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Real-World Survival Outcomes Following Reimbursed Anti-PD-1 Immunotherapy for Melanoma in Ireland

A Population-Based National Cancer Registry Study

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BACKGROUND

Anti-PD-1 checkpoint inhibitors have transformed melanoma treatment.

Reimbursement decisions are primarily informed by clinical trials conducted in selected populations with limited long-term follow-up.

Population-based real-world evidence is needed to evaluate treatment effectiveness in routine practice and inform post-reimbursement HTA.

OBJECTIVE

To evaluate real-world utilisation patterns, survival outcomes and predictors of mortality among patients in Ireland receiving pembrolizumab or nivolumab.

METHODS

Study design
Retrospective population-based cohort study using NCRI data.

Study population
Adults (≥18 years) diagnosed with melanoma between 2014 and 2023 who received pembrolizumab or nivolumab.

Cohort classification
- Adjuvant Stage IIB/IIC
- Adjuvant Stage III
- Advanced / unresectable disease

Defined using registry stage, surgery and treatment sequencing.

Outcomes and analysis
- Overall survival (OS) (Kaplan–Meier methods)
- Predictors of mortality (multivariable Cox regression)
- Descriptive analyses of treatment utilisation and patient characteristics.

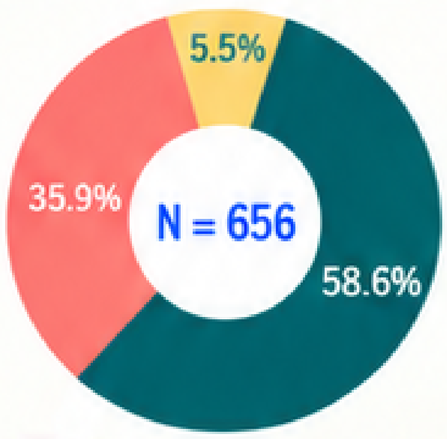
STUDY COHORT AND FOLLOW-UP

N = 656
Adults with melanoma who received anti-PD-1 immunotherapy (2014–2023)

241
deaths during 1,496 person-years of follow-up

4.77 years
Median overall survival (overall cohort)

Patients classified by indication (N = 656)



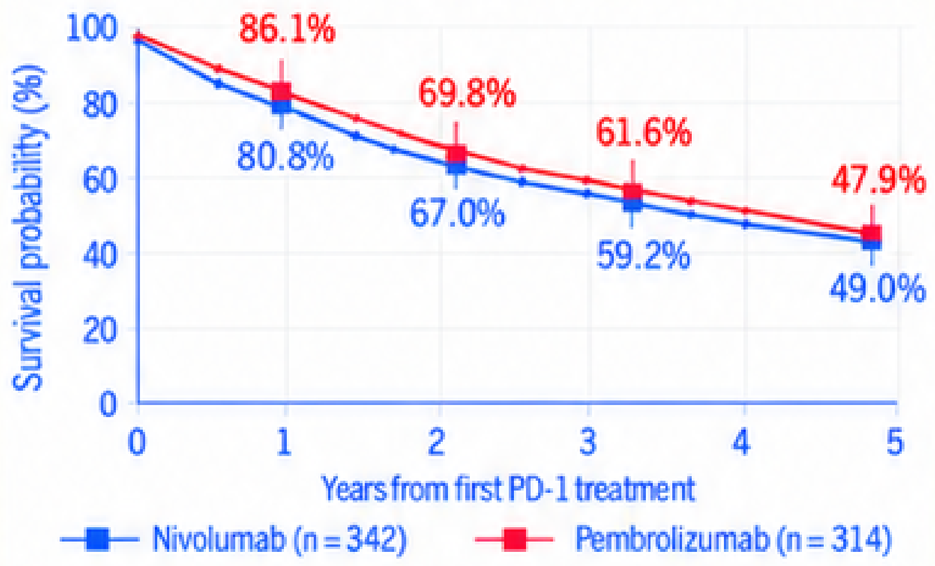
- Adjuvant Stage IIB/IIC: n = 35 (5.5%)
- Adjuvant Stage III: n = 230 (35.9%)
- Advanced / unresectable disease: n = 375 (58.6%)

First anti-PD-1 treatment (N = 656)

Nivolumab n = 342 (52.1%) | Pembrolizumab n = 314 (47.9%)

