In July 2011, the International Board of Lactation Consultant Examiners (IBLCE) administered its 27th annual credentialing examination in lactation consulting. The test was administered in 16 languages to 6,176 candidates in 270 locations across 50 countries and territories representing all continents. For the first time, IBLCE offered computer-based testing (CBT) to a limited number of candidates. The CBT form of the test was administered to 498 candidates in the United States and Canada. The CBT form contained the same items in the same sequence as the paper-and-pencil (P&P) form. IBLCE anticipates expanding CBT in future years.

This candidate population for the 2011 administration was the largest in the test’s history. The population was nearly 50% larger than the prior record in 2010 and the largest year-over-year increase in the test’s history, both as an absolute number and a percentage. This marks the fifth administration in the past six, inclusive, in which the candidate population exceeded the prior record. The population was also larger than the first ten test administrations combined, and more than twice the size of all but four of the prior administrations.

The 2011 candidate population continues a significant trend regarding its composition. For the first 14 years of the program (1985-1998), the United States alone accounted for the majority of the candidates. For 10 of the 11 most recent years, including 2011, the United States accounted for less than half of the candidates. Similarly, for the first eight years of the program (1985-1992), candidates from countries other than the United States, Canada, and Australia accounted for less than 10% of the candidates. The 2011 administration is the twelfth consecutive year in which candidates from these other countries have accounted for more than 30% of the candidates, and the fifth in which this constituency has reached or exceeded 40%.

These statistics mark a continuation of important trends in the candidate population composition and underscore that the IBLCE credential is the global standard of knowledge assessment in lactation consulting.
As the program matures, a significant number of candidates take the test for recertification. For this administration, 1,107 (18%) of the candidates sat for recertification, representing consistent incremental growth. This was a record number of recertification candidates. However the percentage of recertification candidates actually decreased because of still greater growth in the number of candidates sitting for initial certification.

The test was administered in English (both American and British), Croatian, Dutch, French, German, Greek (for the first time), Hungarian, Indonesian, Italian, Japanese, Korean, Polish, Slovenian, Swedish, Spanish, and Taiwanese. A total of 1,484 candidates sat for one of the 15 translated forms of the test. In addition, the English version was linguistically adapted to British English for most English-speaking candidates in countries outside North America, and for candidates in countries in which English is a secondary language but the test was not translated into the primary language. The IBLCE examination has now been administered in 20 languages in more than 50 countries across all major continents, offering unparalleled geographical, cultural, and linguistic access.

The 2011 administration was the 21st in which IBCLCs (International Board Certified Lactation Consultants) chose to recertify by examination. Recertification is required every five years. By IBLCE policy, the first 5-year recertification requirement may be satisfied by either continuing education recognition points (CERPs) or by examination. When certificants are recertified by CERPs, the next 5-year recertification must be fulfilled by examination. An analysis of the recertification candidate performance is given in Table 5 and Figure 2 later in this report.

Examination Development and Structure

The IBLCE examination is based on a 3-dimensional content outline, or test blueprint. This document was derived from a practice analysis by the Board, in conjunction with its Examination Committee members and a Representative Panel of Experts (RPE). On the basis of this study, the Board arranged the examination content according to scientific disciplines, developmental stages (which has since evolved into chronological periods), and taxonomy levels. The latter category indicates whether an item measures recall of knowledge (level 1) or application of knowledge (level 2). The examination blueprint appears in its entirety on the IBLCE website (www.iblce.org).
The examination is scored as a single integrated test. However, it has two multiple-choice item formats: text-based and image-based multiple-choice. The images usually present a color photograph depicting an aspect of breastfeeding, or breast anatomy or pathology, that the candidates must resolve. These test items have a particularly high degree of clinical relevance, and because most of the question is contained in the graphic, translation is facilitated. As IBLCE continually strives to enhance the clinical relevance and realism of the test items, it shifted to a predominantly image-based examination in 2010. Of the 175 items comprising the test, 100 reference images.

Following standard operating procedures, the 2011 examination was developed by a 7-person examination committee that prepares, reviews, edits, and selects test items. The Examination Committee includes broad geographic and practice setting representation and is staffed by the Executive Director, the Examination Manager, and the IBLCE psychometrician.

