



Brief Report

Value of certification in infection prevention and control

James F. Marx PhD, RN, CIC, FAPIC^{a,*}, Sandra Callery RN, MHSc, CIC^b,
Roy Boukidjian MSN, PHN, CIC, NE-BC^c

^a Christus St. Vincent Regional Medical Center, Santa Fe, NM, USA

^b Public Health Ontario, Toronto, ON, Canada

^c Dignity Health, San Francisco, CA, USA



Key Words:
Competency
Compliance
Professional standards
Career Growth
Compensation

The Certification Board of Infection Control and Epidemiology conducted a marketing research study to determine the perceived value of the certification in infection prevention and control among infection prevention professionals and other stakeholders. Four thematic categories were identified: certification process and standards; professionalism, competency, and career growth; patient care, safety, infection prevention and control; and regulatory compliance. Respondents stated that certification demonstrated professional competency, increased career growth, improved regulatory compliance, was important in influencing legislation, and improved the practice of infection prevention and control. Opportunities were to reevaluate eligibility criteria and examination difficulty; demonstrate how certification increases financial compensation and organizational recognition; and offer recertification through continuing education based on the study findings, strategic recommendations and next steps were incorporated into the strategic plan. This article is an overview and summarizes the study findings.

© 2019 Association for Professionals in Infection Control and Epidemiology, Inc. Published by Elsevier Inc. All rights reserved.

Specialty certification demonstrates competency and commitment to the profession.¹ Certification validates knowledge using standardized testing methods. Accredited certification further demonstrates the quality and integrity of the certification process. The Certification Board of Infection Control and Epidemiology (CBIC) administers the only nationally accredited certification in infection prevention and control (CIC). CBIC is accredited by the National Commission on Certifying Agencies, a member of the Institute for Credentialing Excellence. The National Commission on Certifying Agencies accredits certifying agencies to ensure the health, welfare, and safety of the public through accreditation. CIC is one measure of competency and mastery of health care infection prevention and control (IPC) knowledge. Competency defines the professional role.¹ There are over 7,000 individuals with CIC. Although most are from the United States and Canada, there is a growing need for certification outside North America including Europe.²

Infection preventionist (IP) competencies assessed during the CIC examination are identification of infectious disease process; surveillance and epidemiologic investigation; preventing and controlling

the transmission of infectious agents and health care–associated infection; employee and occupational health; management and communication; education and research; environment of care; and cleaning, sterilization, disinfection, and asepsis.³ The Association for Professionals in Infection Control and Epidemiology (APIC) developed the IP Competency Model in 2012. That model states the transition from novice to proficient is accomplished once one passes the CIC examination.⁴ This statement supports the idea that certification is an important career milestone using the framework of the APIC Competency Model.

Certification represents both the individual's and their institution's commitment for continual improvement of IPC practices as well as the certificant's contribution to health care personnel and patient safety.⁵ There are many ways to measure the value of certification. Bernard et al⁶ described higher overall self-assessed competency among certified respondents ($P < .001$). Landers et al⁷ reported the salary of those with the CIC credential was 25% higher than those without CIC credential (\$85,911 vs \$68,817; $P < .01$). Carrico et al⁸ found that those who had CIC scored significantly higher in overall program performance in 5 major program areas than respondents who were not certified (54% vs 43%; $P = .003$). The 5 major program areas were immunization program management; vaccines provided to health care personnel; vaccine handling practices; training provided for the individual(s) responsible for the program; and quality indicators for the program. Krein et al⁹ reported that hospitals with a certified IP on staff had a higher safety

* Address correspondence to James F. Marx, PhD, RN, CIC, FAPIC, Christus St. Vincent Regional Medical Center, Quality Department, 455 St. Michaels Drive, Santa Fe, NM, 87501.

E-mail address: broadstreetsolutions@icloud.com (J.F. Marx).

