Table 1: Steps Involved in Calculating Years of Life Lost (YLL) Due to Obesity

Step	Example 1	Example 2
1. Using NHANES III data, we divided body mass index (BMI: kg/m^2) in to k meaningful ordered non-overlapping categories. We used the following categories: < 17; integer-defined categories from 17 until 45, and > 45.	40 year old white male with a BMI of 35 kg/m^2 (i=20, j=40)	25 year old African American female with a BMI of 40 kg/m^2 (i=25, j=25)
2. Using the NHANES-III data and a non-parametric sliding-window smoothing procedure (described in the text), we estimated the values of $\hat{p}_{i,j}$ which represents the estimated probability of being in the ith BMI category at the jth age for i = 1 to k and for j = 18 to 85.	$\hat{p}_{i,j}$ = 0.01283	$\hat{p}_{i,j}$ = 0.00826
3. Also using the NHANES-III data, we estimated the mean BMI within each BMI category. Denote the estimates, $\hat{m}_i$.	$\hat{m}_i$ = -100/35.40 = -2.82461	$\hat{m}_i$ = -100/40.43 = -2.47326
4. Using the combined NHANES-I and NHANES-II follow-up data, we ran a Cox regression with mortality as the outcome. As covariates, we used BMI, BMI^2, age, age^2, and their interaction terms. Using the resulting equation, we calculated the estimated hazard ratios for each BMI category at each integer-defined age interval by substituting the $\hat{m}_i$ for BMI in the equation and the midpoint of the age interval (e.g., 18.5 for 18 to 19 year olds) for age in the equation. We denoted the estimated hazard ratio for the ith BMI category at the jth age by $\hat{l}_{i,j}$.	$\hat{l}_{i,j}$ =exp(-0.01394*Age -0.000005*Age^2 +4.803759*BMI +0.5798*BMI^2 -0.05418*BMI*Age -0.00652*BMI^2*Age) =exp(-0.01394*40.5 -0.000005*40.5^2 +4.803759*(-2.82461) +0.5798*(-2.82461)^2 -0.05418*(-2.82461)*40.5 -0.00652*(-2.82461)^2*40.5) =0.00441	$\hat{l}_{i,j}$ =exp(-0.07699*Age +0.000474*Age^2 +4.082842*BMI +0.471665*BMI^2 -0.04584*BMI*Age -0.00486*BMI^2*Age) =exp(-0.07699*25.5 +0.000474*25.5^2 +4.082842*(-2.47326) +0.471665*(-2.47326)^2 -0.04584*(-2.47326)*25.5 -0.00486*(-2.47326)^2*25.5) =0.00119
5. For each integer defined age interval, we obtained an estimate of the total probability of death within the interval conditional upon having lived to the start of that interval. We obtained these values from life table for the total population of the United States in 1999 published by the CDC, and denoted them $\hat{g}_j$ for the jth age interval. For example, $\hat{g}_{18}$ is the estimated probability of dying before age 19	$\hat{g}_j$ = 0.00233	$\hat{g}_j$ = 0.00090

given that one has survived until age 18.		
6. For each integer defined age interval, we obtained an estimate of the probability of death within the interval conditional upon having lived to the start of that interval and *being in the first* BMI *category* as $\hat{g}_{1,j} = \frac{\hat{g}_j \hat{l}_{1,j}}{\sum_{i=1}^{k} \left(\hat{p}_{i,j} \hat{l}_{i,j} \right)}$.	$\hat{g}_{1,j} = \frac{\hat{g}_j \hat{l}_{1,j}}{\sum_{i=1}^{k} \left(\hat{p}_{i,j} \hat{l}_{i,j} \right)}$ =(0.00233*0.00882)/0.00319 =0.00645	$\hat{g}_{1,j} = \frac{\hat{g}_j \hat{l}_{1,j}}{\sum_{i=1}^{k} \left(\hat{p}_{i,j} \hat{l}_{i,j} \right)}$ =(0.00090*0.00181)/0.00062 =0.00264
7. For each integer defined age interval, we obtained an estimate of the probability of death within the interval conditional upon having lived to the start of that interval and *being in the ith* BMI *category* as $\hat{g}_{i,j} = \hat{g}_{1,j} \left(\frac{\hat{l}_{i,j}}{\hat{l}_{1,j}} \right)$.	$\hat{g}_{i,j} = \hat{g}_{1,j} \left(\frac{\hat{l}_{i,j}}{\hat{l}_{1,j}} \right)$ =0.00645*(0.00441/0.00882) =0.00323	$\hat{g}_{i,j} = \hat{g}_{1,j} \left(\frac{\hat{l}_{i,j}}{\hat{l}_{1,j}} \right)$ =0.00264*(0.00119/0.00181) =0.00174
8. For a person of age *s* in the ith BMI category, we estimated their expected age of death (defined as the median age of death for a person with their starting age and BMI) as $\hat{h}_{i,s}$ is defined as the minimum integer value of *m* satisfying the following inequality: $0.5 \geq \prod_{j=s}^{m} \left(1 - \hat{g}_{i,j} \right)$.	$\hat{h}_{i,s}$ = 77	$\hat{h}_{i,s}$ = 79
9. The years of life lost for a person of age *s* in the ith BMI category relative to being gth category can then be denoted $\hat{d}_{i-g,s} \equiv \hat{h}_{g,s} - \hat{h}_{i,s}$.	$\hat{d}_{i-g,s} \equiv \hat{h}_{g,s} - \hat{h}_{i,s}$ 80-77= 3 YLL (referent BMI of 24)	$\hat{d}_{i-g,s} \equiv \hat{h}_{g,s} - \hat{h}_{i,s}$ 80-79= 1 YLL (referent BMI of 24)