

A microscopic image of A(H5N1) virus particles. The particles are roughly spherical, with a blue, textured core and a green, textured outer shell. They are scattered across a reddish-brown, textured background.

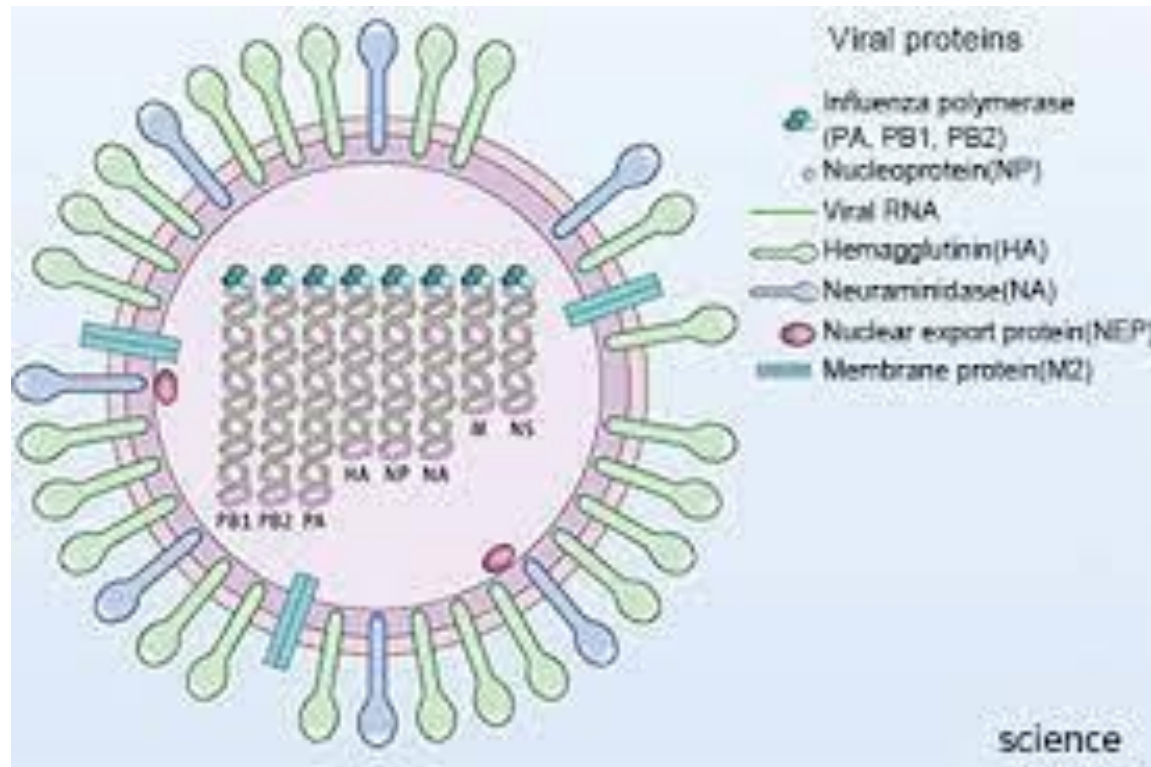
# A(H5N1) Flu

ASPHER COVID-TF 2 / 3 / 2023

Henrique Lopes

# A(H5N1) one (or more) influenza virus

In Influenza, there are **18 different hemagglutinin subtypes** and **11 different neuraminidase subtypes**.