Conflicts of interest: James F. Marx, Sandra Callery, and Roy Boukidjian are members of the Certification Board of Infection Control and Epidemiology, Inc.

culture score. Hospitals with a CIC certified IP participated in infection prevention collaboratives and were more likely to use evidence-based catheter-related bloodstream infection prevention practices.⁹ Hospitals with a CIC certified IP director also had significantly lower incident rate ratio of methicillin-resistant *Staphylococcus aureus* bloodstream infections (incident rate ratio = 0.32; $P = .02$).¹⁰ Hospitals with a CIC certified IP supported evidence-based antimicrobial stewardship, device-associated health care–associated infection interventions, nurse-initiated urinary catheters discontinuation protocols, and ventilator-associated pneumonia prevention practices.¹¹

There are more job opportunities for those who hold the CIC credential than there are for those without the credential. In 2007, Goldrick⁵ reported 30% of employers required the CIC credential to apply for or maintain employment. To compare the changes for CIC requirements, a review of job postings on LinkedIn was done in 2018. The 2018 data in Figure 1 was constructed the same way as in the 2007 Goldrick⁵ study. Almost all states were represented in this sample, however, the states that require the CIC credential are not included in the table. The 2018 table showed the CIC requirement had grown to 46% (16% increase, [LinkedIn.com](https://www.linkedin.com)) (Fig 2). In summary, CIC supports

State	Total	CIC required ²	CIC preferred	CIC not mentioned
AZ	2	1	0	1
CA	14	9	4	1
CO	3	1	2	0
CT	1	0	0	1
FL	9	3	6	0
GA	5	2	3	0
IA	1	1	0	0
ID	1	1	0	0
IL	4	1	2	1
IN	2	1	0	1
KY	2	1	0	1
LA	1	0	0	1
MA	6	5	1	0
MD	2	0	2	0
ME	1	0	1	0
MI	1	0	0	1
MN	2	2	0	0
MO	4	3	1	0
MT	1	1	0	0
NC	1	0	1	0
NH	1	0	0	1
NJ	6	2	2	2
NM	1	0	0	1
NV	2	0	1	1
NY	2	0	0	2
OH	2	1	0	1
OK	1	0	0	1
OR	1	1	0	0
PA	4	4	0	0
TN	3	0	1	2
TX	3	2	1	0
VA	5	1	1	3
VT	1	1	0	0
WA	2	1	1	0
WI	2	0	1	1
WV	1	1	0	0
TOTAL	100	46%	31%	23%

Fig 1. 2018 CIC requirement for infection preventionist LinkedIn job postings in the United States^{1,2}

¹LinkedIn job search accessed November 19, 2018; www.linkedin.com. ²Required to apply or to keep position. CIC, certification in infection prevention and control.

higher salary compensation, increases job satisfaction through a structured career development framework, improves patient outcome, advances evidence-based infection prevention practices, and is valued by the public and within the health care industry.

OBJECTIVE

The purpose of this study was to determine the perceived value of the CIC credential. The target audience were senior level managers, public health officials, current and previous CIC certificants, as well as those never certified. The results of the survey were to be used to reshape and update CBIC's 5-year strategic plan.

METHODS

The CBIC engaged the consulting company *IMPAQ Strategy* in February 2018. *IMPAQ Strategy* provides strategic consulting to non-profit organizations and associations. To prepare for this market research survey, an environmental scan was performed and current CBIC Board members were interviewed. Three primary question domains were developed: what is the current value of the credential; what are the barriers to attaining and maintaining the credential; and how can the value of the credential be increased? These 3 primary domain questions were then divided into 2-3 secondary domain questions for a total of 8 subdomains. The final questionnaire had 28 Likert scale multiple-choice, 2 open-ended, and 21 demographic questions. Free text responses were reviewed for thematic information and, where possible, were mapped to preexisting categories from the primary question in the survey.

