



## Annual Report of Examinations: Primary Eligibility Pathway 2021

### Introduction

The ARRT offers two eligibility pathways for certification and registration: primary and postprimary. This report summarizes examination statistics for individuals applying through the primary eligibility pathway in 2021 for Radiography (RAD), Nuclear Medicine Technology (NMT), Radiation Therapy (THR), Sonography (SON), and Magnetic Resonance Imaging (MRI). This report uses an annual cycle from January to December that aligns with updates to the content specifications and clinical competency requirements for these disciplines. During the reported cycle, the Sonography, Vascular Sonography, and Magnetic Resonance Imaging exams could be taken by those qualifying through either the primary or postprimary eligibility pathway. Only results for those qualifying through the primary eligibility pathway are reported here.

This report summarizes exam volume, first-time candidate exam performance, individual percentile ranks, and school percentile ranks for each examination separately. Each following section presents a brief content outline for the exam and the number of items in each category. Specific results for 2021 are presented including mean scaled section scores, mean total scaled scores, and pass rates as well as charts with historical pass rates and candidate volumes for each exam. Finally, a map detailing first-time candidate volume, mean scaled score, and percent passing for educational programs in each state is included.

Data in this report are not intended to be used as the sole source for educational program evaluation. When interpreting performance at the educational program or state level, it is important to acknowledge that these results are sensitive to multiple factors. These factors may include but are not limited to the number of candidates upon which the means are computed, characteristics of those candidates, educational program admissions criteria, and the emphasis of an educational program's curriculum.

### Interpretation of Scores

**Total Scaled Score:** The ARRT uses scaled scores to report exam results. Total scaled scores can range from 1 to 99.

Scaled scores are desirable because they account for any differences in difficulty between two or more versions of an exam. The use of scaled scores adjusts for differences in exam difficulty such that a given scaled score corresponds to the same level of performance regardless of exam form and permits comparison of exam results over time. Using scaled scores also ensures that those taking different forms are not penalized for taking a slightly more difficult exam.

Scaled scores are sometimes mistaken for percent correct scores. This confusion likely arises because ARRT scaled scores and percentages share a similar range of values. However, a scaled score of 75 does not mean that a candidate correctly answered 75% of the test items.

**Section Scores:** Scaled scores are used to report performance on each section of the exam. The primary purpose of the section scores is to provide general information to candidates regarding their strengths and weaknesses in particular content categories. Section scores can range from 0.1 to 9.9 and are reported in one-tenth point intervals (e.g., 8.1, 8.6). Section scores are intentionally placed on a narrower scale because they are often based on a small number of test



items. Therefore, section scores are not as reliable as the total scaled score and should be interpreted with some caution.

**Passing Score:** A total scaled score of 75 is required to pass all ARRT exams. This pass-fail point, called the “cut score,” is established by ARRT’s Board of Trustees through a process called standard setting. During the standard setting process, the Board receives input from a panel representing a broad constituency of radiologic technologists. The cut score represents the performance standard required to obtain certification and registration; those who meet or exceed the standard pass the exam. Beginning in 2013, the Sonography exam also requires a section scaled score of 7.5 or greater in both the Abdomen and OB/GYN sections.

Readers interested in more detailed reporting, such as an explanation of ARRT’s scaling procedures, or past years’ reports are encouraged to visit the [exam statistics](#) page on the ARRT website.

## Updates

Starting in mid-2021, ARRT introduced a primary eligibility pathway for Vascular Sonography (VS). See the news article [here](#) for more information. Vascular Sonography will not appear in this year’s report as this pathway was not utilized in 2021.

## Summary Statistics

### Exam Volume

Exam	First-time Candidates	Repeat	State	Reinstatement	Total
Radiography	12252	2326	27	353	14958
Nuclear Medicine Technology	414	69	0	2	485
Radiation Therapy	846	240	0	14	1100
Sonography	481	171	0	1	653
Magnetic Resonance Imaging	567	176	0	4	747

Note: The “State” category includes non-ARRT candidates who take an exam only for state licensure. The “Reinstatement” category includes all reinstatement by re-examination candidates.

### First-time Candidate Exam Performance

Exam	Approximate % Correct to Pass	Mean Scaled Score	Pass Rate
Radiography	67	82.3	83.8%
Nuclear Medicine Technology	62	81.0	79.5%
Radiation Therapy	68	80.7	79.8%
Sonography*	67	77.5	56.1%
Magnetic Resonance Imaging	66	78.2	66.3%

\*The Sonography exam requires a passing candidate to achieve a scaled score of 75 or greater on the whole exam, and in addition, achieve section scaled scores of 7.5 or greater in both the Abdominal and OB/GYN sections.



### Individual Performance Percentiles (First-time Candidates)

Percentile Rank	Scaled Score				
	RAD	NMT	THR	SON	MRI
<b>95</b>	93	93	92	92	93
<b>90</b>	92	91	90	89	91
<b>85</b>	91	89	88	87	89
<b>80</b>	90	88	88	86	88
<b>75</b>	88	87	86	84	87
<b>70</b>	87	86	86	83	85
<b>65</b>	86	85	85	82	84
<b>60</b>	85	84	84	81	83
<b>55</b>	84	83	83	79	81
<b>50</b>	83	82	82	78	80
<b>45</b>	82	81	81	77	79
<b>40</b>	81	80	79	76	76
<b>35</b>	80	78	79	74	75
<b>30</b>	79	77	77	74	73
<b>25</b>	78	76	76	72	71
<b>20</b>	76	74	74	70	69
<b>15</b>	74	72	72	67	66
<b>10</b>	71	70	69	65	63
<b>5</b>	67	66	66	61	58

Note: This percentile rank indicates the percentage of candidates scoring below a specified scaled score. Exams with fewer than 60 candidates are reported with fewer percentile categories.



