Web Appendix 1

ALTERNATIVE TUMOR POINT: THE GEOMETRIC MIDPOINT

As an alternative to the tumor's center of gravity, we calculated also the geometric mean of each tumor. We compared the geometric midpoint with the single voxel marked by neuroradiologists as the putative origin, and in these 906 subjects, the geometric midpoint had a mean distance of 5.4 mm from the putative origin (median, 4.9 mm; 75th centile, 7.3 mm; maximum, 44 mm). The medians of the distance from the ear point to the single voxel marked as the putative origin and from the ear point to the geometric midpoint differ less than 2 mm. Using this geometric midpoint instead of the center of gravity does not change any of the results markedly. In Web Table 1 is shown the result from the standard model with a piecewise constant decreasing-distance relationship. This is similar to the corresponding result in Table 2 in the article. In Web Table 2 is shown a comparison of a result from the study by Grell et al. (1) with the result using the same data subset but the geometric midpoint instead of the recorded putative origin. The estimated $\boldsymbol{\alpha}$ values were similar for the two types of tumor points.

Web Table 1: Estimated Elevation in Brain Tumor Risk[a] for Regular Mobile Phone Users With Information on Preferred Side of Use[b] (n = 792), INTERPHONE Grid Data, 2000–2004

Tumor Point	Distance From Preferred Ear to Geometric Mean of Tumor, mm														
	0–55			55.01–75			75.01–95			95.01–115			≥115.01[c]		
	No.[d]	$\hat{\alpha}_1$	95% CI	No.	$\hat{\alpha}_2$	95% CI	No.	$\hat{\alpha}_3$	95% CI	No.	$\hat{\alpha}_4$	95% CI	No.	$\hat{\alpha}$	95% CI
Geometric mean	47	2.09	1.60, 3.80	159	1.88	1.48, 2.45	224	1.40	1.15, 1.81	153	1.04	1.00, 1.43	209	1.00	N/A

Abbreviations: N/A, not applicable; CI, confidence interval.

[a] The $\hat{\alpha}$ values represent the elevation in risk of observing a tumor within a given interval compared with the assumed baseline risk.

[b] Side of the head preferred for mobile phone use.

[c] Reference category ($\hat{\alpha} = 1$).

[d] Number of tumors within a given interval.

Web Table 2: Comparison of Tumor Points from INTERPHONE Grid Data With the Single-Voxel Tumor Origin Recorded by Neuroradiologists or the Calculated Geometric Midpoint (n = 478), 2000–2004

Tumor Point	Distance From Preferred Ear[a] to Recorded Origin Point or Geometric Mean of Tumor, mm														
	0–55			55.01–75			75.01–95			95.01–115			≥115.01[b]		
	No.[c]	$\hat{\alpha}_1$[d]	95% CI	No.	$\hat{\alpha}_2$	95% CI	No.	$\hat{\alpha}_3$	95% CI	No.	$\hat{\alpha}_4$	95% CI	No.	$\hat{\alpha}$	95% CI
Origin point[e]	25	1.82	0.32	100	1.82	0.28	127	1.48	0.22	105	1.09	0.18	121	1.00	N/A
Geometric mean	24	1.70	0.56	105	1.70	0.30	126	1.70	0.30	95	1.00	0.23	128	1.00	N/A

Abbreviations: N/A, not applicable; SE, standard error.

[a] Side of the head preferred for mobile phone use.

[b] Reference category ($\hat{\alpha} = 1$).

[c] Number of tumors within a given interval.

[d] The $\hat{\alpha}$ values represent the elevation in risk of observing a tumor within a given interval compared with the assumed baseline risk.

[e] Result from Grell et al. (1).

Web Appendix 2

EXTRA SENSITIVITY ANALYSES

Here follow the results from the extra sensitivity analyses mentioned but not shown in the article: in Web Table 3 a model with mixing proportion $w_{\text{pref}} = 0.85$ and a model with a piecewise constant decreasing-distance relationship for the subsets used in Cardis et al. (2) and Larjavaara et al. (3); in Web Table 4 a piecewise constant decreasing-distance relationship model with smaller intervals and thus 9 $\hat{\alpha}$-parameters instead of 4.

