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 2022 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, both the 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 2022 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 subject matter experts. 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 not enough candidates utilized this pathway in 2022.

New content specifications went into effect January 1, 2022 for Radiography, Nuclear Medicine Technology, and Radiation Therapy. All exam content specifications may be found on the ARRT website here.

Summary Statistics

Exam Volume

Exam	First-time Candidates	Repeat	State	Reinstatement	Total
Radiography	11293	2611	41	385	14330
Nuclear Medicine Technology	404	84	2	8	498
Radiation Therapy	833	228	1	20	1082
Sonography	487	189	0	2	678
Magnetic Resonance Imaging	636	215	0	6	857

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 %
Radiography	67	82.4	83.5
Nuclear Medicine Technology	64	81.3	80.2
Radiation Therapy	69	80.6	79.6
Sonography*	67	77.3	55.0
Magnetic Resonance Imaging	67	77.4	65.1

*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**
95	94	93	91	91	93
90	92	91	89	89	92
85	91	89	88	87	90
80	90	88	87	86	88
75	89	87	86	84	87
70	88	86	85	83	85
65	87	85	85	82	83
60	86	84	84	80	82
55	85	83	83	79	81
50	84	82	81	78	80
45	83	81	81	77	78
40	82	80	79	76	77
35	80	79	79	74	75
30	79	78	77	73	71
25	78	76	76	72	69
20	76	75	74	70	67
15	74	73	73	68	64
10	71	71	71	64	60
5	66	67	67	60	56

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) and Number of Programs

Percentile Rank	Scaled Score				
	RAD (N = 735)	NMT (N = 95)	THR (N = 101)	SON (N = 220)	MRI (N = 62)
95	89	89	87	87	92
90	88	88	86	86	90
85	87	87	85	83	90
80	86	87	84	83	87
75	86	85	84	82	84
70	85	85	83	81	83
65	85	84	83	79	82
60	84	84	83	78	81
55	84	83	82	78	81
50	83	81	81	77	80
45	83	81	81	76	78
40	82	80	80	75	78
35	82	80	79	75	78
30	81	79	79	73	77
25	81	78	78	72	75
20	80	78	77	70	74
15	79	77	77	70	73
10	77	76	76	68	72
5	74	74	74	65	67

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.
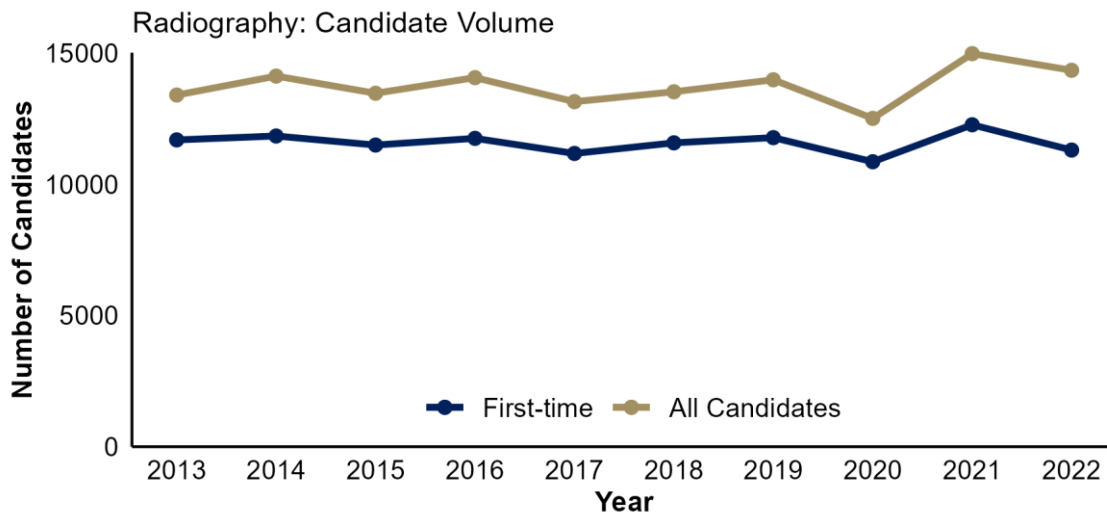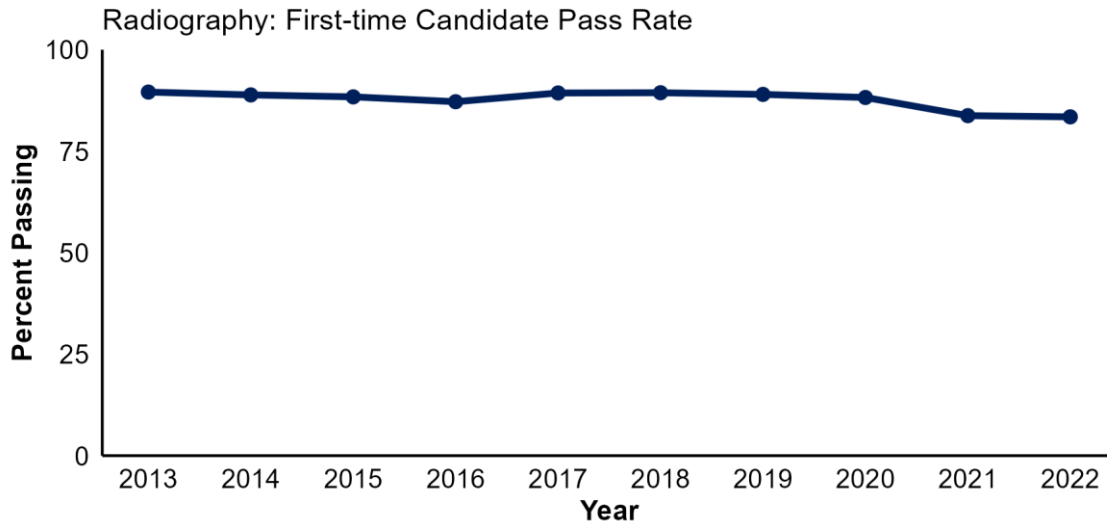
Exam Performance for Radiography

