



Geographic Access to Radiation Therapy in the United States

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Disclosure

- Employer: The University of Texas MD Anderson Cancer Center
- I have no conflicts of interest to disclose.
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Why does geographic access to RT matter?

- Between half and two thirds of people diagnosed with cancer get radiation therapy
- Radiation therapy usually requires multiple treatments
- Distance from radiation facilities is correlated with receipt of RT
 - Decision for breast-conserving surgery + RT vs. mastectomy for breast cancer
 - Definitive RT vs. surgical management of prostate cancer
 - Affects clinical trial participation

...but these studies
are often based on
physician location.

Goyal et al. Ann Surg Oncol. 2015 Apr;22(4):1095-101.

Muralidhar et al. Int J Radiat Oncol Biol Phys. 2016 Oct 1;96(2):313-317.

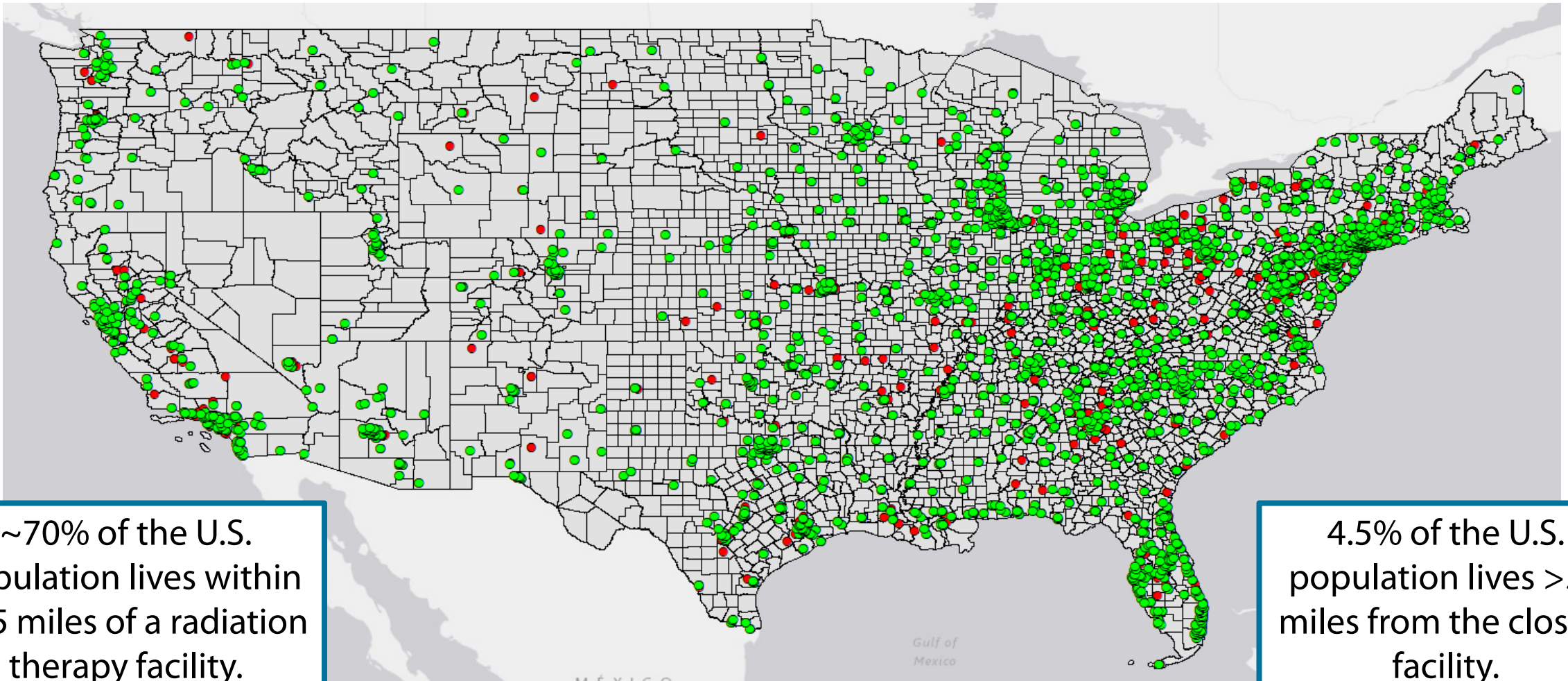
Bruner et al. Int J Radiat Oncol Biol Phys. 2015 Nov 1;93(3):702-9.

Ballas et al. Int J Radiat Oncol Biol Phys. 2006 Nov 15;66(4):1204-11.

