

Infectious Diseases for Data Scientists

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Table of contents

Welcome	3
Acknowledgements	3
Introduction	4
Ground we cannot cover	4
Biology of human immune system	4
Mathematical modelling	4
Genomics, phylodynamics and more	5
Programming	5
 I Data Sources	 6
1 Surveillance	8
1.1 Front-Line Providers	8
1.2 Public Health	8
1.3 National and International Organization	8
1.3.1 County-wide Groups	8
1.3.2 International Groups	8
1.3.3 Non-governmental Groups	8
 References	 9

Welcome

Welcome.

Acknowledgements

Cover art: Cholera in Paris, 1865 by François-Nicolas Chiffart.

Introduction

Drink deep, or taste not the Pierian spring

Alexander Pope in A Little Learning

There has been a trend in making texts of “math/modelling/programming” for x , where x represents a discipline from a basic science. However, in this manuscript, we would like to go the other direction and provide advanced subject matter on the biological and environmental processes that undergird the mathematics and programming. Understand the science of what is being modelled is in many ways just as important as understanding the equations that govern the analysis. This goes to everything from compartmental models used to represent pharmacodynamics to building vaccine effectiveness analysis.

Ground we cannot cover

The field of infectious diseases and mathematical epidemiology is immense. As such, no effort is made to try and capture all of the entirety of the field in the resource. That being said there are exceptional resources available on many of the topics that are briefly addressed here. These include:

Biology of human immune system

[How the Immune System Works](#) by Lauren M. Sompayrac

Mathematical modelling

[Introduction to Infectious Disease Modeling](#) by the Center for Communicable Disease Dynamics

[The Mathematics and Statistics of Infectious Disease Outbreaks](#) by Tom Britton and Michael Hohl

Genomics, phylodynamics and more

Programming

ReCoDE by Imperial College

CEIRR Computational Modeling Core

Part I

Data Sources

This chapter is about data.

1 Surveillance

Here we talk about sources of data.

1.1 Front-Line Providers

1.2 Public Health

1.3 National and International Organization

1.3.1 County-wide Groups

1.3.2 International Groups

1.3.3 Non-governmental Groups

References