Introduction to Infectious Disease Modelling and its Applications

Provisional timetable 2018

		Week 1	Lecturer/ Tutor
Monday, 18th June			
8.45-9.30	Registration		
9.30-10.00	Introduction	Introduction to the course	EV, RW, NM
10.00-11.00	Lecture	1. Introduction to the epidemiology of infections	PF
11.00-11.30		**Coffee break**	
11.30-12.30	Lecture	2. Why bother with modelling?	EM
12.30-1.30		**Course lunch**	
1.15-2.00		**Introduction to the computing network**	
2.00-3.00	Lecture	3. Basic methods for setting up models I – difference equations	RW
3.00-3.30		**Coffee break**	
3.30-4.50	Practical	3. Setting up and interpreting simple models (measles in Excel)	
5.00-6.15	Guest lecture	Guest lecture	
6.15-8.00		**Reception**	
Tuesday, 19th June			
9.00-10.00	Lecture	4. Basic methods for setting up models II – differential equations	RW
10.00-10.30		**Coffee break**	
10.30-12.00	Practical	4. Setting up and interpreting simple models in Berkeley Madonna	
12.00-1.00		**Lunch break**	
1.00-2.00	Discussion	Maths refresher (optional)	KA
2.00-3.00	Lecture	5. The natural dynamics of infectious diseases	TS
3.00-3.30		**Coffee break**	
3.30-4.55	Practical	5. Analysing the dynamics of infectious diseases	
5.15+		**Optional social outing (walk)**	
Wednesday, 20th June			
9.00-10.00	Lecture	6. Review (optional)	EV
10.00-10.30		**Coffee break**	
10.30-11.55	Practical	7. Further practice in setting up models in Berkeley Madonna – modelling influenza transmission	
12.05-1.00	Lecture	8. Applying modelling techniques to analyse seroprevalence data	EV
1.00-2.00		**Lunch break**	
2.00-3.00	Lecture	9. Fitting models to data	KA
3.00-3.30		**Coffee break**	
3.30-5.00	Practical	8/9. Estimating forces of infection by fitting models to seroprevalence data	

Week 1 (cont)

			Lecturer/ Tutor
Thursday, 21st June			
9.00-10.30	Practical	10. Contrasting the effects of rubella vaccination between high and low transmission settings	
10.30-11.00		**Coffee break**	
11.00-12.00	Lecture	11. Methods for incorporating non-random mixing into models	RE
12.00-12.15		Introduction to the group work exercise	
12.15-12.45		Group photo	
12.45-1.30		**Lunch break**	
1.30-2.15	Guest seminar	Guest seminar	
2.15-3.45	Practical	11. Simulating the effects of non-random mixing on transmission and control	
3.45-4.05		**Coffee break**	
4.05–5.15	Group work	12. Work on the group work exercise	
5.20-6.20	Lecture	The history of modelling (Paul Fine)	PF
Friday 22nd June			
9.00–10.30	Group work	13. Work on the group work exercise (Flu/Ebola)	
10.30-11.00		**Coffee break**	
11.00-11.55	Lecture	14. Estimating basic reproduction numbers for non-randomly mixing populations	AK
11.55-12.45	Lunch	**Lunch break (sandwiches provided)**	
12.45-1.45	Guest lecture	Guest lecture	
1.45-3.00	Practical	14. Calculating basic reproduction numbers for non-randomly mixing populations	
3.00-3.30		**Coffee break**	
3.30-4.55	Paper discussion	15. Topical paper discussion	
5.05-6.15	Guest lecture	Guest lecture	
6.15+		**Optional social outing – meal + Eye**	

Week 2

			Lecturer/ Tutor
Monday, 25th June			
9.00-10.00	Lecture	16. Review (optional)	EV
10.00-10.30		**Coffee break**	
10.30-11.25	Lecture	17. Introduction to stochastic modelling and its applications	NM
11.35-1.00	Practical	17. Setting up stochastic models of outbreaks	
1.00-2.00		**Lunch break/modelling clinic**	
2.00-3.00	Lecture	18. Economic evaluation of infectious disease interventions	MJ
3.00-3.30		**Coffee break**	
3.30-4.50	Practical	18. Health economics and sensitivity analysis: Cost-effectiveness of seasonal influenza vaccination	
4.50-5.50	Lecture (optional)	29. Fitting models to data II - numerical optimisation and sensitivity analysis	MJ
		Optional social outing (theatre)	

Week 2 (cont)

