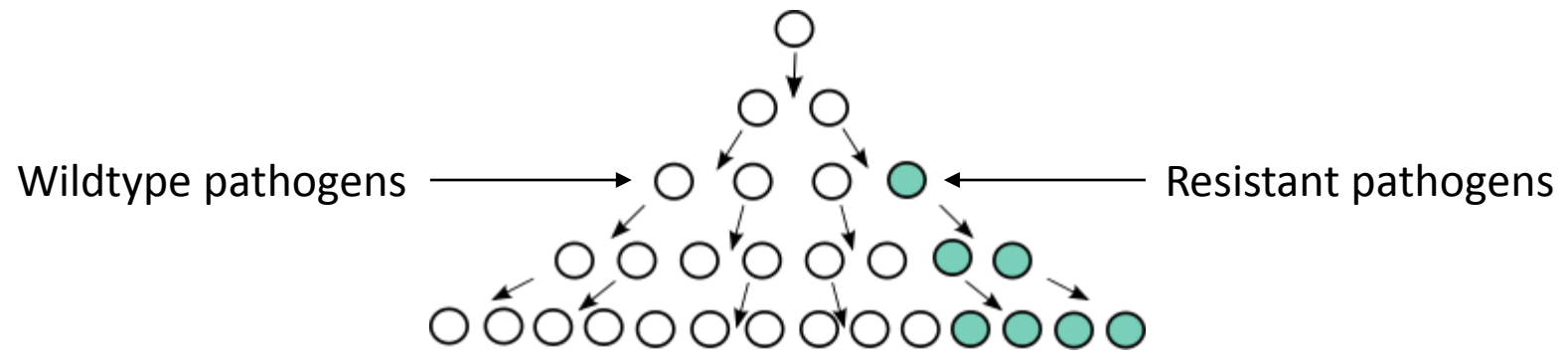


Notes to accompany the AMR simple mathematical modelling code

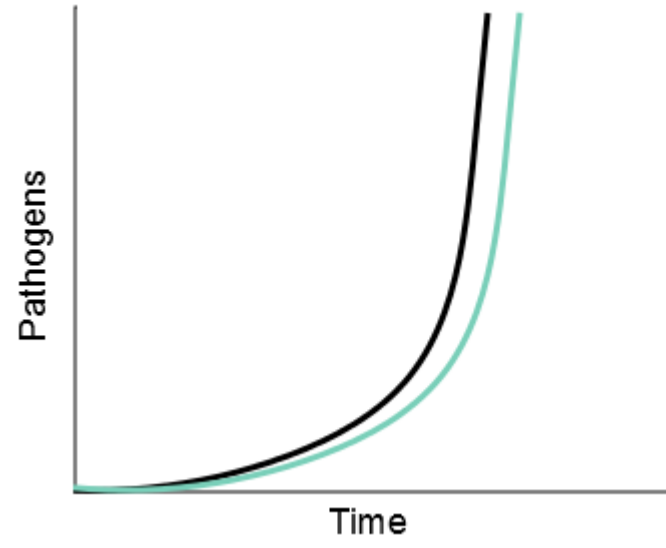
Dr Laith Yakob

London School of Hygiene & Tropical Medicine



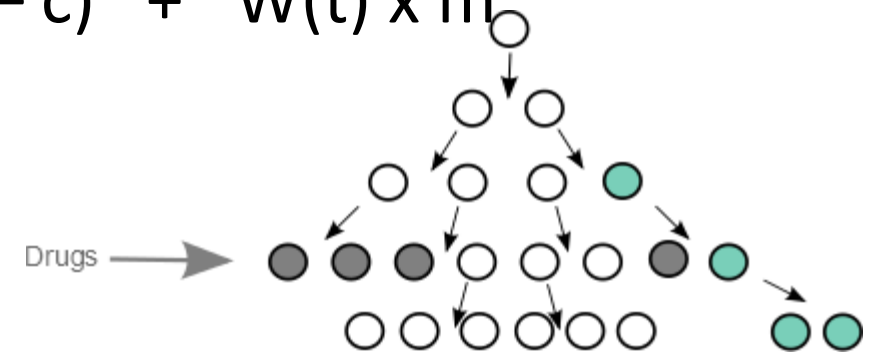
Maths

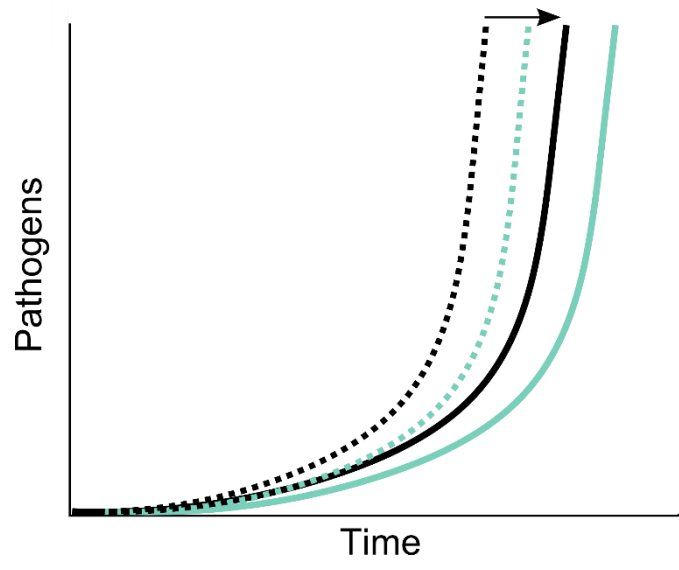
- Call wildtype and resistant pathogens W and R
 - $W(\text{in future time}) = W(\text{now}) \times \text{growth}$
