

# China's progress for potential pandemic preparedness

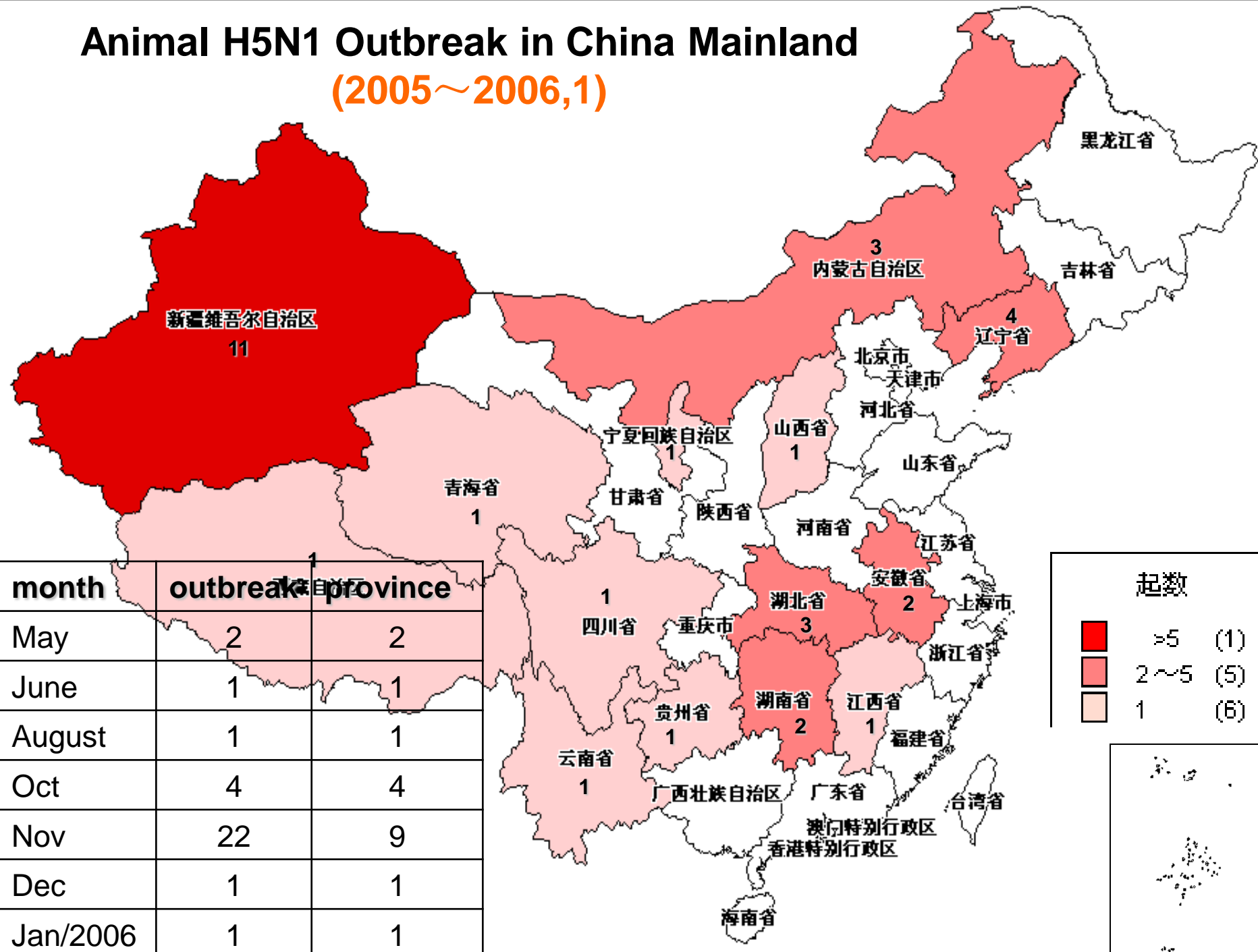
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Ministry of Health, P. R. China  
2006-1-20

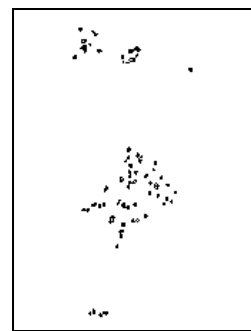
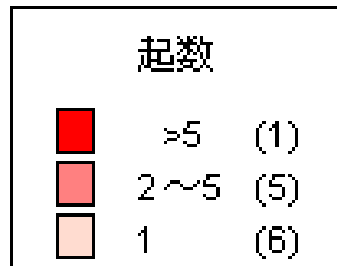


