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**Review Article** 

# Defining the expected 30-day mortality for patients undergoing palliative radiotherapy: A meta-analysis



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#### ABSTRACT

*Background:* The expected 30-day mortality rate for patients treated with palliative radiation is not established. The primary objective of this study is to define the proportion of patients with advanced cancer who die within 30-days of palliative radiotherapy (PR). Additionally, we explored the short term survival of patient subgroups undergoing PR treatment.

*Methods:* We searched MEDLINE, CINAHL, Embase and Cochrane Database of Systematic Reviews from January 1st 1980 to June 26, 2020. We included PUBMED's related search and reference lists to further identify articles. A meta-analysis of these research studies and reviews was performed. Published and unpublished English language randomized controlled trials, observational or prospective studies, and systematic reviews that reported 30-day mortality for patients with advanced cancer who received PR were eligible. Data extraction was done by two independent authors and included study quality indicators. To improve distribution and variance, all proportions were transformed using logit transformation. A random-effects model was used to pool data, using Der Simonian and Laird method of estimation where possible and appropriate.

*Results:* The data from 42 studies contributing 88,516 patients with advanced cancer who received PR were evaluated. The summary proportion of mortality in patients with advanced cancer within 30 days of receiving PR was 16% (95% CI = 14% to 18%). We found substantial heterogeneity in our data ( $I^2 = 98.76\%$ , p < 0.001), hence we applied subgroup analysis to identify potential moderating factors. We found a higher 30-day mortality rate after PR in the following groups: multiple treatment sites (QM(1) = 9.54, p = 0.002), hepatobiliary primary (QM(1) = 24.20, p < 0.001), inpatient status (QM (1) = 92.27, p < 0.001), Eastern Cooperative Oncology Group performance status (ECOG) 3–4 (QM (1) = 8.70, p = 0.003), United States (U.S.) patients (QM(1) = 28.70, p < 0.001) among others.

*Conclusions:* We found that 16% of patients with advanced cancer receiving PR die within 30 days of treatment. Our finding can be used as a benchmark to establish a global quality metric for radiation oncology practice audits.

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Patients diagnosed with incurable cancer will predominantly succumb to the disease itself as the cause of their death [1]. Palliative radiotherapy (PR) is used to alleviate cancer-related symptoms and is given to 19% of patients with cancer [2]. Common indications for PR include pain and fracture prevention from bone metas-

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tases [3], neurological symptoms from spinal cord/cauda equina compression or nerve root compression [4], symptoms from brain metastases [5], and haemostasis [6,7]. Symptomatic responses to PR may take several weeks. This delay means patients treated with PR need to survive long enough to derive a benefit [8]. Oncologists can be optimistic when estimating survival for patients with advanced cancer [9,10], as a consequence patients who are treated can die before deriving any benefit from PR.

Patients with advanced disease should be selected carefully before treatment with PR, especially multifraction radiation treatments (RT), which may be futile close to end

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Abbreviations: PR, palliative radiotherapy; ECOG, Eastern Cooperative Oncology Group performance status; U.S., United States of America; RT, radiation treatments; ROB, risk of bias; ESR, externally studentized residuals; CI, confidence interval. \* Corresponding author at: Princess Alexandra Hospital – ROPART, 31 Raymond

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of life and can increase patient burden and health care costs [11]. Achieving the appropriate balance between providing useful symptom relief and avoiding potentially futile interventions is challenging near end of life [12]. One evidence-based solution to this problem is using short treatment courses (i.e. fewer RT fracfor symptomatic patients with poor prognosis tions) [9.12]. The 30-day mortality after PR is commonly used to audit how many patients with advanced cancer are treated at end of life [136][13]. The 30-day mortality after PR has been considered as a possible quality metric [14]. The use of chemotherapy within 30 days of death is an accepted quality metric, with evidence to support what should be considered standard of care [15–18]. The recommendation from the Royal College of Radiologists that "no more than 20% of patients should die within 30 days of receiving their PR treatment", however, is not evidence-based [19]. We found no published meta-analysis reporting 30-day mortality rate for patients with advanced cancer treated with PR.

We completed a systematic review and meta-analysis to estimate the average proportion of patients who are reported to have died within 30 days of PR. Additionally, we performed subgroup analyses by computing subgroup summary proportions.

#### Methods

Our research was conducted in accordance with the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) statement. The protocol is available on the PROSPERO website: protocol number CRD42020181567 [20]. Low risk ethics approval was obtained from the Metro South Human Research Ethics Committee (reference: HREC/2021/ QMS/73488 on 7 April 2021) and approval from the Queensland Public Health Act for use of the Queensland government (Australia) data [2] (PHA 73488).

#### Search strategy

We searched MEDLINE (PubMed), Embase, CINAHL, and Cochrane Database of Systematic Reviews from January 1st, 1980 to June 26th, 2020. Specific search strategies for each database were built and reported in Appendix A. Citations from the searches were uploaded into EndNote X9, and from here uploaded into Covidence [21], a data management program software. The reference lists of all studies that met inclusion criteria were examined for further identification of relevant studies. A pre-determined study inclusion criterion was used. The study selection process involved title and abstract screening and finally a full text review using Covidence. The selection process as per PRISMA guidelines is presented in Fig. 1 [22]. Two independent reviewers decided on study inclusion after full text review.

#### Protocol and eligibility criteria

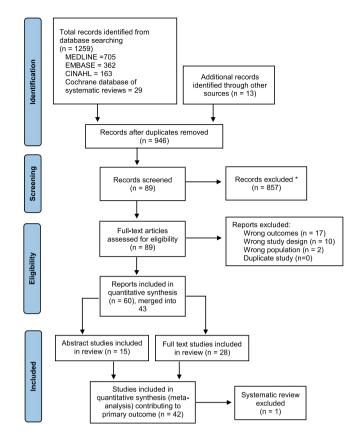
#### (i) Inclusion criteria

Published or unpublished English language studies reporting data for patients of any age, with locally advanced or metastatic cancer treated with external beam PR.

Analytical epidemiological studies including retrospective or prospective cohort and case-control studies, meta-analyses, randomized controlled trials and systematic reviews were eligible.

#### (ii) Exclusion criteria

Studies were excluded if they did not report the primary outcome measure. Studies that focused on palliative chemotherapy only, and radiotherapy (RT) studies that did not report the number of patients treated with PR were excluded.



**Fig. 1.** PRISMA flow diagram. \* = 857 records were excluded after abstract screening by two independent reviewers for not containing the terms "30-day/1-month mortality" or similar.

#### (iii) Outcomes

The primary outcome was the proportion of patients with locally advanced or metastatic cancer treated with PR who died within 30-days of starting treatment.

The secondary outcomes were the impact of the following on the 30-day mortality rate: planned number of fractions, the proportion of patients who died within 30-days of start of treatment who did not complete the planned PR course, radiation technique i.e., highly conformal RT including stereotactic body radiotherapy (SBRT) and volume modulated arc therapy (VMAT) or intensity modulated radiation therapy (IMRT) vs. simple field arrangements; indications for PR.

We investigated the following prespecified groups: indications for PR, primary diagnosis of cancer, inpatient vs. outpatient status RT referral, at time of patient performance status, synchronous chemotheror prior apy, steroid treatment at the time of RT referral, patients who are resident to a care-home at referral for RT, number of patients known to a hospice team at the time of referral for PR, age, patients with non-bone metastases, and those with liver metastases getting PR. For post-hoc subgroup analysis the following was collected: U. S. studies, year of publication, and studies measuring 30-days metric timeline from the start vs. end of the patient's PR course.

We systematically searched for any unpublished data by contacting authors of studies accepted for the full text-review stage of our study screening process. If unpublished data matching our outcomes/subgroups of interest was found, it was included in our meta-analysis. In total, 32 authors were contacted, 15 replied

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resulting in 7 studies providing unpublished data used in this meta-analysis.

#### Data extraction

We used Covidence [21] to merge and extract data from studies included after full-text screening was completed. The data was then coded in a spreadsheet to collate information from each included study. Two reviewers independently extracted: name of primary author, publication year, demographic data, and the total number of PR courses of treatment given to patients in each study. Mortality rate after PR was extracted as the primary outcome of interest.

Moderators: The secondary outcomes and moderator data extracted pre- and post-hoc are listed in the outcomes section above.

#### Risk of bias (ROB) assessment

The quality of individual studies was assessed using a modified version of the ROBINS-I tool [23] (Appendix B.1). Each study was assessed for bias and scored at high, moderate, and low ROB. We assessed the following 6 study ROB domains: study population definition, confounding variables, selection bias, missing data, duplicate publication bias and outcome reporting bias. The Overall ROB for each domain was assigned either low, moderate or high ROB based on the percentage of studies assessed at a certain level of risk: if >/=60% of individual studies were assessed as low ROB for that domain then the overall ROB for this domain was low. If <60% of studies were low ROB for a domain, then the domain ROB was assessed as moderate (sum total number of low + moderate ROB studies for a domain > number of high ROB studies for that domain) or high (number of high ROB studies for a domain > sum total of low + moderate ROB studies for that domain) ROB (Appendix B.2). ROB across studies (publication bias) was assessed by plotting the effect by the inverse of its standard error. The symmetry of this funnel plot was assessed both visually and via regression test for funnel plot asymmetry.

#### Data synthesis and analysis

The included studies are single arm non-comparative studies, so meta-analysis of proportions using a "random effects model" [24] was done. One randomised-controlled trial was included that reported those patients getting PR for bone metastases who were randomised to two different doses of PR comparing single fraction treatment to multi-fraction doses for pain. We were able to obtain our primary outcome, which was reported for the total population (including both treatment arms) of this study, so it was included in our analysis [25]. Visualisation through histogram (Appendix C.1) and Shapiro-Wilk's test [26] indicated non-normality of the primary outcome, hence a logit transformation of proportions was applied [27–29]. Pooled proportion was estimated using the transformed proportions which conformed to normal distribution after transformation, ensuring accurate estimation of summary proportion. All analyses were conducted on transformed proportions with Der Simonian and Laird method of estimation using a random effects model [30]. The transformed proportions, and 95% confidence intervals (95% CI), were reverted to original proportions for ease of reporting and interpretation. The summary proportion and their 95% CI is presented in a Forest plot. We assessed heterogeneity using Cochran's Q [30] and I<sup>2</sup> statistic [31]. Visual inspection of Forest plots, externally studentized residuals (ESRs) and leave-one-out analysis were used to screen for influential studies, and more specifically, to discover whether the one paediatric study [32] or two U.S. studies [33,34] (consisting of restricted adult pop-

ulations) included in our review was statistically influential on the summary proportion of 30-day mortality rate after PR [35]. Because of the high number of studies extracted in this review, the studies with ESR z-values greater than 3 were considered outliers. Leave one out analysis was conducted to examine the influence of outliers. We used subgroup analysis to investigate the potential modifier effect (calculating summary coefficients and 95% CIs) each subgroup has on the overall summary 30-day mortality proportion after PR using a random-effects model as specified in our protocol [36,31]. Each subgroup of interest only included extracted studies that reported the 30-day mortality after PR for that subgroup, and they (as a group) were statistically compared with the 30-day mortality rates of the other of the 42 extracted studies (the studies not reporting the 30-day mortality rate for the subgroup of interest) to be used as a comparator group (called "Other Studies"). Finally, we used funnel and scatter plots to assess for publication/small-study bias [37]. All statistical analyses were performed in the package 'metaphor package in R' [24] (version 1.3.1093, http://www.R-project.org/).

Secondary outcomes and subgroups are reported unmodified (Appendix D.1 to D.6). We evaluated evidence quality according to GRADE principles, describing the primary outcome in terms of bias, precision, indirectness, heterogeneity and publication bias.

#### Results

We found 1259 unique publications through various database searches. 13 additional studies were found by mining references by hand and by using PubMed search for "related articles". After duplicates were removed (313 studies), titles and abstracts of 946 studies were reviewed and 857 studies were excluded at this stage. We retrieved and reviewed the full text of 89 studies for eligibility. After full text review and cross checking, 42 studies (43 studies including one systematic review [13] that was not used for extraction in order to avoid duplication of results) met the inclusion criteria and were selected for data extraction in our meta-analysis (see Fig. 1 and Table 1) while the remaining were excluded (appendix E.1) or merged (appendix E.2).

42 included studies contributed pooled data from a total of 88,516 patients treated with PR in 14 different countries. One of the 42 studies was confined to a paediatric population [32] with a median age of 10 years. The median reported age of all 41 other studies ranged from 61 to 80 years with 41% (16,575/40,742) of patients being female (gender was reported in 16/42 studies). Most studies (76%) included multiple primary sites. Lung cancer was the most common primary studied (8/42 studies), while 6/42 studies focused on patients treated with PR for bone metastases (Table 1).

No studies were excluded based on ROB assessment. We report the ROB for each study by 6 ROB domains assessed (Table 2, Appendix B.2). ROB for domains assessed were all low risk, except for the missing data domain, which was moderate ROB.

21.4% (18,958/88,516) patients in 42 studies died within 30 days of PR. The summary percentage of death within 30 days of PR - for these populations was 16% (95% CI = 14% to 18%). We detected substantial heterogeneity amongst studies (Q statistic 3302.32 (p < 0.001),  $\tau^2 = 0.286$ ,  $I^2 = 98.76$  % [2,25,32–34,39–55,5 7–76]) (Fig. 2).

Two formal tests were used to confirm potential outliers and influential studies based on initial inspection of the forest plot in Fig. 2. ESRs were performed to find studies with Z values greater than 3. No studies met the criteria based on this cut-off (Appendix F.1), which is confirmed by a leave one out forest plot (Appendix F.2).

Importantly, of the 42 studies analysed, we identified two U.S. Surveillance, Epidemiology, and End Results Program (SEER)-

#### Table 1

Characteristics of 42 included studies of 30-day mortality after palliative radiotherapy.

Author	Year	Type of publication	Period of study	Country	Median age (years)	Mean age (years)	Site of primary or indication for treatment of study population	Definition of 30-day mortality	n	N
Meeuse et al [25]	2010	Full text	1996-1998	Netherlands	-	-	Bone metastases	Unknown	63	1,157
Dennis et al [41] *	2011	Full text	1999-2007	Canada	-	-	Bone metastases	Start	70	918
Gupta et al [69]	2012	Abstract	2010	United	71	-	Lung cancer	Start	18	75
				Kingdom			•			
Kapadia et al <mark>[39]</mark>	2012	Full text	2007-2010	USA	-	-	Non-small cell lung cancer	Both	209	730
Fursunovic et al [72]	2013	Abstract	2010	Denmark	-	-	Lung cancer	Unknown	65	293
ung et al [58]	2013	Full text	2011-2012	Canada	65	-	Brain metastases	Start	7	75
Sherman et al [61]	2013	Abstract	Unknown	USA	63	-	Mixed including haematological cancers	Unknown	10	39
Murphy et al [33]	2013	Full text	2000-2007	USA	-	-	Mixed	End	7,093	21,2
Ellsworth et al [43]	2014	Full text	2012	USA	65	-	Bone metastases	End	89	339
Boardman et al [54]	2014	Letter	2012-2013	United	-	-	Mixed	Start	46	396
				Kingdom						
Chan et al [73]	2015	Abstract	2013	United	-	-	Non-small cell lung cancer	Start	11	60
				Kingdom			0			
Petrushevski et al [44] *	2015	Full text	1997-2009	Australia	67	-	Bone metastases	End	873	5,683
Spencer et al [46]	2015	Full text	2004-2011	United	70	_	Mixed	Start	1,846	11,0
	2015	i un text	2004 2011	Kingdom	70		Mixed	Start	1,040	11,0
Nieder et al [47]	2015	Full text	2007-2011	Norway	68	_	Mixed	Start	105	873
Lerner et al [63]	2015	Abstract	2007-2011	United	-		Mixed	Unknown	30	202
	2015	Abstract	2014	Kingdom	-	-	Mixed	UIIKIIUWII	50	202
Chawla et al [55]	2015	Abstract	2013	USA	70		Mixed inpatients	Unknown	29	68
Aladili et al [65]	2015		2013-2014		-	-	Mixed inpatients		29 4	72
Aladili et al [65]	2016	Abstract		United Kingdom		-	Thoracic RT for chest primaries	End		
Buergy et al [68]	2016	Full text	2006-2013	Germany	67	-	Re-irradiation of spinal metastases	End	5	44
Bingham et al [64]	2016	Abstract	2012	USA	-	-	Mixed	End	33	262
Ryoo et al [71]	2017	Full text	2007-2011	USA	-	65.1	Non-small cell lung cancer	End	149	639
Maung Maung Myint et al [74]	2017	Abstract	2015	United Kingdom	-	-	Lung cancer getting high dose palliative RT	End	3	39
Morris et al [45]	2017	Abstract	2014	Ireland	-	69.1	Mixed	Unknown	17	122
Lefresne et al [66] *	2017	Full text	2013	Canada	-	_	Mixed	Start	12	79
Wallace et al [34]	2018	Full text	2012-2015	USA	73	-	Bone metastases	End	92	569
Nieder et al [49]	2018	Full text	2012-2015	Norway	-	71	Mixed	Start	11	101
Shukor et al [51]	2018	Full text	2012-2013	Malaysia	61	-	Mixed	Start	133	585
Tseng et al [60]	2018	Full text	2012-2011	USA	-	_	Mixed	Start	39	203
Fraser et al [40]	2010	Full text	2014-2015	Canada			Lung cancer	Start	448	2,56
Ali et al [57]	2019	Full text	2014-2015	United	80	-	Bladder cancer	End	440	2,50
				Kingdom		-				
Cho et al [42]	2019	Full text	2003-2015	Canada	69	-	Metastatic prostate cancer getting palliative RT to bone metastases	Unknown	334	2,20
Wu et al [48]	2019	Full text	2012-2016	USA	63	-	Secondary metastatic sites	Start	125	518
Denholm et al [50] *	2019	Abstract	2018	United Kingdom	-	-	Mixed	Unknown	28	214
Shaw et al [52]	2019	Abstract	2017	United Kingdom	-	-	Mixed	Start	108	1,11
Clement-Zhao et al [53]	2019	Full text	2015-2016	France	65	-	Mixed	End	7	59
Moreno-Santiago et al	2015	Abstract	2013 2010	Spain	64	_	Mixed	Start	, 27	284
[62]				-						
Wong et al [32] *	2019	Abstract	2008-2018	USA	10	-	Mixed	Unknown	18	113
Lewis et al [75]	2020	Full text	2013-2018	United Kingdom	-	69	Thoracic lung cancer tumours	Start	85	925
Lee et al [59]	2020	Full text	2007-2017	Hong Kong	64	-	Mixed	Start	995	5,79
Kain et al [67]	2020	Full text	2012-	New	71	_	Mixed	Start	178	1,74
			2013,2016-2017	Zealand						-,, .

Author	Year	Year Type of	Period of study Country	Country	Median age	Median age Mean age	Site of primary or indication for treatment of study Definition of 30-day	Definition of 30-day	u	z
		publication			(years)	(years)	population	mortality		
Pitson et al [70]	2020	2020 Full text	2009-2015	Australia	I	I	Mixed	Unknown	309	
Mojica-Marquez et al	2020	2020 Full text	2017-2019	NSA	67	ı	Mixed	Start	193	429
[76]										
Qld Government [2]	2021	2021 Full text	2012-2017	Australia	69		Mixed	End	4,997	
								Total	18,958	88,516
				,						

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patients receiving palliative radiotherapy that died within 30 days of treatment, N = total number of patients getting palliative radiotherapy, full text = study published as full text manuscript, abstract = published 'unpublished data obtained by correspondence with authors of study. - unknown data. n = number of

abstract only. letter = published letter, Mixed = population of patients getting palliative radiotherapy for various indications and containing patients with different primary cancers, start = 30 days were counted from the start of palliative radiotherapy treatment, use = 30 days were started from the palliative radiotherapy treatment, USA = United States of America, RT = radiotherapy, Qld = Queensland, Australia.

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Table 2 Risk of bias (ROB) assessment for extracted studies.

Study Domain	Low ROB	Moderate ROB	High ROB	Overall
Definition of population Confounds defined Selection bias	26/42 24/42 36/42	15/42 12/42 4/42	1/42 6/42 2/42	Low Low Low
Missing data Duplicate publication bias Outcomes reporting bias All extracted studies combined (based on domains)	24/42 35/42 42/42 5/6	2/42 1/42 0/42 1/6	16/42 6/42 0/42 0/5	Moderate Low Low Low

Medicare linked studies containing only patients > 65 years of age, that did not significantly influence the overall 30-day mortality after PR: One was the second largest study in our review having a raw 30-day mortality of 33% (7093/21,279), ESR Z score = 2.39 [33] (study 10 in Fig. F.1), while the second U.S. SEER-Medicare linked study had a 30-day mortality of 16% (92/569) after PR, ESR Z score = 0.02 [34] (study 3 in Fig. F.1). The lone published paediatric study, with a raw 30-day mortality after PR of 16% (18/113), was also non-influential on our summary effect 30-day mortality after PR (ESR Z score = 1.56) [32] (study 2 in Fig. F.1). The study closest to being influential on our summary effect 30-day mortality after PR was by Mojica-Marquez et al (2020) [76] reporting a relatively high 30-day mortality rate of 45% (193/429), ESR analysis of this study revealing a Z score = 2.75 (study 12 in Fig. F.1). The largest study included in our meta-analysis was a Queensland, Australia state-wide study reporting a 30-day mortality after PR of 22% (4,997/22,501) [2]. The ESR for this study resulted in a Z score = 0.65, and therefore was also not influential on the summary effect (study 40 in Fig. F.1).

Subgroup analysis for moderators of 30-day mortality rate after PR are detailed in Table 3 (for subgroup analysis raw data see Appendix D, for subgroup Forest plots see Appendix G). Potential effect modifiers increasing the overall 30-day mortality summary effect included: patients treated with PR treatment at multiple body sites, those with hepatobiliary, melanoma and mesothelioma primaries, those treated with PR as inpatients, those with ECOG performance status 3-4, those with liver metastases, patients who did not complete their planned PR course, and those treated in the United States. Potential effect modifiers decreasing the overall 30-day mortality summary effect included: patients with ECOG performance status 0-1, those treated with synchronous chemotherapy, those treated with SBRT for brain metastases.

Appendix H.1 demonstrates a funnel plot of all 42 extracted studies in the above meta-analysis showing standard error as a measure of precision for each study. Upon visual inspection of this plot clear publication (small study) bias is difficult to ascertain, but the existence of a high degree of study heterogeneity is clear. Fig. 3 contains a scatter plot illustrating study sample size as a measure of precision in order to investigate if funnel plot asymmetry is being induced by the method of funnel plot construction in Fig. H.1. It is unclear, based on visual inspection, if Fig. 3 shows asymmetry and therefore publication bias. In order to further investigate this, an unweighted regression test for funnel plot asymmetry (mixed-effects meta-regression model) was calculated, resulting in a non-significant funnel plot asymmetry with a 95% degree of confidence (Z = -1.74, p = 0.081).

#### Discussion

An evidence-based quality metric defining the expected 30-day mortality rate after PR for RT regulators worldwide to use in audit of radiation oncology departments is currently lacking in the liter-

Study	Events	Total		Proportion	95%-CI	Weight
Meeuse 2010	63	1157	-	0.05	[0.04; 0.07]	2.6%
Aladili 2016	4	72			[0.02; 0.14]	1.4%
Dennis 2011	70	918	+		[0.06; 0.10]	2.6%
MaungMaungMyint 2017		39			[0.02; 0.21]	1.2%
Pitson 2020	309	3811	<b>=</b>		[0.07; 0.09]	2.7%
Lewis 2020	85	925	-	0.09	[0.07; 0.11]	2.6%
Jung 2013	7	75		0.09	[0.04; 0.18]	1.8%
Moreno Santiago 2019	27	284		0.10	[0.06; 0.14]	2.4%
Shaw 2019	108	1112	-	0.10	[0.08; 0.12]	2.6%
Kain 2020	178	1744	+	0.10	[0.09; 0.12]	2.7%
Nieder 2018	11	101		0.11	[0.06; 0.19]	2.0%
Buergy 2016	5	44		0.11	[0.04; 0.25]	1.5%
Boardman 2014	46	396		0.12	[0.09; 0.15]	2.5%
Clement–Zhao 2019	7	59			[0.05; 0.23]	1.7%
Nieder 2015	105	873		0.12	[0.10; 0.14]	2.6%
Bingham 2016	33	262		0.13	[0.09; 0.17]	2.4%
Denholm 2019	28	214			[0.09; 0.18]	2.4%
Morris 2017	17	122			[0.08; 0.21]	2.2%
Lerner 2015	30	202			[0.10; 0.21]	
Cho 2019	334	2203			[0.14; 0.17]	2.7%
Lefresne 2017	12	79			[0.08; 0.25]	2.0%
Petrushevski 2015	873	5683			[0.14; 0.16]	2.7%
Wong 2019	18	113			[0.10; 0.24]	2.2%
Wallace 2018	92	569			[0.13; 0.19]	2.6%
Spencer 2015		11096	E		[0.16; 0.17]	2.7%
Lee 2020	995	5795			[0.16; 0.18]	2.7%
Fraser 2019	448	2569	-		[0.16; 0.19]	2.7%
Ali 2019	44	241			[0.14; 0.24]	2.5%
Chan 2015	11	60			[0.10; 0.30]	2.0%
Tseng 2018	39	203			[0.14; 0.25]	2.5%
Tursunovic 2013	65	293			[0.18; 0.27]	2.6%
Qld Government 2021		22501	-		[0.22; 0.23]	2.7%
Shukor 2018	133	585			[0.19; 0.26]	2.6%
Ryoo 2017	149	639			[0.20; 0.27]	2.7%
Gupta 2012	18	75			[0.15; 0.35]	2.2%
Wu 2019	125	518			[0.21; 0.28]	2.6%
Sherman 2013	10	39			[0.13; 0.42]	1.9%
Ellsworth 2014	89	339			[0.22; 0.31]	2.6%
Kapadia 2012	209	730			[0.25; 0.32]	2.7%
Murphy 2013		21279			[0.33; 0.34]	2.7%
Chawla 2015	29	68			[0.31; 0.55]	2.3%
Mojica–Marquez 2020	193	429		0.45	[0.40; 0.50]	2.6%
Random effects model	0.0000	。 <b>.</b> 「		0.16	[0.14; 0.18]	100.0%
Heterogeneity: $I^2 = 99\%$ , $\tau^2 =$	0.2862, <i>p</i> =	= 0	0.1 0.2 0.3 0.4 0.	5		
		0	0.1 0.2 0.3 0.4 0. Proportion (95% CI)	0		

**Fig. 2.** Forest plot displaying the summary proportion of 30-day mortality rate after palliative radiotherapy: 16% (95% CI = 14% to 18%). Events indicates the number of patients that died within 30 days of palliative radiotherapy), Total indicates the total number of patients getting palliative radiotherapy and Proportion indicates the proportion of patients dying within 30 days of palliative radiotherapy (events/total) with their 95% confidence interval, Weight (study weighting), Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

#### Table 3

Subgroup moderator analysis for 30-day mortality after palliative radiotherapy.

Subgroup of participants getting PR vs. other studies	# of pts. in subgroup of total pts. in all studies $^{\dagger}$ (as a %)	Test for subgroup effect (coefficient 2 = QM (df = 1), p value)
Indication for treatment		
Bone metastases	11836/88516 (13.4%)	0.37, 0.544
Brain Metastases	1010/88516 (1.1%)	1.13, 0.287
Multiple treatment sites	64/88516 (<0.1%)	9.54, 0.002 <sup>‡</sup>
Primary cancer		
Bladder cancer	285/88516 (0.3%)	0.34, 0.559
Breast cancer	3779/88516 (6.5%)	2.50, 0.113
Colorectal cancer	2087/88516 (2.4%)	0.67, 0.413
Lung cancer	13341/88516 (15.1%)	3.10, 0.078
Oesophageal cancer	68/88516 (<0.1%)	3.50, 0.061
Prostate cancer	4990/88516 (5.6%)	1.02, 0.313
GI cancer	28/88516 (<0.01%)	0.05, 0.819
Gynaecological cancers	749/88516 (0.8%)	2.91, 0.088
Hepatobiliary cancer	514/88516 (0.5%)	24.20, <0.001 <sup>‡</sup>
Head and neck cancer	633/88516 (0.7%)	1.34, 0.246
Genitourinary cancer	2005/88516 (2.3%)	0.16, 0.689
Melanoma cancer	1432/88516 (1.6%)	16.19, <0.001 <sup>‡</sup>
Renal cell carcinoma	11/88516 (<0.01%)	2.99, 0.084
CNS cancers	318/88516 (0.4%)	0.70, 0.404
Sarcoma	16/88516 (<0.01%)	1.01, 0.315
Mesothelioma	292/88516 (0.3%)	8.89, 0.003 <sup>‡</sup>
Inpatient status	232/00310 (0.3%)	0.03, 0.003
Inpatients	549/88516 (0.6%)	92.27, <0.001 <sup>‡</sup>
Outpatients	369/88516 (0.6%)	0.16, 0.690
Performance status	509/88510 (0.0%)	0.10, 0.090
ECOG 0–1	996/99 = 16(1.0%)	56.68, <0.001 <sup>‡</sup>
ECOG 0-1 ECOG 2	886/88,516 (1.0%) 505/88,516 (0.6%)	2.05, 0.153
ECOG 3-4	727/88,516 (0.3%)	8.70, 0.003 <sup>‡</sup>
Other subgroups	220/00 516 (0.2%)	20.00 - 0.001
Synchronous chemotherapy	239/88,516 (0.3%)	20.66, <0.001 <sup>‡</sup>
Known to hospice	1,137/88,516 (1.3%)	0.28, 0.599
Age > 60 years	24,177/88,516 (27.3%)	0.60, 0.439
Age <= 60 years	676/58005 (1.2%)	0.00, 0.96
Patients with liver metastases	106/88516 (0.1%)	14.96, <0.001 <sup>‡</sup>
Fractionation		2.44.0.070
Patients getting 1 fraction	5,713/88,516 (6.5%)	3.11, 0.078
Patients getting 2–5 fractions	10,881/88,516 (12.3%)	0.10, 0.749
Patients getting 6–10 fractions	6,553/88,516 (7.4%)	1.34, 0.246
Patients > 10 fractions	3,425/88,516 (3.9%)	1.06, 0.304
Incomplete PR treatment		
Patients not completing tx	120/88,516 (0.1%)	26.51, <0.001 <sup>‡</sup>
Type of PR technology		
Patients getting SBRT for brain metastases	126/88,516 (0.1%)	10.54, 0.001 <sup>‡</sup>
U.S. studies (post-hoc analysis)		
Studies from the U.S.	25,189/88,516 (28.5%)	28.70, <0.001 <sup>‡</sup>
Year of study publication (post-hoc analysis)		
Studies published prior to year 2016	43,283/88,516 (49.0 %)	0.85, 0.358
Timing 30-day mortality (post-hoc analysis)		
Measured from end vs. from start of treatment	51,727/79,564 (65.0%)	0.73, 0.392

† total number of patients included in study = 88,516.

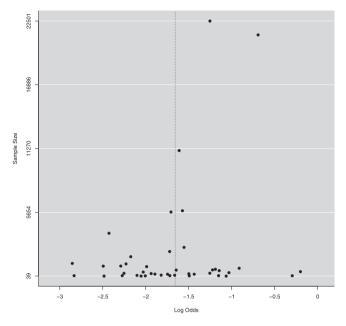
pts = patients, PR = palliative radiotherapy, df = degrees of freedom, SBRT = stereotactic body radiotherapy, U.S. = United States of America, CNS = central nervous system, GI = gastrointestinal, tx = treatment, ECOG = Eastern Cooperative Oncology Group performance status.

<sup>‡</sup> = significant *p* value  $\leq$  0.05.

ature. Our meta-analysis demonstrates an overall 30-day mortality rate of 16% following PR across all included studies, however, significant heterogeneity was observed. Due to considerable heterogeneity in our data, we applied various subgroup analyses which revealed that a higher 30-day mortality rate after PR was associated with: a) multiple sites treated with PR, b) patients with the following primaries: hepatobiliary, melanoma, mesothelioma cancers, c) inpatients, d) ECOG score 3–4, e) patients with liver metastases, f) patients not completing their PR treatment, and g) patients receiving PR in the United States. Conversely, a lower 30-day mortality rate after PR was associated with: a) ECOG 0–1, b) patients treated with synchronous chemotherapy, and c) patients who had brain metastases treated using SBRT.

To assess the statistical conclusions drawn from this metaanalysis, an assessment of certainty is required. Our systematic literature search meant that our findings are unlikely to be at risk of publication bias and unpublished data was included. Indeed, funnel plot examination and unweighted regression test for funnel plot asymmetry support this finding with no detectable smallstudy effect. To ensure we met our primary outcome we employed a very stringent inclusion/exclusion criterion. Our rationale was to avoid including studies that did not differentiate curative radiotherapy treated patients from PR ones. Studies were excluded from our review if authors were unable to distinguish between patients receiving PR versus patients receiving curative radiotherapy [77,78,12]. For example, Guadagnolo et al (2013) [77] reported 7.6% of the 15,287 patients included in their study getting radiotherapy died within 30 days of treatment. It is possible that by excluding these types of studies we have lost data that would change both our primary outcome and some of our primary cancer

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**Fig. 3.** Scatter plot displaying study sample size as a measure of precision to investigate funnel plot asymmetry. The existence of asymmetry is unclear.

subgroup analyses. Nonetheless, the bias created by including these studies into our analyses would be too great given our primary outcome and objectives of assessing all patients getting PR, not curative radiotherapy.

