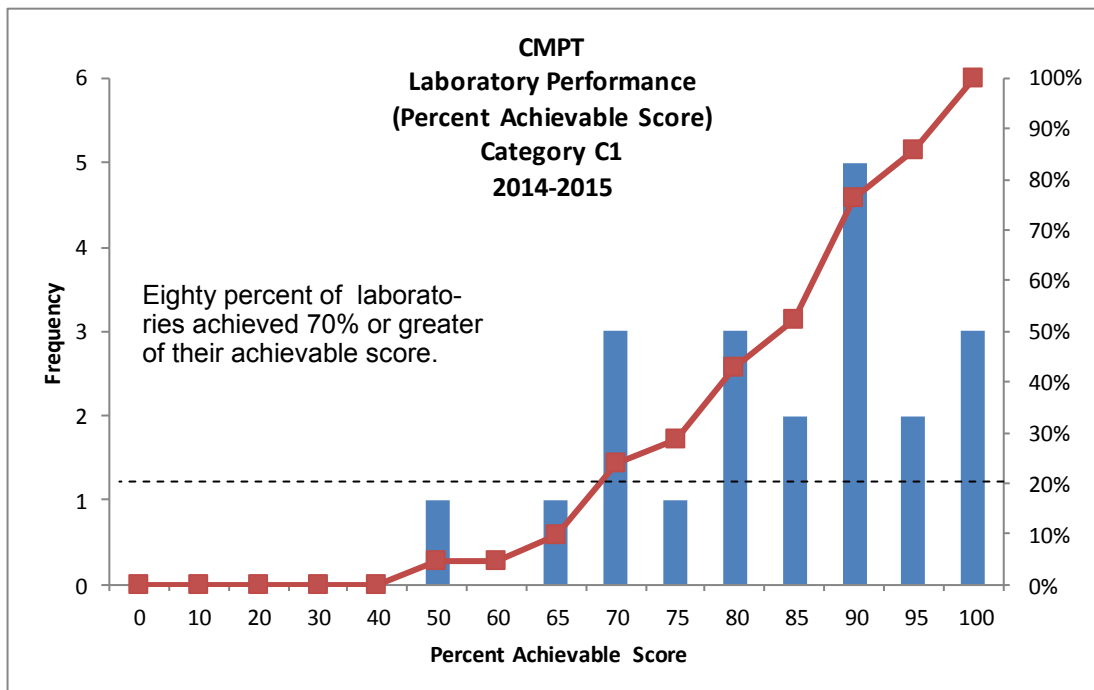
Clinical Bacteriology - All Challenges



Clinical Bacteriology - All Challenges

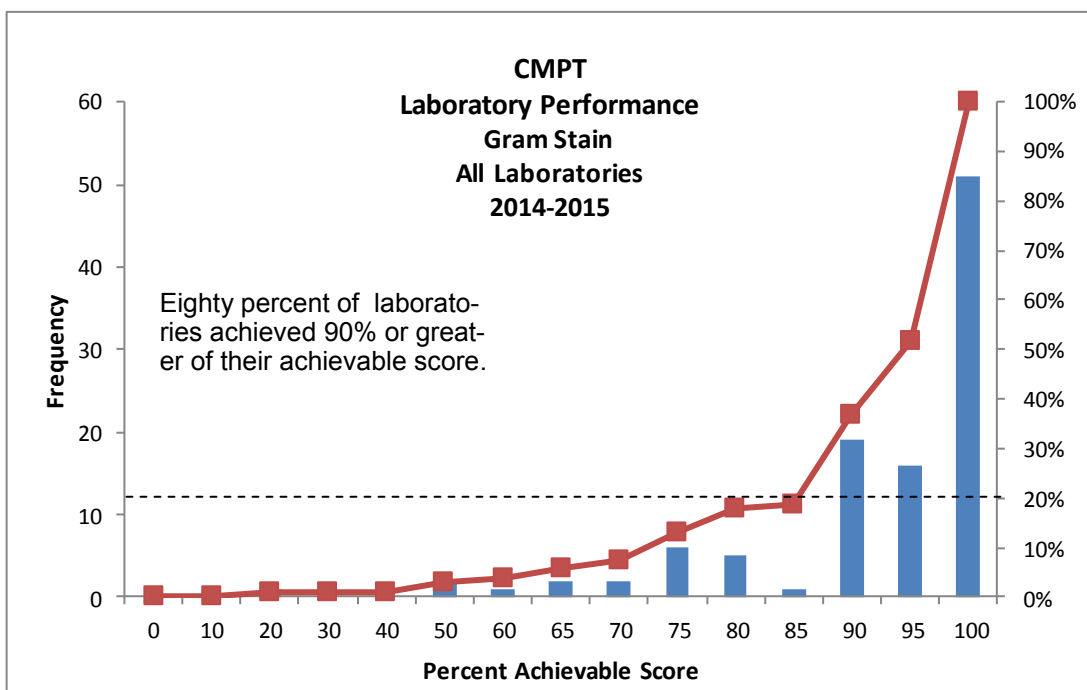


Clinical Bacteriology - All Challenges

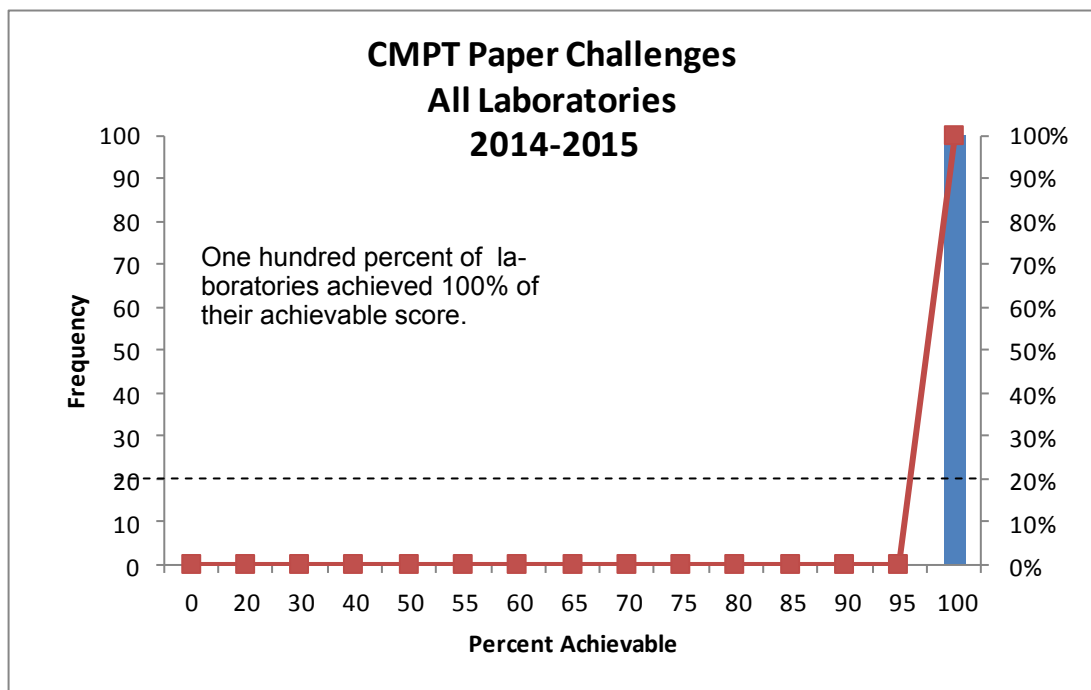
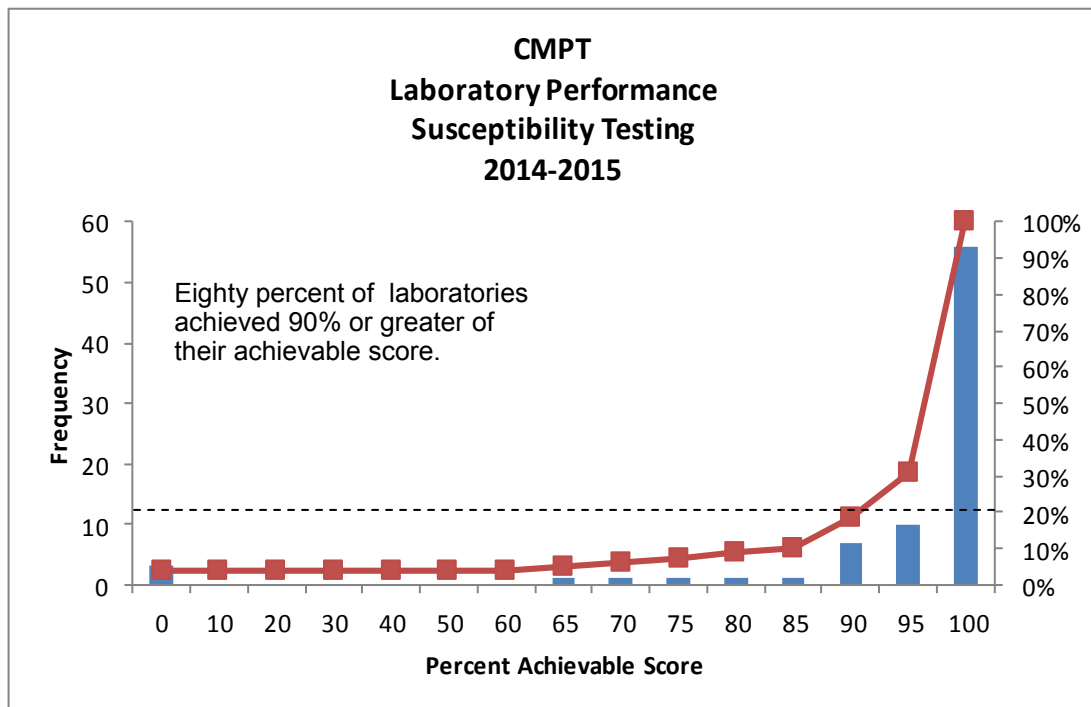