### Educational Program Mean Performance Percentiles (First-time Candidates)

Percentile Rank	Scaled Score				
	RAD	NMT	THR	SON	MRI
<b>95</b>	89	89	87	91	90
<b>90</b>	88	88	87	87	89
<b>85</b>	87	86	85	84	88
<b>80</b>	86	86	85	83	88
<b>75</b>	86	85	84	82	87
<b>70</b>	85	84	83	82	87
<b>65</b>	85	84	83	81	86
<b>60</b>	84	84	82	80	86
<b>55</b>	84	83	81	79	85
<b>50</b>	83	82	81	78	83
<b>45</b>	83	82	81	76	82
<b>40</b>	82	81	80	76	79
<b>35</b>	82	80	80	73	78
<b>30</b>	81	79	79	72	78
<b>25</b>	80	78	78	71	76
<b>20</b>	79	78	77	70	76
<b>15</b>	78	75	76	68	75
<b>10</b>	77	74	75	68	73
<b>5</b>	75	71	74	67	70

Note: This percentile rank indicates the percentage of educational programs below a specified scaled score. Exams with fewer than 60 educational programs are reported with fewer percentile categories.

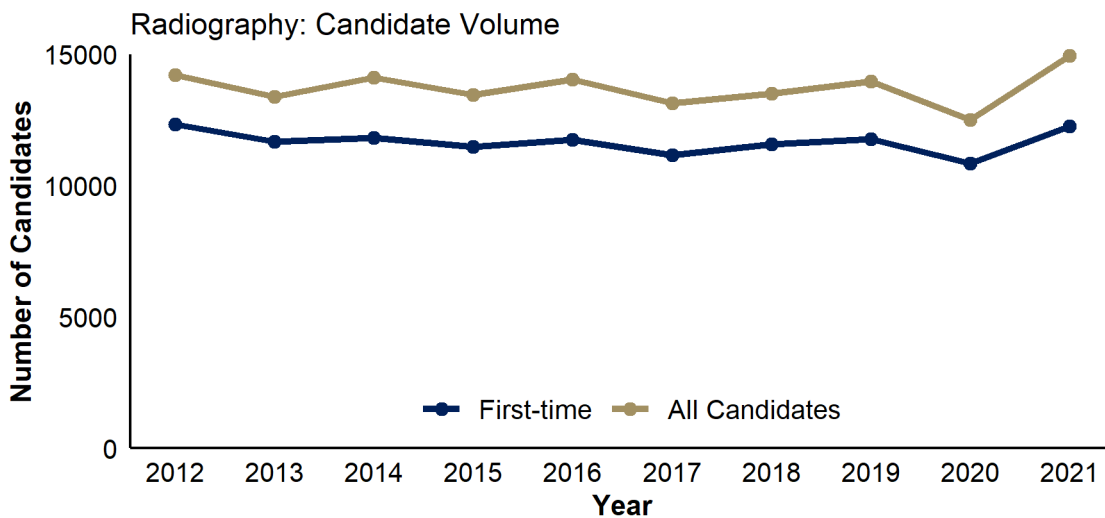
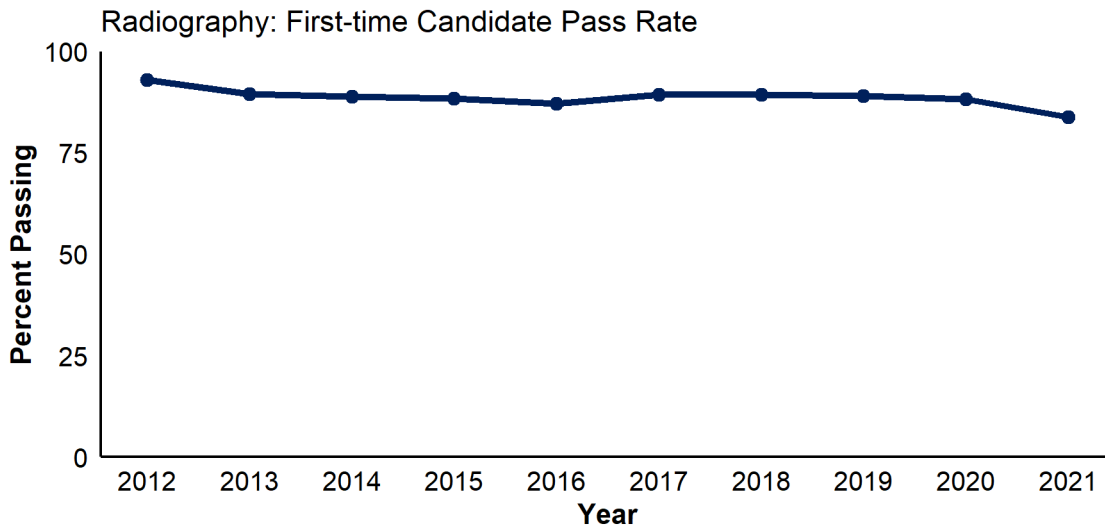


