9.

ULUSAL ERİŞKİN BAĞIŞIKLAMASI SİMPOZYUMU

22-23 KASIM 2024
CROWNE PLAZA | ANKARA

EBÇG KLİMİK DERNEĞİ ERİŞKİN BAĞIŞIKLAMASI ÇALIŞMA GRUBU

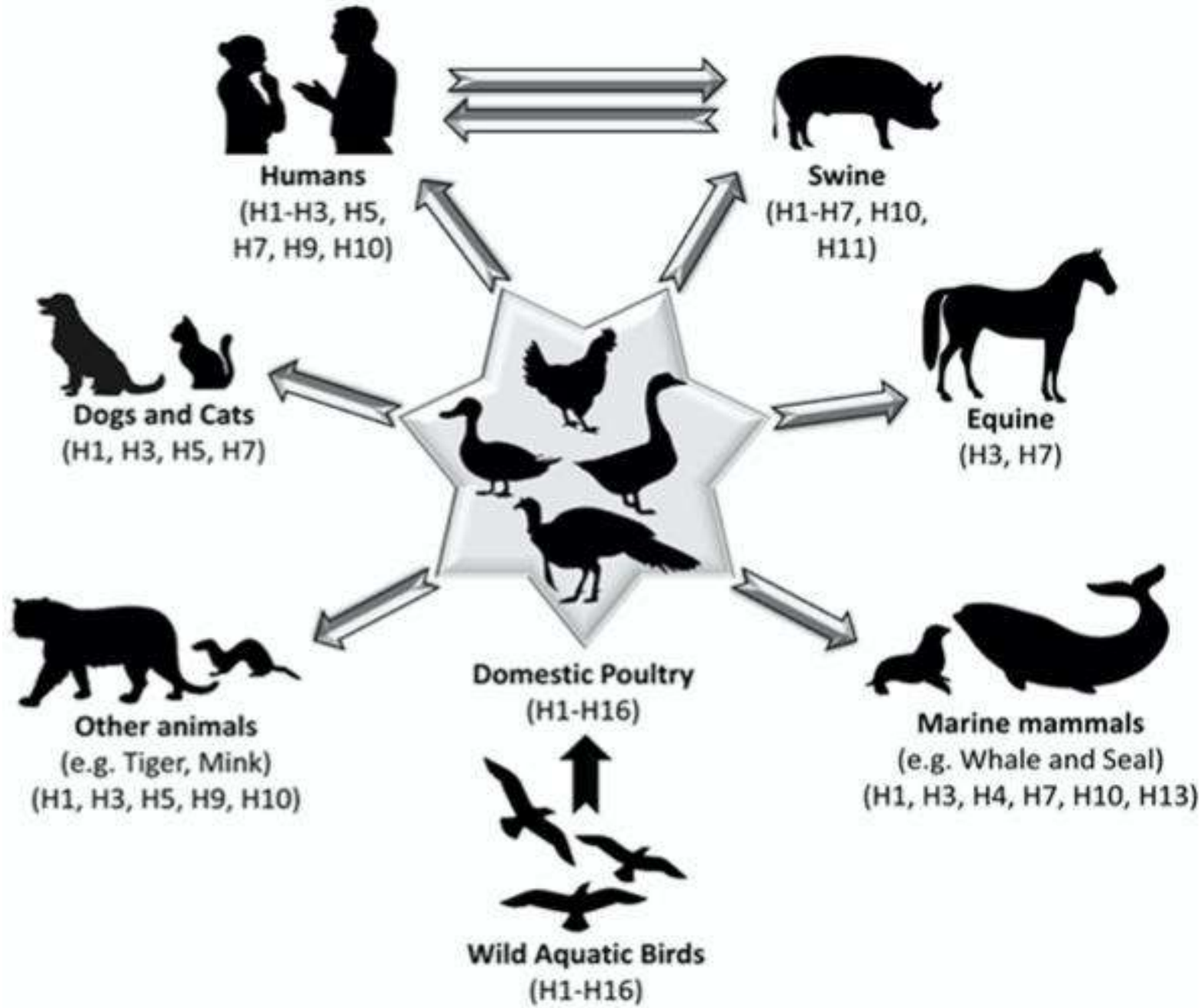
HİBRİT

Güncel ve Gelecekteki Olası Salgınlar ve Bağışıklama: H5N1

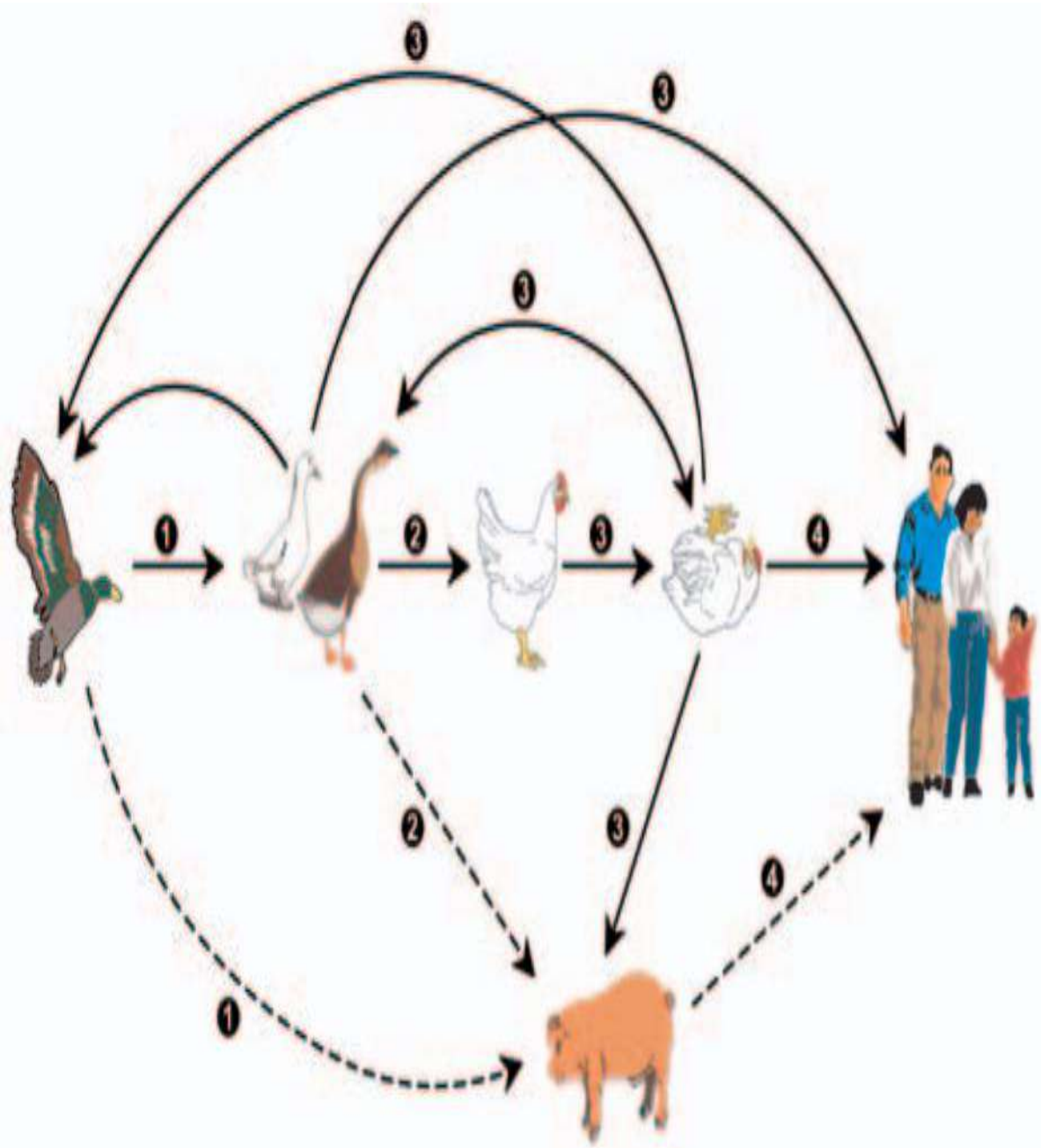
Dr. Funda MEMİŞOĞLU

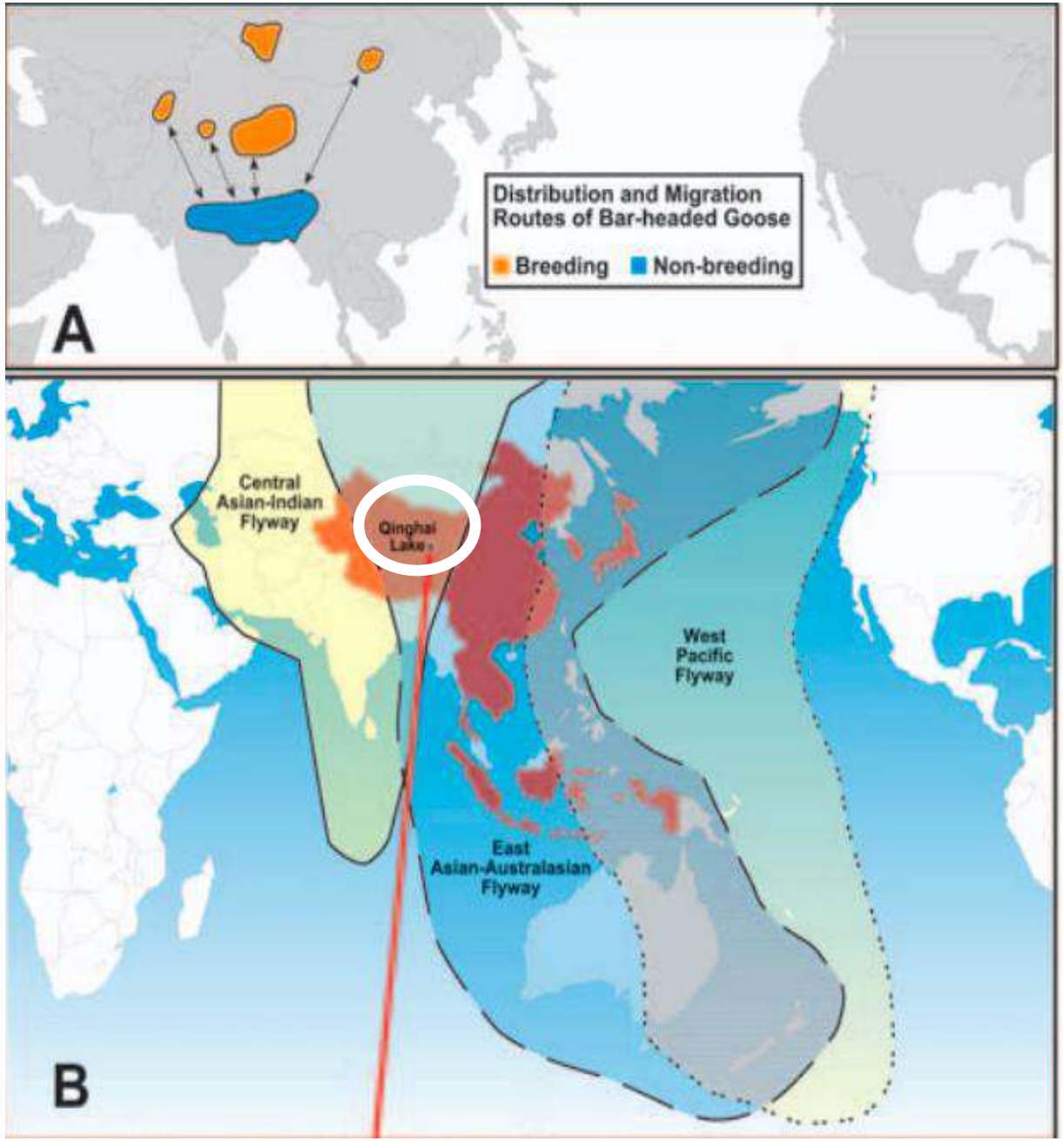
İnönü Üniversitesi Tıp Fakültesi

Enfeksiyon Hastalıkları ve Klinik Mikrobiyoloji Anabilim Dalı

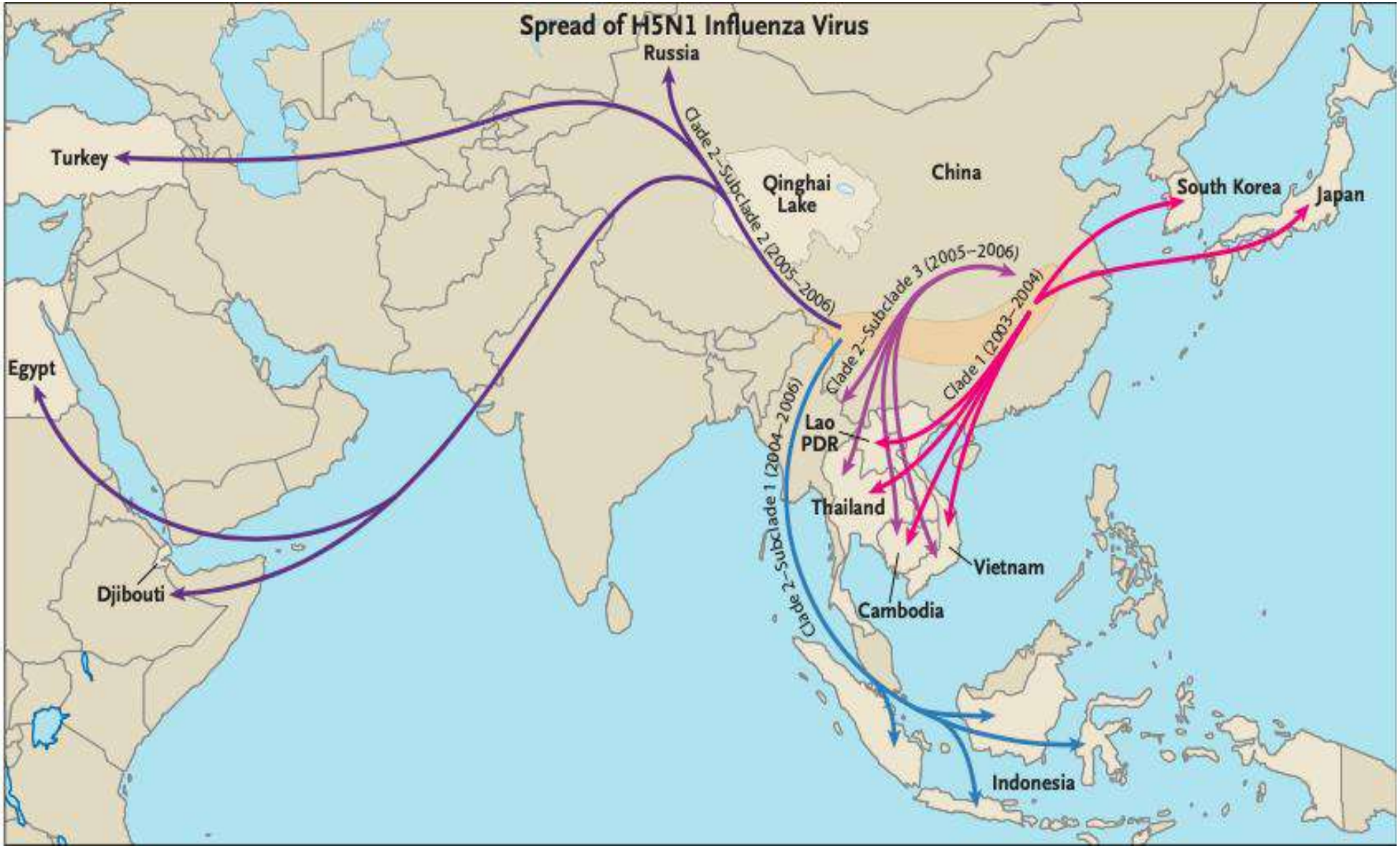


Vaccines 2023, *11*, 1628. https://doi.org/10.3390

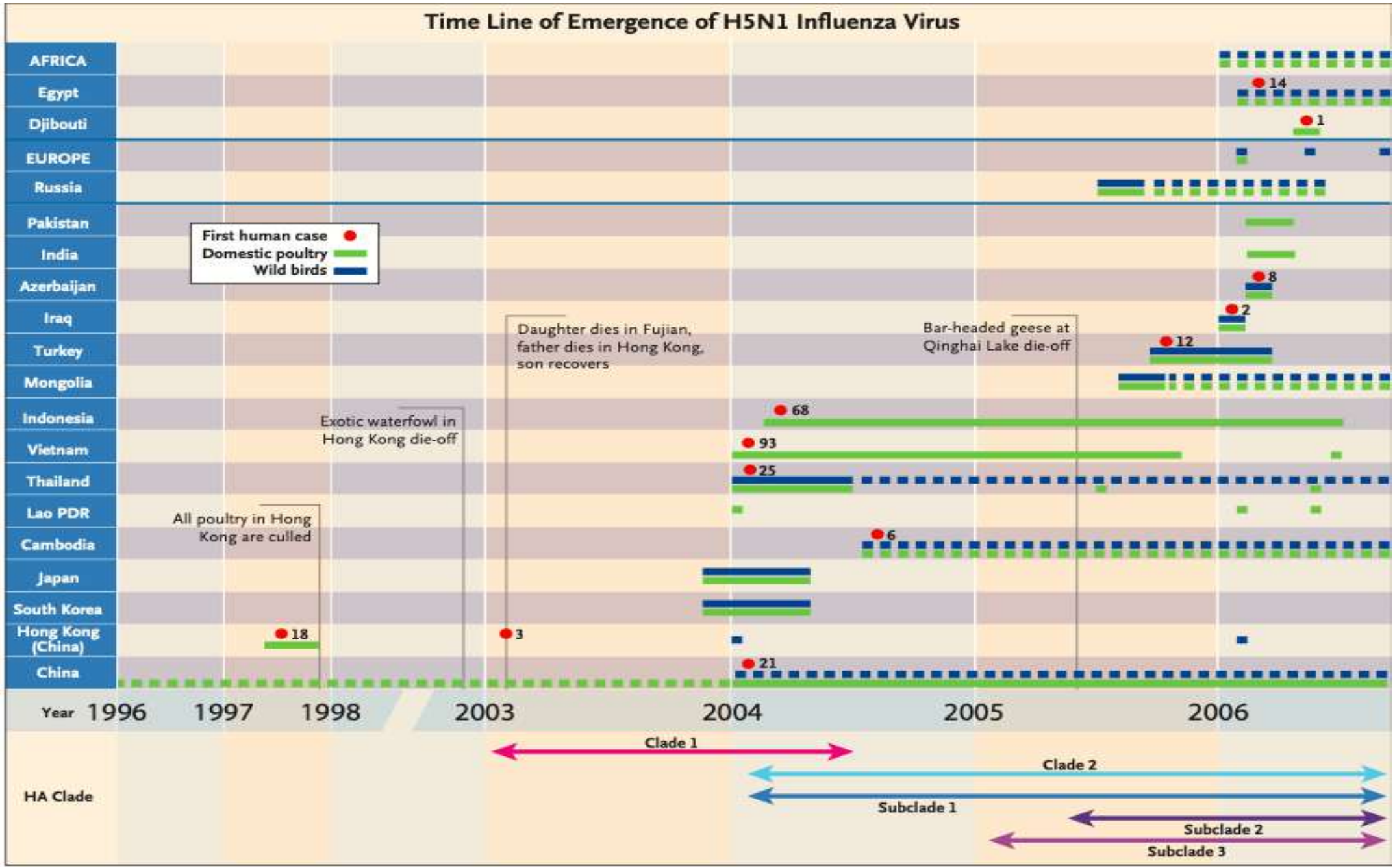




Emerg Infect Dis. 2006 Jan;12(1):3–8.



N Engl J Med (23)2006, 355;21



N Engl J Med (23)2006, 355;21

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 NOVEMBER 23, 2006 VOL. 355 NO. 21

