

## The Geographic Distribution of Graduate Respiratory Therapists in Ohio and Educational Program Outcomes

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## Introduction

This report is the fourth in a series beginning with a seven-year retrospective review of student enrollments, graduation rates, and quality outcomes in 2004, updates in 2006 and future projections in 2007.<sup>1,2,3</sup> With the 3 new Respiratory Therapy educational programs in Ohio producing additional graduates in 2008 and 2009, with reports of hospital staffing shortages diminishing, and with only 7 of 18 respiratory therapy education programs in Ohio meeting or exceeding the Committee on Accreditation for Respiratory Care (CoARC) threshold for percent of graduates earning the Registered Respiratory Therapist (RRT) credential in 2005,<sup>3</sup> the Ohio Respiratory Care Board (ORCB) continues its interest in the quality and productivity of the respiratory care educational programs in Ohio.

The purposes of this 2010 report are to update the previous education reports with 2009 data and to provide the geographic distribution of the supply of graduate therapists and program outcomes. The data presented are a “snapshot” in time and are intended to be considered with the 2009 hospital clinical staffing data contained in the January, 2010 report, “The 2009 Demand and Future Needs for Respiratory Therapists in Ohio Hospitals.” Taken together, these data may provide professional leaders with an overview of the supply of respiratory therapists in relation to current and future needs.

## Methods

In November 2009 the executive director of the ORCB requested copies of the 2009 CoARC Reports of Current Status from the program directors of the 21 respiratory care educational programs identified in the 2007 ORCB report. Figure 1 shows and table 1 lists the sponsoring institutions and locations of the 21 respiratory therapy educational programs and the OSRC district location of the main campus as defined by the Bylaws of the Ohio Society for Respiratory Care.<sup>4</sup> Open circles represent satellite programs or off campus programs offered at a distance from the main campus.

Figure 1. The geographic distribution of respiratory care educational programs in Ohio.

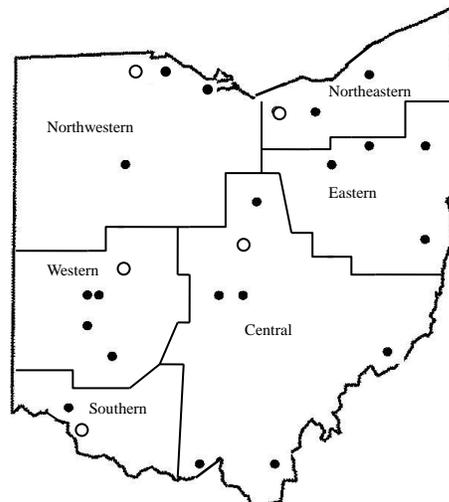


Table 1. The Respiratory Care Educational Programs in Ohio.

<b>Sponsoring Institution</b>	<b>Program Location &amp; Satellites</b>	<b>OSRC District</b>
Bowling Green State University	Huron & Lorain	NW & NE
Cincinnati State Tech & Community College	Cincinnati	S
Collins Career Center - Marshal University	Chesapeake	C
Columbus State Community College	Columbus	C
Cuyahoga Community College	Parma	NE
James A. Rhodes State College	Lima, Archbold, Marion, Urbana	NW
Gateway Community College	Steubenville	E
Kettering College of Medical Arts	Kettering	W
Lakeland Community College	Kirtland	NE
Miami-Jacobs Career College	Dayton	W
North Central State College	Mansfield	C
Shawnee State University	Portsmouth	C
Sinclair Community College	Dayton	W
Southern State Community College	Hillsboro-Washington Court House	W
Stark State College of Technology	Canton	E
The Ohio State University	Columbus	C
University of Akron	Akron	E
Buckeye Hills Career Center	Racine	C
University of Toledo	Toledo	NW
Washington State Community College	Marietta	C
Youngstown State University	Youngstown	E

The Reports of Current Status were completed and submitted to CoARC prior to the September 15, 2009 deadline. These annual reports included data for classes graduating from 2000 through 2009 and current enrollments for classes projected to graduate in 2010 and 2011. All data are oriented to the year of graduation or projected graduation.

The specific data collected from the CoARC reports and included in this report are for the classes of 2006 through 2010. These data include the annual number of applicants for enrollment, maximum enrollment, and actual enrollment; student attrition; graduates; number of graduates employed in respiratory care-related jobs within three months of graduation; and the number of Certified Respiratory Therapists (CRT) and RRTs. Additionally, the data collected included the attrition rate, placement rate, and percents of graduates earning CRT and RRT credentials for the 3-year cohort, 2006-2008.

These data were entered into a computerized statistical spreadsheet, Statistical Package for the Social Sciences (SPSS v 17.0), and annual totals of applications, program capacity, initial enrollment, student attrition, graduates, graduates placed in RT-jobs, CRTs, and RRTs were calculated and reported statewide and by OSRC district. Calculated estimates for the number of graduates in 2009 and 2010 include the number graduated at reporting time plus those students “in progress” multiplied by the statewide 2006 - 2009 average attrition rate.

