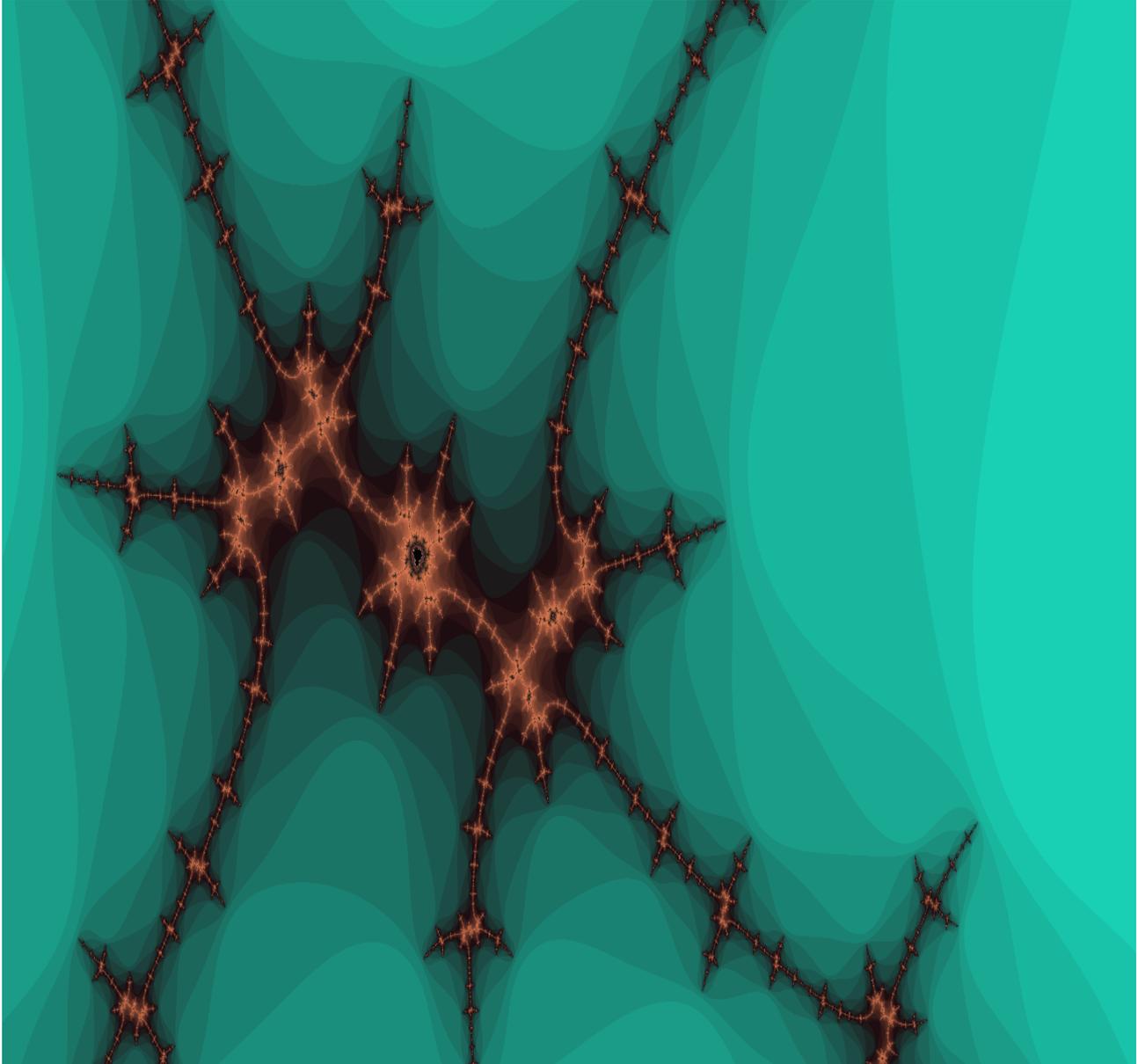


## Radiation Therapy Staffing and Workplace Survey 2020



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American Society of Radiologic Technologists

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## Executive Summary

**Note: This survey data was collected before the COVID-19 pandemic began substantially affecting the surveyed clinical settings.**

The 2020 Radiation Therapy Staffing and Workplace Survey was emailed to 14,027 radiation therapists in February 2020. At the close of the survey in March 2020, a total of 657 completed questionnaires had been submitted for a response rate of 4.7%

The sample size of 657 yields a margin of error for overall percentages of  $\pm 3.8\%$  at the 95% confidence interval.

To keep this report brief, responses to open-ended questions were not included, but are available upon request.

### Staffing of Facilities

The mean number of budgeted full-time equivalents (FTEs) across all facilities surveyed is:

- 7.1 for radiation therapy.
- 2.5 for medical dosimetry.

An estimation of the overall percentages of unfilled positions was calculated using the number of budgeted FTEs along with figures on vacant and recruiting positions.

In radiation therapy, an estimated 7.2% of FTE positions are unfilled.

In medical dosimetry, an estimated 9.6% of FTE positions are unfilled.

Overall mean percentages of unfilled positions, calculated by combining the figures from both therapy and dosimetry, were highest in the Pacific region (14.0%) and lowest in the Mountain region (4.8%). Overall, the percent of unfilled positions combining both disciplines was 8.4%.

The survey also tracks longitudinal changes in staffing levels in radiation therapy and medical dosimetry. The number of FTE radiation therapists budgeted at each facility fell by 0.6 from 7.7 to 7.1 between 2018, when the last Radiation Therapy Staffing Survey was

conducted, and 2020. Overall, the number of FTE therapists budgeted per facility has increased by 1.1 from 6.0 in 2004 to 7.1 in 2020.

- The number of FTE medical dosimetrists budgeted at each facility remained constant at 2.5.
- The estimated vacancy rate for FTE positions in therapy rose by 4.0%, from 3.2% in 2018 to 7.2% in 2020. This marks the third time in a row estimated vacancy rates have risen and is the largest single increase since the inception of the survey in 2004.
- The estimated vacancy rate for FTE positions in medical dosimetry rose by 7.2%, from 2.4% in 2018 to 9.6% in 2020. This reverses a downward trend in vacancy rates for medical dosimetry positions that began in 2012 and, as with the vacancy rates for therapy, represents the single largest rise in vacancy rates since the survey's inception.

### Facility Demographics

A majority of respondents (56.4%) are staff therapists; 19.6% are senior/lead therapists, and 8.4% are medical dosimetrists.

There were respondents from every state except for Delaware and West Virginia.

Suburban facilities represented the largest share (42.7%) of respondents; 42.4% were urban, and the remaining 15.0% were rural.

The average respondent to the survey works in a facility that offers 13.8 services in radiation therapy and related fields. The most commonly offered services are:

- CT/simulation (94.9% of facilities).
- Intensity-modulated radiation therapy (IMRT) (94.9% of facilities).
- Cone-beam CT (CBCT) (92.6% of facilities).

