



Businesses for Health:
Tuberculosis and HIV

**Businesses for Health Papua New Guinea
COVID 19 TOOL BOX SESSION**

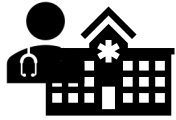
OUTBREAK

What is an outbreak?
What is Herd Immunity?
How many people need to be
vaccinated?



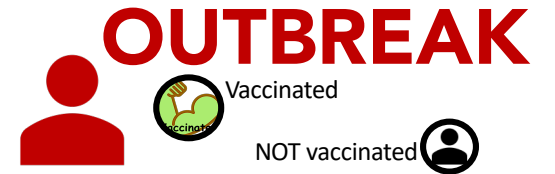
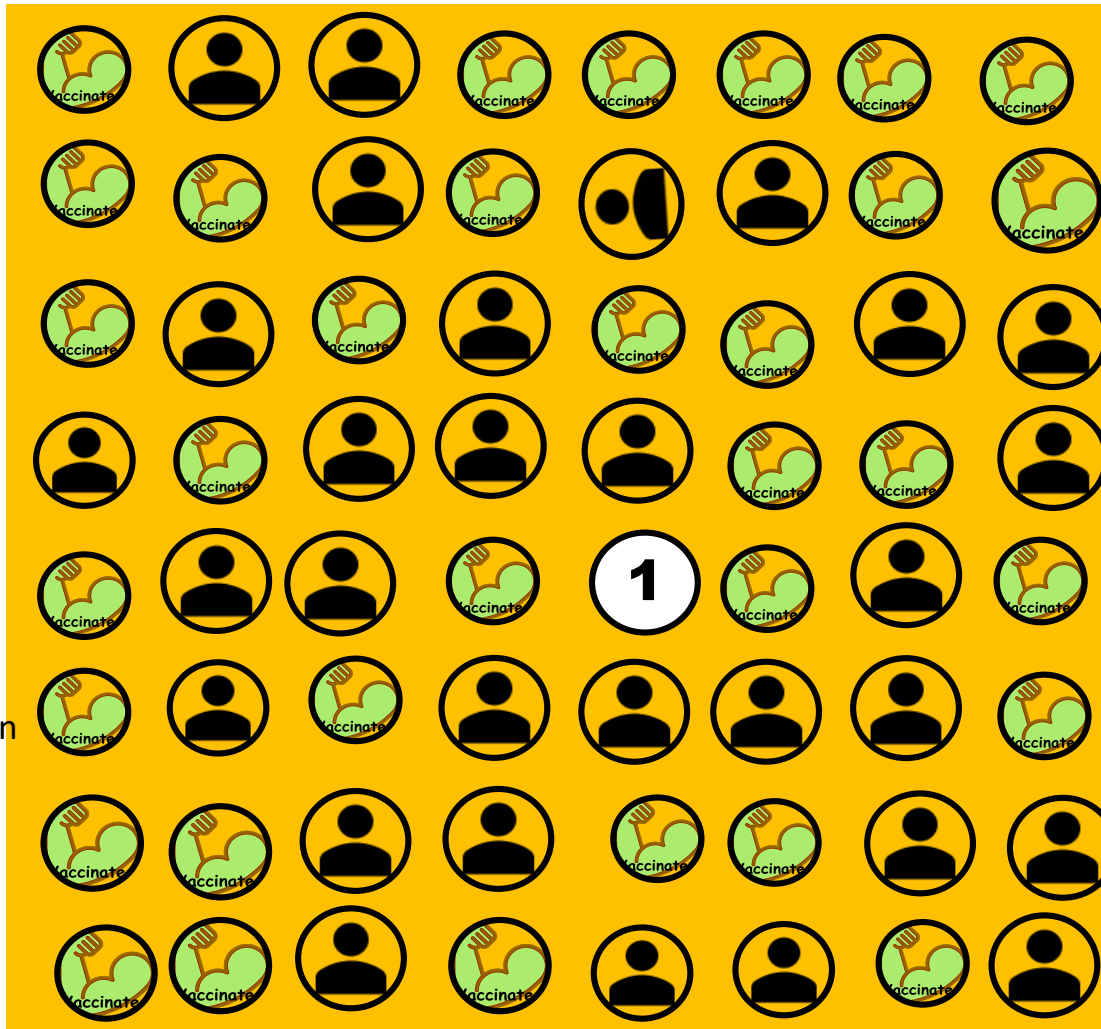
Items in the toolbox

1. Outbreak Animation slide
2. Note on outbreak, vaccinations and immunity for discussion, Q & A
3. Demo Game board to print
4. Outbreak board activity explanation
5. Advanced notes: R_0 the reproduction number
6. Herd immunity
7. Vaccinated game board tokens to print
8. NOT vaccinated game board tokens



Serious cases need hospital care

Read the notes, watch the animation and use the outbreak demo-board to learn more about the spread of infectious diseases



A person (RED) with an infectious disease visits your community.