# Animal H5N1 Outbreak in China Mainland

(2005~2006,1)



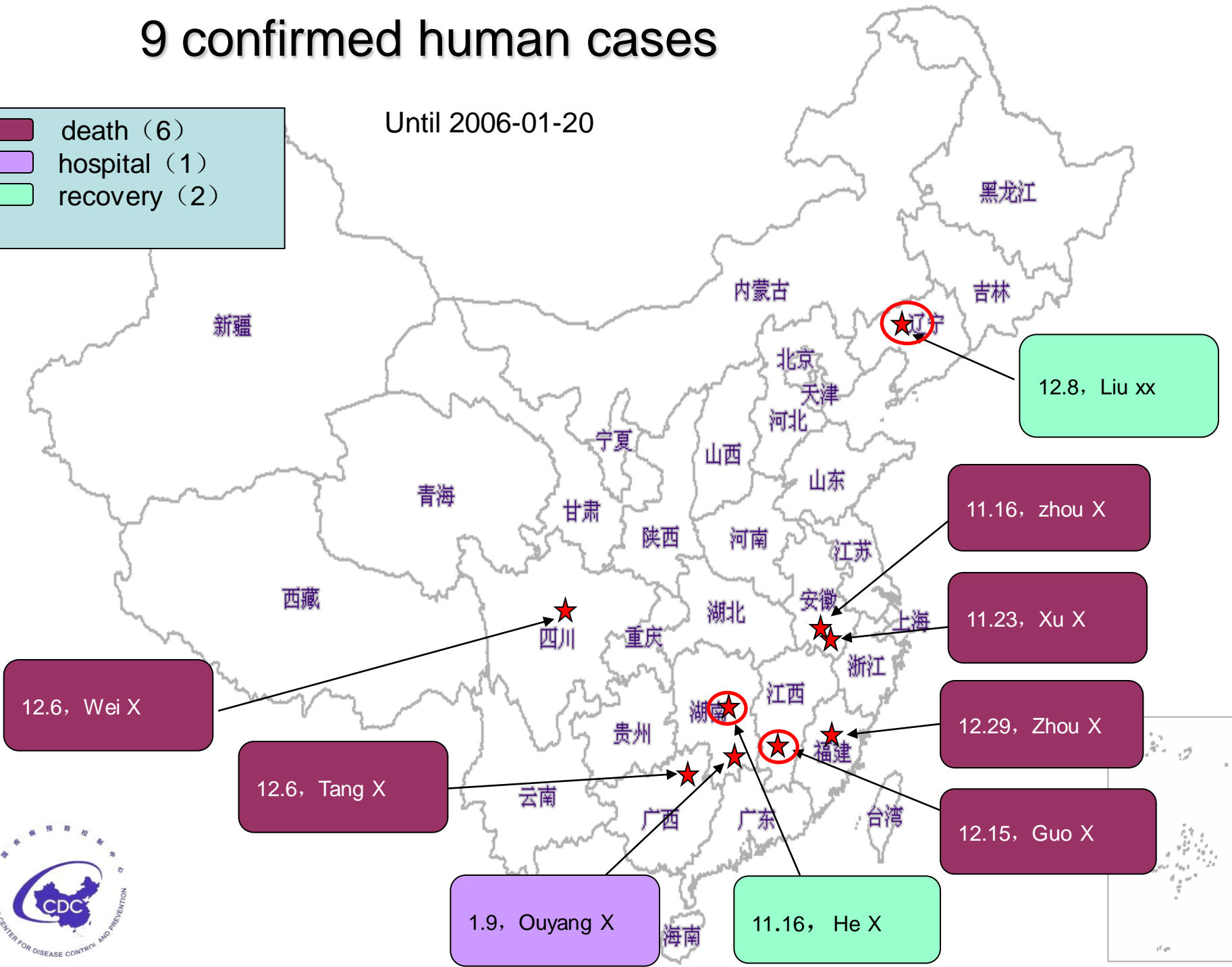
month	outbreak	province
May	2	2
June	1	1
August	1	1
Oct	4	4
Nov	22	9
Dec	1	1
Jan/2006	1	1



# 9 confirmed human cases

Until 2006-01-20

death (6)
hospital (1)
recovery (2)



# Human H5N1 isolates

Virus isolate	Isolation place
A/Anhui/1/2005(H5N1)	Anhui province
A/Anhui/2/2005(H5N1)	Anhui province
A/Guangxi/1/2005(H5N1)	Guangxi province
A/Jiangxi/1/2005(H5N1)	Jiangxi province
A/Fujian/1/2005(H5N1)	Fujian province
A/Sichuan/1/2006(H5N1)	Sichuan province



