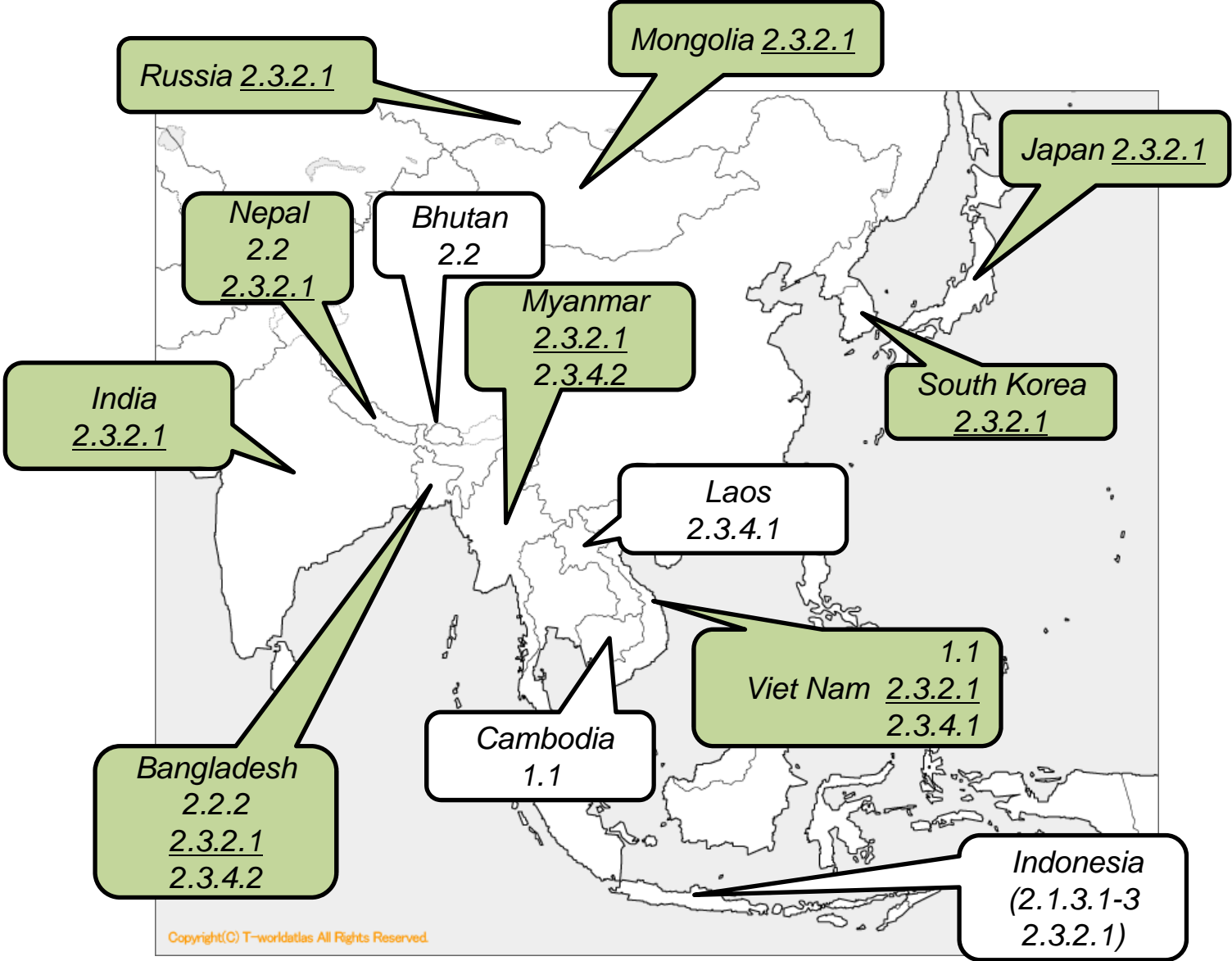


# Updates on the epidemiology of avian influenza viruses

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National Institute of Animal Health, JAPAN

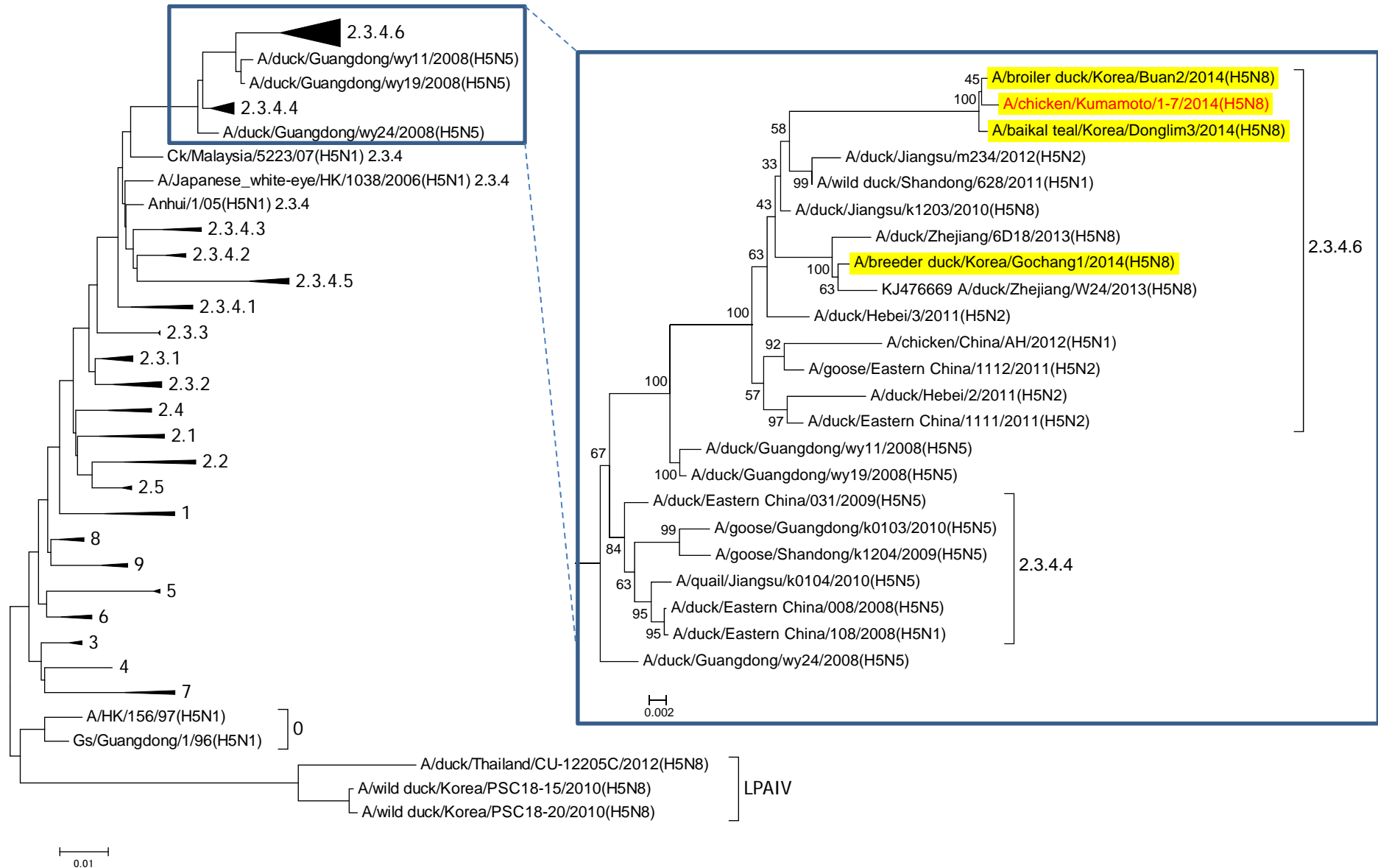
# Dissemination of H5N1 HAPIV defined by HA clade nomenclature during 2010-2012 in Asia



