Sustained National Deworming in Korea 1969-1995

Taejong Kim

Development Research and Learning Network and Impact Evaluation Lab, KDI School of Public Policy and Management

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Walter Cunningham’s face told everybody in the first grade he had hookworms. His absence of shoes told us how he got them. People caught hookworms going barefooted in barnyards and hog wallows.

*(To Kill a Mockingbird, Harper Lee)*
Roundworms (A. lumbricoides)

Estimated 0.8 to 1.2 billion people infected
Heavy infections concentrated in SSA, Latin America, and Asia

Source: http://en.wikipedia.org/wiki/Ascariasis
Life cycle of schistosomes

Sporocysts in snail 4

- Successive generations

Mature miracidia penetrate snail tissue 3

- Cercariae released into water and free-swimming 5

Cercariae lose tails during penetration and become schistosomulae 7

- In motile stage

Cercariae penetrate skin 6

- Infective stage

Cercariae are ingested by human 2

- Diagnostic stage

Migrate to portal blood in liver and mature into adults 8

- Migrate to bloodstream

Paired adult worms migrate to: 10

- Mesenteric venules of bowel/rectum (laying eggs that circulate to the liver and shed in stools)
- Venous plexus of bladder

Eggs hatch releasing miracidia

- In feces 4

- In urine 4

Source: http://en.wikipedia.org/wiki/Schistosomiasis

- About 210 million people infected
- About 700 million people live in areas where infection is common in SSA, Asia, and Latin America
May cause liver and kidney failure and premature death
Second greatest economic cost after malaria
Cost effectiveness

**Figure 4:** Cost-effectiveness at increasing time in school

<table>
<thead>
<tr>
<th>Additional School Years Gained Per $100 Spent</th>
<th>Time in School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information on returns to education, for parents (Madagascar)</td>
<td>20.7 yrs</td>
</tr>
<tr>
<td>Deworming through primary schools (Kenya)</td>
<td>13.9 yrs</td>
</tr>
<tr>
<td>Free primary school uniforms (Kenya)</td>
<td>.71 yrs</td>
</tr>
<tr>
<td>Merit scholarships for girls (Kenya)</td>
<td>.27 yrs</td>
</tr>
<tr>
<td>Conditional cash transfer for girls’ attendance (Malawi)</td>
<td>.09 yrs</td>
</tr>
<tr>
<td>Unconditional cash transfer for girls (Malawi)</td>
<td>.02 yrs</td>
</tr>
</tbody>
</table>

Source: J-PAL Bulletin March 2012
Copenhagen Consensus 2004

Copenhagen Consensus 2004 was the very first Copenhagen Consensus project. The basic idea was to improve prioritization of the numerous problems the world faces, by gathering some of the world's greatest economists to a meeting where some of the biggest challenges in the world would be assessed.

Sustained national deworming in Korea: trends in infection rates among children
Worm epidemiology and “breakpoint”

\[ x_t = \{ \beta + (1-\beta)\alpha^2x_{t-1}^2 \}x_{t-1} + \alpha^2x_{t-1}(1-x_{t-1}) \]
Reduction in worm infection and changes in high school graduation rates
Exposure to the national deworming campaign

“Full exposure” to the deworming campaign in childhood assuming 100% prevalence

Raised years of schooling by 0.6 years for men and by 1.3 years for women,

Increased the probability of high school graduation by 12.2% for men and by 26.2% for women, and

Increased adult wage by 2.3% for men, and by 18.7% for women.

Benefit is to be enjoyed by all generations, current and to come.
### Exposure to deworming and educational attainment (regressions)

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>(1) Complete Years of Schooling</th>
<th>(2)</th>
<th>(3)</th>
<th>(4) Index of High School Graduation</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure</td>
<td>0.9460</td>
<td>0.5685</td>
<td>1.3104</td>
<td>0.1956</td>
<td>0.1221</td>
<td>0.2622</td>
</tr>
<tr>
<td>× Infection Rate</td>
<td>(0.1162)***</td>
<td>(0.1711)***</td>
<td>(0.1510)***</td>
<td>(0.0141)***</td>
<td>(0.0207)***</td>
<td>(0.0188)***</td>
</tr>
<tr>
<td>Female</td>
<td>-1.4221</td>
<td>-0.1266</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0082)***</td>
<td>(0.0010)***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.36</td>
<td>0.19</td>
<td>0.48</td>
<td>0.33</td>
<td>0.21</td>
<td>0.42</td>
</tr>
<tr>
<td>No. of Obs</td>
<td>541,184</td>
<td>263,770</td>
<td>277,414</td>
<td>541,184</td>
<td>263,770</td>
<td>277,414</td>
</tr>
</tbody>
</table>
# Exposure to deworming and productivity (regressions)

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variable: log real wage</td>
<td>All</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Exposure × Infection Rate</td>
<td>0.0496</td>
<td>0.0230</td>
<td>0.1872</td>
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<tr>
<td></td>
<td>(0.0273)*</td>
<td>(0.0309)</td>
<td>(0.0449)**</td>
</tr>
<tr>
<td>Female</td>
<td>-0.3582</td>
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<tr>
<td></td>
<td>(0.0019)**</td>
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<tr>
<td>$R^2$</td>
<td>0.27</td>
<td>0.29</td>
<td>0.06</td>
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<tr>
<td>No. of obs.</td>
<td>185,526</td>
<td>118,838</td>
<td>66,688</td>
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</tbody>
</table>
Under the management philosophy of "For the health of the people", Shin Poong Pharm., Ltd. specializes in manufacturing high-quality domestic medicinal products from ingredients obtained through rigorous quality assurance and strict quality control. Our state-of-the-art facilities ensure the production of high-quality medicinal products.

