

Gulbali Stories – Transcript

One Health: Humans, Wildlife and Disease

Guest: Ariful Islam | Host: Wes Ward

Welcome to Gulbali Stories, where we share inspiring tales of innovation, resilience, and sustainability in agriculture, water, and the environment from Australia and beyond.

Wes Ward – Host [00:00:00]

Welcome, Ariful Islam, to Gulbali Reports. Today, we are speaking about this connection between humans, wildlife, health and disease. What is your interest in this particular area of One Health?

Ariful Islam [00:00:39]

Thank you for having me. I am a veterinarian. My background is veterinary medicine. I work in the One Health space — that means the health of animals, health of humans, and the environment. I particularly focus on viruses: how they move from animals to humans and also into the environment, and ultimately the impact on whole ecosystems. That is my passion and interest. For example, avian influenza virus — it is the virus of birds, but it affects not only birds but also humans and wildlife. Similarly Nipah virus. I am working on viruses that can impact multiple hosts in the ecosystem.

Wes Ward [00:01:33]

Recently, Nipah virus has been in the media. How does the Nipah virus get into the environment? And then how does it go into humans?

Ariful Islam [00:01:45]

Actually, this virus is not new. It was first reported around 25 years ago, in Malaysia in 1998. This is a virus of the bats — specifically fruit bats, which we call flying foxes. They can carry it; they do not become sick themselves, but it can pass from bats to humans or livestock through common interfaces. For example, through half-eaten fruits. In Bangladesh, it comes through date palm sap — a bat infected with saliva, urine, or fecal material can transfer the virus to the sap, and then to a human. In Malaysia, pigs were easily impacted as an intermediate host. In Bangladesh, transmission has been more directly to humans. Recently, we have seen in the media two cases in West Bengal, and previously there have been cases in Kerala and West Bengal where humans have been impacted.

Wes Ward [00:02:50]

So how does it impact on humans once it has gone from the bats — through livestock or directly — into humans?

Ariful Islam [00:03:00]

It is a really dangerous virus because if it passes to humans, the mortality rate — the case fatality rate — is very high: 40 to 70 percent. And currently there is no vaccine and no therapeutic antivirals for this virus. Initially, when it impacts a human, it causes nonspecific flu-like symptoms in the first few days. Then very rapidly, it infects the brain, causing inflammation and swelling of the brain — neurological symptoms, encephalitis — which is

hugely devastating and ultimately leads to death. This is a pandemic-potential virus because of its high mortality rate, 70 percent and in some cases in Bangladesh even 100 percent. Compare that to COVID-19, which was less than 2 percent. That is why we are so concerned.

There is a similar virus in the Australian context — the Hendra virus. It is the same genus. The same flying foxes are the reservoir. The bats carry it, then it transfers to horses, and then from horses to humans. We have had experience of Hendra virus outbreaks in Australia since 1994. So comparing Nipah and Hendra, they share the same genus and the same flying fox reservoir.

Wes Ward [00:04:33]

We have this very dangerous virus for humans. Why hasn't it become a pandemic to date?

Ariful Islam [00:04:43]

Every virus naturally and continuously evolves through mutation and change. At this moment, based on scientific literature and evidence, human-to-human transmission of Nipah is documented but still limited — it is not sustained human-to-human transmission like measles or COVID-19. However, this virus has the capacity and potential to achieve sustained human-to-human transmission and become a pandemic. It is just a matter of time, given the continuous evolving nature of viruses and their hosts.

Wes Ward [00:05:28]

So the message is we need to keep close surveillance on this virus.

Ariful Islam [00:05:33]

Robust surveillance and monitoring, as an early warning system. In the Australian context, we need to monitor these viruses, because any outbreak anywhere in the world is not just their problem. We are integrated and connected — through travel, networks, trade, and economics. We are living in a deeply connected world.

Wes Ward [00:06:02]

What is the difference between Nipah virus and avian influenza? Why the concern about avian influenza?

