# Materials for VC2: notes to teachers

• Pages 2-5 contain instructions and materials for the epidemic game we'll be investigating in VC2. It would be worth printing out copies of the instructions (page 3)
• Pages 6-7 describe possible extensions to the game that we won't cover in VC2 but which might be interesting to try outside VCs.
• Pages 8-9 are copies of a couple of the slides that we'll be showing in VC2. These might not display particularly clearly over the weblink, so it would be worth printing off some copies for your students.

The Spatial epidemic

A simulation model of infection spreading locally through a population.
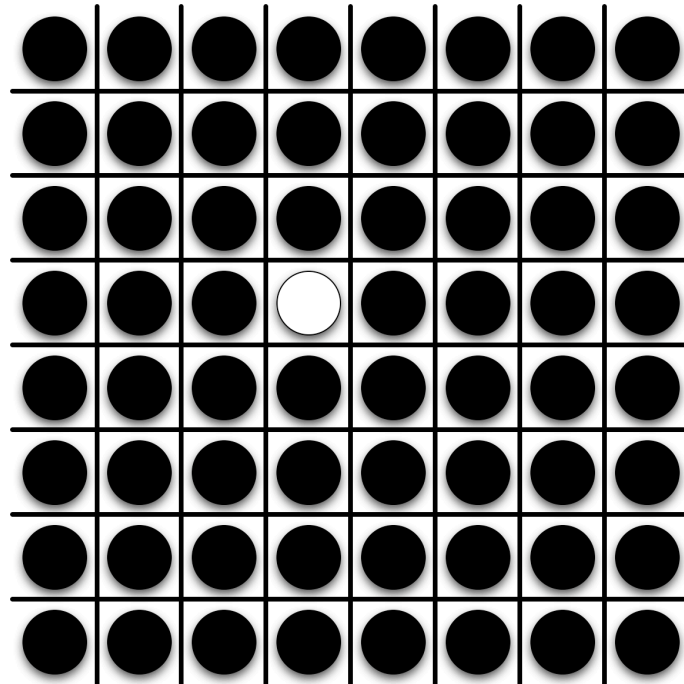
You will need:

• An 8x8 square grid (e.g. a chessboard). Other sizes would work, but will give slightly different results.

• Counters of at least 2 colours.

• 4-sided dice and spinners (though the model can be played with regular dice and a bit more patience)

1 Start with 1 infected counter (white)

2 For each white counter roll a 4-sided die to decide if site **recovers** or **infects a neighbour**.
Roll 1=**recover** – go to **3** ; Roll 2, 3, 4=**infect** – go to **4**

