

# We Will Live or Die by R (revised March 29, 2020)

Key findings from 'Coronavirus: The Hammer and the Dance'

**R is the contagion rate:** how many additional infections each infected person produces. For the Coronavirus, **R** ranges from **3.0** (upper bound estimate on the natural rate of infection) down to **0.32** (under the total lockdown in Wuhan, China). Government policies that limit in-person interaction, and our compliance (or lack thereof) with those policies are the major determinants of **R**.

**The future of the United States depends on R. If we get this wrong, millions will die, our healthcare system will collapse, and we will enter a severe economic depression.**

Strategy	R	U.S. COVID-19 Deaths	Probability of Healthcare Collapse	Duration of Health Crisis*	Economic Consequences
None	2.4+	Many millions	Certain	4-6 months	Catastrophic
	2.2				
	2.0				
Minimal Half-measures	1.8	Many millions	Certain	7+ months	Catastrophic
	1.6				
	1.4				
Weak Mitigation	1.3	Millions	Almost certain	7+ months	Catastrophic
	1.2				
Strong Mitigation	1.1	Hundreds of thousands	Quite Possible	7+ months	Catastrophic
	1.0				
Weak Hammer	0.9	Many tens of thousands	Unlikely	4-6 months	Severe
	0.8				
Strong Hammer	0.7	Tens of thousands	Unlikely	2-3 months	Significant
	0.5				
	0.3				

These results assumes that intervention begins on March 30<sup>th</sup>. Strong hammer techniques may include mandatory shelter-in-place and travel restrictions. Even with a strong hammer strategy (R=0.7), **a one week delay would quintuple the number of deaths and extend the crisis by four weeks.**

Text and figures by Samuel A. Shapero, PhD Bioengineering. Updated March 29, 2020.

Based on Tomas Pueyo's in-depth epidemiological analysis 'Coronavirus: The Hammer and the Dance':

<https://medium.com/@tomaspueyo/coronavirus-the-hammer-and-the-dance-be9337092b56>.

Results generated by the epidemic calculator <https://gabgoh.github.io/COVID/index.html> using model parameters from 'Coronavirus: The Hammer and the Dance', but assumes 10000 infectious individuals on March 10<sup>th</sup>. Additional details can be found at <https://github.com/samshap/liveordiebyr> \*Defined to end when fewer than **10,000** infectious persons remain, at which point testing and containment should be sufficient to manage spread.

**Stay informed. Share. Organize. Advocate. We can make it happen, together!**