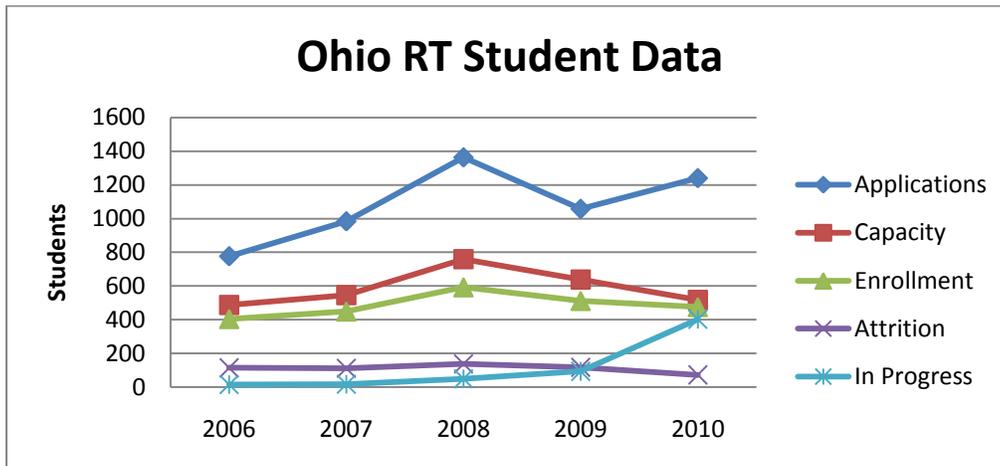
## Results

### Student Enrollment

This report includes data from all 21 respiratory therapy educational programs in Ohio plus a new satellite of Bowling Green State University in Lorain. Few programs reported data for the graduating class of 2011; these are not included in this report. Table 2 and figure 2 present student enrollment data for the classes of 2006 – 2010. The trends of annual increases in the number of applications, statewide program capacity, and enrollments continued until 2008 and declined for 2009 and 2010. Capacity and enrollment were strongly influenced by Miami-Jacobs Career College which added 220 students to statewide capacity for 2008 and which reduced its capacity to 120 for 2009 and to 45 for 2010. For 2009, 94 students remained “in progress” due to their graduation date later than the September 2009 CoARC annual reporting deadline. The statewide student attrition rate for 2005 – 2009 declined from 28.4% in 2005 to 23% in 2009 and to 15.3% for the class of 2010 approximately midway through programs.

Table 2 / Figure 2. Ohio RT student data based upon graduation year.

Ohio	2006	2007	2008	2009	2010
N	18	21	21	22	22
Applications	777	984	1363	1058	1240
Capacity	488	546	759	638	517
Enrollment	405	449	593	512	476
Attrition	115	112	138	118	73
In Progress	16	17	50	94	402



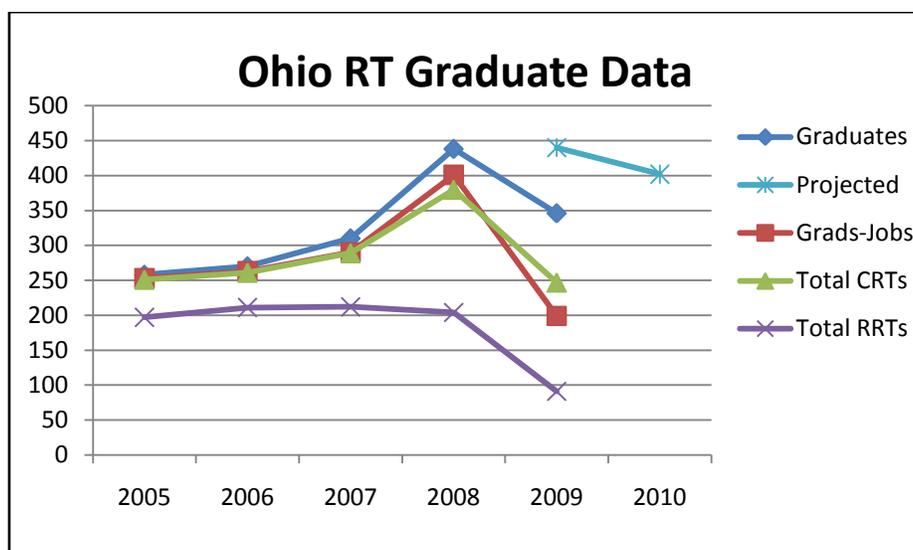
## Student Outcomes

Table 3 and figure 3 present 2005 – 2008 graduate data and projections for 2009 and 2010. The trend of annual increases in the number of graduates continued through 2008 with a 41% increase over 2007. The number of graduates projected for 2009 may be as large as 440, if all 94 students “in progress” graduated on time in 2009. The number of graduates projected for 2010 will likely decrease, even if all 402 students “in progress” graduate on time in 2010. The historic close matching of the number of graduates, graduates in RT-related jobs, and graduates earning the Certified Respiratory Therapist (CRT) credential may have ended in 2008. The trend of annual increases of graduates in RT-related jobs within 3 months of graduation reversed in 2008, declining from 98% to 91.5%. Although the 97% CRT success rate remained steady through 2007, the percentage of graduates who earned CRT declined to 86.8% of graduates in 2008 and to 71% for 2009. The percent RRT success rate was 76% for the class of 2005, 78% for 2006, 68% for 2007, 45% for 2008, and 26% for 2009. These trends shows the importance of additional years of experience for many graduates, and that the reporting deadline of September 2009 particularly influences the CRT and RRT data for the class of 2009.

Table 3 / Figure 3. Ohio RT graduate data based upon graduation year

Ohio	2005	2006	2007	2008	2009
N	18	21	21	22	22
Graduates	258	270	310	438	346*
Grads-Jobs	253	263	290	401	199
Total CRTs	251	261	289	380	247
Total RRTs	197	211	212	204	91

\* Does not include students “in progress” and expected to graduate after September, 2009



## Program Outcomes

To judge educational program quality, CoARC monitors several program outcomes including the attrition rate, placement rate, CRT and RRT percent graduate success, employer and graduate survey results. CoArc monitors the most recent 3-year (2006 – 2008) and 5-year (2004-2008) cohorts to evaluate program outcomes.