Examination Results

The results of the 27th administration of the IBLCE examination are displayed in Table 1. These statistics are based on the total population of 6,176 certification and recertification candidates. The data in Table 1 are presented in percentages only, as the multiple linguistic versions of the test differed slightly in the number of scored items. These differences preclude any meaningful raw score comparisons.

The final statistics are based on the combined text-based and image-based portions. A graph of the total examination scores, in percentages, is displayed in Figure 1. The statistics are presented for the overall test rather than for the two subtests because the examination was designed and intended to be one comprehensive, integrated test.

The statistics are not based on the 175 items that were administered. Some items were deleted from scoring on the basis of a flaw that is typically revealed by an extensive statistical test and item analyses, in accordance with best practices certification testing. These analyses are conducted by the psychometrician and evaluated by the Examination Committee. Items determined by the Committee to have been defective are deleted, and items identified as having been initially
miskeyed are rekeyed. Subsequent to this review, the examinations are rescoring. These quality control procedures promote reliability, validity, and fairness.

Table 1: Summary Statistics of Overall Test Scores*

<table>
<thead>
<tr>
<th>Descriptive Data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Score Range</td>
<td>34-94</td>
</tr>
<tr>
<td>Mean Score**</td>
<td>76.24</td>
</tr>
<tr>
<td>Median</td>
<td>77.00</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>8.56</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reliability Data***</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>KR-20 Reliability</td>
<td>0.88</td>
</tr>
<tr>
<td>Kappa Reliability</td>
<td>0.61</td>
</tr>
<tr>
<td>Standard Error of Measurement of all scores</td>
<td>2.86</td>
</tr>
<tr>
<td>at the pass-fail cutoff score</td>
<td>4.64</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pass-Fail Data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pass-Fail Score</td>
<td>66</td>
</tr>
<tr>
<td>Candidates Passing</td>
<td>88.44</td>
</tr>
<tr>
<td>Candidates Failing</td>
<td>11.56</td>
</tr>
</tbody>
</table>

* Statistics are based on percentage scores for all 6,176 candidates.
** Subtest means are 75.35 for the text-based portion, and 76.86 for the image-based portion.
*** Reliability data are based on the 173-scored-item version for candidates who sat for the American English version of the test.

Additional quality control procedures are applied to assess the adequacy of the translated versions of the test. These quantitative and qualitative procedures are designed to identify any items for which the translation was inadequate, and resulted in a significant performance decrement. When this occurrence is confirmed, the item is deleted selectively; that is, only for the affected linguistic version. For the 2011 examination, two items were deleted from the examination,
overall for psychometric reasons. Due to linguistic flaws, additional items were deleted from several of the translated versions.

**Figure 1: Distribution of Overall Test Scores**

The last portion of the statistical table displays the pass-fail data for the examination, which includes the raw and percentage pass-fail score, and the number (raw) and percentage of candidates passing and failing the examination. The pass-fail cutoff score was determined using a form of the Nedelsky procedure, a criterion-referenced technique (Nedelsky, 1954; Gross, 1985). Applying this procedure, a performance standard or index is determined for each test item (known as a minimum pass index, or MPI) on the basis of its perceived level of difficulty. The examination pass-fail standard is then computed as the average of each of the item performance indices.

A study of this process was conducted for the initial administration of the IBLCE examination and indicated that the standard setting technique yields a valid pass-fail score. Generally, the anticipated relationship between item standard and item performance was attained, as shown in Table 2, indicating that the Board’s *a priori* assessment of item difficulty was deemed to be a valid basis for setting
performance standards. This analysis is replicated for each examination and continues to support the findings of the cutoff score validation study.

