

Is COVID pandemic or endemic? A discussion with Boston University epidemiologist Dr. Eleanor Murray

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Dr. Eleanor (Ellie) Murray is an Assistant Professor of Epidemiology at Boston University School of Public Health who has been an outspoken advocate for sound public health policies and infectious disease control of the COVID-19 pandemic. She has been working on improving science communication about epidemiology and is an Associate Editor for social media at the American Journal of Epidemiology.

The World Socialist Web Site (WSWS) spoke with Dr. Murray in February 2022 at the height of the first wave of the Omicron subvariant that engulfed the globe with hundreds of millions of cases in a few short months. At the time, pundits in the mainstream media and government officials were hailing the arrival of this fast-paced virus. At the time, former Biden White House top medical adviser Dr. Anthony Fauci said in January 2022, “It’s an open question as to whether or not Omicron is going to be the live-virus vaccination everyone is hoping for.”

Many were openly stating that with the passing Omicron wave, COVID-19 would settle into an endemic pattern and the world could move on from the pandemic and get on with business as usual. At the time, the WSWS wrote, “The virus that causes COVID-19 is present worldwide, not localized, and it is highly infectious from person to person and continues to mutate. Also, the waning population immunity means SARS-CoV-2 infections will continue to threaten communities with repeated outbreaks. There is no possibility of it becoming endemic in a scientific sense of the word. The campaign to declare COVID-19 endemic is thus political rather than scientific. Its purpose is to accustom the world’s people to mass infection and death without end.”

Since then, the world has faced repeated waves of infection. In May 2023, the World Health Organization (WHO), the United States and every other country across the globe unceremoniously and abruptly ended the emergency phase of the pandemic and all mitigation measures and tracking systems in place to trace the course of the ongoing global epidemic.

As the fourth year of the COVID-19 pandemic is coming to a close, the WSWS spoke to Dr. Murray once again to address the question if the pandemic is ongoing or have we arrived at the endemic phase of COVID-19 and what are the implications of these designations for the world’s population.

Benjamin Mateus (BM): Good afternoon, Dr. Murray. There has been much talk in the mainstream media that the pandemic is over, and here we are in the middle of another wave of COVID-19 infections. My first question for you, and it is one that keeps coming up, is are we still in a pandemic or not? I thought you would be the one person that could give me a straight answer on this point. So, where are we in the COVID-19 pandemic, in your opinion?

Ellie Murray (EM): Yes, I would love to give you a straight answer, but I think that the problem is that there isn’t a straight answer.

One of the reasons for that is that “pandemic” is not an official term. It’s an imprecise category of things that public health people and epidemiologists use, often retrospectively, to apply to diseases that they want to call attention to where they’re happening all at once, everywhere, and everyone is at risk all at once. But there’s no hard and fast criteria for what makes something a pandemic.

[According to the Oxford University dictionary, a pandemic is defined as “an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people.” The definition does not incorporate levels of population immunity, viral evolution or disease severity.]

In fact, the only thing that’s close to that is the WHO [World Health Organization] has a clear six-level pandemic staging for influenza. But each of those levels specifically references influenza. However, there was a lot of disagreement among infectious disease and epidemiologic experts whether those six levels could just be translated to any disease, and if they could be applied to COVID. As of now the official levels are specifically regarding influenza.

So, then the question becomes, “What is the official designation that exists for such events?” And the answer is the Public Health Emergency of International Concern, or PHEIC, which the WHO has ended for COVID. Whether or not it was reasonable to end that, I think, is very much open to discussion.

Public Health Emergency of International Concern designations are only recent developments that came out of the 2005 revision to the International Health Regulations [IHR] as a result of the SARS outbreak preceding it.

[The regulation became legally binding in 2007 when member states recognized that certain public health incidents had to be designated as PHEIC because they posed a significant global threat. The first full application of the response was to the 2009 swine flu pandemic. It is implemented to apply to “an extraordinary event which is determined to constitute a public health risk to other states through international spread of disease and to potentially require a coordinated international response.”]

The longest running Public Health Emergency of International Concern is a polio outbreak in certain regions of Pakistan *[declared in May 2014 and still in effect]*. It was designated an outbreak of emergency of international concern because it is directly hampering the agreed upon global effort to eradicate polio. The fact that there’s this geographic area that has had difficulty eliminating polio and is seeing constant circulation has meant that everywhere else in the world that has eliminated polio already is at risk of seeing polio reemerge if people travel to and from that region and bring polio with them.

And so, that kind of gives us a blueprint for what we might be thinking

about in terms of public health emergency of international concern; that cases in one area exist at a sufficient level and frequency that every other part of the world should be on guard for the re-emergence of or the outbreak of that disease.

