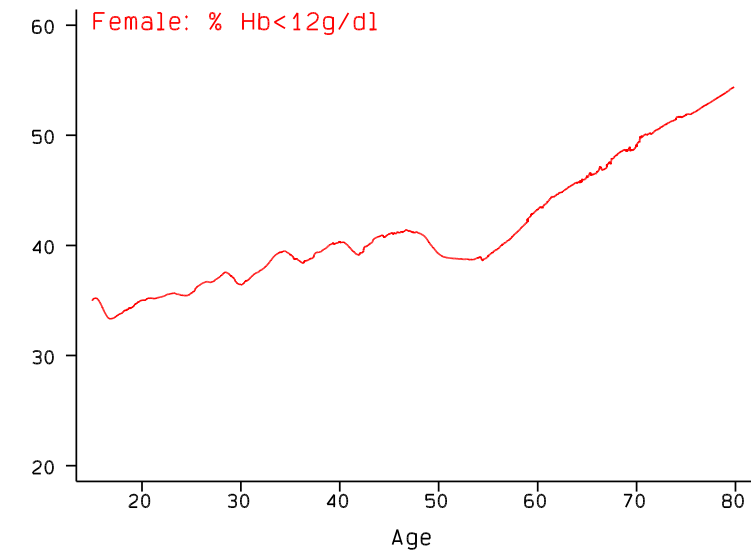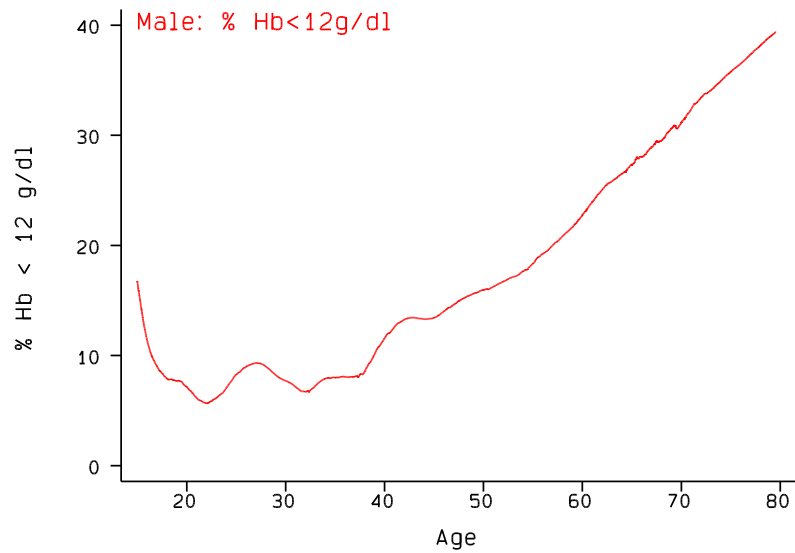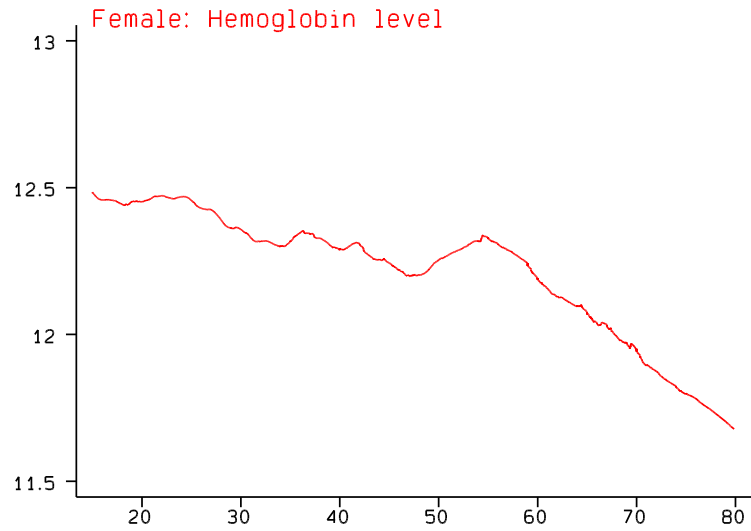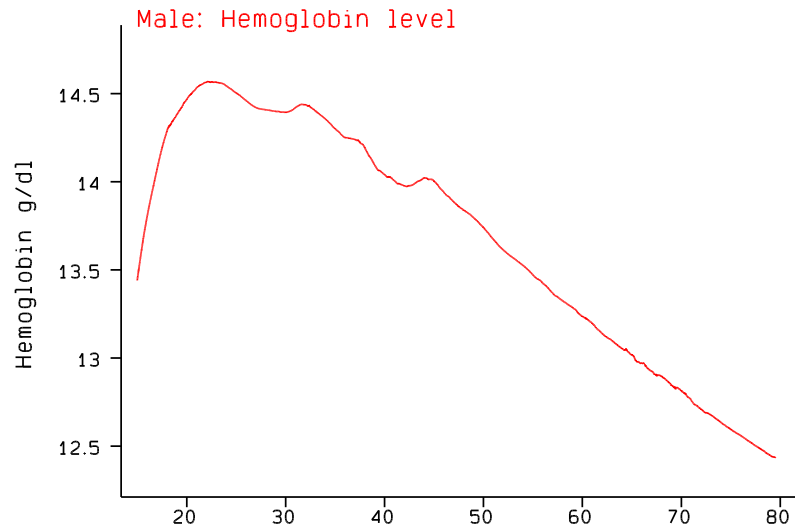Figure 1: Hemoglobin levels in the Indonesian population
