EDITOR’S CHOICE

Equal, but different? Ecological, individual and instrumental approaches to understanding determinants of health

Editing a journal, even a relatively minor one like the International Journal of Epidemiology, can be hard work, but some things make it very rewarding. The chance to reprint a report from the first Framingham study—a community based prospective investigation of tuberculosis control, initiated in 1917—and commentaries from George Comstock about the study itself,2 Mervyn Susser and Zena Stein about Donald Armstrong, the instigator of the study,3 and William Kannel and Daniel Levy, relating it to the better known Framingham heart disease study initiated a generation later4—is an example of one of these rewards. In the case of the transition from Framingham I (TB) to Framingham II (coronary heart disease) the move was certainly from the community to the individual, perhaps in line with the general tendency of epidemiological thinking over this period.

A second example of the joys of editing is the ability to host an extended debate on an important topic, as exemplified by the exchange initiated by Jose Tapia Granados’ analysis of the effect of short-term economic growth on health.5 To cut a long story short, this exchange6–12 relates to the use of data on secular trends in health outcomes (mainly mortality) in relation to economic indicators to estimate whether short-term economic growth improves or harms health. As Tapia Granados and other commentators point out, formal analytical interest in this issue has existed since the first decades of the 20th century, and while the methods have improved greatly, some of the interpretive issues are similar to those raised in an exchange between Joseph Eyer13 (one of whose papers ‘Prosperity as a cause of death’ admirably adopted a title that summarised its content14) and Richard Cooper15 a quarter of a century ago. The continued focus on this is completely justified, as these are important issues about population health. They are also issues than can ultimately only be addressed by the use of aggregate data.

Analyses of population aggregates—either through secular trend data or through the comparison of health outcomes between areas—are basic epidemiological approaches to understanding the determinants of population health, and ones exemplified in pioneering texts such as the first edition of Jerry Morris’ ‘Uses of Epidemiology’16 50 years ago. In recent years such ecological analyses played an important role in the development of the fetal origins of adult disease hypothesis, as discussed in the cohort profile for the Hertfordshire cohort study, which was set up to follow up on the findings from these aggregate analyses.17 Our second cohort profile also starts with a discussion of ecological analyses of cause-specific death rates within China, which identified clear and important environmental influences on disease risk that are now being investigated in a large-scale cohort study involving half a million people.18 A different scale of aggregate experience is illustrated in our Photoessay,19 which considers how social fragmentation is reflected in very specific features of place.

Ecological studies have other advantages, one of which is that they provide estimates of causal effects that are not attenuated by measurement error (which is discussed in another context by Frost and White in this issue).20 However, they are subject to confounding, as Yoav Ben-Shlomo21 discusses in his editorial. An approach that can help here is the use of instrumental variables (discussed in different contexts in our pages several times in recent years22–23), which have even been applied to such seemingly difficult issues as the one tackled by Houweling et al.24 regarding the association between wealth and child mortality.25 Classical epidemiological designs such as using information on the company providing water supply as an index of water quality (as utilized by John Snow) are, essentially, applications of this approach, a fact that links the instrumental variable and ecological analyses.

A final use of aggregates in this issue of the International Journal of Epidemiology is the entertaining comparison of longevity of popes and artists by Carrieri and Serraino.26 These authors suggest that the longer life expectancy of popes reflects the lives characterized by social instability, high-risk behaviours and geographical mobility (and thus infection risk) of the artists. Certainly the life of one of the artists in Carrieri and Serriano’s sample—Michelangelo Merisi, better known as Caravaggio, illustrates these threats to longevity. He often lived in poverty, who was fond of alcohol (see his self-portrait as the god of wine—known as ‘sick little Bacchus’, reproduced here, Figure 1), left the protection and comfort of the house of one patron because he was fed up with the (healthy) diet of salad, travelled constantly, engaged in frequent fights (one leading to murder), was sexually reckless, and who ultimately ‘died as wretchedly as he lived’ aged 39.27 However, the assumption of better behaviour by the popes is perhaps unjustified. Of the 41 popes who succeeded Pope John VIII in 872 when his attendants beat him to death, a third had unnatural deaths, some at the hands of their successors.28 The incipient papacy John XII was accused ‘of homicide, perjury, sacrilege, [and] incest with your relatives, including two of your sisters’. No wonder it was popularly considered that the antichrist would first appear as a pope. While painting the ceiling of the Sistine chapel in the early 1500s Michelangelo despised of his patron, the syphilitic father of (at least) three, Pope Julius II, in verse:

Of chalices they make helmet and sword
And sell by the bucket the blood of the Lord
His cross, his thorns are blades in poison dipped
And even Christ himself is of patience stripped27
Clearly Michelangelo would have recognized the dangers of assuming that certain aggregate groups, such as popes, were free from the vices of other aggregate groups, such as artists.

GEORGE DAVEY SMITH

References