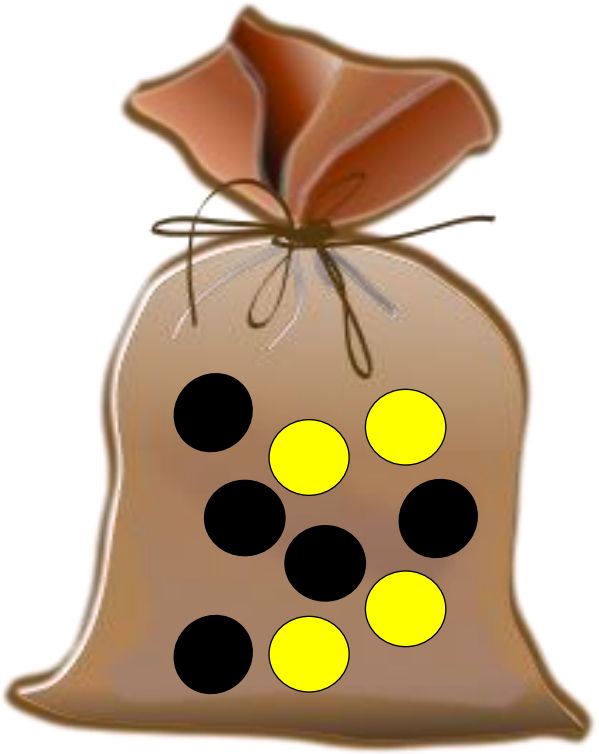
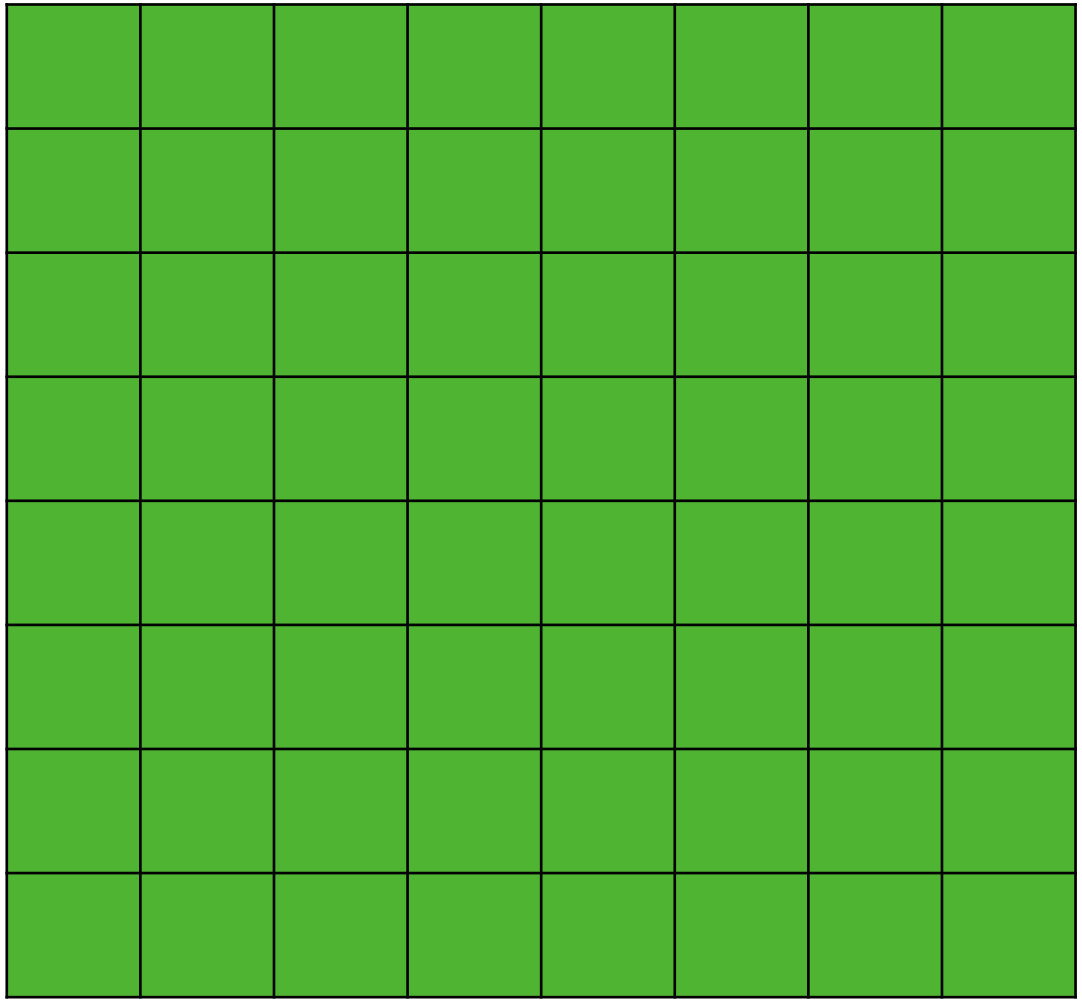
Vaccination game

