

BACKGROUND

- The impact of public policy on treatment intervention has been long understood, but relatively sparsely examined, particularly in the realm of central nervous system (CNS) disease
- For patients with metastatic brain disease, stereotactic radiosurgery (SRS) spares appropriately chosen patients from the invasiveness of operative intervention and the often permanent cognitive morbidity of whole brain radiation, in addition to being more than 40% less expensive than open surgery. (*Brown et al., JAMA 2016; Caruso et al., J Clin Neurosci 2015*)
- SRS is delivered predominantly via two modalities: Gamma Knife radiosurgery (GKRS), and linear accelerator (LINAC); the former usually in a single-fraction setting, and the latter ranging from one to five fractions. (*Andrews et al., Surg Neurol 2006*)
- The implementation of the American Tax Payer Relief Act (ATRA) in 2013 represented the first time that limitations specifically targeting SRS reimbursement were introduced into federal law.
- The subsequent impact of the ATRA on SRS utilization in the United States (US) has yet to be examined.

MATERIALS AND METHODS

- The National Cancer Data Base (NCDB) from 2010-2016 identified brain metastases patients from non-small cell lung cancer (NSCLC) throughout the US having undergone SRS.
- Utilization between GKRS and LINAC was assessed before (2010-2012) versus after (2013-2016) ATRA implementation.
- Utilization was adjusted for several variables, including patient demographics and healthcare system characteristics. Significance was defined as a two-sided P value < 0.05.

RESULTS

- From 2012 to 2013, there was a substantial decrease of LINAC SRS in favor of GKRS overall (37% to 28%) and individually in both academic and non-academic centers.
- Over the three-year span immediately preceding ATRA implementation, 65.8% received GKRS and the remaining 34.2% receiving LINAC.
- In the four years immediately following ATRA implementation 68.0% received GKRS compared with 32% receiving LINAC; these differences were not statistically significant.

Figure 1: Inclusion/exclusion criterion for analysis (full and limited datasets)