## Two dominant Clades of A(H5N1):

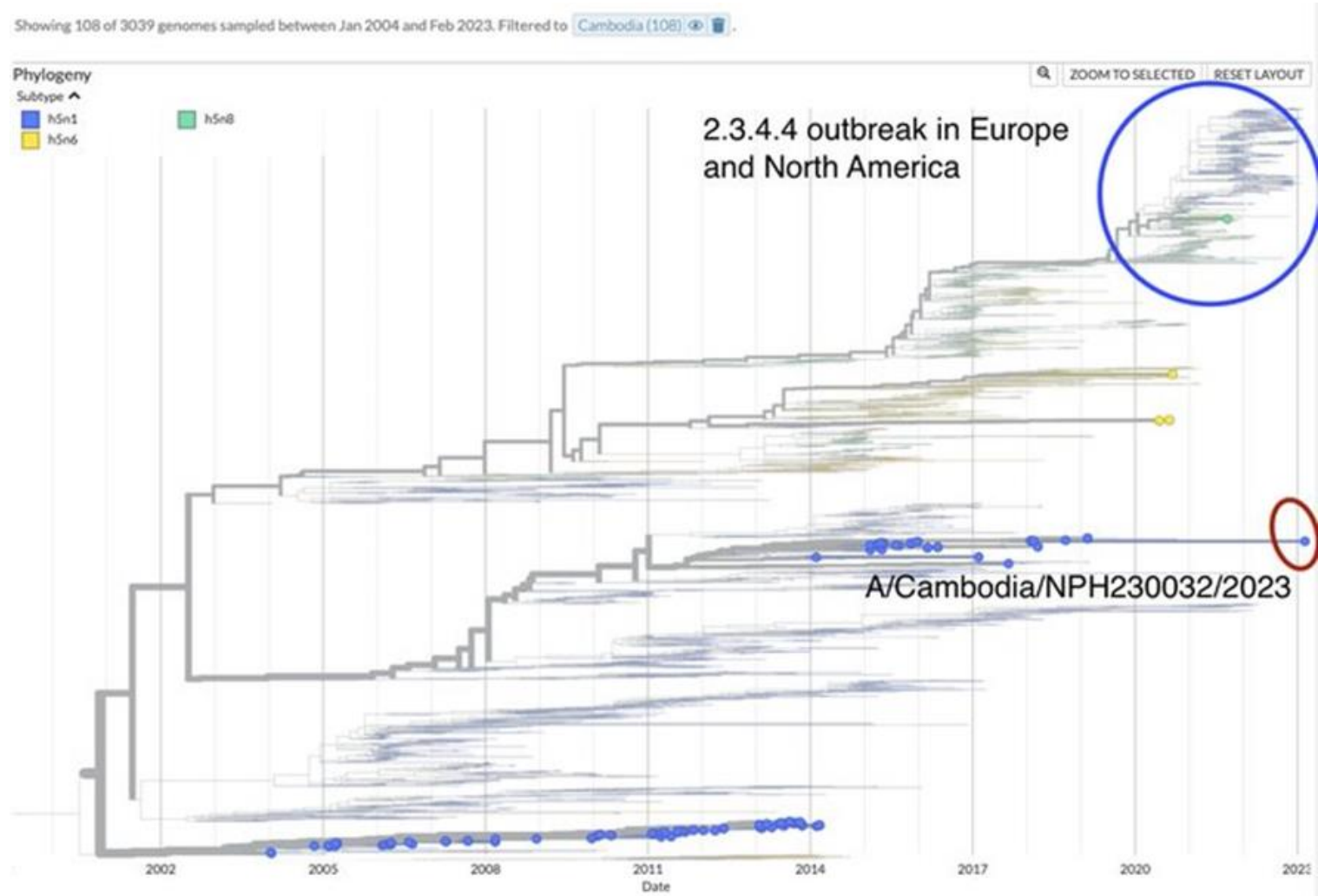
2.3.4.4. in Europe

2.3.4.1 in Asia

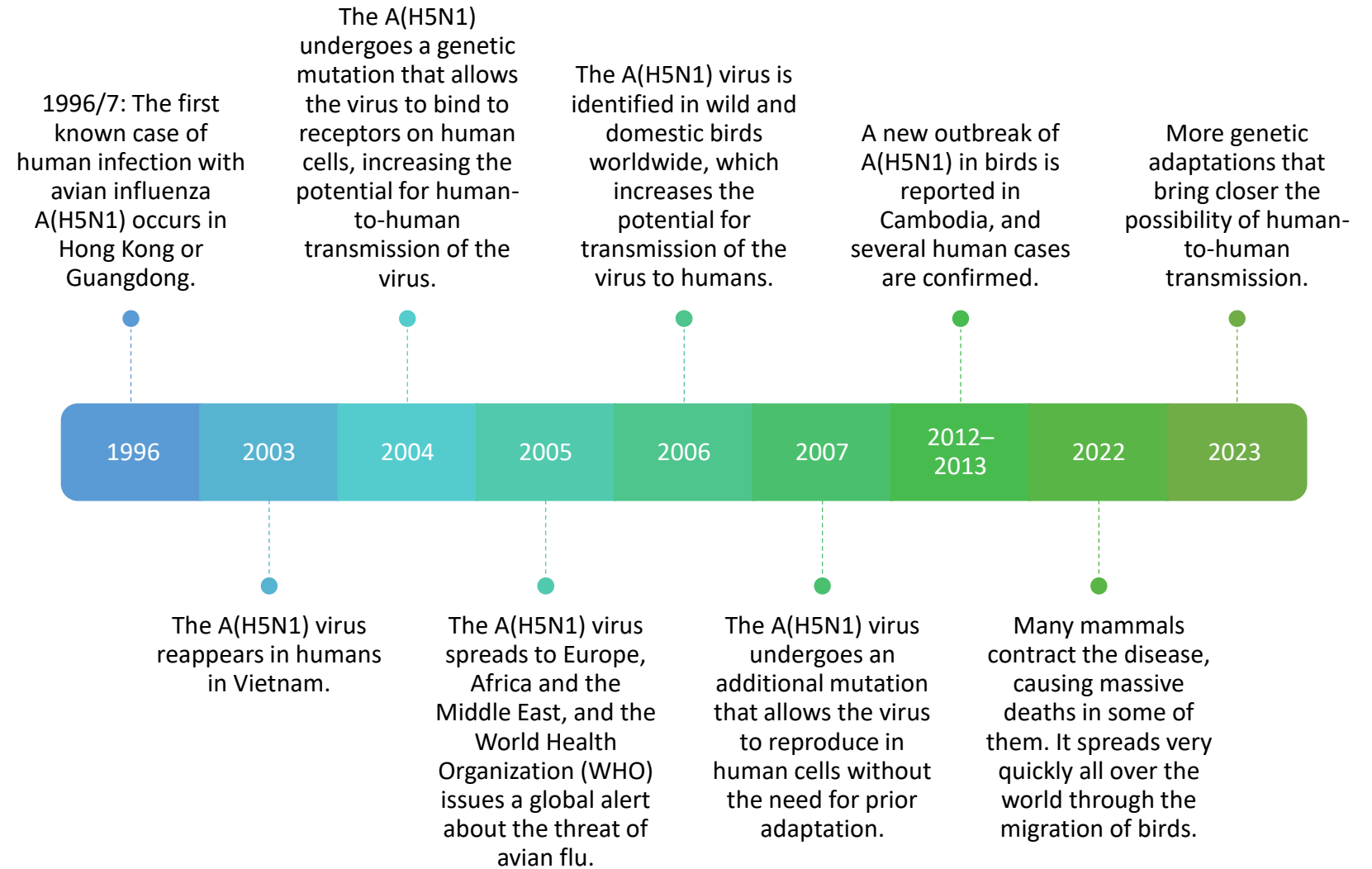
Some people talk about the hypothesis that there is an association of A(H5N1) with A(H5N6) and A(H5N8).

**This approach is called A(H5Nx).**

Evolution of  
A(H5N1) or  
A(H5Nx)?

