

## **Epidemiology sustaining rural livelihoods into the new millennium**

Flavio CORSIN, James F. TURNBULL, Nguyen Van HAO, C. V. MOHAN, Kenton L. MORGAN

The science that once protected 18th century mariners on trade routes through South East Asia is being harnessed to sustain the livelihoods of small-scale Vietnamese farmers. James Lind's simple observation that sailors were protected from potentially fatal scurvy by fresh fruit was one of the first practical applications of epidemiology, thus emerged a powerful tool for human and animal health control. The inclusion of lemon and later limejuice in the diet immortalised British sailors as "limeys", 150 years before the discovery of Vitamin C.

Epidemiology embodies a holistic approach based on a simple concept: record in detail the events associated with a natural outbreak of disease, identify the important factors then intervene to reduce its risks. Although the principles are straightforward the application involves both sophisticated mathematics and experimental design.

Surprisingly this study is one of the first uses of epidemiology in aquaculture. The focus is White Spot Disease of shrimp. This killer disease can wipe out whole shrimp crops in days. It is caused by a virus that has spread throughout Asia during the last 6 years, making it impossible to culture shrimp in some areas. For those who wish an end to destructive industrial shrimp farming this may be welcome but it also affects the small-scale subsistence farmers. Among these are communities in the Mekong Delta practising a centuries' old sustainable system of integrated rice-shrimp farming. This system is the sole means of support for a large number of families in Vietnam, where the child mortality (under 5 years old) is more than 6 times as high as in the UK and almost half of children less than 5 are underweight. A successful shrimp harvest has the dramatic effect of raising families above UN poverty thresholds; crop failure drops them to lowest poverty levels. White Spot Disease means damage to the farming system, nutritional deficiency, financial loss, social upheaval and increased vulnerability. In the small district of Can Duoc there are 1,200 families relying on rice-shrimp culture, White Spot Disease caused these people a loss of over £0.5 million in a single year. Conservative estimates suggested that there are over 10,000 families involved in small-scale shrimp farming in the south of Vietnam alone.

The study was conducted over a production cycle in 1998 and within one year of being funded the preliminary results were present to the local communities and local authorities. A great deal of information was produced and this included practical recommendations to the farmers. One of the main routes of spread of the epidemic was through exchange of water. With advice from the research team the local communities and extension workers developed a system of notification to prevent infection spreading between ponds. Another problem was panic harvesting of undersized shrimp at

the first signs of White Spot Disease in an Area. The farmers now have simple guidelines to differentiate White Spot Disease from other problems and therefore do not harvest prematurely and lose the value of their crop.

Epidemiology, which kept 18<sup>th</sup> century British Limeys healthy, is now helping the rural poor to support their families into the new millennium.