Web Table 3: Estimated Elevation in Brain Tumor Risk[a] for Regular Mobile Phone Users With Information on Preferred Side of Use[b], INTERPHONE Grid Data, 2000–2004

Model	Distance From Preferred Ear to Gravity Center of Tumor, mm														
	0–55			55.01–75			75.01–95			95.01–115			≥115.01[c]		
	No.[d]	$\hat{\alpha}_1$	95% CI	No.	$\hat{\alpha}_2$	95% CI	No.	$\hat{\alpha}_3$	95% CI	No.	$\hat{\alpha}_4$	95% CI	No.	$\hat{\alpha}$	95% CI
Mixing $w_{\text{pref}} = 0.85$[e], $n = 792$	45	3.76	2.04, 5.24	159	2.29	1.60, 3.57	220	1.66	1.23, 2.38	166	1.16	1.00, 1.81	202	1.00	N/A
Cardis et al., $n = 332$	18	1.87	1.34, 4.67	66	1.87	1.21, 2.73	96	1.19	1.00, 1.74	65	1.19	1.00, 1.67	87	1.00	N/A
Larjavaara et al., $n = 428$	16	2.44	1.58, 5.86	78	1.73	1.40, 2.49	93	1.73	1.29, 2.24	99	1.04	1.00, 1.56	142	1.00	N/A

Abbreviations: N/A, not applicable; CI, confidence interval.

[a] The $\hat{\alpha}$ values represent the elevation in risk of observing a tumor within a given interval compared with the assumed baseline risk.

[b] Side of the head preferred for mobile phone use.

[c] Reference category ($\hat{\alpha} = 1$).

[d] Number of tumors within a given interval.

[d] In the model with the mixing proportion, 85% of phone calls were assigned to the preferred side of use and 15% to the nonpreferred side of use.

Web Table 4: Estimated Elevation in Brain Tumor Risk[a] for Regular Mobile Phone Users With Information on Preferred Side of Use[b] (n = 792), INTERPHONE Grid Data, 2000–2004

Model	Distance From Preferred Ear to Gravity Center of Tumor, mm														
	0–50			50.01–60			60.01–70			70.01–80			80.01–90		
	No.[d]	$\hat{\alpha}_1$	95% CI	No.	$\hat{\alpha}_2$	95% CI	No.	$\hat{\alpha}_3$	95% CI	No.	$\hat{\alpha}_4$	95% CI	No.	$\hat{\alpha}_5$	95% CI
Decreasing distance	13	4.22	1.88, 29.2	69	1.86	1.50, 2.87	83	1.86	1.45, 2.65	81	1.47	1.23, 1.95	117	1.47	1.22, 1.95
	90.01–100			100.01–110			110.01–120			120.01–130			≥130.01[c]		
	No.	$\hat{\alpha}_6$	95% CI	No.	$\hat{\alpha}_7$	95% CI	No.	$\hat{\alpha}_8$	95% CI	No.	$\hat{\alpha}_9$	95% CI	No.	$\hat{\alpha}$	95% CI
	111	1.47	1.20, 1.93	58	1.02	1.00, 1.64	102	1.00	1.00, 1.33	104	1.00	1.00, 1.31	54	1.00	N/A

Abbreviations: N/A, not applicable; CI, confidence interval.

[a] The $\hat{\alpha}$ values represent the elevation in risk of observing a tumor within a given interval compared with the assumed baseline risk.

[b] Side of the head preferred for mobile phone use.

[c] Reference category ($\hat{\alpha} = 1$).

[d] Number of tumors within a given interval.

References

1. Grell K, Diggle PJ, Frederiksen K, et al. A three-dimensional point process model for the spatial distribution of disease occurence in relation to an exposure source. *Stat Med*. 2015;34(23):3170–3180.

2. Cardis E, Armstrong BK, Bowman JD, et al. Risk of brain tumours in relation to estimated RF dose from mobile phones: results from five Interphone countries. *Occup Environ Med*. 2011;68(9):631–640.

3. Larjavaara S, Schüz J, Swerdlow A, et al. Location of gliomas in relation to mobile telephone use: A case-case and case-specular analysis. *Am J Epidemiol*. 2011;174(1):2–11.