clinical microbiology proficiency testing

ANNUAL REPORT 2020 - 2021

Innovation • Education • Quality • Assessment • Continual Improvement

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Clinical Microbiology Proficiency Testing

— Established 1982 —

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Esther Kwok BSc, RT, CLQM, Coordinator

ISO 9001:2015 Registration 2002

ISO/IEC 17043:2010 Accreditation 2015

ISO 9001:2015

ISO 9001

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ISO/IEC 17043:2010

Certificate no. 3749.01

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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.
- By providing our customers with our best products and services, we help them ensure providing their best for public and patient health and safety.
- 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 our employees by recognizing their importance to the operation and in maintaining our positive relationships with all our volunteers and customers and stakeholders.
- 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 9001:2015 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 2021

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 FRCPC ……..……..Chair and Managing Director
Esther Kwok, BSc, RT, CLQM ……Coordinator
Caleb Lee, MHA, BMLSc, CLQM ……...Head Technologist
Veronica Restelli, MSc ……..…..Editor
Shadi Alami, MSc ……..……..……..….Technologist
Issa Mckinnon, B.A.Sc. ……..……..Adm. Assistant/Technologist

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:

- **Donald E. Brooks, PhD, FCAHS, Interim Head, Pathology**
- **Genevieve MacMillan, Director, Human Resources and Administration**

CHAIRMAN'S ANNUAL REPORT

CMPT Program

First created in 1983, UBC's Clinical Microbiology Proficiency Testing program has enjoyed over 35 years of experience and expertise while consistently living its mission statement of Innovation, Education, Quality Assessment and Continual Improvement. This past year, starting early in 2020, CMPT (as the rest of the world), ourselves, and our client laboratory partners, endured a year of confusion and stress because o the widespread challenges related to the SARS CoV2 virus (COVID-19).

Many university laboratories have been closed as a consequence of the risks associated with the pandemic. Fortunately, CMPT was appropriately deemed as an essential service and we were allowed to remain open and provide our services. I wish to thank our departmental management who supported our requests and the university administration that allowed us to remain open ensuring the quality and competence of the laboratories that we assess and serve.

CMPT Staff

As the chair and managing director of CMPT, I am thankful for our CMPT staff and the way in which they all pulled together to help us maintain our quality of service through the pandemic. This is not by accident but because of our collective commitment to our program and our mission. I thank Esther Kwok, our coordinator, Caleb Lee, our senior technologist, Veronica Restelli, our web manager, editor, and safety officer. This year we have added on two people: Shadi Alami, our staff technologist and Issa McKinnon who has worked with us as administrative assistant. Issa's position, which was always viewed as part time, ended in July 2021.

I would also like to thank the administrative assistance of the staff of the Department of Pathology and Laboratory Medicine.

CMPT Volunteers

CMPT is grateful for all the support we receive from our committee members and Chairs. Without the committee members, 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 valuable 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, and receive assistance with our Water Program chair. All members in all committees are actively involved in programmatic review and critique development. My appreciation goes out to all of them.

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

CMPT Quality Management System

Mission and Vision Statements

Innovation, Education, Quality Assessment and Continual Improvement

Each year, we have the opportunity to review our mission and vision statements. They have been stable and unchanged for many years, but they continue to be both operative and relevant to what we do and to what we continue to aspire. We see no need for change at this time.

Audits of the CMPT Program and Quality System

Internal Audits

Internal audits were completed by CMPT staff in February 2020 and 2021. These audits are done to ensure our compliance with international standards, with one done consistent with ISO9001 and the other consistent with ISO17043. The internal audits identified some minor issues that required addressing which were successfully completed on time prior to our two external audits.

External Review

CMPT was successfully audited by SAI Global in March 2021. Our Quality System was recognized as being in compliance with ISO 9001:2015 (Quality Management – Requirements) with no deficiencies. In addition, in May 2021, we continued with our audits for compliance with the international standard ISO/ IEC 17043:2010 (Conformity assessment - General requirements for proficiency testing) under the authority of the American Association for Laboratory Accreditation (A2LA). We were found to have no major concerns. Minor concerns were noted, but all were addressed, and our accreditation certificate was received.

Over the years we have found immense value in our decision to seek formal recognition by international certification and accreditation bodies. In addition to the recognition by our peers in the international quality assurance community, it has become a principal factor for national and international laboratories seeking providers for external quality services. Most importantly, CMPT has refined the skills of Quality Management, planning and development of customer services and satisfaction. As the national community of laboratories has consolidated, we have remained financially stable and secure and found the path towards continued innovation and development.

Review of Laboratory Safety

CMPT has formalized its safety processes and participates in the Department of Pathology and Laboratory Medicine Safety Committee. Veronica Restelli serves as our CMPT Safety Officer, and through that capacity she ensures that we are up to date in our requirements, and performs our monthly internal safety monitoring, and keeps us apprised of any potential concerns.

In addition to our planned Quality Management System internal audits, we complete monthly Safety audits which are performed and recorded using an on-line survey. There was also an annual external safety audit performed within our university department. We continue to meet all UBC and national requirements for safety.

CMPT Resources

CMPT is provided sufficient laboratory space within the Department of Pathology and Laboratory Medicine. The department provides resources and personnel to support our finance, human resources, and administrative needs. We appreciate the support we receive from Genevieve MacMillan, Department Director and Dr. Donald Brooks, Department Interim Head.

CMPT relies on the revenues generated through program registration for cost recovery. Over the past several years, many Canadian provinces have undergone laboratory restructuring and consolidation, and this has had an impact on some of our programs.

We have found additional revenue streams, including active research and development to develop new and novel materials for our own programs and also through collaborating with other EQA programs and providing them with consultation assistance and in some cases samples.

In January 2021, with the support of the BC Centre for Disease Control, we developed a new scheme to monitor performance of COVID-19 Rapid Detection Testing.

Our meeting the ISO17043:2010 standard requirements has enhanced our ability to grow the additional resources stream, and allows us to support our growing staff, and to enhance our research and development programs.

In-house Training, Competency, Proficiency

During the last year, we continued the active training and competency assessment for Shadi Alami and Issa McKinnon. All CMPT members are required to regularly take and update courses in Safety, Transport of Dangerous Goods, Confidentiality and Privacy. Some courses are available through UBC and some through external agencies.

CMPT Annual Reviews

Review of Continuing Education for CMPT Staff

CMPT is committed to providing opportunities for our staff to participate in educational opportunities. UBC has created full and free access to LinkedIn Learning for all faculty and staff. We do not actively monitor if staff take advantage of these courses. Because of the crisis associated with the COVID-19 pandemic, all in-person conferences and courses have been cancelled. We trust this will change in 2022.

Review of CMPT Quality System

Quality System

This year, the review of our Strategic Quality Plan (SQP) and Quality Forms (SQF) resulted in some important changes.

Like many Quality Management Systems, our growth and sophistication was not always linear, and changes would occur at different times and under different place headings. The result was that our QMS organization became a structural challenge. While we know where all the pieces were, they did not fit into a cohesive structure. Esther Kwok took on the task of restructuring our QMS manual and set up a new numbering system. This makes information much easier to access. This change was a huge task and required changes in numbering and in page structure and document order.

Along with the clarification of our policy on OFIs, a new policy was created to define our Organization Structure; (SQPA2.1) was adjusted to accommodate our new COVID-19 EQA testing.

OFI review for 2020-2021

For reasons unclear, the first review, normally done in March was missed, and the full review was done in July. During this 12 month interval, 25 OFIs were recorded, 15 of which were Action Errors (AE). Of the remaining improvements, 2 were preventive actions, 2 were Internal Errors that were corrected early, 2 were Document Replacements, and 4 were New Documents Required (with the 6 combined documents all being in a part of our newly revised Strategic Quality Plan). This was down slightly from the previous year (31 OFIs recorded). The full list of OFIs is maintained at CMPT.

A review of the Action Errors indicated they were mainly the result of human errors from information unawareness, inaction, or overwork. This is understandable considering that CMPT has been going through considerable new staffing and continued overwork, which was a theme from before. New personnel, with some inexperience, may have been asked to get involved in work perhaps a little sooner than they were ready. Under the impression they were ready to take on responsibility, again, perhaps because of experienced staff leaving the added complications of working under the complexities of the pandemic.

In summary, while CMPT experienced some challenges, with the implementation of some operational adaptation, we were able to adjust with minimum disruption and maintain our competency and quality as a national provider of EQA services

Review of Programs

Proficiency Testing

EQA is the core activity of CMPT. The changing landscape of medical laboratories in terms of size, number, and activity has stimulated 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 extend the variety of clinically relevant challenges, in addition to our current programs: Clinical Bacteriology, Mycology and Enteric Parasitology, Molecular Screening for Enteric pathogens and multi-resistant organisms, Clostridium difficile toxin, and also Trichomonas and Shiga toxin detection.

Importantly, CMPT also has a proficiency testing program for water testing laboratories which provides samples for 50 laboratories across Canada. Samples are provided for laboratories that work with Membrane Filtration, Presence-Absence, Enzyme Substrate, and Most Probable Water methods. We also provide samples for another Canadian PT program focused on water testing laboratories. Our organizational name -Clinical Microbiology Proficiency Testing- may be misleading and perhaps even inappropriate because we focus much time and energy in providing samples for public health organizations.

