

# Combating syphilis resurgence: China's multifaceted approach

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**SUMMARY:** Syphilis, a chronic infection caused by *Treponema pallidum*, is experiencing a global resurgence, posing significant public health challenges. This study examined the escalating trends of syphilis in the United States, China, and some other countries highlighting the impact of the COVID-19 pandemic, changes in sexual behavior, coinfection with the other infectious diseases such as AIDs, and the role of public health funding. The analysis revealed a stark increase in syphilis cases, particularly among high-risk groups such as men who have sex with men (MSM). China's National Syphilis Control Program (NSCP), initiated in 2010, is a comprehensive approach to syphilis management that incorporates health education, access to testing and treatment, partner notification, safe sex promotion, community interventions, and stigma reduction. The success of the NSCP in reducing early syphilis incidence rates and congenital syphilis in Guangdong Province, that may be served as a model for international syphilis control efforts. This study highlights the necessity for targeted public health interventions and the importance of robust healthcare infrastructure in combating the syphilis epidemic.

**Keywords:** syphilis, global resurgence, social determinations of health (SDoH), the National Syphilis Control Program (NSCP), China's syphilis management

## 1. Syphilis sweeping the world

Syphilis, a chronic systemic sexually transmitted infections (STIs) caused by *Treponema pallidum*, is on the rise globally and poses a major public health concern. It affects multiple organs and systems. Recently, the syphilis dilemma in countries such as the United States, Japan, and the European Union has been reported exhibiting an escalating trend. The United States reported 210,000 cases in 2023 (1), and Japan is facing a "once in fifty years" syphilis epidemic, which mainly involves heterosexual men. Unexpectedly, the number of cases of primary and secondary syphilis has increased significantly in young women. Japan's Ministry of Health has regarded the disease as a public health threat and has strengthened its preventive measures for young women (2). The state quo of the syphilis situation in China is not optimistic. Still, thanks to comprehensive syphilis control measures, such as a syphilis recording system and management strategies that combine traditional Chinese medicine with modern medicine, the National Syphilis Control Program (NSCP), launched in 2010, has played a crucial role. As a result, by 2020, the incidence rate of

early syphilis has dropped significantly from 21.1 cases per 100,000 people to 8.8 cases. Guangdong Province, a province located at southern China, where syphilis was first recorded in China (contained in the Compendium of *Materia Medica*), has taken effective measures to reduce congenital syphilis. The reported sexual syphilis rate has dropped from 128.55 to 5.76 cases per 100,000 live births (3).

## 2. A scary upward trend

The global incidence of syphilis is on the rise, presenting a significant public health challenge. Figure 1 provides a detailed view of the syphilis prevalence, measured as cases per 10,000 individuals, across several countries from 2018 to 2023. The United States has the highest rates among the listed countries, with a substantial increase from 34.82 per 10,000 in 2018 to 61.55 in 2023, highlighting a severe and growing syphilis epidemic (4). China has seen a general increase in syphilis prevalence, starting at 38.19 per 10,000 in 2018, reaching a high of 41.73 in 2019, and then stabilizing around 37.61 in 2023 (5). Australia's syphilis rates have fluctuated,