Vaccination game

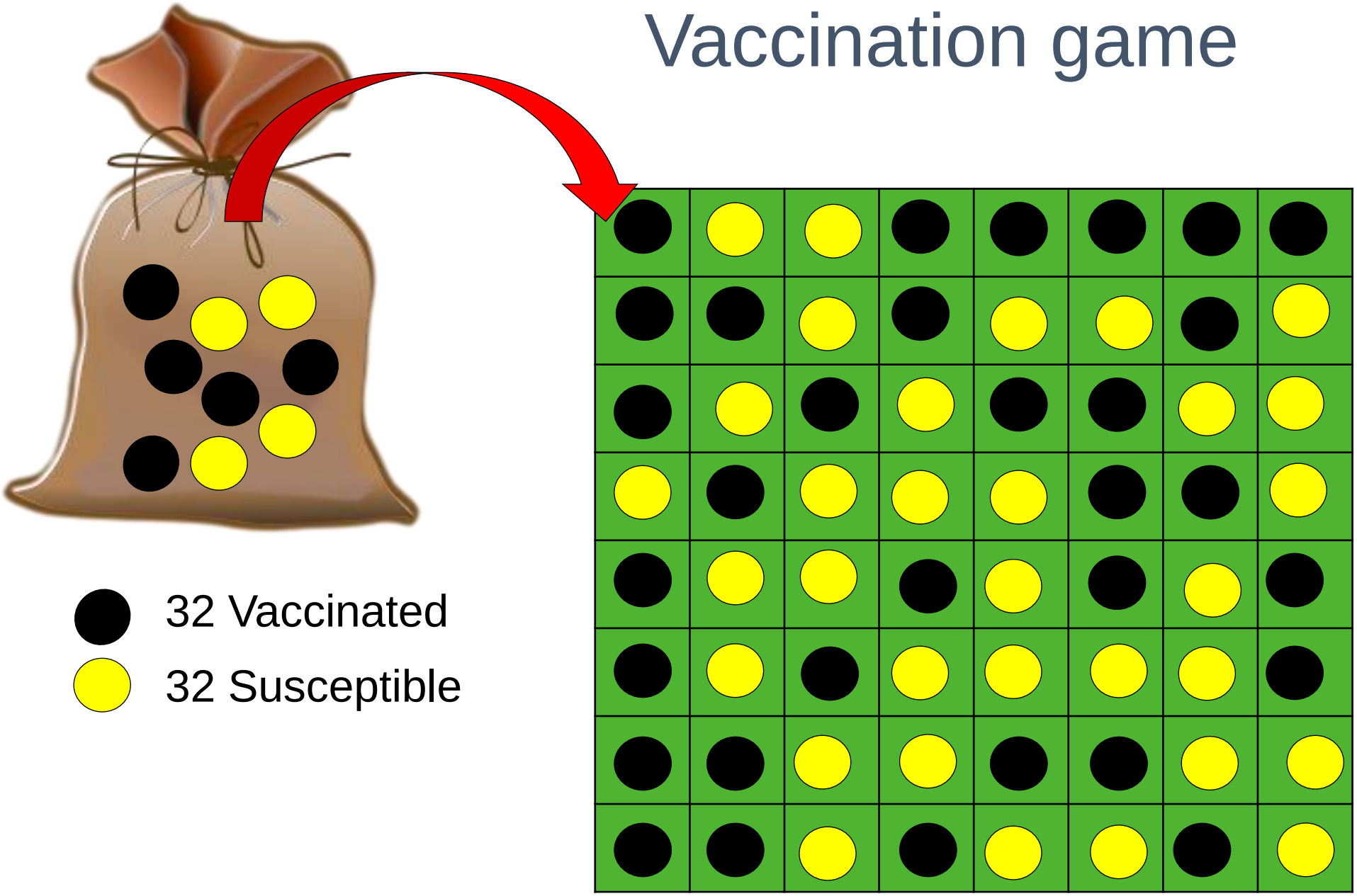


32 Vaccinated

32 Susceptible

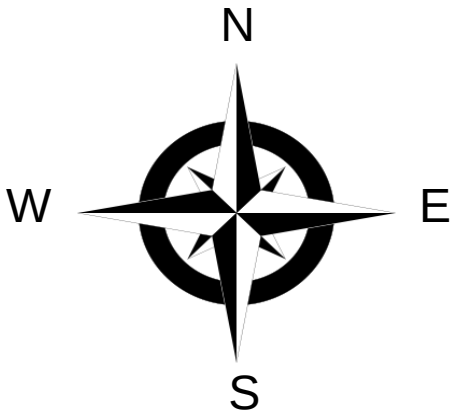


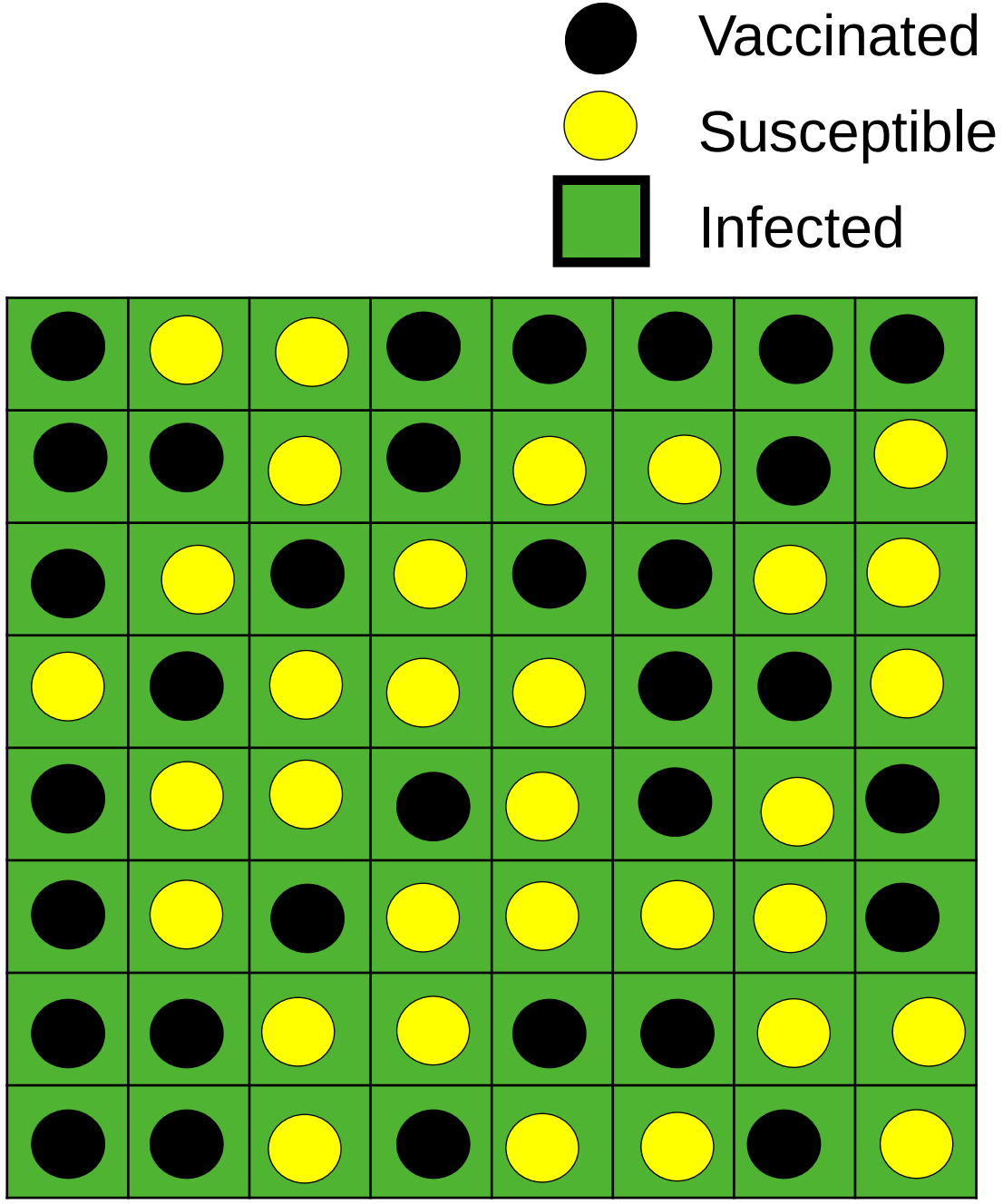