In addition, this year we developed a new program for EQA monitoring laboratories (and other health professionals) performing tests for COVID-19. (See below for more detail).

Sample Provider

Because of our international status by virtue of accreditation to ISO17043:2010, and our other international activities, CMPT is regularly contacted to provide samples for EQA programs in other countries, or to provide samples for laboratories. While this originally was a small portion of our total activities, we now have two clients, and the amount of sample production is getting larger. We view this activity both as a way to support our own research and development, and also as a mean to provide these programs and their client groups with high quality EQA materials. This activity is consistent with our mission and vision and as a contributor to national and international Innovation, Education, Quality Assessment, and Continual Improvement

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 twelve years we have provided educational PT training for delegates from more than 10 countries. While we had some successes, we also found that many of the trainees who came to Vancouver, were unable to follow-through with program development because of insufficient in-country access to resources

In 2018-2019, working through one of our strategic partners, Oneworld Accuracy, Dr. Noble provided some limited EQA training on-site in the National EQA Program for Nigeria and also for the National Institute for Public Health Addis Ababa, Ethiopia, and assisted with the program in Jordan. One of the programs had some success.

Discussions are currently underway for a possible new international candidate program for 2021.

Administrative Support

As an outcome from 37 years of experience and the excellence of our Quality system and our needs to develop our own administrative program for contacts with couriers and other essential activities, CMPT has previously provided support to another program within UBC without the same level of expertise. That program is no longer a component of UBC and we no longer provide that service.

In 2020, UBC introduced the finance/human resources software package Workday into all its activities. While in time Workday will be recognized as a valuable step forward, the learning curve has been substantial and requires significant amount of dedication and troubleshooting. This has largely fallen on CMPT's coordinator, Esther Kwok, and within the Department on Genevieve MacMillan and others. While certain processes will become routine with time, to date, it would not appear to be as efficient and time saving as many would like to see it grow into,

CMPT Professional Development Course

In 2014, CMPT proposed a program where laboratorians could receive continuing education credits for reading the critiques in our Clinical Bacteriology, Mycology, and Enteric Parasitology programs and answering an on-line quiz. The program was trialed during 2015 with about 50 people participating. A post program survey indicated a very positive response rating the program as Excellent or Very Good and both Educational and Informative.

Following the survey, a decision was made to open the Professional Development Course in 2016. During the first year, the course had 156 registered participants. 98/156 completed at least one quiz. 52 participants completed at least one category (Clinical Bacteriology, Mycology, or Enteric Parasitology) obtaining a certificate for it.

In 2020, we repeated the survey for the 80 current participants. Of the current participants about a third have participated since (or prior to) 2016. The group are strongly positive of the program and continue to give high marks for the educational and informational value of the Professional Development Course.

In 2017, CMPT decided to open the registration to Microbiology residents and other individuals that might be interested. In 2019-2020, no residents were taking the course, that being said, in the 2020 survey there was a strong support for it. We consider the CMPT Professional Development Course as an education tool for all laboratory personnel.

International Proficiency Testing Participation

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 appointed as the Chair of the Microbiology Working Group for the European Committee for External Quality Assessment for Laboratory Medicine (EQALM) for 2015-2019. In 2018, the annual EQALM conference was held in Zagreb Croatia. (Note: While EQALM is a European based international organization, EQA programs throughout Europe, North America, South America, and southern Africa participate in EQALM). Through EQALM, Dr. Noble has been able to develop survey studies on international laboratory performance antimicrobial resistance, enteric pathogens, and clinical virology. Dr. Noble stepped down from his position with EQALM but CMPT continues to be a member organization.

CMPT Quality Indicators

1- Customer Satisfaction Surveys

This year CMPT looked at the satisfaction of our participants during the COVID-19 period. Many laboratories were under extra stress during the pandemic. We wanted to know if the laboratories perceived CMPT as part of the problem.

Q1 - Were there communication (includes telephone, email, notifications to or from CMPT office) problems with CMPT?

Answer	%	Count
We had NO problems associated with CMPT Communications over the last year;	92.5%	37
Communications were mostly fine (business as usual) but we had some problems that stood out	7.5%	3
We had a lot of problems communicating with CMPT	0.0%	0
Total	100.0%	40

Q2 - Were there problems with transportation of or receiving CMPT EQA samples?

Answer	%	Count
We had NO problems associated with transport or receiving of CMPT samples over the last year.	90.0%	36
Transport and receiving of CMPT samples were mostly fine (business as usual) but we had some problems that stood out	10.0%	4
We had a lot of problems with transport or receiving CMPT over the past year	0.0%	0
Total	100.0%	40

Q3 - Were there problems with construction or Quality of CMPT EQA samples?

Answer	%	Count
We noticed NO deterioration in the quality or function of CMPT samples over the last year?	65.79%	25
CMPT samples were mostly fine (business as usual) but some problems stood out	28.95%	11
We noticed a lot of problems with CMPT samples over the past year	5.26%	2
Total	100%	38

Q4 - Were there problems with CMPT reports or critiques?

Answer	%	Count
CMPT reports and information provided had NO deterioration in the quality or thoroughness over the last year	84.2%	32
CMPT reports and information was mostly fine (business as usual) but some problems stood out	15.8%	6
We noticed a lot of problems with CMPT reports and information over the past year	0.0%	0
Total	100.0%	38

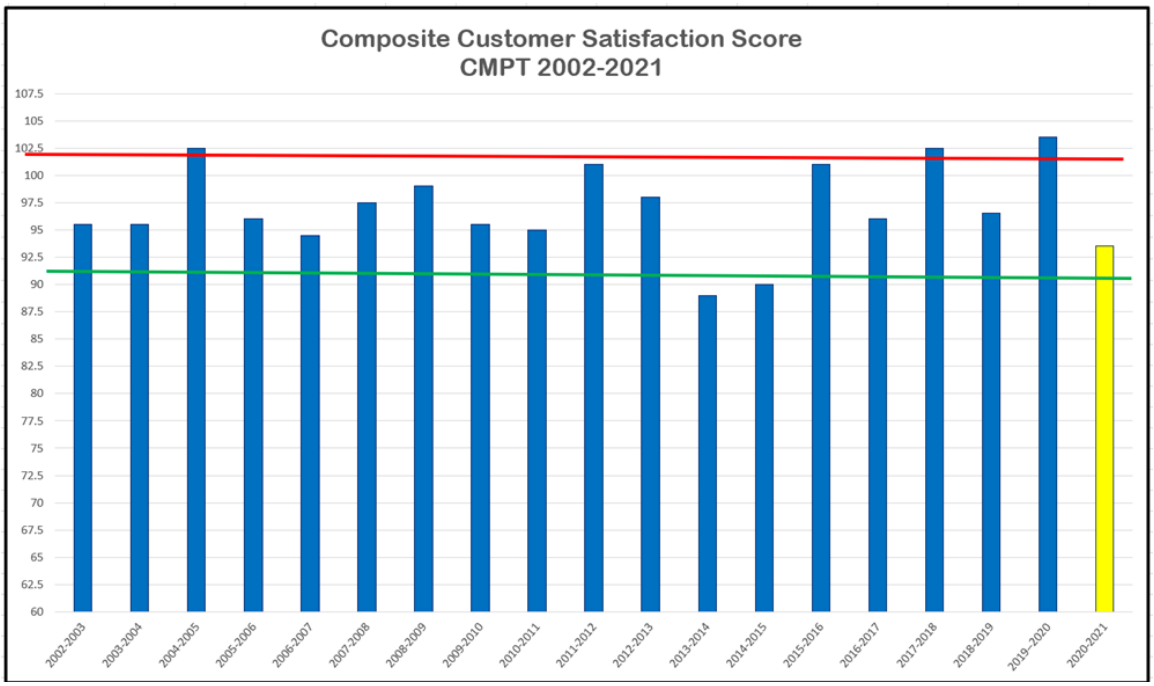
On balance, we interpreted the survey as strongly positive, but we also noted with concern the two complaints about sample construction. Two laboratories stated they had problems with a test that is used for testing for drinking water contamination. This was thoroughly investigated by CMPT. It was found intermittently that about 5 percent of laboratories made similar complaints. The problem that would be found at one time, would not repeat. At no time did our reagents or methods of sample production change. Over time, during the time of investigation, the problem disappeared without explanation. We cannot account for it as a problem related to COVID-19. Ultimately it was recorded as a complaint, resolved without explanation.

2- CMPT Composite Satisfaction Score (CSS)

Each year, CMPT combines the information from the surveys with other factors (contracts, complaints, consultations) and derives a weighted composite score - Customer Satisfaction. In the weighting negative comments, lost contracts, and complaints are weighted greater than their positive counterparts. We have been monitoring this indicator since 2002-2003 (18 years). A scale has been developed whereby great concern would result if we had a satisfaction survey with an approval score of 70 or if we lost one of more contracts as a result of dissatisfaction. A satisfaction score of greater than 90 or gaining three or more contracts would raise our composite score above 100 which we would take as evidence of excellence.

