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

3 October 2023 (*last updated 25 January 2024*)

Candidate vaccine viruses*

Antigenic prototype	Clade	Candidate vaccine virus	Developing institute	Available from
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

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

Antigenic prototype	Clade	Candidate vaccine virus	Developing institute	Available from
A/duck/Vietnam/NCVD-1584/2012	2.3.2.1c	Wild type virus		WHO CCs
		NIBRG-301*	MHRA, UK	MHRA, UK
A/chicken/Guiyang/1153/2016	2.3.2.1d	Wild type virus		WHO CCs
		SJ0009	SJCRH, USA HKU, China	SJCRH, USA HKU, China
A/duck/Laos/3295/2006	2.3.4	Wild type virus		WHO CCs
		CBER-RG1*	CBER/FDA, USA	CBER/FDA, USA
A/Anhui/1/2005		Wild type virus		WHO CCs
	2.3.4	**IDCDC-RG6***	CDC, USA	CDC, USA
A/Japanese white eye/HK/1038/2006	2.3.4	Wild type virus		WHO CCs
		SJRG-164281*	SJCRH, USA HKU, China	SJCRH, USA
A/chicken/Hong Kong/AP156/2008	2.3.4	Wild type virus		WHO CCs
		SJ-002*	SJCRH, USA HKU, China	SJCRH, USA
A/chicken/Bangladesh/11rs1984-30/2011	2.3.4.2	Wild type virus		WHO CCs
		IDCDC-RG36*	CDC, USA	CDC, USA
A/Guizhou/1/2013	2.3.4.2	Wild type virus		WHO CCs
		IDCDC-RG35*	CCDC, China CDC, USA	CCDC, China CDC, USA
A/goose/Guiyang/337/2006	4	Wild type virus		WHO CCs
		SJRG-165396*	SJCRH, USA HKU, China	SJCRH, USA
A/chicken/Vietnam/NCVD-016/2008	7.1	Wild type virus		WHO CCs
		IDCDC-RG12*	CDC, USA	CDC, USA
A/chicken/Vietnam/NCVD-03/2008	7.1	Wild type virus		WHO CCs
		IDCDC-RG25A*	CDC, USA	CDC, USA
A/duck/Bangladesh/17D1012/2018	2.3.2.1a	**IDCDC-RG63A***	CDC, USA	CDC, USA

A/American wigeon/South Carolina/22-000345-001/2021-like	2.3.4.4b	Wild type virus		CDC, USA
		IDCDC-RG78A†	CDC, USA	

†New CVV shown in blue

**These viruses are candidate vaccine viruses which have passed relevant safety testing and two-way haemagglutination inhibition (HI) tests. They can be handled under BSL-2 enhanced containment[1].*

Candidate vaccine viruses in preparation

Antigenic prototype	Clade	Developing Institute	Available from
A/chicken/Ghana/20/2015-like	2.3.2.1f	CDC, USA	**Pending**
A/chicken/Ghana/AVL-76321VIR7050-39/2021-like	2.3.4.4b	CDC, USA	**Pending**
A/Ezo red fox/Hokkaido/1/2022-like†	2.3.4.4b	NIID, Japan	**Pending**

†New CVV shown in blue

Institutes contact details for candidate vaccine virus orders and other information:
CBER/FDA: CBERshippingrequests@fda.hhs.gov
CDC: nmb7@cdc.gov (subject: CVV request)
CCDC: whocc-china@cnic.org.cn
MHRA: standards@nibsc.org or enquiries@nibsc.org
NIID: flu-vaccine@nih.go.jp
NIV: niv.influenza@gmail.com
HKU: malik@hkucc.hku.hk
SJCRH: richard.webby@stjude.org
WHO CCs: https://www.who.int/initiatives/global-influenza-surveillance-and-response-system/who-collaboration-center-erl?CxitPEOtTWx0xUd5TJdODSXcnyJqzYd7FZeivpn7xcI=

[1] *Guidelines for the safe development and production of vaccines to human pandemic influenza viruses and influenza viruses with pandemic potential, Annex 3, TRS No 1016 (who.int)*

Reference antigens (freeze dried)

Starting materials		Ref Ag Lot number	Unitage (µgHA/ml)	Available from
Parent virus	**CVV**			
A/Vietnam/1194/2004	**NIBRG-14**	09/184	67	MHRA, UK
A/turkey/Turkey/1/2005	**NIBRG-23**	07/112	80	MHRA, UK
		H5-Ag-1510 (cell)	93	CBER/FDA, USA
A/Anhui/1/2005	**IDCDC-RG6**	07/290	99	MHRA, UK
		H5-AG-0911	58	CBER/FDA, USA
A/Cambodia/R0405050/2007	**NIBRG-88**	08/216	93	MHRA, UK
A/Vietnam/1203/2004	**161052 (SJCRH)**	89	53	CBER/FDA, USA
A/Indonesia/5/2005	**IDCDC-RG2**	83	32	CBER/FDA, USA
		2013/99B	85	TGA, Australia
A/Bar-headed goose/Qinghai/1A/2005	**163222 (SJCRH)**	63	69	CBER/FDA, USA
A/duck/Vietnam/NCVD-1584/2012	**NIBRG-301**	17/142	47	MHRA, UK
A/duck/Bangladesh/19097/2013	**n/a**	H5-AG-1409 (cell)	88	CBER/FDA, USA
A/Egypt/N03072/2010	**IDCDC-RG-29**	H5-Ag-1201	67	CBER/FDA, USA
A/American wigeon/South Carolina/AH0195145/2021	**SeqHSSVR02**	**H5-Ag-2311 (cell)*§**	96	CBER/FDA, USA

**New reagents shown in blue*

§Calibrated using Anti-A/Astrakhan/3212/2020 HA antisera, CBER Lot #H5-Ab-2313

Sheep antisera

Parent virus	Order Lot number	Available from
A/Anhui/1/2005-like	07/338	MHRA, UK
	08/142	MHRA, UK
	H5-AB-1209	CBER/FDA, USA
A/Cambodia/R0405050/2007-like	08/210	MHRA, UK
A/Hong Kong/489/97-like	98/666	MHRA, UK
A/Vietnam/1203/2004-like	H5-Ab-1811; H5-Ab-1812	CBER/FDA, USA
A/Indonesia/5/2005-like	H5-Ab-1217	CBER/FDA, USA
	AS406	TGA, Australia
A/Bar-headed goose/Qinghai/1A/2005-like	S-112SP	CBER/FDA, USA
A/Vietnam/1194/2004-like	07/148	MHRA, UK
	09/192	MHRA, UK
A/turkey/Turkey/1/2005-like	06/192	MHRA, UK
	08/126[§]	MHRA, UK
A/duck/Vietnam/NCVD-1584/2012-like	14/318	MHRA, UK
A/duck/Bangladesh/19097/2013	H5-Ab-1513	CBER/FDA, USA
A/Egypt/N03072/2010	H5-Ab-1203	CBER/FDA, USA

[§] *Anti NA serum for tests of neuraminidase identification*

WHO Essential Regulatory Laboratories (ERLs) contact details for reagent orders and other information:
CBER/FDA: CBERShippingRequests@fda.hhs.gov
MHRA: standards@nibsc.org or enquiries@nibsc.org
TGA: influenza.reagents@tga.gov.au

For information of other type and subtype candidate vaccine viruses and potency testing reagents, please go to: https://www.who.int/teams/global-influenza-programme/vaccines/who-recommendations/zoonotic-influenza-viruses-and-candidate-vaccine-viruses

For general enquiries, please contact gisrs-whohq@who.int