# Exam Performance for Radiography

## Content Categories and First-time Candidate Scores

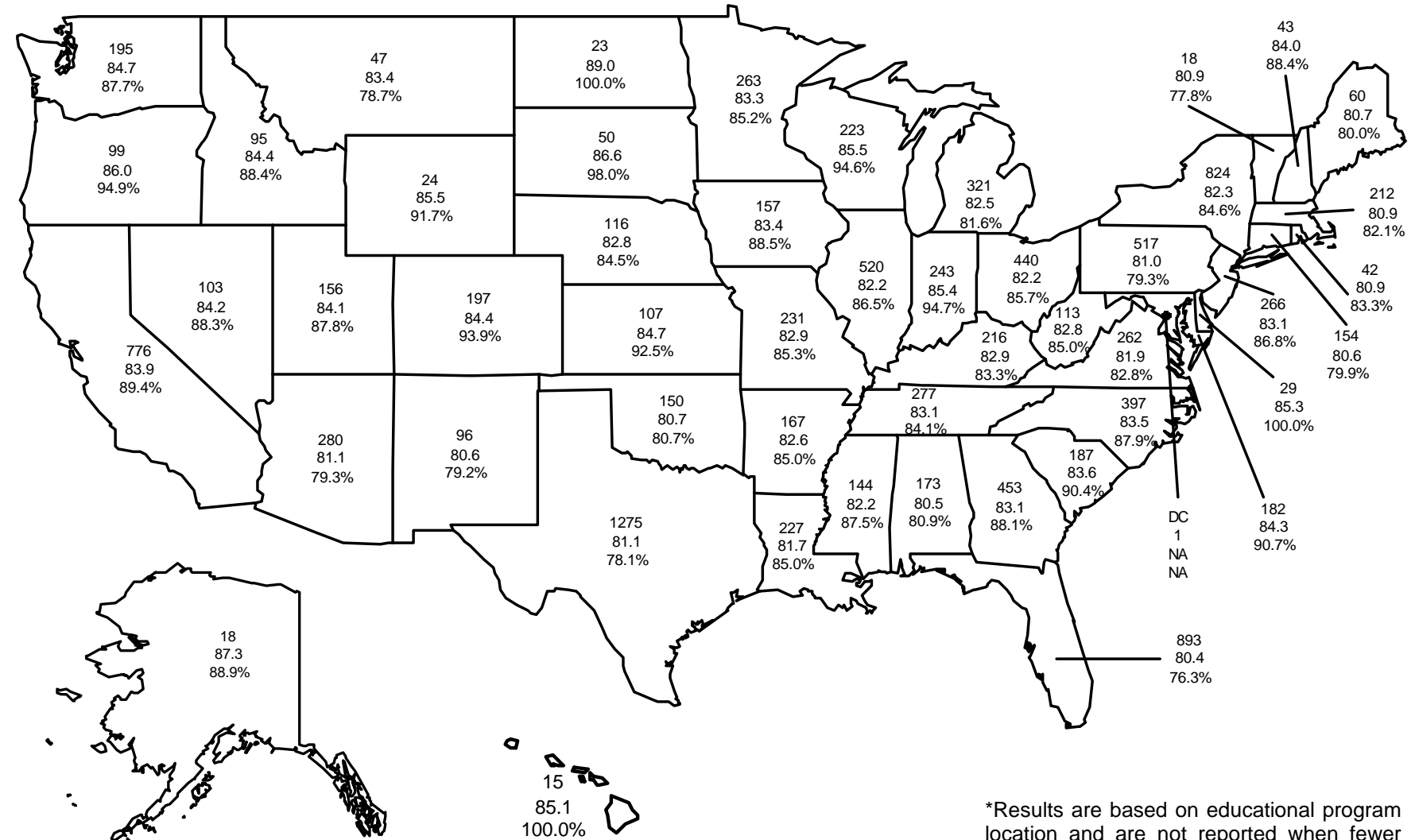
Content Categories	# Items	Mean Score
Patient Interactions and Management	33	8.4
Radiation Physics and Radiobiology	22	8.2
Radiation Protection	31	8.1
Image Acquisition and Technical Evaluation	21	8.2
Equipment Operation and Quality Assurance	29	8.1
Head, Spine, and Pelvis Procedures	18	8.3
Thorax and Abdomen Procedures	21	8.2
Extremity Procedures	<u>25</u>	<u>8.3</u>
<b>Total</b>	<b>200</b>	<b>82.3</b>

**Pass Rate: 83.80%**



## Radiography

### Number of First-time Candidates, Mean Scaled Score, and Percentage Passing\*



\*Results are based on educational program location and are not reported when fewer than three candidates from a state took the examination.

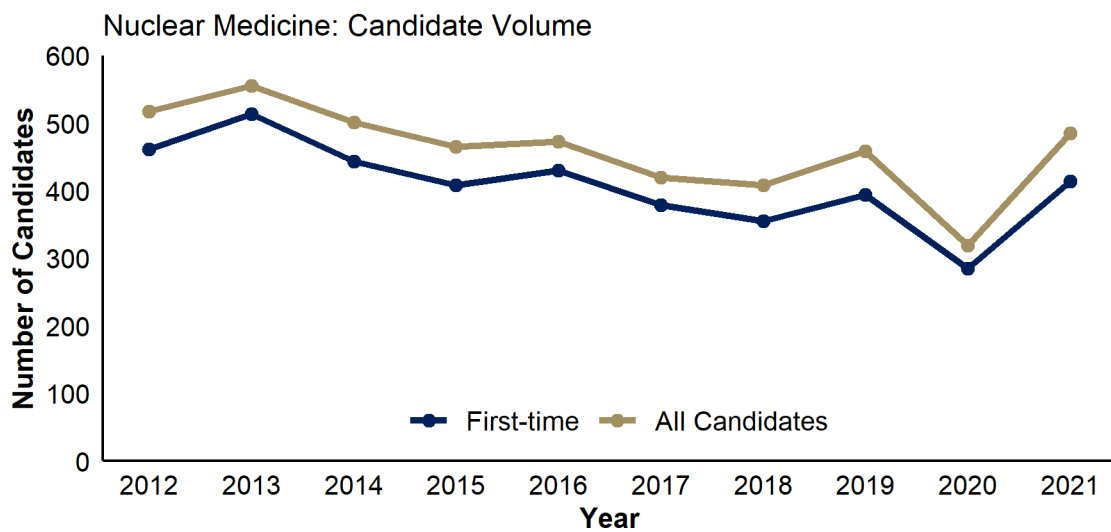
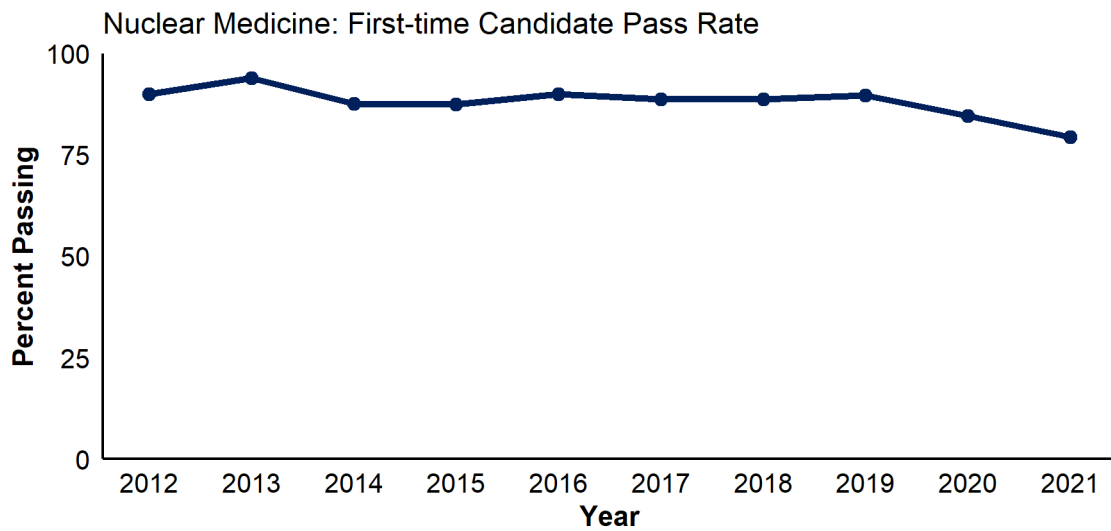