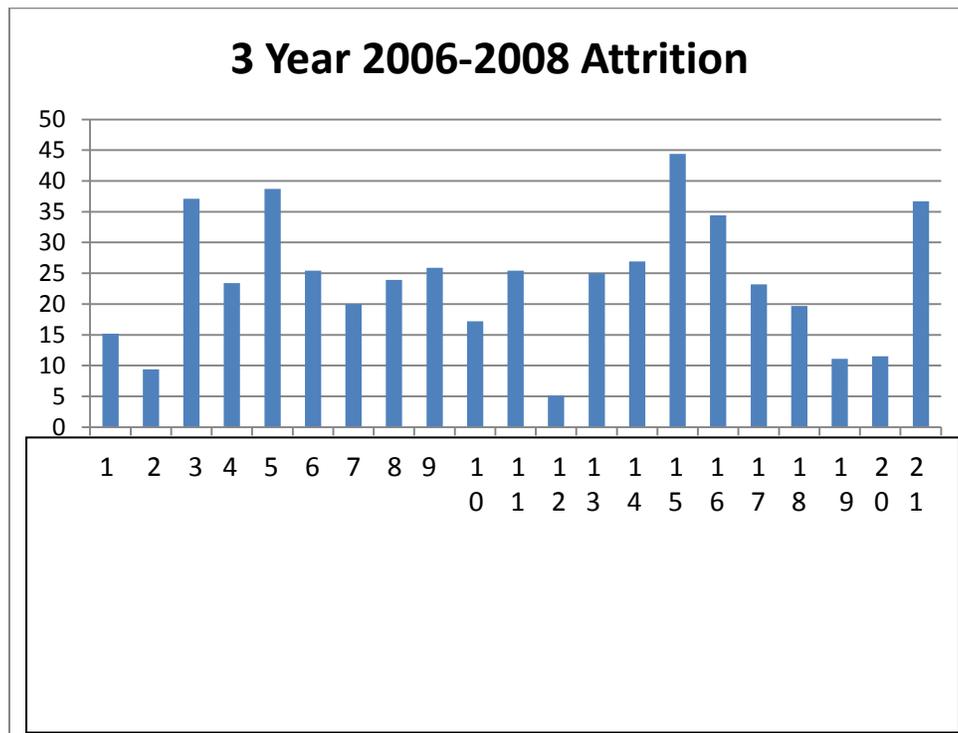
Employer and graduate survey results are almost unanimously positive for all Ohio respiratory therapy educational programs.

Attrition is the number of students initially enrolled but do not graduate due to personal or academic reasons. The CoArc threshold is no more than 30% attrition.

The placement rate is defined as graduates in respiratory therapy-related jobs within 3 months of graduation. The CoArc threshold is no less than 70% placement.

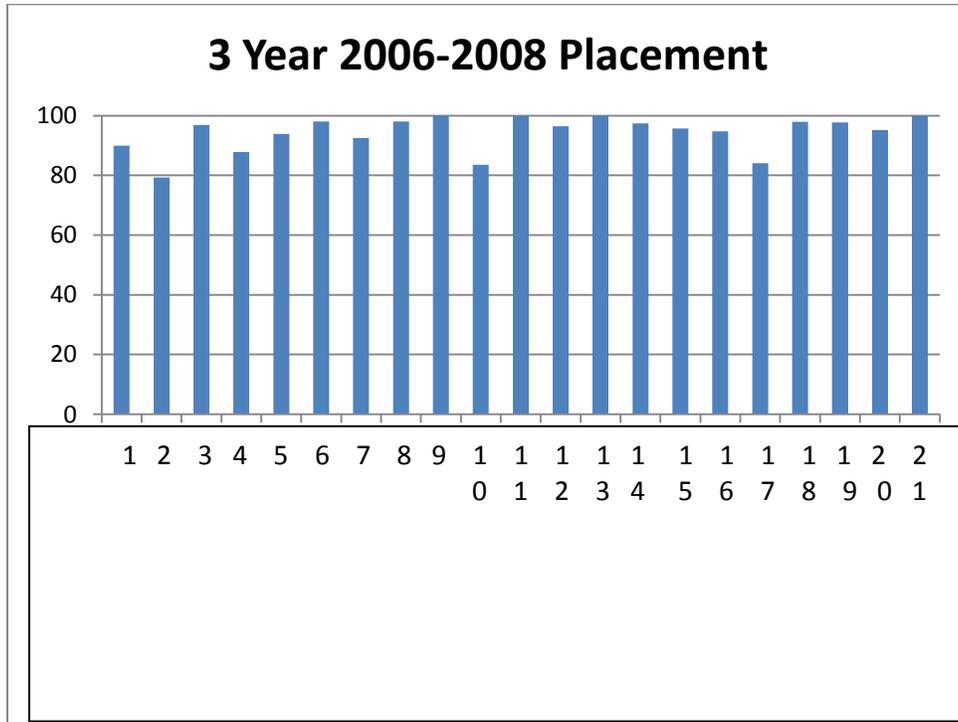
Figures 4 and 5 present the attrition and placement outcomes of Ohio respiratory therapy educational programs for the most recent 3-year (2006 – 2008). Ohio's 3 new programs did not have graduates in 2006; their averages are 2-year averages, for 2007 and 2008 only.

