Learning From Experience: Improving the Process of Internationally Educated Nurses’ (IENs) Applications for Registration

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Executive Summary

As the world becomes increasingly interconnected and nurses continue to migrate to find employment opportunities, the employment of internationally educated nurses (IENs) is one strategy used to address global nursing shortages. As part of a regulated profession, this means registered nurses must meet specific requirements for each jurisdiction in which they choose to work. Yet differences in health systems, nursing education programs and nursing scopes of practice around the globe create challenges in determining and comparing IEN competencies. An evidence-informed, fair, and transparent registration process is paramount in ensuring the safe care of the population and equitable treatment of IENs.

In 2007 and 2008, health regions in Alberta, Canada responded to the nursing shortage by launching international recruitment initiatives, resulting in a ten-fold increase in IEN applications to the College and Association of Registered Nurses of Alberta (CARNA) over a short period of time. Subsequent changes to Alberta’s employment landscape in 2009 led to a decrease in the number of IEN applications. This relative respite in application volume created a unique opportunity to identify evidence which could better inform the IEN application for registration process. Using existing application data, observations related to common IEN application characteristics were explored analytically in relation to success or challenges at key outcomes in the process.

The Learning from Experience: Improving the Process of Internationally Educated Nurses’ Applications for Registration (LFE) project sought to use evidence to increase the efficiency of the IEN application for registration process, while remaining committed to the principles of fairness, transparency, and above all, public safety.

The core of the LFE project was a retrospective, systematic statistical analysis of four high-volume years of IEN application data. The findings were used to inform the development, implementation and evaluation of evidence-informed policy and practice changes to the IEN application for registration process. The data analysis was conducted to identify characteristics that contribute to success or challenges in the registration process, and to clearly identify process timelines.

Informed by the findings from the baseline data analysis, as well as existing practice and expertise, the LFE Research Team and CARNA staff developed and implemented changes to the IEN application for registration process including: revisions to application assessment policies, the development of guidelines for initial assessment; the introduction of an option for some applicants to proceed directly to bridging education without completing a competency assessment; a shift in the management of bridging education; revisions to process time limits; and the review and revisions of communication tools to improve clarity and transparency. The changes were implemented in August 2013 and evaluated both statistically and through stakeholder consultations.
An evaluation of the LFE changes included positive reviews from CARNA staff and stakeholders, with respondents stating that the approach was evidence-informed, more efficient and transparent. The LFE project evaluation indicated that the project increased the awareness and understanding of the project and characteristics related to success or challenges in the process, produced information and knowledge products that were applicable to other jurisdictions and stakeholders, and could inform action on policies and practices.

The LFE project also included a number of supporting projects to enhance the research team’s understanding of IEN application characteristics, evaluate competency assessment results in relation to the larger IEN application for registration process, understand the rationale behind choices made in relation to a new assessment outcome, facilitate dissemination of the project methodology, and evaluate the project implementation and impact.

In addition to the body of evidence generated by the core activities of the LFE project, information about IEN application characteristics was analyzed for ineligible applicants and in relation to competency assessment results. The latter analysis informed the development of a blueprint for competency assessment. The LFE Research Team also developed a data guide to support other jurisdictions in conducting similar data analyses and potentially act as a data dictionary across jurisdictions. As well, an external researcher conducted a qualitative study to gain an understanding of the factors that contribute to an IEN’s choice in the new assessment outcome.

To our knowledge, the LFE project is the first to use quantitative evidence to support the IEN application for registration process. The implementation of evidence-informed policies and practices based on baseline data findings, and the evaluation of policy and practice changes are examples of evidence-informed regulatory practice that can be applied across jurisdictions and professions.

The evidence identified in the project also has the potential to inform policies and practices for assessment centres, educational institutions, governments, and employers, as well as to inform IENs. The LFE project findings also have the potential to inform health human resource planning, and ultimately contribute to a higher quality and safer health system.

The authors note that the information and learnings from this project would benefit from further study, including replication studies and prospective research. In order to develop a longitudinal understanding of IEN assessments and outcomes, ongoing analysis of CARNA IEN application data is recommended.
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1.0 Introduction

1.1 Background

Global shortages of registered nurses (RNs) have been well documented by various organizations including the World Health Organization (2002) and the Canadian Nurses Association (2009). In Alberta, Canada, health regions responded to the shortage, in part, by launching international recruitment initiatives from 2006 to 2008. Recruitment initiatives most commonly focused on the Philippines, India, the United Kingdom and Ireland, and the United States. Consequently, the College and Association of Registered Nurses of Alberta (CARNa) experienced a ten-fold increase in the number of applications from internationally educated nurses (IENs). The unexpected increase in volume initially overwhelmed CARNa’s administrative and assessment capacity. With the benefit of financial support from the provincial government and employers, CARNa was able to respond to the increased volume of applications and develop processes and expertise to increase operational capacity.

In 2009, the province of Alberta implemented a restructuring of the health care system which, in combination with a global recession, led to dramatic changes in the employment market for RNs, including a temporary halt to IEN recruitment. The resulting decrease in the number of IEN applications to CARNa allowed a unique opportunity to analytically explore subjective observations of common characteristics of IEN applicants related to their success or challenges in the IEN application for registration process.

The Learning from Experience: Improving the Process of Internationally Educated Nurses’ Applications for Registration (LFE) project sought to use evidence to increase the efficiency of the IEN application for registration process, while remaining committed to the principles of fairness, transparency, and above all, public safety.

The research project was led by CARNa and funded by Alberta Health through Health Canada’s Internationally Educated Health Professionals Initiative. The views expressed herein do not necessarily represent the views of Health Canada or Alberta Health.

1.2 Project Purpose and Objectives

The LFE project sought to improve the efficiency of the IEN application for registration process while upholding CARNa’s commitment to public safety and to the principles of fairness and transparency.

The LFE project objectives were to:

1. Develop an evidence-informed model for the assessment of IEN applications for registration.
2. Make CARNa processes as transparent, simple and efficient as possible from the receipt of a complete application to eligibility for RN registration.
3. Clearly articulate requirements and expectations of applicants.
4. Build capacity and leadership in the area of nursing regulation.

1.3 Project Research Strategies

The LFE project research strategies were to:
1. Analyze IEN application data to inform the evaluation and improvement of CARNA policies and practices for the IEN application for registration process.
2. Identify trends, strengths and gaps in IEN groups applying for RN registration in Alberta.
3. Observe application characteristics as related to the outcomes of the Substantially Equivalent Competency (SEC) Assessment and to the need for additional education.
4. Compare the success rates on the national entry-to-practice examination and registration outcomes of groups of applicants.
5. Review and evaluate any process changes based on data analysis.

1.4 Project Overview

The core of the LFE project was the development, implementation and evaluation of evidence-informed policy and practice changes to the IEN application for registration process. It included three phases:
1. A retrospective, systematic statistical analysis of four years of IEN application data to identify characteristics that contribute to success or challenges in the registration process, and to identify process timelines.
2. The development and implementation of evidence-informed policy and practice changes.
3. Statistical analysis of pre- and post-implementation data to evaluate the implemented changes.

The LFE project also included a number of supporting projects to enhance the research team’s understanding of IEN application characteristics, evaluate competency assessment results in relation to the broader IEN application for registration process, understand the rationale behind choices made in relation to a new assessment outcome, facilitate dissemination of project methodology, and evaluate project implementation and impact.
2.0 Evidence-Informed Policy and Practice

2.1 Baseline Data Analysis

A baseline data analysis was conducted to identify application characteristics related to success or challenges at key outcomes in the IEN application for registration process, and to analyze timelines for key phases of the process. The baseline data findings were used to inform changes to policies and practices at CARNA.

2.1.1 The IEN Application for Registration Process

The IEN application for registration process is complex, involving multiple stakeholders and significant time. The process may have spanned from several months to several years from the time an initial application was submitted to when an IEN obtained an initial RN registration. The project analyzed application characteristics in relation to the following six key outcome points in the IEN application for registration process.

1. Initial Assessment Outcome

An application was considered complete and ready for assessment when all the necessary application documents were received from the applicant and source organizations, such as educational institutions and regulatory bodies. An assessor reviewed the file and rendered a decision based on the applicant’s education and experience. Files involving more complicated decisions were reviewed by the Registrar or Registration Committee. Prior to the LFE project changes, three primary assessment decision outcomes were possible:

1. **Temporary Permit (TP) Eligible.** Applicants may have been “TP Eligible” if they were assessed as having competencies substantially equivalent to a graduate of an Alberta entry-level, baccalaureate nursing program and if they met all other registration requirements. This allowed the applicant to attempt the national entry-to-practice exam and to work in Alberta as a Graduate Nurse temporarily in order to obtain a positive employer reference.

2. **Ineligible.** Applicants may have been “Ineligible” for registration as an RN in Alberta if they clearly demonstrated a lack of appropriate education and experience or they did not meet all of the registration requirements (e.g. fitness to practice, good character/reputation).

3. **Referred to a Substantially Equivalent Competency Assessment.** If further information about an applicant’s competencies was required, the applicant was “Referred to SEC”. The SEC Assessment was designed to determine whether the applicant possessed entry-to-practice competencies required to fulfill the roles and responsibilities expected of RNs in Alberta. Following a review of the SEC Assessment report, the applicant may or may not have been referred to bridging education to address competency gaps prior to becoming TP Eligible.
2. **SEC Assessment Review Outcome**

Following an initial assessment outcome of “Referred to SEC”, applicants who completed an SEC Assessment had their assessment results and application file reviewed by CARNA and received one of the following SEC Review Outcomes:

1. TP Eligible.
2. **Referred to Bridging Education.** If the applicant had competency gaps, the applicant was “Referred to Bridging Education”.
3. Ineligible. Applicants were deemed “Ineligible” if their SEC Assessment results revealed competency gaps that were too extensive to be addressed by bridging education.

3. **Bridging Education Completion Outcome**

Following an SEC Assessment review outcome of “Referred to Bridging Education”, the applicant could have been required to complete up to ten courses to address competency gaps identified during the SEC Assessment. Outcomes at this point referred to course completion or failure:

1. TP Eligible. Applicants were deemed “TP Eligible” if they successfully passed all of the required courses and continued to meet all other registration requirements.
2. Ineligible. An applicant who failed any one course two or more times was deemed “Ineligible”.

4. **Temporary Permit Eligibility**

If an applicant was assessed as having competencies that were substantially equivalent to a graduate of an Alberta entry-level, baccalaureate nursing program and met all other registration requirements, he or she was eligible to apply for a TP. This may have occurred at any of the three outcome points described above. A TP allowed an applicant to work in Alberta as a Graduate Nurse temporarily, in order to obtain a positive Alberta employer reference based on 225 hours of employment which met the good character/reputation requirement. Often applicants wrote the national entry-to-practice exam while working with a TP. Each TP was valid for six months and could be renewed twice for a total of 18 months in order to complete requirements. The applicant could obtain a positive Alberta employer reference and pass the national entry-to-practice exam in either order.

5. **National Entry-to-Practice Examination Outcome**

The Canadian Registered Nurse Examination (CRNE) was the national entry-to-practice exam that all applicants (internationally and Canadian educated) were required to pass until January 5, 2015 at which point the exam changed to the NCLEX-RN. Regardless of the type of exam written, applicants were required to pass in up to three attempts to proceed with the application process. Applicants who failed the exam after the third attempt were not eligible for registration (“Ineligible”). In rare circumstances, an applicant may have been approved to undertake a fourth writing.
6. Initial RN Registration

Applicants who passed the national entry-to-practice exam and successfully completed all other requirements were eligible to apply for an RN registration. The initial RN registration outcome point marked whether an applicant obtained their initial RN registration in Alberta or had been deemed Ineligible at any time during the application process. Outcomes at this point included:

1. RN registration.
2. Ineligible. This outcome was recorded if the applicant had been deemed “Ineligible” at any time during the application process.

