

Supporting information Table 1: 2004–2010 poultry H5/H7 influenza A serological sampling, by EU member state and poultry category

✓ = results submitted for all years poultry category existed

✗ = results not submitted for any years poultry category existed

[year] = results submitted for these years

	Ducks & Geese ¹	Breeder Ducks ²	Fattening Ducks ²	Breeder Geese ²	Fattening Geese ²	Chicken Breeders ³	Broilers ¹	FR ⁵ Broilers ²	Non FR ⁵ broilers ²	Laying Hens ¹	FR ⁵ laying-hens ²	Non FR ⁵ laying-hens ²	Turkey breeders ³	Fattening Turkeys ³	Game birds ³	Ratites ³	Other ³	Backyard Flocks ³
Austria	✓	✗	✓	✗	✓	✗	✗	✗	✗	✓	✗	✓	✗	✓	✗	2005-10	✗	✗
Belgium	✓	2007-08	✓	✓	✗	2005-2010	✗	✗	✗	2005-06	✓	✓	2005, 2007	✓	2005-2010	2004-08	2004-05, 2007-08	2006-08
Bulgaria⁴	✗	2010	✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	2007, 2010	2007	2007-09	2007	2007-10	2007-10
Cyprus	✓	✗	2007-08	✗	✗	2005-2010	✓	✗	2007	✓	2008-10	✓	✗	✓	✓	2004-09	2007	2005-2010
Czech Republic	2005, 2006 ⁶	✓	✗	✓	✗	✗	✗	✗	2007	✓	✗	✓	2005-06	2004, 2007-10	2006-10	✗	✗	✗
Denmark	2005, 2006 ⁶	✓	✓	✓	✓	✓	✓	2008-10	✗	✓	✓	✓	✗	✓	2006-10	✗	✗	✗
Estonia	2006	✗	✗	✗	✗	2007	✗	✗	✗	2005-06	✗	✓	✗	✗	2007-08	✗	2004, 2009	✗
Finland	✓	2007	✓	2007	2007-08	✓	2004	✗	2007	✓	✓	✓	2005, 2007	2004, 2006-2010	✓	✓	✗	2007
France	✓	✓	✓	✓	✗	✗	2006	✓	✗	✓	✓	✗	✓	✓	2005-10	2004, 06, 08	2004-05	2007-10
Germany	✓	2007-08	✓	2007-08, 2010	✓	2006-09	2006	2009	2007, 2009-10	✓	✓	✓	2006-08, 2010	✓	2004, 2006-10	2004-08, 2010	2004, 2007-10	2004, 2006-10

	Ducks & Geese ¹	Breeder Ducks ²	Fattening Ducks ²	Breeder Geese ²	Fattening Geese ²	Chicken Breeders ³	Broilers ¹	FR ⁵ Broilers ²	Non FR ⁵ broilers ²	Laying Hens ¹	FR ⁵ laying-hens ²	Non FR ⁵ laying-hens ²	Turkey breeders ³	Fattening Turkeys ³	Game birds ³	Ratites ³	Other ³	Backyard Flocks ³
Greece	✓	✗	2007	✗	✗	2004, 2006-10	✓	2007, 2009-10	2007	✓	✗	✓	2007-10	✓	✓	✓	✗	2007-10
Hungary	✓	✓	✓	✓	✓	2007-10	✗	✗	2007-08	2005-06	✓	✓	2007-10	✓	2005-10	2007-10	2004, 07-08,10	2006-10
Ireland	✓	✗	2007,09	✗	2009	✓	✗	✓	✗	✓	✓	✓	✓	✓	2007	✗	✗	✗
Italy	✓	✓	✓	✓	✓	✓	2004	2007	2007	✓	✓	✓	✓	✓	2005-10	✓	2007-10	2007-10
Lithuania	✓	✗	2007-08	✗	2007,2009	2004-07	✓	✗	✓	✓	✗	✓	2005,2007-08	2004-06, 2010	2006	2004-05	2007-08	2005-06
Luxembourg	✗	✗	✗	✗	✗	✗	✗	2008-10	✓	✓	2008-10	✓	✗	✗	✗	✓	2008-09	2006-09
Latvia	✓	✗	2007-08, 2010	✗	2007,2010	2007, 2009-10	✗	✗	✗	✓	✗	✓	✗	2004-07	2004-06	2004-08,2010	2008-09	2006-10
Malta	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	2007,09	✗	✗	✗	✗	2004	✗
Netherlands	✓	✓	✓	✗	✗	✓	✓	2008-09	✓	✓	✓	✓	✓	2004-05, 2007-10	✗	✗	2004-05	✗
Poland	✓	✓	✓	✓	✓	✓	✗	✗	✓	✓	✗	✓	2004, 2008-10	✓	2006-10	✓	✗	✗
Portugal	✓	✓	✓	✗	✗	✓	2006	✓	2007-09	✓	✗	✓	2004-05	✓	✓	✓	2004-05 2008-10	2006-10
Romania ⁴	✗	2007-09	2007,10	2007	2007	2007-09	✗	2007-08	✓	✗	2007-08	✓	2007-08	2007-08, 2010	2007-10	2009-10	2007-08	2007-10
Spain	✓	2008-09	✓	2008	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2005-10

