Public Health Practice

Schistosomiasis control in China

Zhou Daren, Li Yuesheng, & Yang Xianming

Well-organized programmes combining local involvement and major government projects have been successful in controlling schistosomiasis to a large extent in China. The task is far from complete, however, especially in some lacustrine and mountainous areas, where conditions are highly favourable for the vector snails, and difficult to modify. A long-term programme of health education, medical care and infrastructure development is needed.

Archeological studies show that there were people who suffered from schistosomiasis in China at least 2100 years ago. *Schistosoma japonicum* eggs were found in a female corpse dating from the Western Han dynasty, excavated in 1971 in Hunan province, and in a male corpse dating from the Han dynasty, excavated in 1975 in Hubei province *(1)*. The first diagnosis of *S. japonicum* infection in the world was made in 1905 by an American physician on a fisherman in Hunan province *(2)*.

After the founding of the People's Republic of China, large-scale surveys of schistosomiasis were organized, which showed that the disease was endemic in 380 counties of 12 provinces south of the Yangtze river. About 100 million people were exposed to the infection, of whom 12 million were already infected.

The authors are from the Hunan Institute of Parasitic Diseases, Huabanqiao Road, Yueyang, Hunan 414000, China, which is also a WHO Collaborating Centre for Schistosomiasis Control. Professor Zhou is the Director of the Institute, Dr Li is an Associate Professor and Epidemiologist, and Dr Yang is a Medical Officer.

An appropriate and stable management structure, from central to township level, has been a crucial factor in the progress achieved thus far.

About 14 000 square kilometres were infested with *Oncomelania* snails.

Past achievements

A schistosomiasis control campaign was launched in 1956, and since then the disease has been eradicated in four of the twelve provinces concerned: Fujian, Guangdong, Guangzi and Shanghai. Prevalence has also been reduced in many of the other provinces; the disease has been eradicated in 158 counties and effectively controlled in 101. The number of counties in which schistosomiasis is endemic has been reduced from 380 to 129 (a 68% reduction), and the number of people infected has been reduced from 12 million to 1.6 million (an 87% reduction). The areas that serve as a habitat for infected snails have

Organization of schistosomiasis control in China

Level	Political	Administrative	Technical
National	State Council Ministry of Public Health Ministry of Agriculture Ministry of Water Resources		Chinese Academy of Preventive Medicine
	Leading group for schistosomiasis control	Bureau for Prevention and Treatment of Endemic Diseases	Institute of Parasitic Diseases
Provincial	Leading group	Office of Endemic Diseases/ Schistosomiasis	Institute for Parasitic or Antiendemic Diseases
Prefecture	Leading group	Office of Endemic Diseases/ Schistosomiasis	Anti-epidemic or Sanitation Station
County	Leading group	Bureau of Public Health	Anti-Schistosomiasis Station

been reduced from 14 000 to 3700 sq. km (a 74% reduction) *(3, 4)*.

An appropriate and stable management structure, from central to township level, has been a crucial factor in the progress achieved thus far. As shown in the Table, each administrative level has a "leading group for schistosomiasis control". This group consists of responsible officers from the departments of public health, water resources, agriculture, planning, and finance, who jointly set up a schistosomiasis control office to draft laws and regulations, plan and carry out programmes, and monitor progress. Technical aspects are taken care of at the national and provincial levels by an Institute of Parasitic Diseases, which carries out scientific research and trains staff for field duties *(5)*. The anti-schistosomiasis stations at prefecture and county level are responsible for carrying out particular activities of the control programme, such as providing health education on how to avoid infection, exterminating snails, and finding and treating cases.

Schistosomiasis control requires a combination of scientific and social methods.

This well-developed system makes it possible to organize and carry out large-scale control activities effectively. Initially, the guiding principles for these activities are formulated by the national government. On the basis of these principles, a wide variety of control programmes are organized according to the epidemiology of the disease and the ecological distribution of the vector snails. In general, these programmes emphasize health education, local participation, coordination with water management and agricultural activities, modifying the environment to make it unsuitable as a habitat for snails, and doing practical scientific research.

The effectiveness of this approach was shown especially clearly in nine counties around Shanghai in which schistosomiasis was endemic. More than 3 million people were exposed to the infection, 750 000 were infected, and there were 170 sq. km of snail-infested land. The environment was modified

by a combination of local involvement and a construction programme to meet agricultural and irrigation needs, and the disease was in "effectively controlled" status by 1975. All patients were cured by 1985, and no new cases have occurred. The suffering and deprivation caused by schistosomiasis in the Shanghai area have been replaced by health and prosperity *(5)*.

The present challenge

There are still 3600 sq. km of snail-infested land in China, spread over 121 counties in eight provinces, mainly in the lake areas (95.5%); the rest are in the mountains (4%) and land areas linked by waterways (0.5%). An estimated 1 580 000 people are infected with schistosomiasis, 86% of whom come from the lake areas, the rest from the mountains. In the lake areas the schistosomes are found in snails along the Yangtze River and the shores of lakes that are linked to it. The water level is high in the summer and goes down in the winter, leaving a deep deposit of silt and sand from the river, in which grass springs up, providing an environment in which the vector breeds rapidly. As a result, the snail-infested area is actually increasing. Snails carrying the parasite travel into the farming areas through the irrigation channels. Migrants and their cattle who visit these areas also get infected, and carry the parasite further afield. In mountain areas with a mild climate and heavy rainfall, snails breed in the streams, valley pastures, terraced fields and irrigation canals. The complex canal systems, steep mountains and widely scattered population in these areas make control difficult, especially as cattle and wild animals are the main reservoir of infection *(6)*.

Schistosomiasis control, which requires a combination of scientific and social methods, will be a long-term operation in the remaining endemic areas because of the complex ways in which transmission occurs. Three main strategies should be emphasized:

- Providing health education in endemic areas to reduce the number of people who get infected from contaminated water.

The complex canal systems, steep mountains and widely scattered population make control difficult, especially as cattle and wild animals are the main reservoir of infection.

- Carrying out mass chemotherapy programmes for infected people and cattle to reduce both actual morbidity and the source of infection.
- Developing agricultural and water supply systems to eliminate snail-infested areas, and building houses with improved water supply and sanitation facilities. ■

References

1 *Review of controlling schistosomiasis in the past 30 years.* Beijing, Office of Schistosomiasis Control of the Central Communist Party Committee. Shanghai Publishing House of Science & Technology, 1986: 15–16 (in Chinese).

2 **Logan OT.** A case of dysentery in Hunan Province caused by the trematode *Schistosoma japonicum*. *Journal of Chinese medicine,* 1905, **19**: 243–245 (in Chinese).

3 **Wang Fanzheng.** [Review of control of schistosomiasis in the People's Republic of China.] *Chinese journal of schistosomiasis control,* 1989, **1**(3): 1–4 (in Chinese).

4 **Chian Xingzhong.** *Endemic map of schistosomiasis in China.* Beijing, Map Publishing House of the People's Republic of China, 1987: 17–23 (in Chinese).

5 **Pan Handing.** *Review of eradicated schistosomiasis in Shanghai.* Shanghai Publishing House of Science & Technology, 1988: 1–23 (in Chinese).

6 **Yuan Hongchang.** Control strategies and endemic features of schistosomiasis in China. In: *International Symposium on Schistosomiasis – Abstracts.* Beijing, Ministry of Public Health, 1992: 30–36