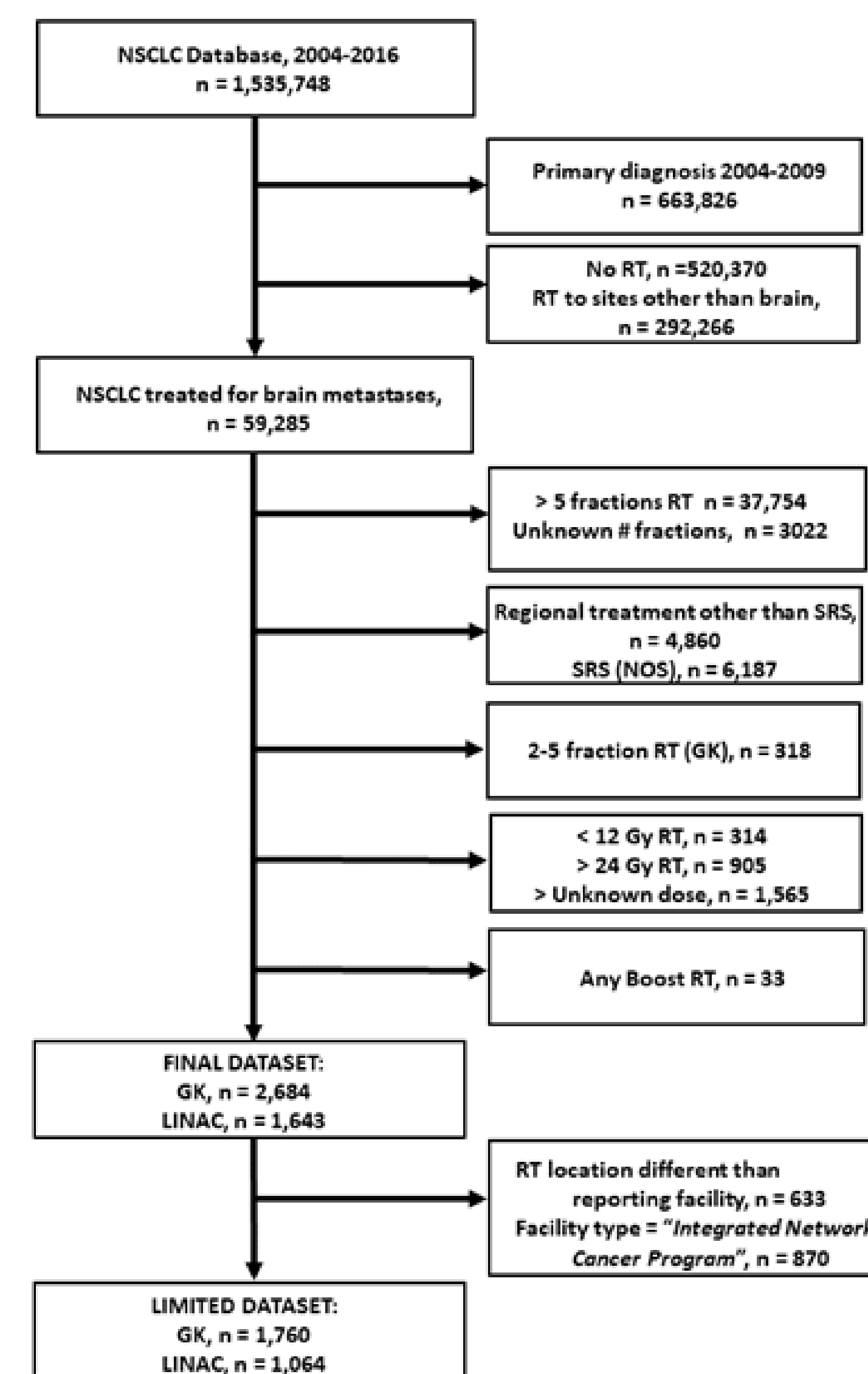
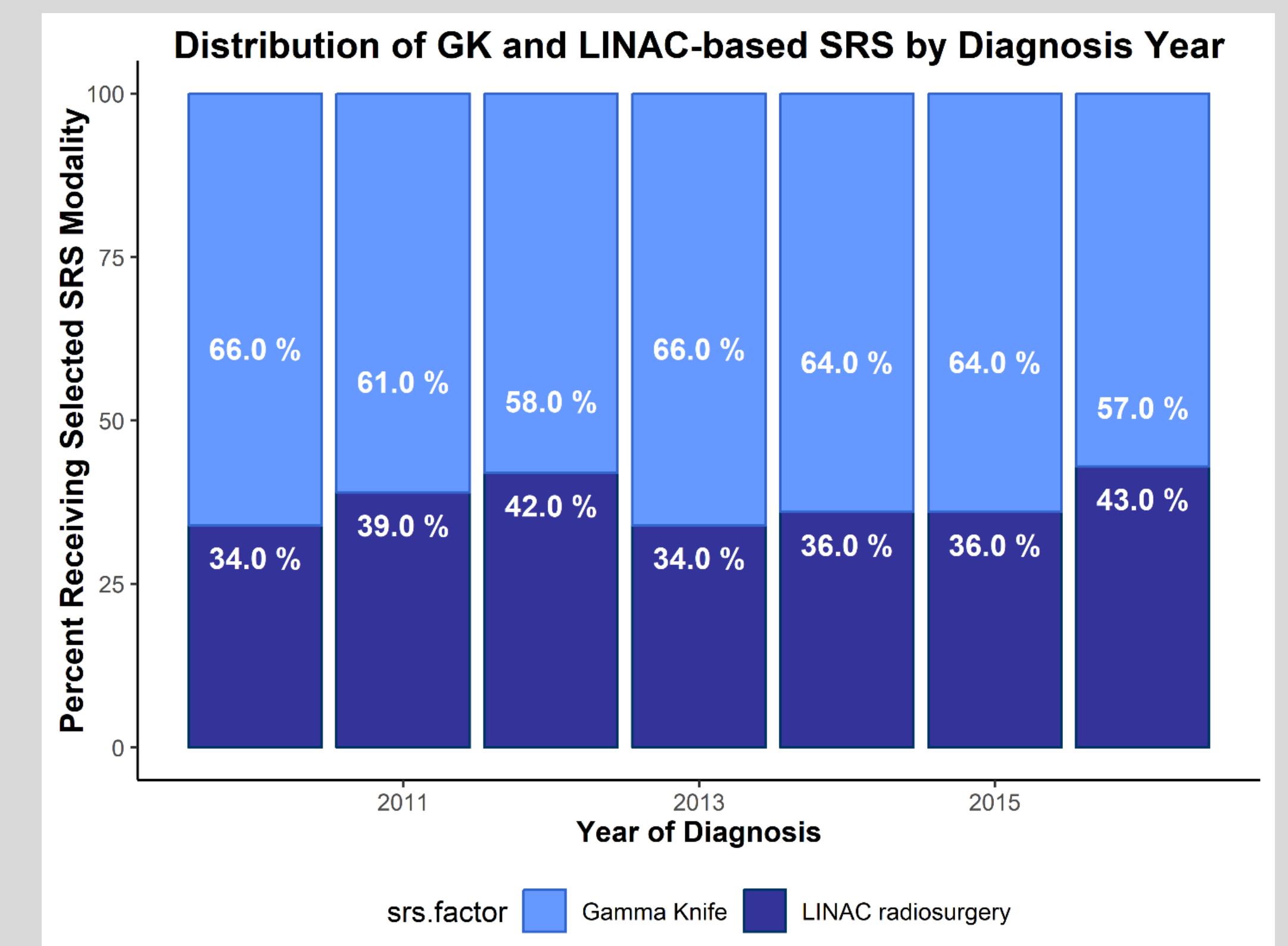


