Supplementary materials

Table S1 The AIC/BIC values of five distributions fitted and extended the survival curves

Curves	Parameter	Exponential	Weibull	Lognormal	Loglogistic	Gamma
Sac-TMT+ PEM PFS	AIC	602.0864	596.8370	587.6879	592.4298	594.8971
	BIC	605.5201	603.7045	594.5554	599.2973	601.7645
CHEM+PEM PFS	AIC	823.7100	797.5653	785.2422	787.5868	792.0523
	BIC	827.1305	804.4063	792.0832	794.4279	798.8934
Sac-TMT+ PEM OS	AIC	359.0271	344.0262	338.2945	342.1213	341.7953
	BIC	362.4608	350.8936	345.1619	348.9888	348.6627
CHEM+PEM OS	AIC	496.3018	486.3687	484.2982	484.9044	485.3808
	BIC	499.7223	493.2098	491.1393	491.7455	492.2218

Sac-TMT Sacituzumab tirumotecan; *PEMB* pembrolizumab.

Table S2 The best and second-best fitting distributions and corresponding parameters

Curves	**Fit**	**Distributions**	**Parameters**
Sac-TMT+PEMB PFS	Best-fitting	Lognormal	Meanlog=2.54, Sdlog=1.13
	Second best-fitting	Loglogistic	Shape=1.55, Scale=12.22
Sac-TMT+PEMB OS	Best-fitting	Lognormal	Meanlog=3.22, Sdlog=0.88
	Second best-fitting	Gamma	Shape=2.50, Rate=0.097
CHEM+PEMB PFS	Best-fitting	Lognormal	Meanlog=1.89, Sdlog=0.86
	Second best-fitting	Loglogistic	Shape=2.02, Scale=6.60
CHEM+PEMB OS	Best-fitting	Lognormal	Meanlog=3.04, Sdlog=1.10
	Second best-fitting	Loglogistic	Shape=1.73, Scale=18.93

Note: The parameters for the survival curve distribution are specified in monthly time units.

Sac-TMT Sacituzumab tirumotecan; *PEMB* pembrolizumab.

Table S3 Results of proportional hazards assumption test of reconstructed IPD

Item	**PFS/value**	**OS/value**
Sample	Experimental n=229; Control n=226	Experimental n=229; Control n=226
Event/Censoring	Experimental 75/154; Control 124/102	Experimental 35/194; Control 54/172
Proportional hazards test (Schoenfeld)-rank	χ^2=1.30, P=0.255）	χ^2 =2.06, P=0.151
Proportional hazards test (Schoenfeld)-log	χ^2=1.22, P=0.269	χ^2 =3.25, P=0.071
HR (Experimental vs Control)	0.482 (95%CI 0.361-0.642, P <0.0001)	0.589 (95% CI 0.385-0.901, P= 0.015)
Log-rank between-group difference	χ^2=25.73, P<0.0001	χ^2 = 6.10, P=0.014

Experimental Sacituzumab tirumotecan plus pembrolizumab; *Control* chemotherapy plus pembrolizumab.

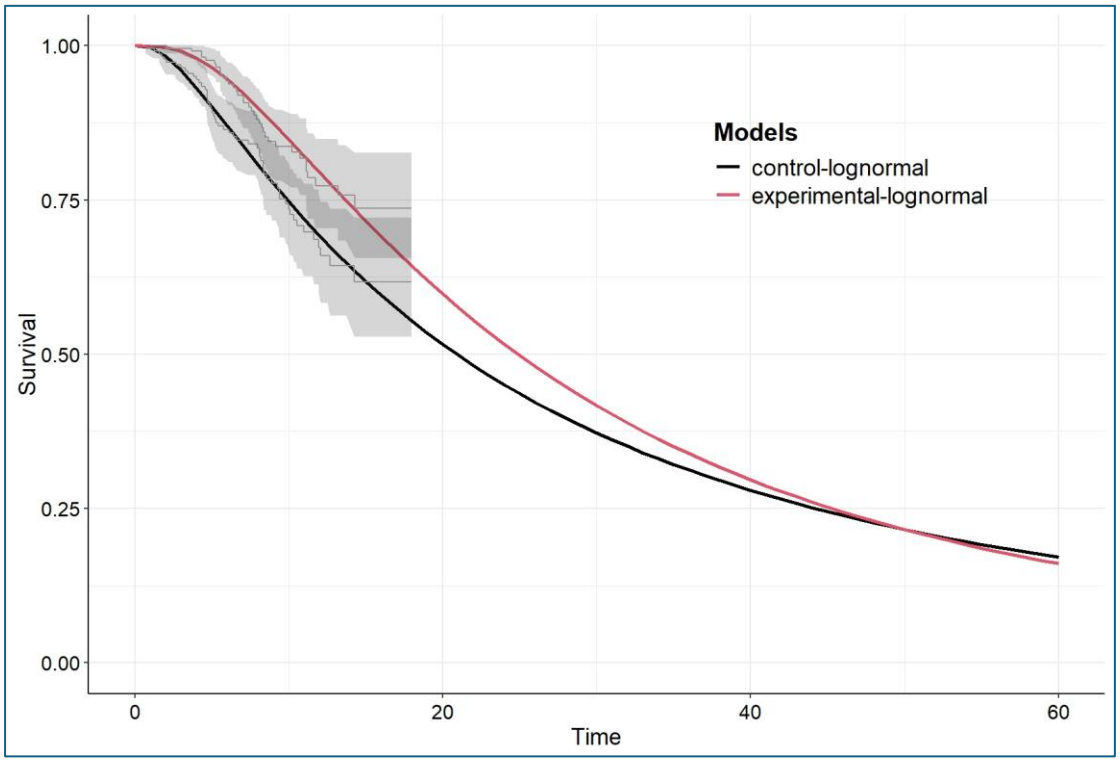

Figure S1 The optimal distribution model fitting and extrapolation of the OS curves

