Vital Surveillances

Epidemic Status of Soil-Transmitted Helminthiasis — China, 2023–2024

Huihui Zhu[1]; Jilei Huang[1]; Changhai Zhou[1]; Tingjun Zhu[1]; Luyuan Zhao[1]; Shizhu Li[1,2,#]; Menbao Qian[1,#]

Summary

What is already known about this topic?

Established in 2016, China's national surveillance system for soil-transmitted helminthiasis provides annual data that are essential for its control. Surveillance data from 2016 to 2022 indicated a steady decline in the overall infection rate, from 2.46% in 2016 to 0.64% in 2022.

What is added by this report?

In 2023 and 2024, the infection rates of soil-transmitted helminth (STH) were 0.53% and 0.47%, respectively, according to national surveillance. The overall infection rate has declined since 2016.

What are the implications for public health practice?

Soil-transmitted helminthiasis exhibits a low prevalence nationwide, yet displays significant geographical and demographic heterogeneity, as well as ongoing transmission risks. Tailored strategies must be implemented to strengthen national control efforts, advance transmission control and prevent interruptions.

ABSTRACT

Introduction: This study reports on 2023–2024 national surveillance data from China's soil-transmitted helminthiasis surveillance network, which covers over 400 counties across 31 provincial-level divisions (PLADs) and the Xinjiang Production and Construction Corps (XPCC). These findings aim to guide future control strategies.

Methods: In 2023 and 2024, each PLAD will select 10%–15% of its jurisdictions as annual surveillance counties, resulting in 437 and 459 counties being chosen, respectively. Using geographically stratified cluster random sampling, 1,000 participants were enrolled in each county. Stool samples from all participants and soil samples from five households in each village were collected and examined. Infection rates and intensities were calculated and compared using the Chi-square test.

Results: In 2023 and 2024, the infection rates of soil-transmitted helminth (STH) were 0.53% (2,381/449,220) and 0.47% (2,233/476,756) , respectively, with significant differences. High STH prevalence was concentrated in Sichuan, Yunnan, and Chongqing in both years, with obvious infection heterogeneity according to sex and age. Hookworm infection was the dominant type, followed by *Ascaris lumbricoides* and *Trichuris trichiura*. Environmental soil monitoring confirmed the presence of Ascaris eggs and hookworm larvae.

Conclusion: Despite the low overall prevalence, soil-transmitted helminthiasis in China remains geographically and demographically heterogeneous. Targeted strategies are required to strengthen control measures and work toward control and eventual interruptions.

Soil-transmitted helminths (STH), primarily hookworms, *Ascaris lumbricoides* and *Trichuris trichiura* (*1*), pose a major health threat in China. Heavy infections cause intestinal damage, leading to malnutrition, stunting, anemia, impaired immune function in children, and adverse pregnancy outcomes (*2*–*3*). Despite historical declines in prevalence due to control programs and improved living standards, STHs remain widely distributed (*4*–*6*). A 2015 national survey on key parasitic diseases reported an overall STH infection rate of 4.49% in China, corresponding to an estimated 29.12 million infected individuals (*6*).

In 2016, China integrated STH surveillance into a Central Government-funded Project for the Control of Malaria and Other Key Parasitic Diseases, establishing a nationwide surveillance system (*7*). From 2016 to 2022, the national STH surveillance program gradually expanded to over 400 monitoring counties across all 31 provincial-level divisions (PLADs) and the Xinjiang Production and Construction Corps (XPCC).

Epidemiological patterns of STH infections have evolved (*7*–*13*). Using 2023–2024 national STH surveillance data, this study analyzed infection status in China to provide evidence for future control strategies.

METHODS

Study Population and Sampling

National surveillance across all 31 PLADs and the XPCC in 2023–2024 will employ a stratified cluster random sampling design. Annually, each PLAD selects 10%–15% of its counties (totaling 437 and 459 counties, respectively). Each county was stratified into five geographical sectors (east, west, south, north, and central) with one administrative village randomly selected per sector. From each village, 200 permanent residents were enrolled by cluster sampling, with 1,000 participants per county (*7*–*13*) representing all age groups. Each participant provided a fresh stool specimen (30 g).

Five households per village were randomly chosen for environmental sampling. One composite soil sample (≥400 g) was collected from each household's farmland or garden, subdivided for pathogen-specific analysis: 350 g for hookworm larval detection and 50 g for *Ascaris lumbricoides* egg identification.

