20,000 babies were to be recruited nationwide after birth. But between January and early September this year, just 249 women signed up, according to the ESRC, which oversaw the study. A review of the project in July identified recruitment as a major concern, and on 10 July, the ESRC decided that the study should close. The cancellation was publicly announced on 22 October.

PREMATURE DEMISE?

Dezateux and some of her colleagues say that the closure was premature, and that they were not sufficiently consulted on the decision. They accept that recruitment was difficult, a challenge intensified by the study's remit to include a substantial proportion of families from ethnic-minority and disadvantaged groups, who have historically been particularly hard to recruit.

But the researchers say that they intended to test and refine recruitment methods during the first phase of the study — for example, the team had planned to make the study less burdensome for women by collecting information during a routine ultrasound scan rather than asking for a separate visit — and that the review process did not take such plans fully into account.

Fiona Armstrong, who was responsible for Life Study at the ESRC, says that the research council did indeed consider the researchers' plans to adjust the recruitment process — and consulted the research team as part of that process — but ultimately, it still concluded that "whatever might be done wasn't enough". "We couldn't take the risk of putting more and more money into it," she says. The study consumed around £9 million ($13.8 million), a sliver of the more than $1.2 billion — over 15 years — that was sunk into the US National Children's Study (NCS).

Epidemiologists are drawing parallels between Life Study's demise and that of the NCS. "It's déjà vu all over again," says Mark Klebanoff, a paediatric epidemiologist at Nationwide Children's Hospital in Columbus, Ohio.

Clinical epidemiologist George Davey Smith, who co-directs a separate birth-cohort study at the University of Bristol, UK, notes that a huge challenge for both efforts was that they were trying to provide answers to extremely diverse questions, which put constraints on the studies' designs. For example, assessing inequalities between socio-economic groups requires data from a large, representative population sample that includes disadvantaged and minority groups — whereas answering questions relating to the origin of disease requires the collection of extensive biological samples such as blood and tissues. "It's incredibly sad," he adds of Life Study's end.

"We have to find ways of doing this that pose the least burden possible to participants."

Those involved in both studies hope to salvage something from the wreckage. After the NCS ended, plans emerged for a more modest study of influences on child health; Dezateux says that she and her colleagues are "determined to take forward key elements" of Life Study.

Whether and how such studies can be conducted in future is unclear. Response rates are falling in many surveys and population studies compared with those in decades past, say researchers — perhaps because there are more demands on people's attention. "We have to be mindful of the fact that people's lives are busier than ever," says Klebanoff. "We have to find ways of doing this that pose the least burden possible to participants."

Scientists need to exploit existing data sources more, says Stoltenberg. Extensive databases of health, educational and income data exist in many countries and provide vast amounts of information on the cheap — as long as people consent to their use. In Norway, such databases have been crucial to the success of its national birth-cohort study, which is following more than 100,000 children, she says.

But it is important to create systems through which information can be more easily extracted from such databases for use in cohort and other types of research, she adds. "We don't have the infrastructure," she says. "We're trying to drive sophisticated vehicles like birth-cohort studies where there are no real roads." ■

PLANETARY SCIENCE

Falling junk has scientific value

Astronomers prepare to observe an impact off Sri Lanka.

BY TRACI WATSON

Researchers call it sheer coincidence that a newly discovered piece of space junk is officially designated WT1190F. But the letters in the name, which form the acronym for an unprintable expression of bafflement, are an appropriate fit for an object that is as mysterious as it is unprecedented.

Scientists have worked out that WT1190F will plunge to Earth from above the Indian Ocean on 13 November, making it one of the very few space objects whose impact can be accurately predicted. More unusual still, WT1190F was a 'lost' piece of space debris orbiting far beyond the Moon, ignored and unidentified, before being glimpsed by a telescope in early October.