## HPAI outbreaks reported to OIE in 2014

Countries (regions)	Subtype	Date of start of the event	Date of last occurrence	Total Outbreaks
Cambodia	H5N1	07/02/2014	20/03/2014	5
China (People's Rep. of)	H5N1	27/12/2013		4
	H5N2	21/12/2013		2
	H5N6	23/04/2014	04/05/2014	1
India	H5N1	31/01/2014	21/02/2014	1
Japan	H5N8	11/04/2014	16/04/2014	1
Korea (Dem. People's Rep.)	H5N1	21/03/2014		3
Korea (Rep. of)	H5N8	16/01/2014		29
Laos	H5N6	13/03/2014	31/03/2014	1
Libya	H5N1	04/03/2014	06/03/2014	1
Nepal	H5N1	13/02/2014	22/05/2014	1
Vietnam	H5N1	07/10/2013	11/04/2014	39
	H5N6	22/04/2014		2
Australia	H7N2	08/10/2013	21/02/2014	2
Chinese Taipei	H5N2	15/04/2014	23/07/2014	1

# Phylogenetic analysis of Hemagglutinin (HA) gene of clade 2.3.4.6



\*sequence data from NCBI database and GISAID database.

# Assessment of pathogenicity of A/chicken/Kumamoto/1-7/2014(H5N8)

1. Putative amino acid sequence adjacent to the cleavage site of HA protein:

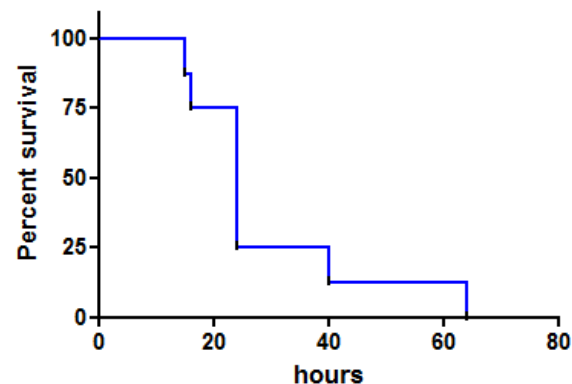


2. Experimental infection by intravenously inoculation

Any influenza virus that is lethal for six, seven or eight of eight 4- to 8 week-old susceptible chickens within 10 days following intravenous inoculation with 0.2 ml of a 1/10 dilution of a bacteria-free, infective allantoic fluid is classified highly pathogenic avian influenza virus. (Ref: Chapter 2.3.4 of OIE manual)

Above mentioned volume(0.2 ml) of a 1/10 dilution of the allantoic fluid of eggs (64HA) was intravenously inoculated into eight 5-week-old chickens and lethality was observed for 10 days.

**Survival rate of chickens**



hpi	survival	
	rate(%)	number
0	100	8
15	87.5	7
16	75	6
24	25	2
40	12.5	1
64	0	0



## Pathogenicity of Ck/Kumamoto/1-7/2014 (H5N8) by intranasal inoculation

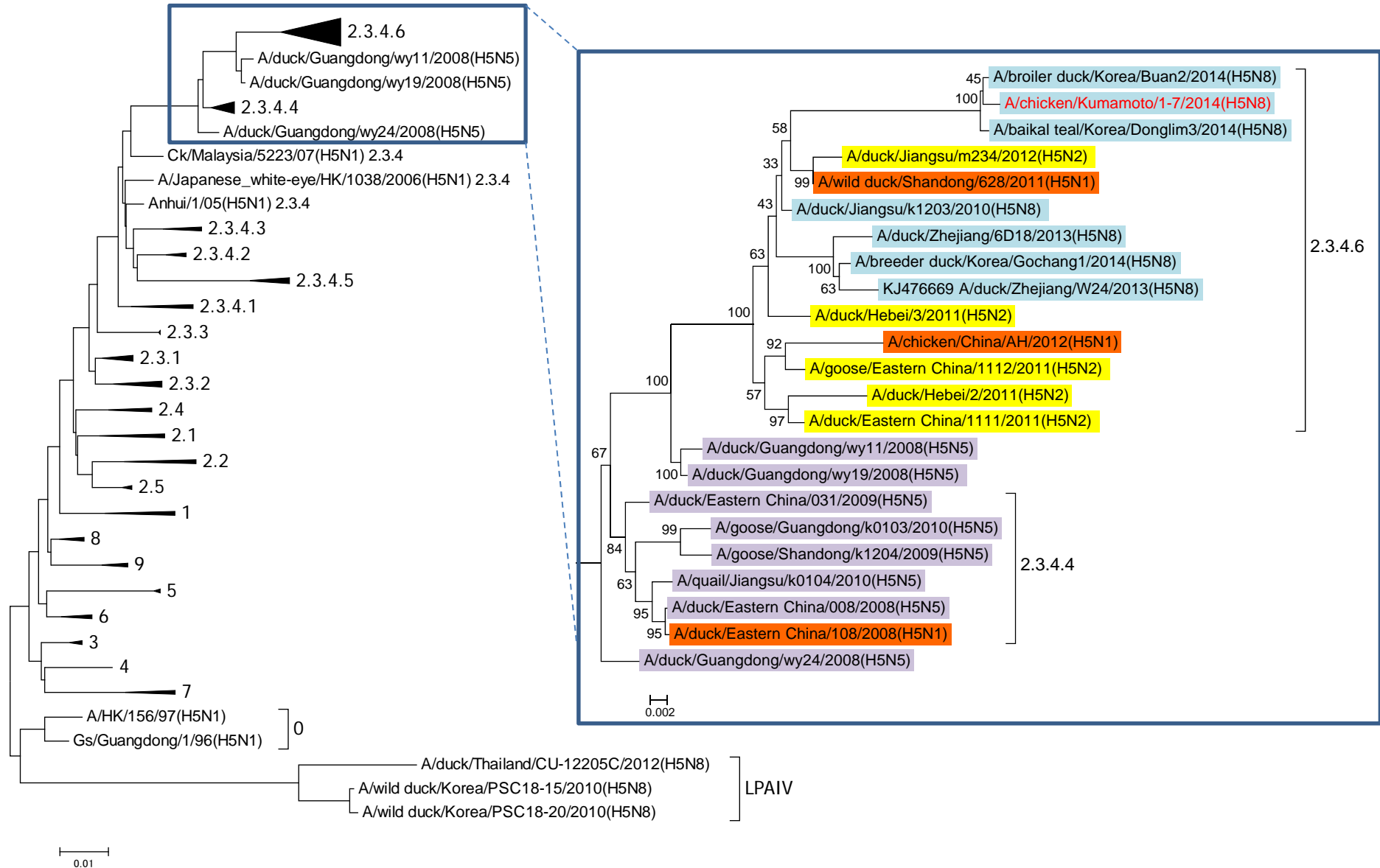
Chickens						
	inoculum EID <sub>50</sub> /head	Dead/Total	Time to death	Virus isolation from trachea	Virus isolation from cloaca	Anti-NP antibody (16dpi)
10 wks old	10 <sup>6</sup>	6/6	308h	6/6	6/6	NT
	10 <sup>4</sup>	0/3	-	0/3	0/3	0/3
	10 <sup>2</sup>	0/3	-	0/3	0/3	0/3
5 wks old	10 <sup>6</sup>	3/3	120h	3/3	3/3	NT
	10 <sup>4</sup>	0/3	-	0/3	0/3	0/3
	10 <sup>2</sup>	0/3	-	0/3	0/3	0/3