	Ducks & Geese ¹	Breeder Ducks ²	Fattening Ducks ²	Breeder Geese ²	Fattening Geese ²	Chicken Breeders ³	Broilers ¹	FR ⁵ Broilers ²	Non FR ⁵ broilers ²	Laying Hens ¹	FR ⁵ laying-hens ²	Non FR ⁵ laying-hens ²	Turkey breeders ³	Fattening Turkeys ³	Game birds ³	Ratites ³	Other ³	Backyard Flocks ³
Sweden	✓	✗	✓	2008	✓	✓	2006	✗	✓	✓	✓	✓	2005-10	✓	2007-10	✓	✗	2008-09
Slovenia	✓	✗	✗	✗	✗	✓	✗	✗	✗	✓	✗	✓	✗	✓	✓	✓	2007	2008-10
Slovakia	✓	✗	✓	2007	2008-10	2005-10	2005-06	✗	✓	✓	✗	✓	2004, 2006-10	✓	✓	✓	2007	✗
UK	✓	2008-10	✓	2008-10	✓	✓	2004	✗	✗	✓	✓	✓	✓	✓	✓	2004-07	2004, 2007	2006-07

¹ Data 2004-2006

² Data 2007-2010

³ Data 2004-2010

⁴ Entered EU 2007

⁵ FR= free-range

⁶ 2004 virological testing excluded

Supporting information Table 2: Scope and magnitude of European Union Influenza A poultry surveillance 2004–2010

Exposure variable		No. annual poultry category reports submitted (total possible) ¹	Median no. holding tests performed per report ² (IQR)	Median reported total no. holdings ³ (IQR)
Year	2004	132 (250)	32 (9 – 108)	58 (15 – 300)
	2005	138 (250)	35 (9 – 95)	70 (15 – 411)
	2006	151 (250)	40 (12 – 102)	83 (21 – 369)
	2007	248 (405)	25.5 (8 – 99)	57 (10 – 305)
	2008	228 (405)	23 (5.5 – 77)	58 (13 – 468)
	2009	212 (405)	29 (8 – 82.5)	64 (12 – 380)
	2010	205 (405)	34 (8 – 76)	56 (11 – 368)
EU member state:	Austria	31 (90)	54 (17 – 65)	62 (17 – 138)
	Belgium	56 (90)	24 (11-75)	33 (19 – 86)
	Bulgaria	32 (60)	51 (7 – 154)	97 (10 – 181)
	Cyprus	52 (90)	8 (4 – 20)	12 (7 – 30)
	Czech Republic	31 (90)	16 (12 – 53)	20 (12 – 75)
	Denmark	54 (90)	33 (7 – 186)	54 (18 – 120)
	Estonia	12 (90)	12 (1-14)	13 (1 – 61)
	Finland	54 (90)	15 (5 – 52)	26 (9- 65)
	France	56 (90)	99 (68 – 156)	2239 (317 – 4540)
	Germany	70 (90)	21 (5 – 84)	2771 (40 – 23 187)
	Greece	53 (90)	18 (4 – 45)	44 (9 – 205)
	Hungary	65 (90)	41 (8 – 130)	121 (24 – 468)
	Ireland	43 (90)	47 (4 – 77)	83 (8 – 99)
	Italy	75 (90)	300 (92 – 1020)	307 (100 – 1076)
	Latvia	37 (90)	3 (2 – 24)	3 (2 – 10)
	Lithuania	38 (90)	6 (1 – 13)	4 (1 – 11)
	Luxembourg	29 (90)	4 (2 – 6)	4 (2 – 11)
	Malta	6 (90)	40 (30 – 63)	81 (40 – 305)
	Netherlands	53 (90)	252 (28 – 1167)	204 (56 – 669)
	Poland	56 (90)	48 (18 – 83)	178 (46 – 531)
	Portugal	66 (90)	58 (14 – 101)	118 (18 – 210)
Romania	39 (60)	68 (8 – 285)	69 (4 – 218)	
Slovakia	59 (90)	12 (5 – 28)	17 (6 – 48)	
Slovenia	39 (90)	16 (9 – 54)	25 (10 – 122)	
Spain	84 (90)	132 (34 – 269)	434 (71 – 1315)	
Sweden	61 (90)	23 (7 – 33)	28 (12– 82)	
UK	63 (90)	41 (10 – 66)	365 (112 – 985)	
Poultry category:	Broilers	27 (75)	22 (7 – 679)	135 (25 – 1971)
	Free-range broilers	31 (108)	19 (3 – 89)	35 (13 – 190)
	Breeder geese	39 (108)	13 (4 – 17)	13 (8 – 117)
	Non-free-range broilers	44 (108)	26 (3 – 188)	181 (18 – 1191)
	Breeder ducks	46 (108)	9 (3 – 27)	15 (5 – 54)
	Fattening geese	47 (108)	27 (4 - 70)	35 (5 – 306)
	Other	52 (183)	18 (3 – 292)	58 (6 – 1709)
	Free-range layers	56 (108)	33 (11 – 84)	97 (27 – 257)
	Ducks & geese ⁴	62 (75)	33 (8 -132)	39 (14 – 231)
	Backyard flocks	69 (183)	98 (25 – 1338)	19 132 (3000 – 147 743)
	Laying hens	72 (75)	67 (35 – 147)	233 (83 – 1288)
	Fattening ducks	76 (108)	17 (5 – 65)	42 (5 – 214)
	Turkey breeders	85 (183)	8 (4 – 18)	8 (4 – 45)
	Non free-range laying-hens	101 (108)	59 (41 – 109)	236 (59 – 941)
	Ratites	115 (183)	9 (4 – 23)	17 (5 – 56)