**Note:** If you only have six sided dice simply roll again if you get a 5 or 6.

3 **Recovery**: Turn the white counter black

4 **Infection**: Choose a neighbour to infect – use a spinner or a 4-sided die. Remove from the board (temporarily) the counter to be infected
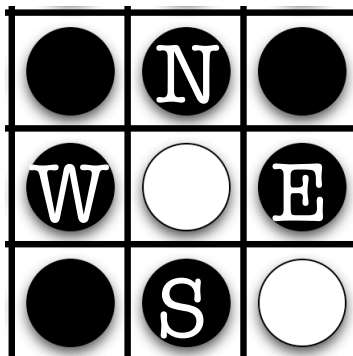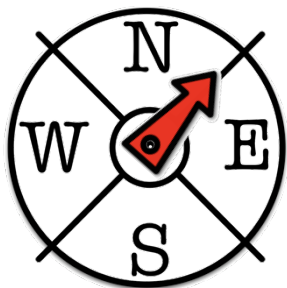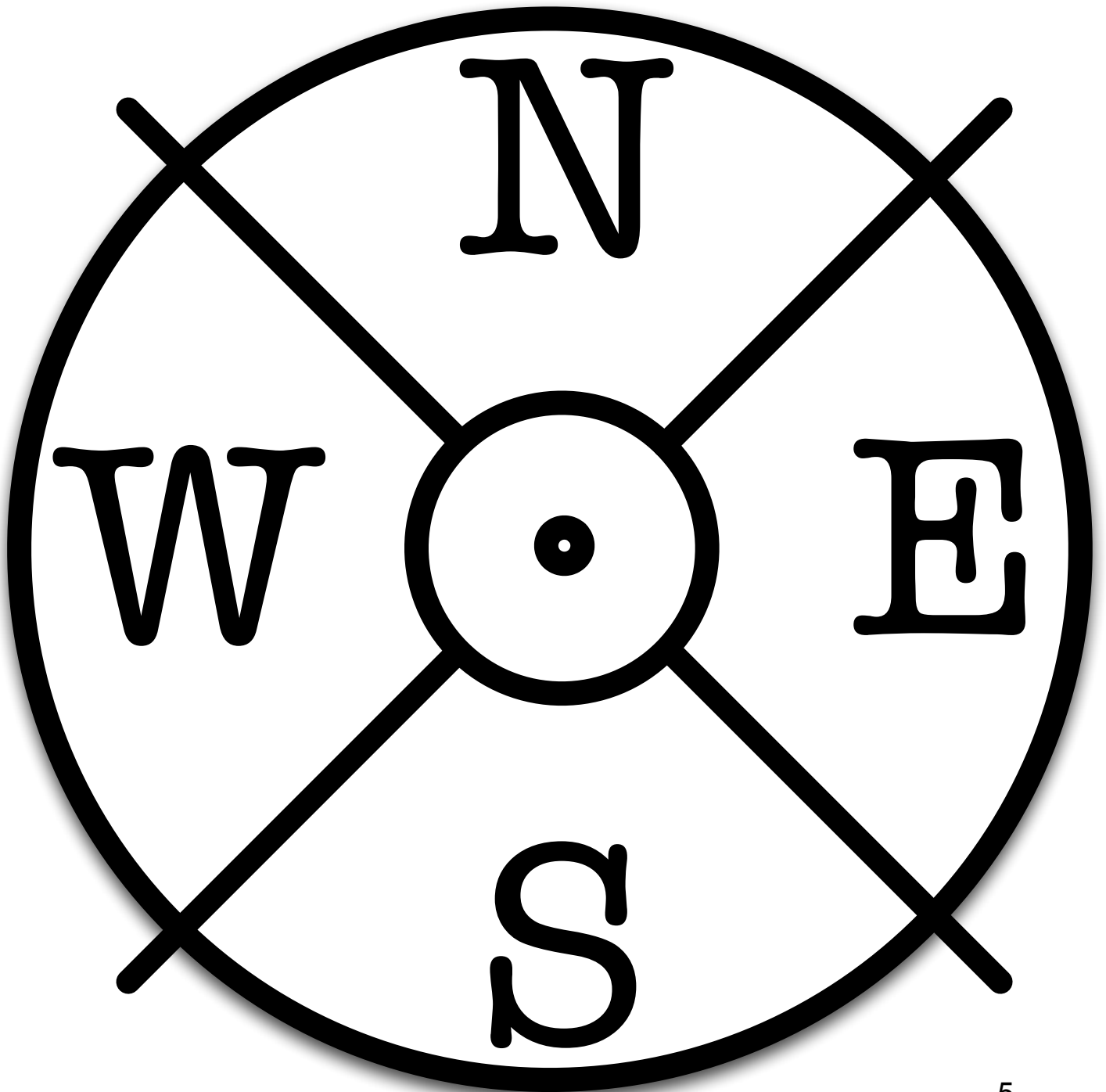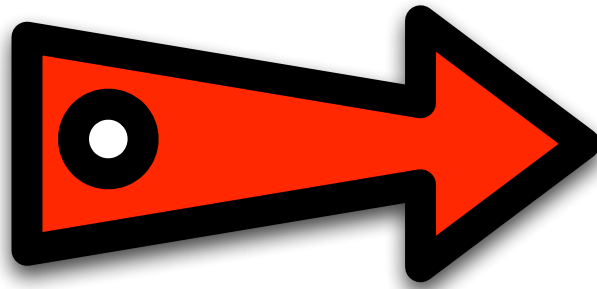
5 Repeat **2**—**4** for each white counter **from the previous round**

6 Fill all empty sites with white counters and start next round at step **2**

Note: whenever a white counter is chosen to be infected nothing happens and the contact has been "wasted".