Gram Stain Challenges

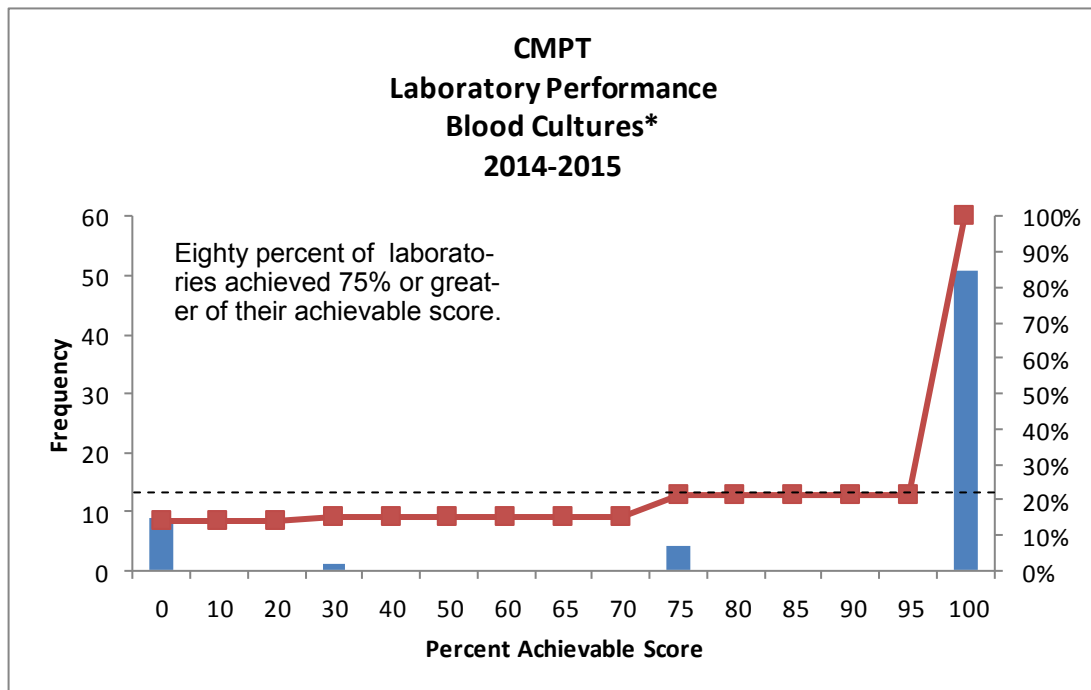
Gram Stain Challenges



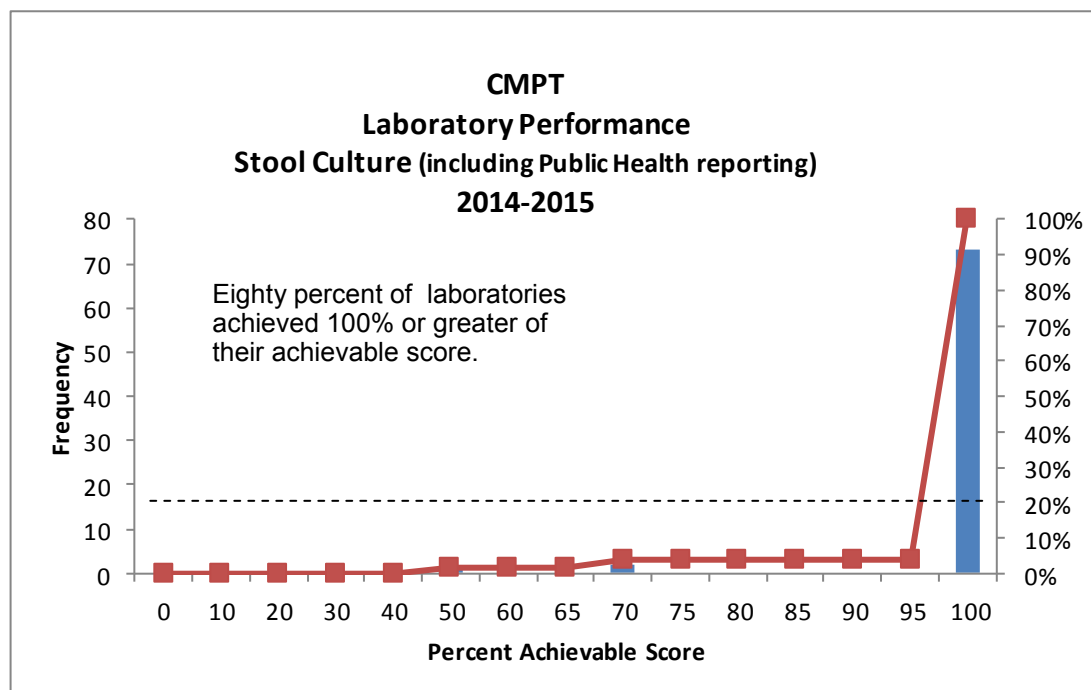
Clinical Bacteriology



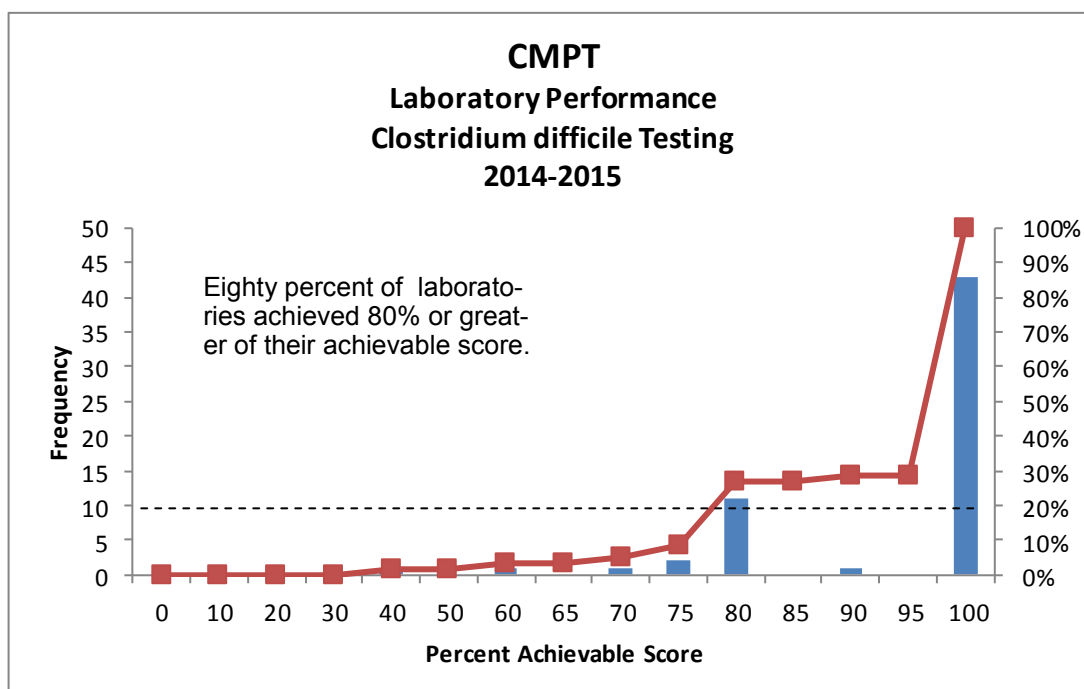
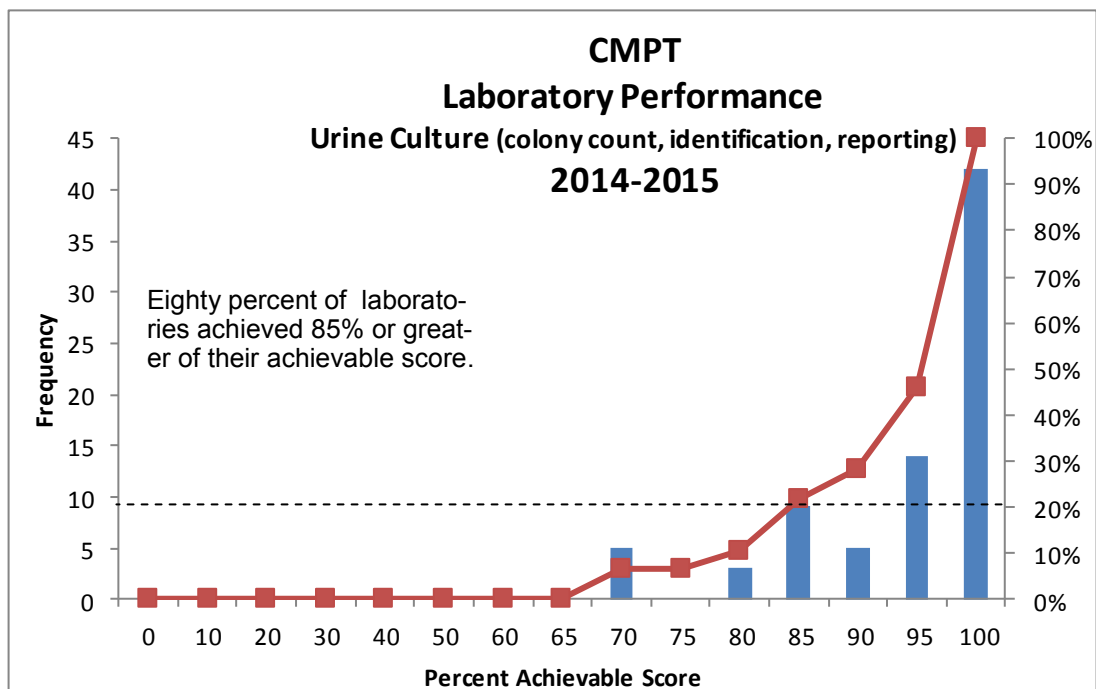
Clinical Bacteriology