Figure 4. Ohio Respiratory Therapy Program Attrition Rates



\* includes classes of 2007 and 2008 only

Figure 5. Ohio Respiratory Therapy Program Placement Rates

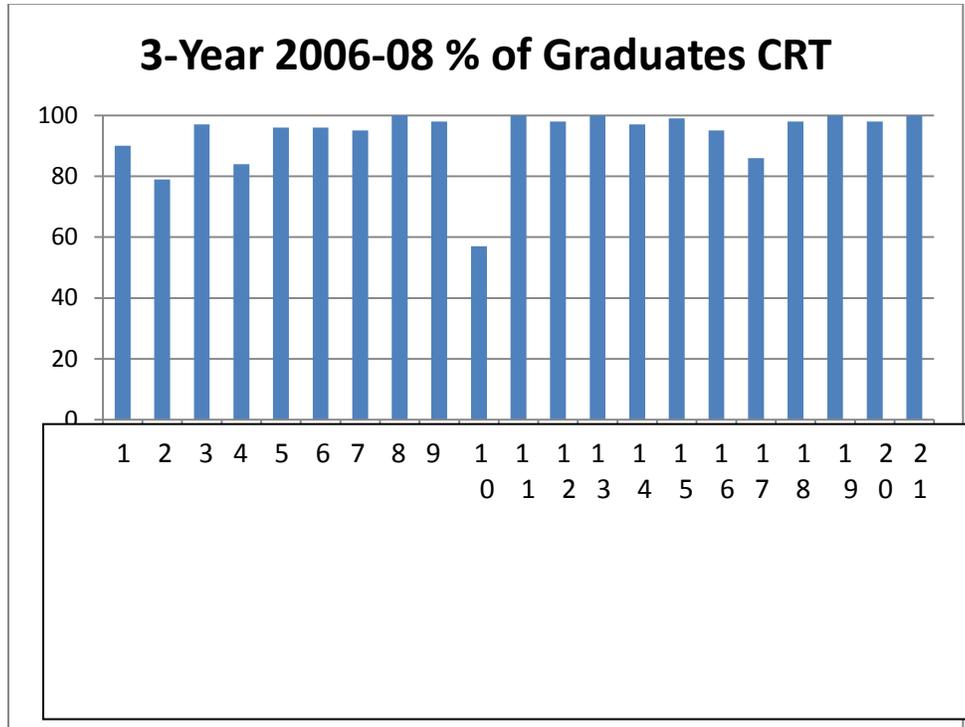


\* includes classes of 2007 and 2008 only

Figures 6 and 7 present the CRT and RRT credentialing examination outcomes for each program for the most recent 3-year (2006 – 2008) cohort used by CoARC to evaluate program outcomes. Percent success is number of graduates who earned the credential divided by the total number of graduates. Ohio’s 3 new programs did not have graduates in 2006; their averages are 2-year averages, 2007 and 2008 only. The new satellite program of Bowling Green at Lorain projects initial graduates in December, 2009.

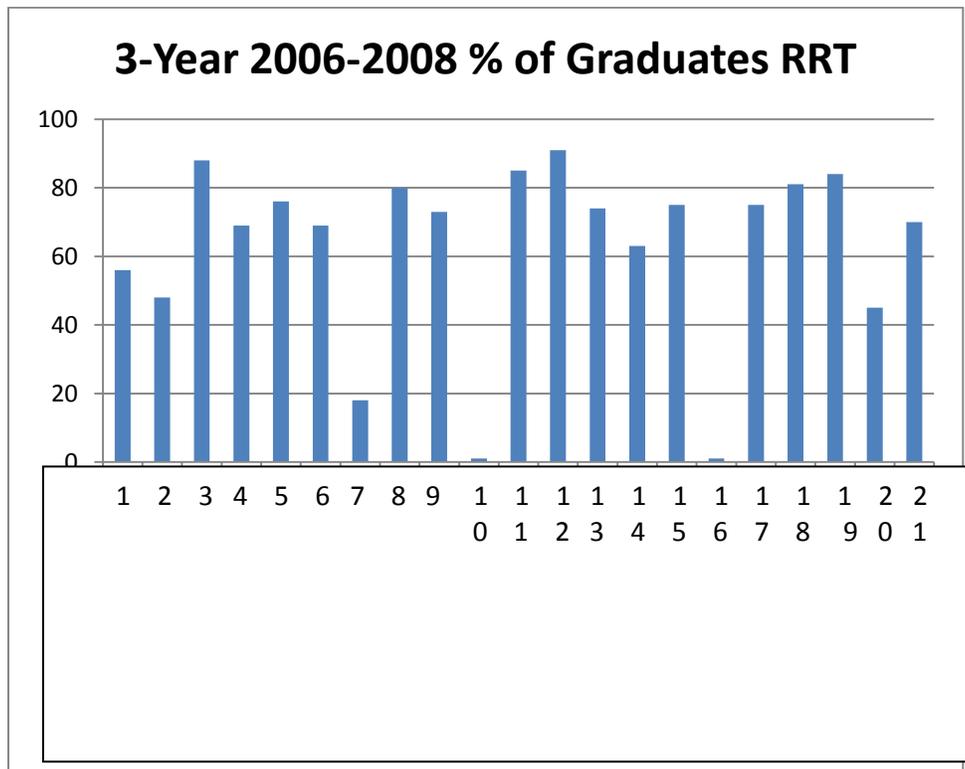
Results that are less than 100% include those graduates not participating in the examination process and those not passing the examinations. Participation in the credentialing examinations cannot be determined from the CoARC current status reports.