Game grid template
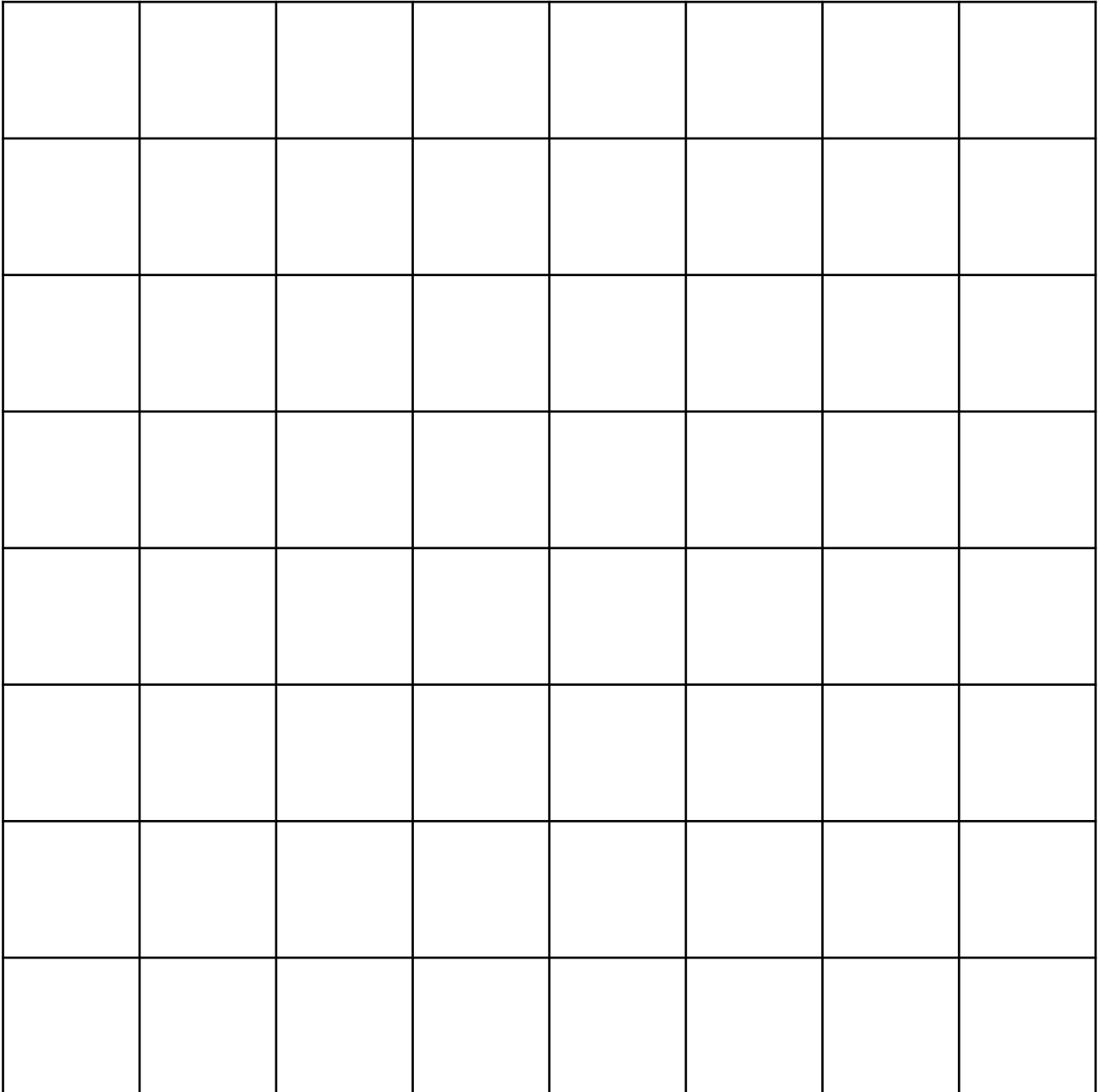
Spinner template

Extending the model

The spatial epidemic model can easily be adapted to model other epidemic situations. *(We don't expect to cover these extensions in VC2.)*

For example:
- Try using a **different probability of recovery**.
- Try adding occasional **"long range" infections** – e.g. by including a segment on the spinner that indicates that infection should jump further than one square away.
- **Include immunity**: rather than allowing individuals to be infected multiple times, what happens if they are immune to further infection? Use a different colour of counters to represent immune individuals.

