



CAN TRADITIONAL MEDICINES GO MAINSTREAM?

Traditional medicine is already used by billions worldwide. Researchers, regulators and the World Health Organization (WHO) are now working to generate acceptable evidence, win regulatory acceptance, and integrate traditional medicines into modern clinical care. **By Ben Deighton**

During his more than 20 years of experience as a Chinese medicine rheumatologist in Hong Kong and Macau, [Liang Liu](#) saw a constant stream of patients coming to him after failing to get adequate treatment from conventional medicine, for a wide range of conditions from rheumatoid arthritis to lupus.

“Many patients, after the western medical treatment... they ask for a Chinese medicine doctor,” says Liu, who is now director of the academic committee of Guangzhou University of Chinese Medicine, in China’s third-biggest city.

Liu puts it down to the fact that in Chinese medicine, the practice is to identify different subtypes of patient and disease, and the treatment differs for each.

It is a similar situation in the Indian traditional ayurvedic system. “The ayurvedic physician will

give medicine based on the person,” explains [Bhushan Patwardhan](#), an academic at Savitribai Phule Pune University in Pune, and a research professor at India’s Ministry of Ayush, which covers traditional medicine systems such as ayurveda, yoga and homoeopathy.

In two-thirds of countries polled by the WHO in its most [recent global survey](#), between 40 and 99% of their populations use some form of traditional, complementary or integrative medicine (TCIM), which encompasses everything from acupuncture to ashwagandha.

Both China and India are pushing to build the evidence base for their respective traditional medicines (Fig. 1), to ensure safety for patients in their own countries, and in the hope of widening global use and unlocking western markets.

In October last year, China’s National Medical Products Administration issued a

consultation on traditional Chinese medicine injections¹, in which sterilized plant-based extracts are injected directly into the body to help treat cardiovascular, neurovascular and inflammatory conditions. At the heart of this new approach is a post-marketing system that would oblige producers to demonstrate safety and efficacy through randomized clinical trials (RCTs).

“The policy direction is clear,” explains [Chen Chen](#), a clinical neurologist and researcher at Shanxi Cardiovascular Hospital in China. “Competition is shifting from scale-based to evidence- and quality-based.”

From tradition to evidence

Around half of the world’s population lacks access to essential health services, [according to the World Bank](#), and for many, traditional medicine is their primary source of healthcare.



Fig. 1 | Global medicines. Traditional therapies, including Ayurvedic (left) and Chinese herbal therapies (right), are used by many populations globally. Credit: Philip Game / Alamy (left); VisualHongKong / Alamy (right)

Yet less than 1% of global health research funding is dedicated to traditional practices.

In 2022, the Indian government and the WHO announced an agreement to establish the [WHO Global Traditional Medicine Centre](#) in the northwestern city of Jamnagar. A conference jointly organized by the WHO and the Indian government in 2025 resulted in the Delhi Declaration, which included a commitment to integrate “safe and effective” traditional medicines into health systems.

Traditional medicines have long been a source of pharmaceutical treatments, from aspirin, which is derived from willow bark used by the ancient Egyptians, to the anti-malarial artemisinin, which came from sweet wormwood used for thousands of years in Chinese medicine. The development of the contraceptive pill depended on plant steroids derived from Mexican wild yams, and important childhood anticancer drugs, such as vincristine, were derived from the rosy periwinkle.

However, they can also be approved in western countries as herbal remedies, giving patients access to treatments such as ginkgo biloba, a tree-derived supplement used to tackle age-related cognitive impairment that has origins in ancient Chinese medicines, and valerian root, a relaxant that forms part of ayurvedic treatments.

Chen believes that this trend will hold for traditional Chinese medicine injections, if the active ingredient is isolated and purified, raising the possibility of gaining approvals as new drugs in Europe or the USA, whereas oral, multi-component formulations will instead be mostly used in traditional medicine systems.

Yet for western regulators, the available evidence is often insufficient for herbal remedies to be recommended for medicinal use. “We are aware that somehow they would like also to fit in our way of thinking because they would

like to enter the European market,” says [Carmen Purdel](#), chair of the European Medicines Agency’s Committee on Herbal Medicinal Products (HMPC).

Purdel explains that for traditional remedies to enter European Union (EU) markets, they must demonstrate the ‘three pillars’ of safety, quality and efficacy. Where clinical trials are required, she says producers should use standardized methodologies and ensure high-quality clinical data. The HMPC issues EU herbal monographs that national regulators can draw on when deciding whether to authorize or register herbal medicinal products.

