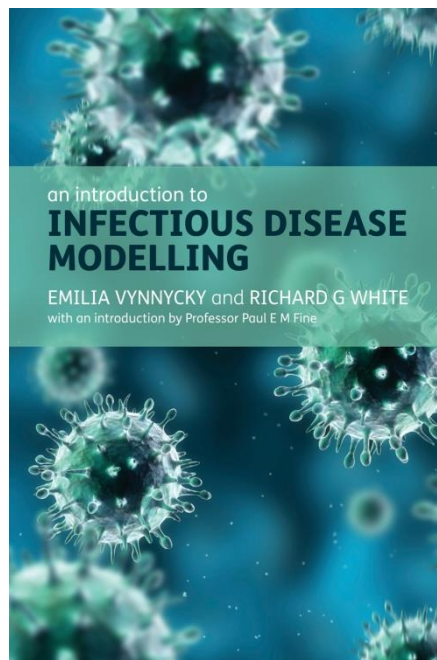


An Introduction to Infectious Disease Modelling

Errata (updated August 2021)



We have done our best to ensure the book is as free of errors as possible, but it is inevitable that some remain. Please search this document to see if your issue has been discussed already and if not, use the feedback page on the book's website to send us details. Unfortunately, we cannot respond to each comment individually, but any errors found will be included as soon as they have been verified, together with a correction.

Please visit www.anintroductiontoinfectiousdiseasemodelling.com for updates.

Many thanks for taking the time to comment on the book.

Contents

| | Page |
|---|-------------|
| Issues in the book published after December 2010 | 3 |
| Issues in the book published before December 2010 | 4 |
| Amendments to the solutions to the exercises..... | 8 |

Issues in the book published after December 2010

The following are the errata identified in the book published after December 2010.

| Chapter | Page number | Location | Correction |
|---------|-------------|--|---|
| 5 | 111 | Line 3 | $rate = \ln(1-risk)$ should be replaced with $rate = -\ln(1-risk)$ |
| 5 | 111 | Line 4 | $\ln(1-\lambda_a)$ should be replaced with $-\ln(1-\lambda_a)$ |
| 6 | 156 | 1 st line of Iteration 4 (Step 1) | “0.15” should be replaced with “0.2” and 0.478 should be replaced by 0.5904. The equation should read: $1-(1-0.2)^4 = 0.5904$ |
| 7 | 220 | Exercise 7.4 b) ii) | “50,000” should be replaced with “650,000” |
| 7 | 220 | Exercise 7.4 b) ii) | The following text should be included after “group”: “assuming that infants have maternal immunity for the first three months of life” |

Issues in the book published before December 2010

The following errata can typically be found in copies of the book that were published until the middle of December 2010 and have been corrected in copies published thereafter.

You can quickly identify which version of the book you have bought by looking on the first page of the Preface: if the third line from the bottom has the book's webpage address, then you have a corrected copy of the book.

General comment about use of the word “incidence”:

One very helpful reader has pointed out that we have not followed the strict definition of “incidence” that is used in epidemiology, namely as “the number of new infections (or whatever) *per susceptible or person at risk* per unit time”. For example, we have sometimes used the term “incidence” when we simply meant “the number of new infections (or whatever) per unit time”. We identified this error quite late in the book's production and tried to correct this wherever possible, but unfortunately, were unable to correct this everywhere.

We can only apologise for this lapse and trust that it doesn't confuse you too much. In any case, we will correct this in the next edition.

| Chapter | Page number | Location | Correction |
|---------|-------------|---|---|
| 1 | 6 | 5 th line above equation 1.2 | The word “less than” should be replaced with the words “greater than” |
| 1 | 6 | 4 th line above equation 1.2 | The word “greater than” should be replaced with the words “less than” |
| 1 | 10 | 1 st line of the second paragraph of section 1.5 | The word “sorts” should be inserted between the words “broad” and “of”. |
| 2 | 25 | 1 st line after Figure 2.5 | “ λI_t ” should be replaced with “ $\lambda_t S_t$ ” |
| 2 | 35 | Equation 2.20 | δt is missing in the term “ fE_t ”. The equation should read: $I_{t+\delta t} = I_t + fE_t \delta t - rI_t \delta t$ |