How do these changes alter the spatial patterns of disease spread in the model?
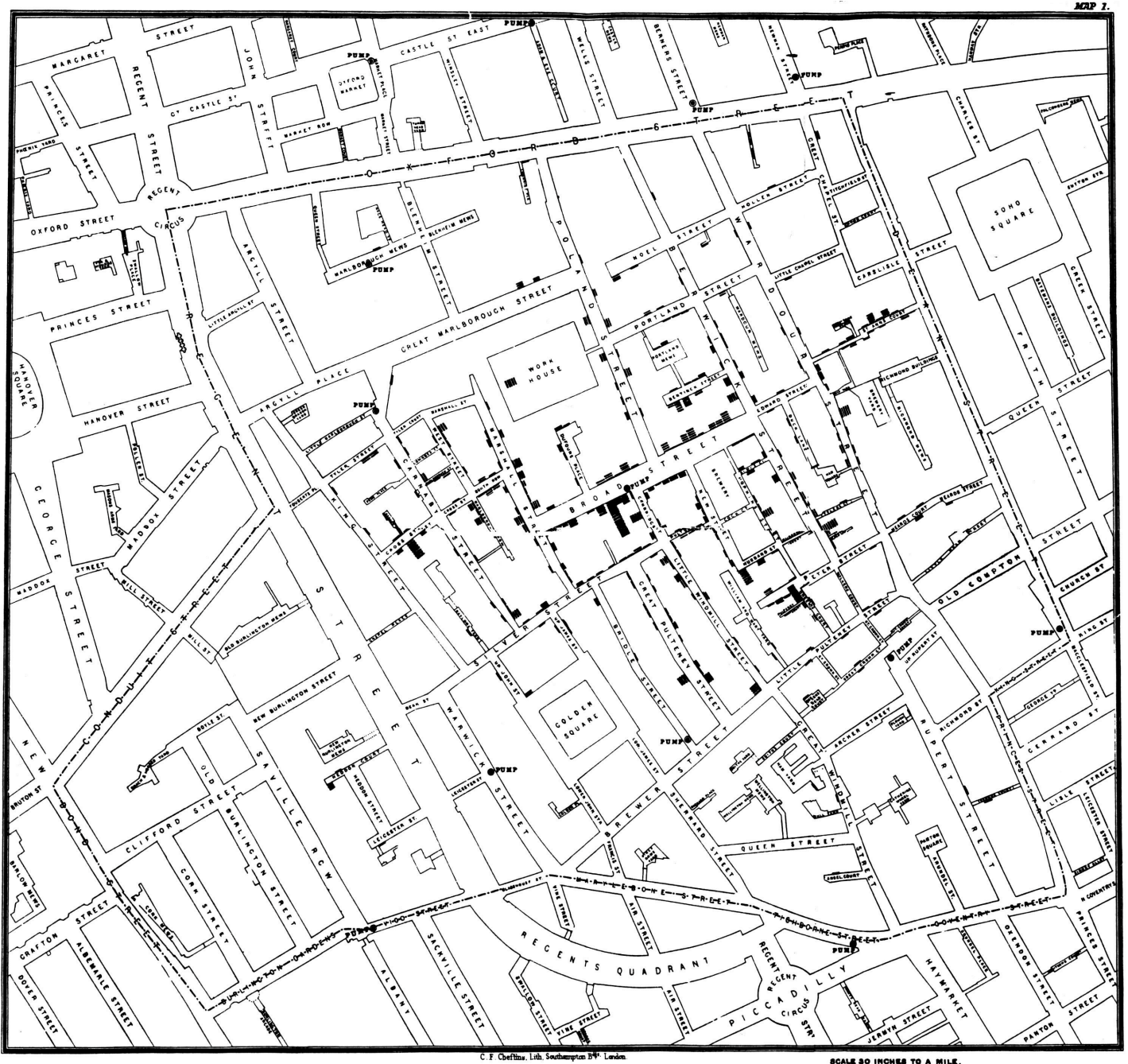
Feel free to devise other versions of the model. What does it miss out? What would you like it to do better?
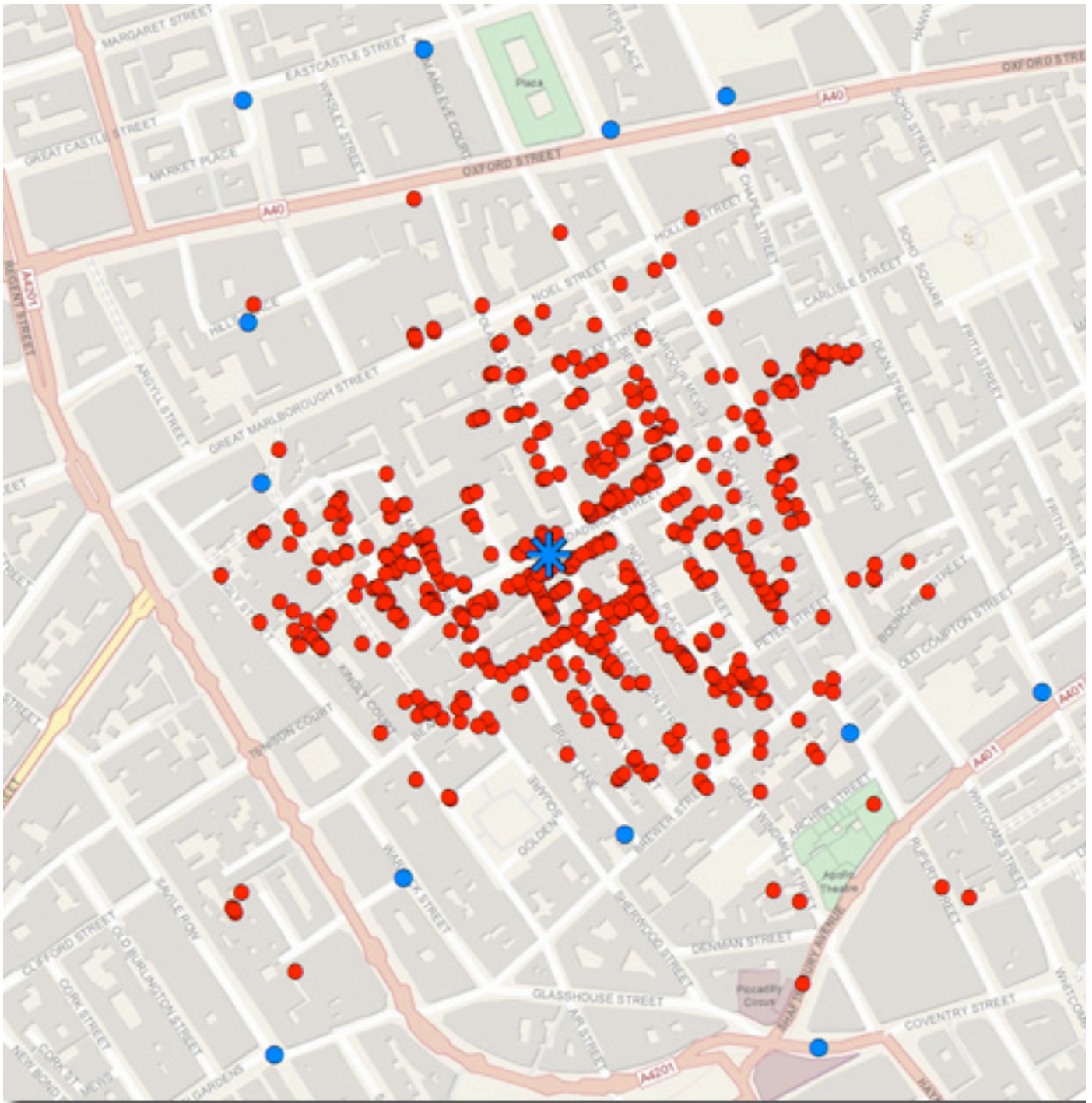