Vaccination game

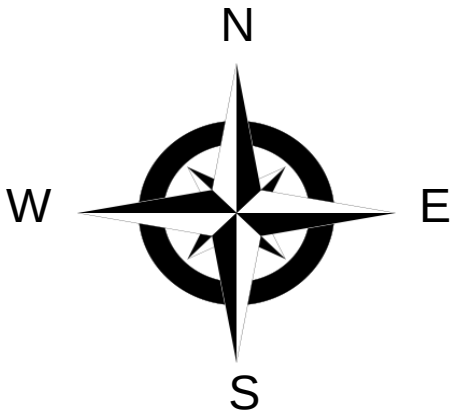


32 Vaccinated

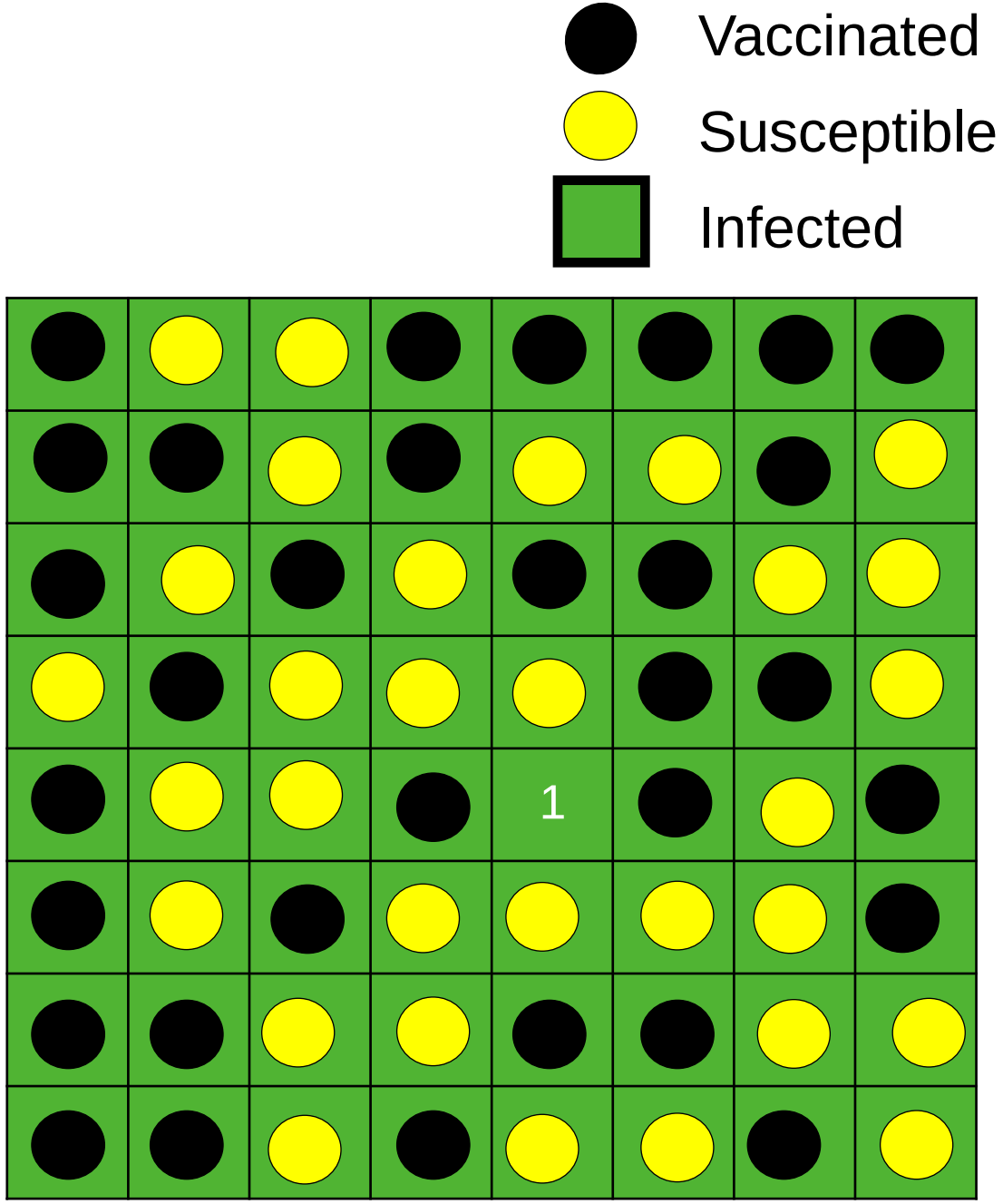
32 Susceptible