In 2020-21, CMPT had 2 new contracts (+10 points) and 4 consultations (+20), we lost no contracts but had 1 complaints about a test not working as expected (see above). (-25). The approval rating for the satisfaction surveys was 87.1 (+831). In addition, there were 10 free text positive comments (+50) and 2 negative ones (-20). Our final score for the year was 94.0, lower than last year, but well within our zone of acceptable

In my opinion the combination of certification to ISO9001:2015 and accreditation to ISO IEC17043:2010 brings quality and customer awareness/satisfaction to front of mind.



Over time we have found that this score gives us a perspective on our performance, although we have observed some refinements would be appropriate. Because the same survey structure has been used for 17 years, we would not likely make any changes without considerable review and analysis. We anticipate that we will continue to complete 20 years of analysis.

Fully Ungraded Samples

As mentioned, CMPT samples may be ungraded for a variety of reasons, the most common being the laboratory reports the sample is one that is not normally processed (SNNP). On rare occasion, a sample may be deemed inappropriate for grading because it was found contaminated or faulty after it was submitted. CMPT ensures that to some degree all samples have grading potential, and monitors those samples that are fully ungraded.

Year	Fully 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
2010-2011	0

Year	Fully Ungraded samples
2011-2012	0
2012-2013	3
2013-2014	0
2014-2015	0
2015-2016	0
2016-2017	0
2017-2018	0
2018-2019	0
2019-2020	0
2020-2021	0

4- Clinical Bacteriology Appeal Resolution

CMPT provides Clinical Bacteriology samples with the intent that they can be graded to indicate test performance competency. All results from all samples are graded by the full Clinical Bacteriology Committee and are assessed on a 4-point scale. Participants have the opportunity to view the committee assessment, and if they feel the assessment was harsh or unfair, they have both a right and obligation to appeal. Over the last 16 years, the number of appeal requests have dropped. We have not investigated the foundations of that change.

In 2020-2021, we had only one appeal for re-evaluation, in this case pertaining to an antimicrobial susceptibility report. The committee considered the request, and determined its validity. The grade was changed from unacceptable to ungraded.

Year	Graded Challenges	Appeal	Support request	Affirm committee
'2004-05	6378	11		
`2005-06	6378	21		
`2006-07	x	20		
`2007-08	x	31		
`2008-09	x	15		
2009-20	x	13		
2010-11	6067	15	6	9
2011-12	6726	13	2	11
2012-13	6325	x	x	X
2013-14	6300	17	6	11
2014-15	6013	17	6	1
2015-16	6013	9	4	5
2016-17	5008	1	0	1
2017-18	4829	2	2	0
2018-19	3506	2 (2 ungraded)	**0**	**0**
2019-20	4623	7 (1 ungraded)	2	4
2020-2021	**2993**	**1**	**1**	**0**

Participant Laboratory Performance 2020-2021

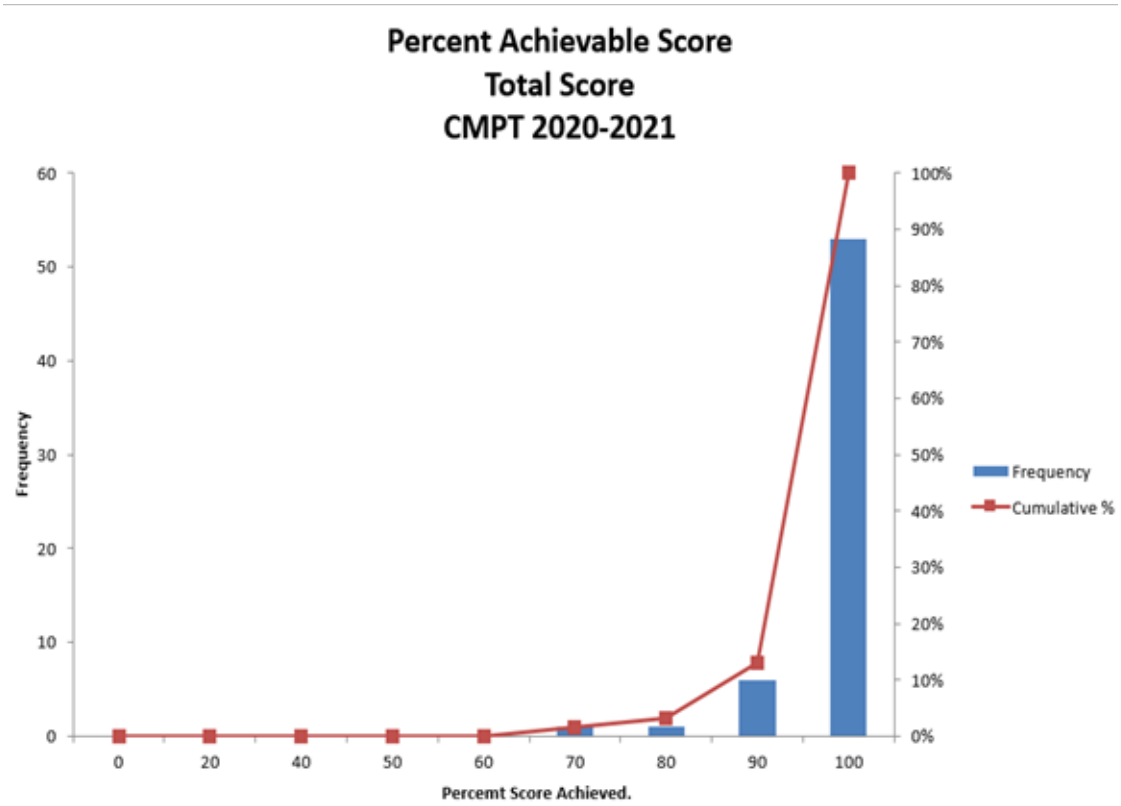
Clinical Bacteriology Samples submitted

In 2020-2021, CMPT provided a total of 4311 samples to Clinical Bacteriology laboratories. Of these, 2993 samples were graded and 1318 (31%) were not graded, the predominant reason being that the laboratory reported the sample to be one they would not normally perform that sample (SNNP) and thus assessing for competency would be unfair. Antimicrobial susceptibility testing is the single test category with the greatest number of ungraded results - 1516 of 3207 (48.5%) challenges.

In 2020-2021, there were no rejected samples for Quality Control reasons.

In assessing laboratory performance (and its reflection upon CMPT as the sample provider), CMPT has adopted a threshold performance expectation that 90 percent of laboratories must achieve 90 percent of their achievable score as measured over four (4) test events over 12 months. If less than 80 percent of reference laboratories are unable to achieve an acceptable score or if 50 percent of the total group of laboratories are unable to achieve an acceptable score the sample is deemed as inappropriate for assessment.

Of graded challenges, 2824 (94.4%) were evaluated as acceptable. One hundred eighteen (118) or 3.9% were evaluated as sufficiently wrong, that if they had been reported on a clinical sample, they could have potentially resulted in harm for the patient.



CMPT Presentations and Publications including www.CMPT.ca

The COVID pandemic put a hold on all in-person conferences. While some attempted to replace them with virtual events, overall participation in these events was costly far beyond any benefits of contact or interaction. Two of the essential events for CMPT were the annual European Quality Assurance in Laboratory Medicine (EQALM) and our sister conference POLQM Quality Conference.

We look forward to a return of conferences and workshops in the hopefully near future.

While presentations and publications have been on a temporary hold, the CMPT website continues to be the program's primary communication centre for data entry, preliminary results, critiques, newsletters, and the annual report. We thank Veronica Restelli for all her activities in keeping www.cmpt.ca fresh and full of relevant and important information.

Research and development

CMPT ensures that its methods and products are always current and relevant to an increasing audience of testing and analytical laboratories in a broad range of topics related within the field of laboratory microbiology. There is constant revision and improvement, thanks to our senior scientist, Caleb Lee.

In 2021, we started to work on samples for Food Microbiology with the assistance of Issa McKinnon, in part because we believe we will be able to supply an existing customer with samples. That program was put on hold when we were invited to be active in providing proficiency testing for laboratories in British Columbia (and beyond) for Rapid Antigen Detection testing for COVID-19. The program is under the primary authority of the BC Diagnostic Accreditation Program.

At the time of writing this report, the program has been in operation for approximately 5 months and is continuing to expand and broaden. Data is not provided in the report because of the early nature of the testing. It is sufficient to say that, for the most part, laboratories have performed as anticipated. Importantly, we have detected some errors where people and organizations were potentially receiving incorrect information. We have highlighted all these concerns and cooperated with investigations and have seen remedial actions being implemented, including retraining, which has produced some improvements.

I would like to thank all of the staff, in particular Veronica Restelli and Esther Kwok for making the COVID-19 program a success.

For the foreseeable time forward, we will leave the Food Microbiology development on pause. Other programs are being considered.

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. (See CMPT SWOT ANALYSIS 2020-2025).

Succession Planning

CMPT has long recognized the importance of succession planning, not only for the chair of CMPT, but also other senior staff members. In 2020 the Department of Pathology and Laboratory Medicine was actively engaged in putting into place a successor for the chair. A lot of progress has been made. See below.