Ducks						
	inoculum EID <sub>50</sub> /head	Dead/Total	Time to death	Virus isolation from trachea	Virus isolation from cloaca	Anti-NP antibody (14dpi)
4 wks old	10 <sup>6</sup>	0/4	-	4/4	4/4	4/4
	10 <sup>4</sup>	0/4	-	4/4	4/4	4/4
	10 <sup>2</sup>	0/4	-	0/4	3/4*	0/4

\* < 0.5 log<sub>10</sub> EID<sub>50</sub>/ml



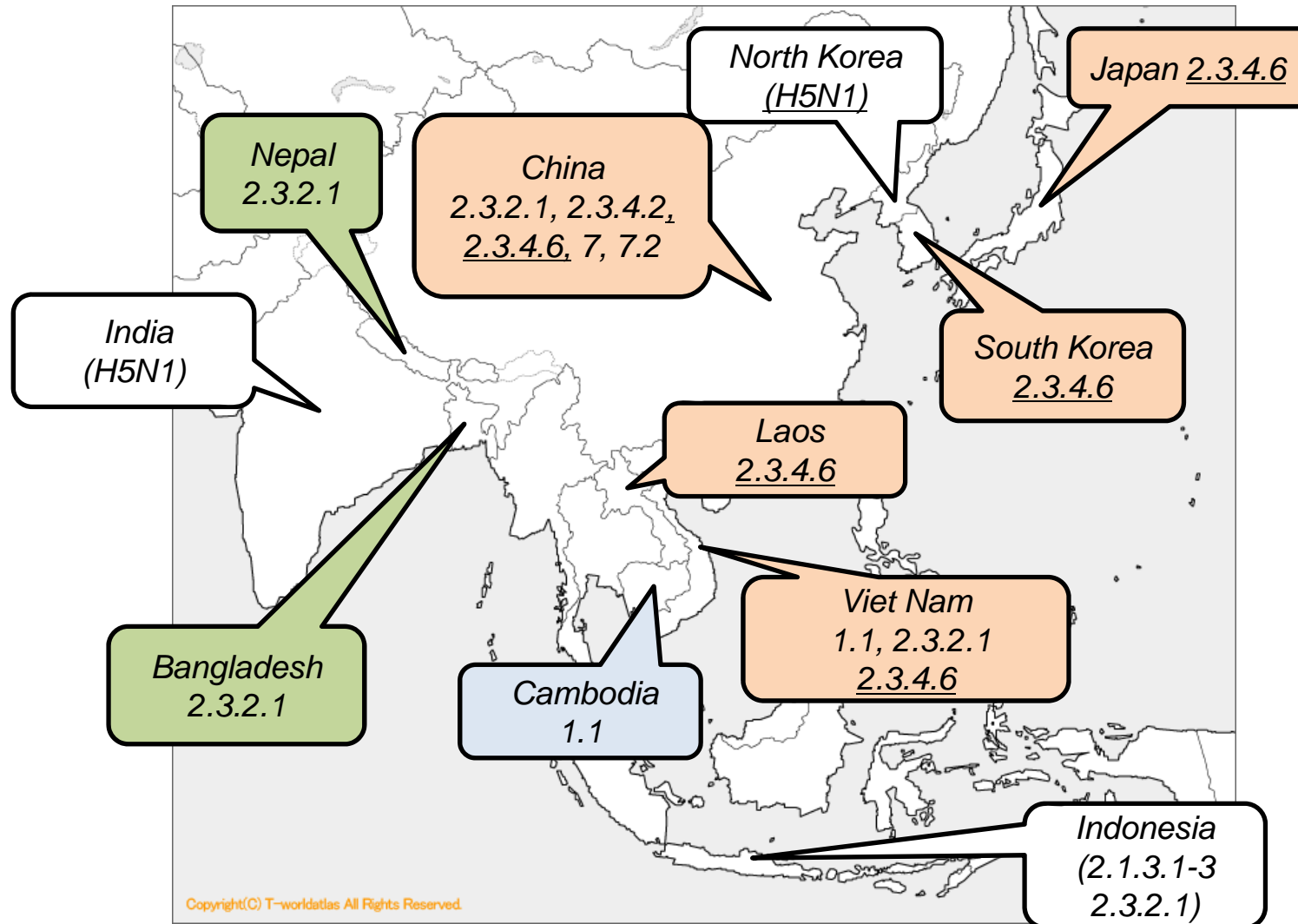
# Phylogenetic analysis of Hemagglutinin (HA) gene of clade 2.3.4.6

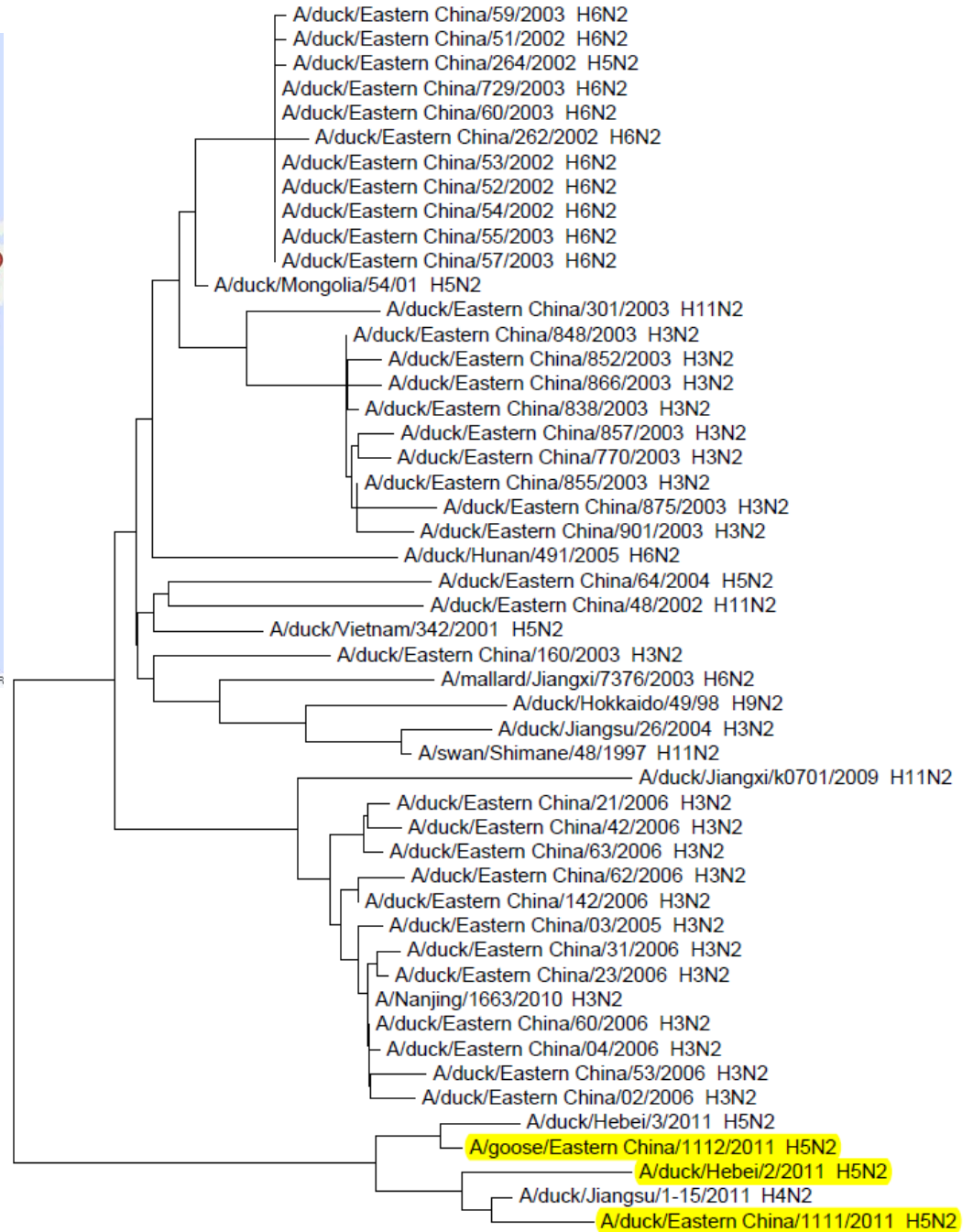
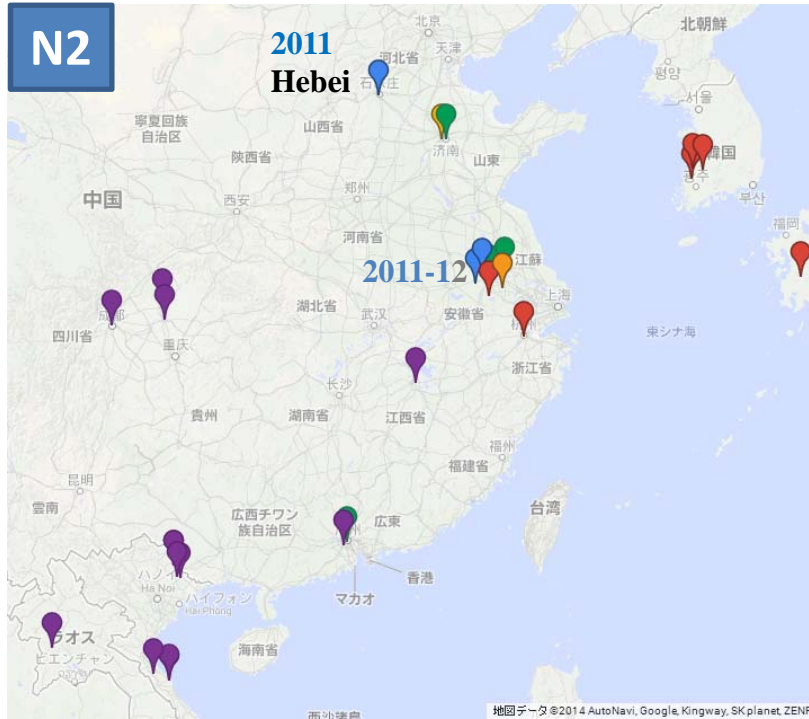