Furthermore, except for the missing data domain, overall, ROB for the included studies was low. Retrospective palliative studies involving patients nearing the end of their lives are at a high risk of missing data, given the nature of the included patients [79]. However, since our study had an objectively measurable endpoint (patient's death) and the remaining subgroup analysis was not dependent on patient recall, missing data may have been less of an issue for our study.

A limitation of our study was that we did not include non-English studies. Consequently, some studies from non-English speaking countries may have been missed and our results may not be applicable to radiation oncology centers from those countries. Given the large number of patients from various countries included in our review, the risk of biased results based on our inclusion criteria would likely be minimal. Another potential source of bias was the different ways that the 30-day mortality timeline was measured by the included studies: some studies measured the 30 days starting from the beginning of the patient's last course of treatment, while others measured this from the end of the last PR course. This may have introduced bias for the overall 30-day mortality rate reported by our meta-analysis, particularly for those patients who had longer PR courses. We attempted to measure this by performing subgroup analysis comparing studies reporting counting 30-day mortality from the beginning of patient treatment vs. those counting from the end of their treatment, which revealed that this did not significantly change the summary effect. Finally, subgroup analysis was used to explain the high heterogeneity found amongst the 42 studies extracted. Bias, however, may exist in the way subgroup analysis was performed: Most of the studies we extracted data from included a general mix of populations of patients ie. Not differentiating between primary diagnoses and the other confounding variables/secondary outcomes we measured. In many cases these studies failed to report the 30-day mortality rate for the subgroup of interest, which was key to all our secondary outcomes/subgroup analysis. These studies found to not be reporting a subgroup 30-day mortality rate after PR were added to the "Other studies" comparator subgroup and their 30-day mortality rate after PR as a group were statistically compared to the subgroup of interests' 30-day mortality rate after PR. This bias was impossible to avoid given the heterogenous nature of populations in the PR studies included in our metaanalysis, and their lack of reporting of 30-day mortality for subgroups of interest.

The diverse international patient populations and forms of PR treatments included in this meta-analysis reflect that seen in radiation oncology departments world-wide. The studies we extracted from included patients with various primaries in both inpatients and outpatients getting PR for different indications for treatment with several PR external beam technologies used. Some of these patients did not complete their planned PR treatment and patient's ages ranged from advanced age to paediatric patients. This may explain the significant heterogeneity found of the studies in our review: Q statistic 3302.32 (p < 0.0001),  $I^2 = 98.76\%$ . We were able to explore the potential effect of heterogeneity via subgroup analysis. Our findings illustrate the importance of considering the number of sites of treatment, primary cancer type, inpatient status, ECOG score, the use of synchronous chemotherapy, the presence of liver metastases and the country of treatment when determining the expected 30-day mortality rate for a specific patient population.

Finally, the summary statistic 16% (95% CI 14% to 18%) is precise, with tight confidence intervals, which exclude effect sizes that are not clinically meaningful. This outcome, along with the above assessment of heterogeneity, bias, and well-defined inclusion/exclusion criteria, and no detectable small study bias for our review lead us to conclude that our primary outcome and subgroup analysis was truly a representative measure of the 30-day mortality after PR.

Our post-hoc U.S. study vs. non-U.S. study subgroup analysis showed that there may be a higher expected 30-day mortality rate for those treated with PR in the U.S. compared to elsewhere. The U. S. has a unique and complex collection of private and publicly based health insurance funds used to pay for health care utilization, including for cancer treatment. U.S. based studies have identified a disparity in use of cancer treatments, including radiotherapy, at the end of life depending on a patient's health insurance coverage [80,16,77]. It may be that U.S.-specific demographic, socio-economic and insurance coverage-related factors influence the possible difference found in the expected 30-day mortality rate for those receiving PR in the U.S. vs. elsewhere in the world.

To date, only one systematic review has been completed analyzing patients receiving radiotherapy who died within 30 days of their treatment. This review by Park and colleagues [13] included 20 English studies for analysis (search dates Jan. 1960 to Dec. 2016). Of these only seven of the studies met our rigorous inclusion criteria whilst the remaining 13 studies were excluded due to meeting our exclusion criteria mentioned above: studies did not report both the total number of patients receiving PR and the total number of patients dying within 30 days of PR. Since Park and colleagues' original publication five years ago, there has been renewed interest in this field as evidenced by the plethora of publications [2,32,52,53,57,59,60,62,66,67,70,71,34,74–76,40,42,45,4 8–51]. In addition, our review found 14 other studies published pre-2017 reporting 30-day mortality after PR not reported by Park and colleagues [41,44,46,54,55,58,61,63–65,68,72,73,81].

As noted by the Park and colleagues review, 53–82% of patients did not complete their RT [12,13,39,56,78,82], with poor performance status and patient's death being the primary causes [12,13,39,82]. Our subgroup analysis indicates that patients who did not complete their PR treatment had a higher expected 30-

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day mortality rate after PR. This may reflect an inappropriately longer planned treatment course of PR for those patients with a poor prognosis. Further research is needed into this population of patients.

Park and colleagues [13] reported an overall 30-day mortality after PR of between 9–15.3% ( $\mu \pm \sigma$  = 12.1  $\pm$  3.2), which is close to the finding of our meta-analysis: 16% (95% CI 14% to 18%). This fits with our finding that study publication date ( $\geq$ 2016 vs. <2016) did not modify our summary 30-day mortality rate after PR. We report a consistent finding to the literature that a higher 30-day mortality rate after PR occurs in the following subgroups: a) patients being treated for multiple metastatic sites, b) patients with ECOG scores 3-4 [13,33,39,43,77,78,82-87]. In addition, we found subgroups of patients with hepatobiliary, melanoma, and mesothelioma primaries, inpatients receiving PR, and patients with liver metastases at PR referral also had higher expected 30-day mortality rates after PR, which are novel findings and based on data from studies published after Park and colleagues [13] was published. Notably lung primary and patient age did not modify the overall summary effect of 30-day mortality rate after PR of all studies, which was in contrast to what Park et al. (2017) reported: both lung [13,43,77,78,82–86] and greater age [33,39,87] were found to be predictors of PR at the end-of-life. The difference in some of the above findings may be related to our subgroup analysis being heavily reliant on studies published after the Park et al (2017) review, which makes our findings novel and a publication first using a meta-analysis. Another reason for the differences may be that we excluded studies that did not differentiate those patients getting PR from those getting curative intent radiotherapy, whereas Park et al. (2017) included such studies in their review. In contrast to our meta-analysis, Park et al (2017) also did not report to have included unpublished results in their review.

In order to minimize 30-day mortality after PR, accurate estimation of disease related survival is imperative to know. Overestimation of prognosis by radiation oncologists (reportedly up to 34% of the time) [88] results in high intensity cancer care towards the end of life [89]. Identification of which health care workers (if any) are better at prognostication for palliative care patients has been studied. Variably, more experienced clinicians are reportedly better at prognosticating, multidisciplinary teams may be better at prognostication than individual clinicians, while others report the combination of clinicians estimation with formalized calculation of a prognostic score can result in more accurate prognostication [90].

Multiple prognostic scores specific to patients treated with PR have been developed and evaluated [91–93]. There are some prognostication factors specific to certain subsets of patients treated with PR, such as patients receiving PR for brain metastases [94], and for patients with spinal cord compression [95]. These models include a diverse set of validated prognostic factors. Performance status, site of primary cancer, and site or burden of metastases are commonly included factors in current prognostic models. This justifies the collection of 30-day mortality rate data based on these patient factors and is evidenced in our findings that primary cancer types (hepatobiliary, melanoma, and mesothelioma), patient ECOG 3–4 scores, and patients with liver metastases getting PR, all have a higher 30-day mortality rate after PR compared to that of our overall summary effect.

Minimizing burden of interventions at end of life is imperative. The use of a validated prognostic scoring tool prior to the decision to offer PR should be encouraged as a way of reducing the 30-day mortality after PR. Given the efficacy of single fraction PR for bone metastases for short term palliation is indisputable and recommended as best practice, estimation of 30-day and 90-day mortality using prognostic tools can avoid burdensome longer treatment schedules near the end of life [3,8]. Our subgroup analysis did not find PR fractionation subgroups had a significant effect on the overall 30-day mortality rate summary effect. This finding is in conflict with multiple studies showing differences in fractionation: most studies report lower 30-day mortality rates with higher fractionation of PR treatments [46,52,75,96,97], suggesting this may reflect a positive change in RT practice in reaction to evidence showing single fraction PR treatment of uncomplicated painful bone metastases should be gold standard [3]. A few studies (one including all cancer primaries [51], and another study of those with prostate cancer getting treatment for bone metastases [42]) have shown no difference in survival between PR fractionation groups. Our findings could be explained by the fact that many studies did not report the 30-day mortality rate for different fractionation groups, and in some cases, the fractionation groupings were defined differently from ours. For example, only four studies we extracted from reported the 30-day mortality rate for patients getting >= 10 fractions of PR treatment. Several studies also reported 30-day mortality rate based on total numbers of treatments given (one patient could have multiple treatments) [40,46,53,59] as opposed to reporting only the last treatment each patient received, the latter method being the outcome we used to assess fractionation and 30-day mortality rate. We did find that patients getting SBRT for brain metastases as a subgroup appeared to have a lower 30-day mortality rate after PR, which likely reflects the appropriate selection of patients with relatively good prognostic outlook for SBRT treatment. Only one study [71] reported the 30-day mortality rate for any patients getting SBRT for brain metastases, which was 4% (5/126). This low rate would be expected in patients with advanced cancer, but likely oligo-metastatic or oligo-progressive disease burden, who were given SBRT. Therefore, the data obtained for our overall summary 30-day mortality rate after PR would not apply to this select population of patients with comparably better prognoses. Our subgroup analysis for those patients getting SBRT for brain metastases confirmed that, as a subgroup, SBRT for brain metastases significantly modifies the 30-day mortality after PR summary effect by lowering it.

Unexpected deaths and rapid deterioration at end of life are inevitable and so there will always be patients who die within 30 days of their PR, however it is crucial to minimize unnecessary burden and potential toxicity for patients receiving end of life care. This review presents the strongest evidence to date to establish an evidence-based quality metric for 30-day mortality for those patients having PR. Radiation oncology sites around the world are encouraged to use the 16% 30-day mortality after PR found in this review as a benchmark for auditing of their own local 30day mortality rates after PR. This will help improve the quality of treatment by triggering a review of radiotherapy policies in centers that have a significantly higher rate of mortality. Departments that have a 30-day mortality rate after PR that exceeds 16% must look at the distribution of factors that might influence this higher rate: i.e., histology/indications for PR/proportion of inpatients vs. outpatients etc. and seek to explain the reason their department's 30day mortality rate is higher, and if this is justifiably so.

Future studies evaluating 30-day mortality rates after PR should report details of radiotherapy dose, fractionation and technique, given the growth in SBRT use in the palliative population. More dedicated studies examining the 30-day mortality after PR in paediatric populations are also needed in order to minimize risk of treatment at the end of life in this important group. With ongoing audit and publication of post audit results, it may be that the 30day mortality after PR will improve further. This reduction in 30day mortality rate should be an aim for radiation oncology practice worldwide.

#### Conclusion

We found 16% of patients treated with PR die within 30-days of their treatment worldwide. This is the highest quality evidence to determine a quality metric for radiation oncology centers providing PR. This quality metric can be used by peak radiation oncology regulatory bodies to evaluate individual radiation oncology centers providing patients with PR treatment. This metric can also be used to formulate guidelines for PR. The 30-day mortality rate post PR may be higher in U.S. centers (compared to non-U.S. centers), inpatients, hepatobiliary, melanoma, mesothelioma primary cancers, patients with multiple metastatic sites being treated, those with liver metastases, with higher ECOG scores and those not completing treatment. Meanwhile those with lower ECOG scores, those treated with stereotactic PR for brain metastases and those getting synchronous chemotherapy may have a lower 30-day mortality rate.

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#### **Conflicts of interest**

None.

#### Data availability

the data extracted for this study is available via Mendeley Data: Kutzko, Justin (2022), "30-day mortality after palliative radiotherapy", Mendeley Data, V1, doi: 10.17632/6fybjbpcxg.1

#### Appendices

#### Appendix A Database search terms used for study

Databases Searched: MEDLINE (PubMed), CENTRAL, Embase, CINAHL, Cochrane review Database

PubMed search

(((("palliative radiotherapy") OR ("palliative radiation")) OR ("palliative RT")) AND (((((("end of life") OR ("30 day mortality"))) OR (mortality)) OR ("quality indicator")) OR (hospice)) OR ("terminally ill"))) OR (((RT[Title/Abstract]) OR ("radiation therapy"[Title/ Abstract])) AND (("End of Life"[Title/Abstract] OR eol[Title/ Abstract])) OR ("hospice care"[Title/Abstract])))

Filters: Publication date from 1980/01/01 to 2020/03/31 **Embase search** 

('palliative radiation':ti,ab,kw OR 'palliative radiotherapy':ti,ab, kw) AND

('end of life':ti,ab,kw OR '30 day mortality':ti,ab,kw OR 'quality indicator':ti,ab,kw OR hospice:ti,ab,kw OR 'terminally ill':ti,ab,kw OR mortality:ti,ab,kw OR 'last month of life':ti,ab,kw) OR

('radiotherapy during eol':ab,ti)

#### Appendix **B**

#### Table B1

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Risk of bias scoring template.

Definition of population	No inclusion criteria	No inclusion criteria	Patients included in study only	Inclusion criteria	Inclusion criteria described:
lefinition of population	No inclusion criteria describedNo details provided for: 1) Recruitment process 2) Demographic age, sex Intervention: palliative RT dose and fractiona- tion not defined	No inclusion criteria describedSome demographic detail provided: 1) Recruitment process 2) Demographics age sex, described. Intervention: palliative radiotherapy defined 30-day mortality defined Co-interventions not described (chemother- apy, targeted therapy) RT dose and fractiona- tion not described	Patients included in study only defined by all deaths from palliative radiotherapy (not defined clearly i.e., external beam radiotherapy) over a time period, not necessarily all patients who had palliative radiotherapy. Recruitment process description vague or incomplete. Co-interventions not described RT treatment episodes described (not in detail)	described:	<ul> <li>Inclusion criteria described:</li> <li>1) Includes recruitment dates</li> <li>2) "all sequential patients treated with palliative radiotherapy</li> <li>3) Setting described</li> <li>4) Demographics described Age sex.</li> <li>5) Performance status reported</li> <li>6) Co-morbidity reported</li> <li>7) Metastatic disease/ not detailedCo-intervention described in detail (chemotherapy, targeted therapy) for all participants.</li> <li>Intervention: palliative radiotherapy defined in deta (EBRT, SBRT, 3D CRT)</li> <li>30-day mortality clearly defined as "death 30 days after either end of the palliative radiotherapy or from start of treatment".</li> <li>Co-interventions described in detail (chemotherapy)</li> <li>RT treatment dose /dose range and fractionation/rang described in detail</li> </ul>
Confounds defined	<ul> <li>Score = 0</li> <li>No mention of confounding factors Confounding factors include, but not limited to:</li> <li>1) Performance status</li> <li>2) Patient known to Palliative care service</li> <li>3) Inpatient</li> <li>4) Hospice inpatient</li> <li>5) Co-interventions (e.g., chemotherapy or targeted therapy)</li> <li>6) Outpatient</li> </ul>	<ul> <li>Score = 1</li> <li>One confounding factor describedConfounding factors include, but not limited to: <ol> <li>Performance status</li> <li>Patient known to Pallia- tive care service</li> <li>Inpatient</li> <li>Hospice inpatient</li> <li>Co-interventions (e.g., chemotherapy or tar- geted therapy)</li> <li>Outpatient</li> </ol> </li> </ul>	Score = 2 Two confounding factors describedConfounding factors include, but not limited to: 1) Performance status 2) Patient known to Palliative care service 3) Inpatient 4) Hospice inpatient 5) Co-interventions (e.g., chemotherapy or targeted therapy) 6) Outpatient	targeted therapy) RT treatment dose and fractionation described in detail Score = 3 Three confounding factors describedConfounding factors include, but not limited to: 1) Performance status 2) Patient known to Pal- liative care service 3) Inpatient 4) Hospice inpatient 5) Co-interventions (e.g., chemotherapy or tar- geted therapy) 6) Outpatient	Score = 4 >Three confounding factors describedConfounding factors include, but not limited to: 1) Performance status 2) Patient known to Palliative care service 3) Inpatient 4) Hospice inpatient 5) Co-interventions (e.g., chemotherapy or targeted therapy 6) Outpatient

(continued on next page)

Duplicate publication bias	There are multiple publications involving the same (or some of the same, or different) authors, and there is uncertainty about whether the studies are true duplicates or not. Score = 0		It is clear that the study is duplicate publication of a Score = 4	s a stand-alone study or is an exact nother study
Outcomes reporting bias	The primary outcome was not reported (but secondary ones were) based on the primary outcome listed in the methods			ven for the study whether or not it
	Score = 0		Score = 4	
Reporting bias	Yes, bias exists		No reporting biases	
	Score = 0		Score = 4	
Selection bias	No inclusion criteria described	Population defined retrospectively (E.g. from a database of all deaths or all hospice patients) going from death backwards,	Patient cohort identified (patients receiving palliative RT), then outcome measured. Palliative RT not clearly	Patient cohort identified (those consecutive patients receiving palliative RT), then outcome measured.
		those treated with RT	defined	Palliative RT clearly defined
		identified in this population		
Missing Data	Score = 0 Patient population given without numbers of patients excluded from study or lost to follow up or missing information	Score = 2	Score = 6 Starting population defined and number of patients excluded from study, but no totals given for exclusions for missing data or patients lost to follow up.	Clearly state starting population of patients and how/why patients were excluded to get to final population reported in study. Numbers provided for exclusions due to incomplete data and /or loss to follow up.
	Score = 0		Score = 6	

RT = radiotherapy, EBRT = external beam radiotherapy, SBRT = stereotactic body radiotherapy, 3D CRT = three dimensional conformal radiation therapy. Scoring for each risk of bias category:

1. for categories out of 4 points: 0-1 = high ROB, 3-4 points = low ROB, 2 points = consensus between two reviewers for high vs. low ROB

2. for categories out of 6 points: 0-2 points = high ROB, 4-6 points = low ROB

#### Table B2

Individual study risk of bias assessment.

Study	Year	Definition of population	Confounds defined	Selection bias	Missing data	Duplicate publication bias	Outcomes reporting bias
Meeuse et al [25] *	2010	Low	Low	Low	Low	Low	Low
Dennis et al [41]*	2011	Moderate	Low	Low	Low	Low	Low
Gupta et al [69] ^	2012	Moderate	Moderate	Low	Low	Low	Low
Kapadia et al [39] *	2012	Low	Low	Low	Low	Low	Low
Murphy et al [33] *	2013	Low	High	High	Low	Low	Low
Tursunovic et al [72]	2013	Moderate	Moderate	Low	High	Low	Low
Jung et al [58] *	2013	Low	Low	Low	Low	Low	Low
Sherman et al [61]	2013	Moderate	Moderate	Low	High	Low	Low
Ellsworth et al [43] ^*	2014	Low	Low	Low	Low	High	Low
Boardman et al [54]	2014	Moderate	High	Moderate	High	Low	Low
Petrushevski et al [44]	2015	Moderate	High	Low	High	Low	Low
Chan et al [73]	2015	Moderate	Moderate	Low	High	Low	Low
Spencer et al [46] *^	2015	Low	Low	Low	Low	Low	Low
Nieder et al [47] *^	2015	Low	Low	Low	Low	Low	Low
Chawla et al [55]	2015	Moderate	Low	Moderate	High	Low	Low
Lerner et al [63]	2015	Moderate	High	Low	High	Low	Low
Aladili et al [65]	2016	Low	Moderate	Low	High	Low	Low
Bingham et al [64] ^	2016	Moderate	Moderate	Low	Low	High	Low
Buergy et al [68] *	2016	Low	Low	Low	Low	Low	Low
Ryoo et al [71] *	2017	Low	Low	Low	Low	Low	Low
Maung Maung Myint et al	2017	High	Moderate	Low	High	Low	Low
[74]					-		
Morris et al [45] ^	2017	Low	Moderate	Low	Low	Moderate	Low
Lefresne et al [66] *	2017	Low	Low	Low	Low	High	Low
Nieder et al [49] *	2018	Low	Low	Low	High	Low	Low
Shukor et al [51] *	2018	Low	Low	Low	High	Low	Low
Tseng et al [60]	2018	Low	Low	Low	Low	Low	Low
Wallace et al [34] *^	2018	Low	High	High	Low	High	Low
Fraser et al [40] *^	2019	Low	Low	Low	High	High	Low
Cho et al [42] *	2019	Low	Low	Low	Low	Low	Low
Wu et al [48] *^	2019	Low	Low	Low	High	High	Low
Denholm et al [50]	2019	Moderate	Moderate	Low	Moderate	Low	Low
Shaw et al [52]	2019	Moderate	High	Low	Low	Low	Low
Clement-Zhao et al [53] *	2019	Low	Low	Low	Low	Low	Low
Ali et al [57] *	2019	Low	Low	Low	High	Low	Low
Moreno-Santiago et al [62]	2019	Low	Moderate	Low	Low	Low	Low
Wong et al [32] ^	2019	Moderate	Moderate	Low	Low	Low	Low
Lewis et al [75] *	2020	Low	Low	Low	Low	Low	Low
Lee et al [59] *^	2020	Low	Low	Low	High	Low	Low
Kain et al [67] *	2020	Low	Low	Low	Low	Low	Low
Pitson et al [70] *^	2020	Moderate	Low	Moderate	High	Low	Low
Mojica-Marquez et al [81] *	2020	Low	Low	Low	Moderate	Low	Low
Queensland Government [2]	2021	Moderate	Moderate	Moderate	Low	Low	Low

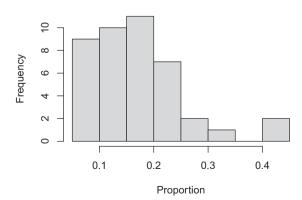
^ indicates multiple studies covering the same population were merged as one in the data extraction phase.

\*indicates included studies that were published as full text manuscripts.

Definitions: High = study assessed as high risk of bias for this category, Moderate = study assessed as being between high and low risk of bias for this category, low = study assessed as being low risk of bias for this category.

#### Appendix C

#### Histogram of proportions



**Fig. C1.** A non-normal distribution of proportions was found of studies reporting 30-day mortality after palliative radiotherapy.

#### Appendix D

#### Table D1

Indications for radiotherapy subgroup analysis and raw data.

Indication for palliative RT	Study	Number of patients dying within 30 days of palliative RT	Total number of patients receiving palliative RT	30-day mortality rate and subgroup moderator analysis
Bone metastases	Wu et al. (2019) [48]	66	293	
	Shukor et al. (2018) [51]	38	201	
	Shaw et al. (2019) [52] *	78	473	
	Dennis et al. (2011) [41]	70	918	
	Cho et al. (2019) [42]	334	2203	
	Ellsworth et al. (2014) [43]	89	339	
	Petrushevski et al. (2014) [44]	873	5683	
	Meeuse et al. (2010) [25]	63	1157	
	Wallace et al. (2018) [34]	92	569	
	Total	1703	11,836	14%
	Summary effect size (bone metastases)			0.15 (0.12, 0.18)
	Summary effect size (Other studies)			0.17 (0.14, 0.19)
	Test of moderators: coefficient			0.37, 0.544
Brain metastases	2 (QM, p value)	140	639	
Brain metastases	Ryoo et al. (2017) [71]	149 43	146	
	Wu et al. (2019) [48]			
	Shukor et al. (2018) [51]	26 7	150 75	
	Jung et al. (2013) [58] Total			22%
		225	1010	
	Summary effect size (brain metastases)			0.20 (0.15, 0.28)
	Summary effect size (Other studies)			0.16 (0.13, 0.18)
	Test of moderators: coefficient 2 (QM, p value)			1.13, 0.287
Multiple treatment sites	Shukor et al. (2018) [51]	20	64	
	Total	20	64	31%
	Summary effect size (multiple sites)	20		0.31 (0.21, 0.44)
	Summary effect size (Other			0.16 (0.14, 0.18)
	studies) Test of moderators: coefficient 2 (QM, p value)			9.54, 0.002 <sup>‡</sup>

\*unpublished data gained from correspondence with authors of study, RT = radiotherapy. QM = test for moderators (coefficient 2), (df =1). <sup>‡</sup> = significant p value  $\leq$  0.05.

#### Table D2

Primary cancer subgroup analysis and raw data.

Primary cancer diagnosis	Study	Number of patients dying within 30 days of palliative RT	Total number of patients receiving palliative RT	30-day mortality rate and subgroup moderator analysis
Bladder cancer	Ali et al. (2019) [57]	44	241	
	Kain et al. (2020) [67]	6	44	
	Total	50	285	17.5%
	Summary effect size (Bladder cancer)			0.18 (0.14, 0.22)
	Summary effect size (Other studies)			0.16 (0.14, 0.19)
	Test of moderators: coefficient 2 (QM, p value)			0.34, 0.559
Breast cancer	Shukor et al. (2018) [51]	20	154	
	Tseng et al. (2018) [60] *	3	16	
	Kain et al. (2020) [67]	8	245	
	Pitson et al. (2020) [70]	10	1192	
	Old Government (2020) [2]	336	2172	
	Total	377	3779	10%
	Summary effect size (breast cancer)			0.7 (0.02, 0.18)
	Summary effect size (Other studies)			0.16 (0.13, 0.19)
	Test of moderators: coefficient 2 (QM, p value)			2.50, 0.113
Colorectal cancer	Shukor et al. (2018) [51]	10	43	
	Kain et al. (2020) [67]	14	167	
	Pitson et al. (2020) [70]	12	302	
	Qld Government (2020) [2]	316	1575	
	Total	352	2087	17%
	Summary effect size (colorectal cancer)	552	2001	0.12 (0.05, 0.24)
	Summary effect size (Other studies)			0.16 (0.14, 0.19)
	Test of moderators: coefficient 2 (QM, p value)			0.67, 0.413
Lung cancer	Gupta et al. $(2012)$ [69]	18	75	0.07, 0.415
Lung cuncer	Ryoo et al. (2017) [71]	149	639	
	Shukor et al. (2018) [51]	41	168	
	Tursunovic et al. (2013) [72]	65	293	
	Chan et al. (2015) [73]	11	60	
	Tseng et al. (2018) [60] *	9	48	
	Maung Maung Myint et al. (2017) [74]	3	39	
	Kain et al. (2020) [67]	75	439	
	Pitson et al. (2020) [70]	121	616	
	Qld Government (2020) [2]	1860	6661	
	Fraser et al. (2019) [40]	448	2569	
	Lefresne et al. (2017) [66]	12	79	
		85	925	
	Lewis et al. (2020) [75]	85 209	730	
	Kapadia et al. (2012) [39] Total	3106		23%
		3106	13,341	
	Summary effect size (lung cancer) Summary effect size (Other studies)			0.20 (0.16, 0.24)
				0.15 (0.12, 0.19)
Ossenhansel senses	Test of moderators: coefficient 2 (QM, p value)	r.	69	3.10, 0.0783
Oesophageal cancer	Kain et al. (2020) [67]	5	68	79/
	Total	5	68	7%
	Summary effect size (Oesophageal cancer)			0.07 (0.03, 0.16)
	Summary effect size (Other studies)			0.16 (0.14, 0.19)
	Test of moderators: coefficient 2 (QM, p value)	334	2203	3.50, 0.061
Prostate cancer	Cho et al. (2019) [42]			

#### Table D2 (continued)

Primary cancer diagnosis	Study	Number of patients dying within 30 days of palliative RT	Total number of patients receiving palliative RT	30-day mortality rate and subgroup moderator analys
	Kain et al. (2020) [67]	14	272	
	Qld Government (2020) [2]	401	2515	
	Total	749	4990	15%
	Summary effect size (prostate cancer)			0.13 (0.10, 0.17)
	Summary effect size (Other studies)			0.16 (0.13, 0.19)
	Test of moderators: coefficient 2 (QM, p value)			1.02, 0.313
GI cancer	Tseng et al. (2018) [60] *	4	28	1.02, 0.313
GI Calleel	Total	4	28	14%
		4	28	
	Summary effect size (GI cancer)			0.14 (0.05, 0.32)
	Summary effect size (Other studies)			0.16 (0.14, 0.18)
	Test of moderators: coefficient 2 (QM, p value)			0.05, 0.819
Gynaecological cancers	Shukor et al. (2018) [51]	10	27	
	Tseng et al. (2018) [60] *	2	5	
	Qld Government (2020) [2]	134	717	
	Total	146	749	19%
	Summary effect size (gynaecological cancer)			0.27 (0.14, 0.45)
	Summary effect size (Other studies)			0.16 (0.13, 0.19)
	Test of moderators: coefficient 2 (QM, p value)			2.91, 0.088
Hepatobiliary cancer	Shukor et al. (2018) [51]	4	10	,
reputobiliary cancer	Qld Government (2020) [2]	134	504	
	Total	138	514	27%
	Summary effect size (hepatobiliary cancer)	158	514	0.27 (0.23, 0.31)
	Summary effect size (Other studies)			0.16 (0.13, 0.19)
	Test of moderators: coefficient 2 (QM, p value)			24.20, <0.001 <sup>‡</sup>
Head and neck cancer	Shukor et al. (2018) [51]	8	18	
	Tseng et al. (2018) [60] *	1	14	
	Qld Government (2020) [2]	134	601	
	Total	143	633	23%
	Summary effect size (head and neck cancer)			0.25 (0.12, 0.45)
	Summary effect size (Other studies)			0.16 (0.13, 0.19)
	Test of moderators: coefficient 2 (QM, p value)			1.34, 0.246
Genitourinary cancer	Shukor et al. (2018) [51]	15	67	
	Tseng et al. (2018) [60] *	6	19	
	Pitson et al. (2020) [70]	38	545	
	Qld Government (2020) [2]	317	1374	
	Total	376	2005	19%
	Summary effect size (Genitourinary cancer)	510	2005	0.18 (0.09, 0.34)
	Summary effect size (Other studies)			0.16 (0.13, 0.19)
	5 55 ( )			
N	Test of moderators: coefficient 2 (QM, p value)	220	1 422	0.16, 0.689
Melanoma cancer	Qld Government (2020) [2]	328	1432	2201
	Total	328	1432	23%
	Summary effect size (melanoma cancer)			0.23 (0.21, 0.25)
	Summary effect size (Other studies)			0.16 (0.13, 0.19)
	Test of moderators: coefficient 2 (QM, p value)			16.19, <0.001 <sup>‡</sup>
Renal cell carcinoma	Tseng et al. (2018) [60] *	4	11	
	Total	4	11	36%
	Summary effect size (Renal cell cancers)			0.36 (0.14, 0.66)
	Summary effect size (Other studies)			0.16 (0.14, 0.18)
	Test of moderators: coefficient 2 (QM, p value)			2.99, 0.084
CNS cancers	Qld Government (2020) [2]	44	318	2.35, 0.004
ento cuncero	2.4 Government (2020) [2]		510	

#### Table D2 (continued)

Primary cancer diagnosis	Study	Number of patients dying within 30 days of palliative RT	Total number of patients receiving palliative RT	30-day mortality rate and subgroup moderator analysis
	Total	44	318	14%
	Summary effect size (CNS cancers)			0.14 (0.10, 0.18)
	Summary effect size (Other studies)			0.16 (0.13, 0.19)
	Test of moderators: coefficient 2 (QM, p value)			0.70, 0.404
Sarcoma	Tseng et al. (2018) [60] *	1	16	
	Total	1	16	6%
	Summary effect size (sarcoma cancers)			0.06 (0.01, 0.34)
	Summary effect size (Other studies)			0.16 (0.14, 0.18)
	Test of moderators: coefficient 2 (QM, p value)			1.01, 0.315
Mesothelioma	Qld Government (2020) [2]	69	292	
	Total	69	292	24%
	Summary effect size (mesothelioma cancers)			0.24 (0.19, 0.29)
	Summary effect size (Other studies)			0.16 (0.13, 0.19)
	Test of moderators: coefficient 2 (QM, p value))			8.89, 0.003 <sup>‡</sup>

\*indicates unpublished data gained by correspondence with authors of study, RT = radiotherapy. Qld = Queensland, GI = gastrointestinal, CNS = central nervous system, QM = test for moderators (coefficient 2), (df = 1), ‡ = significant p value  $\leq 0.05$ .

npatient and outpatient status subgroup analysis and raw data.	