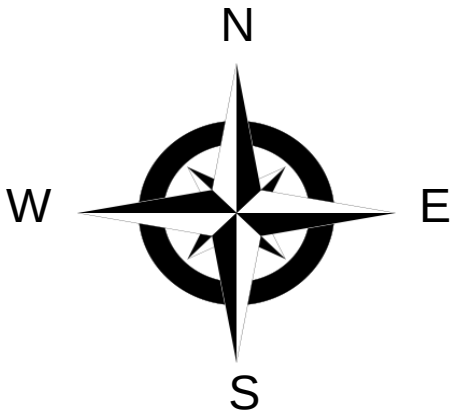

N
W
E
S


Vaccinated
Susceptible
Infected

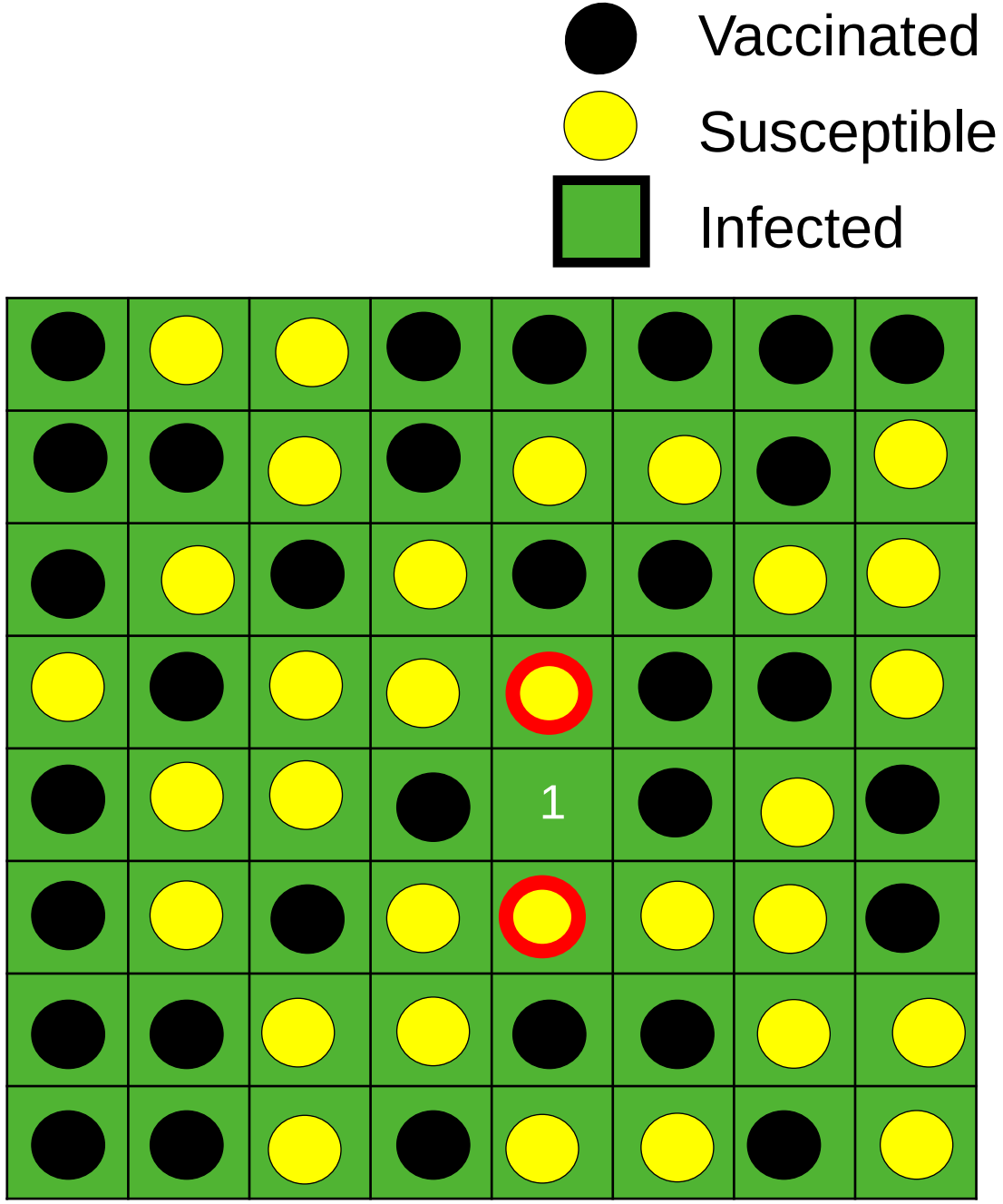


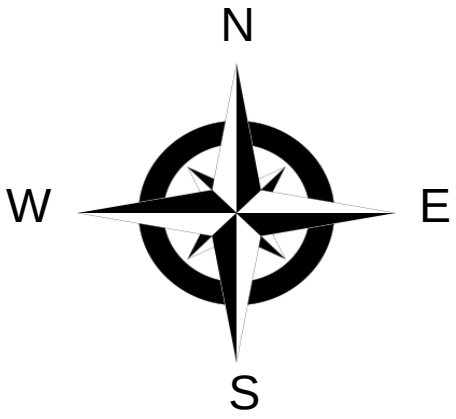
- Remove to create first case



