
Questioning as we learn: An introduction to critical thinking

Material for Higher Education students in Sierra Leone by INASP, UK



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Unit 4 - Snippet 95

You most likely figured out that the diagram in the previous snippet pictures cause–effect relations between air, water & soil pollution, and human health. Have you spotted a few relationships? For example, that air pollution through substances such as lead or carbon monoxide (CO) can cause headaches and fatigue. Water pollution through bacteria, parasites or chemicals can cause gastroenteritis (sickness that involves the stomach and small intestine).

Research has proved relationships between environmental factors and diseases. But be careful and do not jump to premature conclusions in reality. Let's imagine the following scenario:

A community has a battery recycling plant and the factory increases the production of lead over the course of time. At the same time, doctors start to record an increase in patients suffering from headaches and fatigue. Researchers start to investigate possible causes for the increase. The diagram shows some potential causes. For example, the plant could cause pollution of the air with lead which can cause nerve damage in humans and result in symptoms such as headaches and fatigue. Then there could be a cause–effect relationship between the increase in lead production and the air pollution which causes the patients' suffering.

However, it could also be that the root cause is an increase in the population of the wider community. The factory receives more batteries to recycle which leads to higher lead production but there have been built more clinics and medical surgeries, and a higher number of people are visiting a doctor when they are unwell. The increase in recorded numbers of patients with headaches and fatigue is actually caused by more doctor visits and not linked to any pollution through the plant. The lead production and the recorded numbers of headache and fatigue are correlated in the way that they have the same root cause – the economic development of the community – without having a direct cause–effect relationship.

It could also be pure coincidence. For example, a new plant director started around the same time as the community clinic got new management. The plant director increases the lead production and the new clinic management demands more diligent recording of patient cases what results in an increase of recorded headaches and fatigue cases; probably not even an actual increase of unwell people.