

## How many children needing deworming attend school?

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The WHO strategy for control of soil-transmitted helminthiasis (STH) focuses on routine preventive chemotherapy (PC) of all children (ages 1-14) in endemic areas. Schools offer a cost-effective platform to deliver PC to school-age children (SAC: ages 5-14), as they allow for ready access to much of the target population (i.e. school-enrolled children) and leverage existing infrastructure by enabling teachers to act as distributors. In 2015, 63% of the SAC requiring PC received treatment. While school-based PC has demonstrated its success in reaching large numbers of children, assuring treatment to out-of-school children remains a key challenge. In this article, we seek to estimate the number of SAC requiring PC not enrolled in school and thus, potentially unreached or difficult to reach through a school-based PC platform.

To quantify the out-of-school population, we compared WHO estimates of the number of SAC requiring PC by country to UNICEF estimates of the proportion of primary SAC not enrolled in school [1]. In addition to slight differences in age profiles used by the two databases, our ability to quantify the number of out-of-school children requiring PC is limited by uncertainty about the extent to which SAC requiring PC are represented in the national household surveys compiled by UNICEF (e.g. UNICEF data may represent the entire country while PC may only be required in parts of a country). However, notably nearly 63% of SAC requiring PC (excluding India) are from 44 (43%) countries where more than 85% of the total SAC population is considered at-risk of STH. Therefore, we expect a reasonable level of representation of SAC requiring PC using nationally representative UNICEF data.

Out-of-school data were available for 91% (93/102) of countries requiring PC – representing over 99% of the global SAC population at-risk of STH (Table 1). The proportion of out-of-school children ranged from under 1% (in four countries) to 75% (Somalia and South Sudan) (Figure 1). Based on these data, the number of out-of-school children requiring PC is substantial. An estimated 107 million (19%) SAC requiring PC are out-of-school worldwide; the majority of which are in Africa (51 million), South-East Asia (32 million) and the Eastern Mediterranean (19 million) (Table 1).

Out-of-school children are typically economically disadvantaged and have limited access to proper hygiene and sanitation. They exemplify STH advocacy messaging which frequently emphasizes the ‘pro-poor’ potential of PC, with the aim of assisting ‘the bottom billion.’ A platform – and global campaign – that excludes these children could fail to reach those with higher prevalence rates and intensity of infection relative to their school-attending peers.[2] Furthermore, the systematic under-treatment of out-of-school children could potentially ignore an important transmission reservoir, and thus, undermine global control efforts.

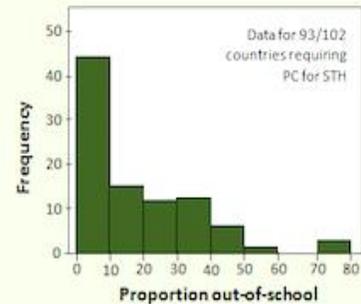
While ‘outreach activities’ (e.g. school-children accompanying their non-enrolled siblings and friends to school on a “treatment day”) can serve out-of-school children,[3],[4] improved PC program monitoring, such as coverage surveys and treatment reporting by enrollment status, are needed to monitor coverage and thus help ensure that those at greatest risk receive PC. Where programs consistently fail to reach out-of-school children, implementers and donors will need to consider other methods and platforms to cover this important population.

**Table 1. Out-of-school data among school-age children requiring PC for STH**

Geographical Region	Requiring PC for STH		Out-of-school estimates	
	Countries <sup>a</sup>	SAC (million) <sup>a</sup>	Proportion	SAC (million)
Africa	42 (41)	190.6 (190.5)	27%	50.9
Americas	25 (21)	32.1 (29.7)	5%	1.6
South-East Asia	8 (8)	247.5 (247.5)	13%	31.8
European	5 (5)	1.5 (1.5)	24%	0.4
Eastern Mediterranean	7 (7)	51.2 (51.2)	37%	18.7
Western Pacific	15 (11)	48.6 (46.6)	8%	3.6
<b>Global</b>	<b>102 (93)</b>	<b>571.6 (567.0)</b>	<b>19%</b>	<b>107.0</b>

<sup>a</sup> Values in the parenthesis indicate countries and SAC requiring PC for STH represented by available out-of-school data

**Figure 1. National out-of-school data**



- [1] UNICEF. <http://data.unicef.org/topic/education/primary-education/>
- [2] Montesor et. al. 2001. School enrolment in Zanzibar linked to children’s age and helminth infection.
- [3] WHO. 2012. Soil-transmitted helminthiases: progress report 2001-2020 and strategic plan 2011-2020. Page 17.
- [4] WHO. 2011. Helminth control in school-age children: a guide for managers of control programmes. Page 34-35.