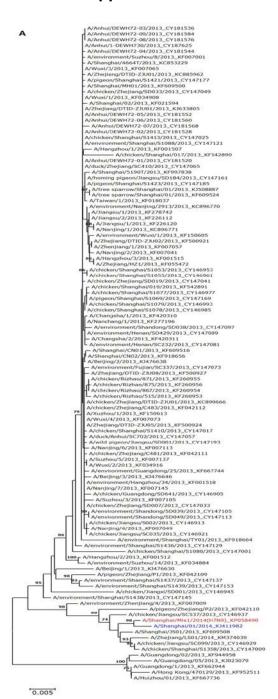
## Co-infection with Avian (H7N9) and Pandemic (H1N1) 2009 Influenza Viruses, China

## **Technical Appendix**



```
A/Shanghai/MH01/2013_KF609501
В
                                          A/Wuxl/2/2013_KF034917
                                          - A/environment/Suzhou/14/2013 KF034885
                                        A/tree sparrow/Shanghai/01/2013_KJ508888
- A/Beijing/3/2013_KJ476647
                                        A/Wuxi/1/2013_KF034909
                                       — A/Suzhou/3/2013 KF007106
A/chicken/Jiangsu/SC537/2013_CY146938
A/chicken/ZheJiang/C481/2013_KF042095
A/chicken/ZheJiang/DTID-ZUU01/2013_KC899667
                                        A/Suzhou/5/2013_KF007138
A/Shanghal/5190T/2013_KF997837
— A/chicken/Shanghal/017/2013_KF542888
A/environment/Shanghal/51088/2013_CY147122
                                            - A/Taiwan/1/2013_KF018038
                                      — A/Taiwan/1/2013_KF018038
A/Wuxi/4/2013_KF007074
A/Pilgeon/Shanghal/S1423/2013_CY147186
A/chicken/Shanghal/S1053/2013_CY146954
A/wild pigeon/Jiangsu/SD001/2013_CY146954
A/Manjing/4/2013_KF007050
A/chicken/Zhejiang/SD019/2013_CY147042
A/hicken/Zhejiang/SD019/2013_CY147042
A/chicken/Zhegiang/SD019/2013_CY1470667
                                          A/chicken/Shanghai/S1055/2013 CY146962
                                        - A/environment/Shanghai/TY01/2013_KF918665

- A/Wuxi/3/2013_KF007066

A/Xuzhou/1/2013_KF150614
                                        A/ZheJiang/HZ1/2013_KF055468
                                       A/Zhejiang/DTID-ZJU01/2013_K)633806
A/Zhejiang/DTID-ZJU01/2013_KC885961
-A/Chlcken/Jiangsu/SC035/2013_CY146922
A/environment/Shanghal/S1438/2013_CY147146
                                        A/homing pigeon/liangsu/50184/2013_CY147162
— A/tree sparrow/Shanghal/01/2013_KF609525
- A/Beljing/2/2013_K3476639
                                       A/chicken/Shanghal/S1410/2013_CY147018
A/chicken/Rizhao/871/2013_KF260711
A/chicken/Rizhao/867/2013_KF260710
A/chicken/Rizhao/875/2013_KF260712
                                          A/environment/Fujian/SC337/2013_CY147074
                                        - Avenvironment/rujans/s233/2013_C/14/0/4
A/Nanjing/7/2013_KF007146

— A/Hangzhou/1/2013_KF001508
A/chicken/ZheJiang/SD033/2013_CY147050
A/environment/Shanghal/S1436/2013_CY147130
                                       A/Shanghai/CN01/2013_KF609517
A/Shanghai/CN02/2013_KF918657
A/Nanjing/6/2013_KF007114
                                           A/Shanghai/Mix1/2014(H7N9)_KP058485
                                        A/chicken/Jiangsu/S002/2013_CY146914
                                        A/chicken/Juangdong/S0641/2013_CY146906
A/chicken/Guangdong/S0641/2013_CY146906
A/Shanghal/02/2013_KF021595
A/Shanghal/4664T/2013_KC853230
                                           - A/environment/Suzhou/8/2013 KF007002
                                        Avanvironment/suzhou/8/2013_KF0
- A/Beijing/1/2013_KJ476631
- A/duck/Anhui/SC702/013_CY147058
- A/Shanghai/01/2014_KJ411981
                                          A/Zhejjiang/LS01/2014_KM374040
A/Chicken/Shanghai/S1413/2013_CY147026
A/pigeon/Shanghai/S1421/2013_CY147178
A/Anhui/DEWH72-07/2013_CY181567
                                          A/Anhui/DEWH72-04/2013_CY181543
                                          A/Anhui/DEWH72-02/2013_CY181527
A/Anhui/DEWH72-06/2013_CY181559
A/Anhui/DEWH72-05/2013_CY181551
                                          A/Anhui/1-DEWH730/2013_CY187624
                                          A/Anhui/DEWH72-01/2013_CY181519
A/Anhui/DEWH72-03/2013_CY181535
A/Anhui/DEWH72-08/2013_CY181575
                                           A/Anhui/DEWH72-09/2013 CY181583
                                                   A/Shanghai/JS01/2013_KF609509

A/environment/Wanjing/2913/2013_KC896769

A/environment/Wuxi/1/2013_KF150606
                                                         A/Nanjing/2/2013_KF007042
                                                        A/Zhenjlang/1/2013_KF007058
A/Jiangsu/1/2013_KF278743
97 A/Jiangsu/2/2013_KF226111
                                   40 A/Jiangsu/1/2013_KF226119
A/Nanjing/1/2013_KC896772
A/Nanjing/1/2013_KC896772
A/environment/Shanghai/S1439/2013_CY147154
A/chicken/ZheJiang/C483/2013_KF042096
                                       A/chicken/Zhejiang/SD007/Z013_L13_V
A/pigeon/Zhejiang/P1/2013_KF042093
A/duck/Zhejiang/SC410/2013_CY147066
A/Hong Kong/470129/2013_KF952512
A/Guangdong/02/2013_KF9
                                                         - A/chicken/Zhejiang/SD007/2013 CY147034
                                                100 A/Guangdong/02/2013_KF952512

100 A/Guangdong/02/2013_KF944959

A/Guangdong/1/2013_KF662945

A/Huizhou/01/2013_KF667737

A/chicken/Shangha/S1080/2013_CY147002
                                                                         - A/environment/Shandong/SD038/2013 CY147098
                                                                                 A/Changsha/2/2013_KF420309
A/Changsha/1/2013_KF420308
A/Nanchang/1/2013_KF469232
A/environment/Henan/SD429/2013_CY147090
                                                                                         A/chicken/Jiangxi/SD001/2013_CY146946
A/environment/Henan/SC232/2013_CY147082
A/chicken/Shanghai/S1077/2013_CY146978
                                                                                         A/chicken/Shanghai/S1077/2013_CY146994
A/chicken/Shanghai/S1079/2013_CY146994
A/pigeor/Shanghai/S1069/2013_CY147170
A/chicken/Shanghai/S1078/2013_CY146986
A/chicken/Shanghai/S1078/2013_CY146986
A/chicken/Shanghai/S1076/2013_CY146970
                                                                                               /environment/Shandong/SD039/2013_CY147106
