

**Table S1** Summary of baseline characteristics of all patients

Characteristics	Type	Before weighting		After weighting	
		Standard Mean Diff.	Variance Ratio	Standard Mean Diff.	Variance Ratio
Age	Contin	0.184	1.246	0.000	1.247
Sex					
Male	Binary	-0.023		0.000	
Female	Binary	0.023		0.000	
Histology					
Squamous	Binary	-0.087		0.000	
Non-squamous	Binary	0.087		0.000	
Smoking history					
Yes	Binary	0.015		0.000	
No	Binary	-0.015		0.000	
ECOG PS					
0-1	Binary	-0.121		0.000	
≥2	Binary	0.121		0.000	
Liver metastases					
Yes	Binary	0.081		0.000	
No	Binary	-0.081		0.000	
Brain metastases					
Yes	Binary	0.069		0.000	
No	Binary	-0.069		0.000	
Gene mutation					
Yes	Binary	0.062		0.000	
No	Binary	-0.215		0.000	
Unknown	Binary	0.153		0.000	
Tumor stage					
IIIB	Binary	0.095		0.000	
IV	Binary	-0.095		0.000	
Previous lines of therapy					
1	Binary	-0.064		0.00	
2	Binary	0.144		0.00	
≥3	Binary	-0.080		0.000	
Best response to previous line					
PR	Binary	-0.168		0.000	
SD	Binary	0.048		0.000	
PD	Binary	0.120		0.000	
Initial immunotherapy regimen					
Monotherapy	Binary	0.192		0.000	
Combination	Binary	-0.192		0.000	

Contin: continuous variable; Binary: binary variable; ECOG PS, Eastern Cooperative Oncology Group Performance Status; PR, partial response; SD, stable disease; PD, progressive disease.

**Table S2** Summary of the baseline characteristics of patients in the initial immune monotherapy subgroup

Characteristics	Type	Before balancing		After balancing	
		Standard Mean Diff.	Variance Ratio	Standard Mean Diff.	Variance Ratio
Age	Contin	-0.287	1.812	-0.094	1.607
Sex					
Male	Binary	0.019		0.006	
Female	Binary	-0.019		-0.006	
Histology					
Squamous	Binary	-0.285		-0.094	
Non-squamous	Binary	0.285		0.094	
Smoking history					
Yes	Binary	-0.198		-0.065	
No	Binary	0.198		0.065	
ECOG PS					
0-1	Binary	0.172		0.056	
≥ 2	Binary	-0.172		-0.056	
Liver metastases					
Yes	Binary	0.004		0.002	
No	Binary	-0.004		-0.002	
Brain metastases					
Yes	Binary	-0.182		-0.059	
No	Binary	0.182		0.059	
Gene mutation					
Yes	Binary	-0.019		-0.006	
No	Binary	0.411		0.133	
Unknown	Binary	-0.391		-0.127	
Tumor stages					
IIIB	Binary	-0.279		-0.092	
IV	Binary	0.279		0.092	
Previous lines of therapy					
1	Binary	-0.033		-0.010	
2	Binary	-0.072		-0.024	
≥3	Binary	0.105		0.034	
Best response to previous line					
PR	Binary	0.157		0.050	
SD	Binary	-0.112		-0.038	
PD	Binary	-0.045		-0.013	

Contin: continuous variable; Binary: binary variable; ECOG PS, Eastern Cooperative Oncology Group Performance Status; PR, partial response; SD, stable disease; PD, progressive disease.

**Table S3** Summary of the baseline characteristics of patients in the initial immune combination therapy subgroup

Characteristics	Type	Before balancing		After balancing	
		Standard Mean Diff.	Variance Ratio	Standard Mean Diff.	Variance Ratio
Age	Contin	0.073	0.997	0.031	0.765
Sex					
Male	Binary	-0.076		-0.030	
Female	Binary	0.076		0.030	
Histology					
Squamous	Binary	-0.356		-0.143	
Non-squamous	Binary	0.356		0.143	
Smoking history					
Yes	Binary	-0.118		-0.046	
No	Binary	0.118		0.046	
ECOG PS					
0-1	Binary	-0.065		-0.026	
≥2	Binary	0.065		0.026	
Liver metastases					
Yes	Binary	0.145		0.057	
No	Binary	-0.145		-0.057	
Brain metastases					
Yes	Binary	0.006		0.002	
No	Binary	-0.006		-0.002	
Gene mutation					
Yes	Binary	0.127		0.050	
No	Binary	-0.077		-0.031	
Unknown	Binary	-0.050		-0.019	
Tumor stages					
IIIB	Binary	-0.032		-0.012	
IV	Binary	0.032		0.012	
Previous lines of therapy					
1	Binary	-0.035		-0.012	
2	Binary	0.098		0.039	
≥3	Binary	-0.063		-0.027	
Best response to previous line					
PR	Binary	-0.147		-0.059	
SD	Binary	0.090		0.036	
PD	Binary	0.057		0.023	