Ariful Islam [00:06:13]

Avian influenza is a scary virus. It is commonly known as "bird flu" but it has two forms: high pathogenicity avian influenza (HPAI) and low pathogenicity avian influenza (LPAI). High pathogenicity avian influenza means high infection rates and high mortality in avian hosts and wildlife, and it can also transmit to humans. It is a huge global concern — it has impacted the livestock industry enormously, particularly the poultry industry.

If you look at the Northern Hemisphere, Europe, and the USA, this virus has moved from birds and is now infecting dairy cattle. For Australia, our dairy industry and our poultry industry are both huge, and we export large quantities of livestock products globally. The virus is transmitting rapidly — it has impacted Asia, Europe, and even Antarctica. Mammals such as sea lions and penguins have been affected, and millions of birds have died. The impact on wildlife conservation is devastating. H5N1 is really evolving more rapidly than Nipah virus, and it is a genuine pandemic concern.

Wes Ward [00:07:42]

What are we afraid of that would happen to Australia if avian influenza really grabbed a hold here?

Ariful Islam [00:07:50]

Australia has unique biodiversity and unique wildlife. Australia also has a rich agricultural industry worth billions of dollars. If you look at the impact in Europe, it has been enormous. This virus could enter Australia through migratory wild birds. Australia sits at the end of several migratory flyways, with many birds coming through from Asia and other parts of the world. The virus can only enter Australia through wild birds. If it does enter Australia, the impact on our agriculture industry — specifically the poultry industry — would be a grave concern, and likewise for our wildlife. There would also be significant implications for human health.

Wes Ward [00:08:45]

So we are looking at a disease that could have very big implications across the whole wider environment — both agriculture and our wildlife.

Ariful Islam [00:08:58]

Yes, and for human health as well. The Australian Government, recognising these One Health issues, has established the Australia CDC — the Australian Centre for Disease Control and Prevention. Like the US CDC and European CDC, Australia now has health experts currently monitoring these diseases, providing direction to government. This is a good step from the government's side — establishing the Australia CDC to monitor threats, build an early warning system, and develop a surveillance platform.

Wes Ward

Australia is very unique in being an island and being, to date, out of the flight path as it were of avian influenza. What do you think we need to look forward to in the future? We have set up the CDC — what else do you think we need to do as a country to prepare ourselves for an outbreak like avian influenza?

Ariful Islam

We need a strong, robust surveillance platform — and that means a standing, coordinated surveillance system across government, industry, and other stakeholders. That is really required. We also need to closely and robustly monitor wild bird surveillance across Australia, particularly identifying hotspots where wild birds arrive and might possibly bring the virus in.

You may be aware of recent news — in Australia's external territory, Heard Island, H5N1 was detected in elephant seals last November. That means H5N1 has already been detected around 4,000 kilometres from Western Australia. This indicates the virus can reach Australia, and is not as far away as we might think. So we need a surveillance platform. Even if a virus is detected, we need preparedness: how will it be handled? What laboratory strengthening is needed? How do we extend our manpower and activate a coordinated, One Health approach across the Australian agricultural sector and the human health sector, as well as for wildlife conservation and biosecurity?

Wes Ward

Hendra has already shown its face in Australia. What do you think we can learn from these viruses in how we handle these outbreaks?

Ariful Islam

As you know, our recent experience of COVID-19 globally has been a huge learning. We need to be prepared to prevent another pandemic threat. We do not want another pandemic — the economic impact, the livelihood disruption, the global context — it has been

devastating. So that means we need proactive surveillance, strengthening of laboratory capacity, and our workforce trained to work in a coordinated response.

Proactive response — not reactive — is key, especially developing early warning systems that can alert us to any outbreak before it reaches the community. We need to understand the pathogenicity, transmission, and other pathways ahead of time. Our logistics and supplies must be ready. For Nipah specifically, a vaccine needs to be developed. If we have a vaccine and antivirals, we can apply them rapidly in these cases. The WHO and others are working on developing a Nipah vaccine, but it is still under development.

Ariful Islam continues research into how viruses persist in animals and spill over into neighbouring human populations, particularly examining how changes in human behaviour can cause — or even prevent — the spread of viral diseases.

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