Content Categories and First-time Candidate Scores

Content Categories	# Items	Mean Score
Patient Interactions and Management	33	8.5
Radiation Physics and Radiobiology	21	8.3
Radiation Protection	29	8.3
Image Acquisition and Technical Evaluation	26	7.9
Equipment Operation and Quality Assurance	25	7.9
Head, Spine, and Pelvis Procedures	18	8.2
Thorax and Abdomen Procedures	20	8.2
Extremity Procedures	<u>28</u>	<u>8.5</u>
Total	200	82.4

Pass Rate: 83.5%

Radiography: First-time Candidate Pass Rate

Radiography: Candidate Volume

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

182
83.5
83.0%

43
80.8
69.8%

22
91.5
100.0%

249
82.9
86.7%

14
76.4
57.1%

43
81.7
88.4%

61
81.9
86.9%

77
84.6
92.2%

79
83.8
92.4%

56
86.2
92.9%

213
85.1
92.5%

644
82.4
82.9%

178
81.3
78.7%

21
82.3
85.7%

146
83.1
87.0%

300
82.7
84.7%

391
81.6
79.3%

38
81.7
84.2%

115
83.0
84.3%

481
82.7
85.9%

229
84.9
92.6%

429
81.8
82.5%

220
83.4
87.3%

101
85.9
95.0%

159
84.5
85.5%

193
83.0
85.0%

114
85.0
93.9%

214
84.5
92.1%

206
82.9
86.9%

92
82.6
88.0%

260
83.2
86.9%

123
83.3
84.6%

750
82.9
84.8%

136
81.3
88.2%

148
82.7
83.1%

261
83.5
86.6%

351
84.5
90.6%

26
83.6
88.5%

240
81.4
78.8%

75
78.5
69.3%

173
83.2
86.7%

137
84.1
86.9%

136
82.7
89.0%

206
81.8
87.9%

344
84.0
88.1%

DC
6
81.0
100.0%

1194
81.3
79.0%

222
82.6
86.0%

980
80.6
77.0%

18
85.8
88.9%

14
85.1
92.9%

*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	24	8.6
Radiation Physics, Radiobiology, and Regulations	25	8.2
Instrumentation	33	7.7
Radionuclides and Radiopharmaceuticals	28	8.1
Cardiac Procedures	25	8.2
Endocrine and Oncology Procedures	25	8.2
Gastrointestinal and Genitourinary Procedures	18	8.2
Other Imaging Procedures	22	8.1
Total	200	81.3