2.1.2 Methodology

Statistical analysis of four years of IEN application data from a peak application period at CARNA (January 1, 2008 – December 31, 2011) was conducted in two stages: exploratory and confirmatory data analysis, to examine the association of potential characteristic variables with outcomes. A timeline analysis based on date information associated with each phase in the IEN application for registration process was also conducted. The data reflected a snapshot of the study sample on the day that the data extraction occurred (August 3, 2012). As applicants continued through the application for registration process, data extracted at a later date would reflect their progress.

Inclusion Criteria

The baseline data analysis included applications that met the following criteria:

- IEN applications (entry-level nursing education received outside of Canada);
- Assessed under the Health Professions Act; and
- Active, assessed and/or lapsed (24 months of inactivity) after the application was considered completed.

Ultimately, 3504 application files were included in the baseline data analysis.

Exploratory Analysis

Exploratory data analysis employed descriptive statistics to explore relationships between variables and to help guide confirmatory analysis. The analysis used SPSS version 20 and SAS version 9.2 to calculate frequencies, cross tabulations, chi-square tests, variance, means and histograms for each variable. Continuous variables were analyzed both as continuous and categorical variables, categorized and described by frequency and in cross tabulations.

Confirmatory Analysis

Confirmatory analysis was conducted with STATA version 12 to identify inferential statistics that tested hypotheses about the data. To summarize the independent associations of multiple exploratory variables simultaneously, logistic regression analysis
with stepwise selection was conducted. Stepwise logistic regression also provided a list of candidate variables for the final model. Some variables that did not show a significant effect in statistical regression were identified as important in policy and practice, thus an additional four to six variables were identified for inclusion in the final model based on relevance, experience and logical rationale.

Logistic regression analysis with stepwise selection was conducted to narrow the number of candidate variables. Model diagnosis, goodness of fit tests and type III error tests of fixed effects were also performed to ensure models were valid and inferences were statistically sound. A multi-level logistic regression model was also used to analyze the associations between applicants’ country of education and process outcomes with considerations for individual differences.

**Timeline Analysis**

Process date variables were used to understand timelines and were analyzed separately from other variables. Descriptive statistics for each phase of the process, and for the process overall, were identified to inform a clear understanding of longitudinal timelines.

**2.1.3 Results**

**Demographic Information**

On average, the IEN applicants in the baseline data were 32 years of age, 12-13 years younger than the Albertan and Canadian RN populations in 2011 (Canadian Institute for Health Information, 2011). The baseline data also had a larger percentage of males than the Alberta RN population (18.35% compared to 5%) (College and Association of Registered Nurses of Alberta, 2011). Almost three quarters of applicants were educated in the Philippines (48.94%) or India (24.71%). Only a quarter of the applicants had a degree considered similar to an Alberta baccalaureate (26.66%), while almost all of the applicants had practice currency at the time of application (graduation or 1125 hours of practice within the five years prior to applying, 96.38%), with an average time since last practiced of approximately four months. Summaries of the demographic and outcome statistics for the baseline, pre- and post-implementation applicants are included in Appendix B.

**Process Outcomes**

Following CARNA’s initial assessment, almost three quarters of applicants were referred for an SEC Assessment for further evaluation of their competencies (72.40%) while slightly more than a quarter were “TP Eligible” (27.46%). Confirmatory analysis modeling indicated that applicants with a degree similar to an Alberta baccalaureate, who were educated where the scope of practice is similar to Canada, who had practice currency, who had five or more years of experience, or who had experience in additional countries other than the country of their education were more likely to be “TP Eligible” at the initial assessment outcome. Applicants who held a Canadian LPN registration, who had a self-
declared employment practice focus in pediatrics, or who had last practiced one to four years ago were more likely to be “Referred to SEC”. It is important to note that 88.76% of the applicants who had a Canadian LPN registration were educated in the Philippines therefore this group may have reflected characteristics of the education country group as opposed to Canadian LPN registration independently.

Of the 860 applicants who completed an SEC Assessment, the majority were referred to bridging education (70.81%), while a quarter were deemed ineligible for registration (24.65%). Only two percent were deemed “TP Eligible” after an SEC Assessment. Confirmatory analysis modeling indicated that applicants who received their education where the scope of nursing practice is similar to Canada, or who held a Canadian LPN registration were more likely to be “Referred to Bridging Education” than be “Ineligible”.

At the time of data extraction, 331 applicants had completed bridging education. Applicants who successfully completed their bridging education and continued to meet all other registration requirements were “TP Eligible” (97.58%); however a few applicants failed bridging education and became “Ineligible”. Since this outcome relied solely on the successful completion of bridging education while continuing to meet other registration requirements and there was no additional assessment involved, it was not included in confirmatory analysis modeling.

At the time of the data extraction, 1304 applicants (37.21%) had become “TP Eligible”. An additional 226 applicants (6.45%) were deemed “Ineligible” at one of the TP decision points. Confirmatory analysis modeling indicated that applicants who received their education where the scope of nursing practice is similar to Canada, applicants with a degree similar to an Alberta baccalaureate, a self-reported employment practice focus in medicine/surgery, or experience in additional countries other than where they were educated were more likely to be “TP Eligible”. In contrast, male applicants, applicants with more than a year since they last practiced or who took one to two years between graduation and their first employment were more likely to be “Ineligible”.

There were 747 applicants who wrote the national entry-to-practice exam through CARNA. Of those 81.93% passed, 4.68% failed and were eligible to write again, and 13.39% failed three times and were therefore deemed ineligible. Effects of the pathway to TP eligibility related to the exam outcome were also investigated. Findings showed that the majority of applicants who wrote the exam were “TP Eligible” at the Initial Assessment Outcome (63.19%). More than one third of applicants who wrote the exam were “TP Eligible” following bridging education (34.67%). Exam pass rates were fairly similar between applicants deemed “TP Eligible” at the initial assessment (79.45%) and those who completed bridging education (85.33%). Confirmatory analysis models indicated that applicants who received their education where the scope of nursing practice is similar to Canada, or who had more than two years between graduation and their first employment were more likely to pass the exam whereas applicants who were 45 years and older were more likely to fail the exam than applicants whose age was 20-24 years. Applicants were also more likely to fail the exam if they wrote the exam three
times or took a greater amount of time than average (428 days) to complete bridging education.

Overall, at the time of data extraction, 14.75% of the applicants had obtained their initial RN registration and 7.45% had been deemed “Ineligible”. While many applicants were still in the IEN application for registration process, it is important to note that 50.17% of the applicants in the study had lapsed application files; having made no forward progress toward meeting registration requirements for two years.

Timeline Analysis

Timeline analysis found that the average time for applicants to complete the IEN application for registration process was 656 calendar days. This ranged from an average of 537 days for applicants who were deemed “TP Eligible” at the Initial Assessment Outcome to an average of 889 days for applicants who completed an SEC Assessment and bridging education. The analysis did not include the time required for the applicant and source organizations to submit documents or information to complete the application, a process which may take months to years. Not unexpectedly, some of the longest periods of time during the process were the time to complete the SEC Assessment (354 days on average) and bridging education (428 days on average). The time between the applicant becoming “TP Eligible” and completing the remaining requirements to apply for their initial RN registration was also lengthy (394 days on average).

2.2 Policy and Practice Changes

The baseline data analysis findings were used in combination with the knowledge and expertise of CARNAs Registration Services department to inform changes to IEN application for registration policies and practices at CARNAs. Project stakeholders from CARNAs, the University of Alberta and Mount Royal University were engaged in 19 facilitated sessions to develop policy and practice changes that were feasible within the study timeframe and with the resources available. Legal counsel reviewed the proposed changes to policies and practices before they were finalized.

SEC Assessment or Direct to Bridging Education Option

A fourth initial assessment outcome was added to provide some applicants with an option to proceed directly to bridging education without having to first complete an SEC Assessment. This change was based on two findings. First, at the initial assessment, the majority of applicants were referred to an SEC Assessment (72.40%) and the majority of applicants who completed the SEC Assessment were subsequently required to complete bridging education (70.81%). Second, the timeline analysis showed that the time between CARNAs notifying the applicant that they had been referred to an SEC Assessment and the time CARNAs received the SEC Assessment results (354 calendar days) was a long phase of the process. Proceeding directly to bridging education offered the possibility of substantially reducing the overall time of the process, benefitting both
applicants and employers. Providing applicants with this choice also responded to feedback received from IENs during stakeholder consultations at the beginning of the project that indicated that some applicants would prefer to proceed directly to bridging education.

Identification of applicants who were eligible for the option was incorporated into an assessment checklist which is described in the next section. Using this new option, applicants who chose to proceed directly to bridging education were required to complete a full bridging education program consisting of ten courses. Alternatively, courses assigned to applicants who chose to complete an SEC Assessment depended on the results of the assessment. That is, they may have been required to complete only selected courses or the full bridging education program. At the same time, applicants who chose to complete an SEC Assessment could have potentially become “TP Eligible” (thus requiring no bridging education) or be deemed “Ineligible” depending on the outcome of the SEC Assessment.

Assessment Criteria Checklist

The baseline data analysis provided key information used in the development of an application assessment checklist. The checklist incorporated the characteristics related to success or challenges in the IEN application for registration process and provided a formalized, consistent, step-wise algorithm for initial assessment decisions. It combined the baseline data findings with legislated requirements and the expertise of CARNA’s registration department staff to identify key application characteristics in initial assessment decision-making.

The first step was a review of the application for criteria that would lead to an applicant being “Ineligible”. While the majority of the ineligibility criteria, such as “not educated as a nurse” or “not educated at a post-secondary level”, were based on existing legislation, practice and experience, the baseline data findings led to the addition of exclusion criteria for those applicants with more than ten years elapsed since last practiced. The data showed that those applicants were unlikely to be successful in their application.

The second step in the checklist instructed the assessor to consider whether the applicant required an SEC Assessment. The baseline data analysis revealed certain characteristics common to applicants who experienced challenges during the registration process. These applicants required an SEC Assessment, as there may have been competency gaps that could not be addressed by bridging education. Some of the criteria in this step, such as failure of a previous nursing registration exam, were based on experience while some new criteria based on data findings were added; for example: applicants who had a four- to nine-year gap since their last practice or since graduating from an RN education program.

The next step distinguished applications that were immediately eligible for a TP. While all of the other steps on the assessment checklist required only one criterion to be met in
order for the decision to apply, the TP Eligible decision required all three of the following criteria to be met:

1. The applicant must have held a baccalaureate degree in nursing, similar to an Alberta baccalaureate degree (three to four years of post-secondary, generalist nursing education following 12 years of primary and secondary education), and received where the scope of RN practice is similar to that in Canada;
2. The applicant must have met the currency of practice requirement (1125 hours of RN practice or graduation within the past five years); and
3. Not more than 12 months may have elapsed between the initial assessment and the date of graduation from the applicant’s nursing education program or since last practiced.

These criteria were developed based on statistical modeling that showed applicants meeting these criteria were more likely to be “TP Eligible” and successful in other areas of the IEN application for registration process. Applicants with a similar baccalaureate degree, received where the scope of nursing practice is similar to Canada were more likely to be successful at all outcome points.

The fourth section on the assessment criteria checklist defined criteria for applicants to be eligible for the “SEC Assessment or Direct to Bridging Education Option”. If the applicant did not meet any of the previous criteria but met any one of the following criteria, this option was available.

- The applicant’s nursing education was not considered similar to an Alberta baccalaureate degree (i.e. it was not generalist education and/or was not three to four years of post-secondary nursing education following 12 years of primary and secondary education);
- The applicant’s nursing education was completed where the scope of nursing practice was not similar to Canada;
- The applicant graduated between 24 and 48 months prior to the initial assessment and did not have any RN work experience; or
- The applicant last practiced as an RN between 24 and 48 months prior to the initial assessment.

Baseline data analysis showed that these characteristics were associated with being more likely to be referred to an SEC Assessment and/or bridging education.

Applicants who did not meet the criteria for any of the above categories were referred to an SEC Assessment to obtain further information on their competencies. In rare or unique circumstances where none of the criteria applied or the outcome was ambiguous, the file was referred to the Registrar for review.