## Exam Performance for Nuclear Medicine Technology

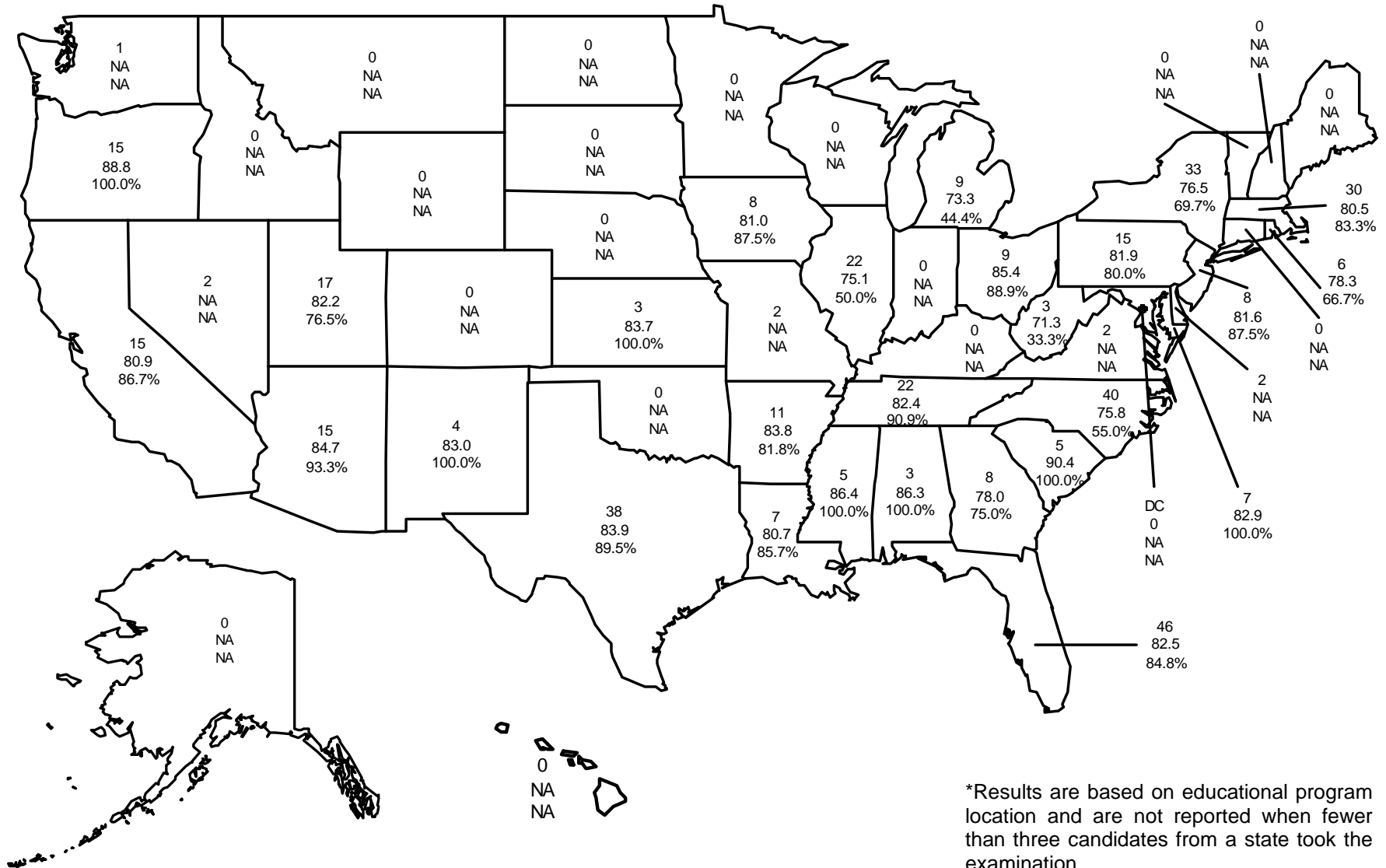
### Content Categories and First-time Candidate Scores

Content Categories	# Items	Mean Score
Patient Interactions and Management	20	8.2
Radiation Physics, Radiobiology, and Regulations	22	8.0
Instrumentation	38	8.1
Radionuclides and Radiopharmaceuticals	24	7.9
Cardiac Procedures	24	8.3
Endocrine and Oncology Procedures	28	7.7
Gastrointestinal and Genitourinary Procedures	20	8.3
Other Imaging Procedures	<u>24</u>	<u>8.4</u>
<b>Total</b>	<b>200</b>	<b>81.0</b>

**Pass Rate: 79.50%**



## Nuclear Medicine Technology Number of First-time Candidates, Mean Scaled Score, and Percentage Passing\*



\*Results are based on educational program location and are not reported when fewer than three candidates from a state took the examination.