A/environment/Shandong/SD049/2013_CY147114
```

0.005

```
87 A/Beljing/2/2013_K3476640
C
                                                                               A/Shanghal/CN02/2013_KF918658
A/Shanghal/CN01/2013_KF609518
A/Shanghal/02/2013_KF021596
A/Nanjing/1/2013_KC896773
                                                                                A/Jiangsu/1/2013_KF226118
                                                                            96 A/Jiangsu/1/2013_KF278744
A/Jiangsu/2/2013_KF226110
A/chicken/Shanghai/019/2013_KF542887
A/chicken/Shanghai/S1079/2013_CY146995
                                                                                 A/chicken/Shanghai/S1078/2013 CY146987
                                                                              A/chicken/Shanghai/S1076/2013_CY146971
A/pigeon/Shanghai/S1069/2013_CY147171
A/Shanghai/MH01/2013_KF609502
                                                                                - A/chicken/Shanghai/S1077/2013_CY146979
                                                                              A/Nanjing/6/2013_KF007115

— A/Wuxi/3/2013_KF007067

- A/Nanjing/4/2013_KF007051

- A/Suzhou/3/2013_KF007107
                                                                                A/chicken/Shanghai/S1055/2013_CY146963

    A/environment/Guangdong/25/2013_KF667745
    A/Beljing/1/2013_KJ476632
A/chicken/Jiangsu/S002/2013_CY146915
    A/chicken/Jiangsu/SC035/2013_CY146923
                                                                               A/chicken/Guangdong/SD641/2013_CY146907

— A/duck/Anhul/SC702/2013_CY147059

A/chicken/Jiangxi/SD001/2013_CY146947

A/chicken/Shanghai/S1410/2013_CY147019
                                                                                 - A/FuJian/1/2013_KF061025
                                                                            — AFujian/1/2013_KF061025
A/Wuxi/4/2013_KF007075
A/tree sparrow/Shanghal/01/2013_KJ508889
A/Shanghal/51907/2013_KF997836
A/homing pigeon/Jianspux/50184/2013_CY147163
A/pigeon/Shanghal/S1423/2013_CY147187
— A/environment/Shandong/S0038/2013_CY147799
A/pigeon/Shanghal/S1421/2013_CY147799
A/pigeon/Shanghal/S1421/2013_CY147799
A/Pigeon/Shanghal/S1421/2013_CY147791
                                                                                A/environment/Henan/SD429/2013_CY147091
                                                                             - A/environment/Henan/SD429/2013_CY147091

A/chicken/Zbejiang/Ca83/2013_KF042088

- A/environment/Wux/1/2013_KF150607

- A/environment/Wux/1/2013_KF0506761

- A/Nanjing/2/2013_KF007091

- A/Zbejing/3/2013_KF007095

- A/Bejing/3/2013_KF007095

- A/Bejing/3/2013_KF007091

- A/Bejing/3/2013_KF007091
                                                                              — Noesing: 3,2013_N-1/0096
— A/environment/Shanghai/TV01/2013_KF918666
A/environment/Shanghai/TV01/2013_CY147115
_ A/chicken/Rizhao/867/2013_KF260466
— A/chicken/Rizhao/857/2013_KF260468
                                                                                A/environment/Henan/SC232/2013_CY147083
                                                                               A/environment/Shandong/SD039/2013_CY147107

A/wild pigeon/Jiangsu/SD001/2013_CY147195

— A/Shanghai/4664T/2013_KC853226

— A/chicken/Shanghai/017/2013_KF542886
                                                                                  A/Nanchang/1/2013 KF277195
                                                                                - Aydankhang; IJ 2013_K727/139

Ayenvironment/Suzhou/8/2013_KF007003

- Aychicken/Rizhao/515/2013_KF260465

Aychicken/Zhejiang/C481/2013_KF042087

Aychicken/Zhejiang/SD019/2013_CY147043
                                                                                A/Xuzhou/1/2013_KF150615
A/Suzhou/5/2013_KF007139
- A/Wuxi/2/2013_KF034918
A/environment/Fujian/SC337/2013_CY147075
                                                                             A/Changsha//2013_KF420306

A/Changsha/2/2013_KF420307

A/Khangsha/2/2013_KF420307

A/Khanjing/7/2013_KF007147

A/Khanjing/7/2013_KF007147

A/Khanghai/01/2014_KH411980
                                                                                A/Zhejiang/LS01/2014_KM374041
A/Anhui/DEWH72-03/2013_CY181534
A/Anhui/DEWH72-04/2013_CY181542
A/Anhui/1-DEWH730/2013_CY187623
                                                                                  A/Anhui/DEWH72-02/2013_CY181526
                                                                                 A/Anhui/DEWH72-05/2013_CY181550
A/Anhui/DEWH72-05/2013_CY181574
A/Anhui/DEWH72-01/2013_CY181518
— A/Anhui/DEWH72-07/2013_CY181566
                                                                              — A/Anhu/DEWH/2-0//2013_CY181568

— A/Anhu/DEWH72-06/2013_CY181588

— A/Anhu/DEWH72-09/2013_CY181582

— A/Chicker/Jiangsu/SC537/2013_CY146939

991_A/Guangdong/1/2013_KF662746

— A/Huizhou/01/2013_KF667738
                                                                        A/chicken/Shanghai/S1413/2013_CY147027
A/environment/Shanghai/S1088/2013_CY147123
— A/environment/Shanghai/S1439/2013_CY147125

    A/chicken/Shanghai/S1080/2013_CY147003

                                                                             — A/environment/Suzhou/14/2013_KF034886

— A/pigeon/Zhejlang/P2/2013_KF042086

A/chicken/Zhejlang/S0033/2013_CY147051

A/Zhejlang/DTID-ZJU01/2013_KC885955
                                                                                                              A/Zhejiang/HZ1/2013_KF055466
                                              - A/Zhejiang/DTID-ZJU01/Z013_KJ633807
- A/duck/Zhejiang/SC410/2013_CY147067
A/environment/Zhenjiang/4/2013_KF007011