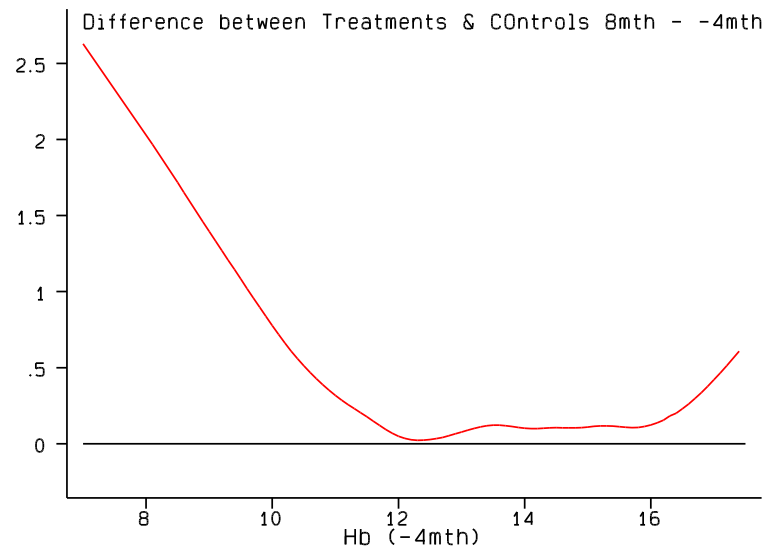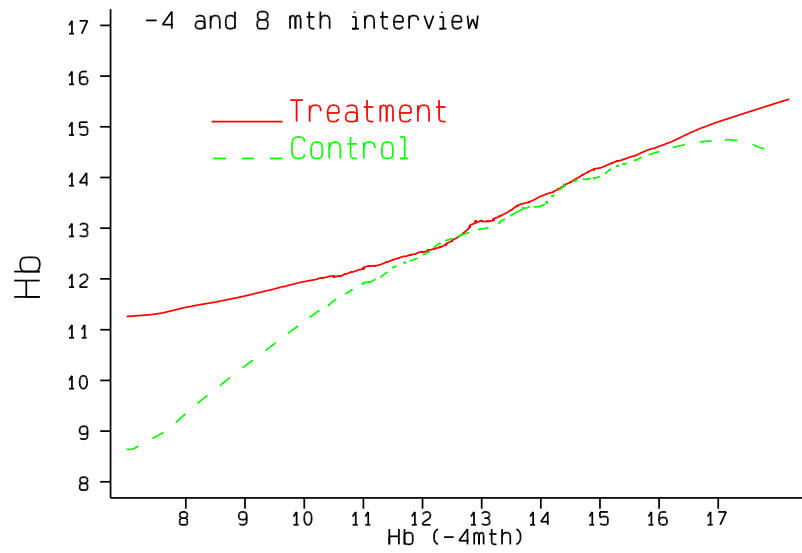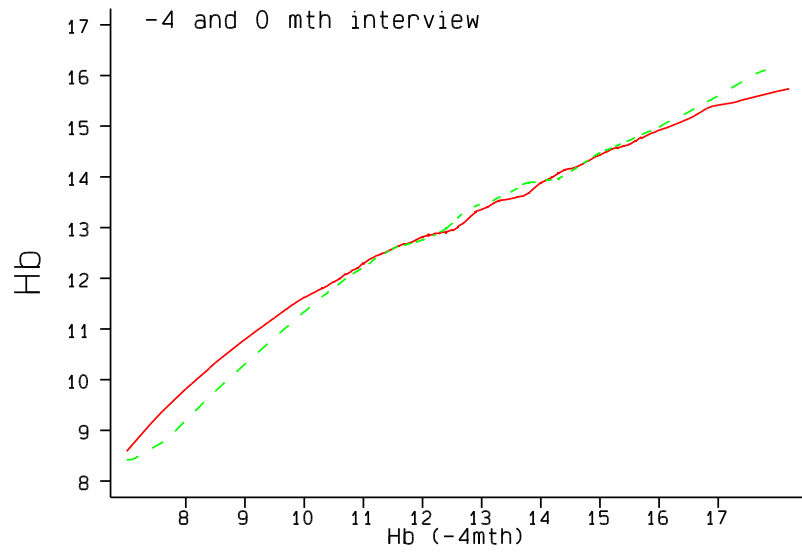
Figure 2: Hemoglobin level of males age 30-70