**Bridging Education Practices**

During the project, CARN reviewed all of the policies and practices in the IEN application for registration process and acknowledged that education management was not within the scope of nursing regulation. Prior to the policy and practice changes, CARN closely monitored the applicant’s progression through the bridging education process. Any required bridging education courses were determined during the post-SEC
Assessment review, and CARNAt was notified of the completion of each course. For some applicants, CARNAt made modifications to the course requirements if the applicant experienced challenges, such as failing pre-requisite courses or had difficulty meeting the English language requirement.

CARNAt chose to reduce involvement in monitoring an applicant’s progress through bridging education. While CARNAt continued to make the assessment decisions and determine which bridging education courses were required, oversight of the progression through and completion of bridging education transitioned to the applicant and educational institution with the applicant returning to CARNAt with a transcript once all bridging education was completed.

This shift, and the development of the “SEC Assessment or Direct to Bridging Education Option”, were implemented in collaboration with the educational institution that offered the bridging education program in Alberta.

**Application Timelines**

CARNAt made changes to organizational policies pertaining to timelines in the interest of increasing efficiency and reducing the overall time to obtain an RN registration. More efficient timelines allow an applicant to enter the workplace sooner, and reduce the likelihood of an applicant losing practice currency during the process. The timeline policy changes are outlined in Appendix C.

Prior to the policy changes, applicants needed to demonstrate forward movement in the process at least every two years or their application was considered lapsed. This rolling two-year timeframe was reset upon the submission of each required document, at each assessment stage or on the completion of each course. For example, submitting one document every 24 months could extend the application submission stage by several years. Informed by the baseline data analysis, CARNAt changed to a phased approach where applicants had a defined amount of time to complete each phase of the process. If an applicant exceeded a timeline it would not preclude them from becoming registered, but rather required that the applicant reapply and be reassessed as the applicant’s competencies may have changed over time.

For example, the amount of time allowable to assemble a complete application was reduced to one year from the previous two-year rolling policy which could stretch to multiple years. As well, following the change, applicants deemed eligible for a TP had one year rather than two to obtain their first of up to three TPs. Similarly, the allowable time between when an applicant is notified that they are eligible for RN registration to the time they submit the application was reduced from two years to one.

The amount of time available to complete bridging education was increased from three years to four years. While this appears to be an extension, previously, applicants could have had up to a two-year lapse and then reinitiate their courses, with the timeline for finishing bridging education potentially extending well beyond three years. Within the
new timeframe, applicants in the full bridging education program were required to complete all of the courses within four years, with no extensions permitted. Should an applicant take longer than four years, they would be required to reapply. Applicants who were referred to individual courses must complete all of the assigned courses within two years. As well, applicants must have submitted bridging education results to CARNA within one year of completing their education. The development of this timeframe also took into consideration the institutional policies and capacity of the bridging program at the time and may be adjusted in the future.

Communications

One of the aims of the LFE project was to enhance transparency in the IEN application for registration process. With this in mind, CARNA revised information on its website and in the online IEN self-assessment tool. As well, the policy and practice changes required updates to various communications tools, especially emails and letters, and several changes were made to the online registration form.

The LFE Research Team created a series of videos illustrating nursing practice in Alberta and highlighting specific RN competencies required for practice in Alberta which IENs consistently had difficulties demonstrating in the SEC Assessment. The videos were posted on CARNA’s website and focused on the RN role in discharge teaching; reporting errors; dealing with culturally sensitive issues; interprofessional teams; communication; patient refusal of care; total comprehensive health assessment; responding to emergency situations; and advocating for patients/reporting abuse.

CARN A implemented all the LFE changes on August 26, 2013.

2.3 Pre- and Post-Implementation Data Analyses

Data analyses similar to the baseline data analysis were conducted both pre- and post-implementation to contribute to an evaluation of the changes and better understanding of the changing demographics of IEN applicants over time.

2.3.1 Methodology

Similar to the baseline data analysis, exploratory, confirmatory and timeline analyses of complete application files received at CARNA from IENs during the pre-implementation time period (January 1, 2012 to August 26, 2013) and post-implementation time period (August 27, 2013 to May 29, 2015) were conducted. Data were extracted for both data sets on May 29, 2015. Other than the dates, the same inclusion criteria used in the baseline data analysis was applied to both the pre- and post-implementation data.

Pre- and post-implementation models were limited to variables identified as significant in the baseline data analysis and used to inform the policy and practice changes. For the post-implementation data, confirmatory analysis modeling was conducted at the Initial Assessment Outcome only due to small sample sizes at later outcomes. Additionally, an
exemplar analysis was conducted on the pre- and post-implementation data to allow for statistically significant comparisons between the two data sets.

The elapsed time in the IEN application for registration process was limited for applications in the post-implementation data with only 20 months between the beginning of the post-implementation time period and data extraction (baseline data analysis showed that the average time in the process was 21.6 months). Therefore, the majority of applicants who were referred to an SEC Assessment and/or bridging education were still in the process at the time of data extraction. Exemplar analysis compared groups of applicants defined by several key characteristics to compare pre- and post-implementation samples with a large enough size to enable a comparison. The exemplar groups focused on applicants who received their education where the scope of nursing practice is similar to Canada, had a degree similar to an Alberta baccalaureate (three to four years post-secondary general nursing education following 12 years of primary and secondary school) and had practice currency.

Comparison analysis was performed on the pre- and post-implementation exemplar groups by controlling confounding factors in order to measure the intervention effects and minimize bias due to applicants’ characteristics and other potential risk factors. Statistical tests (nonparametric tests, Mann–Whitney U-tests) were used to compare the means of continuous variables for the exemplar groups while frequency and chi-squared tests were performed for categorical variables for both groups. Chi-squared tests were used to determine whether there was a significant difference between the expected frequencies and the observed frequencies at one or more categorical outcomes. If there was a significant association between the differences in the two data sets and process outcomes through descriptive analysis, confirmatory analysis was performed with logistic models built on outcomes using demographics and intervention indicators as candidate variables.

Survival analyses were used to compare the timelines between the two exemplar groups. Log-Rank tests were used to compare the timeline intervals between pre- and post-intervention exemplar groups, analyzing covariates (such as demographic and intervention effects) that may have been associated with the outcome timelines. A Cox regression model was also built to estimate the relationship of multiple variables to process time intervals.

2.3.2 Results

The exploratory analysis of the pre- and post-implementation data highlighted demographic differences between the two groups of applicants which are detailed in Appendix B. The majority of the demographic, education and employment characteristics were similar between the two data sets; however there were a larger percentage of post-implementation applicants who had a degree similar to an Alberta baccalaureate (40.07% compared to 31.92%). The post-implementation data also had a discernably higher percentage of applicants educated in the Tropics/Caribbean (13.94% compared
to 5.17%) and lower percentage of applicants educated in the Philippines (36.59% compared to 44.37%) than the pre-implementation data.

Almost double the percentage of both the pre- and post-implementation applicants were residing in Canada at the time of application compared to the baseline analysis period. As well, approximately ten percent fewer applicants met the thresholds for theory and clinical hours in education, and more than double the percentage received their education where the scope of nursing practice is similar to Canada. While the employment characteristic statistics were similar between the pre- and post-implementation applicants (10-14% only had experience in the country of their education), there was a sharp decrease from 68.46% of the baseline applicants.

The outcome demographics showed that after the initial assessment, the percentage of applicants who were “Referred to SEC” dropped considerably in the post-implementation data. However, when added to the percentage of the post-implementation applicants that were eligible for the “SEC Assessment or Direct to Bridging Education Option”, the percentage was similar to the pre-implementation data. Following an SEC Assessment, the percentage of post-implementation applicants “Referred to Bridging Education” was lower and the percentage of applicants deemed “Ineligible” was higher than for the pre-implementation applicants. This may be related to the LFE policy changes, as many of the applicants who previously would have been “Referred to Bridging Education” following an SEC Assessment were offered the option to proceed directly there. As a result, applicants in the post-implementation data who completed an SEC Assessment were typically referred to the assessment because assessors were concerned that their competency gaps may have been too extensive to be addressed by bridging education. As well, some applicants who chose to complete an SEC Assessment rather than proceeding to bridging education may have done so assuming their competency levels were comparable or due to wait times for the bridging program.

The percentage of applicants who passed the national-entry-to-practice exam was lower for the post-implementation applicants however, this could be accounted for by two factors. Fewer applicants had attempted the exam, given the time of the data extraction, and those who had were on their first or second attempt and still eligible to write the exam again. During the post-implementation period, the national entry-to-practice exam policy changed to recognize previous passing results, thereby allowing a number of applicants who had previously passed the exam in the United States to bypass writing the exam in Canada. If the external exam passing results were considered, the percentage of applicants who passed the nation entry-to-practice exam was similar between the pre- and post-implementation applicants.

Data related to the TP and initial RN outcome points reflected the pre- and post-implementation timeframes in relation to the elapsed time before data extraction. 52.35% of the pre-implementation applicants and 80.49% of the post-implementation applicants were still active in the process at the time of data extraction.
Confirmatory modeling of the pre-implementation outcomes and post-implementation outcomes showed that education credential, education received where the scope of nursing practice is similar to Canada and number of years since last practice may be related to success in the IEN application for registration process for the pre- and post-implementation applicants. The other outcomes in the post-implementation data were not modeled due to small sample sizes.

Timeline analysis indicated that the average time for pre-implementation applicants to obtain an initial RN registration was 594 calendar days, similar to that of the baseline. The average time for post-implementation applicants to obtain an initial RN registration was 305 calendar days. As well, most of the timelines for the post-implementation applicants were shorter than the pre-implementation applicant timelines. However, the majority of post-implementation applicants were still active in the process thus the timelines in the post-implementation analysis were likely skewed by applicants who completed the process quickly. As well, it is difficult to draw a causal relationship between the decreased post-implementation timelines and the LFE changes as the LFE changes did not occur in isolation. Similar to the baseline data analysis, the timelines analyzed in the pre- and post-implementation data did not include the amount of time taken to submit a complete application which may have been additional months to years.

The exemplar analysis was conducted to reduce the potential sample bias and enable a more robust comparison between the pre- and post-implementation applicants. No significant differences in applicant characteristics and outcomes were found between the two exemplar groups. The two exceptions were the post-implementation exemplar group being slightly older, with an average age of 34 compared to 31.5 in the pre-implementation exemplar group; and comprised of a lower percentage of applicants educated in Australia/New Zealand and a higher percentage educated in the Tropics/Caribbean. These findings confirmed that the exemplars were largely similar and that the characteristics and outcomes were not associated with the intervention effect.

The exemplar timeline analysis demonstrated that the timeframes for the IEN application for registration process were significantly reduced from pre-implementation to post-implementation. There were two exceptions: the time for the initial assessment, and the time for the applicant to write their first national entry-to-practice exam following notification that they are eligible to do so. Overall, the post-implementation exemplar group obtained an initial RN registration in an average of 294 calendar days, 137 days less than the pre-implementation exemplar group which took an average of 431 calendar days.

The findings from the pre- and post-implementation data analyses were used in association with qualitative feedback from stakeholders and other jurisdictions to inform the evaluation of the LFE policy and practice changes.
2.4 Evaluation of Evidence-Informed Policy and Practice Changes

Findings from the pre- and post-implementation data analysis were considered along with feedback from CARNA’s Registration Services department and external stakeholders to evaluate the evidence-informed policy and practice changes implemented in the LFE project.

During evaluation interviews, feedback from staff indicated that the data findings and subsequent knowledge products were valuable for decision-making. Staff felt the LFE project knowledge products validated and increased their confidence in assessment decisions. Staff members and the LFE Research Team felt that the project evidence made assessment criteria clearer and more evidence-informed, resulting in a better understanding for both CARNAs and applicants.

During evaluation interviews, respondents frequently discussed the creation and importance of the checklists, letter templates, forms, and communication tools, and many reported using the products daily. The tools had become embedded in practice and were credited with improving assessment efficiency. Respondents agreed that the guidelines for assessment and associated materials were improved by the project.

Staff also noted the new website content, including the videos, were valuable for establishing and clarifying expectations for RN practice in Alberta. The respondents discussed how the website used LFE findings to offer reliable information and the videos showed the knowledge and competencies that are required to be an RN in Alberta, indicating that the knowledge products were also useful for stakeholders and IENs.