Patient location status	Study	Number of patients dying within 30 days of palliative RT	Total number of patients receiving palliative RT	30-day mortality rate and subgroup moderator analysis
Inpatient Outpatient	Ryoo et al. (2017) [71] Shukor et al. (2018) [51] Ellsworth et al. (2014) [43] Chawla et al. (2015) [55] Total Summary effect size (inpatient) Summary effect size (Other studies) Test of moderators: coefficient 2 (QM, p value) Shukor et al. (2018) [51] Total Summary effect size (outpatient) Summary effect size (Other studies) Test of moderators: coefficient 2 (QM, p value)	65 78 47 29 219 55 55	166 216 99 68 549 369 369	40% 0.40 (0.36, 0.45) 0.15 (0.13, 0.17) <b>92.27, &lt;0.001</b> <sup>‡</sup> 15% 0.15 (0.12, 0.19) 0.16 (0.14, 0.18) 0.16, 0.690

RT = radiotherapy. QM = test for moderators (coefficient 2), (df =1).  $\ddagger$  = significant *p* value  $\le$  0.05.

### Table D4

ECOG score subgroup analysis and raw data.

Performance status	Study	Number of patients dying within 30 days of palliative RT	Total number of patients receiving palliative RT	30-day mortality rate and subgroup moderator analysis
ECOG 0-1	Kain et al. (2020) [67] Total Summary effect size (ECOG 0–1) Summary effect size (Other studies)	39 39	886 886	4% 0.04 (0.03,0.06) 0.16 (0.14,0.19)
	Test of moderators: coefficient 2 (QM, p value)			56.68, <0.001 <sup>‡</sup>
ECOG 2	Kain et al. (2020) [67]	67	505	
	Total	67	505	13%
	Summary effect size (ECOG 2)			0.13 (0.11, 0.17)
	Summary effect size (Other studies)			0.16 (0.14, 0.19)
	Test of moderators: coefficient 2 (QM, p value)			2.05, 0.153
ECOG 3-4	Nieder et al. (2015) [47]	79	219	
	Shukor et al. (2018) [51]	78	180	
	Kain et al. (2020) [67]	71	328	
	Total	228	727	31%
	Summary effect size (ECOG 3–4)			0.33 (0.21, 0.47)
	Summary effect size (Other studies)			0.16 (0.14, 0.19)
	Test of moderators: coefficient 2 (QM, p value)			8.70, 0.003 <sup>‡</sup>

ECOG = Eastern Cooperative Oncology Group performance status. RT = radiotherapy. QM = test for moderators (coefficient 2), (df =1).  $\ddagger$  = significant p value  $\le$  0.05.

#### Table D5

Other subgroups analysis and raw data.

Other subgroups	Study	Number of patients dying within 30 days of palliative RT	Total number of patients receiving palliative RT	30-day mortality rate and subgroup moderator analysis	
Synchronous chemotherapy	Shukor et al. (2018) [51]	8	239		
10	Total	8	239	3%	
	Summary effect size			0.03 (0.02, 0.07)	
	(synchronous chemo)				
	Summary effect size (Other			0.16 (0.14, 0.18)	
	studies)				
	Test of moderators: coefficient			20.66, <0.001 <sup>‡</sup>	
	2 (QM, p value)				
Known to hospice	Jung et al. (2013) [58]	7	75		
-	Pitson et al. (2020) [70]	184	1062		
	Total	191	1137	17%	
	Summary effect size (hospice)			0.14 (0.08, 0.24)	
	Summary effect size (Other			0.16 (0.14, 0.19)	
	studies)				
	Test of moderators: coefficient			0.28, 0.599	
	2 (QM, p value)				
Age > 60yrs	Shukor et al. (2018) [51]	63	288		
	Kain et al. (2020) [67]	145	1365		
	Murphy et al. (2013) [33]	7093	21,279		
	Wallace et al. (2018) [34]	92	569		
	Total	7393	23,501	31%	
	Summary effect size			0.19 (0.10, 0.35)	
	(age > 60yrs)				
	Summary effect size (Other			0.16 (0.14, 0.18)	
	studies)				
	Test of moderators: coefficient			0.63, 0.429	
	2 (QM, p value)				
Age $\leq$ 60yrs	Shukor et al. (2018) [51]	70	297		
	Kain et al. (2020) [67]	33	379		
	Murphy et al. (2013) [33]	0	0		
	Wallace et al. (2018) [34]	0	0		
	Total	103	676	15%	
	Summary effect size (age			0.15 (0.05, 0.35)	
	<=60yrs)				
	Summary effect size (Other			0.15 (0.14, 0.17)	
	studies)				
	Test of moderators: coefficient			0.00, 0.96	
	2 (QM, p value)				

#### Table D5 (continued)

Other subgroups	Study	Number of patients dying within 30 days of palliative RT	Total number of patients receiving palliative RT	30-day mortality rate and subgroup moderator analysis
Patients with liver metastases	Ryoo et al. (2017) [71]	34	106	
	Total Summary effect size (liver metastases) Summary effect size (Other studies)	34	106	32% 0.32 (0.24, 0.42) 0.16 (0.14, 0.19)
	Test of moderators: coefficient 2 (QM, p value)			14.96, <0.001 <sup>‡</sup>

RT = radiotherapy. QM = test for moderators (coefficient 2), (df =1).  $\ddagger$  = significant p value  $\le$  0.05.

 Table D6

 Fractionation and other subgroup analysis and raw data.

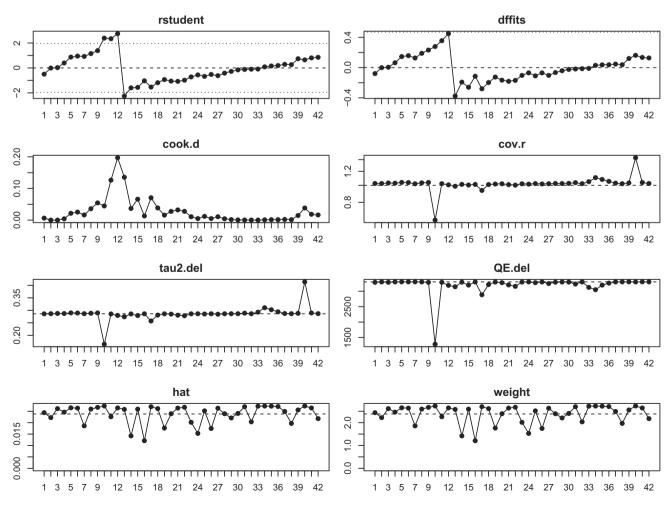
Patients getting 1 fraction         Subsor et al. (2019) [51]*         36         142           Action         Advance et al. (2019) [52]*         61         427           Turusmovic et al. (2019) [52]*         129         875           Elswort et al. (2019) [14]         129         875           Elswort et al. (2019) [14]         129         875           Elswort et al. (2019) [21]         131         3501           Vollation et al. (2019) [21]         171         3501           Vollation et al. (2019) [21]         132         103           Joint         527         5713         272           Summary effect size (1/fraction)         501         0.16 (0.13. 0.19)         0.16 (0.13. 0.19)           Patients getting 1         5         223         131. 0.028         0.16 (0.13. 0.19)           Fact of motion         5         223         0.16 (0.13. 0.19)         0.16 (0.13. 0.19)           Gld Government (2020) [21]         2503         9591         0.16 (0.13. 0.19)         0.16 (0.13. 0.19)           Fact of motion         5         223         0.16 (0.13. 0.19)         0.16 (0.13. 0.19)         0.16 (0.13. 0.19)           Fact of motions         5         223         0.16 (0.13. 0.19)         0.16 (0.13. 0.19)         0.16	Subgroup	Study	Number of patients dying within 30 days of palliative RT	Total number of patients receiving palliative RT	30-day mortality rate and subgroup moderator analysis
Shaw et al. (2019) [52]*         81         427           Tursunovic et al. (2019) [42]         129         875           Elisworth et al. (2014) [43]         7         394           Value et al. (2019) [57]         45         394           Value et al. (2019) [57]         5713         275           Summary effert size (10ner studies)         1527         5713         275           Summary effert size (10ner studies)         1527         5713         276           Summary effert size (10ner studies)         1527         5713         276           Summary effert size (10ner studies)         111         994         110.078           Value)         220         236         110.078           Tursunovic et al. (2019) [52]         20         60         60           Kain et al. (2000) [67]         111         994         0.16 (0.13, 0.19)           Opd Government (2000) [21         2505         10.081         24%           Summary effert size (2-5 fractions)         0.16 (0.13, 0.19)         0.16 (0.13, 0.19)           Tursunovic et al. (2019) [52]*         5         223         0.16 (0.13, 0.19)           Summary effert size (2-6 fractions)         1064         61611         0.16 (0.10, 0.11)           Fractions		Shukor et al. (2018) [51]	36	142	
Cho et al. (2019) [42]         129         875           Elsworth et al. (2014) [51]         45         394           Qid covernment (2020) [2]         1171         351           Total         1527         931           Total         1527         0.22 (0.15, 0.30)           Summary effect size (1 fraction)         0.21 (0.15, 0.30)         0.21 (0.15, 0.30)           Summary effect size (1 fraction)         0.22 (0.15, 0.30)         0.21 (0.15, 0.30)           Test of moderators: coefficient 2 (QM, p         226         236           Tractions         Tisset of moderators: coefficient 2 (QM, p         0.01 (0.01, 0.01)           Summary effect size (1 fraction)         994         0.16 (0.13, 0.19)           Summary effect size (1 fractions)         0.16 (0.01, 0.01)         0.16 (0.01, 0.01)           Summary effect size (1 fractions)         0.16 (0.01, 0.01)         0.16 (0.01, 0.01)           Summary effect size (1 fractions)         0.16 (0.01, 0.01)         0.16 (0.01, 0.01)           Total         200         60         0.18 (0.01, 0.01)           Turus morie et al. (2019) [52]*         5         223           Total         1004         653         106           Summary effect size (1 fractions)         0.00 (0.04, 0.19)         0.16 (0.13, 0.19)		Shaw et al. (2019) [52] *	81	427	
Elsworth et al. (2006) [243]         7         27           Kaie et al. (2006) [27]         1171         3941           Value et al. (2008) [34]         32         1931           Total         5272         5713         2724           Summary effet size (1 fraction)         322         0.15, 0.30)         0.16 (0.13, 0.19)           Summary effet size (1 fraction)         32         236         222 (0.15, 0.30)           Patients getting 2-5         Tass of modentous: coefficient 2 (0M, p.         311, 0.078         311, 0.078           Nature et al. (2019) [52]         20         60         5         5           Value et al. (2019) [52]         20         60         5         0.16 (0.13, 0.19)           Nature et al. (2019) [52]         203         9591         -         0.16 (0.10, 0.31)           Total         2256         10.881         24%         0.16 (0.10, 0.31)           Summary effet size (2-5 fractions)         5         223         0.16 (0.10, 0.31)         0.16 (0.13, 0.19)           Fact ons         Total (0.000) [21]         1064         6553         0.07 (0.04, 0.04)         0.16 (0.13, 0.19)         0.16 (0.13, 0.19)         0.16 (0.13, 0.19)         0.16 (0.13, 0.19)         0.16 (0.13, 0.19)         0.16 (0.13, 0.19)         0.16 (0		Tursunovic et al. (2013) [72]	26	64	
kain et al. (2020) [p1]         45         394           QH Government (2000) [2]         1171         3591           Total         1327         133           Total         1527         022 (0.15, 0.30)           Summary effect size (1 fraction)         1527         022 (0.15, 0.30)           Summary effect size (1 fraction)         022 (0.15, 0.30)         0.16 (0.13, 0.19)           Summary effect size (0.06 studies)         0.16 (0.13, 0.19)         0.16 (0.13, 0.19)           Factions         Shaw et al. (2013) [72]         20         036           Kain et al. (2020) [02]         2503         9591         0.16 (0.13, 0.19)           Jotal         9591         0.16 (0.13, 0.19)         0.16 (0.13, 0.19)           Summory effect size (2.5 fractions)         2556         0.18 (0.10, 0.31)         0.16 (0.13, 0.19)           Summary effect size (0.01 er studies)         244'         0.18 (0.10, 0.31)         0.16 (0.13, 0.19)           Summary effect size (0.01 er studies)         1064         6531         16X'           Summary effect size (0.01 er studies)         1064         6531         16X'           Summary effect size (0.01 er studies)         1064         6531         16X'           Summary effect size (0.01 er studies)         106 (0.02, 0.02)					
pdf Government (2020) [2]         1171         3591           Value et al. (2018) [34]         32         5713         272           Summary effet size (1 fraction)         527         5713         0.22 (0.15, 0.30)           Summary effet size (0ther studies)					
wildlace et al. (2018) [54]         32         193           Total         1527         2713         222 (0.15, 0.30)           Summary effect size (1 fraction)         327         322 (0.15, 0.30)           Summary effect size (10 fraction)         321         0.222 (0.15, 0.30)           Patients getting 2-5         fractions         311, 0.078           fractions         Naw et al. (2019) [52]         20         60           Kain et al. (2020) [67]         111         994           Qld Government (0200) [2]         2503         9991           Total         2656         0.188 (0.10, 0.31)           Summary effect size (0.167 studies)         0.18 (0.10, 0.31)           Summary effect size (0.107 studies)         0.18 (0.10, 0.31)           Total or size (2-5 fractions)         0.18 (0.10, 0.31)           Test of moderators: cofficient 2 (0M, p         0.18 (0.10, 0.31)           Total or size (2-5 fractions)         169           Total or size (2-5 fractions)         169           Total or size (2-6 fractions)         169           Total or size (2-6 fractions)         169           Total or size (2-6 fractions)         169           Tactions         162 (0.01, 0.19)           Sammary effect size (0.101 [72]         19					
Image: set in part of the set of the studies in the set of the studies i					
Summary effect size (1/ fraction)         0.22 (0.15, 0.30)           Patients getting 2-5         Shaw et al. (2019) [52]         22         236           Fractions         Tursurovic et al. (2013) [72]         20         60           Value)         994					27%
Summary effect size (Other studies) rest of moderators: coefficient 2 (QM, p value))         3.11, 0.078           Patients getting 2-5 fractions         Tursanovic et al. (2019) [52]         22         236           Tursanovic et al. (2019) [52]         20         60           Kain et al. (2020) [67]         111         944           Other and (2020) [67]         111         944           Summary effect size (2-5 fractions)         0.16 (0.13, 0.19)         0.16 (0.13, 0.19)           Summary effect size (2-5 fractions)         0.16 (0.13, 0.19)         0.16 (0.13, 0.19)           Patients getting 5-10         Shaw et al. (2019) [52]*         5         223           Fractions         Other studies)         0.16 (0.13, 0.19)         0.16 (0.13, 0.19)           Value)         1064         6553         1.089 (0.04, 0.19)           Patients getting 5-10         Shaw et al. (2019) [52]*         0         0.16 (0.13, 0.19)           Summary effect size (-10 fractons)         1064         6553         1.089 (0.04, 0.19)           Summary effect size (-10 fractons)         0.15 (0.13, 0.18)         1.14 (0.13, 0.19)           Fractions         Summary effect size (-10 fractons)         0.15 (0.13, 0.18)           Summary effect size (-10 fractons)         0.15 (0.13, 0.18)         0.15 (0.13, 0.18)			1527	5715	
Patients getting 2-5 fractions         Shaw et al. (2019) [52]         22         236           Patients getting 2-5 fractions         Tursunovic et al. (2013) [72]         20         60           Value 1, 2020) [2]         2503         9501         24%           Value 1, 2020) [2]         2503         9501         0.18 (0.10.0.37)           Total         Confections         0.18 (0.10.0.37)         0.16 (0.13.0.19)           Summary effect size (2-5 fractions)         0.18 (0.10.0.37)         0.16 (0.13.0.19)           Patients getting 5-10         Shaw et al. (2019) [52]*         5         223           Patients getting 5-10         Shaw et al. (2019) [52]*         5         223           Patients getting 5-10         Shaw et al. (2019) [52]*         5         223           Patients getting 5-10         Shaw et al. (2019) [52]*         1064         6553         106           Summary effect size (6-10 fractions)         0.16 (0.13.0.19)         0.16 (0.13.0.19)         0.16 (0.13.0.19)           Summary effect size (0.16 fractions)         0         0         0.00         0.00 (0.04.0.19)           Summary effect size (0.10 fractions)         0         0         0.10 (0.04.0.29)         0.10 (0.04.0.29)           Value)         Value)         277         150					
value)           value)         value)           Patients getting 2-5         Shaw et al. (2019) [52]         22         236           Tractions         Tursunovic et al. (2013) [72]         20         60           Kain et al. (2020) [67]         111         994           Old Government (2020) [2]         2503         9591           Total         2556         10.881         24%           Summary effect size (2-5 fractions)         0.16 (0.13, 0.19)         0.16 (0.13, 0.19)           Summary effect size (2-6 fractions)         0.10 (0.749         0.10 (0.749           Value)         value)         1064         6553         106%           Summary effect size (0-10 fractions)         0.06 (0.04, 0.19)         0.16 (0.13, 0.19)         1.34, 0.246           Value)         Tarsunovic et al. (2013) [72]         0         118           Fast of moderators: coefficient 2 (0M, p         1.34, 0.246         0.16 (0.13, 0.19)           Value)         21         23         3157           Value)         24         27         150         716 dl           Summary effect size (0-16 practions)         0.16 (0.14, 0.20)         28         39           Summary effect size (ofter studies)         0.16 (0.14, 0.20)					
fractions       Tursunovic et al. (2013) [72]       20       60         Kain et al. (2020) [67]       111       994         Old Government (2020) [2]       2503       9591         Total       2656       10.881       24%         Summary effect size (Other studies)       0.16 (0.10, 0.31)       0.16 (0.10, 0.31)         Summary effect size (Other studies)       0.10, 0.749       0.10, 0.749         value!)       Shaw et al. (2013) [52] *       5       223         Fractions       Tract (2020) [2]       1040       6161         Total       10264       653       168         Summary effect size (Other studies)       0.16 (0.13, 0.19)       0.16 (0.13, 0.19)         Total       1040       6161       164         Summary effect size (Other studies)       0.16 (0.13, 0.19)       1.34, 0.246         value)       Shaw et al. (2019) [52] *       0       118         Patients getting > 10       Shaw et al. (2019) [52] *       0       0.16 (0.13, 0.19)         Test of moderators: coefficient 2 (QM, p       value)       0.13 (0.04, 0.20)       0.05 (0.04, 0.20)         Patients getting > 10       Shaw et al. (2019) [51]       2       8       39         completing       Ait et al. (2019) [51]					
Kain et al. (2020) [c7]       111       994         Qld Government (2020) [2]       2503       9591         Total       2656       10,881       24%         Summary effect size (2-5 fractions)       0.18 (0.10, 0.31)       0.16 (0.13, 0.19)         Summary effect size (2-5 fractions)       0.16 (0.13, 0.19)       0.16 (0.13, 0.19)         Factions       Tarsunoite et al. (2013) [72]       19       169         fractions       Qld Government (2020) [2]       1040       6151         Total       1026 (Other studies)       0.06 (0.04, 0.19)       0.016 (0.01, 0.31)         Summary effect size (6-10 fractions)       0.06 (0.04, 0.19)       0.016 (0.13, 0.19)       1.34, 0.246         Value)       Test of moderators: coefficient 2 (QM, p       0.16 (0.13, 0.19)       1.34, 0.246         Value)       Summary effect size (01ther studies)       1.34, 0.246       0.16 (0.13, 0.19)         fractions       Level)       5       0.16 (0.13, 0.19)       0.16 (0.13, 0.19)         fractions       Level)       Summary effect size (01ther studies)       0.13 (0.04, 0.29)       0.16 (0.10, 0.19)         fractions       Summary effect size (01ther studies)       0       1.34, 0.246       0.16 (0.14, 0.19)         fractins getting > 10       Shaw et al. (2019) [51]		Shaw et al. (2019) [52]	22	236	
Qid Covernment (2020) [2]       2503       9991         Total       2656       10,881       24#         Summary effect size (2-5 fractions)       0.16 (0.13, 0.19)       0.16 (0.13, 0.19)         Test of moderators: coefficient 2 (QM, p       0.16 (0.13, 0.19)       0.10, 0.749         value))       1040       161         Fractions       Qif Covernment (2020) [2]       1040       161         If actions       1064       6553       16%         Summary effect size (6-10 fractions)       0.06 (0.04, 0.19)       0.16 (0.13, 0.19)         Summary effect size (0.19 [52]*       0       118       0.09 (0.04, 0.19)         Value)       0.16 (outra)       0.16 (0.13, 0.19)       1.34, 0.246         Patients getting >10       Naw et al. (2019) [52]*       0       0       0.15 (0.13, 0.19)         If actions       Value)       0.10 (0.04, 0.20)       0.13 (0.19)       0.13 (0.19)         If action (2000) [2]       28 and 3157       0.10 (0.04, 0.20)       0.15 (0.13, 0.18)         If action (2000) [2]       28 and 3157       0.10 (0.04, 0.20)       0.15 (0.13, 0.18)         If act in (2018) [51]       28       39       0.10 (0.04, 0.20)       0.15 (0.13, 0.18)         If act in (2018) [51]       17       310					
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$					
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$					2.4%
			2656	10,881	
Fest of moderators: coefficient 2 (QM, p value)         0.10, 0.749           Patients getting 6-10 fractions         Shaw et al. (2019) [52]*         5         223           Tursunovic et al. (2013) [72]         19         169           1040         6161         100           Total         1064         6553         168           Summary effect size (6-10 fractions)         0.09 (0.04, 0.19)         0.16 (0.13, 0.19)           Summary effect size (10ther studies)         0.16 (0.13, 0.19)         1.34, 0.246           rest of moderators: coefficient 2 (QM, p         0.10 (0.04, 0.29)         0.16 (0.13, 0.19)           rest of moderators: coefficient 2 (QM, p         0.10 (0.04, 0.20)         0.15 (0.13, 0.19)           rest of moderators: coefficient 2 (QM, p         0.10 (0.04, 0.20)         0.15 (0.13, 0.18)           rest of moderators: coefficient 2 (QM, p         0.10 (0.04, 0.20)         0.15 (0.13, 0.18)           rest of moderators: coefficient 2 (QM, p         0.10 (0.04, 0.20)         0.15 (0.13, 0.18)           rest of moderators: coefficient 2 (QM, p         0.10 (0.04, 0.20)         0.15 (0.13, 0.18)           rest of moderators: coefficient 2 (QM, p         0.10 (0.04, 0.20)         0.15 (0.13, 0.18)           rest of moderators: coefficient 2 (QM, p         0.55 (0.39, 0.70)         1.06, 0.304           completing </td <td></td> <td></td> <td></td> <td></td> <td></td>					
Patients getting 6-10 fractions       Shaw et al. (2019) [52]*       5       223         Fractions       Diff (2013) [72]       19       169         Qld Government (2020) [2]       1040       6161         Summary effect size (0-10 fractions)       0.06 (0.04, 0.19)       0.16 (0.13, 0.19)         Summary effect size (0-10 fractions)       0.06 (0.04, 0.19)       0.16 (0.13, 0.19)         Fatients getting 5-10       Staw et al. (2019) [52]*       0       1064         fractions       Lewis et al. (2019) [52]*       0       0         fractions       Lewis et al. (2019) [52]*       0       0         fractions       Lewis et al. (2019) [52]*       0       0         fractions       Lewis et al. (2019) [22]       283       3157         Wallace et al. (2018) [34]       27       150       0.10 (0.04, 0.20)         Summary effect size (10 fractions)       Summary effect size (10 fractions)       0.15 (0.13, 0.18)       1.06, 0.304         Summary effect size (10 fractions)       Summary effect size (10 fractions)       0.15 (0.13, 0.18)       1.06, 0.304         reat of moderators: coefficient 2 (QM, p       Value)       0.15 (0.13, 0.18)       1.06, 0.304         Patients not       Summary effect size (10 fractions)       Summary effect size (10 fractions) <td< td=""><td></td><td></td><td></td><td></td><td></td></td<>					
Patients getting 6-10 fractions       Shaw'et al. (2019) [52]*       5       23         fractions       Unsunovic et al. (2013) [72]       19       169         Qld Government (2020) [2]       1040       6161         Total       1064       6553       16%         Diff Government (2020) [2]       1040       6161       0.09 (0.04, 0.19)         Fact of moderators: coefficient 2 (QM, p       1.34, 0.246       0.16 (0.13, 0.19)         Fact of moderators: coefficient 2 (QM, p       0       0       0.16 (0.13, 0.19)         Fact of moderators: coefficient 2 (QM, p       0       0       0         Value)       0       118       1.0246       0         fractions       Summary effect size (016 rations)       310       3425       9%         Summary effect size (016 rations)       310       3425       9%       0.10 (0.04, 0.20)         Summary effect size (016 rations)       310       300       0.15 (0.13, 0.18)       1.06, 0.304         reati of moderators: coefficient 2 (QM, p       value)       1.06, 0.304       0.15 (0.13, 0.18)       1.06, 0.304         reatients not       Shukor et al. (2018) [51]       28       39       31       5       1.7         reati (couplei size (pther statides)       5					
Qld Government (2020) [2]         1040         6161           Total         1064         6553         65%           Summary effect size (0ther studies)         0.09 (0.04, 0.19)         0.016 (0.13, 0.19)           Fact of moderators: coefficient 2 (0M, p         0.16 (0.13, 0.19)         134, 0.246           rest of moderators: coefficient 2 (0M, p         0         0           fractions         Eavis et al. (2019) [52]*         0         0           Qld Government (2020) [2]         283         3157         0.10 (0.04, 0.20)           Vallace et al. (2018) [34]         310         3425         9%           Summary effect size (10 fractions)         310         3425         9%           Summary effect size (10 fractions)         0.15 (0.13, 0.18)         0.15 (0.13, 0.18)           Summary effect size (10 fractions)         310         3425         9%           Summary effect size (10 fractions)         0.15 (0.13, 0.18)         0.15 (0.13, 0.18)           Test of moderators: coefficient 2 (0M, p         310         310         310           rest of moderators: coefficient 2 (0M, p         1.06, 0.304         0.55 (0.39, 0.70)           treatment         Summary effect size (0ther studies)         5         1.16 (0.14, 0.19)           reatinent)         Summary	Patients getting 6-10		5	223	
Qld Government (2020) [2]         1040         6161           Total         1064         6553         65%           Summary effect size (0ther studies)         0.09 (0.04, 0.19)         0.016 (0.13, 0.19)           Fact of moderators: coefficient 2 (0M, p         0.16 (0.13, 0.19)         134, 0.246           rest of moderators: coefficient 2 (0M, p         0         0           fractions         Eavis et al. (2019) [52]*         0         0           Qld Government (2020) [2]         283         3157         0.10 (0.04, 0.20)           Vallace et al. (2018) [34]         310         3425         9%           Summary effect size (10 fractions)         310         3425         9%           Summary effect size (10 fractions)         0.15 (0.13, 0.18)         0.15 (0.13, 0.18)           Summary effect size (10 fractions)         310         3425         9%           Summary effect size (10 fractions)         0.15 (0.13, 0.18)         0.15 (0.13, 0.18)           Test of moderators: coefficient 2 (0M, p         310         310         310           rest of moderators: coefficient 2 (0M, p         1.06, 0.304         0.55 (0.39, 0.70)           treatment         Summary effect size (0ther studies)         5         1.16 (0.14, 0.19)           reatinent)         Summary			19	169	
Summary effect size (6-10 fractions) Summary effect size (0ther studies) Est of moderators: coefficient 2 (0M, p value))         0.09 (0.04, 0.19) 0.16 (0.13, 0.19) 1.34, 0.246           Patients getting > 10         118         1.34, 0.246           fractions         Lewis et al. (2019) [52] *         0         0           Qld Government (2020) [2]         283         3157		Qld Government (2020) [2]		6161	
Summary effect size (0ther studies) rest of moderators: coefficient 2 (QM, p value))       0.16 (0.13, 0.19) 1.24, 0.246         Patients getting > 10       Saw et al. (2019) [52]*       0       118         fractions       Lewis et al. (2020) [75]       0       0         Qld Government (2020) [2]       283       3157         Wallace et al. (2018) [34]       27       150         Total       310       3425       9%         Summary effect size (>10 fractions)       0.15 (0.13, 0.18)       0.15 (0.13, 0.18)         Fest of moderators: coefficient 2 (QM, p       1.06, 0.304       0.15 (0.13, 0.18)         rest of moderators: coefficient 2 (QM, p       1.06, 0.304       0.15 (0.13, 0.18)         completing       Ali et al. (2018) [51]       28       39         completing       Ali et al. (2018) [51]       28       39         completing       Ali et al. (2018) [51]       5       17         Meeuse et al. (2015) [63]       5       17       55 (0.39, 0.70)         Teat of moderators: coefficient 2 (QM, p       255 (0.39, 0.70)       255 (0.39, 0.70)         Test of moderators: coefficient 2 (QM, p       265       0.16 (0.14, 0.19)         Teat of moderators: coefficient 2 (QM, p       265       0.16 (0.14, 0.19)         Test of moderators: coeffi			1064	6553	
Fast of moderators: coefficient 2 (QM, p value))       1.34, 0.246         Patients getting > 10       118         fractions       Lewis et al. (2019) [52]*       0       0         Qld Government (2020) [2]       283       3157         Wallace et al. (2018) [34]       27       150         Total       310       3425       9%         Summary effect size (0ther studies)       0.10 (0.04, 0.20)       0.15 (0.13, 0.18)         Test of moderators: coefficient 2 (QM, p       1.06, 0.304       0.16 (0.04, 0.20)         value)       Value       28       39         Patients not       Shukv et al. (2018) [51]       28       39         completing       Ali et al. (2018) [51]       17       1.06, 0.304         value)       Value)       1.06       0.50 (0.39, 0.70)         patients not       Shukv et al. (2019) [52]       18       31         completing       Ali et al. (2019) [25]       18       31         Total       68       120       57%         Summary effect size (0ther studies)       0.16 (0.14, 0.19)       26.51, 40.001 <sup>±</sup> reatment       Summary effect size (0ther studies)       0.16 (0.14, 0.19)       26.51, 40.001 <sup>±</sup> Patients getting SBRT       For of moder					
value)       value)         Patients getting > 10       Shaw et al. (2019) [52] *       0       118         fractions       Lewis et al. (2020) [75]       0       0         Qld Government (2020) [2]       283       3157         Wallace et al. (2018) [34]       27       150         Total       310       3425       9%         Summary effect size (>10 fractions)       0.15 (0.13, 0.18)       0.15 (0.13, 0.18)         Test of moderators: coefficient 2 (QM, p       0.10 (0.04, 0.20)       0.15 (0.13, 0.18)         rest of moderators: coefficient 2 (QM, p       0.15 (0.13, 0.18)       1.06, 0.304         completing       Ali et al. (2018) [51]       28       39         reatment       Lerner et al. (2015) [63]       5       17         Meeuse et al. (2010) [25]       18       31       106         Total       68       120       57%       0.16 (0.14, 0.19)         Summary effect size (0ther studies)       0.16 (0.14, 0.19)       26.51, <0.001 <sup>±</sup> 26.51, <0.001 <sup>±</sup> Patients getting SBRT       Kyoe et al. (2017) [71]       5       126       4%       0.04 (0.02, 0.09)       0.016 (0.14, 0.18)         Teat of moderators: coefficient 2 (QM, p       5       126       10.54, 0.001 <sup>±</sup> 0.04 (0					
Patients getting > 10       Shaw et al. (2019) [52]*       0       118         fractions       Lewis et al. (2020) [75]       0       0         Qld Government (2020) [2]       283       3157         Wallace et al. (2018) [34]       27       150         Total       310       3425       9%         Summary effect size (>10 fractions)       0.15 (0.13, 0.18)       0.15 (0.13, 0.18)         Summary effect size (Other studies)       1.06, 0.304       0.15 (0.13, 0.18)         rest of moderators: coefficient 2 (QM, p       1.06, 0.304       0.15 (0.13, 0.18)         value))       Patients not       Shukor et al. (2018) [51]       28       39         completing       Ali et al. (2019) [52]       17       33         treatment       Lerner et al. (2015) [63]       5       17         Meeuse et al. (2010) [25]       18       31       55 (0.39, 0.70)         treatment       Summary effect size (pts not completing treatment)       0.16 (0.14, 0.19)       26.51, -0.001 <sup>±</sup> Summary effect size (pts rudies)       5       126       4%       0.04 (0.02, 0.09)         Patients getting SBRT       Summary effect size (other studies)       0.16 (0.14, 0.18)       0.16 (0.14, 0.18)         for brain metastases       5       12					1.34, 0.240
fractions       Lewis et al. (2020) [75]       0       0         Qid Government (2020) [2]       283       3157         Wallace et al. (2018) [34]       27       150         Total       310       3425       9%         Summary effect size (>10 fractions)       0.10 (0.04, 0.20)       0.15 (0.13, 0.18)         Test of moderators: coefficient 2 (QM, p       1.06, 0.304       1.06, 0.304         value))       Patients not       Slukor et al. (2018) [51]       28       39         completing       Ali et al. (2019) [57]       17       33       1.06, 0.304         treatment       Lerner et al. (2015) [63]       5       17       Meeuse et al. (2010) [25]       18       31         Total       68       120       57%       0.16 (0.14, 0.19)       26.51, <0.001 <sup>±</sup> Patients getting SBRT       Kyoo et al. (2017) [71]       5       126       26.51, <0.001 <sup>±</sup> Patients getting SBRT       Kyoo et al. (2017) [71]       5       126       4%         Summary effect size (patients getting SBRT)       0.04 (0.02, 0.09)       0.04 (0.02, 0.09)       0.016 (0.14, 0.18)         Treatment)       Summary effect size (patients getting SBRT)       0.04 (0.02, 0.09)       0.16 (0.14, 0.18)         Fest of moderators: coeffic	Patients getting > 10		0	118	
Qld Government (2020) [2]       283       3157         Wallace et al. (2018) [34]       27       150         Total       310       3425       9%         Summary effect size (>10 fractions)       310       3425       9%         Summary effect size (0ther studies)       0.10 (0.04, 0.20)       0.15 (0.13, 0.18)         Summary effect size (0ther studies)       1.06, 0.304       0.15 (0.13, 0.18)         rest of moderators: coefficient 2 (QM, p       1.06, 0.304       0.15 (0.13, 0.18)         value))       7       33       1.06, 0.304         Patients not       Shukor et al. (2015) [63]       5       17         Meeuse et al. (2015) [63]       5       17       5         Meeuse et al. (2010) [25]       18       31       0.55 (0.39, 0.70)         treatment       Summary effect size (Dther studies)       0.16 (0.14, 0.19)       26.51, <0.001 <sup>±</sup> Summary effect size (Other studies)       126       5       1.66 (0.14, 0.19)         Patients getting SBRT       Ryoo et al. (2017) [71]       5       126         Summary effect size (Dther studies)       126       4%         summary effect size (Dther studies)       0.16 (0.14, 0.18)       0.16 (0.14, 0.18)         reatin metastase       5       126					
Wallace et al. (2018) [34]       27       150         Total       310       3425       9%         Summary effect size (>10 fractions)       0.10 (0.04, 0.20)       0.15 (0.13, 0.18)         Summary effect size (Other studies)       1.06, 0.304       1.06, 0.304         rest of moderators: coefficient 2 (QM, p       1.06, 0.304       1.06, 0.304         value)       7       33       1.06, 0.304         Patients not       Shukor et al. (2018) [51]       28       39         completing       Ali et al. (2019) [57]       17       33         treatment       Lerner et al. (2015) [63]       5       17         Meeuse et al. (2010) [25]       18       31       5         Total       68       120       57%         Summary effect size (other studies)       0.55 (0.39, 0.70)       16 (0.14, 0.19)         Test of moderators: coefficient 2 (QM, p       26.51, <0.001 <sup>±</sup> 26.51, <0.001 <sup>±</sup> value)       Ryoo et al. (2017) [71]       5       126       4%         Summary effect size (patients getting SBRT)       0.04 (0.02, 0.09)       0.04 (0.02, 0.09)       0.01 <sup>±</sup> Summary effect size (other studies)       5       126       4%       0.04 (0.02, 0.09)       0.16 (0.14, 0.18)       10.54, 0.					
Summary effect size (>10 fractions)       0.10 (0.04, 0.20)         Summary effect size (0ther studies)       0.15 (0.13, 0.18)         Test of moderators: coefficient 2 (QM, p       1.06, 0.304         value)       100         Patients not       Shukor et al. (2018) [51]       28       39         completing       Ali et al. (2019) [57]       17       33         treatment       Lerner et al. (2015) [63]       5       17         Meeuse et al. (2010) [25]       18       31         Total       68       120       57%         Summary effect size (0ther studies)       0.16 (0.14, 0.19)       26.51, <0.001 <sup>±</sup> Test of moderators: coefficient 2 (QM, p       0.16 (0.14, 0.19)       26.51, <0.001 <sup>±</sup> Patients getting SBRT       Kyoo et al. (2017) [71]       5       126         For brain metastases       5       126       4%         Summary effect size (Dther studies)       5       0.04 (0.02, 0.09)         Summary effect size (Dther studies)       0.04 (0.02, 0.09)       0.16 (0.14, 0.18)         Fest of moderators: coefficient 2 (QM, p       0.04 (0.02, 0.09)       0.16 (0.14, 0.18)         Summary effect size (Dther studies)       10.54, 0.001 <sup>±</sup> 10.54, 0.001 <sup>±</sup>		Wallace et al. (2018) [34]	27	150	
Summary effect size (Other studies) Test of moderators: coefficient 2 (QM, p       0.15 (0.13, 0.18)         Value))       1.06, 0.304         Patients not       Shukor et al. (2018) [51]       28       39         completing       Ali et al. (2019) [57]       17       33         treatment       Lerner et al. (2015) [63]       5       17         Meeuse et al. (2010) [25]       18       31         Total       68       120       57%         Summary effect size (pts not completing treatment)       0.16 (0.14, 0.19)       26.51, <0.001 <sup>‡</sup> Summary effect size (Other studies)       0.16 (0.14, 0.19)       26.51, <0.001 <sup>‡</sup> Patients getting SBRT       for brain metastases       5       126         Summary effect size (Other studies)       5       126       4%         Summary effect size (other studies)       5       126       4%         Summary effect size (other studies)       5       126       4%         Summary effect size (other studies)       0.16 (0.02, 0.09)       0.16 (0.04, 0.18)         Test of moderators: coefficient 2 (QM, p       10.54, 0.001 <sup>‡</sup> 0.16 (0.14, 0.18)			310	3425	
Test of moderators: coefficient 2 (QM, p       1.06, 0.304         value))       100, 0.304         Patients not       Shukor et al. (2018) [51]       28       39         completing       Ali et al. (2019) [57]       17       33         treatment       Lerner et al. (2010) [25]       18       31         Total       68       120       57%         Summary effect size (pts not completing treatment)       0.55 (0.39, 0.70)       0.55 (0.39, 0.70)         Summary effect size (other studies)       0.16 (0.14, 0.19)       26.51, <0.001 <sup>‡</sup> Patients getting SBRT       Ryoo et al. (2017) [71]       5       126         for brain metastases       5       126       4%         Summary effect size (Other studies)       5       0.04 (0.02, 0.09)         Summary effect size (patients getting SBRT)       0.04 (0.02, 0.09)       0.16 (0.14, 0.18)         for brain metastases       5       126       4%         Summary effect size (Other studies)       0.04 (0.02, 0.09)       0.16 (0.14, 0.18)         fest of moderators: coefficient 2 (QM, p       0.04 (0.02, 0.09)       0.16 (0.14, 0.18)         fest of moderators: coefficient 2 (QM, p       10.54, 0.001 <sup>‡</sup> 10.54, 0.001 <sup>‡</sup>					
value))       value)         Patients not       Shukor et al. (2018) [51]       28       39         completing       Ali et al. (2019) [57]       17       33         treatment       Lerner et al. (2015) [63]       5       17         Meeuse et al. (2010) [25]       18       31         Total       68       120       57%         Summary effect size (pts not completing treatment)       0.55 (0.39, 0.70)       0.55 (0.39, 0.70)         Summary effect size (other studies)       7est of moderators: coefficient 2 (QM, p       0.16 (0.14, 0.19)         value))       5       126       4%         Patients getting SBRT       Ryoo et al. (2017) [71]       5       126         for brain metastases       5       126       4%         Summary effect size (patients getting SBRT)       0.04 (0.02, 0.09)       0.04 (0.02, 0.09)         Summary effect size (other studies)       5       126       4%         for brain metastases       5       126       4%         Summary effect size (other studies)       0.16 (0.14, 0.18)       0.16 (0.14, 0.18)         for brain metastases       5       126       4%       10.54, 0.001 <sup>±</sup>					
Patients not completing       Shuk or et al. (2018) [51]       28       39         completing       Ali et al. (2019) [57]       17       33         treatment       Lerner et al. (2015) [63]       5       17         Meeuse et al. (2010) [25]       18       31         Total       68       120       57%         Summary effect size (pts not completing treatment)       0.55 (0.39, 0.70)       57%         Summary effect size (Other studies)       0.16 (0.14, 0.19)       26.51, <0.001 <sup>‡</sup> Patients getting SBRT       Kyoo et al. (2017) [71]       5       126         Patients getting SBRT       5       126       4%         Summary effect size (Datients getting SBRT)       0.04 (0.02, 0.09)       0.04 (0.02, 0.09)         Summary effect size (Other studies)       5       126       4%         Summary effect size (Datients getting SBRT)       0.04 (0.02, 0.09)       0.16 (0.14, 0.18)         Summary effect size (Other studies)       0.16 (0.14, 0.18)       0.16 (0.14, 0.18)         Test of moderators: coefficient 2 (QM, p       0.16 (0.14, 0.18)       0.16 (0.14, 0.18)         Summary effect size (Other studies)       0.16 (0.14, 0.18)       0.154, 0.001 <sup>‡</sup>					1.06, 0.304
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Patients not		28	30	
treatment       Lerner et al. (2015) [63]       5       17         Meeuse et al. (2010) [25]       18       31         Total       68       120       57%         Summary effect size (pts not completing treatment)       0.55 (0.39, 0.70)       0.55 (0.39, 0.70)         Summary effect size (other studies)       0.16 (0.14, 0.19)       26.51, <0.001 <sup>‡</sup> Test of moderators: coefficient 2 (QM, p       26.51, <0.001 <sup>‡</sup> 26.51, <0.001 <sup>‡</sup> value))       Patients getting SBRT       Ryoo et al. (2017) [71]       5       126         Summary effect size (patients getting SBRT)       0.04 (0.02, 0.09)       0.04 (0.02, 0.09)         Summary effect size (Other studies)       5       126       4%         Test of moderators: coefficient 2 (QM, p       0.16 (0.14, 0.18)       0.16 (0.14, 0.18)         Test of moderators: coefficient 2 (QM, p       0.16 (0.14, 0.18)       0.16 (0.14, 0.18)         Test of moderators: coefficient 2 (QM, p       0.16 (0.14, 0.18)       0.16 (0.14, 0.18)					
Meeuse et al. (2010) [25]       18       31         Total       68       120       57%         Summary effect size (pts not completing treatment)       0.55 (0.39, 0.70)       0.55 (0.39, 0.70)         Summary effect size (Other studies)       0.16 (0.14, 0.19)       26.51, <0.001 <sup>±</sup> Test of moderators: coefficient 2 (QM, p value))       5       126         Patients getting SBRT for brain metastases       5       126         Summary effect size (Datents getting SBRT)       0.04 (0.02, 0.09)         Summary effect size (Datents getting SBRT)       0.16 (0.14, 0.18)         Test of moderators: coefficient 2 (QM, p       0.16 (0.14, 0.18)         Test of moderators: coefficient 2 (QM, p       0.16 (0.14, 0.18)	1 0				
Total       68       120       57%         Summary effect size (pts not completing treatment)       0.55 (0.39, 0.70)         Summary effect size (Other studies)       0.16 (0.14, 0.19)         Test of moderators: coefficient 2 (QM, p value))       26.51, <0.001*					
treatment)       treatment)         Summary effect size (Other studies)       0.16 (0.14, 0.19)         Test of moderators: coefficient 2 (QM, p       26.51, <0.001 <sup>±</sup> value))       Ryoo et al. (2017) [71]       5         Patients getting SBRT for brain metastases       5       126         Summary effect size (patients getting SBRT)       0.04 (0.02, 0.09)         Summary effect size (Other studies)       0.16 (0.14, 0.18)         Test of moderators: coefficient 2 (QM, p       10.54, 0.001 <sup>±</sup>					57%
Test of moderators: coefficient 2 (QM, p value))     26.51, <0.001 <sup>‡</sup> Patients getting SBRT for brain metastases     Ryoo et al. (2017) [71]     5     126       5     126     4%       Summary effect size (patients getting SBRT) Summary effect size (Other studies) Test of moderators: coefficient 2 (QM, p     0.04 (0.02, 0.09) 0.16 (0.14, 0.18) 10.54, 0.001 <sup>‡</sup>					0.55 (0.39, 0.70)
Patients getting SBRT for brain metastases       Ryo et al. (2017) [71]       5       126         5       126       4%         Summary effect size (patients getting SBRT) Summary effect size (Other studies) Test of moderators: coefficient 2 (QM, p       0.04 (0.02, 0.09)         10.54, 0.001 <sup>‡</sup> 10.54, 0.001 <sup>‡</sup>		Test of moderators: coefficient 2 (QM, p			
for brain metastases 5 126 4% Summary effect size (patients getting SBRT) 0.04 (0.02, 0.09) Summary effect size (Other studies) 0.16 (0.14, 0.18) Test of moderators: coefficient 2 (QM, p 10.54, 0.001 <sup>‡</sup>	Detients with a CDDT		5	100	
5       126       4%         Summary effect size (patients getting SBRT)       0.04 (0.02, 0.09)         Summary effect size (Other studies)       0.16 (0.14, 0.18)         Test of moderators: coefficient 2 (QM, p       10.54, 0.001 <sup>‡</sup>	0 0	Kyoo et al. (2017) [71]	5	126	
Summary effect size (patients getting SBRT)0.04 (0.02, 0.09)Summary effect size (Other studies)0.16 (0.14, 0.18)Test of moderators: coefficient 2 (QM, p10.54, 0.001‡	IOI DIAIII IIIELASIASES		5	126	4%
Summary effect size (Other studies)0.16 (0.14, 0.18)Test of moderators: coefficient 2 (QM, p10.54, 0.001‡		Summary effect size (natients getting SBRT)	5	120	
Test of moderators: coefficient 2 (QM, p 10.54, 0.001 <sup>‡</sup>					
value))		value))			

