



Sharjah American  
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# THE EFFECIENCY OF THE CORONAVIRUS VACCINES (COVID-19)

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## ABSTRACT

The COVID antibodies albeit popular, were made cautiously and gradually to guarantee that it is protected and compelling for battling the worldwide pandemic.

Immunization creation is certainly not a quick and simple cycle, there are a few phases and a various number of tests required, and after it is made, dosages for everyone on the planet should be made also.

## INTRODUCTION

After an outbreak of the Corona Virus (Covid-19), we can all agree that our lives have changed drastically. After the outbreak in December 2019 in China, life all around the world has been limited to face masks and social distancing.

The COVID vaccines although in high demand, were made very carefully and slowly to ensure that it is safe and effective for fighting the global pandemic.

Vaccine creation is not a fast and easy process, there are several stages and a numerous number of tests needed, and after it is created, doses for every person in the world must be made as well.

To put this into perspective, previous vaccines for other plagues took more than just a few years, the previous record holder for fastest vaccine made was the mumps vaccine, and that took 4 years! On average a vaccine takes 10 to 15 years to make.



## METHODS AND MATERIALS

### PHASE I:

- about 100 people are tested for the initial safety check of the candidate vaccine.
- tests done in the same country the candidate vaccine was developed.
- tests are first done on adults, and if that goes well, they slowly progress to young adults, children, and elders.

### PHASE II:

- contains two parts:
  - part(a): indicates that exposure to plague was through experimental challenge.
  - part(b): indicates exposure was under an area plagued with the current virus.
- if part(a) results were effective, then the testers proceed to part(b), however, if part(a) was ineffective, then that vaccine must be completely abandoned.

### PHASE III:

- has the same purpose as part(b), but with a much larger sample.
- test subjects are mostly infants randomly selected in targeted areas, or one final target area depending on the situation.

### PHASE IV:

- after a vaccine has been licensed, national authorities will monitor the spread of the vaccine and keep a close eye.
- it is then up to the national authorities to evaluate whether the long-term effects and rare occurrences due to the vaccine are cost-effective and the best option country-wide.

## RESULTS

The value of the correlation coefficient:

$$r = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sqrt{\sum(x - \bar{x})^2 \sum(y - \bar{y})^2}}$$
$$r = \frac{181889725}{\sqrt{1957802.9 \times 24314748018}} = 0.8337$$

The correlation coefficient of 0.8337 indicates that there is a strong positive linear relationship between the worldwide coronavirus cases and the cases in the UAE alone.

The value of the coefficient of determination:

$$r^2 = 0.695$$

A coefficient of determination of 0.695 indicates that, 69.5% of the variability in the coronavirus cases worldwide can be explained by the linear relationship between the worldwide cases and the UAE cases.