There was full agreement amongst CARNAs’s Registration Services staff and the LFE Research Team that the project resulted in a more streamlined and evidence-informed IEN application for registration process.

Consultations with stakeholders after the implementation of the LFE changes confirmed that the LFE project used an evidence-informed approach to develop and implement policy and practice changes. The primary benefit of the changes for most stakeholders were the initiatives aimed at reducing the amount of time in the process thereby enabling IENs to enter the workforce sooner. However, it was noted that while decreased timelines can benefit IENs, they can also increase pressure on applicants.

Stakeholders identified concerns related to the cost of travel required to undertake the SEC Assessment. Further concern was identified for applicants required to complete the full bridging education program as the program was only offered in a face-to-face format. The expense of traveling to engage in studies was a perceived hardship.

The “SEC Assessment or Direct to Bridging Education Option” had a direct impact on the educational institutions that offered bridging education, affecting logistics and making it easier to plan since more applicants were required to complete the full bridging education program. The change also challenged bridging education capacity as more
applicants sought to access the entire program. As well, education institutions observed an increased sense of community among students and changes in student demographics as a result of the option. For example, there was a broader range of competency levels in some courses. The transition to applicant and educational institution-managed bridging education continued to be supported by collaboration between the educational institutions and CARNA.

3.0 Ineligible Applicant Data Analysis

In addition to informing policy and practice changes at CARNA, the baseline data analysis also generated further research questions. One of the research topics surrounded the investigation into whether there were application characteristics related to IENs being deemed “Ineligible” during the process.

The ineligible applicant data analysis sought to:
1. Identify application characteristics of ineligible applicants;
2. Quantify the volume of applicants deemed “Ineligible” at each phase of the IEN application for registration process; and
3. Understand time spent by ineligible applicants in the IEN application for registration process.

3.1 Methodology

The ineligible applicant data analysis used the same exploratory, confirmatory and timeline analyses as the baseline data analysis. It included complete application files received at CARNA for 4165 applicants between January 1, 2008 and May 29, 2015, incorporating the baseline, pre- and post-implementation applicants. During that time 436 applications were deemed “Ineligible” with the majority of the ineligible applicants from the baseline data analysis (71.79%).

Due to sample sizes, confirmatory analysis logistic regression modeling was only conducted for the outcomes following an SEC Assessment, the national entry-to-practice exam, and compared to applicants who received an initial RN application. For some cross tabulations and outcome modeling, groups from the total population (n = 4165) such as applicants who were referred to bridging education or who were TP Eligible following an SEC Assessment, or applicants who passed the national entry-to-practice exam, were used as comparison groups for ineligible applicants.

3.2 Results

The majority of applicants who were deemed “Ineligible” received the decision based on their SEC Assessment results (87.38%). Less than ten percent were deemed “Ineligible” due to failing the national entry-to-practice exam three or more times (8.03%) while
2.98% were deemed “Ineligible” upon initial assessment and 1.61% were deemed “Ineligible” due to failing a bridging education course two or more times.

The demographic characteristics were similar between the ineligible applicants and the total population with a few notable exceptions. There was a higher percentage of ineligible applicants residing in Canada at the time of application (68.58%) compared to the total population (31.72%) and a higher percentage of ineligible applicants who did not have practice currency at the time of application (9.86%) than the total population (3.41%). Conversely, there were fewer ineligible applicants that had a degree similar to an Alberta baccalaureate (13.99%) or that were educated where the scope of nursing practice is similar to Canada (4.36%) compared to the total population (28.07% and 18.51% respectively).

Confirmatory analysis modeling was conducted at the outcome points following an SEC Assessment, and the national entry-to-practice exam, and comparing ineligible applicants to applicants who obtained an initial RN registration. Following an SEC Assessment, applicants who were deemed “Ineligible” were compared to applicants in the total population who were “TP Eligible” or “Referred to Bridging Education” using statistical modeling. Following the national entry-to-practice exam, applicants who failed the exam three or more times and were deemed “Ineligible” were compared to applicants in the total population who passed.

The statistical modeling indicated that there was significant evidence that applicants who received their education where the scope of nursing practice is similar to Canada were likely to have positive results at all three outcome points. Applicants age 25-29 or who had a Canadian LPN registration were more likely to be TP Eligible or Referred to Bridging Education following an SEC Assessment. Experience in countries other than the applicant’s education country was related to being deemed “Ineligible” following an SEC Assessment. Applicants who had a degree similar to an Alberta baccalaureate, practice currency, or a Canadian LPN registration were more likely to obtain an initial RN registration than be deemed Ineligible.

The average time for ineligible applicants in the IEN application for registration process was 55 calendar days for applicants who were ineligible upon initial assessment, 366 calendar days for applicants deemed ineligible following an SEC Assessment, 808 calendar days for applicants who failed a bridging education course twice or more, and 819 calendar days for applicants who were deemed ineligible due to failing the national entry-to-practice exam.

The findings from the ineligible applicant data analysis, along with the other LFE project analyses may contribute to the further development of evidence-informed policies and practices at CARNA. The findings may also be used by other regulatory bodies, SEC Assessment centres, educational institutions, employers and governments to inform policy development or adaptations related to the IEN application for registration process.
4.0 Competency Assessment Analyses

4.1 SEC Assessment Competencies Data Analysis

The SEC Assessment was designed to evaluate an applicant’s nursing competencies to determine if they were substantially equivalent to a newly graduated Alberta RN. A statistical analysis linking SEC Assessment data and LFE registration process data was completed. The analysis examined the SEC Assessment competencies in relation to each other, to application characteristics, and to subsequent outcomes in the IEN application for registration process.

4.1.1 Methodology

SEC Assessment Competency Data

The SEC Assessment provider in Alberta collected SEC Assessment data as part of routine reporting in the IEN application for registration process. The data included in the study contained competency scores from applicants who completed an SEC Assessment between May 2008 and September 2012. SEC Assessment Centre staff retroactively entered data from 1425 SEC Assessment manually into an electronic database, between April and June 2013.

SEC Assessments focused on entry-to-practice competencies in six categories:

- Professional Responsibility and Accountability;
- Knowledge-Based Practice: Specialized Body of Knowledge;
- Knowledge-Based Practice: Competent Application of Knowledge;
- Ethical Practice;
- Service to the Public; and
- Self-Regulation.

General Nursing competencies were used in the analysis.

In February 2011, the competency rating scale for SEC Assessments changed from a three-point rating scale to a four-point rating scale. In order to accommodate the difference between the scales, a five-point analysis scale was developed as described in Table 1.

<table>
<thead>
<tr>
<th>Table 1: Alignment of SEC Assessment Scales</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>3 Point Scale</td>
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<tr>
<td>Not Met</td>
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<td>1</td>
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| 4 Point Scale                             |
| Low Partially Met | Partially Met | High Partially Met | Met |
| 1        | 2             | -                  | 3   | 4   |

| Analysis Scale                            |
| Low Partially Met | Partially Met | High Partially Met | Met |
| 1        | 2             | 3                  | 4   | 5   |
In order to identify the most challenging and strongest individual competencies, mean scores were used for analysis. Mean scores for all individual competencies were calculated and compared within each aggregated competency category. As well, comparisons of aggregated competency categories were conducted based on Cochran-Mantel-Haenszel tests and proportional odds models. For proportional odds models, the five SEC Assessment competency scores on the analysis scale were grouped into three groups based on the typical practice of CARNA registration assessors when they reviewed an IEN's SEC Assessment results.

**IEN Application for Registration Process Data**

After linking the SEC Assessment data and LFE project baseline data based on unique stakeholder numbers, 1076 SEC Assessment reports were analyzed.

Exploratory demographic and cross tabulation analyses were conducted on the applicable LFE project baseline data using a similar methodology to the baseline data analysis.

**SEC Assessment Data and LFE Project Data Linkages**

Aggregated Median and Average Competency Scores were calculated for each of the applicant characteristic variables based on the individual competencies for each applicant. Therefore, every applicant had one overall score to represent all of their SEC Assessment competencies. Descriptive statistics were then generated for each variable.

Trends in competencies by education country group were modeled by using a random intercept proportional odds model. Aggregated competency groups and education country groups were used as covariates, and their interaction term was added to the model.

Descriptive statistics (frequency, mean, histograms) were generated for each course type by aggregated competency category. Spearman correlations between the aggregated competency category and each course type were also produced to evaluate the independently paired associations between the competency categories and courses.

Cross tabulations between national entry-to-practice exam results and the SEC Assessment competency categories were conducted using chi-squared tests. A bivariate analysis between the exam results and the mean scores of aggregated SEC Assessment competency categories was also conducted. Logistic regression models were used to explore the independent associations between the exam results (pass or fail) and SEC Assessment multiple choice and short answer percentage scores, and the mean scores of the SEC Assessment competencies within each aggregated competency category. The model diagnostic was based on Hosmer-Lemeshow tests and a Receiver Operating Characteristic curve was produced to assess the predictive power of each variable. Aggregated Competency Mean Scores were also calculated for
applicants who were deemed “Ineligible” compared to applicants who received an initial RN registration.

4.1.2 Results

Both Aggregated Competency Mean Scores and statistical modeling identified that applicants most often met competencies in the Professional Responsibility and Accountability category. The remaining competency categories from strongest to most challenging were Ethical Practice, Self-Regulation, Service to the Public, and Knowledge-Based Practice: Specialized Body of Knowledge. The most challenging competency category was Knowledge-Based Practice: Competent Application of Knowledge.

Applicants had similar SEC Assessment results regardless of their age, gender, basic education credential, number of countries of experience or practice currency. Applicants educated where the scope of nursing practice is similar to Canada or those with a Canadian LPN registration had higher mean scores on the SEC Assessment than applicants who did not have those characteristics.

The trend across competency categories was generally the same for all of the education country groups represented in the study. That is, applicants demonstrated stronger competencies in Ethical Practice, Professional Responsibility and Accountability and Self-Regulation, and challenges in the Service to the Public, Knowledge-Based Practice: Specialized Body of Knowledge and Knowledge-Based Practice: Competent Application of Knowledge competency categories. Applicants educated in the United Kingdom and United States country groups had better odds of meeting all of the competency categories whereas applicants educated in the India and Asia country groups had the lowest odds of meeting competencies.

The investigation into whether individual competency categories were related to the courses assigned indicated that applicants who were referred to each type of course had more challenges meeting all of the competencies than the applicants who were not referred to that type of course. An exception was for Nursing Skills courses where there was no discernable difference between the results of applicants who were referred to Nursing Skills courses compared to applicants who were not referred. This result may be due to the educational program requirement to complete Nursing Skills courses as prerequisites to Clinical Practice courses, meaning that more applicants took Nursing Skills courses than those who were required to take them based on SEC Assessment results.

Across all of the competency categories, applicants who passed the national entry-to-practice exam had higher competency scores compared to applicants who failed the exam. Statistical modeling confirmed that applicants with high SEC Assessment competency scores across all categories were more likely to pass. Conversely, ineligible applicants displayed noticeably lower scores across all of the competency categories compared to applicants who obtained an initial RN registration.
The findings from the SEC Assessment Competencies Data Analysis may be used to develop evidence-informed policies regarding CARN\'s assessment of the SEC Assessment results. The findings also have the potential to inform IENs, as well as policies and practices at SEC Assessment centres, educational institutions, and other regulatory bodies. SEC Assessment centres may use the findings in the development of assessment tools while educational institutions may refer to the findings in the development of bridging education curriculum. IEN applicants could use the findings to inform their preparation for the SEC Assessment. Other regulatory bodies may use the findings in a similar manner as CARN\', to guide registration assessors or inform competency assessment blueprints.

4.2 Psychometric Review of Competencies

The SEC Assessment Competencies Data Analysis was initially used to inform the development of a blueprint for the SEC Assessment. During the LFE project, the SEC Assessments for Alberta applicants were conducted in Alberta until June 30, 2013 and in British Columbia from August 27, 2013 until after the post-implementation study time period.