For this 27th administration of the IBLCE examination, the overall rounded pass-fail cutoff score was 66%. As the pass-fail scores are determined on an item-by-item basis, the deletion of additional items in the translated versions of the test does not necessarily affect the percentage pass-fail score. Certainly, the additional deleted items do not make the pass-fail cutoff score more difficult to attain. This is because when items are deleted from computing the candidate scores, the deleted item MPIs are deleted from the passing-score computation also. The rounded pass-fail cutoff score for all translated versions of the 2011 test was the same (i.e., 66%), despite variance in the number of items.

| Table 2  Comparison of Indices for Item Standard Setting and Performance |
|----------|----------------|----------------|
| **MPI Values** | **Number of Items** | **Mean P-Values** |
| 90       | 51         | 85.4          |
| 60       | 92         | 73.3          |
| 45       | 24         | 69.7          |
| 36       | 5          | 69.8          |
| 30       | 1          | 62.0          |

Routine equating analyses were conducted to evaluate the consistency of the test’s difficulty and cutoff score relative to prior administrations. The results indicated that the test was more difficult in comparison with most prior tests, but very similar to the 2010 examination. As the level of candidate preparedness was similar to that of prior candidate populations and the pass-fail cut score was similar, the pass rate was similar as well, slightly below 90%.

Candidates whose overall score was at or above the pass-fail cut score received the IBCLC credential as an International Board Certified Lactation Consultant if they were taking the test for initial certification. If they were vying for recertification, a passing score allowed them to retain their IBCLC status. Any candidates whose overall score was below the cutoff score are eligible for re-examination; however, if they were recertification candidates, their certification status was terminated.
All candidates, regardless of whether they passed or failed the examination, received a supplementary diagnostic performance report that indicated their number of correct responses for each discipline and chronological period. For failing candidates, this report is useful in identifying subject matter strengths and weaknesses, which may be particularly valuable in preparing for a subsequent examination. For passing candidates, this report may identify subject matter areas where continuing education is likely to be most useful.

The aggregate performance for each content discipline and chronological period is shown in Tables 3 and 4, respectively. These tables indicate the number of items scored for each of the disciplines and periods, and the average percentage of correct responses.

**Table 3: Aggregate Performance on Content Disciplines**

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Number of Items Scored</th>
<th>Mean % of Items Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Maternal and Infant Anatomy</td>
<td>21</td>
<td>80.9</td>
</tr>
<tr>
<td>B. Maternal and Infant Normal Physiology and Endocrinology</td>
<td>21</td>
<td>79.4</td>
</tr>
<tr>
<td>C. Maternal and Infant Normal Nutrition and Biochemistry</td>
<td>9</td>
<td>77.0</td>
</tr>
<tr>
<td>D. Maternal and Infant Immunology and Infectious Disease</td>
<td>11</td>
<td>66.3</td>
</tr>
<tr>
<td>E. Maternal and Infant Pathology</td>
<td>30</td>
<td>71.4</td>
</tr>
<tr>
<td>F. Maternal and Infant Pharmacology and Toxicology</td>
<td>11</td>
<td>75.5</td>
</tr>
<tr>
<td>G. Psychology, Sociology, and Anthropology</td>
<td>12</td>
<td>80.6</td>
</tr>
<tr>
<td>H. Growth Parameters and Developmental Milestones</td>
<td>8</td>
<td>78.7</td>
</tr>
<tr>
<td>I. Interpretation of Research</td>
<td>5</td>
<td>72.7</td>
</tr>
<tr>
<td>J. Ethical and Legal Issues</td>
<td>6</td>
<td>89.4</td>
</tr>
<tr>
<td>K. Breastfeeding Equipment and Technology</td>
<td>9</td>
<td>67.2</td>
</tr>
<tr>
<td>L. Techniques</td>
<td>23</td>
<td>78.4</td>
</tr>
<tr>
<td>M. Public Health</td>
<td>7</td>
<td>74.8</td>
</tr>
</tbody>
</table>

* Based on items deleted selectively from scoring on translated versions because of linguistic flaws, the number of items within some disciplines is lower for some translated versions of the test.

For the content disciplines, the highest performance level was in discipline J (Ethical and Legal Issues), with a mean score of 89.4%. The lowest performance level was in discipline K (Breastfeeding Equipment and Technology), with a mean score of 67.2%. For the chronological periods, the range of subscores was less broad. The highest performance level was in period 2 (Prenatal), with a mean...
score of 84.7%. Period 3 (Labor/Birth {Perinatal}) had the lowest performance level, with a mean score of 67.3%.