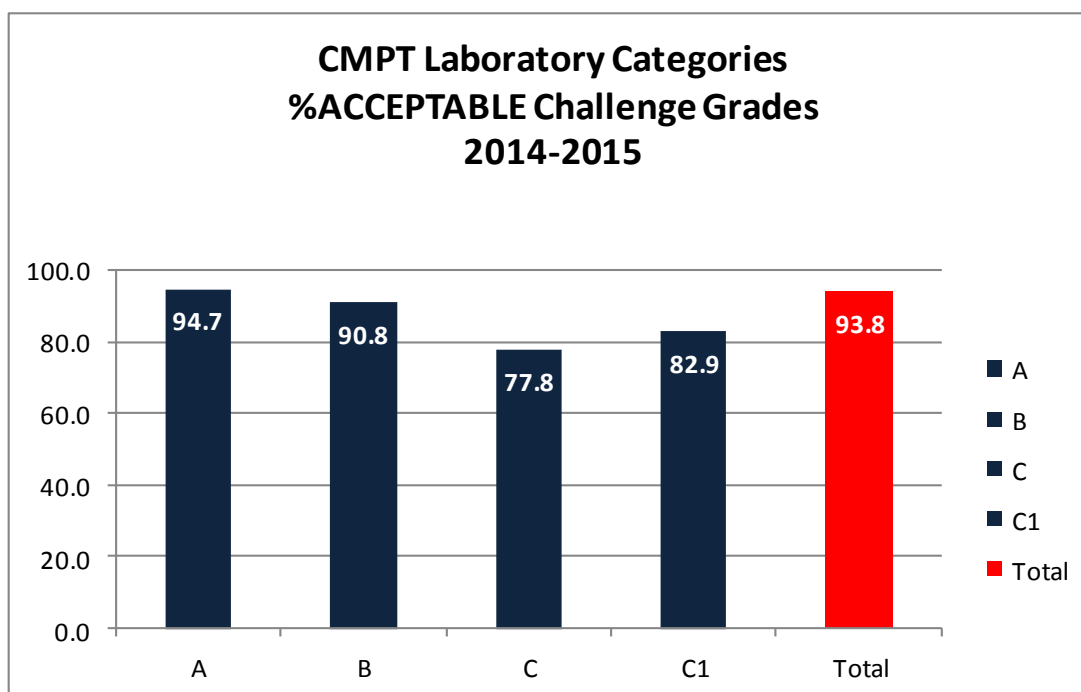


*Note: only one graded sample

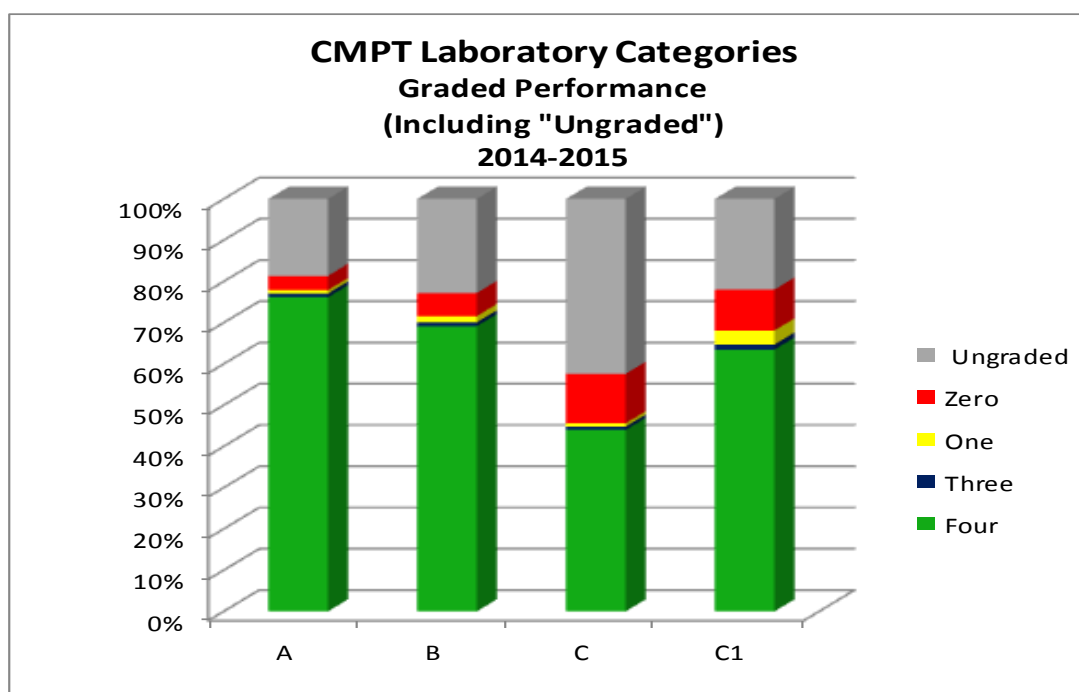
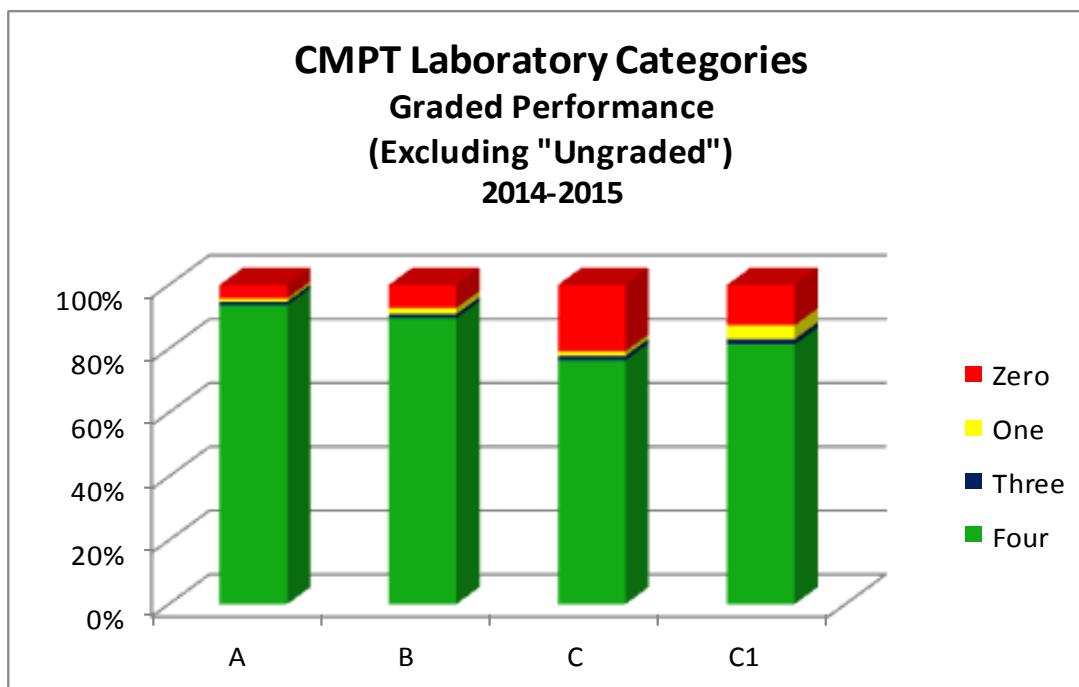


Clinical Bacteriology



Clinical Bacteriology—Group Statistics

Clinical Bacteriology—Group Statistics



WATER MICROBIOLOGY PROGRAM

CMPT acknowledges with appreciation the valuable and essential advisory and technical support of:
 Chris Enick, BSc.....Exova, Surrey, BC
 Brian Auk, BSc.....BCCDC/BCPHMRL Environmental Microbiology, Vancouver, BC

CMPT participates with the following organizations to provide external quality assessment challenges and assistance for water bacteriology.

- Enhanced Water Quality Assurance (British Columbia Water Bacteriology Approval Committee)
- BCCDC/BCPHMRL Environmental Microbiology Laboratory
- British Columbia Ministry of the Environment

In 2014, forty-five laboratories participated in the water bacteriology program.

Drinking Water challenge surveys are shipped to laboratories three times per year. Each survey consists of sets of 4 drinking water samples.

Recreational Water challenge surveys are shipped two times per year. Each survey consists of one set of recreational water samples (spa water, freshwater beach or marine water). Participants participate in one, two or all the recreational challenge samples.

Not all laboratories perform all challenges and not all laboratories use the same methods when testing water samples.

Laboratories perform testing use one to four methods depending on the laboratory's accreditation criteria. Laboratories also perform a qualitative method, the Presence/Absence method, as their primary method or in addition to the quantitative methods.