The RED person infects the first person, who in turn infects the people closest to them.

Vaccination for this disease prevents serious illness or death. Watch what happens when half (32 people) have been vaccinated and half have NOT been vaccinated.

In an outbreak of COVID-19 Some need to go to the haus sik where they infect HWs. Some die, some move away. Some don't even know they are infected.



1 to 3 people may die for every 100 cases

Out of 100 people infected, how many people have serious CCOVID-19 disease?
 How people are likely to die of COVID-19?
 Why doesn't everyone get sick or die?
 With widespread infection in your own community how many do you expect will get very sick or need hospital care?
 Does this scenario demonstrate the value of vaccination? How?

HOW TO PLAY

1. print the green board
2. print and cut up the tokens who represent
3. learn about R_0
4. For round 1 vaccinate 32 people (50%) of your community
5. Watch the animation
6. Discuss

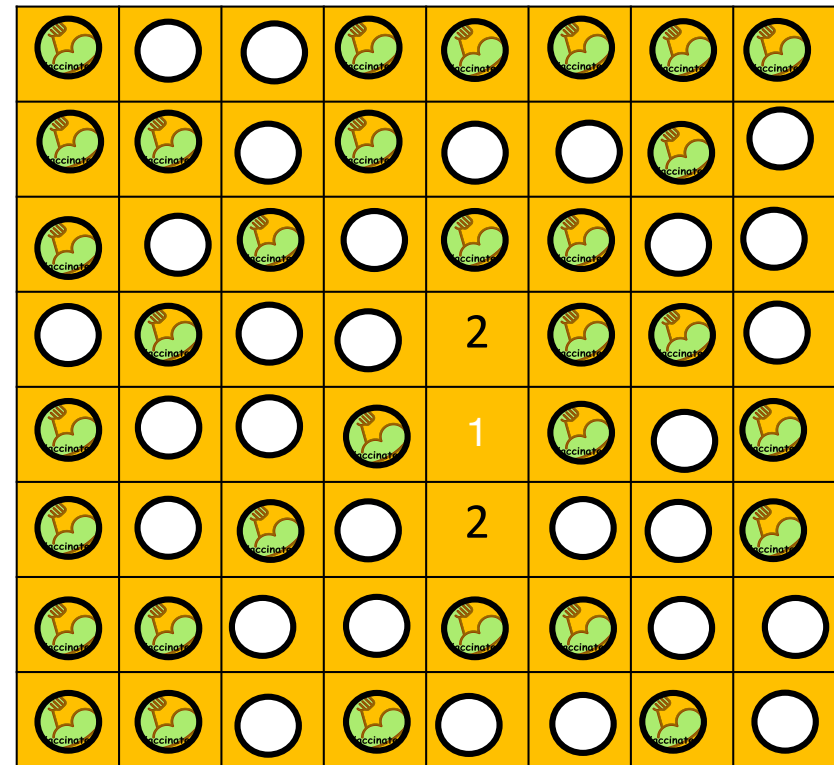
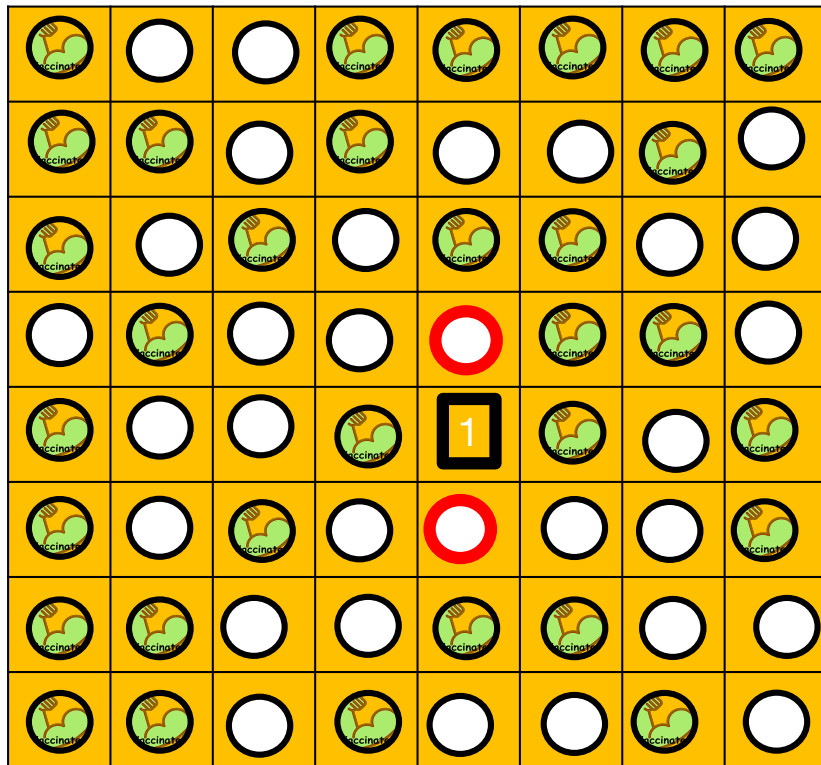
- The green board represents your community or workplace
- Each square is covered by a token (representing either a vaccinated or NOT vaccinated person)
- The first case of disease occurs when you remove a NOT VACCINATED token (person)
- The empty GREEN square represents a person who is now infected and infectious
- To see how an epidemic or outbreak occurs, remove the tokens of NOT vaccinated people above, below or next to the infectious (square) person
- Vaccinated people remain on the board.
- Repeat until the epidemic or outbreak is over
- Watch the animated outbreak with 32 vaccinated & 32 NOT vaccinated
- Discuss who is protected and what we mean by herd immunity and why does R_0 change?