(continued on next page)

#### Table D6 (continued)

Subgroup	Study	Number of patients dying within 30 days of palliative RT	Total number of patients receiving palliative RT	30-day mortality rate and subgroup moderator analysis
USA studies (post-hoc)	Ryoo et al. (2017) [71]	149	639	
	Ellsworth et al. (2014) [43]	89	339	
	Kapadia et al. (2012) [39]	209	730	
	Wu et al. (2019) [48]	125	518	
	Chawla et al. (2015) [55]	29	68	
	Tseng et al. (2018) [60]	39	203	
	Sherman et al. (2013) [61]	10	40	
	Bingham et al. (2016) [64]	33	262	
	Wong et al. (2019) [32]	18	113	
		8079	25189	32%
	Summary effect size (U.S. studies)			0.25 (0.21, 0.30)
	Summary effect size (other studies)			0.13 (0.12, 0.15)
	Test of moderators: coefficient 2 (QM, p value)			28.70, <0.001 <sup>‡</sup>
Study year (≥2016) (post- hoc	,	6241	35,998	17%
	Summary effect size (studies from 2016 on)			0.15 (0.13, 0.18)
	Summary effect size (studies older than 2016)			0.18 (0.13, 0.23)
	Test of moderators: coefficient 2 (QM, p value)			0.85, 0.358
Timing of 30-day mortality (post-hoc)	(from end of treatment)	13,389	51,727	26%
	Summary effect size (studies 30-day mortality from end of treatment course)			0.18 (0.14, 0.22)
	Summary effect size (studies 30-day mortality from start of treatment course)			0.15 (0.13, 0.18)
	Test of moderators: coefficient 2 (QM, p value)			0.73, 0.392

\*unpublished data gained from correspondence with authors of study, RT = radiotherapy, USA = United States of America. QM = test for moderators (coefficient 2), (df =1).  $\ddagger$  significant p value  $\leq$  0.05, SBRT = stereotactic Body Radiotherapy.



**Fig. F1.** Externally studentized residual screening analysis to investigate for infuential studies. None of the studies extracted were influential in this meta-analysis (based on externally studentized residuals cutoff  $\geq$  3 in absolute value). Study numbers correst **66** nd to ordering of studies in Fig. F.2 (1 to 42 from top to bottom of Fig. F.2).

#### Appendix E

#### Table E1

Studies excluded based on full manuscript review. 

Excluded study	Reason for exclusion	Details
Yu et al. (2014) [38]	Wrong study design	Review: the studies from this article meeting inclusion/exclusion criteria
		have all been included in our search and in Park et al. (2017) [13] review
Anshushaug et al. (2015) [82]	Wrong study design	No total number of participants getting PR reported
Guadagnolo et al. (2013) [77]	Wrong study design	SEER Medicare-linked database excluding those under 65 years of age. Not
		reporting the total number of patients getting PR
Morin et al. (2016) [98]	Wrong outcomes	not reporting total that received PR
Zhang et al. (2014) [99]	Wrong outcomes	Study not reporting only those getting PR
Zhang et al. (2017) [85]	Wrong study design	Total number participants getting PR not reported. Attempted to contact
List al. (2017) [100]	147	author but no response
Li et al. (2017) [100]	Wrong outcomes	Not reporting 30-day mortality of all those getting PR
Nieder et al. (2017) [101]	Wrong outcomes	Not reporting those who died within 30 days of PR
Futagami et al. (2016) [102]	Wrong outcomes	30-day mortality of those getting chemotherapy for gynaecological cancers
Clement-Zhao et al. (2018) [103]	Wrong outcomes	This study did not obtain a 30-day mortality rate after PR
Huang J et al. (2014) [104]	Wrong population	Participants included had "invasive cancer", clarification requested from authors if this population had advanced or metastatic cancer, but no reply
Gallais Serezal et al. (2016) [105]	Wrong study design	Participants were all those who died in nation-wide register, but would
		have excluded patients dying at home or resident to a care-home
Dennis et al. (2011) [106]	Wrong outcomes	Efficacy of PR studies
Becerra et al. (2018) [107]	Wrong outcomes	Not able to confirm total that had palliative radiotherapy with the authors
Toole et al. (2012) [56]	Wrong population	Mix of palliative and curative RT population included, authors not able to confirm palliative RT numbers
Patel et al. (2014) [108]	Merged with Toole et al. (2012) [56]	
Grendarova et al. (2015) [78]	Wrong study design	Mix of palliative and curative RT population included, and authors not able
		to give totals of PR participants only.
Caussa et al. (2011) [109]	Wrong outcomes	Patients who died within 30 days of their PR not provided, unable to contact
		authors
Spencer et al. (2019) [110]	Wrong outcomes	Attempted to get unpublished data for 30-day mortality after PR but authors not able to provide
Gripp et al. (2010) [12]	Wrong outcomes	Study not differentiating those getting PR vs. curative intent radiotherapy
Varma et al. (2017) [111]	Wrong outcomes	30 day mortality after PR not reported, attempted to contact author but
	0	unable to
Sun et al. (2021) [112]	Wrong outcomes	30 day mortality after PR not reported, attempted to contact author but
	0	unable to
Berger et al. (2014) [114]	Wrong outcomes	Total that had PR not reported
Cassidy et al. (2018) [115]	Wrong outcomes	Not reporting 30-day mortality after PR. Attempted to contact author but unsuccessful
Panoff et al. (2015) [116]	Wrong population	Mix of curative and palliative patients reported
Tiwana et al. (2016) [83]	Wrong outcome	Authors can't provide number of patients who died within 30 days of PR
Tiwana et al. (2014) [117]	Merged with Tiwana et al. (2016) [83]	
Olson et al. (2014) [118]	Merged with Tiwana et al. (2016) [83]	

PR = palliative radiotherapy, SEER = Surveillance, Epidemiology, and End Results program, RT = radiotherapy.

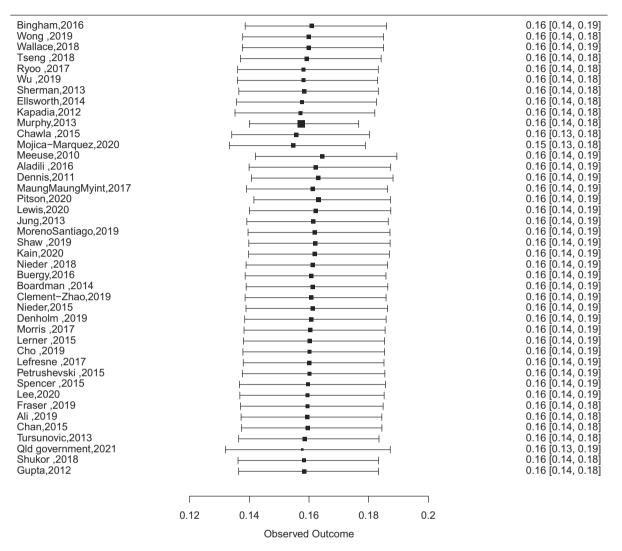
#### Table E2

Studies merged into extracted studies used in this review.

Main parent extracted study	Studies merged into parent extracted study
A 0	
Lee et al. (2020) [59]	Lee & Wong (2020) [119]
Pitson et al. (2020) [70]	Pitson et al. (2019) [120]
Ellsworth et al. (2014) [43]	Alcorn et al. (2013) [121]
	Alcorn et al. (2013) [122]
Gupta et al. (2012) [69]	Gupta et al. (2012) [81]
Wong et al. (2019) [32]	Hwang et al. (2018) [123]
Fraser et al. (2019) [40]	Fraser et al. (2018) [124]
Morris et al. (2017) [45]	Morris et al. (2017) [125]
Bingham et al. (2016) [64]	Dvorak et al. (2016) [64]
	Lopez et al. (2017) [126]
Wu et al. (2019) [48]	Wu et al. (2017) [127]
	Witztum et al. (2019) [128]
Spencer et al. (2015) [46]	Nieder 2015 [129]
	Hall et al. (2011) [130]
	Spencer et al. (2015) [131]
Wallace et al. (2018) [34]	Wallace et al. (2017) [132]
Nieder et al. (2015) [47]	Nieder et al. (2014) [133]
	Nieder et al. (2015) [134]
	Nieder et al. (2014) [135]
	Angelo et al. (2014) [86]
	Nieder et al. (2015) [113]

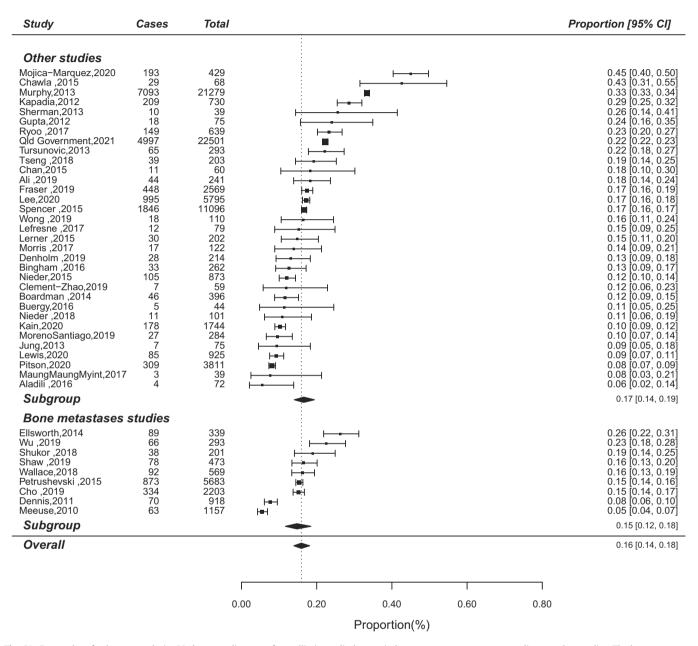
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**Fig. F2.** Forest plot of the summary proportion with each study individually "left out" of analysis. None of the 42 studies were influential on the summary proportion 30-day mortality rate after palliative radiotherapy. Observed outcome is the proportion of patients dying within 30 days of palliative radiotherapy. Qld = Queensland, Australia.

#### Appendix G



**Fig. G1.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in bone metastases treatment studies vs. other studies. The bone metastases treatment subgroup did not significantly modify the overall summary effect proportion (QM(1) = 0.37, p = 0.544). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% CI]
Other studies				
Mojica-Marquez,2020 Chawla ,2015 Murphy,2013 Kapadia,2012 Ellsworth,2014 Sherman,2013 Gupta,2012 Qld government,2021 Tursunovic,2013 Tseng ,2018 Chan,2015 Ali ,2019 Fraser ,2019 Lee,2020 Spencer ,2015 Wallace,2018 Wong,2019 Petrushevski ,2015 Lefresne ,2017 Cho ,2019 Lerner ,2015 Morris ,2017 Denholm ,2019 Bingham ,2016 Nieder,2015 Clement-Zhao,2019 Boardman ,2014 Buergy,2016 Nieder ,2018 Kain,2020 Shaw ,2019 MorenoSantiago,2019 Lewis,2020 Pitson,2020 MaungMaungMyint,2017 Dennis,2011 Aladili ,2016 Meeuse,2010	$\begin{array}{c} 193\\ 29\\ 7093\\ 89\\ 10\\ 18\\ 4997\\ 65\\ 39\\ 11\\ 44\\ 448\\ 995\\ 1846\\ 992\\ 1846\\ 992\\ 1846\\ 992\\ 18873\\ 122\\ 334\\ 105\\ 17\\ 28\\ 330\\ 17\\ 28\\ 331\\ 105\\ 7\\ 46\\ 5\\ 11\\ 178\\ 108\\ 27\\ 85\\ 309\\ 3\\ 70\\ 4\\ 63\end{array}$	$\begin{array}{r} 429\\ 68\\ 21279\\ 730\\ 339\\ 39\\ 75\\ 22501\\ 293\\ 203\\ 60\\ 241\\ 2569\\ 5795\\ 11096\\ 569\\ 569\\ 113\\ 5683\\ 79\\ 2203\\ 202\\ 122\\ 214\\ 262\\ 873\\ 59\\ 396\\ 44\\ 101\\ 1744\\ 1112\\ 284\\ 925\\ 3811\\ 39\\ 918\\ 72\\ 1157\end{array}$		$\begin{array}{c} 0.45 & [0.40, 0.50] \\ 0.43 & [0.31, 0.55] \\ 0.33 & [0.33, 0.34] \\ 0.29 & [0.25, 0.32] \\ 0.26 & [0.22, 0.31] \\ 0.24 & [0.14, 0.41] \\ 0.24 & [0.16, 0.35] \\ 0.22 & [0.22, 0.23] \\ 0.22 & [0.22, 0.23] \\ 0.22 & [0.18, 0.27] \\ 0.19 & [0.14, 0.25] \\ 0.18 & [0.10, 0.30] \\ 0.18 & [0.14, 0.24] \\ 0.17 & [0.16, 0.19] \\ 0.17 & [0.16, 0.19] \\ 0.17 & [0.16, 0.19] \\ 0.17 & [0.16, 0.17] \\ 0.16 & [0.13, 0.19] \\ 0.16 & [0.13, 0.19] \\ 0.15 & [0.14, 0.16] \\ 0.15 & [0.14, 0.16] \\ 0.15 & [0.14, 0.16] \\ 0.15 & [0.14, 0.16] \\ 0.15 & [0.14, 0.16] \\ 0.15 & [0.14, 0.16] \\ 0.15 & [0.14, 0.16] \\ 0.15 & [0.14, 0.16] \\ 0.15 & [0.14, 0.16] \\ 0.15 & [0.14, 0.16] \\ 0.15 & [0.14, 0.16] \\ 0.15 & [0.09, 0.25] \\ 0.11 & [0.09, 0.18] \\ 0.13 & [0.09, 0.18] \\ 0.13 & [0.09, 0.14] \\ 0.12 & [0.06, 0.23] \\ 0.12 & [0.06, 0.23] \\ 0.12 & [0.08, 0.12] \\ 0.10 & [0.07, 0.14] \\ 0.09 & [0.07, 0.14] \\ 0.09 & [0.07, 0.14] \\ 0.08 & [0.07, 0.09] \\ 0.08 & [0.03, 0.21] \\ 0.08 & [0.03, 0.21] \\ 0.06 & [0.02, 0.14] \\ 0.05 & [0.04, 0.07] \\ \end{array}$
Subgroup			◆	0.16 [0.13, 0.18]
Brain metastases	radiother	apv studies	5	
Wu ,2019 Ryoo ,2017 Shukor ,2018 Jung,2013	43 149 26 7	146 639 150 75		0.29 [0.23, 0.37] 0.23 [0.20, 0.27] 0.17 [0.12, 0.24] 0.09 [0.05, 0.18]
Subgroup				0.20 [0.15, 0.28]
Overall			<b>•</b>	0.16 [0.14, 0.19]
		Г	i	
		0.0	0 0.20 0.40 0.60	
			Proportion(%)	

**Fig. G2.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in brain metastases treatment studies vs. other studies. The brain metastases treatment subgroup did not significantly modify the overall summary effect proportion (QM(1) = 1.13, p = 0.287). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

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Study	Cases	Total		Proportion [95% CI]
Other studies				
Mojica-Marquez,2020 Chawla ,2015 Murphy ,2013 Kapadia,2012 Ellsworth,2014 Sherman,2013 Wu ,2019 Gupta,2012 Ryoo ,2017 Qld Government,2021 Tursunovic,2013 Tseng ,2018 Chan,2015 Ali ,2019 Fraser ,2019 Lee,2020 Spencer ,2015 Wong,2019 Wallace,2018 Petrushevski ,2015 Lefresne ,2017 Cho ,2019 Lerner ,2015 Morris ,2017 Denholm ,2019 Bingham ,2016 Nieder,2015 Clement-Zhao,2019 Boardman ,2014 Buergy,2016 Nieder ,2018 Kain,2020 Shaw ,2019 MorenoSantiago,2019 Jung,2013 Lewis,2020 MaungMaungMyint,2017 Dennia,2011 Aladili ,2016 Meeuse,2010	$\begin{array}{c} 193\\ 29\\ 7093\\ 209\\ 89\\ 10\\ 125\\ 18\\ 149\\ 4997\\ 65\\ 39\\ 11\\ 44\\ 4995\\ 1846\\ 18\\ 995\\ 1846\\ 92\\ 873\\ 12\\ 334\\ 30\\ 17\\ 28\\ 33\\ 105\\ 7\\ 46\\ 5\\ 11\\ 178\\ 108\\ 27\\ 7\\ 8\\ 5\\ 309\\ 3\\ 70\\ 4\\ 63\end{array}$	$\begin{array}{r} 429\\ 68\\ 21279\\ 730\\ 339\\ 518\\ 75\\ 639\\ 22501\\ 293\\ 203\\ 60\\ 241\\ 2569\\ 5795\\ 11096\\ 110\\ 569\\ 5795\\ 11096\\ 110\\ 569\\ 5795\\ 2203\\ 202\\ 122\\ 214\\ 262\\ 873\\ 59\\ 396\\ 44\\ 101\\ 1744\\ 1112\\ 284\\ 75\\ 925\\ 3811\\ 399\\ 918\\ 72\\ 1157\end{array}$		$\begin{array}{c} 0.45 \ [0.40, 0.50]\\ 0.43 \ [0.31, 0.55]\\ 0.33 \ [0.33, 0.34]\\ 0.29 \ [0.22, 0.32]\\ 0.26 \ [0.22, 0.31]\\ 0.26 \ [0.14, 0.41]\\ 0.24 \ [0.21, 0.28]\\ 0.24 \ [0.21, 0.28]\\ 0.22 \ [0.22, 0.23]\\ 0.22 \ [0.22, 0.23]\\ 0.22 \ [0.22, 0.23]\\ 0.22 \ [0.22, 0.23]\\ 0.22 \ [0.22, 0.23]\\ 0.22 \ [0.22, 0.23]\\ 0.22 \ [0.22, 0.23]\\ 0.22 \ [0.18, 0.27]\\ 0.19 \ [0.14, 0.25]\\ 0.18 \ [0.10, 0.30]\\ 0.18 \ [0.14, 0.24]\\ 0.17 \ [0.16, 0.18]\\ 0.17 \ [0.16, 0.18]\\ 0.17 \ [0.16, 0.18]\\ 0.17 \ [0.16, 0.18]\\ 0.17 \ [0.16, 0.19]\\ 0.15 \ [0.01, 0.24]\\ 0.16 \ [0.11, 0.24]\\ 0.16 \ [0.11, 0.24]\\ 0.15 \ [0.01, 0.17]\\ 0.15 \ [0.01, 0.17]\\ 0.15 \ [0.01, 0.17]\\ 0.15 \ [0.01, 0.25]\\ 0.11 \ [0.00, 0.25]\\ 0.11 \ [0.05, 0.25]\\ 0.11 \ [0.05, 0.25]\\ 0.11 \ [0.06, 0.19]\\ 0.10 \ [0.07, 0.14]\\ 0.09 \ [0.07, 0.14]\\ 0.09 \ [0.07, 0.14]\\ 0.09 \ [0.07, 0.09]\\ 0.08 \ [0.07, 0.09]\\ 0.08 \ [0.07, 0.09]\\ 0.08 \ [0.07, 0.09]\\ 0.08 \ [0.02, 0.14]\\ 0.08 \ [0.04, 0.07]\\ 0.08 \ [0.04, 0.07]\\ 0.04 \ [0.02, 0.14]\\ 0.06 \ [0.02, 0.14]\\ 0.06 \ [0.02, 0.14]\\ 0.06 \ [0.02, 0.14]\\ 0.06 \ [0.02, 0.14]\\ 0.06 \ [0.02, 0.14]\\ 0.06 \ [0.02, 0.14]\\ 0.06 \ [0.02, 0.14]\\ 0.06 \ [0.02, 0.14]\\ 0.06 \ [0.02, 0.14]\\ 0.06 \ [0.02, 0.14]\\ 0.06 \ [0.02, 0.14]\\ 0.06 \ [0.02, 0.14]\\ 0.06 \ [0.02, 0.14]\\ 0.05 \ [0.04, 0.07]\\ 0.08 \ [0.06, 0.02]\\ 0.07 \ [0.09]\\ 0.08 \ [0.07]\\ 0.08 \ [0.06, 0.02]\\ 0.04 \ [0.07]\\ 0.$
Subgroup			•	0.16 [0.14, 0.18]
Multiple treatment	sites stu	dies		
Shukor ,2018	20	64	F	0.31 [0.21, 0.44]
Subgroup				0.31 [0.21, 0.44]
Overall			•	0.17 [0.15, 0.20]
		I	÷ 	
		0.0	0 0.20 0.40 0.60	
			Proportion(%)	