Pass Rate: 80.2%

Nuclear Medicine: First-time Candidate Pass Rate

Nuclear Medicine: Candidate Volume

Nuclear Medicine
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.
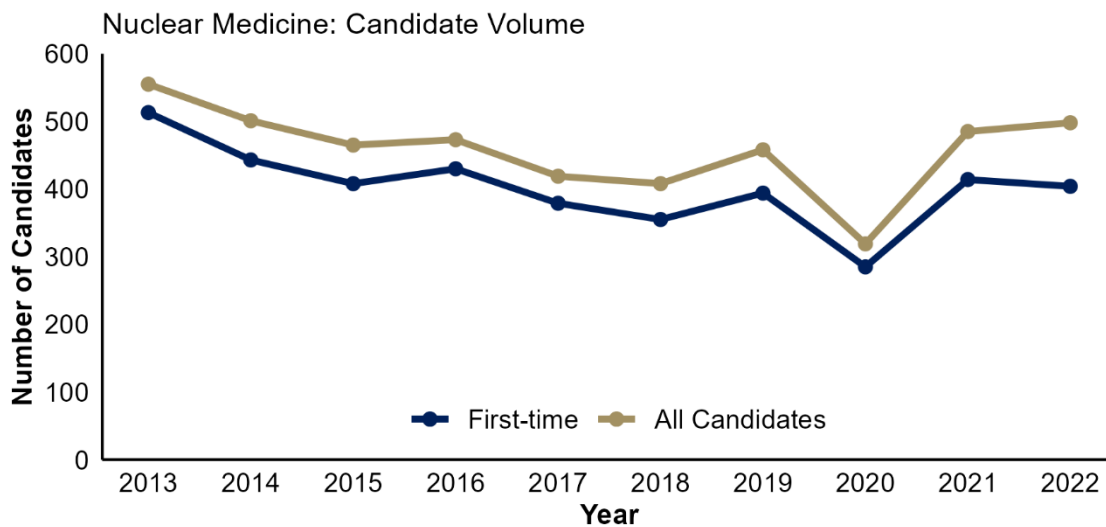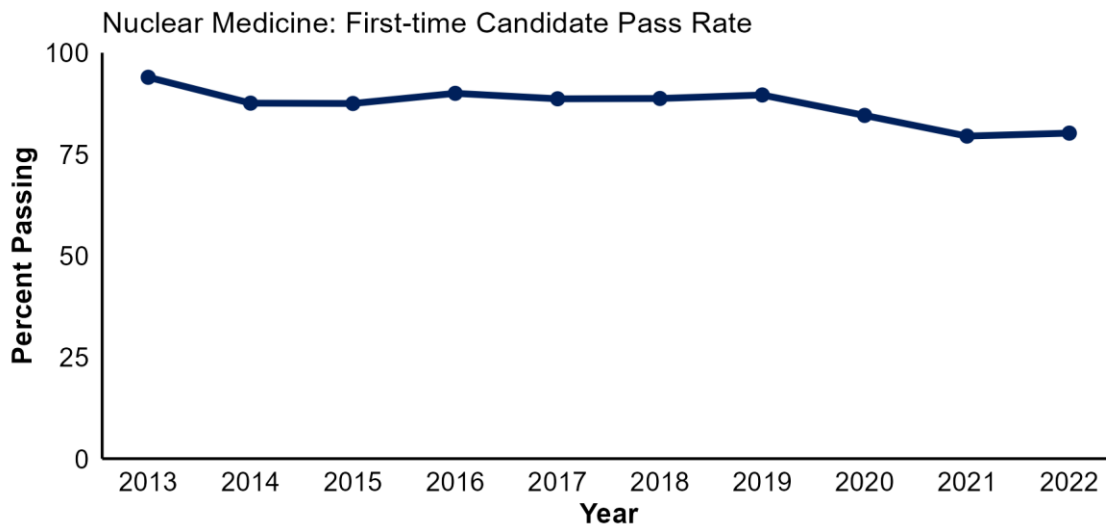
Exam Performance for Radiation Therapy
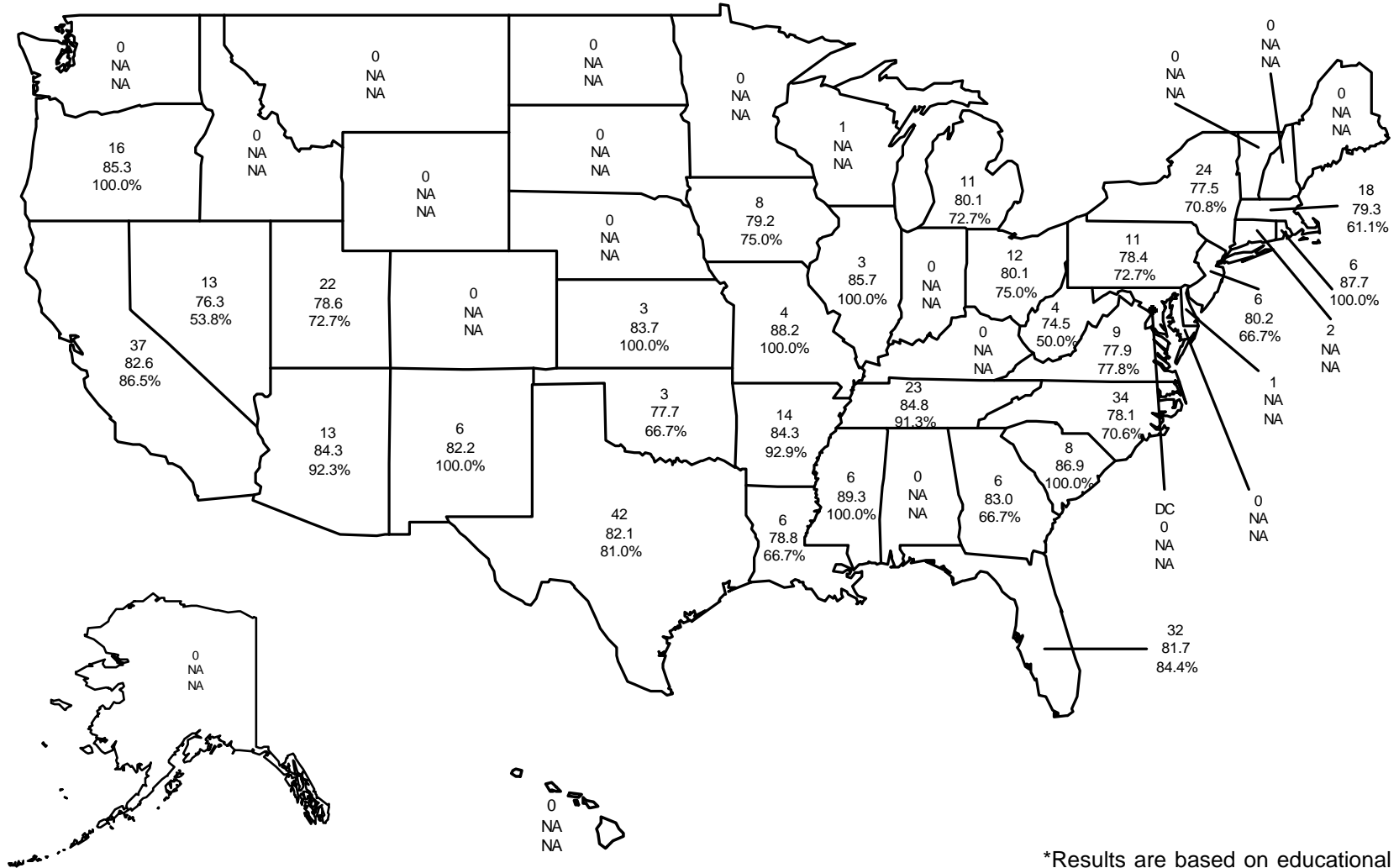
Content Categories and First-time Candidate Scores

Content Categories	# Items	Mean Score
Patient Interactions and Management	29	8.7
Patient and Medical Record Management	17	8.1
Radiation Physics and Radiobiology	21	7.7
Radiation Protection, Equipment Operation, and Quality Assurance	30	7.8
Treatment Sites and Tumors	26	8.3
Treatment Volume Localization	18	8.2
Prescription and Dose Calculation	24	7.6
Treatments	<u>35</u>	<u>8.0</u>
Total	200	80.6

Pass Rate: 79.6%

Radiation Therapy: First-time Candidate Pass Rate

Radiation Therapy: Candidate Volume

Radiation Therapy
Number of First-time Candidates, Mean Scaled Score, and Percentage Passing*