We are committed to providing quality medicinal products to the global market. We have developed our own production processes and quality standards to ensure the safety and efficacy of our products.

Shin Poong Pharm., Ltd. is proud to provide domestic medicinal products to the world. We are committed to the principles of "For the health of the people" and strive to improve people's health through the development of high-quality medicinal products.

http://www.shinpoong.co.kr/company.intro.asp
Help from Japan

Generous help from the Japanese Overseas Technical Cooperation Agency (precursor to JICA) was essential for the kick-off

- Microscopes, centrifuges, refrigerators, and vans
- Medicine to be given to all school children who tested positive for three years,
- Training of inspectors

…thanks to the cooperation of our partner, KAPE, with its unsurpassed passion for self-help, integrity in its organization, and consistency in its strategy and implementation, and thanks also to the sincerity of experts and relevant agencies in the country for serious collaboration… set the standard for all technical cooperation projects to aspire to in the future.
<table>
<thead>
<tr>
<th>대표명</th>
<th>대상자수</th>
<th>검사자수</th>
<th>양단 포유자수</th>
<th>양단 음성</th>
<th>양단 양성</th>
<th>백혈증</th>
<th>백혈증 전성</th>
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<td>상성</td>
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<td>334</td>
<td>270</td>
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<td>반포</td>
<td>832</td>
<td>762</td>
<td>552</td>
<td>471</td>
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<tr>
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<td>성덕</td>
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<td>323</td>
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<tr>
<td>(연성)</td>
<td>174</td>
<td>150</td>
<td>102</td>
<td>92</td>
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<tr>
<td>장기</td>
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<td>1,516</td>
<td>1,214</td>
<td>1,095</td>
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<tr>
<td>정안</td>
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<td>1,047</td>
<td>660</td>
<td>531</td>
<td>13</td>
<td>348</td>
<td></td>
</tr>
</tbody>
</table>
서

문

발표는 본회가 기생충 질병 예방법에 의하여 전국
출판회사 아동 및 중학교 동학경을 대상으로 하여
1969년도 후계에 실시한 기생충 감염증의
점검이다.

이번 검사는 보건사회부 및 문교부의 지시에 의한
검사시점 및 요법을 확고, 전국적인 조치를, 주
진 분협회 본부 및 각 지방의 검사소로 하여 검사
를 전담하여 소번역, 부정의 확보가 검사에 참여한
되므로는 전 확보가, 한 사람도 빠짐없이 검
사에 참여할수 있는 제구를 이루었으며

검사방법에 있어서는 장의 비도 등질법을 사용
하고 기생충의 검출력이 가장 정확한 새로운 두
충 등질법으로 통일, 기생충 점검을 실시하였다.

그러나 몇몇 소수 지역은 검사방법을 통일하기로
한 것에도 있어 높함으로, 실적이나 1970년도 부
타는 전원 통일된 검사방법에 의하여 완벽한 기생
충 점검이 실시된 것이다.

본 통계에 있어서 점검을 기하고자 정한 수의

을 정주하였으나 미리한 점에 대하여는 문헌에

관심을 가지신 분들의 지도를 받아 정차 완비하시

거 하여 이 통계와 사례발견을 위하여 규소하고

원효가 되려면 타령으로 판단하였다.

본 통계에서 나타난 기생충의 질병 감염

자에 대하여는 전국 부로 특장을 실시하였으며

1970년도 부터는 중학교 학생이 가지므로

특장은 실시하고자 한다.

결국으로 학교 기생충 감염증방법을 위하여 물질 방

면으로 지원해 주신 문교부, 보건사회부, 과학기술

에 전기로 교육의회, 각 교육인사, 각 교육교 관

제관 및 각 지방 보건사회 관계자 일본 O, T, C, A,

성과의 기생충 예방회 여러분에게 감사의

자료, 통계, 연구문의 노고에 대하여 칭찬 드리는 바이다.

1969년

의

한국기생충학학회

의

기장 이중선

16
Deworming collaboration overseas by Korea,

Neither national nor sustained! Maybe good, but great?
1. Public policy perspective: good public investment can be made great (sustained, national)

2. Governance perspective: why don’t governments do the obviously good things?

3. Public management perspective: government-civil society cooperation, dedication and nimbleness of CSO (KAPE with 150 people and lean budget)

4. Aid effectiveness

5. Spearhead human capital, private enterprise, and development (KAPE and Shinpoong Pharmaceuticals)

www.kdevelopdia.org