# NEWS IN FOCUS

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About 33,000 babies have been recruited for the Born in Guangzhou Cohort Study since 2012.

EPIDEMIOLOGY

# Gigantic Chinese–baby study yields rich results

*Public–health insights have already emerged, and microbiome research is under way.*

BY DAVID CYRANOSKI

An ambitious Chinese study tracking tens of thousands of babies and their mothers has begun to bear fruit — just six years after the study's leaders recruited their first sets of mothers and babies.

Researchers have already published results based on the cohort study, some with important public-health implications. And many more investigations are under way. One will examine infants' microbiomes, the collections of bacteria and other microorganisms that inhabit their bodies — a hot topic in health research and a key goal of the study.

The Born in Guangzhou Cohort Study[1] has recruited about 33,000 babies and their mothers since 2012. The study's leaders are hoping to reach 50,000 baby–mother sets by 2020. And this year, investigators started recruiting 5,000 maternal grandmothers to the project, enabling research across multiple generations.

"The data is vast, and there is space for many different groups globally to mine this information," says Maria Gloria Dominguez-Bello, a microbiologist at Rutgers, The State University of New Jersey, in New Brunswick, who is not involved in the study. "I really admire this effort from the Chinese team."

Ezra Susser, an epidemiologist from Columbia University in New York City, says the cohort is also important because it is tracking mothers and babies during a period of rapid economic development and social change in China, where previous studies of this type have been limited in scale.

The Guangzhou project aims to set itself apart from previous large birth-cohort studies in Norway and Denmark by enabling detailed investigations of the links between the microbiome and disease. Two others, in the United States and United Kingdom, had planned ▶

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▶ to include microbiome data, but both were cancelled because of trouble recruiting participants. The US study also struggled with excessive costs and management issues.

The Chinese team has so far avoided similar problems. Its rich collection of 1.6 million biological samples includes stools, blood, placental tissue and umbilical cords. Extensive surveys also record participants' eating habits, mental health, and other lifestyle factors, such as the amount of mould in their houses.

### FIRST FINDINGS

Incense burning is common in southern China, and one study based on the Guangzhou project found that exposure to the resulting fumes increases the risk of hypertension in expectant mothers[2].

Another study found that progesterone, a drug used around the world to reduce the risk of a preterm birth, was prescribed too early in pregnancy in more than 40% of women studied[3]. The researchers found that giving women the drug before 14 weeks of gestation did not reduce their chances of a preterm birth, but put them at higher risk of needing a caesarean section and of developing postpartum depression. The authors consider the findings "an urgent public-health concern".

Other studies are in progress. A team from the University of Birmingham, UK, and BGI, one of China's largest genome-sequencing institutes, in Shenzhen, is trying to characterize how the microbiomes of babies born vaginally — who are exposed to their mothers' microbes on their journey down the birth canal — differ from those of infants born by caesarean section. Although similar studies have been done on a smaller scale, Dominguez-Bello says that the Guangzhou cohort will offer statistical power to separate out other variables that could influence an infant's microbiome. These include pre- and postnatal medications and environmental pollutants.

*"The data is vast and there is space for many different groups globally to mine this information."*

Xiu Qiu, an epidemiologist at Guangzhou Women and Children's Medical Center and the director of the Guangzhou project, is using the cohort data to test her surprising, but tentative, finding that older mothers having a second child have a lower risk of depression during pregnancy than do women pregnant with their first child[3]. She had expected that women who already have a baby when they are pregnant would be under more stress and face a higher financial burden, and so would be more likely to experience depression. The end of China's one-child policy in 2016 means the birth-cohort study offers a fresh opportunity to study an increasing number of women, many of them older, who are having a second child, she says.

Sing Sing Way, a paediatrician at the Cincinnati Children's Hospital in Ohio, meanwhile, will be looking at the data provided by the addition of grandmothers to the study to understand why cells from mothers can live on indefinitely in their offspring. Studies in mice suggest that these cells have a protective role when the offspring are pregnant, says Way[4].

Xia Huimin, a co-founder of the project, says that the Guangzhou cohort has the power to answer many more questions like this. He hopes scientists around the world will use it. "We would like scientists from everywhere to work with us." ∎

1. Qiu, X. et al. Eur. J. Epidemiol. **32**, 337–346 (2017).
2. He, J.-R. et al. Sci. Total Environ. **610–611**, 1421–1427 (2018).
3. Shen, S. et al. Lancet **386**, S58 (2015).
4. Kinder, J. M. et al. Cell **162**, 505–515 (2015).

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MEDICAL RESEARCH

# Longevity data hint at no natural limit on lifespan

*Death rates plateau in elderly people, reviving a debate about how long humans can live.*

BY ELIE DOLGIN

There might be no natural limit to how long humans can live — at least not one yet in sight.

That proposal — which runs contrary to the claims of some demographers and biologists — comes from a statistical analysis published on 28 June in *Science.* It examined the probabilities of survival of nearly 4,000 'super-elderly' people in Italy, all aged 105 and older (E. Barbi *et al. Science* **360**, 1459–1461; 2018).

The study was led by Sapienza University demographer Elisabetta Barbi and University of Roma Tre statistician Francesco Lagona, both based in Rome. Their team found that the risk of death — which, throughout most of life, seems to increase as people age — levels off after age 105, creating a 'mortality plateau'. At that point, the researchers say, the odds of someone dying from one birthday to the next are roughly 50:50 (see 'Longevity unlimited').

"If there is a mortality plateau, then there is

### LONGEVITY UNLIMITED

A person's chances of dying tend to increase throughout adulthood, but a model based on data from 3,836 people aged 105 or older predicts that this trend flattens out in very elderly people.
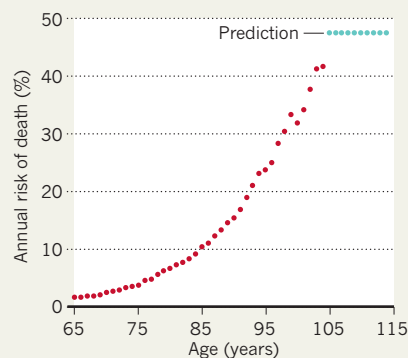


no limit to human longevity," says Jean-Marie Robine, a demographer at the French Institute of Health and Medical Research in Montpellier.

That would mean that someone such as Chiyo Miyako, a Japanese great-great-great-grandmother who, at 117, is the world's oldest known person, could live for years to come — or even forever, at least hypothetically.

Researchers have long debated whether humans have an upper age limit. The consensus holds that the risk of death steadily increases in adulthood, up to about age 80 or so. But there's vehement disagreement about what happens as people enter their 90s and 100s.

Some scientists have examined demographic data and concluded that there is a fixed, natural 'shelf life' for our species, and that mortality rates keep increasing. Others have looked at the same data and concluded that the death risk flattens out in one's ultra-golden years, and therefore that human lifespan does not have an upper threshold.

In 2016, geneticist Jan Vijg and his colleagues at Albert Einstein College of Medicine in New York City rekindled the debate when they analysed the reported ages at death for the