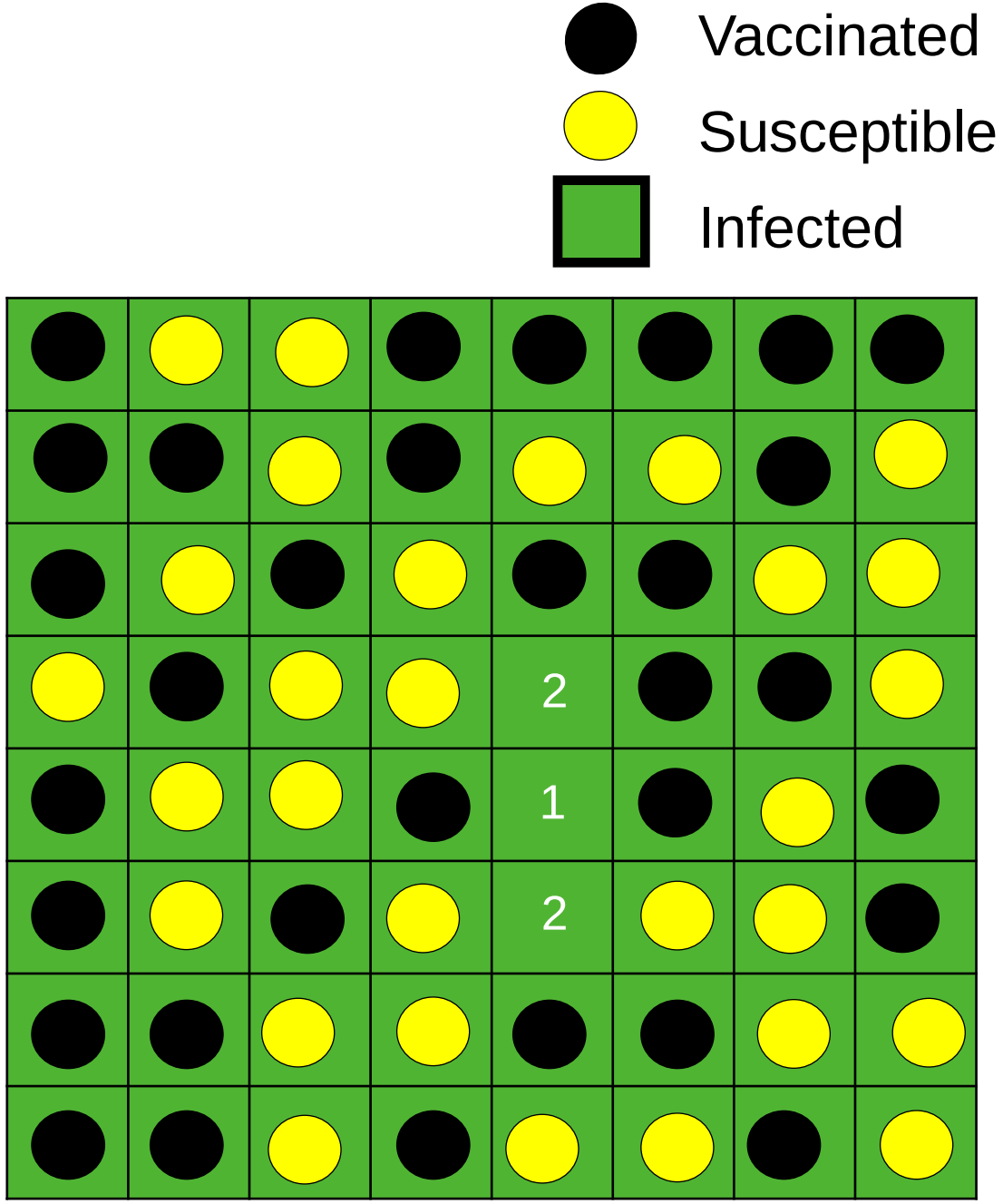


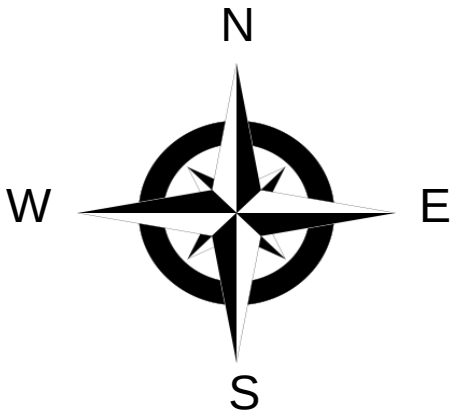
- Remove to create first case
- Infect susceptible neighbours