## HA homology comparison

	A/Anhui/1/05 (H5N1)	A/Anhui/2/05 (H5N1)	A/Guangxi/1/05 (H5N1)	A/CK/Hunan/21/05 (H5N1)	A/CK/Liaoning/23/05 (H5N1)	A/Jiangxi/1/05 (H5N1)	A/Fujian/1/05 (H5N1)	A/DK/Fujian/1734/05 (H5N1)
A/Anhui/1/05 (H5N1)		99.5%	99.3%	99.2%	95.2%	98.8%	99.1%	99.3%
A/Anhui/2/05 (H5N1)			99.2%	99.2%	95.1%	98.7%	98.9%	99.2%
A/Guangxi/1/05 (H5N1)				99.4%	95.5%	99.0%	99.1%	99.4%
A/CK/Hunan/21/05 (H5N1)					95.4%	98.9%	99.1%	99.3%
A/CK/Liaoning/23/05 (H5N1)						94.6%	96.8%	96.9%
A/Jiangxi/1/05 (H5N1)							98.8%	99.0%
A/Fujian/1/05 (H5N1)								99.1%
A/DK/Fujian/1734/05 (H5N1)								

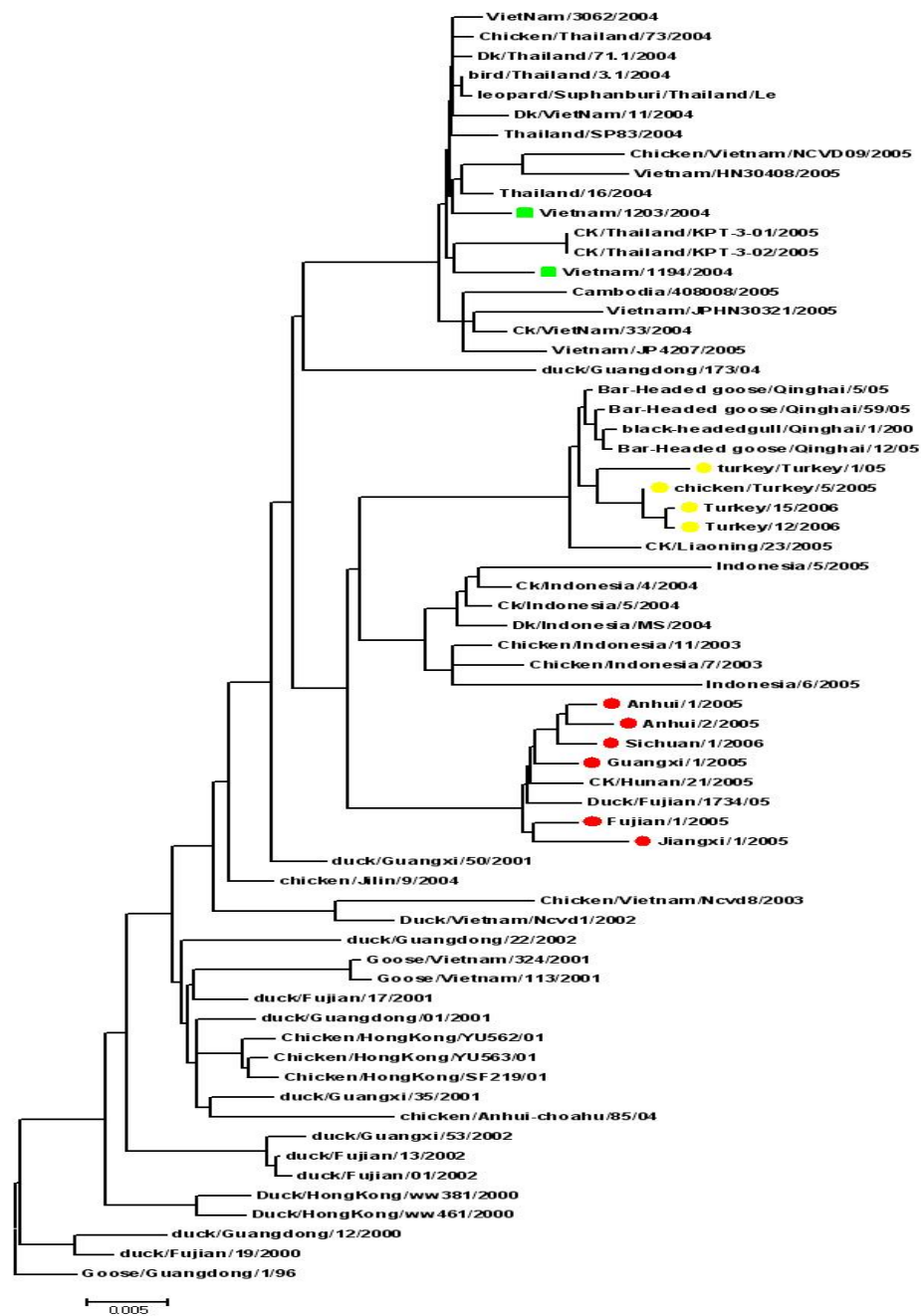


### HA protein homology comparison

	A/Anhui/1/05 (H5N1)	A/Anhui/2/05 (H5N1)	A/Guangxi/1/05 (H5N1)	A/CK/Hunan/21/05 (H5N1)	A/CK/Liaoning/23/05 (H5N1)	A/Jiangxi/1/05 (H5N1)	A/Fujian/1/05 (H5N1)	A/DK/Fujian/1734/05 (H5N1)
A/Anhui/1/05 (H5N1)		99.3%	99.6%	99.5%	96.7%	98.9%	99.6%	99.5%
A/Anhui/2/05 (H5N1)			99.3%	99.1%	96.3%	98.6%	99.1%	99.1%
A/Guangxi/1/05 (H5N1)				99.5%	96.7%	98.9%	99.5%	99.5%
A/CK/Hunan/21/05 (H5N1)					96.3%	98.8%	99.3%	99.3%
A/CK/Liaoning/23/05 (H5N1)						96.0%	96.5%	96.3%
A/Jiangxi/1/05 (H5N1)							99.1%	98.8%
A/Fujian/1/05 (H5N1)								99.3%
A/DK/Fujian/1734/05 (H5N1)								



# HA



virus	HA 226-228 AA	Avian (QSG)	Human (LSS)
A/Anhui/1/05	QSG	✓	
A/Anhui/2/05	QSG	✓	