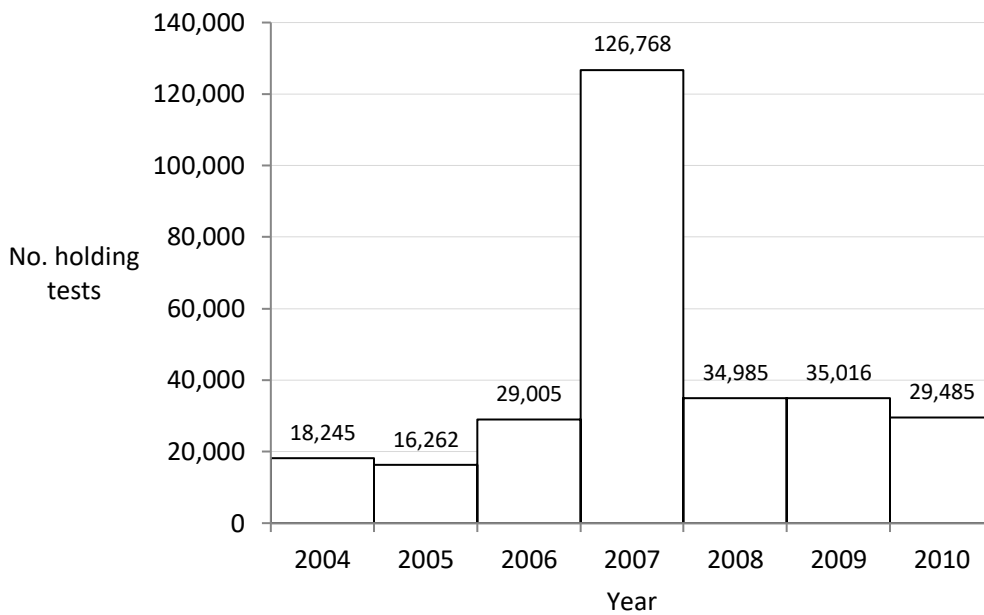
	Game birds	119 (183)	22 (9 – 58)	31 (12 – 195)
	Chicken breeders	124 (183)	48 (14 – 111)	86 (23 – 368)
	Fattening turkeys	149 (183)	61 (26 – 110)	105 (35 – 407)
Free-range category⁴:	Non-free-range	101 (108)	59 (41 – 109)	236 (59 – 941)
	Free-range	56 (108)	33 (11 – 84)	97 (27 – 257)

¹ One 'annual poultry category report' represents serological testing undertaken in one poultry category, in one member state, in one year (e.g. breeder ducks in Germany in 2008). Total possible represents the number of annual poultry category reports expected if all member states serologically sampled all poultry categories in all years (relevant to exposure variable in this table).