Looking to the Future

As a direct consequence of the recognition of our ISO17043:2010 accreditation, and our presence on the international stage, CMPT has been approached by new laboratories across Canada and Europe and Africa for new opportunities. Over the next year we anticipate several new programs and opportunities occurring.

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A Strategic Plan (SWOT) was developed in 2016. Consistent with ISO 9001:2015, the plan was developed to take into consideration both internal and external factors. The plan has been re-examined and updated in 2020 (see below)

Partnerships

During 2020 the Canadian Immunohistology Quality Control (cIQc) ceased to be a program of UBC. This has reduced their need for our assistance going forward.

Importantly, we continue to have opportunities to collaborate with PT-Canada, Oneworld Accuracy network, European organisation for external Quality Assurance providers in Laboratory Medicine (EQALM), and of course, our sister program -Program Office for Laboratory Quality Management-.

GOALS and OBJECTIVES 2019 - 2020

P19_1	Complete Chairman's succession.	Near completion
P19_2	Continue with international collaborations with national and international partners.	Ongoing with success
P19_3	Develop new provincial collaborations within British Columbia, including but not limited to BC Patient Safety and Quality Council	Ongoing with success
P19_4	Seek new members for CMPT advisory committees, with special reference to Water Testing Laboratories.	Partial
P19_5	Integrate new personnel into CMPT Team	Ongoing with
P19_6	Revisit SQP renumbering project	Completed
Q19_1	Continue with ISO9001 certification with ISO9001:2015	Ongoing with
Q19_2	Continue with A2LA certification with ISO/IEC17025:2010	Ongoing with
Q19_3	Develop a new SWOT analysis	Completed

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GOALS and OBJECTIVES 2020 - 2021

Q20-1	***Develop Action Plans associated with the new SWOT analysis***	Ongoing
Q20-2	Develop new collaborative activities with European EQA	Partial
Q20-3	Complete R&D phase on Food Microbiology	On hold Replaced with COVID
P20-1	Move forward to complete chair succession	Near comple-tion
P20-2	Develop a Food Microbiology Customer base	On hold Replaced with COVID
P20-3	Develop new opportunities for collaborations especially with BC agencies.	Active through COVID
P20-4	Continue with Certification (ISO9001:2015)	Active
P20-5	Continue with Accreditation (ISO IEC17043:2010)	Active

GOALS and OBJECTIVES 2021 - 2022

Q21-1	***Continue Action Plans associated with the new SWOT analysis***	
Q21-2	Develop new collaborative activities with International EQA	
Q21-3	Focus on Viral and other EQA programs	
P21-1	Complete chair succession	
P21-2	Maintain and Growth COVID/Viral and other EQA base	
P21-3	Continue to grow opportunities for collaborations especially with BC agencies.	
P21-4	Continue with Certification (ISO9001:2015)	
P21-5	Continue with Accreditation (ISO IEC17043:2010)	

CHAIRMAN'S ANNUAL REPORT

SWOT ANALYSIS for CMPT (2020-2025)	
Strengths	Strong Support within the Department of Pathology and Laboratory Medicine UBC Strong, Effective, Capable, Professional Staff Strong support by customers as seen by satisfaction surveys and Composite Satisfaction Score Strong commitment to Innovation, Education, Quality Assessment, Continual Improvement. Strong network of collaboration partners Certification (ISO9001:2015) and Accreditation (ISO IEC 17043:2010)
Weaknesses	Tendency to allow team to become overworked, increasing the opportunities for error Insufficient engagement and collaborations with other programs within the department and UBC. Insufficient engagement with laboratory medicine residents and with BMLSc Strong on practical R&D but not taking advantage of platform for academic research Funding is based on provision of service and requires regular renewals. If a client decides that they either cannot or choose to not renew a contract, then CMPT could have financial difficulties.
Opportunities	Expanding network of EQA collaboration partners Expansion into other laboratory testing arenas (Food, Virology, and others) New opportunities with new leadership by 2022 Link CMPT into opportunities for Capstone projects. Continue to seek EQA programs wanting EQA Training
Threats	**Strong capable team is aging. Need to be more effective in building up next generation.** **Consistent threat of continued laboratory mergers (megalab) and the potential impact on CMPT as a laboratory Quality Partner** **Unlikely, but still possible failure to complete succession plan in 2021**

Signed Michael A Noble,
Chair, CMPT September 2021

COMMITTEE MEMBERS 2020 - 2021

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

Chris Enick, BSc ……..……..Element, Surrey, BC

Mycology Program

Robert Rennie, PhD FCCM, D(ABMM) ……..……..University of Alberta Hospital, Edmonton, AB

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

Brad Jansen BSc, MLT…….……..……Provincial Laboratory for Public Health, Edmonton, AB

Enteric Parasitology Program

Romina Reyes, MD FRCPC ……..……..……..……LifeLabs, Surrey, BC

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Clinical Bacteriology Program

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Doris Poole, MLT, BSc…….……..……..Queen Elizabeth Hospital, Charlottetown, PEI

Janet Reid, BMLSc, ART …….……Saint John Regional Hospital, NB

Robert Rennie, PhD FCCM, D(ABMM) ……..……University of Alberta Hospital, Edmonton, AB

Denise Sitter, ART ……...Cadham Provincial Laboratory, Winnipeg, MB

CLINICAL BACTERIOLOGY PROGRAM

CMPT acknowledges, with appreciation, the valuable and essential advisory and technical support of the Clinical Bacteriology Advisory Committee. 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 C1 laboratories only receive Gram staining samples

Participant Laboratory Performance 2020-2021

Clinical Bacteriology Samples submitted

In 2020-2021, CMPT provided a total of 4311 samples to Clinical Bacteriology laboratories. Of these, 2993 samples were graded and 1318 (31%) were not graded, the predominant reason being that the laboratory reported the sample to be one they would not normally perform that sample (SNNP) and thus assessing for competency would be unfair. Antimicrobial susceptibility testing is the single test category with the greatest number of ungraded results - 1516 of 3207 (48.5%) challenges.

In 2020-2021, there were no rejected samples for Quality Control reasons.

In assessing laboratory performance (and its reflection upon CMPT as the sample provider), CMPT has adopted a threshold performance expectation that 90 percent of laboratories must achieve 90 percent of their achievable score as measured over four (4) test events over 12 months. If less than 80 percent of reference laboratories are unable to achieve an acceptable score or if 50 percent of the total group of laboratories are unable to achieve an acceptable score the sample is deemed as inappropriate for assessment.

Of graded challenges, 2824 (94.4%) were evaluated as acceptable. One hundred eighteen (118) or 3.9% were evaluated as sufficiently wrong, that if they had been reported on a clinical sample, they could have potentially resulted in harm for the patient.

In all key challenge groups, laboratories receiving CMPT challenges met the required level of ninety percent of laboratories achieving 90 percent of achievable score (see histograms).

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.

