# Filling in the ILT in Excel

# Age

**Questions:**

What is the age range?

What age do we start at?

# Mortality - p65+t andq65+t

**Questions:**

What is the starting mortality?

How do we move from one year to the next?

How does force of mortality come into play here?

## Some initial values:

In cell D5, enter “**=10/1000**” because of the assumption of 10 lives per thousand at age 65. In cell E5, enter “**=1-D5**” because the probability of survivingfrom age 65 to age 66 is the complement of dying between those ages.

## Using force of mortality

We assume that the rate of mortality, μ, increases by 10% every year.

Assuming a constant force of mortality over the year:

px = =

px+1 = e-1.1μ = px1.1

Therefore, in cell E6, enter “**=E5^1.1**”. Select cells E6:E61 and use the *Fill Down* command (CTRL + d).

In cell D6, enter “**=1-E6**” because the probability of dying between ages 66 and 67 is the complement of surviving during that time.

Select cells D6:D61 and use the *Fill Down* command.

# Mortality - tp65

**Questions:**

How can we get tp65 from p65+t?

In cell F5, enter “**1**” because the probability of surviving from age 65 to 65, given that the participant is already 65 is 1.

In cell F6, enter “**=E5**” because p65 is equal to 1p65.

In cell F7, enter “**=F6\*E6**” because t+sp65=tp65\*sp65+t.

Select cells F7:F61 and use the *Fill Down* command.

# Number of lives – l65+t

**Questions:**

What is the relationship between l65+t and tp65?

In cell G5, enter “**=60000000/100000**”. $60 million is from the case study and represents the sum of all participant contributions at age 65. 100 thousand indicates the average deposit per participant. The quotient of the two provides the number of initial participants.

In cell G6, enter “**=G$5\*F6**” because lx+t=lx\*tpx. Select cells G6:G61 and use the *Fill Down* command. The ‘$’ symbol locks the column or row of a particular cell when using ‘Fill’ functions.