

# THIS WEEK

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## Troubling thoughts

*A sustained commitment to mental-health treatment for Fukushima evacuees could also help survivors of future disasters.*

Natural disasters create bold images: winds blow, waves crash ashore, buildings burn. Yet some of the most important long-term consequences are invisible. Survivors can be gripped by anxiety, depression and post-traumatic stress disorder (PTSD) for years after a disaster — especially if they are unable to return home and rebuild.

This is exactly the situation faced by thousands of residents of eastern Fukushima prefecture in Japan, who fled their homes ahead of the meltdown of three reactors at the Fukushima Daiichi nuclear plant in March 2011. As described on page 290, many evacuees are now anxious and depressed about their long-term prospects. Researchers have found evidence that they suffer from elevated levels of anxiety and PTSD-related symptoms, and there are fears that substance abuse and other problems may be on the rise.

Mental health is a major component of the Fukushima Health Management Survey, the government effort to monitor survivors for adverse health effects from the accident. The survey includes a small but competent team of mental-health professionals who are chronicling mental-health and lifestyle issues. Last year, they heard from more than 90,000 evacuees who answered a brief questionnaire about their mental state. The results were not encouraging: levels of PTSD-like symptoms nearly a year after the accident were similar to those of workers who had responded to the 2001 attacks on the World Trade Center in New York.

The health survey's goal is not simply to record the effects of the accident, but also to support the evacuees. Counsellors targeted nearly 5,000 individuals for follow-up phone calls to discuss any mental-health problems. Unfortunately, a phone call may not be enough. The survey itself had less than a 50% response rate, and those who were called for follow-ups tended to stay on the line for just a few minutes — unwilling or unable to talk in detail about their problems.

The researchers involved in the health survey would like to do more. They want to conduct face-to-face interviews and set up counselling centres. But money is tight and the survey is already over budget. It currently spends about twice what the government has allocated, and budgetary wrangling between the prefectural and central governments could lead to further cuts. In this precarious financial environment, the team has found itself unable to hire long-term staff, or even print pamphlets about mental-health issues for the evacuees.

That is an unfortunate state of affairs because Fukushima presents a good opportunity to learn about the best ways to treat the mental-health problems of disaster victims. Although researchers have chronicled mental-health impacts from diverse crises ranging from 2005's Hurricane Katrina and the 2010 earthquake in Haiti to the ongoing Israeli-Palestinian conflict, the literature on how to actually treat these problems is fairly thin. Fukushima's evacuees are similar to survivors of other events in many ways. Nearly all suffer from sub-clinical symptoms that are difficult to diagnose. The size of the afflicted population makes one-on-one therapy impractical. And the

situation is complicated by a deep mistrust of the authorities, whom many evacuees blame for their present woes. But unlike many disaster zones, Fukushima is a developed region with a well-educated, well-documented and contactable population. Much could be learned by studying and treating these evacuees in the long term.

And the evacuees will need that help. Unlike the survivors of many other disasters (including those who were affected by the tsunami that sparked the nuclear meltdown), Fukushima's nuclear evacuees live in fear of radiation exposure. They worry that they or their children may fall ill from the accident, and their anxiety could grow as the years pass. Nearly half of all Japanese people will develop cancer at some point in their lives, and evacuees will wonder whether that cancer is connected to the accident. Studies of mothers who were evacuated from the 1986 nuclear disaster in Chernobyl, Ukraine, show that this anxiety for their children can last for decades, and

may never entirely go away.

Given all this, the Fukushima Health Management Survey deserves continued and even increased support from the government. Survey scientists should also seek lasting collaborations with researchers outside Japan so that the lessons learned there, so painfully earned, can be shared with the world. ■

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## Knowledge trades

*Institutions must carefully evaluate their researchers' relationships with Wall Street.*

Few researchers would care to put a price on their professional reputation. Yet when neurologist Sidney Gilman decided to divulge confidential clinical-trial data to a hedge-fund manager, he did exactly that. Court documents show that Gilman earned more than US\$100,000 for his illegal tips about the failure of an experimental drug for Alzheimer's disease; the hedge fund made \$276 million in direct gains and avoided losses. After he was caught, Gilman lost not only the cash but also his career, retiring from his position at the University of Michigan Medical School in Ann Arbor.

In recent conversations with a *Nature* reporter, several academics converged in their assessment of Gilman's case, which became the biggest insider-trading case in US history: “stupid”.

Nevertheless, many of these same academics continue to serve as

consultants for the investment industry, where knowledge is money and confidential knowledge is the most precious currency of all. Like Gilman, they participate in 'expert network' firms that bring together academic specialists and clients who seek technical information (see page 280). Such firms do not work exclusively for the investment industry, but hedge funds make up a sizeable part of their business. Expert networks make it easier for researchers to dabble at advising Wall Street, often for clients who do not disclose the companies for which they work.

Undoubtedly, the vast majority of consultations for financial firms do not result in illegal exchanges. Gilman and his alleged hedge-fund co-conspirator were clearly mindful of their transgressions and went to some lengths to evade the barriers to insider trading erected by the expert network that united them in the first place. Experts contacted by *Nature* were confident that they had never divulged confidential information. They were less confident about others, noting that less experienced or over-eager colleagues might be prone to a slip of the tongue here and there.