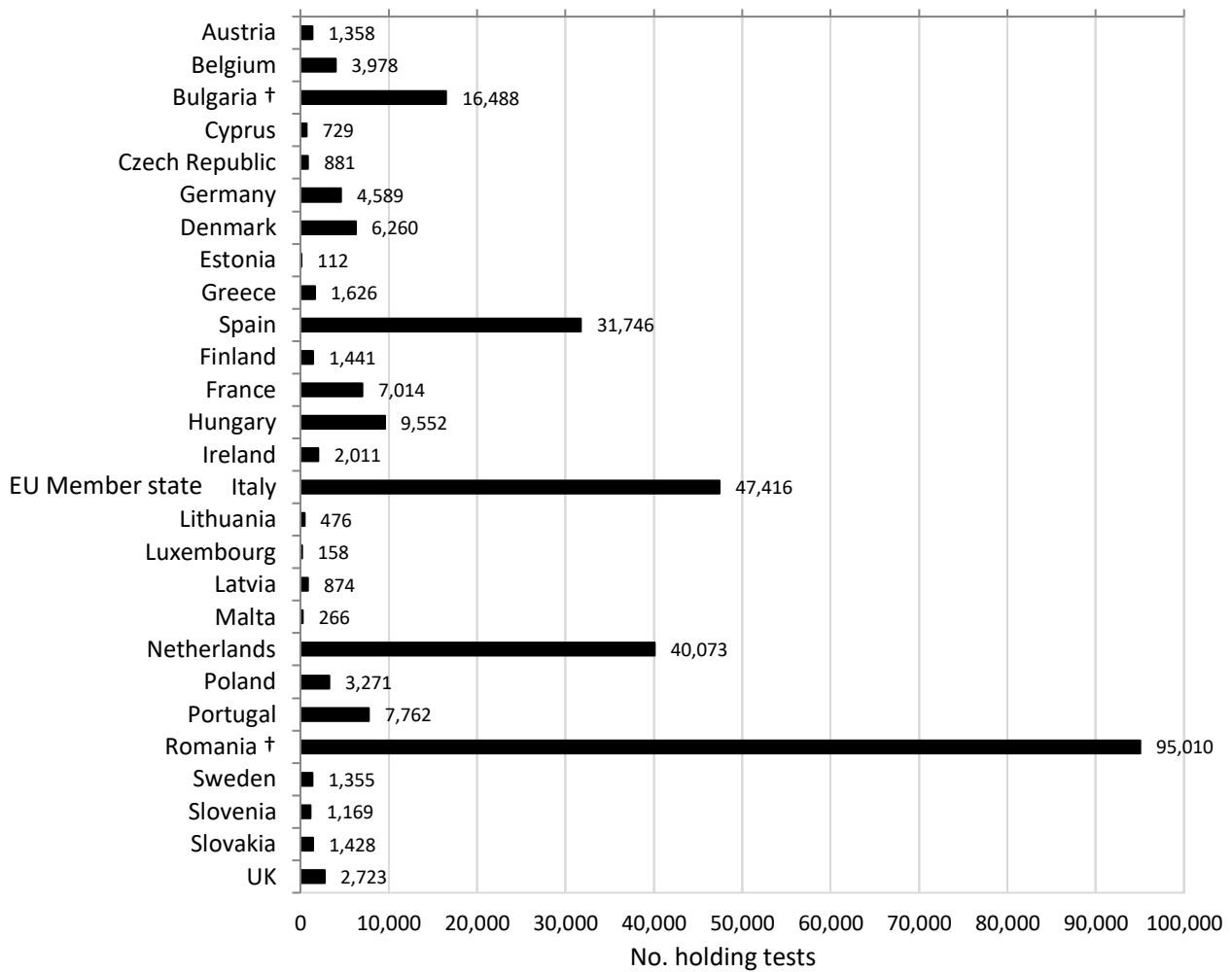
² Number of holding tests performed within one annual poultry category report (relevant to exposure variable)

³ Reported total number of holdings within one annual poultry category report (relevant to exposure variable)

