Supplement 1: Data sources from each participating nation

Data sources

Patient data for both the historic and prospective cohorts will come from various existing and new databases in France, the Netherlands, Portugal and Spain.

France

The QUALITOP cohort from France includes three historic and two prospective databases from Hospices Civils de Lyon (**Table 1**). The historic IMMUCARE ELDERLY cohort focused on clinical outcomes and irAEs after initiating ICI monotherapy or combination therapy between 2007 and 2019, with follow-up until late 2020. Data collected in the IMMUCARE BASE from 2019 in a clinical trial ('A Clinical and Biological Prospective Database of Patients Treated with Anticancer Immunotherapy and Follow-up of Their Immune-related Adverse Events irAE', registered NCT03989323 in clinicaltrial.gov) constitute the second historic cohort. This collected data for approximately 550 patients from the start of ICI treatment, irrespective of cancer type. Since August 2021, the study has included the QUALITOP quality of life questionnaires, demarcating the start of the prospective IMMUCARE BASE QUALITOP cohort. Earlier, in April 2021, the QoLD CART study began the prospective monitoring of HRQoL using the FACT-Lym for patients with diffuse large B-cell lymphoma receiving CAR T-cell therapy. Patients diagnosed with lymphoma who receive CAR T-cell therapy will be invited to a prospective QUALITOP cohort.

The Netherlands

We will include three historic and two prospective databases from the Netherlands. The OncoLifeS data biobank has collected data on clinical well-being and quality of life (assessed by EORTC-QLQ C30) since 2015 for patients with an oncological diagnosis treated in the University Medical Center Groningen.[29] Quality of life is monitored for 2 years after treatment and clinical outcomes are monitored continuously. We extracted additional data on irAEs for a historic cohort of approximately 500 patients with lung cancer who received ICIs and will use the same processes to collect the

prospective data. Amsterdam University Medical Centers will lead the data collection for patients treated with CAR T-cell therapy in the Netherlands from January 2020, using data from the nationwide 'Follow that CAR' biobank initiated by the Dutch National CAR-T Tumor Board. This biobank has prospectively monitored clinical outcomes and quality of life, using the FACT-Lym, for patients with diffuse large B-cell lymphoma treated with CAR T-cell therapy. The historic cohort comprises approximately 40 patients, and the same process will be used to collect the prospective data. Lastly, the eQuiPe study collected data on quality of life for patients with advanced cancers in the Netherlands and is linked to the Netherlands Cancer Registry. The data from this study are included as a historic cohort.

Portugal

The Instituto Português de Oncologia in Lisboa invited patients diagnosed with lymphoma treated with CAR T-cell therapy or ICIs to participate in the prospective QUALITOP cohort from the end of 2021 onwards. No historical patient data are available.

Spain

The Hospital Clinic of Barcelona has asked patients treated for melanoma to consent to the inclusion of their data in the "Xarxa de Melanoma de Catalunya" database since 2016. This database allows participating centres to investigate phenotypic, genetic and disease evolution in patients, using biomaterials, including DNA, stored in the "Colecció de la Unitat de melanoma" (IDIBAPS registry code: R120904-090, National ISCIII registry code: C.0000334). Since January 2020, they have collected data on clinical well-being and quality of life (assessed by EORTC-QLQ C30) for patients with melanoma treated with ICIs. We have included approximately 50 patients in a historical melanoma cohort and will use the same process for the prospective data collection.

Supplement 2: Overview of collected clinical data

All clinical data is manually extracted from patients electronic medical records. Data collected include, but are not limited to, the examples provided.

Domain	Examples
Baseline	
Patient demographics	Sex, month and year of birth, height
Cancer diagnosis	Cancer type (ICD-10), date of diagnosis, current stage (TNM/Lugano)
Past and current cancer treatment	Type of treatment (surgery, chemotherapy, targeted therapy, immunotherapy, radiotherapy), treatment line, start date, stop date, treatment medication, medication dose, number of cycles, best response, early treatment termination, reason for early treatment termination
Medical History	Relevant medical history (ICD-10) (e.g. cardiovascular diseases, neurological diseases, pulmonary diseases, diabetes, renal diseases, malignancies, auto-immune diseases), start date, end date
Current medication	medication type (according to Drug Ontology (DrOn), start date
Continuous monitoring	
Clinical examination	Date of examination, weight, temperature, heart rate, systolic blood pressure, diastolic blood pressure, oxygen saturation, respiratory rate, ECOG performance status, response to treatment (RECIST/Lugano)
Blood analyses	Date of examination, CRP, glucose, creatinine, troponine, ASAT, ALAT, LDH, albumin, protein, sodium, potassium, leucocytes, erythrocytes, thrombocytes, neutrophils, eosinophils, lymphocytes, haemoglobin, TSH, FT4, cortisol
Adverse events	Adverse event type (CTCAE), adverse event grade (CTCAE), start date, end date, treatment