An observing campaign is now taking shape to follow the object as it dives through Earth's atmosphere, says Gerhard Drolshagen, co-manager in Noordwijk, the Netherlands, of the European Space Agency's near-Earth objects office. The event not only offers a scientific opportunity to watch an object plunge through the atmosphere, but also tests the plans that astronomers have put in place to coordinate their efforts when a potentially dangerous space object shows up. "What we planned to do seems to work," Drolshagen says. "But it's still three weeks to go." ▶

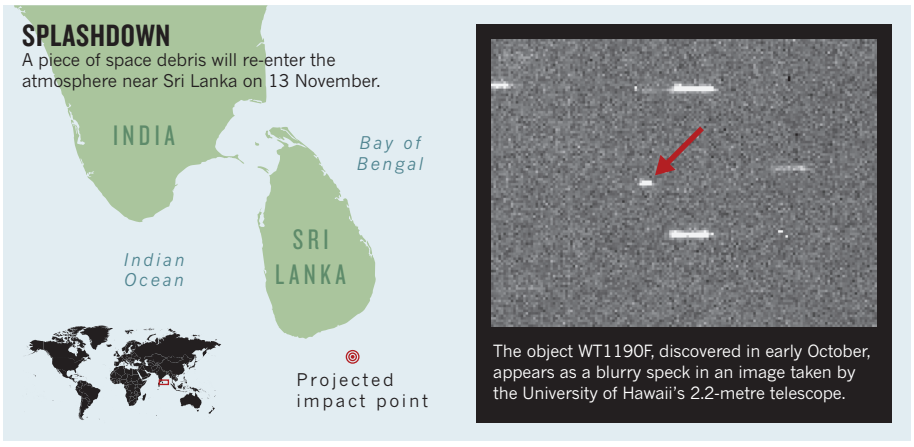

IMAGE: B. BOLIN/R. JEDICKE/M. MICHELI/ESA/SSA

WT1190F was detected by the Catalina Sky Survey, a programme based at the University of Arizona, Tucson, aimed at discovering asteroids and comets that swing close to Earth. At first, scientists didn't know what to make of this weird body. But they quickly computed its trajectory after collecting further observations and unearthing 2012 and 2013 sightings from telescope archives, says independent astronomy-software developer Bill Gray, who has been tracking the debris with astronomers at NASA's Jet Propulsion Laboratory in Pasadena, California.

WT1190F travels in a highly elliptical orbit, swinging out twice as far as the Earth–Moon distance, Gray says. His calculations show that it will hit Earth at 06:20 UTC, entering the ocean about 65 kilometres off the southern tip of Sri Lanka (see 'Splashdown'). Much, if not all, of it will burn up in the atmosphere, but "I would not necessarily want to be going fishing directly underneath it", Gray says.

The object is only 1 to 2 metres in size, and its trajectory shows that it has a low density, and is perhaps hollow. That suggests an artificial object — "a lost piece of space history that's come back to haunt us," says Jonathan McDowell, an astrophysicist at the Harvard–Smithsonian Center for Astrophysics in Cambridge, Massachusetts. It could be a spent rocket stage or panelling shed by a recent Moon mission. It is also possible that the debris dates back decades, perhaps even to the Apollo era. An object seen orbiting Earth in 2002 was eventually identified as a discarded segment of the *Saturn V* rocket that launched the second mission to put humans on the Moon.

WT1190F is a rare breed of space object. Researchers are currently tracking only 20 or so artificial objects in distant orbits, says Gareth Williams, an astronomer at the Minor Planet Center in Cambridge, Massachusetts. There are probably many more such pieces of space junk in orbit around the Earth–Moon system, but it is impossible to say how many. No others are known to have made the return trip to Earth, although it is likely that some have done so without anyone noticing, McDowell says.

Drolshagen plans to get spectral information on the object, which may help to identify it, and he hopes to coordinate impact observations conducted on ships or aeroplanes. But that may be the end of the concerted effort to study this class of object. Unlike near-Earth asteroids, space debris that flies well away from Earth has not commanded significant amounts of funding or attention. The US military, which tracks space debris, says that it lacks the ability to identify WT1190F or to predict its path.