If that's our definition, then everywhere should be on guard for outbreaks of COVID. We're seeing regular clear patterns emerge of an increase in cases every three to six months. The idea that we shouldn't all be aware of the possibility of a COVID outbreak, that doesn't seem right.

For polio there's an explicit agreed upon global effort to eradicate that disease which is not the case of COVID. So maybe it's the fact that the polio cases that are happening in this area in Pakistan are specifically a threat to the global community's goal with respect to the disease that makes it an emergency of international concern. In which case, it's not clear that COVID needs to be categorized as a public health emergency of international concern because the stated international goal seems to be ... meh [*complete indifference*]. And so, there's pretty much no way to threaten that goal.

Criteria defined by politics not science

BM: Allow me to paraphrase—what you're saying is the reason why the public health emergency of international concern is no longer a goal even though the constantly mutating virus that causes COVID remains a threat and spreads every three to six months causing hospitalizations, Long COVID and kills people is because governments no longer care about it. That tells me that what you're referring to is not a real public health scientific issue, but a political issue.

EM: And that's exactly the point that there are no specific defined criteria that we can look up and compare numbers to and say, scientifically, this makes something a pandemic.

The designation that the WHO has for the public health emergency of international concern is based on what's going on in the world, but it's also based on politics in the same way that the United States' federal emergency was based on what was happening on the ground but also on politics. Any official discussion on the issue of if we are still in a pandemic or not really became a political question even though these should be scientific and data-driven issues.

BM: If I may ask, in the same way that maybe "pandemic" is a vague term, I assume "endemicity or endemic" COVID is difficult to define because the two are somewhat related?

EM: Yeah, so this is another interesting term. We often see things which people who specialize in pandemic preparedness consider pandemics. I had a chance to speak with Stephen Morse, my mentor at Columbia with whom I did my master's degree, when the COVID outbreak started. He told me that this was the ninth or tenth pandemic he had dealt with. He said, "I'm not really concerned that we're going to see something new here."

But the scale of it was so much bigger because of how badly they responded to it in large part. And for most people who are outside of the infectious disease pandemic response community, this is the first pandemic that they have ever encountered or are aware of.

Much of the literature in infectious diseases that discuss pandemic and endemic diseases discuss it in a retrospective sense. They are talking about events that have occurred in the past. For instance, the black death, cholera, etc. It's easy to look back and say, "This is the time when this pandemic happened." And then the disease either went away or persisted at a low level.

There is a mathematical definition of endemic that is used frequently in infectious disease modeling, which is that over some long-run period, the

average number of cases infected by any one case is basically one, so that it can fluctuate a little bit, but it averages out over the long run to one.

In a modeling scenario, the implications of that are that you run your model's time scale out long enough until the average number of new cases stabilizes around one [*R0-reproduction number*]. And that period is however long it takes to get to that point. But in the real world we can't really apply that mathematical definition because we haven't set a defined time period. For example, if we look at the COVID data and try to estimate the average number of new cases, should we be estimating this over the last week, the last six months, the last year or the last two years? We don't know. Obviously for COVID, we can't start the time before January 2020. So that, that's a cap on how long we could be talking about. But if we look at the last week compared to last year or the last 24 months, we're going to get different averages.

BM: With regard to our discussion on endemic COVID, where we see infection rates at some low-level steady state, that proposition that is being claimed by various pundits seems absurd to me. There are two issues with this concept that are problematic.

First is the continuing convergent evolution of the coronavirus. It is constantly mutating with no end in sight in its ability to find new ways to adapt itself, especially in the context that we allow it to spread far and wide endlessly. I'd even say that it's improving and getting better at transmitting and evading. Additionally, the number of progenies and the speed of these various lineages is striking.

The second thing is because population immunity is constantly waning, we will never reach some meaningful population immunity where we will see low levels of disease where the reproductive number hovers around one.

How do you square these with this coronavirus and our discussion on the mathematical models for endemic disease? I don't think we will ever reach endemic COVID.

EM: Yes. And there is third aspect to the term "endemic." One is that we have this mathematical aspect that we just can't apply it in the real world because it's not specified well enough to apply to real data. The other piece is that when we actually look at the use of the word endemic—both currently and historically—there is an implicit and sometimes explicit part of the definition of that term that means a disease is endemic when the people who are bearing the burden of infection and disease are people who we don't really care about.

When we talk about diseases that are occurring within a country that's rich, endemic disease are those affecting groups that are marginalized, that are in poverty, minoritized race, ethnicity groups, that kind of thing. When we're talking about other countries, we talk about endemic diseases in places like the former colonies of the British Empire: "Those people over there have an endemic disease."