A small slip can move markets. Telltale cues from body language (a shift in a chair) and tone of voice (a hesitation, a cough) can speak volumes, as can the unguarded answer to one acute question slipped into an otherwise innocuous conversation. Indeed, journalists might find the techniques used by hedge-fund managers to dig out confidential information uncomfortably familiar. Many academics are trained to handle the press; few receive education in how to deal with the financial industry.

The cavalier attitude towards this work is disturbing. For busy physicians, recruitment letters from expert networks are part of a steady flow of surveys and consulting requests that clog their inboxes. Some of the researchers interviewed by *Nature* could not remember which expert networking firms they consult for. Consultations were often viewed as an easy way to pick up a little extra cash when time permits, and, if lucky, perhaps have an engaging conversation along the way.

This casual approach extends to institutions, many of which are well versed in negotiating the rocky road of conflicts of interest raised by

consultations for the drug or medical-device industries, but have not explored the issues raised when advising hedge funds. Universities are already wrestling with the mounting requirements from federal funders for the reporting of potential conflicts of interest, and are unlikely to welcome yet another category of extracurricular activities to monitor.

All involved must take the relationship between researchers and Wall Street more seriously. Institutions should discuss the risks involved and,

**"Avoidance may be the best strategy to prevent accidental leaks."**

when warranted, take a proactive stance, perhaps using the Cleveland Clinic in Ohio as a guide. Since 2005, the clinic has instituted a special level of legal review for relationships between faculty members and the investment industry. Physicians who embark on these relationships are given special educational material — which might soon include the

newspaper accounts of the Gilman case.

As US regulators cracked down on insider trading, some researchers cut their ties with the financial industry and expert networks for fear of being tainted by association. Those who still consult for Wall Street often say that they do so to help guide investment in their field. That aim is laudable, but it cannot be used to justify consultation on topics that could overlap with privileged information. For example, a researcher who works on a clinical trial for an experimental diabetes drug should think twice before consulting with a hedge fund about diabetes drugs.

Avoidance may be the best strategy to prevent accidental leaks. The Gerson Lehrman Group, the expert network based in New York that employed Gilman, has policies in place to protect consultants from the consequences of unintended disclosure. Two stand out as potentially the most powerful: an academic can refuse a consultation if the subject matter might tread near confidential information; and he or she can abort a consultation — and still get paid — if a client presses for insider knowledge. So the solution is simple: when asked to disclose confidential information, hang up the phone. ■

# Natural history

*Age-old field methods can tell us more about animal behaviour than can laboratory models.*

**I**n the autumn of 1927, the biologist Francis Sumner spent two months in Florida and Alabama trapping wild oldfield mice for studies of skin pigmentation. With the advice of local farmers, Sumner managed to shoo hundreds of rodents out of their burrows.

Sumner also took the opportunity to document the complexity of the vacated mouseholes, detailed in an article published two years later (Sumner, F. B. & Karol, J. J. *J. Mammal.* **10**, 213–215; 1929). The creatures' burrows included a long entrance tunnel leading to a nest and, in case of an invading snake, a secondary escape tunnel that didn't quite reach the surface, a metre or so from the entrance. Other ethologists have since characterized the humble mouse burrow, the structure of which is seen as a model of complex animal behaviour.

Fast-forward almost a century, and a team led by Hopi Hoekstra of Harvard University in Cambridge, Massachusetts, has elegantly unpicked the genetic basis of this behaviour using a cross-breeding design and cutting-edge genotyping methods. Such work, published in this issue (see pages 284 and 402), should appeal to more than just mouse fanciers. Like few papers before, the work shows how long-forgotten field observations, evolutionary theory and molecular genetics can all be brought to bear on a single question.

We have learned much about the physiology of behaviour from model organisms such as laboratory mice — for example, the

discovery of genes that determine circadian rhythms, which revealed important mechanisms underlying behaviours such as sleep. But decades of selection for convenient traits such as docility have made laboratory models less than ideal for studying the evolution of complex behaviours. They tell biologists little about the vast behavioural differences that can exist between closely related animals, probably as a result of natural and sexual selection.

Scientists interested in probing the behaviour of wild animals can follow Hoekstra's lead and pick animals and behaviours with a rich history of observation and striking differences between close relatives. Decades-old observations of ant behaviour, including those by Edward O. Wilson, culminated in the discovery, published online in *Nature* today, that a social chromosome explains why some red imported fire ant colonies have one queen, whereas others accept multiple queens.

There are, of course, risks to tackling behavioural genomics in wild animals. The ultimate proof of any gene's role in a specific behaviour involves knocking in or out the gene to remove or endow that behaviour. Such experiments are a challenge even in model organisms, and so far few precedents have been set in non-model species.

Model organisms, imperfect as they are when it comes to studying some behaviours, have focused attention on a handful of organisms. If every interesting animal becomes fair game, there is a risk that behavioural genetics will be fragmented. "If everyone does it in their own species, it will not be a very productive type of enterprise," says Laurent Keller, a geneticist at the University of Lausanne, Switzerland, who led the ant research. He suggests that scientists converge on a set of wild animals in which to intensely study behaviour. If the latest research is any indication, such animals will be no strangers to historians of biology. ■

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