Estimating the Lifetime Survival and QALYs of Tumor-Treating Fields in Combination With Temozolomide for Glioblastoma Using a Korean Population

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Background

- Glioblastoma (GBM) is an aggressive brain cancer with poor prognosis despite standard treatment.[1]
- Standard of care includes surgery, radiotherapy, and maintenance temozolomide (TMZ) chemotherapy.[1]
- Tumor-Treating Fields (TTFields) are a non-invasive therapy delivering low-intensity alternating electric fields that disrupt cancer cell division and inhibit tumor growth.[1]
- The EF-14 trial demonstrated that TTFields + TMZ significantly improved progression-free survival (PFS) and overall survival (OS) compared to TMZ alone.[1]
- Prior lifetime analyses in international settings showed TTFields + TMZ increased survival by 1.25 life-years (LYs) and 0.96 quality-adjusted life years (QALYs).[2]
- No previous lifetime survival and QALY estimation specific to the Korean GBM population has been reported

Objective

Estimate **lifetime survival** (LYs) and **quality-adjusted life expectancy** (QALYs) of TTFields + TMZ versus TMZ alone in **Korean patients** with newly diagnosed GBM

Methods

- **Model type**: Partitioned survival model with 3 health states[3]: Progression-Free Survival (PFS), Progressive Disease (PD) and Death
- **Time horizon**: 40 years (lifetime).
- **Survival modeling**: Three-phase approach[2]: **Years 1–5**: Kaplan–Meier data from the South Korean EF-14 subgroup (2.8 years follow-up for TTFields + TMZ; 2.5 years for TMZ) supplemented with EF-14 overall data. **Years 5–15**: Conditional survival approach based on epidemiologic GBM data. **Years 15–40**: Background mortality from Korean life tables.
- **Utilities**: Literature-based estimates for PFS and PD health states[3]

Results

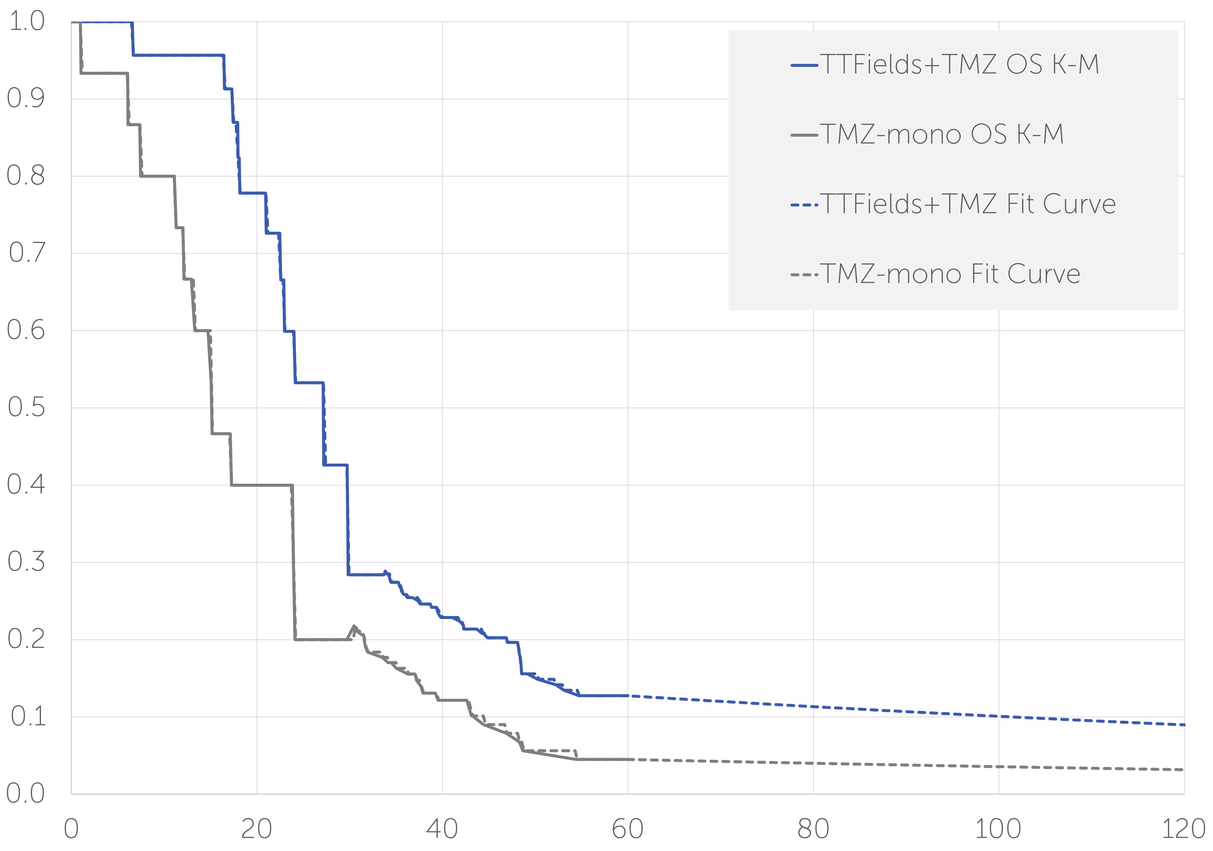
- **Previous publication**: In the EF-14 overall population, TTFields plus standard care extended outcomes by +1.25 life-years and +0.96 QALYs compared with standard care alone (Guzauskas, 2018). These results provided a benchmark for assessing the value of TTFields.
- **South Korea–specific base case**: Restricting the analysis to patients from South Korea showed even greater benefit. The base case demonstrated +1.41 life-years and +1.09 QALYs, highlighting improved survival and quality-adjusted life expectancy in this setting.
- **Comparison**: Results in the Korean population are consistent with the EF-14 overall population, while suggesting stronger benefits locally. This underscores the importance of country-specific analyses to inform decision-making.