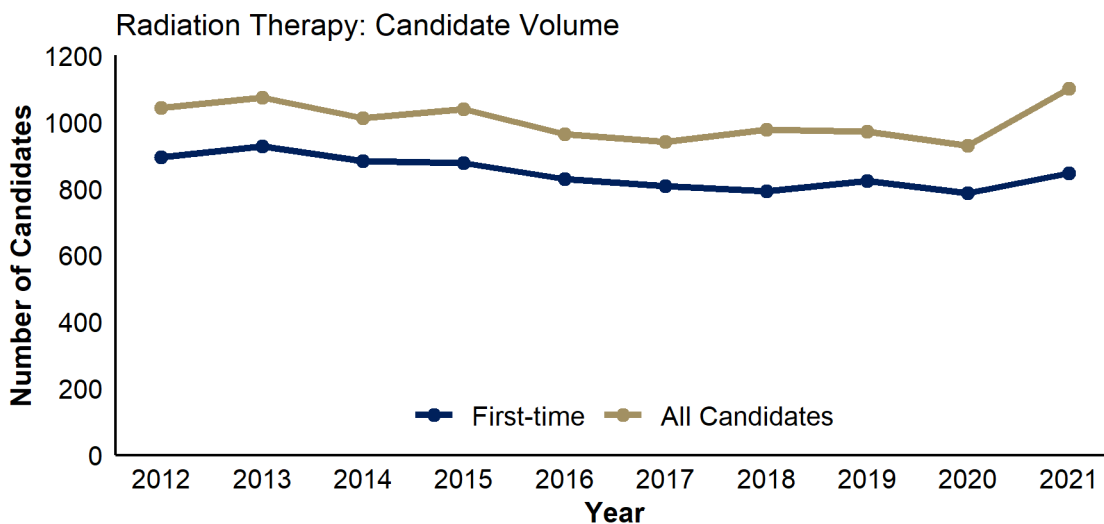
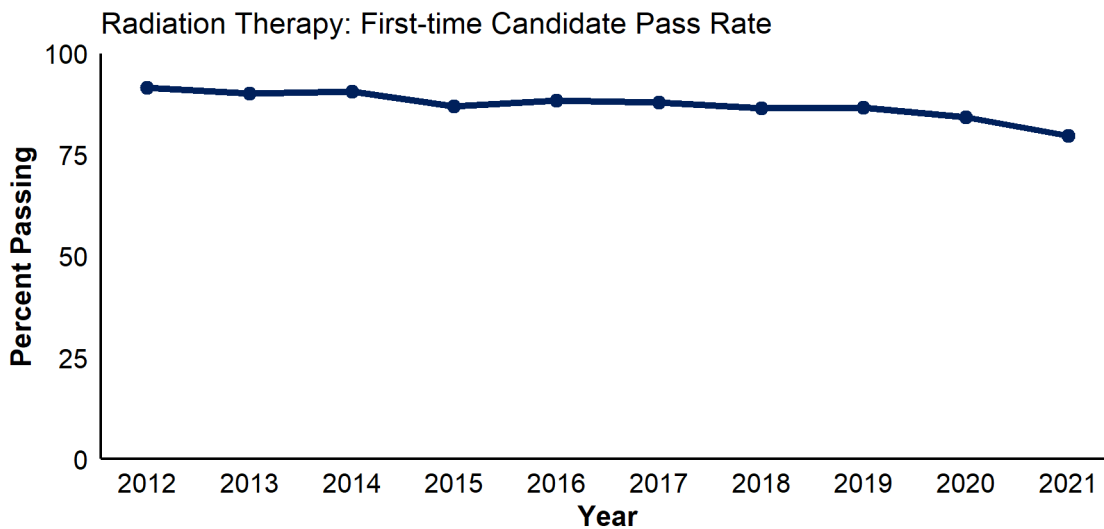


## Exam Performance for Radiation Therapy

### Content Categories and First-time Candidate Scores

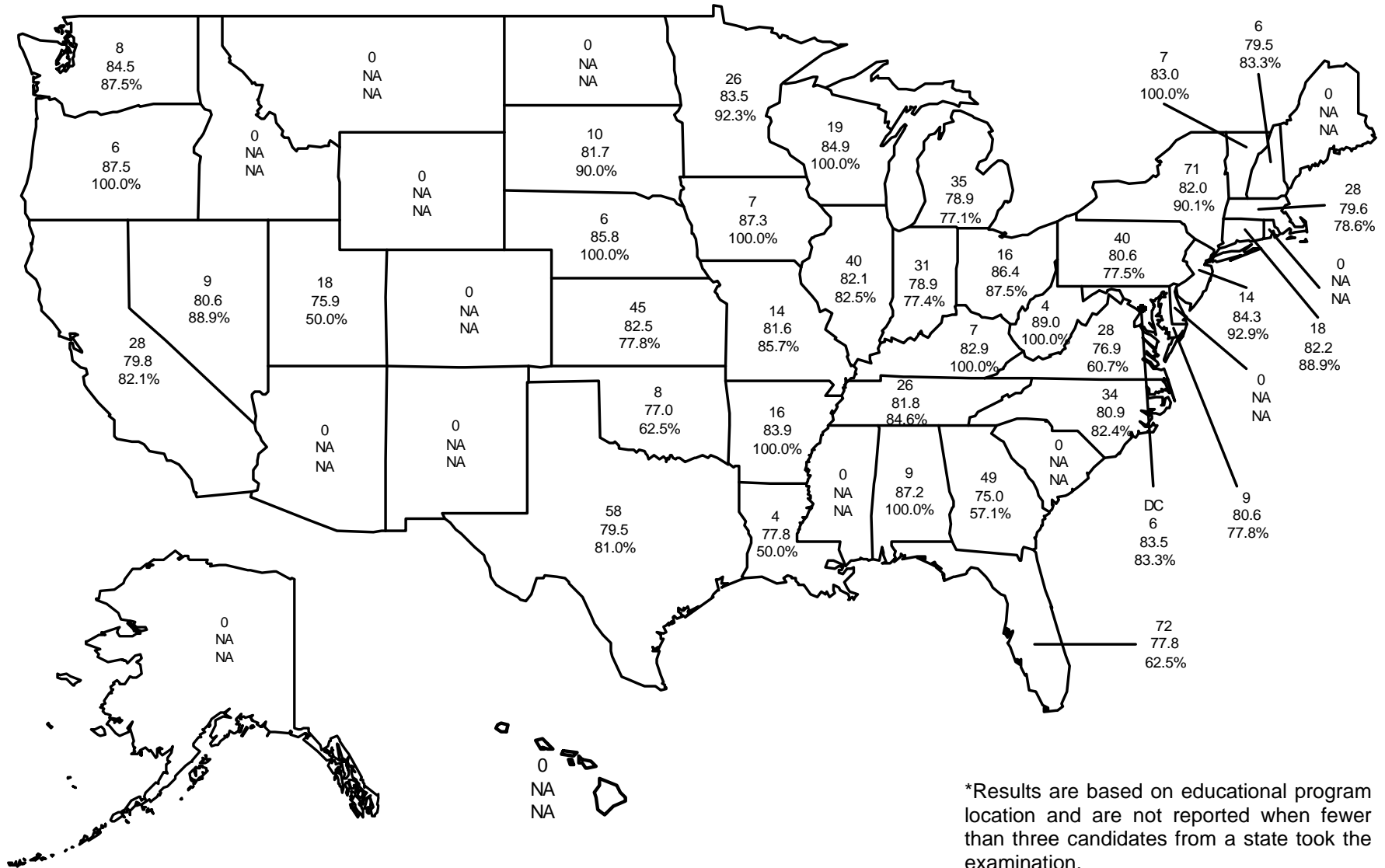
Content Categories	# Items	Mean Score
Patient Interactions	25	8.6
Patient and Medical Record Management	22	8.1
Radiation Physics, Equipment, and Quality Assurance	20	7.7
Radiation Protection	29	7.7
Treatment Sites and Tumors	26	8.1
Treatment Volume Localization	18	8.2
Prescription and Dose Calculation	24	7.8
Treatments	<u>36</u>	<u>8.4</u>
<b>Total</b>	<b>200</b>	<b>80.7</b>