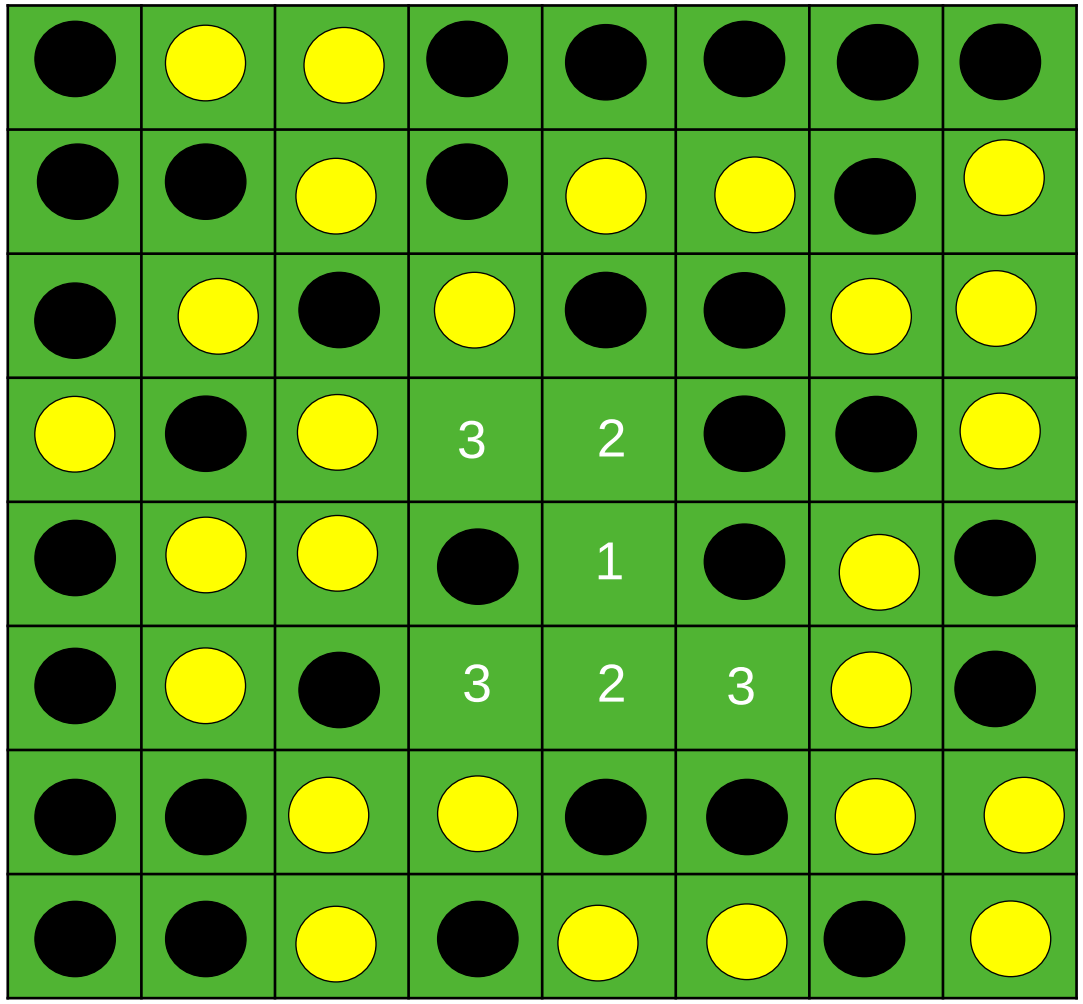


- Remove to create first case
- Infect susceptible neighbours
- Repeat until epidemic over





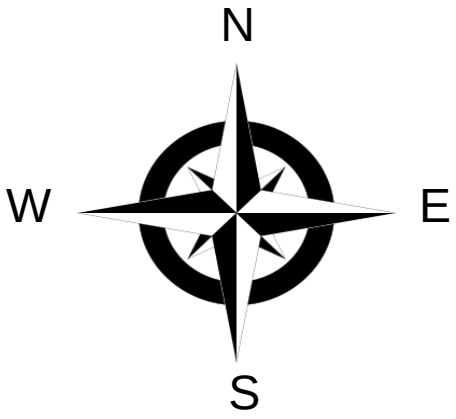
- Remove to create first case
- Infect susceptible neighbours
- Repeat until epidemic over