The most commonly offered services remained the same from the previous survey in 2018.

The least commonly offered services are:

- Hyperthermia (4.7% of facilities).
- Proton therapy (5.9% of facilities).

- Dynamic adaptive radiation therapy (8.4% of facilities).

As with the most commonly offered services, the least commonly offered services remained the same from the previous iteration of the survey.

When asked which, if any, services they plan to expand, 58.3% said they plan to add additional LINAC therapy units, 19.7% plan to add real-time surface tracking, and 15.9% plan to add adaptive planning; 29.6% have no plans to add any of the new services listed.

### Calculation of Percent Vacancy Rates

The estimated proportion of unfilled positions for a given specialty in the population of U.S. hospital-based radiology facilities is calculated as:

$$(\text{mean number of vacant and recruiting FTEs per facility}) / (\text{mean number of budgeted FTEs per facility}) * 100$$

For example, in radiation therapy the mean vacant and recruiting FTE positions per facility is 0.25. When divided by the mean budgeted FTE of 7.7, this yields a proportion of unfilled FTE positions of 0.032. Multiplying by 100 to give the percent value, and then rounding to the nearest tenth, gives the percent vacancy rate for radiation therapy of 3.2%.

Note that only responses that included both the number of budgeted FTEs and the number of vacant and recruiting FTEs were used in the calculation of vacancy rates.

### Outliers

Numeric variables were analyzed for non-representative outliers with cross-tabulated scatter plots and box plots. By conventional definition, data points that were 1.5 times greater than the third quartile were designated as outliers and excluded from the analysis.

According to the responses provided, the average facility treats 49.0 patients each day and uses 2.2 linear accelerators.

### Personnel Demographics

The average respondent works at a facility that schedules 2.4 therapists and 1.1 dosimetrist per linear accelerator. On average, there are 0.7 hours per day when only one therapist is scheduled per linear accelerator.

## Staffing of Facilities

Provide the budgeted and vacant full-time equivalents (FTEs) for your facility. Please use decimals for fractional FTEs.

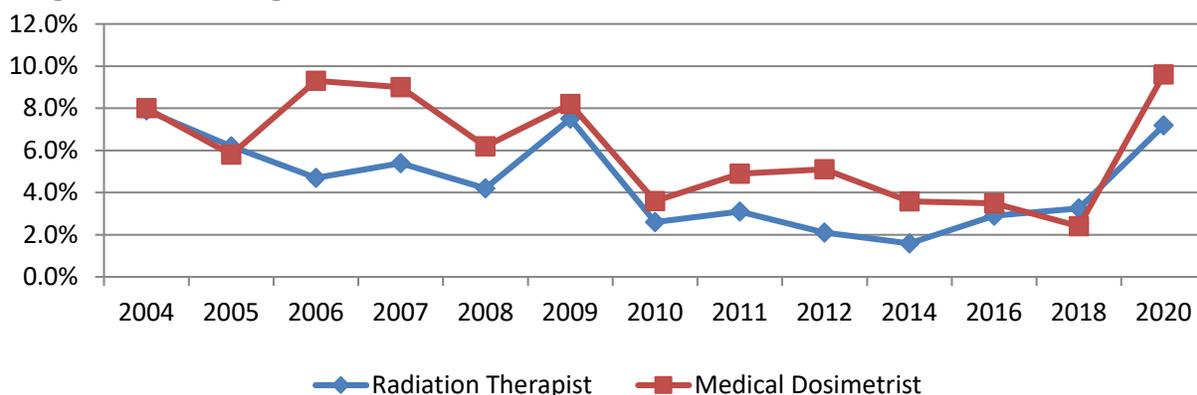
### Radiation Therapist

Year	N	Mean Budgeted FTEs per facility	Mean Vacant and recruiting FTEs per facility	Estimated Percent unfilled FTE positions
2004	360	6.0	0.47	7.9%
2005	352	6.4	0.40	6.2%
2006	522	6.8	0.31	4.7%
2007	549	7.1	0.39	5.4%
2008	476	6.8	0.29	4.2%
2009	448	7.2	0.54	7.5%
2010	484	7.2	0.19	2.6%
2011	460	7.4	0.23	3.1%
2012	439	7.4	0.16	2.1%
2014	575	8.2	0.13	1.6%
2016	552	7.3	0.21	2.9%
2018	124	7.7	0.25	3.2%
2020	517	7.1	0.51	7.2%

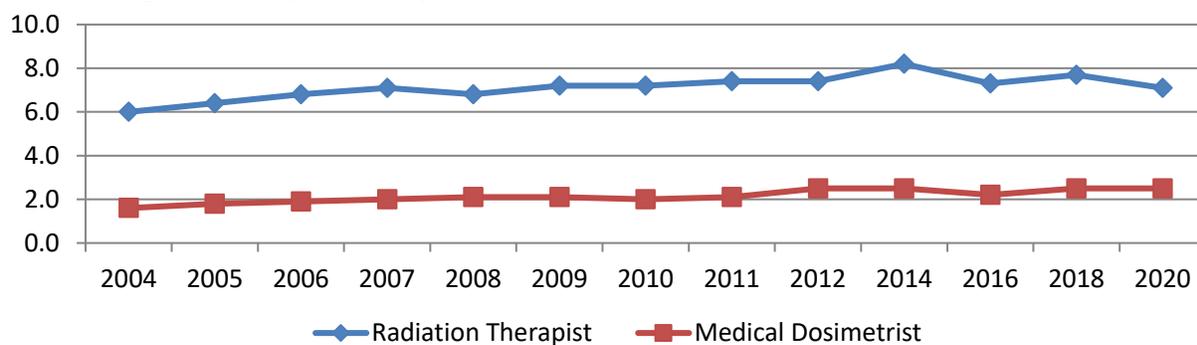
### Medical Dosimetrist

Year	N	Mean Budgeted FTEs per facility	Mean Vacant and recruiting FTEs per facility	Estimated Percent unfilled FTE positions
2004	360	1.6	0.13	8.0%
2005	352	1.8	0.11	5.8%
2006	522	1.9	0.18	9.3%
2007	549	2.0	0.18	9.0%
2008	441	2.1	0.13	6.2%
2009	409	2.1	0.17	8.2%
2010	432	2.0	0.07	3.6%
2011	411	2.1	0.10	4.9%
2012	406	2.5	0.12	5.1%
2014	544	2.5	0.09	3.6%
2016	517	2.2	0.08	3.5%
2018	117	2.5	0.06	2.4%
2020	447	2.5	0.24	9.6%