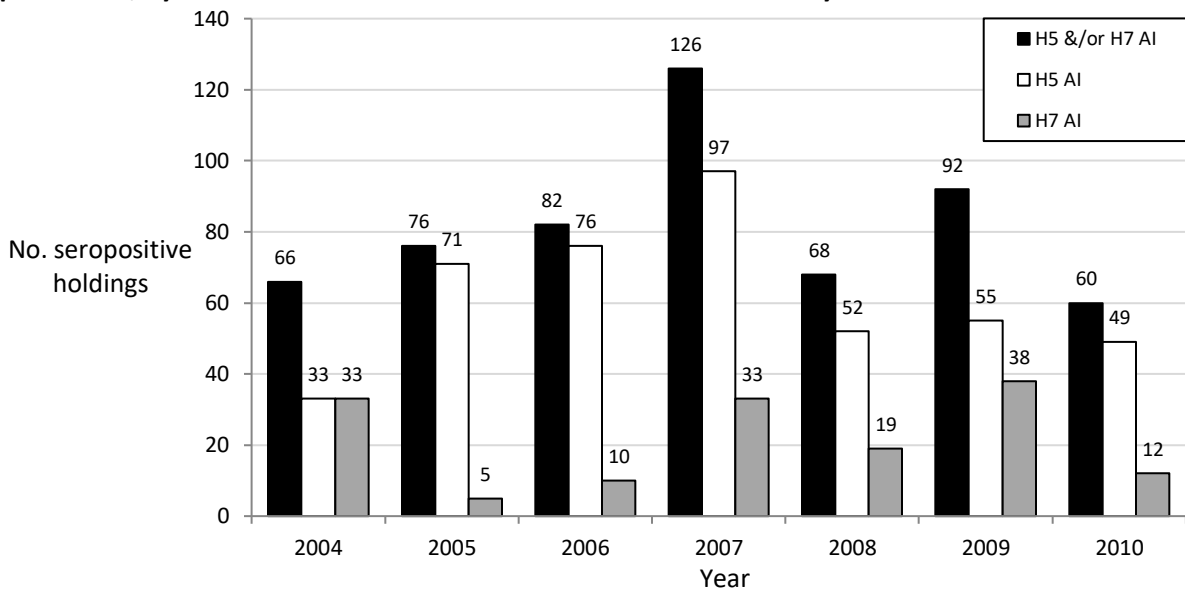
⁴ Considered free-range laying-hens and non-free-range laying-hens only



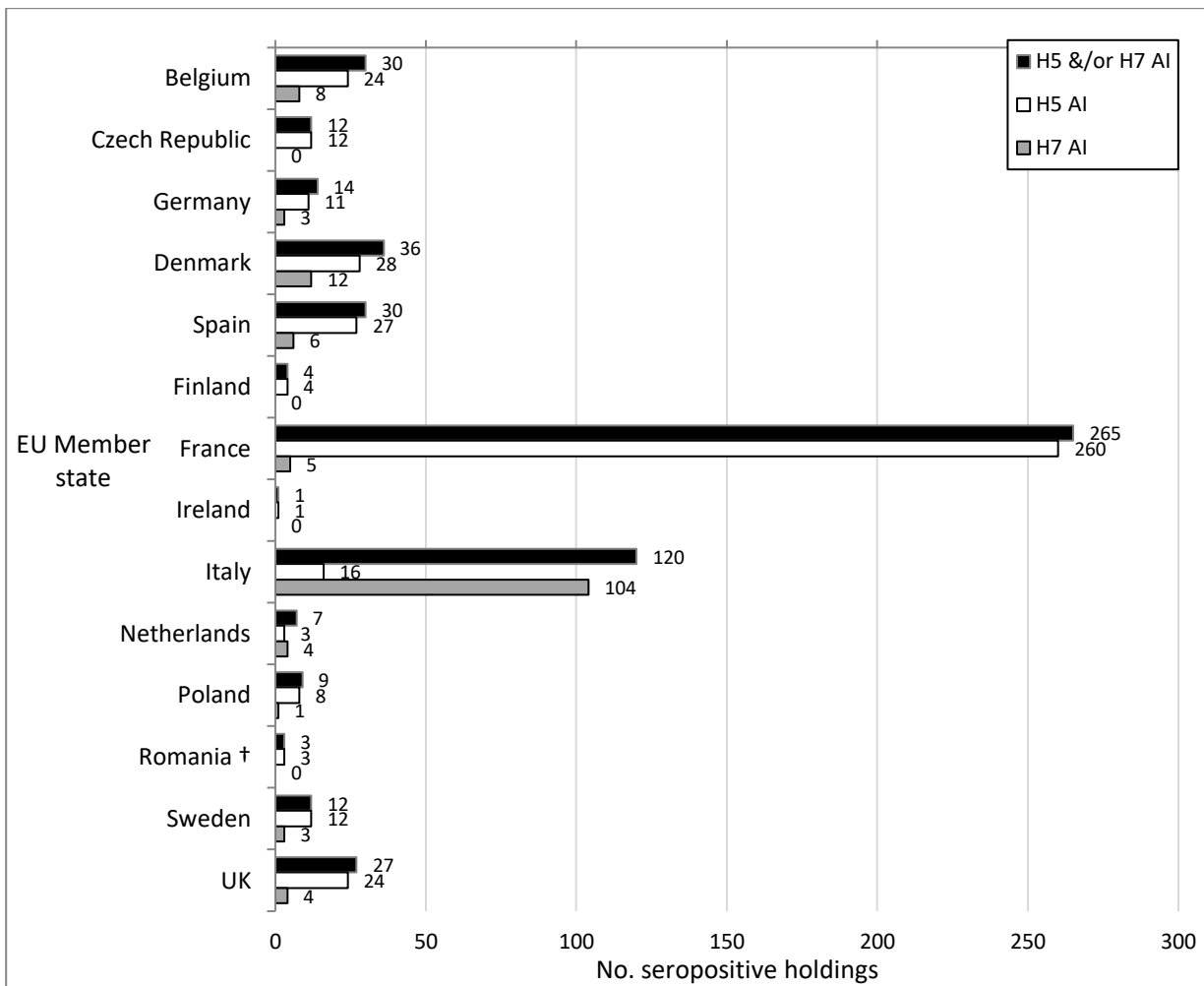
Supporting information Figure 1: EU H5 and H7 influenza A surveillance 2004–2010: total poultry holding tests performed, by year.