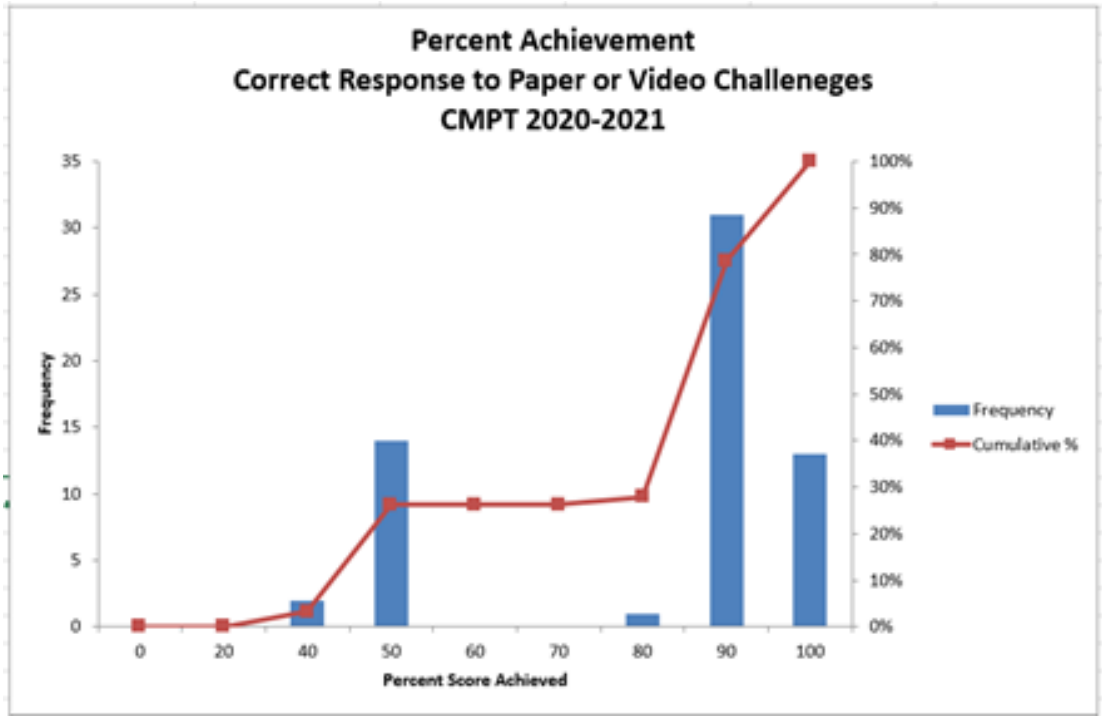
How to read the histograms

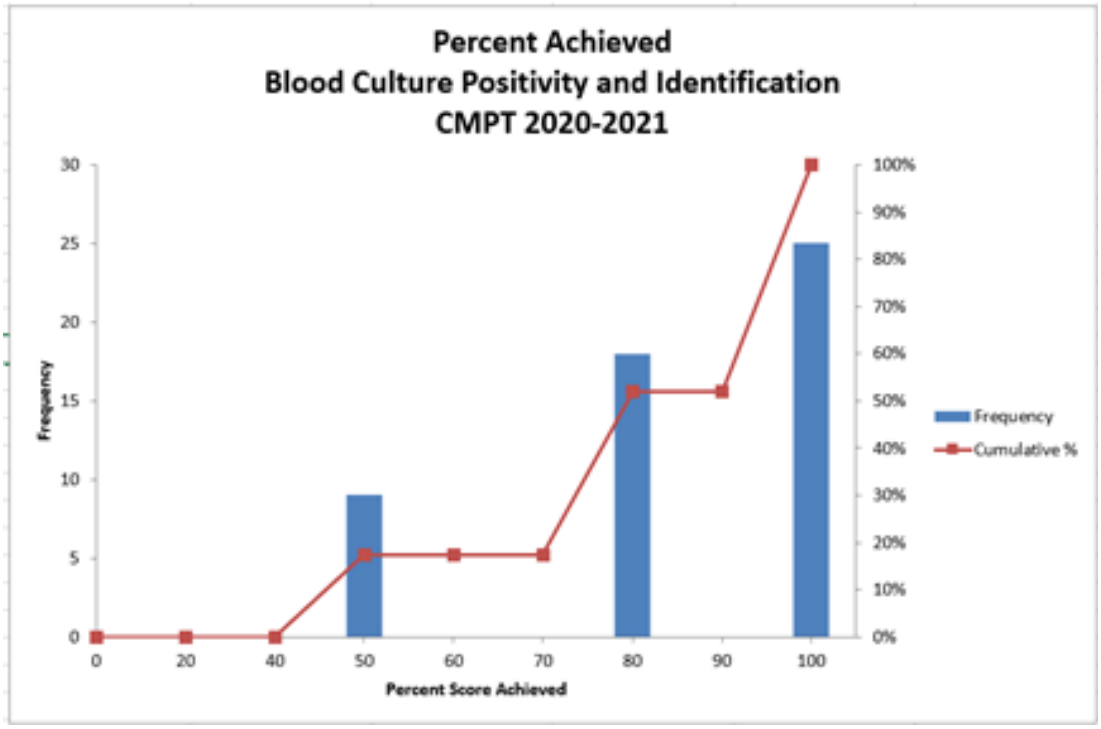
The number of laboratories achieving a specific grade is indicated by the height of the columns over the Percent Achievable Score, and is read on the LEFT side scale of the chart (frequency).

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.

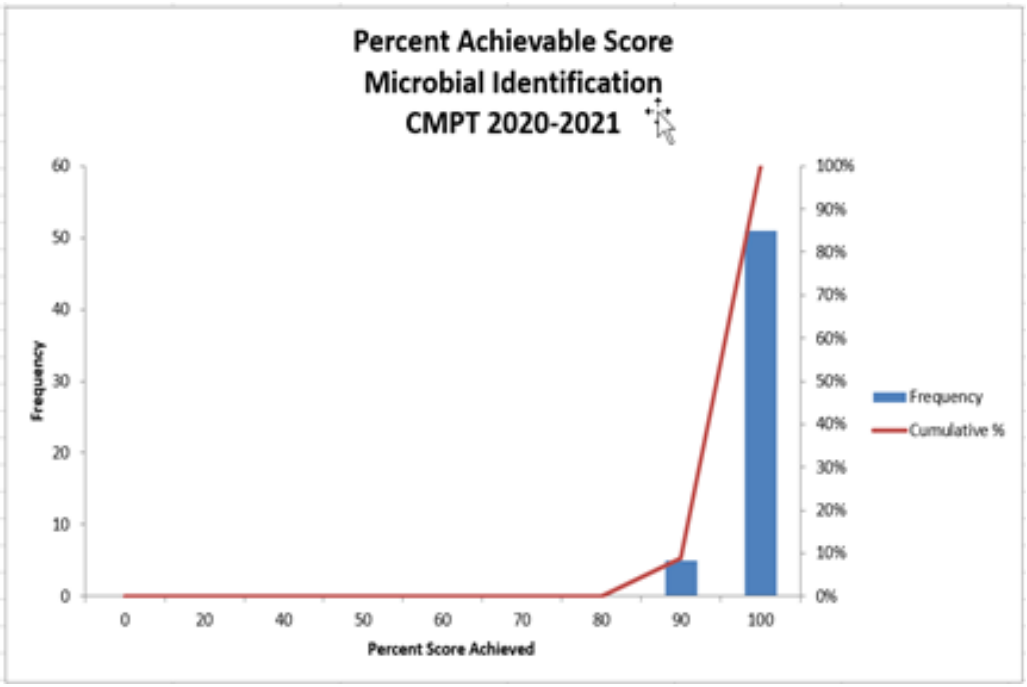
Clinical Bacteriology - Histograms 2020-2021

The following graphics indicate the relative success on specific challenges including paper and video challenges, blood cultures, bacterial identification and susceptibility testing. Note that the overall graphic is influenced by the preponderance of identification and susceptibility Gram staining challenges.