Never do we talk about endemic syphilis in the United States or endemic herpes virus. We rolled out the human papillomavirus [HPV] vaccine several years ago. No one ever said, "Why do we need a vaccine? HPV is endemic." We don't talk about diseases as endemic when we care about the people that they infect even if they routinely and regularly happen. We say, "Seasonal influenza," we don't say, "Endemic influenza." Health departments will put out reminders about the potential for norovirus outbreaks every winter in daycares and elementary schools because that's norovirus season, but we don't say we have endemic norovirus.

So, there's this whole aspect of endemic where the use of the word conveys a disinterest in preventing the disease. And that's not officially built into the definition. But if you unpack, explore, and ask how this is used and when this is used, what you see is that historically it's very clear that's the real meaning behind the application of the word endemic. And then more recently, you see all the places where it isn't used.

And when you go back and review the use of these terms in the media, the switch from talking about COVID pandemic to endemic COVID, you

start to see this shift in how people refer to endemic COVID as being only a problem for people with chronic diseases, immune-compromised, or for the very old. It's those people that have to deal with this disease, and not us. And if we take that definition, then, yes, I think a lot of the United States and the world has shifted to the idea that they don't really care about who's getting COVID, and so it's endemic. But it's also everywhere and all the time. And it's worth asking ourselves whether we really don't care about the people who get COVID.

BM: Well, my own recent experiences in my hospital, I recently overheard two doctors discussing how a patient who had been admitted for some time for an assortment of ailments eventually died after catching the virus. The nature of the discussion was casual and anecdotal lacking any reflection. They didn't ask why the hospital wasn't testing the staff or why we weren't mandated to mask. Or why did we fail to protect this patient under our care. All they said was, "What a way to go!"

And while I'm listening to this, I am thinking about my residents who are catching COVID from each other and worried they will infect my patients. You barely see anyone wearing a mask anymore, and often when they are, it's above the lip but below the nose masking.

The reason I raise these points is because you had made an important point in our first interview. You said if we eliminated COVID, then we would be able to stop thinking about it. But endemic COVID would mean paying constant attention to where the virus is and how to protect populations from infections by tracking, tracing, and employing public health measures to mitigate against it. But now with the public health emergency phase having ended, we have also stopped thinking about it. What does that say about the state of public health in the US?

EM: The closest analogy would be to say that we're dealing with an established seasonal COVID. But I also hesitate to use the word seasonal because when we look at the curves, we're seeing ... let me rephrase. The flu has a single season each year. Norovirus has a single season each year. Even polio, when that was in the US, was seasonal once a year.

What we're seeing with COVID is over and over these repeated spikes and troughs of cases, hospitalizations and deaths. When we look at the past four years, they do seem to roughly match up in terms of when in the year these things are happening, but it's not once a year. And it's not even twice a year. What we're seeing is something that looks more like every three to four months.

There are some variations there, and it's very hard to tell from that data that we have what the driver of these waves are. Originally there was a lot of suggestions that, because it was a respiratory virus, maybe we could expect it to settle down to the same season as influenza or RSV because there are environmental conditions that allow those diseases to transmit, and those conditions are more prevalent in the winter months. But we don't see that pattern happening with COVID.

And in fact, one of the key indicators that's probably not what we should expect is that we don't see a reversal of the timing of the peaks of COVID in the Northern and Southern Hemispheres. For instance, Australia's flu season is in Australia's winter. Australia's COVID season seems to be basically at the same time as everybody else's COVID season. That's a tipoff that it's not weather or other environmental conditions.

We reliably see that as we move into November and December during the holiday season that cases begin to skyrocket. And so, one reasonable hypothesis is that maybe gathering people together is increasing the spread—meaning celebrating the holidays, traveling for the holidays, those things are causing these peaks that we see in the winter months because Australia celebrates Christmas at the same as everywhere else. Maybe that's a piece.

And when we look closer at the data, we do see that in May and June, as schools end, we have graduation parties and people go on summer trips and things of that nature, we see spikes in cases.

We also seem to see a spike in August and September as the new school year begins to roll out around the country. That says maybe it is something about bringing people together, especially people from multiple different places. And if that is what's driving these waves, then it would be feasible to control this because if it is everybody being everywhere for the summer and then they're congregating back as school starts, then we can possibly prevent these waves.

People don't stay infected with COVID for very long. If you simply had precautions, extra precautions in place through the month, from the start of school to the end of the month of September, you would expect to not see that lead into cases. Similarly, if we moved into putting in precautions around, at least in terms of masks and ventilation on transits during November, December and January, we might be able to blunt the winter peaks.