Examination Methods

Fecal samples were analyzed for soil-transmitted helminth eggs using the modified Kato-Katz thick smear method, with duplicate slides per sample. Soil samples were processed for hookworm larvae via warm saline (5% NaCl, 45 °C) sedimentation and for *Ascaris lumbricoides* eggs via saturated sodium nitrate flotation.

Quality Control

The National Institute of Parasitic Diseases, Chinese Center for Disease Control and Prevention (National Center for Tropical Diseases Research), hereafter referred to as the National Institute of Parasitic Diseases (NIPD), delivers standardized training and on-site supervision. Provincial and municipal CDCs provided technical training and validated the results by reexamining 10% of positive and 5% of negative slides from each site. The NIPD also performed random slide rechecks.

All data were entered into the national Parasitic Disease Control Information Management System at the county level and subjected to multi-tier verification (municipal, provincial, and national). At each stage, discrepancies triggered the return and correction of data. The national authorities conducted a final review to obtain a definitive dataset.

Statistical Analysis

Data were analyzed using SAS 9.2 (SAS Institute Inc., Cary, NC, USA). Overall and species-specific (hookworm, *Ascaris lumbricoides*, *Trichuris trichiura*) infection rates and intensities were calculated, stratified by PLAD, sex, and age group, with between-group comparisons made by chi-square test (α =0.05). Soil detection rates for hookworm larvae and *Ascaris* eggs were also determined using the following formula:

$$\text{infection rate}(\%) = (\text{number of positive cases}/\text{number examined}) \times 100\% \quad (1)$$

$$\text{detection rate}(\%) = (\text{number of positive soil samples}/\text{number of soil samples examined}) \times 100\%. \quad (2)$$

RESULTS

Overall Prevalence of STH Infections

The STH infection rates in 2023 and 2024 were 0.53% (2,381/449,220) and 0.47% (2,233/476,756) respectively (Table 1). The infection rate is significantly lower in 2024 than in 2023 (χ^2=7.56; P<0.05).

Geographical Distribution

The STH infection rates in PLADs and XPCC demonstrated marked geographical heterogeneity, and the highest PLAD prevalence was recorded in Sichuan, Yunnan, and Chongqing in both years. No infections were detected in the four PLADs in 2023 or in eight PLADs in 2024 (Table 1).

Gender Distribution

Sex heterogeneity was observed in both years. The infection rate was significantly higher in women compared to men both in 2023 (χ^2=23.15, P<0.0001) and in 2024 (χ^2=6.87, P<0.01).

Age Distribution

Age group heterogeneity was found, with the highest infection rate observed in individuals aged 60 years and above, and the lowest in individuals aged 0–6 years in both years. Statistically significant differences in infection rates were identified among all age groups in

TABLE 1. Infection rate of soil-transmitted helminth by PLADs in China, 2023–2024.