Figure 6. Ohio Respiratory Therapy Program NBRC CRT Percent Graduate Success



\* includes classes of 2007 and 2008 only

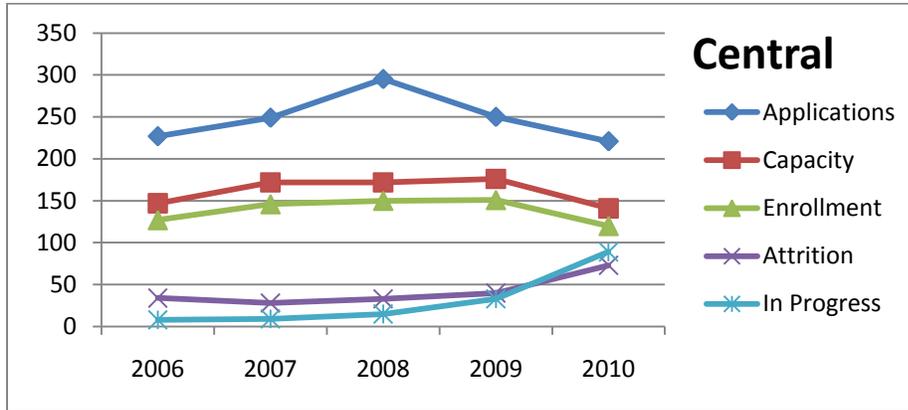
Figure 7. Ohio Respiratory Therapy Program NBRC RRT Percent Graduate Success



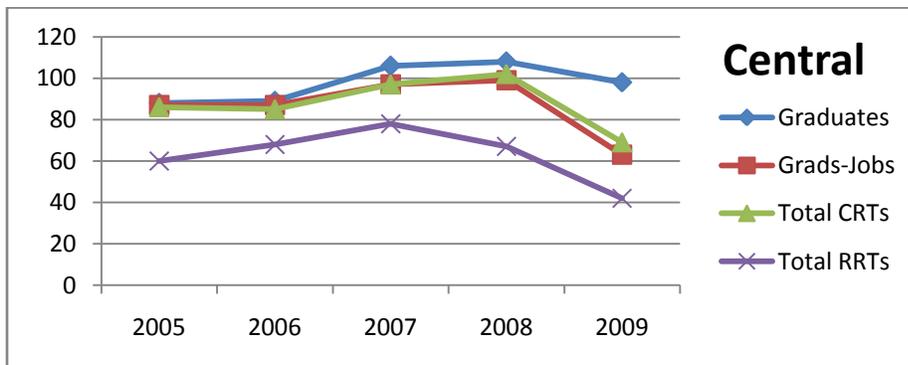
\* includes classes of 2007 and 2008 only

## OSRC District RT Student and Graduate Data

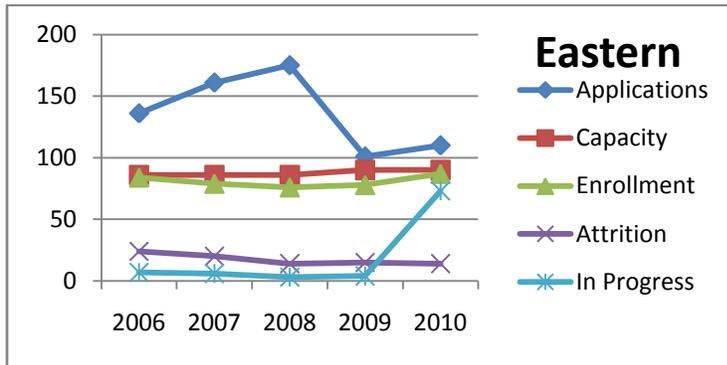
The following tables and figures provide the results paralleling the statewide results for the 6 districts of the OSRC.



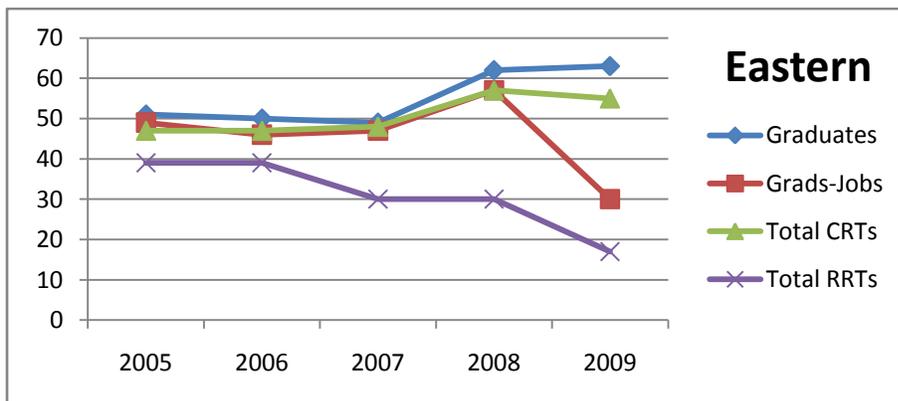
Central	2006	2007	2008	2009	2010
N	6	7	7	7	7
Applications	227	249	295	250	221
Capacity	147	172	172	176	141
Enrollment	127	146	150	151	120
Attrition	34	28	33	40	73
In Progress	8	9	15	33	89



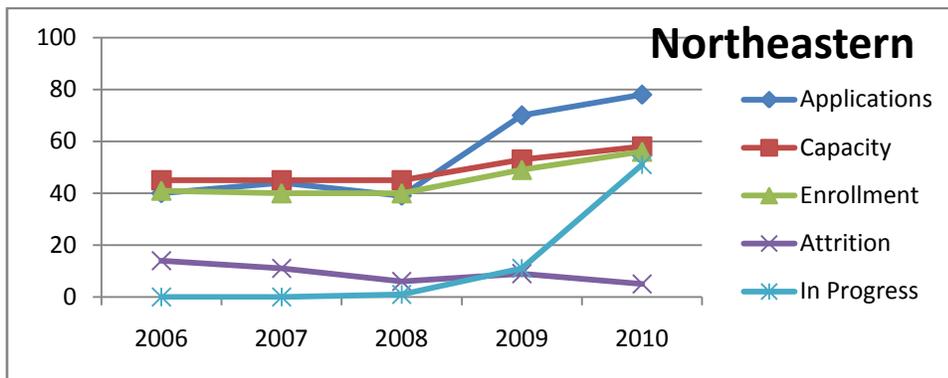
Central	2005	2006	2007	2008	2009
N	6	6	7	7	7
Graduates	88	89	106	108	98
Grads-Jobs	87	87	97	99	63
Total CRTs	86	85	97	102	69
Total RRTs	60	68	78	67	42