A/Guangxi/1/05	QSG	✓	
A/Jiangxi/1/05	QSG	✓	
A/Fujian/1/05	QSG	✓	
A/Sichuan/1/2006	QSG	✓	
A/CK/Hunan/21/05	QSG	✓	
A/CK/LNHS/23/05	QSG	✓	
A/Ck/Fujian/1734/2005	QSG	✓	
A/Indonesia/6/2005	QSG	✓	
A/BHG/Qinghai/5/05	QSG	✓	
A/Thailand/16/2004	QSG	✓	
A/turkey/Turkey/1/05	QSG	✓	
A/Vietnam/1194/2004	QSG	✓	
A/Turkey/12/2006	QNG	✓	





virus	HA 338-346 AA	Avian (Multiple basic AA)	Human (Single basic AA)
A/Anhui/1/05	LRERRRKRG	✓	
A/Anhui/2/05	LRERRRKRG	✓	
A/Guangxi/1/05	LRERRRKRG	✓	
A/Jiangxi/1/05	LRERRRRRG	✓	
A/Fujian/1/05	LRERRRKRG	✓	
A/Sichuan/1/2006	LRERRRKRG	✓	
A/CK/Hunan/21/05	LRERRRKRG	✓	
A/CK/LNHS/23/05	QRERRRKRG	✓	
A/Ck/Fujian/1734/2005	LRERRRKRG	✓	
A/Indonesia/6/2005	QGERRRKRG	✓	
A/BHG/Qinghai/5/05	QRERRRKRG	✓	
A/Thailand/16/2004	QGERRRKRG	✓	
A/turkey/Turkey/1/05	QGERRRKRG	✓	
A/Vietnam/1194/2004	QRERRRKRG	✓	
A/Turkey/12/2006	QRERRRKRG	✓	



virus	HA 274 AA	Sensitive (H)	Resistant (Y)
A/Anhui/1/05	LNAPNYHYEE	✓	
A/Anhui/2/05	LNAPNYHYEE	✓	
A/Guangxi/1/05	LNAPNYHYEE	✓	
A/Jiangxi/1/05	LNAPTYHYEE	✓	
A/Fujian/1/05	LDAPNYHYEE	✓	
A/Sichuan/1/2006	LDAPNYHYEE	✓	
A/CK/Hunan/21/05	LDAPNYHYEE	✓	
A/CK/LNHS/23/05	LNAPNYHYEE	✓	
A/Ck/Fujian/1734/2005	LDAPNYHYEE	✓	
A/Indonesia/6/2005	LDAPNYHYEE	✓	
A/BHG/Qinghai/5/05	LDAPNYHYEE	✓	
A/Thailand/16/2004	LDAPNYHYEE	✓	
A/turkey/Turkey/1/05	LDAPNYHYEE	✓	
A/Vietnam/1194/2004	LDAPNYHYEE	✓	
A/Turkey/12/2006	LNAPNYHYEE	✓	



