Modelling Response
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Model Structures Incorporating Response

1. Partitioned Survival Analysis
   A. Modified With Response
   B. With Landmark Analysis
2. Time-to-Event
Disease pathway

Partitioned Survival Analysis: Classic

- Most common modeling technique in oncology
- Well received by HTAs and clinicians and easy and quick to implement
- Based on the historically most common clinical trial outcomes: OS and PFS

Underlying assumptions:
- Costs, utilities and survival depend on progression status
- Treatment costs often external to structure with time-to-treatment discontinuation curves.
Disease pathway very limited with partition SA

1A. Partitioned Survival Analysis: With Response

- Accepted structure with the use of response
- Can be extrapolated
- Data are often available
- Treatment costs often external to structure
Example of Data for Modified Partitioned SA

Nivolumab versus docetaxel in advanced sqNSCLC

Disease pathway still limited with response
1B. Partitioned Survival Analysis with Landmark Analysis

Partitioned Survival Analysis with Landmark Analysis

**Advantages**
- Allows modelling survival according to response
- Might be easier to fit survival, if it follows simpler patterns conditional on response
- Still simple and easy to understand
- Better clinical validity
- Keeps the partitioned survival structure

**Disadvantages**
- Choice of landmark point is subjective
- Results of clinical trials are rarely published in this format
- Due to fewer events, extrapolation of OS after response can be even more uncertain
- Potential for bias: patients surviving until landmark point can differ between responders and non-responders
Landmark analysis further extends pathway

2. Time to Event Model – Full pathway

Other events can be in the model:
- Infusion
- Dose change, interruption
- Lose of response
- Crossover
- Switch to next treatment line
- Monitoring
- Adverse events
Can be combined with previous types
TTE can model the full disease pathway