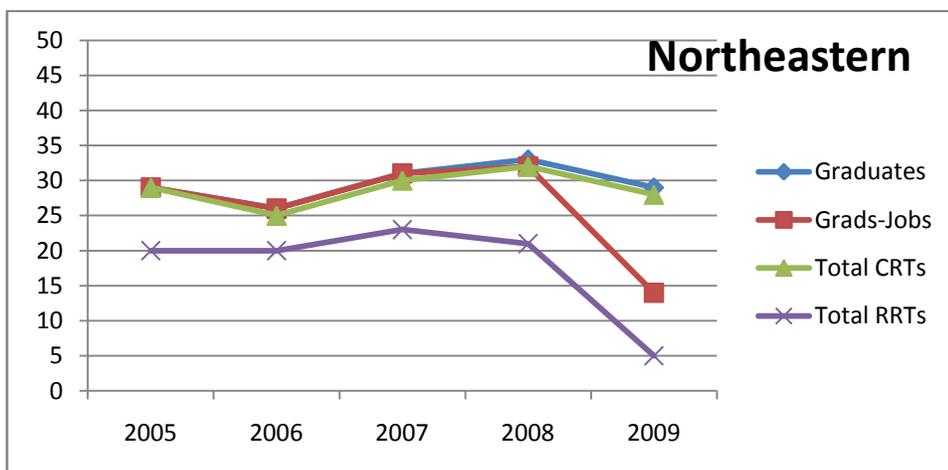
Eastern	2006	2007	2008	2009	2010
N	4	4	4	4	4
Applications	136	161	175	101	110
Capacity	86	86	86	90	90
Enrollment	84	79	76	78	87
Attrition	24	20	14	15	14
In Progress	7	6	3	4	73



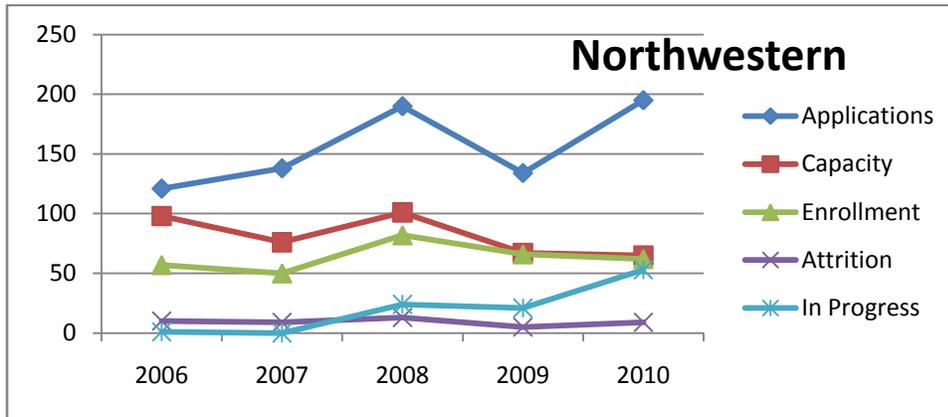
Eastern	2005	2006	2007	2008	2009
N	4	4	4	4	4
Graduates	51	50	49	62	63
Grads-Jobs	49	46	47	57	30
Total CRTs	47	47	48	57	55
Total RRTs	39	39	30	30	17



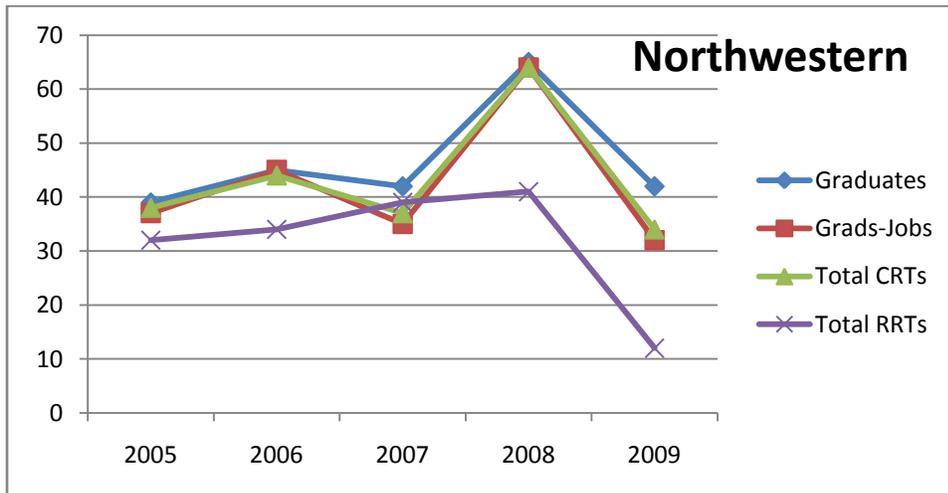
NorthEastern	2006	2007	2008	2009	2010
N	2	2	2	2	2
Applications	40	44	39	70	78
Capacity	45	45	45	53	58
Enrollment	41	40	40	49	56
Attrition	14	11	6	9	5
In Progress	0	0	1	11	51