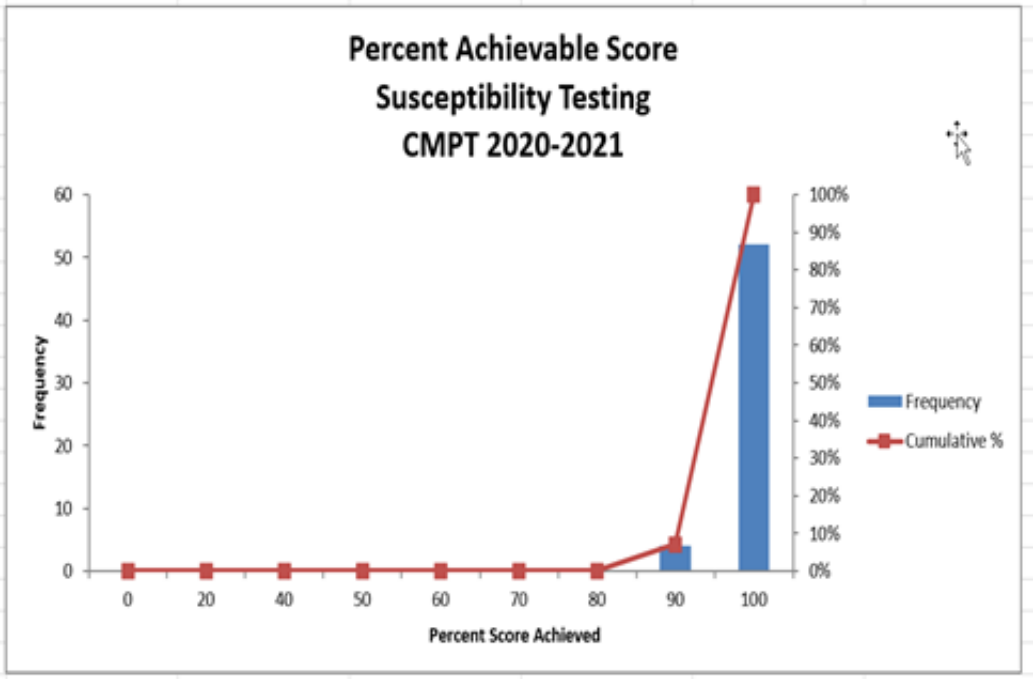


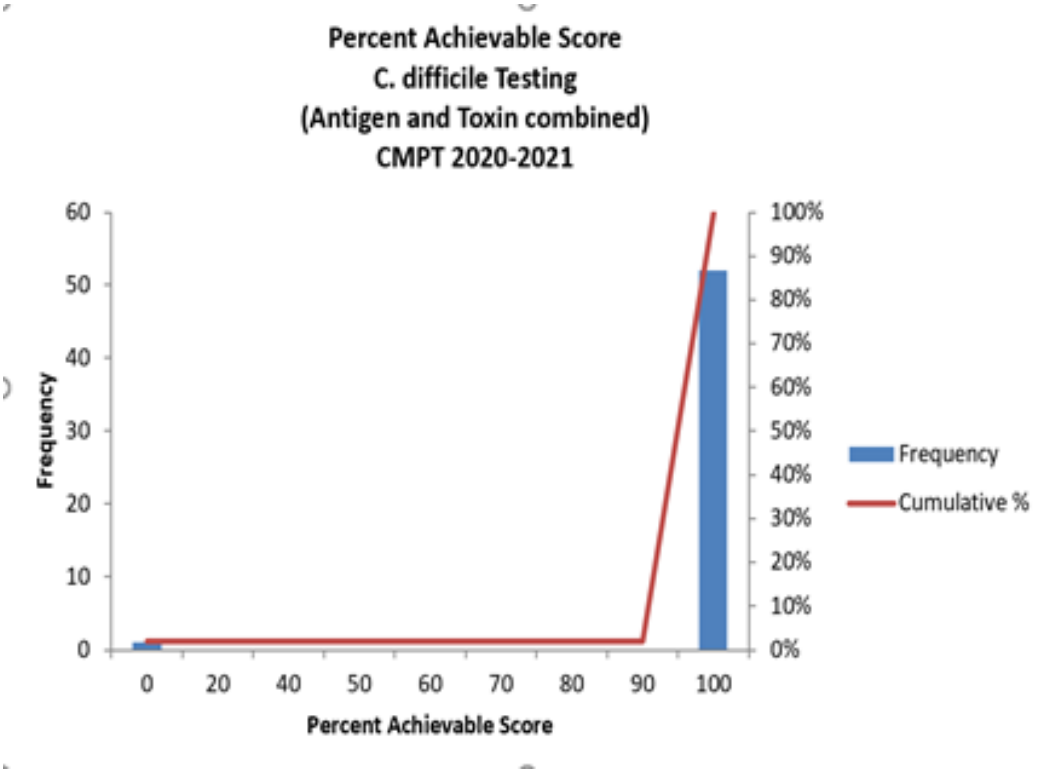


Clinical Bacteriology- Histograms



Clinical Bacteriology- Histograms





WATER MICROBIOLOGY PROGRAM

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

Chris Enick BSc…….....Element, Surrey, 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 Environmental Microbiology Laboratory
- British Columbia Ministry of the Environment

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

Starting in 2015, the Heterotrophic Plate Count program was offered to laboratories that tested drinking water samples with this method.

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 the Presence/Absence method, as their primary method or in addition to other methods.

The drinking water bacteriology (membrane filtration, Enzyme Substrate, MPN and Presence/Absence methods) challenge records for 2020 are shown in Table 1, Heterotrophic Plate Count program records are shown in Table 2, and the recreational water challenge records are show in Table 3.

Table 1: 2020 Drinking Water Bacteriology challenge record

Date	Sample No.	Organism	Membrane Filtration mean/median/MU% cfu/100 ml		Enzyme Substrate mean/median MPN/100 ml		MPN mean/median MPN/100 ml		Presence/ Absence (P/A)
			Total Coliforms	***E.coli***	Total Coliforms	***E.coli***	Total Coli-forms	***E.coli***	**Total Coliforms/ *E.coli***
W201 April 6, 2020	1	*Escherichia coli*	30/30/21	32/30/22	32.2/30.0	32.6/36.4	≥23/≥23	≥23/≥23	P/P
	2	*Enterobacter* species	68/66/18	0/0/0	69.1/67.9	0/0	≥23/≥23	0/0	P/A
	3	*Escherichia coli*	16/16/22	16/15/21	16.0/15.5	15.2/15.3	13.6/12.0	13.6/12.0	P/P
	4	no organisms present	0/0/0	0/0/0	0/0	0/0	0/0	0/0	A/A
W202 July 13, 2020	1	*Enterobacter* species	17/16/26	0/0	20.5/21.5	0/0	16.6/16.0	0/0	P/A
	2	no organisms present	0/0/0	0/0/0	0/0	0/0	0/0	0/0	A/A
	3	*Enterobacter* species	17/17/19	0/0/0	17.2/16.8	0/0	17.2/16.1	0/0	P/A
	4	*Escherichia coli*	58/57/25	57/56/26	62.8/58.0	50.5/54.4	≥23/≥23	≥23/≥23	P/P
W203 October 26, 2020	1	*Escherichia coli*	30/30/20	28/29/16	34.6/32.9	33.2/32.0	21/23	21/23	P/P
	2	*Escherichia coli*	15/16/17	14/14/19	16.5/17.0	16.5/17.0	20/20	20/20	P/P
	3	*Escherichia coli*	57/59/14	55/52/13	64.3/63.9	61.3/63.8	≥23/≥23	≥23/≥23	P/P
	4	*Enterobacter* species	18/18/28	0/0/0	17.8/17.2	0/0	15/12	0/0	P/A

Table 2: 2020 Drinking Water Bacteriology for Heterotrophic Plate Count

Date	Sample No.	Organism	mean/median (cfu/ml) /MU%
H201 April 6, 2020	1	no organisms present	0/0/0
	2	*Enterobacter* species	72/68/19
	3	*Escherichia coli*	209/206/21
	4	*Escherichia coli*	153/146/13
H202 July 13, 2020	1	*Enterobacter* species	140/139/17
	2	*Escherichia coli*	100/98/13
	3	*Enterobacter* species	53/52/22
	4	*Escherichia coli*	94/94/17
H203 October 26, 2020	1	*Enterobacter* species	193/206/23
	2	no organisms present	0/0/0
	3	*Enterobacter* species	125/121/22
	4	*Escherichia coli*	69/67/25

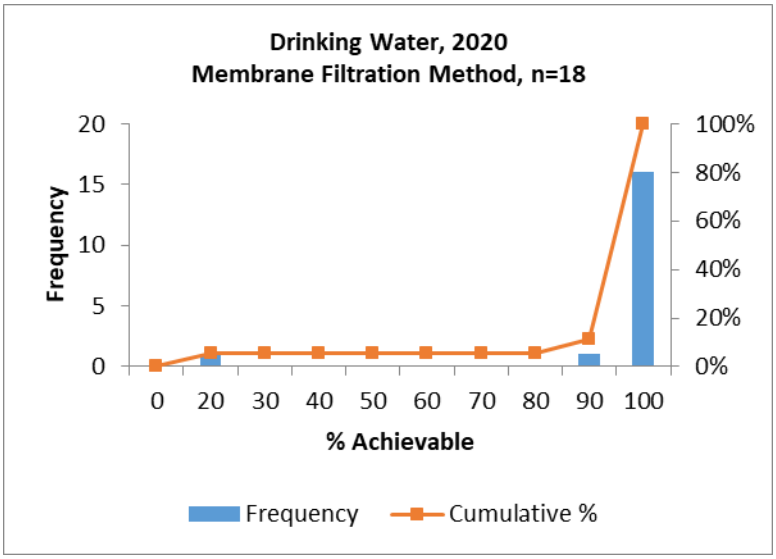
Table 3: 2020 Recreational Water Bacteriology challenge record

Date	Source	Challenge	mean/median/MU%	
			Membrane Filtration (cfu/100mL)	Enzyme Substrate MPN/100 ml
R201 April 6, 2020	Spa Water	*Pseudomonas aeruginosa*	181/180/20	154.4/161.6
	Freshwater Beach	*Escherichia coli*	248/245/17	234.1/240.0
	Marine Water	*Enterococcus* species	100/100/13	90.5/90.5
R202 August 24, 2020	Spa Water	*Pseudomonas aeruginosa*	125.5/130.0/25.5	206.0/209.5
	Freshwater Beach	*Escherichia coli*	89.5/86.0/15.0	80.8/92.5
	Marine Water	*Enterococcus* species	254.7/244/13.3	264.5/268.4

MU% - not applicable for EST, MPN or PA methods

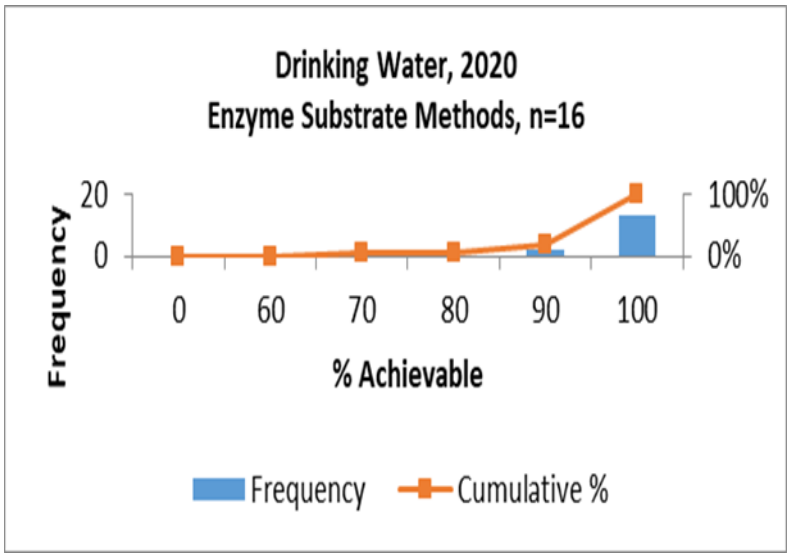
Water Bacteriology (Drinking and Environmental Water Sample) Score