The drinking water bacteriology (membrane filtration, Enzyme Substrate, MPN and Presence/Absence methods) challenge records for 2014 are shown in Table 1 and the recreational water challenge records are shown in Table 2.

WATER MICROBIOLOGY PROGRAM

Table 1. Simulated drinking water bacteriology challenge record for 2014

Date	Sample No.	Organism	Membrane Filtration mean/median cfu/100 ml		Enzyme Substrate mean/median MPN/100 ml		MPN mean/median MPN/100 ml		Presence/Absence (P/A)
			Total Coliforms	<i>E.coli</i>	Total Coliforms	<i>E.coli</i>	Total Coliforms	<i>E.coli</i>	Total Coliforms/ <i>E.coli</i>
W141 April 2014	1	<i>Escherichia coli</i>	34/35	34/35	37/35	35/35	≥23/≥23	≥23/≥23	P/P
	2	no organisms present	0/0	0/0	0/0	0/0	0/0	0/0	A/A
	3	<i>Escherichia coli</i>	35/33	34/33	33/33	31/33	≥23/≥23	≥23/≥23	P/P
	4	<i>Enterobacter</i> species	67/72	0/0	74/74	0/0	>23/>23	0/0	P/A
W142 July 2014	1	<i>Enterobacter</i> species	20/19	0/0	18/19	0/0	16.9/16.1	0/0	P/A
	2	<i>Escherichia coli</i>	66/66	65/66	68/68	66/63	≥23/≥23	≥23/≥23	P/P
	3	<i>Escherichia coli</i>	17/17	17/18	17/18	17/16	20/23	20/23	P/P
	4	no organisms present	0/0	0/0	0/0	0/0	0/0	0/0	A/A
W143 October 2014	1	<i>Escherichia coli</i>	44/45	44/45	50/50	47/50	>23/>23	>23/>23	P/P
	2	<i>Enterobacter</i> species	35/36	0/0	37/36	0/0	≥23/≥23	0/0	P/A
	3	<i>Escherichia coli</i>	44/43	42/42	48/47	42/47	>23/>23	>23/>23	P/P
	4	<i>Enterobacter</i> species	33/35	0/0	33/34	0/0	≥23/≥23	0/0	P/A

