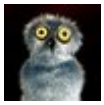
Twitter Thread by Osmium Penguin, Certified Generalist



Osmium Penguin, Certified Generalist
@osmie

Incoming rant.

I'm pressing the "tweet" button as I type, and I'm typing as I think, so there's every possibility that this will drift into tangents and/or nowhere. Of course, that's true pretty much every time I start threading.

I know diddly-squat about physiology.

Friends and family who *do* know anything about physiology regularly mock my (apparently bizarre) theories of how bodies work.

I am not a trustworthy narrator when it comes to things like How Vaccines Work.

I know diddly-squat about epidemiology.

Unlike physiology, where I am firmly in the domain of Messrs. Dunning and Kruger, I've read enough about the subject to understand how little I know.

This is a complicated subject, where obvious truths are seldom either obvious or true.

I also know diddly-squat about public health policy.

Public *transportation* policy is way more in my wheelhouse. But this at least lets me make some useful analogies.

…I mentioned digressions? Yeah, I just started to write a very long digression about public transportation paradoxes, and it was taking away from the point I wanted to make.

The much shorter version (believe it or not) is:

(1) It's often better for an individual to choose Car > Bus > Bike.

(2) But the more people who choose Bike, the less crowded the buses will be, making them more appealing.

(3) And the more people who choose Bus, the less crowded the roads will be, making *them* more appealing.

(4) So on a population level, one of the best things you can do to relieve road traffic is build bike lanes.

(5) But just try convincing 95% of car drivers of that.

The lesson from this paradox is that cause and effect are (a) separated by at least one intermediate step, and (b) statistical in nature, rendering them (c) not obvious.

I know diddly-squat about public health policy, but I know enough about public policy in general to recognize that similar paradoxes are Most Definitely going to show up.

So with all of those caveats in place, here are some things I believe that I understand about vaccines, epidemiology, and pandemic response.

1. Having a virus isn't an on/off binary switch.

At this very moment, everyone on the planet has a certain number of virus particles in their system. Many of us are lucky enough to have zero. Many of us have billions or more.

(Viruses are small. Humans are big. "Billions" seems like a safe number, but maybe it's trillions? Quadrillions? I don't really have a sense of scale. I know very little about physiology.)

2. The human body has many levels of immune response.

The big ones, like antibodies and histamine, don't show up until later in an infection. In the early stages of an infection, we've got brute-force responses like snot, which covers foreign objects in goop and washes them out.

So even if we've never seen a given virus before, even if we're immunocompromised, our bodies can often defend ourselves against small numbers of virus particles, just through sheer brute force.

Thus,

3. The more virus particles we're exposed to, the more of them will get through our brute-force defenses, and set up a proper infection.

4. THIS IS NOT A BINARY SWITCH.

You don't just Have A Virus or Not Have A Virus. You get exposed to some number of virus particles, and some amount of protection against them, and at any given moment, either you or the virus is winning.

(This is about the point where people who know more than diddly-squat about physiology usually chime in and start mocking me. I don't believe that I have anything about this correct except for the way statistics work.)

(IT IS NOT A BINARY SWITCH.)

5. A vaccine trains your body to produce antibodies that are effective against a particular virus.

When a virus particle gets through your brute-force defenses, and your antibody system gets called in, the vaccine gives it a headstart. Your body gets to turn on the factories ("build those antibodies!") instead of the laboratories ("let's figure out how to fight this thing!").

6. This means that the virus is getting fought early. It means that it can't get as large a presence in your body before your immune system starts winning.

It DOESN'T mean that the virus is instantly wiped out on arrival, as if you used a super-laser in a video game.

The graph of viral load over time looks something like a logistic curve (stays high, the virus wins) or a normal curve (goes down, the human wins).

A vaccine doesn't change that.

It just makes the "normal" curve likelier, and the peak of the normal curve lower.

Thus,

7. Even if you've been vaccinated, getting exposed to the enough of the virus at once can make you very sick.

8. Even if you've been vaccinated and you DON'T have enough virus to make you very sick, you can easily have enough virus to infect someone else. Especially if THEY haven't been vaccinated.

9. But if you've been vaccinated, then the peak of that graph will probably be lower … meaning that you can't breathe AS MUCH virus into the air, as you would've done without the vaccine.

And the peak will probably be narrower … meaning you won't be infectious for as long.

All of this means that:

10. Every human, anywhere on the planet, who gets a vaccine, lowers *my* risk of catching a virus. Maybe by an infinitesimal amount, but it's better than nothing.

I'll celebrate every person who gets a vaccine against the current major virus.

But also:

11. Humans who are at higher risk of severe outcomes are OBVIOUSLY the people who need the vaccine most … at least, when they can safely get it; there are immunocompromised people for whom even a vaccine is too much risk.

If you stand in their way, you're a jerk.

And:

12. Humans who are at higher risk of spreading the virus, e.g. through frequent and/or close human interaction, are equally obviously the people who need the vaccine *second*.

But here's where my diddly-squat knowledge of public health policy comes into play.

"Risk of severe outcome" is a medical question, once you already have the disease.

"Risk of transmission" is a social question, which we've been learning all year to ameliorate.

Different diseases surely have different ratios on the relative importance of these risks.

If there's a lot you can do to reduce severe outcomes, but not much to reduce transmission (e.g. the common cold), then probably you want to give more vaccines to the transmission people.

And vice versa.

I don't know nearly enough about epidemiology to guess where covid lands.

But I can look at the public health responses around the world and make an educated guess about what people who DO know epidemiology & public health policy are thinking.

And it sure looks to me as though we've learned some very effective systems against spreading covid: physical distancing, economic shutdowns for indoor businesses, universal masking, plexiglas barriers, good ventilation…

…all of which make the Severe Outcome people a higher priority, at least in regions where those protocols are regularly being followed.

In regions where those protocols are not being followed, maybe the calculus is different.

I expect it would have to be. Public policy doesn't work well if you start from an assumption that everybody is a model citizen.

13. I've lost track of my numbering.

I believe strongly that I have lost track of my numbering.

14. When I am offered a vaccine, I will make an appointment immediately and get it. I'm told this will be in, like, July. I'll take what I can get.

15. Before I am offered a vaccine, I will celebrate every single person who is offered one.

16. After I get my vaccine, I will maintain all of the same protocols I've been following all year, because IT'S NOT A BINARY SWITCH. Not for me, and not for anyone close to me.

17. Anybody who is looking for a binary switch — in masks, in social distancing, in vaccination, or anywhere else — is wrong. Because that is how video games work, and this is not a video game.