**Pass Rate: 79.80%**



## Radiation Therapy

### Number of First-time Candidates, Mean Scaled Score, and Percentage Passing\*



\*Results are based on educational program location and are not reported when fewer than three candidates from a state took the examination.



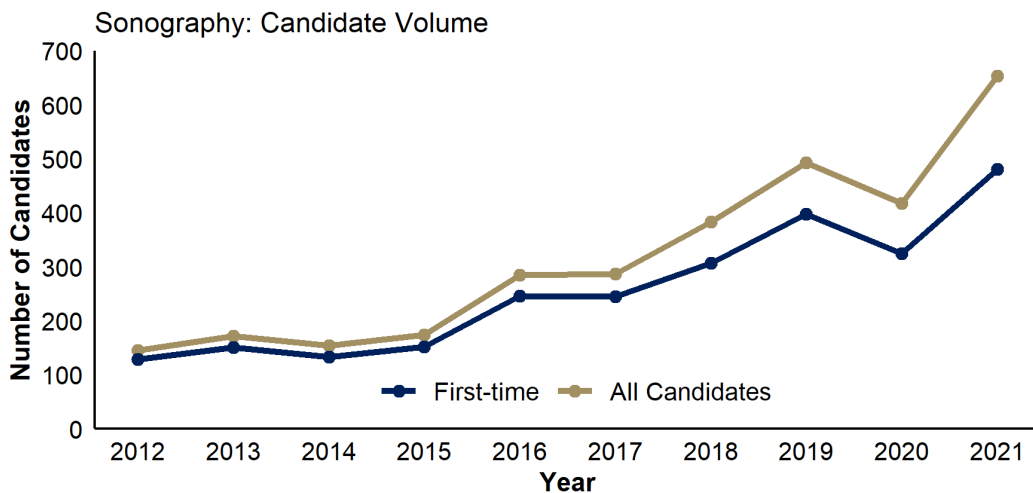
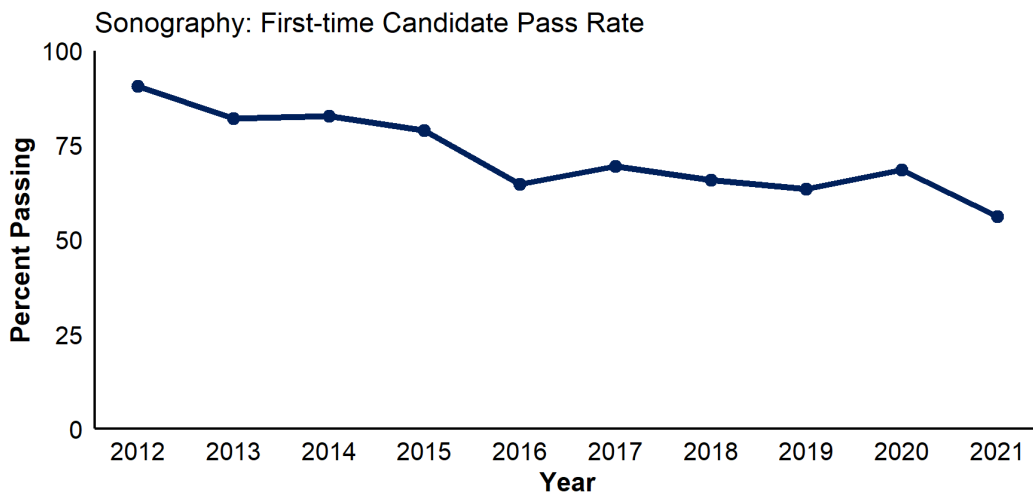
## Exam Performance for Sonography

