

Supplementary Table 4

| | Different substitution | Identical substitution | |
|-----------------------|--|---|---|
| | | Different season | Same season |
| Sampled data | G50E (2006S), G50E (2007N), K140I (2007N), K173Q (2008N), V213A (2009S), P194L (2009S), N145S (2011S), S157L (2013N), N53D (2013N) | Q261R (2007N), N45S (2010S), N225D (2014S), Q311H (2014S) | G5V (2000N), K92T (2000N), Q33R (2000N), D271N (2000N), R50G (2000S), S199P (2000S), P273S (2000S), S247C (2000S), A106V (2002N), N144D (2002N), S186G (2002N), R50G (2003N), E83K (2003N), A131T (2003N), V202I (2003N), W222R (2003N), G225D (2003N), L25I (2003N), H75Q (2003N), H155T (2003N), S186G (2003N), Q156H (2003N), N126D (2003S), Y105H (2003S), Y159F (2004S), S189N (2004S), S227P (2004S), K145N (2004S), V226I (2004S), S193F (2005S), D225N (2005S), N144K (2009S), K158N (2009S), N189K (2009S), E62K (2009S), K158N (2010S), N189K (2010S), T212A (2010S), D53N (2011N), Y94H (2011N), I230V (2011N), E280A (2011N), V223I (2011S), N321S (2011S), A198S (2011S), S45N (2013N), T48I (2013N), N278K (2013N), N145S (2013N), Q33R (2013N), T128A (2013S), R142G (2013S), L3I (2015N), N144S (2015N), F159Y (2015N), K160T (2015N) |
| Unsampled data | H311Q (2013N), D225N (2013N), G142R (2015N) | Q261R (2007S), N45S (2011N), N225D (2015N), Q311H (2015N) | |