## Statistical modelling of EQ-5D

### Data description

The extracted data

There are two variants of data due to different source of value sets used: original set and UK set. The original set used the EQ-5D values

### Exploratory analysis

In conclusion, as we specified above, the level of QALY loss is not significantly time-dependent conditioning on those have not recovered yet. In another way, the length of unwellness status does not affect the value of QALY loss as well. Therefore, we can modelled the behaviour of recovery and QALY loss separately.

The h

### Time-to-recovery model

### Health-related quality of life model

Time-to-recovery

For the time-to-recovery, s the measurements were not continuous, we cannot track the actual timing for patients getting recovered. In this stage we used the

Restricted to those not recovered yet, there are three clear clusters in the QALY values. We labelled them as Z: temporary well off, L: light situation, and S: severe situation.

### Results

Simulations based on the model

Difference between data and simulation

Assess by KL-divergence

## Regression modelling of EQ-5D in time and by age

Several regression models were fitted to the EQ-5D transformed index scores to assess EQ-5D progression in number of days elapsed since rash onset (see Table A3). These included models with and without age as a continuous covariate, including different functional structures to explain the relationship between EQ-5D and age, such as linear and second deferent polynomial terms. Models with and without different types of random effects (random intercept and random slope) and levels (patient and patient cohort) and which explored different polynomial and spline structures for time since rash onset were considered. Time since rash onset was rescaled (from days to years) to fit random effect models in order to avoid convergence problems relating to large differences between the scales of this and the outcome variable (EQ-5D scores).

The interaction between time and age was also explored, because older patients may recover more slowly than relatively young patients.

In the models including random effects, more complicate structures were considered in order to fit the fixed effects of EQ-5D index scores in time, including splines with 1-8 inner knots, which determines the complexity of spline functions.

The number of inner knots was chosen according to the AIC scores. This method divids the variable of interest (in this case the time since rash onset in years) into quantiles. Therefore, the inner knots for the best fitting mode

Model objectives

In this stage, we modelled the

Data preparation

The EQ-5D scores were mapped linearly to [0.3, 0.7].

**Basic assumptions**

**Model ranges**

Model selection

Summary of modelling process