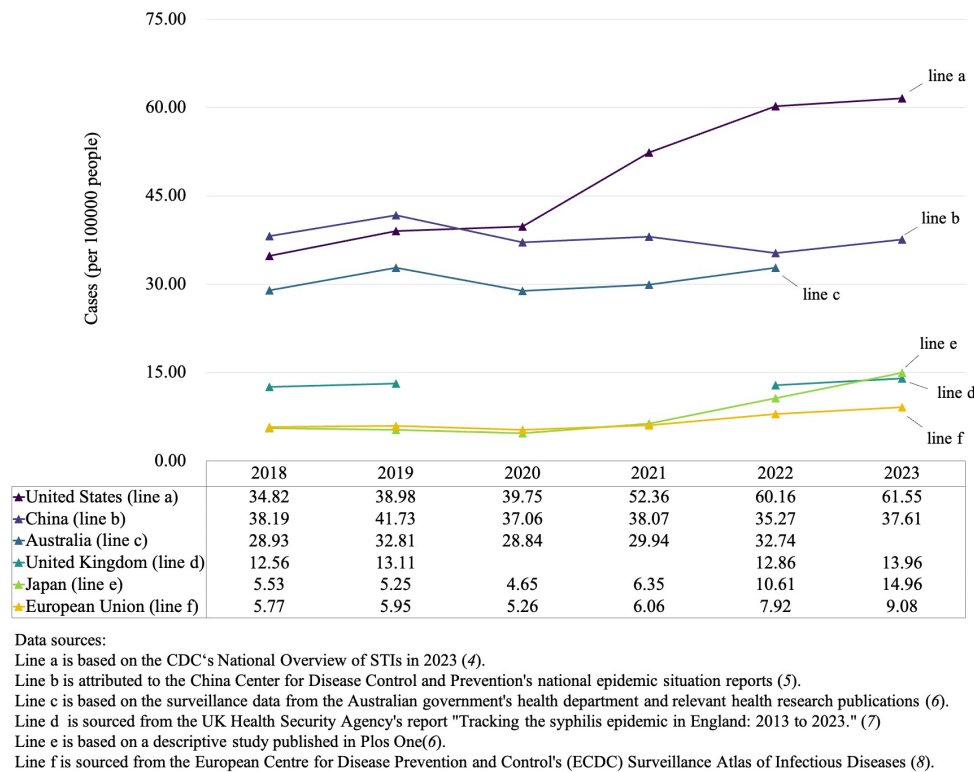


Figure 1. Progressive syphilis trends across nations: A comparative analysis.

beginning at 28.93 per 10,000 in 2018, peaking at 32.81 in 2019, and then slightly decreasing to 32.74 in 2023 (6). The United Kingdom's data indicates a moderate rise in syphilis prevalence, from 12.56 per 10,000 in 2018 to 13.96 in 2023 (7). Japan has experienced a notable increase, with syphilis rates growing from 5.53 per 10,000 in 2018 to 14.96 in 2023, which is approximately a 2.7-fold increase, indicating a significant upward trend (6). The European Union has shown a steady rise in syphilis rates, from 5.77 per 10,000 in 2018 to 9.08 in 2023 (8).

### 3. The resurgence of syphilis from the perspective of social determinations of health (SDoH)

A variety of factors cause the resurgence of syphilis, which is more obvious in high-risk groups such as MSM (9). The factors affecting the population can be summarized according to the social determinants of health (SDoH) model as follows:

1). *Changes in health behaviors:* As online interaction methods have become more popular, the incidence of casual sexual encounters facilitated by digital platforms has surged. This trend may contribute to enhancing syphilis transmission rates, consequently broadening the spread of the disease and increasing the number of vulnerable individuals (10). The adoption of pre-exposure prophylaxis (PrEP) has been associated with an uptick in cases of unprotected anal intercourse, consequently fueling a surge in syphilis diagnoses (11). This enhancement poses heightened risk of exposure and

infection, particularly in several at-risk communities.

2). *Improved health awareness and diagnostic techniques:* It will lead to an increase in the self-detection rate of more suspected infected people and is more likely to lead to an increase in the reporting and identification of confirmed syphilis cases (12).

3). *The comprehensive impacts of COVID-19 pandemic:* On the one hand, during lockdown periods, diminished social interactions and sexual activities among at-risk populations might curtail syphilis proliferation, causing a downturn. However, on the other hand, the pandemic prompted a reallocation of healthcare resources, diminishing syphilis detection and patients' access to diagnostic and therapeutic services. This reduction in early case identification and intervention opportunities might fuel syphilis transmission. Conversely, congenital syphilis cases experienced an increase throughout the pandemic, with an upswing in vertical transmission. Post-pandemic, heightened economic and social strain may elevate population stress and alter relational dynamics, potentially inciting more hazardous sexual practices (13).

4). *Diminution in Public Health Financing:* Recently, the predominant allocation of public health budgets to combat the COVID-19 crisis may have sidetracked the populace's focus on STIs prevention and management. This reorientation of priorities could have resulted in a surge in syphilis cases (14).

5). *Historical and modern environmental impacts:* Historically, individuals with syphilis have been stigmatized as immoral, with artistic depictions from the

renaissance through the 18th century mirroring societal alarm towards the disease, categorizing it as a 'social affliction' (15). In the contemporary era, the rise of the adult entertainment sector has exposed performers to significant health jeopardy (16). The reluctance to consistently employ condoms has fueled the spread of STIs, and the proliferation of pornography has reshaped sexual norms, indirectly contributing to syphilis dissemination (17).

6). *Interplay with Other Ailments*: The coinfection of syphilis with HIV is a significant consequence, given that those living with HIV are at an elevated risk for syphilis. Additionally, an increase in syphilis has been observed among premenopausal women and in cases of congenital syphilis (2).