virus	M2 25-42 AA	Sensitive ( 26L, 27V, 30A, 31S, 34G )	Resistant ( 26F, 27A, 30T, 31N, 34E )
A/Anhui/1/05	PLVVAASIIIGILHLILWIL	✓	
A/Anhui/2/05	PLVVAASIIIGILHLILWIL	✓	
A/Guangxi/1/05	PLVVAASIIIGILHLILWIL	✓	
A/Jiangxi/1/05	PLVVAASIIIGILHLILWIL	✓	
A/Fujian/1/05	PLVVAASIIIGILHLILWIL	✓	
A/Sichuan/1/2006	PLVVAASIIIGILHLILWIL	✓	
A/CK/Hunan/21/05	PLVVAASIIIGILHLILWIL	✓	
A/CK/LNHS/23/05	PLVVAASIIIGILHLILWIL	✓	
A/Ck/Fujian/1734/2005	PLVVAASIIIGILHLILWIL	✓	
A/Indonesia/6/2005	PLVVAASIIIGILHLILWIL	✓	
A/BHG/Qinghai/5/05	PLVVAASIIIGILHLILWIL	✓	
A/Thailand/16/2004	PIVVAANIIGILHLILWIL		✓
A/turkey/Turkey/1/05	PLVVAASIIIGILHLILWIL	✓	
A/Vietnam/1194/2004	PIVVAANIIGILHLILWIL		✓
A/Turkey/12/2006	PLVVAASIIIGILHLILWIL	✓	



Virus	PB2 ( 627)	E	K
A/Anhui/1/05	AAAPPEQ	✓	
A/Anhui/2/05	AAAPPEQ	✓	
A/Guangxi/1/05	AAAPPEQ	✓	
A/Jiangxi/1/05	AAAPPKQ		✓
A/Fujian/1/05	AAAPPKQ		✓
A/Sichuan/1/2006			✓
A/CK/Hunan/21/05	AAAPPEQ	✓	
A/CK/LNHS/23/05	AAAPPEQ	✓	
A/Ck/Fujian/1734/2005	AAAPPEQ	✓	
A/Indonesia/6/2005	AAAPPKQ		✓
A/BHG/Qinghai/5/05	AAAPPKQ		✓
A/Thailand/16/2004	AAAPPKQ		✓
A/turkey/Turkey/1/05	AAAPPKQ		✓
A/Vietnam/1194/2004	AAAPPKQ		✓
A/Turkey/12/2006	AAAPPKQ		



# Results summary

- all genes of these 5 viruses are avian influenza original, no evidences to show the recombination or reassortant between the avian and human influenza;
- the receptor binding specificity is still avian virus-like specific;
- the connecting peptide between HA1 and HA2 subunits is still multiple basic amino acids;
- all viruses are sensitive to M2 inhibitor and NA inhibitor drugs;
- the sequence of all virus isolates are very similar with the H5N1 avian influenza virus isolated from poultry in china.



# Actions for avian influenza surveillance and control

- the national pandemic plan has been developed; a lot of activities are conducting from national to local levels;
- atypical pneumonia case reporting system has been strengthened, all 9 confirmed human cases were detected by this surveillance system;
- active surveillance conducted after the poultry outbreak happened;
- the capacity of the influenza laboratories including national and local level has been improved greatly;

