drug's effects should also be done before its use becomes widespread. And bioethicist Dominic Sisti of the University of Pennsylvania in Philadelphia worries that too many physicians already consider it a standard part of their armamentarium. The way in which ketamine should be administered still needs to be worked out, says psychiatrist Kyle Lapidus at Stony Brook University in New York. He already prescribes ketamine off-label for some patients, and guesses that dozens of physicians across the country do the same. At therapeutic doses, it often produces a dissociative, out-of-body sensation that lasts less than an hour. At higher doses, recreational users report experiencing a 'K-hole', a deeply disoriented state accompanied by vivid hallucinations.

Companies hope to profit by developing patentable variations on ketamine for treating depression. A nasal spray containing a structural variant called esketamine earned a coveted 'breakthrough therapy designation' from the US Food and Drug Administration in 2013. The designation allows its manufacturer, Johnson & Johnson in New Brunswick, New Jersey, to fast-track esketamine through the regulatory process. The company plans to release the results of a 200-person study early this year; its head neuroscience researcher, Husseini Manji, says that initial results "look very good".

Last month, a company called Naurex, based in Evanston, Illinois, released results from a 386-person trial showing that its own ketamine-like drug, GLYX-13, successfully treated depression in about half of patients, without hallucinatory side effects. Roche of Basel, Switzerland, is also expected to release results early this year from a 357-person trial of a drug called decoglurant, which targets the glutamate pathway.

"It blew the doors off what we thought we knew about depression treatment."

It is unclear why ketamine's psychoactive effects are considered a drawback, Sisti says. He questions the ethics of making patients pay more for a patented, non-dissociative drug if unmodified ketamine works just as well.

Ketamine's fast action is particularly promising for suicide prevention, says Carlos Zarate of the NIMH. Instead of being committed to institutions for weeks of treatment, people who have just attempted suicide might be treated with ketamine and released in days or even hours. Zarate has found that ketamine seems specifically to affect the desire to attempt suicide, whether a person is clinically depressed or not (E. D. Ballard *et al. J. Psychiatr. Res.* **58,** 161–166; 2014). That observation suggests that suicidal behaviour might be distinct from depression. Zarate is using ketamine to treat around 50 people with depression, some of whom have suicidal thoughts, to study these effects.

Early this year, his group will begin a multi-year study of people who have attempted suicide within the previous two weeks, imaging their brain activity and comparing them with people who attempted suicide more than a year previously and with people with depression who have never attempted suicide. Those who have recently attempted suicide will be enrolled in a clinical trial of ketamine; at the same time, Zarate hopes to learn more about what an actively suicidal brain looks like. ■

CORRECTION

The News Feature 'Keeping the lights on' (*Nature* **515,** 326–329; 2014) incorrectly stated that the Boston Biomedical Research Institute went bankrupt and closed in 2013. It closed its doors under financial duress, but did not go bankrupt. The story also states that funds for indirect costs cannot be used to support researchers who lose grants or have yet to win one. Because the money from indirect costs goes into a general fund, institutions may spend it any way they wish, but these expenses cannot be reimbursed as indirect costs.