### Longitudinal Tracking of Estimated Percent Unfilled FTE Positions



### Mean Budgeted FTEs per Facility



## 2020 Estimated Percent of Unfilled FTE Positions by Geographic Region<sup>a</sup>

		New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
Radiation Therapy	N	41	26	69	48	113	27	37	83	72
	%	3.5%	6.9%	8.9%	5.7%	8.3%	6.3%	8.7%	3.8%	11.3%
Medical Dosimetry	N	36	24	66	40	107	26	32	74	70
	%	15.1%	5.7%	4.1%	8.8%	10.0%	4.3%	14.3%	5.8%	16.8%
<b>Overall Mean</b>		8.9%	6.3%	6.6%	7.1%	9.1%	5.3%	11.3%	4.8%	14.0%

<sup>a</sup> Middle Atlantic: New York, Pennsylvania, and New Jersey

South Atlantic: Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida

New England: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut

Mountain: Idaho, Montana, Wyoming, Nevada, Utah, Colorado, Arizona, and New Mexico

Pacific: Alaska, Washington, Oregon, California, and Hawaii

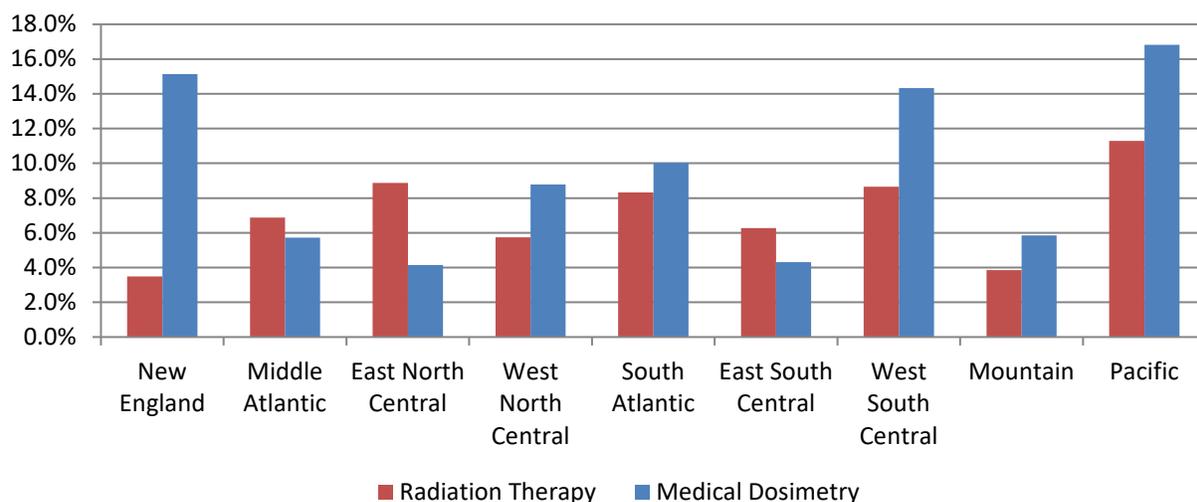
West North Central: Missouri, North Dakota, South Dakota, Nebraska, Kansas, Minnesota, and Iowa

East North Central: Wisconsin, Michigan, Illinois, Indiana, and Ohio

East South Central: Kentucky, Tennessee, Mississippi, and Alabama

West South Central: Oklahoma, Texas, Arkansas, and Louisiana

### 2020 Estimated Percent of Unfilled FTE Positions by Geographic Region

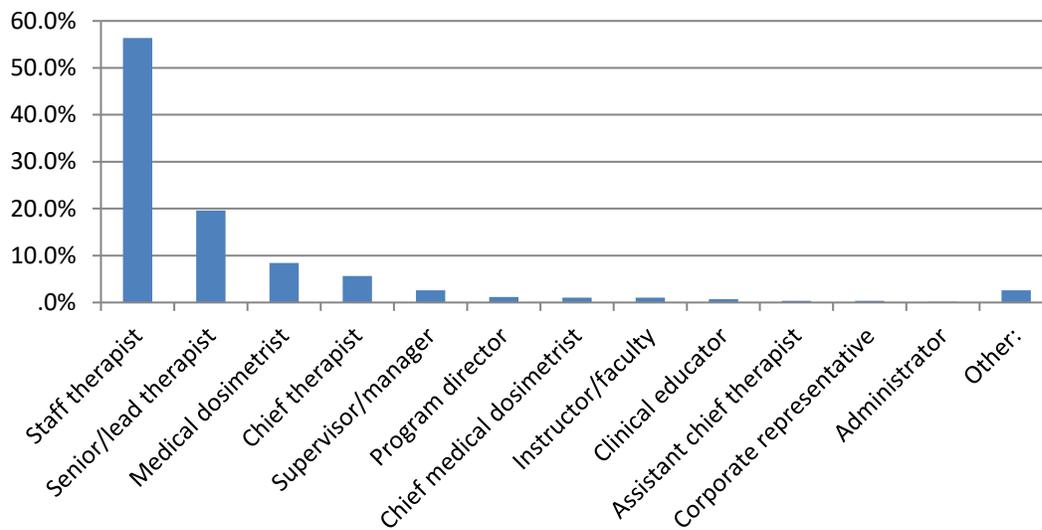


## Facility Demographics

### What is your primary job function?

	N	Valid Percent
Staff therapist	328	56.4%
Senior/lead therapist	114	19.6%
Medical dosimetrist	49	8.4%
Chief therapist	33	5.7%
Supervisor/manager	15	2.6%
Program director	7	1.2%
Chief medical dosimetrist	6	1.0%
Instructor/faculty	6	1.0%
Clinical educator	4	0.7%
Assistant chief therapist	2	0.3%
Corporate representative	2	0.3%
Administrator	1	0.2%
Other:	15	2.6%
<b>Total</b>	<b>582</b>	<b>100.0%</b>

### What is your primary job function?



### Responding Facilities by State

State	N
Alabama	8
Alaska	1
Arizona	11
Arkansas	5
California	60
Colorado	10
Connecticut	11
Delaware	0
Florida	40
Georgia	16

State	N
Hawaii	2
Idaho	6
Illinois	23
Indiana	32
Iowa	5
Kansas	9
Kentucky	10
Louisiana	6
Maine	3
Maryland/DC	16

State	N
Massachusetts	15
Michigan	31
Minnesota	27
Mississippi	4
Missouri	12
Montana	4
Nebraska	11
Nevada	6
New Hampshire	7
New Jersey	18

State	N
New Mexico	3
New York	37
North Carolina	16
North Dakota	2
Ohio	18
Oklahoma	5
Oregon	6
Pennsylvania	25
Rhode Island	1
South Carolina	9

