

John Snow 1813 – 1858: Constructivism in action

Soho was the site of a terrible and devastating outbreak of disease that killed 600 people within a quarter of a mile in the course of a few days in 1854. But thanks to a local doctor, this was one of the last great Cholera epidemics. His name was John Snow.

Outbreak

Cholera is a horrible disease. Following infection, the patient at first doesn't feel particularly ill, and the first sign is diarrhoea. But this soon gets out of control. Within a short time - often only two or three days - about half the victims will die, mainly of dehydration. It was assumed that cholera was airborne, but Snow was sure this wasn't right. As a doctor he attended many patients without getting Cholera himself. Second, he argued that the infection always seemed to affect the gut before the patient felt generally ill, and this suggested that it was ingested. He published *The Mode of Communication of Cholera* in 1849 - but many refused to abandon the 'miasma' (bad air) theory.

Towards the end of August 1854, he got the chance to prove his ideas in the most dramatic circumstances. During late August 1854, there were a few Cholera deaths in Soho. But during the night of August 31st and September 1st there was what Snow called "a violent increase in the malady". Fifty-six new cases were reported that night. The next day there were 143 new cases, and on 2nd September, 116. And the deaths followed swiftly: 70 on September 1st, 127 on the 2nd.

As soon as he heard how awful the outbreak was, Snow determined to investigate it. To account for such a swift and violent epidemic, he was sure the water must be contaminated, and his suspicion immediately fell on the popular pump that stood at the junction of Broad Street and Cambridge Street. He examined it on the 3rd of September, but found only minimal visible contamination. This wasn't enough evidence. He went to the Register of Deaths and got details of all the deaths from cholera in the Golden Square, Berwick St and St Anne's, Soho, districts that week. Armed with the places where people had died, Snow returned to the streets to find out what had really happened. The most obvious thing was that most of the deaths were close to the pump. In fact, of the 89 who died by 2nd September, only ten lived closer to any other pump, and in five of those cases he discovered that the dead person actually preferred the water from the Broad Street pump, and sent for it specially.

On Poland Street was the Workhouse, with 535 inmates, and surrounded on three sides by houses in which Cholera deaths had occurred. Yet only five people died there. The Work House had its own well. Snow visited Mr Huggins of the Brewery in Broad St. He told him that they, too, had their own well but that as far as he knew the men never drank water at all - they stuck to beer. There were no deaths in the Brewery. But at the

percussion cap factory at No 37 they weren't so lucky. Two tubs of water were kept for the workers, and 18 of them died. The water came from the Broad Street Pump.

Investigation

The cases that clinched it for Snow concerned two ladies who died not in Soho, but in Hampstead, over five miles away, and in Islington, where there was no outbreak. Puzzled, Snow visited the house where one had died, and was told that every day a cart took a large bottle of water from the Broad Street pump all the way to Hampstead because the lady liked the taste. A delivery of water arrived on Thursday 31st August, and she drank then and on the Friday. By Saturday she was dead. The other lady was her niece, who paid a visit, drank the water, and then died at home in Islington.

By the 7th September, Soho was deserted. Three quarters of the people had fled - which helped to slow the outbreak. But there were still 28 new cases that day. In the evening, Snow met the Board of Guardians of St James's parish, and told them what he had found. The handle was removed from the pump the next day - and the number of cases immediately started to diminish.

Investigation of the Broad Street pump revealed what had probably been going on. The well below the pump was about 28 feet deep. At 22 feet down, within yards of the well, there was a sewer. A few people reported that the water had smelt "offensive", or that it "went off" near the time of the outbreak. Snow was now certain that the well had been contaminated with infected sewage - either from the sewer or the many nearby cesspits. As the outbreak continued, the sewage became more contaminated, and so did the water.

What is important about John Snow is his recognition of the power of statistics. He didn't know what the organism was that caused Cholera, so instead he gathered what might have been thought of as 'anecdotal' evidence - stories.

It would have been easy for Snow to dismiss the "constructions" of the local people (the water smelt offensive, there was a change in the water just before the outbreak) especially as the dominant medical theory of the time was that cholera was air-borne spread through miasma. But the cumulative effect of his meticulously gathered data was devastating - and was the beginning of the end for Cholera in Britain.

Although Snow wouldn't have described it like this, the gathering of subjective data, and the process of emergent theory development fit entirely into the constructivist paradigm.