Avian Influenza A (H5N1) Infection in Eastern Turkey in 2006

Ahmet Faik Oner, M.D., Ali Bay, M.D., Sukru Arslan, M.D., Hayrettin Akdeniz, M.D., Huseyin Avni Sahin, M.D., Yasar Cesur, M.D., Serdar Epcacan, M.D., Neziha Yilmaz, M.D., Ibrahim Deger, M.D., Baran Kizilyildiz, M.D., Hasan Karsen, M.D., and Mehmet Ceyhan, M.D.

Figure 1. Locations of Cases of H5N1 Infection in Turkey. The white boxes denote places with documented cases of H5N1 virus infection.

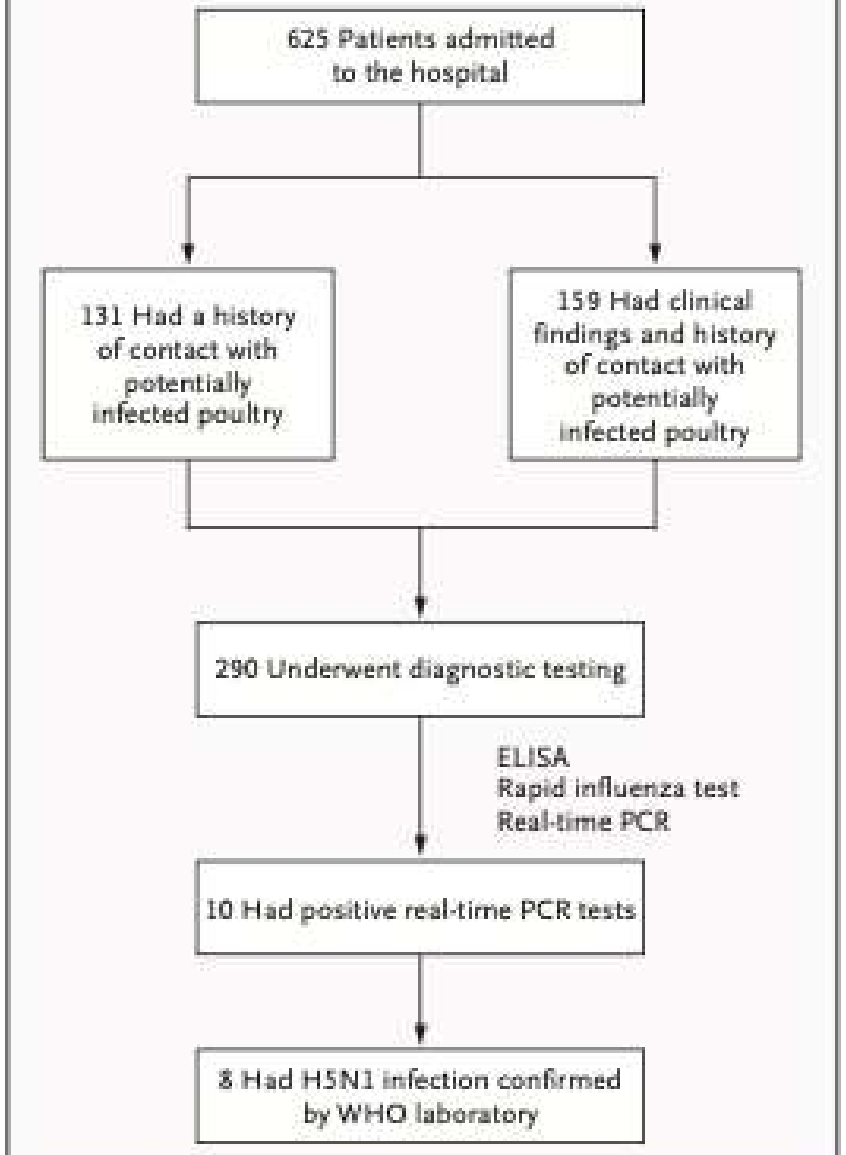
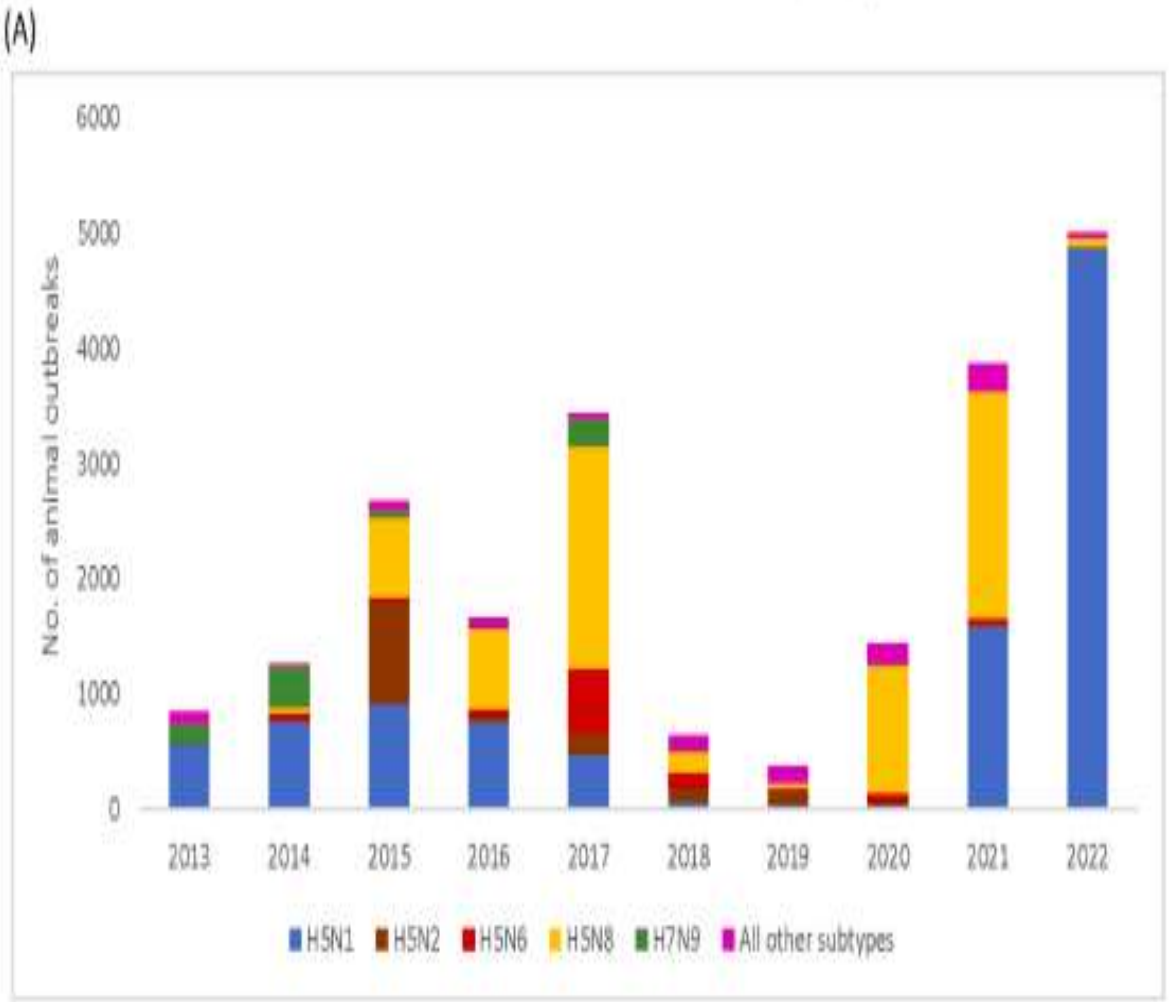
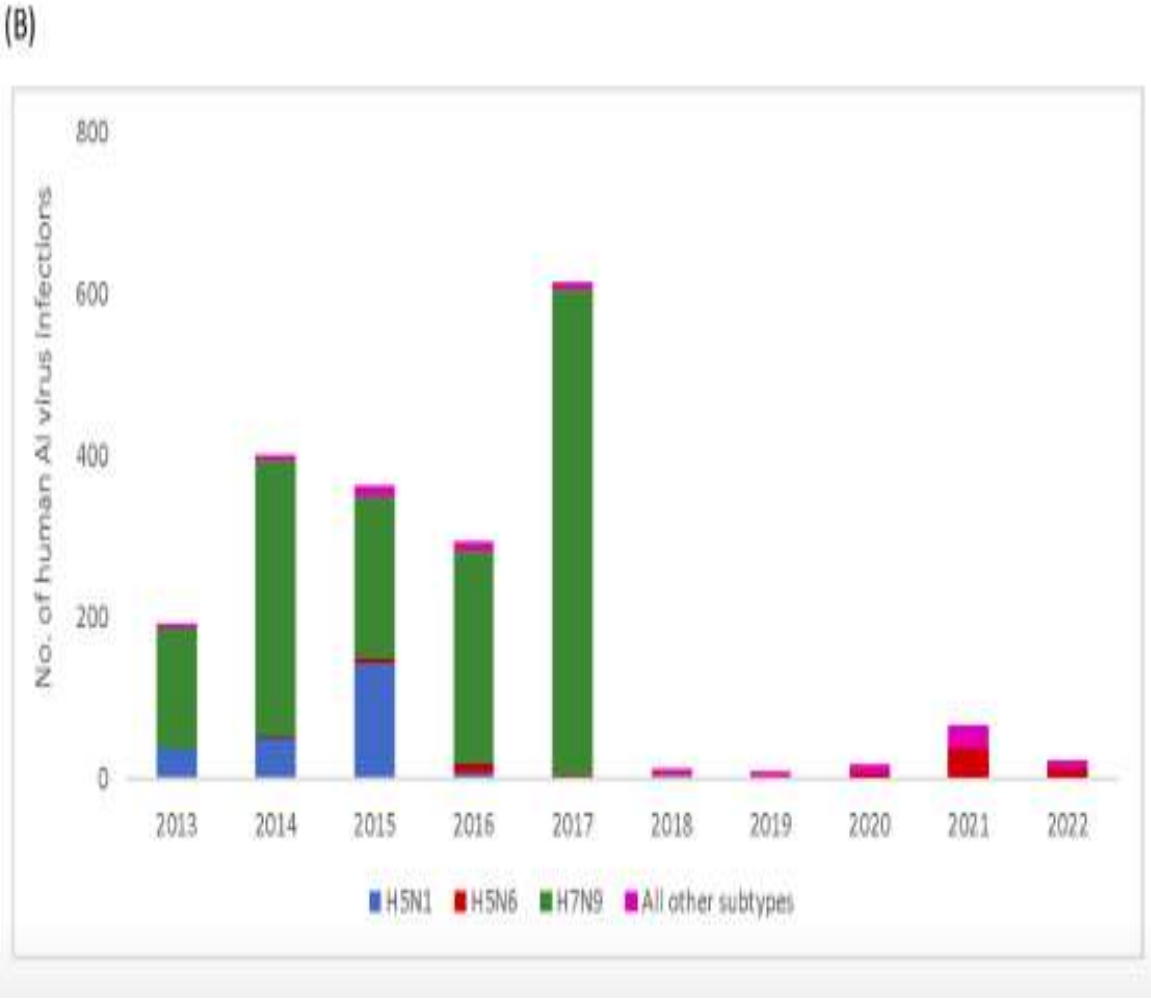


Figure 2. Diagnostic Testing in the Patients Evaluated.
Among the 625 patients seen in the hospital, H5N1 virus was detected in 10 after testing with an ELISA, a rapid influenza test, and a real-time PCR test.