### Table 4: Aggregate Performance on Chronological Periods

<table>
<thead>
<tr>
<th>Chronological Period</th>
<th>Number of Items Scored*</th>
<th>Mean % of Items Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Preconception</td>
<td>4</td>
<td>75.2</td>
</tr>
<tr>
<td>2. Prenatal</td>
<td>9</td>
<td>84.7</td>
</tr>
<tr>
<td>3. Labor/Birth (Perinatal)</td>
<td>8</td>
<td>67.3</td>
</tr>
<tr>
<td>4. Prematurity</td>
<td>8</td>
<td>73.9</td>
</tr>
<tr>
<td>5. 0-2 Days</td>
<td>25</td>
<td>78.0</td>
</tr>
<tr>
<td>6. 3-14 Days</td>
<td>19</td>
<td>71.0</td>
</tr>
<tr>
<td>7. 15-28 Days</td>
<td>21</td>
<td>80.6</td>
</tr>
<tr>
<td>8. 1-3 Months</td>
<td>14</td>
<td>67.9</td>
</tr>
<tr>
<td>9. 4-6 Months</td>
<td>14</td>
<td>73.9</td>
</tr>
<tr>
<td>10. 7-12 Months</td>
<td>5</td>
<td>68.2</td>
</tr>
<tr>
<td>11. Beyond 12 Months</td>
<td>4</td>
<td>82.0</td>
</tr>
<tr>
<td>12. General Principles</td>
<td>42</td>
<td>79.7</td>
</tr>
</tbody>
</table>

* Based on items deleted selectively from scoring on translated versions because of linguistic flaws, the number of items within some chronological periods is lower for some translated versions of the test.

Table 5 displays the candidate means and pass rates based on candidate certification status. In this table, performance is compared for candidates taking the test for initial certification, and for recertification at 5-, 10-, 15-, 20- and 25-year periods. Figure 2 displays these data in graphic format.

The performance of the candidates sitting for recertification was excellent. Each of the five recertification groups exhibited a higher mean and pass rate than the candidates sitting for initial certification. In addition, there was a linear progression in the mean performance among four of the five recertification groups. Generally, progressively longer recertification periods represent candidates with a longer career as a lactation consultant, and a commitment to continued knowledge and credential maintenance. Of the total 1,107 recertification candidates, 98.1% passed; this replicates a pattern of superior performance by recertification candidates on prior examinations.

The 27th administration of the IBLCE examination for certifying lactation consultants was very successful, and the Board congratulates all candidates who
sat for the examination, both for initial and continued certification. Regardless of whether they passed or failed, these candidates had the courage and fortitude to accept the challenge of the examination. The Board is also grateful to the members of the Examination Committee and to the many professionals who contributed test items and images for the examination.

<table>
<thead>
<tr>
<th>Certification Status</th>
<th>Number of Candidates</th>
<th>Mean Score</th>
<th>Pass Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Certification</td>
<td>5069</td>
<td>75.3</td>
<td>86.3</td>
</tr>
<tr>
<td>Recertification by Exam at 5 Years</td>
<td>156</td>
<td>78.0</td>
<td>95.5</td>
</tr>
<tr>
<td>Recertification by Exam at 10 Years</td>
<td>712</td>
<td>80.6</td>
<td>98.2</td>
</tr>
<tr>
<td>Recertification by Exam at 15 Years</td>
<td>75</td>
<td>80.9</td>
<td>100.0</td>
</tr>
<tr>
<td>Recertification by Exam at 20 Years</td>
<td>145</td>
<td>83.4</td>
<td>100.0</td>
</tr>
<tr>
<td>Recertification by Exam at 25 Years</td>
<td>19</td>
<td>82.7</td>
<td>94.7</td>
</tr>
<tr>
<td>Recertification Total</td>
<td>1107</td>
<td>80.7</td>
<td>98.1</td>
</tr>
</tbody>
</table>

Figure 2: Comparative Performance by Certification Status
The next administration of the IBLCE examination will be in July 2012.