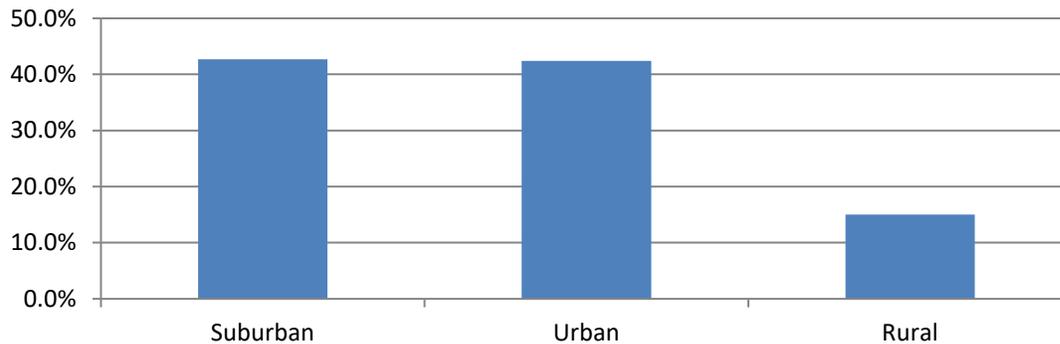
State	N
South Dakota	5
Tennessee	12
Texas	34
Utah	3
Vermont	4
Virginia	20
Washington	11
West Virginia	0
Wisconsin	31
Wyoming	2

\*N.b. There were 4 respondents from outside of the United States.

### Location of Facility:

	N	Valid Percent
Suburban	279	42.7%
Urban	277	42.4%
Rural	98	15.0%
Total	654	100.0%

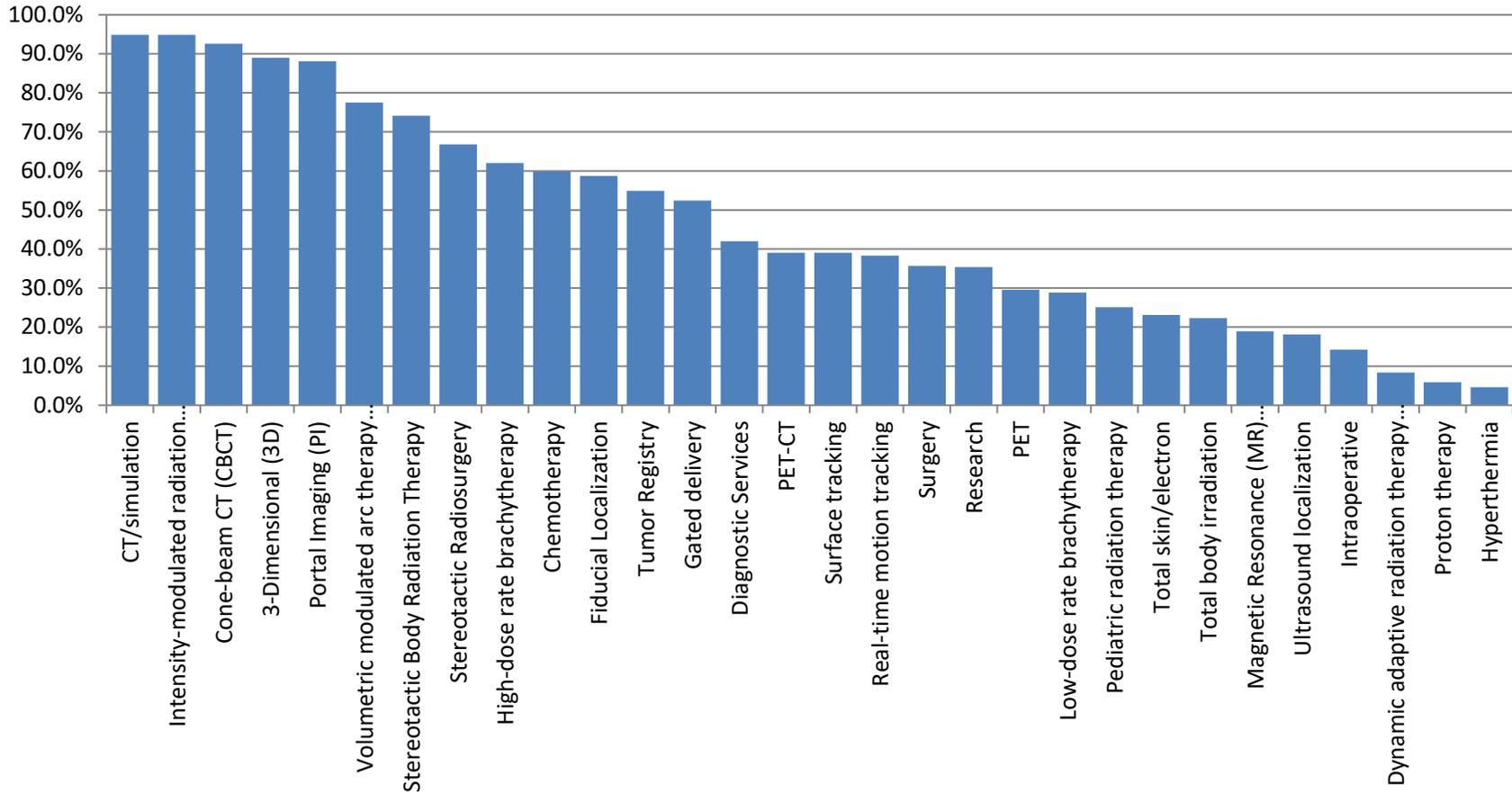
### Location of facility:



**Which of the following services does your facility provide?**

	<b>N</b>	<b>Percent of Cases</b>
<b>CT/simulation</b>	612	94.9%
<b>Intensity-modulated radiation therapy (IMRT)</b>	612	94.9%
<b>Cone-beam CT (CBCT)</b>	597	92.6%
<b>3-Dimensional (3D)</b>	574	89.0%
<b>Portal Imaging (PI)</b>	568	88.1%
<b>Volumetric modulated arc therapy (VMAT)</b>	500	77.5%
<b>Stereotactic Body Radiation Therapy</b>	478	74.1%
<b>Stereotactic Radiosurgery</b>	431	66.8%
<b>High-dose rate brachytherapy</b>	400	62.0%
<b>Chemotherapy</b>	386	59.8%
<b>Fiducial Localization</b>	379	58.8%
<b>Tumor Registry</b>	354	54.9%
<b>Gated delivery</b>	338	52.4%
<b>Diagnostic Services</b>	271	42.0%
<b>PET-CT</b>	252	39.1%
<b>Surface tracking</b>	252	39.1%
<b>Real-time motion tracking</b>	247	38.3%
<b>Surgery</b>	230	35.7%
<b>Research</b>	228	35.3%
<b>PET</b>	191	29.6%
<b>Low-dose rate brachytherapy</b>	186	28.8%
<b>Pediatric radiation therapy</b>	162	25.1%
<b>Total skin/electron</b>	149	23.1%
<b>Total body irradiation</b>	144	22.3%
<b>Magnetic Resonance (MR) localization</b>	122	18.9%
<b>Ultrasound localization</b>	117	18.1%
<b>Intraoperative</b>	92	14.3%
<b>Dynamic adaptive radiation therapy (DART)</b>	54	8.4%
<b>Proton therapy</b>	38	5.9%
<b>Hyperthermia</b>	30	4.7%