Figure 1. Global animal outbreaks (A) and human infections (B) with avian influenza (AI) virus by subtype, January 2013–June 2022





- AI salgınları daha sık
- Coğrafi olarak daha yaygın

JMIR Public Health Surveill 2023;9:e46383

The Journal of Infectious Diseases
REVIEW

Avian Influenza Human Infections at the Human-Animal Interface

Damien A. M. Philippon, Peng Wu, Benjamin J. Cowling, and Eric H. Y. Lau
WHO Collaborating Centre for Infectious Disease Epidemiology and Control, School of Public Health, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong Special Administrative Region, China

Table 2. Number of Cases per Year per Subtype[a]

Subtype	1996–2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
H5N1	18	6	46	98	115	88	44	73	48	62	32	39	52	145	10	4	…	1	881
H5N6	…	…	…	…	…	…	…	…	…	…	…	…	3	5	9	2	3	…	22
H6N1	…	…	…	…	…	…	…	…	…	…	…	1	…	…	…	…	…	…	1
H7N2	1	1	…	…	…	4	…	…	…	…	…	…	…	…	2	…	…	…	8
H7N3	…	…	2	…	1	…	…	…	…	…	2	…	…	…	…	…	…	…	5
H7N4	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	1	…	…	1
H7N7	1	89	…	…	…	…	…	…	…	…	…	3	…	…	…	…	…	…	93
H7N9[b]	…	…	…	…	…	…	…	…	…	…	…	158	339	190	265	599	2	1	1554
H9N2	8	1	1	…	…	1	1	2	…	1	…	2	2	12	10	7	7	3	58
H10N7	…	…	2	…	…	…	…	…	2	…	…	…	…	…	…	…	…	…	4
H10N8	…	…	…	…	…	…	…	…	…	…	…	1	2	…	…	…	…	…	3
Total	28	97	51	98	116	93	45	75	50	63	34	204	398	352	296	613	12	5	2644

J Infect Dis, 2020;222:528–37

Zoonotic infections by avian influenza virus: changing global epidemiology, investigation, and control

Mei Kang, Li-Fang Wang*, Bo-Wen Sun*, Wen-Bo Wan, Xiang Ji, Guy Baele, Yu-Hai Bi, Marc A Suchard, Alexander Lai, Min Zha Yan-Hong Zhu, Lei Ma, Hai-Peng Li, Ayidana Haerheng, Yang-Rui Qi, Rui-Lan Wang, Na He, Shuo Su*

Lancet Infect Dis 2024; 24: e522–31

1 Ocak 2013-6 Haziran 2023

	Total	H3N8	H5N1	H5N6	H5N8	H6N1	H7N2	H7N4	H7N7	H7N9	H9N2	H10N3	H10N8
Infections in humans	2050	3	266	85	7	1	2	1	3	1568	106	2	3
Age	53 (0·2–91)	5 (4–5	19 (0·6–77)	50 (1–81)	NA (29–60)	20 (20)	NA	68 (68)	NA	57 (0·4–91)	4 (0·2–86)	37 (33–41)	73 (55–75)
0–15 years*	272 (13%)	2 (67%	119 (46%)	11 (13%)	NA	0	NA	0	NA	54 (3%)	86 (83%)	0	0
16–59 years*	1049 (52%)	1 (33%	132 (51%)	60 (71%)	NA	1 (100%)	NA	0	NA	838 (54%)	14 (14%)	2 (100%)	1 (33%)
≥60 years*	696 (35%)	0	8 (3%)	13 (16%)	NA	0	NA	1 (100%)	NA	669 (43%)	3 (3%)	0	2 (67%)
Male	1302 (64%)	2 (67%	121 (46%)	47 (56%)	2 (29%)	0	NA	0	NA	1087 (70%)	40 (39%)	2 (100%)	1 (33%)
Western Pacific region	Cambodia, China, Laos, Malaysia, and Viet Nam	China	Cambodia, China, Laos, and Viet Nam	China and Laos	..	China	..	China	..	China and Malaysia	Cambodia and China	China	China
South-East Asia region	Bangladesh, India, Indonesia, and Nepal	..	Bangladesh, India, Indonesia, and Nepal	..	..	..	..	..	..	..	Bangladesh and India	..	..
European region	Italy, Russia, Spain, and UK	..	Spain and UK	..	Russia	..	..	..	Italy	..	..	..	..
Region of the Americas	Canada, USA, Ecuador, and Chile	..	Canada, USA, Ecuador, and Chile	..	..	..	USA	..	..	Canada	..	..	..
African region	Senegal and Nigeria†	..	..	..	..	..	..	..	..	..	Senegal	..	..
Eastern Mediterranean region	Egypt and Oman	..	Egypt	..	..	..	..	..	..	..	Egypt and Oman	..	..
Outcome‡	752 (37%)	1 (33%	98 (37%)	33 (39%)	NA	0	0	0	NA	616 (39%)	2 (2%)	NA	2 (67%)

Zoonotic infections by avian influenza virus: changing global epidemiology, investigation, and control

Lancet Infect Dis 2024; 24: e522–31

Mei Kang*, Li-Fang Wang*, Bo-Wen Sun*, Wen-Bo Wan, Xiang Ji, Guy Baele, Yu-Hai Bi, Marc A Suchard, Alexander Lai, Min Zhang, Lin Wang, Yan-Hong Zhu, Lei Ma, Hai-Peng Li, Ayidana Haerheng, Yang-Rui Qi, Rui-Lan Wang, Na He, Shuo Su

- Laboratuvarca doğrulanmış 2050 insan enfeksiyonu
- Toplam 12 kuş gribi virüsü alt tipi
- Yeni ortaya çıkan 8 alt tip
  - A(H7N9), A(H6N1), A(H10N8), A(H5N6), A(H7N4), A(H5N8),A(H10N3), A(H3N8)
- Yeniden ortaya çıkan 4 alt tip
  - A(H5N1), A(H7N2), A(H7N7), A(H9N2)

Cumulative number of confirmed human cases† for avian influenza A(H5N1) reported to WHO, 2003-2024

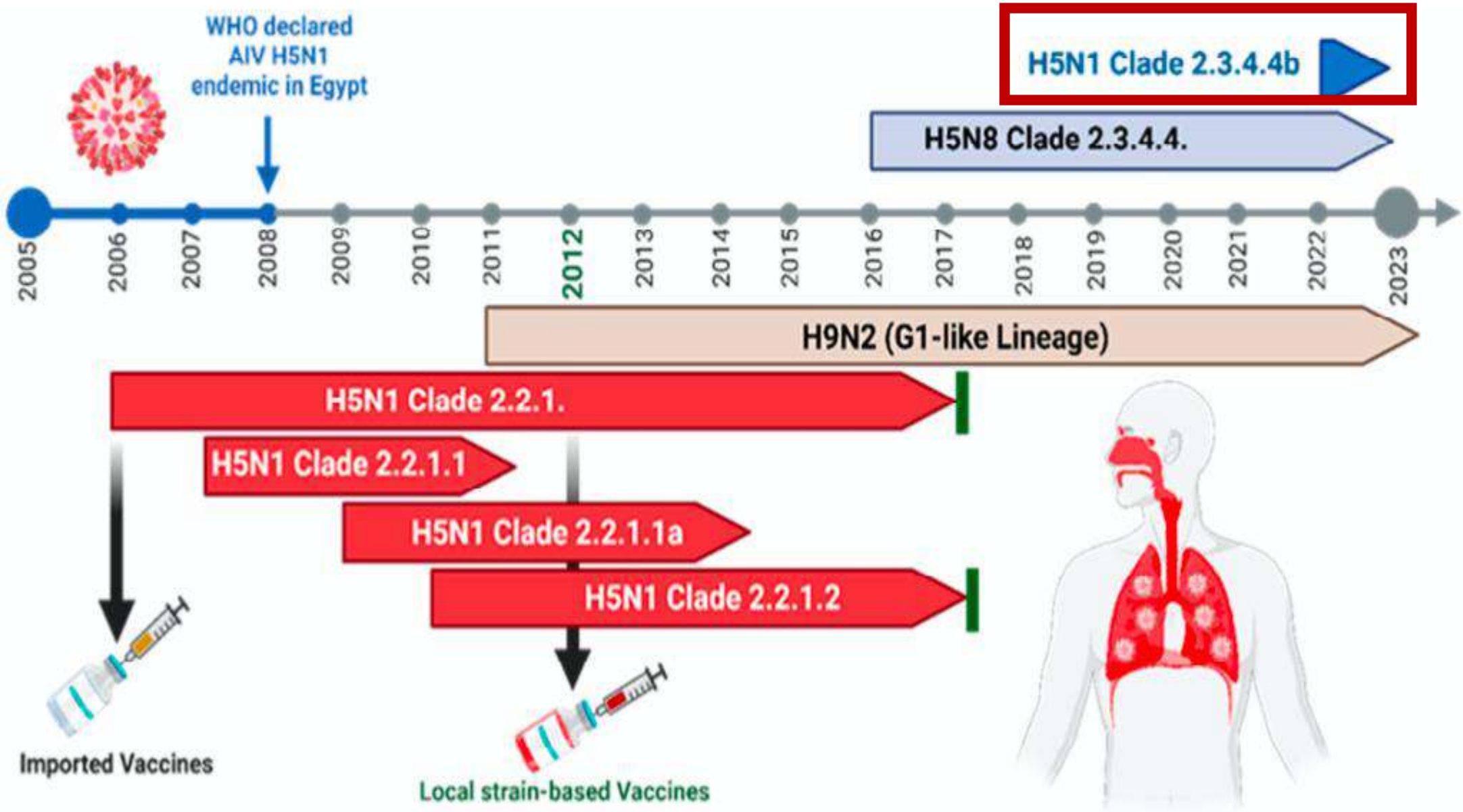
Country	2003-2009*		2010-2014*		2015-2019*		2020		2021		2022		2023		2024		Total	
	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths
Azerbaijan	8	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	5
Bangladesh	1	0	6	1	1	0	0	0	0	0	0	0	0	0	0	0	8	1
Cambodia	9	7	47	30	0	0	0	0	0	0	0	0	6	4	5	1	67	42
Canada	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Chile	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
China	38	25	9	5	6	1	0	0	0	0	1	1	1	0	0	0	55	32
Djibouti	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Ecuador	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Egypt	90	27	120	50	149	43	0	0	0	0	0	0	0	0	0	0	359	120
India	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1
Indonesia	162	134	35	31	3	3	0	0	0	0	0	0	0	0	0	0	200	168
Iraq	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2
Lao People's Democratic Republic	2	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3	2
Myanmar	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Nepal	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1
Nigeria	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Pakistan	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1
Spain	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0
Thailand	25	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	17
Turkey	12	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	4
United Kingdom	0	0	0	0	0	0	0	0	1	0	0	0	4	0	0	0	5	0
United States of America	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Viet Nam	112	57	15	7	0	0	0	0	0	0	1	0	0	0	0	0	128	64
Total	**468**	**282**	**233**	**125**	**160**	**48**	**1**	**0**	**2**	**1**	**6**	**1**	**12**	**4**	**5**	**1**	**887**	**462**

*2003-2009, 2010-2014 and 2015-2019 total figures. Breakdowns by year available on subsequent tables.
†This count includes reported detections in asymptomatic individuals. In some cases, the confirmation of transient contamination of the nasopharynx/oropharynx with virus particles after exposure to contaminated environment remains inconclusive. Total number of cases includes number of deaths.

Screenshot

World Health Organization

https://cdn.who.int/media/docs/default-source/influenza/h5n1-human-case-cumulative-table/2024



Vaccines 2023, *11*, 1628. https://doi.org/10.3390

Anatolia genetworks Ürünler Hastalıklar Kurumsal

BBC NEWS TÜRKÇE

Afyonkarahisar ve Denizli'de kuş gribi nedeniyle 6,5 milyon kanatlı hayvan itlaf edildi

Bandırma'daki bir tavuk çiftliği

2 Mart 2023

9 Temmmuz 2024

Sağlık > Sağlık haberleri

Kuş gribi vakalarında endişe verici tablo: 'İnsan sağlığı için tetikte olunmalı'

2 Kasım 2024

ın Dakika... Konya'da 'kuş gribi' vakası görüldü: Bakanlıktan ilk açıklama!

Tarım ve Orman Bakanlığı, Konya'nın Meram ilçesindeki bir işletmede yaşanan kanatlı hayvan ölümleri sonrası yapılan analizlerde; kuş gribi tespit edildiğini, hastalığın yayılmasını önlemek adına her türlü tedbirin alındığını ve salgın olarak nitelendirilebilecek bir durumun söz konusu olmadığını açıkladı.

Kuş gribi kabusu geri dönüyor: Sektör tedirgin, uzmanlar uyarıyor!

Türkiye'de kuş gribi vakaları yeniden gündemde. Son olarak Rusya, Konya'dan kümes hayvanı eti ve yenilebilir yumurta ithalatına geçici kısıtlamalar getirdi. Veteriner Hekimler Derneği Genel Başkanı Dr. Gülay Ertürk, gerekli tedbirler ve biyogüvenlik önlemleri alınmadığı takdirde kuş gribinin büyük bir salgına dönüşebileceği uyarısında bulundu.

Haber Merkezi

YAYINLAMA
14 Kasım 2024 12:10

GÜNCELLEME
14 Kasım 2024 12:32

Eskişehir'de kuş gribi alarmı! 5 mahalle karantinada

Eskişehir'in Sivrihisar ilçesindeki bir tavuk çiftliğinde kuş gribine rastlanması üzerine ilçedeki 5 mahalle karantinaya alındı.

10.11.2024 - 14:09 Haberler - Anadolu Ajansı

Paylaş

Kuş gribi Türkiye'de göründü! O şehirde 5 mahalle karantina altına alındı

Eskişehir'in Sivrihisar ilçesinde de kuş gribi tespit edildi. Bir çiftlikte aniden gerçekleşen 15 tavuk ölümünün ardından ilçedeki 5 mahallenin karantinaya alındığı öğrenildi.