A list of potential survey respondents was gathered through membership rosters provided by the APIC and Infection Prevention and Control Canada (IPAC Canada), CBIC contact lists, and a purchased database from the IQVIA Institute for Human Data Science for health care executives. The IQVIA coordinates alliances between life science companies, medical researchers, government agencies, payers, non-profit organizations, and other health care stakeholders to deliver insights and solutions using human data science. Eligible respondents were limited to those with a paid membership in APIC or IPAC, contacts provided by CBIC, and the purchased mailing list from the IQVIA. The survey/questionnaires were sent out by direct e-mail to senior level managers, public health officials, current and previous CIC certificants, as well as those never certified. The survey response window was limited to 12 days. The survey was also available through the CBIC's social media sites, including LinkedIn, Facebook, and Twitter. Market research techniques using both qualitative and quantitative methods were used to collect and analyze data.

Follow-up 15-minute telephone interviews were conducted on 12 randomly selected respondents from each of the following categories: executives and administrators, individuals with a lapsed CIC credential, young professionals with >10 years of professional experience, public health officials, Canadians, and individuals who have never held the CIC credential. Unique questions were developed for each

cohort. The interviews were used to dive deeper into opinions and interests regarding the CIC's role in IPC, and their personal experiences with the credential.

RESULTS

A total of 34,778 surveys were distributed by e-mail to potential respondents in mid-May 2018; 30,409 were sent to IP professionals and 4,369 were sent to health executives, senior level managers, and public health officials. There was a 12-day response window from May 21 through June 1, 2018. A total of 4,372 surveys were returned (12.6% response rate). Of the 4,372 respondents, 2,032 (46%) currently hold CIC, 238 (5.5%) respondents previously held CIC, and 1,960 (45%) respondents never held CIC. Respondent's years of experience were: <5 years (28.6%), 5-10 years (39.3%), 11-20 years (17.4%), 21-30 years (10.3%), and >30 years (4.2%). Most respondents (62%) were between ages 30 and 60 years; 12.8% were aged <30 years, and 25% were aged >60 years.

Most respondents support the value of CIC, particularly in the following organization types: academic and nonacademic hospitals, university, public health agency, none/retried, and other. Respondents from community-based hospice, dental practice, freestanding emergency department, and surgical centers were similar and tended to be more negative. Respondents from long-term care and skilled nursing facilities looked similar and tended to show mixed answers when compared with both groups of respondents noted earlier.

Four thematic categories were identified: certification process and standards; professionalism, competency, and career growth; patient care, safety, infection prevention and control; and regulatory compliance.

(1) Certification process and standards. Most respondents felt positive about the current standards, processes, and requirements. Eligibility and the certification process for both initial and recertification were clear. The study preparation process and time to complete the examination were also reported as clear, reasonable, and adequate. One opportunity was to reevaluate eligibility criteria and examination difficulty.

(2) Professionalism, competency, and career growth. Respondents reported that certification demonstrated professional competency and increased career growth, however, they were less positive as to whether certification would lead to monetary compensation and an increase in organizational recognition.

(3) Patient care, safety, infection prevention and control. Respondents reported that the certification improved the practice of IPC, as well as improved patient care and patient safety.

(4) Regulatory compliance. Respondents stated that certification improved regulatory compliance and was important in influencing legislation. Other improvement recommendations were to offer specialized learning tracks, to increase CIC brand awareness for regulatory agencies to endorse certification, and to incorporate continuing education into the recertification process (Fig 3).

	CIC Required	CIC Preferred	CIC Not Mentioned
Goldrick, 2007	30%	38%	32%
LinkedIn, 2018	46%	31%	23%
Difference	+16%	-7%	-9%

Fig 2. Comparison of changes for CIC requirement in infection preventionist job postings. CIC, certification in infection prevention and control.