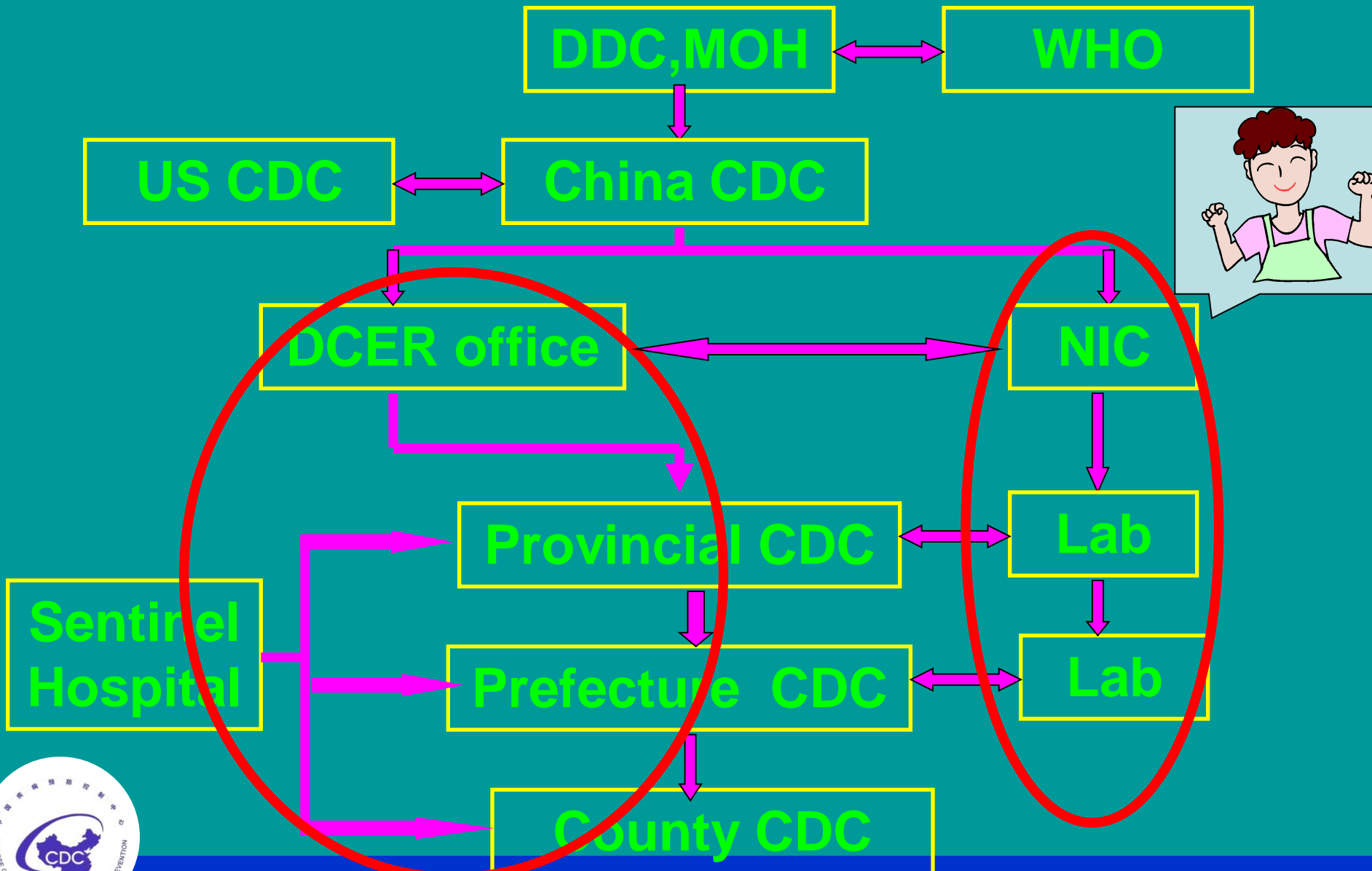


# Actions for avian influenza surveillance and control

- the influenza and human avian influenza surveillance system has been expanded to rural area, currently totally 198 sentinel hospitals and 63 influenza laboratories have been developed for the surveillance network
- in order to fast the information collection and sharing , China CDC has developed a professional human-avian influenza surveillance information system