Variable	Base Case	Source
General Inputs		
Age	56	Stupp et al. 2017
Horizon	30	Stupp et al. 2017
Utility Inputs		
Utility: PFS	0.85	Garside et al. 2007
Utility: Progressed Disease	0.73	Garside et al. 2007

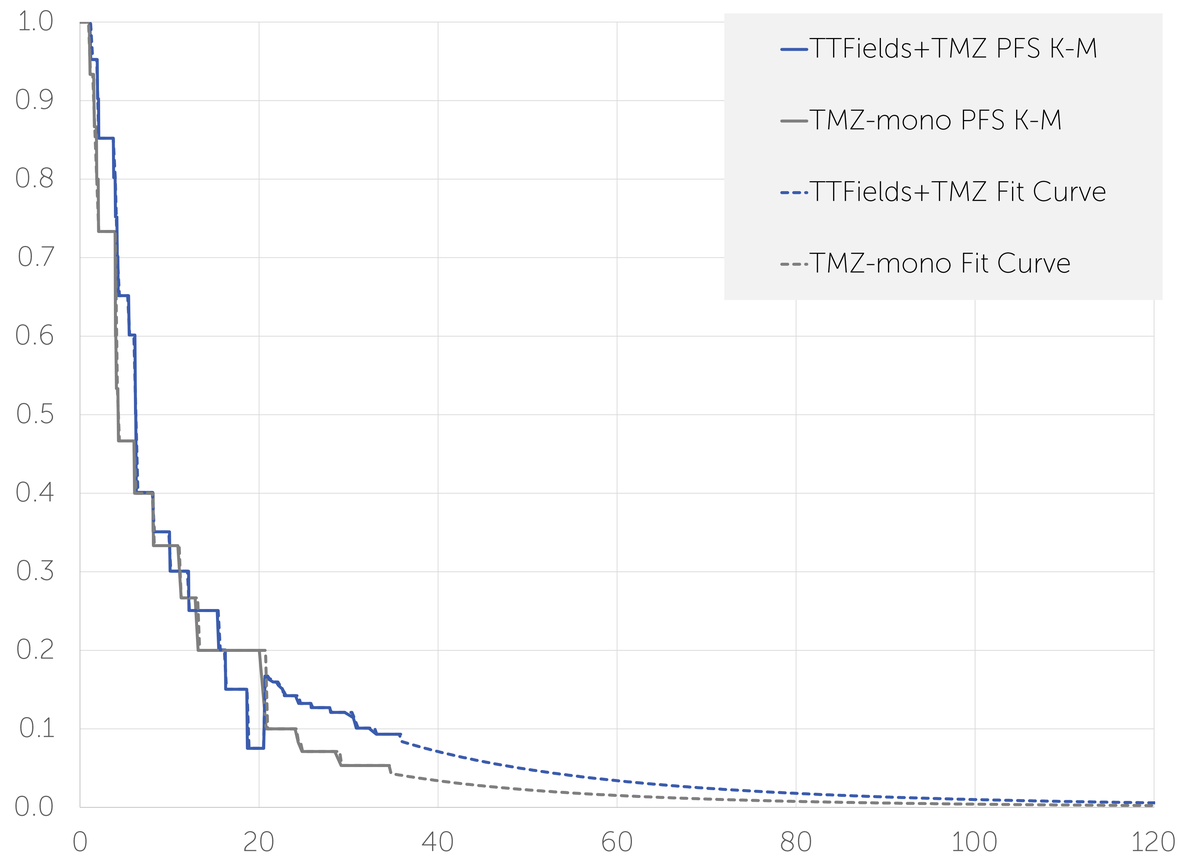
Table 1: Model inputs

	Life Years	QALYs
TTFields + TMZ	3.55	2.72
TMZ Monotherapy	2.04	1.59
Δ	1.51	1.13

Table 2: Results



Graph 1: Overall Survival



Graph 2: Progression-Free Survival

Conclusion

- TTFields + TMZ **substantially improves** both survival and quality-adjusted survival compared to TMZ alone in Korean GBM patients.
- Incremental gains of +1.51 LYs and +1.13 QALYs exceed previously reported global averages.
- Findings suggest that **certain populations may experience greater benefit** from TTFields, potentially due to patient characteristics, treatment patterns, or healthcare system factors.
- Supports the integration of TTFields into GBM management in Korea to improve both longevity and quality of life.

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