"There is no official, funded effort to do tracking of deep-Earth orbits the way we track low-Earth orbit," McDowell says. "I think that has to change". ■

ONCOLOGY

Cancer-fighting viruses near market

Anticipated approval in Europe and the United States could spur a promising field with a chequered past.

BY HEIDI LEDFORD

An engineered herpesvirus that provokes an immune reponse against cancer seems poised to become the first treatment of its kind approved for use in Europe and the United States. On 23 October, advisers to the European Medicines Agency endorsed the approval of a genetically engineered virus called talimogene laherparepvec (T-VEC) to treat advanced melanoma. In April, advisers to the US Food and Drug Administration (FDA) did the same, and the agency is expected to approve T-VEC this month.

With dozens of ongoing clinical trials of similar 'oncolytic' viruses, researchers hope that such an approval could generate the enthusiasm and cash needed to spur further development of the approach. "The era of the oncolytic virus is probably here," says Stephen Russell, a cancer researcher and haematologist at the Mayo Clinic in Rochester, Minnesota. "I expect to see a great deal happening over the next few years."

Viral infection can ravage a tumour while leaving abutting healthy cells untouched.

Many viruses preferentially infect cancer cells. Malignancy can suppress normal antiviral responses, and sometimes the mutations that drive tumour growth also make cells more susceptible to infection. Viral infection can thus ravage a tumour while leaving abutting healthy cells untouched, says Brad Thompson, president of the pharmaceutical-development firm Oncolytics Biotech in Calgary, Canada.

EARLY ATTEMPTS

The strategy builds on a phenomenon that has been appreciated for more than a century. Physicians in the 1800s noted that their cancer patients sometimes unexpectedly went into remission after experiencing a viral infection. These case reports later inspired doctors, particularly in the 1950s and 1960s, to raid nature's viral cupboard. Clinicians injected cancer patients with a menagerie of viruses. Sometimes the therapy destroyed the tumour, and sometimes it killed the person instead.

Unlike the wild viruses used in those mid-twentieth-century experiments, some of today's anti-cancer viruses are painstakingly engineered. T-VEC, for example, has been altered to drastically reduce its ability to cause herpes. Researchers also inserted a gene encoding a protein that stimulates the immune system, which makes the virus even more potent against cancer (see 'Going viral against cancer').

As more researchers entered the field and initiated small clinical tests, they began to produce enticing anecdotes. Russell recalls the case of an individual with myeloma who remained sick after undergoing two stem-cell transplants. A tumour on the left side of her forehead had degraded the bone underneath and was putting pressure on her brain. Yet treatment with an experimental virus sent her into complete remission (S. Russell *et al. Mayo Clin. Proc.* **89,** 926–933; 2014). "She's a star patient who convinced us that this oncolytic paradigm can really work," he says.

But statistics — not anecdotes — rule over drug approvals. In 2005, regulators in China approved an oncolytic adenovirus called H101 to treat head-and-neck cancer, after evidence showed that the treatment could shrink tumours. Those trials stopped short of assessing improvements in patient survival — a measure often required for FDA approval. Since then, a medical-tourism industry has built up in China for people who cannot get the therapy in their home countries.

Then, in May this year, a team supported by biotechnology giant Amgen of Thousand Oaks, California, published promising results from a large clinical trial of T-VEC (R. H. Andtbacka *et al. J. Clin. Oncol.* **33,** 2780–2788; 2015). The virus both shrank tumours in people with advanced melanoma and extended patient survival by a median of 4.4 months. Yet statistically, survival benefits fell just a hair's breadth of significance. "That raised the question, 'Well, what is statistical significance? Is this an active agent or not?'" Russell says.

He and others note that the therapy — which must be injected directly into tumours — seemed to rein in cancer elsewhere in the