PLADs	2023									2024								
	No. exam' d	STH		Hookworm		*Ascaris lumbricoides*		*Trichuris trichura*		No. exam' d	STH		Hookworm		*Ascaris lumbricoides*		*Trichuris trichura*	
		No. infected	Infection rate (%)	No. infected	Infection rate (%)	No. infected	Infection rate (%)	No. infected	Infection rate (%)		No. infected	Infection rate (%)	No. infected	Infection rate (%)	No. infected	Infection rate (%)	No. infected	Infection rate (%)
Beijing	7,376	0	0	0	0	0	0	0	0	7,377	0	0	0	0	0	0	0	0
Tianjin	3,041	0	0	0	0	0	0	0	0	3,094	0	0	0	0	0	0	0	0
Hebei	20,100	0	0	0	0	0	0	0	0	22,292	0	0	0	0	0	0	0	0
Shanxi	18,383	8	0.04	0	0	8	0.04	0	0	15,290	0	0	0	0	0	0	0	0
Inner Mongolia	10,096	1	0.01	0	0	1	0.01	0	0	16,101	0	0	0	0	0	0	0	0
Liaoning	14,016	7	0.05	0	0	7	0.05	0	0	14,003	9	0.06	0	0	9	0.06	0	0
Jilin	23,820	40	0.17	0	0	40	0.17	0	0	21,040	23	0.11	0	0	23	0.11	0	0
Heilongjiang	33,098	9	0.03	0	0	9	0.03	0	0	22,022	5	0.02	0	0	0	0	5	0.02
Shanghai	3,295	0	0	0	0	0	0	0	0	5,074	0	0	0	0	0	0	0	0
Jiangsu	11,279	2	0.02	1	0.01	0	0	1	0.01	11,254	5	0.04	4	0.04	1	0.01	0	0
Zhejiang	10,299	44	0.43	44	0.43	0	0	0	0	11,334	38	0.34	38	0.34	0	0	0	0
Anhui	29,168	103	0.35	89	0.31	6	0.02	9	0.03	29,214	76	0.26	62	0.21	8	0.03	7	0.02
Fujian	16,424	88	0.54	68	0.41	0	0	20	0.12	12,686	36	0.28	33	0.26	0	0	3	0.02
Jiangxi	15,295	110	0.72	84	0.55	23	0.15	3	0.02	15,303	70	0.46	51	0.33	7	0.05	12	0.08
Shandong	14,507	45	0.31	0	0	2	0.01	43	0.3	17,718	21	0.12	0	0	1	0.01	20	0.11
Henan	17,615	8	0.05	1	0.01	5	0.03	2	0.01	16,361	1	0.01	1	0.01	0	0	0	0
Hubei	13,218	7	0.05	0	0	5	0.04	2	0.02	11,184	0	0	0	0	0	0	0	0
Hunan	14,045	68	0.48	58	0.41	7	0.05	5	0.04	21,140	125	0.59	57	0.27	53	0.25	15	0.07
Guangdong	22,640	20	0.09	14	0.06	1	0	5	0.02	25,409	18	0.07	7	0.03	6	0.02	5	0.02
Guangxi	15,295	92	0.6	70	0.46	0	0	22	0.14	23,749	75	0.32	36	0.15	0	0	41	0.17
Hainan	4,177	26	0.62	22	0.53	0	0	4	0.1	3,009	28	0.93	27	0.9	0	0	1	0.03
Chongqing	9,069	258	2.84	220	2.43	34	0.37	4	0.04	8,516	233	2.74	194	2.28	32	0.38	9	0.11
Sichuan	17,288	631	3.65	276	1.6	178	1.03	249	1.44	34,052	719	2.11	466	1.37	90	0.26	214	0.63
Guizhou	16,260	72	0.44	52	0.32	18	0.11	4	0.02	20,228	69	0.34	46	0.23	15	0.07	8	0.04
Yunnan	19,966	593	2.97	412	2.06	116	0.58	82	0.41	17,554	480	2.73	434	2.47	9	0.05	45	0.26
Xizang	9,449	7	0.07	0	0	6	0.06	1	0.01	8,735	122	1.4	0	0	50	0.57	73	0.84
Shaanxi	19,071	3	0.02	0	0	3	0.02	0	0	20,014	0	0	0	0	0	0	0	0

Continued

PLADs	2023									2024								
	No. exam' d	STH		Hookworm		*Ascaris lumbricoides*		*Trichuris trichura*		No. exam' d	STH		Hookworm		*Ascaris lumbricoides*		*Trichuris trichura*	
		No. infected	Infection rate (%)	No. infected	Infection rate (%)	No. infected	Infection rate (%)	No. infected	Infection rate (%)		No. infected	Infection rate (%)	No. infected	Infection rate (%)	No. infected	Infection rate (%)	No. infected	Infection rate (%)
Gansu	10,228	3	0.03	0	0	3	0.03	0	0	10,453	20	0.19	0	0	20	0.19	0	0
Qinghai	6,252	87	1.39	0	0	87	1.39	0	0	6,142	32	0.52	0	0	32	0.52	0	0
Ningxia	9,277	22	0.24	0	0	20	0.22	2	0.02	10,357	15	0.14	0	0	15	0.14	0	0
Xinjiang	13,133	13	0.1	2	0.02	11	0.08	0	0	14,051	6	0.04	0	0	5	0.04	1	0.01
XPCC	2,040	14	0.69	0	0	13	0.64	1	0.05	2,000	7	0.35	0	0	7	0.35	0	0
Total	449,220	2,381	0.53	1413	0.31	603	0.13	459	0.1	476,756	2,233	0.47	1,456	0.31	383	0.08	459	0.1

Abbreviation: PLAD=provincial-level divisions; STH=soil-transmitted helminths; XPCC=Xinjiang Production and Construction Corps.

TABLE 2. Infection rate of soil-transmitted helminth by age group in China, 2023–2024.