BM: You're speaking about a directed mitigation, right?

EM: Yes. If it's basically that we are seeing repeated peaks of COVID and they're happening at predictable times or they're happening at roughly the same time every year, then we stand a chance to act in advance.

And when we talk about an endemic disease, ignoring the whole part about not caring about those people, we usually intend to mean something like we have some sense of being able to predict when the disease is going to be a problem. Since the emergency phase of the pandemic ended in May, we've basically stopped doing any precautions.

Now what we're seeing is what happens when we don't do anything for COVID overall. (Mitigation is now at the individual level.) It turns out what we're seeing is roughly the same pattern as what we saw last year and the year before and the year before that. And so, it is reasonable to guess that we'll see a big spike in cases fueled by Thanksgiving and Christmas travel.

If it's reasonable to assume that, then it's reasonable to take precautions.

Basically, what I am trying to say is that there's this tension between the idea of thinking it's endemic, meaning we expect it is seasonal and therefore we expect it to happen, and the idea that therefore we have to let it happen.

BM: I think the other issue that is at play here—obviously we are seeing three waves each year—has to do with the fact ... given these movements of populations, the gathering indoors, knowing the virus is airborne that leads to high numbers of cases and rapid rates of short-lived infections, to a great extent can these repeated waves of infection across the globe be explained by the waning of immunity? If everyone gets infected rapidly, then everyone's immunity has begun to wane or decline making the population susceptible again. So, it's not just the gathering part of it, but there is the immunologic component. Meanwhile viral evolution finds better ways to transmit and evade. Your thoughts?

EM: Yeah, I have been thinking this for a while. And in particular, one of the kind of concerns I have had since 2021 is that the way that the vaccines were rolled out on this very strict, "you must, you can only get it starting now" type schedule, potentially synced up people's immune systems. Meaning the majority of people were all immunized within a short time and their immune systems, roughly on average performing the same, therefore waning at roughly the same rate over the same time period, and COVID is mutating at its rate, then what you see at some point, you see the threshold of enough people whose immunity has waned that you are open to another peak.

That is the other piece. It's reasonable to look at the May-June peak and say this is probably the beginning of summer and the end of school that's fueling this, but then why aren't we seeing an Easter peak or a spring break peak which we didn't really see? And so, I do think there may be this component of synced-up immunity. And every wave we have potentially resyncs people's immunity. Every time we roll out these

vaccines with a “starting today, you’re eligible,” like “get it now before it’s gone” attitude, we might sync people up more.

But I will say, this is still just a hypothesis that I have. I have talked to a couple people I know who have COVID models that they’ve been using for a couple years and we’ve discussed looking at, if this is what is happening and then consider ways of unsyncing population immunity and see if we can reduce disease burden and cases. But we just haven’t had time to do that project, unfortunately. My very strong suspicion is that, as you say, we’re seeing there are certain activities at certain times that make outbreaks more likely. And then, as we keep having outbreaks at that time, we end up again syncing people’s immunity, which then leads to a lull in infections when most people have immunity and then waning and mutation that leads to opportunity.

BM: You had said that when we consider COVID as endemic, then there is a social obligation to protect people and that implies bolstering our public health. Clearly this isn’t happening. Wastewater now is being used to track disease in regions rather than using it as an early warning system. It has become our only surveillance system.

Long COVID, the pandemic within the pandemic

But now we’re now seeing this other component of the pandemic within the pandemic, and that is Long COVID, which is also not being addressed by our public health or healthcare infrastructure. I’d like your thoughts about this. Because from what I understand with the recent studies on viral persistence and activation of the immune system and immune exhaustion, Long COVID isn’t something that hits one person and skips another person. Rather there is a continuous spectrum of Long COVID from asymptomatic to symptomatic. And we don’t know the very long-term issues about infection and reinfection in the population.

EM: I have a couple comments. One is that it was not unexpected that there should be some post-viral syndrome from a new respiratory virus pandemic. People get post-viral syndromes like post-viral fatigue from the flu and from other viruses. We are also learning more about how the possibility that early infection with viruses may be the cause of some later-in-life serious chronic diseases. And this is something that could have been on people’s radar.

Second, I think it’s very difficult to understand what exactly is happening with Long COVID because of the very ad hoc data that we have on the disease process. And a lot of that is also coming from the ad hoc data we have on COVID. If initially when the pandemic seemed it was getting out of control, the government could have designated a large group of people to follow, meaning they would be regularly tested and data collected on what happened to them, then those people could have served as a picture of what might be happening with the rest of us. But we don’t really have something like that, certainly not something that was just initiated by the CDC.