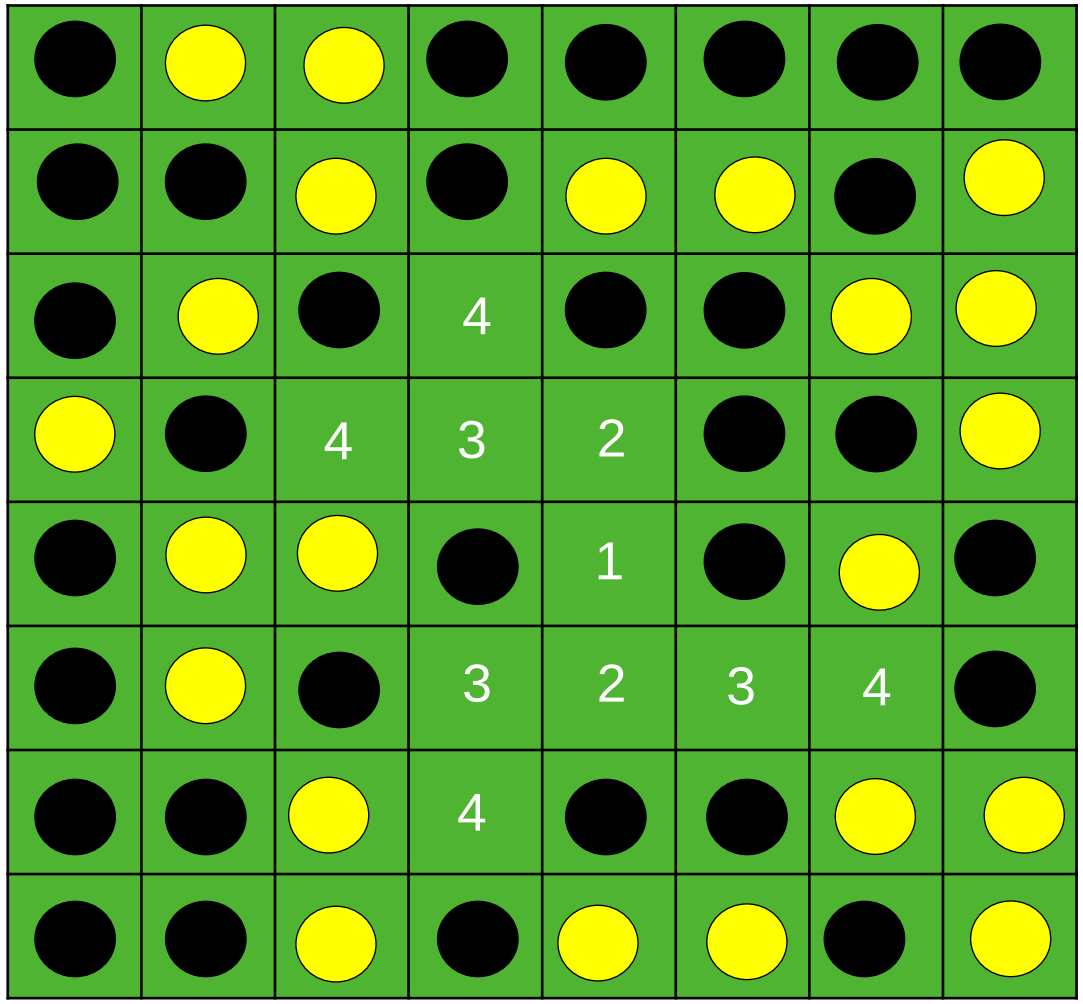
Vaccinated

Susceptible

Infected



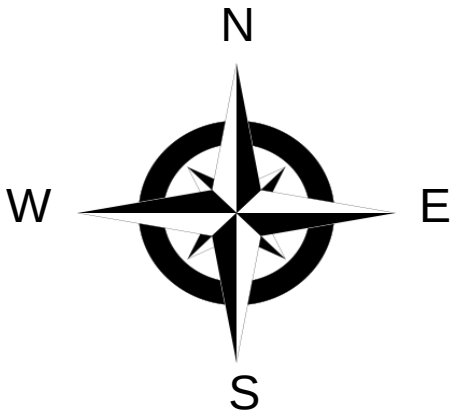
- Remove to create first case
- Infect susceptible neighbours
- Repeat until epidemic over