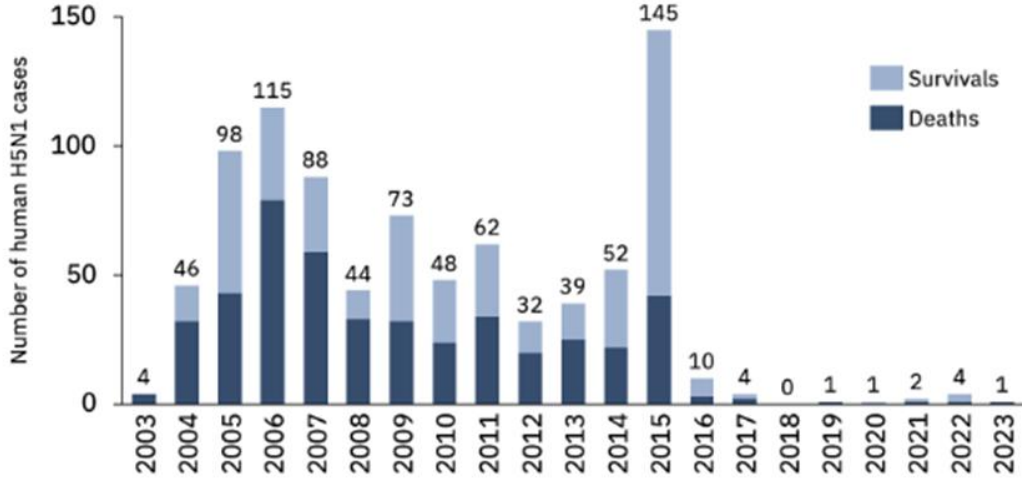


# A(H5N1) timeline highlights



Cases and deaths reported by the WHO from January 2003 to January 2023

Depending on the sources, mortality in humans varies between 53% and 59%



Source: [WHO](#)

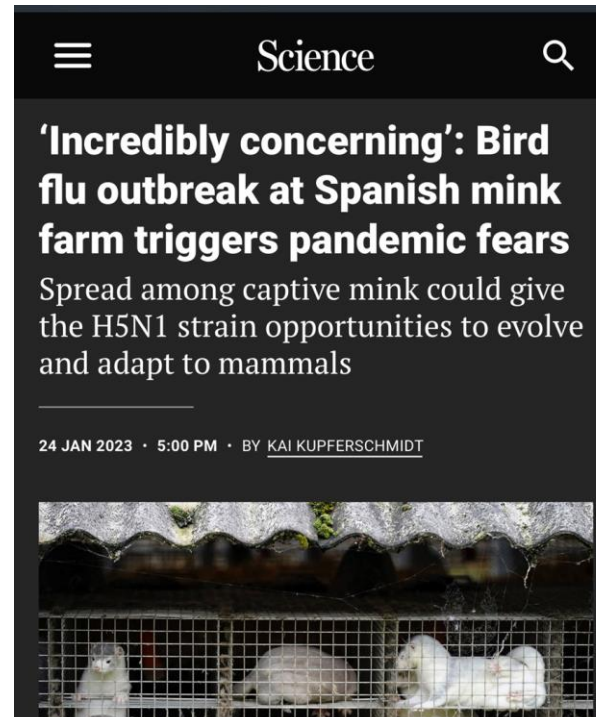
Confirmed human H5N1 infections reported to the WHO, 2003 to present.

As of 27 February 2023, there have been **873 cases**, including **458 deaths**, of human infection with avian influenza A(H5N1) reported in 22 countries (Azerbaijan, Bangladesh, Cambodia, Canada, China, Djibouti, Ecuador, Egypt, Indonesia, India, Iraq, Laos, Myanmar, Nepal, Nigeria, Pakistan, Spain, Thailand, Türkiye, Vietnam, United Kingdom and United States). To date, no human-to-human transmission has been detected.

Source: ECDC, 1 March 23

# Mammalian animal species confirmed with A(H5N1)

- Minks are a species that represents an increased risk due to their history of being closely related to the human influenza family, particularly in types A.



Outbreaks in farmed mink could give H5N1 an opportunity to further evolve and adapt to mammals. MADS CLAUS RASMUSSEN/RITZAU SCANPIX VIA AP

## Species

- American black bear
- Amur leopard
- Bobcat
- Bottlenose dolphin
- Coyote
- Fisher
- Grey seal
- Raccoon
- Skunk
- Striped skunk
- Virginia opossum
- Grizzly bear
- Kodiak bear
- Harbor seal
- Red fox



[Media centre](#)

## Cluster of avian influenza in Cambodia

News story

1 Mar 2023



[Translate this page](#)

In February 2023, Cambodia reported a family cluster in Sithor Kandal district, Prey Veng province, with two people (a girl and her father) infected with avian influenza A(H5N1) virus. The 11-year-old girl died on 22 February, the father was asymptomatic, isolated at the referral hospital and has now been discharged.

### Mortality in Europe is much lower than in Asia.

Possible explanations:

1. In Asia people choose the animals they consume while they are still alive and in Europe we buy food mostly in the supermarket.
2. Clades may have different results.
3. Different response capacities of health systems.

