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Space and time seem to play an essential role in health risk perception. A hazard has a footprint in space and time – at any point in time the footprint might be represented as an area, though in some cases a point or line might be adequate, and over time the footprint might move to form a track or trajectory. The footprint of SARS infection risk over the past twelve months is particularly complex, and might be better conceived as a space-time continuous field, with risk quantified at any point and time, rather than as a collection of discrete, moving objects.

My perception of risk is determined by the interaction between the risk footprint and my own location, which is also a complex pattern in space and time. Some hazards require simply that I be located inside the footprint to perceive the risk – earthquake risk is a case in point. In other cases perception of risk is determined by relative location, and by my expectations about distance decay. Some risks require physical contact, or co-location, while in other cases physical proximity is sufficient. I know, for example, that AIDS requires physical contact and am unlikely to feel at risk when close to AIDS infection, but in the SARS case simply being in the same city as SARS infection has led to the perception of risk.

It is clear also that the perception of health risk is to some extent determined by the media, which have their own spatial dimensions. It is still possible in today's information-rich and media-dominated world for entire cultures to be effectively isolated, an obvious example being North Korea. Awareness of proximity to risk is also to some degree media-controlled: I am far more aware, for example, of proximity to SARS risk than to risks of similar magnitude in the Western US from bubonic plague or Hanta virus.

It's obvious that the tools of GIS have a major role to play in handling the data needed to understand these dimensions of risk perception. Less obvious is the fact that the relevant data supply is rapidly improving. Substantial data sets are already available on space-time behavior (tracks) of individuals at spatial resolutions of meters, and temporal resolutions of minutes. It is estimated that there are already 20 million vehicles on US roads with GPS installed, allowing measurement of position at rates as high as 1 Hz. There is interesting research to be done on the parsing of such tracks, to infer behaviors, activities, and events from positions, velocities, and accelerations. For some types of health risk, such as those deriving from environmental exposure, it is clear that much larger extents are required in space and time, and that resolutions can be much coarser.

This optimistic picture of tools and data is not matched, however, by the situation with respect to methods and models. Consider for example a set of tracks for a sample of people over the course of a diurnal cycle. At any fixed time the tracks create a point pattern, for which we have abundant models and methods available. But for tracks we appear to lack even the simplest null hypothesis – what do we mean, exactly, by a random track, and what do we expect about the tracks of individuals? We have not even begun to develop the appropriate concepts, terms, and analytic tools (though see recent work on this by Harvey Miller). Although it is tempting to think of visualizing tracks as three-dimensional structures, using the vertical dimension to represent time, we also lack effective ways of displaying tracks to expose systematic and anomalous behaviors – not surprisingly given the dearth of models and analytic methods.

Hopefully the new abundance of tracking data will lead to a surge of interest in defining appropriate methods and hypotheses. Tracking data also raises a number of social issues: under what circumstances will people allow themselves to be tracked, what constraints will regulators place on tracking data, and will researchers be allowed access to individual tracks, or only to suitably anonymized aggregates?