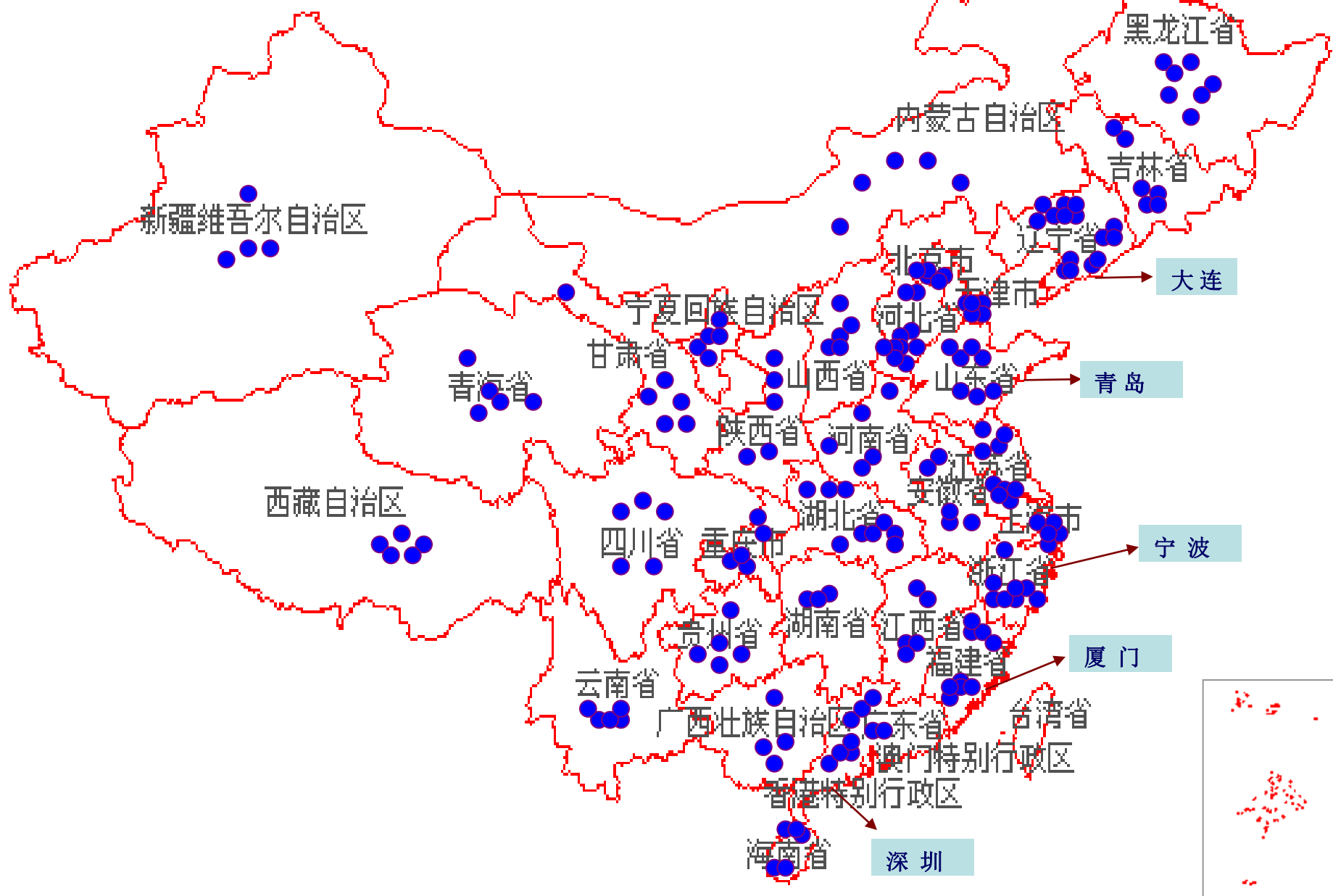


# Influenza Surveillance Network. China

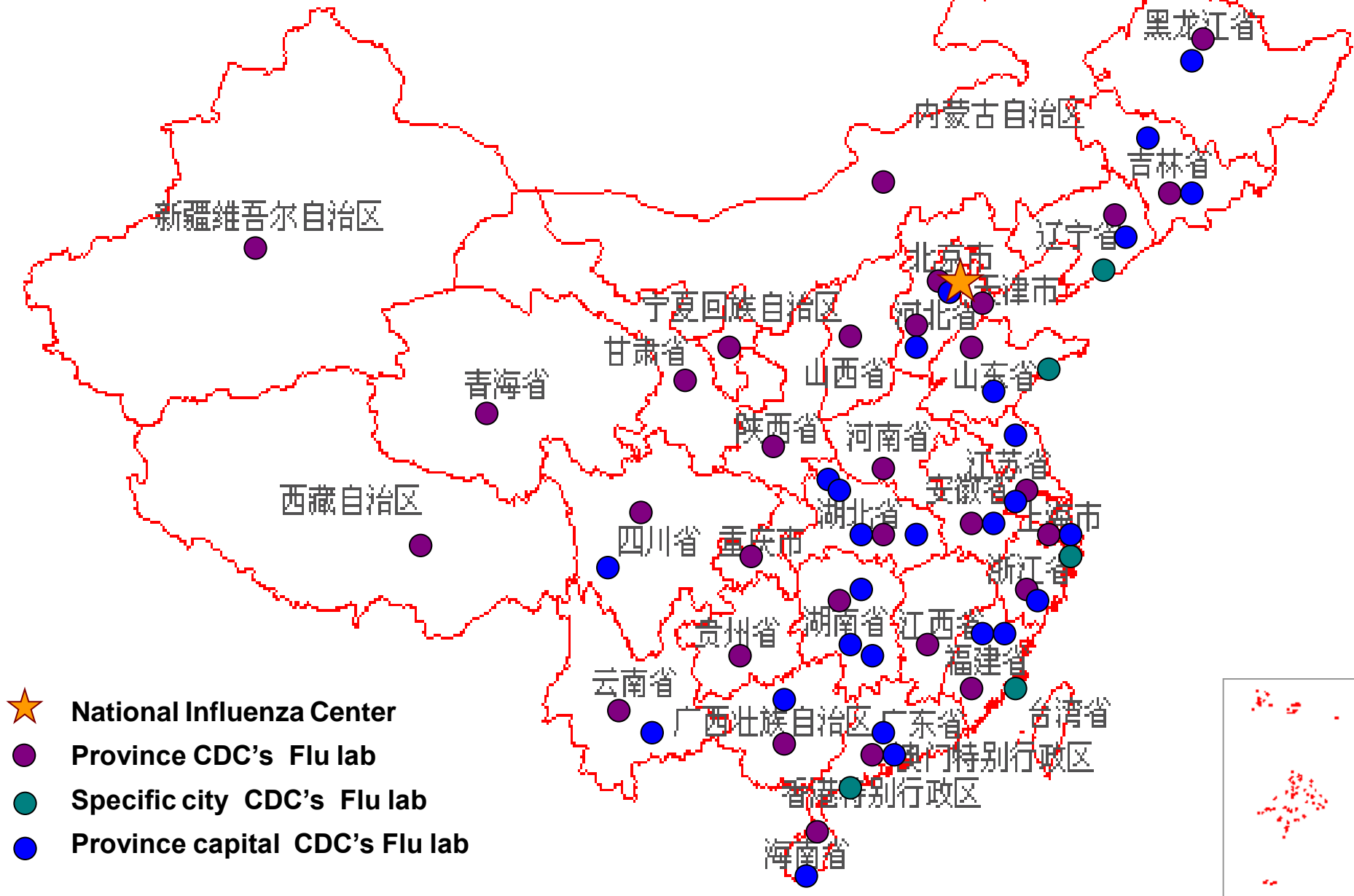




# Expansion Surveillance Coverage: 198 Sentinel Hospitals in 31 provinces, from Oct 2005



# Laboratory Network in China





# 中国流感/人禽流感监测信息系统 Influenza Surveillance Information System



用户名: 123456 所属地区: 广东 所属机构: 疾病预防控制中心

有问题请联系: 国家CDC管理员 中科软科技股份 隐藏条件 X

开始日期: 2005-9-3  结束日期: 2005-9-5  问题分类: 流感/禽流感问题

公告栏 <span style="float: right;">新建</span>				
主题	发布人	发布人地区	发布时间	操作
第0页/共0页 每页10行 跳到第0页 <span style="float: right;"> <input type="button" value="首页"/> <input type="button" value="上页"/> <input type="button" value="下页"/> <input type="button" value="末页"/> </span>				

- 功能菜单**
- 传报卡管理
    - 传报卡查询
  - 流感流行病学监测
  - 流感病原学监测
  - 人禽流感监测
  - 数据字典管理
  - 系统功能
  - 查看公告栏
  - 修改密码
  - 操作手册下载
  - 退出系统



# Actions for avian influenza surveillance and control

- 1000 staffs have got training in 2005, and more training courses are taking around the country



全国流感/人禽流感监测实施方案与信息系统培训班



20 8:52AM

# Actions for avian influenza surveillance and control

- the human H5N1 vaccine started the clinical trial I experiment



# Pandemic vaccine R&D

*Based on the assays of various types, doses and schedules of immunization onto more than 3000 mice and rats, the strategies of the type, doses and immunization schedule of testing vaccine for **clinical trial** were almost have been done.*

## Testing vaccines for clinical trial

- Immunization dosage: 1.25, 2.5, 5.0, 10.0  $\mu\text{g/ml}$
- Type: Inactivated Pandemic Influenza Vaccine (whole virion, AI-absorbed)
- Immunization schedule: 0, 28 day





# Actions for avian influenza surveillance and control

- close cooperation with WHO and other international organizations and other countries on avian influenza, MoH shared all information regarding the avian influenza virus with international society, such as sharing virus isolates with WHO, providing virus sequence to the international scientists.



# Challenges

- china is so big, there are 1.3 billion people and 70% living in rural area;
- the traditional agricultural mode gives more chance for people to get infection;
- there are not enough professional staff for the surveillance and control system, especially in local level;
- short of fund support, such as reagents and equipments supply for the local laboratories.



# Suggestions

- information transparency;
- closer cooperation through international agency;
- support the basic research on virus ecology, transmission and pathology, et al;
- strengthen the public education on avian influenza basic knowledge;
- fast the vaccine and drug development.



*Thank you*