The vast majority of people who have contracted the disease so far are **professionals linked to the production of chickens and ducks.**

The infection of the Cambodian child, daughter of a farmer who deals with these animals, challenged this principle. The father had a mild outbreak and the daughter died.

# Even without having become an epidemic, A(H5N1) is already a crisis

- Around 200 million birds intended for human consumption died or had to be slaughtered.



The screenshot shows the top of a Guardian article. The header includes navigation links like 'Print subscriptions', 'Sign in', 'Search jobs', 'Search', and 'International edition'. Below this is the Guardian logo and a 'Support us' button. The main navigation bar lists 'News', 'Opinion', 'Sport', 'Culture', 'Lifestyle', and 'More'. A sub-navigation bar includes 'Environment', 'Climate crisis', 'Wildlife', 'Energy', and 'Pollution'. The article title is 'Avian flu has led to the killing of 140m farmed birds since last October'. A sub-headline reads 'Culls and compensation have cost hundreds of millions of pounds in the US, UK and Europe, with current outbreak predicted to worsen'. A 'Most viewed' sidebar lists several other articles. At the bottom left, there is a 'Supported by the guardian.org' logo and a date 'Fri 9 Dec 2022 13:54 GMT'.

GREEN NEWS

## More than 500 sea lions and 55,000 birds die from bird flu in Peru



This handout picture released by the Peruvian National Wildlife Areas Service (SERANP) shows scientists at the Paracas National Reserve inspecting a dead sea lion. Copyright SERANP / AFP

It represents a strong threat to natural ecosystems.



# What are the actual known risks to humans?

According to WHO and ECDC, the risk of contagion at this time for the average citizen is very low and for professionals who deal with potentially infectable animals it is low to medium.

There seems to be no risk in eating meat from contaminated poultry as long as it is well cooked (Podcast ECDC).

There have been no demonstrated cases of person-to-person transmission to date.

# How can you get A(H5N1)?

Direct contact with chickens, geese and ducks (at least).

Contact with contaminated surfaces. It appears that the virus can survive for several days given the right conditions. It has not been demonstrated that there has been transmission to humans by this route.

Inhalation of contaminated droplets or dust.

## Lateral flow tests being prepared for UK in case of avian flu

A person in Cambodia died from H5N1, the UK Health Security Agency has said, alert but says human-to-human transmission is rare



### Most viewed

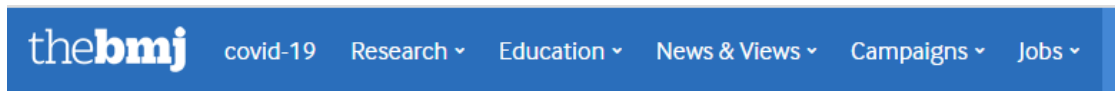


There are some tools and positive expectations in the short term

- Antiviral drugs commonly used for the flu worked well in infected people.
- Some countries used these antivirals in a preventive situation, namely in people who were at high risk or who were near people infected with A(H1N5).
- There are rapid advances towards the production of lateral flow tests for A(H1N5).

# But there are worries for the future...

## 1. Vaccine solutions that cover A(H1N5) are needed.



### News

#### H5N1: Governments should invest in vaccines for all flu strains, says incoming WHO chief scientist

BMJ 2023 ; 380 doi: <https://doi.org/10.1136/bmj.p434> (Published 22 February 2023)

Cite this as: *BMJ* 2023;380:p434

Article

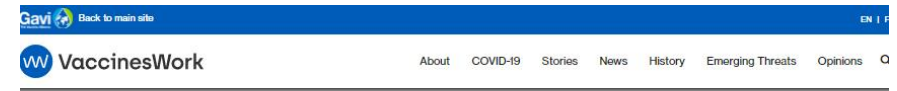
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Elisabeth Mahase

Jeremy Farrar, Chief scientist of WHO: “In terms of potential pandemic, H5N1 is a big worry.”