 $\rightarrow W(t+1) = W(t) \times g$
 - $R(\text{in future time}) = R(\text{now}) \times \text{growth} \quad \text{PLUS} \quad W(\text{now}) \times \text{spontaneous mutation}$
 $\rightarrow R(t+1) = R(t) \times g + W(t) \times m$



- $W(t+1) = W(t) \times (g - c)$

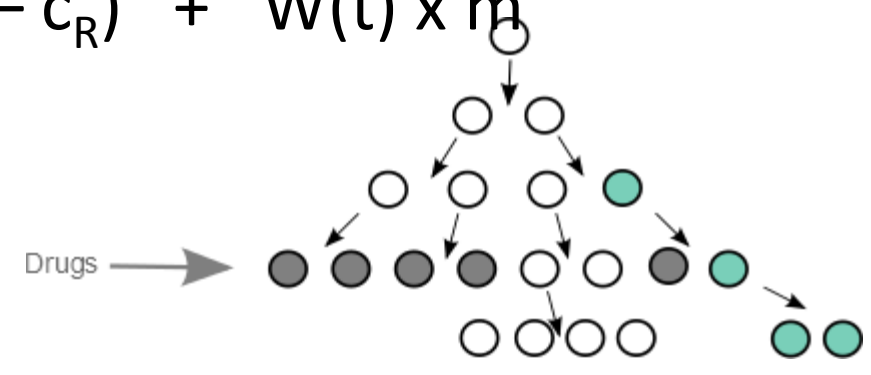
- $R(t+1) = R(t) \times (g - c) + W(t) \times m$