Map of the United States showing, for each state, the number of first-time candidates, mean scaled score, and percentage passing:

- Washington: 10, 83.4, 100.0%
- Oregon: 9, 87.9, 100.0%
- Idaho: 0, NA, NA
- Montana: 0, NA, NA
- North Dakota: 0, NA, NA
- Minnesota: 31, 82.4, 90.3%
- Wisconsin: 21, 85.5, 100.0%
- Michigan: 48, 78.5, 68.8%
- New York: 63, 82.3, 88.9%
- Vermont: 8, 83.9, 100.0%
- New Hampshire: 5, 82.0, 100.0%
- Maine: 0, NA, NA
- Massachusetts: 20, 73.2, 50.0%
- South Dakota: 6, 79.7, 83.3%
- Wyoming: 0, NA, NA
- Iowa: 7, 85.6, 85.7%
- Nebraska: 8, 82.8, 75.0%
- Illinois: 41, 81.1, 75.6%
- Indiana: 18, 81.8, 88.9%
- Ohio: 22, 84.5, 90.9%
- Pennsylvania: 27, 79.0, 74.1%
- New Jersey: 14, 81.1, 92.9%
- Connecticut: 0, NA, NA
- Rhode Island: 8, 85.5, 87.5%
- Nevada: 7, 79.3, 71.4%
- Utah: 32, 75.5, 53.1%
- Colorado: 0, NA, NA
- Kansas: 37, 84.7, 97.3%
- Missouri: 12, 78.1, 66.7%
- Kentucky: 13, 76.9, 61.5%
- West Virginia: 4, 89.5, 100.0%
- Virginia: 30, 81.4, 83.3%
- Maryland: 0, NA, NA
- Delaware: 14, 81.1, 85.7%
- California: 29, 81.3, 86.2%
- Arizona: 0, NA, NA
- New Mexico: 0, NA, NA
- Oklahoma: 10, 77.0, 60.0%
- Arkansas: 11, 83.0, 100.0%
- Tennessee: 20, 79.4, 75.0%
- North Carolina: 37, 81.1, 78.4%
- South Carolina: 0, NA, NA
- Texas: 54, 82.7, 83.3%
- Louisiana: 3, 80.0, 100.0%
- Mississippi: 0, NA, NA
- Alabama: 7, 81.4, 100.0%
- Georgia: 61, 74.7, 57.4%
- DC: 6, 78.2, 83.3%
- Florida: 73, 80.5, 79.5%
- Alaska: 0, NA, NA
- Hawaii: 0, NA, NA