\*sequence data from NCBI database and GISAID database.

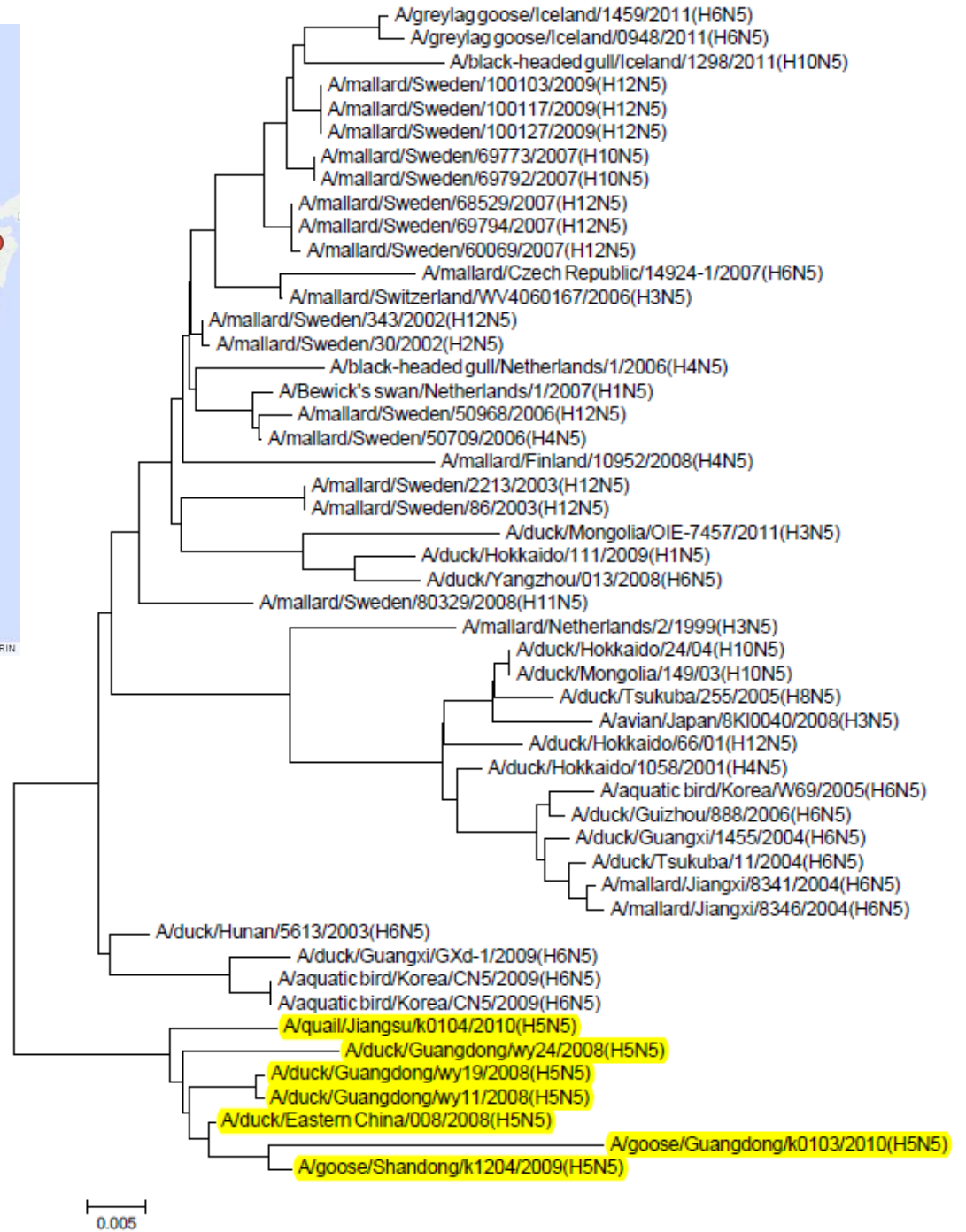


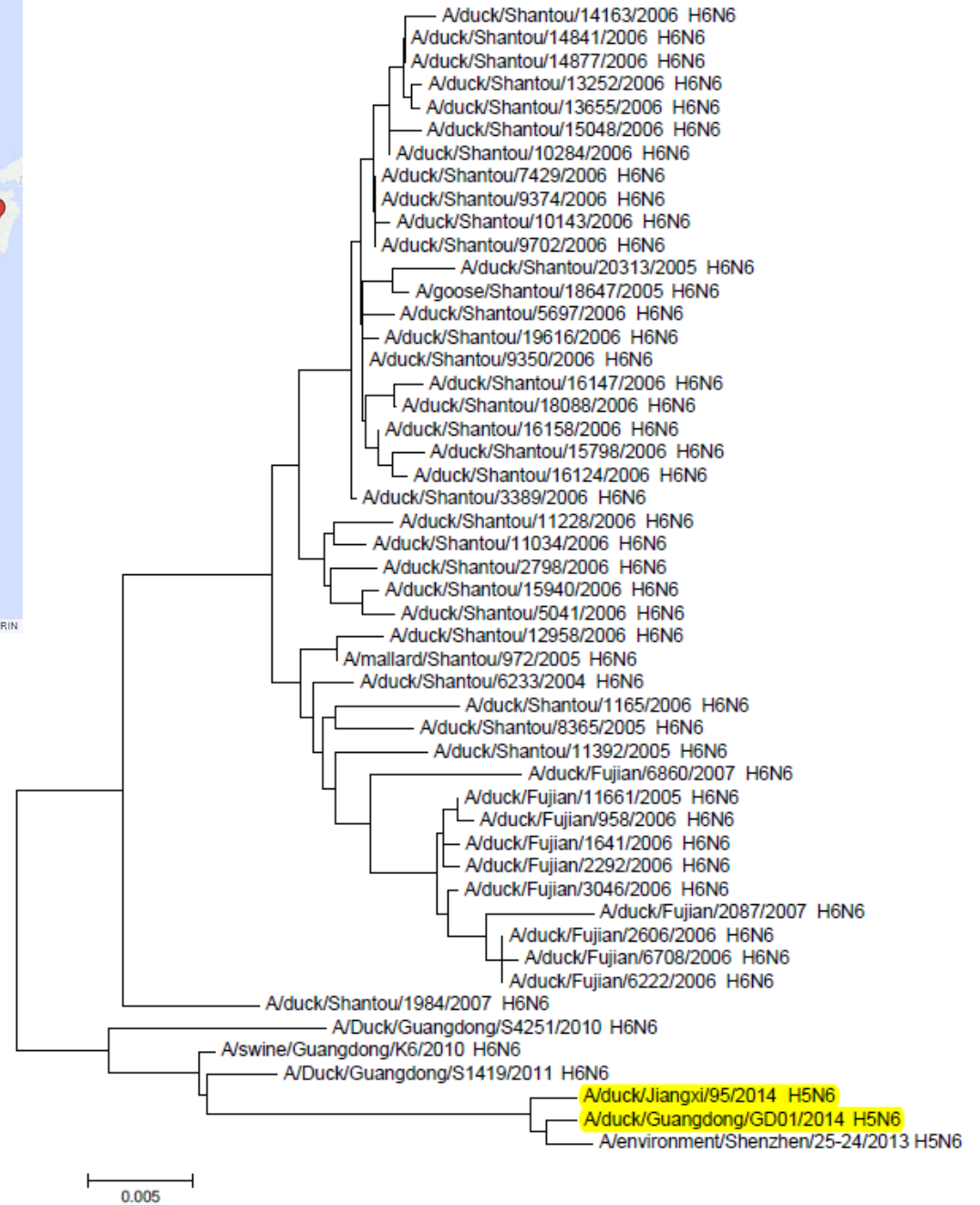
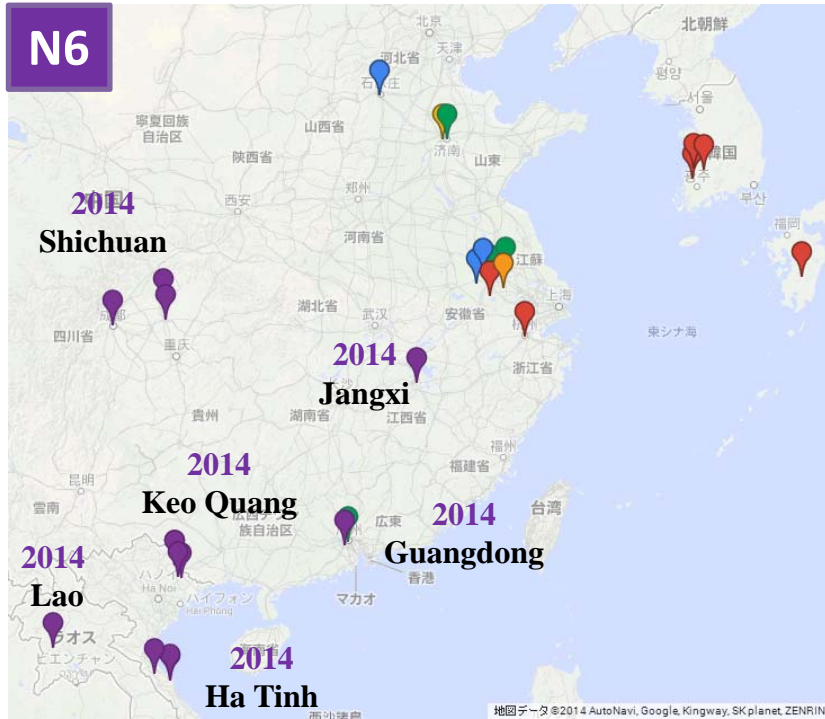
# Dissemination of H5 HAPIV defined by HA clade nomenclature during 2013-2014 in Asia



