

# UNIT 8: Infectious disease

# Outline

## Introduction

## Rate of spread

## Single-epidemic model

### Epidemic size

## Recurrent epidemic models

### Dynamics

## Reproductive numbers and risk

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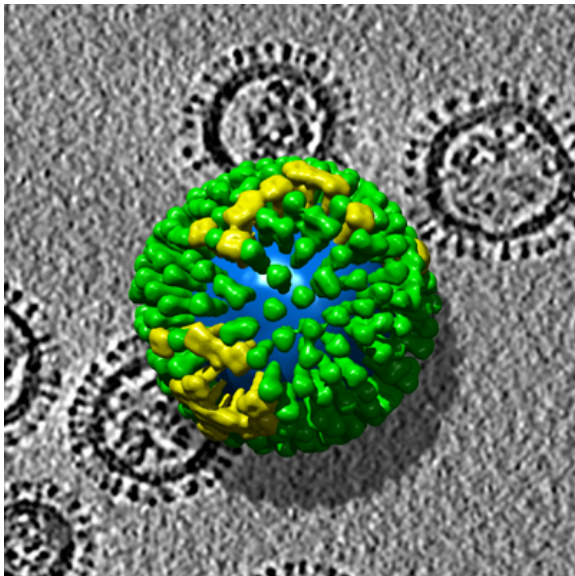
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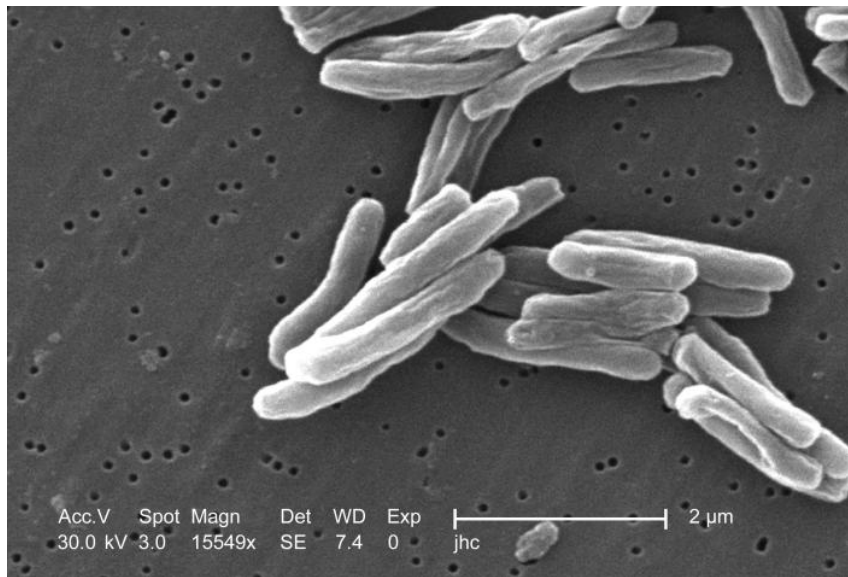
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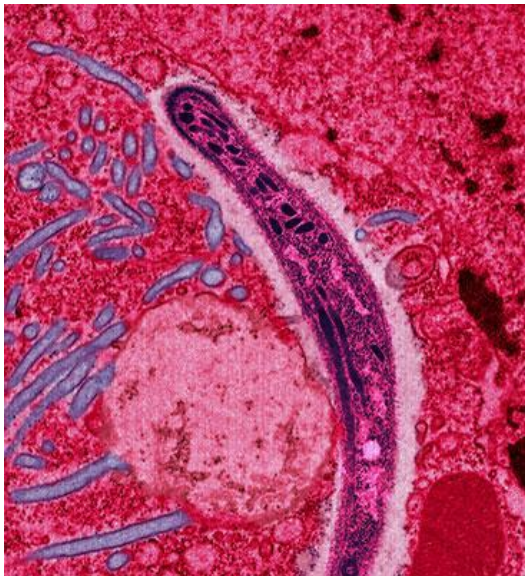
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# Malaria sporozoite