**Fig. G3.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in studies of patients getting treated at multiple body sites vs. other studies. The multiple treatment sites subgroup did significantly raise the overall summary effect proportion (QM(1) = 9.54, p = 0.002). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% CI]
Other studies				
Mojica-Marquez,2020	193	429	. <b>⊢</b> •	0.45 [0.40, 0.5]
Chawla ,2015	29	68		0.43 [0.31, 0.5
Murphy,2013	7093 209	21279		0.33 0.33
Kapadia,2012 Ellsworth,2014	209 89	730 339	· · · · · ·	0.29 [0.25, 0.3 0.26 [0.22, 0.3
Sherman,2013	10	39		0.26 [0.22, 0.3
Wu .2019	125	518		0.24 [0.21, 0.2
Gupta,2012	18	75		0.24 [0.24, 0.2]
Ryoo ,2017	149	639		0.23 [0.20, 0.2]
Shukor ,2018	133	585		0.23 [0.20, 0.2]
Qld government ,2021	4997	22501		0.22 [0.22, 0.23
Tursunovic,2013	65	293		0.22 0.18, 0.2
Tseng ,2018	39	203		0.19 [0.14, 0.2
Chan,2015	11	60		0.18 0.10, 0.3
Fraser ,2019	448	2569	<del> </del> ≡-	0.17 [0.16, 0.1
Lee,2020	995	5795		0.17 [0.16, 0.1]
Spencer ,2015	1846	11096		0.17 [0.16, 0.1
Wong ,2019	18	110		0.16 [0.11, 0.2
Wallace,2018	92	569		0.16 [0.13, 0.1
Petrushevski ,2015	873	5683		0.15 [0.14, 0.1
Lefresne ,2017	12 334	79 2203		0.15 [0.09, 0.2 0.15 [0.14, 0.1
Cho ,2019 Lerner ,2015	30	2203		0.15 [0.14, 0.1 0.15 [0.11, 0.2
Morris ,2017	17	122		0.13 [0.11, 0.2]
Denholm ,2019	28	214		0.13 [0.09, 0.1]
Bingham ,2016	33	262		0.13 [0.09, 0.1
Nieder,2015	105	873		0.12 [0.10, 0.14
Clement-Zhao,2019	7	59		0.12 0.06, 0.23
Boardman ,2014	46	396	' <b>⊢</b> ∎→  '	0.12 [0.09, 0.1
Buergy,2016	5	44		0.11 0.05, 0.2
Nieder ,2018	11	101		0.11 [0.06, 0.19
Shaw ,2019	108	1112	<b>⊢</b> ∎-  :	0.10 0.08, 0.12
MorenoSantiago,2019	27	284	┝╼╌┤	0.10 [0.07, 0.14
Jung,2013	7	75	┝━━─┊┤	0.09 [0.05, 0.1]
Lewis,2020	85	925		0.09 [0.07, 0.1
Pitson,2020	309	3811		0.08 [0.07, 0.0
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.2
Dennis,2011	70 4	918	, H <b>a</b> -1 , <u>i</u>	0.08 [0.06, 0.1
Aladili ,2016 Meeuse,2010	63	72 1157		0.06 [0.02, 0.1/ 0.05 [0.04, 0.0]
Subgroup	05	1157		0.16 [0.14, 0.1
eusgroup				0.10 [0.11, 0.14
Bladder cancer studies				
Ali ,2019	44	241		0.18 [0.14, 0.2
Kain,2020	6	44		0.14 [0.06, 0.2
Subgroup			-	0.18 [0.14, 0.22
Overall			•	0.17 [0.15, 0.1
		Г		
		0.0	0 0.20 0.40 0.60	
		510		

**Fig. G4.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in bladder cancer studies vs. other studies. The bladder cancer subgroup did not significantly modify the overall summary effect proportion (QM(1) = 0.34, p = 0.559). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% Cl]
Other studies				
Mojica-Marquez,2020	193	429	⊢	0.45 [0.40, 0.50]
Chawla ,2015	29	68		0.43 [0.31, 0.55]
Murphy ,2013	7093	21279		0.33 [0.33, 0.34]
Kapadia,2012	209	730		0.29 [0.25, 0.32]
Ellsworth,2014	89	339		0.26 [0.22, 0.31]
Sherman,2013	10	39		0.26 [0.14, 0.41]
Wu ,2019	125	518	<b>⊢</b> ∎−−	0.24 [0.21, 0.28]
Gupta,2012	18	75	<u>}</u>	0.24 [0.16, 0.35]
Ryoo ,2017	149	639	┝╼╾┥	0.23 [0.20, 0.27]
Tursunovic,2013	65	293	<b>⊢</b>	0.22 [0.18, 0.27]
Chan,2015	11	60		0.18 [0.10, 0.30]
Ali,2019	44	241		0.18 [0.14, 0.24]
Fraser ,2019	448	2569		0.17 [0.16, 0.19]
Lee,2020	995	5795		0.17 [0.16, 0.18]
Spencer ,2015	1846	11096		0.17 [0.16, 0.17]
Wallace,2018	92	569		0.16 [0.13, 0.19]
Wong,2019	18	113		0.16 [0.10, 0.24]
Petrushevski ,2015	873	5683		0.15 [0.14, 0.16]
Lefresne ,2017	12	79		0.15 [0.09, 0.25]
Cho ,2019	334	2203		0.15 [0.14, 0.17]
Lerner ,2015	30	202		0.15 [0.11, 0.20]
Morris ,2017	17	122		0.14 [0.09, 0.21]
Denholm ,2019	28	214		0.13 [0.09, 0.18]
Bingham ,2016	33	262		0.13 [0.09, 0.17]
Nieder,2015	105	873		0.12 [0.10, 0.14]
Clement-Zhao,2019	7	59		0.12 [0.06, 0.23]
Boardman ,2014	46	396		0.12 [0.09, 0.15]
Buergy,2016	5	44		0.11 [0.05, 0.25]
Nieder ,2018	11	101		0.11 [0.06, 0.19]
Shaw ,2019	108	1112		0.10 [0.08, 0.12]
MorenoSantiago,2019	27	284		0.10 [0.07, 0.14]
Jung,2013	7	75		0.09 [0.05, 0.18]
Lewis,2020	85	925	' : ' ├ <b>₽</b> ┤	0.09 [0.07, 0.11]
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.21]
Dennis,2011	70	918	╵┝╾┥	0.08 [0.06, 0.10]
Aladili ,2016	4	72		0.06 [0.02, 0.14]
Meeuse,2010	63	1157		0.05 [0.04, 0.07]
Subgroup			•	0.16 [0.13, 0.19]
Breast cancer studies	S			
Tseng ,2018	3	16	<u>├───</u>	0.19 [0.06, 0.45]
Qld government,2021	336	2172		0.15 [0.14, 0.17]
Shukor ,2018	20	154		0.13 [0.09, 0.19]
Kain,2020	8	245		0.03 [0.02, 0.06]
Pitson,2020	10	1192		0.01 [0.00, 0.02]
Subgroup				0.07 [0.02, 0.18]
Overall			<b>•</b>	0.16 [0.13, 0.18]
		I	· · · · · · · · · · · · · · · · · · ·	
		0.0	00 0.20 0.40 0.60	
			Proportion(%)	

**Fig. G5.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in breast cancer studies vs. other studies. The breast cancer subgroup did not significantly modify the overall summary effect proportion (QM(1) = 2.50, p = 0.113). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% CI]
Other studies				
Mojica-Marquez,2020	193	429		0.45 [0.40, 0.5
Chawla ,2015	29	68	<u>⊢</u>	0.43 [0.31, 0.5
Murphy,2013	7093	21279		0.33 [0.33, 0.3
Kapadia,2012	209	730	E   <b>→</b> ■→]	0.29 [0.25, 0.3
Ellsworth,2014	89	339		0.26 [0.22, 0.3
Sherman,2013	10	39	<u>↓</u>	0.26 [0.14, 0.4
Wu ,2019	125	518		0.24 [0.21, 0.28
Gupta,2012	18	75	<u>↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ </u>	0.24 [0.16, 0.3
Ryoo ,2017	149	639	<b>⊢</b>	0.23 [0.20, 0.2]
Tursunovic,2013	65	293		0.22 [0.18, 0.2]
Tseng ,2018	39	203		0.19 [0.14, 0.2
Chan,2015	11	60	<u>·</u> : <u></u>	0.18 [0.10, 0.30
Ali,2019	44	241		0.18 [0.14, 0.24
Fraser ,2019	448	2569	} <b>=</b> -	0.17 [0.16, 0.19
Lee,2020	995	5795		0.17 [0.16, 0.18
Spencer ,2015	1846	11096		0.17 [0.16, 0.17
Wallace,2018	92	569		0.16 [0.13, 0.19
Wong,2019	18	113		0.16 [0.10, 0.24
Petrushevski ,2015	873	5683		0.15 [0.14, 0.1
Lefresne ,2017	12	79		0.15 [0.09, 0.2
Cho ,2019	334	2203	' ; <b>⊢</b> ∎:	0.15 [0.14, 0.1
Lerner ,2015	30	202		0.15 [0.11, 0.2
Morris ,2017	17	122		0.14 [0.09, 0.2
Denholm ,2019	28	214		0.13 [0.09, 0.1]
Bingham ,2016	33	262		0.13 [0.09, 0.1
Nieder,2015	105	873	`⊢∎- ┊`	0.12 [0.10, 0.1
Clement-Zhao,2019	7	59		0.12 [0.06, 0.2
Boardman ,2014	46	396	·	0.12 [0.09, 0.1]
Buergy,2016	5	44		0.11 [0.05, 0.2
Nieder ,2018	11	101	' <u></u>	0.11 [0.06, 0.19
Shaw ,2019	108	1112		0.10 [0.08, 0.12
MorenoSantiago,2019	27	284		0.10 [0.07, 0.14
Jung,2013	7	75		0.09 [0.05, 0.18
Lewis,2020	85	925	'⊢=-	0.09 [0.07, 0.1
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.2
Dennis,2011	70	918	′ ⊢∎⊣ <sup>∶</sup> ′	0.08 [0.06, 0.10
Aladili ,2016	4	72		0.06 [0.02, 0.14
Meeuse,2010	63	1157	'''''   <del>■</del>	0.05 [0.04, 0.05
				-
Subgroup				0.16 [0.14, 0.19
Colorectal cancer stu				
Shukor ,2018	10	43	<u> </u>	0.23 [0.13, 0.3
Qld government,2021	316	1575	· · · · · · · · · · · · · · · · · · ·	0.20 [0.18, 0.2]
Kain,2020	14	167		0.08 [0.05, 0.14
Pitson,2020	12	302	++-1	0.04 [0.02, 0.0]
Subgroup				0.12 [0.05, 0.2
Overall			•	0.16 [0.13, 0.1
		0.0	0 0.20 0.40 0.60	

**Fig. G6.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in colorectal cancer studies vs. other studies. The colorectal cancer subgroup did not significantly modify the overall summary effect proportion (QM(1) = 0.67, p = 0.413). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

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Study	Cases	Total		Proportion [95% CI]
Other studies				
Mojica-Marquez,2020	193	429	<u> </u>	0.45 [0.40, 0.5
2015, Chawla	29	68		0.43 [0.31, 0.5
/lurphy,2013	7093	21279		0.33 [0.33, 0.3
Ellsworth,2014	89	339	j <b>⊢-</b> ∎	0.26 [0.22, 0.3
Sherman,2013	10	39		0.26 [0.14, 0.4
Vu ,2019	125	518	÷ <b>⊢</b> ∎→	0.24 [0.21, 0.
Ali,2019	44	241	<u>  - ;  </u>	0.18 [0.14, 0.
.ee,2020	995	5795		0.17 [0.16, 0.
Spencer,2015	1846	11096	i i i i i i i i i i i i i i i i i i i	0.17 [0.16, 0.
Vallace,2018	92	569		0.16 [0.13, 0.
Vong,2019	18	113		0.16 [0.10, 0.
etrushevski ,2015	873	5683		0.15 [0.14, 0.
cho ,2019	334	2203		0.15 [0.14, 0.
erner ,2015	30	202		0.15 [0.11, 0.
Norris ,2017	17	122		0.14 [0.09, 0.
enholm ,2019	28	214		0.13 [0.09, 0.
Bingham ,2016	33	262		0.13 [0.09, 0.
lieder,2015	105	873		0.13 [0.09, 0. 0.12 [0.10, 0.
lement-Zhao,2019	7	59		0.12 [0.10, 0. 0.12 [0.06, 0.
		396		
oardman ,2014	46			0.12 [0.09, 0
Suergy,2016	5	44		0.11 [0.05, 0.
lieder ,2018	11	101		0.11 [0.06, 0
haw ,2019	108	1112	, H <b>=</b> -	0.10 [0.08, 0
lorenoSantiago,2019	27	284		0.10 [0.07, 0
ung,2013	7	75	<b>├──→</b>	0.09 [0.05, 0.
ennis,2011	70	918	┝╾┥	0.08 [0.06, 0.
ladili ,2016	4	72		0.06 [0.02, 0.
leeuse,2010	63	1157	H=-1	0.05 [0.04, 0.
Subgroup			-	0.15 [0.12, 0.
Lung cancer studies				
Kapadia,2012	209	730		0.29 [0.25, 0.3
Qld government,2021	1860	6661		0.28 [0.27, 0.
Shukor ,2018	41	168		0.24 [0.19, 0.
Supta,2012	18	75		0.24 [0.16, 0.
	149	639		
tyoo ,2017 ursunovic,2013	65	293		0.23 [0.20, 0.
	121			0.22 [0.18, 0.
Pitson,2020		616		0.20 [0.17, 0.
seng ,2018	9	48		0.19 [0.10, 0
han,2015	11	60		0.18 [0.10, 0
raser ,2019	448	2569	, <del>l</del> ≢l	0.17 [0.16, 0
ain,2020	75	439		0.17 [0.14, 0
efresne ,2017	12	79		0.15 [0.09, 0.
.ewis,2020	85	925	┝╾┥	0.09 [0.07, 0.
laungMaungMyint,2017	3	39		0.08 [0.03, 0.
Subgroup				0.20 [0.16, 0.
Overall			<b>~</b>	0.18 [0.15, 0.
		Г		
		0.0	00 0.20 0.40 0.60	
		۲ ٥.c	00 0.20 0.40 0.60 Proportion(%)	

**Fig. G7.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in lung cancer studies vs. other studies. The lung cancer subgroup did not significantly modify the overall summary effect proportion (QM(1) = 3.10, p = 0.078). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

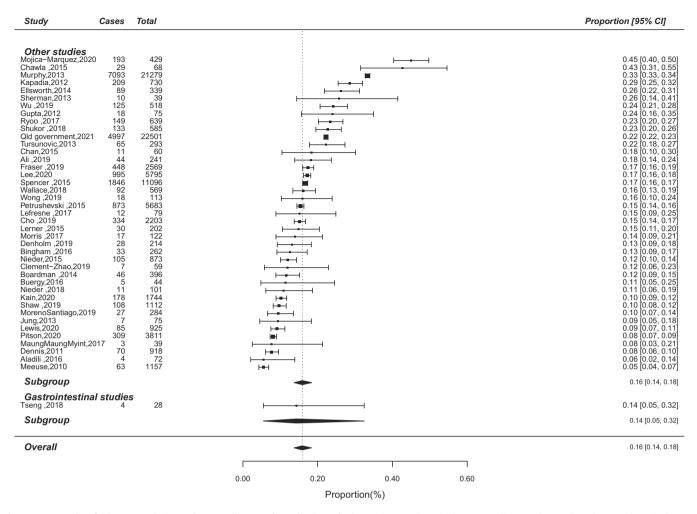
Study	Cases	Total		Proportion [95% CI]
Other studies				
Mojica-Marquez,2020	193	429	<b>⊢</b>	0.45 [0.40, 0.5
Chawla ,2015	29	68	<u>⊢</u>	0.43 [0.31, 0.5
Murphy,2013	7093	21279	El construction de la constructi	0.33 [0.33, 0.34
Kapadia,2012	209	730	÷ +++++	0.29 [0.25, 0.32
Ellsworth,2014	89	339		0.26 [0.22, 0.31
Sherman,2013	10	39	↓ · · · · · · · · · · · · · · · · · · ·	0.26 0.14, 0.41
Wu ,2019	125	518		0.24 [0.21, 0.28
Gupta,2012	18	75	· · · · · · · · · · · · · · · · · · ·	0.24 [0.16, 0.35
Ryoo ,2017	149	639	, ,,	0.23 [0.20, 0.27
Shukor ,2018	133	585		0.23 [0.20, 0.26
Tursunovic,2013	65	293		0.22 [0.18, 0.27
Qld government,2021	3129	14267		0.22 [0.21, 0.23
Tseng ,2018	39	203		0.19 [0.14, 0.25
Chan,2015	11	60		0.18 [0.10, 0.30
Ali ,2019	44	241		0.18 [0.14, 0.24
Fraser ,2019	448	2569		0.17 [0.16, 0.19
Lee,2020	995	5795		0.17 [0.16, 0.18
Spencer ,2015	1846	11096		0.17 [0.16, 0.17
Wallace,2018	92	569		0.16 [0.13, 0.19
Wong,2019	18	113		0.16 [0.10, 0.24
Petrushevski ,2015	873	5683		0.15 [0.14, 0.16
Lefresne ,2017	12	79		0.15 [0.09, 0.25
Cho ,2019	334	2203	' : ' + <del>=</del> -	0.15 [0.14, 0.17
Lerner ,2015	30	202		0.15 [0.11, 0.20
Morris ,2017	17	122		0.14 [0.09, 0.21
Denholm ,2019	28	214		0.13 [0.09, 0.18
Bingham ,2016	33	262		0.13 [0.09, 0.17
Nieder.2015	105	873	'⊢=	0.12 [0.10, 0.14
Clement-Zhao,2019	7	59		0.12 [0.06, 0.23
Boardman ,2014	46	396		0.12 [0.09, 0.15
Buergy,2016	5	44		0.11 [0.05, 0.25
Nieder ,2018	11	101		0.11 [0.06, 0.19
Shaw ,2019	108	1112	' <u>⊦</u> ∎-  .	0.10 [0.08, 0.12
MorenoSantiago,2019	27	284		0.10 [0.07, 0.14
Jung,2013	7	75		0.09 [0.05, 0.18
Lewis,2020	85	925	'	0.09 [0.07, 0.11
Pitson,2020	309	3811		0.08 [0.07, 0.09
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.21
Dennis,2011	70	918	' ├ <b>ब</b> ┥	0.08 [0.06, 0.10
Aladili ,2016	4	72		0.06 [0.02, 0.14
Meeuse,2010	63	1157	' <del> =</del> ┤	0.05 [0.04, 0.07
Subgroup			<b>~</b>	0.16 [0.14, 0.19
Oesophageal cancer	studies			
Kain,2020	5	68	<b>├──</b> ■────┤	0.07 [0.03, 0.16
Subgroup				0.07 [0.03, 0.16
Overall			•	0.16 [0.13, 0.18
		Г	i	
		0.0	0 0.20 0.40 0.60	
			Proportion(%)	

**Fig. G8.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in oesophageal cancer studies vs. other studies. The oesophageal cancer subgroup did not significantly modify the overall summary effect proportion (QM(1) = 3.50, p = 0.061). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

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Cases	Total		Proportion [95% CI]
193	429		0.45 [0.40, 0.50
29	68	<u> </u>	0.43 [0.31, 0.5
			0.33 [0.33, 0.3
			0.29 [0.25, 0.32
			0.26 [0.22, 0.3]
			0.26 [0.14, 0.4
			0.24 [0.21, 0.28
			0.24 [0.21, 0.20
			0.23 [0.20, 0.27
			0.23 [0.20, 0.26
			0.22 [0.18, 0.27
		<u>⊨</u>	0.19 [0.14, 0.25
			0.18 [0.10, 0.30
44		<del>:</del> ∎	0.18 [0.14, 0.24
448	2569	} <del>∎</del> ∣	0.17 [0.16, 0.19
995	5795		0.17 [0.16, 0.18
1846	11096		0.17 [0.16, 0.17
92	569		0.16 [0.13, 0.19
			0.16 [0.10, 0.24
			0.15 [0.14, 0.16
			0.15 [0.09, 0.25
			0.15 [0.09, 0.23
			0.14 [0.09, 0.21
			0.13 [0.09, 0.18
			0.13 [0.09, 0.17
		┝╼┤	0.12 [0.10, 0.14
			0.12 [0.06, 0.23
46	396	<u>⊢</u> ]	0.12 [0.09, 0.15
5	44	<b>├</b> ── <b>∎</b>	0.11 [0.05, 0.25
11	101		0.11 [0.06, 0.19
108	1112	<b>⊢</b> ∎-1	0.10 [0.08, 0.12
27	284	<u>⊢</u>	0.10 0.07, 0.14
7	75		0.09 [0.05, 0.18
			0.09 [0.07, 0.11
			0.08 [0.07, 0.09
			0.08 [0.03, 0.21
			0.08 [0.06, 0.10
			0.06 [0.02, 0.14
63	1157		0.05 [0.04, 0.07
			0.16 [0.13, 0.19
401	2515	<del>i</del> ≡-1	0.16 [0.15, 0.17
334	2203	la l	0.15 [0.14, 0.17
14	272	<b>⊢≠</b> −↓	0.05 [0.03, 0.09
		<b>~</b>	0.13 [0.10, 0.17
		•	0.15 [0.13, 0.17
	r		
	0.0	00 0.20 0.40 0.60	
	0.0		
	29 7093 209 89 10 125 18 149 133 65 39 11 44 448 995 1846 92 18 873 12 30 17 28 33 105 7 46 5 11 108 27 7 85 309 3 70 4 63 <b>ies</b> 401 334	193         429           29         68           7093         21279           209         730           89         339           10         39           125         518           18         75           149         639           39         203           11         60           44         241           448         2569           995         5795           1846         11006           92         569           18         113           873         5683           12         79           30         202           17         122           28         214           33         262           105         873           7         59           46         396           5         44           11         101           108         1112           27         284           7         75           85         925           309         3811           3         39	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

**Fig. G9.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in prostate cancer studies vs. other studies. The prostate cancer subgroup did not significantly modify the overall summary effect proportion (QM(1) = 1.02, p = 0.313). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.



**Fig. G10.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in gastrointestinal cancer studies vs. other studies. The gastrointestinal cancer subgroup did not significantly modify the overall summary effect proportion (QM(1) = 0.05, p = 0.819). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% Cl]
Other studies				
Mojica-Marquez,2020	193	429	⊢	0.45 [0.40, 0.5
Chawla ,2015	29	68	<b>⊢</b>	0.43 [0.31, 0.5
Murphy,2013	7093	21279		0.33 [0.33, 0.3
Kapadia,2012	209	730	<b>⊢</b> ∎-√	0.29 [0.25, 0.3
Ellsworth,2014	89	339		0.26 [0.22, 0.3
Sherman,2013	10	39		0.26 [0.14, 0.4
Nu ,2019	125	518	· · · · · · · · · · · · · · · · · · ·	0.24 [0.21, 0.2
Gupta,2012	18	75		0.24 [0.16, 0.3
Ryoo ,2017	149	639		0.23 [0.20, 0.2
Tursunovic,2013	65	293		0.22 [0.18, 0.2
Chan,2015	11	60		0.18 [0.10, 0.3
	44	241		
Ali ,2019				0.18 [0.14, 0.2
Fraser ,2019	448	2569		0.17 [0.16, 0.1
Lee,2020	995	5795		0.17 [0.16, 0.1
Spencer ,2015	1846	11096		0.17 [0.16, 0.1
Wallace,2018	92	569		0.16 [0.13, 0.1
Wong ,2019	18	113		0.16 [0.10, 0.2
Petrushevski ,2015	873	5683		0.15 [0.14, 0.1
Lefresne ,2017	12	79		0.15 [0.09, 0.2
Cho ,2019	334	2203	l <del>ai</del>	0.15 [0.14, 0.1
Lerner ,2015	30	202		0.15 [0.11, 0.2
Morris ,2017	17	122		0.14 [0.09, 0.2
Denholm ,2019	28	214		0.13 [0.09, 0.1
Bingham ,2016	33	262		0.13 [0.09, 0.1
Nieder,2015	105	873	' :' }æ⊰:	0.12 [0.10, 0.1
Clement-Zhao,2019	7	59		0.12 [0.06, 0.2
Boardman ,2014	46	396		0.12 [0.09, 0.1
Buergy,2016	40 5	44		0.12 [0.05, 0.1]
	11	101		
Nieder ,2018				0.11 [0.06, 0.1
Kain,2020	178	1744		0.10 [0.09, 0.1
Shaw ,2019	108	1112	, <del> =</del>	0.10 [0.08, 0.1]
MorenoSantiago,2019	27	284		0.10 [0.07, 0.14
Jung,2013	7	75		0.09 [0.05, 0.1]
Lewis,2020	85	925	H <b>=</b> -  :	0.09 [0.07, 0.1
Pitson,2020	309	3811		0.08 [0.07, 0.09
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.2
Dennis,2011	70	918	<mark>}≡</mark>	0.08 [0.06, 0.1
Aladili ,2016	4	72	<b>⊢</b> ∎−−−↓	0.06 [0.02, 0.14
Meeuse,2010	63	1157	H .	0.05 [0.04, 0.0]
Subgroup			<b>•</b>	0.16 [0.13, 0.1
Gynecological cancer studies				
Tseng ,2018	2	5	<b>⊢</b>	0.40 [0.10, 0.8
Shukor ,2018	10	27	· · · · · · · · · · · · · · · · · · ·	0.37 [0.21, 0.5
Qld government,2021	134	717	È = 1	0.19 [0.16, 0.2
Subgroup				0.27 [0.14, 0.4
Overall			•	0.16 [0.14, 0.1
			:	
		0	0 0.20 0.40 0.60 0.80	
			Proportion(%)	

**Fig. G11.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in gynaecological cancer studies vs. other studies. The gynaecological cancer subgroup did not significantly modify the overall summary effect proportion (QM(1) = 2.91, p = 0.088). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

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Study	Cases	Total		Proportion [95% CI]
Other studies				
Mojica-Marquez,2020	193	429	⊢	0.45 [0.40, 0.50]
Chawla ,2015	29	68	<u>⊢</u> – – – – – – – – – – – – – – – – – – –	0.43 [0.31, 0.55]
Murphy,2013	7093	21279		0.33 [0.33, 0.34]
Kapadia,2012	209	730	÷ <b>⊢</b> ∎-	0.29 [0.25, 0.32]
Ellsworth,2014	89	339	<u>}</u> →	0.26 [0.22, 0.31]
Sherman,2013	10	39		0.26 [0.14, 0.41]
Wu ,2019	125	518	<u>├</u> ─ <b>■</b> ─┤	0.24 [0.21, 0.28]
Gupta,2012	18	75		0.24 [0.16, 0.35]
Ryoo ,2017	149	639		0.23 [0.20, 0.27]
Tursunovic,2013	65	293		0.22 [0.18, 0.27]
Tseng ,2018	39	203		0.19 [0.14, 0.25]
Chan,2015	11	60		0.18 [0.10, 0.30]
Ali ,2019	44	241		0.18 [0.14, 0.24]
Fraser ,2019	448	2569		0.17 [0.16, 0.19]
Lee,2020	995	5795		0.17 [0.16, 0.18]
Spencer ,2015	1846	11096		0.17 [0.16, 0.17]
Wallace,2018	92	569		0.16 [0.13, 0.19]
Wong,2019	18	113		0.16 [0.10, 0.24]
Petrushevski ,2015	873	5683		0.15 [0.14, 0.16]
Lefresne ,2017	12	79		0.15 [0.09, 0.25]
Cho ,2019	334	2203		0.15 [0.14, 0.17]
Lerner ,2015	30	202		0.15 [0.11, 0.20]
Morris ,2017	17	122		0.14 [0.09, 0.21]
Denholm ,2019	28	214		0.13 [0.09, 0.18]
Bingham ,2016	33	214		0.13 [0.09, 0.17]
Nieder,2015	33 105	262 873		
	7	59	_ <del>  = 1</del>	0.12 [0.10, 0.14]
Clement-Zhao,2019				0.12 [0.06, 0.23]
Boardman ,2014	46 5	396 44		0.12 [0.09, 0.15]
Buergy,2016	5 11			0.11 [0.05, 0.25]
Nieder ,2018		101 1744		0.11 [0.06, 0.19]
Kain,2020 Shaw ,2019	178 108	1112		0.10 [0.09, 0.12]
				0.10 [0.08, 0.12]
MorenoSantiago,2019	27	284		0.10 [0.07, 0.14]
Jung,2013	7	75		0.09 [0.05, 0.18]
Lewis,2020	85	925		0.09 [0.07, 0.11]
Pitson,2020	309	3811		0.08 [0.07, 0.09]
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.21]
Dennis,2011	70	918	. <del> =</del>	0.08 [0.06, 0.10]
Aladili ,2016	4	72		0.06 [0.02, 0.14]
Meeuse,2010	63	1157	H=1	0.05 [0.04, 0.07]
Subgroup			◆	0.16 [0.13, 0.19]
Hepatobiliary cancer studies				
Shukor ,2018	4	10	<u>⊨</u>	0.40 [0.16, 0.70]
Qld government,2021	134	504	' ⊦	0.27 [0.23, 0.31]
Subgroup				0.27 [0.23, 0.31]
			-	
Overall			<b>•</b>	0.21 [0.19, 0.24]
		0.	00 0.20 0.40 0.60 0.80	
			Proportion(%)	

**Fig. G12.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in hepatobiliary cancer studies vs. other studies. The hepatobiliary cancer subgroup did significantly raise the overall summary effect proportion (QM(1) = 24.20, p < 0.001). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% CI]
Other studies				
Mojica-Marquez,2020	193	429	⊢	0.45 [0.40, 0.50]
Chawla ,2015	29	68		0.43 [0.31, 0.55]
Murphy,2013	7093	21279		0.33 [0.33, 0.34]
Kapadia,2012	209	730	┝╼┥	0.29 [0.25, 0.32]
Ellsworth,2014	89	339	┝━━━┥	0.26 [0.22, 0.31]
Sherman,2013	10	39		0.26 [0.14, 0.41]
Wu ,2019	125	518	÷ <b>⊢</b> ∎	0.24 [0.21, 0.28]
Gupta,2012	18	75	⊨	0.24 [0.16, 0.35]
Ryoo ,2017	149	639	┝╼┥	0.23 [0.20, 0.27]
Tursunovic,2013	65	293	·	0.22 [0.18, 0.27]
Chan,2015	11	60		0.18 [0.10, 0.30]
Ali ,2019	44	241		0.18 [0.14, 0.24]
Fraser ,2019	448	2569		0.17 [0.16, 0.19]
Lee,2020	995	5795		0.17 [0.16, 0.18]
Spencer ,2015	1846	11096		0.17 [0.16, 0.17]
Wallace,2018	92	569	;.  -=	0.16 [0.13, 0.19]
Wong ,2019	18	113		0.16 [0.10, 0.24]
Petrushevski ,2015	873	5683		0.15 [0.14, 0.16]
Lefresne ,2017	12	79		0.15 [0.09, 0.25]
Cho ,2019	334	2203	' : '   <del>∎ </del>	0.15 [0.14, 0.17]
Lerner ,2015	30	202		0.15 [0.11, 0.20]
Morris ,2017	17	122		0.14 [0.09, 0.21]
Denholm ,2019	28	214		0.13 [0.09, 0.18]
Bingham ,2016	33	262		0.13 [0.09, 0.17]
Nieder,2015	105	873		0.12 [0.10, 0.14]
Clement-Zhao,2019	7	59		0.12 [0.06, 0.23]
Boardman ,2014	46	396		0.12 [0.09, 0.15]
Buergy,2016		44		0.12 [0.05, 0.15]
Nieder ,2018	11	101		0.11 [0.06, 0.19]
Kain,2020	178	1744		0.10 [0.09, 0.12]
Shaw ,2019	108	1112		0.10 [0.08, 0.12]
MorenoSantiago,2019	27	284		0.10 [0.03, 0.12]
Jung,2013	7	75		0.09 [0.05, 0.18]
Lewis,2020	85	925		0.09 [0.03, 0.18]
Pitson,2020	309	3811		0.08 [0.07, 0.09]
MaungMaungMyint,2017	309	39		0.08 [0.07, 0.09]
Dennis,2011	70	918		0.08 [0.03, 0.21]
Aladili ,2016	70 4	72		0.08 [0.08, 0.10] 0.06 [0.02, 0.14]
Meeuse,2010	63	1157		0.05 [0.04, 0.07]
Subgroup			•	0.16 [0.13, 0.19]
Head and neck cancer st				
Shukor ,2018	8	18	j <b>⊢</b>	0.44 [0.24, 0.67]
Qld government,2021	134	601	┝╼┤	0.22 [0.19, 0.26]
Tseng ,2018	1	14		0.07 [0.01, 0.37]
Subgroup				0.25 [0.12, 0.45]
Overall			<b>~</b>	0.16 [0.13, 0.19]
		0.	0 0.20 0.40 0.60 0.80	
			Proportion(%)	