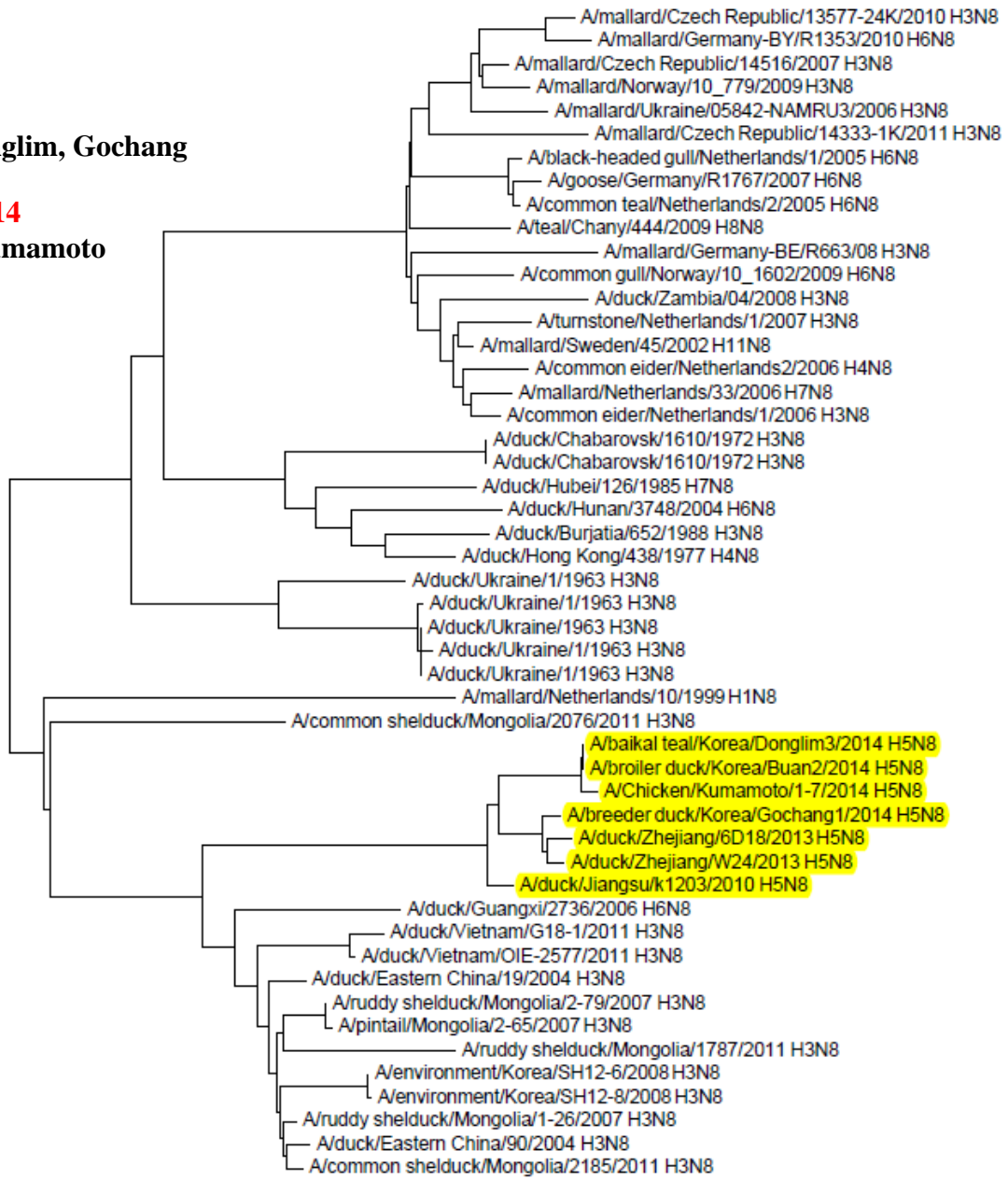


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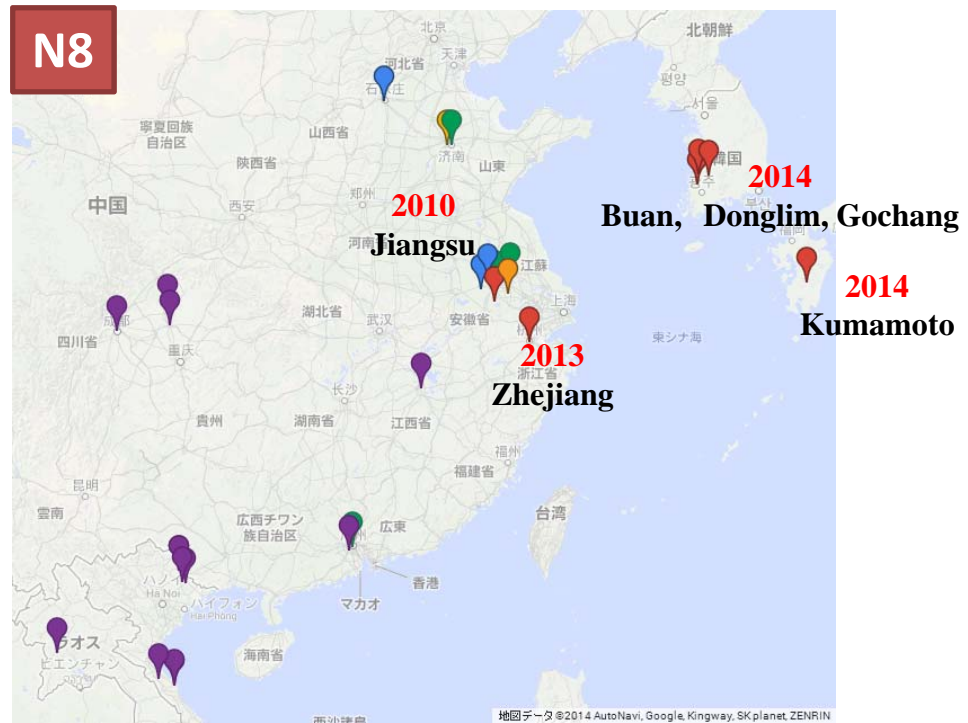
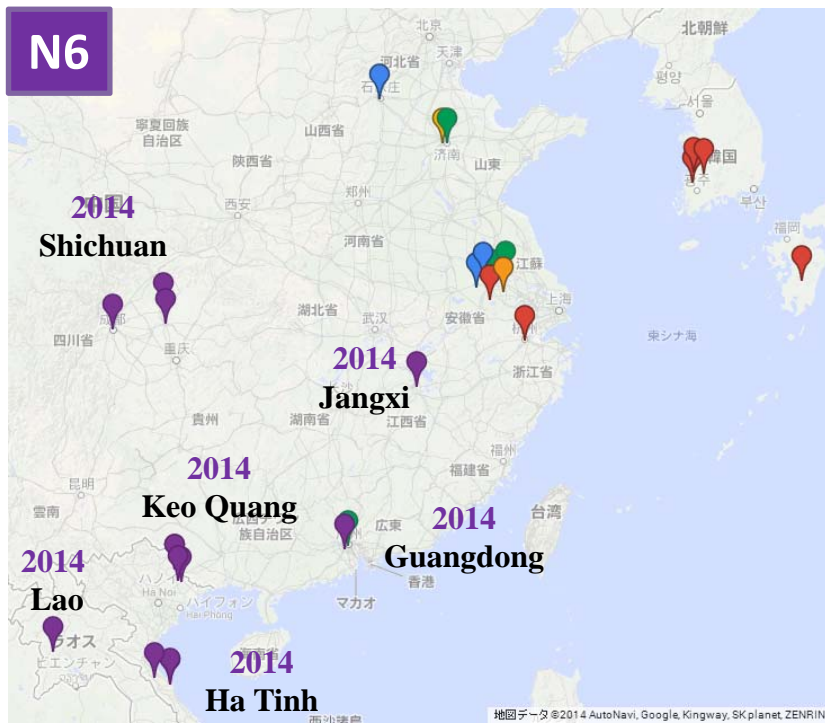