*Results are based on educational program location and are not reported when fewer than three candidates from a state took the examination.
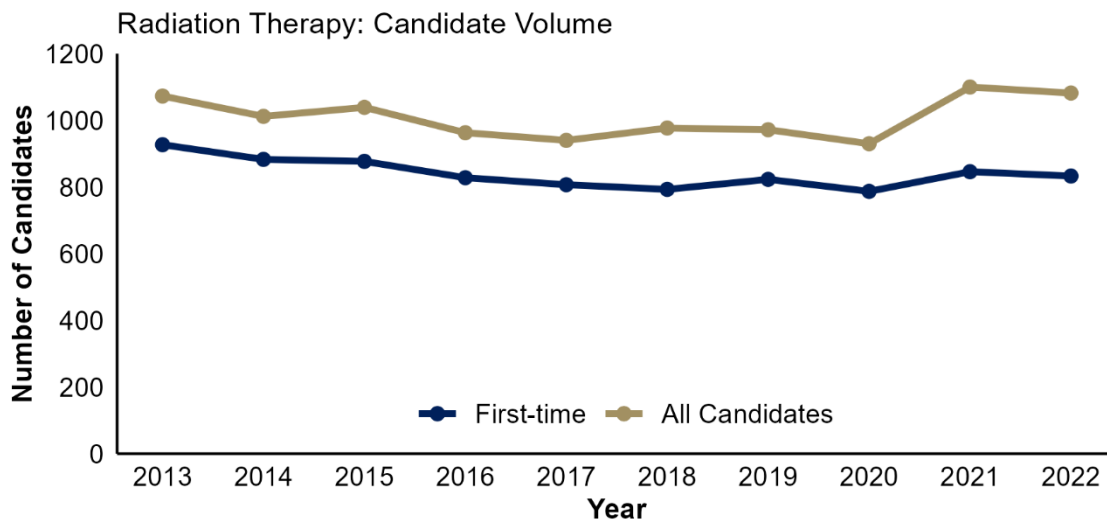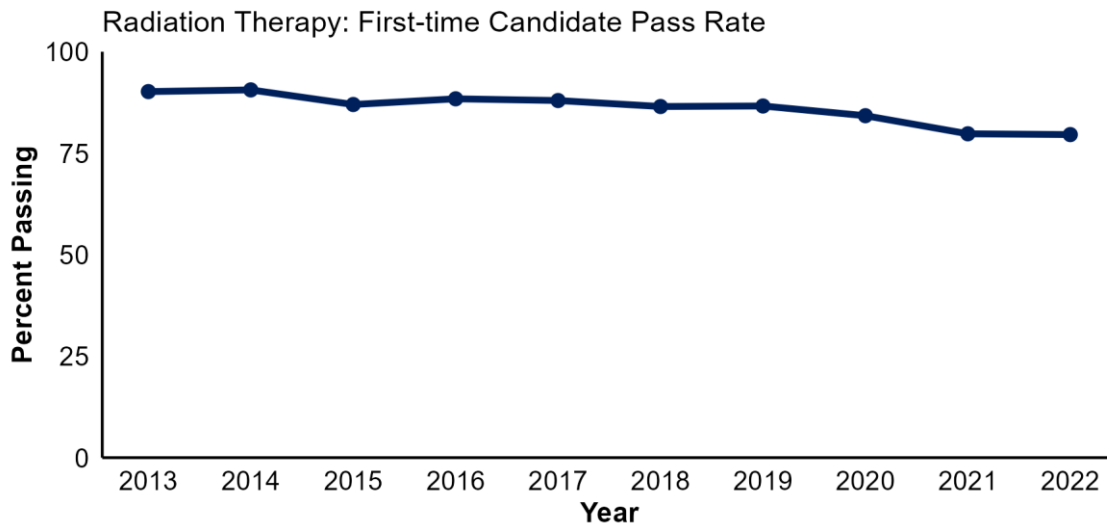