| Chapter | Page number | Location | Correction |
|---------|-------------|---|--|
| 3 | 43 | Table 3.1, row for day 55, column 4 | 0.00 should be replaced with 0.04. |
| 3 | 56 | 3 rd line after equation 3.17 | $t=1$ should be replaced with $t=0$ |
| 3 | 56 | 1 st line after equation 3.18 | $t=2$ should be replaced with $t=1$ |
| 4 | 79 | Equation for R_0 in the grey box for Example 4.2.4.1 | Strictly speaking, if we apply equation 4.22, the equation should be as follows: $R_0 = \frac{\ln(0.302) - \ln(0.7)}{0.302 - 0.7}$ However, the value for R_0 remains unchanged. |
| 4 | 84 | y-axis title | The title should read "Number of new infectious persons/100,000/week" |
| 4 | 94 | Figure 4.26 | The figure included here is incorrect. Please go to page 7 of this document to see the correct figure. |
| 4 | 79 | Figure 4.13a | The time units for the y-axis title are incorrect and should be in weekly, rather than daily units. The y-axis title should read "Number of infectious individuals/100,000/week". |
| 4 | 93 | Equations 4.31 and 4.32 | The equals sign should be replaced with an \approx sign. |
| 5 | 113 | 1 st line after equation 5.12 | μ should be replaced by " $1/\mu$ ". |
| 5 | 119 | 3 rd line after Figure 5.9 | The word "low" should be replaced by the word "high" and the word "high" should be replaced by the word "low". This line should read "...>1.5 years if the force of infection is high and low respectively". |
| 5 | 138 | 3 rd and 2 nd lines from the bottom of the grey box | "229" should be replaced by "559" and "777" should be replaced by "770". |
| 5 | 139 | Caption to Figure 5.22 | The word "incidence" should be replaced by the words "number of new infections per 100,000". Also, the reference to Equation 5.29 should be replaced with a reference to Equation 5.28. |
| 5 | 140 | Figure 5.23b | The y-axis title should be replaced with "The daily number of new infections per 100,000". |
| 5 | 146 | 2 nd line of question 5.10d | The text "part b)" should be replaced with the text "part c)". |
| 6 | 153 | caption to Figure 6.2, 4 th line | The word "prevalence" should be replaced with the word "number" |
| 6 | 168 | line above equation 6.9 | The words "and infectious persons recover to become immune" should be inserted after the comma |

| Chapter | Page number | Location | Correction |
|-------------|-------------|---|--|
| 6 | 173 | 3 rd line of section 6.8.3 | The “word “of” should be inserted between the words “One” and “the”. The start of this sentence should read “One of the earliest...” |
| 7 | 203 | y-axis title to Figure 7.11 | This should read “Daily number of new infections per 100,000” |
| 7 | 208 | Equation 7.36 | “ I_o ” should be replaced by “ $I_{o,k}$ ”. The equation should therefore read : $I_{o,k+1} = 3I_{y,k} + 0.2I_{o,k}$ |
| 7 | 210 | 1 st line below the caption | “15 per cent and 85 per cent” should be replaced with “14 per cent and 86 per cent”. |
| 7 | 210 | 8 th line from the bottom | “3.6” should be replaced with “3.53” |
| 7 | 210 | 7 th line from the bottom | “3.6” should be replaced with “3.53” |
| 7 | 212 | 6 th line after the end of Panel 7.9 | The word “generally” should be inserted between the words “it” and “always”. Some exceptions are discussed in the suggested exercises for model 7.4. |
| 7 | 220 | Exercise 7.5 | 8.79×10^{-5} in the bottom right hand corner of the matrix should be replaced with 7.14×10^{-5} . |
| 8 | 252 | 1 st line after Figure 8.14 | The first occurrence of the word “The” should be replaced by the word “This”. The start of the sentence should therefore read “This is clearly true...” |
| 8 | 257 | The 2 sentences preceding equation 8.68 | References to the high and low activity should be replaced with references to men and women. The sentences should read as follows “The typical infectee is some theoretical average of men and women . If we let x be the probability the typical infectee is a man , and $1-x$ be the > probability the typical infectee is a woman , R_o is the maximum value that satisfies the following matrix equation:” |
| 8 | 265 | Caption to Figure 8.21 | The square should be replaced with a diamond. |
| Basic maths | 355 | Title of the grey box | r_i should be replaced by ρ_i |
| Index | 370 | Reference to “with-like mixing pattern (assortive) mixing patterns” | This should be replaced with “with-like (assortative) mixing pattern”. |
| Index | 370 | Reference to “with-unlike (disassortive) mixing patterns” | This should be replaced with “with-unlike (disassortative) mixing patterns” |

