Appendix D: Utility Functions, Adjustment Costs and The Status Quo term

The modelling approach requires separation of the utility gain from a year without FHS and the adjustment costs associated with a person's FHS being removed and then returning.

Formally, the utility (for example, the improvement in welfare or happiness) obtained from removing the condition is given by:

(1.) U= Adj + V(T) – ? COST

where:

- Adj is the adjustment cost in utility terms
- V(T) is the utility gain from removing the condition for a period of T years
- COST is the monetary payment required to remove the condition and ? is the utility change associated with that payment (the marginal utility of money).

V(T) may be linear in T, or one could expect a declining marginal function if respondents discount future benefits, or even an increasing function if, absent adjustment costs, they have an increasing marginal value for longer periods of relief. This can be determined empirically from analysis of the DCE data.

The adjustment cost term, Adj, can be estimated as the Alternative Specific Coefficient (ASC) associated with taking the treatment i.e. an effect that is independent of length of treatment.

The derivation of the WTP associated with a year's removal of the FHS condition is given by:

(2.)

If V(T) is linear in t then it means the same value is applied for a year, irrespective of the length of treatment. If V(T) is nonlinear then the marginal value of an additional year will vary according to the year (T) in which it is evaluated.

For the COI model, the appropriate value is evaluated at T=1, that is, the current year.

For example, if the value of year without the FHS condition is a quadratic function of time of the form:

(3.) V(T) = aT+ bT2

then the value of an additional year of not having the condition is given by

(4.) a + 2bT

For the CoI model the appropriate value for the marginal utility associated with avoiding a year in the condition is given by a+2b, and the equivalent value in monetary terms

(5.) (a+2b)/ ?.

It is possible to identify an equivalent monetary value associated with the adjustment cost for example, Adj/ ?.

As discussed in the report, the context being evaluated determines whether the WTP to move away from the SQ should be included in the calculation of the WTP for time without one's FHS.

This monetary value (WTP for SQ) should not be included in the COI model, as it represents the value that is associated with a change in condition, whereas the COI model is concerned with costs of ongoing conditions. If, in contrast, one was interested in evaluating the market potential for a treatment that did indeed deliver relief from the FHS then this additional value should be included in the analysis, as it will modify the WTP value to transition from having, to not having, the condition.

For the COI model it is the economic value associated with the ongoing pain, suffering, inconvenience and cost that is relevant.