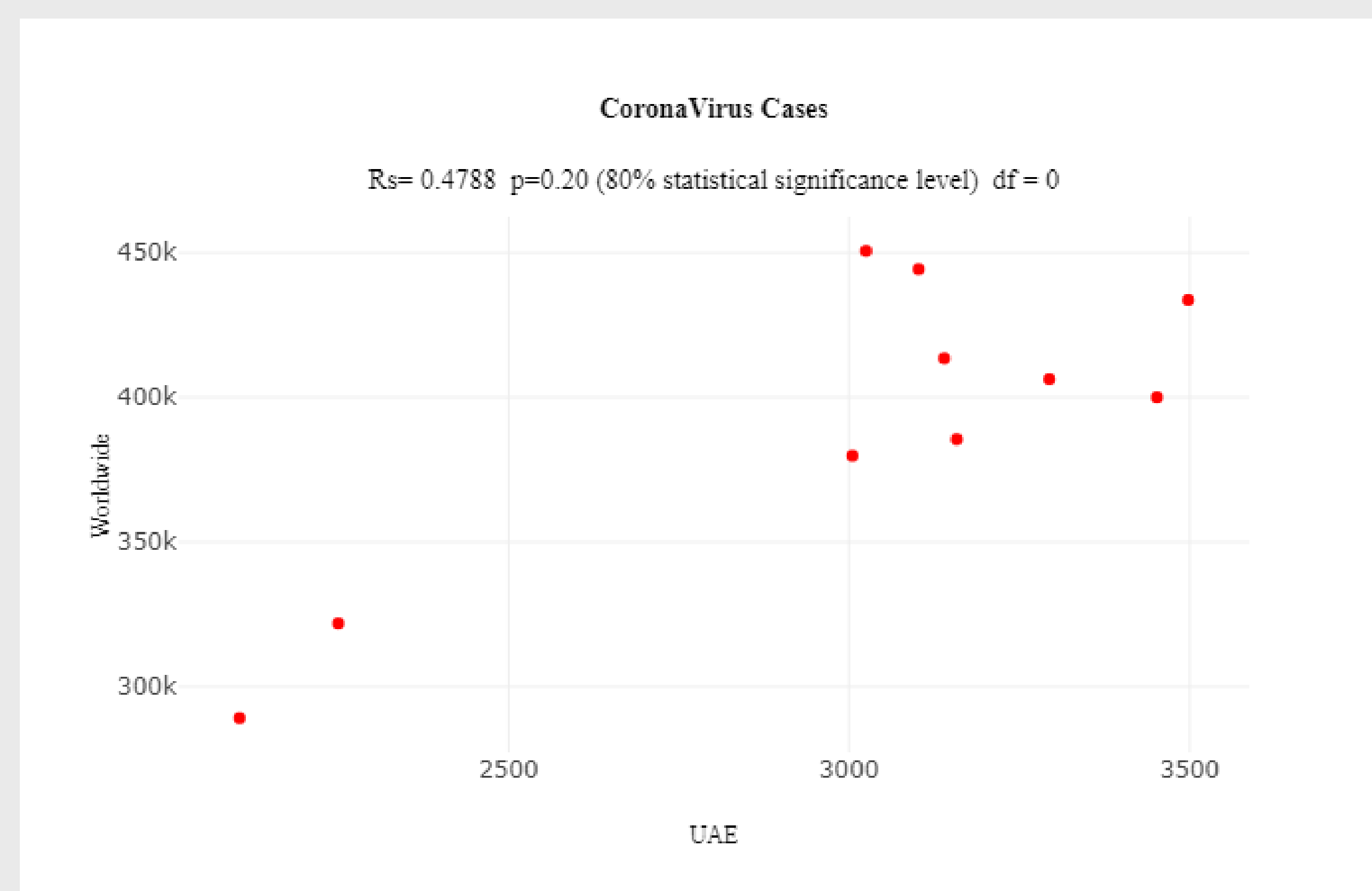
The equation of the regression line:

$$\hat{y} = 92.90502x + 113457.50406$$

The regression line would help us predict the number of cases world wide knowing the number of cases in the UAE within the range of x values we have to avoid extrapolation.

Worldwide (Y)	UAE (X)
399,987	3452
406235	3294
413,460	3140
385448	3158
321,817	2250
289,174	2105
379796	3005
444295	3102
450573	3025
433635	3498

$x - \bar{x}$	$y - \bar{y}$	$(x - \bar{x})^2$	$(x - \bar{x})(y - \bar{y})$
449.1	7545	201690.81	3388459.5
291.1	13793	84739.21	4015142.3
137.1	21018	18796.41	2881567.8
155.1	-6994	24056.01	-1084769.4
-752.9	-70625	566858.41	53173562.5
-897.9	-103268	806224.41	92724337.2
2.1	-12646	4.41	-26556.6
99.1	51853	9820.81	5138632.3
22.1	58131	488.41	1284695.1
495.1	41193	245124.01	20394654.3
$\bar{x} = 3002.9$	$\bar{y} = 392442$	Sum of square: 1957802.9	Sum of square: 181889725



## DISCUSSION

“When experts optimistically say that they expect a Covid-19 vaccine by the end of 2020, they’re talking about an emergency use authorized vaccine, not a fully-approved one,” says Dr. Seema Yasmin, director of the Stanford Health Communication Initiative.

**The first person to receive the Pfizer vaccine was 91-year-old Margaret Keenan.**



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