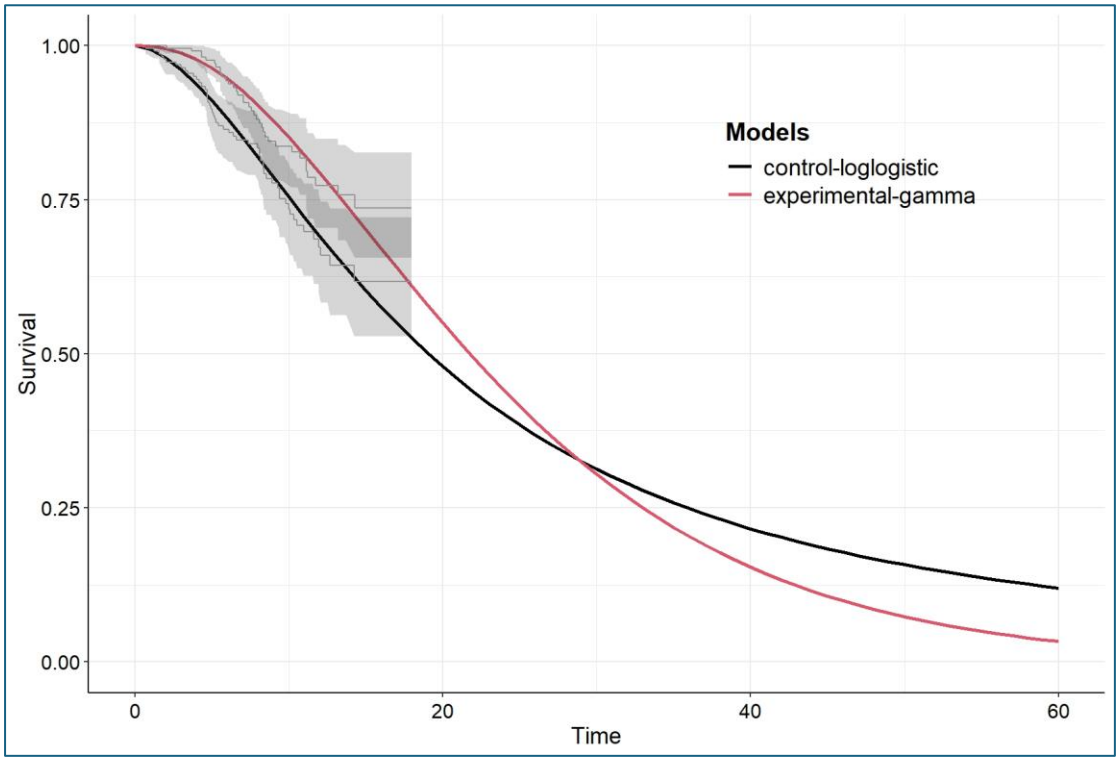

Figure S2 The second-best-fitting distribution model fitting and extrapolation of the OS curves

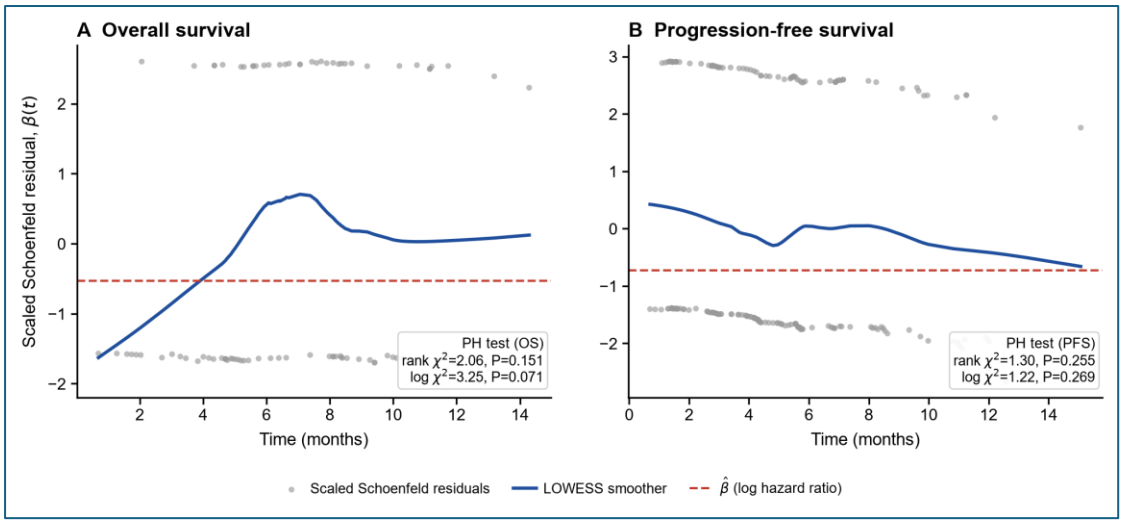

Figure S3 Schoenfeld residuals over time for the proportional-hazards assumption