Yayınlanma: 10 Kasım 2024 Pazar 15:54

Table 1
LPAI A virus subtypes reported to cause human illness and associated clinical syndromes

Subtype	Patient Characteristics	Clinical Syndromes	Illness Severity	Countries	Years (Illness Onset)
H6N1	Young adult	Moderate lower respiratory tract disease	Moderate	Taiwan	2013
H7N2	Adults	Upper respiratory tract illness, conjunctivitis, lower respiratory tract disease	Mild to moderate	US; UK	2002, 2003, 2007, 2016[a]
H7N3	Adults				2004, 2006
H7N4	Elderly adult				2017
H7N7	Adults				1980,[b] 1996
H7N9	All ages			Kong ive iwan,	2013–2018
H9N2	Young children and ad with influenza-like illness; one immunosuppressed a with bilateral pneumonia		e in 1 case	ecial Administrat on of China; Bangladesh, Egypt, Oman	1998, 1999, 2003, 2007, 2008, 2009, 2011, 2013–2017, 2019
H10N7	Adults	Conjunctivitis and upper respiratory tract illness	Mild	Australia	2010
H10N8	Middle-aged and elderly adults	Severe pneumonia, critical illness with multiorgan failure	Critical illness, fatal outcome in 2 of 3 cases	China	2013, 2014

- Üst solunum yolu infeksiyonu
- Orta düzey alt solunum yolu infeksiyonu
- Konjunktivit

- H7N9 ve H10N8
  - Ciddi pnömoni
  - Çoklu organ yetmezliği

Infect Dis Clin N Am 33 (2019) 907–932

Table 2
HPAI A virus subtypes reported to cause human illness and associated clinical syndromes

Subtype	Patient Characteristics	Clinical Syndromes		Countries	Years
H5N1	All ages, primarily children and young adults	U	ority ness	Hong Kong Special Administrative Region of China; China; Vietnam; Thailand; Cambodia; Indonesia; China; Turkey; Iraq; Azerbaijan; Egypt; Djibouti; Nigeria; Laos PDR; Nepal; Pakistan; Myanmar; Bangladesh; Canada (imported from China)	1997, 2003–2017, 2019
H5N6	Adults	Upper respiratory tract illness, severe pneumonia, respiratory failure, ARDS, multiorgan failure	One case with mild illness; most cases with critical illness, mortality >50%	China	2014–2018
H7N3	Adults	Conjunctivitis	Mild	Canada; UK; Mexico; Italy	2004, 2006, 2012, 2013
H7N7	All ages	Hepatitis, conjunctivitis, upper respiratory tract illness, severe pneumonia, respiratory failure, ARDS, multiorgan failure	Mild to critical illness with fatal outcome in one adult; majority with mild illness (conjunctivitis)	UK; the Netherlands, Italy	1959, 1996, 2003, 2013
H7N9		Pneumonia, respiratory failure, ARDS, multiorgan failure	Critical illness, high mortality	China	2016–2017, 2019

- Üst solunum yolu infeksiyonu
- Alt solunum yolu infeksiyonu
- Ensefalit
- ARDS
- Çoklu organ yetmezlği

Infect Dis Clin N Am 33 (2019) 907–932

Şiddetli Avian İnfluenza İnfeksiyonu Klinik ve Laboratuvar Bulguları

Kabul klinik bulguları	▪ Ateş ▪ Öksürük ▪ Nefes darlığı ▪ Göğüs ağrısı ▪ Miyalji ▪ İshal, halsizlik, baş ağrısı, boğaz ağrısı	▪ Radyografik bulgular ▪ Bilateral yamalı, interstisyel, lober ve/veya yaygın infiltratlar ▪ Buzlu cam opasiteleri ▪ Konsolidasyon ▪ Hava bronkogramları

Kabul laboratuvar bulguları	▪ Lökosit düşük veya normal
	▪ Lenfopeni
	▪ Trombositopeni
		▪ H5N1 mortalitesiyle ilişki:
		  ▪ Nötropeni
		  ▪ Yüksek alanin aminotransferaz

Hastaneye yatışta klinik komplikasyonlar	▪ Solunum yetmezliği ▪ ARDS ▪ Refrakter hipoksemi ▪ Plevral efüzyon ▪ Pnömotoraks ▪ Kalp yetmezliği	▪ Akut böbrek hasarı/renal yetmezlik ▪ Çoklu organ yetmezliği ▪ Septik şok ▪ Rabdomiyoliz ▪ Gebe hastalarda spontan düşük ▪ Yaygın intravasküler koagülasyon ▪ Ensefalit ▪ Bakteriyel ve fungal koenfeksiyon
Hastaneye yatışta laboratuvar bulguları	▪ Yüksek laktat, kreatinin kinaz, hepatik transaminazlar	▪ Hipoalbüminemi ▪ Lökopeni veya lökositoz

Infect Dis Clin N Am 33 (2019) 907–932

The Journal of Infectious Diseases
ID TRANSLATIONAL SCIENCE UPDATE

An Update on Highly Pathogenic Avian Influenza A(H5N1) Virus, Clade 2.3.4.4b

Richard J. Webby[1] and Timothy M. Uyeki[2]

[1]World Health Organization Collaborating Centre for Studies on the Ecology of Influenza in Animals and Birds, St Jude Children's Research Hospital, Memphis, Tennessee; and [2]Influenza Division, National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia

A/goose/Guangdong/1/96-soyundan gelen clade 2.3.4.4b

2021 yılı

- Dünya çapında kuşlar arasında yayılma
- Kümes hayvanı salgınları
- Çok çeşitli kara ve deniz memeli türlerinin enfeksiyonları
- Avrupa'da sadece mevsimsel değil, endemik
- Afrika'da artan tespitler
- Kuzey Amerika ve Güney Amerika'ya yayıldı

2024 yılı

- Süt sığırlarında tespit edildi
- Sığırlar arasında bulaşmayı gösteren moleküler ve epidemiyolojik kanıtlar
- Temel adaptif belirteç polimeraz proteinlerinde (PB2)

- Enfekte memelilerde
  - **HPAI A(H5N1) virüslerinde reseptör tercihlerini değiştirme seçilim baskısı daha yüksek olabilir**

J Infect Dis, 2024;230:533–42

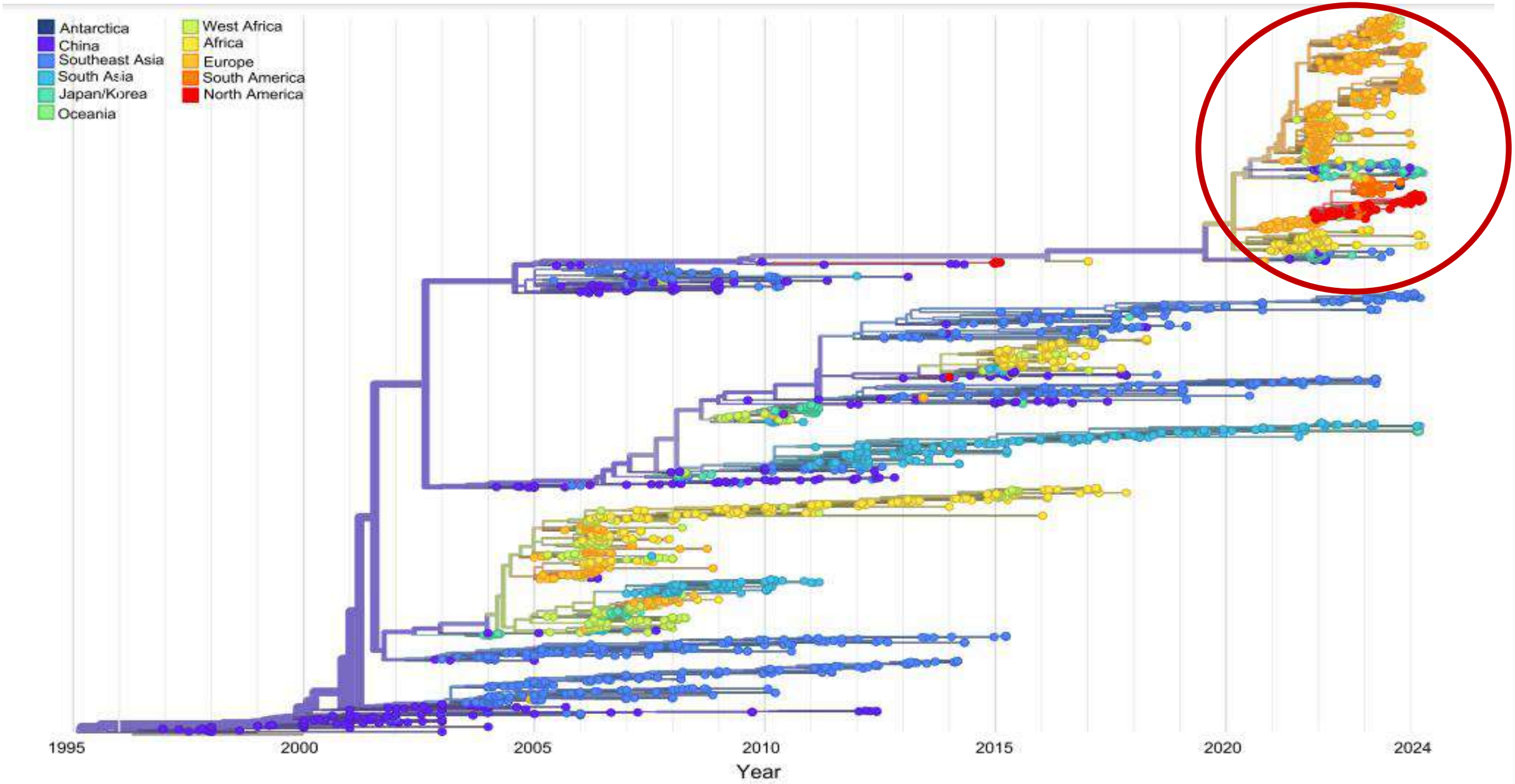


Figure 1. Phylogenetic tree of hemagglutinin sequences of H5N1 viruses. Tips are colored by the region in which the specimens were collected. Clade 2.3.3.4b viruses are shown in the upper right portion of the tree. Figure produced from Nextstrain [8, 9] with permission from Louise Moncla.

J Infect Dis, 2024;230:533–42

Highly Pathogenic Avian Influenza A(H5N1) Virus in Wild Red Foxes, the Netherlands, 2021

Jolianne M. Rijks, Hanna Hesselink, Pim Lollinga,

Figure. Salivating red fox (*Vulpes vulpes*) cub 1 during a fit, the Netherlands, 2021. Seizure started with retracting lips at 0 sec (A), followed by facial wrinkling with opening of mouth at 0.07 sec (B), closing of the jaws at 0.17 sec (C), then back to "normal" at 0.40 sec (D), before this sequence starts all over at 0.50 sec.

- Hollanda'da vahşi doğada bulunan, nörolojik belirtileri olan 2 kızıl tilki (Vulpes vulpes) yavrusu
- HPAI H5N1 2.3.4.4b clade
  - Solunum veya nörolojik hastalık belirtileri gösteren hayvanlar için ayırıcı tanı listesinde olmalı

- Tek bir çiftlik, vizonlarda
- HPAI H5N1 2.3.4.4b clade
- PB2 geninde T271A mutasyonu

- 20 çiftlikte tilki, Amerikan vizonu ve rakun
- HPAI H5N1 2.3.4.4b clade
- PB2 geninde E627K ve T271A mutasyonu

25 Mart 2024

30 Ekim 2024

USDA Animal and Plant Health Inspection Service
U.S. DEPARTMENT OF AGRICULTURE

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Home › News and Updates › Agency Announcements › USDA, FDA and CDC Share Update on HPAI Detections in Dairy Cattle

USDA, FDA and CDC Share Update on HPAI Detections in Dairy Cattle

Home › News and Updates › Agency Anno
Federal and State Veterinary, Public Health Ag

Federal and Sta
Agencies Share
Kansas, Texas Dairy Herds

Detections in Oregon Backyard Farm, Including First H5N1 Detections in Swine

terinary Agencies Share
ctions in Oregon Backyard
Farm, Including First H5N1 Detections in Swine

RESEARCH

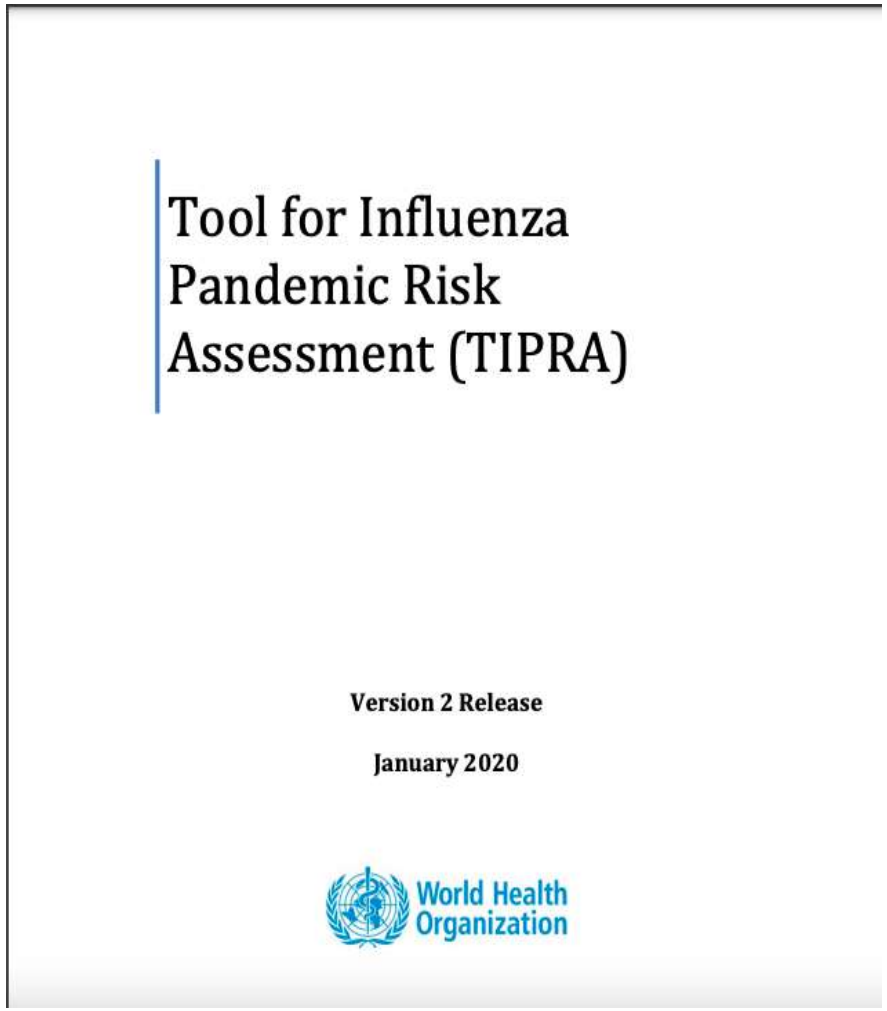
Highly Pathogenic Avian Influenza A(H5N1) Clade 2.3.4.4b Virus Infection in Domestic Dairy Cattle and Cats, United States, 2024

Eric R. Burrough, Drew R. Magstadt, Barbara Petersen, Simon J. Timmermans, Phillip C. Gauger, Jianqiang Zhang, Chris Siepker, Marta Mainenti, Ganwu Li, Alexis C. Thompson, Patrick J. Gorden, Paul J. Plummer, Rodger Main

- ABD eyaletlerinde süt sığırlarında ve kedilerde aynı HPAI H5N1 clade 2.3.4.4b
- Enfekte sığırlarda spesifik olmayan hastalık
  - Azalmış yem alımı ve geviş getirme
  - Süt üretiminde ani düşüş
- Çiğ kolostrum ve enfekte inek sütüyle beslenen evcil kedilerde
  - Ölümcül sistemik grip enfeksiyonu
- İnekten-ineğe bulaşma var
  - Enfekte ineklerin taşındığı çiftliklerde hastalık gözlendi
- Türler arası ve memeliden memeliye bulaşmanın önlenmesi için
  - Yerli üretim hayvanlarında HPAI virüslerinin sürekli olarak izlenmesi

Emerg Infect Dis. 2024 Jul;30(7):1335-1343

İnfluenza Pandemik Risk Değerlendirmesi

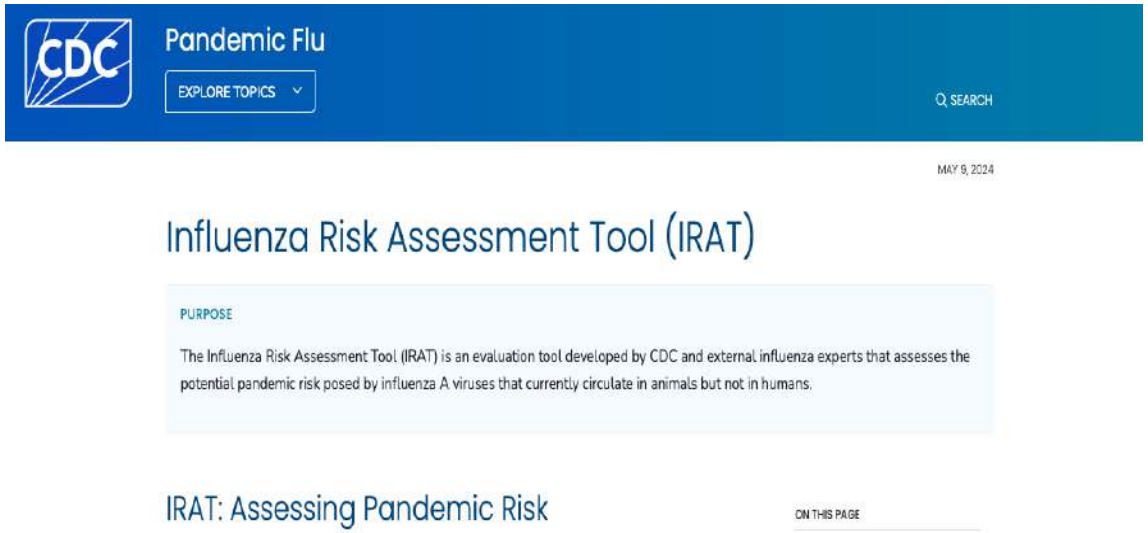


A. Virüsün özellikleri:
- reseptör bağlanma özellikleri
- genomik özellikler
- hayvan modellerinde bulaşma
- antiviral tedaviye duyarlılık