                                          - A/environment/Shanghai/S1437/2013_CY147139
                                          - A/environment/Shanghal/S1437/2013_CY147139
- A/environment/Shanghal/S1438/2013_CY147147
- A/environment/Shanghal/S1438/2013_CY147131
- A/environment/Shanghal/S1436/2013_CY147131
- A/environment/Shanghal/S10007/2013_CY147035
- A/Shanghal/S012/2013_CY147031
- A/Shanghal/S012/2013_CY147031
- A/chicken/Shanghal/S1358/2013_CY147031
- A/chicken/Shanghal/S1358/2013_CY147031
- A/chicken/Shanghal/S1358/2013_CY147031
                                                                                                                     A/chicken/Rizhao/871/2013 KF260467
                                                                                  A/Guangdong/02/2013_KF944960

A/Guangdong/04/2013_KJ023073

A/Guangdong/05/2013_KJ023081
```

```
A/Suzhou/5/2013_KF007141
D
                               A/Xuzhou/1/2013_KF150617
                              A/Wuxi/2/2013_KF034920
                              A/chicken/Shanghai/S1053/2013_CY146957

    A/chicken/Shanghai/S1055/2013_CY146965
    A/Anhui/DEWH72-03/2013_CY181532

                              A/Anhui/DEWH72-09/2013_CY181580
                              A/chicken/Shanghai/S1413/2013 CY147029
                              A/tree sparrow/Shanghai/01/2013_KF609528
                              A/pigeon/Shanghai/S1423/2013_CY147189
                              A/Anhui/DEWH72-05/2013_CY181548
                              A/chicken/Guangdong/SD641/2013_CY146909
A/Shanghai/MH01/2013_KF609504
                              A/chicken/Zhejiang/SD019/2013_CY147045
                                - A/Zhejjang/LS01/2014 KM374043
                              A/Nanjing/7/2013_KF007149
                             A/Anhui/DEWH72-07/2013_CY181564
A/tree sparrow/Shanghai/01/2013_KJ508891
                             A/wild pigeon/Jiangsu/SD001/2013_CY147197

A/Zhejiang/DTID-ZJU01/2013_KJ633808

A/Zhejiang/DTID-ZJU01/2013_KC885957
                              A/Beijing/1/2013 KJ476634
                              A/Shanghai/CN02/2013_KF918660
                              A/Nanjing/2/2013_KF007045
                              A/Wuxi/1/2013_KF034912
                             A/chicken/Jiangsu/SC035/2013_CY146925
—— A/chicken/Shanghai/017/2013_KF542882
                              A/chicken/Zhejiang/SD033/2013_CY147053
                              A/Wuxi/3/2013 KF007069
                              A/Anhui/DEWH72-02/2013_CY181524
                             A/Taiwan/S02076/2013_KF018046
— A/Zhejiang/DTID-ZJU10/2013_KF732004
                             A/Anhui/DEWH72-08/2013_CY181572
— A/Fujian/1/2013_KF061026
                              A/chicken/Jiangsu/SC537/2013_CY146941
                              A/Hangzhou/1/2013_KF001510
                              A/Shanghai/CN01/2013_KF609520
                              A/Anhui/DEWH72-01/2013 CY181516
                              A/Shanghai/02/2013_KF021598
                             94 A/chicken/Rizhao/867/2013_KF259978
A/chicken/Rizhao/875/2013_KF259980
                              A/chicken/Jiangsu/S002/2013_CY146917
                              A/chicken/Zhejiang/DTID-ZJU01/2013 KC899670
                              A/duck/Anhui/SC702/2013_CY147061
                             — A/Shanghai/5190T/2013_KF997833
A/Anhui/1-DEWH730/2013_CY187621
                             - A/Anhui/DEWH72-06/2013_CY181556
A/homing pigeon/Jiangsu/SD184/2013_CY147165
                               A/pigeon/Shanghai/S1421/2013_CY147181
                              A/Beijing/3/2013 KJ476650
                              A/duck/Zhejiang/SC410/2013_CY147069
                             A/Anhui/DEWH72-04/2013_CY181540
                               - A/Suzhou/3/2013_KF007109
                              A/Taiwan/1/2013_KF018040
                              A/Beijing/2/2013_KJ476642
                              A/chicken/Shanghai/S1410/2013_CY147021
                               A/chicken/Zhejiang/C481/2013_KF042083
                                  A/Shanghai/Mix1/2014(H7N9)_KP058487
                              - A/Shanghai/01/2014 KJ411978
                             A/Nanjing/4/2013_KF007053
                                A/Nanjing/6/2013_KF007117
                                A/Zhejiang/HZ1/2013_KF055465
                                A/Jiangsu/2/2013_KF226108
                                A/chicken/Jiangsu/SC099/2013 CY146933
                                A/Jiangsu/1/2013_KF278749
                                 A/Wuxi/4/2013 KF007077
                                A/Zhenjiang/1/2013_KF007061
                                 — A/chicken/Shanghai/S1358/2013_CY147013

– A/chicken/Zhejiang/SD007/2013_CY147037
                           A/Jiangsu/1/2013_KF226116
                          A/Nanjing/1/2013_KC896775
A/chicken/Shanghai/S1079/2013_CY146997
                             A/Changsha/1/2013_KF420302
A/Nanchang/1/2013_KF277193
                              A/chicken/Jiangxi/SD001/2013_CY146949
                              A/pigeon/Shanghai/S1069/2013 CY147173
                              A/chicken/Shanghai/S1078/2013_CY146989
                             A/chicken/Shanghai/S1076/2013_CY146973
- A/chicken/Shanghai/019/2013_KF542883

    A/chicken/Shanghai/S1077/2013_CY146981
    A/Changsha/2/2013_KF420303

                                                   - A/Hong Kong/470129/2013_KF952509
                                A/pigeon/Zhejiang/P1/2013_KF042082
A/pigeon/Zhejiang/P2/2013_KF042082
                                      - A/pigeon/Zhejiang/P1/2013_KF042081
                                   A/chicken/Shanghai/S1080/2013 CY147005
                                 100 A/Huizhou/01/2013_KF667740