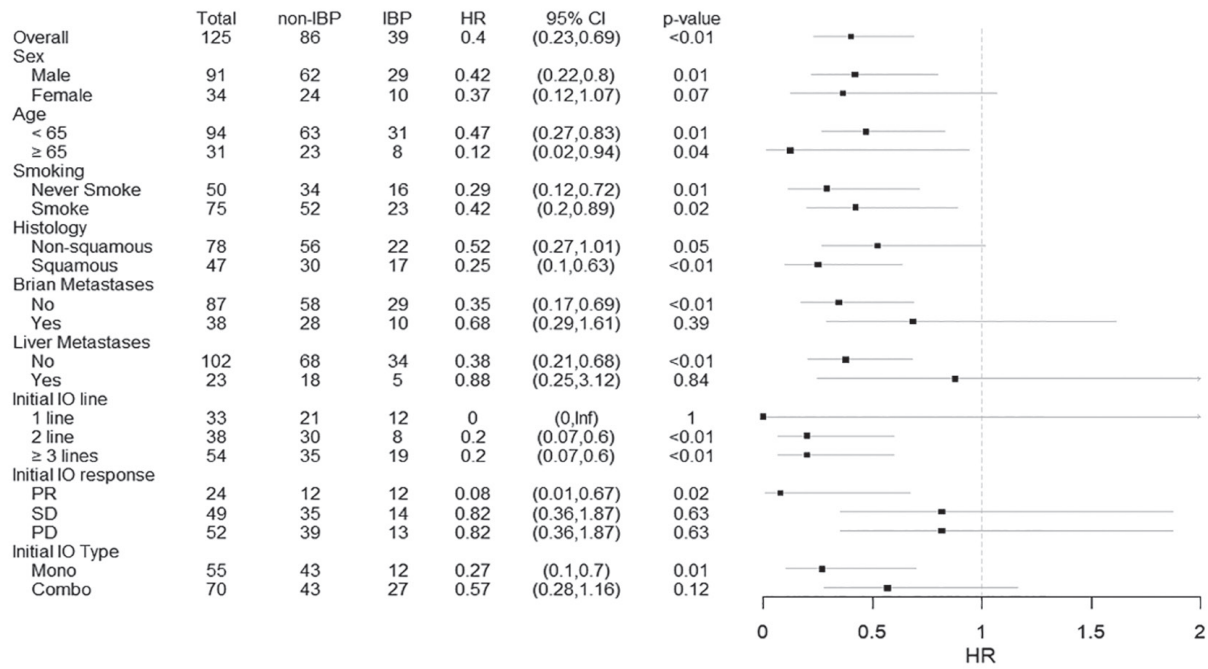
Contin: continuous variable; Binary: binary variable; ECOG PS, Eastern Cooperative Oncology Group Performance Status; PR, partial response; SD, stable disease; PD, progressive disease.

**Table S4** Summary of the baseline characteristics of patients who had non-PR (SD/PD) as their best response to previous line