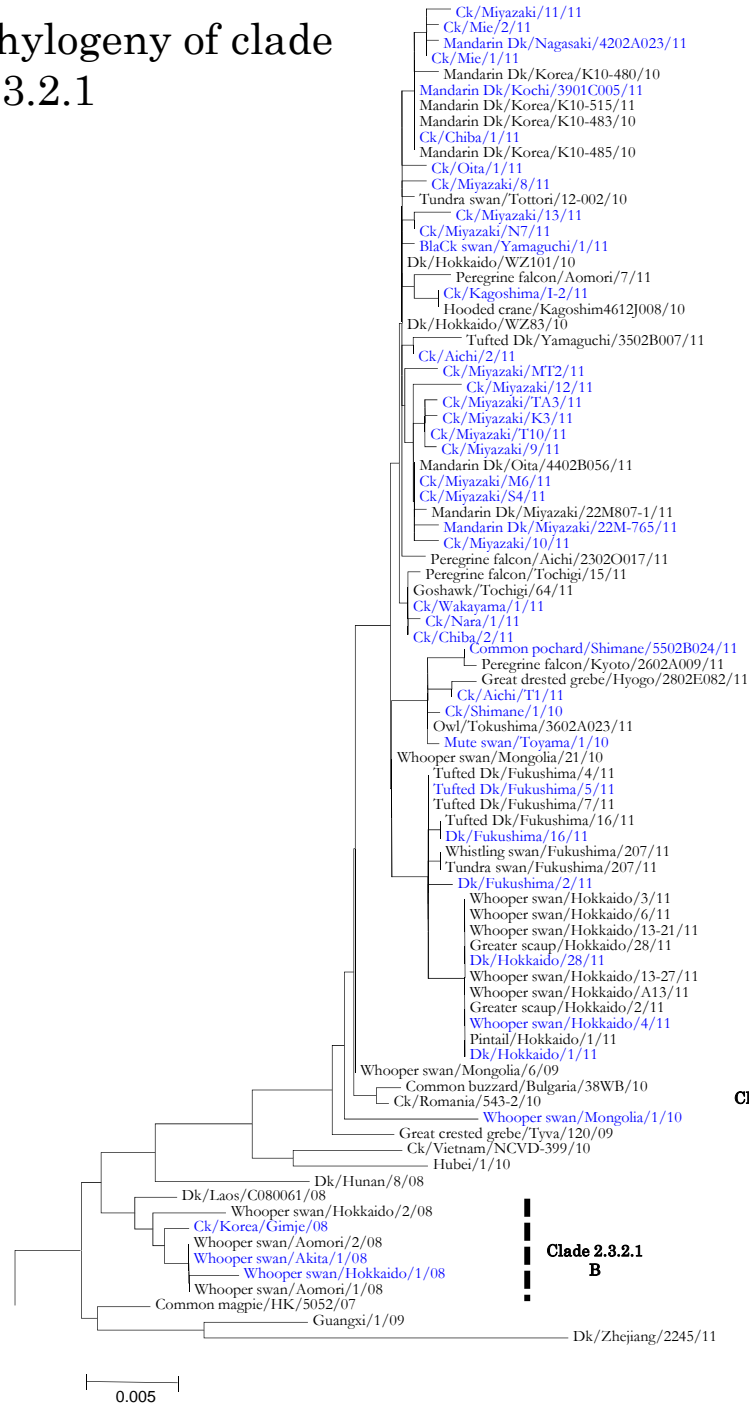




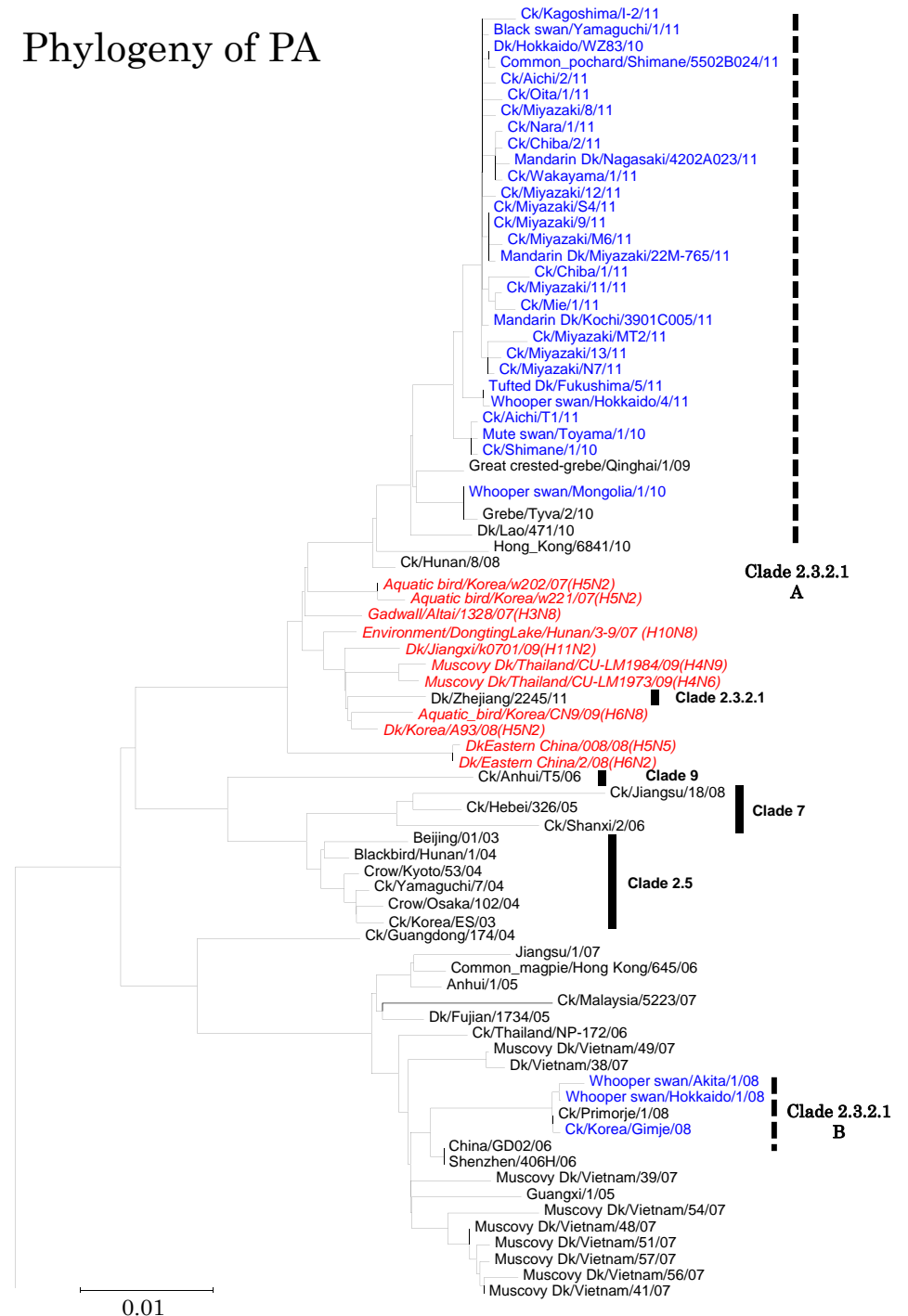