                                        A/Guangdong/1/2013_KF662948
                                                  - A/Guangdong/03/2013_KJ023068
                                              A/Guangdong/05/2013_KJ023083
                                           A/Guangdong/02/2013_KF944961
A/Guangdong/04/2013_KJ023075
```

```
A/chicken/Shanghai/S1413/2013_CY147031
                    A/pigeon/Shanghai/S1421/2013_CY147183
E
                  A/Suzhou/3/2013_KF007111
A/Anhui/DEWH72-03/2013_CY181530
                  A/Xuzhou/1/2013_KF150619
A/Shanghai/MH01/2013_KF609506
                  A/chicken/Rizhao/871/2013_KF259460
A/Anhui/DEWH72-08/2013_CY181570
                  A/Guangdong/04/2013_KJ023077
A/chicken/Shanghai/S1053/2013_CY146959
A/chicken/Shanghai/S1055/2013_CY146967
A/chicken/Zhejiang/SD033/2013_CY147055
                   A/chicken/Rizhao/867/2013_KF259459
                   A/Huizhou/01/2013_KF667742
                  A/Beijing/2/2013_KJ476644
— A/Guangdong/02/2013_KF944962
                  A/Anhui/DEWH72-02/2013_CY181522
A/Anhui/DEWH72-06/2013_CY181554
                  A/Shanghai/02/2013_KF021600
A/chicken/Rizhao/875/2013_KF259461
                   — A/duck/Zhejiang/SC410/2013_CY147071
A/Shanghai/CN01/2013_KF609522
                   A/Hangzhou/1/2013 KC853764
                   A/Anhui/DEWH72-01/2013_CY181514
                  A/chicken/Shanghai/S1410/2013_CY147023
— A/Wuxi/2/2013_KF034922
                   A/Wuxi/1/2013 KF034914
                   A/Anhui/1-DEWH730/2013_CY187619
                   A/duck/Anhui/SC702/2013_CY147063
                   A/Nanjing/4/2013_KF007055
                   A/chicken/Guangdong/SD641/2013_CY146911
A/Guangdong/05/2013_KJ023085
                   A/Beijing/3/2013 KJ476652
                   A/Shanghai/CN02/2013_KF918662
                   A/Anhui/DEWH72-07/2013_CY181562
                   A/Nanjing/7/2013_KF007151
                           - A/chicken/Shanghai/017/2013 KF542878
                   A/wild pigeon/Jiangsu/SD001/2013_CY147199
                   A/Wuxi/3/2013 KF007071
                   A/Suzhou/5/2013_KF007143
                   A/Guangdong/1/2013 KF662950
                   A/Nanjing/6/2013_KF007119
                   A/Fujian/1/2013_KC994455
                   A/Anhui/DEWH72-05/2013_CY181546
                                 - A/Guanadona/03/2013 KJ023070
                    A/Zhejiang/DTID-ZJU10/2013_KF732007
                   A/Anhui/DEWH72-04/2013_CY181538
A/Anhui/DEWH72-09/2013_CY181578
                   A/chicken/Jiangsu/SC035/2013_CY146927
                   A/chicken/Rizhao/515/2013_KF259458
A/chicken/Zhejiang/C481/2013_KF042107
                    A/chicken/Zhejiang/DTID-ZJU01/2013_KC899672
                    A/Beijing/1/2013_KJ476636

    A/Shanghai/4664T/2013_KC853227
    A/Zhejiang/DTID-ZJU01/2013_KJ633811

                  A/Zhejiang/DTID-ZJUU1/2013_N00300.
A/Zhejiang/DTID-ZJU01/2013_KC885959
A/chicken/Shanghai/019/2013_KF542879
                   A/chicken/Shanghai/S1077/2013_CY146983
A/Changsha/1/2013_KF420300
                   A/chicken/Shanghai/S1076/2013_CY146975
A/pigeon/Shanghai/S1069/2013_CY147175
                   A/Nanchang/1/2013_KF277192
A/chicken/Jiangxi/SD001/2013_CY146951
                   A/Changsha/2/2013_KF420301
A/chicken/Shanghai/S1078/2013_CY146991
                     - A/chicken/Shanghai/S1079/2013_CY146999

    A/chicken/Shanghai/S1080/2013_CY147007

                     A/chicken/Zhejiang/SD019/2013_CY147047
A/Zhejiang/KLED32/2013_KF193405
                                          A/chicken/Jiangsu/SC537/2013_CY146943
A/Nanjing/1/2013_KC896777
                                                 — A/Zhejiang/HZ1/2013_KF055471
A/Jiangsu/2/2013_KF226106
                                                 A/Jiangsu/1/2013_KF278747
A/chicken/Jiangsu/SC099/2013_CY146935
                                                 A/Nanjing/2/2013_KF007047
A/Zhenjiang/1/2013_KF007063
                                                 A/Jiangsu/1/2013_KF226114
A/chicken/Jiangsu/S002/2013_CY146919
                                                 A/Wuxi/4/2013_KF007079
A/chicken/Shanghai/S1358/2013_CY147015
                                                    A/chicken/Zhejiang/C483/2013_KF042108
A/Shanghai/Mix1/2014(H7N9)_KP058488
                                                           A/chicken/Zhejiang/SD007/2013_CY147039
A/pigeon/Zhejiang/P1/2013_KF042105
                                                      A/pigeon/Zhejiang/r 4,2552
A/shanghai/01/2014_KJ411976
— A/pigeon/Zhejiang/P2/2013_KF042106
                                                     — A/Shanghai/JS01/2013_KF609514
A/tree sparrow/Shanghai/01/2013_KF609530
                                                     A/Taiwan/S02076/2013_KF018048
A/pigeon/Shanghai/S1423/2013_CY147191
                                                     A/Shanghai/5190T/2013_KF997834
A/homing pigeon/Jiangsu/SD184/2013_CY147167
```

```
A/pigeon/Shanghai/S1421/2013_CY147184
— A/Shanghai/4664T/2013_KC853232
F
                                   A/chicken/Shanghai/S1413/2013_CY147032
A/chicken/Shanghai/019/2013_KF542885
                                   — A/Nanjing/6/2013_KF007120
A/Anhui/DEWH72-05/2013_CY181549
                                   A/Anhui/DEWH72-08/2013_CY181573
A/Anhui/DEWH72-09/2013_CY181581
                                   A/Changsha/1/2013_KF420304
A/Shanghai/5190T/2013_KF997835

    A/Zhejiang/DTID-ZJU01/2013_KC885960
    A/chicken/Shanghai/S1079/2013_CY147000

    A/Beijing/2/2013_KJ476645
    A/Shanghai/02/2013_KF021601

                                    – A/Wuxi/1/2013_KF034915
– A/Shanghai/MH01/2013_KF609507
                                   A/Zhejiang/DTID-ZJU01/2013_KJ633812
A/Anhui/DEWH72-01/2013_CY181517
                                   A/chicken/Shanghai/S1053/2013_CY146960
