

Additional file 4: References of the 45 included articles.

References of included studies (n=45)	
[31]	Tiensin T, Nielen M, Vernooij H, et al (2007) Transmission of the highly pathogenic avian influenza virus H5N1 within flocks during the 2004 epidemic in Thailand. <i>J Infect Dis</i> 196:1679–1684. https://doi.org/10.1086/522007
[32]	Walker PGT, Cauchemez S, Hartemink N, et al (2012) Outbreaks of H5N1 in poultry in Thailand: the relative role of poultry production types in sustaining transmission and the impact of active surveillance in control. <i>J R Soc Interface</i> 9:1836–1845. https://doi.org/10.1098/rsif.2012.0022
[33]	Marquetoux N, Paul M, Wongnarkpet S, et al (2012) Estimating spatial and temporal variations of the reproduction number for highly pathogenic avian influenza H5N1 epidemic in Thailand. <i>Prev Vet Med</i> 106:143–151. https://doi.org/10.1016/j.prevetmed.2012.01.021
[34]	Retkute R, Jewell CP, Van Boeckel TP, et al (2018) Dynamics of the 2004 avian influenza H5N1 outbreak in Thailand: the role of duck farming, sequential model fitting and control. <i>Prev Vet Med</i> 159:171–181. https://doi.org/10.1016/j.prevetmed.2018.09.014
[35]	van den Broek J (2021) Modelling the reproductive power function. <i>J Appl Stat</i> 48:176–190. https://doi.org/10.1080/02664763.2020.1716696
[36]	Walker PGT, Cauchemez S, Métras R, et al (2010) A Bayesian approach to quantifying the effects of mass poultry vaccination upon the spatial and temporal dynamics of H5N1 in northern Vietnam. <i>PLOS Comput Biol</i> 6:e1000683. https://doi.org/10.1371/journal.pcbi.1000683
[37]	Delabougliuse A, Choisy M, Phan TD, et al (2017) Economic factors influencing zoonotic disease dynamics: demand for poultry meat and seasonal transmission of avian influenza in Vietnam. <i>Sci Rep</i> 7:5905. https://doi.org/10.1038/s41598-017-06244-6
[38]	Kim T, Hwang W, Zhang A, et al (2010) Multi-agent modeling of the South Korean avian influenza epidemic. <i>BMC Infect Dis</i> 10:236. https://doi.org/10.1186/1471-2334-10-236
[39]	Kim W-H, Cho S (2021) Estimation of the basic reproduction numbers of the subtypes H5N1, H5N8, and H5N6 during the highly pathogenic avian influenza epidemic spread between farms. <i>Front Vet Sci</i> 8:597630. https://doi.org/10.3389/fvets.2021.597630
[40]	Smirnova A, Tuncer N (2014) Estimating time-dependent transmission rate of avian influenza via stable numerical algorithm. <i>J Inverse Ill-Posed Probl</i> 22:31–62. https://doi.org/10.1515/jip-2012-0097
[41]	Tuncer N, Martcheva M (2013) Modeling seasonality in avian influenza H5N1. <i>J Biol Syst</i> 21:1340004. https://doi.org/10.1142/S0218339013400044
[42]	Hill EM, House T, Dhingra MS, et al (2017) Modelling H5N1 in Bangladesh across spatial scales: model complexity and zoonotic transmission risk. <i>Epidemics</i> 20:37–55. https://doi.org/10.1016/j.epidem.2017.02.007
[43]	Hill EM, House T, Dhingra MS, et al (2018) The impact of surveillance and control on highly pathogenic avian influenza outbreaks in poultry in Dhaka division, Bangladesh. <i>PLOS Comput Biol</i> 14:e1006439. https://doi.org/10.1371/journal.pcbi.1006439