Age groups (years)	2023									2024								
	No. exam' d	STH		Hookworm		*Ascaris lumbricoides*		*Trichuris trichura*		No. exam' d	STH		Hookworm		*Ascaris lumbricoides*		*Trichuris trichura*	
		No. infected	Infection rate (%)	No. infected	Infection rate (%)	No. infected	Infection rate (%)	No. infected	Infection rate (%)		No. infected	Infection rate (%)	No. infected	Infection rate (%)	No. infected	Infection rate (%)	No. infected	Infection rate (%)
0–6	28,354	73	0.26	6	0.02	45	0.16	28	0.10	27,416	35	0.13	12	0.04	17	0.06	8	0.03
7–14	55,754	309	0.55	68	0.12	145	0.26	137	0.25	54,484	200	0.37	22	0.04	60	0.11	151	0.28
15–44	123,008	415	0.34	165	0.13	124	0.10	147	0.12	124,151	381	0.31	182	0.15	77	0.06	138	0.11
45–59	111,270	508	0.46	312	0.28	129	0.12	78	0.07	116,599	505	0.43	334	0.29	91	0.08	90	0.08
≥60	130,834	1,076	0.82	862	0.66	160	0.12	69	0.05	154,106	1,112	0.72	906	0.59	138	0.09	72	0.05
Total	449,220	2,381	0.53	1,413	0.31	603	0.13	459	0.10	476,756	2,233	0.47	1,456	0.31	383	0.08	459	0.10

Abbreviation: STH=soil-transmitted helminths.

2023 (χ^2=350.72, P<0.0001) and 2024 (χ^2=364.77, P<0.0001) (Table 2).

Hookworm Infection

The overall hookworm infection rate was 0.31% (1,413/449,220) and 0.31% (1,456/476,756) in 2023 and 2024 respectively, and no significant difference was found (χ^2=0.63, P>0.05) between them. The infection rates exceeded 1.00% in three PLADs – Chongqing, Yunnan, and Sichuan – in both years. No infections were detected in 16 PLADs in 2023 or 17 PLADs in 2024 (Table 1). Moreover, sex and age differences were statistically significant in both years (P<0.001) (Table 2).

Ascaris lumbricoides Infection

The overall infection rate of *Ascaris lumbricoides* was 0.13% (603/449,220) in 2023 and 0.08% (383/476,756) in 2024, the infection rate was higher in 2023 than in 2024 (χ^2=63.17, P<0.001). Rates were above 1.00% in two PLADs by 2023 and in no PLADs by 2024. No infections were detected in 9 PLADs in 2023 and in 14 PLADs in 2024 (Table 1). Moreover, sex and age differences were statistically significant in both years (P<0.001), except for sex, which showed no statistical significance in 2023 (P>0.05) (Table 2).

Trichuris trichiura Infection

The overall *Trichuris trichiura* infection rate was 0.10% (459/449,220) in 2023 and 0.10% (459/476,756) in 2024 respectively, and no significant difference was found (χ^2=0.81, P>0.05) between them. The prevalence was <1.00% in all PLADs in both years, except Sichuan in 2023. No infections were detected in 14 PLADs in 2023 or in 17 PLADs in 2024 (Table 1). No significant sex differences were observed in either year (P>0.05), while age differences were statistically significant in both years (P<0.0001) (Table 2).

Infection Intensity

Over 85% and 93% of hookworm, *Ascaris lumbricoides*, and *Trichuris trichiura* infections were mild in 2023 and 2024, respectively. Moderate and severe cases were observed in all three species in both years (Table 3).

Soil Contamination

The detection rates of Ascaris eggs were 1.93% (52/2700) and 1.37% (37/2,691) in soil samples, and positive samples were identified in nine and four PLADs in 2023 and 2024, respectively. The highest detection rates were found in Qinghai and Sichuan in both years, and contamination was found in both farmland and vegetable garden soils.

The detection rates of hookworm larvae were 2.44% (66/2,700) and 2.27% (61/2,691) in the soil samples, respectively, and positive samples were identified in seven and five PLADs in 2023 and 2024, respectively. The highest detection rates were observed in Jiangxi and Anhui in 2023 and in Yunnan and Chongqing in 2024, and larvae were present in both farmland and vegetable garden soils.

DISCUSSION

Soil-transmitted helminthiasis remains a persistent public health challenge that has long been endemic to China (*14*). Since the 20th century, nationwide control efforts have made substantial progress. Successive national parasite surveys demonstrated a marked decline in STH infection rates from 53.58% in 1990 (*4*) to 4.49% in 2015 (*6*). Despite this reduction, transmission continues, with pockets of hyper-endemicity highlighting control complexity (*15*). The National Implementation Plan for Comprehensive Control of Key Parasitic Diseases (2024–2030) calls for enhanced and control targets: highly endemic PLADs should reduce infection rates by >10% by 2025 and by >30% by 2030, while other PLADs maintain low prevalence. Sustained, intensive interventions are crucial to improve STH control in China.