                                   A/Nanchang/1/2013 KF277194
                                    A/Anhui/DEWH72-03/2013_CY181533
                                            - A/Zheijang/DTID-ZJU10/2013 KF732008
                                   A/Beijing/1/2013_N-1/6653
A/Beijing/3/2013_K1476653
                                   A/chicken/Zhejiang/SD033/2013_CY147056
                                   A/chicken/Jiangsu/SC537/2013_CY146944
A/chicken/Shanghai/S1358/2013_CY147016
                                   A/pigeon/Shanghai/S1069/2013_CY147176
                                     - A/wild pigeon/Jiangsu/SD001/2013_CY147200
                                   A/Shanghai/Mix1/2014(H7N9)_KP058489
A/Shanghai/01/2014_KJ411979
                                   A/Wuxi/4/2013 KF007080
                                   A/chicken/Shanghai/S1055/2013_CY146968
                                   A/chicken/Shanghai/S1076/2013_CY146976
— A/duck/Anhui/SC702/2013_CY147064
                                   A/duck/Zhejiang/SC410/2013_CY147072
A/Taiwan/1/2013_KF018036
                                   A/chicken/Zhejiang/C481/2013_KF042099
A/chicken/Zhejiang/C483/2013_KF042100
                                   A/Jiangsu/1/2013_KF226117
A/Nanjing/1/2013_KC896778
                                   A/Anhui/DEWH72-02/2013_CY181525
A/homing pigeon/Jiangsu/SD184/2013_CY147168

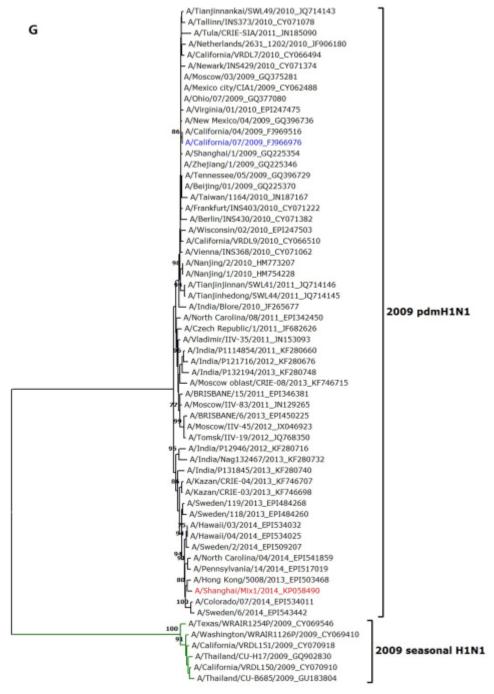
    A/Wuxi/3/2013_KF007072
    A/chicken/Zhejiang/DTID-ZJU01/2013_KC899673

                                   A/chicken/Zhejiang/SD019/2013_CY147048
A/pigeon/Shanghai/S1423/2013_CY147192
                                   — A/Fujian/1/2013_KC994456
A/Nanjing/7/2013_KF007152
                                   A/Anhui/DEWH72-07/2013_CY181565
                                   A/chicken/Guanadona/SD641/2013 CY146912
                                      A/chicken/Jiangxi/SD001/2013_CY146952
                                           A/chicken/Jiangsu/SC035/2013 CY146928
                                           A/Zhenjiang/1/2013_KF007064
                                           A/Nanjing/2/2013_KF007048

    A/Zhejiang/HZ1/2013_KF055469

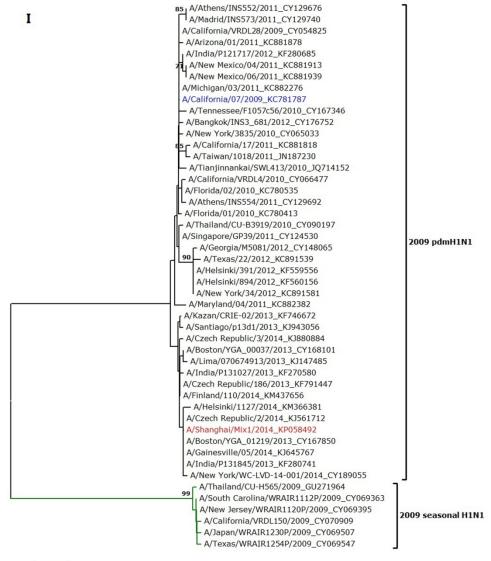
                                   A/chicken/Shanghai/S1078/2013_CY146992
                                     A/Changsha/2/2013_KF420305
                                   A/chicken/Shanghai/S1410/2013_CY147024
A/chicken/Jiangsu/S002/2013_CY146920
                                    - A/Nanjing/4/2013 KF007056
                                   A/chicken/Shanghai/S1077/2013_CY146984
                                   A/Hangzhou/1/2013 KF001511
                                   A/chicken/Rizhao/515/2013_KF260221
                                         A/Jiangsu/1/2013_KF278748
A/Jiangsu/2/2013_KF226109
                                    A/Shanghai/CN01/2013_KF609523
A/Shanghai/CN02/2013_KF918663
                                   A/Anhui/1-DEWH730/2013_CY187622
A/Anhui/DEWH72-04/2013_CY181541
                                    A/Suzhou/5/2013_KF007144
A/Xuzhou/1/2013_KF150620
                                   A/Suzhou/3/2013_KF007112
— A/Wuxi/2/2013_KF034923
                                   A/Anhui/DEWH72-06/2013_CY181557
A/chicken/Jiangsu/SC099/2013_CY146936
                                       – A/Zhejiang/LS01/2014_KM374046
–– A/chicken/Shanghai/017/2013_KF542884
                                       A/chicken/Rizhao/871/2013_KF260223
A/chicken/Rizhao/867/2013_KF260222
                                    A/chicken/Rizhao/875/2013_KF260224
A/tree sparrow/Shanghai/01/2013_KJ508894
                                   A/tree sparrow/Shanghai/01/2013_KF609531

97 A/chicken/Zhejiang/SD007/2013_CY147040
                                                A/Shanghai/JS01/2013_KF609515
                         A/chicken/Shanghai/S1080/2013_CY147008
                                                     —— A/pigeon/Zhejiang/P1/2013_KF042097
- A/pigeon/Zhejiang/P2/2013_KF042098
                                                      - A/Zhejiang/KLED32/2013_KF193406
                              A/Guangdong/1/2013_KF662947
                                 A/Huizhou/01/2013_KF667743
                                  83 A/Guangdong/02/2013_KF944963
                                         A/Guangdong/05/2013_KJ023086
                                              - A/Guangdong/03/2013 KJ023071
                                         A/Guangdong/04/2013_KJ023078
     0.005
```



0.02

```
95 A/Singapore/GP2257/2010_JX309494
                                      A/Singapore/GP2726/2010_JX309444
н
                                     A/Singapore/ON1868/2009_CY063786
                                     A/California/VRDL28/2009_CY054825
                                     A/California/17/2011_KC881818
A/Taiwan/1018/2011_JN187230
                                     A/Mexico city/CIA10/2009_CY064409
                                     A/Alabama/01/2010_KC781897
                                     A/California/07/2009_KC781787
                                      A/Tianjinnankai/SWL413/2010_JQ714152
                                     A/California/04/2009_GQ377049
                                     A/Boston/118/2009_CY064530
                                     A/California/20/2011_KC882265
                                      A/Athens/INS552/2011_CY129676
                                      A/Madrid/INS573/2011_CY129740
                                     A/Wisconsin/15/2011_KC881691
                                      - A/California/VRDL5/2010 CY066485
                                      A/Nevada/01/2010_KC780892
                                      A/Tennessee/F1067/2010_CY167378
                                      A/Florida/01/2010_KC780413