The SEC Assessment blueprint identified the competencies to be assessed. The blueprint also provided guidelines on how the competencies should be examined within the assessment to support accurate decision-making in regards to the applicant\'s professional competence in relation to the entry-to-practice competencies expected of an Alberta RN.

Blueprint development focused on the 104 entry-to-practice competencies outlined in CARN\’s *Entry-to-Practice Competencies for the Registered Nurses Profession* (College and Association of Registered Nurses of Alberta, 2013) and the resulting blueprint can be used to inform the development of or adaption to a new assessment structure and assessment tools.

4.2.1 Methodology

The development of the SEC Assessment blueprint was led by a contracted psychometrician working with subject matter experts to develop the blueprint based on LFE data findings, experience and expertise, the current SEC Assessment, and best practices.

The blueprint was developed in five phases starting with the definition of the SEC Assessment process which would act as a basis for the blueprint. A group of CARN\' staff, including the Registrar and registration assessors, participated in a facilitated discussion to determine which components of the SEC Assessment should be included in the blueprint. In parallel to this process, a Competency Rating Survey was distributed to 48 subject matter experts identified by CARN\' and the SEC Assessment provider to
obtain feedback on the relative importance and frequency of use of each of the 104 entry-to-practice competencies during the first year of an Alberta RN’s practice.

Following the completion of the Competency Rating Survey, a Competency Mapping Survey was distributed to the same group. The latter survey asked respondents to identify whether each of the 104 entry-to-practice competencies would be better assessed by a multiple choice question exam, performance-based assessment or both.

A Blueprint Committee consisting of seven RNs, participated in a facilitated teleconference to review the Competency Mapping Survey results. The results were used to finalize the competencies to be assessed by each type of assessment tool.

The blueprint itself was finalized by the Blueprint Committee during a two-day holistic blueprint evaluation workshop. The committee made recommendations on competency weights and assessment tool guidelines. For the written exam, committee members completed a Holistic Blueprint Survey, assigning an importance ranking and percentage weight for each competency category. To determine the final weight range, committee members completed the survey again following a facilitated discussion towards obtaining consensus and incorporating the LFE project’s SEC Assessment Competencies Data Analysis findings. The participants also discussed the structure and recommendations for the Clinical Judgement assessment and modified objective structured clinical exams (OSCEs).

4.2.2 Results

Defining the SEC Assessment Process

At the time of the blueprint development, the SEC Assessment consisted of:

- Multiple choice and short answer written exams;
- A modified OSCE;
- Interview-based case management scenarios known as a Clinical Judgement assessment; and
- A Triple Jump assessment where the applicant identifies client issues/problems, selects relevant interventions, and provides evaluation strategies.

An overview of each of the components, including the benefits and challenges of each assessment was provided by the psychometrician. In the subsequent discussion, participants determined that the following assessments should be included in the SEC Assessment blueprint:

- Multiple choice exams (no short answer questions) with universal Professional Responsibility and Accountability, Ethical Practice, Service to the Public, and Self-Regulation questions that would apply to all of four types of the SEC Assessment (general, maternal/newborn, child health, mental health) and specific Knowledge-Based Practice questions for each type of exam that could be interchanged or combined;
- Modified OSCEs containing more than one scenario for all four SEC Assessment types; and
- Clinical Judgment assessments for all four SEC Assessment types.

**Competency Rating Survey**

The response rate for the Competency Rating Survey was 46%. Using a model that considered frequency and importance to have equal influence on overall importance, psychometric staff determined the degree of emphasis (proportion of test items) allocated to each competency category in the test plan.

Based on the Competency Rating Survey, the competency category with the largest weight was *Knowledge-Based Practice* (52.98%), which reflected the large number of competencies in the category (54 competencies). The other competency categories had weights ranging from 6.56% (*Service to the Public*) to 18.48% (*Ethical Practice*).

**Competency Mapping**

Based on the results of the Competency Mapping Survey, for which 27% of the subject matter experts provided responses, the Blueprint Committee determined which competencies would be best assessed by the multiple choice exam, modified OSCEs and Clinical Judgement.

Overall, the multiple choice exam would assess the most competencies (76) followed by the modified OSCEs (50) and the Clinical Judgement assessment (17). Across all of the assessments, *Knowledge-Based Practice* had the highest weights, accounting for more than 50% of the competencies assessed. The highest weights for *Professional Responsibility and Accountability* competencies were in the modified OSCEs (23%) while *Ethical Practice* was weighted similarly across all of the assessment types (~20%). The highest weights for *Service to the Public* and *Self-Regulation* (~10%) were in the multiple choice exam with *Self-Regulation* not assessed in the modified OSCEs and *Service to the Public* not assessed in the Clinical Judgment.

**Holistic Blueprint Evaluation**

Based on the Holistic Blueprint Survey results and facilitated discussion, subject matter expertise, the LFE project SEC Assessment Competencies Data Analysis findings, and best practices, the Blueprint Committee determined the weights for each competency category on the written exam as follows:

- Professional Responsibility and Accountability: 10 – 20%
- Knowledge-Based Practice: 56 – 66%
- Ethical Practice: 7 – 13%
- Service to the Public: 5 – 9%
- Self-Regulation: 6 – 10%
They also recommended a structure for a written exam containing 200 multiple choice questions with 120 Knowledge-Based Practice questions and 80 questions in the other four competency categories. For specialty assessments, the Knowledge-Based Practice questions can be substituted to assess content in the specialty area. For applicants who are referred to multiple types of assessments, the Knowledge-Based Practice questions can be added. For example, if an applicant is referred to a general assessment plus one specialty assessment, the written exam would consist of 320 questions: 120 general Knowledge-Based Practice questions, 120 specialty area Knowledge-Based Practice questions and 80 questions on the other competency categories. This would decrease the length of the written exam from the current format where applicants must take the full written exam for both assessments (i.e. 200 questions for the general assessment plus 200 questions for the specialty assessment), as well as decrease the number of exam items required for the other four competency categories.

The Blueprint Committee also recommended other test specifications for the written exam including the percentage of individual versus case-based questions, percentage of knowledge/comprehension versus application/critical thinking questions, targets for life span categories, gender balance, client diversity and variety in health care environments.

In regards to the Clinical Judgment assessment, the Blueprint Committee endorsed the current model of 12 three minute scenarios for a total of 45 minutes. However rather than the current additive model for multiple assessments (i.e. 12 general nursing scenarios plus 12 specialty scenarios), the committee recommended a cap of 12 scenarios with the following combinations for assessments:

- General assessment or specialty assessment only: 12 scenarios;
- General assessment plus one specialty assessment: 6 general scenarios and 6 specialty scenarios;
- General assessment plus two specialty assessments: 6 general scenarios and 3 scenarios per specialty area;
- General assessment plus all three specialty assessments: 6 general scenarios and 2 scenarios per specialty area.

For all Clinical Judgement assessments: at least one scenario must align with the Professional Responsibility and Accountability or Self-Regulation competencies, at least one scenario must align with the Ethical Practice competencies, and the majority of the scenarios must align with the Knowledge-Based Practice competencies. Recommendations on gender, client diversity and health care environments were also determined.

For the modified OSCEs, the Blueprint Committee determined that the OSCEs will include 12 stations regardless of the number of SEC Assessments types required. The composition of stations for multiple assessment will be as follows:

- General assessment or specialty assessment only: 12 stations;
- General assessment plus one specialty assessment: 6 general stations and 6 specialty stations;
- General assessment plus two specialty assessments: 4 general stations and 4 stations per specialty area;
- General assessment plus all three specialty assessments: 4 general stations, 3 maternal/newborn stations, 3 child health stations and 2 mental health stations.

The committee also recommended that each station be of uniform duration, between 10 to 15 minutes. There will be a combination of procedure and written questions stations which can be combined or assessed separately. At least one station will be linked to one other station.

The SEC Assessment blueprint may be used by CARNA and SEC Assessment centres in the development of a new or adapted SEC Assessment or to guide the development of assessment tools. It may also be used to inform the future adaptation of the SEC Assessment for other groups such as RNs who have been out of practice for a significant amount of time or RNs with conduct issues. The development of the blueprint was timely given efforts to establish an SEC Assessment centre in Alberta in the near future.

5.0 LFE Data Guide

Historically, there has been little evidence available to inform regulatory processes, especially for IEN registration. One of the key objectives of the LFE project was to improve the IEN application for registration process using quantitative evidence. The analysis of past application data and identification of trends, strengths and gaps in IEN application characteristics related to outcomes informed a more efficient, transparent and fair assessment process, and improved CARNA’s confidence in the process.

From the start, the LFE Research Team recognized the collaborative potential of the project. Two jurisdictional symposiums were included in the original proposal in order to facilitate face-to-face meetings with Canadian RN regulators to inform them about the methodology and results of the project, to gain advice and feedback, and to field test possible policy changes. The presentation of the baseline data analysis findings at the 2013 Jurisdictional Symposium garnered interest in replicating the LFE data analysis from several other jurisdictions. As a result, a practical data guide was developed as a tool that could be used by other regulatory bodies to provide a foundation for LFE data analysis within their own jurisdictions. It also provided a common data dictionary that could enable data comparability across jurisdictions.
5.1 Methodology

The LFE Data Guide was developed in collaboration with RN regulatory bodies from two other Canadian jurisdictions. Members of the LFE Research Team developed an initial draft of the LFE Data Guide based on the data code book developed during the baseline data analysis. Using the insight gained from the baseline data analysis and the policy and practice development discussions, a working group identified which variables should be included in the guide and of those, which variables comprised the core data set and which variables were optional.

In order to increase the universality of the LFE Data Guide, the working group brought the draft guide to the two other jurisdictions during site visits. The goals of the visits were to gain an understanding of each jurisdiction’s IEN application for registration process and the data that each jurisdiction collected. Each jurisdiction also provided initial feedback on the variables included in the draft data guide. As expected, the other jurisdictions did not necessarily collect the same application data as CARNA. In some cases, data was similar but labeled differently, confirming the value of a common data guide.

Following the site visits, the working group revised the data guide and shared it with the two jurisdictions for two rounds of reviews. Lastly, the guide was reviewed and finalized by the LFE Research Team.

5.2 Results

The data guide provided information on how to collect two main types of data: data collected from administrative databases (“Data Elements”) and data derived from calculations using the Data Elements (“Derived Data Elements”). Information about the Data Elements included variable and code names, definitions, data formats and codes, and an indication as to whether the data was available in the National Nursing Assessment Service (NNAS) electronic data. Derived Data Element information included the source Data Elements and calculation instructions for each variable. There was also a data cleaning section outlining the rationale and actions required to assure the quality of the data; that is, to ensure the accuracy and validity of the data collected.

The LFE Data Guide was shared with the Canadian RN regulators at the 2016 Jurisdictional Symposium.

6.0 Understanding the SEC Assessment/Bridging Education Choice

The LFE policy and practice changes included the addition of a new initial assessment outcome, the “SEC Assessment or Direct to Bridging Education Option”. Based on feedback from initial project consultation where IEN applicants indicated a preference to
skip the SEC Assessment and proceed directly to bridging education, as well as the baseline data analysis finding that most applicants who completed an SEC Assessment required bridging education, the LFE Research Team was surprised to see that initial choices strongly favoured the completion of an SEC Assessment.

In order to better understand applicants’ choices, CARNA contracted a researcher to conduct a qualitative study. The project was designed to determine what factors impacted an applicant’s decision to undergo an SEC Assessment or to proceed directly to bridging education.

During the LFE project, there were several key changes that impacted the IEN application for registration process and may have impacted applicants’ decisions. File processing was paused in the summer of 2013 when the SEC Assessment Centre in Alberta closed. On August 26, 2013, a provider in British Columbia began conducting SEC Assessments for Alberta applicants. The LFE policy and practice changes were implemented the same day and all of the files that were placed on hold were reassessed using the LFE assessment criteria checklist. As well, in April 2014, the full bridging education program ceased to be offered in Edmonton and was only available in Calgary. For some applicants, these changes meant travel was required, at their expense, to continue with the registration process.