Table 2. Simulated recreational water bacteriology challenge record for 2014

Date	Source	Challenge	Membrane Filtration mean/median cfu/100mL	Enzyme Substrate mean/median MPN/100 ml
R141 April 2014	Spa Water	<i>Pseudomonas aeruginosa</i>	377/362	383/437
	Freshwater Beach	<i>Escherichia coli</i>	65/64	62/64
	Marine Water	<i>Enterococcus</i> species	232/219	169/150
R142 August 2014	Spa Water	<i>Pseudomonas aeruginosa</i>	226/215	160/201
	Freshwater Beach	<i>Escherichia coli</i>	391/390	451/450
	Marine Water	<i>Enterococcus</i> species	96/93	102/86

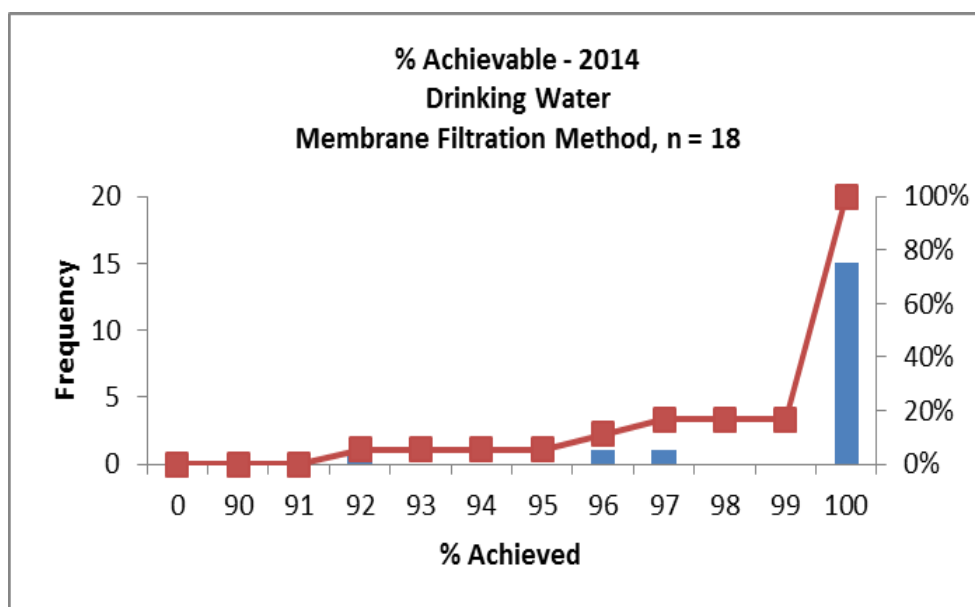
WATER MICROBIOLOGY PROGRAM

Water Bacteriology (Drinking and Environmental Water Sample) Score

Laboratory testing results are graded based on the Membrane Filtration, Enzyme Substrate, MPN and/or Presence/Absence methods. All methods are graded on a point scale for assessment of water samples with the exception of the Presence/Absence method, a qualitative method and are, therefore, graded qualitatively. With 12 drinking water samples tested for the program year, the maximum score is 36. With 3 environmental water samples, laboratories can receive up to a maximum score of 9.

The following Score Tables illustrate the % Achievable scores for methods used for Drinking Water samples during 2014.

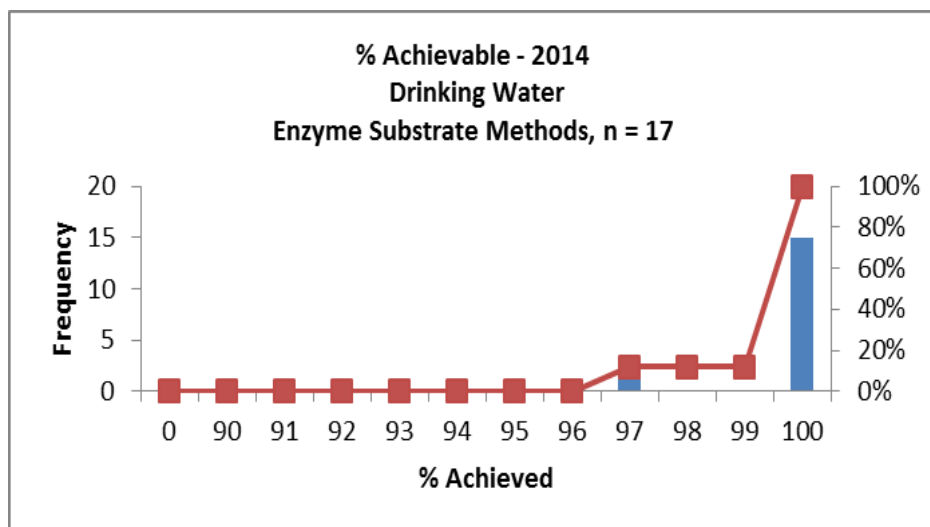
Drinking Water Testing Laboratories Performance for 2014—Membrane Filtration Method		
% Achievable	Labs (n=18)	Cumulative %
92	1	6
96	1	11
97	1	17
100	15	100



WATER MICROBIOLOGY PROGRAM

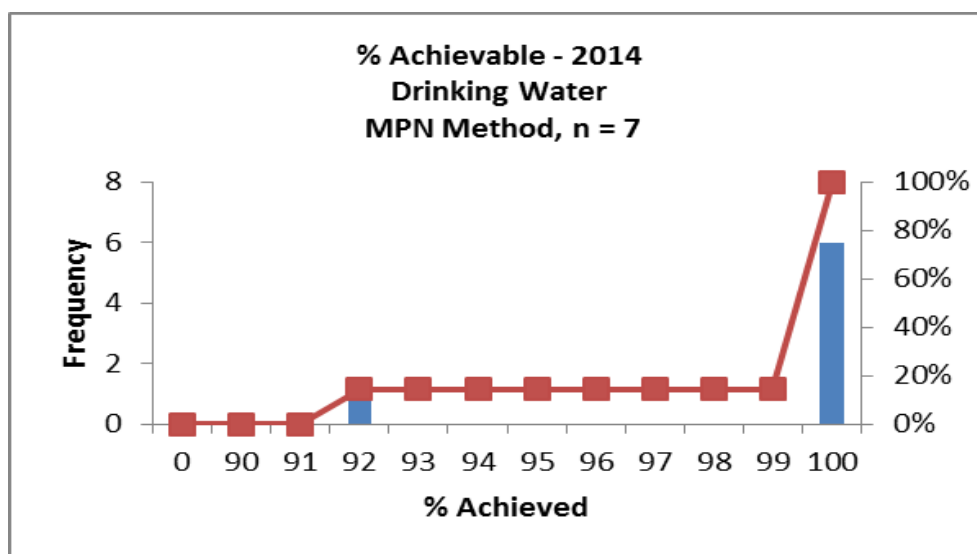
Drinking Water Testing Laboratories Performance for 2014—Enzyme Substrate Method

