

“moderately enriched” to less than 4.5% ²³⁵U. It is unclear what material the Iranian official was referring to in his 25 January claim, but it is presumed to be 1,200 kilograms of moderately enriched uranium hexafluoride. If further enriched, this could yield more than 30 kilograms of weapons-grade uranium, enough to build one fission bomb.

How quickly could Iran make a bomb once it has enough weapons-grade uranium?

Possessing fissile material is not enough: a country also has to master the design and manufacture of a bomb. In particular, uranium hexafluoride must be converted to uranium metal, which is not straightforward, says Richard Johnson, a proliferation specialist at the Nuclear Threat Initiative, a policy research centre in Washington DC. According to Albright, some intelligence agencies estimate that it could take Iran about two years to make its first two bombs if it wanted to do this.

If the nuclear deal is scrapped, will Iran be legally entitled to go nuclear?

No. Because Iran has signed the NPT, it is committed to using nuclear technology exclusively for peaceful purposes. Members of the NPT must allow the IAEA to verify their compliance, or face consequences. But Iran could withdraw from the NPT, as North Korea did in 2003, as it was becoming a nuclear power. Iranian foreign minister Mohammad Javad Zarif said on 20 January that the country is prepared to withdraw if its continued enrichment programme is reported to the UN Security Council.

So is Iran actively working towards a nuclear bomb?

“All the signs are that they are not,” says Zia Mian, a physicist and nuclear-policy expert at Princeton University. The country has complied with the rigorous IAEA inspection regime set out in the JCPOA. This means that a nuclear-weapons programme is “either hidden so well that no one has been able to find it so far, or that there is no such crash programme”, he says. Albright agrees, saying that Iran could be stockpiling enriched uranium to increase its leverage in future negotiations. “You don’t see some of the indicators that would imply a well worked-out decision” to actually build bombs, he says. But expanding stockpiles of enriched uranium brings the country closer to being able to make a nuclear bomb — if it wishes.

By Davide Castelvecchi



CHRISTOPHER FURLONG/GETTY

The Xhosa people have greater genetic diversity than do people of non-African descent.

AFRICAN SCHIZOPHRENIA STUDY IDENTIFIES DAMAGING MUTATIONS

Genetic studies of mental illness have largely been conducted in people with European ancestry.

By Alison Abbott

The first genomic analysis of schizophrenia in an African population has identified multiple rare mutations that occur more frequently in people with the condition.

The mutations are mainly in genes that are important for brain development and the brain’s synapses, structures that coordinate communication between neurons. The findings, published on 31 January (S. Gulsuner *et al. Science* **367**, 569–573; 2020), match those of other schizophrenia studies — but nearly all previous research has been conducted in European or Asian populations.

This research is important because Africa has represented a big gap in the populations that geneticists have studied, says psychiatric geneticist Andreas Meyer-Lindenberg, director of the Central Institute of Mental Health in Mannheim, Germany. He says that the work lends support to current hypotheses about the biological origins of schizophrenia, which can cause hallucinations and delusions. Researchers think that each mutation contributes a small amount to the overall risk of developing the condition, and that disruption to synapses could be crucial to the disease’s development.

Geneticists have long been criticized for failing to sample diverse populations for genomic

studies, which have largely neglected African people. “This urgently needs more attention,” says Ambrose Wonkam, a human geneticist at the University of Cape Town, South Africa.

This bias means that diagnostic tests and treatments developed on the basis of these studies might not work in certain populations. But studies in diverse populations also allow researchers to build up a fuller picture of diseases. In particular, African people as a group have genomes that are more diverse than those of other populations because the vast majority of human evolution took place in Africa.

The study enrolled around 900 people with schizophrenia and a similar number of controls. All identified as Xhosa, members of an ethnic group who live mainly in South Africa.

The researchers sequenced the participants’ genomes and searched for mutations that damage genes. Such mutations were much more prevalent in people with schizophrenia than in the control individuals, and were concentrated in genes that are highly expressed in the brain or involved in synapse function.

The results echo those of a large Swedish study (G. Genovese *et al. Nature Neurosci.* **19**, 1433–1441; 2016) that used the same methods, but the density of mutations in affected genes were generally larger in the Xhosa participants. The authors say that this reflects the greater genetic variation among Xhosa people.