                                     A/Florida/02/2010_KC780535
                                      A/Tennessee/F1057c56/2010_CY167346
                                      A/New York/3835/2010 CY065033
                                     A/Alabama/03/2010_KC781164
                                      A/Athens/INS413/2010_CY071285
                                      A/Athens/INS411/2010_CY071269
                                      A/New Mexico/04/2011_KC881913
                                     1 A/New Mexico/06/2011_KC881939
                                     A/Athens/INS554/2011 CY129692
                                     A/India/P121717/2012_KF280685
                                      A/Tomsk/IIV-19/2012_JQ768351
                                      A/Vladivostok/28/2012_JX473008
                                      A/Bangkok/INS3_681/2012_CY176752
                                     A/Aarhus/INS3_653/2011_CY176576
                                     A/Denmark/72/2011_CY090806
                                     A/Denmark/73/2011_CY090822
                                      A/California/14/2011_KC881780
                                      A/Madrid/INS534/2011_CY129432
                                     A/Michigan/03/2011_KC882276
                                                                                        2009 pdmH1N1
                                     A/Taiwan/4709/2011 10693754
                                     A/Arizona/01/2011 KC881878
                                     A/Beijing/HZ01/2011_JF816660
                                      A/Florida/06/2012_JX905427
                                      A/Mexico City/INER0958/2012_JQ927305
                                      A/Texas/26/2012_KC891551
                                      A/Bronx/INS3_673/2012 CY176696
                                      A/Dayton/INS3_676/2012 CY176720
                                     A/Texas/22/2012_KC891539
                                      A/Aarhus/INS3_655/2011_CY176592
                                     A/Wisconsin/16/2011_KC881641
                                      A/Singapore/EN1/2011_CY124514
                                     A/Singapore/GP39/2011_CY124530
                                      A/Helsinki/100/2013 KF559396
                                      A/Helsinki/1199/2012 KF560284
                                      A/Boston/YGA_00037/2013 CY168101
                                      - A/Lima/070674913/2013 KJ147485
                                       A/Santa Clara/YGA_03030/2013 CY170677
                                        A/Nicaragua/5612_05/2013 CY188471
                                      A/Helsinki/1011/2013 KF560252
                                       A/Czech Republic/186/2013 KF791447
                                       A/Czech Republic/188/2013 KF791463
                                       A/Houston/JMM 148/2013 CY183335
                                       A/Kazan/CRIE-02/2013_KF746672
                                       A/Santiago/p13d1/2013_KJ943056
                                       A/India/P131027/2013_KF270580
                                       A/Gainesville/05/2014_KJ645767
                                    A/Czech Republic/3/2014_KJ880884
A/Finland/110/2014_KM437656
                                        A/Helsinki/162M/2014_KM366541
                                        A/Washington/07/2014_KM409132
                                        A/Helsinki/1127/2014_KM366381
                                        A/New York/WC-LVD-14-001/2014_CY189055
                                        A/New York/WC-LVD-14-005/2014_CY189087
                                        A/Finland/30/2014_KM437720
                                       A/Boston/YGA_01219/2013_CY167850
                                        A/India/P131845/2013_KF280741
                                      A/Czech Republic/2/2014_KJ561712
                                        A/Shanghai/Mix1/2014_KP058491
                                       A/Texas/WRAIR1254P/2009_CY069547
                                       - A/New Jersey/WRAIR1120P/2009 CY069395
                                        A/California/VRDL150/2009_CY070909
                                                                                      2009 seasonal H1N1
                                        A/South Carolina/WRAIR1112P/2009_CY069363
                                        A/Japan/WRAIR1230P/2009_CY069507
                                       A/Thailand/CU-H565/2009_GU271964
```



0.02

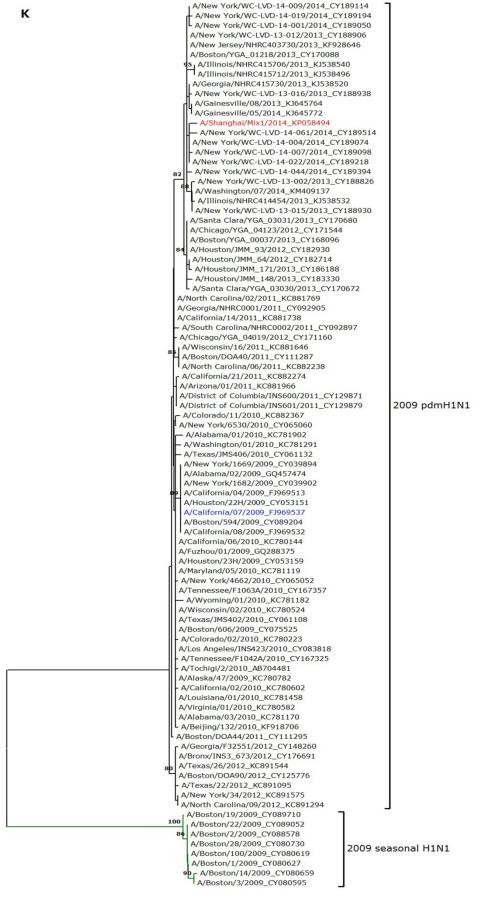
```
A/Alabama/01/2010 KC781899
                                                        A/Iowa/01/2010_KC782018
J
                                                       A/California/VRDL26/2009 CY054806
                                                       A/Alchi/202/2009_GU138903
A/Akita/1/2009_GQ365413
                                                        A/Boston/DOA14/2011_CY111209
A/California/17/2011_KC882258
A/Taiwan/1018/2011_JN187288
                                                       A/Beljing/7/2009_HQ533871
A/Indiana/03/2010_KC780692
                                                       - A/New York/3834/2010_CY065022
- A/California/VRDL2/2010_CY066458
                                                        - A/New York/6530/2010_CY065062
- A/Iowa/04/2010_KC781353
                                                        A/California/VRDL10/2010_CY063182
                                                        A/California/VRDL123/2009_CY066362
A/Tennessee/F1067/2010_CY167375
                                                        A/Alaska/47/2009_KC780776
- A/Boston/DOA08/2011_ CY134468