**Fig. G13.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in head and neck cancer studies vs. other studies. The head and neck cancer subgroup did not significantly modify the overall summary effect proportion (QM(1) = 1.34, p = 0.246). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% CI]
Other studies				
Mojica-Marquez,2020	193	429	⊢	0.45 [0.40, 0.50
Chawla ,2015	29	68	<b>⊢</b> −−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−	0.43 [0.31, 0.55
Murphy,2013	7093	21279		0.33 [0.33, 0.34
Kapadia,2012	209	730	<b>⊢</b> ∎1	0.29 [0.25, 0.32
Ellsworth,2014	89	339	<b>⊢</b> ∎−−1	0.26 [0.22, 0.31
Sherman,2013	10	39	<del>  −−−−−−</del>	0.26 [0.14, 0.41
Wu ,2019	125	518	<b>⊢≠</b> −1	0.24 [0.21, 0.28
Gupta,2012	18	75	<u>├</u>	0.24 [0.16, 0.35
Ryoo ,2017	149	639	<u>⊢</u>	0.23 [0.20, 0.27
Tursunovic,2013	65	293	i ⊨ <b></b> 1	0.22 [0.18, 0.27]
Chan,2015	11	60		0.18 [0.10, 0.30
Ali ,2019	44	241		0.18 [0.14, 0.24
Fraser ,2019	448	2569	} <del>■</del> ┤	0.17 [0.16, 0.19
Lee,2020	995	5795	) <del>=</del> (	0.17 [0.16, 0.18
2015, Spencer	1846	11096	<b>H</b>	0.17 [0.16, 0.17]
Wallace,2018	92	569		0.16 [0.13, 0.19
Wong ,2019	18	113		0.16 [0.10, 0.24
2015, Petrushevski	873	5683		0.15 [0.14, 0.16
Lefresne ,2017	12	79		0.15 [0.09, 0.25
Cho ,2019	334	2203	<del>■  </del>	0.15 [0.14, 0.17]
Lerner ,2015	30	202		0.15 [0.11, 0.20]
Morris ,2017	17	122		0.14 [0.09, 0.21]
Denholm ,2019	28	214		0.13 [0.09, 0.18]
Bingham ,2016	33	262		0.13 [0.09, 0.17]
Nieder,2015	105	873	┝╼┥	0.12 [0.10, 0.14]
Clement-Zhao,2019	7	59		0.12 [0.06, 0.23]
Boardman ,2014	46	396		0.12 [0.09, 0.15]
Buergy,2016	5	44		0.11 [0.05, 0.25]
Nieder ,2018	11	101		0.11 [0.06, 0.19]
Kain,2020	178	1744	} <del>∎</del>	0.10 [0.09, 0.12]
Shaw ,2019	108	1112	<b>⊨</b> ∎-  :	0.10 [0.08, 0.12]
MorenoSantiago,2019	27	284	<b>⊢</b> ∎−−1	0.10 [0.07, 0.14]
Jung,2013	7	75		0.09 [0.05, 0.18]
Lewis,2020	85	925	┝━┥	0.09 [0.07, 0.11]
MaungMaungMyint,2017	3	39	<u>  − • − − − − − − − − − − − − − − − − − </u>	0.08 [0.03, 0.21]
Dennis,2011	70	918	┝╼┥	0.08 [0.06, 0.10]
Aladili ,2016	4	72		0.06 [0.02, 0.14]
Meeuse,2010	63	1157		0.05 [0.04, 0.07]
Subgroup			<b>•</b>	0.16 [0.13, 0.19]
Genitourinary cancer	r studies			
Tseng ,2018	6	19	· · · · · · · · · · · · · · · · · · ·	0.32 [0.15, 0.55]
Qld government,2021	317	1374	⊢∎⊣	0.23 [0.21, 0.25
Shukor ,2018	15	67		0.22 [0.14, 0.34
Pitson,2020	38	545	H=-1	0.07 [0.05, 0.09]
Subgroup				0.18 [0.09, 0.34]
Overall			•	0.16 [0.13, 0.19]
		0.	00 0.20 0.40 0.60	0.80
			Proportion(%)	

**Fig. G14.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in genitourinary cancer studies vs. other studies. The genitourinary cancer subgroup did not significantly modify the overall summary effect proportion (QM(1) = 0.16, p = 0.689). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% CI]
Other studies				
Mojica-Marquez,2020	193	429	<b>⊢</b> ∎−−1	0.45 [0.40, 0.5
Chawla ,2015	29	68	<b>⊢</b>	0.43 [0.31, 0.5
Murphy,2013	7093	21279		0.33 [0.33, 0.3
Kapadia,2012	209	730		0.29 [0.25, 0.3
Ellsworth,2014	89	339		0.26 [0.22, 0.3
Sherman,2013	10	39	<u> </u>	0.26 [0.14, 0.4
Nu ,2019	125	518		0.24 [0.21, 0.2
Gupta,2012	18	75		0.24 [0.16, 0.3
Ryoo ,2017	149	639	· · · ·	0.23 [0.20, 0.2
Shukor ,2018	133	585		0.23 [0.20, 0.2
Tursunovic,2013	65	293		0.22 [0.18, 0.2
Tseng ,2018	39	203		0.19 [0.14, 0.2
Chan,2015	11	60		0.18 [0.10, 0.3
Ali ,2019	44	241		0.18 [0.14, 0.2
Fraser ,2019	448	2569	' : '   <del>∎</del>	0.17 [0.16, 0.1
_ee,2020	995	5795		0.17 [0.16, 0.1
Spencer ,2015	1846	11096		0.17 [0.16, 0.1
Vallace,2018	92	569		0.16 [0.13, 0.1
Nong,2019	18	113		0.16 [0.10, 0.2
Petrushevski ,2015	873	5683		0.15 [0.14, 0.1
_efresne ,2017	12	79		0.15 [0.09, 0.2
Cho ,2019	334	2203		0.15 [0.14, 0.1
_erner ,2015	30	202		0.15 [0.14, 0.1
Morris ,2017	17	122		0.13 [0.14, 0.2
Denholm ,2019	28	214		0.13 [0.09, 0.1
Bingham ,2016	33	214		0.13 [0.09, 0.1 0.13 [0.09, 0.1
Nieder,2015	105	873		0.12 [0.10, 0.1
Clement-Zhao,2019	7	59		0.12 [0.16, 0.1
Boardman ,2014	46	396		0.12 [0.08, 0.2 0.12 [0.09, 0.1
	40	398 44		
Buergy,2016				0.11 [0.05, 0.2
Nieder ,2018	11 178	101 1744		0.11 [0.06, 0.1
Kain,2020	108			0.10 [0.09, 0.1]
Shaw ,2019		1112	, ┝ <del>■</del> ┥	0.10 [0.08, 0.12
VorenoSantiago,2019	27	284		0.10 [0.07, 0.1
Jung,2013	7	75		0.09 [0.05, 0.1
_ewis,2020	85	925	┝━┤	0.09 [0.07, 0.1
Pitson,2020	309	3811		0.08 [0.07, 0.0
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.2]
Dennis,2011	70	918	<b>+</b> −	0.08 [0.06, 0.1]
Aladili ,2016	4	72		0.06 [0.02, 0.14
Meeuse,2010	63	1157	¦=-	0.05 [0.04, 0.0
Subgroup			•	0.16 [0.13, 0.19
Melanoma cancer stud	dies			
Qld government,2021	328	1432		0.23 [0.21, 0.2
Subaroup			•	0.23 [0.21, 0.2
Subgroup			<b>◆</b>	0.23 [0.2
Overall			<b>•</b>	0.21 [0.19, 0
		Г		
		0.0	0 0.20 0.40 0.60	

**Fig. G15.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in melanoma cancer studies vs. other studies. The melanoma cancer subgroup did significantly raise the overall summary effect proportion (QM(1) = 16.19, p < 0.001). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% CI]
Other studies				
Mojica-Marquez,2020	193	429		0.45 [0.40, 0.50
Chawla ,2015	29	68	<b>→</b>	0.43 [0.31, 0.55
Murphy,2013	7093	21279		0.33 [0.33, 0.34
Kapadia,2012	209	730		0.29 [0.25, 0.32
Ellsworth,2014	89	339		0.26 [0.22, 0.31
Sherman,2013	10	39		0.26 [0.14, 0.41
Wu ,2019	125	518	· · · · · · · · · · · · · · · · · · ·	0.24 [0.21, 0.28
Gupta,2012	18	75	· · · ·	0.24 [0.16, 0.35
Ryoo ,2017	149	639		0.23 [0.20, 0.27
Shukor ,2018	133	585		0.23 [0.20, 0.26
Qld government,2021	4997	22501		0.22 [0.22, 0.23
Tursunovic,2013	65	293		0.22 [0.18, 0.27
CAQ,(unpublished)	3129	14267		0.22 [0.21, 0.23
Chan,2015	11	60		0.18 [0.10, 0.30
Ali ,2019	44	241		0.18 [0.14, 0.24
Fraser ,2019	448	2569		0.17 [0.16, 0.19
Lee,2020	995	5795		0.17 [0.16, 0.18
Spencer ,2015	1846	11096		0.17 [0.16, 0.17
Wallace,2018	92	569		0.16 [0.13, 0.19
Wong,2019	92 18	113		
Petrushevski ,2015	873	5683		0.16 [0.10, 0.24
				0.15 [0.14, 0.16
Lefresne ,2017	12	79		0.15 [0.09, 0.25
Cho ,2019	334	2203	, <del>1=</del>	0.15 [0.14, 0.17
Lerner ,2015	30	202		0.15 [0.11, 0.20
Morris ,2017	17	122		0.14 [0.09, 0.21
Denholm ,2019	28	214		0.13 [0.09, 0.18
Bingham ,2016	33	262		0.13 [0.09, 0.17
Nieder,2015	105	873		0.12 [0.10, 0.14
Clement-Zhao,2019	7	59		0.12 [0.06, 0.23
Boardman ,2014	46	396		0.12 [0.09, 0.15
Buergy,2016	5	44		0.11 [0.05, 0.25
Nieder ,2018	11	101		0.11 [0.06, 0.19
Kain,2020	178	1744	H=-1	0.10 [0.09, 0.12
Shaw ,2019	108	1112	<b>}</b> ≢-	0.10 [0.08, 0.12]
MorenoSantiago,2019	27	284	┝╼╌┥┊	0.10 [0.07, 0.14
Jung,2013	7	75		0.09 [0.05, 0.18
Lewis,2020	85	925		0.09 [0.07, 0.11]
Pitson,2020	309	3811		0.08 [0.07, 0.09
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.21]
Dennis,2011	70	918	<del> =</del>	0.08 [0.06, 0.10]
Aladili ,2016	4	72	<b>├</b> •	0.06 [0.02, 0.14
Meeuse,2010	63	1157	H	0.05 [0.04, 0.07
Subgroup			<b>•</b>	0.16 [0.14, 0.18
Renal cell cancer studies				
Tseng ,2018	4	11		0.36 [0.14, 0.66
-	4			
Subgroup				0.36 [0.14, 0.66
Overall			<b>•</b>	0.16 [0.14, 0.19
		0.	0 0.20 0.40 0.60 0.80	
			Proportion(%)	

**Fig. G16.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in renal cell cancer studies vs. other studies. The renal cell cancer subgroup did not significantly modify the overall summary effect proportion (QM(1) = 2.99, p = 0.084). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	total		Proportion [95% CI]
other studies				
Mojica-Marquez,2020	193	429	⊢	0.45 [0.40, 0.50
Chawla ,2015	29	68	· · · · · · · · · · · · · · · · · · ·	0.43 [0.31, 0.55
Murphy,2013	7093	21279	<b>H</b>	0.33 [0.33, 0.34
Kapadia,2012	209	730	. ⊢•1	0.29 [0.25, 0.32
Ellsworth,2014	89	339	<b>⊢</b> ⊷−−	0.26 [0.22, 0.31]
Sherman,2013	10	39	<u>-</u>	0.26 [0.14, 0.41]
Wu ,2019	125	518	┝╼╾┥	0.24 [0.21, 0.28]
Gupta,2012	18	75		0.24 [0.16, 0.35]
Ryoo ,2017	149	639	. <b>⊢</b> ∎	0.23 [0.20, 0.27]
Shukor ,2018	133	585	<b>⊢</b> •−-1	0.23 [0.20, 0.26]
Tursunovic,2013	65	293		0.22 [0.18, 0.27]
Tseng ,2018	39	203		0.19 [0.14, 0.25]
Chan,2015	11	60	<u>├</u>	0.18 [0.10, 0.30]
Ali ,2019	44	241	<del>∶</del>	0.18 [0.14, 0.24]
Fraser ,2019	448	2569	} <del>≡</del> {	0.17 [0.16, 0.19]
Lee,2020	995	5795		0.17 [0.16, 0.18]
Spencer ,2015	1846	11096	<b>H</b>	0.17 [0.16, 0.17]
Wallace,2018	92	569	⊢ <del>i</del> ∎1	0.16 [0.13, 0.19]
Wong,2019	18	113		0.16 [0.10, 0.24]
Petrushevski ,2015	873	5683	<del>                                    </del>	0.15 [0.14, 0.16]
Lefresne ,2017	12	79		0.15 [0.09, 0.25]
Cho ,2019	334	2203	· · · · · · · · · · · · · · · · · · ·	0.15 [0.14, 0.17]
Lerner ,2015	30	202		0.15 [0.11, 0.20]
Morris ,2017	17	122		0.14 [0.09, 0.21]
Denholm ,2019	28	214		0.13 [0.09, 0.18]
Bingham ,2016	33	262		0.13 [0.09, 0.17]
Nieder,2015	105	873	`⊢∎	0.12 [0.10, 0.14]
Clement-Zhao,2019	7	59		0.12 [0.06, 0.23]
Boardman ,2014	46	396	· · · · · · · · · · · · · · · · · · ·	0.12 [0.09, 0.15]
Buergy,2016	5	44		0.11 [0.05, 0.25]
Nieder ,2018	11	101		0.11 [0.06, 0.19]
Kain,2020	178	1744	· · ·	0.10 [0.09, 0.12]
Shaw ,2019	108	1112	<b>⊢</b> ∎-1	0.10 [0.08, 0.12]
MorenoSantiago,2019	27	284		0.10 [0.07, 0.14]
Jung,2013	7	75		0.09 [0.05, 0.18]
Lewis,2020	85	925	· · · · · · · · · · · · · · · · · · ·	0.09 [0.07, 0.11]
Pitson,2020	309	3811		0.08 [0.07, 0.09]
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.21]
Dennis,2011	70	918	+=-	0.08 [0.06, 0.10]
Aladili ,2016	4	72		0.06 [0.02, 0.14]
Meeuse,2010	63	1157	, , , , , , , , , , , , , , , , , , ,	0.05 [0.04, 0.07]
Subgroup			<b>~</b>	0.16 [0.13, 0.19]
central neurvous syst	tem cancer st	udies 318		0.14 [0.10, 0.18]
-	44	310		
Subgroup				0.14 [0.10, 0.18]
Overall			•	0.15 [0.13, 0.18]
		Г	i	
		0.0	0 0.20 0.40 0.60	
			Proportion(%)	

**Fig. G17.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in central nervous system cancer studies vs. other studies. The central nervous system cancer subgroup did not significantly modify the overall summary effect proportion (QM(1) = 0.70, p = 0.404). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

193 29 7093 209 89 10 125 18 149 133 4997 65 11 44 448 995 1846 92 18 873 12 334	429 68 21279 730 339 518 75 639 585 22501 293 60 241 2569 5795 11096 569 113 5683 79		0.45 [0.40, 0.50 0.43 [0.31, 0.55 0.33 [0.33, 0.34 0.29 [0.25, 0.32 0.26 [0.22, 0.31 0.26 [0.14, 0.41 0.24 [0.21, 0.28 0.24 [0.16, 0.35 0.23 [0.20, 0.27 0.23 [0.20, 0.27 0.22 [0.22, 0.23 0.22 [0.22, 0.23 0.22 [0.22, 0.23 0.22 [0.18, 0.27 0.18 [0.10, 0.30 0.18 [0.14, 0.24 0.17 [0.16, 0.19 0.17 [0.16, 0.17 0.16 [0.13, 0.19 0.16 [0.13, 0.19 0.16 [0.13, 0.19
29 7093 209 89 10 125 18 149 133 4997 65 11 44 448 995 1846 92 1846 92 18 873 12 334	68 21279 730 339 518 75 639 585 22501 293 60 241 2569 5795 11096 569 113 5683	j 1	0.43 [0.31, 0.56 0.33 [0.33, 0.34 0.29 [0.25, 0.33 0.26 [0.22, 0.3 0.26 [0.24, 0.4 0.24 [0.21, 0.22 0.24 [0.20, 0.27 0.23 [0.20, 0.27 0.23 [0.20, 0.27 0.22 [0.22, 0.22 0.22 [0.22, 0.22 0.18 [0.10, 0.33 0.18 [0.14, 0.24 0.17 [0.16, 0.11 0.17 [0.16, 0.11 0.16 [0.13, 0.15]
7093 209 89 10 125 18 133 4997 65 11 44 448 995 1846 92 18 873 12 334	21279 730 339 518 75 639 585 22501 293 60 241 2569 5795 11096 569 113 5683	j 1	0.33 [0.33, 0.34 0.29 [0.25, 0.33 0.26 [0.22, 0.33 0.26 [0.22, 0.33 0.26 [0.22, 0.33 0.26 [0.14, 0.4' 0.24 [0.21, 0.24 0.24 [0.16, 0.33 0.23 [0.20, 0.22 0.23 [0.20, 0.22 0.22 [0.28, 0.22 0.22 [0.18, 0.22 0.18 [0.14, 0.24 0.17 [0.16, 0.13 0.17 [0.16, 0.11 0.17 [0.16, 0.11 0.16 [0.13, 0.19]
209 89 10 125 18 149 133 4997 65 11 44 448 995 1846 92 18 46 92 18 873 12 334	730 339 518 75 639 585 22501 293 60 241 2569 5795 11096 569 113 5683	j 1	0.29 [0.25, 0.3] 0.26 [0.22, 0.3] 0.26 [0.14, 0.4] 0.24 [0.21, 0.2] 0.24 [0.21, 0.2] 0.24 [0.21, 0.2] 0.23 [0.20, 0.2] 0.23 [0.20, 0.2] 0.22 [0.22, 0.2] 0.22 [0.22, 0.2] 0.23 [0.18, 0.2] 0.18 [0.10, 0.3] 0.18 [0.14, 0.2] 0.17 [0.16, 0.11] 0.17 [0.16, 0.11] 0.16 [0.13, 0.19] 0.13 [0.13, 0.19] 0.15 [0.13, 0.19] 0.16 [0.13, 0.19] 0.12 [0.15, 0.19] 0.12 [0
89 10 125 18 149 133 4997 65 11 44 448 995 1846 92 1846 92 18 873 12 334	339 39 518 75 639 585 22501 293 60 241 2569 5795 11096 569 113 5683	j 1	0.26 [0.22, 0.3] 0.26 [0.24, 0.4] 0.24 [0.21, 0.24 0.24 [0.16, 0.3] 0.23 [0.20, 0.2] 0.23 [0.20, 0.2] 0.22 [0.22, 0.22] 0.22 [0.18, 0.2] 0.18 [0.10, 0.3] 0.18 [0.14, 0.22 0.17 [0.16, 0.11] 0.17 [0.16, 0.11] 0.17 [0.16, 0.11] 0.16 [0.13, 0.19]
10 125 18 149 133 4997 65 11 44 448 995 1846 92 188 873 12 334	39 518 75 639 585 22501 293 60 241 2569 5795 11096 569 113 5683	j 1	0.26 (0.14, 0.4 0.24 (0.21, 0.24 0.24 (0.16, 0.33 0.23 (0.20, 0.27 0.23 (0.20, 0.27 0.22 (0.22, 0.22 0.22 (0.18, 0.27 0.18 (0.10, 0.33 0.18 (0.14, 0.24 0.17 (0.16, 0.11 0.17 (0.16, 0.11 0.16 (0.13, 0.15)
125 18 149 133 4997 65 11 44 448 995 1846 92 18 873 312 334	518 75 639 585 22501 293 60 241 2569 5795 11096 569 113 5683		0.26 (0.14, 0.4 0.24 (0.21, 0.24 0.24 (0.16, 0.33 0.23 (0.20, 0.27 0.23 (0.20, 0.27 0.22 (0.22, 0.22 0.22 (0.18, 0.27 0.18 (0.10, 0.33 0.18 (0.14, 0.24 0.17 (0.16, 0.11 0.17 (0.16, 0.11 0.16 (0.13, 0.15)
125 18 149 133 4997 65 11 44 448 995 1846 92 18 873 312 334	518 75 639 585 22501 293 60 241 2569 5795 11096 569 113 5683		0.24 (0.21, 0.26 0.24 (0.16, 0.36 0.23 (0.20, 0.27 0.23 (0.20, 0.27 0.22 (0.22, 0.22 0.22 (0.22, 0.22 0.22 (0.18, 0.27 0.18 (0.10, 0.30 0.18 (0.14, 0.24 0.17 (0.16, 0.18 0.17 (0.16, 0.11 0.16 (0.13, 0.19
18 149 133 4997 65 11 44 995 1846 92 1846 92 18 873 12 334	75 639 585 22501 293 60 241 2569 5795 11096 569 113 5683		0.24 [0.16, 0.35 0.23 [0.20, 0.27 0.23 [0.20, 0.26 0.22 [0.22, 0.23 0.22 [0.22, 0.23 0.22 [0.14, 0.24 0.18 [0.10, 0.30 0.18 [0.14, 0.24 0.17 [0.16, 0.15 0.17 [0.16, 0.15 0.17 [0.16, 0.15 0.17 [0.16, 0.15
133 4997 65 11 44 448 995 1846 92 18 873 12 334	639 585 22501 293 60 241 2569 5795 11096 569 113 5683		0.23 [0.20, 0.27 0.23 [0.20, 0.26 0.22 [0.22, 0.23 0.22 [0.18, 0.27 0.18 [0.10, 0.30 0.18 [0.14, 0.24 0.17 [0.16, 0.15 0.17 [0.16, 0.16 0.17 [0.16, 0.16 0.17 [0.16, 0.19 0.16 [0.13, 0.19
133 4997 65 11 44 448 995 1846 92 18 873 12 334	585 22501 293 60 241 2569 5795 11096 569 113 5683		0.23 [0.20, 0.26 0.22 [0.22, 0.23 0.22 [0.18, 0.27 0.18 [0.10, 0.3 0.18 [0.10, 0.3 0.18 [0.14, 0.24 0.17 [0.16, 0.15 0.17 [0.16, 0.15 0.17 [0.16, 0.17 0.16 [0.13, 0.19
4997 65 11 44 995 1846 92 18 873 12 334	22501 293 60 241 2569 5795 11096 569 113 5683		0.22 [0.22, 0.23 0.22 [0.18, 0.27 0.18 [0.10, 0.30 0.18 [0.14, 0.24 0.17 [0.16, 0.19 0.17 [0.16, 0.19 0.17 [0.16, 0.17 0.16 [0.13, 0.19
65 11 44 995 1846 92 18 873 12 334	293 60 241 2569 5795 11096 569 113 5683		0.22 [0.18, 0.27 0.18 [0.10, 0.30 0.18 [0.14, 0.24 0.17 [0.16, 0.19 0.17 [0.16, 0.18 0.17 [0.16, 0.18 0.17 [0.16, 0.17
11 44 995 1846 92 18 873 12 334	60 241 2569 5795 11096 569 113 5683		0.18 [0.10, 0.30 0.18 [0.14, 0.24 0.17 [0.16, 0.19 0.17 [0.16, 0.18 0.17 [0.16, 0.19 0.17 [0.16, 0.17
44 995 1846 92 18 873 12 334	241 2569 5795 11096 569 113 5683		0.18 [0.14, 0.24 0.17 [0.16, 0.15 0.17 [0.16, 0.18 0.17 [0.16, 0.18 0.17 [0.16, 0.17 0.16 [0.13, 0.19
448 995 1846 92 18 873 12 334	2569 5795 11096 569 113 5683		0.17 [0.16, 0.19 0.17 [0.16, 0.18 0.17 [0.16, 0.17 0.16 [0.13, 0.19
995 1846 92 18 873 12 334	5795 11096 569 113 5683		0.17 [0.16, 0.18 0.17 [0.16, 0.17 0.16 [0.13, 0.19
1846 92 18 873 12 334	11096 569 113 5683		0.17 [0.16, 0.17 0.16 [0.13, 0.19
92 18 873 12 334	569 113 5683		0.16 [0.13, 0.19
18 873 12 334	113 5683		
873 12 334	5683		
12 334			
334	/9		0.15 [0.14, 0.16
			0.15 [0.09, 0.25
	2203		0.15 [0.14, 0.17
30	202		0.15 [0.11, 0.20
			0.14 [0.09, 0.21
			0.13 [0.09, 0.18
			0.13 [0.09, 0.17
		┝╼┥┊	0.12 [0.10, 0.14
			0.12 [0.06, 0.23
		<b>⊢</b> ∎	0.12 [0.09, 0.15
5	44		0.11 [0.05, 0.25
11	101		0.11 [0.06, 0.19
	1744	┝┻┤	0.10 [0.09, 0.12
108	1112	┝━┥┊	0.10 [0.08, 0.12
27	284	┝-■	0.10 [0.07, 0.14
7	75		0.09 [0.05, 0.18
85	925	<b>⊢</b> ∎-	0.09 [0.07, 0.11
309	3811		0.08 [0.07, 0.09
3	39		0.08 [0.03, 0.21
70	918		0.08 [0.06, 0.10
4	72		0.06 [0.02, 0.14
63	1157	· · · · · · · · · · · · · · · · · · ·	0.05 [0.04, 0.07
		<b>•</b>	0.16 [0.14, 0.18
1	16 H		0.06 [0.01, 0.34
	-		0.06 [0.01, 0.34
		<b></b>	0.16 [0.14, 0.18
	Г	:	
	0.00	0 0.20 0.40 0.60	
	17 28 33 105 7 46 5 11 178 108 27 7 85 309 3 70 4 63	17       122         28       214         33       262         105       873         7       59         46       396         5       44         11       101         178       1744         108       1112         27       284         7       75         85       925         309       3811         3       39         70       918         4       72         63       1157	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$

**Fig. G18.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in sarcoma studies vs. other studies. The sarcoma subgroup did not significantly modify the overall summary effect proportion (QM(1) = 1.01, p = 0.315). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% Cl
Other studies				
Mojica-Marquez,2020	193	429	<b>⊢</b>	0.45 [0.40, 0.5
Chawla ,2015	29	68	· · · · · · · · · · · · · · · · · · ·	0.43 [0.31, 0.5
Murphy,2013	7093	21279		0.33 [0.33, 0.3
Kapadia,2012	209	730	<b>⊢</b> •−-1	0.29 [0.25, 0.3
Ellsworth,2014	89	339	<u>├─</u> ∎──┤	0.26 [0.22, 0.3
Sherman,2013	10	39		0.26 [0.14, 0.4
Wu ,2019	125	518	<b>⊢</b> ∎−−	0.24 [0.21, 0.2
Gupta,2012	18	75	<u> </u>	0.24 [0.16, 0.3
Ryoo ,2017	149	639	⊢	0.23 [0.20, 0.2
Shukor ,2018	133	585		0.23 [0.20, 0.2
Tursunovic,2013	65	293	k <u>−−</u> −−−−	0.22 [0.18, 0.2
Tseng ,2018	39	203	<u> </u>	0.19 [0.14, 0.2
Chan,2015	11	60		0.18 [0.10, 0.3
Ali ,2019	44	241		0.18 [0.14, 0.2
Fraser ,2019	448	2569		0.17 [0.16, 0.1
Lee,2020	995	5795		0.17 [0.16, 0.1
Spencer ,2015	1846	11096		0.17 [0.16, 0.1
Wallace,2018	92	569		0.16 [0.13, 0.1
Wong,2019	18	113		0.16 [0.10, 0.2
Petrushevski ,2015	873	5683		0.15 [0.14, 0.4
Lefresne ,2017	12	79		0.15 [0.09, 0.2
Cho ,2019	334	2203		0.15 [0.14, 0.4
Lerner ,2015	30	202		0.15 [0.11, 0.2
Morris ,2017	17	122		0.14 [0.09, 0.2
Denholm ,2019	28	214		0.13 [0.09, 0.
Bingham ,2016	33	262		0.13 [0.09, 0.1
Nieder,2015	105	873	' ''	0.12 [0.10, 0.7
Clement-Zhao,2019	7	59		0.12 [0.06, 0.2
Boardman ,2014	46	396	' <b>⊢</b> ∎  '	0.12 [0.09, 0.1
Buergy,2016	5	44		0.11 [0.05, 0.2
Nieder ,2018	11	101		0.11 [0.06, 0.7
Kain,2020	178	1744	' +∎-	0.10 [0.09, 0.1
Shaw ,2019	108	1112		0.10 [0.08, 0.1
MorenoSantiago,2019	27	284		0.10 [0.07, 0.1
Jung,2013	7	75		0.09 [0.05, 0.1
Lewis,2020	85	925	' <u>⊦</u> ∎⊰	0.09 [0.07, 0.1
Pitson,2020	309	3811		0.08 [0.07, 0.0
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.2
Dennis,2011	70	918	' · · · · · · · · · · · · · · · · · · ·	0.08 [0.06, 0.1
Aladili ,2016	4	72		0.06 [0.02, 0.7
Meeuse,2010	63	1157		0.05 [0.04, 0.0
Subgroup			•	0.16 [0.13, 0.1
Mesothelioma studies				
Qld government,2021	69	292	<u> </u>	0.24 [0.19, 0.2
Subgroup			-	0.24 [0.19, 0.2
Overall			•	0.18 [0.16, 0.
		I	· · · · · · · · · · · · · · · · · · ·	
		0.0	00 0.20 0.40 0.60	

**Fig. G19.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in mesothelioma studies vs. other studies. The mesothelioma subgroup did significantly raise the overall summary effect proportion (QM(1) = 8.89, p = 0.003). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% CI]
Other studies				
Mojica-Marquez,2020	193	429		0.45 [0.40, 0.50]
Murphy,2013	7093	21279	<b>H</b>	0.33 [0.33, 0.34]
Kapadia,2012	209	730	┝╼╾┥	0.29 [0.25, 0.32]
Sherman,2013	10	39	<u>├</u>	0.26 [0.14, 0.41]
Wu ,2019	125	518		0.24 [0.21, 0.28]
Gupta,2012	18	75	<u>⊢</u>	0.24 [0.16, 0.35]
Qld government ,2021	4997	22501		0.22 [0.22, 0.23]
Tursunovic,2013	65	293		0.22 [0.18, 0.27]
Tseng ,2018	39	203		0.19 [0.14, 0.25]
Chan,2015	11	60		0.18 [0.10, 0.30]
Ali ,2019	44	241		0.18 [0.14, 0.24]
Fraser ,2019	448	2569	<b> </b> ■	0.17 [0.16, 0.19]
Lee,2020	995	5795		0.17 [0.16, 0.18]
Spencer ,2015	1846	11096		0.17 [0.16, 0.17]
Wallace,2018	92	569		0.16 [0.13, 0.19]
Wong,2019	18	113	<u>⊢                                      </u>	0.16 [0.10, 0.24]
Petrushevski ,2015	873	5683		0.15 [0.14, 0.16]
Lefresne ,2017	12	79		0.15 [0.09, 0.25]
Cho ,2019	334	2203	· +=-1	0.15 [0.14, 0.17]
Lerner ,2015	30	202		0.15 [0.11, 0.20]
Morris ,2017	17	122		0.14 [0.09, 0.21]
Denholm ,2019	28	214		0.13 [0.09, 0.18]
Bingham ,2016	33	262		0.13 [0.09, 0.17]
Nieder,2015	105	873		0.12 [0.10, 0.14]
Clement-Zhao,2019	7	59		0.12 [0.06, 0.23]
Boardman ,2014	46	396		0.12 [0.09, 0.15]
Buergy,2016	-0	44		0.11 [0.05, 0.25]
Nieder ,2018	11	101		0.11 [0.06, 0.19]
Kain,2020	178	1744		0.10 [0.09, 0.12]
Shaw ,2019	108	1112		0.10 [0.08, 0.12]
MorenoSantiago,2019	27	284		0.10 [0.06, 0.12]
Jung,2013	7	75		0.09 [0.05, 0.14]
Lewis,2020	85	925		0.09 [0.03, 0.18]
Pitson,2020	309	3811		0.08 [0.07, 0.09]
MaungMaungMyint,2017	309	39		0.08 [0.07, 0.09]
Dennis,2011	70	918		0.08 [0.03, 0.21]
Aladili ,2016	4	72		
	63			0.06 [0.02, 0.14]
Meeuse,2010	63	1157	H=1	0.05 [0.04, 0.07]
Subgroup			◆	0.15 [0.13, 0.17]
Inpatient studies				
Ellsworth,2014	47	99	<b>⊢</b>	0.47 [0.38, 0.57]
Chawla ,2015	29	68	÷ +	0.43 [0.31, 0.55]
Ryoo ,2017	65	166	<b>⊢</b>	0.39 [0.32, 0.47]
Shukor ,2018	78	216	<u>├</u>	0.36 [0.30, 0.43]
Subgroup			-	0.40 [0.36, 0.45]
Overall			<b>~</b>	0.25 [0.22, 0.27]
			1 1 1	
		0	00 0.20 0.40 0.60	
			Proportion(%)	

