**Appendix 1**

1. **First we will prove that using the two step approach u will never result in a value greater than 1.**

As $p$ is a probability, it is always $0<p<1$, consequently $0<1-p<1$.

On the other hand, $1-w$ represents the mean utility value for those people not in perfect health, therefore, necessarily $1-w<1.$

If we multiply $1-w<1 $with a positive value on both sides we get

$$\left(1-p\right)∙\left(1-w\right)<\left(1-p\right) $$

At the same time, summing a positive value in both sides to this formula, we obtain

$$u=p∙1+\left(1-p\right)∙\left(1-w\right)<p+\left(1-p\right)=1$$

1. **In addition, it is possible to obtain negative mean utility values using this approach.**

Let $\left(1-w\right)<0$, as $1-w$ represents the mean utility value for those people not in perfect health asthat is a possible case.

If we multiply $1-w<0 $with a positive value $1-p>0$,

$$\left(1-p\right)∙\left(1-w\right)<0$$

Therefore, when we sum a positive value on both sides, we obtain

$$p+\left(1-p\right)∙\left(1-w\right)<p$$

That means that in those cases when $\left(1-w\right)<\frac{-p}{1-p} $ we will find that

$$u= p+\left(1-p\right)∙\left(1-w\right)< p+\left(1-p\right)∙\frac{-p}{1-p}<p-p=0$$