### Content Categories and First-time Candidate Scores

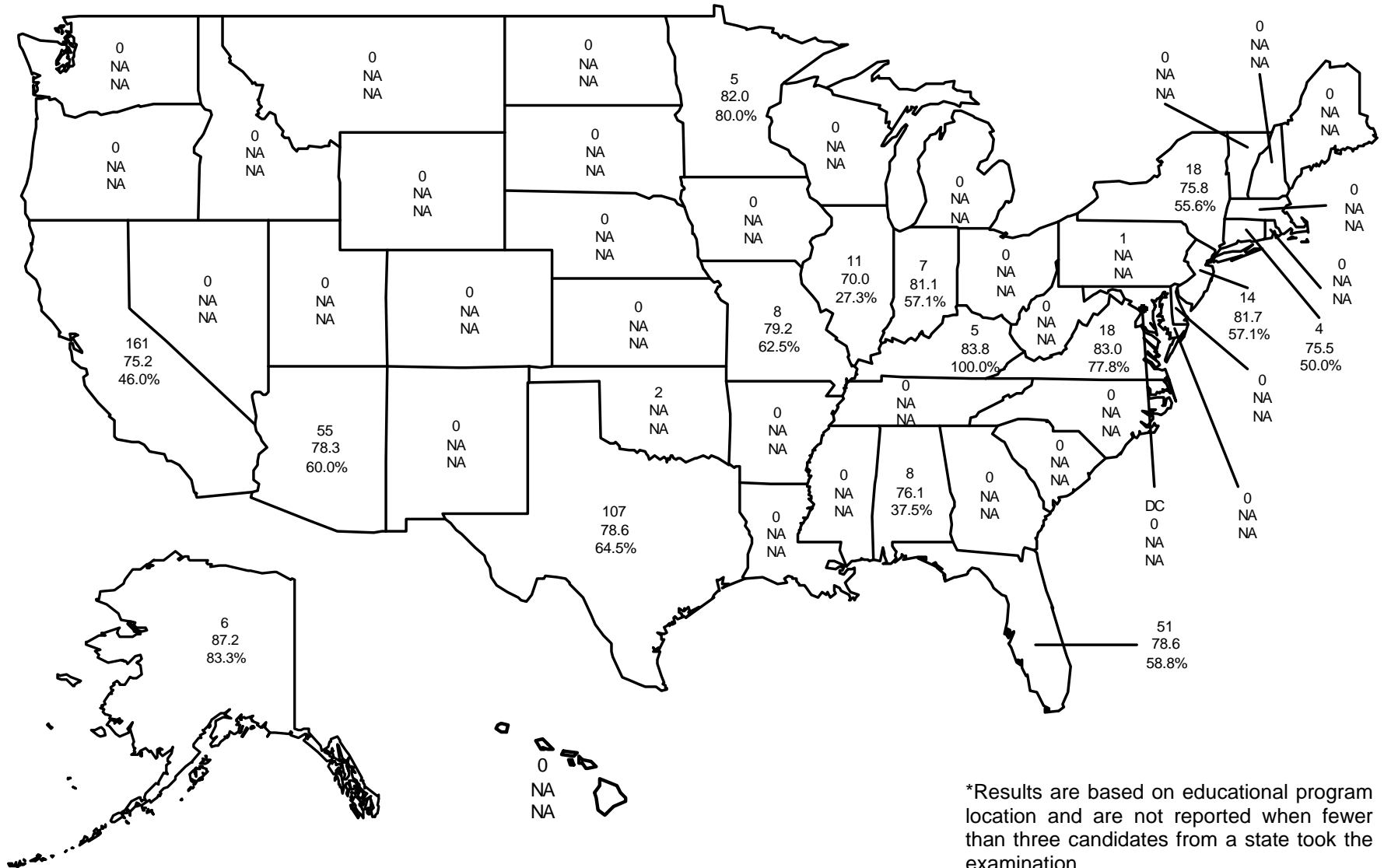
Content Categories	# Items	Mean Score
Patient Interactions and Management	29	8.0
Basic Principles of Ultrasound	50	7.4
Image Formation	44	7.6
Evaluation and Selection of Representative Images	21	8.3
Abdomen	75	7.8
<i>OB/GYN*</i>	<i>109*</i>	<i>7.8*</i>
First Trimester Obstetrics	18	8.0
Second/Third Trimester Obstetrics	61	7.7
Gynecology	30	8.0
Superficial Structures and Other Sonographic Procedures	<u>32</u>	<u>7.6</u>
<b>Total</b>	<b>360</b>	<b>77.5</b>

**Pass Rate: 56.10%**

\* The OBGYN score is a composite of the First Trimester Obstetrics, Second/Third Trimester and High Risk Obstetrics, and Gynecology sections.



## Sonography Number of First-time Candidates, Mean Scaled Score, and Percentage Passing\*

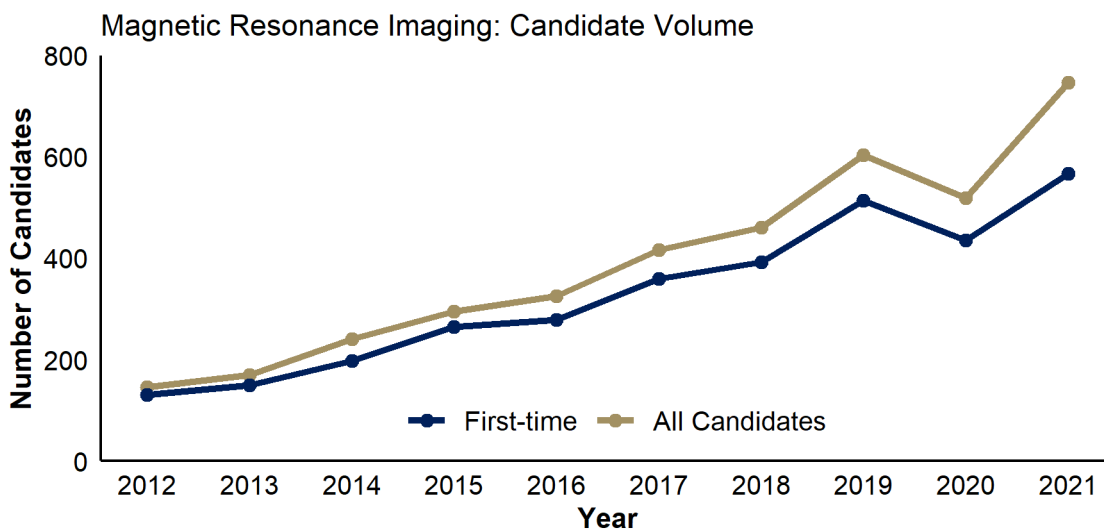
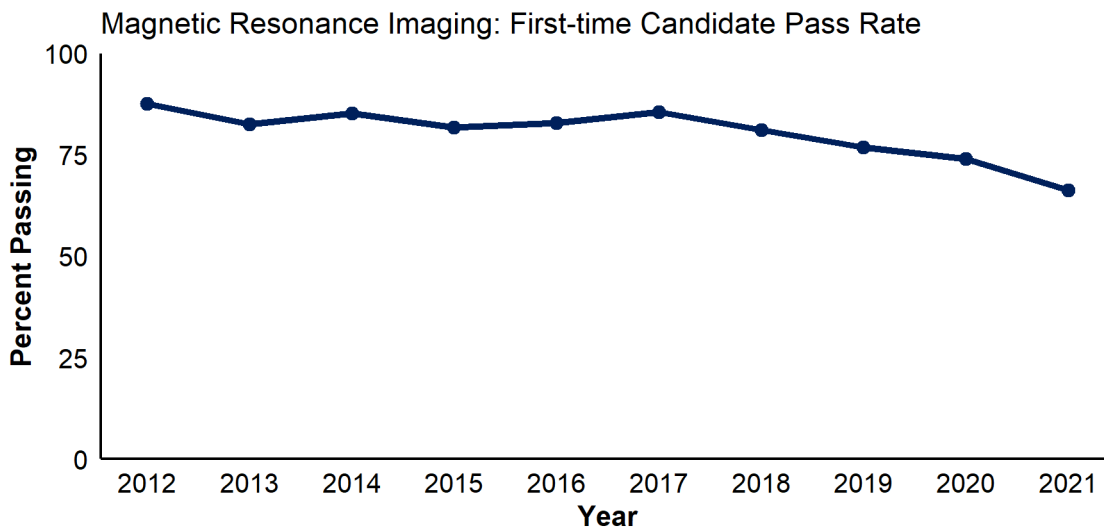