Purdel says they had formed a working group with India’s Ministry of Ayush in 2021. “We tried to explain to them the rules [as] they are in the EU,” she says, but adds that they did not understand things in the same way.

Safety first

Purdel gives the example of the Indian herbal relaxant [ashwagandha](#), saying it can cause issues with the thyroid and the liver. “If the safety is not demonstrated,” she says, “then how [are we] going to establish a monograph?”

In 2023, [Denmark banned](#) ashwagandha because of possible effects on sex hormones, although it remains on sale in several other European countries. Yet Patwardhan takes issue with the ban, likening it to banning an apple because of trace amounts of cyanide in the seeds. “If you use the same analogy, then you should ban apple in Denmark,” he says. “Many good traditional medicines are being targeted, saying that they don’t have evidence or they have toxicity or they have this or they have that.”

At the heart of the problem is the difficulty in performing RCTs to demonstrate safety and efficacy of many traditional medicines (Fig. 2).

In Chinese medicine, doctors look at several symptoms across the patient, seeing it as a

pattern that is unique to that patient, and then tailoring prescription and dose accordingly. This requires a new personalized approach to RCTs according to Liu, in which patients are selected according to their genotype instead of standard diagnostic characteristics². Under this view, precision medicine shares similarities with traditional Asian treatments.

In addition, “you often can’t use a placebo because it’s a multi-component formula”, explains [Holger Cramer](#), a professor in complementary medicine at the University Hospital Tübingen in Germany.

According to Cramer, for blended treatments or therapies, the best approach is often comparative effectiveness research, in which one approach is compared with another. For example, Cramer points to a 2015 study³ that showed that patients with breast cancer had improved quality of life when complementary treatments were added to their breast cancer treatment, compared with those who received only standard care.

For Patwardhan, “RCTs are a gold standard for a single molecule, single target”. However, “RCT may not be a right model for complex interventions”.

Reverse pharmacology

Patwardhan was one of the early proponents of reverse pharmacology, in which investigators track back from seeing that an intervention works and try to establish the cause. In the 1980s, India approved a standardized extract of the ayurvedic plant resin-based medicine guggul as a treatment to lower cholesterol. In 2002, researchers were able to identify the mechanism behind the lipid-lowering activity of the active compound guggulsterone⁴.

Patwardhan believes that to properly document the efficacy of traditional medicines, experimental evidence needs to be complemented with real-world experiential evidence. “We must develop robust methodology to capture that experiential evidence,” he says.

It is a sentiment echoed by [John Reeder](#), the WHO’s former director of research for health. Reeder underlines that for new drug applications, the standard of proof must be an RCT, and that traditional medicines can serve as a source of new active ingredients. However, he also believes that there is need for another kind of evidence to support wider use of traditional medicinal practices. “If you take some of these interventions, it’s incredibly difficult to evaluate. And I think that’s one of the reasons the evidence isn’t there,” he says.



Fig. 2 | People first. Person-centered treatments such as acupuncture (left) or Ayurvedic therapies (right) can be challenging to evaluate in a randomized clinical trial. Credit: Angela Hampton Picture Library / Alamy (left); robertharding / Alamy (right)

Reeder collaborated closely with the WHO's Global Traditional Medicines Centre to try to determine what the evidence for traditional medicines should look like for them to be included in WHO guidelines. The objective was "to take this from a bit of a fringe to go, 'okay, countries like India and China really see the potential of this, let's ... say, okay, if we want evidence to convince ourselves to put this into guidelines, how do we do that? What do we ask for? What would be a reasonable goalpost to put up?'"

He cites the example of descriptive studies, which are based on real-world evidence. "If you have a descriptive study on so many people, it is an overwhelming weight of evidence," he says, adding that there should be a debate around what constitutes an agreeable benchmark. "I believe it's a really sensible discussion to have," he says.

More evidence on which traditional treatments are effective could enable medical practitioners to include them in what they offer patients – where the evidence supports it. "So, your GP might as well be prescribing you yoga as well as an antidepressant, or instead of an antidepressant. But, at the moment, you don't have the evidence for that," says Reeder.

Decoding complexity

For Reeder, artificial intelligence (AI) will have an increasingly important role in helping to build evidence for the often-complex interactions seen in many traditional medicines. "I think the opportunity will be there to ask really quite complex questions of trials and be able to do trials which we haven't conceived of before that might be multifactorial, that might have all these different aspects, and

see if there are trends that would meet an evidence threshold."