#### 4. Lessons from China's Syphilis Management

Observing the data presented in Figure 1, it is notable that despite its substantial population, China has managed to sustain a declining trajectory in syphilis cases. The National Syphilis Control Program (NSCP), initiated in 2010, aims to manage syphilis via various levels of the Social-Ecological Model (SEM) (18) (Figure 2). Thus, prevention of syphilis can be divided into several levels:

##### 4.1. Individual Level

1). *Health Education and Awareness*: NSCP encompasses extensive public outreach efforts aimed at enlightening the citizenry on syphilis, detailing its modes of transmission, and promoting preventive strategies.

2). *Access to Testing and Treatment*: Upon the roles of NSCP, there is a commitment to provide the populace with affordable access to syphilis screening and therapeutic interventions, pivotal for timely identification and medical care.

##### 4.2. Interpersonal Level

1). *Partner Notification and Counseling*: Within the framework of NSCP, proactive contact tracing is implemented to reach out to and offer screening and medical intervention to the intimate partners of those identified with syphilis, ensuring a comprehensive approach to the disease management.

2). *Safe Sex Promotion*: The NSCP actively encourages the use of condoms and advocates for safe sexual behaviors as a preventive measure.

##### 4.3. Community Level

1). *Community Engagement Initiatives*: The NSCP bolsters grassroots efforts, including peer-led educational campaigns and community-driven health seminars, to involve local populations in the collective fight against syphilis.

2). *Combating Stigma*: As integral part of NSCP, they focus on mitigating the social stigma surrounding syphilis. This is aimed at creating an environment in which individuals feel empowered to access testing and treatment services without the dread of being subjected to prejudice or discrimination.

##### 4.4. Societal Level

1). *Policy and Healthcare Infrastructure*: The NSCP bolsters management of syphilis through a robust policy framework, including mandatory case reporting and standardized STIs protocols. It also enhances the national healthcare system by expanding access to comprehensive STIs services, training medical staff, and upgrading diagnostic facilities.

2). *Epidemiological Surveillance and Information Gathering*: Central to NSCP is a sophisticated system for monitoring and data collection that is instrumental in tracking the spread of syphilis. This system is crucial for appraising the efficacy of control strategies and for guiding decisions regarding policy formulation and resource allocation.

##### 4.5. Environmental Level

1). *Media Outreach Initiatives*: NSCP employs mass media channels to disseminate critical information on syphilis prevention and the significance of regular testing to a wide audience.

2). *Educational Curriculum Integration*: NSCP conducts sexual health education within the school system's curricula, aiming to instill a solid understanding of sexual health in the younger demographic and to cultivate a positive disposition toward it from an early age.

The resurgence of syphilis, often accompanied by HIV coinfection, poses a significant challenge to public

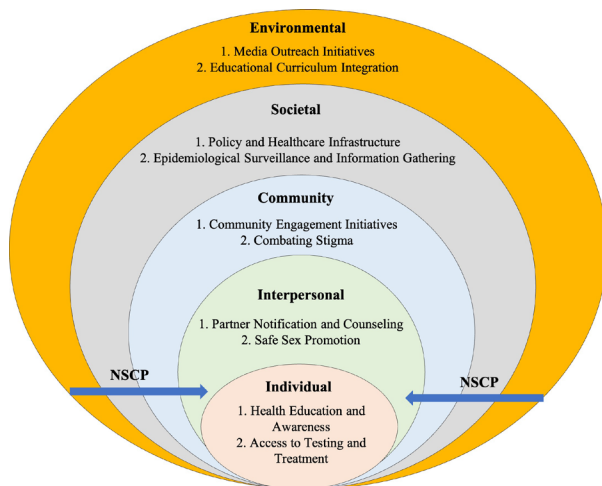


Figure 2. Syphilis control hierarchical: Integrating NSCP through social-ecological model (SEM).

health. This intersection complicates treatment and increases transmission risks, highlighting the need for a comprehensive approach to syphilis management, including HIV coinfection (19). The NSCP addresses these issues, and the government has further efforts with the "Action Plan for Eliminating Mother-to-Child Transmission of HIV, Syphilis, and Hepatitis B (2022-2025) (20)", demonstrating a strategic commitment to tackling these intertwined epidemics.

## 5. Conclusions

The global syphilis resurgence highlights a critical public health challenge, with notable increases in countries such as the US, and Japan. China's National Syphilis Control Program (NSCP) has effectively mitigated this trend. NSCP serves as a model for addressing syphilis, emphasizing the importance of a multifaceted approach to controlling and preventing syphilis.

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