B. İnsan popülasyonundaki özellikler:
- insan enfeksiyonu
- hastalığın şiddeti
- popülasyon bağışıklığı (olasılık)
- popülasyon bağışıklığı (etki)

C. İnsan olmayan konaklarda virüs ekolojisi ve epidemiyolojisi:
- hayvanlarda coğrafi dağılım
- hayvanlarda enfeksiyonlar

https://www.who.int/teams/global-influenza-programme/avian-influenza/tool-for-influenza-pandemic-risk-assessment-(tipra)



IRAT's 10 Risk Elements

Risk Elements: Ranked and Weighed

Influenza experts generate numerical values (point score) to estimate the pandemic risk associated with each of the 10 risk elements. The point scores fall into three general classifications of risk: **low risk**, **moderate risk** and **high risk:**

- **Low risk** is associated with a point score between 1.0 and 3.9;
- **Moderate risk** is associated with a point score between 4.0-7.9; and,
- **High risk** is associated with a point score between 8.0-10.0.

https://www.cdc.gov/pandemic-flu/php/national-strategy/influenza-risk-assessment-tool.html

Influenza Risk Assessment Tool (IRAT)

Virus Report

Prepared by the CDC Influenza Division

Highly pathogenic avian influenza A(H5N1) virus; clade 2.3.4.4b
Virus Strain: A/mink/Spain/3691-8_22VIR10586-10

Date of Evaluation: April 2023

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Influenza Risk Assessment Tool (IRAT)

Virus Report

Prepared by the CDC Influenza Division

Highly pathogenic avian influenza A(H5N1) virus; clade 2.3.4.4b Virus Strain: A/Texas/37/2024

Date of Evaluation: June 2024

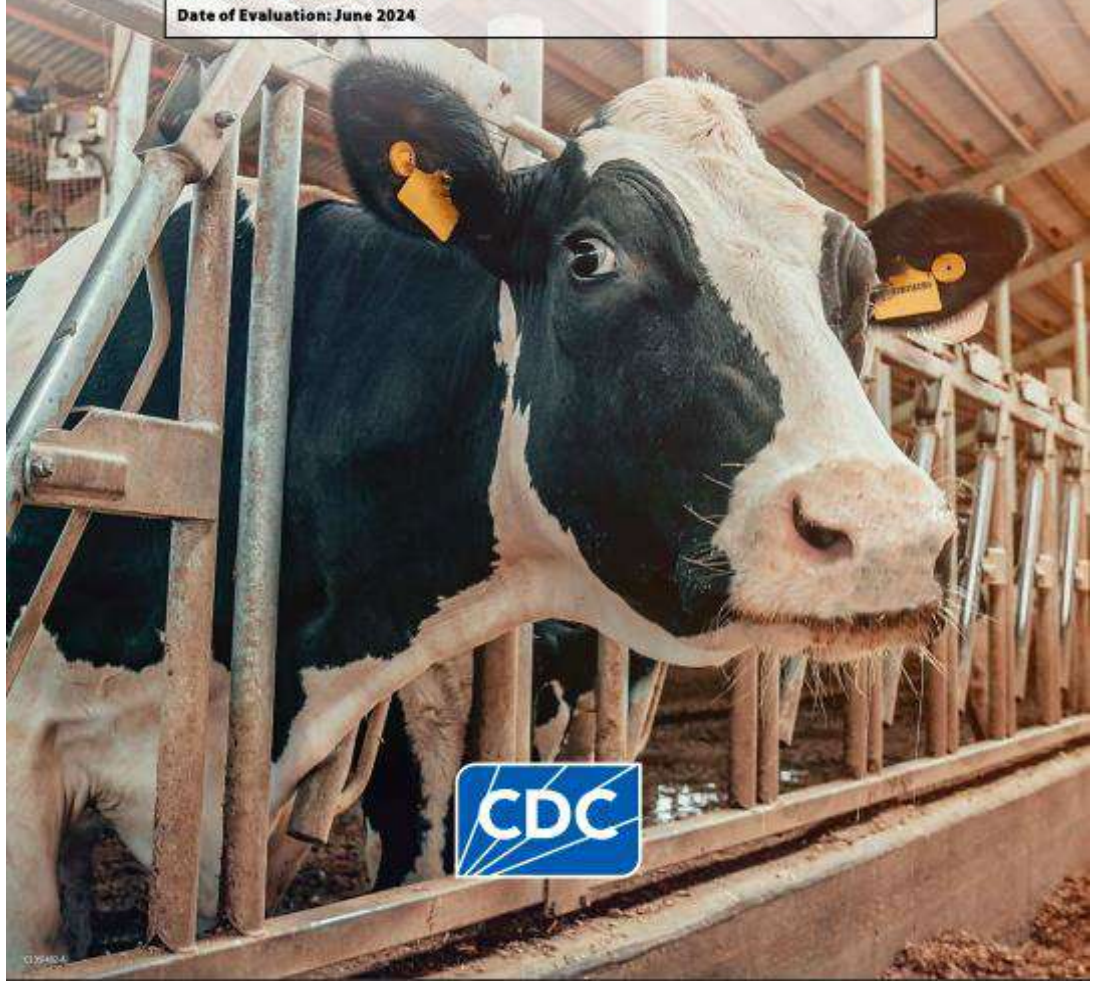


Table 1: Estimated Weighted Risk of Potential Emergence[1] for Highly Pathogenic Avian Influenza A(H5N1) virus clade 2.3.4.4b; A/mink/Spain/3691-8_22VIR10586-10 evaluated in April 2023

Risk Element	Weight (W)	Risk Score (RS)	W X RS
Human Infections	0.2929	4.60	1.35
Transmission in Animal Models	0.1929	3.67	0.71
Receptor Binding	0.1429	3.00	0.43
Population Immunity	0.1096	9.20	1.01
Infections in Animals	0.0846	6.57	0.56
Genomic Analysis	0.0646	6.00	0.39
Antigenic Relatedness	0.0479	4.83	0.23
Global Distribution in Animals	0.0336	8.17	0.27
Disease Severity and Pathogenesis	0.0211	7.50	0.16
Antiviral Treatment Options	0.0100	3.25	0.03
Total	**1.0001**		**5.13**

Table 2: Estimated Weighted Risk of Potential Public Health Impact1[2] for Highly Pathogenic Avian Influenza A(H5N1) virus clade 2.3.4.4b; A/mink/Spain/3691-8_22VIR10586-10 evaluated in April 2023

Risk Element	Weight (W)	Risk Score (RS)	W X RS
Disease Severity and Pathogenesis	0.2929	7.50	2.20
Population Immunity	0.1929	9.20	1.77
Human Infections	0.1429	4.60	0.66
Antiviral Treatment Options	0.1096	3.25	0.36
Antigenic Relatedness	0.0846	4.83	0.41
Receptor Binding	0.0646	3.00	0.19
Genomic Analysis	0.0479	6.00	0.29
Transmission in Animal Models	0.0336	3.67	0.12
Global Distribution in Animals	0.0211	8.17	0.17
Infections in Animals	0.0100	6.57	0.07
Total	**1.0001**		**6.24**

Table 1: Estimated Weighted Risk of Potential Emergence[1] for Highly Pathogenic Avian Influenza A(H5N1) virus clade 2.3.4.4b; A/Texas/37/2024 evaluated in June 2024

Risk Element	Weight (W)	Risk Score (RS)	W X RS
Human Infections	0.2929	4.75	1.39
Transmission in Animal Models	0.1929	7.00	1.35
Receptor Binding	0.1429	3.00	0.43
Population Immunity	0.1096	9.14	1.00
Infections in Animals	0.0846	7.00	0.59
Genomic Analysis	0.0646	6.50	0.42
Antigenic Relatedness	0.0479	4.71	0.23
Global Distribution in Animals	0.0336	6.17	0.21
Disease Severity and Pathogenesis	0.0211	6.71	0.14
Antiviral Treatment Options	0.0100	3.40	0.03
Total	**1.0001**	**5.79**	

Table 2: Estimated Weighted Risk of Potential Public Health Impact[1] for Highly Pathogenic Avian Influenza A(H5N1) virus clade 2.3.4.4b; A/Texas/37/2024 evaluated in June 2024

Risk Element	Weight (W)	Risk Score (RS)	W X RS
Disease Severity and Pathogenesis	0.2929	6.71	1.97
Population Immunity	0.1929	9.14	1.76
Human Infections	0.1429	4.75	0.68
Antiviral Treatment Options	0.1096	3.40	0.37
Antigenic Relatedness	0.0846	4.71	0.40
Receptor Binding	0.0646	3.00	0.19
Genomic Analysis	0.0479	6.50	0.31
Transmission in Animal Models	0.0336	7.00	0.24
Global Distribution in Animals	0.0211	6.17	0.13
Infections in Animals	0.0100	7.00	0.07
Total	**1.0001**	**6.12**	

The NEW ENGLAND JOURNAL of MEDICINE

CORRESPONDENCE

Highly Pathogenic Avian Influenza A(H5N1) Virus Infection in a Dairy Farm Worker

Figure 1. Conjunctivitis with Subconjunctival Hemorrhage in Both Eyes.

- **Enfekte bir memeli ile temas yoluyla edinilen ilk A(H5N1) insan enfeksiyonu**

- Mart 2024, süt çiftliği işçisinin sağ gözünde kızarıklık
  - Sağ gözde subkonjonktival kanama
  - İnce, seröz akıntı
- Süt inekleriyle yakın temas
  - İneklerle çalışırken eldiven var
  - Solunum veya göz koruması yok
- Konjonktival ve nazofaringeal sürüntü örneklerinde
  - RT-PCR ile her iki örnekte HPAI (H5N1) pozitif
  - Tüm gen segmentleri, Mart 2024'te Teksas'taki süt sığırı virüsleriyle yakından ilişkili
  - Memeli konaklara viral adaptasyonla ilişkili
    - PB2 E627K mutasyonu var

N Engl J Med. 2024: 390;21

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 JANUARY 27, 2005 VOL. 352 NO. 4

Probable Person-to-Person Transmission of Avian Influenza A (H5N1)

Kumnuan Ungchusak, M.D., M.P.H., Prasert Auewarakul, M.D., Scott F. Dowell, M.D., M.P.H.,

ABSTRACT

BACKGROUND

During 2004, a highly pathogenic avian influenza A (H5N1) virus caused poultry disease in eight Asian countries and infected at least 44 persons, killing 32; most of these persons had had close contact with poultry. No evidence of efficient person-to-person transmission has yet been reported. We investigated possible person-to-person transmission in a family cluster of the disease in Thailand.

METHODS

For each of the three involved patients, we reviewed the circumstances and timing of exposures to poultry and to other ill persons. Fiel[illegible] sur-viving patient, instituted active surveillan[illegible] and culled th[illegible]

- İki olguda enfekte hayvan teması yok
  - Indeks hastaya korunmasız maruz kalma sonucu kişiden kişiye bulaşma

[illegible] pneumonia after providing [illegible] also provided unprotected nursing care; she had [illegible] mother first had fever, followed by pneumonia seven days later. Autopsy tissue from the mother and nasopharyngeal and throat swabs from the aunt were positive for influenza A (H5N1) by RT-PCR. No additional chains of transmission were identified, and sequencing of the viral genes identified no change in the receptor-binding site of hemagglutinin or other key features of the virus. The sequences of all eight viral gene segments clustered closely with other H5N1 sequences from recent avian isolates in Thailand.

CONCLUSIONS

Disease in the mother and aunt probably resulted from person-to-person transmission of this lethal avian influenzavirus during unprotected exposure to the critically ill index patient.

Probable limited person-to-person transmission of highly pathogenic avian influenza A (H5N1) virus in China

Hua Wang, Zijian Feng*, Yuelong Shu*, Hongjie Yu*, Lei Zhou, Rongqiang Zu, Yang Huai, Jie Dong, Changjun Bao, Leying Wen, Hong Wang, Peng Yang, Wei Zhao, Libo Dong, Minghao Zhou, Qiaohong Liao, Haitao Yang, Min Wang, Xiaojun Lu, Zhiyang Shi, Wei Wang, Ling Gu, Fengcai Zhu, Qun Li, Weidong Yin, Weizhong Yang, Dexin Li, Timothy M Uyeki, Yu Wang*

Summary

Background In December, 2007, a family cluster of two individuals infected with highly pathogenic avian influenza A (H5N1) virus was identified in Jiangsu Province, China. Field and laboratory investigations were implemented immediately by public-health authorities.

Methods Epidemiologi… …d virological data … patients were tested by … of cases were monitore… collected for H5N1 t… microneutralisation an…

Findings The 24-year-o… antiviral treatment an… plausible exposure to … substantial unprotecte… …close exposure to one or both cases with… adequate protective equi… …stigation. Of these individuals, 78 (86%) received oseltamivir chemoprophylaxis and two had mild illness. Both ill contacts tested negative for H5N1 by RT PCR. All 91 close contacts tested negative for H5N1 antibodies. H5N1 viruses isolated from the two cases were genetically identical except for one non-synonymous nucleotide substitution.

Interpretation Limited, non-sustained person-to-person transmission of H5N1 virus probably occurred in this family cluster.

Funding Chinese Ministry of Science and Technology; US National Institute of Allergy and Infectious Diseases, National Institutes of Health; China-US Collaborative Program on Emerging and Re-emerging Infectious Diseases.