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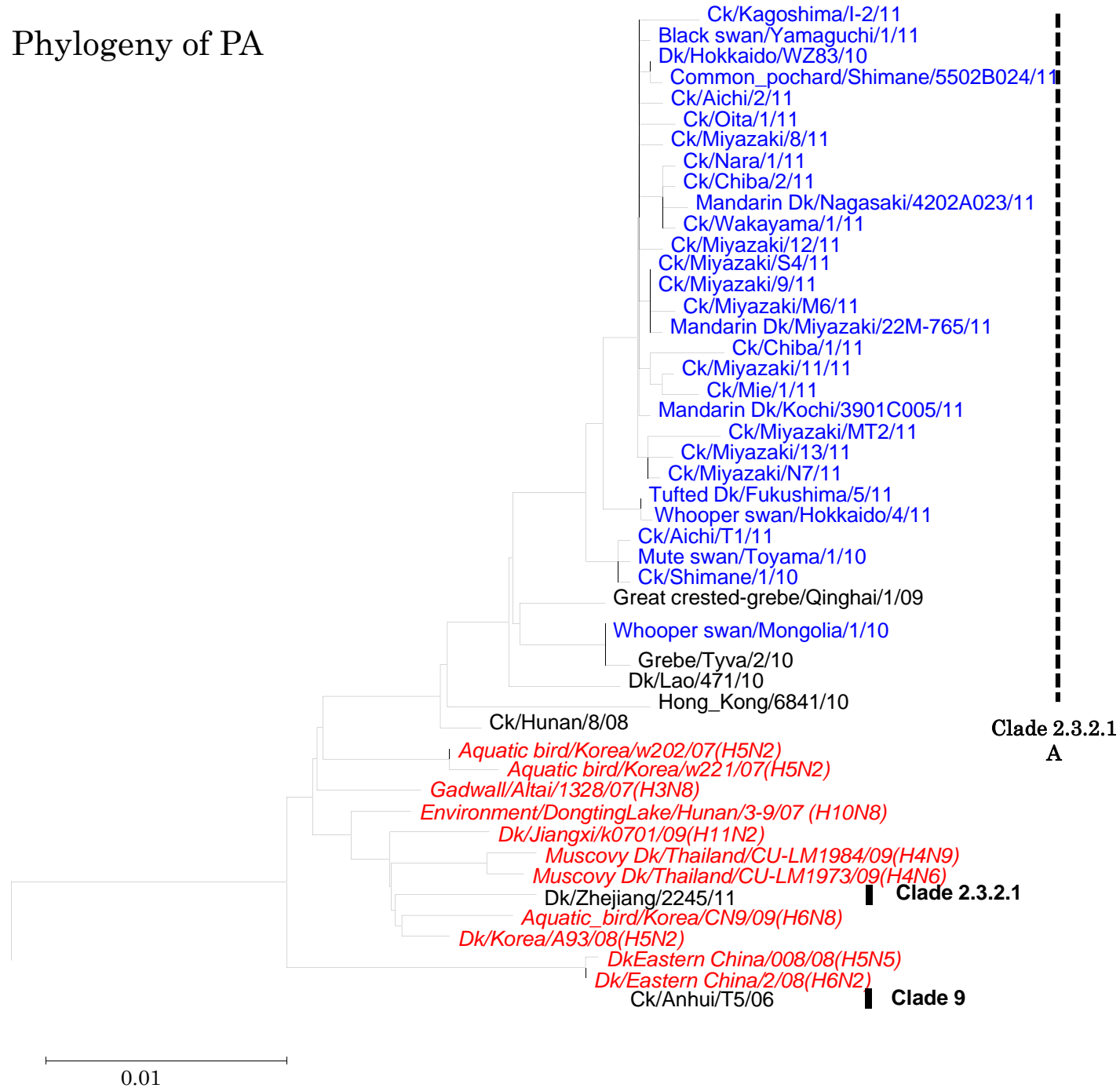
# Phylogeny of clade 2.3.2.1