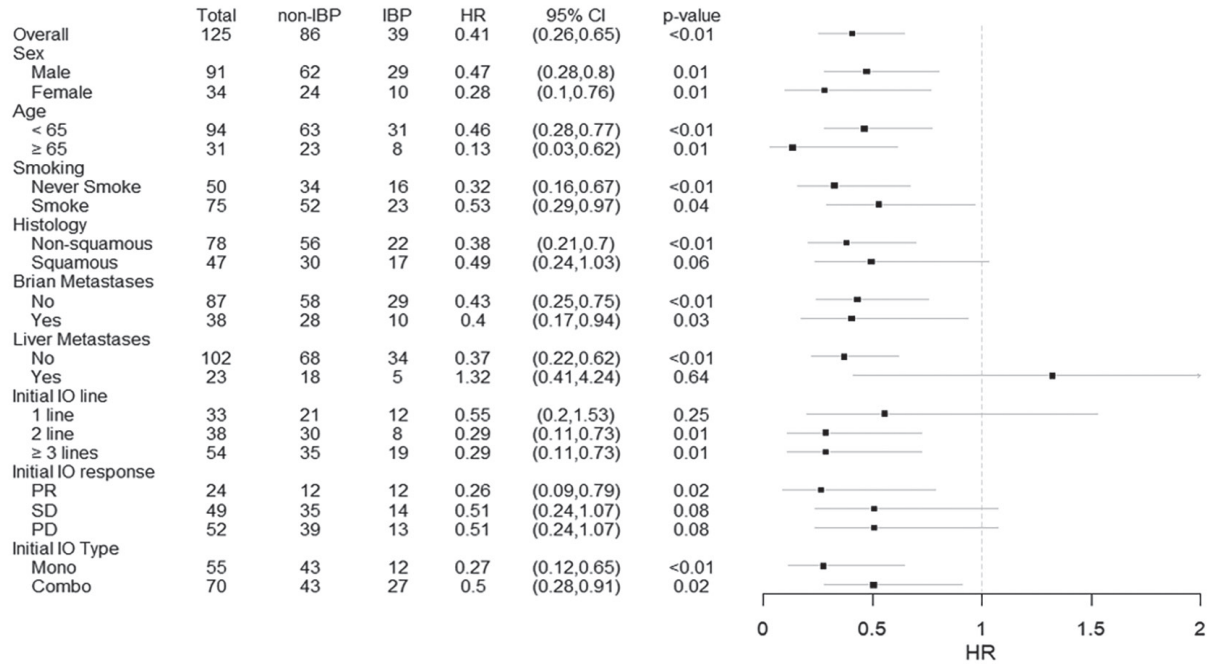
Characteristics	Type	Before balancing		After balancing	
		Standard Mean Diff.	Variance Ratio	Standard Mean Diff.	Variance Ratio
Age	Contin	0.148	1.569	0.032	1.409
Sex					
Male	Binary	-0.048		-0.009	
Female	Binary	0.048		0.009	
Histology					
Squamous	Binary	-0.029		-0.006	
Non-squamous	Binary	0.029		0.006	
Smoking history					
Yes	Binary	-0.022		-0.004	
No	Binary	0.022		0.004	
ECOG PS					
0-1	Binary	-0.115		-0.024	
≥2	Binary	0.115		0.024	
Liver metastases					
Yes	Binary	0.092		0.018	
No	Binary	-0.092		-0.018	
Brain metastases					
Yes	Binary	-0.023		-0.005	
No	Binary	0.023		0.005	
Gene mutation					
Yes	Binary	0.021		0.006	
No	Binary	0.197		0.041	
Unknown	Binary	-0.218		-0.047	
Tumor stages					
IIIB	Binary	0.156		0.032	
IV	Binary	-0.156		-0.032	
Previous lines of therapy					
1	Binary	0.058		0.013	
2	Binary	0.193		0.040	
≥3	Binary	-0.251		-0.053	
Initial immunotherapy regimen					
Monotherapy	Binary	0.194		0.040	
Combination	Binary	-0.194		-0.040	

Contin: continuous variable; Binary: binary variable; ECOG PS, Eastern Cooperative Oncology Group Performance Status; PR, partial response; SD, stable disease; PD, progressive disease.

**A**

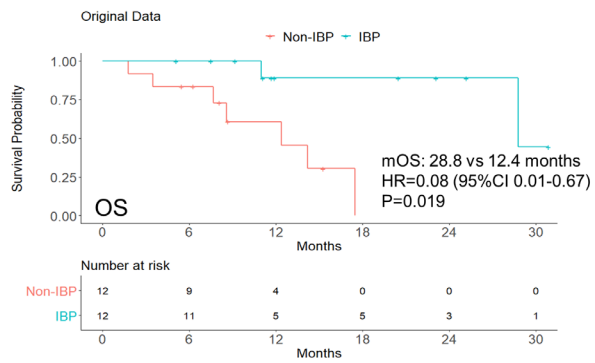


**B**

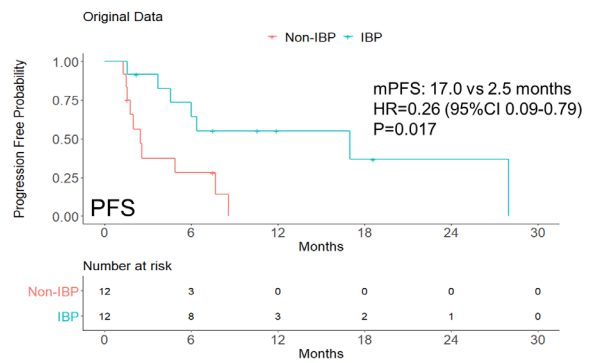


**Figure S1** Forest plots of PFS (A) and OS (B) in the IBP and non-IBP groups.

**A**



**B**



**Figure S2** Kaplan-Meier curves of OS (A) and PFS (B) from original data in the subgroup of patients who had PR as their best response to previous line.