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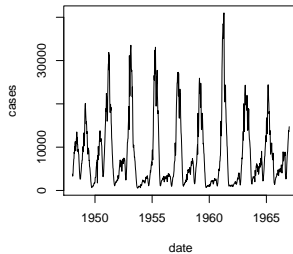
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**Measles reports from England and Wales**

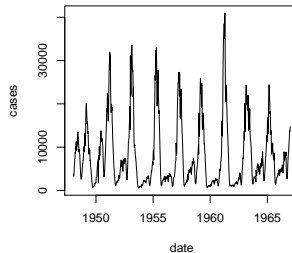


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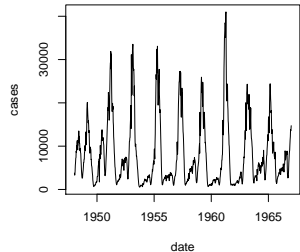


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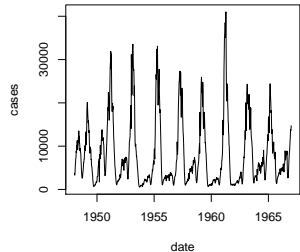


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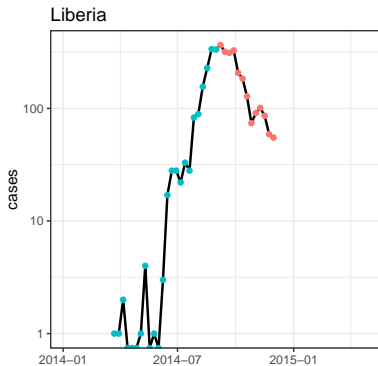
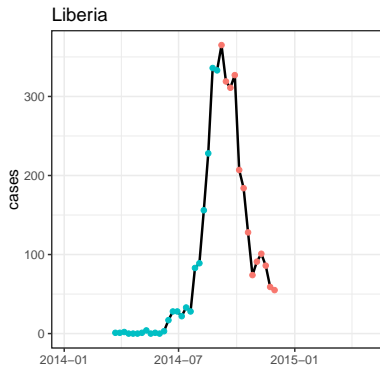
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# Example: the West African Ebola epidemic



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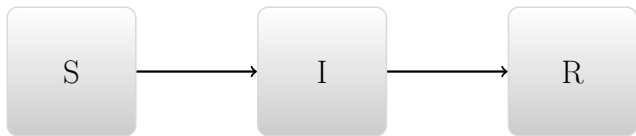
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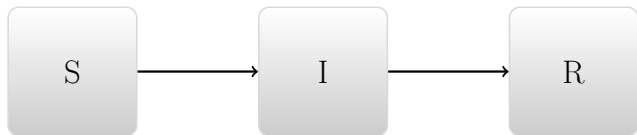
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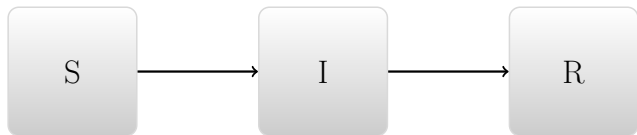
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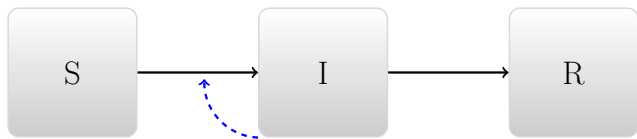


