For the surveillance of COVID-19 in waste water, we can define a unique data processing that will provide us with maximum confidence to find out a sharp design of our projected goal.

We can take clinical infection rate of COVID-19 in a local region, then we can construct a defined ratio, proportional to SARS-CoV-2 genetic material found within the total viral concentration of appropriate wastewater sample size of that specific region.

The following mathematical processing may be considered as a preliminary reflection of the context.

Let,

Clinical infection rate (%) = R_1

Viral exposure rate (%) = R_2

$$R_2 = \frac{Covid{-}19\ concentration}{total\ viral\ concentration} \times 100$$

Surveillance ratio = C

$C = R_1 : R_2$

$C \neq 0$

if C > 1; infection decreasing*
if C < 1; infection on the go*
[*other conditions can be assumed theoretically]

Sample	R_1	R_2	C
Day 1			
Day 2			
Day 3			
Day 4			
Day 5			

Here we have defined a **computational ratio** (C) that is dependent on our scheduled sampling of a specific region. So, the value of C should be predisposed on the regular environmental factors & other biochemical parameters. We have set a conditional value of C that will indicate the speculative status of disease emergence within the target location.

We have set two conditional values of C.

For C > 1, we can conclude that infection rate within the population will be decreasing by time. Thus continuous surveillance may be a great alternative to determine the public health risks for the ongoing pandemic.

For C < 1, we can conclude that the infection rate is going on the line. The more the value of C tends toward 0, the more the degree of emergence increases.

So for the value of C, there will be an optimal value ($\mathbf{C_K}$) based on public health initiatives by which we can say that the emergence of the disease is in a stationary phase.

Here we can set a decisive expression for the value of C.

For this we can setup an **emergence scale** with C value by which we can determine the public health disasters & up to date status of the viral genetic material in the wastewater as well as our targeted population.

To setup an emergence scale, we have to compare each individual data in accordance with the environmental factors that impair the viral exposure rate (R_2).

So R_2 is dependent on various factors such as temperature, pH, humidity etc. We also should check the presence of antiviral drugs in the wastewater & community as well.

For each comparison of R_2 value with the environmental factors, we can determine the survival rate of viral particles in different environmental conditions.

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