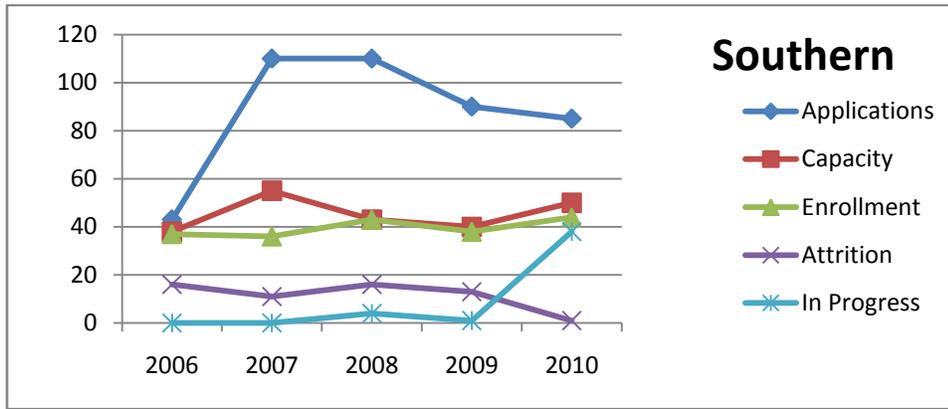
Northeastern	2005	2006	2007	2008	2009
N	2	2	2	2	2
Graduates	29	26	31	33	29
Grads-Jobs	29	26	31	32	14
Total CRTs	29	25	30	32	28
Total RRTs	20	20	23	21	5



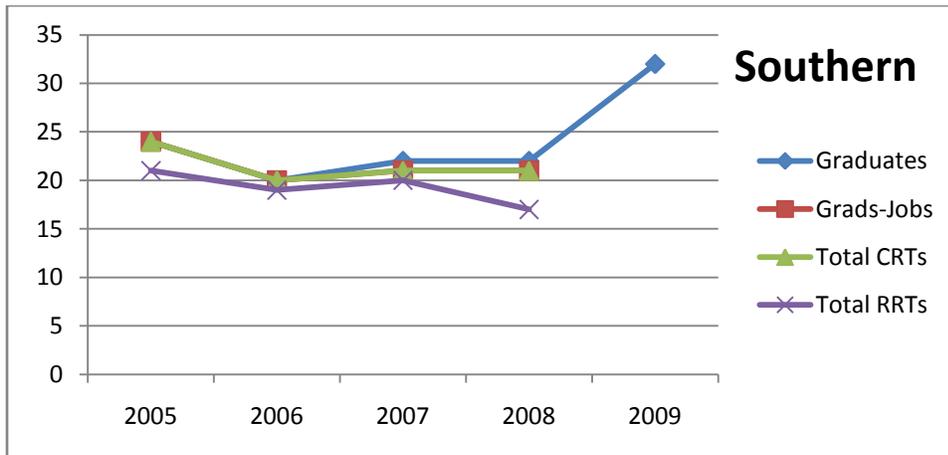
NorthWestern	2006	2007	2008	2009	2010
N	3	3	3	3	3
Applications	121	138	190	134	195
Capacity	98	76	101	67	65
Enrollment	57	50	82	66	62
Attrition	10	9	13	5	9
In Progress	1	0	24	21	53



Northwestern	2005	2006	2007	2008	2009
N	3	3	3	3	3
Graduates	39	45	42	65	42
Grads-Jobs	37	45	35	64	32
Total CRTs	38	44	37	64	34
Total RRTs	32	34	39	41	12

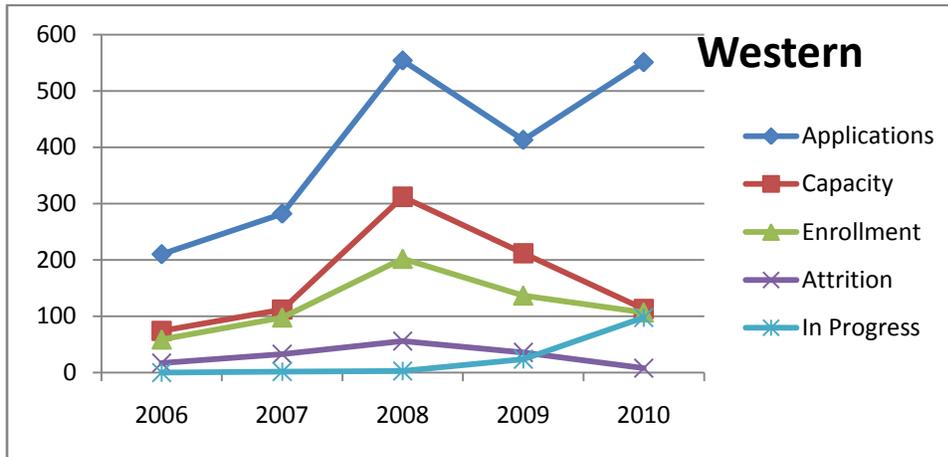


Southern	2006	2007	2008	2009	2010
N	1	1	1	1	1
Applications	43	110	110	90	85
Capacity	38	55	43	40	50
Enrollment	37	36	43	38	44
Attrition	16	11	16	13	1
In Progress	0	0	4	1	38

