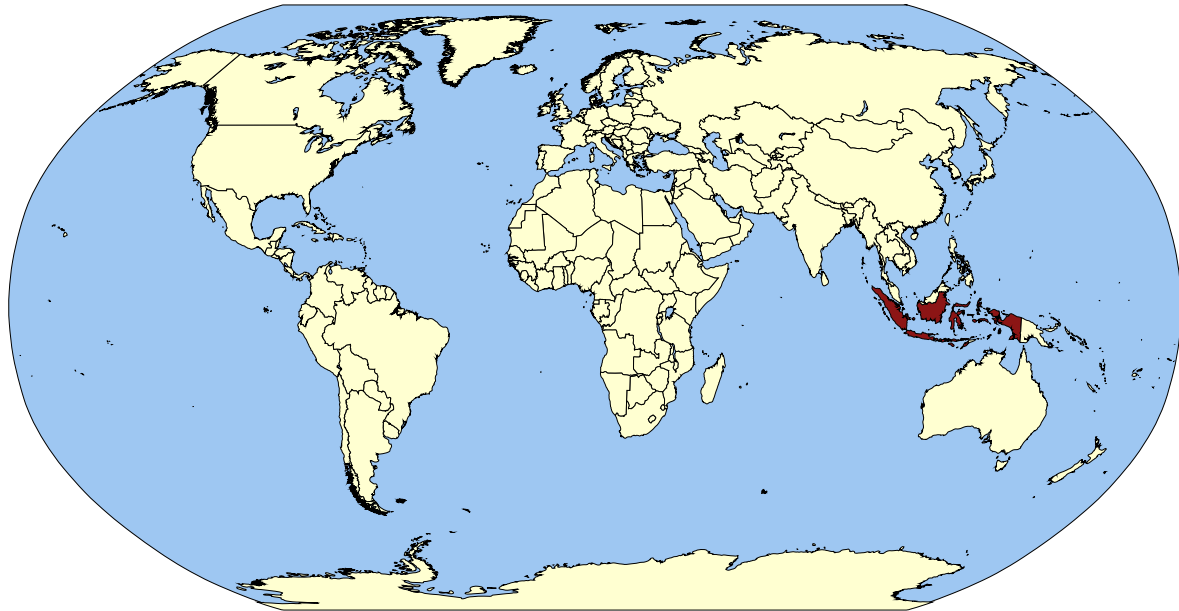


Indonesia



The History of Schistosomiasis in Indonesia

Schistosomiasis in Indonesia is confined to the Central Sulawesi province, where *S. japonicum* transmission through the intermediate snail host *Oncomelania hupensis lindoensis* is currently and historically endemic in three isolated areas in the Lindu and Napu districts [1]. A control program was initiated in 1973, with comprehensive activity in place by 1982. Although transmission rates were significantly reduced, disease transmission is sustained by a diverse reservoir of *S. japonicum* mammalian host species including cows, buffaloes, sheep, goats, and rodents among other animals [2]. Control activities ended in 2005, and surveys since this time show a sustained resurgence in transmission rates in all three endemic areas [3]. The Indonesian Ministry of Health (IMOH) has generated a strategic plan to eliminate schistosomiasis in Central Sulawesi province by 2020 through a praziquantel mass drug administration alongside health education, environmental management and agro-engineering [2].

Schistosomiasis in Indonesia [9]

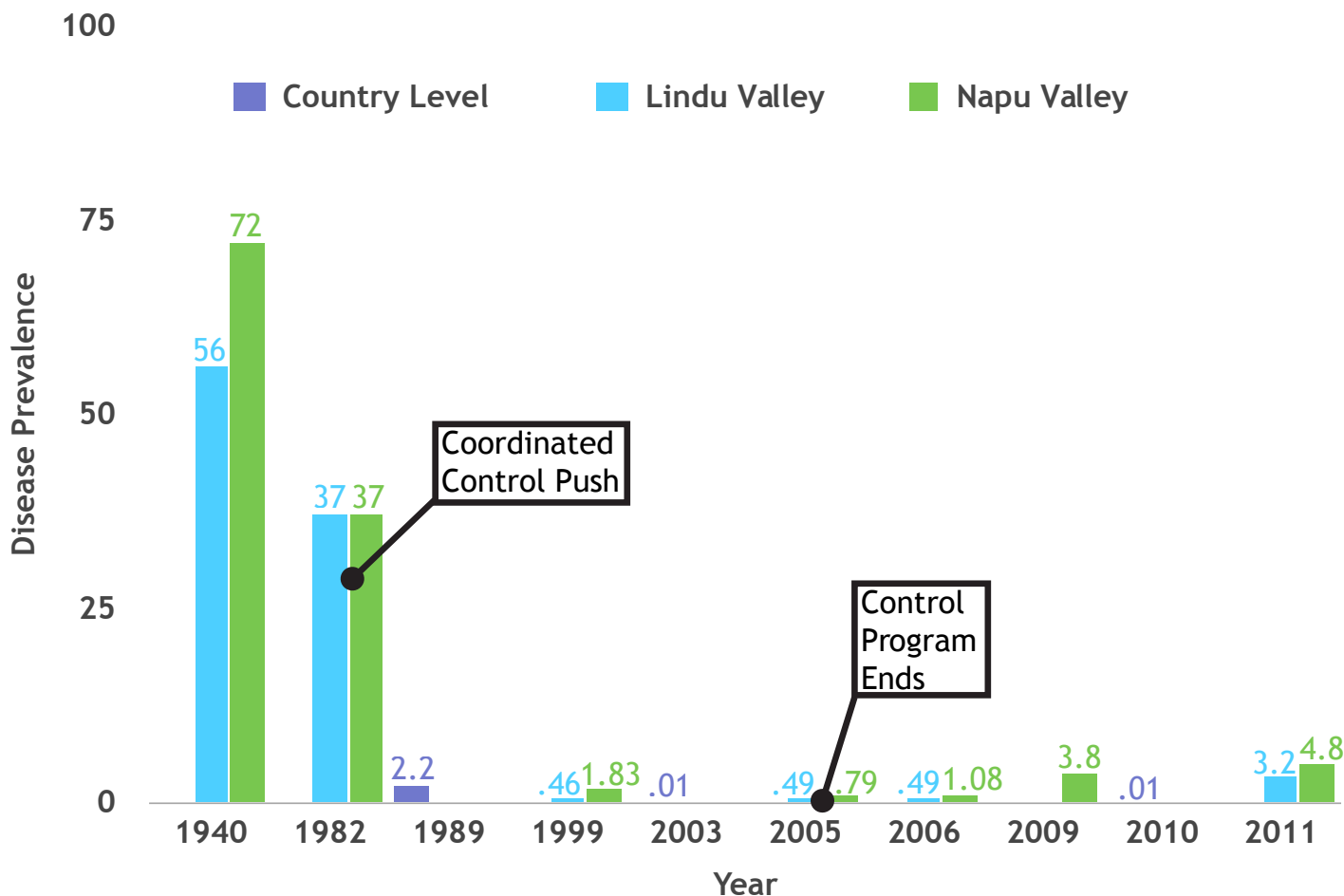
Indonesia treats **2/3** of its targeted population for schistosomiasis