Table 3
Hemoglobin status: Intent to treat effects

Indicator	Sample	Status at 8 mths Treat-ment (1)	Control (2)	Diff T-C (3)	-4 mths Diff T-C (4)	8 - (-4)mths Diff-in Diff (5)	Adj Diff -in-diff (6)	Low Hb @baseline DinD (7)	High Hb @baseline DinD (8)	Low-High Hb@base DinDinD (9)
Hemoglobin	Male	13.250	13.127	0.123	-0.059	0.183	0.181	0.399	0.101	0.297
		[0.040]	[0.040]	[0.057]	[0.059]	[0.057]	[0.057]	[0.109]	[0.064]	[0.126]
	Female	11.974	11.819	0.156	0.040	0.116	0.117	0.203	-0.022	0.225
		[0.033]	[0.033]	[0.046]	[0.048]	[0.048]	[0.048]	[0.057]	[0.081]	[0.099]
Hemoglobin <11g/dl	Male	0.069	0.078	-0.009	0.009	-0.017	-0.017	-0.066	0.000	-0.066
		[0.006]	[0.006]	[0.009]	[0.010]	[0.011]	[0.011]	[0.021]	[0.012]	[0.024]
	Female	0.195	0.249	-0.054	-0.012	-0.041	-0.041	-0.072	0.017	-0.089
		[0.009]	[0.009]	[0.013]	[0.014]	[0.016]	[0.016]	[0.019]	[0.027]	[0.033]
Hemoglobin <12g/dl	Male	0.179	0.206	-0.027	-0.004	-0.023	-0.023	-0.046	-0.013	-0.033
		[0.009]	[0.009]	[0.013]	[0.014]	[0.015]	[0.015]	[0.030]	[0.017]	[0.034]
	Female	0.461	0.499	-0.038	-0.024	-0.014	-0.014	-0.036	0.020	-0.056
		[0.011]	[0.011]	[0.016]	[0.016]	[0.019]	[0.019]	[0.022]	[0.032]	[0.039]
Sample size	Male	1,804	1,759	3,563	3,563	3,563	3,563	899	2,664	3,563
	Female	2,021	2,042	4,063	4,063	4,063	4,063	2,710	1,353	4,063

Notes: Standard errors in parentheses. (3)=(2)-(1); (5)=(4)-(3); (6) adjusts for age (10 year splines); (9)=(8)-(7); Low Hb is Hb<12.5g/dl at baseline; High Hb is Hb$\geq$12.5g/dl at baseline)

Table 4: Intent to treat effects on subjects stratified by Hb status at baseline
Work, earnings and hours of work