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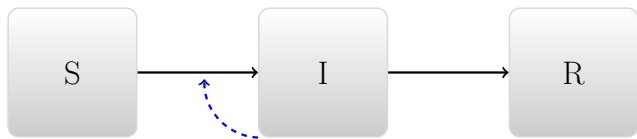
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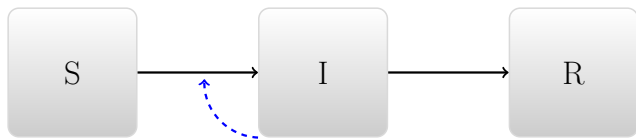
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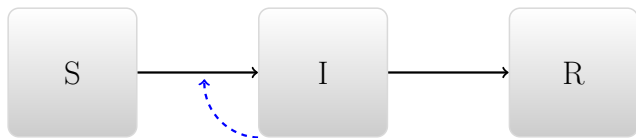
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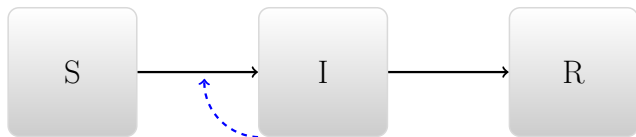
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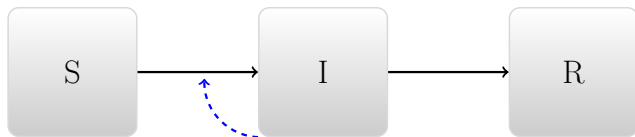
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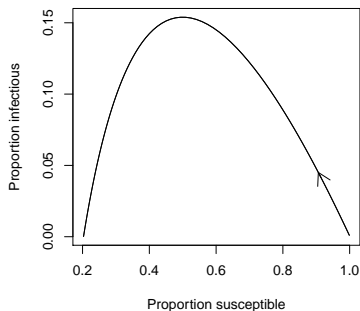
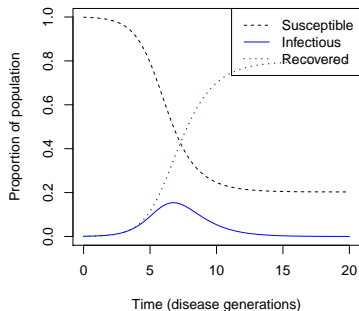
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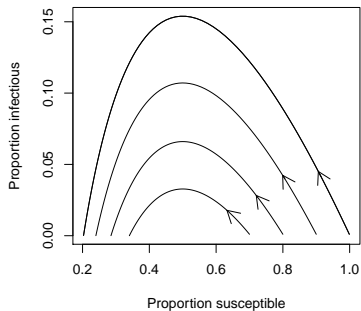
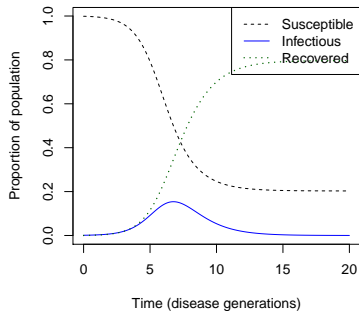
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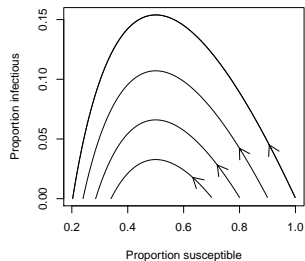


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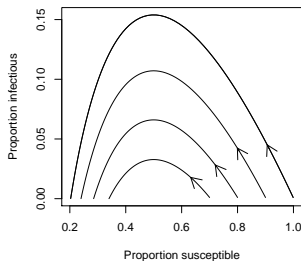
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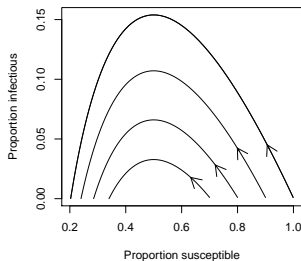
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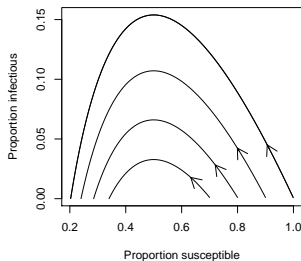