Table 1: Utilization of LINAC versus Gamma Knife SRS before (2010-2012), during (2012-2014), and after (2015-2016) implementation of the ATRA

Population	Level	n	2010-2012	2013-2014	2015-2016	p-value
All eligible	Gamma Knife	2684	774 (61.4)	841 (64.8)	1069 (60.5)	0.043
	LINAC radiosurgery	1643	487 (38.6)	457 (35.2)	699 (39.5)	
Non-Academic	Gamma Knife	405	135 (44.3)	133 (52.4)	137 (38.4)	0.003
	LINAC radiosurgery	511	170 (55.7)	121 (47.6)	220 (61.6)	
Academic	Gamma Knife	1355	380 (71.0)	426 (71.0)	549 (71.0)	1.000
	LINAC radiosurgery	553	155 (29.0)	174 (29.0)	224 (29.0)	
Medicare	Gamma Knife	1305	364 (60.2)	404 (63.0)	537 (59.5)	0.361
	LINAC radiosurgery	843	241 (39.8)	237 (37.0)	365 (40.5)	
Medicaid	Gamma Knife	258	59 (67.0)	95 (76.6)	104 (55.0)	<0.001
	LINAC radiosurgery	143	29 (33.0)	29 (23.4)	85 (45.0)	

RESULTS

Figure 2: Distribution of Gamma knife and LINAC-based SRS use by year of diagnosis



CONCLUSIONS

- ATRA implementation in 2013 caused an initial spike in Gamma Knife SRS utilization, followed by a steady decline towards rates prior to implementation.
- These findings are indicative that the ATRA provision mandating Medicare reduction of outpatient payments for Gamma Knife to be equivalent with those of LINAC SRS had a significant short-term impact on the radiosurgical treatment of metastatic brain disease throughout the US.

Such findings should serve as a reminder of the importance and impact of public policy on treatment modality utilization by physicians and hospitals.

DISCLOSURES

McClelland, Degrin, Chen, Watson, Jaboin – nothing to disclose

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