6.1 Methodology

CARNa invited all applicable applicants to participate in the study and forwarded the names and contact information of the applicants who indicated interest to the researcher. The research program then contacted the applicants via email to provide additional information and schedule an interview, to a maximum of three attempts.

Applicants were approached in three distinct groups:

1. Applicants who were assessed before the LFE policy and practice changes implementation in August 2013, and who had been notified that they required an SEC Assessment. These applicants were placed on hold when the SEC Assessment Centre in Alberta closed (July 2013) until an alternate SEC Assessment setting was identified in British Columbia, at which point they were reassessed.
2. Applicants who were offered the choice between an SEC Assessment and bridging education during early implementation (September to December 2013); and
3. Applicants who were offered the choice after it had been established for some time (January to March 2015).

Twenty six participants consented to participate in the study, nine from Group 1, ten from Group 2, and seven from Group 3. Interviews were conducted in-person, by phone or by Skype using a semi-structured interview guide. All of the interviews were recorded, transcribed, and analyzed using Nvivo Qualitative Data Analysis software.
6.2 Results

Several applicants in Group 1 identified cost and location as important factors in their decision-making. The SEC Assessment was identified as the more affordable option even considering the travel and accommodation costs related to completing the SEC Assessment in British Columbia. Applicants living abroad indicated that the costs for either option were significant.

For many participants, the experience of family, friends and colleagues played a significant role in decision-making. For example, if an applicant was aware of another applicant’s successful experience with the SEC Assessment (e.g., proceeding to TP eligibility or referred to a few courses) it may have led them to choose the SEC Assessment. Similarly, if an applicant was aware of another applicant’s challenges with the SEC Assessment (e.g., requiring the full bridging program or being deemed Ineligible), it may have led them to choose bridging education. Some participants also cited family support and encouragement as factors when making the decision.

Age and family responsibilities were also factors that led some applicants to choose to take the SEC Assessment. Applicants who felt they were too mature for additional schooling or were not able to attend school amongst their other responsibilities expressed concerns in choosing bridging education.

Other participants’ sense of professionalism led them to choose the SEC Assessment, feeling confident in their competencies or believing bridging education would not enhance their knowledge and skills.

Similar themes emerged for Groups 2 and 3 however participants from these groups had stronger opinions about the location of the SEC Assessment stating that they would have preferred to complete an SEC Assessment in Alberta due to financial and time constraints.

Some participants from Groups 2 and 3 also felt anxiety related to the time constraint to make the decision. Upon notification of eligibility for the option, applicants were instructed to reply with a choice within 30 days. As well, participants said they would have liked more information about what areas and skills would be assessed by the SEC Assessment or what courses were required for bridging education before they made a decision. Participants who lived abroad stated that the time constraint was more challenging as they had less opportunity for communication with CARNA by phone because of time zone differences.

Overall, participants stated that more information about the SEC Assessment and bridging education program would have been beneficial to support decision-making as some made the choice without feeling that they understood either option.

Other factors that arose from Groups 2 and 3 were a lack of confidence in an applicant’s ability to complete the SEC Assessment which contributed to the choice of bridging...
education. The acknowledgement that an applicant’s competencies were not equivalent to the entry-to-practice competencies in Alberta also contributed to one applicant’s choice to proceed directly to bridging education.

The study participants cited a better understanding of how CARN A assesses applicants, readier access to information about the SEC Assessment and bridging education program, and designated CARN A contacts, as factors that would have supported their decision-making.

7.0 Project Evaluation

CARN A contracted an evaluation of the LFE project in order to analyze the project implementation, and understand how the project findings could impact the IEN application for registration process, the stakeholders of that process and other Canadian RN regulators.

7.1 Methodology

A mixed methods approach was used to obtain data to address the following five evaluation questions:

1. Did the LFE project increase the awareness and understanding of the IEN application for registration process and/or characteristics that may contribute to success in the process, for CARN A and for other stakeholders?
2. Were the knowledge products produced during the LFE project applied?
3. Did the LFE project contribute to action on policies and practices at CARN A or for any stakeholders?
4. What were the barriers and enablers to conducting the LFE project?
5. To what extent can the LFE project methodology be applied outside of CARN A?

Information was gathered from a number of sources in order to identify responses to the questions. Stakeholder consultations were conducted from January to March 2015 with representatives from an assessment centre, educational institutions, government ministries, employers and immigrant aide societies in order to gain an understanding of stakeholders’ awareness of the IEN application for registration process and LFE project, the impacts of and any changes based on the implemented LFE changes, and further opportunities to improve the efficiency of the IEN application for registration process.

In October and November 2015, interviews and focus groups with members of the LFE Research Team and CARN A’s Registration Services staff were conducted to elicit feedback on the project. As well, the LFE project hosted a Jurisdictional Symposium in February 2016 to share project findings with RN regulatory bodies across Canada. The symposium included a survey to gather data on the potential impact of the project for other jurisdictions. Throughout the duration of the LFE project, the project team maintained a Barrier and Enabler Log which also informed the evaluation.
7.2 Results

Awareness and Understanding

Members of the LFE Research Team and CARNA’s Registration Services staff indicated that the LFE project increased their awareness and understanding of the IEN application for registration process, application characteristics and how the characteristics were related to the process. All of the respondents reported an increase in their knowledge due to the project findings. A greater understanding of the assessment criteria and timelines were the most common examples of an improved understanding of the process. Some interviewees felt that that the project findings gave them the evidence to validate assessment decisions and there was a reported increase in confidence due to the improved awareness and understanding from the project.

Stakeholders were aware of the project to varying degrees. Some stakeholders knew about the project at a high level while others knew about the specific components in which they were involved. There were a couple stakeholders who were not aware of the project or associated process changes at all. The stakeholders had many questions about the IEN application for registration process and LFE project findings during the consultations. They provided suggestions for building awareness, including the development of: occupational profiles, process flow charts, outlines of bridging education courses, videos, and education sessions. Stakeholders who received LFE project updates stated that they were helpful.

Application of Knowledge Products

The evaluation investigated the use of knowledge products generated from the baseline data analysis, and the development of the policy and practice changes. Additional knowledge products from other LFE project activities were produced after the evaluation therefore it was not possible to evaluate their application. Some feedback for this question was used to inform the evaluation of the policy and practice changes described in Section 2.4.

CARNA’s Registration Services staff and the LFE Research Team reported that the knowledge products were used by CARNA. The LFE Research Team members also discussed the knowledge sharing activities that had been completed or were to be completed during the LFE Project including knowledge sharing with other regulatory bodies across Canada and via academic publications. There was also discussion about sharing decision-making tools with other nursing regulatory bodies across the country as the feedback CARNA had received so far had been positive.

Stakeholders felt that CARNA employed an evidence-informed approach to develop and implement changes to the IEN application for registration process through the LFE project and stated that the project provided them knowledge which had the potential to support their own decision-making. Some stakeholders indicated that LFE project findings may be useful for future reporting. The majority of stakeholders cited the
CARNA website as their primary source of information about the IEN application for registration process with one stakeholder stating that it had improved over the course of the LFE project.

Other Canadian RN regulators agreed or strongly agreed that the LFE project produced information that they could use in their jurisdiction. While four of six respondents planned to use information from the LFE project to inform their IEN application for registration process, two respondents were unsure. Many of the symposium attendees indicated that further internal discussion would be required to assess uses for the LFE project results.

**Action on Policies and Practices**

LFE Research Team members and CARNA’s Registration Services staff agreed that there was an impact on decision-making and practices but there were varying perspectives as to the extent of the impact on shaping policies. Some respondents discussed examples of policy changes while others felt that it was too early to make policy changes for CARNA or stakeholders. The evaluator surmised that this may have been due in part to different perceptions of what defines a policy versus a practice change. There was more agreement as to the impact of the LFE project on practice changes with full agreement that the project resulted in a more streamlined and evidence-informed process.

Program changes for the educational institution that offers bridging education had also been made based on the LFE project. The changes were incorporated in association with the LFE project changes in August 2013 and included scheduling, the implementation of a cohort model, and communications.

While some stakeholders felt that evidence from the LFE project could support their decision-making, others felt that the LFE changes would not impact policies or practices within their organization especially in light of larger systematic changes such as NNAS and the change in the national entry-to-practice exam. For many stakeholders the primary impact of the IEN application for registration process was the time required to obtain registration, therefore some responded that decreasing the time by making the process more efficient would be beneficial.

Although the majority of the Canadian RN regulators felt there was potential to apply the project findings to their own IEN application for registration processes, there had been no action on policies or practices at the time of the 2016 Jurisdictional Symposium as many regulatory bodies were waiting to consider the LFE project findings as a whole. Yet five out of six jurisdictions agreed that the LFE project produced information that could be used to inform their policies and practices. Specifically, there was interest expressed in using the *LFE Data Guide* and assessment checklist.
Barriers and Enablers

Carna’s Registration Services staff and the LFE Research Team reported barriers arising from external influences including the location of the SEC Assessment Centre outside of Alberta, bridging education capacity, the introduction of NNAS and the change in national entry-to-practice exam. Internally, the complexity of the process and data challenges were frequently mentioned. There was also a concern that the decrease in IEN applications during the course of the project may have made analytic comparisons more complex. Respondents also felt that there was a struggle to balance the research and implementation of changes with ongoing administrative timelines and stakeholder requirements, as is the case for many research projects.

The project leadership also indicated that external influences and data challenges were barriers to the LFE project. As well, in May 2013, CARNA changed their client management system software requiring the development of a new data query and integration of the data codes to enable comparisons across data sets. Human resource changes and financial complexities also contributed to challenges for the project.

The LFE Research Team and CARNA’s Registration Services staff felt that the project enablers were strong and resulted in a successful, meaningful project. The project leadership was highly praised, with the project organization, transparency, energy and resourcefulness of the leads emphasized numerous times. A healthy team dynamic and continuous involvement from CARNA staff was also highlighted as some of the biggest contributors to the success of the project. The project leadership equally identified access to and the expertise of CARNA’s staff and the LFE Research Team as important enablers in the execution of the project.

Application Outside of CARNA

The LFE Research Team and CARNA’s Registration Services staff expressed pride in the project output but also in the rigorous methodology that was employed. They felt that the methodology had a high level of replicability for other regulatory bodies to study data related to the registration of RNs, LPNs, health care aides or other health professionals. Respondents also felt that the methodology could be applied in other jurisdictions or elsewhere in the health system and that there may be interest from other countries. LFE Research Team members mentioned that the LFE Data Guide was designed to support the spread of similar analyses and may help to develop a nation-wide evidence base or potentially support the evaluation of the impact of the newly implemented NNAS.

The respondents acknowledged that a direct application of the methodology to other organizations would be challenging because of variations in legislation, regulations, applicant demographics, and processes. However, it was felt that the methodology could be easily applied to LPN registration in Alberta.

Other Canadian RN regulatory bodies felt that the methodology could be applied in their jurisdiction. Two jurisdictions felt that it could be applied as is, two felt that it could be
applied with modifications and one was unsure. Two jurisdictions do not register RNs directly but rather by endorsement (IENs must first register in another Canadian jurisdiction) therefore the LFE project methodology would not be applicable to them. The methodology may need to be adapted to different legislation and regulations, and symposium attendees stated the need to discuss the methodology and findings within their organization. However, survey responses did indicate an interest in applying the LFE methodology.

8.0 Discussion

To our knowledge, the Learning from Experience: Improving the Process of Internationally Educated Nurses’ Applications for Registration project is the first to investigate the relationship between IEN application characteristics and process outcomes and timelines, to support evidence-informed policies for the registration of internationally educated health professionals.

Prior to the study, limited evidence was available to inform the IEN application for registration process. Policies and practices surrounding the process were often developed based on experience and expertise. The evidence that was available was often extrapolated from broader research on nurse migration, acculturation and employment, and research focused on characteristics related to success or challenges in the workplace (Blythe, Baumann, Rhéaume, & McIntosh, 2009; Sherman & Eggenberger, 2008; Spetz, Gates, & Jones, 2014; Walani, 2013; Xu, Zaikina-Montgomery, & Shen, 2010).