Supporting information Figure 2: EU H5 and H7 influenza A surveillance 2004–2010: total holding tests performed, by EU member state. † denotes Member states that only contributed data from 2007–2010.

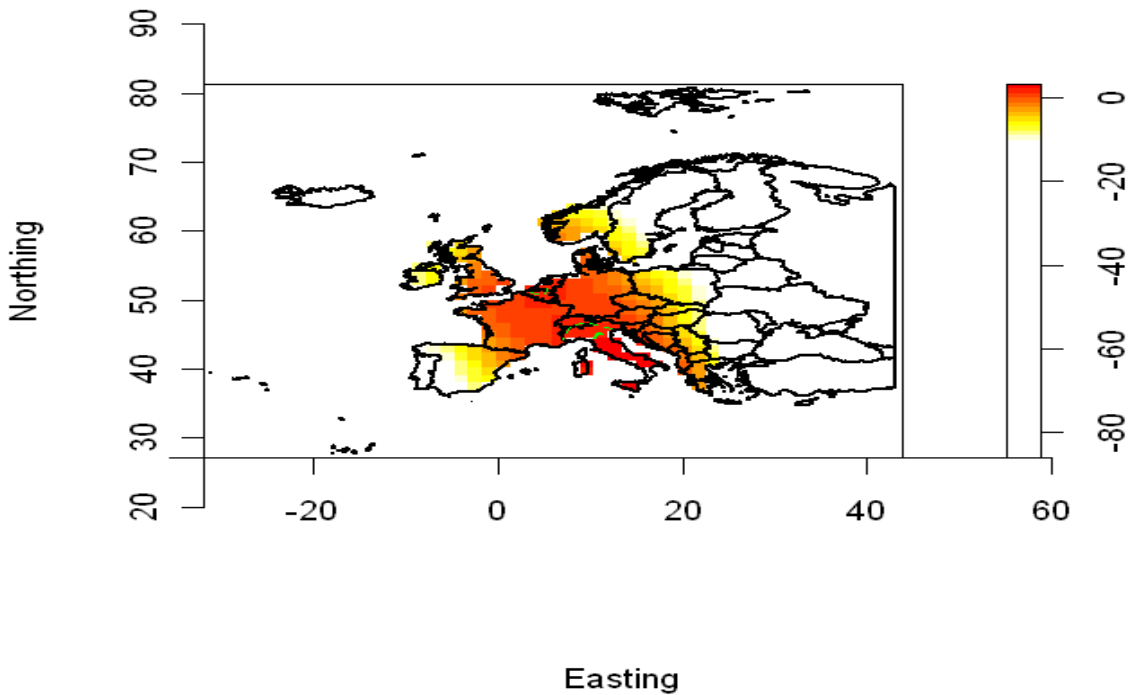


Supporting information Figure 3: EU H5 and H7 influenza A serosurveillance 2004–2010: no. seropositive holdings detected, by year