The efforts to build an evidence base are converging with newer technologies such as AI and genomics, says [Shyama Kuruvilla](#), interim director of the WHO Global Traditional Medicine Centre. "The evolution of AI and genomics and technologies like EEGs [electroencephalograms] and magnetic imaging that allow us to understand better how TCIM methods work, are coming together in a really interesting and important convergence that's going to really support the use of TCIM moving forward," she says.

Using digital technologies forms an integral part of the WHO's 2025–2034 Global Traditional Medicine Strategy⁵, in which the first objective is to build an evidence base, partly by developing appropriate AI tools.

AI is being used to help document how traditional medicines are being used, look for patterns across systems, and examine formulations to see which ones might be effective. "There are hundreds of thousands of formulations," says Kuruvilla, giving the example of India's [Traditional Knowledge Digital Library](#), where there are [over 500,000 formulations](#).

"There has been a rapid increase in the use of machine learning, natural language processing, and generative AI tools to analyze large bodies of traditional medicine knowledge, identify patterns in clinical data, and support evidence synthesis," explains [Jeremy Y. Ng](#), a researcher focusing on how AI is being used in traditional medicine at University Hospital Tübingen in Germany.

He said AI was also helping to look at treatments such as acupuncture and herbal medicines to help "uncover biological mechanisms

that would have been difficult to identify using conventional methods alone". He gives the example of acupuncture, in which research suggests lipid molecules have a role, and AI may help acupuncture move towards more personalized interventions⁶.

Genomics has had a particular role in revealing evidence behind the categorizations used in Ayurvedic treatments, an approach that Patwardhan has dubbed "ayurgenomics".

Early studies by Patwardhan and colleagues reported associations between Ayurvedic Prakriti categories, known as Vata, Pitta and Kapha, and variation in *HLA* genes, suggesting that traditional phenotypic categories might reflect underlying biological differences. More recently, genome-wide analyses identified single nucleotide polymorphism (SNP) patterns that distinguish Prakriti groups, some with links to biological pathways⁷.

"A small work which we started with a small idea from traditional knowledge system has become now a multi-million project," says Patwardhan.

Global evidence

This rising evidence-base for traditional medicine could be part of a virtuous circle, says Kuruvilla, as an increasing trend for wellness among people in rich countries helps to spur research to establish which traditional treatments work and which do not. This, in turn, would ideally benefit those in low- and middle-income countries for whom traditional medicine is their main health resource.

"It's about evidence-informed choices at all levels and expanded trusted choice for health," says Kuruvilla. "People are seeking those solutions, and I think ensuring that those solutions are safe and effective and trusted is really our global health role."

One way the WHO is helping to achieve this is through a global network supporting a health literacy project called [Informed Health Choices](#). "This would include public-facing materials and sort of decision trees, but also working with practitioner associations, with governments," says Kuruvilla.

For Cramer, the growing evidence for traditional and complementary medicines will mean that they are increasingly integrated into clinical practice. He says cancer is a disease area in which traditional and complementary medicines could provide support. "We have fantastic conventional medicine approaches to treat cancer, to heal cancer, to deal with the disease itself," he says. "But still patients suffer from a lot of side effects, from secondary symptoms of the disease, and here TCIM has a lot to offer."



Fig. 3 | Mistletoe therapy. Mistletoe extracts are reimbursed in Germany for some palliative cancer care indications, despite continuing debate over their effectiveness. Credit: PhotoSG / Alamy

He gives the example of yoga and mindfulness⁸. “There is really good evidence showing that for persistent fatigue in cancer

survivors, yoga is [among] the most effective non-pharmacological intervention we have,” he says. “Mindfulness, for example, is effective in reducing anxiety and depression in cancer survivors.”

An important step would be to conduct cost-effectiveness studies to see whether traditional medicines can save health systems money by reducing the burden of symptoms, encouraging governments and health payers to cover their costs, Cramer notes.

And some traditional and complementary medicines are already being included in healthcare. For example, in Germany, mistletoe extracts are available on prescription and reimbursed by statutory health insurance for palliative cancer care, despite limited evidence that they improve quality of life in patients with breast cancer (Fig. 3).

In the end, according to Liu, the momentum behind this integration isn’t something that comes from regulatory agencies or governments, but from patients and medical practitioners themselves. “Because doctors, they know what’s the pain of the patients, what’s the need of the patients, and what they can do to help the patients,” he says, whether this is from conventional or traditional treatments.

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