| Indicator | Sample | Change in Treatments - Change in Controls | | |
		If low Hb @baseline DinD (1)	If high Hb @baseline DinD (2)	Low-High Hb @baseline DinDinD (3)
1. Pr(not working in month of survey interview)	Male	-0.036 [0.012]	-0.003 [0.007]	-0.033 [0.014]
	Female	-0.020 [0.014]	0.029 [0.020]	-0.049 [0.024]
2. $\sqrt[4]{}$Earnings (Rp 000) (last 4 months)	Male	0.576 [0.299]	-0.012 [0.173]	0.582 [0.346]
	Female	0.163 [0.091]	0.033 [0.127]	0.130 [0.156]
3. Hours spent working (last 4 months)	Male	-12.968 [36.368]	-44.185 [21.027]	31.217 [42.013]
	Female	9.644 [15.264]	30.137 [21.425]	-20.493 [26.309]
4. $\sqrt[4]{}$Hrly earnings (Rp 000) (last 4 months)	Male	0.126 [0.066]	0.007 [0.038]	0.119 [0.076]
	Female	0.034 [0.025]	-0.009 [0.035]	0.043 [0.043]
5. $\sqrt[4]{}$Hrly earnings (Rp 000) conditional on being non zero (last 4 months)	Male	0.113 [0.069]	-0.006 [0.040]	0.119 [0.080]
	Female	0.056 [0.026]	-0.021 [0.037]	0.077 [0.046]
6. $\sqrt[4]{}$Earnings (Rp 000) if self-employed (last 4 months)	Male	1.091 [0.445]	-0.386 [0.285]	1.477 [0.528]
	Female	0.177 [0.214]	0.101 [0.305]	0.076 [0.373]
7. $\sqrt[4]{}$Hrly earnings (Rp 000) if self-employed (last 4 months)	Male	0.230 [0.093]	-0.078 [0.059]	0.308 [0.110]
	Female	0.031 [0.052]	-0.036 [0.074]	0.067 [0.090]

Notes: Standard errors in parentheses. Columns 1, 2 and 3 in this table correspond with Table 3 columns 7, 8 and 9, respectively. See Table 3 for sample sizes for all rows 1 through 3. Estimates in row 4 are based on 3,350 males and 2,999 females; 3,102 males and 1,878 females in row 5 and 1,835 males and 746 females in rows 6 and 7.

Table 5: Intent to treat effects on subjects stratified by Hb status at baseline
Time allocation

| | | Change in Treatments - Change in Controls | | |
| | | If low Hb @baseline | If high Hb @baseline | Low-High Hb @baseline |
Indicator	Sample	DinD (1)	DinD (2)	DinDinD (3)
During prior day, number of hours spent on				
1. Work	Male	0.076 [0.265]	-0.083 [0.155]	0.159 [0.307]
	Female	0.087 [0.151]	-0.112 [0.214]	0.199 [0.261]
2. Sleep	Male	-0.343 [0.165]	-0.026 [0.096]	-0.317 [0.191]
	Female	0.059 [0.079]	0.231 [0.111]	-0.172 [0.136]
3. Leisure activities	Male	0.280 [0.296]	0.042 [0.173]	0.238 [0.342]
	Female	-0.095 [0.168]	0.145 [0.238]	-0.241 [0.291]
4. Housework	Male	0.068 [0.174]	0.021 [0.101]	0.047 [0.201]
	Female	-0.236 [0.161]	0.151 [0.227]	-0.387 [0.278]
5. Family care	Male	-0.001 [0.107]	0.012 [0.062]	-0.013 [0.124]
	Female	-0.080 [0.106]	0.045 [0.150]	-0.125 [0.184]
6. Number of days work lost (in last month)	Male	-0.818 [0.382]	0.061 [0.223]	-0.879 [0.443]
	Female	-0.110 [0.217]	-0.163 [0.306]	0.053 [0.375]

Notes: Standard errors in parentheses. See Table 3 for sample sizes.

Table 6: Intent to treat effects on subjects stratified by Hb status at baseline
Physical health: Intent to treat effects

| Indicator | Sample | Change in Treatments - Change in Controls | | |
		If low Hb @baseline DinD (1)	If high Hb @baseline DinD (2)	Low-High Hb @baseline DinDinD (3)
1. Pr(Unable carry heavy load) self reported	Male	-0.032 [0.015]	0.002 [0.008]	-0.034 [0.017]
	Female	-0.008 [0.014]	-0.018 [0.019]	0.009 [0.023]
2. Pr(Has more energy) self reported	Male	0.026 [0.021]	0.001 [0.013]	0.025 [0.025]
	Female	0.011 [0.012]	-0.008 [0.017]	0.019 [0.020]
3. Pr(Has less energy) self reported	Male	-0.032 [0.012]	0.010 [0.007]	-0.041 [0.014]
	Female	0.009 [0.008]	-0.009 [0.011]	0.017 [0.014]
4. Pr(Felt fatigued) (in last month)	Male	-0.040 [0.043]	-0.050 [0.025]	0.010 [0.049]
	Female	-0.007 [0.025]	-0.013 [0.036]	0.006 [0.044]
5. Pr(Felt dizzy) (in last month)	Male	-0.043 [0.037]	-0.023 [0.022]	-0.020 [0.043]
	Female	-0.056 [0.024]	0.016 [0.033]	-0.072 [0.041]

Notes: Standard errors in parentheses; see Table 3 for sample sizes.