Improvement Recommended	Currently Hold	Previously Held	Never Held
Offer CIC Specialized Learning Tracks	816 (43.4%)	95 (48.7%)	1003 (60.4%)
Greater Brand Awareness	856 (45.5%)	76 (39.0%)	653 (39.3%)
Endorsement of CIC by accrediting agencies	1050 (55.9%)	89 (45.5%)	603 (36.3%)
Incorporate CE/CEU for recertification	805 (42.8)	104 (53.3%)	722 (43.5%)
Increased published research supporting CIC and its benefits	611 (32.5%)	50 (25.6%)	513 (30.9%)
Incorporating CIC into higher education curriculums	367 (19.5%)	53 (27.2%)	575 (34.6%)
Meeting legislative requirements (mandates for the CIC)	626 (33.35)	52 (26.7%)	356 (21.4%)
Partnerships with other certifying organizations	356 (18.9%)	55 (28.9)	480 (28.9%)
More rigorous certification requirements	97 (5.2%)	5 (2.6%)	33 (2.0%)
More rigorous examination requirements	56 (3.0%)	6 (3.1%)	42 (2.5%)

Fig 3. Recommended ways to improve the CIC. CE, continuing education; CEU, continuing education units; CIC, certification in infection prevention and control.

The IMPAQ Strategy team conducted follow-up interviews with a randomly selected group of respondents at the conclusion of the survey. Key findings from the 12 interviews across the identified 7 groups of respondents were as follows:

Executives and administrators: have an option to either take the examination after 5 years or do a continuing education option, most well-known certifications have this option; need to add laboratory personnel as potential for certification; CIC credential desired but not a requirement—organization will pay for study materials, meetings, but not the examination; CIC credential is competing for professionals—is more difficult to attain and maintain due to the amount of experience and study.

Never held a CIC credential: one interviewee stated that she was denied her participation in an examination preparation class for having too much experience. Others wanted continuing education units instead of the examination option; the enrollment process is smooth and helpful; CBIC has a lot of information on their website; many leaders do not support funding for CIC credential; hospitals have the best support; long-term care facilities, local public health levels, and outpatient facilities do not have support; providing some test taking tips would be helpful; cost prohibitive, especially toward end of career; one barrier is the requirement to have 2 years of

experience prior to taking examination, that being a time-sensitive barrier; there is a need to be able to access resources and materials without having to pay for them, such as study guides and other infection prevention information; recertification as either a very brief examination or continuing education units every 2–3 years instead of a full examination at 5 years; CBIC being at conferences is good for marketing, but would also market at educational institutions so that new graduates know this is a next step in career advancement; and there is too much information on the examination and would need more experience to be prepared to take the examination.

For those with a lapsed CIC credential: many would like to see continuing education units for recertification; would like to drop the prerequisite of 2 years of experience for the examination; the CIC certification was not required for position; too expensive, not reimbursed by employer; consider those who work outside of hospital and direct patient care; lack of time to study; failed the examination; struggle to maintain continuing education units in smaller towns and would not cover enough information for the IP; and getting close to retirement. Currently, CIC certificant respondents who do not plan to recertify or who plan to let their certification lapse stated it was due to upcoming retirement.

DISCUSSION

The main takeaway from this study was an increased sense of professionalism, competency, and career growth associated with obtaining the CIC credential, as well as improved patient safety. In addition, there were several opportunities identified for the CBIC to consider incorporating into the upcoming strategic plan. Some main opportunities identified by the respondents include the promotion of the credential to accrediting agencies, increasing brand awareness externally and internally as familiarity of the credential grew as an individual gained experience within the profession, consider continued education credits for recertification, and offering specialized certification tracks across the continuum of care. Results were presented to the CBIC Board of Directors and staff in September 2018 and the CBIC strategic plan for 2019–2021 was updated in November 2018.