Exam Performance for Sonography
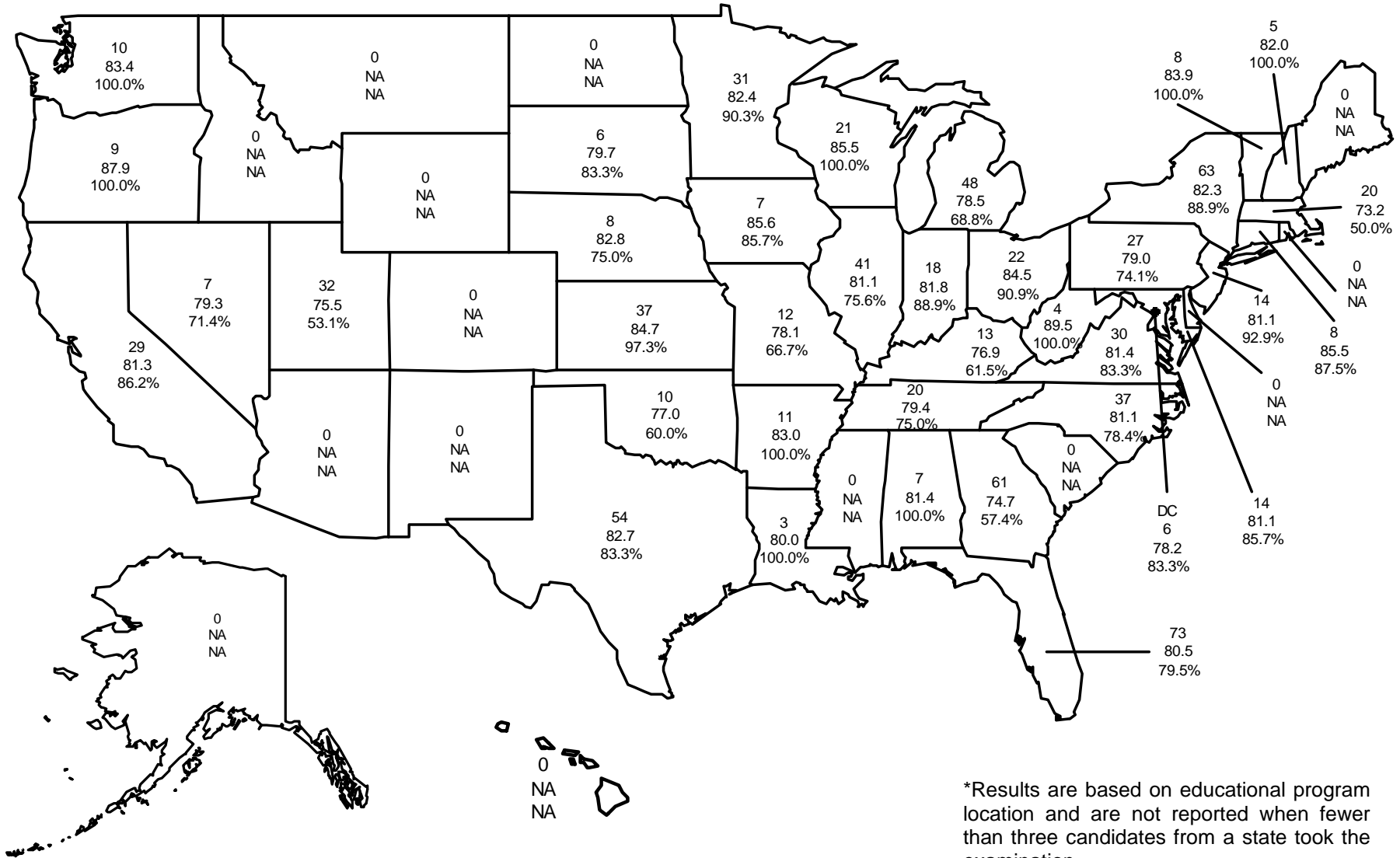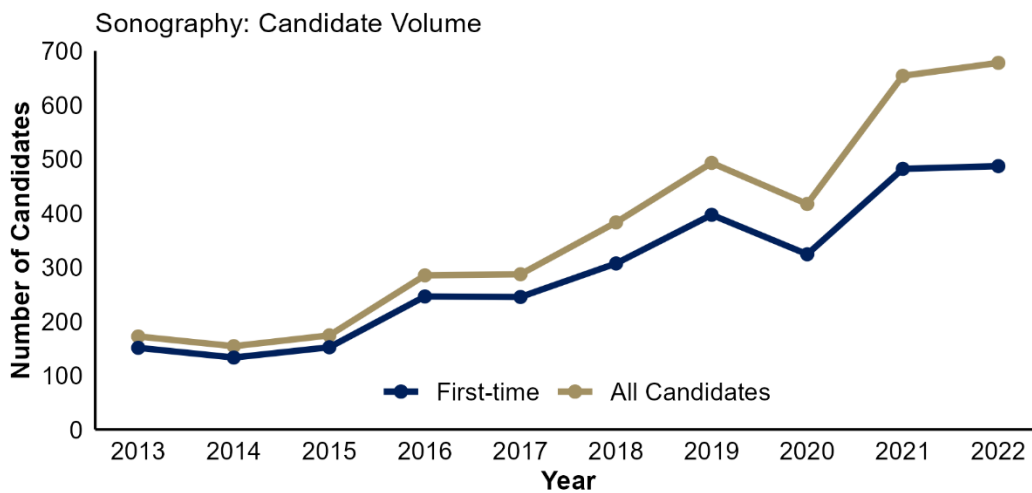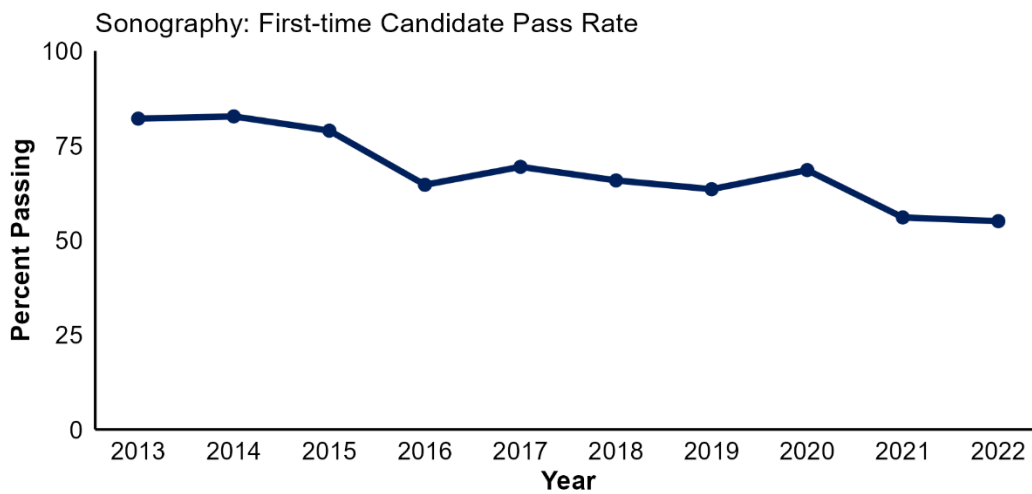
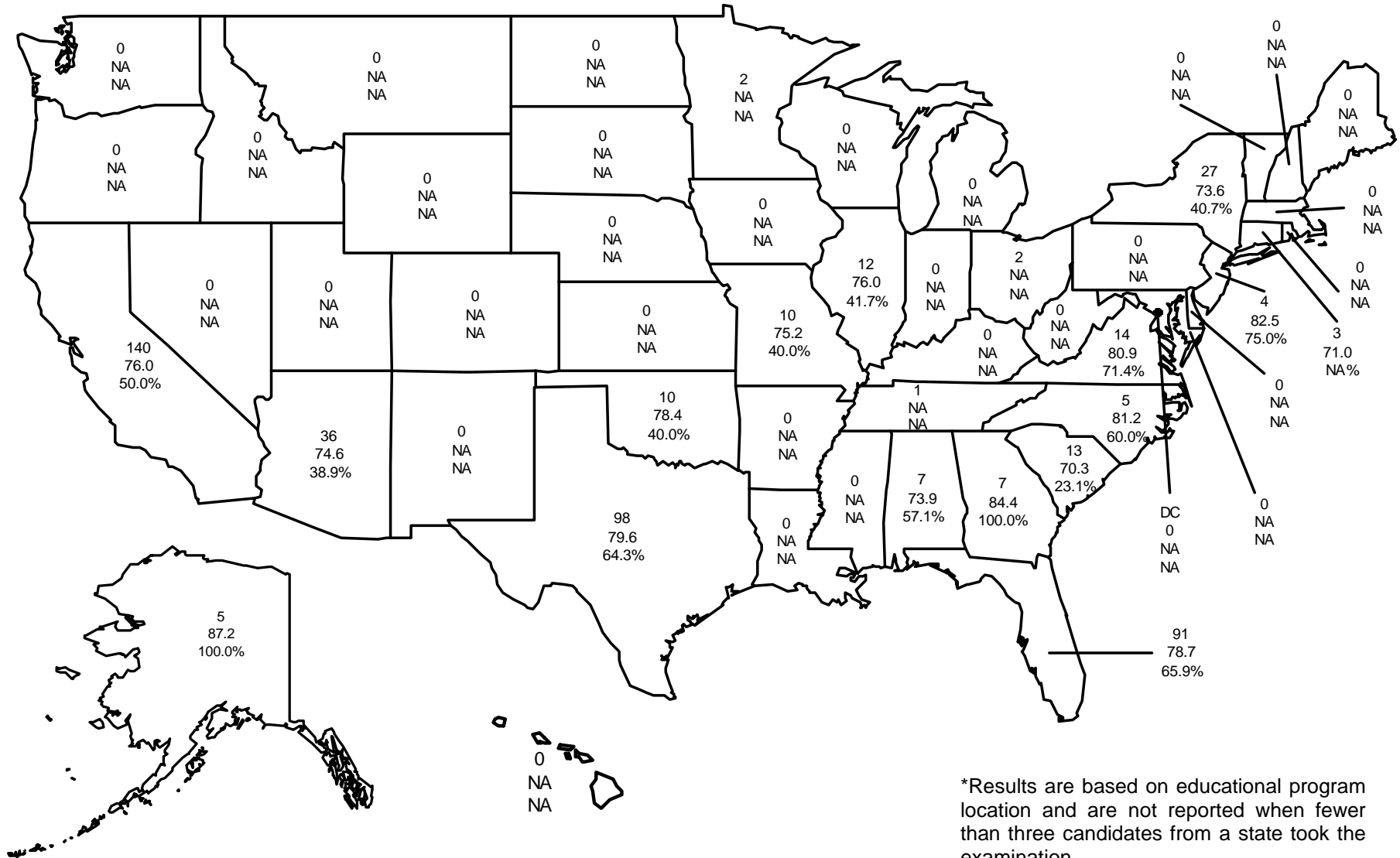## Content Categories and First-time Candidate Scores