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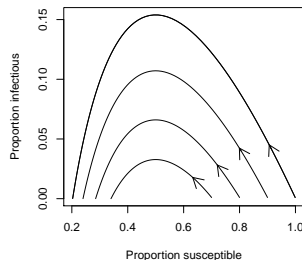
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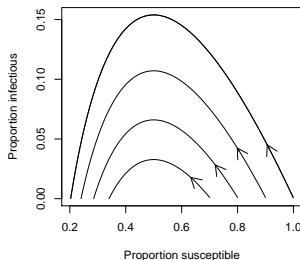
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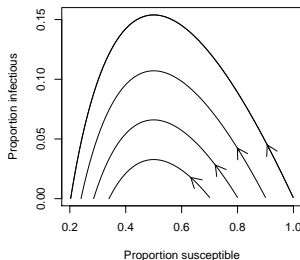
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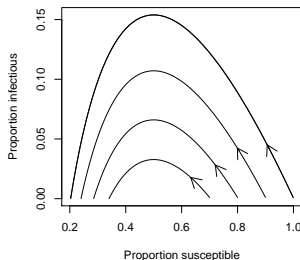
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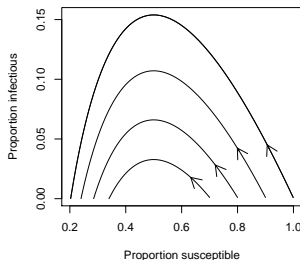
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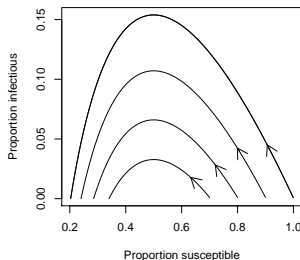
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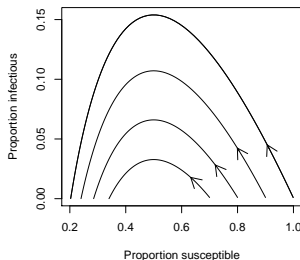
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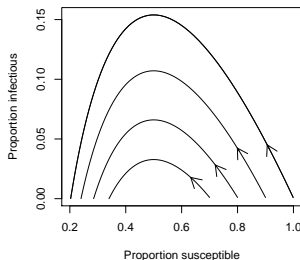
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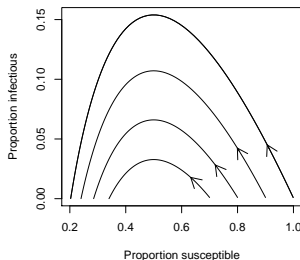
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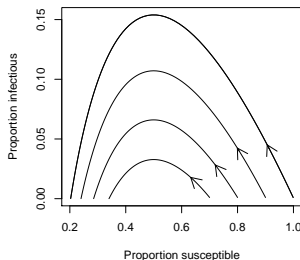
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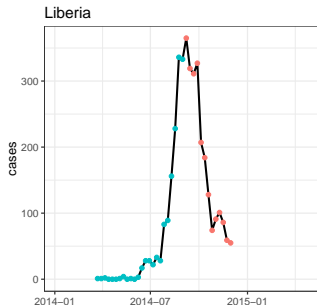
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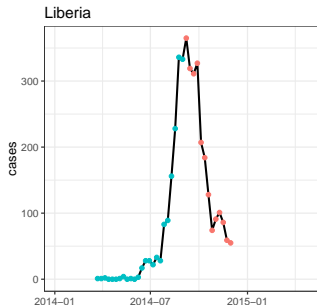
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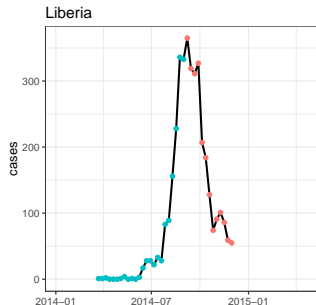
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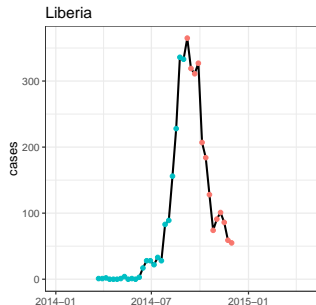
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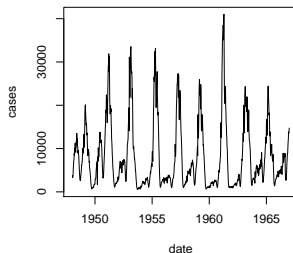
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**Measles reports from England and Wales**



