

Surveillance and the arrow of time

*"Time glides by with constant movement, not unlike a stream.
For neither can a stream stay its course, nor can the fleeting hour."*

Ovid, Metamorphoses XV, 180.

From The Arrow of Time A Voyage Through Science to Solve Time's
Greatest Mystery
Peter Coveney & Roger Highfield

The arrow of time is a fundamental characteristic of how the universe operates and as a consequence the fundamental biology of disease processes are time dependent. This is reflected in models of the natural history of disease. The life course of individuals within a population also follows a time dependent sequence. Given the fundamental importance of time's arrow, surveillance is philosophically more attractive than single population based surveys. Time is a continuity and surveillance systems should be designed to reflect that important characteristic rather than a discontinuous series of surveys. There are also serendipitous advantages to continual collection. For example, a continual data collection system can be used to quickly collect information when an important and unexpected event takes place that may affect the health of the population. Three relatively recent examples are murder of prominent public servant in South Australia in 2002, the Twin Towers tragedy in US in September 11, 2003, and the surprise introduction of daylight saving in Western Australia, 1 December 2006. Continual data collection systems provide time related information that can be used to assess the impact of an event, health promotion campaign or the emergence of a new pandemic disease. A surveillance system that reflects time's arrow can assess the magnitude of the impact and the course of the impact over time and nothing else can do that at a population level. Examples will be provided.

**Michael Phillips,
Stefano Campostrini,
Alison Daly, Anne Taylor**