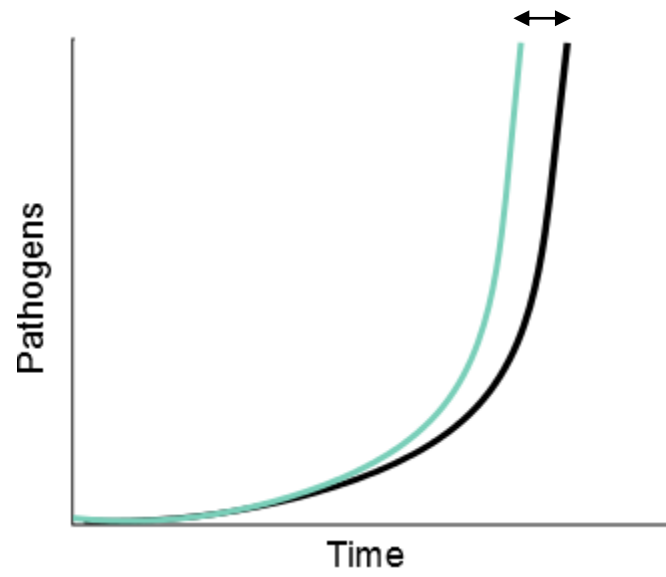


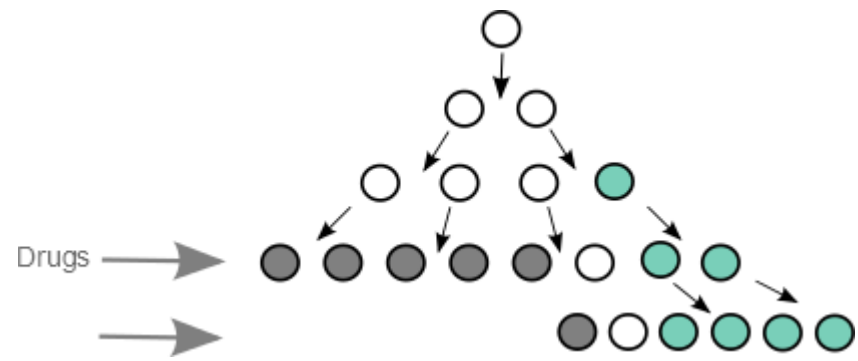


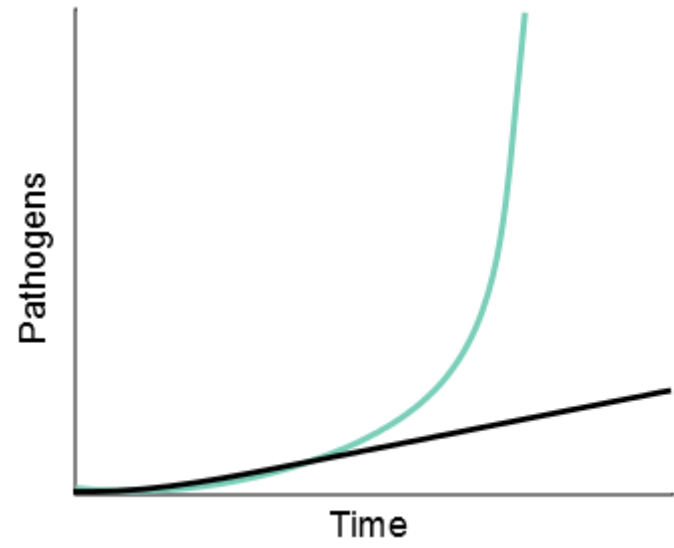
- $W(t+1) = W(t) \times (g - c)$

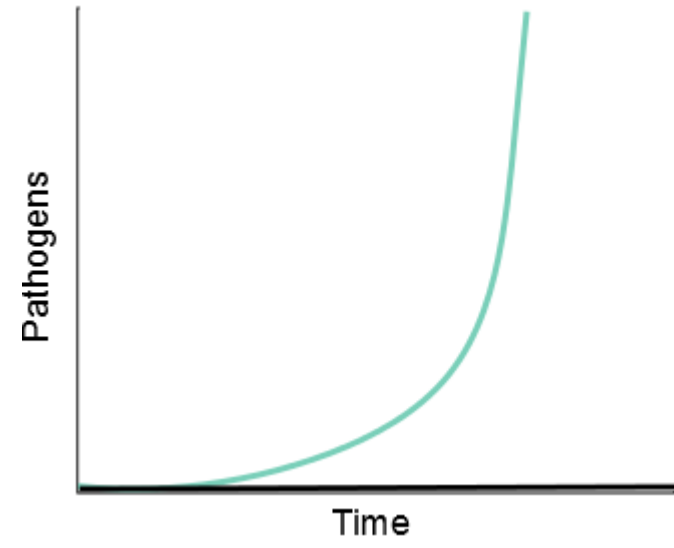
- $R(t+1) = R(t) \times (g - c_R) + W(t) \times m$











Trade-offs

- $W(t+1) = W(t) \times (g - c)$
- $R(t+1) = R(t) \times (g_R - c_R) + W(t) \times m$