                                                        A/District of Columbia/WRAIR0313/2011 CY090028
                                                        V/Beijing/501/2009_GQ223410
                                                         A/Taiwan/1164/2010_JN187283
                                                        A/Beijing/01/2009_GQ225374
A/California/04/2009_FJ969517
                                                        A/Beijing/02/2009_GQ183628
                                                        A/Beijing/4/2009_GQ232094
                                                         A/California/07/2009_FJ969536
                                                         A/New York/1669/2009_CY039896
A/New York/1682/2009_CY039904
                                                        A/Arizona/01/2011_KC881968
A/California/21/2011_KC882272
                                                        A/District of Columbia/INS601/2011 CY129881
                                                          A/Czech Republic/1/2011_JF682630
                                                         A/Cologne/INS537/2011_CY129609
                                                        A/Bonn/INS533/2011_CY129593
A/California/14/2011_KC881740
                                                        A/Taiwan/1749/2011 IN187295
                                                       A/Czech Republic/111/2011_JQ693485
A/Czech Republic/112/2011_JQ693493
                                                       - A/California/NHRC0001/2011_CY092883
A/California/20/2011_KC882267
                                                      A/Cologne/INS3_686/2011_CY176757
A/Georgia/T51700/2012_CY148254
                                                     A/Shanghai/3184T/2011_JN631064
                                                                                                                                 2009 pdmH1N1
                                                      A/Shanghai/3242T/2011_JN631065
                                                      A/Shanghai/3162T/2011_JN631063
                                                      A/Shanghai/3141T/2011_JN631062
A/Qingdao/F404/2011_KF411258
                                                       A/Qingdao/F204/2011_KF411257
                                                       A/Taiwan/2883/2011_JN187296
                                                       A/Taiwan/3697/2011_JN187297
                                                       A/Tennessee/F2068/2011_CY167663
A/Boston/DOA90/2012_CY125778
                                                       A/Texas/26/2012_KC891567
                                                        A/Texas/23/2012_KC891553
                                                       A/Dayton/INS3_676/2012_CY176717
                                                       A/Texas/27/2012_KC891535
A/Georgia/F32551/2012_CY148262
                                                       A/Boston/DOA93/2012_CY125786
A/Bronx/INS3_674/2012_CY176701
                                                        A/Florida/06/2012_JX905430
                                                        A/Gainesville/05/2014_KJ645773
                                                        A/Bronx/INS3_673/2012_CY176693
                                                       A/Texas/22/2012_KC891537
A/New York/34/2012_GQ338334
                                                        A/North Carolina/09/2012_KC891257
A/Durham/INS3_648/2012_CY176533
                                                        A/North Carolina/18/2012_KC891303
                                                        A/Houston/JMM_122/2013_CY183148
A/Houston/JMM_152/2013_CY186046
                                                         A/Boston/YGA_01185/2013_CY169866
- A/Houston/JMM_131/2013_CY183220
                                                        A/Santa Clara/YGA 03033/2013 CY170698
                                                       A/Boston/YGA_00087/2013_CY168426
A/Boston/YGA_01202/2013_CY169978
                                                       A/Boston/YGA_00037/2013_CY168098

A/Boston/YGA_00037/2013_CY168098

A/Czech Republic/186/2013_KF791450

A/Czech Republic/187/2013_KF791458

A/Czech Republic/188/2013_KF791466
                                                         A/Houston/JMM_148/2013_CY183332
                                                         A/Santa Clara/YGA_03031/2013_CY170682
A/New York/WC-LVD-14-003/2014_CY189068
                                                         A/Washington/07/2014_KM409135
A/Czech Republic/3/2014_KJ880887
                                                          A/Shanghai/Mix1/2014 KP058493
                                                           A/Czech Republic/2/2014_KJ561715
                                                          A/New York/WC-LVD-14-001/2014 CY189052
                                                          - A/New York/WC-LVD-14-022/2014_CY189220
A/New York/1169/2009_CY173378
                                                        A/Shanghai/LWS1/2009 GO850596
                                                         A/Boston/1/2009_CY080629
                                                           A/Boston/11/2009 CY080645
                                                        A/Boston/11/2009_C1000043
A/New York/1160/2009_CY173322
A/Boston/100/2009_CY080621
                                                                                                                         2009 seasonal H1N1
                                                         A/Washington/WRAIR1126P/2009_CY069414
- A/California/VRDL134/2009_CY064802
                                                          A/Niigata/08F031/2009 CY043498