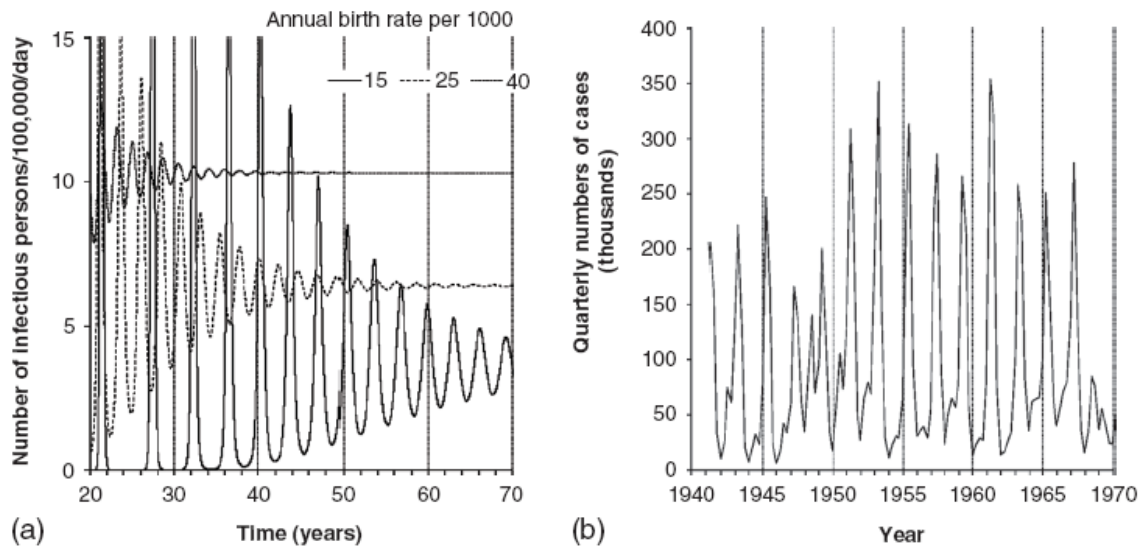
Corrected Figure 4.26:

Fig. 4.26 (a) Predictions of the daily number of infectious persons per 100,000 population with measles for different values of the birth rate, obtained using the model described in Panel 4.3, assuming that the birth rate exceeds the death rate (Model 4.6, online). The average life expectancy is assumed to be 60 years; the annual birth rates of 15, 25, 40 per 1000 are similar to those seen in the USA, South Central Asia and sub-Saharan Africa during the early 2000s.⁴⁴ All other parameter values in the model are identical to those described in the caption to Figure 4.17. The x axis shows the time since the introduction of one infectious person into a totally susceptible population comprising 100,000 persons. (b) Observed notifications of measles in England and Wales during the period 1940–1970.⁴⁷

Amendments to the solutions to the exercises

The following are the corrections that have been made to the solutions to the exercises provided in the book.

| Location | Correction | Date of correction |
|----------------------|---|-----------------------|
| Exercise 2.1a | The equations should be as follows: Humans: $s_{t+1}^h = s_t^h - \lambda_t^h s_t^h + r i_t^h$ $i_{t+1}^h = i_t^h + \lambda_t^h s_t^h - r i_t^h$ Mosquitoes: $s_{t+1}^v = s_t^v + b - \lambda_t^v s_t^v - \mu s_t^v$ $i_{t+1}^v = i_t^v + \lambda_t^v s_t^v - \mu i_t^v$ | end of September 2010 |
| Exercise 4.2a | The solution should read " $R_{\sigma} \approx 29$ " and not " $R_{\sigma} \approx 10$ ", | end of September 2010 |
| Exercise 4.2a | The equals sign in the equations for the inter-epidemic period has been replaced with an approximately equals to sign (i.e. " \approx "). | early November 2010 |
| Exercise 5.6 | A constant term "K" was added to the term $s(a)e^{\lambda a}$. However, note that this constant term disappears in Step 2 and so including it does not affect the outcome of interest. | August 2021 |
| Exercise 7.2 b) ii) | "0.035" has been replaced with "0.0035" | August 2021 |
| Exercise 7.2 b) iii) | "0.035" has been replaced with "0.0035" and "0.095" has been replaced with "0.0095". The equation now reads: $\overline{\lambda_o(t)} = \lambda_{oy}(t) + \lambda_{oo}(t) = 0.006 + 0.0035 = 0.0095$ per day. | August 2021 |
| Exercise 7.4bii) | A reference to Model 7.5 has been added to the end of the solution. | early November 2010 |
| Exercise 7.5b) | A reference to Model 7.6 has been added to the end of the solution. | early November 2010 |