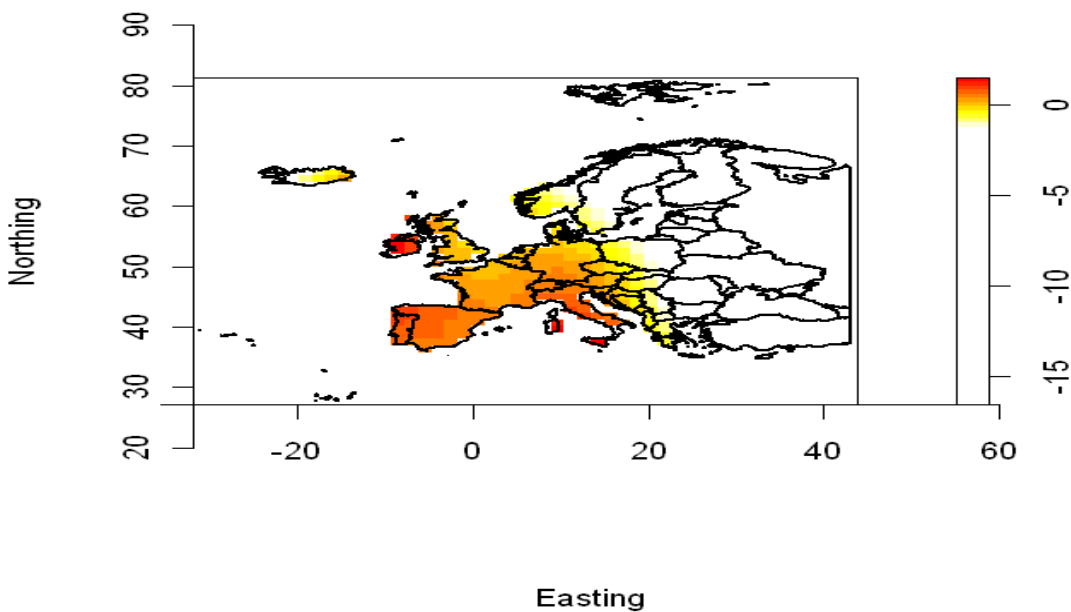
Supporting information Figure 4: EU H5 and H7 serosurveillance 2004–2010: no. seropositive holdings detected, by EU member state. † denotes Member states that only contributed data from 2007–2010. Member states that are not depicted in the figure did not detect H5 or H7 influenza A in their surveillance efforts across this time period.

Adaptive log-risk function



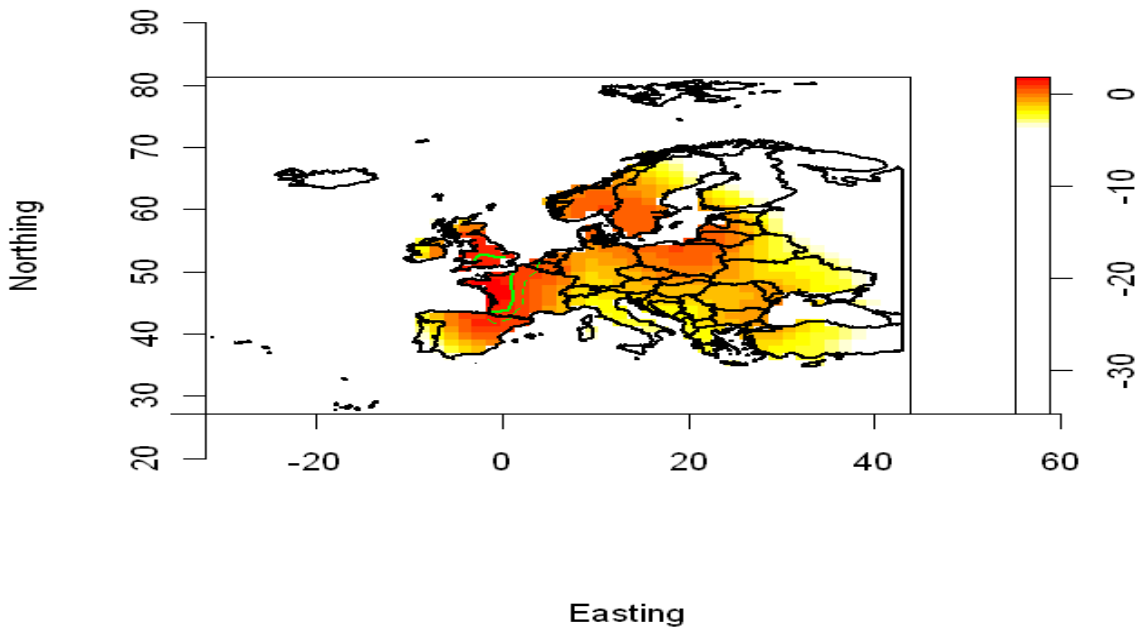
Supporting information Figure 5: Plot of spatial relative risk of regional H7 influenza A serology results, created from binary regional results for gallinaceous poultry results from 2008–2010. The thick contour line represents the upper 5th percentile of risk and the dashed lines indicate the upper 25th percentile.