				Lecturer/ Tutor
Tuesday, 26th June				
9.00-10.15	Practical	19. Setting up discrete-time stochastic models in Berkeley Madonna (modelling nosocomial transmission)		
10.15-10.30		**Coffee break**		
10.30-11.25	Lecture	20. Network modelling		NM
11.35-1.00	Practical	20. Network modelling		
1.00-2.00		**Lunch break/modelling clinic**		
2.00-3.30	Practical	21. Applications of stochastic models: estimating R_n for eliminated and emerging diseases		
3.30-4.00		**Coffee break**		
4.00-5.30	Groupwork	22. Groupwork (Flu/Ebola)		
Wednesday, 27th June				
9.00-10.30	Groupwork	23. Groupwork (Flu/Ebola)		
10.30-11.00		**Coffee break**		
11.00-11.55	Lecture	24. An introduction to real-time modelling		
12.05-1.00	TB/Vet lecture	25. Models for the transmission dynamics of *M tuberculosis*	26. Applications in veterinary epidemiology: Spatial transmission and meta-population models	TB: EV VET: JE
1.00-2.00		**Lunch break/modelling clinic**	**Lunch break/modelling clinic**	
2.00-3.30	TB practical/ Vet practical	25. Modelling *M tuberculosis* transmission and disease	26. Applications of models to veterinary epidemiology and zoonoses	
3.30-3.50		**Coffee break**	**Coffee break**	
3.50-4.45	STI/MAL lecture	27. Simple sexually-transmitted infection model	28.Modelling malaria transmission and control	5.
5.00-6.30	Fun quiz	Fun infectious disease quiz with snacks (optional)		
Thursday, 28th June				
9.00-10.00	Lecture	An introduction to phylodynamics		SH
10.00-10.30		**Coffee break**	**Coffee break**	
10.30-11.55	STI/MAL practical	27 (cont). Simple sexually-transmitted infection models	28 (cont). The Ross-Macdonald model	
12.05-1.00	HIV/RT Lecture	31. Modelling HIV transmission and control	32. The applications of real-time modelling	HIV: RW RT: MB
1.00-2.00	Lecture/ discussion	Further modelling taster (Optional)		KA, RE, SF
2.00-3.30	PD/RTpractical	30 (cont). The applications of phylodynamics	32. The applications of real-time modelling	
3.30-3.50		**Coffee break**		
3.50-5.15	Group work	33. Work on the group work exercise (Flu/Ebola)		

Week 2 (cont)

Lecturer/ Tutor (1st named leads session)

Friday, 29th June

9.00-11.00	Groupwork	34. Poster presentations	
11.00-11.30		**Coffee break**	
11.30-11.50	Groupwork	35. Conclusion to the groupwork exercise	
11.50-12.30	Discussion	Course evaluation	
12.30-1.30	Lunch	Course lunch	
1.30		**END OF COURSE**	

Key to teaching staff initials: names and affiliations:

KA	Katie Atkins (IDE/EPH)
MB	Marc Baguelin (LSHTM/PHE)
YC	Yoon Choi (PHE)
RE	Rosalind Eggo (IDE/EPH)
PF	Paul Fine (IDE/EPH)
SFl	Stefan Flasche (IDE/EPH)
SFu	Sebastian Funk (IDE/EPH)
SH	Stephane Hue (IDE/EPH)
MJ	Mark Jit (PHE/EPH)
PK	Petra Klepac (IDE/EPH)
AK	Adam Kucharski (IDE/EPH)
NM	Nicky McCreesh (IDE/EPH)
GM	Graham Medley (GHD/PHP)
JM	James Munday (IDE/EPH)
KO	Kath O'Reilly (DDC/ITD)
SR	Sophie Rhodes (IDE/EPH)
TS	Tom Sumner (IDE/EPH)
EV	Emilia Vynnycky (PHE/LSHTM))
RW	Richard White (IDE/EPH)
LY	Laith Yakob (DDC/ITD)

Key to affiliations:

DDC = Department of Disease Control
EPH = Faculty of Epidemiology and Population Health, LSHTM
GHD = Department of Global Health and Development, LSHTM
ITD = Faculty of Infectious and Tropical Diseases, LSHTM
HSRP = Department of Health Services Research and Policy, LSHTM
IDE = Department of Infectious Disease Epidemiology, LSHTM
PHP = Faculty of Public Health and Policy, LSHTM
PHE = Public Health England, Colindale, London