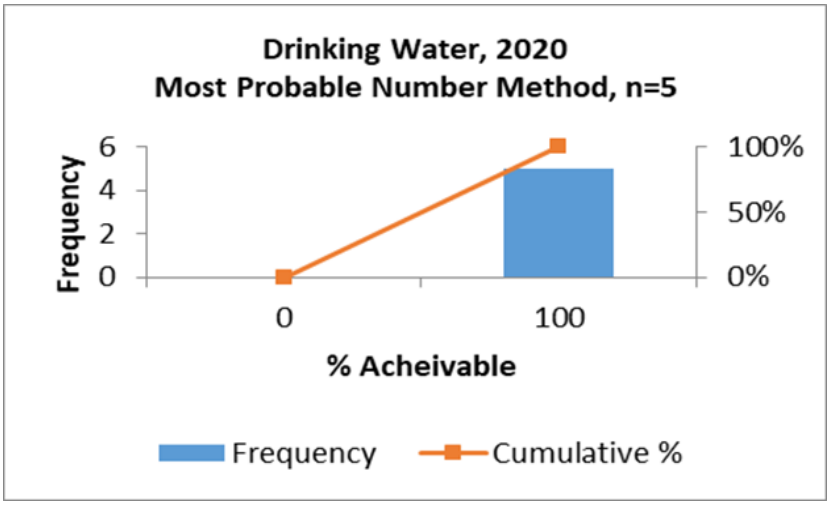
Laboratory testing results are graded based on the Membrane Filtration, Enzyme Substrate, MPN, Heterotrophic Plate Count (HPC) and/or Presence/Absence methods. All methods are graded on a point scale for assessment of water samples with the exception of the Presence/Absence method, a qualitative method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



Drinking Water -Membrane Filtration method, 2020 (n=18)	
% Achievable	Cumulative %
20	6
90	11
100	100

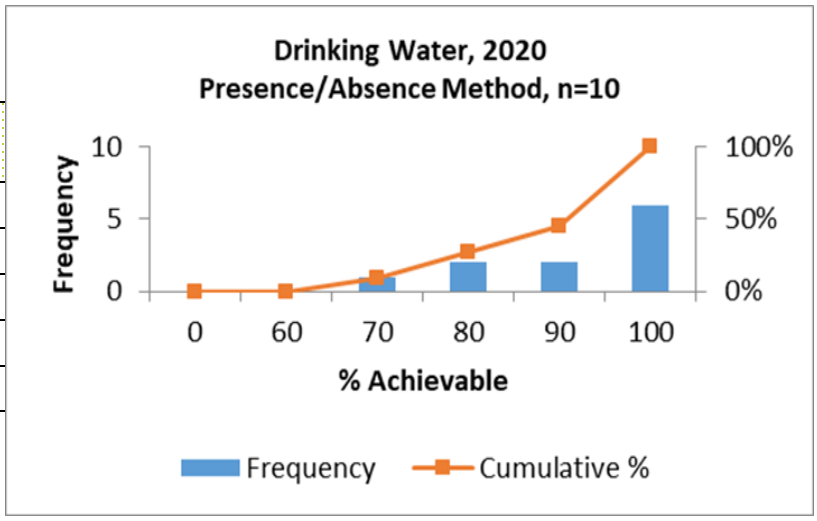
Drinking Water Enzyme Substrate methods, 2020 (n=16)	
% Achievable	Cumulative %
70	6
80	6
90	19
100	100





Drinking Water - Most Probable Number (MPN) method, 2020 (n=5)	
% Achievable	Cumulative %
100	100.00

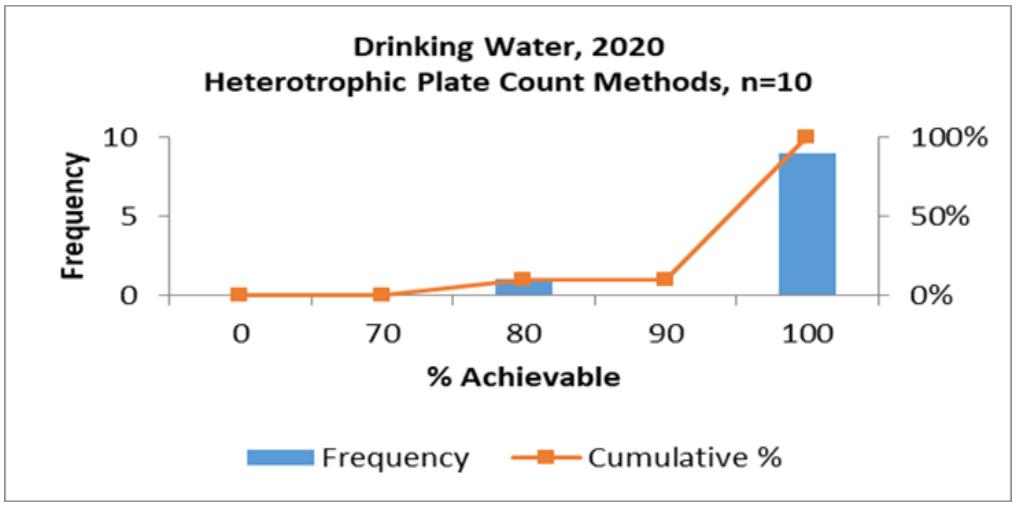
Drinking Water - Presence/ Absence methods, 2020 (n=10)	
% Achievable	Cumulative %
70	9
80	27
90	45
100	100



WATER MICROBIOLOGY PROGRAM

The following Table illustrates the Achievable scores for the Heterotrophic Plate Count method used for Drinking Water samples during 2020.

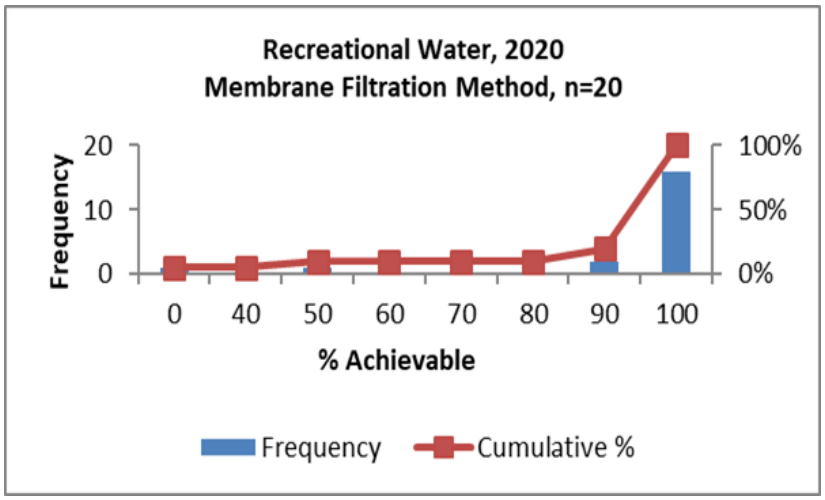
Drinking Water Performance Table for Heterotrophic Plate Count (HPC) method Table, 2020	
% Achievable	**Cumulative %**
80	10
100	100

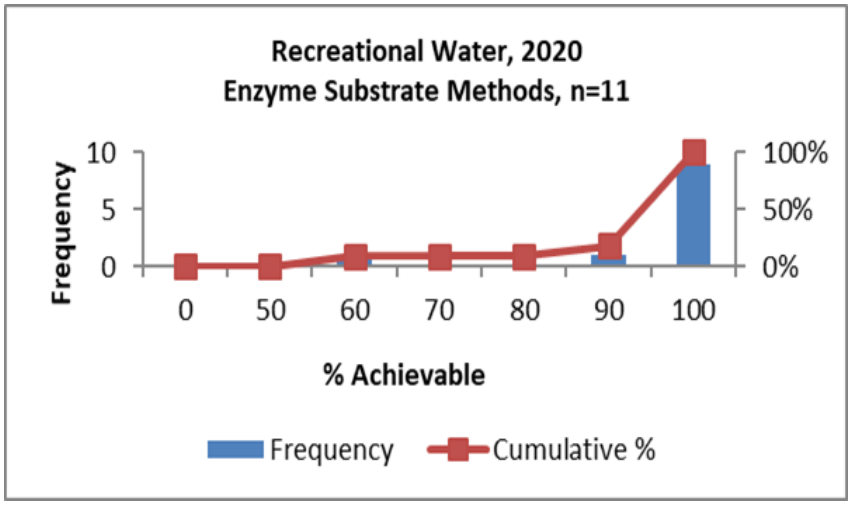


WATER MICROBIOLOGY PROGRAM

The following Score Tables illustrate the Achievable scores for Membrane Filtration and Enzyme Substrate methods used for Recreational Water samples during 2020.

Recreational Water - Membrane Filtration method, 2020	
% Achievable	Cumulative %
0	5
50	10
90	20
100	100





Recreational Water - Enzyme Substrate method, 2020	
% Achievable	Cumulative %
60	9
90	18
100	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

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

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

The Mycology Plus Program was introduced in June 2001. Participants receive 3 shipments per year, each including 3 fungal smear slides for direct examination and 3 proficiency challenges for the identification of dermatophytes, molds, common laboratory contaminants, and yeasts.

In 2016-2017, the expert committee decided to start grading mycology challenges. Grading is on a two -point scale, acceptable or unacceptable. Susceptibility challenges for yeasts were introduced in 2008 and laboratories performing anti-fungal testing were encouraged to report their results.