% Achievable	Labs (n=17)	Cumulative %
97	2	12
100	15	100



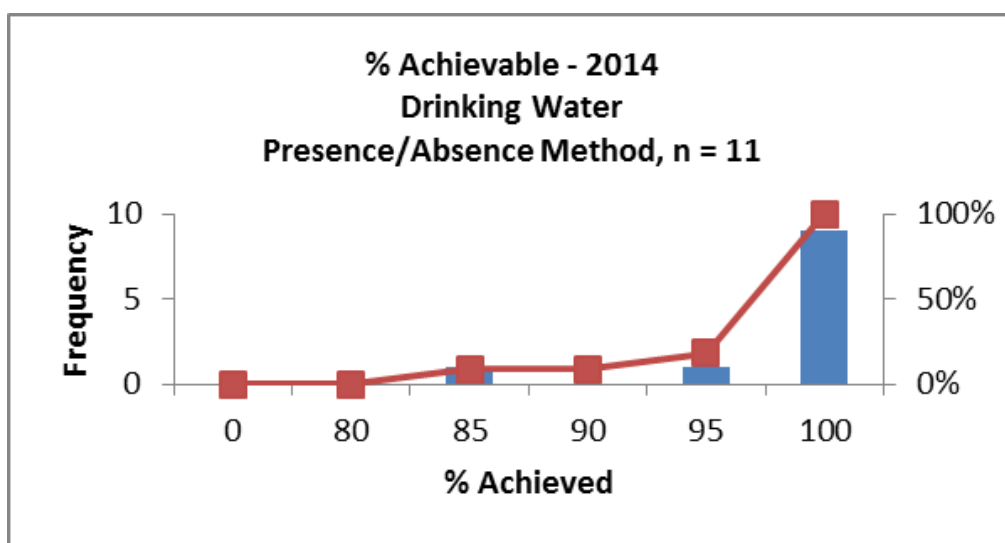
Drinking Water Testing Laboratories Performance for 2014—Most Probable Method (MPN)

% Achievable	Labs (n=7)	Cumulative %
92	1	14
100	6	100



WATER MICROBIOLOGY PROGRAM

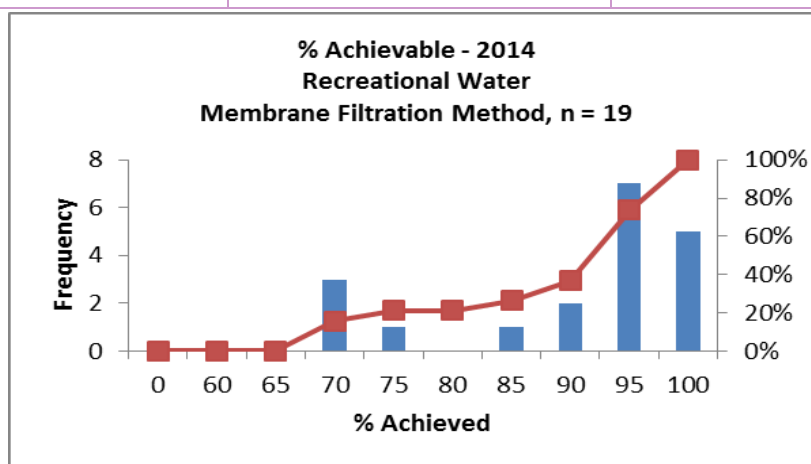
Drinking Water Testing Laboratories Performance for 2014—Presence/Absence Method		
% Achievable	Labs (n=11)	Cumulative %
85	1	9
95	1	18
100	9	100



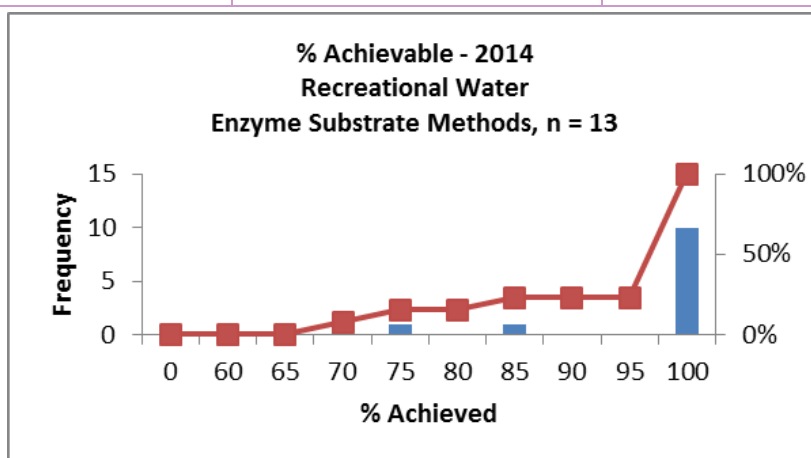
WATER MICROBIOLOGY PROGRAM

The following Score Tables illustrate the % Achievable scores for methods used for Recreational Water samples during 2014.

Recreational Water Laboratories Performance for 2014—Membrane Filtration Method		
% Achievable	Labs (n=19)	Cumulative %
70	3	16
75	1	21
85	1	26
90	2	37
95	7	74
100	5	100



Recreational Water Laboratories Performance for 2014- Enzyme Substrate/MPN Methods		
% Achievable	Labs (n=13)	Cumulative %
70	1	8
75	1	15
85	1	23
100	10	100



WATER MICROBIOLOGY PROGRAM

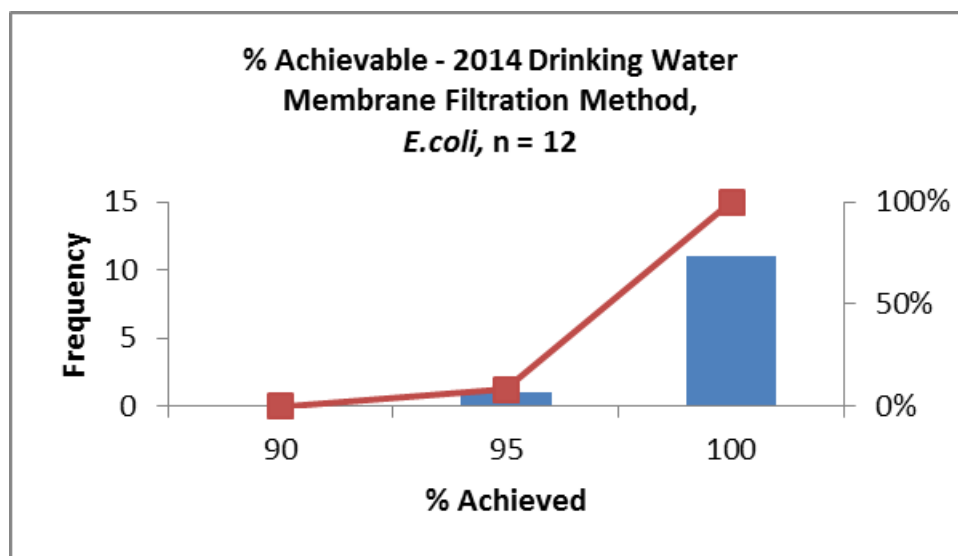
E.coli Supplemental Testing

A total of 15 laboratories (all methods) perform supplemental water bacteriology testing to discern *Escherichia coli* from other thermotolerant coliforms.

These laboratories are assessed as a separate group and were assessed an additional 36 points maximum for the program year per method if they reported *Escherichia coli* and thermotolerant coliforms. The Membrane Filtration and the MPN methods were the primary methods used for testing, however, two laboratories used the Enzyme Substrate method.

