**STUDENT NAME**

**COLLEGE NUMBER**

**DATE**

**Question 7**

**Solution using the indirect standard method:**

**Scenario:**

Suppose we would like to determine mortality rate of American blacks over the general American population. We use:

* Black Americans – standard population
* American population – study population

The first step is to garner data using the CRUD rates per age for the black American population

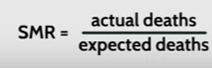
|  |  |
| --- | --- |
| Age | Corona deaths per 1000 pop |
| 0-24 | 0.1 |
| 25-54 | 0.4 |
| 55-74 | 2.2 |
| 75+ | 7.1 |

As can be seen, the corona deaths are higher in black Americans who are above the age of 55.

The next step is to find the expected deaths in the study population

|  |  |  |  |
| --- | --- | --- | --- |
| Age | Corona deaths per 1000 | People identifying as “black” | Expected deaths |
| 0-24 | 0.1 | 15.4 M | 1,540 |
| 25-54 | 0.4 | 16.2 M | 6,488 |
| 55-74 | 2.2 | 5.9 M | 12,996 |
| 75+ | 7.1 | 1.4 M | 10,533 |

Then using the standardised mortality ratio (SMR) which is calculated as:



So in this case, we take our exacted death count as:

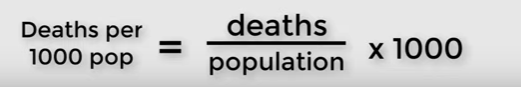
**65,000/31,558** and the answer is **2.06**. So by answering the question, yes, American blacks have a higher mortality rate 2.06 times the general American population.

**Question 8**

**Solution using the direct standardisation method:**

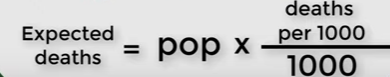
Scenario:

Here we evaluate the larger population based on the values obtained from the sub population of study. We look at Covid 19 death rates in a small province called Kerala and compare it to the general Indian population. Asssuming Karala crud deaths is at 2.2 and India at 1.We then determine the deaths per 1,000 population using the below formula:



|  |  |  |  |
| --- | --- | --- | --- |
| Age | Population | deaths | Corona deaths per 1,000 |
| 0-24 | 9.9 m | 1,034 | 0.1 |
| 25-54 | 13.8 m | 16,554 | 1.2 |
| 55-74 | 7.9 m | 28,263 | 3.6 |
| 75+ | 3.2 m | 30,944 | 9.6 |

Now, given the crud rates we have worked from above, we can use these rates to calculate the expected deaths in the whole Indian population: We do this using the formular as:



|  |  |  |  |
| --- | --- | --- | --- |
| Age | Corona deaths per 1,000 | Population | Expected deaths |
| 0-24 | 0.1 | 611m | 61,100 |
| 25-54 | 1.2 | 562m | 674,400 |
| 55-74 | 3.6 | 165 m | 594,000 |
| 75+ | 9.6 | 28m | 268,800 |

The final step is to get the age standardised mortality rate using the below formula:



Whih gives us 1.2. If initillay Kerala crude rate was at 2.2 and now with direct standardization, it turns out that the death rate is even lower both for Kerala and the overall indian population.

Crude rates: