Twitter Thread by Denise Dewald, MD ■

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Thread■on modes of pathogen transmission. #monkeypox

Transmission is messy, and there is no single mode that pathogens employ to invade a body. Indeed, modes can change.

Plague provides a great example of this: it occurs in multiple forms, depending on transmission route. 1/13

All are caused by the bacterium Yersenia pestis

Bubonic plague occurs when infected fleas bite a person, or the bacteria enter through a break in the skin. Infection causes characteristic "buboes"

Preventative strategy would be flea and rat control. 2/13 https://t.co/xR5gdRuK53

Plague can become more widespread via the bloodstream, causing septicemic plague. This leads to black areas of necrosis in the body, hence the term, "Black Death."

As long as it doesn't get to the lungs, prevention is the same as previous - flea and rodent control. 3/13

However if the bacteria set up infection in the lungs, they can now exit the body via respiratory aerosols

This is now pneumonic plague, a highly contagious form of the disease, transmissible by air, with an incubation period of only 1-3 days & 100% fatal without treatment. 4/13

The infection control measures of flea and rodent control are ineffective against pneumonic plague -- isolation and treatment of cases, airborne precautions, and prophylactic treatment and monitoring of exposed individuals are needed. 5/13

In comparison, the bubonic version of plague is "only" 30-60% fatal without treatment (yeah, some people survived plague in the Middle Ages - infection wasn't a 100% death sentence). 6/13

Smallpox similarly has different modes of transmission, as well as differences in severity depending on mode of transmission.

Infection by skin inoculation conferred 2-3% mortality.

Infection by inhalation conferred up to 30% mortality. 7/13

This was the basis for variolation, the precursor of vaccination:

Variolation = purposeful infection of someone with smallpox via the cutaneous route

Vaccination = purposeful infection of someone with the related cowpox virus, which produces mild disease but cross immunity 8/13

So this is a cautionary tale about monkeypox. Monkeypox can cause airway lesions and has been shown to transmit by aerosol in experimental animals, using the more lethal Zaire strain of the virus. 9/13

Current mpx strain produces pharyngeal lesions at the very least. The question that we don't know the answer to is how effectively the airway lesions can produce infectious aerosols that can infect other people

We cannot assume this can't happen; there is too much at risk 10/13

If monkeypox starts effectively infecting the airway and particularly the lungs, spreading predominantly by aerosol route, we will have a huge problem on our hands, with not only a more transmissible virus, but potentially a more severe one. 11/13

The more monkeypox passages in humans, the more adept it will become at infecting them.

This is how zoonoses transform into human epidemic diseases.

We just experienced this with Covid. 12/13

Don't say that this could not have been predicted this if it comes to pass.

I would really prefer that we stop monkeypox in its tracks, by aggressive public health measures including ring vaccination, so we don't need to find out. 13/end