A national STH surveillance system currently covers over 400 monitoring counties across all 31 PLADs and XPCC (*7*). Surveillance data from 2016 to 2022 indicate a steady infection rate decline from 2.46% to 0.64% (*7*–*13*). New data show rates of 0.53% (2023) and 0.47% (2024), continuing the downward trend, highlighting persistent epidemiological patterns. Infections were clustered regionally, with higher prevalence in warm, humid southern PLADs (Sichuan, Yunnan, and Chongqing), where climate and agricultural practices favor transmission, particularly of hookworm (*15*). Lower rates occurred in cooler, more developed eastern and northeastern regions (Beijing, Shanghai, and Heilongjiang). Demographically, infection rates were higher in women and peaked among adults ≥60 years, followed by children aged 7–14 years and adults 45–59 years, consistent with known at-risk populations (*7*–*13*). Older adults

TABLE 3. Infection intensity of hookworm, *Ascaris lumbricoides*, and *Trichuris trichiura* in China, 2023–2024.

Species	2023						2024					
	No. infected			Ratio of infection (%)			No. infected			Ratio of infection (%)		
	Mild	Moderate	Severe	Mild	Moderate	Severe	Mild	Moderate	Severe	Mild	Moderate	Severe
Hookworm	1,324	41	48	93.70	2.90	3.40	1,371	42	43	94.16	2.88	2.95
Ascaris lumbricoides	516	86	1	85.57	14.26	0.17	371	10	2	96.87	2.61	0.52
Trichuris trichiura	439	19	1	95.64	4.14	0.22	431	28	0	93.90	6.10	0

frequently face farming; children face risks from outdoor activities and hygiene practices. Given hookworm dominance, future strategies should prioritize this species while maintaining comprehensive efforts against all major STH.

Surveillance data showed persistent *Ascaris* egg contamination in PLADs (Qinghai and Sichuan), and with hookworm larvae in various regions (Jiangxi and Yunnan), indicating ongoing environmental transmission risk. Future STH control should prioritize sanitation improvements, such as expanding access to hygienic toilets and enhancing environmental management, to disrupt transmission and lower infection rates.

Given geographical disparities, regionally targeted strategies are required. In highly endemic areas, focused interventions should aim to reduce infection rates, and a comprehensive strategy of health education as the precursor and source control as the mainstay should be implemented. In low-endemic areas, efforts should shift toward transmission control and eventual elimination. Currently, STH infection rates exceed 1.00% in only four PLADs, whereas all others remain below this threshold. Specific provincial objectives for transmission control and interruption were set in line with the National Implementation Plan for Comprehensive Control of Key Parasitic Diseases (2024–2030). PLADs are advised to align activities with the national standard Control and Interruption of Soil-transmitted Helminth Transmission (WS/T629-2018) and to utilize the forthcoming Measures of Evaluation for Soil-transmitted Helminth Transmission Control and Interruption to systematically advance toward STH control and eventual interruption in China.

China has made significant strides in soil-transmitted helminthiasis prevention and control, where the National Surveillance System plays a key role. Currently, the national prevalence is low. However, considerable disparities persist across regions and population groups, with some areas reporting elevated infection rates. Therefore, implementing targeted interventions in high-prevalence regions guided by national surveillance results is essential. In areas where conditions allow, efforts should be made to control and eliminate soil-transmitted helminthiasis, advancing China's efforts towards a new phase of parasitic disease control.

Conflicts of interest: No conflicts of interest.

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[#] Corresponding authors: Shizhu Li, lisz@chinacdc.cn; Menbao Qian, qianmb@nipd.chinacdc.cn.

[1] National Health Commission Key Laboratory of Parasite and Vector Biology, WHO Collaborating Centre for Tropical Diseases, National Center for International Research on Tropical Diseases, National Institute of Parasitic Diseases, Chinese Center for Disease Control and Prevention & Chinese Center for Tropical Diseases Research, Shanghai, China; [2] School of Global Health, School of Medicine, Chinese Center for Tropical Diseases Research-Shanghai Jiao Tong University, Shanghai, China.

