

Life-saving maths: How does vaccination work?



Standing Disease

You will need:

- lots of people
- room to stand up

The activity:

- Step 1: choose one person to be the first case of Standing Disease - the main symptom is being unable to sit or lie down, you just have to keep standing up.
 - Step 2: it's quite infectious - so that person chooses two more people to be infected.
 - Step 3: each infected person infects two more people.
- ... and so on, until the whole class is infected.

Questions to discuss:

- How many steps did it take the disease to infect the whole class?
- How many people were infected at each stage? How could you describe this number sequence?
- What difference would it make if 3 people were infected at each stage instead of 2? How could you describe that number sequence?
- What about if n people were infected at each stage?

- How many steps would it take to infect the whole school?
- How about the UK? - the population is about 62 million.
- How about the whole world? - the population is about 7 billion.

How good is this model?

- What aspects of the model tell us something useful about how epidemics progress?
- What does the model predict which doesn't make sense?
- Can you think of ways to improve it?

Vaccination: Standing Disease

<https://motivate.maths.org/content/MathsHealth/Vaccination/>

Produced by Motivate, part of the Millennium Mathematics Project at the University of Cambridge, with grant funding from the Wellcome Trust (c) University of Cambridge 2011.

Permission is granted to reproduce this sheet for non-commercial educational uses only; for any other use please contact us: mmp@maths.cam.ac.uk www.mmp.maths.org