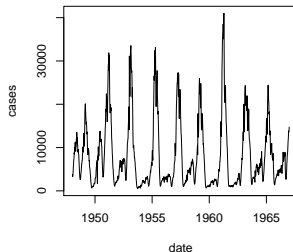


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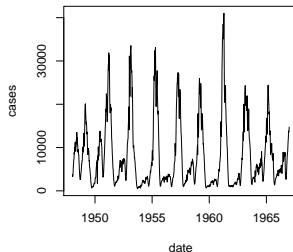
**Measles reports from England and Wales**



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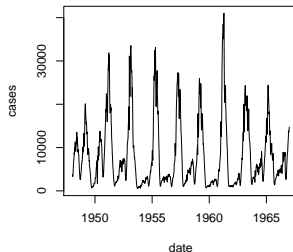
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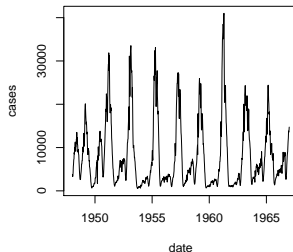
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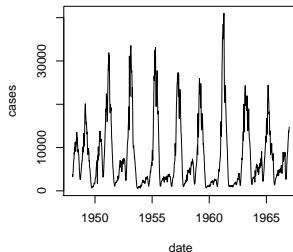
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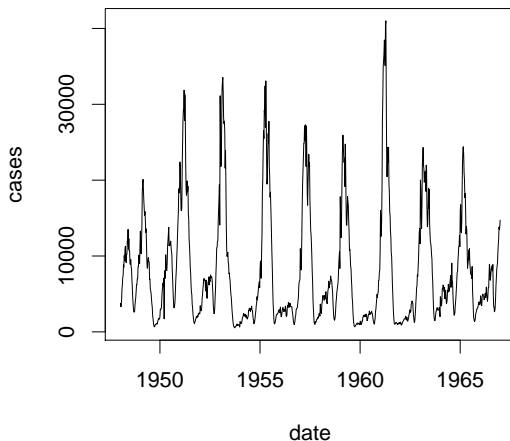
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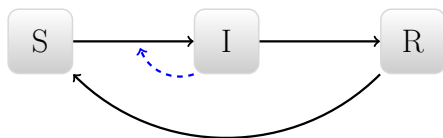


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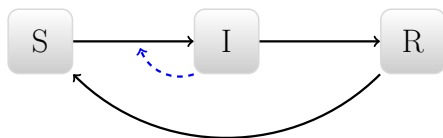
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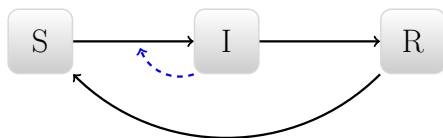
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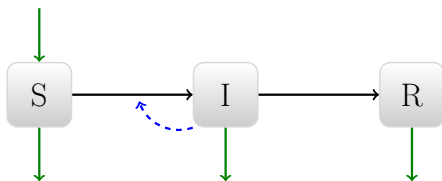


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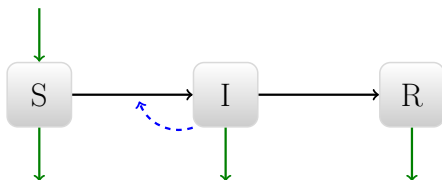


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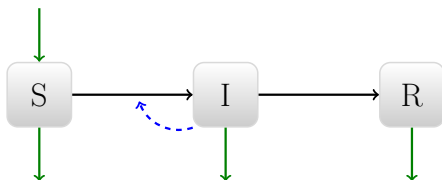