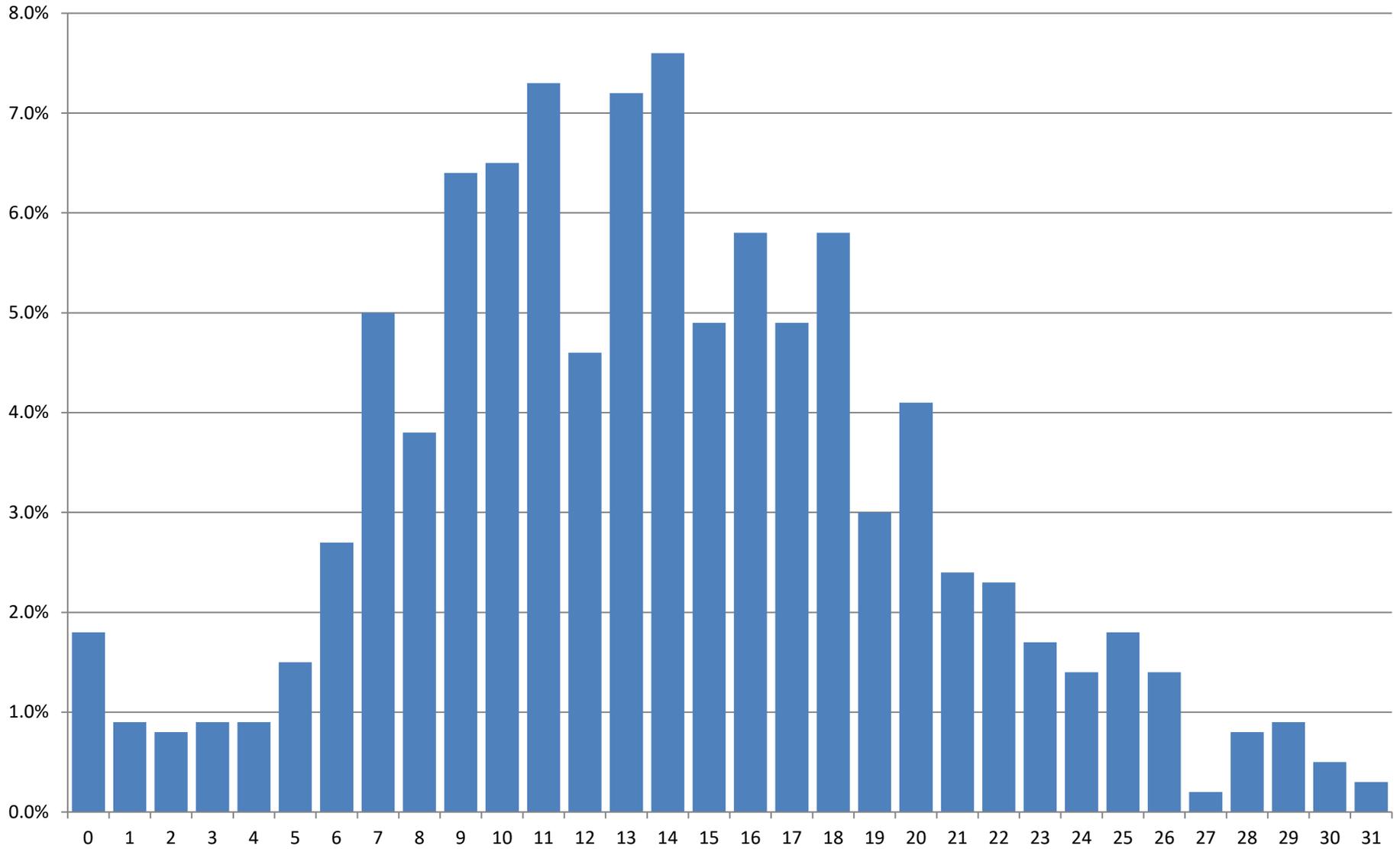
### Which of the following services does your facility provide?



### Number of Services Provided by Each Facility

	N	Valid Percent	Cumulative Percent
0	12	1.8%	1.8%
1	6	0.9%	2.7%
2	5	0.8%	3.5%
3	6	0.9%	4.4%
4	6	0.9%	5.3%
5	10	1.5%	6.8%
6	18	2.7%	9.6%
7	33	5.0%	14.6%
8	25	3.8%	18.4%
9	42	6.4%	24.8%
10	43	6.5%	31.4%
11	48	7.3%	38.7%
12	30	4.6%	43.2%
13	47	7.2%	50.4%
14	50	7.6%	58.0%
15	32	4.9%	62.9%
16	38	5.8%	68.6%
17	32	4.9%	73.5%
18	38	5.8%	79.3%
19	20	3.0%	82.3%
20	27	4.1%	86.5%
21	16	2.4%	88.9%
22	15	2.3%	91.2%
23	11	1.7%	92.8%
24	9	1.4%	94.2%
25	12	1.8%	96.0%
26	9	1.4%	97.4%
27	1	0.2%	97.6%
28	5	0.8%	98.3%
29	6	0.9%	99.2%
30	3	0.5%	99.7%
31	2	0.3%	100.0%
Total	657	100.00%	
Mean	<b>13.8 (SD=6.2)</b>		
Percentiles	5th=4.0, 25th=10.0, 50th=13.0 75th=18.0, 95th=25.0		