News from this site

Bird flu

Vaccine development

#### Why bird flu vaccines need urgent R&D

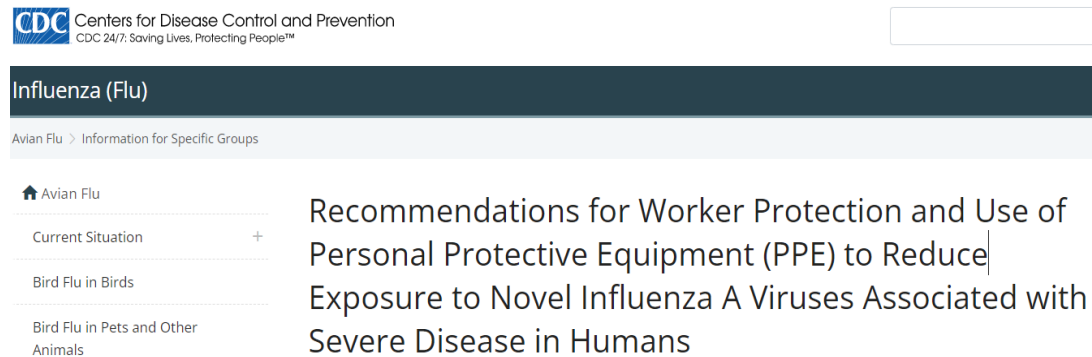
As bird flu has started to show up in mammals, concerns continue that the virus might mutate to spread amongst people. If that happens, we'd need a vaccine, fast – here's where we are so far.

15 February 2023 • 5 min read • by [Priya Joti](#)



# But there are worries for the future...

2. The personal protective equipment (PPE) seems to work reasonably well, but...



The screenshot shows the CDC website interface. At the top left is the CDC logo and the text 'Centers for Disease Control and Prevention'. Below this is a search bar. The main content area is titled 'Influenza (Flu)'. Underneath, there is a breadcrumb trail: 'Avian Flu > Information for Specific Groups'. A sidebar on the left lists categories: 'Avian Flu', 'Current Situation', 'Bird Flu in Birds', and 'Bird Flu in Pets and Other Animals'. The main article title is 'Recommendations for Worker Protection and Use of Personal Protective Equipment (PPE) to Reduce Exposure to Novel Influenza A Viruses Associated with Severe Disease in Humans'.

There are clear protection recommendations, well framed in the quality systems of the major international bodies.



The screenshot shows the Eurosurveillance journal article page. The header features the Eurosurveillance logo and the text 'Europe's journal on infectious disease surveillance, epidemiology and global health'. Below the header is a navigation menu with options: 'Current', 'Archives', 'Print Editions', 'Collections', 'About Us', and 'Editorial Policies'. The article title is 'Influenza A(H5N1) detection in two asymptomatic poultry farm workers in Spain, September to October 2022: suspected environmental contamination'. The article is categorized as a 'Rapid communication' and has an 'Open Access' status. There are 'Like' and 'Download' buttons. The authors listed are: Esteban Aznar<sup>1\*</sup>, Inmaculada Casas<sup>2,4</sup>, Alejandro González Praetorius<sup>3</sup>, María José Ruano Ramos<sup>4</sup>, Francisco Pozo<sup>2</sup>, María José Sierra Moros<sup>1,5</sup>, María Victoria García Rivera<sup>6</sup>, Azucena Sánchez Sánchez<sup>4</sup>, Elena García Villacieros<sup>7</sup>, Gabriela Saravia<sup>1</sup>, María Iglesias-Caballero<sup>2</sup>, Elena Román Marcos<sup>6\*\*</sup>, Lucía García San Miguel<sup>1,\*\*</sup>.

“Both workers were involved in egg collection and routine cleaning tasks. They used personal protection equipment, including an FFP2 mask, gloves, boots and an apron.”

# But there are worries for the future...

3. Here we go again with the fake news...even before the pandemic happens...



The Alaskan Patriot @Alaskan\_Patriot · Feb 27

PANIC ... PANIC ... PANIC

Covid-19 is no longer be a big concern to people but the **H5N1** bird flu has got medical researchers in an uproar. It's another flu virus coming just as predicted. Not predicted by conspiracy theorists, but by Bill Gates, Dr Fauci, WHO, and CDC.