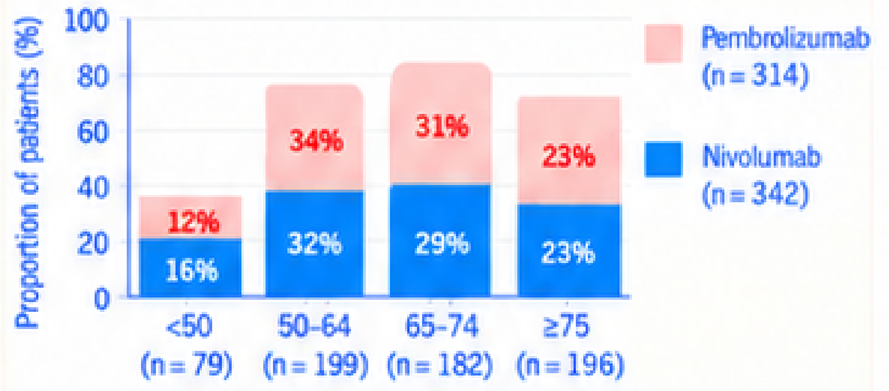
RESULTS

1. Overall survival following first anti-PD-1 treatment

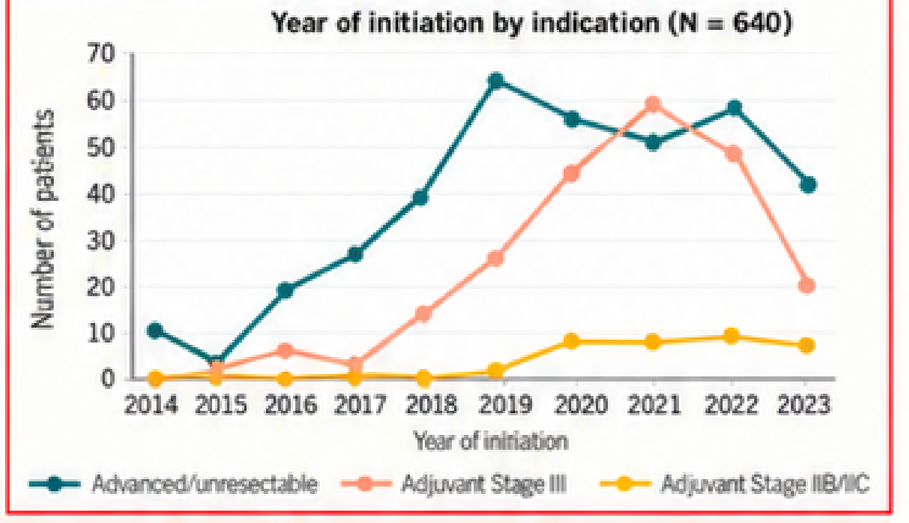


Number at risk	Years from first PD-1 treatment					
	0	1	2	3	4	5
Nivolumab (n = 342)	342	265	206	160	120	90
Pembrolizumab (n = 314)	314	268	220	184	140	104

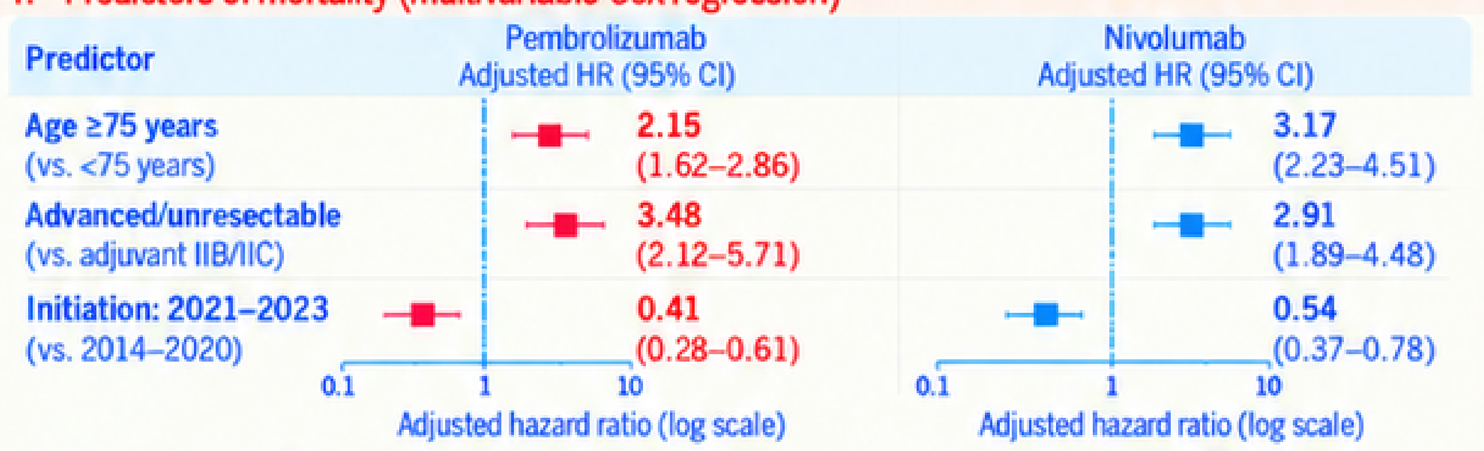
2. Patient characteristics at PD-1 initiation



3. Treatment initiation over time



4. Predictors of mortality (multivariable Cox regression)



Reference categories:
- Age: <75 years
- Indication: adjuvant IIB/IIC
- Initiation: 2014–2020

Adjusted estimates: see model definitions.

CONCLUSIONS

- Real-world survival following anti-PD-1 immunotherapy varied across melanoma treatment indications, reflecting differences in disease stage, baseline prognosis and patient characteristics.
- These findings provide population-based evidence on survival outcomes following reimbursed anti-PD-1 treatment and highlight the potential of national cancer registry data to inform post-reimbursement evaluation and HTA in Ireland.

POLICY IMPLICATIONS

- Provide real-world evidence to inform post-reimbursement evaluations
- Support evidence-based use of immunotherapy in melanoma
- Reduce uncertainty for HTA assessments and reimbursement decisions
- Inform cancer management and resource planning

LIMITATIONS

- Observational design with potential residual confounding.
- Indication classification based on registry stage, surgery and treatment records and may be subject to misclassification.
- Small cohort size for adjuvant Stage IIB/IIC (n = 35), limiting precision of survival estimates.
- Limited information on disease recurrence and subsequent treatments.

Data source: National Cancer Registry Ireland (NCRI)