Aile kümesinde sınırlı, sürekli olmayan kişiden kişiye bulaşma

Lancet 2008; 371: 1427–34

Published Online
April 8, 2008.
DOI:10.1016/S0140-6736(08)60493-6

See Comment page 1392

See Seminar page 1464

*Contributed equally

Jiangsu Provincial Centre for Disease Control and Prevention, Nanjing, China (H Wang MD, R Zu MD, C Bao MD, M Zhou MD, H Yang MD, Z Shi MD, L Gu MD, F Zhu MD); **Office for Disease Control and Emergency Response, Chinese Centre for Disease Control and Prevention (China CDC), Beijing, China** (Z Feng MD, H Yu MD, L Zhou MD, Y Huai MD, P Yang PhD, Q Liao MD, Q Li MD, W Yang MD, Prof Y Wang PhD); **State Key Laboratory for Infectious Disease Prevention and Control, National Institute for Viral Disease Control and Prevention, China CDC, Beijing, China** (Y Shu PhD, J Dong MD,

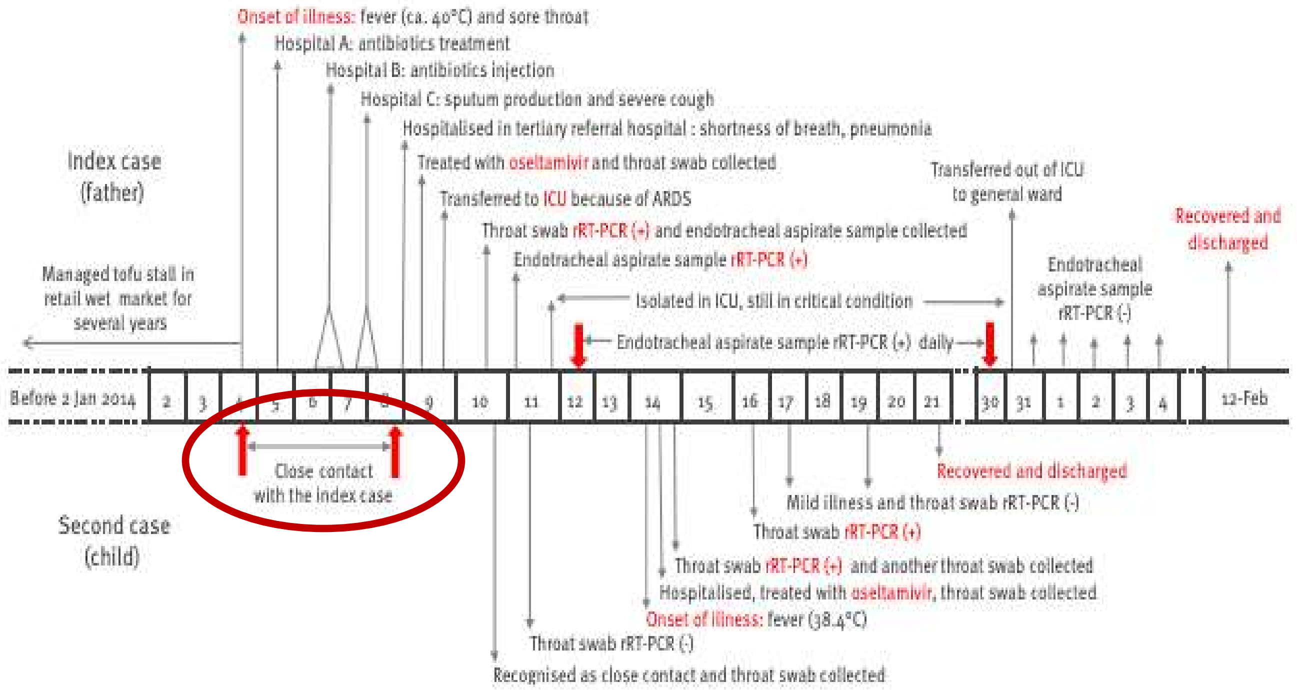
SURVEILLANCE AND OUTBREAK REPORTS

Transmission of avian influenza A(H7N9) virus from father to child: a report of limited person-to-person transmission, Guangzhou, China, January 2014

X C Xiao[1,2], K B Li[1,2], Z Q Chen[1,2], B Di[1,2], Z C Yang[1,2], J Yuan[1], H B Luo[3], S L Ye[4], H Liu[1], J Y Lu[1], Z Nie[5], X P Tang[3], M Wang (wangming@gzcdc.org.cn)[1], B J Zheng[6]

FIGURE 1

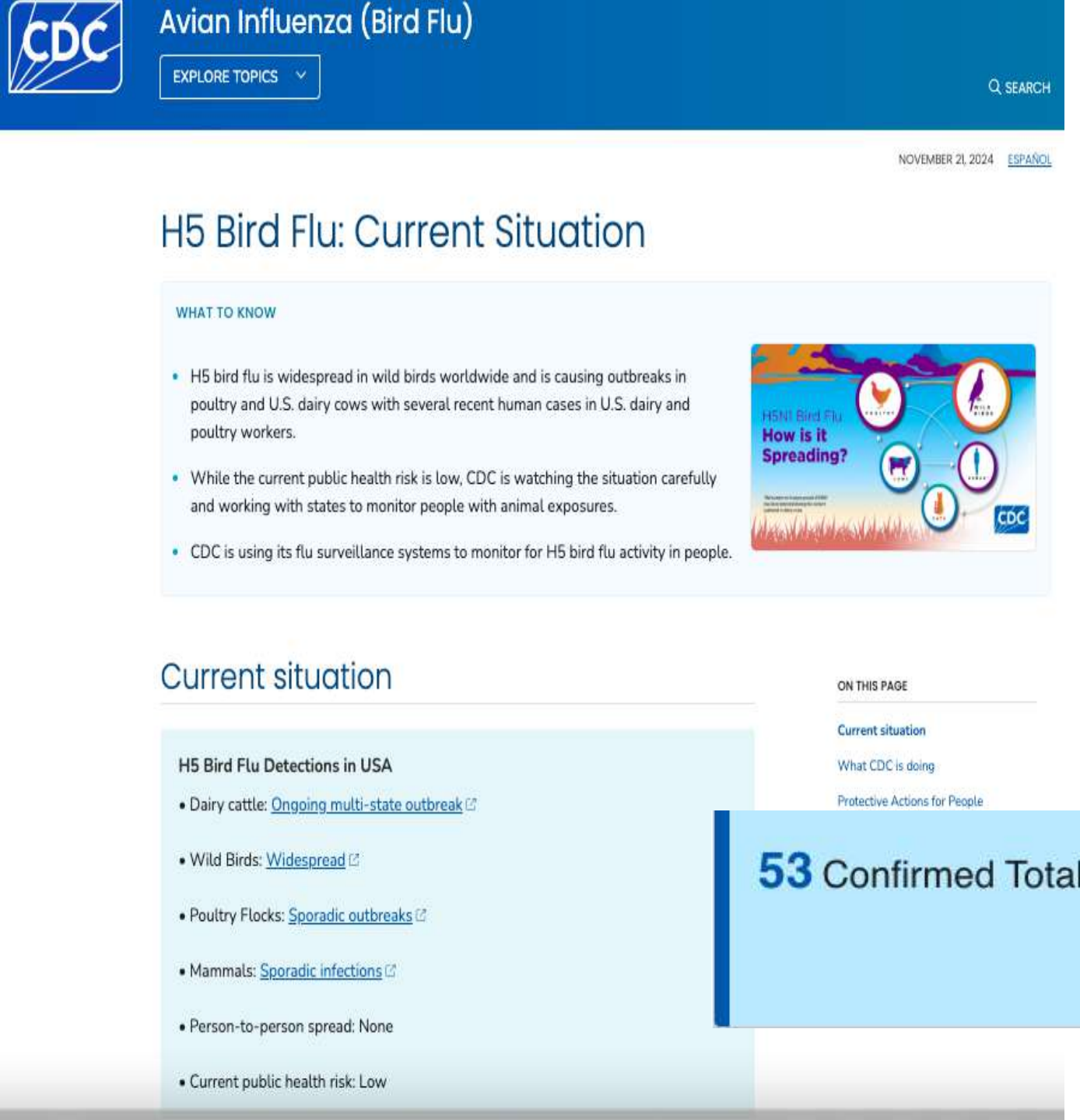
Timeline of disease in two laboratory-confirmed cases of a family cluster of influenza A(H7N9) in Guangzhou, China, January 2014



We investigated a possible person-to-person transmission within a family cluster of two confirmed influenza A(H7N9) patients in Guangzhou, China. The index case, a man in his late twenties, worked in a wet market that was confirmed to be contaminated by the influenza A(H7N9) virus. He developed a consistent fever and severe pneumonia after 4 January 2014. In contrast, the second case, his five-year-old child, who only developed a mild disea... ...isease onset of the index case, ...th ...se ...ne ...ed ...d- ...ve ...us ...s, ...ad ...ntact with the cases, ...id ...7N9) virus infection, indicating that the person-to-person transmissibility of the virus remained limited. Our finding underlines the importance of carefully, thoroughly and punctually following-up close contacts of influenza A(H7N9) cases to allow detection of any secondary cases, as these may constitute an early warning signal of the virus's increasing ability to transmit from person-to-person.

- Enfekte hayvan teması yok
- İndeks vakayla korumasız ve çok yakın temas
- İki vakadan izole edilen virüs HA genlerinin dizileri %100 aynı

Euro Surveill. 2014 Jun 26;19(25):20837.

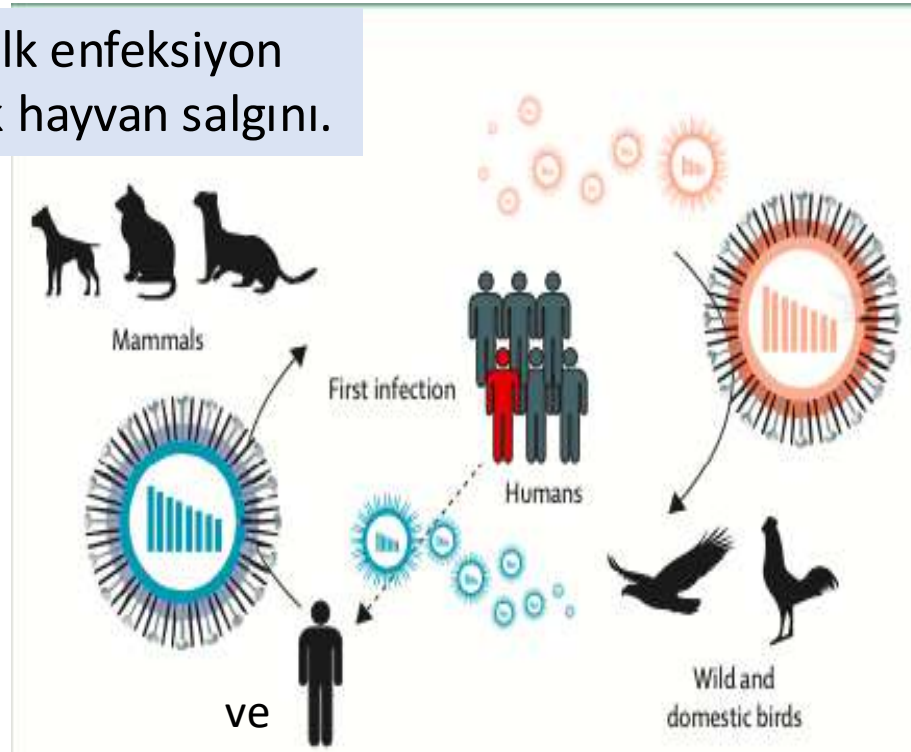


- H5 kuş gribi
  - Dünya çapında yabani kuşlarda yaygın
  - Kümes hayvanlarında salgın
  - Süt ineklerinde salgın
  - Süt ve kümes hayvanı işçilerinde insan vakası
  - Mevcut halk sağlığı riski düşük
  - İnsandan insana geçiş yok
  - Dikkatli izlem

53 Confirmed Total Reported Human Cases in the United States

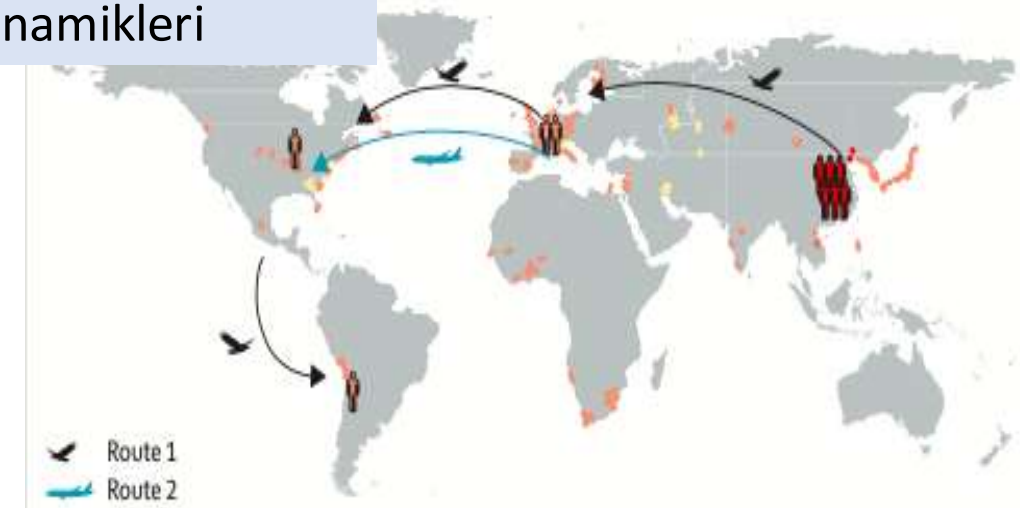
https://www.cdc.gov/bird-flu/situation-summary/index.html

- İnsanlarda ilk enfeksiyon
- Bildirilen ilk hayvan salgını.

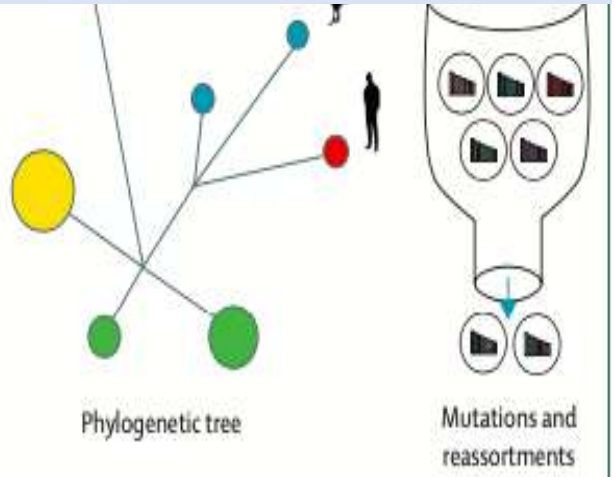


ve

- Köken
- Bulaşma dinamikleri



- Örnekleme
- Tanı



- Tek Sağlık
- Kontrol stratejileri

Lancet Infect Dis 2024; 24: e522–31

Kuş gribinde ‘Tek Sağlık’ Yaklaşımı

- Konak türler arasında gelişmiş gözetim
- Hızlı tanı ve klinik yönetim
- Çiftliklerde sıkılaştırılmış biyogüvenlik
- Hızlandırılmış aşı geliştirme
- Etkili bir aşılama stratejisi
- Hayvanları aşılama
- Veterinerlik alt yapısını güçlendirme
- Hayvan ve insan sektörleri arasında işbirliği
- Güvenli gıda
- Küresel iş birliğinin teşvik edilmesi

Lancet Infect Dis 2024; 24: e522–31
EFSA Journal. 2024;22:e8735


National Library of Medicine
National Center for Biotechnology Information
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Gammainfluenzavirus (C)
Betainfluenzavirus (B)
Deltainfluenzavirus (D)
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Influenza Virus BLAST
Influenza Virus Annotation Tool (FLAN)
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Legacy Influenza Resource


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In Focus
Recommended composition of influenza virus vaccines for use in the 2025 Southern Hemisphere Influenza Season announced
(Melbourne, Australia) An advisory group of experts taking part in a meeting organized by the WHO Global Influenza Programme between 23-26 September 2024 analyzed influenza virus surveillance data generated by the WHO Global Influenza Surveillance and Response System (GISRS), and issued on 27 September 2024, recommendations on the composition of the influenza vaccines for the following influenza season.
These recommendations are used by the national vaccine regulatory agencies and the pharmaceutical companies to develop, produce and license influenza vaccines.
read more:
GISRS
GLOBAL INFLUENZA SURVEILLANCE & RESPONSE SYSTEM
中国新冠疫情
Lineage comparison
Data shared via EpiFlu, EpiCoV, EpiRSV, EpiPox, EpiArbo
20,120,970
genetic sequence submissions


BV-BRC 3.42.3
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BACTERIAL AND VIRAL BIOINFORMATICS RESOURCE CENTER
Welcome to the Bacterial and Viral Bioinformatics Resource Center (BV-BRC), an information system designed to support research on bacterial and viral infectious diseases. The BV-BRC combines the data and tools from the Legacy BRC resources: PATRIC, the bacterial BRC, and IRD and ViPR, the viral BRCs. If you are transitioning from PATRIC or IRD/ViPR, please refer to the Quick Start Guide to learn how to get started with BV-BRC. Please contact us if you have any questions or issues.
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Mpox 2024
Influenza H5N1 2024
SARS-CoV-2
NEWS & ANNOUNCEMENTS
BV-BRC Renewal
The BV-BRC will continue to be supported by NIAID under Award Number U24AI183849. We will continue to support all of the current

国家微生物科学数据中心
National Microbiology Data Center

Influenza virus variation risk evaluation system (VarEPS-Influ)