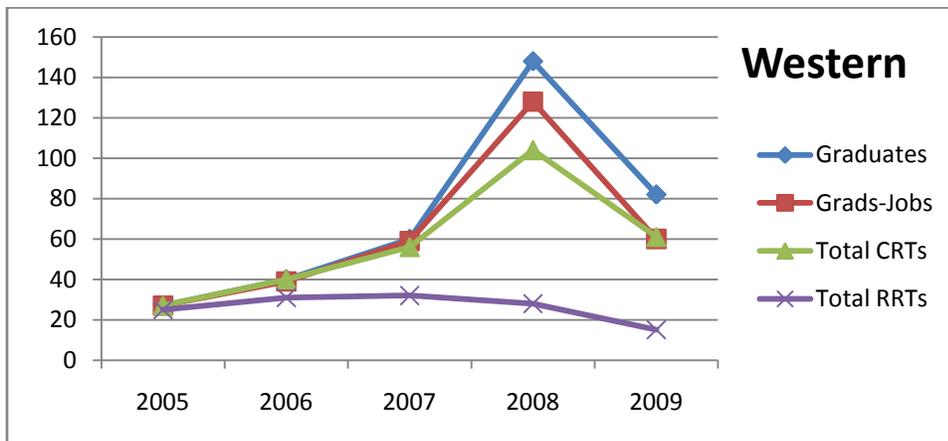


Southern	2005	2006	2007	2008	2009
N	1	1	1	1	1
Graduates	24	20	22	22	32*
Grads-Jobs	24	20	21	21	
Total CRTs	24	20	21	21	
Total RRTs	21	19	20	17	

\* Includes graduates near and/or after the reporting time.



Western	2006	2007	2008	2009	2010
N	2	4	4	4	4
Applications	210	282	554	413	551
Capacity	74	112	312	212	113
Enrollment	59	98	202	137	107
Attrition	17	33	56	36	8
In Progress	0	2	3	24	98



Western	2005	2006	2007	2008	2009
N	2	2	4	4	3
Graduates	27	40	60	148	82
Grads-Jobs	27	39	59	128	60
Total CRTs	27	40	56	104	61
Total RRTs	25	31	32	28	15

## Summary and Conclusion

When the American Association for Respiratory Care (AARC) published the 2005 Human Resources Study<sup>5</sup> indicating 11,695 vacant full time equivalent staff therapists and a staffing vacancy rate of 8.65%, many directors and managers of Ohio's hospital respiratory care departments echoed the findings and reported a shortage of qualified staff respiratory therapists. Staffing shortages were considered the result of declining enrollments and graduates of the nation's respiratory therapy educational programs prior to 2003. Since 2003, Ohio has seen annual increases in applications, program capacity, enrollment, and graduates. These trends continued through 2008, declined in 2009 and 2010, and were highly influenced by new programs and satellite programs.

Staffing shortages may have been partially relieved. In 2009 the AARC projected only 3637 vacant full time staff therapist vacancies nationwide, a 4.4% vacancy rate.<sup>6</sup> In Ohio in 2009, with almost 400 new graduates, the vacancy rate is estimated as 3.3% with only 115 estimated vacancies statewide.<sup>7</sup>

Although the number of graduates has increased annually, the number of graduates in jobs within 3 months of graduation and the number of CRTs declined statewide in 2009, the first decline since 1999.<sup>1</sup> The 2009 statewide gaps between the number of graduates and number in jobs are noteworthy, especially in the Eastern, Northwestern and Western Districts. The statewide number of graduates is predicted to remain unchanged in 2009 and decrease 8.6% for 2010. The gap between the number of graduates, number of graduates in jobs within 3 months of graduation and the number of CRTs and RRTs are projected to widen for the classes of 2009 and 2010.

This report summarizes the 2009 CoARC Reports of Current Status provided to the Ohio Respiratory Care Board. Although these reports are updated and revised annually by program directors, these reports are a snapshot in time. Graduation dates near or after the reporting deadline significantly influence data of some programs for 2009. CoARC considers the 3-year cohort (2006-08) a more valid indicator of program outcomes and quality.

CoARC is the agency authorized to approve respiratory therapy educational programs by the Ohio Respiratory Care Board. CoARC has established "Outcomes Assessment Thresholds," and these thresholds define the criteria for initial and continuing accreditation. In addition to positive graduate and employer satisfaction survey results, these thresholds address student attrition, job placement, and percentages of graduates attempting and passing NBRC credentialing examinations. The NBRC entry-level examination is recognized by the ORCB as the licensing examination. CoARC thresholds are:

- no more than 30% attrition,
- no less than 70% job placement,
- 90% of graduates to attempt the entry-level CRT examination
- 80% of graduate to pass the CRT examination,
- 65% to attempt the advanced-level RRT examinations and
- 50% of graduates to earn the RRT credential.

As an alternative to 50% of graduates earning the RRT credential, CoARC accepts an alternative measurement of program outcomes, the "Comprehensive Written Registry Self Assessment

Examination.” CoARC considers a 55% correct score on this examination as “passing,” and if used as an alternative program outcome, 80% of the graduates are expected to pass.

### Ohio Program Outcomes Summary

- The average attrition rate of Ohio programs for 2006-08 was 23.7% (range 5.1% - 44.4%); 5 Ohio programs failed to meet the attrition threshold.
- The average placement rate of Ohio programs for 2006-08 was 94.2% (range 79.3% - 100%); all Ohio programs exceeded the placement threshold.
- The average CRT success rate of Ohio programs for 2006-08 was 93.5% (range 57% - 100%); 2 Ohio programs reported less than 80% CRT success; both are new programs which reported outcomes for only 2007 and 2008.
- The average RRT success rate of Ohio programs for 2006-08 was 62.9% (range 0 – 91%); 5 Ohio programs reported less than 50% RRT success; 3 are new programs which reported outcomes for only 2007 and 2008. Six Ohio programs utilized the alternate program outcome for 2006-08; their average percent passing was 87.8%.

In 2009 CoARC became an independent accrediting agency, no longer associated with the Commission on Allied Health Education Programs (CAHEP). CoARC became the Commission on Accreditation for Respiratory Care. New standards are pending approval by sponsoring organizations and implementation. The next deadline for the Report of Current Status will be April 15, 2011.

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