Table 1: 2020 challenge results

Survey	Samples			Grades*		
				A	U	UG
MY2004 April 2020	**Fungal Smear** (hyphae)	**A**	Negative	10		
		B	Positive	10		
		C	Negative	10		
	Yeast	**1**	*Candida albicans*	10		
	Dermato-	**2**	*Microsporum cookei*	10		
	Mold	**3**	*Aspergillus niger*	10		
MY2008 August 2020	**Fungal Smear** (hyphae)	**A**	Negative	9	1	
		B	Positive	9	1	
		C	Positive	9	1	
	Yeast	**1**	*Saccharomyces cerevisiae*	9	1	
	Dermato-	**2**	*Trichophyton verrucosum*	7	3	
	Mold	**3**	*Sporothrix schenckii*	6	4	
MY2011 November 2020	**Fungal Smear** (hyphae)	**A**	Positive	9	1	
		B	Negative	10		
		C	Positive	9	1	
	Yeast	**1**	*Rhodotorula* species	10		
	Dermato-	**2**	*Microsporon canis*	10		
	Mold	**3**	*Alternaria* species	10		
			Totals	**167**	**13**	**0**

*Grades: A: acceptable; U: unacceptable; UG: ungraded

**susceptibilities applicable

ENTERIC PARASITOLOGY PROGRAM

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

Romina Reyes MD FRCPC……..LifeLabs, Surrey, BC

Joan Tomblin MD FRCPC…….…….... Royal Columbian Hospital, New Westminster, BC

Pauline Tomlin MPH, ART, BSc……..…..Provincial Laboratory for Public Health, Edmonton, AB

Quantine Wong BSc…….……..…..…BCCDC, Vancouver, BC

Enteric parasitology samples are actual clinical samples fixed in formalin solution; these samples are kindly provided by LifeLabs, DynaLife, PLPHE, and BCCDC .

Participants receive 3 surveys per year. Each survey consists of 3 SAF preserved samples that are suitable for concentration techniques and smear preparation;

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 2020 challenges.

Table1. Enteric Parasitology Challenges 2020

Date	Sample	Parasite(s)	A*	U*	UG*
April 2020	PA2004-1	*Entamoeba coli, Endolimax nana,* ***Blastocystis* species**	12	2	
	PA2004-2	**Hookworm, *Hymenolepis nana, Giarcia lamblia, Ascaris* species, *Blastocystis* species**			14
	PA2004-3	No ova or parasites	14		
July 2020	PA2007-1	***Cryptosporidium* species**, *Entamoeba coli*	17		
	PA2007-2	No ova or parasites	17		
	PA2007-3	***Blastocystis* species**	17		
September 2020	PA2010-1	*Endolimax nana,* ***Blastocystis* species**	13	2	
	PA2010-2	***Giardia lamblia***	15		
	PA2010-3	No ova or parasites, white blood cells, red blood cells	15		
		Total	**120**	**4**	**14**

BOLD – pathogen **Blue – potential pathogen**

*Grades: A: acceptable; U: unacceptable; UG: ungraded

TRICHOMONAS VAGINALIS PROGRAM

CMPT launched the *Trichomonas vaginalis* Program with the first shipment on August 8, 2011. The program consisted of 2 surveys in 2011. Since 2012, the number of surveys was increased to 3. Each survey consists of 4 samples which are suitable for antigen or DNA testing.

Grading is based on a 2 point scale (acceptable or unacceptable). Table 1 lists the samples and grades received for the 2020 challenges.

Table 1. *Trichomonas vaginalis* Challenges 2020

Date	Sample	Results	Acceptable	Unacceptable	Ungraded
April 2020	TR2004-1	Negative	21	0	0
	TR2004-2	Positive	21	0	0
	TR2004-3	Negative	21	0	0
	TR2004-4	Positive	21	0	0
July 2020	TR2007-1	Positive	20	1	0
	TR2007-2	Positive	20	1	0
	TR2007-3	Negative	20	1	0
	TR2007-4	Negative	20	1	0
September 2020	TR2010-1	Negative	20	0	1
	TR2010-2	Negative	20	0	1
	TR2010-3	Negative	20	0	1
	TR2010-4	Positive	20	0	1
		Total	**244**	**4**	**4**

SHIGA TOXIN PROGRAM

CMPT launched the Shiga Toxin Program with the first shipment on May 7, 2012. Participants receive 2 surveys a year with each survey consisting of 3 simulated stool samples.

Grading is based on a 2 point scale (acceptable or unacceptable). Table 1 lists the samples and grades received for the 2020 challenges.

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

Table 1. Shiga Toxin Challenges 2020

Date	Sample	Results	Acceptable	Unacceptable	Ungraded
May 2020	ST2005-1	gene and toxin positive	12	1	0
	ST2005-2	gene and toxin negative	13	0	0
	ST2005-3	gene and toxin positive	13	0	0
November 2020	ST2011-1	gene and toxin negative	13	0	0
	ST2011-2	gene and toxin positive	13	0	0
	ST2011-3	gene and toxin positive	13	0	0
		Total	**77**	**1**	**0**

SCREENING AND MOLECULAR TESTING PROGRAM

CMPT launched the Molecular Proficiency Testing Program with the first shipment on March 23, 2009. The program consists of 2 surveys. With each survey participants receive 4 samples for methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant *Enterococcus* species (VRE) and group B *Streptococcus* (GBS) each. In 2019, CMPT expanded the Molecular Proficiency Testing Program to include carbapenem-resistant *Enterobacteriaceae* (CRE). Because all of the samples can also be tested using screening methods, such as chromogenic media, the program was renamed as the "Screening and Molecular" Program. Laboratories can participate in one, some or all of the 4 sample types.

Grading is based on a 2 point scale (acceptable or unacceptable). Table 1 lists the samples and grades received for the 2020 challenges.

Table 1. Screening and Molecular Challenges 2020

Date	Sample		Results	Acceptable	Unacceptable	Ungraded/DNP
April 2020	MRSA	MR 2004-1	negative	33		
		MR 2004-2	negative	33		
		MR 2004-3	positive	33		
		MR 2004-4	positive	32	1	
	VRE	VR 2004-1	positive (van B)	17	8	5
		VR 2004-2	negative	30		
		VR 2004-3	negative	30		
		VR 2004-4	positive (van A)	25	2	3
	GBS	GB 2004-1	positive	31		
		GB 2004-2	negative	31		
		GB 2004-3	negative	31		
		GB 2004-4	positive	31		
	CRE	CRE 2004-1	negative	20	1	
		CRE 2004-2	positive	21		
		CRE 2004-3	positive	21		
		CRE 2004-4	positive	20	1	
			Total	**439**	13	8

Table 1. Screening and Molecular Challenges 2020 cont.

Date	Sample		Results	Acceptable	Unacceptable	Ungraded/DNP
August 2020	MRSA	MR 2008-1	positive	33		
		MR 2008-2	negative	33		
		MR 2008-3	positive	33		
		MR 2008-4	negative	33		
	VRE	VR 2008-1	negative	29	1	
		VR 2008-2	negative	29	1	
		VR 2008-3	positive	25	1	4
		VR 2008-4	negative	29	1	
	GBS	GB 2008-1	negative	31		
		GB 2008-2	positive	31		
		GB 2008-3	negative	30	1	
		GB 2008-4	positive	30	1	
	CRE	CRE 2008-1	negative	21		
		CRE 2008-2	negative	20		
		CRE 2008-3	negative	21		
		CRE 2008-4	positive	21		
			Total	**449**	**6**	4
			Year Total	**888**	**19**	**12**

ACID FAST BACILLI PROGRAM

CMPT launched the Acid Fast Bacilli Program on April 10, 2017. Participants receive 3 surveys a year, each survey consisting of 3 simulated smears for acid fast staining and interpretation.

Grading is based on a 2 point scale (acceptable or unacceptable). Table 1 lists the samples and grades received for the 2020 challenges.

Table 1. Acid Fast Bacilli Challenges 2020

Date	Sample	Results	Acceptable	Unacceptable	Ungraded
April 2020	AFB2004-1	positive	6		
	AFB2004-2	positive	6		
	AFB2004-3	negative	6		
July 2020	AFB2007-1	negative	5	1	
	AFB2007-2	positive	5	1	
	AFB2007-3	negative	5	1	
September 2020	AFB2010-1	negative	6		
	AFB2010-2	positive	6		
	AFB2010-3	positive	6		
		Total	**51**	3	

ENTERIC PANEL PROGRAM

CMPT launched the Enteric Panel Program with the first shipment on April 23, 2018. Participants receive 2 surveys per year; each survey consisting of 4 simulated stool samples for the detection of enteric pathogens by molecular methods.

Grading is based on a 2 point scale (acceptable or unacceptable). Table 1 lists the samples and grades received for the 2020 challenges.

Table 1. Enteric Panel Challenges 2020

Date	Sample	Results	Acceptable	Unacceptable	Ungraded
April 2020	EP2004-1	*Shigella flexneri*	8		
	EP2004-2	*Aeromonas hydrophila*	4	2	3
	EP2004-3	*Campylobacter jejuni*	9		
	EP2004-4	Negative	9		
August 2020	EP2008-1	*Yersinia* species	6	3	1
	EP2008-2	*Salmonella* species	9	1	
	EP2008-3	*Vibrio* species	4	5	1
	EP2008-4	*Escherichia coli* O157	9		
		Total	**58**	**11**	**5**