VIRAL CONTAGION

Lesson 4 Context

It is now six months after the outbreak and many things could have happened. The idea behind this lesson is to investigate three possible scenarios that could have happened.

It will require pupils to use different mathematical knowledge from the first three lessons.

The lesson is also designed to stimulate debate around access to medicine and to make pupils question if where they are born makes a difference to their chances of survival and success.

All the figures suggested are supposed represent what might have happened 6 months after the initial outbreak.

Teachers are encouraged to create their own scenarios and the materials and ideas provided here are just possibilities.

Scenario 1 -The virus responded to antiviral drugs

Due to the difference in access to medicine globally the death rate varies from continent to continent. .

Estimates suggest the following death rates for each continent. Pupils will need to use the probabilities to estimate the number of deaths for each continent. This scenario is based on the virus responding to antiviral drugs.

Continent	Human Beings	Probability of Death from Contagion	Number of deaths	
Asia	4,216,000,000	0.3		incorrect
Africa	1,072,000,000	0.5		incorrect
North America	346,000,000	0.04		incorrect
South America	596,000,000	0.25		incorrect
Europe	740,000,000	0.03		incorrect
Oceania	37,000,000	0.01		incorrect
Total Number of global deaths		incorrect		

This scenario provides some very interesting discussion points.

Why are the probabilities of dying from the virus for Asia and Africa higher than those of Europe and North America?

This question brings up the question of access to expensive drugs and of wealth and resource distribution on a global scale.

What percentage of the world population has died as a result of this virus?

Scenario 2 -The virus doesn't respond to antiviral drugs

In the second scenario the virus does not respond to any drugs. This leads to the death rates changing particularly in the richer continents where in some cases the death rate is higher. than in poorer continents.

Continent	Human Beings	Probability of Death from Contagion	Number of deaths
Asia	4,216,000,000	0.4	
Africa	1,072,000,000	0.5	
North America	346,000,000	0.56	
South America	596,000,000	0.37	
Europe	740,000,000	0.61	
Oceania	37,000,000	0.16	
Total Number of global deaths			

What percentage of the world's population has died as a result of the outbreak now.

Scenario 3 – Predicted infection rates did not occur

What was all the fuss about?

In this scenario not nearly as many people died from the virus as was first predicted.

These death rates show that whilst a lot of people still died globally from the virus, the percentage of the world population remained very small.

Continent	Human Beings	Probability of Death from Contagion	Number of deaths
Asia	4,216,000,000	0.02	
Africa	1,072,000	0.03	
North America	346,000,000	0.001	
South America	596,000,000	0.06	
Europe	740,000,000	0.009	
Oceania	37,000,000	0.007	
Total Number of global deaths			

Pupils are asked to prepare the figures for all three of the scenarios and to make sure they can answer questions on this. The idea is that they prepare these figures in groups and that they check each other's figures as they go before presenting to their peers.

At the higher end pupils are asked to work out the estimates for global deaths using upper and lower bounds as well as the given estimates.

For example, from the screenshot above if we took Asia statistics the upper bound would be calculated using 0.025*4,216,000,000 and the lower bound would be 0.015*4,216,000,000. If this is done for each continents statistics it adds a lot more challenge to the task.