

Defining rare diseases in China

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Summary

China has the world's largest population of people with rare diseases. However, defining rare diseases remains a challenge in China. Over the past few decades, several definitions have been proposed but they have yet to be agreed to by all stakeholders. To overcome this impasse, a list of several rare diseases has recently been created. This rare disease list might be used in place of a prevalence-based definition, especially in healthcare policy-making.

Keywords: China, rare diseases, definition

China's concept of rare diseases was first sketched out by the radiologists Drs. Gui Lin and Chenglin Wang in the early 1980s, at nearly the same time that the Orphan Drug Act was passed in the United States (1). In the 1980s, advanced medical equipment, and computed tomography (CT) and magnetic resonance imaging (MRI) in particular, began to arrive in China, and many cases of rare diseases were identified and reported for the first time by hospitals across the country. However, the definition of rare diseases was not considered at the time.

With China's rapid social and economic development over the past decade, rare diseases have become a major issue once again. Given China's massive population, the widespread view is that China has the largest population of people affected by rare diseases, and now is the time to look for healthcare solutions to rare diseases. A growing chorus of voices is calling for legislation on rare diseases and orphan drugs in line with the model in the United States and elsewhere (2). Since legislation would need to specifically identify its scope, the definition of rare diseases has surfaced once again.

Over the past decade, the most widely used definition for rare diseases in China has been the WHO's definition of a rare disease, *i.e.* a disease

with an incidence of 0.65-1‰. However, the validity of the WHO's definition has recently been called into question. Definitions of rare disease from other countries and organization such as the United States and Europe Union have consistently been used as a reference. However, these definitions have a relatively broad scope. For example, some cancers with a low prevalence such as ovarian cancer and some rare diseases listed by Orphanet were not regarded as rare diseases by most doctors in Shandong Province, China, according to a previous survey by the current authors (3).

At a seminar conducted by the Genetics Branch of the Chinese Medical Association on May 17, 2010, experts mainly in the field of medical genetics suggested that rare diseases in China be defined as "disorders with a prevalence less than 1/500,000 or with an incidence less than 1/10,000 among newborns" (4). This definition sets a threshold lower than all currently established definitions in use worldwide, thus excluding most recognized rare disorders. As a result, this definition of rare diseases has not been agreed to by all stakeholders, and especially patient organizations.

Most definitions of rare diseases are prevalence-based. Because of the lack of epidemiological data on rare diseases in China, deducing the population threshold that defines rare diseases is difficult. In 2015, the current authors proposed a bottom-up approach to define rare diseases in China. This strategy depends not on prevalence but on the minimum number of patients needed for industry to make a reasonable profit on an innovative drug (5). The current authors proffered 300,000 to 500,000 cases as a reference threshold with which to define rare diseases in China. This proposal

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linked the concept of rare diseases with orphan drugs, so it is highly useful in terms of Chinese policy-making on rare diseases. However, this definition has several limitations since the level of Chinese R&D on innovative drugs cannot be accurately determined.

Supporting evidence for both international and domestic definitions of rare diseases is lacking in China, so reaching a consensus has been difficult. Most recently, some stakeholders began to deviate from a prevalence-based definition and listing rare diseases instead. A year ago, the City of Shanghai drafted a list of rare diseases that include 58 typical rare disorders; most are extremely rare but can be treated with corresponding orphan drugs. In September 2016, a patients' organization proposed another list of rare diseases that included 147 disorders. These efforts stay away from the prevalence threshold and the concept of defining all rare diseases at one time but prioritize the need to identify treatable disorders, which are more amenable to policy-making.

Improvement in healthcare for rare diseases has become a national effort. Last year, China established a committee to formulate medical strategies for rare diseases. An official definition of rare disease will presumably be discussed and proposed in the near future.

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