

# Masks Quiz

<https://twitter.com/nntaleb/status/1270715896294633472>

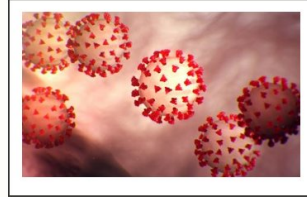
Springfield-Greene County Health Department News Releases

Posted on: June 8, 2020

## June 8, 2020 - Incubation period closes: no clients contract COVID-19 from salon exposure

The Springfield-Greene County Health Department is encouraged to report that the incubation period has passed from those potentially exposed from Great Clips. No clients of either stylist nor additional coworkers contracted COVID-19 as a result.

"This is exciting news about the value of masking to prevent COVID-19," said Director of Health Clay Goddard. "We are studying more closely the details of these exposures, including what types of face coverings were worn and what other precautions were taken to lead to this encouraging result. We never want an exposure like this to happen, but this situation will greatly expand our understanding of how this novel coronavirus spreads."



In addition to masking, Great Clips had policies in place that also likely prevented the spread of disease—such as distancing of salon chairs, staggering appointments and other measures that will also be studied, Goddard noted.

Two stylists had tested positive after working at the Great Clips at 1864 S. Glenstone Ave, potentially exposing 140 clients and six other coworkers. No additional clients or coworkers tested positive.

Testing was offered to all those potentially exposed, and 46 people pursued testing—all came back negative. Regardless of testing, all potentially exposed were quarantined for the duration of their exposure period.

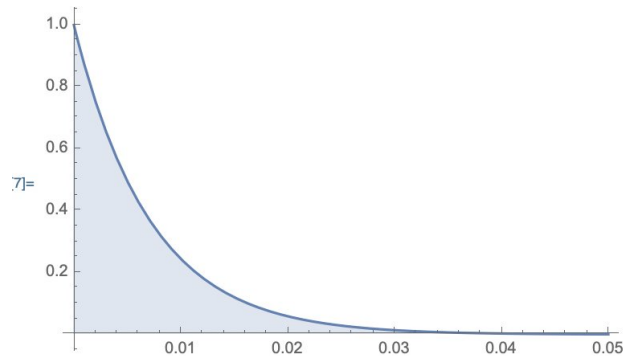
The Salon : What is the probability of having 0 infections for **both** stylists each seeing 70 clients if the probability of infection is  $p$ ?

## Effectiveness of Masks and Statistical Signals [Maximally Simplified Explanation]

The Salon : What is the probability of having 0 infections for **both** stylists each seeing 70 clients if the probability of infection is  $p$ ?

**Hint** : it is the same as a single stylist seeing 140 people,  $(1-p)^{140}$ , since  $(1-p)^{70}(1-p)^{70}$

```
7]:= Plot[(1 - p)^140, {p, 0, .05}, PlotRange -> All, Filling -> Bottom]
```



```
0]:= TableForm[
  Table[{p, (1 - p)^140, CDF[BinomialDistribution[70, p], 0]^2,
    CDF[BinomialDistribution[140, p], 0]}, {p, 0.00, .003, .0005}],
  TableHeadings -> {None, {"p", "(1-p)^140", "Binomial"}}]
```

TableForm=

p	$(1-p)^{140}$	Binomial	
0.	1.	1	1
0.0005	0.932377	0.932377	0.932377
0.001	0.869297	0.869297	0.869297
0.0015	0.810456	0.810456	0.810456
0.002	0.755572	0.755572	0.755572
0.0025	0.704379	0.704379	0.704379
0.003	0.656632	0.656632	0.656632

Assume uniform metaprobability. No big difference under variously parametrized beta distributions.

$$\int_0^1 (1-p)^n dp = \frac{1}{n+1} = \frac{1}{141}$$

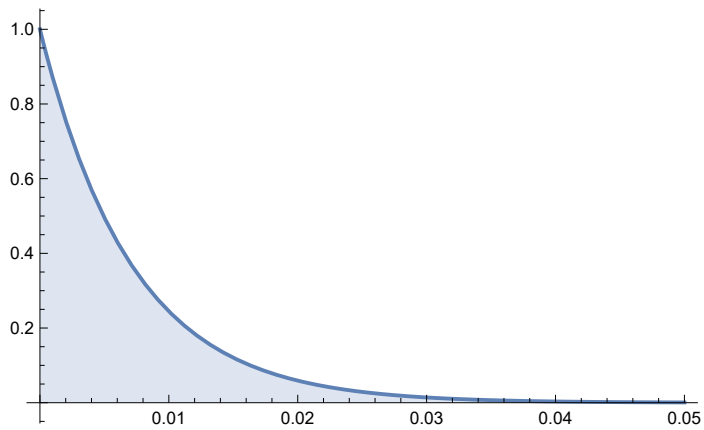
```
1]:= CDF[BinomialDistribution[n, p], 0]
```

```
2]:= (1 - p)^n
```

It is the same as a single stylist seeing 140 people, assuming independence.

```
In[ ]:= Plot[(1 - p)140, {p, 0, 0.05}, PlotRange -> All, Filling -> Bottom]
```

Out[ ]:=



```
In[ ]:= TableForm[
  Table[{p, (1 - p)140, CDF[BinomialDistribution[70, p], 0]2,
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Out[ ]//TableForm=

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**Itay** @SumoTail · Jun 10, 2020 ...

This is a wrong approach and wrong answer. Since there are super-spreaders and the rest ... obviously mask reduces the chances of spreading & infection if we could quantify the exact rates at the super-spreader cases this could be huge

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**Nassim Nicholas Taleb**  @nntaleb · Jun 10, 2020 ...

These ARE superspreaders

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**Itay** @SumoTail · Jun 10, 2020 ...


[en.wikipedia.org/wiki/Superspreading event](https://en.wikipedia.org/wiki/Superspreading_event) , [networksciencebook.com/chapter/10#epidemiology](https://networksciencebook.com/chapter/10#epidemiology)

[en.wikipedia.org](https://en.wikipedia.org/wiki/Superspreading_event)  
Superspreading event - Wikipedia

1               

**William Schudlich** @WSchudlich1 · Jun 11, 2020 ...

They had contact with 140 people. W/o masks, they would have been superspreaders. With masks = no transmission.

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