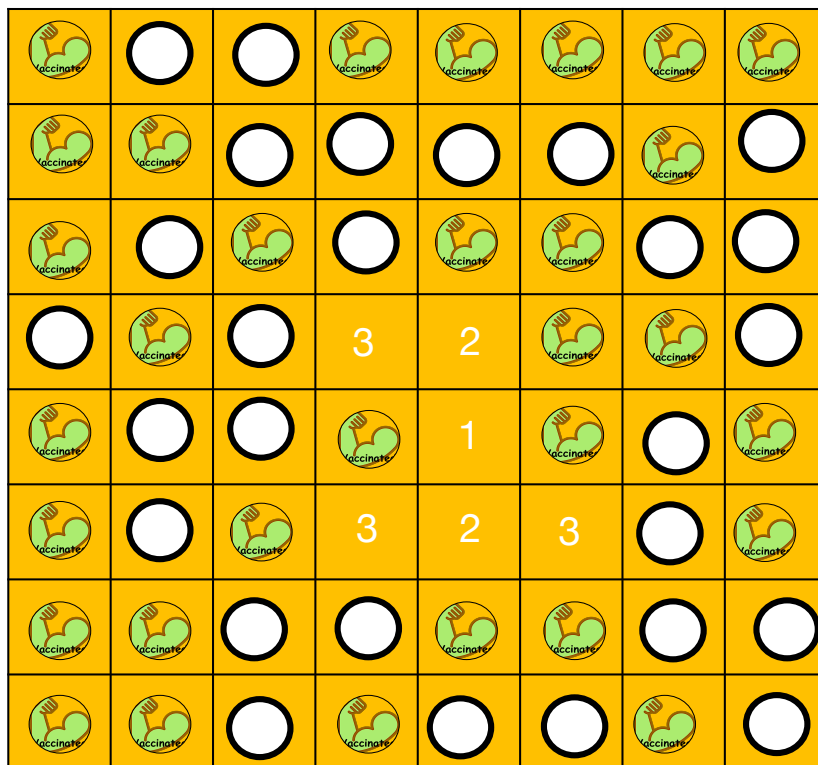
Businesses
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Papua New Guinea
Vaccination
Education