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REFERENCES

1. Bethony J, Brooker S, Albonico M, Geiger SM, Loukas A, Diemert D, et al. Soil-transmitted helminth infections: ascariasis, trichuriasis, and hookworm. Lancet 2006;367(9521):1521 – 32. https://doi.org/10.1016/S0140-6736(06)68653-4.
2. Caldrer S, Ursini T, Santucci B, Motta L, Angheben A. Soil-transmitted helminths and anaemia: a neglected association outside the tropics. Microorganisms 2022;10(5):1027. https://doi.org/10.3390/microorganisms10051027.
3. Ellwanger JH, Ziliotto M, Kulmann-Leal B, Chies JAB. Iron deficiency and soil-transmitted helminth infection: classic and neglected connections. Parasitol Res 2022;121(12):3381 – 92. https://doi.org/10.1007/s00436-022-07697-z.
4. Xu LQ, Jiang ZX, Yu SH, Xu SH, Chang J, Wu ZX, et al. Characteristics and recent trends in endemicity of human parasitic diseases in China. Chin J Parasitol Parasit Dis 1995;13(3):214-7. (In Chinese).
5. Coordinating Office of the National Survey on the Important Human Parasitic Diseases. A national survey on current status of the important parasitic diseases in human population. Chin J Parasitol Parasit Dis 2005;23(5 Suppl):332-40. http://dx.doi.org/10.3969/j.issn.1000-7423.2005.z1.004. (In Chinese).
6. Chen YD, Zhou CH, Zhu HH, Huang JL, Duan L, Zhu TJ, et al. National survey on the current status of important human parasitic diseases in China in 2015. Chin J Parasitol Parasit Dis 2020;38(1):5 – 16. https://doi.org/10.12140/j.issn.1000-7423.2020.01.002.
7. Chinese Center for Disease Control and Prevention. Annual report on surveillance of infectious diseases in China, 2016. Beijing: Chinese Center for Disease Control and Prevention. 2016; p. 384-392. https://book.kongfz.com/22528/7161116072/. (In Chinese).
8. Zhu HH, Huang JL, Zhu TJ, Duan L, Zhou CH, Qian MB, et al. National surveillance of soil-transmitted helminth infections in 2017. Chin J Parasitol Parasit Dis 2019;37(1):12 – 7. https://doi.org/10.12140/j.issn.1000-7423.2019.01.003.
9. Zhu HH, Huang JL, Zhou CH, Zhu TJ, Qian MB, Zhang MZ, et al. Soil-transmitted helminthiasis—China, 2018. China CDC Wkly 2020;2(3):34 – 8. https://doi.org/10.46234/ccdcw2020.010.
10. Zhu HH, Huang JL, Chen YD, Zhou CH, Zhu TJ, Qian MB, et al. Analysis on endemic status of soil-transmitted nematode infection in China in 2019. Chin J Parasitol Parasit Dis 2021;39(5):666 – 73. https://doi.org/10.12140/j.issn.1000-7423.2021.05.015.
11. Zhang MZ, Huang JL, Zhu HH, Zhou CH, Zhu TJ, Qian MB, et al. Epidemiological analysis of soil-transmitted nematode infections in China in 2020. Chin J Parasitol Parasit Dis 2023;41(3):331 – 5,343. https://doi.org/10.12140/j.issn.1000-7423.2023.03.011.
12. Zhao LY, Huang JL, Zhou CH, Zhu TJ, Zhu HH, Zhou XN, et al. National surveillance on soil-transmitted helminth infections in China, 2021. Chin J Parasitol Parasit Dis 2024;42(6):687 – 93. https://doi.org/10.12140/j.issn.1000-7423.2024.06.001.
13. Zhu HH, Huang JL, Zhou CH, Zhu TJ, Zhao LY, Qian MB, et al. National surveillance of soil-transmitted helminth infecions in China in 2022. Chin J Parasitol Parasit Dis 2025;43(4):451 – 7. https://doi.org/10.12140/j.issn.1000-7423.2025.04.001.
14. Tang LH, Xu LQ, Chen YD. Parasitic disease control and research in China. Beijing: Beijing Science and Technology Press. 2012; p. 2. http://find.nlc.cn/search/showDocDetails?docId=3389715174287262016&dataSource=ucs01&query. (In Chinese).
15. Zhu HH, Zhou CH, Zhang MZ, Huang JL, Zhu TJ, Qian MB, et al. Engagement of the National Institute of Parasitic Diseases in control of soil-transmitted helminthiasis in China. Adv Parasitol 2020;110:217 – 44. https://doi.org/10.1016/bs.apar.2020.04.008.