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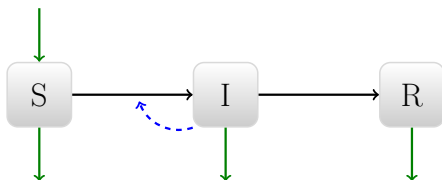
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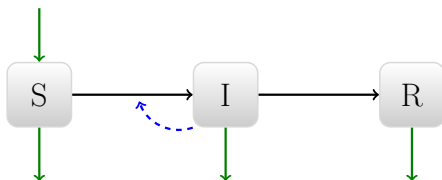
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# Outline

Introduction

Rate of spread

Single-epidemic model

Epidemic size

Recurrent epidemic models

Dynamics

Reproductive numbers and risk

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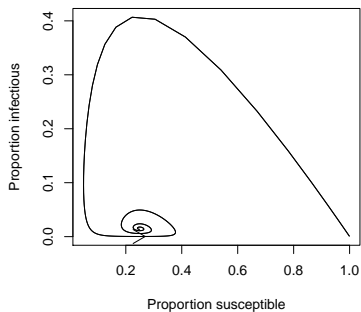
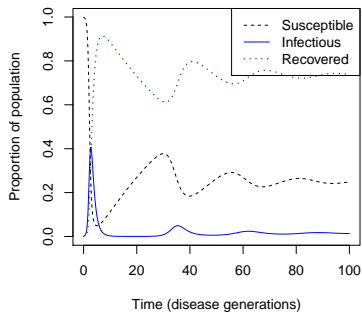
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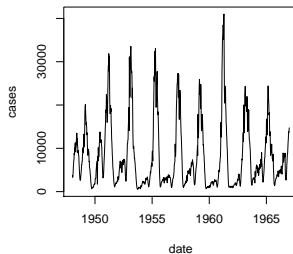
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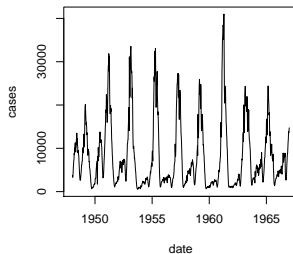


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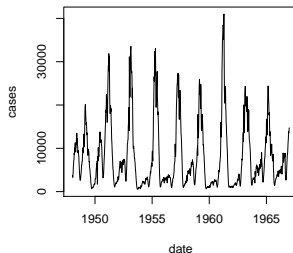


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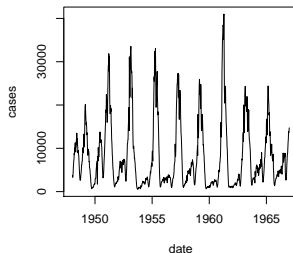
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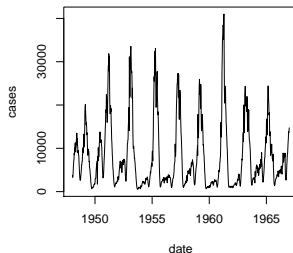
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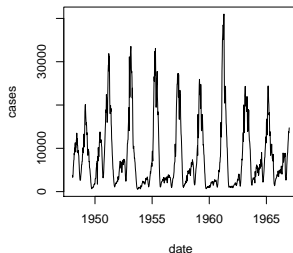


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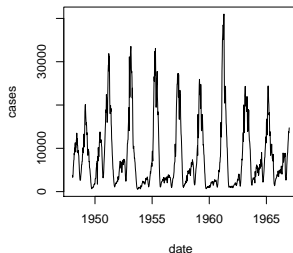
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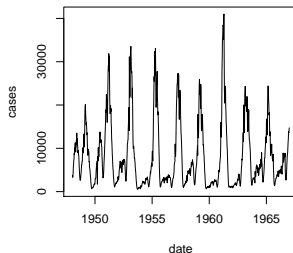
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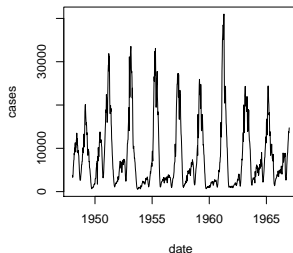