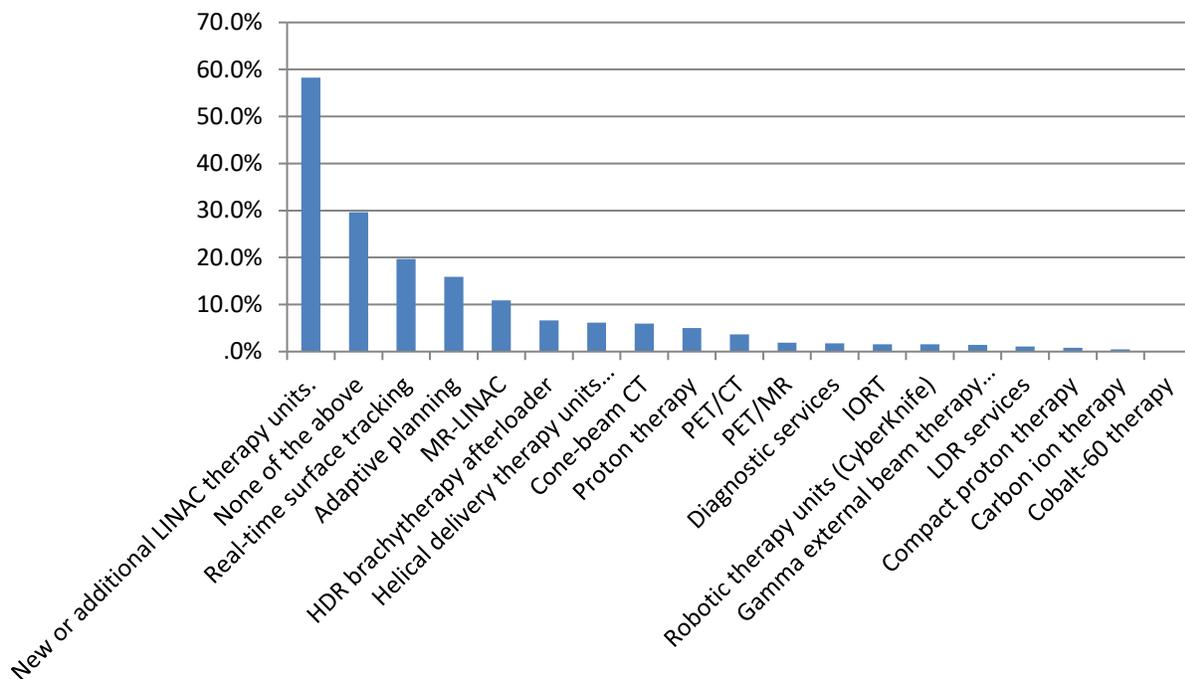
**Number of Service Offered:**



Over the next few years, is your facility planning to expand services to include any of the following?

	N	Percent of Cases
New or additional LINAC therapy units.	370	58.3%
None of the above	188	29.6%
Real-time surface tracking	125	19.7%
Adaptive planning	101	15.9%
MR-LINAC	69	10.9%
HDR brachytherapy afterloader	42	6.6%
Helical delivery therapy units (TomoTherapy, Halcyon, etc.)	39	6.1%
Cone-beam CT	38	6.0%
Proton therapy	32	5.0%
PET/CT	23	3.6%
PET/MR	12	1.9%
Diagnostic services	11	1.7%
IORT	10	1.6%
Robotic therapy units (CyberKnife)	10	1.6%
Gamma external beam therapy (GammaKnife, GammaPod, etc.)	9	1.4%
LDR services	7	1.1%
Compact proton therapy	5	0.8%
Carbon ion therapy	3	0.5%
Cobalt-60 therapy	1	0.2%

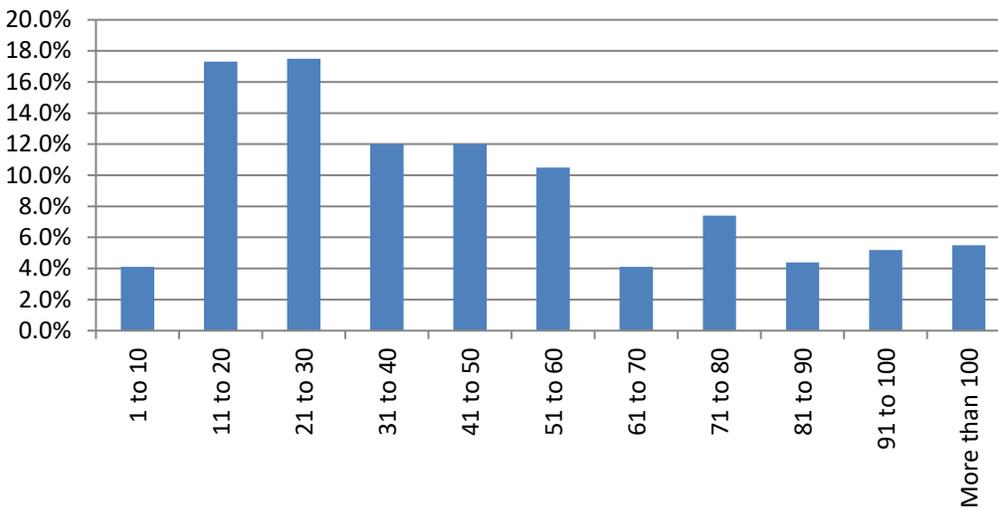
Over the next few years, is your facility planning to expand services to include any of the following?



**On average, how many patients are treated daily at your facility?**

	N	Valid Percent	Cumulative Percent
1 to 10	22	4.1%	4.1%
11 to 20	94	17.3%	21.4%
21 to 30	95	17.5%	38.9%
31 to 40	65	12.0%	50.9%
41 to 50	65	12.0%	62.9%
51 to 60	57	10.5%	73.4%
61 to 70	22	4.1%	77.5%
71 to 80	40	7.4%	84.9%
81 to 90	24	4.4%	89.3%
91 to 100	28	5.2%	94.5%
More than 100	30	5.5%	100.0%
Total	542	100.0%	
<b>Mean</b>	<b>49.0 (SD=31.0)</b>		
Percentiles	5th=12.0, 25th=25.0, 50th=40.0 75th=70.0, 95th=110.0		

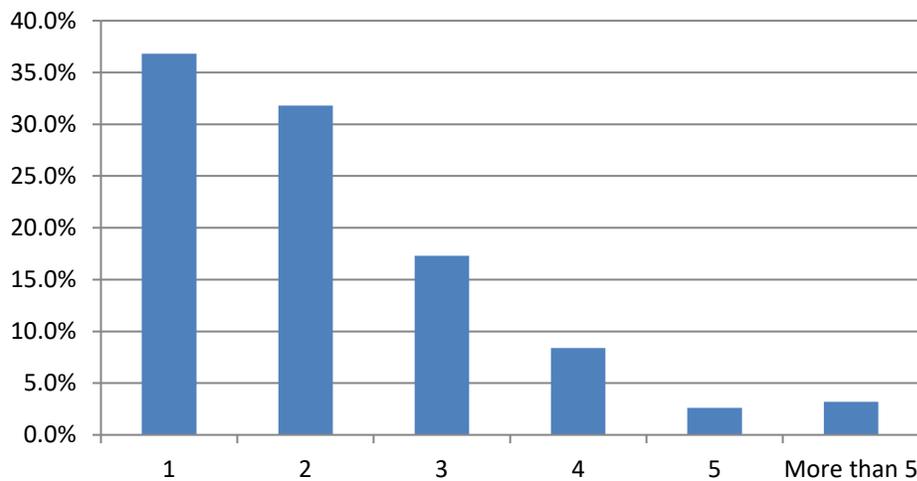
**On average, how many patients are treated daily at your facility?**



