Geography of Disease

(Source: Reasoning with Biomedical Evidence: Understanding Disease Spread and Risk at KS3 A 2008-09 project)

Introduction

This project was designed to engage students (aged 12-14 years) with ideas about the spread of disease and risk. Through this project funded by the Wellcome Trust, the GA and Durham University worked with teachers from Maths and Geography departments to explore ways to contribute to the development of spatially aware, informed, numerate citizens through developing a greater understanding and application of a range of complex higher order skills.

In June 2008, an article in the *Independent* newspaper carried a warning from the Health Protection Agency (HPA) that measles had become endemic in Britain. The article cautioned that 'the number of unvaccinated children was now large enough to sustain the "continuous spread" of the potentially lethal virus in the community'. But what has measles got to do with geography? As part of this project, Aston comprehensive school developed a scheme of work that focuses on the global spread of measles, developing key geographical skills in the process.

What are the local-global issues that we and young people need to understand in the early 21st century? In a globalised world the spread of infectious diseases ignores boundaries and potentially affects us all. The education and promotion of healthy citizens who make informed decisions to manage their own well-being is an essential first step to reducing the ever-increasing rise in infections. Geography helps us to explore the distribution and spread of disease, risk taking behaviours, prejudice and lack of understanding of issues such as appropriate methods of control at local, national and international scales.

Thinking geographically encourages us to explore how we are connected personally and in our communities to wider global issues and examine the responsibilities we and young people have to engage in considered action for change.

Understanding and communicating with biomedical data (particularly the risks associated with the spread of disease) is increasingly an urgent component of informed citizenship. Often in school, real-world issues are simplified for pedagogic purposes, usually reducing processes to two variable problems with strong assumptions about causal relationships. However, this not so much simplifies as destroys the authenticity of the material. It is exactly this failing that this project tried to overcome. The focus of the project is on the risk associated with the spread of disease.

The project addressed the following points:

- To what extent can pupils deal with greater complexity in data if they have the appropriate visualisation tools and support?
- Can students better understand critical issues facing themselves and the world if they can reason confidently with numerical data?

Aston Comprehensive School

Lindsay Burgin, a geography teacher from has developed a mini-scheme of work focusing on Measles and AIDS here and in Africa. The project, designed for Year 9 students, runs for ten lessons and encourages students to use and manipulate a range of resources.

Aston's Year 9 students investigated disease at a range scales, from its local impact on families to its national and global contexts. The project develops key geographical skills through map and graph interpretation. Working with statistics allowed students to understand the patterns of disease and identify possible strategies to help improve conditions in the areas most affected.

Refer to the Aston scheme of work and the end of year test. (NB both resources were developed in the context of the 2007 National Curriculum).

St Ivo School, Cambridgeshire

Tuberculosis (TB) was the focus for teachers and students at St Ivo School in Cambridgeshire. Thirty Year 9 students were involved in the assignment, which consisted of four preparation lessons and a mock 'World Health Summit'. Refer to the PowerPoint overview.

In Lesson 1 students were introduced to TB and its global effects before being given the task of interpreting TB trends on graphs. Use of the diamond 9 ranking activity (pictured to the right) encouraged them to rank the causes of TB in order of their significance. Students were then introduced to multivariate data analysis- the multiple data sets allowed the students to explore several trends and identify the factors affecting TB.

World Health Summit

The mock 'World Health Summit' involved several countries trying to eradicate TB. Each country was represented by a group of students who researched and presented the causes and trends of TB in their respective countries. They were asked to prepare a short (5 minute max) presentation/speech about their country to explain the background information to the rest of the summit countries and to include some information on:

- Geographical location & neighbouring countries
- Total population, including density & % urban population
- Life expectancy
- How wealthy is your country? (look at GNI per capita US$ 2005)
- Do you have any debts? (How much?)
- Any immunisations against diseases?
- Estimated number of people with HIV (2005)
- TB rates – how many people have TB? Who has highest levels of TB? (male/female, age?)

In the closing address each country was asked to offer solutions to the TB crisis.

Students were referred to the following sources of information:

- Gabon (GAB) - Demographics, Health & Infant Mortality - UNICEF DATA (Click on country, left hand column under UNICEF type in country name, then look at STATISTICS section)
- *http://en.wikipedia.org/wiki/Bangladesh* (put your own country name at the end of the Wikipedia address)
- The World Factbook - The World Factbook (cia.gov) CIA World FactBook

As a final task students and staff were asked to fill out an evaluation form. Students enjoyed learning about TB, using ICT, graphs and matching statements. However, it was the WHS day and the research it involved that generated the most enthusiasm.

The project was a great success, with students learning many facts and skills. It was an enjoyable and rewarding day for both students and staff.