One limitation of the study was the sample population. Because most respondents came from the CBIC/APIC/IPAC contact lists (95.6%), the results may only reflect the value of certification to those already familiar with certification and not the larger health care audience or the public. This marketing research study was not able to assess the value of certification to the consumer, health care regulators, or senior health care leadership. Another limitation was the short 12-day response timeframe.

CONCLUSIONS

The CIC credential has grown in volume, relevancy, and significance throughout the past 35 years. This is evidenced by the value of certification study results as well as previous published literature highlighting key facts and sentiment within the IPC community. In addition, external activities by legislatures have increased their focus on certification requirement as it continues to validate one's competency within the profession. The outcome of this study provides a pulse of current CIC credential standing within the IPC community and allows for additional research to be conducted that further highlight the value of certification.

Acknowledgements

The authors acknowledge IMPAQ Strategy for conducting the marketing research study. CBIC staff; Anne N. Krolikowski, CAE,

CBIC, Executive Director; Stephanie Dernek, CAE, Senior Program Manager; and Rosha Brister, Administrative Coordinator. 2018 CBIC Board of Directors; Joann Andrews, President; Roy Boukidjian, President-Elect; James F. Marx, Secretary; Karen Anderson, Treasurer; Lita Jo Henman, Past President; Sandra Callery, Director; Vincent Hsu, Director; Janet Glowicz, Director; Ivan W. Gowe, Director; Christopher L. Olson, Director; Jacie Colyn Volkman, Director; Linda Goss, Director; Pamela Rohrbach, Director; Steven M. Langan, Consumer Director.

References

1. Murphy DM, Hanchett M, Olmsted RN, Farber MR, Lee TB, Haas JP, et al. Competency in infection prevention: a conceptual approach to guide current and future practice. *Am J Infect Control* 2012;40:296–303.
2. Zingg W, Muters NT, Harbarth S, Friedrich AW. Education in infection control: a need for European certification. *Clin Microbiol Infect* 2015;21:1052–6.
3. Henman LJ, Corrigan R, Carrico R, Suh KN, Anderson K, Boukidjian R, et al. Identifying changes in the role of the infection preventionist through the 2014 practice analysis study conducted by the Certification Board of Infection Control and Epidemiology, Inc. *Am J Infect Control* 2015;43:664–8.
4. Davis J, Billings C, Malik C. Revisiting the Association for Professionals in Infection Control and Epidemiology Competency Model for the Infection Preventionist: an evolving conceptual framework. *Am J Infect Control* 2018;46:921–7.
5. Goldrick BA. The Certification Board of Infection Control and Epidemiology white paper: the value of certification for infection control professionals. *Am J Infect Control* 2007;35:150–6.
6. Bernard H, Hackbarth D, Olmsted RN, Murphy D. Creation of a competency-based professional development program for infection preventionists guided by the APIC Competency Model: steps in the process. *Am J Infect Control* 2018;46:1202–10.
7. Landers T, Davis J, Crist K, Malik C. APIC MegaSurvey: methodology and overview. *Am J Infect Control* 2017;45:584–8.
8. Carrico RM, Wiemken T, Westhusing K, Christensen D, McKinney WP. Health care personnel immunization programs: an assessment of knowledge and practice among infection preventionists in US health care facilities. *Am J Infect Control* 2013;41:581–4.
9. Krein SL, Hofer TP, Kowalski CP, Olmsted RN, Kauffman CA, Forman JH, et al. Use of central venous catheter-related bloodstream infection prevention practices by US hospitals. *Mayo Clin Proc* 2007;82:672–8.
10. Pogorzelska M, Stone PW, Larson EL. Certification in infection control matters: impact of infection control department characteristics and policies on rates of multidrug-resistant infections. *Am J Infect Control* 2012;40:96–101.
11. Saint S, Greene MT, Olmsted RN, Chopra V, Meddings J, Safdar N, et al. Perceived strength of evidence supporting practices to prevent health care-associated infection: results from a national survey of infection prevention personnel. *Am J Infect Control* 2013;41:100–6.