### How many linear accelerators are used in your facility?

	N	Valid Percent	Cumulative Percent
1	198	36.8%	36.8%
2	171	31.8%	68.6%
3	93	17.3%	85.9%
4	45	8.4%	94.2%
5	14	2.6%	96.8%
More than 5	17	3.2%	100.0%
<b>Total</b>	<b>538</b>	<b>100.0%</b>	
<b>Mean</b>	<b>2.2 (SD=1.3)</b>		
<b>Percentiles</b>	5th=1.0, 25th=1.0, 50th=2.0 75th=3.0, 95th=5.0		

### How many linear accelerators are used in your facility?

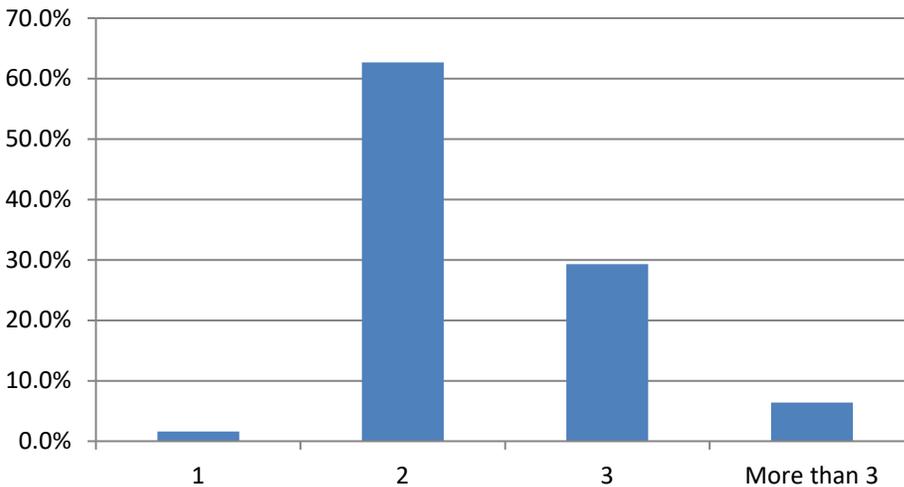


## Personnel Demographics

On average, how many therapists per linear accelerator are routinely scheduled at your facility?

	N	Valid Percent	Cumulative Percent
1	8	1.6%	1.6%
2	313	62.7%	64.3%
3	146	29.3%	93.6%
More than 3	32	6.4%	100.0%
<b>Total</b>	499	100.0%	
<b>Mean</b>	<b>2.4 (SD=0.6)</b>		
<b>Percentiles</b>	5th=2.0, 25th=2.0, 50th=2.0 75th=3.0, 95th=3.5		

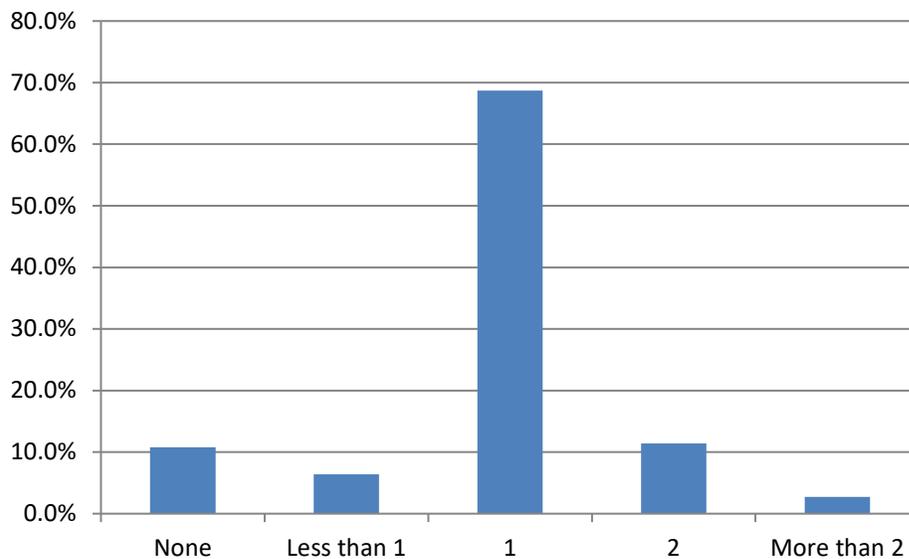
On average, how many therapists per linear accelerator are routinely scheduled at your facility?



**On average, how many dosimetrists per linear accelerator are routinely scheduled at your facility?**

	N	Valid Percent	Cumulative Percent
0	52	10.8%	10.8%
Less than 1	31	6.4%	17.2%
1	332	68.7%	85.9%
2	55	11.4%	97.3%
More than 2	13	2.7%	100.0%
<b>Total</b>	483	100.0%	
<b>Mean</b>	<b>1.1 (SD=0.6)</b>		
<b>Percentiles</b>	5th=0.0, 25th=1.0, 50th=1.0 75th=1.0, 95th=2.0		

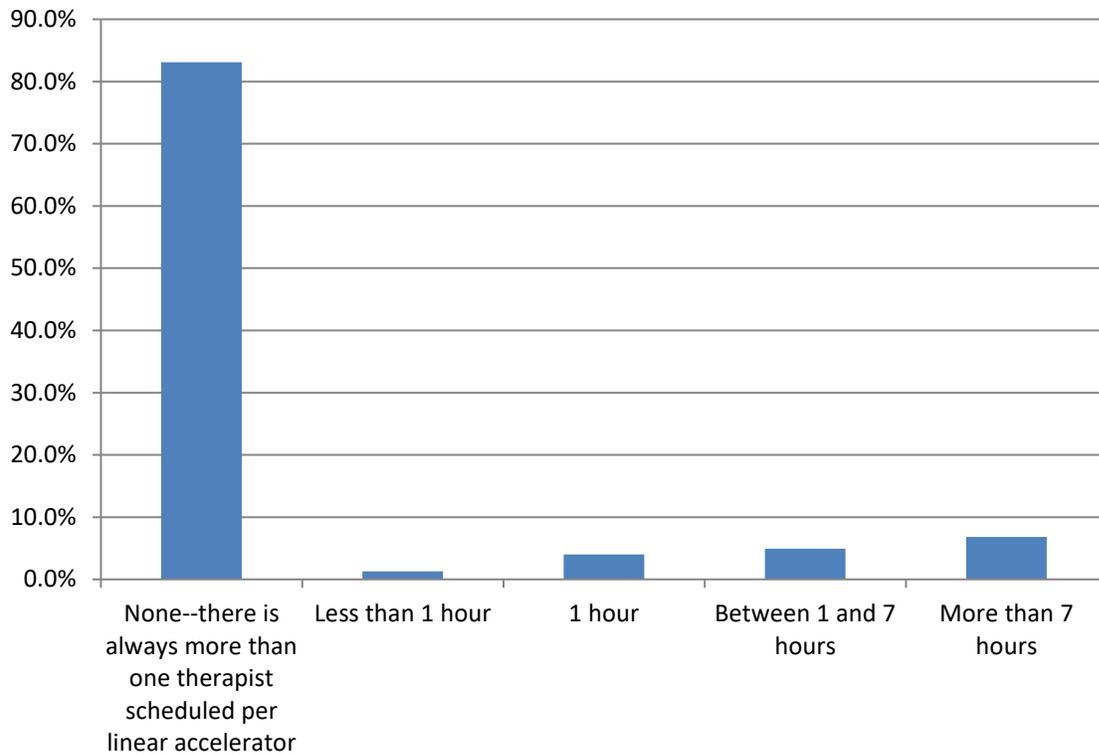
**On average, how many dosimetrists per linear accelerator are routinely scheduled at your facility?**