**Fig. G20.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in studies of inpatients vs. other studies. The inpatient studies subgroup did significantly raise the overall summary effect proportion (QM(1) = 92.27, p < 0.001). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% CI]
Other studies				
Nojica-Marquez,2020	193	429	÷ ⊢	0.45 [0.40, 0.5
Chawla ,2015	29	68	<u>⊢</u>	0.43 [0.31, 0.5
/lurphy,2013	7093	21279		0.33 [0.33, 0.3
Kapadia,2012	209	730		0.29 [0.25, 0.3
llsworth,2014	89	339	<b>⊢_</b>	0.26 [0.22, 0.3
Sherman,2013	10	39		0.26 [0.14, 0.4
Vu ,2019	125	518	' <u>·</u> · · · · ·	0.24 [0.21, 0.2
Supta,2012	18	75		0.24 [0.16, 0.3
Ryoo ,2017	149	639		0.23 [0.20, 0.2
Qld government ,2021	4997	22501		0.22 [0.22, 0.2
ursunovic,2013	65	293		0.22 [0.22, 0.2
seng ,2018	39	203		0.19 [0.14, 0.2
Seng ,2018 Chan,2015	11	60		0.18 [0.14, 0.2
		241		
li ,2019	44			0.18 [0.14, 0.2
raser ,2019	448	2569	: <b> =</b> -	0.17 [0.16, 0.1
.ee,2020	995	5795		0.17 [0.16, 0.1
Spencer, 2015	1846	11096	jii i i i i i i i i i i i i i i i i i i	0.17 [0.16, 0.1
Vallace,2018	92	569	⊢ <del>;</del> 1	0.16 [0.13, 0.1
Vong,2019	18	113		0.16 [0.10, 0.2
etrushevski ,2015	873	5683		0.15 [0.14, 0.1
efresne ,2017	12	79	<u>├──</u> • <u></u>	0.15 [0.09, 0.2
2019, 2019	334	2203	⊢ <del>≤</del> -	0.15 [0.14, 0.1
erner ,2015.	30	202		0.15 [0.11, 0.2
Norris ,2017	17	122		0.14 [0.09, 0.2
enholm ,2019	28	214		0.13 [0.09, 0.1]
Bingham ,2016	33	262		0.13 [0.09, 0.1
Nieder,2015	105	873		0.12 [0.10, 0.14
Clement-Zhao,2019	7	59		0.12 [0.06, 0.23
Boardman ,2014	46	396		0.12 [0.09, 0.1
Buergy,2016	5	44		0.11 [0.05, 0.2
Nieder ,2018	11	101		0.11 [0.06, 0.1
Kain,2020	178	1744	' · · · · · · · · · · · · · · · · · · ·	0.10 [0.09, 0.12
Shaw ,2019	108	1112		0.10 [0.08, 0.12
MorenoSantiago,2019	27	284		0.10 [0.07, 0.1/
lung,2013	7	75		
				0.09 [0.05, 0.1
.ewis,2020	85	925	<b>⊢</b> ∎-1	0.09 [0.07, 0.1
Pitson,2020	309	3811		0.08 [0.07, 0.0
/laungMaungMyint,2017	3	39		0.08 [0.03, 0.2]
Dennis,2011	70	918	<b>⊢</b> ∎-	0.08 [0.06, 0.10
Aladili ,2016	4	72		0.06 [0.02, 0.14
Meeuse,2010	63	1157	H=1	0.05 [0.04, 0.07
Subgroup			• •	0.16 [0.14, 0.18
Outpatient studies				
Shukor ,2018	55	369		0.15 [0.12, 0.1
51000 ,2010	00	505		0.10[0.12, 0.1
Subgroup			-	0.15 [0.12, 0.1
Overall			•	0.16 [0.14, 0.1
		r		
		0.0	00 0.20 0.40 0.60	
		0.0	Proportion(%)	

**Fig. G21.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in studies of outpatients vs. other studies. The outpatient subgroup did not significantly modify the overall summary effect proportion (QM(1) = 0.16, p = 0.690). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% CI]
Other studies				
Mojica-Marquez,2020	193	429	÷ +	0.45 [0.40, 0.50]
Chawla ,2015	29	68	<u> </u>	0.43 [0.31, 0.55]
Murphy,2013	7093	21279		0.33 [0.33, 0.34]
Kapadia,2012	209	730	÷ +++	0.29 [0.25, 0.32]
Ellsworth,2014	89	339	<b>⊢</b>	0.26 [0.22, 0.31]
Sherman,2013	10	39	<b>⊨</b>	0.26 [0.14, 0.41]
Wu ,2019	125	518	. <b>⊢</b> ∎	0.24 [0.21, 0.28]
Gupta,2012	18	75	<b>├──</b>	0.24 [0.16, 0.35]
Ryoo ,2017	149	639	. <b>⊢</b> ∙−-	0.23 [0.20, 0.27]
Shukor ,2018	133	585	⊢	0.23 [0.20, 0.26]
Qld government,2021	4997	22501		0.22 [0.22, 0.23]
Tursunovic,2013	65	293		0.22 [0.18, 0.27]
Tseng ,2018	39	203	├	0.19 [0.14, 0.25]
Chan,2015	11	60		0.18 [0.10, 0.30]
Ali ,2019	44	241		0.18 [0.14, 0.24]
Fraser ,2019	448	2569		0.17 [0.16, 0.19]
Lee,2020	995	5795		0.17 [0.16, 0.18]
Spencer ,2015	1846	11096	. 📕 .	0.17 [0.16, 0.17]
Wallace,2018	92	569		0.16 [0.13, 0.19]
Petrushevski ,2015	873	5683		0.15 [0.14, 0.16]
Lefresne ,2017	12	79		0.15 [0.09, 0.25]
Cho ,2019	334	2203	, <u>}</u>	0.15 [0.14, 0.17]
Lerner ,2015	30	202		0.15 [0.11, 0.20]
Morris ,2017	17	122		0.14 [0.09, 0.21]
Denholm ,2019 Bingham ,2016	28 33	214 262		0.13 [0.09, 0.18] 0.13 [0.09, 0.17]
Nieder,2015	105	873		0.13 [0.09, 0.17] 0.12 [0.10, 0.14]
Clement-Zhao,2019	7	59		0.12 [0.16, 0.14]
Boardman ,2014	46	396		0.12 [0.09, 0.23]
Buergy,2016	-0	44		0.11 [0.05, 0.25]
Nieder ,2018	11	101		0.11 [0.06, 0.19]
Shaw ,2019	108	1112		0.10 [0.08, 0.12]
MorenoSantiago,2019	27	284		0.10 [0.07, 0.14]
Jung,2013	7	75		0.09 [0.05, 0.18]
Lewis,2020	85	925		0.09 [0.07, 0.11]
Pitson,2020	309	3811		0.08 [0.07, 0.09]
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.21]
Dennis,2011	70	918	· . ⊦=⊣	0.08 [0.06, 0.10]
Aladili ,2016	4	72		0.06 [0.02, 0.14]
Meeuse,2010	63	1157		0.05 [0.04, 0.07]
Subgroup			•	0.16 [0.14, 0.19]
ECOG 0–1 studies				
Kain,2020	39	886	H=-1	0.04 [0.03, 0.06]
Subgroup			•	0.04 [0.03, 0.06]
Overall			•	0.12 [0.11, 0.14]
			<u> </u>	
		0	00 0.20 0.40 0.60	
		ŭ	0.20 0.40 0.60	
			Proportion(%)	

**Fig. G22.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in studies of patients with Eastern Cooperative Oncology Group performance score 0–1 vs. other studies. The Eastern Cooperative Oncology Group performance score 0–1 subgroup did significantly lower the overall summary effect proportion (QM (1) = 56.68, p < 0.001). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QI = Queensland, Australia, ECOG = Eastern Cooperative Oncology Group performance score.

		Proportion [95% CI]
429	⊢	0.45 [0.40, 0.50]
68	· · · ·	0.43 [0.31, 0.55
21279		0.33 [0.33, 0.34
730		0.29 [0.25, 0.32
339		0.26 [0.22, 0.31
39		0.26 [0.14, 0.41]
518		0.24 [0.21, 0.28]
75		0.24 [0.16, 0.35]
639		0.23 [0.20, 0.27]
585		0.23 [0.20, 0.26]
22501		0.22 [0.22, 0.23]
293		0.22 [0.22, 0.23]
203		0.19 [0.14, 0.25]
60		0.18 [0.14, 0.23]
241		0.18 [0.14, 0.24]
2569		0.17 [0.16, 0.19]
5795		0.17 [0.16, 0.18]
11096		0.17 [0.16, 0.17]
569		0.16 [0.13, 0.19]
113		0.16 [0.10, 0.24]
5683	i i i i i i i i i i i i i i i i i i i	0.15 [0.14, 0.16]
79		0.15 [0.09, 0.25]
2203	<del>  ∉  </del>	0.15 [0.14, 0.17]
202		0.15 [0.11, 0.20]
122		0.14 [0.09, 0.21]
214		0.13 [0.09, 0.18]
262	┝━━╧┥	0.13 [0.09, 0.17]
873	<b>⊢</b> ∎  <sup>1</sup>	0.12 [0.10, 0.14]
59		0.12 [0.06, 0.23]
396		0.12 [0.09, 0.15]
44		0.11 [0.05, 0.25]
101		0.11 [0.06, 0.19]
1112		0.10 [0.08, 0.12]
284		0.10 [0.07, 0.14]
75		0.09 [0.05, 0.18]
925	╵┊╵	0.09 [0.07, 0.11]
3811		0.08 [0.07, 0.09]
39		0.08 [0.03, 0.21]
918		0.08 [0.06, 0.12]
72		0.06 [0.02, 0.14]
1157		0.05 [0.04, 0.07]
1157		
	<b>*</b>	0.16 [0.14, 0.19]
505	F <b>=</b> <del>i</del> 1	0.13 [0.11, 0.17]
	-	0.13 [0.11, 0.17]
	•	0.15 [0.13, 0.17]
0	00 0.20 0.40 0.60	
	0.6	0.00 0.20 0.40 0.60 Proportion(%)

**Fig. G23.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in studies of patients with Eastern Cooperative Oncology Group performance score 2 vs. other studies. The Eastern Cooperative Oncology Group performance score 2 subgroup did not significantly modify the overall summary effect proportion (QM (1) = 2.05, p = 0.153). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QI = Queensland, Australia, ECOG = Eastern Cooperative Oncology Group performance score.

Other studies				
Mojica-Marquez,2020	193	429	<b>⊢_</b> =	0.45 [0.40, 0.50
Chawla ,2015	29	68		0.43 [0.31, 0.55
Murphy,2013	7093	21279		0.33 [0.33, 0.34
Kapadia,2012	209	730		0.29 [0.25, 0.32
Ellsworth,2014	89	339		0.26 [0.22, 0.31
Sherman,2013	10	39		0.26 [0.14, 0.41
Wu ,2019	125	518		0.24 [0.21, 0.28
Gupta,2012	18	75		0.24 [0.16, 0.35
Ryoo ,2017	149	639		0.23 [0.20, 0.27
Qld government ,2021	4997	22501		0.22 [0.22, 0.23
Tursunovic,2013	65	293		0.22 [0.18, 0.27
Tseng ,2018	39	203		0.19 [0.14, 0.25
Chan,2015	11	60		0.18 0.10, 0.30
Ali ,2019	44	241		0.18 [0.14, 0.24
Fraser ,2019	448	2569	I I I I I I I I I I I I I I I I I I I	0.17 [0.16, 0.19
Lee,2020	995	5795		0.17 [0.16, 0.18
Spencer ,2015	1846	11096		0.17 [0.16, 0.17
Wallace,2018	92	569	·:- 	0.16 [0.13, 0.19
Wong,2019	18	113		0.16 [0.10, 0.24
Petrushevski ,2015	873	5683		0.15 [0.14, 0.16
Lefresne ,2017	12	79		0.15 [0.09, 0.25
Cho ,2019	334	2203	· · · · · · · · · · · · · · · · · · ·	0.15 [0.14, 0.17
Lerner ,2015	30	202		0.15 [0.11, 0.20
Morris 2017	17	122		0.14 [0.09, 0.21
Denholm ,2019	28	214	i i i i i i i i i i i i i i i i i i i	0.13 [0.09, 0.18
Bingham ,2016	33	262	ii	0.13 [0.09, 0.17
Clement-Zhao,2019	7	59		0.12 [0.06, 0.23
Boardman ,2014	46	396	·	0.12 [0.09, 0.15
Buergy,2016	5	44		0.11 [0.05, 0.25
Nieder ,2018	11	101		0.11 [0.06, 0.19
Shaw ,2019	108	1112	· · · · · · · · · · · · · · · · · · ·	0.10 [0.08, 0.12
MorenoSantiago,2019	27	284		0.10 [0.07, 0.14
Jung,2013	7	75		0.09 [0.05, 0.18
Lewis,2020	85	925	· · · · · · · · · · · · · · · · · · ·	0.09 [0.07, 0.11
Pitson,2020	309	3811		0.08 [0.07, 0.09
MaungMaungMyint,2017	3	39		0.08 0.03, 0.21
Dennis,2011	70	918	· · · · · · · · · · · · · · · · · · ·	0.08 0.06, 0.10
Aladili ,2016	4	72		0.06 [0.02, 0.14
Meeuse,2010	63	1157	i Heri	0.05 [0.04, 0.07
Subgroup			<b>~</b>	0.16 [0.14, 0.19
ECOG 3-4 studies				
Shukor ,2018	78	180	<b>⊢</b>	0.43 [0.36, 0.51
Nieder,2015	79	219		0.36 [0.30, 0.43
Kain,2020	71	328	<u>}</u> →•→┤ ′ ′	0.22 [0.18, 0.26
Subgroup				0.33 [0.21, 0.47
Overall			<b>~</b>	0.17 [0.15, 0.20
			· · · · · · · · · · · · · · · · · · ·	
		0.0	00 0.20 0.40 0.60	
		0.0		

**Fig. G24.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in studies of patients with Eastern Cooperative Oncology Group performance score 3–4 vs. other studies. The Eastern Cooperative Oncology Group performance score 3–4 subgroup did significantly raise the overall summary effect proportion (QM (1) = 8.70, p = 0.003). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia, ECOG = Eastern Cooperative Oncology Group performance score.

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Other studies				
Mojica-Marquez,2020	193	429	⊨	0.45 [0.40, 0.50]
Chawla ,2015	29	68	<b>⊢</b>	0.43 [0.31, 0.55]
Murphy,2013	7093	21279		0.33 [0.33, 0.34]
Kapadia,2012	209	730	. <b>⊢</b> ∎	0.29 [0.25, 0.32]
Ellsworth,2014	89	339	<b>⊢</b> ∎−−	0.26 [0.22, 0.31]
Sherman,2013	10	39	<b>├────</b>	0.26 [0.14, 0.41]
Wu ,2019	125	518	┝╼╾┥	0.24 [0.21, 0.28]
Gupta,2012	18	75	<b>├───-</b>	0.24 [0.16, 0.35]
Ryoo ,2017	149	639	÷ <b>⊢</b> ∎	0.23 [0.20, 0.27]
Qld government ,2021	4997	22501		0.22 [0.22, 0.23]
Tursunovic,2013	65	293		0.22 [0.18, 0.27]
Tseng ,2018	39	203		0.19 [0.14, 0.25]
Chan,2015	11	60		0.18 [0.10, 0.30]
Ali ,2019	44	241	l <del>; − − −  </del>	0.18 [0.14, 0.24]
Fraser ,2019	448	2569	÷ <b>⊦</b> ∎-1	0.17 [0.16, 0.19]
Lee,2020	995	5795	H=1	0.17 [0.16, 0.18]
Spencer ,2015	1846	11096		0.17 [0.16, 0.17]
Wallace,2018	92	569	. <del> :=</del>	0.16 [0.13, 0.19]
Wong ,2019	18	113		0.16 [0.10, 0.24]
Petrushevski ,2015	873	5683		0.15 [0.14, 0.16]
Lefresne ,2017	12	79		0.15 [0.09, 0.25]
Cho ,2019	334	2203	, H <del>el</del>	0.15 [0.14, 0.17]
Lerner ,2015	30	202		0.15 [0.11, 0.20]
Morris ,2017	17	122		0.14 [0.09, 0.21]
Denholm ,2019	28	214		0.13 [0.09, 0.18]
Bingham ,2016	33 105	262 873		0.13 [0.09, 0.17]
Nieder,2015 Clement-Zhao,2019	7	59		0.12 [0.10, 0.14]
Boardman ,2014	46	396		0.12 [0.06, 0.23]
Buergy,2016	40	44		0.12 [0.09, 0.15] 0.11 [0.05, 0.25]
Nieder ,2018	11	101		0.11 [0.06, 0.19]
Kain,2020	178	1744		0.10 [0.09, 0.12]
Shaw ,2019	108	1112	= 1 :   = 1 :	0.10 [0.08, 0.12]
MorenoSantiago,2019	27	284		0.10 [0.07, 0.14]
Jung,2013	7	75		0.09 [0.05, 0.18]
Lewis,2020	85	925		0.09 [0.07, 0.11]
Pitson,2020	309	3811		0.08 [0.07, 0.09]
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.21]
Dennis,2011	70	918	' <u>+</u> ∎-  '	0.08 [0.06, 0.10]
Aladili ,2016	4	72		0.06 [0.02, 0.14]
Meeuse,2010	63	1157	H=1	0.05 [0.04, 0.07]
Subgroup			<b>~</b>	0.16 [0.14, 0.18]
Synchronous chemoti Shukor ,2018	herapy studie	<b>s</b> 239	++	0.03 [0.02, 0.07]
Subgroup				0.03 [0.02, 0.07]
Cubyloup			~	0.00 [0.02, 0.07]
Overall			•	0.15 [0.13, 0.17]
		I		
		0.0	00 0.20 0.40 0.60	
			Proportion(%)	

**Fig. G25.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in studies of patients getting synchronous chemotherapy vs. other studies. The synchronous chemotherapy subgroup did significantly lower the overall summary effect proportion (QM(1) = 20.66, p < 0.001). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Cases	Total		Proportion [95% Cl]
193	429		0.45 [0.40, 0.5
			0.43 [0.31, 0.5
			0.33 [0.33, 0.3
			0.29 [0.25, 0.3
			0.26 [0.22, 0.3
			0.26 [0.14, 0.4
			0.24 [0.21, 0.2
			0.24 [0.16, 0.3
			0.23 [0.20, 0.2
			0.23 [0.20, 0.2
			0.22 [0.22, 0.2
65	293		0.22 [0.18, 0.2
39	203		0.19 [0.14, 0.2
11	60		0.18 [0.10, 0.3
44	241		0.18 [0.14, 0.2
448	2569		0.17 [0.16, 0.1
995	5795		0.17 [0.16, 0.1
1846	11096	É Contra de	0.17 [0.16, 0.1
92	569		0.16 [0.13, 0.1
18	113		0.16 [0.10, 0.2
873	5683	l <del>a i</del>	0.15 [0.14, 0.1
12	79		0.15 [0.09, 0.2
334	2203	<b>⊢</b> ∎-]	0.15 [0.14, 0.1
30	202		0.15 [0.11, 0.2
17	122		0.14 [0.09, 0.2
			0.13 [0.09, 0.1
		<b>⊢</b>	0.13 [0.09, 0.1
		<b>⊢</b> ∎-1	0.12 [0.10, 0.1
			0.12 [0.06, 0.2
			0.12 [0.09, 0.1
			0.11 [0.05, 0.2
			0.11 [0.06, 0.1
			0.10 [0.09, 0.1]
		┝╾┥	0.10 [0.08, 0.1
		┝╼╾┥┊	0.10 [0.07, 0.1
			0.09 [0.07, 0.1
			0.08 [0.03, 0.2
		, ⊢•-⊣ , j	0.08 [0.06, 0.1
			0.06 [0.02, 0.1
63	1157		0.05 [0.04, 0.0
		<b>•</b>	0.16 [0.14, 0.1
udies			
184	1062	i- H <del>-</del> ∎	0.17 [0.15, 0.2
7	75		0.09 [0.05, 0.1
			0.14 [0.08, 0.2
		<b>~</b>	0.16 [0.14, 0.1
	г		
	0.0	0 0.20 0.40 0.60	
	0.0		
	193 29 7093 209 89 10 125 18 149 133 4997 65 39 11 44 448 995 1846 92 18 873 12 334 30 17 28 33 105 7 46 5 11 1728 33 105 7 46 5 11 1728 33 105 7 46 5 11 1728 33 105 7 46 5 11 1728 33 105 7 46 5 11 1728 33 105 7 7 46 5 177 46 5 177 177 177 177 177 177 177 177 177 1	193         429           29         68           7093         21279           209         730           89         339           10         39           125         518           18         75           149         639           133         585           4997         22501           65         293           39         203           11         60           44         241           448         2569           995         5795           1846         11096           92         569           18         113           873         5683           12         79           334         2203           30         202           17         122           28         214           33         262           105         873           7         59           46         396           5         44           11         101           178         1744           108         111	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

**Fig. G26.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in studies of patients known to hospice vs. other studies. The known to hospice subgroup did not significantly modify the overall summary effect proportion (QM(1) = 0.28, p = 0.559). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% CI]
Other studies				
Mojica-Marguez,2020	193	429		0.45 [0.40, 0.50]
Chawla ,2015	29	68		0.43 [0.31, 0.55]
Kapadia,2012	209	730		0.29 [0.25, 0.32]
Ellsworth,2014	89	339		0.26 [0.22, 0.31]
Sherman, 2013	10	39		0.26 [0.14, 0.41]
Wu ,2019	125	518		0.24 [0.21, 0.28]
Gupta,2012	18	75		0.24 [0.27, 0.26]
Ryoo ,2017	149	639		0.24 [0.16, 0.35]
Tursunovic,2013	65	293		0.22 [0.20, 0.27]
	3129	293 14267		
Qld government, (unpublished)			, j. 📕 ,	0.22 [0.21, 0.23]
Tseng ,2018	39	203		0.19 [0.14, 0.25]
Chan,2015	11	60		0.18 [0.10, 0.30]
Ali ,2019	44	241		0.18 [0.14, 0.24]
Fraser ,2019	448	2569	} <del>■</del> ┥	0.17 [0.16, 0.19]
Lee,2020	995	5795		0.17 [0.16, 0.18]
Spencer ,2015	1846	11096		0.17 [0.16, 0.17]
Wong,2019	18	113		0.16 [0.10, 0.24]
Petrushevski ,2015	873	5683		0.15 [0.14, 0.16]
Lefresne ,2017	12	79		0.15 [0.09, 0.25]
Cho ,2019	334	2203	<b>⊦</b> ∎.́-	0.15 [0.14, 0.17]
Lerner ,2015	30	202		0.15 [0.11, 0.20]
Morris ,2017	17	122		0.14 [0.09, 0.21]
Denholm ,2019	28	214		0.13 [0.09, 0.18]
Bingham ,2016	33	262		0.13 [0.09, 0.17]
Nieder,2015	105	873	, ⊨=-1 :	0.12 [0.10, 0.14]
Clement-Zhao,2019	7	59		0.12 [0.06, 0.23]
Boardman ,2014	46	396		0.12 [0.09, 0.15]
Buergy,2016	5	44		0.11 [0.05, 0.25]
Nieder ,2018	11	101		0.11 [0.06, 0.19]
Shaw ,2019	108	1112		0.10 [0.08, 0.12]
MorenoSantiago,2019	27	284		0.10 [0.07, 0.14]
	7	284		
Jung,2013		925		0.09 [0.05, 0.18]
Lewis,2020	85			0.09 [0.07, 0.11]
Pitson,2020	309	3811		0.08 [0.07, 0.09]
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.21]
Dennis,2011	70	918	┝━┤	0.08 [0.06, 0.10]
Aladili ,2016	4	72		0.06 [0.02, 0.14]
Meeuse,2010	63	1157	æ	0.05 [0.04, 0.07]
Subgroup			◆	0.16 [0.14, 0.18]
Age greater than 60 ye				
Murphy,2013	7093	21279		0.33 [0.33, 0.34]
Shukor ,2018	63	288	<b>├─</b> ●──┤	0.22 [0.17, 0.27]
Wallace,2018	92	569	┝╼╌┥	0.16 [0.13, 0.19]
Kain,2020	145	1365	F≢-I	0.11 [0.09, 0.12]
Subgroup				0.19 [0.10, 0.35]
Overall			•	0.16 [0.14, 0.18]
		0	00 0.20 0.40 0.60	
		0.	00 0.20 0.40 0.60	

**Fig. G27.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in studies of patients greater than 60 years of age vs. other studies. The greater than 60 years of age subgroup did not significantly modify the overall summary effect proportion (QM(1) = 0.63, p = 0.429). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% CI]
Other studies				
Chawla ,2015	29	68		0.43 [0.31, 0.5
Kapadia,2012	209	730		0.29 [0.25, 0.3
Ellsworth,2014	89	339		0.26 [0.22, 0.3
Sherman,2013	10	39	÷ · · ·	0.26 [0.14, 0.4
Wu ,2019	125	518	· · · · · · · · · · · · · · · · · · ·	0.24 [0.21, 0.2
Gupta,2012	18	75	i	0.24 [0.16, 0.3
Ryoo ,2017	149	639	<b>⊢</b> •−↓	0.23 [0.20, 0.2
Tursunovic,2013	65	293		0.22 [0.18, 0.2
CAQ,(unpublished)	3129	14267	<b>H</b>	0.22 [0.21, 0.2
Tseng ,2018	39	203		0.19 [0.14, 0.2
Chan,2015	11	60		0.18 [0.10, 0.3
Ali ,2019	44	241	<u> </u>	0.18 [0.14, 0.2
Fraser ,2019	448	2569	<del>■</del>	0.17 [0.16, 0.1
Lee,2020	995	5795		0.17 [0.16, 0.1
Spencer ,2015	1846	11096		0.17 [0.16, 0.1
Wong,2019	18	113		0.16 [0.10, 0.2
2015, Petrushevski	873	5683	唐	0.15 [0.14, 0.1
Lefresne ,2017	12	79		0.15 [0.09, 0.2
Cho ,2019	334	2203	<del> ≢ </del>	0.15 [0.14, 0.1
Lerner ,2015	30	202		0.15 [0.11, 0.2
Morris ,2017	17	122	<u> </u>	0.14 [0.09, 0.2
Denholm ,2019	28	214		0.13 [0.09, 0.1
Bingham ,2016	33	262		0.13 [0.09, 0.1
Nieder,2015	105	873	┝╼┤	0.12 [0.10, 0.1
Clement-Zhao,2019	7	59		0.12 [0.06, 0.2
Boardman ,2014	46	396	<b>⊢</b> ∎−-]	0.12 [0.09, 0.1
Buergy,2016	5	44		0.11 [0.05, 0.2
Nieder ,2018	11	101		0.11 [0.06, 0.1
Shaw ,2019	108	1112	_ <b> </b> ■_	0.10 [0.08, 0.1]
MorenoSantiago,2019	27	284		0.10 [0.07, 0.1
Jung,2013	7	75		0.09 [0.05, 0.1
Lewis,2020	85	925	┝╼┤	0.09 [0.07, 0.1
Pitson,2020	309	3811		0.08 [0.07, 0.0
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.2
Dennis,2011	70	918		0.08 [0.06, 0.1
Aladili ,2016	4	72		0.06 [0.02, 0.1
Meeuse,2010	63	1157	<b>}</b> ∎-	0.05 [0.04, 0.0
Subgroup			<b>•</b>	0.15 [0.14, 0.1
Age less than/equal t	o 60 years stu	dies		
Shukor ,2018	70	297	<b>⊢</b>	0.24 [0.19, 0.2
Kain,2020	33	379		0.09 [0.06, 0.1]
Subgroup				0.15 [0.05, 0.3
Overall			•	0.15 [0.14, 0.1
		-		
		1		
		0.0	0 0.20 0.40 0.60	

**Fig. C28.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in studies of patients </= 60 years of age vs. other studies. The </= 60 years of age vs. other studies. The </= 60 years of age subgroup did not significantly modify the overall summary effect proportion (QM(1) = 0.00, p = 0.96). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% CI]
Other studies				
Mojica-Marquez,2020	193	429		0.45 [0.40, 0.5
Chawla ,2015	29	68		0.43 [0.31, 0.5
Chawla ,2015	29	68		0.43 [0.31, 0.5
Murphy,2013	7093	21279		0.33 [0.33, 0.34
	209	730		
Kapadia,2012				0.29 [0.25, 0.3
Ellsworth,2014	89	339		0.26 [0.22, 0.3
Sherman,2013	10	39		0.26 [0.14, 0.4
Wu ,2019	125	518		0.24 [0.21, 0.23
Gupta,2012	18	75		0.24 [0.16, 0.3
Shukor ,2018	133	585		0.23 [0.20, 0.26
Qld government ,2021	4997	22501		0.22 [0.22, 0.23
Tursunovic,2013	65	293	<u>├</u>	0.22 [0.18, 0.2]
Tseng ,2018	39	203		0.19 [0.14, 0.2
Chan,2015	11	60		0.18 [0.10, 0.30
Ali ,2019	44	241		0.18 [0.14, 0.24
Fraser ,2019	448	2569	i i i i i i i i i i i i i i i i i i i	0.17 [0.16, 0.1
Lee,2020	995	5795	l <del>a</del> (	0.17 [0.16, 0.17
Spencer ,2015	1846	11096		0.17 [0.16, 0.1
Wong,2019	18	113		0.16 [0.10, 0.24
Petrushevski ,2015	873	5683		0.15 [0.14, 0.16
Lefresne ,2017	12	79		0.15 [0.09, 0.2
Cho ,2019	334	2203	' <b>⊢</b> ∎⊣	0.15 [0.14, 0.1
Lerner ,2015	30	202		0.15 [0.11, 0.2
Morris ,2017	17	122		0.14 [0.09, 0.2
Denholm ,2019	28	214		0.14 [0.09, 0.2
Bingham ,2016	33	262		0.13 [0.09, 0.13
Nieder,2015	105	873		0.12 [0.10, 0.14
Clement-Zhao,2019	7	59		0.12 [0.16, 0.14
	46	396		
Boardman ,2014	40 5			0.12 [0.09, 0.1
Buergy,2016		44		0.11 [0.05, 0.2
Nieder ,2018	11	101		0.11 [0.06, 0.19
Kain,2020	178	1744		0.10 [0.09, 0.12
Shaw ,2019	108	1112		0.10 [0.08, 0.12
MorenoSantiago,2019	27	284		0.10 [0.07, 0.14
Jung,2013	7	75		0.09 [0.05, 0.18
Lewis,2020	85	925	┝╾┤	0.09 [0.07, 0.1
Pitson,2020	309	3811		0.08 [0.07, 0.09
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.2
Dennis,2011	70	918	┝ <del>╸</del> ┥ ┊	0.08 [0.06, 0.10
Aladili ,2016	4	72	<b>⊢</b> •──┤ :	0.06 [0.02, 0.14
Meeuse,2010	63	1157	Herl	0.05 [0.04, 0.0
Subgroup			•	0.16 [0.14, 0.1
Liver metastases studies				
Ryoo ,2017	, 34	106	<b>⊢</b>	0.32 [0.24, 0.4
	01	100		-
Subgroup				0.32 [0.24, 0.4
Overall			<b>*</b>	0.18 [0.16, 0.2
		F	1	
		0.0	) 0.20 0.40 0.60	
		0.0	0.20 0.40 0.60	
			Proportion(%)	