[44]	Ssematimba A, Okike I, Ahmed GM, et al (2018) Estimating the between-farm transmission rates for highly pathogenic avian influenza subtype H5N1 epidemics in Bangladesh between 2007 and 2013. <i>Transbound Emerg Dis</i> 65:e127–e134. https://doi.org/10.1111/tbed.12692
[45]	Pandit PS, Bunn DA, Pande SA, Aly SS (2013) Modeling highly pathogenic avian influenza transmission in wild birds and poultry in West Bengal, India. <i>Sci Rep</i> 3:2175. https://doi.org/10.1038/srep02175
[46]	Pelletier STK, Rorres C, Macko PC, et al (2012) Models of highly pathogenic avian influenza epidemics in commercial poultry flocks in Nigeria and Ghana. <i>Trop Anim Health Prod</i> 44:1681–1687. https://doi.org/10.1007/s11250-012-0124-2
[47]	Bett B, Henning J, Abdu P, et al (2012) Transmission rate and reproductive number of the H5N1 highly pathogenic avian influenza virus during the December 2005–July 2008 epidemic in Nigeria. <i>Transbound Emerg Dis</i> 61:60–68. https://doi.org/10.1111/tbed.12003
[48]	Brown M, Moore L, McMahan B, et al (2015) Constructing rigorous and broad biosurveillance networks for detecting emerging zoonotic outbreaks. <i>PLOS ONE</i> 10:e0124037. https://doi.org/10.1371/journal.pone.0124037
[49]	Lee EK, Liu Y, Pietz FH (2017) A computational framework for a digital surveillance and response tool: application to avian influenza. <i>AMIA Annu Symp Proc</i> 2017:1090–1099
[50]	Ward MP, Maftai D, Apostu C, Suru A (2009) Estimation of the basic reproductive number (R_0) for epidemic, highly pathogenic avian influenza subtype H5N1 spread. <i>Epidemiol Infect</i> 137:219–226. https://doi.org/10.1017/S0950268808000885
[51]	Rorres C, Pelletier STK, Bruhn MC, Smith G (2011a) Ongoing estimation of the epidemic parameters of a stochastic, spatial, discrete-time model for a 1983–84 avian influenza epidemic. <i>avdi</i> 55:35–42. https://doi.org/10.1637/9429-061710-Reg.1
[52]	Rorres C, Pelletier STK, Smith G (2011b) Stochastic modeling of animal epidemics using data collected over three different spatial scales. <i>Epidemics</i> 3:61–70. https://doi.org/10.1016/j.epidem.2011.02.003
[53]	Bonney PJ, Malladi S, Boender GJ, et al (2018) Spatial transmission of H5N2 highly pathogenic avian influenza between Minnesota poultry premises during the 2015 outbreak. <i>PLOS ONE</i> 13:e0204262. https://doi.org/10.1371/journal.pone.0204262
[54]	Ssematimba A, Malladi S, Hagens TJ, et al (2019) Estimating within-flock transmission rate parameter for H5N2 highly pathogenic avian influenza virus in Minnesota turkey flocks during the 2015 epizootic. <i>Epidemiol Infect</i> 147:1–8. https://doi.org/10.1017/S0950268819000633
[55]	Bonney PJ, Malladi S, Ssematimba A, et al (2021) Estimating epidemiological parameters using diagnostic testing data from low pathogenicity avian influenza infected turkey houses. <i>Sci Rep</i> 11:1602. https://doi.org/10.1038/s41598-021-81254-z
[56]	Lee H, Lao A (2018) Transmission dynamics and control strategies assessment of avian influenza A (H5N6) in the Philippines. <i>Infect Dis Model</i> 3:35–59. https://doi.org/10.1016/j.idm.2018.03.004
[57]	Salvador R, Tanquilut N, Macmac R, et al (2020) Evaluation of strategies using simulation model to control a potential outbreak of highly pathogenic avian influenza among poultry farms in Central Luzon, Philippines. <i>PLOS ONE</i> 15:e0238815. https://doi.org/10.1371/journal.pone.0238815