## Exam Performance for Magnetic Resonance Imaging

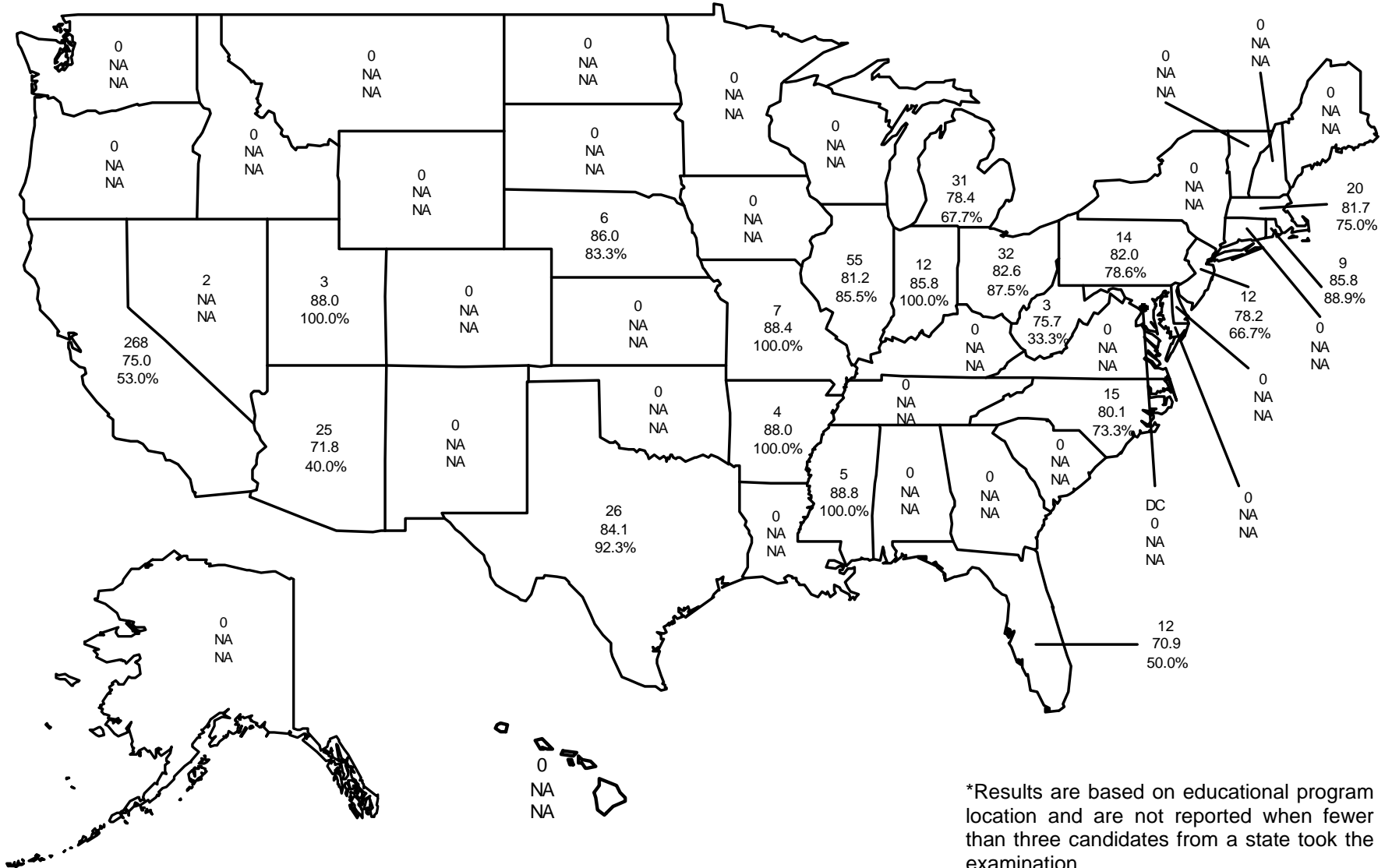
### Content Categories and First-time Candidate Scores

Content Categories	# Items	Mean Score
Patient Interactions and Management	18	7.6
MRI Screening and Safety	20	7.9
Physical Principles of Image Formation	39	7.9
Sequence Parameters and Options	36	8.0
Data Acquisition, Processing, and Storage	30	7.8
Neurological	25	8.0
Body	15	7.3
Musculoskeletal	<u>17</u>	<u>7.7</u>
<b>Total</b>	<b>200</b>	<b>78.2</b>

**Pass Rate: 66.30%**



## Magnetic Resonance Imaging Number of First-time Candidates, Mean Scaled Score, and Percentage Passing\*



\*Results are based on educational program location and are not reported when fewer than three candidates from a state took the examination.