Content Categories	# Items	Mean Score
Patient Interactions and Management	29	7.9
Basic Principles of Ultrasound	50	7.2
Image Formation	44	7.8
Evaluation and Selection of Representative Images	21	8.3
Abdomen	75	7.8
*OB/GYN**	*109*	7.7
First Trimester Obstetrics	18	8.1
Second/Third Trimester and High Risk Obstetrics	61	7.5
Gynecology	30	7.9
Superficial Structures and Other Sonographic Procedures	<u>32</u>	<u>7.8</u>
Total	360	77.3

Pass Rate: 55.0%

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

Sonography: First-time Candidate Pass Rate

Sonography: Candidate Volume

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

State data (number / mean scaled score / percentage passing):

- 0 / NA / NA
- 0 / NA / NA
- 0 / NA / NA
- 2 / NA / NA
- 0 / NA / NA
- 0 / NA / NA
- 0 / NA / NA
- 0 / NA / NA
- 27 / 73.6 / 40.7%
- 0 / NA / NA
- 0 / NA / NA
- 0 / NA / NA
- 0 / NA / NA
- 0 / NA / NA
- 0 / NA / NA
- 0 / NA / NA
- 0 / NA / NA
- 0 / NA / NA
- 0 / NA / NA
- 0 / NA / NA
- 12 / 76.0 / 41.7%
- 0 / NA / NA
- 2 / NA / NA
- 0 / NA / NA
- 4 / 82.5 / 75.0%
- 3 / 71.0 / NA%
- 140 / 76.0 / 50.0%
- 0 / NA / NA
- 0 / NA / NA
- 10 / 75.2 / 40.0%
- 10 / 78.4 / 40.0%
- 0 / NA / NA
- 0 / NA / NA
- 14 / 80.9 / 71.4%
- 0 / NA / NA
- 5 / 81.2 / 60.0%
- 36 / 74.6 / 38.9%
- 0 / NA / NA
- 1 / NA / NA
- 13 / 70.3 / 23.1%
- 98 / 79.6 / 64.3%
- 0 / NA / NA
- 7 / 73.9 / 57.1%
- 7 / 84.4 / 100.0%
- 0 / NA / NA
- 0 / NA / NA
- DC 0 / NA / NA
- 0 / NA / NA
- 5 / 87.2 / 100.0%
- 0 / NA / NA (Hawaii)
- 91 / 78.7 / 65.9% (Florida)