Adaptive log-risk function



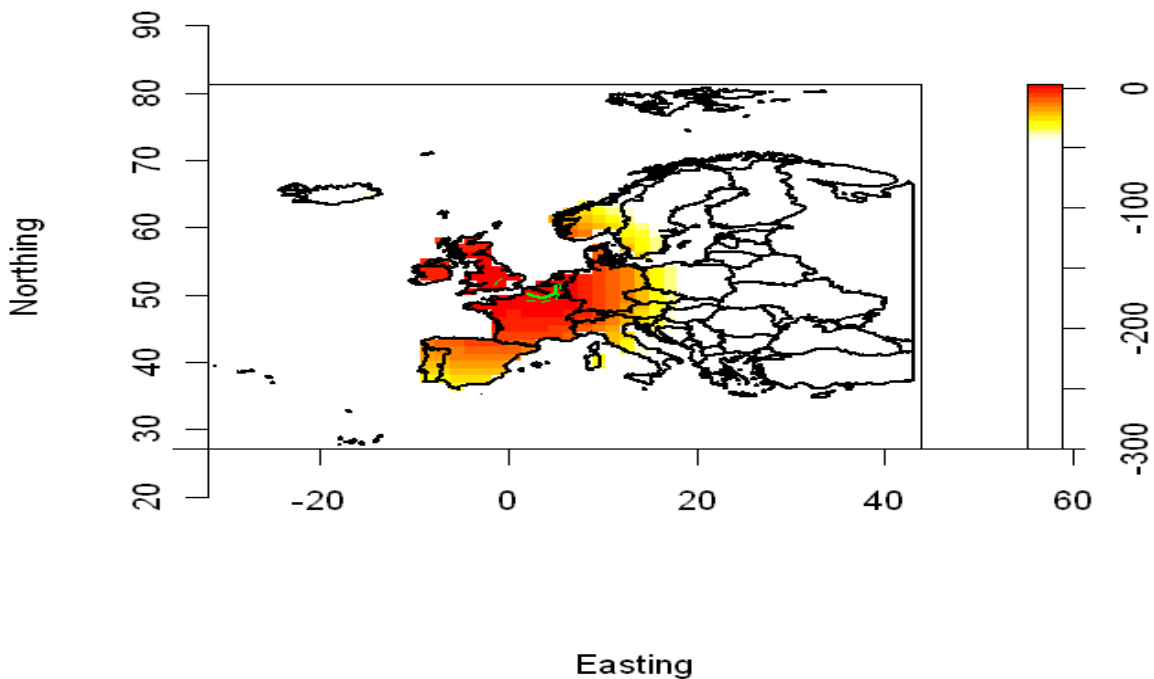
Supporting information Figure 6: Plot of spatial relative risk of regional H5 influenza A serology results, created from binary regional results for gallinaceous poultry results from 2008–2010. The thick contour line represents the upper 5th percentile of risk and the dashed lines indicate the upper 25th percentile.

Adaptive log-risk function



Supporting information Figure 7: Plot of spatial relative risk of regional H5 influenza A serology results, created from binary regional results for duck and geese results from 2008–2010. The thick contour line represents the upper 5th percentile of risk and the dashed lines indicate the upper 25th percentile.

Adaptive log-risk function



Supporting information Figure 8: Plot of spatial relative risk of regional H7 influenza A serology results, created from binary regional results for duck and geese results from 2008–2010. The thick contour line represents the upper 5th percentile of risk and the dashed lines indicate the upper 25th percentile.