|  |  |  |  |
| --- | --- | --- | --- |
| **Result/treatment** | **Ok** | **Ill** | **Sum** |
| **Med** | X=3 | Y=1 | **4** |
| **Plac** | Z=3 | Q=1 | **4** |
| **Sum** | **6** | **2** | **8** |

a)

Since P(improved/plac) is 3 out of 4 which means 3 are ok and 1 is ill.

So z=3 and q=1.

Now in ill column, since q=1 and sum = 2, so y=1;

Now in med row, since y=1 and sum =4, so x=3.

Yes the independence is true and it is wanted to find out the other values.

We have assumed the null hypothesis that independence holds true and the probability we get is

P(x1.1| 6,24,4)= (4C3)\*(4C3)/(8C6)= (6! \* 2! \* 4! \* 4!)/(8! \* 3! \* 1! \* 3! \* 1!)= 4/7= 0.57

Since 0.57 is too high to be neglected we accept the null hypothesis that independence holds true.

b)

|  |  |  |  |
| --- | --- | --- | --- |
| **Result/treatment** | **Ok** | **Ill** | **Sum** |
| **Med** | X=2 | Y=2 | **4** |
| **Plac** | Z=4 | Q=0 | **4** |
| **Sum** | **6** | **2** | **8** |

P(x1,1| 6,2,4,4)=(6! \* 2! \* 4! \* 4!)/(8! \* 2! \* 2! \* 4! \* 0! ) = 0.21

|  |  |  |  |
| --- | --- | --- | --- |
| **Result/treatment** | **Ok** | **Ill** | **Sum** |
| **Med** | X=3 | Y=1 | **4** |
| **Plac** | Z=3 | Q=1 | **4** |
| **Sum** | **6** | **2** | **8** |

P(x1.1|6,2,4,4)=(6!\*2!\*4!\*4!)/(8!\*3!\*1!\*3!\*1!)=0.57

|  |  |  |  |
| --- | --- | --- | --- |
| **Result/treatment** | **Ok** | **Ill** | **Sum** |
| **Med** | X=4 | Y=0 | **4** |
| **Plac** | Z=2 | Q=2 | **4** |
| **Sum** | **6** | **2** | **8** |

P(x1.1|6,2,4,4)=(6! 2! 4! 4!)/(8! 4! 0! 2! 2!)= 0.21

Sum= 0.21+0.57+0.21= 0.99 (approx. 1)