**Fig. G29.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in studies of patients with liver metastases vs. other studies. The liver metastases subgroup did significantly raise the overall summary effect proportion (QM(1) = 14.96, p < 0.001). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% CI
Other studies				
Mojica-Marquez,2020	193	429	÷ +	0.45 [0.40, 0.5
Chawla ,2015	29	68	<b>⊢</b>	0.43 [0.31, 0.5
Murphy,2013	7093	21279		0.33 [0.33, 0.3
Kapadia,2012	209	730		0.29 [0.25, 0.3
Sherman,2013	10	39		0.26 [0.14, 0.4
Nu ,2019	125	518		0.24 [0.21, 0.2
Gupta,2012	18	75		0.24 [0.16, 0.3
2017, Ryoo	149	639		0.23 [0.20, 0.2
Tseng ,2018	39	203		0.19 [0.14, 0.2
Chan,2015	11	60	<b>⊢</b>	0.18 [0.10, 0.3
Ali ,2019	44	241		0.18 [0.14, 0.2
Fraser ,2019	448	2569		0.17 [0.16, 0.1
Lee,2020	995	5795		0.17 [0.16, 0.1
Spencer ,2015	1846	11096		0.17 [0.16, 0.7
Wong,2019	18	113		0.16 [0.10, 0.2
-				
Petrushevski ,2015	873	5683		0.15 [0.14, 0.1
_efresne ,2017	12	79		0.15 [0.09, 0.1
Lerner ,2015	30	202		0.15 [0.11, 0.2
Morris ,2017	17	122		0.14 [0.09, 0.2
Denholm ,2019	28	214		0.13 [0.09, 0.1
Bingham ,2016	33	262		0.13 [0.09, 0.1
Nieder.2015	105	873		0.12 [0.10, 0.1
Clement-Zhao,2019	7	59		0.12 [0.06, 0.1
	46	396		
Boardman ,2014				0.12 [0.09, 0.
Buergy,2016	5	44		0.11 [0.05, 0.2
Nieder ,2018	11	101		0.11 [0.06, 0.7
MorenoSantiago,2019	27	284	<b>⊢</b> ∎−-  :	0.10 [0.07, 0.4
Jung,2013	7	75		0.09 [0.05, 0.1
Lewis,2020	85	925	<b>⊢∎-</b> ↓	0.09 [0.07, 0.4
Pitson,2020	309	3811		0.08 [0.07, 0.0
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.2
Dennis,2011	70	918	' - ' ' }æ⊰	0.08 [0.06, 0.1
Aladili ,2016	4	72		0.06 [0.02, 0.1
Meeuse,2010	63	1157	┝┲╼───┐┊ ┝╋┥	0.05 [0.04, 0.0
Subgroup			•	0.16 [0.13, 0.1
Single fraction radiot	herapy studie	s		
Tursunovic,2013	26	64	÷ +	0.41 [0.29, 0.5
Qld government ,2021	1171	3591	' '	0.33 [0.31, 0.3
Ellsworth,2014	7	27		0.26 [0.13, 0.4
Shukor ,2018	36	142		0.25 [0.19, 0.3
Shaw ,2019	81	427		0.19 [0.16, 0.1
Wallace,2018	32	193		0.17 [0.12, 0.1
Cho ,2019	129	875	┝╼╌┤	0.15 [0.13, 0.
Kain,2020	45	394	⊢	0.11 [0.09, 0.1
Subgroup				0.22 [0.15, 0.3
Overall			•	0.17 [0.14, 0.3
		-		
		0.0	0 0.20 0.40 0.60	

**Fig. G30.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in studies of patients getting single fraction treatments vs. other studies. The single fraction subgroup did not significantly modify the overall summary effect proportion (QM(1) = 3.11, p = 0.078). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% CI]
Other studies				
Mojica-Marquez,2020	193	429		0.45 [0.40, 0.50
Chawla ,2015	29	68		0.43 [0.31, 0.5
Murphy,2013	7093	21279		0.33 [0.33, 0.34
Kapadia,2012	209	730		0.29 [0.25, 0.32
Ellsworth,2014	89	339		0.26 [0.22, 0.3
Sherman,2013	10	39		0.26 [0.14, 0.41
Wu ,2019	125	518		0.24 [0.21, 0.28
Gupta,2012	18	75		0.24 [0.16, 0.35
Ryoo ,2017	149	639		0.23 [0.20, 0.27
Shukor ,2018	133	585		0.23 [0.20, 0.27
	39	203		
Tseng ,2018		203		0.19 [0.14, 0.25
Chan,2015 Ali ,2019	11	241		0.18 [0.10, 0.30
	44			0.18 [0.14, 0.24
Fraser ,2019	448	2569	k=-1	0.17 [0.16, 0.19
Lee,2020	995	5795		0.17 [0.16, 0.18
Spencer ,2015	1846	11096		0.17 [0.16, 0.17
Wallace,2018	92	569	F	0.16 [0.13, 0.19
Wong,2019	18	113		0.16 [0.10, 0.24
Petrushevski ,2015	873	5683	<del> =</del> ]	0.15 [0.14, 0.16
Lefresne ,2017	12	79		0.15 [0.09, 0.25
Cho ,2019	334	2203		0.15 [0.14, 0.17
Lerner ,2015	30	202		0.15 [0.11, 0.20
Morris ,2017	17	122		0.14 [0.09, 0.21
Denholm ,2019	28	214		0.13 [0.09, 0.18
Bingham ,2016	33	262		0.13 [0.09, 0.17
Nieder,2015	105	873		0.12 [0.10, 0.14
Clement-Zhao,2019	7	59		0.12 [0.06, 0.23
Boardman ,2014	46	396		0.12 [0.09, 0.15
Buergy,2016	5	44		0.11 [0.05, 0.25
Nieder ,2018	11	101		0.11 [0.06, 0.19
MorenoSantiago,2019	27	284		0.10 [0.07, 0.14
Jung,2013	7	75		0.09 [0.05, 0.18
Lewis,2020	85	925	'	0.09 [0.07, 0.11
Pitson,2020	309	3811		0.08 [0.07, 0.09
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.21
Dennis,2011	70	918		0.08 [0.06, 0.10
Aladili ,2016	4	72		0.06 [0.02, 0.14
Meeuse,2010	63	1157		0.05 [0.04, 0.07
Meeuse,2010	03	1157	■1	0.05 [0.04, 0.07
Subgroup			<b></b>	0.16 [0.13, 0.19
2–5 fractions radiothe	erapv studies			
Tursunovic,2013	20	60	<b>⊢</b>	0.33 [0.23, 0.46
Qld government ,2021	2503	9591		0.26 [0.25, 0.27
Kain,2020	111	994	: (=) 	0.11 [0.09, 0.13
Shaw ,2019	22	236		0.09 [0.06, 0.14
	22	200	1 - 1	
Subgroup				0.18 [0.10, 0.3
Overall			•	0.16 [0.14, 0.15
		1		
		0.0	00 0.20 0.40 0.60	

**Fig. G31.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in studies of patients getting a 2–5 fraction treatments vs. other studies. The 2–5 fraction treatment subgroup did not significantly modify the overall summary effect proportion (QM(1) = 0.10, p = 0.749). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% CI]
Other studies				
Mojica-Marquez,2020	193	429		0.45 [0.40, 0.50]
Chawla ,2015	29	68	÷ +	0.43 [0.31, 0.55]
Murphy,2013	7093	21279		0.33 [0.33, 0.34]
Kapadia,2012	209	730	<u>;</u>	0.29 [0.25, 0.32]
Ellsworth,2014	89	339		0.26 [0.22, 0.31]
Sherman,2013	10	39		0.26 [0.14, 0.41]
Wu ,2019	125	518		0.24 [0.21, 0.28]
Gupta,2012	18	75		0.24 [0.16, 0.35]
Ryoo ,2017	149	639		0.23 [0.20, 0.27]
Shukor ,2018	133	585		0.23 [0.20, 0.26]
Tseng ,2018	39	203		0.19 [0.14, 0.25]
Chan,2015	11	60		0.18 [0.10, 0.30]
Ali ,2019	44	241		0.18 [0.14, 0.24]
Fraser ,2019	448	2569		0.17 [0.16, 0.19]
Lee,2020	995 1846	5795 11096		0.17 [0.16, 0.18]
Spencer ,2015 Wallace,2018	92	569	, <b>17</b> ,	0.17 [0.16, 0.17] 0.16 [0.13, 0.19]
Wong,2019	92 18	113		0.16 [0.10, 0.24]
Petrushevski ,2015	873	5683		0.15 [0.14, 0.16]
Lefresne ,2017	12	79		0.15 [0.09, 0.25]
Cho ,2019	334	2203		0.15 [0.09, 0.23]
Lerner ,2015	30	2203		0.15 [0.14, 0.17]
Morris ,2017	17	122		0.13 [0.11, 0.20]
Denholm ,2019	28	214		0.13 [0.09, 0.21]
Bingham ,2016	33	262		0.13 [0.09, 0.17]
Nieder,2015	105	873		0.12 [0.10, 0.14]
Clement-Zhao,2019	7	59		0.12 [0.06, 0.23]
Boardman ,2014	46	396		0.12 [0.09, 0.15]
Buergy,2016	5	44		0.11 [0.05, 0.25]
Nieder ,2018	11	101		0.11 [0.06, 0.19]
Kain,2020	178	1744		0.10 [0.09, 0.12]
MorenoSantiago,2019	27	284		0.10 [0.07, 0.14]
Jung,2013	7	75		0.09 [0.05, 0.18]
Lewis,2020	85	925	<b></b>	0.09 [0.07, 0.11]
Pitson,2020	309	3811		0.08 [0.07, 0.09]
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.21]
Dennis,2011	70	918	∎-  ÷	0.08 [0.06, 0.10]
Aladili ,2016	4	72		0.06 [0.02, 0.14]
Meeuse,2010	63	1157	H <del>al</del>	0.05 [0.04, 0.07]
Subgroup			<b>*</b>	0.16 [0.13, 0.19]
6–10 fractions radio	otherany studie	\$		
Qld government,2021	1040	6161		0.17 [0.16, 0.18]
Tursunovic,2013	19	169		0.11 [0.07, 0.17]
Shaw ,2019	5	223	H=	0.02 [0.01, 0.05]
Subgroup				0.09 [0.04, 0.19]
Overall			★	0.15 [0.13, 0.18]
		I		
		0.0	00 0.20 0.40 0.60	
			Proportion(%)	

**Fig. G32.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in studies of patients getting 6–10 fraction treatments vs. other studies. The 6–10 fraction treatment subgroup did not significantly modify the overall summary effect proportion (QM(1) = 1.34, p = 0.246). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

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Study	Cases	Total		Proportion [95% Cl]
Other studies				
Chawla ,2015	29	68	· · · · · · · · · · · · · · · · · · ·	0.43 [0.31, 0.55]
Murphy,2013	7093	21279		0.33 [0.33, 0.34]
Kapadia,2012	209	730	<b>⊢</b> ∎→	0.29 [0.25, 0.32]
Ellsworth,2014	89	339		0.26 [0.22, 0.31]
Sherman,2013	10	39		0.26 [0.14, 0.41]
Wu ,2019	125	518		0.24 [0.21, 0.28]
Gupta,2012	18	75		0.24 [0.16, 0.35]
Ryoo ,2017	149	639		0.24 [0.10, 0.35]
Shukor ,2018	133	585	. <b>⊢</b> •1	0.23 [0.20, 0.26]
Tursunovic,2013	65	293	. <b>⊢</b> -∎	0.22 [0.18, 0.27]
Tseng ,2018	39	203	l <del>i a</del>	0.19 [0.14, 0.25]
Chan,2015	11	60		0.18 [0.10, 0.30]
Ali ,2019	44	241		0.18 [0.14, 0.24]
Fraser ,2019	448	2569	<del>■</del>	0.17 [0.16, 0.19]
Lee,2020	995	5795	H	0.17 [0.16, 0.18]
Spencer ,2015	1846	11096		0.17 [0.16, 0.17]
Wallace,2018	92	569		0.16 [0.13, 0.19]
Wong,2019	18	113		0.16 [0.10, 0.24]
-	873	5683		
Petrushevski ,2015 Lefresne ,2017	12	79		0.15 [0.14, 0.16] 0.15 [0.09, 0.25]
Cho ,2019	334	2203	⊦ <del>≠</del> l	0.15 [0.14, 0.17]
Lerner ,2015	30	202		0.15 [0.11, 0.20]
Morris ,2017	17	122		0.14 [0.09, 0.21]
Denholm ,2019	28	214		0.13 [0.09, 0.18]
Bingham ,2016	33	262	<b>⊢</b> ∎ <u>÷</u> −	0.13 [0.09, 0.17]
Nieder,2015	105	873	<b>⊢</b> ∎ :	0.12 [0.10, 0.14]
Clement-Zhao,2019	7	59		0.12 [0.06, 0.23]
Boardman ,2014	46	396	·	0.12 [0.09, 0.15]
Buergy,2016	5	44		0.11 [0.05, 0.25]
Nieder ,2018	11	101		0.11 [0.06, 0.19]
Kain,2020	178	1744		0.10 [0.09, 0.12]
	27	284		
MorenoSantiago,2019				0.10 [0.07, 0.14]
Jung,2013	7	75		0.09 [0.05, 0.18]
Lewis,2020	85	925	┝╼┥	0.09 [0.07, 0.11]
Pitson,2020	309	3811		0.08 [0.07, 0.09]
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.21]
Dennis,2011	70	918	┝┳┥	0.08 [0.06, 0.10]
Aladili ,2016	4	72	<b>⊢</b> ∎−−−−↓ <sup>‡</sup>	0.06 [0.02, 0.14]
Meeuse,2010	63	1157	· · · · · · · · · · · · · · · · · · ·	0.05 [0.04, 0.07]
Subgroup			•	0.15 [0.13, 0.18]
0				
Greater than 10 fraction				
Wallace,2018	27	150	<del>∶_</del>	0.18 [0.13, 0.25]
Qld government,2021	283	3157		0.09 [0.08, 0.10]
Shaw ,2019	0	118		0.00 [0.00, 0.06]
Subgroup				0.10 [0.04, 0.20]
Overall			•	0.15 [0.13, 0.18]
		1		
		0.0	00 0.20 0.40 0.60	0.80 1.00
			Proportion(%)	

**Fig. G33.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in studies of patients getting more than 10 fraction treatments vs. other studies. The > 10 fraction treatment subgroup did not significantly modify the overall summary effect proportion (QM(1) = 1.06, p = 0.304). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% (
Other studies				
Mojica-Marquez,2020	193	429	┝╼╾┥	0.45 [0.40, 0.5
Chawla ,2015	29	68		0.43 [0.31, 0.55
Murphy,2013	7093	21279		0.33 [0.33, 0.34
Kapadia,2012	209	730		0.29 [0.25, 0.32
Ellsworth,2014	89	339		0.26 [0.22, 0.31
Sherman,2013	10	39		0.26 [0.14, 0.41
Wu ,2019	125	518	' : <b>⊢</b> ∎-	0.24 [0.21, 0.28
Gupta,2012	18	75		0.24 [0.16, 0.35
Ryoo ,2017	149	639		0.23 [0.20, 0.27
Qld government ,2021	4997	22501		0.22 [0.22, 0.23
Tursunovic,2013	65	293		0.22 [0.18, 0.27
Tseng ,2018	39	203		0.19 [0.14, 0.25
Chan,2015	11	60		0.18 [0.10, 0.30
Fraser ,2019	448	2569		0.17 [0.16, 0.19
Lee,2020	995	5795	H	0.17 [0.16, 0.18
Spencer ,2015	1846	11096		0.17 [0.16, 0.17
Wallace,2018	92	569		0.16 [0.13, 0.19
Wong,2019	18	113		0.16 [0.10, 0.24
Petrushevski ,2015	873	5683		0.15 [0.14, 0.16
Lefresne ,2017	12	79		0.15 [0.09, 0.25
	334	2203		
Cho ,2019				0.15 [0.14, 0.17
Morris ,2017	17	122		0.14 [0.09, 0.21
Denholm ,2019	28	214		0.13 [0.09, 0.18
Bingham ,2016	33	262	┝╼╾┥┊	0.13 [0.09, 0.17
Nieder,2015	105	873	┝╾┥ :	0.12 [0.10, 0.14
Clement-Zhao,2019	7	59		0.12 [0.06, 0.23
Boardman ,2014	46	396	<b>⊢</b> ∎-1 :	0.12 [0.09, 0.15
Buergy,2016	5	44		0.11 [0.05, 0.25
Nieder ,2018	11	101		0.11 [0.06, 0.19
Kain,2020	178	1744		0.10 [0.09, 0.12
Shaw ,2019	108	1112		0.10 [0.08, 0.12
MorenoSantiago,2019	27	284	-  	0.10 [0.07, 0.14
Jung,2013	7	75		0.09 [0.05, 0.18
Lewis,2020	85	925		0.09 [0.03, 0.12
	309			
Pitson,2020		3811	, <b>H</b>	0.08 [0.07, 0.09
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.21
Dennis,2011	70	918		0.08 [0.06, 0.10
Aladili ,2016	4	72		0.06 [0.02, 0.14
Subgroup			•	0.16 [0.14, 0.19
Incomplete treatment studies				
Shukor ,2018	28	39	L	0.72 [0.56, 0.84
Meeuse,2010	18	39		0.72 [0.36, 0.32 0.58 [0.40, 0.74
Ali ,2019		33		
	17			0.52 [0.35, 0.68
Lerner ,2015	5	17		0.29 [0.13, 0.54
Subgroup				0.55 [0.39, 0.70
Overall			•	0.18 [0.16, 0.2
		0	0 0.20 0.40 0.60 0.80 1.00	
		0		
			Proportion(%)	

**Fig. G34.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in studies of patients not completing treatment vs. other studies. The incomplete treatment subgroup did significantly raise the overall summary effect proportion (QM(1) = 26.51, p < 0.001). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

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Cases	Total		Proportion [95% CI]
193	429		0.45 [0.40, 0.5
29	68		0.43 [0.31, 0.5
			0.33 [0.33, 0.3
			0.29 [0.25, 0.3
			0.26 [0.22, 0.3
			0.26 [0.14, 0.4
			0.24 [0.21, 0.2
			0.24 [0.24] 0.16, 0.35
			0.24 [0.16, 0.3
		<b>■</b> .	0.22 [0.22, 0.2]
		; <b> </b> -	0.22 [0.18, 0.2]
			0.19 [0.14, 0.2
			0.18 [0.10, 0.30
			0.18 [0.14, 0.24
		┝═┤	0.17 [0.16, 0.19
995	5795		0.17 [0.16, 0.18
1846	11096		0.17 [0.16, 0.17
92	569	- <del>:</del> ∎	0.16 [0.13, 0.19
18	113		0.16 [0.10, 0.24
873	5683		0.15 0.14, 0.10
			0.15 [0.09, 0.2
			0.15 [0.14, 0.17
			0.15 [0.11, 0.20
			0.14 [0.09, 0.2
			0.13 [0.09, 0.1]
			0.13 [0.09, 0.1
			0.12 [0.10, 0.14
			0.12 [0.06, 0.23
		<b>⊢</b> ∎,	0.12 [0.09, 0.1
			0.11 [0.05, 0.25
			0.11 [0.06, 0.19
			0.10 [0.09, 0.12
		┝┳┥ :	0.10 [0.08, 0.12
	284	<b>⊢</b> ∎−−  :	0.10 [0.07, 0.14
7	75	<u>├──</u> ∎───┊──┤	0.09 [0.05, 0.18
85	925	<b>⊢</b> ∎-	0.09 [0.07, 0.1
309	3811		0.08 [0.07, 0.09
3	39		0.08 [0.03, 0.2
			0.08 [0.06, 0.10
			0.06 [0.02, 0.14
			0.05 [0.04, 0.05
00	1107		-
		◆	0.16 [0.14, 0.15
5	126	Here I	0.04 [0.02, 0.09
-			-
			0.04 [0.02, 0.0
		<b>~</b>	0.15 [0.13, 0.1
	,		
	(	0.00 0.20 0.40 0.60	
	$193 \\ 29 \\ 7093 \\ 209 \\ 89 \\ 10 \\ 125 \\ 18 \\ 133 \\ 4997 \\ 65 \\ 39 \\ 11 \\ 44 \\ 448 \\ 995 \\ 1846 \\ 92 \\ 18 \\ 873 \\ 12 \\ 334 \\ 30 \\ 17 \\ 28 \\ 33 \\ 105 \\ 7 \\ 46 \\ 5 \\ 11 \\ 178 \\ 108 \\ 27 \\ 7 \\ 85 \\ 10 \\ 17 \\ 28 \\ 33 \\ 105 \\ 7 \\ 46 \\ 5 \\ 11 \\ 178 \\ 108 \\ 27 \\ 7 \\ 85 \\ 10 \\ 17 \\ 28 \\ 33 \\ 105 \\ 7 \\ 46 \\ 5 \\ 11 \\ 178 \\ 108 \\ 27 \\ 7 \\ 85 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 1$	193 $429$ $29$ $68$ $7093$ $21279$ $209$ $730$ $89$ $339$ $10$ $39$ $125$ $518$ $18$ $75$ $133$ $585$ $4997$ $22501$ $65$ $293$ $39$ $203$ $11$ $60$ $44$ $241$ $448$ $2569$ $995$ $5795$ $1846$ $11096$ $92$ $569$ $18$ $113$ $873$ $5683$ $12$ $79$ $334$ $2203$ $30$ $202$ $17$ $122$ $28$ $214$ $33$ $262$ $105$ $873$ $7$ $59$ $46$ $396$ $5$ $44$ $11$ $101$ $178$ $1744$ $108$ $1112$ $27$ $284$ $7$ $75$ $85$ $925$ $309$ $3811$ $3$ $39$ $70$ $918$ $4$ $72$ $63$ $1157$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

**Fig. G35.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in studies of patients getting stereotactic body radiotherapy for brain metastases vs. other studies. The stereotactic body radiotherapy for brain metastases treatment subgroup did significantly lower the overall summary effect proportion (QM (1) = 10.54, p = 0.001). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia, SBRT = stereotactic body radiotherapy.

Study	Cases	Total		Proportion [95% CI]
Non-U.S. studies				
Gupta,2012 Shukor ,2018 Qld government,2021 Tursunovic,2013 Chan,2015 Ali ,2019 Fraser ,2019 Lee,2020 Spencer ,2015 Petrushevski ,2015 Lefresne ,2017 Cho ,2019 Lerner ,2015 Morris ,2017 Denholm ,2019 Nieder,2015 Clement-Zhao,2019 Boardman ,2014 Buergy,2016 Nieder ,2018 Kain,2020 Shaw ,2019 MorenoSantiago,2019 Jung,2013 Lewis,2020 Pitson,2020 MaungMaungMyint,2017 Dennis,2011 Aladii ,2016 Meeuse,2010	$\begin{array}{c} 18\\ 133\\ 4997\\ 65\\ 11\\ 44\\ 448\\ 995\\ 1846\\ 873\\ 12\\ 334\\ 30\\ 17\\ 28\\ 105\\ 7\\ 46\\ 5\\ 11\\ 178\\ 108\\ 27\\ 7\\ 85\\ 309\\ 3\\ 70\\ 463\end{array}$	$\begin{array}{c} 75\\ 585\\ 22501\\ 293\\ 60\\ 241\\ 2569\\ 5795\\ 11096\\ 5683\\ 79\\ 2203\\ 202\\ 122\\ 214\\ 873\\ 59\\ 396\\ 44\\ 101\\ 1744\\ 1112\\ 284\\ 75\\ 925\\ 3811\\ 39\\ 918\\ 72\\ 1157\end{array}$		0.24 [0.16, 0.35] 0.23 [0.20, 0.26] 0.22 [0.22, 0.23] 0.22 [0.18, 0.27] 0.18 [0.10, 0.30] 0.18 [0.14, 0.24] 0.17 [0.16, 0.19] 0.17 [0.16, 0.17] 0.15 [0.14, 0.16] 0.15 [0.09, 0.25] 0.15 [0.14, 0.17] 0.15 [0.10, 0.25] 0.14 [0.09, 0.21] 0.12 [0.00, 0.15] 0.11 [0.05, 0.25] 0.11 [0.06, 0.12] 0.10 [0.08, 0.12] 0.10 [0.08, 0.12] 0.10 [0.07, 0.14] 0.09 [0.07, 0.14] 0.08 [0.07, 0.14] 0.08 [0.07, 0.14] 0.08 [0.07, 0.14] 0.08 [0.07, 0.14] 0.08 [0.02, 0.14] 0.08 [0.04, 0.10] 0.06 [0.22, 0.14] 0.07]
Subgroup			•	0.13 [0.12, 0.15]
U.S. studies				
Mojica-Marquez,2020 Chawla ,2015 Murphy,2013 Kapadia,2012 Ellsworth,2014 Sherman,2013 Wu ,2019 Ryoo ,2017 Tseng ,2018 Wallace,2018 Wong ,2019 Bingham,2016	193 29 7093 209 89 10 125 149 39 92 18 33	429 68 21279 730 339 518 639 203 569 113 262		$\begin{array}{c} 0.45 \; [0.40, 0.50] \\ 0.43 \; [0.31, 0.55] \\ 0.33 \; [0.33, 0.34] \\ 0.29 \; [0.25, 0.32] \\ 0.26 \; [0.22, 0.31] \\ 0.26 \; [0.14, 0.41] \\ 0.24 \; [0.21, 0.28] \\ 0.23 \; [0.20, 0.27] \\ 0.19 \; [0.14, 0.25] \\ 0.16 \; [0.13, 0.19] \\ 0.13 \; [0.09, 0.17] \end{array}$
Subgroup			-	0.25 [0.21, 0.30]
Overall			•	0.16 [0.14, 0.18]
				0
		0.0		U
			Proportion(%)	

**Fig. G36.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in studies of patients in the United States of America vs. other studies. The United States subgroup did significantly raise the overall summary effect proportion (QM(1) = 28.70, p < 0.001). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia, U.S. = United States of America.

Other studies				
Mojica-Marquez,2020	193	429	<b>⊢_</b> ■	0.45 [0.40, 0.50
Wu ,2019	125	518		0.24 [0.21, 0.28
Ryoo ,2017	149	639	· · · · · · · · · · · · · · · · · · ·	0.23 [0.20, 0.27
Shukor ,2018	133	585	, , , , , , , , , , , , , , , , , , ,	0.23 [0.20, 0.26
Qld Government,2021	4997	22501		0.22 [0.22, 0.23
Tseng ,2018	39	203		0.19 [0.14, 0.25
Ali ,2019	44	241		0.18 [0.14, 0.24
Fraser ,2019	448	2569		0.17 [0.16, 0.19
Lee,2020	995	5795		0.17 [0.16, 0.18
Wong ,2019	18	110		0.16 [0.11, 0.24
Wallace,2018	92	569		0.16 [0.13, 0.19
Lefresne ,2017	12	79		0.15 [0.09, 0.25
Cho ,2019	334	2203		0.15 [0.14, 0.17
Morris ,2017	17	122		0.14 [0.09, 0.21
Denholm ,2019	28	214		0.13 [0.09, 0.18
Bingham,2016	33	262		0.13 [0.09, 0.17
Clement-Zhao,2019	7	59		0.12 [0.06, 0.23
Buergy,2016	5	44		0.11 [0.05, 0.25
Nieder ,2018	11	101		0.11 [0.06, 0.19
Kain,2020	178	1744	' · · · · · · · · · · · · · · · · · · ·	0.10 [0.09, 0.12
Shaw ,2019	108	1112		0.10 [0.08, 0.12
MorenoSantiago,2019	27	284		0.10 [0.07, 0.14
Lewis,2020	85	925		0.09 [0.07, 0.11
Pitson,2020	309	3811		0.08 [0.07, 0.09
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.21
Aladili ,2016	4	72		0.06 [0.02, 0.14
Subgroup			-	0.15 [0.13, 0.18
Prior to 2016 studies				
Chawla ,2015	29	68	· · · · · · · · · · · · · · · · · · ·	0.43 [0.31, 0.55
Murphy,2013	7093	21279	<b>H</b>	0.33 [0.33, 0.34
Kapadia,2012	209	730	÷ ⊢•	0.29 [0.25, 0.32
Ellsworth,2014	89	339	÷	0.26 [0.22, 0.31
Sherman,2013	10	39	<u>↓</u>	0.26 [0.14, 0.41
Gupta,2012	18	75	<b>⊢</b>	0.24 [0.16, 0.35
Tursunovic,2013	65	293	i <b>⊢</b>	0.22 [0.18, 0.27
Chan,2015	11	60		0.18 [0.10, 0.30
Spencer ,2015	1846	11096	ja 🖌 📜	0.17 0.16, 0.17
Petrushevski ,2015	873	5683	H <del>al</del>	0.15 [0.14, 0.16
Lerner ,2015	30	202	<u>⊢_</u>	0.15 [0.11, 0.20
Nieder,2015	105	873	<b>⊢</b> ∎-1	0.12 [0.10, 0.14
Boardman ,2014	46	396	<b>⊢</b> ∎	0.12 [0.09, 0.15
Jung,2013	7	75	<u>}</u>	0.09 [0.05, 0.18
Dennis,2011	70	918		0.08 [0.06, 0.10
Meeuse,2010	63	1157	H=-1	0.05 [0.04, 0.07
Subgroup				0.18 [0.13, 0.23
Overall			<b>*</b>	0.16 [0.14, 0.18
			î	
		0	0 0.20 0.40 0.60	
		-	Proportion(%)	

**Fig. G37.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in studies prior to year 2016 vs. other studies. The prior to year 2016 subgroup did not significantly modify the overall summary effect proportion (QM(1) = 0.85, p = 0.358). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study),  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

Study	Cases	Total		Proportion [95% C
From start of treatme	ent			
Mojica-marquez,2020	193	429	⊢	0.45 [0.40, 0.50
Wu ,2019	125	518		0.24 [0.21, 0.28
Gupta,2012	18	75		0.24 [0.16, 0.35
Shukor ,2018	133	585		0.23 [0.20, 0.26
Tseng ,2018	39	203		0.19 [0.14, 0.25
Chan,2015	11	60	<u>├</u>	0.18 [0.10, 0.30
Fraser ,2019	448	2569	}≖⊣	0.17 [0.16, 0.19
Lee,2020	995	5795	j=i	0.17 [0.16, 0.18
Spencer ,2015	1846	11096		0.17 [0.16, 0.17
Lefresne ,2017	12	79	⊢ŧ	0.15 [0.09, 0.25
Nieder,2015	105	873	┝╼┤	0.12 [0.10, 0.14
Boardman ,2014	46	396	<b>⊢</b> ∎−-	0.12 [0.09, 0.15
Nieder ,2018	11	101	<u>├──</u> <b>-</b>	0.11 [0.06, 0.19
Kain,2020	178	1744	┝┻┥	0.10 [0.09, 0.12
Shaw ,2019	108	1112	┝━┥	0.10 [0.08, 0.12
MorenoSantiago,2019	27	284	⊢•−→ <sup>1</sup>	0.10 [0.07, 0.14
Jung,2013	7	75		0.09 [0.05, 0.18
Lewis,2020	85	925	<b>⊢</b> ∎-	0.09 [0.07, 0.1
Dennis,2011	70	918	<b>⊢=</b> -	0.08 [0.06, 0.10
Subgroup			◆	0.15 [0.13, 0.18
From end of treatme	nt			
Murphy,2013	7093	21279	<b>H</b>	0.33 [0.33, 0.34
Ellsworth,2014	89	339		0.26 [0.22, 0.31
Ryoo ,2017	149	639	<b>⊢</b>	0.23 [0.20, 0.27
Qld government,2021	4997	22501		0.22 [0.22, 0.23
Ali ,2019	44	241		0.18 [0.14, 0.24
Wallace,2018	92	569		0.16 [0.13, 0.19
Petrushevski ,2015	873	5683		0.15 [0.14, 0.16
Bingham,2016	33	262		0.13 [0.09, 0.17
Clement-Zhao,2019	7	59		0.12 [0.06, 0.23
Buergy,2016	5	44		0.11 [0.05, 0.25
MaungMaungMyint,2017	3	39		0.08 [0.03, 0.2
Aladili ,2016	4	72	· · · · · · · · · · · · · · · · · · ·	0.06 [0.02, 0.14
Subgroup				0.18 [0.14, 0.22
				0110 [0111, 0122
Overall			•	0.16 [0.14, 0.18
		Г	· · · · · · · · · · · · · · · · · · ·	
		0.00	0.20 0.40 0.60 0.80	
			Proportion(%)	

**Fig. G38.** Forest plot of subgroup analysis: 30-day mortality rate after palliative radiotherapy in studies measuring 30 days from end of patients' treatment vs. studies measuring from the beginning of their treatment. The measuring from end of treatment subgroup did not significantly modify the overall summary effect proportion (QM (1) = 0.73, p = 0.392). Cases indicate the number of patients that died within 30-days of their palliative radiotherapy, Total indicates the number of patients getting palliative radiotherapy, and proportion indicates the proportion of patients dying within 30-days of palliative radiotherapy (cases/total). Abbreviations CI = confidence intervals (horizontal lines),  $\blacksquare$  = 30-day mortality rate of study).  $\blacklozenge$  = subgroup effect; overall summary effect proportion (dotted vertical line), QId = Queensland, Australia.

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## Appendix H

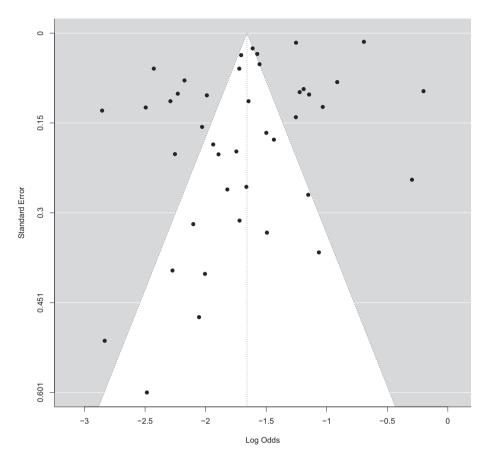


Fig. H1. Funnel plot displaying study standard error as a measure of precision. Heterogeneity is illustrated, but asymmetry and therefore small study bias is unclear.

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