Membrane Filtration Method Score Table, 2014—Drinking Water Testing Laboratories Performance for *E.coli*

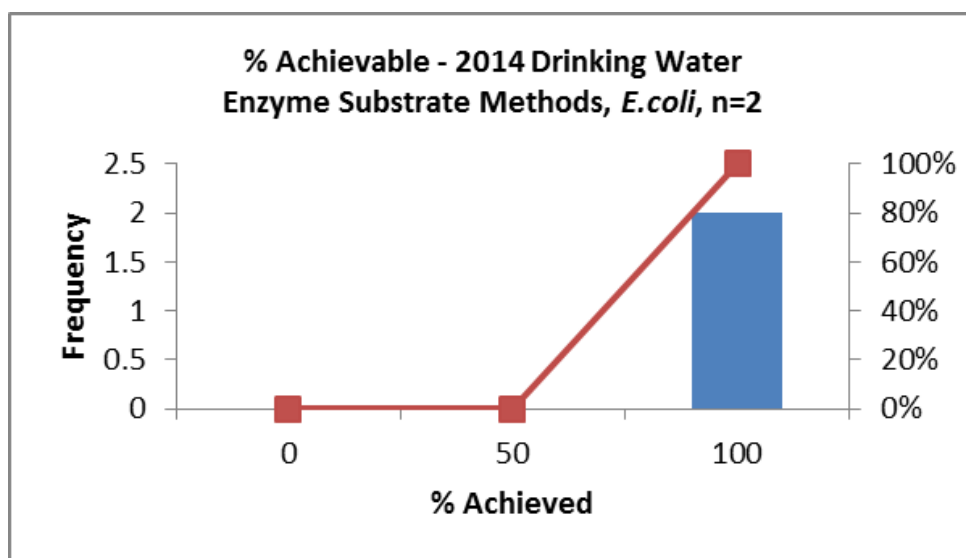
% Achievable	Labs (n=12)	Cumulative %
95	1	8
100	11	100



WATER MICROBIOLOGY PROGRAM

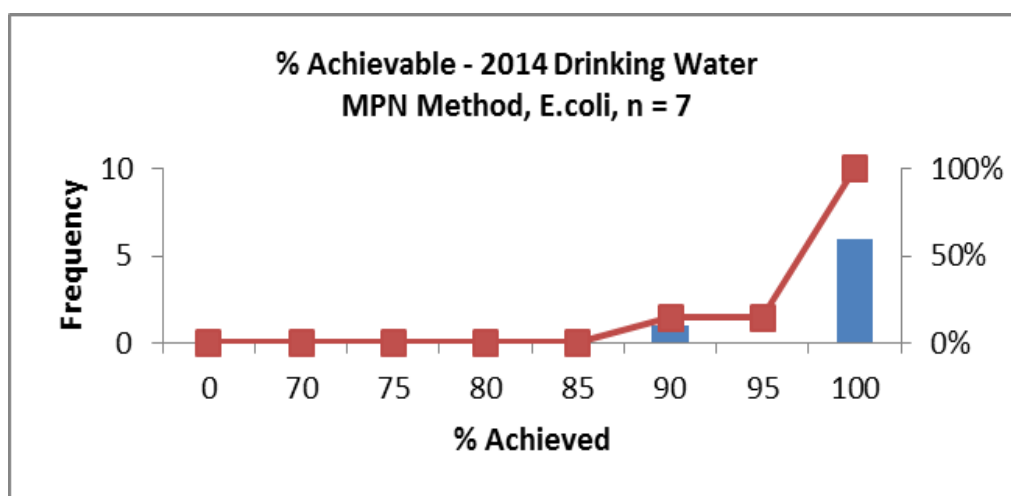
Enzyme Substrate Methods Score Table, 2014 - Drinking Water Testing Laboratories Performance for *E.coli*

% Achievable	Labs (n=2)	Cumulative %
100	2	100



Most Probable Number (MPN) Score Table, 2014—Drinking Water Testing Laboratories Performance for *E.coli*

% Achievable	Labs (n=7)	Cumulative %
90	1	14
100	6	100



MYCOLOGY PROGRAM

CMPT acknowledges with appreciation the valuable and essential advisory and technical support of:

Robert Rennie, MD FRCPC.....University of Alberta Hospital, Edmonton, AB

Jeff Fuller, FCCM, (D) ABMM.....University of Alberta, Edmonton, AB

Romina Reyes, MD FRCPC.....LifeLabs, Burnaby, BC

Brad Jansen BSc, MLT.....University of Alberta Hospital, Edmonton, AB

Dermatophyte (Basic) Mycology Program

The Basic Mycology Program serves two constituent groups:

- British Columbia clinical dermatologists who perform mycology cultures in office laboratories.
- Microbiology laboratories that participate in this program to supplement other quality assurance programs to maintain proficiency in handling and identifying dermatology related fungi and yeasts.

For the past 25 years, CMPT has provided a **Dermatophyte (Basic) Mycology Program** for proficiency testing suitable for those doing office mycology and as a supplement for laboratories requiring a small number of additional challenges. The primary focus is the identification of dermatophytes and commonly recovered contaminants. In 2013-2014, CMPT added an additional fungal smear to the program. The four fungal isolates for 2014-2015 are listed in Table 1.

Table 1. Basic Mycology Program Challenges 2014 - 2015				
Survey		Sample		Fungal Smear /Identification Challenge
1409	Sept. 8, 2014	Fungal Smear	A	Positive
			B	Negative
		Culture samples	1	<i>Candida parapsilosis</i>
			2	<i>Microsporum gypseum</i>
1504	April 13, 2015	Fungal Smear	A	Negative
			B	Positive
		Culture samples	1	<i>Candida krusei</i>
			2	<i>Trichophyton violaceum</i>

MYCOLOGY PROGRAM

Mycology Plus Program

The Mycology Plus Program was introduced to participants in June 2001 and includes 12 proficiency challenges for dermatophytes, common laboratory contaminants, yeast identification and fungal smear slides. It is an extension to the Dermatophyte (Basic) Mycology Program and currently grades are not awarded.

Susceptibility challenges for yeasts were introduced in 2008 and laboratories that perform anti-fungal testing were encouraged to report their results.

In 2013-2014, CMPT added an additional fungal smear to the program.

The 2014-2015 challenges are noted in Table 2.

Table 2. Mycology Plus Program Challenges 2014 - 2015

Survey	Fungal Smear*			Yeast	Dermatophytes	Molds
	A	B	C	1	2	3
1409 expected	positive	negative	positive	<i>Candida parapsilosis</i> - Central Line -	<i>Microsporum gypseum</i> - Skin Scraping -	<i>Lichtheimia species</i> - Wound Swab -
1409 reported	positive (8) negative (1)	negative (9)	positive (9)	<i>C. parapsilosis</i> (8) 3 laboratories performed susceptibilities	<i>M. gypseum</i> (2) <i>M. persicolor</i> (1) <i>Microsporum</i> spp. (3) <i>T. mentagrophytes</i> (1) Dermatophyte, refer (1)	<i>Lichtheimia corymbifera</i> complex (1) <i>Absidia</i> species (5) <i>Rhizomucor</i> species (1) Zygomycetes (1)
1501 expected	negative	negative	positive	<i>Cryptococcus neoformans</i> - Cerebrospinal Fluid -	<i>Microsporum audouinii</i> - Hair -	<i>Cladosporium</i> species - Nail -
1501 reported	negative (8)	negative (8)	positive (8)	<i>C. neoformans</i> (5) <i>C. neoformans</i> / <i>gattii</i> (1) sample not normally processed (1) 2 laboratories performed susceptibilities	<i>M. audouinii</i> (3) <i>Trichophyton</i> species (1) <i>Trichophyton rubrum</i> (2) Fungus isolated (1)	<i>Cladosporium</i> species (7)
1504 expected	negative	positive	negative	<i>Candida krusei</i> - Joint fluid -	<i>Trichophyton violaceum</i> - Skin scraping -	<i>Rhinocladiella</i> species - Skin biopsy -
1504 reported	negative (8)	positive (8)	negative (8)	<i>C. krusei</i> (7) 5 laboratories performed susceptibilities	<i>T. violaceum</i> (3) <i>Trichophyton</i> species (1) <i>T. rubrum</i> (1) Fungus isolated (2)	<i>Fonsecaea</i> species (2) <i>Exophiala</i> species (2) <i>Sporothrix schenckii</i> (1) Fungus isolated (1) Black mold, refer (1)

