the intervention under examination. Of course modelling too has its weak points. Failings in model theory or logic, inaccuracies in model parameters, or omission of key factors can all invalidate results.²⁻³

Modelling has been applied widely in epidemiology, treatment assessment, and healthcare management.⁴ It has been used to assess breast, cervical, and other cancer screening programmes⁵⁻⁶; to assess screening for genetic defects such as cystic fibrosis⁷; and to assess screening for infectious disease, notably HIV,⁸ and non-infectious disease, such as diabetic retinopathy.⁹

The use of modelling in the assessment of screening programmes provides a particularly good example of how the strengths and weaknesses of the experimental and modelling approaches are largely complementary, and how these methods can be brought together to good effect. In Sherlaw-Johnson et al's model, for example, field experimentation and observation were required to establish key parameters, such as the diagnostic accuracy of screening tests or the natural rate of disease progression. Modelling was used to discover how the various components of disease progression and detection interrelated and how their effects unfolded over time, illustrating the power of the modelling approach in bringing together disparate pieces of information into a unified framework. Modelling also allowed sensitivity tests on the effect of uncertainty in key parameters, such as diagnostic accuracy, to be investigated. Other modelling work on screening for cervical cancer has investigated the effect of changes in the screening interval, a parameter that is time consuming to investigate using an experimental approach.¹⁰

Modelling has some less obvious benefits too, as operational researchers and other analysts active in using this approach have discovered. The process of constructing the model promotes systematic thought and generates insights about the nature of its components and how they interact, which may help

identify areas in which empirical research is most needed, help generate new epidemiological or clinical hypotheses, and help produce novel ideas for useful interventions. Modelling can thus support systemic or "joined up" thinking.¹¹ The availability of user friendly computer modelling tools makes the approach more accessible to a wider range of users and often allows a shift of emphasis from mathematical virtuosity towards clinical or managerial relevance.

There is an opportunity for rapprochement in the debate over trials and modelling. Methods for assessing healthcare interventions, such as screening programmes, no less than the interventions themselves, need to be effective and efficient—needs which are most likely to be met through a hybrid approach. Both methods have much to offer and, in proportions appropriate to the situation, both should be used.

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An annoying sound

I must have been asleep for an hour or so. What had woken me? It was an insistent and ominous hissing noise, like the sound of a half submerged ballcock in the cistern. I dragged myself out of bed and padded through to the bathroom. No problem here; but the sound had followed me and was at the same intensity.

"It's obviously the overflow tank in the loft."

Then followed thoughts of an inevitable drip, drip on the ceiling as the fault gathered momentum. Light beneath the door of the spare bedroom indicated that my lodger was still awake, presumably peacefully reading—a young, fit and, I hoped, gallant student architect, a friend of my son, and on a three month placement in Glasgow.

I knocked apologetically and explained the situation. Rod emerged, looking slightly puzzled.

"What is it you hear?"

I described the hissing ballcock, anticipating that around 2.30am water would start dripping through the ceiling.

He moved politely from room to room, ear cocked to catch what to him seemed a strangely elusive sound. Finally, declining my offer to lower the loft ladder for him, and with a look that clearly indicated he considered his landlady was fast approaching

senility, he declared roundly that he could hear nothing, and retired to bed.

Thoroughly aggrieved and deflated, I stood listening to this, by now, deafening noise, which I was sure threatened a cascade through the ceiling at any moment.

"How could he be so heartless? And me a poor elderly defenceless female."

Before investigating the loft myself, as I knew I must, I decided that a strengthening cup of tea was called for. But as I descended the stairs to the kitchen and the decibels did not decrease, the awful truth hit me. I was carrying the ballcock around in my head. I wonder if tinnitus always attacks so suddenly?

Junella McKay, *housewife, Paisley*

We welcome articles of up to 600 words on topics such as *A memorable patient, A paper that changed my practice, My most unfortunate mistake*, or any other piece conveying instruction, pathos, or humour. If possible the article should be supplied on a disk. Permission is needed from the patient or a relative if an identifiable patient is referred to.