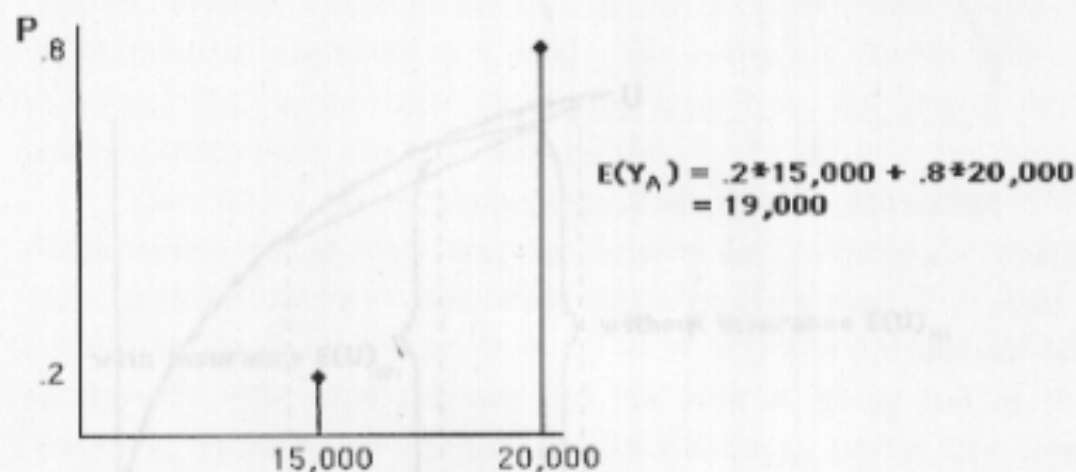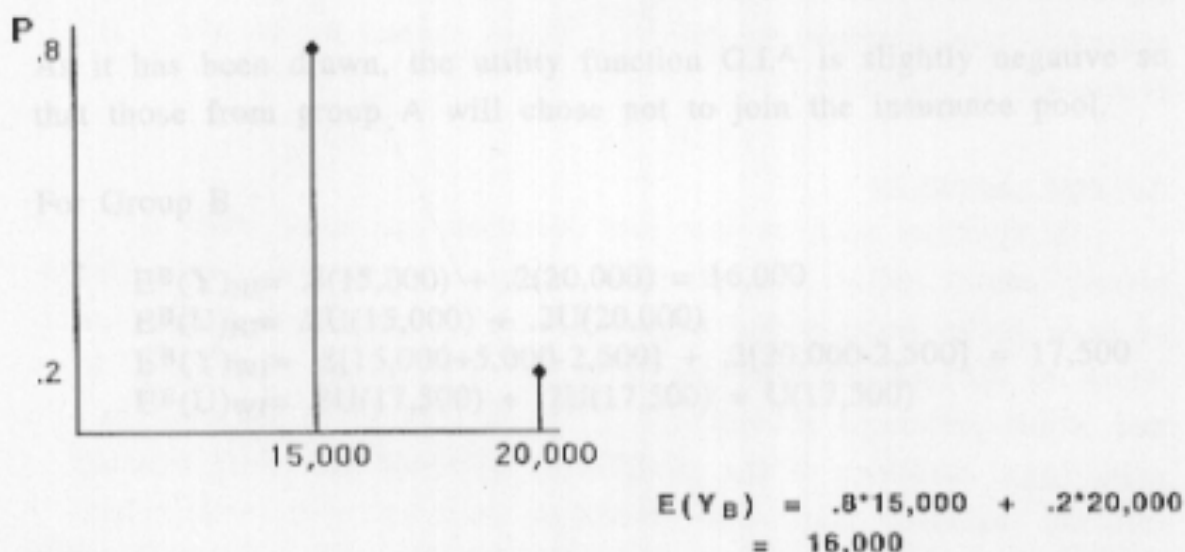## Differential Risk

Suppose there are distinct groups in the population having different risk of illness.

Group A $p^A(ill) = .2$ $p^A(not\ ill) = .8$

$$E(Y_A) = .2*15,000 + .8*20,000$$
$$= 19,000$$

Group B $p^B(ill) = .8$ $p^B(not\ ill) = .2$

$$E(Y_B) = .8*15,000 + .2*20,000$$
$$= 16,000$$

Note that if the two groups are of equal size and they are combined
$p^{A+B}(ill) = .5*p^A(ill) + .5*p^B(ill) = .5*.2 + .5*.8 = .5$ and
$p^{A+B}(not\ ill) = .5*p^A(not\ ill) + .5*p^B(not\ ill) = .5*.8 + .5*.2 = .5$