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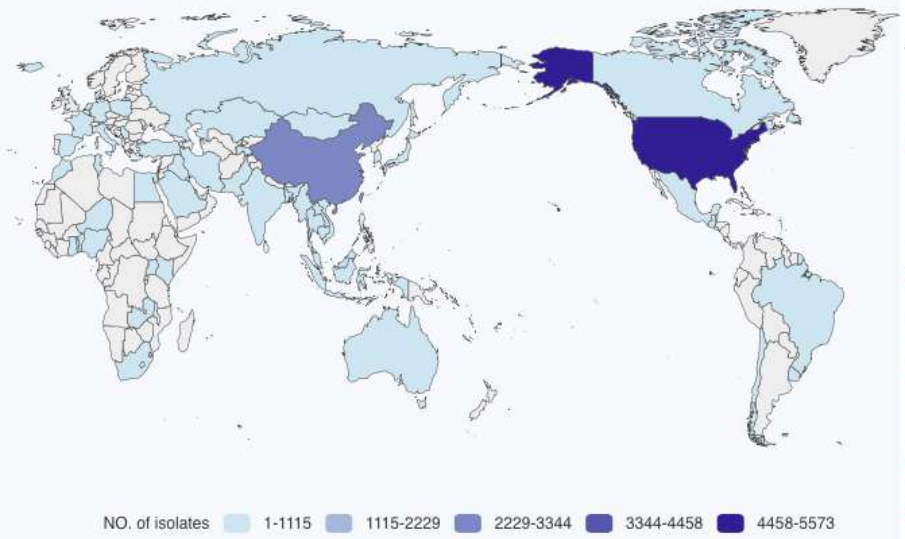
VarEPS-Influ

VarEPS-Influ databas
employs a 'multidimer
tools to assess the ph
tertiary structures, rec
and other aspects of t

Global distribution of Influenza virus

Influenza A virus | Influenza B virus | Influenza C virus

pre2000 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019 2021 2023



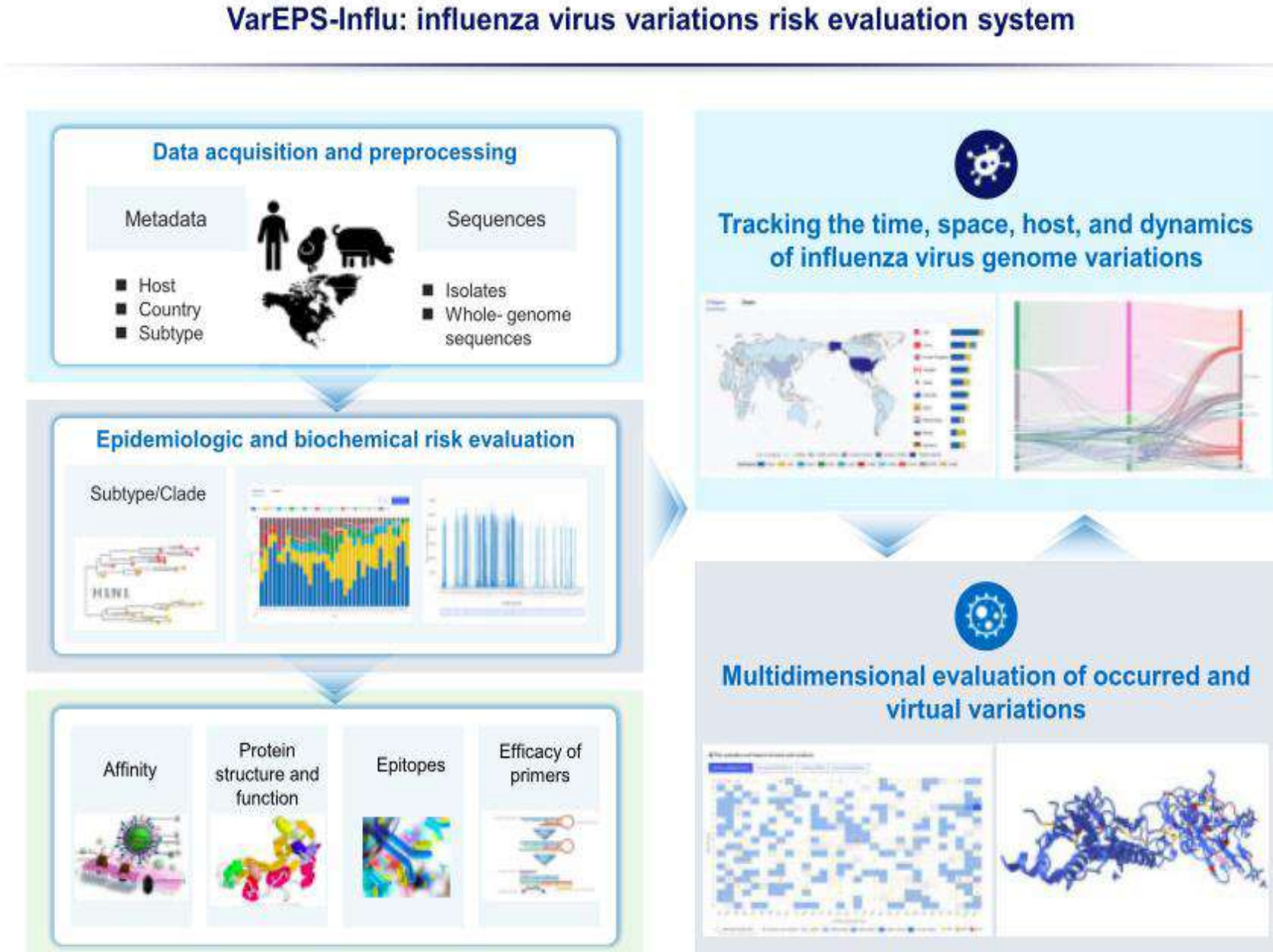
Isolates	197,022
Whole genomes	80,846
Sequences	902,036
Variations	93,096
Nonsynonym variants	70,158

World	New
164,002	12,248

USA	5573
China	3075
Canada	601
Australia	392
Denmark	247
Italy	233
India	196
Korea	180
Vietnam	146
Egypt	140

https://nmdc.cn/influvar/

Graphical abstract



Nucleic Acids Research, 2024, 52, D798–D807

Zoonotic influenza: candidate vaccine viruses and potency testing reagents

‹ Recommendations for influenza vaccine composition

Zoonotic influenza candidate vaccine viruses

Seasonal influenza candidate vaccine viruses

Northern hemisphere influenza seasons

2024-2025

1. A(H5N1)
2. A(H5) non-A(H5N1)
3. A(H7N9)
4. A(H7)
5. A(H9N2)
6. A(H1) variant
7. A(H3N2) variant
8. A(H3N8)

Southern hemisphere influenza seasons

2025

1. A(H5N1)
2. A(H5) non-A(H5N1)
3. A(H7N9)
4. A(H7)
5. A(H9N2)
6. A(H1) variant
7. A(H3N2) variant
8. A(H3N8)
9. A(H10)

https://www.who.int/teams/global-influenza-programme/vaccines/who-recommendations/

FDA U.S. FOOD & DRUG ADMINISTRATION

← Home / Vaccines, Blood & Biologics / Vaccines / Vaccines Licensed for Use in the United States

Vaccines Licensed for Use in the United States

Influenza A (H5N1) Virus Monovalent Vaccine, Adjuvanted	AREPANRIX
Influenza Virus Vaccine, H5N1 (for National Stockpile)	No Trade Name
Influenza A (H5N1) Virus Monovalent Vaccine, Adjuvanted	No Trade Name
Influenza A (H5N1) Monovalent Vaccine, Adjuvanted	AUDENZ

https://www.fda.gov/vaccines-blood-biologics/vaccines/vaccines-licensed-use-united-states

U.S. FOOD & DRUG ADMINISTRATION

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AUDENZ

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Vaccines, Blood & Biologics

Infectious Disease Tests

STN: 125692
Proper Name: Influenza A (H5N1) Monovalent Vaccine, Adjuvanted
Tradename: AUDENZ
Manufacturer: Seqirus, Inc.
Indication:

U.S. FOOD & DRUG ADMINISTRATION

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Influenza A (H5N1) Virus Monovalent Vaccine, Adjuvanted

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Vaccines

Emergency Use Authorization for Vaccines

STN#: 125419
Proper Name: Influenza A (H5N1) Virus Monovalent Vaccine, Adjuvanted
Tradename: N/A
Manufacturer: ID Biomedical Corporation of Quebec

U.S. FOOD & DRUG ADMINISTRATION

← Home / Vaccines, Blood & Biologics / Vaccines / Influenza Virus Vaccine, H5N1 (for National Stockpile)

Influenza Virus Vaccine, H5N1 (for National Stockpile)

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Vaccines

Emergency Use Authorization for Vaccines Explained

Approved Vaccine Products

STN: 125244
Proper Name: Influenza Virus Vaccine, H5N1
Trade Name: N/A
Manufacturer: Sanofi Pasteur Inc
Indication:

- For active immunization of persons 18 through 64 years of age at increased risk of exposure to the H5N1 influenza virus subtype contained in the vaccine

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AREPANRIX

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Vaccines, Blood & Biologics

Infectious Disease Tests

CBER Reports

Center for Biologics Evaluation and Research (CBER) Product

STN: 125419
Proper Name: Influenza A (H5N1) Virus Monovalent Vaccine, Adjuvanted
Tradename: AREPANRIX
Manufacturer: ID Biomedical Corporation of Quebec
Indication:

- AREPANRIX is a vaccine indicated for active immunization for the prevention of disease caused by the influenza A virus H5N1 subtype contained in the vaccine.
- AREPANRIX is approved for use in individuals 6 months and older at increased risk of exposure to the influenza A virus H5N1 subtype contained in the vaccine.

https://www.fda.gov/vaccines-blood-biologics/vaccines/vaccines-licensed-use-united-states

World Health Organization

Summary of status of development and availability of A(H5N1) candidate vaccine viruses and potency testing reagents

Antigenic and genetic analyses are performed by the WHO Collaborating Centres of the Global Influenza Surveillance and Response System (GISRS). Unless otherwise indicated all candidate vaccine viruses posted on this table have passed two-way haemagglutination inhibition (HI) test. National or Regional control authorities approve the composition and formulation of vaccines used in each country

23 February 2024

Candidate vaccine viruses*

Antigenic prototype	Clade	Candidate vaccine virus	Developing institute	Available from
A/bar headed goose/Qinghai/1A/2005	2.2	Wild type virus		WHO CCs
		SJRG-163222*	SJCRH, USA HKU, China	SJCRH, USA
A/whooper swan/Mongolia/244/2005	2.2	Wild type virus		WHO CCs
		SJRG-163243*	SJCRH, USA	SJCRH, USA
A/turkey/Turkey/1/2005	2.2.1	Wild type virus		WHO CCs
		NIBRG-23*	MHRA, UK	MHRA, UK
A/Egypt/2321-NAMRU3/2007	2.2.1	Wild type virus		WHO CCs
		IDCDC-RG11*	CDC, USA	CDC, USA
A/Egypt/N03072/2010	2.2.1	Wild type virus		WHO CCs
		IDCDC-RG29*	CDC, USA	CDC, USA
A/Egypt/3300-NAMRU3/2008	2.2.1.1	Wild type virus		WHO CCs
		IDCDC-RG13*	CDC, USA	CDC, USA
A/Egypt/N04915/2014	2.2.1.2	Wild type virus		WHO CCs
		NIBRG-306*	MHRA, UK	MHRA, UK
A/common magpie/Hong Kong /5052/2007	2.3.2.1	Wild type virus		WHO CCs
		SJRG-166615*	SJCRH, USA HKU, China	SJCRH, USA
A/Hubei/1/2010	2.3.2.1a	Wild type virus		WHO CCs
		IDCDC-RG30*	CCDC, China CDC, USA	CCDC, China CDC, USA
A/duck/Bangladesh/19097/2013	2.3.2.1a	Wild type virus		WHO CCs
		SJ001*	SJCRH, USA	SJCRH, USA
A/barn swallow/Hong Kong/D10-1161/2010	2.3.2.1b	Wild type virus		WHO CCs
		SJ-003*	SJCRH, USA HKU, China	SJCRH, USA
A/Vietnam/1194/2004	1	Wild type virus		WHO CCs
		NIBRG-14*	MHRA, UK	MHRA, UK
A/Vietnam/1203/2004	1	Wild type virus		WHO CCs
		SJRG-161052*	CDC, USA SJCRH, USA HKU, China	SJCRH, USA CDC, USA
A/Cambodia/R0405050/2007	1.1	Wild type virus		WHO CCs
		NIBRG-88*	MHRA, UK	MHRA, UK
A/Cambodia/X0810301/2013	1.1.1	Wild type virus		WHO CCs
		IDCDC-RG34B*	CDC, USA	CDC, USA
A/duck/Hunan/795/2002	2.1	Wild type virus		WHO CCs
		SJRG-166614*	SJCRH, USA HKU, China	SJCRH, USA
A/Indonesia/5/2005	2.1.3.2	Wild type virus		WHO CCs
		IDCDC-RG2*	CDC, USA	CDC, USA
A/Indonesia/NIHRD11771/2011	2.1.3.2a	Wild type virus		WHO CCs
		NIIDRG-9*	NIID, Japan NIHRD, Indonesia	NIID, Japan
A/chicken/India/NIV33487/2006	2.2	Wild type virus		WHO CCs
		IBCDC-RG7*	NIV, India CDC, USA	NIV, India CDC, USA

Table 3. Recent development of vaccines against avian influenza virus.

S. No.	Name of Vaccine	Type of Vaccine	Immune Response	Virus Subtype	Reference
1	H5-Re13, H5-Re-14, H7-Re-4	Inactivated virus vaccine	Antibody-mediated response	H5N1, H5N6, H5N8, H7N9	[348]
2	H5 candidate vaccine strain A/17/turkey/Turkey/05/133 H5N2	Live-attenuated influenza virus	Antibody-mediated response	H5N2	[303]
3	Nobilis Influenza H5N2 vaccine	Inactivated virus vaccine	Antibody-mediated response	H5N2	[349]
4	MF59-adjuvanted seasonal influenza vaccine (Fluad®) Novartis Vaccines and Diagnostics Inc., MA, USA	Trivalent inactivated vaccine	Antibody, Cell-mediated response	H5N1	[350]
5	AS03-adjuvanted prepandemic H5N1 influenza vaccine	Inactivated virus vaccine	Antibody and cell-mediated response	H5N1	[351]
6	H7N9 LAIV	Live-attenuated influenza virus	Antibody-mediated response	N7N9	[352]
7	Beta-propriolactone whole-inactivated virus	Inactivated virus vaccine	Antibody and cell-mediated responses	H9N2	[353]
8	H5N1 pandemic live-attenuated influenza virus vaccination	Live-attenuated influenza virus	T-cell-mediated response	H5N1	[310]
9	Newcastle Disease Virus H5 vaccine	Vector-based vaccine	Antibody, mucosal and cell-mediated response	H5N1	[354]
10	H5N1 influenza virus vaccine (Manufactured by: Sanofi Pasteur, Inc.)	Inactivated monovalent influenza virus vaccine	Antibody-mediated response	H5N1	[355]
11	Pandemic influenza vaccine H5N1 Astrazeneca	Live-attenuated influenza virus	Antibody-mediated response	H5N1	[356]
12	H7 pandemic live-attenuated influenza vaccines (pLAIV)	Live-attenuated influenza virus	Antibody-mediated response	H7N7	[357]
13	H9N2 avian influenza virus-like particle vaccine	Virus-like particle vaccine	Antibody and cell-mediated responses	H9N2	[358]

Vaccines 2023, *11*, 593. https://doi.org/10.3390

Evrensel Grip Virüsü Aşıları Gerekli

- Pandemi öncesi aşılar
  - Güvenli, güçlü ve geniş koruyucu bağışıklık sağlamalı
  - Stoklama ve pandemi hazırlığıyla tutarlı üretim özelliklerine sahip olmalı

- Mevcut insan IV'lerine karşı onaylanan aşılarda ilke
  - Salgına neden olması beklenen suşun HA glikoproteini için koruyucu antikorları indüklemek

- Hangi AIV alt tipinin bir sonraki insan pandemisine yol açacağını tahmin etmek zor