We also don’t really know much about what happens with other coronavirus infections. And the viruses that we have recently detected as possible causes of later-in-life chronic diseases tend to be viruses that don’t cause very many symptoms when people are infected with them at younger ages.

So, I think that there’s also an open question here of what later-in-life conditions were that were always caused by coronaviruses. However, we just didn’t know because they were so far apart. And now that we’ve had so many people exposed to this new and more severe coronavirus all at once, it might make sense that we see these issues emerging. But it’s quite disconcerting to see so much emerging and persisting so rapidly after infection, because post-viral fatigue following influenza usually resolves

in about six months.

Yet, we’re seeing people with Long COVID who still have symptoms from the 2020 infection. That’s definitely atypical.

We really need to be digging a lot deeper into that. It’s also important that we’re aware of the challenges that lie ahead because, for example, we have almost no idea of who hasn’t had COVID, which means we have almost no idea who the people are that we might use as a control group to see what the frequency of various symptoms is if you didn’t have COVID.

And there were a lot of disruptions related to the pandemic that were not necessarily related to you yourself being infected. Without a clear idea of who hasn’t been infected, without a clear set of people who haven’t been infected, it’s very difficult to say these things are due to this person’s infection, rather than these things are due to some other issues that disrupted their lives in some important way, like missed medical visits.

Please don’t take this as me saying that Long COVID isn’t a thing. It absolutely is. But describing which pieces come from where, especially when we’re thinking about things that are so hard to measure, like fatigue and mental foginess, which can also be related or exacerbated by stress and stressful life events and grief and all these things that most people have been experiencing. But we have no control group to say, “What do we expect to have seen if the pandemic happened, but you didn’t get infected?” That makes it difficult.

BM: I think what you’re saying is that we will need to dig into health records pre-pandemic to see what the incidence of certain diseases is and compare it to the population moving forward because it will be critical to make a correct accounting of the impact of COVID on the population. People will want answers.

But, to the point that you raised earlier, if endemic COVID is something that happens to those people, then Long COVID and the chronic diseases associated with it are something that happens to those people, we can call it endemic Long COVID, there may not be any interest in getting this data.

And I think, to a great extent, accepting Long COVID as a real problem then forces you to accept COVID as a serious issue. Ignoring Long COVID allows public health officials and governments to evade dealing with COVID as the primary causative factor.

As we near the end of our discussion, I wanted to ask you about your concerns over viral evolution.

EM: I think the biggest public misconception is the idea that viruses have to evolve to become tame.

I recently started using this analogy because I think it helps. COVID is a wild creature and it’s living amongst us, and at any time it could become more of a tiger and less of a house cat. It’s not even, it’s not a house cat at all.

But there’s no reason why it will necessarily be tamed. Wolves lived with us for many centuries, and we tamed them into dogs, but rats have not been tamed. We don’t have wolves roaming our cities. We tamed them all to dogs. We got rid of the wolves. But we couldn’t do it to rats. We couldn’t do it to cockroaches. Maybe we can’t do it to COVID.

And my understanding from the virologists and modelers is that there is a lot of ways in which COVID could mutate to completely escape our immunity that we’ve built up so far, which would potentially reset people to not exactly where we were in the beginning of the pandemic, but close to it. The other thing is we know it can evolve to be more severe, because we saw that with the Delta variant.

The Delta variant was much more severe, but we were lucky because it was only more severe. Omicron and its descendants are more transmissible. They’re just as severe as the original version, perhaps similar to Alpha, but they’re less severe than Delta. But because they’re more transmissible, they cause more disease and death and hospitalization than either of those.

But if Omicron acquired a Delta level severity, that would be a colossal problem. And Delta wasn't that much more severe. Even if it doesn't acquire complete immune-escape, if it continues at the level it's doing so far, which seems to be reasonably good at pushing past people's immunity levels, and because it's so transmissible, if it just also became as severe as Delta, with no other changes, we could be right back to where we were in the beginning in terms of hospitals being overwhelmed and a really massive catastrophe.

BM: Dr. Murray, any final comments you'd like to make?

EM: Coming back to the original question of this interview, endemic, I think the main take-home is this: Catchphrases have been used frequently to sway public opinion without any regard to the science, and endemic is one of those catchphrases. And it's not really a matter of if it's endemic or not, it's a matter of do we care?

BM: Yes, I agree with you. Dr. Murray, it's been a pleasure to speak with you again. And I hope you stay safe. Thank you.

EM: Thank you.



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