**How many, if any, hours per day does your facility routinely schedule only one therapist per linear accelerator?**

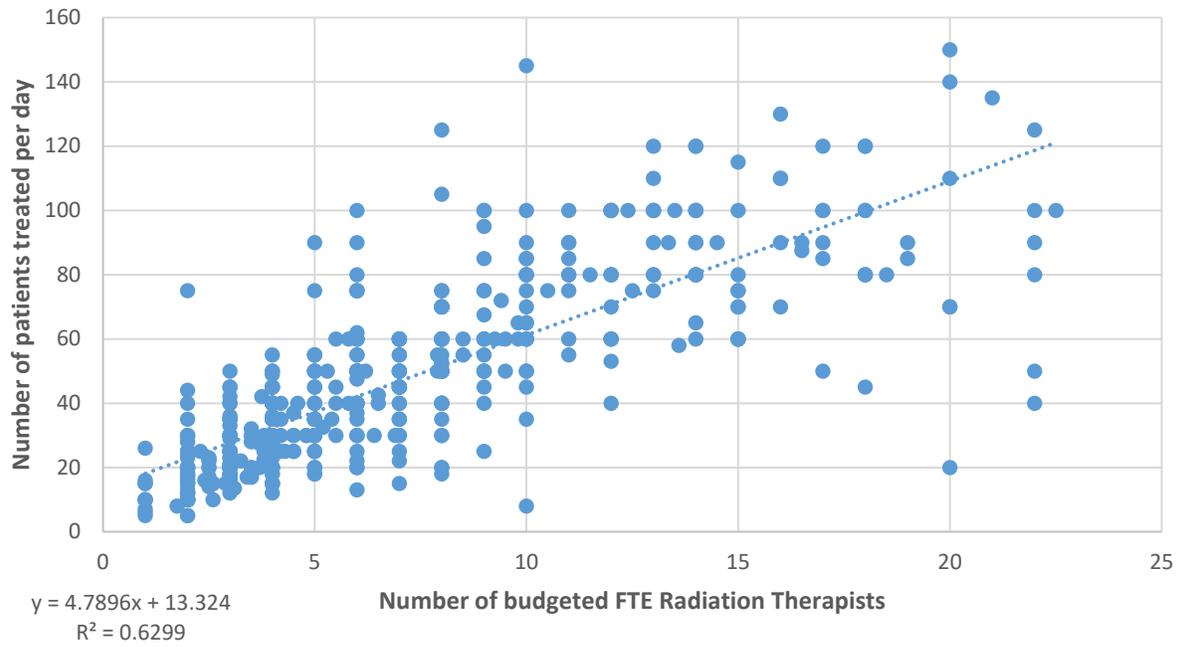
	N	Valid Percent	Cumulative Percent
None--there is always more than one therapist scheduled per linear accelerator	461	83.1%	83.1%
Less than 1 hour	7	1.3%	84.3%
1 hour	22	4.0%	88.3%
Between 1 and 7 hours	27	4.9%	93.2%
More than 7 hours	38	6.8%	100.0%
<b>Total</b>	555	100.0%	
<b>Mean</b>	<b>0.7 (SD=2.1)</b>		
<b>Percentiles</b>	5th=0.0, 25th=0.0, 50th=0.0 75th=0.0, 95th=8.0		

**How many, if any, hours per day does your facility routinely schedule only one therapist per linear accelerator?**

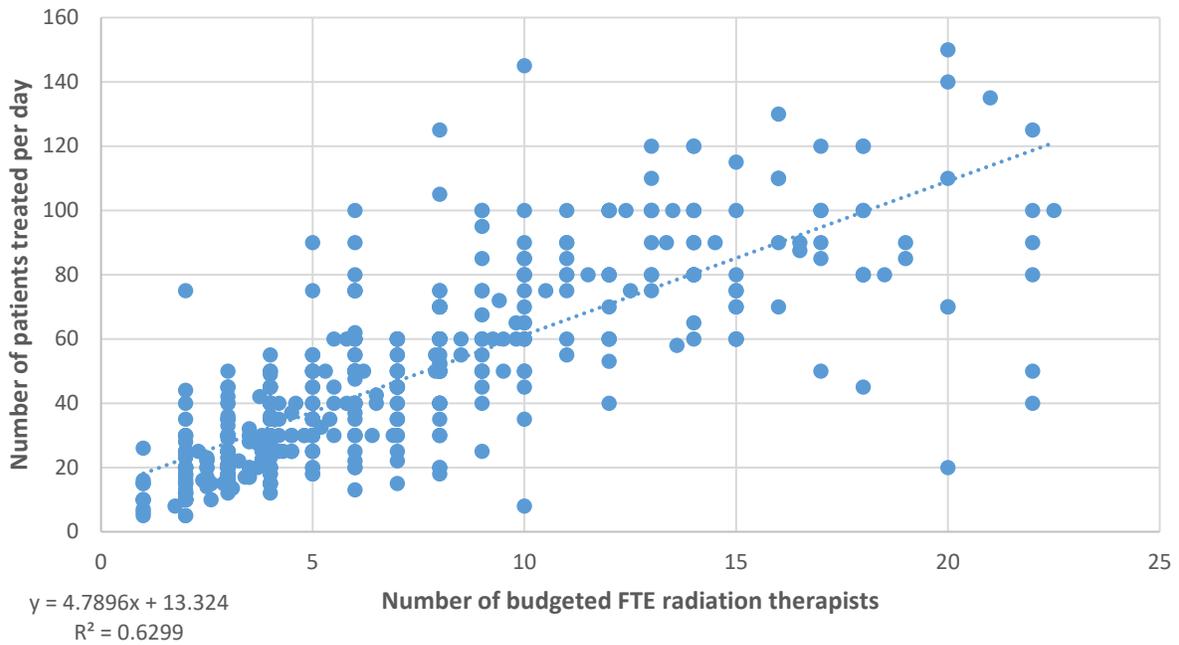




### Number of Budgeted FTE Radiation Therapists per Facility by Number of Patients Treated per Day



### Number of budgeted FTE radiation therapists per facility by number of patients treated per day



### Number of Budgeted FTE Medical Dosimetrists per Facility by Number of Patients Treated per Day