Ted Nugent @TedNugent · Feb 25

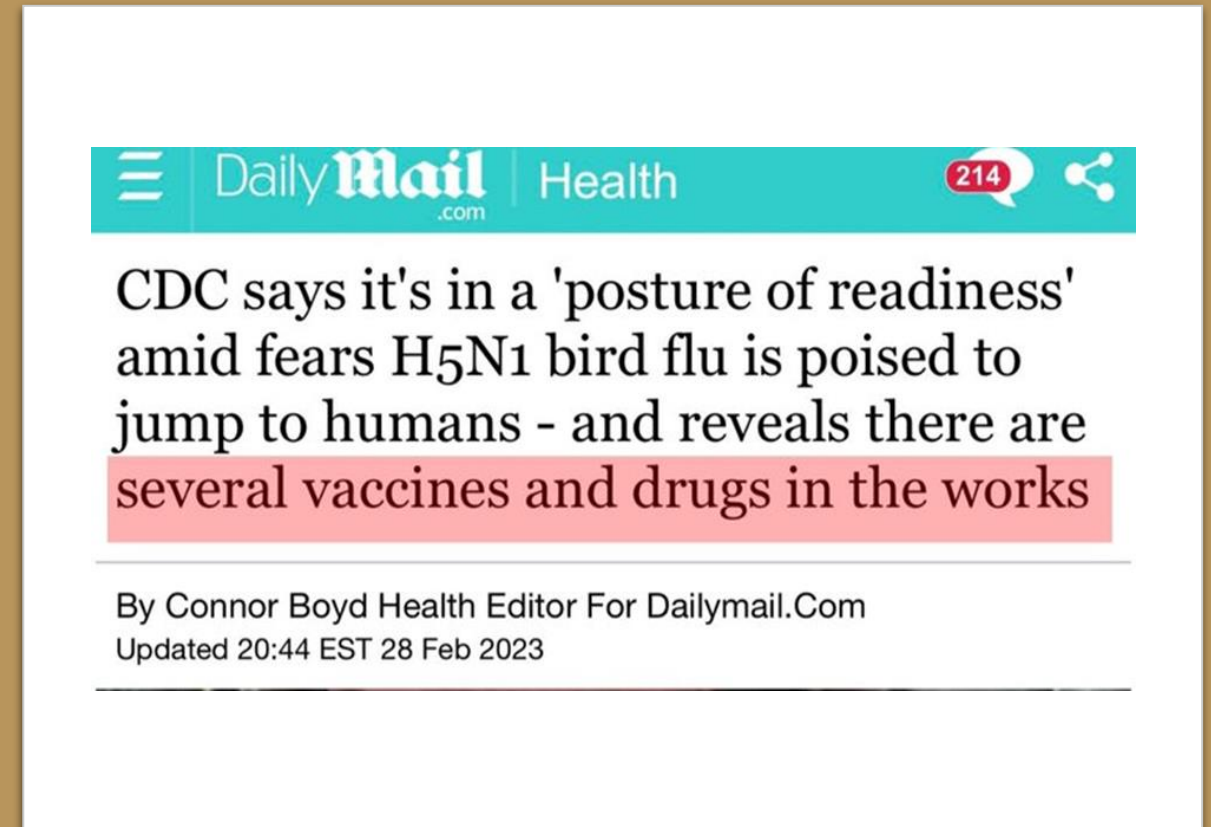
The problem with natural immunity is that it's free and can't be taxed by big pharma and big brother.

5 8 19 900

@DcrInYYC · Feb 24

Pretty much all I have to say about **H5N1** is that we had better hope for some dumb luck with this virus. The incompetents that forced a SARS2 pandemic & global epidemic on the world are going to also force a **H5N1** pandemic on the world.

1 3 22 659



Daily Mail Health 214

## CDC says it's in a 'posture of readiness' amid fears H5N1 bird flu is poised to jump to humans - and reveals there are several vaccines and drugs in the works

By Connor Boyd Health Editor For Dailymail.Com  
Updated 20:44 EST 28 Feb 2023

# Some open risks...

Contaminated wild birds transmit the virus to poultry on small farms and self-production where there are no sanitary measures or capacity for rapid recognition of the virus.

Curious contact with carcasses of dead birds and other animals on beaches and fields.

Sanitary isolations are not respected with the recommended distances from farms where there were infected animals.