                                                          A/California/VRDL224/2009_CY074238
                                                          A/Taiwan/1026/2009_HQ291934
```



```
A/Georgia/NHRC415730/2013_KJ538521

A/New York/WC-LVD-13-018/2013_CY188957

A/Georgia/NHRC415361/2013_KJ538545

A/New York/WC-LVD-13-004/2013_CY188895

A/New York/WC-LVD-13-009/2013_CY188893

A/Califfornia/NHRC41615/2013_KJ538599

A/New York/WC-LVD-13-010/2013_CY188893

A/New York/WC-LVD-13-010/2013_CY188893

A/New York/WC-LVD-14-015/2014_CY189053

A/New York/WC-LVD-14-015/2014_CY189053

A/New York/WC-LVD-14-015/2014_CY189053

A/New York/WC-LVD-14-015/2014_CY189165

A/New York/WC-LVD-14-015/2014_CY189133

A/Geoton/YGA_0037/2013_CY168999

A/Texas/JMM_52/2012_CY135112

A/Czech Republic/198/2013_KF791453

A/Czech Republic/198/2013_KF791453

A/Czech Republic/198/2013_KF791459

A/Czech Republic/188/2013_KF791459

A/Santa Clara/YGA_03035/2013_CY170091

A/Santa Clara/YGA_03033/2013_CY170091

A/Santa Clara/YGA_03033/2013_CY170699

A/Santa Clara/YGA_03033/2013_CY170699

A/Santa Clara/YGA_03033/2013_CY170699

A/Santa Clara/YGA_03033/2013_CY170699

A/Santa Clara/YGA_03033/2013_CY170991

A/Company A/California/CALITERIA
A/Qingdao/F103/2011_KF411281

A/Qingdao/F103/2011_KF411281

A/Qingdao/F103/2011_KF411281

A/Qingdao/F103/2011_KF411281

A/Qingdao/F103/2011_CY176774

A/Kowloon/INS3_689/2011_CY176782

A/Boston/DOA093/2012_CY125787

A/Texas/Z/2012_KC891505

A/Boston/DOA093/2012_CY125787

A/Texas/Z/2012_KC891505

A/Boston/DOA093/2012_CY125787

A/Texas/Z/2012_CY148263

A/Durham/INS3_648/2012_CY176534

A/Dayton/INS3_648/2012_CY176554

A/Dayton/INS3_648/2012_CY176554

A/Georgia/M5081/2012_CY167552

A/Tennessee/F204/2011_KC882318

A/California/12/2011_KC882090

A/New York/294/2010_CY065047

A/California/12
L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2009 pdmH1N1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       - A/Qingdao/F966/2010_KF411275
A/Akita/1/2009_GQ365414
A/California/14/2009_GQ117038
- A/California/14/2009_GQ117038
- A/California/17/2011_KC882050
A/Alabama/03/2010_KC781171
| A/Boston/DOA53/2011_CY134589
| A/Wisconsin/15/2011_KC881724
A/Tennessee/F10718/2010_CY167400
A/Beijing/132/2010_KF918707
- A/California/06/2010_KC780142
A/Czech Republic/111/2011_JQ693488
| A/Beijing/7/2009_HQ533872
| A/Taiwan/167/2009_CY053494
| A/Qingdao/1530/2009_KF411267
| A/Taiwan/5270/2010_NN187343
| A/Taiwan/3994/2010_NR187342
| A/Qingdao/F894/2010_KF411274
| A/Aichi/202/2009_GU135996
| A/New York/6530/2010_CY065063
| A/Texas/JM5413/2010_CY061191
| A/Texas/JM5413/2010_CY061191
| A/Texas/JM5413/2010_CY061191
| A/Texas/JM5413/2010_CY061191
| A/Texas/JM5411/2010_CY061175
| A/Boston/116/2009_CY064512
| A/Utah/02/2010_KC780500
| A/Czech Republic/112/2011_JQ693496
| A/Shanghai/P1/2009_AB539743
| A/California/02/2010_KC780508
| A/Tennessee/F1076/2010_CY167424
| P96 | A/Alaska/14/2011_KC881843
| A/Boston/109/2009_CY063480
| A/New York/1682/2009_CY039995
| A/Boston/109/2009_CY063496
| A/Beijing/501/2009_HQ698631
| A/California/07/2009_F1966086
| A/Texas/45122282/2009_CY039997
| A/Balifornia/06/2009_F1969538
| A/California/06/2009_F1969538
| A/California/06/2009_F1969538
| A/California/06/2009_F1969538
| A/Texas/45122282/2009_CY052931
| A/California/06/2009_F1971074
| A/Texas/08/2009_GQ168853
| A/California/06/2009_F1971074
| A/Texas/08/2009_GQ168853
| A/California/06/2009_F1971074
| A/Texas/08/2009_GQ168853
| A/California/06/2009_F1971074
| A/Texas/08/2009_GQ168853
| A/California/07/RDL232/2009_CY074279
| A/Salnghai/LWS1/2009_GQ850599
| A/California/07/RDL232/2009_CY074463
| A/Rew York/1185/2009_CY043541
| A/New York/1185/2009_CY043541
| A/Taiwan/11026/2009_HQ291859
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A/Akita/1/2009_GQ365414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A/California/14/2009 GO117038
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A/New York/1185/2009_CY173499
- A/Kyoto/08K056/2009_CY043541
- A/Taiwan/1026/2009_HQ291859
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2009 seasonal H1N1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A/California/VRDL292/2009_CY074487
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     - A/California/VRDL292/2009_CY074487

- A/Mexico/24004/2009_CY147591

A/Boston/11/2009_CY080646

A/Boston/12009_CY080630

A/Boston/41/2009_CY080797

A/California/VRDL229/2009_CY073865

- A/New York/1183/2009_CY173483
```

Technical Appendix Figure. Phylogenetic analysis of 12 internal genes of the co-infection viruses in Shanghai, China. Phylogenetic trees were constructed by using the neighbor-joining method with bootstrap analysis of 1,000 replicates in MEGA 5.1 program. Numbers next to nodes indicate bootstrap value percentages (>70%). Panels A, B, C, D, E, F were the PB2, PB1, PA, NP, MP, NS phylogenetic trees of the A/Shanghai/Mix1/2014(H7N9) strain, respectively, and panels G, H, J, K, L, M were the PB2, PB1, PA, NP, MP, NS phylogenetic trees of the A/Shanghai/Mix1/2014(H1N1) strain, respectively. Red font indicates the A/Shanghai/Mix1/2014(H7N9) and A/Shanghai/Mix1/2014(H1N1) strains isolated from the co-infection patient from Shanghai, China. Blue font in the phylogenetic trees of the A/Shanghai/Mix1/2014(H7N9) strain indicates the representative strains of Shanghai area during the same wave of the H7N9 outbreak in China (1). Blue font in the phylogenetic trees of the A/Shanghai/Mix1/2014(H1N1) strain indicates the recommended influenza vaccine strain in the 2013–14 Northern Hemisphere influenza season (http://www.who.int/influenza/vaccines/virus/recommendations/2013\_14\_north/en/). Scale bars indicate nucleotide substitutions per site. The GISAID or GenBank accession numbers of

the influenza viruses in the construction of the phylogenetic analyses are displayed in the

phylogenetic trees, which followed the taxon names.