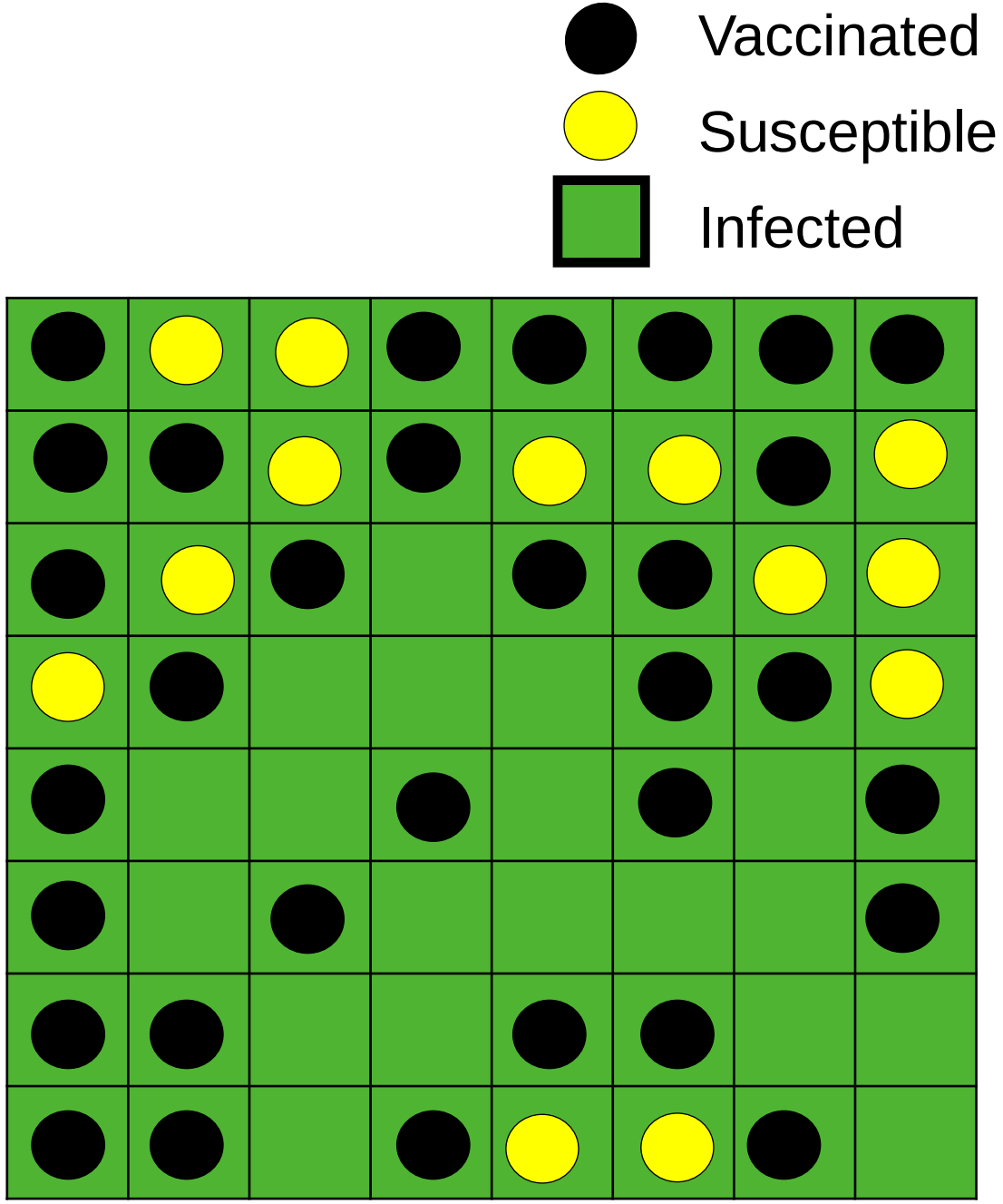
Vaccinated

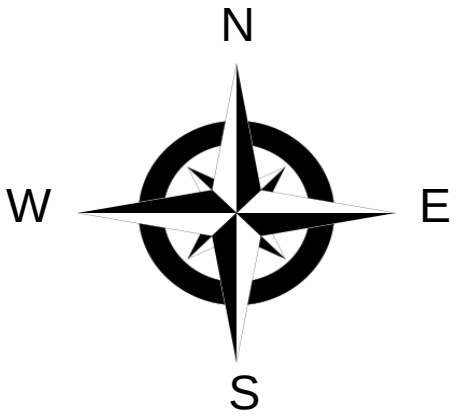
Susceptible

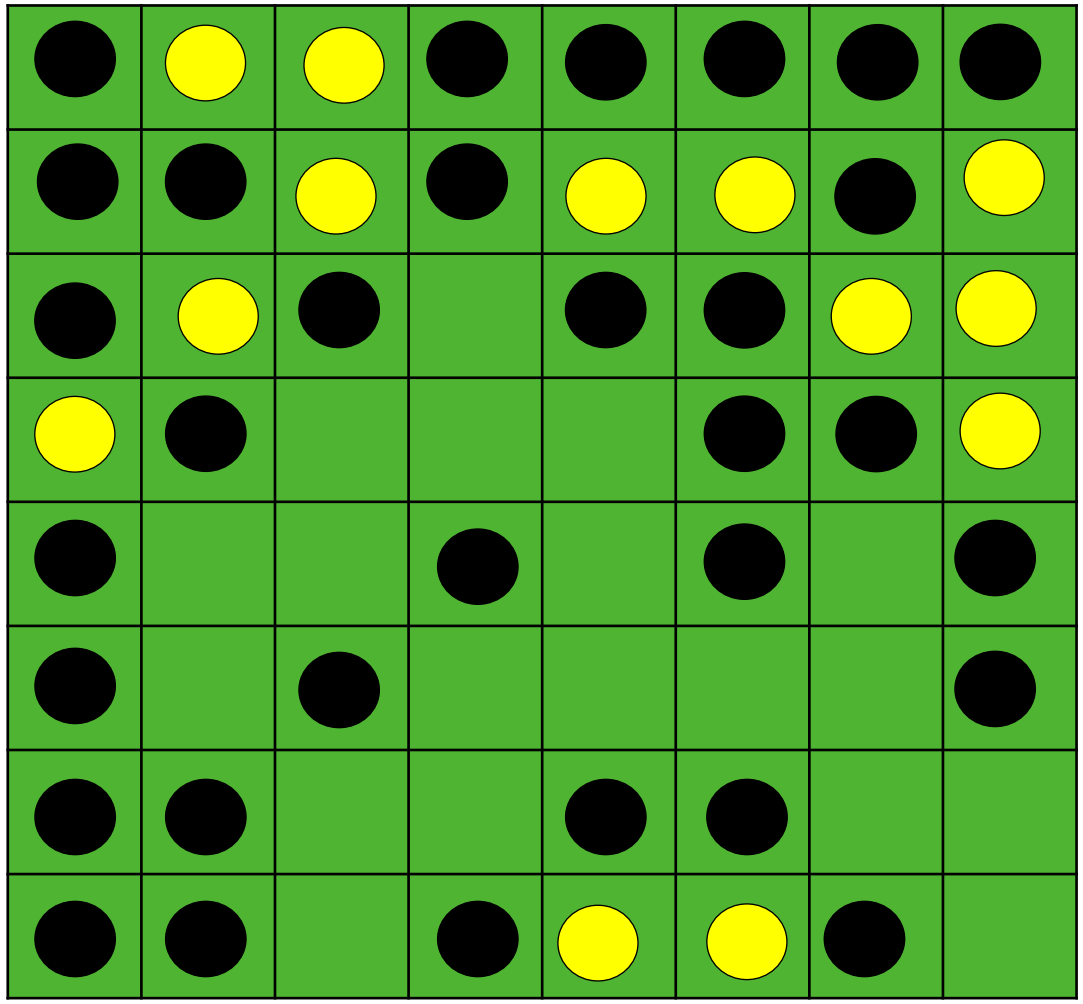
Infected



- Remove to create first case
- Infect susceptible neighbours
- Repeat until epidemic over
- Record total cases







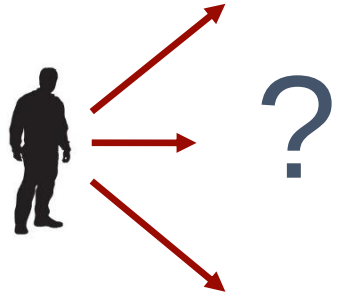
Vaccinated

Susceptible

Infected

- Remove to create first case
- Infect susceptible neighbours
- Repeat until epidemic over
- Record total cases
- Try with 48 vaccinated/16 not

Reproduction number (R_0)

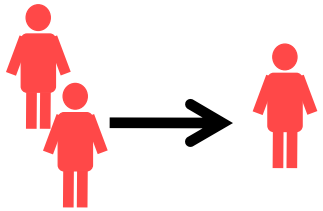


?

R_0 measures how quickly an epidemic will take off…

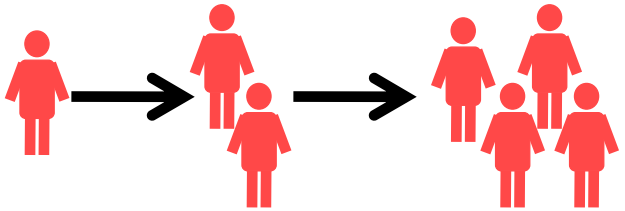
$R_0 < 1$

Cases **decrease** each step



$R_0 > 1$

Cases **increase** each step



Herd immunity

Herd immunity

Proportion of the population we need to vaccinate: $\frac{R_0-1}{R_0}$

• Rabies	0
• Flu	1–2
• Ebola (West Africa)	1–2
• Chickenpox	10
• Measles	16–18

Herd immunity

Proportion of the population we need to vaccinate: $\frac{R_0-1}{R_0}$

	R_0	Vaccinate
• Flu	1–2	1/2
• Ebola (West Africa)	1–2	1/2
• Chickenpox	10	9/10
• Measles	16–18	17/18