# Phylogeny of PA

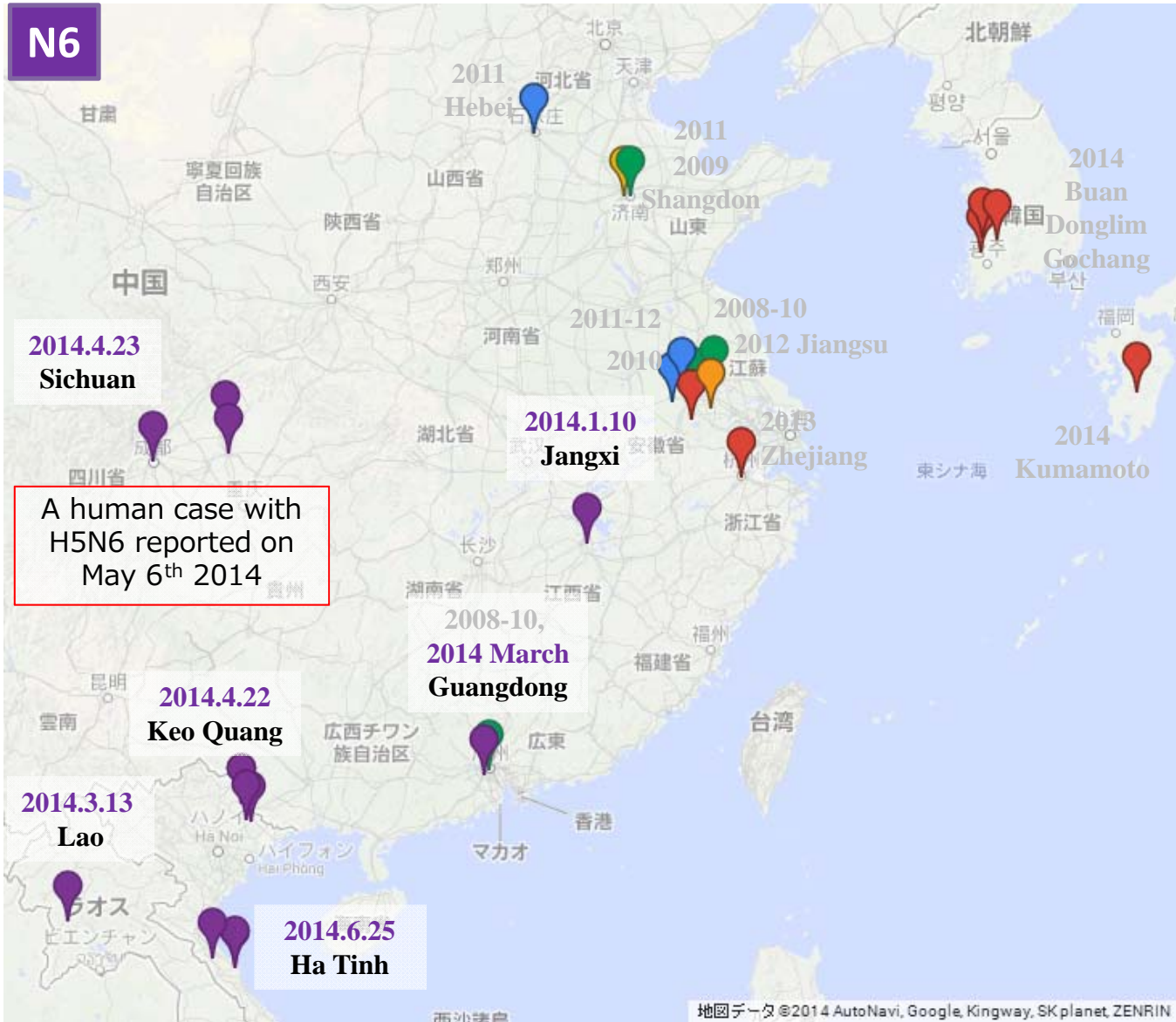


# Phylogeny of PA





**N6**



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## H5N1 infection in humans in 2014

Country	Province	Age	Sex	Date of onset	Date of Hospitalization	Date of Death	Exposure to
Canada	Alberta			27-Dec-13	1-Jan-14	3-Jan-14	unknown
Cambodia	Kampong Thom	5	M	24-Jan-14	30-Jan-14		Dead chicken in neighbourhood., was around while family prepared chicken
	Kratie	8	M	31-Jan-14	6-Feb-14	7-Feb-14	Dead chicken in neighbourhood, helped preparing chicken.
	Kratie	4	M	8-Feb-14	13-Feb-14		Dead chicken in neighborhood
	Kampong Cham	10	F	26-Jan-14	20 Feb 2014 after confirmation	recovered	Dead and sick ducks in village; helped preparing duck.
	Kampong Cham	11	F	9-Feb-14	20 Feb 2014 after confirmation	recovered	Dead chickens in neighborhood
	Phnom Penh	3	M	22-Feb-14	28-Feb-14	2-Mar-14	Dead poultry in the neighborhood
	Kandal	8	M	24-Feb-14	4-Mar-14	NA	Dead poultry in the neighbourhood
	Kampong Chhnang	11	M	3-Mar-14	5-Mar-14	6-Mar-14	Helped prepare dead chickens and ducks for food and was exposed to dead poultry in neighborhood
	Kampot	2	F	8-Mar-14	13-Mar-14	14-Mar-14	Dead poultry in the neighborhood.
China	Guangxi	75	M	NA	29-Jan-14		Exposure to poultry
	Hunan	5	F	17-Feb-14	NA	recovered	NA
Egypt	Behaira Governorate	56	F	6-Mar-14	9-Mar-14	NA	Dead and sick poultry (ducks and chickens)
	Demitta Governorate	4	M	7-Mar-14	12-Mar-14	NA	Dead and sick poultry (ducks and chickens)
	Menia	34	M	15-Jun-14	22-Jun-14	NA	Poultry market near home
Indonesia	Central Java	2	M	10-Apr-14	13-Apr-14	20-Apr-14	Sick and dead backyard poultry
Vietnam	Binh Phuoc	52	M	11-Jan-14	16-Jan-14	18-Jan-14	Slaughter and consumption of duck
	Dong Thap	60	F	22-Jan-14	27-Jan-14	28-Jan-14	Slaughter and consumption of duck, poultry deaths at son- in-law's residence

# Thank you for your attention

Acknowledgement

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