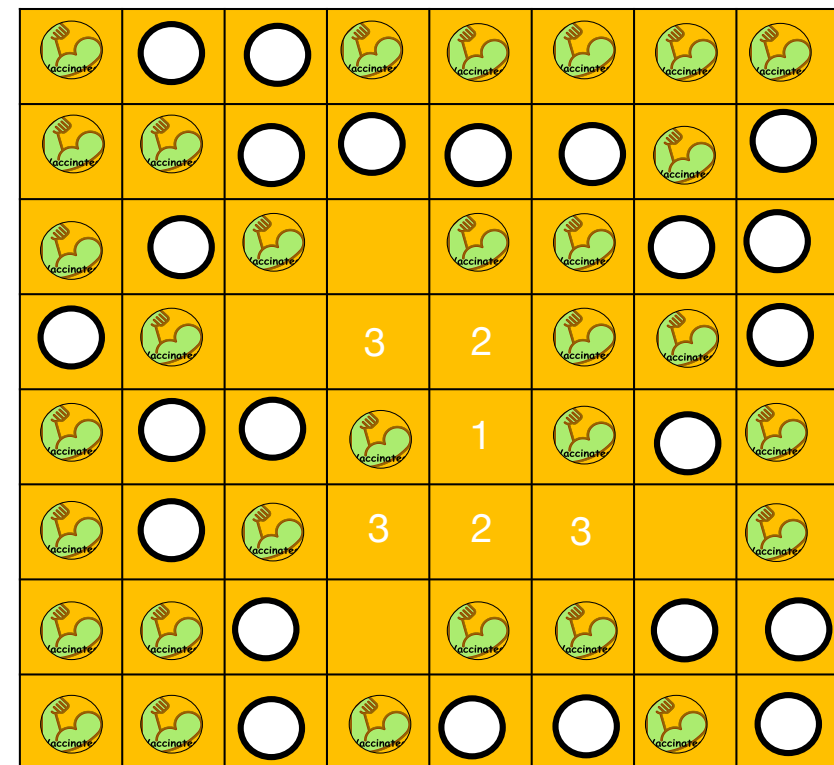


1. Set the board up with 32 Vaccinated and 32 NOT vaccinated people scattered throughout your workplace/community
2. Repeat the outbreak with 48 Vaccinated and 16 NOT vaccinated people. What is the difference in how many infections and how many people are protected by the 'herd'

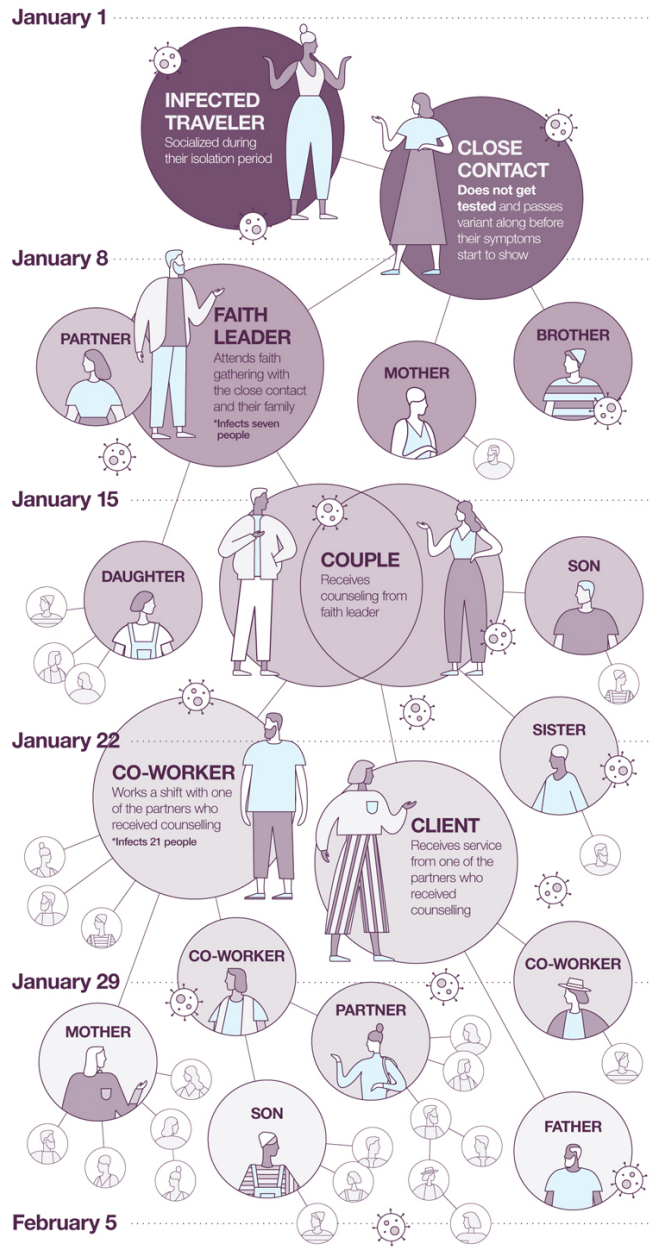
- Not Vaccinated people infect susceptible neighbours, Repeat until epidemic over



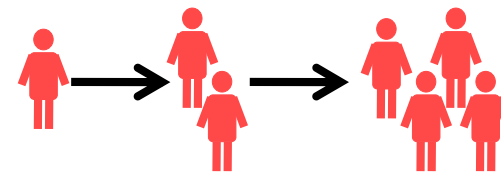
- Where will 4th transmission occur?
- Record total cases
- Repeat the game with 48 vaccinated / 16 not vaccinated



Reproduction Number (R_0)



- Is a measure of how infectious a disease is
- measures how quickly an epidemic will take off...
- $R_0 > 1$ is number of cases increase each step



$$\text{Herd Immunity} = \frac{R_0 - 1}{R_0}$$

Is different for every disease

1. Calculate the percentage of the population we need to vaccinate to achieve herd immunity for these diseases?

- Flu $R_0 = 2$
- Chickenpox $R_0 = 10$
- Measles $R_0 = 18$

Depends on the R_0 (the reproduction number)

2. How many people do we need to vaccinate in PNG to achieve herd immunity for COVID-19 if the

- $R_0 = 2$
- if $R_0 = 5$
- if $R_0 = 15$