- Çeşitli influenza alt tiplerini/suşlarını nötralize etmek için geniş bir spektruma sahip ‘evrensel influenza’ aşılarının (UIV) geliştirilmesi amaçlanmalı

Vaccines 2023, *11*, 593. https://doi.org/10.3390

Evrensel Grip Virüsü Aşıları

- Korunan antijenik epitop bölgesi aşıları
- DNA aşıları
- mRNA aşıları
- Nanopartikül veya VLP tabanlı aşılar

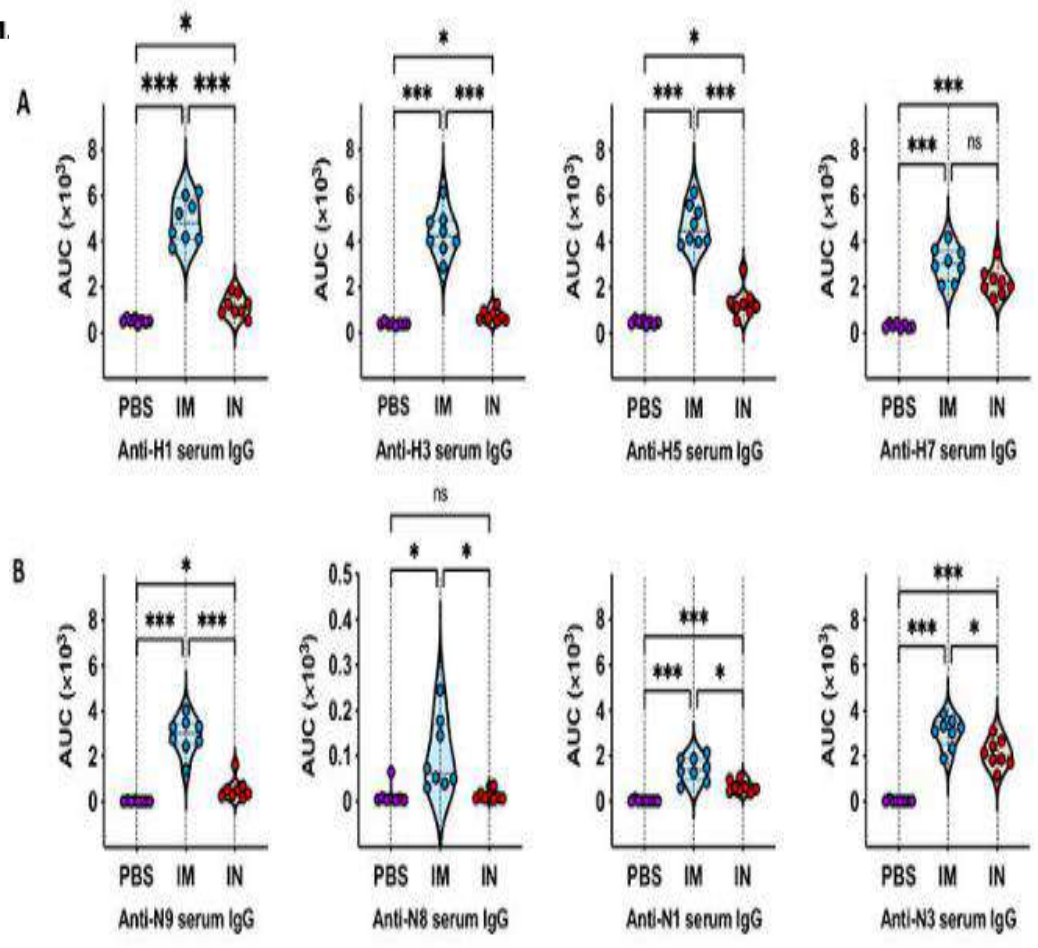
Vaccines 2023, *11*, 593. https://doi.org/10.3390

HHS Public Access
Author manuscript
Sci Transl Med. Author manuscript; available in PMC 2024 April 17.

Published in final edited form as:
Sci Transl Med. 2022 July 13; 14(653): eabo2167. doi:10.1126/scitranslmed.abo2167.

An inactivated multivalent influenza A virus vaccine is broadly protective in mice and ferrets

Jaekeun Park[1,†], Sharon L. Fong Legaspi[1], Louis M.



- H1N9, H3N8, H5N1 ve H7N3'ün dört β-propiolaktonla inaktifleştirilmiş, LPIAV alt tipinden oluşur
- Geniş, heterosubtipik IAV koruması sağlamak mümkün
- Klinik geliştirme için umut vadeden bir aday

Sci Transl Med. 2022 July 13; 14(653)

HHS Public Access
Author manuscript
Science. Author manuscript; available in PMC 2024 January 16.

Published in final edited form as:
Science. 2022 November 25; 378(6622): 899–904. doi:10.1126/science.abm0271.

A multivalent nucleoside-modified mRNA vaccine against all known influenza virus subtypes

Claudia P. Arevalo[1], **Marcus J. Bolton**[1], **Valerie Le Sage**[2], **Naiqing Ye**[1], **Colleen Furey**[1],

- Çok değerlikli bir aşı
- 20 influenza A ve B virüs alt tipi hemaglutinin antijenlerini kodlayan, nükleozid modifiye mRNA-LNP aşısı
- Farelerde ve gelinciklerde
  - Kodlanan 20 antijenin hepsine tepki gösteren, yüksek düzeyde, çapraz reaktif ve alt tipe özgü antikorlar ortaya çıkardı.

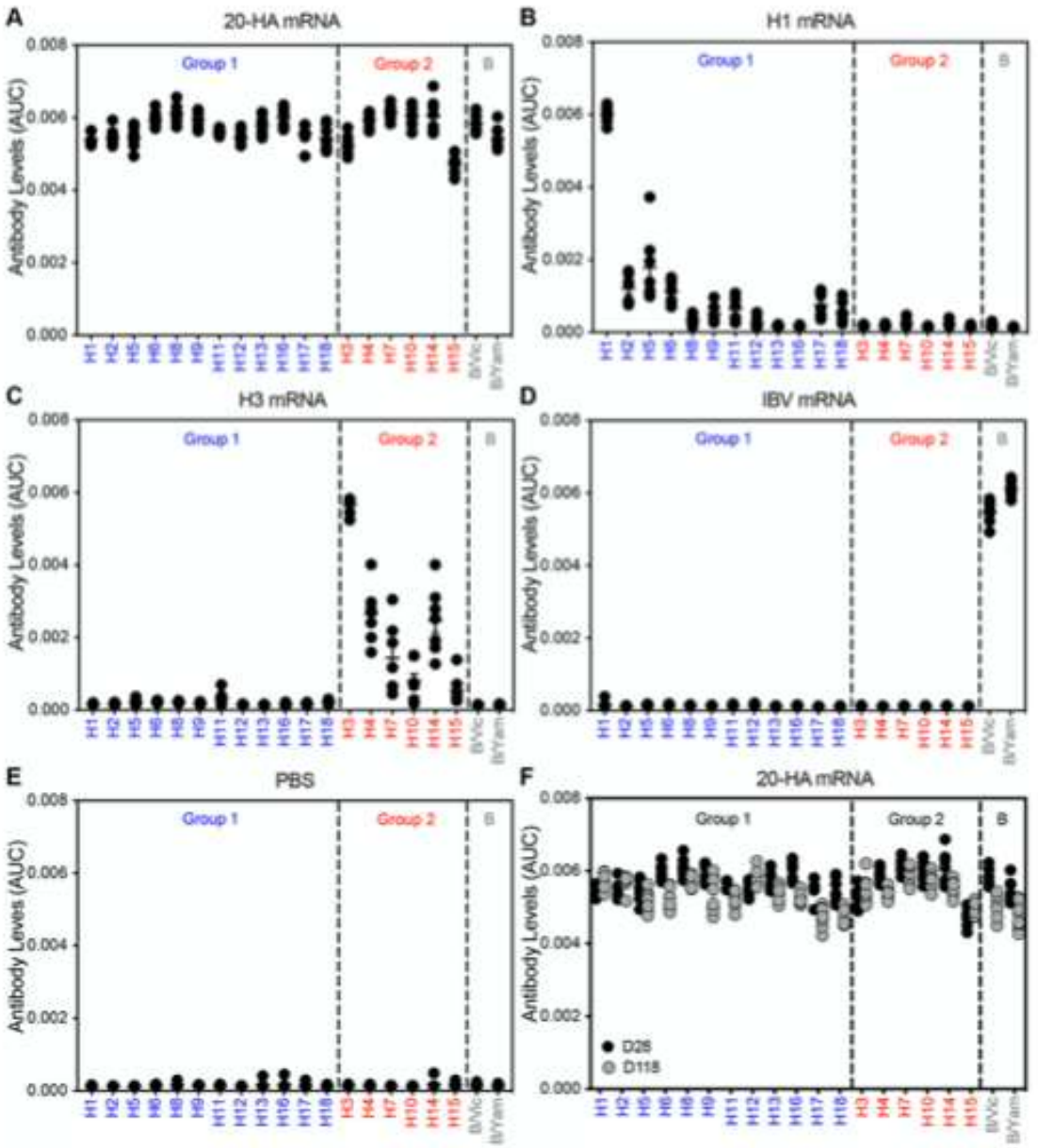


Fig. 1. 20-HA mRNA-LNP vaccine elicits long-lived antibody responses that react to all 20 HAs.

Science. 2022 November 25; 378(6622): 899–904.

nature medicine

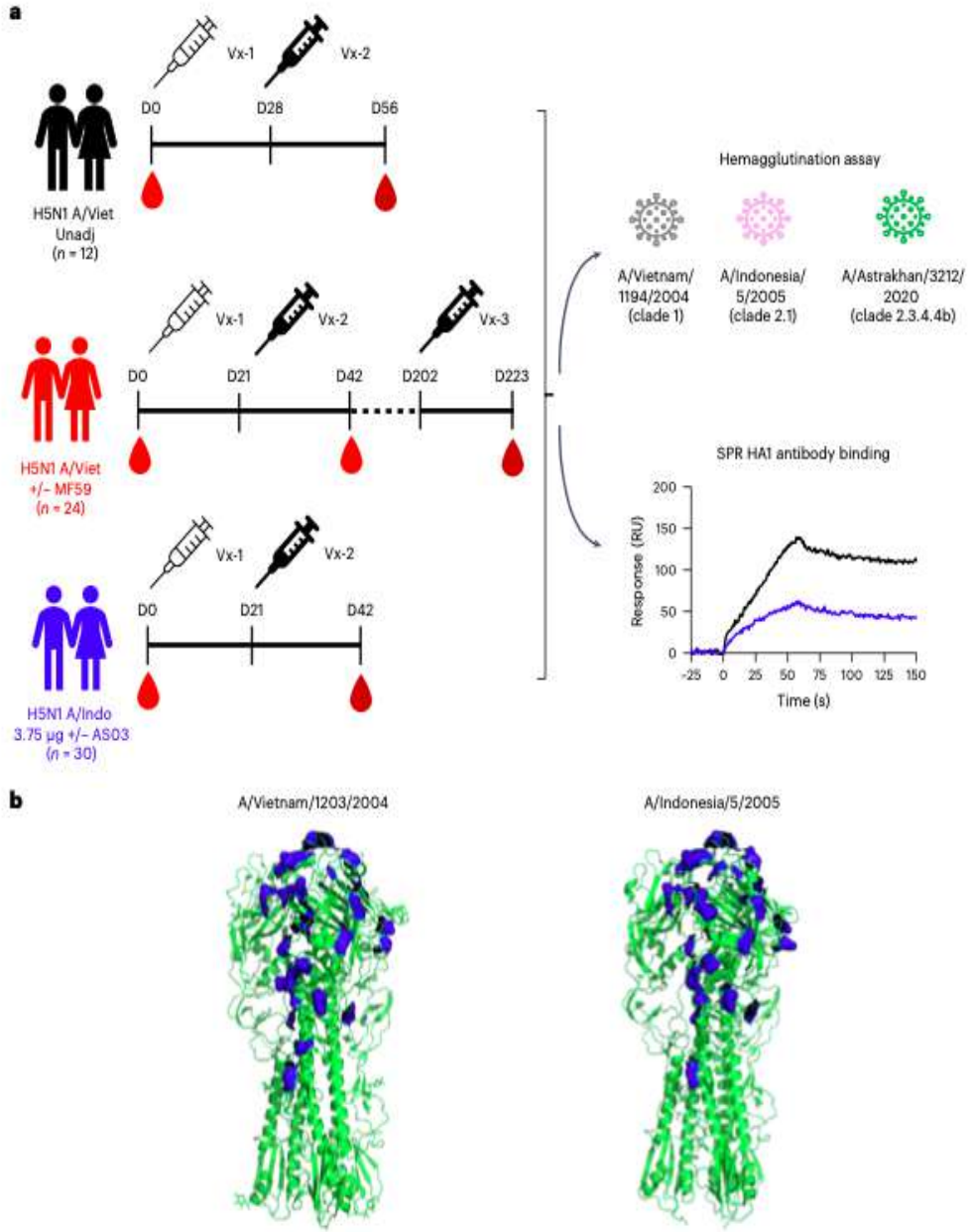
Brief Communication https://doi.org/10.1038/s41591-024-03189-y

Licensed H5N1 vaccines generate cross-neutralizing antibodies against highly pathogenic H5N1 clade 2.3.4.4b influenza virus

- H5N1 clade 2.3.4.4b virüsüne karşı etkili aşıların geliştirilmesi halk sağlığı önceliği

- Lisanslı H5N1 aşılarının clade 2.3.4.4b A/Astrakhan/3212/2020 virüsüne etkinliği araştırıldı
  - AS03-adjuvanlı-A/Endonezya clade 2.1
  - MF59-adjuvanlı-A/Vietnam aşısından clade 1
  - Non-adjuvan-/ Vietnam aşısından clade 1

- Adjuvanlı aşılarda %60-95'lik serokonversiyon
- Güncellenmiş H5N1 aşıları mevcut olana kadar köprü aşıları olarak yararlı



microbiology research

Review

Avian Influenza: Could the H5N1 Virus Be a Potential Next Threat?

Elena Imperia [1,2], Liliana Bazzani [3], Fabio Scarpa [4], Alessandra Borsetti [5], Nicola Petrosillo [6], Marta Giovanetti [3,7,*] and Massimo Ciccozzi [1,*]

New Microbes and New Infections 59 (2024) 101416

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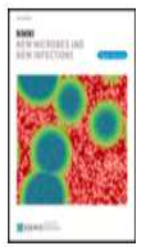

Editorial

Feathered fears: Could avian H5N1 influenza be the next pandemic threat of disease X?

International Journal of Infectious Diseases 145 (2024) 107062

Contents lists available at ScienceDirect

International Journal of Infectious Diseases

journal homepage: www.elsevier.com/locate/ijid

Editorial

Avian 'Bird' Flu – undue media panic or genuine concern for pandemic potential requiring global preparedness action? ☆

Eskild Petersen [1,2,3,*], Ziad A Memish [4,5,6], David S Hui [7,8], Alessandra Scagliarini [3,9],

Sonuç

- Günümüzde dolaşan A(H5N1) virüsü;
  - Ciddi hastalıklara yol açar
  - Yüksek ölüm oranı
  - Daha bulaşıcı varyantlara dönüşme potansiyeli
  - İnsandan insana bulaşması olası görülmemekte

- Zoonotik enfeksiyondan şüphelenildiğinde en kısa sürede indeks hasta ve potansiyel temaslılarda tam genom tabanlı gözetim
  - İnsanlar arasında sessiz bulaşmayı tespit etmek
  - Adaptif mutasyonların birikmesini önlemek için

- Gerçek zamanlı izleme çabalarının dünya çapında entegre edilmesi
  - Yeni varyantların erken tespiti ve karakterizasyonunu sağlamak
    - Genomik gözetim stratejilerine acil yatırım

- ‘Tek Sağlık’ yaklaşımı

- ‘Evrensel İnfluenza Aşıları’ geliştirilmeli