[58]	Lee J, Ko Y, Jung E (2019) Effective control measures considering spatial heterogeneity to mitigate the 2016–2017 avian influenza epidemic in the Republic of Korea. <i>PLOS ONE</i> 14:e0218202. https://doi.org/10.1371/journal.pone.0218202
[59]	Hobbelen PHF, Elbers ARW, Werkman M, et al (2020) Estimating the introduction time of highly pathogenic avian influenza into poultry flocks. <i>Sci Rep</i> 10:12388. https://doi.org/10.1038/s41598-020-68623-w
[60]	Andronico A, Courcoul A, Bronner A, et al (2019) Highly pathogenic avian influenza H5N8 in south-west France 2016–2017: a modeling study of control strategies. <i>Epidemics</i> 28:1–8. https://doi.org/10.1016/j.epidem.2019.03.006
[61]	Vergne T, Gubbins S, Guinat C, et al (2021) Inferring within-flock transmission dynamics of highly pathogenic avian influenza H5N8 virus in France, 2020. <i>Transbound Emerg Dis</i> 68:3151–3155. https://doi.org/10.1111/tbed.14202
[62]	Dorigatti I, Mulatti P, Rosà R, et al (2010) Modelling the spatial spread of H7N1 avian influenza virus among poultry farms in Italy. <i>Epidemics</i> 2:29–35. https://doi.org/10.1016/j.epidem.2010.01.002
[63]	Gonzales JL, Elbers ARW, van der Goot JA, et al (2012) Using egg production data to quantify within-flock transmission of low pathogenic avian influenza virus in commercial layer chickens. <i>Prev Vet Med</i> 107:253–259. https://doi.org/10.1016/j.prevetmed.2012.06.010
[64]	Smith G, Dunipace S (2011) How backyard poultry flocks influence the effort required to curtail avian influenza epidemics in commercial poultry flocks. <i>Epidemics</i> 3:71–75. https://doi.org/10.1016/j.epidem.2011.01.003
[65]	Stegeman A, Bouma A, Elbers ARW, et al (2004) Avian influenza A virus (H7N7) epidemic in the Netherlands in 2003: course of the epidemic and effectiveness of control measures. <i>J Infect Dis</i> 190:2088–2095. https://doi.org/10.1086/425583
[66]	Le Menach A, Vergu E, Grais RF, et al (2006) Key strategies for reducing spread of avian influenza among commercial poultry holdings: lessons for transmission to humans. <i>Proc R Soc B Biol Sci</i> 273:2467–2475. https://doi.org/10.1098/rspb.2006.3609
[67]	Boender GJ, Hagenaars TJ, Bouma A, et al (2007) Risk maps for the spread of highly pathogenic avian influenza in poultry. <i>PLOS Computational Biology</i> 3:e71. https://doi.org/10.1371/journal.pcbi.0030071
[68]	Bavinck V, Bouma A, van Boven M, et al (2009) The role of backyard poultry flocks in the epidemic of highly pathogenic avian influenza virus (H7N7) in the Netherlands in 2003. <i>Prev Vet Med</i> 88:247–254. https://doi.org/10.1016/j.prevetmed.2008.10.007
[69]	Bos MEH, Nielen M, Koch G, et al (2009) Back-calculation method shows that within-flock transmission of highly pathogenic avian influenza (H7N7) virus in the Netherlands is not influenced by housing risk factors. <i>Prev Vet Med</i> 88:278–285. https://doi.org/10.1016/j.prevetmed.2008.12.003
[70]	Backer JA, van Roermund HJW, Fischer EAJ, et al (2015) Controlling highly pathogenic avian influenza outbreaks: an epidemiological and economic model analysis. <i>Prev Vet Med</i> 121:142–150. https://doi.org/10.1016/j.prevetmed.2015.06.006
[71]	Seymour RG, Kypraios T, O’Neill PD, Hagenaars TJ (2021) A Bayesian nonparametric analysis of the 2003 outbreak of highly pathogenic avian influenza in the Netherlands. <i>J R Stat Soc Ser C Appl Stat</i> 70:1323–1343. https://doi.org/10.1111/rssc.12515

[72]	Li R, Bai Y, Heaney A, et al (2017) Inference and forecast of H7N9 influenza in China, 2013 to 2015. <i>Euro Surveill</i> 22:30462. https://doi.org/10.2807/1560-7917.ES.2017.22.7.30462
[73]	Chen Y, Wen Y (2019) Spatiotemporal distributions and dynamics of human infections with the A H7N9 avian influenza virus. <i>Comput Math Methods Med</i> 2019:e9248246. https://doi.org/10.1155/2019/9248246
[74]	Bai N, Zhang J, Li L, Jin Z (2019) Evaluating the effect of virus mutation on the transmission of avian influenza H7N9 virus in China based on dynamical model. <i>Math Biosci Eng</i> 16:3393–3410. https://doi.org/10.3934/mbe.2019170
[75]	Zhu G, Kang M, Wei X, et al (2021) Different intervention strategies toward live poultry markets against avian influenza A (H7N9) virus: model-based assessment. <i>Environ Res</i> 198:110465. https://doi.org/10.1016/j.envres.2020.110465