Little quantitative data was available to inform the IEN application for registration process. The majority of research related to IEN application characteristics was qualitative (Armitage & Suter, 2010; Ogilvie, Leung, Gushuliak, McGuire, & Burgess-Pinto, 2007). There were also studies which focused on specific aspects of the IEN application for registration process (Besner, Jackson, McGuire, & Surgeoner, 2010; College of Registered Nurses of British Columbia, 2012).

The LFE project identified key application characteristics that were related to success or challenges in the IEN application for registration process. The evidence indicated that education received where the scope of nursing practice is similar to Canada was significantly related to positive outcomes in the process across multiple outcome points and all of the time periods analyzed in the project. Education credential, practice currency and the number of years since last practiced or graduated were also significantly related to multiple outcome points. However, there were some characteristics identified as significant in the baseline data analysis which were not suitable for policy development (e.g., age, gender).

Following the pre- and post-implementation data analyses, the LFE Research Team reviewed the findings to identify further policy and practice changes that may have been implemented. The LFE Research Team was satisfied with the majority of the LFE
changes and most of the post-implementation data findings were not surprising. However, a review of the national entry-to-practice exam pass rates by education country indicated low passing rates for applicants educated in Jamaica. Applicants educated in Jamaica were included in the Education Received Where the Scope of Nursing Practice is Similar to Canada category during the duration of the project and were likely granted a TP without completing an SEC Assessment or bridging education. However, in the post-implementation data analysis only 55.56% of the applicants educated in Jamaica who wrote the national entry-to-practice exam had passed at the time of data extraction. Based on this finding, CARNA’s Registration Services department will consider applicants educated in Jamaica as receiving their education where the scope of nursing practice is not similar to Canada.

The Education Received Where the Scope of Nursing Practice is Similar to Canada group included applicants educated in the United States, United Kingdom country group (including Ireland), Australia/New Zealand and Jamaica. It was identified as a proxy variable in an attempt to capture the cultural and language factors that qualitative studies identify as significantly impacting integration into the workplace (Benton, González-Jurado, & Beneit-Montesinos, 2013; Besner et al., 2010; Magnusdottir, 2005; O’Neill, 2011). The LFE Research Team investigated several distinctions such as similar health systems and similar population demographics, however they were difficult to define. To determine similar nursing scopes of practice, the LFE Research Team reviewed publicly available scope of practice documents from all of the jurisdictions that indicated nursing education delivery in English. The team attempted to verify whether key Alberta RN competencies (e.g., total assessment, interprofessional practice, identifying and reporting errors, patient advocacy) were present in the RN scope of practice for each jurisdiction.

**External Factors**

During the course of the LFE project there were a number of external events that impacted the IEN application for registration process and affected the timeline analysis. As CARNAs is only one of many stakeholders involved in the process, the statistical timeline analysis was not intended or able to draw conclusions about the LFE policy and practice changes based on a causal relationship.

Key external changes that affected the IEN application for registration process during the LFE project included the:

- Closure of the SEC Assessment Centre in Alberta on July 1, 2013. SEC Assessments for Alberta applicants were conducted in British Columbia beginning on August 27, 2013. Thus applicants who chose or were referred to an SEC Assessment had to travel to British Columbia;
- Discontinuation of the full bridging education program in Edmonton in April 2014. This change resulted in the only full bridging education program in Alberta being available in Calgary and impacted program capacity;
- Implementation of NNAS in August 2014, requiring IEN applicants to apply to NNAS first and then to their choice of regulatory body;
- Change in the national entry-to-practice exam in January 2015 from a paper-based exam offered three times per year to a computer-based adaptive exam (NCLEX-RN) offered at exam centres year round. As well, regulatory bodies across Canada began accepting passing results from the NCLEX-RN, retroactively to 1982.

In addition to these events, the IEN application for registration process was consistently impacted by application volumes and staff workloads.

Despite the complexities of the process and the multitude of contributing factors, the evaluation of the evidence-informed policies and practices developed during the LFE project was largely positive.

### 8.1 Sustainability

A fundamental aspect of the LFE project was the identification of evidence to inform the IEN application for registration process. Within the scope of the project, CARNA and an educational institution used the baseline data findings to develop and implement changes to policies and practices with a goal of improving assessments and efficiency. In order to support the ongoing identification and use of evidence to support the IEN application for registration process, the project team worked with CARNA’s Information Technology department to refine the LFE data query to facilitate operational data extractions to inform reporting and future policy and practice discussions.

The LFE project also supported the development of a number of communication tools to increase the clarity and transparency of the IEN application for registration process. In addition to the communication tool development and revisions implemented in August 2013, the project developed a 10 minute orientation video to inform IENs and process stakeholders about the IEN application for registration process. The video is available on the CARNA website and was shared with immigrant aide societies throughout Alberta.

The *LFE Data Guide* was developed to support other regulatory bodies to conduct similar data analyses with their own administrative data. The guide was shared with the Canadian RN regulators during the 2016 Jurisdictional Symposium and CARNA will continue to support the jurisdictions in its use. The guide may also serve as a common data dictionary across jurisdictions or inform NNAS to identify relevant data for collection.

In 2016, the LFE Research Team published the LFE study protocol in the *Journal of Advanced Nursing*. There are also plans to submit six more articles related to the study to disseminate the project methodology and findings internationally. As well, representatives from the LFE Research Team have presented in numerous local, regional, national and international venues to speak about the LFE project and increase awareness about the project findings which may serve as evidence to inform regulatory bodies, educational institutions, governments, employers and IENs around the world.
8.2 Recommendations

The LFE project was large and often complex in scope leading to a number of recommendations for future research projects, as well as regulatory body operations. At the outset, a re-analysis of the pre- and post-implementation data is recommended in the one to three years to allow time for the applicants to progress through the process. This will allow for data to be collected for larger numbers of applicants at later outcome points in the process and, therefore, more robust statistical analysis.

Operationally, data entry and cleaning were resource intense endeavors. While operational changes were made to facilitate the ongoing entry of data in CARNA’s administrative database, the LFE Research Team recommends the development of strategies to improve accurate and consistent data entry. By addressing data accuracy at the point of entry, CARNA can reduce the amount of cleaning required upon data extraction.

The LFE Research Team also identified potential topics for future research related to the LFE project including:

- Conducting the LFE data analysis with multiple jurisdictions or nationally;
- Extending the scope of the LFE data analyses to identify characteristics and IEN application for registration process outcomes in relation to employment outcomes;
- Investigating assumptions surrounding which countries have similar scopes of practice to Canada; and
- Conducting similar analyses across health professions.

Ultimately, the registration of IENs is a collective responsibility between regulatory bodies, educational institutions, employers, governments, and individual IENs (Macdonald-Renz & Davies, 2010; McAfee, A & Brynjolfsson E, 2012; Spector, 2010). The LFE project is a valuable foundation which can support collaboration between stakeholders in identifying evidence and developing evidence-informed policies and practices to improve the IEN application for registration process as a whole.

8.3 Limitations

The data analyzed in the LFE project was collected by CARNA as part of routine data collection during the IEN application for registration process. The project drew data from an active administrative database which was not designed for research purposes therefore the data were not entered and cleaned in isolation. The project leadership, Data Entry Clerks and Data Analyst thoroughly reviewed and cleaned the data extracted for these analyses however, variations for future data analyses may exist.

Several variables investigated in the data analyses, such as employment practice focus and employment hours, were self-reported by applicants and not independently verified during the IEN application for registration process. As well, limitations due to sample
sizes required the analysis of some education countries in country groups to minimize imbalances. Applicants educated in the Philippines, India, United States and United Kingdom were the primary source countries represented in the data and accounted for approximately three quarters of the applicants. In the baseline data, which had the most diversity, the remaining quarter of applicants were educated in 68 different countries.

For the SEC Assessment Competencies Data Analysis, the timeframe for the SEC Assessment data was different than the timeframe for the LFE Project baseline data, therefore data linkage was complex with some of the SEC Assessment records falling outside of the baseline data period.

While the pre- and post-implementation data analysis indicated that the overall time for an applicant to obtain an initial RN registration was shorter for the post-implementation applicants compared to the pre-implementation applicants both for the overall analysis and the exemplar analysis, caution must be exercised in interpreting the results. Due to the short elapsed time between the post-implementation time period and data extraction, 80% of the post-implementation applicants were still in the process of obtaining an initial RN registration. Indeed over 50% of the pre-implementation applicants were also still in the process at the time of data extraction. It is recommended that a similar analysis be conducted within the next one to three years to allow the further progression of applicants in the process in order to gain a more balanced evaluation of the implemented changes.

Data in all of the timeline analyses did not include the period prior to the applicant’s complete application. Therefore, the period of time required for the applicant to obtain, or for the source organizations to send, all of the supporting documentation to meet the application requirements was not included in the timeline analysis findings. This period may have ranged from several days to multiple years before the implementation of the LFE changes and NNAS.

Literature investigating IEN transition into the workplace identified culture, family support, immigration challenges, conflicting obligations and language as key factors that affect IEN integration. However, this study was unable to statistically analyze those factors as they are difficult to measure and CARNA does not capture any data related to these variables.

9.0 Conclusion

The Learning from Experience: Improving the Process of Internationally Educated Nurses’ Applications for Registration project identified substantial evidence to inform the IEN application for registration process. The findings identified and knowledge gained from the project was used to inform policy and practice changes which were implemented at CARNA during the project, and will continue to inform improvements in IEN registration. The project addressed a gap in evidence by quantitatively analyzing IEN applications to determine whether there were characteristics related to success or
challenges at key outcomes in the IEN application for registration process, and provided information about process timelines that was not previously available.

As health systems move towards an emphasis on evidence-informed practice, there is also a growing call for evidence-informed regulation (McGuire & Murphy, 2005; Spector, 2010). Indeed, regulatory bodies collect and manage large amounts of data which can support evidence-informed decision-making for assessments, policies and organizational processes (McAfee & Brynjolfsson, 2012; Spector, 2010). Using evidence to inform a more consistent, efficient IEN application for registration process in turn contributes to an IEN’s ability to transition into the workplace in a timely manner which benefits all of the stakeholders involved.

The LFE project findings have the potential to provide important evidence to health profession regulatory bodies nationally and internationally. RN regulators across Canada have been kept apprised of this work throughout the project and the project findings have been presented to representatives from other health profession regulatory bodies in Alberta. Additionally, the project design supported the possibility of future collaboration with other jurisdictions for data collection and analysis, as well as policy development.

In addition to professional registration, the LFE project findings may be applied to policy and practice decisions at assessment centres, educational institutions, employers, and governments, and to inform IENs. The LFE project may also contribute to an increased understanding of successful international applicant characteristics and improved practices enhancing the IEN application for registration process, which in turn can support evidence-informed policy that may lead to improved health human resource system planning and the resulting health system performance. Ultimately, the LFE project sought to improve IEN assessments and the IEN application for registration process that will contribute to a higher quality and safer health care system in Alberta and potentially across Canada.
Appendix A: Glossary

**Bridging Education**
Education provided for IENs to enhance professional nursing communication; build nursing knowledge and nursing practice skills in Canadian health care settings; and strengthen clinical and ethical reasoning. Bridging education may have consisted of one to ten courses depending on an IEN’s competency gaps.

**Basic Education Credential/Entry-Level Education**
The education credential that qualifies an applicant for registration as an RN (e.g., baccalaureate or diploma/associate degree). For the LFE Project, the basic education credential reflected the level at which the credential was assessed (i.e., similarity to an Alberta baccalaureate) as opposed to the credential indicated on the applicant transcript.

**CARNA**
College and Association of Registered Nurses of Alberta, the professional and regulatory body for registered nurses in Alberta, Canada and the organization that led the Learning From Experience project.

**Competencies**
The knowledge, skills, judgments and attributes required of an RN to practice safely and ethically in a designated role and setting. (Canadian Nurses Association, 2012)

**CRNE**
Canadian Registered Nurse Examination, the national entry-to-practice examination in Canada until October 2014.

**IEN**
Internationally educated nurse, a nurse who obtained his or her basic nursing education credential outside of Canada.