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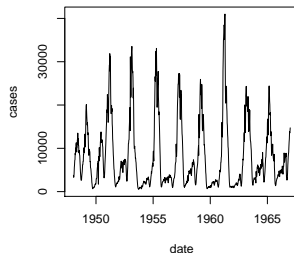


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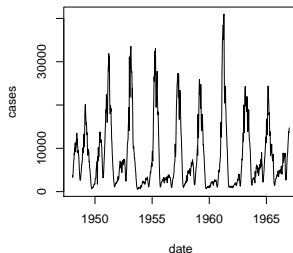
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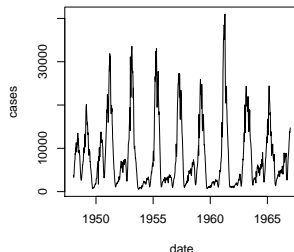


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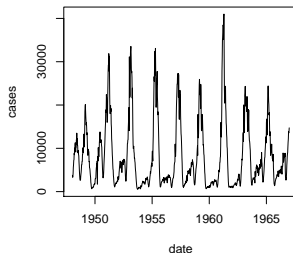
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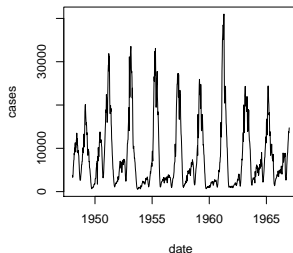
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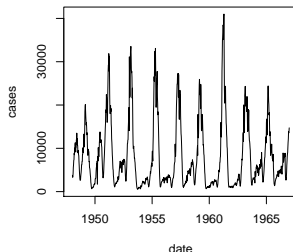
Measles reports from England and Wales



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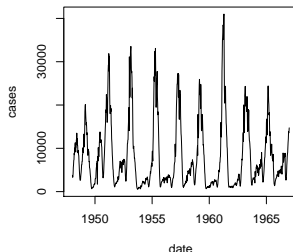
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# Outline

Introduction

Rate of spread

Single-epidemic model

Epidemic size

Recurrent epidemic models

Dynamics

Reproductive numbers and risk

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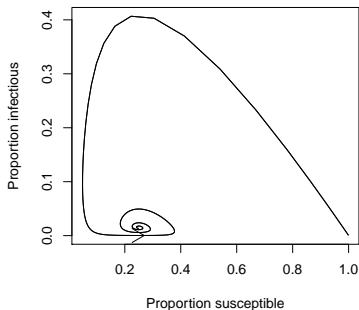
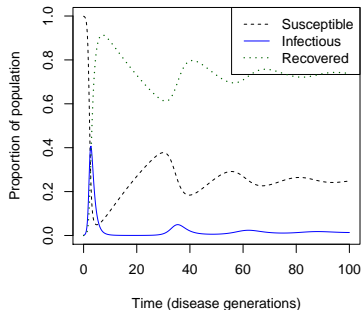
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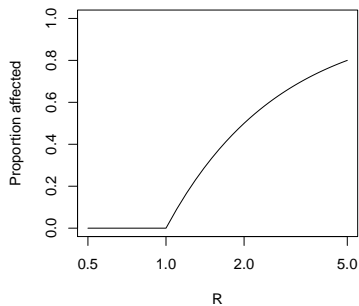
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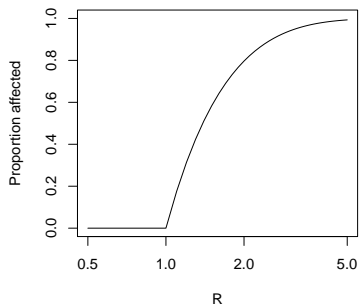


# *Reproductive numbers and risk*

**Equilibrium**



**Single epidemic**



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