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

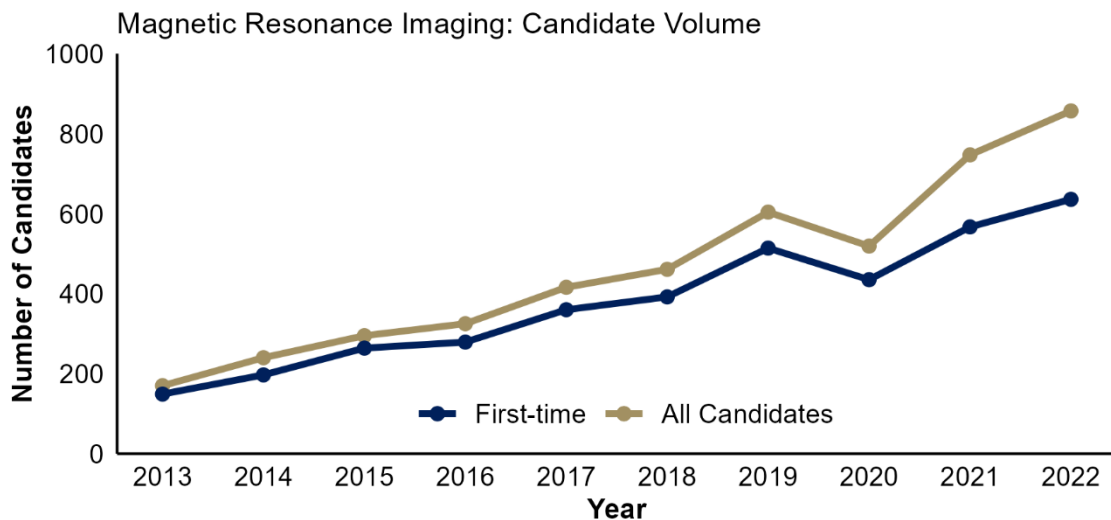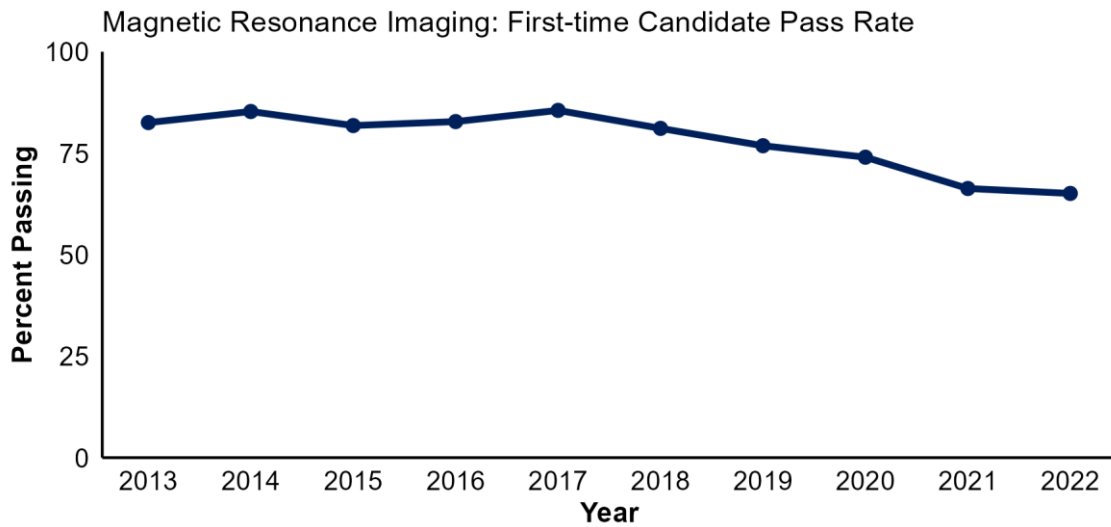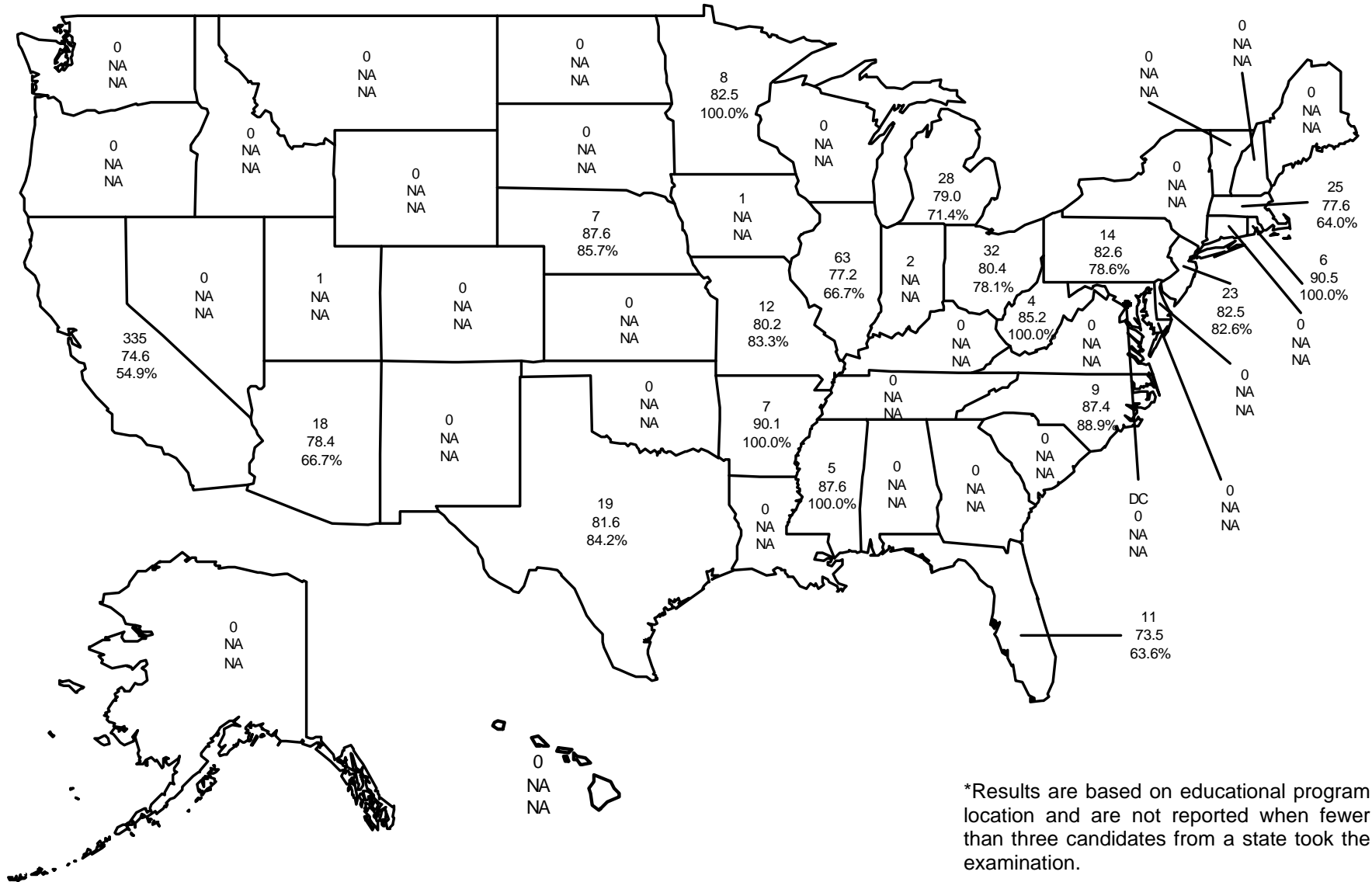# Exam Performance for Magnetic Resonance Imaging

Content Categories and First-time Candidate Scores

Content Categories		# Items	Mean Score
Patient Interactions and Management		18	7.7
MRI Screening and Safety		20	8.1
Physical Principles of Image Formation		39	7.9
Sequence Parameters and Options		36	7.9
Data Acquisition, Processing, and Storage		30	7.3
Neurological		25	7.9
Body		15	7.2
Musculoskeletal		<u>17</u>	<u>7.5</u>
	Total	200	77.4
Pass Rate: 65.1%			

Magnetic Resonance Imaging: First-time Candidate Pass Rate

Magnetic Resonance Imaging: Candidate Volume

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.