* 1 laboratory participates in the Fungal Smear portion only

ENTERIC PARASITOLOGY PROGRAM

CMPT acknowledges with appreciation the essential advisory and technical support of:

Tara Bonham, RT.....LifeLabs, Surrey, BC
 Romina Reyes, MD FRCPC.....LifeLabs, Burnaby, BC
 Joan Tomblin, MD FRCPC.....Royal Columbian Hospital, New Westminster, BC
 Quantine Wong, BSc.....BCCDC/BCPHMRL, Vancouver, BC

Samples are supplied by LifeLabs, DynaLife Dx and BCCDC/BCPHMRL.

The program consists of three surveys per year. Each survey consists of three sodium acetate-acetic acid-formalin (SAF) preserved feces samples in enough quantities to perform concentration techniques and permanent smears for each sample.

In total, each participant performs nine challenge readings per year, each including a concentrate and a permanent stained smear.

Grading is assessed on the combined results of the stained smear and the concentrate and is based on a 2 point scale (acceptable or unacceptable). Table 1 lists the samples and grades received for the 2014 challenges.

Table 1. Enteric Parasitology Challenges 2014					
Date	Sample	Parasite	Acceptable	Unacceptable	Ungraded
April 2014	1404-1	Taenia species <i>Entamoeba coli</i> Blastocystis hominis	21	1	0
	1404-2	Hookworm <i>Ascaris lumbricoides</i> Blastocystis hominis	16	5	0
	1404-3	No ova or parasites	21	0	0
July 2014	1407-1	Ascaris species Blastocystis hominis	21	0	0
	1407-2	Blastocystis hominis <i>Iodamoeba bütschlii</i> <i>Endolimax nana</i>	20	1	0
	1407-3	Dientamoeba fragilis Blastocystis hominis	20	1	0
September 2014	1410-1	Diphyllobothrium latum Blastocystis hominis <i>Entamoeba coli</i> <i>Entamoeba hartmanni</i>	21	0	0
	1410-2	No ova or parasites	21	0	0
	1410-3	Cryptosporidium species	21	0	0
Total			181	8	0

BOLD – pathogens/potential pathogens

TRICHOMONAS VAGINALIS ANTIGEN PROGRAM

CMPT launched the *Trichomonas vaginalis* antigen program with the first shipment on August 8, 2011; the program consisted of 2 surveys in 2011 and in 2012 the number of surveys increased to 3.

Each survey consists of 4 samples which are designed to be tested with the Genzyme OSOM® *Trichomonas* Rapid Test Kit.

Grading is based on a 2 point scale (acceptable or unacceptable). Table 1 lists the samples, results, and grades received for the 2014 challenges.

Table 1. *Trichomonas vaginalis* Antigen Challenges 2014

Date	Sample	Results	Acceptable	Unacceptable	Ungraded
April 2014	1404-1	positive	32	1	0
	1404-2	positive	32	1	0
	1404-3	negative	32	1	0
	1404-4	negative	32	1	0
July 2014	1407-1	negative	32	0	0
	1407-2	positive	32	0	0
	1407-3	negative	32	0	0
	1407-4	positive	32	0	0
September 2014	1410-1	negative	32	0	0
	1410-2	positive	32	0	0
	1410-3	positive	32	0	0
	1410-4	positive	32	0	0
Total			384	4	0

SHIGA TOXIN PROGRAM

CMPT acknowledges with appreciation the essential advisory and technical support of Denise Sitter from Cadham Provincial Laboratory, Winnipeg, MB.

CMPT launched the Shiga Toxin Program on May 7, 2012.

The program consists of 2 surveys per year, each survey consisting of 3 simulated stool samples that are suitable for detecting the presence of Shiga toxin by antigen or cytotoxicity methods or for detecting Shiga toxin genes by PCR.

Grading is based on a 2 point scale (acceptable or unacceptable).

Table 1 lists the samples and grades received for the 2014 challenges.

Table 1. Shiga Toxin Challenges 2014

Date	Sample	Results	Acceptable	Unacceptable	Ungraded
May 2014	1405-1	gene and toxin negative	8	0	0
	1405-2	gene and toxin negative	8	0	0
	1405-3	gene and toxin positive	8	0	0
November 2014	1411-1	gene and toxin positive	8	0	0
	1411-2	gene and toxin positive	8	0	0
	1411-3	gene and toxin negative	7	1	0
Total			47	1	0

MOLECULAR TESTING PROGRAM

CMPT launched the Molecular Proficiency Testing Program with the first shipment on March 23, 2009.

The program consists of 2 surveys per year. Each survey consists of:

- 4 samples for methicillin-resistant *Staphylococcus aureus* (MRSA) testing,
- 4 samples for vancomycin-resistant *Enterococcus* species (VRE) testing and
- 4 samples for group B streptococcus (GBS) testing.

Laboratories can participate in some or all of the 3 sample types.

Molecular Testing Grading Schemes

Grading is based on a 2 point scale (correct or incorrect). Table 1 lists the samples and grades received for the 2014 challenges.

Table1. Molecular Challenges 2014

Date	Sample		Results	Acceptable	Unacceptable
April 2014	MRSA	MR1404-1	positive	4	0
		MR1404-2	positive	4	0
		MR1404-3	negative	2	2
		MR1404-4	negative	2	2
	VRE	V1404-1	negative	3	0
		V1404-2	positive	3	0
		V1404-3	positive	2	1
		V1404-4	negative	3	0
	GBS	GB1404-1	negative	1	0
		GB1404-2	positive	1	0
		GB1404-3	positive	1	0
		GB1404-4	negative	1	0
August 2014	MRSA	MR1408-1	negative	2	1
		MR1408-2	positive	3	0
		MR1408-3	positive	3	0
		MR1408-4	negative	3	0
	VRE	V1408-1	negative	3	0
		V1408-2	negative	3	0
		V1408-3	negative	3	0
		V1408-4	positive	3	0
	GBS	GB1408-1	positive	1	0
		GB1408-2	positive	1	0
		GB1408-3	negative	1	0
		GB1408-4	positive	1	0
Total				54	6

2014 - 2015 CMPT PROGRAMS' PARTICIPANTS

Clinical Bacteriology - Distribution of Participant Laboratories

Province / Territory	Joined in	A	B	C	C1	Total
Alberta	1992	13		1		14
British Columbia	1982	14	3	1	16	34
Manitoba	2001	6	1			7
New Brunswick	1993	4				4
Nova Scotia	1993	8	1			9
Northwest Territories	1992	1				1
Ontario	2004	1				1
Prince Edward Island	1993	2				2
Saskatchewan	1996	10	1	1	2	14
Yukon	1992	1				1
Total		60	6	3	18	87