Method

- Contacted state regulatory bodies and dosimetric accrediting bodies to collect information on locations where patients receive RT (2018-2020)
- Geocoded addresses into latitude/longitude coordinates; rounded coordinates to 2 decimal places (~1km) to create identifiers of RT sites
- Geospatial analysis:
 - Generated maps
 - Attributed populations to counties based on census data
 - Calculated distance between county centroids and closest RT facilities
- Compared results with similar database created in 2005

Results: Proximity to Clinics

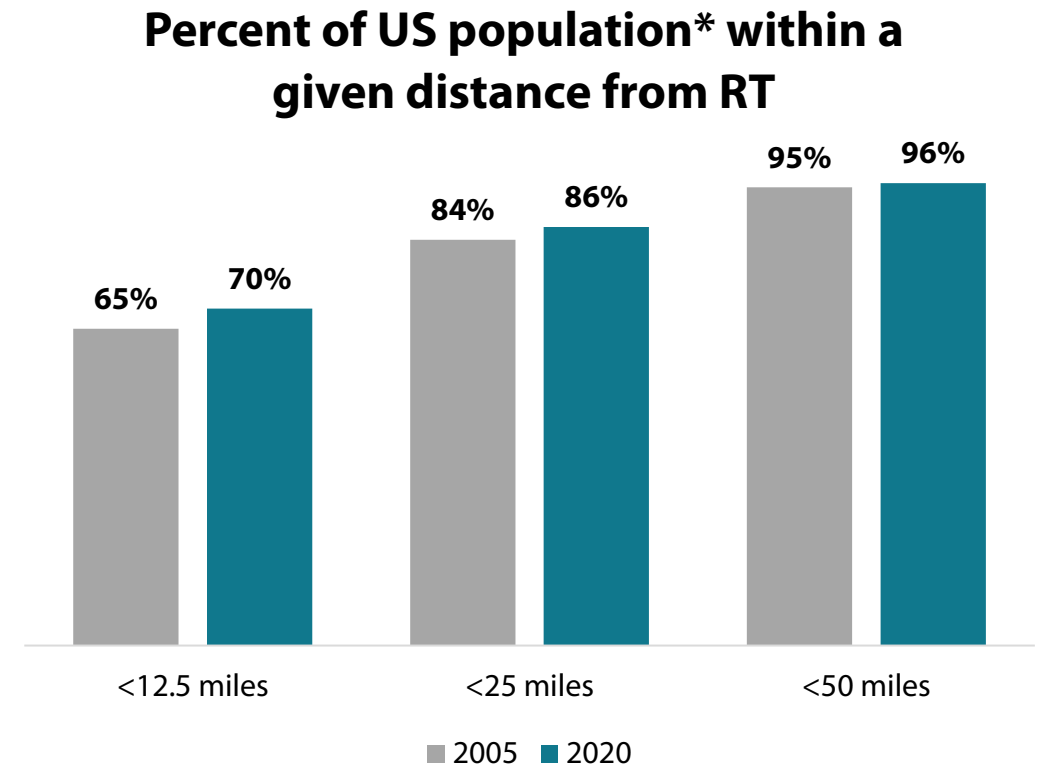


~70% of the U.S. population lives within 12.5 miles of a radiation therapy facility.

4.5% of the U.S. population lives >50 miles from the closest facility.

Results: Change Over Time

- **17% growth:** 2,332 facilities in 2020 versus 1,987 in 2005
- 33% of sites (662/1987) in the 2005 dataset did not exist in the updated dataset
- The rate of growth increased faster for people closest to facilities than it did for those farther away



*based on attributing the population to a county centroid

Discussion

- Growth in RT facilities (17% from 2005-2020) mirrors the growth in treated cases (12% from 2004-2014). **Both ~1.2% annual growth**
- The percent of the population with greatest access (<12.5 or <25 miles to RT) increased faster than the population <50 miles to RT. **Are resources being allocated appropriately?**
- Findings are consistent with recent reports of substantial variation in radiation oncologist density

Royce et al. J Am Coll Radiol. 2018 Nov;15(11):1558-1564.

Jemal et al. CA Cancer J Clin. Jan-Feb 2004;54(1):8-29.

Siegel et al. CA Cancer J Clin. Jan-Feb 2014;64(1):9-29.

Bates et al. Pract Radiat Oncol. 2020 May 16;S1879-8500(20)30105-3.

Conclusions

- This is the most complete database on RT facilities in the US
- Despite a significant growth in the number of RT facilities over the past 15 years, about 4.5% of the US population still has limited geographic access to RT (>50 miles)
- Future opportunities to use this data to better understand underserved US populations