**Ineligible**
An applicant may be deemed ineligible if his or her competency gaps are too extensive to be addressed within the IEN application for registration process. Ineligible applicants must complete a four year Canadian baccalaureate nursing degree to be eligible for RN registration in Alberta.

**Initial Assessment**
The assessment conducted by the regulatory body to determine whether an applicant’s competencies are substantially equivalent to an Alberta RN based on a review of the applicant’s education and experience documentation.

**Lapsed Application**
An application may have lapsed if there was no forward movement towards meeting registration requirements for a specified period of time. Timelines for lapsed applications are detailed in Appendix C.

**LPN**
Licensed practical nurse, a regulated nursing professional who completes two years of post-secondary nursing education and is registered with a licensed practical nurse regulatory body.

**NCLEX-RN**
The Canadian national entry-to-practice examination as of January 5, 2015.
NNAS
National Nursing Assessment Service, the organization that coordinates a consistent national approach for internationally educated nurses seeking registration/licensure to practice in Canadian jurisdictions. As of August 12, 2014, all IEN applicants must apply to NNAS before applying to the regulatory body.

Post-Bridging Education Review
Regulatory body review of the applicant file information and bridging education results following bridging education completion.

Practice Currency
Graduation or 1125 hours of experience, within the five years prior to application, as defined in regulation.

RN
Registered nurse, a regulated nursing professional who obtains a baccalaureate degree in nursing in Canada or is determined to have substantially equivalent competencies, and is registered with a registered nurse regulatory body.

SEC/SEC Assessment
Substantially Equivalent Competency Assessment, an evaluation that uses a variety of strategies to assess an IEN’s professional knowledge, skills, attributes, values, and judgment.

SEC Assessment Review
Regulatory body’s review of the SEC Assessment results and application file information.

TP
Temporary Permit, a temporary registration which allows the applicant to work as a Graduate Nurse in Canada to obtain experience in the Canadian health care system in order to obtain a satisfactory reference from a Canadian employer.
Appendix B: Baseline, Pre- and Post-Implementation Applicant Statistics

Table B.1: Summary of Key Baseline, Pre- and Post-Implementation Applicant Demographics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Baseline Data (n=3504)</th>
<th>Pre (n = 426)</th>
<th>Post (n = 287)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Age</td>
<td>32</td>
<td>30</td>
<td>34</td>
</tr>
<tr>
<td>Gender</td>
<td>18.35% Male</td>
<td>18.78%</td>
<td>18.82%</td>
</tr>
<tr>
<td></td>
<td>81.65% Female</td>
<td>81.22%</td>
<td>81.18%</td>
</tr>
<tr>
<td>Residence in Canada at the Time of Application</td>
<td>27.51% Yes</td>
<td>53.29%</td>
<td>56.45%</td>
</tr>
<tr>
<td></td>
<td>72.49% No</td>
<td>46.71%</td>
<td>43.55%</td>
</tr>
<tr>
<td>Basic Credential Received</td>
<td>26.66% Degree</td>
<td>31.92%</td>
<td>40.07%</td>
</tr>
<tr>
<td></td>
<td>73.20% Diploma</td>
<td>67.37%</td>
<td>58.54%</td>
</tr>
<tr>
<td></td>
<td>0.14% Other</td>
<td>0.71%</td>
<td>1.39%</td>
</tr>
<tr>
<td>Educated Where the Scope of Practice is Similar to Canada</td>
<td>15.35% Yes</td>
<td>37.79%</td>
<td>44.60%</td>
</tr>
<tr>
<td></td>
<td>84.65% No</td>
<td>62.21%</td>
<td>55.40%</td>
</tr>
<tr>
<td>Years Since Last Practiced</td>
<td>0.32</td>
<td>0.92</td>
<td>1.17</td>
</tr>
<tr>
<td>Practice Currency</td>
<td>96.38% Current</td>
<td>97.65%</td>
<td>97.21%</td>
</tr>
<tr>
<td></td>
<td>3.62% Not Current</td>
<td>2.35%</td>
<td>2.79%</td>
</tr>
<tr>
<td>Transition Experience</td>
<td>68.46% Education Country Only</td>
<td>13.38%</td>
<td>11.50%</td>
</tr>
<tr>
<td></td>
<td>31.54% Additional Countries</td>
<td>86.62%</td>
<td>88.50%</td>
</tr>
<tr>
<td>Canadian LPN Registration</td>
<td>5.08% Yes</td>
<td>0.94%</td>
<td>2.44%</td>
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<tr>
<td></td>
<td>94.92% Not Reported</td>
<td>99.06%</td>
<td>97.56%</td>
</tr>
</tbody>
</table>

Table B.2: Education Country Groups Represented in the Baseline, Pre- and Post-Implementation Data

<table>
<thead>
<tr>
<th>Education Country Group</th>
<th>Baseline (%)</th>
<th>Pre (%)</th>
<th>Post (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Kingdom</td>
<td>4.54</td>
<td>13.62</td>
<td>11.15</td>
</tr>
<tr>
<td>Western Europe</td>
<td>0.80</td>
<td>1.41</td>
<td>1.74</td>
</tr>
<tr>
<td>South America</td>
<td>0.23</td>
<td>0.23</td>
<td>0.35</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>0.63</td>
<td>0.47</td>
<td>0.70</td>
</tr>
<tr>
<td>Africa</td>
<td>6.11</td>
<td>3.05</td>
<td>2.09</td>
</tr>
<tr>
<td>Middle East</td>
<td>0.97</td>
<td>0.94</td>
<td>1.05</td>
</tr>
<tr>
<td>Australia/New Zealand</td>
<td>2.40</td>
<td>4.46</td>
<td>3.83</td>
</tr>
<tr>
<td>Asia</td>
<td>1.00</td>
<td>0.70</td>
<td>0.35</td>
</tr>
<tr>
<td>Tropics/Caribbean</td>
<td>3.42</td>
<td>5.17</td>
<td>13.94</td>
</tr>
<tr>
<td>China</td>
<td>0.68</td>
<td>0.23</td>
<td>0.35</td>
</tr>
<tr>
<td>India</td>
<td>24.71</td>
<td>10.09</td>
<td>9.76</td>
</tr>
<tr>
<td>Philippines</td>
<td>48.94</td>
<td>44.37</td>
<td>36.59</td>
</tr>
<tr>
<td>United States</td>
<td>5.57</td>
<td>15.26</td>
<td>18.12</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Baseline</td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td><strong>Initial Assessment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• TP Eligible</td>
<td>962 (27.46%)</td>
<td>95 (22.30%)</td>
<td>94 (32.75%)</td>
</tr>
<tr>
<td>• Referred to SEC</td>
<td>2537 (72.40%)</td>
<td>325 (76.29%)</td>
<td>45 (15.68%)</td>
</tr>
<tr>
<td>• SEC/BCN Choice</td>
<td>--</td>
<td>--</td>
<td>147 (51.22%)</td>
</tr>
<tr>
<td>• Ineligible</td>
<td>5 (0.14%)</td>
<td>6 (1.41%)</td>
<td>1 (0.35%)</td>
</tr>
<tr>
<td><strong>SEC Assessment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• TP Eligible</td>
<td>19 (2.21%)</td>
<td>4 (1.97%)</td>
<td>1 (2.08%)</td>
</tr>
<tr>
<td>• Referred to Bridging</td>
<td>609 (70.81%)</td>
<td>115 (56.65%)</td>
<td>17 (35.42%)</td>
</tr>
<tr>
<td>• Referred to 2nd SEC</td>
<td>20 (2.33%)</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>• Ineligible</td>
<td>212 (24.65%)</td>
<td>84 (41.38%)</td>
<td>30 (62.50%)</td>
</tr>
<tr>
<td><strong>Bridging Education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• TP Eligible</td>
<td>323 (97.58%)</td>
<td>69 (97.18%)</td>
<td>5 (100.00%)</td>
</tr>
<tr>
<td>• Ineligible</td>
<td>8 (2.42%)</td>
<td>2 (2.82%)</td>
<td>0 (0.00%)</td>
</tr>
<tr>
<td><strong>TP Eligibility</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• TP Eligible</td>
<td>1304 (37.21%)</td>
<td>168 (39.44%)</td>
<td>100 (34.84%)</td>
</tr>
<tr>
<td>• Ineligible</td>
<td>226 (6.45%)</td>
<td>92 (21.59%)</td>
<td>31 (10.80%)</td>
</tr>
<tr>
<td>• Active/Lapsed</td>
<td>1974 (56.34%)</td>
<td>166 (38.97%)</td>
<td>156 (54.36%)</td>
</tr>
<tr>
<td><strong>Exam w/External</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Pass Exam</td>
<td>612 (81.93%)</td>
<td>94 (80.34%)</td>
<td>17 (68.00%)</td>
</tr>
<tr>
<td>• Fail Results</td>
<td>135 (18.07%)</td>
<td>23 (19.66%)</td>
<td>8 (32.00%)</td>
</tr>
<tr>
<td><strong>Initial RN Registration</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Initial RN</td>
<td>517 (14.75%)</td>
<td>88 (20.66%)</td>
<td>25 (8.71%)</td>
</tr>
<tr>
<td>• Ineligible</td>
<td>261 (7.45%)</td>
<td>92 (21.59%)</td>
<td>31 (10.80%)</td>
</tr>
<tr>
<td>• Active</td>
<td>968 (27.63%)</td>
<td>223 (52.35%)</td>
<td>231 (80.49%)</td>
</tr>
<tr>
<td>• Lapsed</td>
<td>1758 (50.17%)</td>
<td>23 (5.40%)</td>
<td>0 (0.00%)</td>
</tr>
</tbody>
</table>

Table B.3: Outcome Frequencies for the Baseline, Pre- and Post-Implementation Applicants
## Appendix C: IEN Application for Registration Process Timelines

Table C.1: IEN Application for Registration Process Timelines Pre- and Post-Implementation

<table>
<thead>
<tr>
<th>Process Phase</th>
<th>Pre-LFE</th>
<th>LFE Policy Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Submission</td>
<td>2 years (rolling)</td>
<td>1 year from Intent to Apply (Intent to Apply: 1 month, Further Assessment: 11 months)</td>
</tr>
<tr>
<td>SEC Assessment/Review</td>
<td>2 years (rolling)</td>
<td>2 years</td>
</tr>
<tr>
<td>Bridging Education</td>
<td>3 years (2 years rolling)</td>
<td>Full Program: 4 years* Individual courses: 2 years* *within 1 year after completion</td>
</tr>
<tr>
<td>TP Eligible Time</td>
<td>2 years (rolling)</td>
<td>1 year to take out first TP or write the Exam, additional 1 year after Exam if written before taking a TP No more than 2 years between exam attempts or TPs</td>
</tr>
<tr>
<td>TP Time</td>
<td>3 TPs x 6 months maximum</td>
<td>(no change)</td>
</tr>
<tr>
<td>RN Application Time</td>
<td>2 years (rolling)</td>
<td>1 year to apply after eligible for initial RN</td>
</tr>
</tbody>
</table>

Table C.1 details the timelines for the IEN application for registration process prior to and following the implementation of LFE policy and practice changes. If an applicant does not meet a timeline their application is considered lapsed and the applicant must re-apply and be re-assessed before proceeding in the process.
Appendix D: References and Reports

References


Learning From Experience Project Reports

LFE Baseline Data Analysis Report
LFE Baseline Data Analysis Technical Report
LFE Pre- and Post-Implementation Data Analyses Report
LFE Pre- and Post-Implementation Data Analyses Technical Report
LFE Pre-Implementation Data Analysis Technical Report
LFE Post-Implementation Data Analysis Technical Report
LFE Ineligible Data Analysis Report
LFE Ineligible Data Analysis Technical Report
LFE SEC Assessment Data Analysis Report
LFE SEC Assessment Data Analysis Technical Report
CARN A Blueprint Development: SEC Assessment Report
LFE Data Guide
Internationally Educated Nurses SEC/BCN Choice Qualitative Project Report
LFE Project Evaluation Report
Appendix E: Research Team and Acknowledgements

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University of Alberta
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