Spinner template, longer-range transmission
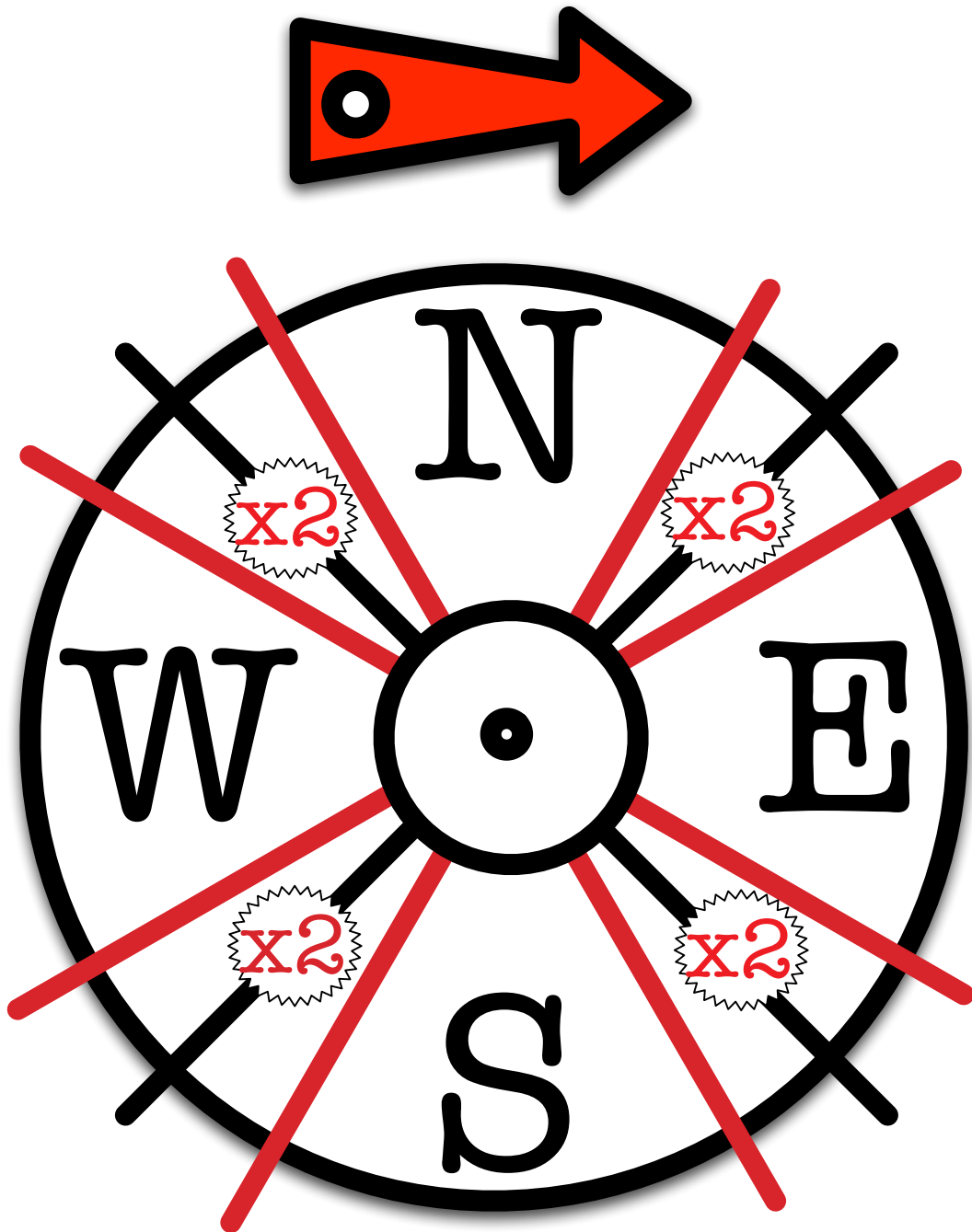
Use the "x2" region to generate infections that jump to 2 squares away (or further, for longer-distance transmission)

John Snow's cholera map

Soho, London, 1854. Each black rectangle represents a cholera death.

John Snow's map, replotted

Cholera cases shown as red circles.
Water pumps shown in blue, with the Broad
Street pump as a blue star.

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