<1% of the population requires preventative chemotherapy for schistosomiasis

Indonesia reaches **around 50%** of the school-age children who require treatment

Overview of Indonesia [10]

- » Population in 2015: 255,993,674
- » Official Languages: Bahasa Indonesia
- » Capital: Jakarta
- » Republic
- » Percentage of Population with Access to Improved Drinking Water in 2012: 84.9%
- » Percentage of Population with Access to Improved Sanitation in 2011: 58.8%



Disease Prevalence in Indonesia

The graph above reflects trends in schistosomiasis prevalence of the past seven decades. Currently, country-wide prevalence of schistosomiasis in Indonesia is low, with an estimated prevalence of 2.2% in 1989 reduced to <0.01% by 2003 [4,5]. Prevalence in the three endemic areas on in Central Sulawesi, however, has been historically very high. Schistosomiasis was first identified in Indonesia in 1937 [6]. In 1940 transmission rates were estimated as high as 56% around Lake Lindu and 72% in villages in the Napu Valley [6]. When control efforts were terminated in 2005, prevalence in the Lindu and Napu Valleys had been reduced to 0.49% and 0.79%, respectively [7]. Between 2008 and 2011, however, prevalence rates had increased to as much as 3.2% and 4.8% in the Lindu and Napu Valleys, demonstrating the need for sustained chemotherapy in order to keep transmission rates from increasing [3].

Implementing Biological Control

Comprehensive control strategies prior to 2005 involved chemotherapy, hygiene and sanitation improvement, and agro-engineering [1]. In 1999, a project developed by the IMOH and the Asian Development Bank to improve sanitation access in the endemic area referred to as “Central Sulawesi Integrated Area Development and Conservation” was created with the goal to protect a national park situated between Lindu and Napu Valleys [6]. The newly developed Schistosomiasis Project within the IMOH involves yearly MDA as its core strategy to reduce human infection. Education, environmental management, and rat and snail surveillance is also planned [1]. The intermediate snail host, *Oncomelania hupensis lindoensi*, is known to live in abandoned rice fields, within dense wild cane, and along creeks, seepage waters, and ditches [1]. A significant hurdle to elimination is the large reservoir of infective animal hosts in Indonesia, a hurdle similarly faced in other *S. japonicum* endemic areas in Asia, most notably China and the Philippines [2].

References

1. Chitsulo, L., Engels, D., Montresor, a, & Savioli, L. The global status of schistosomiasis and its control. *Acta tropica*, **77.1** (2000): 41-51.
2. Plan, A. I. Neglected Tropical Diseases in Indonesia TROPICAL Neglected Tropical Diseases in Indonesia. (2015).
3. Tan, M., Kusriastuti, R., Savioli, L. & Hotez, P. J. Indonesia: an emerging market economy beset by neglected tropical diseases (NTDs). *PLoS Negl. Trop. Dis.* **8**, e2449 (2014).
4. Satrija, F., Ridwan, Y., Jastal, Samarang & Rauf, A. Current status of schistosomiasis in Indonesia. *Acta Trop.* (2013). doi:10.1016/j.actatropica.2013.06.014
5. Rollinson, D. *et al.* Time to set the agenda for schistosomiasis elimination. *Acta Trop.* **128**, 423-440 (2013).
6. Utroska, J.A., Chen, M.G., Dixon, H., Yoon, S., Helling-Borda, M., Hogerzeil, H.V., Mott, K. E. *An Estimate of Global Needs for Praziquantel within Schistosomiasis Control Programmes.* *whqlibdoc.who.int* at <http://whqlibdoc.who.int/HQ/1989/WHO_SCHISTO_89.102_Rev1.pdf>
7. Izhar, A., Sinaga, R. M., Sudomo, M. & Wardiyo, N. D. Recent situation of schistosomiasis in Indonesia. in *Acta Trop.* **82**, 283-288 (2002).
8. Zhou, X., Bergquist, R., Leonardo, L. & Olveda, R. Schistosomiasis : The Disease and its Control.
9. WHO. PCT Databank for Schistosomiasis. at <http://www.who.int/neglected_diseases/preventive_chemotherapy/sch/en/>
10. Central Intelligence Agency. (2014). Indonesia. In *The World Factbook.* at <<https://www.cia.gov/library/publications/the-world-factbook/geos/id.html>>