Table 6: Intent to treat effects on subjects stratified by Hb status at baseline
Physical health: Intent to treat effects

Indicator	Sample	Change in Treatments - Change in Controls		
		If low Hb @baseline DinD (1)	If high Hb @baseline DinD (2)	Low-High Hb @baseline DinDinD (3)
1. Pr(Unable carry heavy load) self reported	Male	-0.032 [0.015]	0.002 [0.008]	-0.034 [0.017]
	Female	-0.008 [0.014]	-0.018 [0.019]	0.009 [0.023]
2. Pr(Has more energy) self reported	Male	0.026 [0.021]	0.001 [0.013]	0.025 [0.025]
	Female	0.011 [0.012]	-0.008 [0.017]	0.019 [0.020]
3. Pr(Has less energy) self reported	Male	-0.032 [0.012]	0.010 [0.007]	-0.041 [0.014]
	Female	0.009 [0.008]	-0.009 [0.011]	0.017 [0.014]
4. Pr(Felt fatigued) (in last month)	Male	-0.040 [0.043]	-0.050 [0.025]	0.010 [0.049]
	Female	-0.007 [0.025]	-0.013 [0.036]	0.006 [0.044]
5. Pr(Felt dizzy) (in last month)	Male	-0.043 [0.037]	-0.023 [0.022]	-0.020 [0.043]
	Female	-0.056 [0.024]	0.016 [0.033]	-0.072 [0.041]

Notes: Standard errors in parentheses; see Table 3 for sample sizes.

Table 7: Intent to treat effects on subjects stratified by Hb status at baseline
Psychological health: Intent to treat effects

| | | Change in Treatments - Change in Controls | | |
| | | If low Hb @baseline | If high Hb @baseline | Low-High Hb @baseline |
Indicator	Sample	DinD (1)	DinD (2)	DinDinD (3)
1. Pr(finds normal tasks an effort)	Male	-0.073 [0.029]	-0.009 [0.017]	-0.064 [0.034]
	Female	0.026 [0.019]	0.011 [0.027]	0.015 [0.033]
2. Pr(has difficulty sleeping)	Male	-0.102 [0.036]	0.007 [0.021]	-0.109 [0.042]
	Female	0.032 [0.022]	0.018 [0.031]	0.014 [0.038]
3. Pr(feels anxious)	Male	-0.018 [0.023]	0.003 [0.013]	-0.021 [0.027]
	Female	-0.020 [0.017]	0.042 [0.024]	-0.062 [0.029]
4. Pr(does not think about future)	Male	0.074 [0.023]	-0.004 [0.013]	0.078 [0.027]
	Female	-0.006 [0.014]	0.034 [0.020]	-0.040 [0.025]

Notes: Standard errors in parentheses; see Table 3 for sample sizes.

Table 1: 1998 Average pupil and school characteristics, pre-treatment[†]

	Group 1 (25 schools)	Group 2 (25 schools)	Group 3 (25 schools)	Group 1 – Group 3	Group 2 – Group 3
Panel A: Pre-school to Grade 8					
Male	0.53	0.51	0.52	0.01 (0.02)	-0.01 (0.02)
Proportion girls < 13 years, and all boys	0.89	0.89	0.88	0.00 (0.01)	0.01 (0.01)
Grade progression [= Grade – (Age – 6)]	-2.1	-1.9	-2.1	-0.0 (0.1)	0.1 (0.1)
Year of birth	1986.2	1986.5	1985.8	0.4** (0.2)	0.8*** (0.2)
Panel B: Grades 3 to 8					
Attendance recorded in school registers (during the four weeks prior to the pupil survey)	0.973	0.963	0.969	0.003 (0.004)	-0.006 (0.004)
Access to latrine at home	0.82	0.81	0.82	0.00 (0.03)	-0.01 (0.03)
Have livestock (cows, goats, pigs, sheep) at home	0.66	0.67	0.66	-0.00 (0.03)	0.01 (0.03)
Weight-for-age Z-score (low scores denote undernutrition)	-1.39	-1.40	-1.44	0.05 (0.05)	0.04 (0.05)
Blood in stool (self-reported)	0.26	0.22	0.19	0.07** (0.03)	0.03 (0.03)
Sick often (self-reported)	0.10	0.10	0.08	0.02** (0.01)	0.02** (0.01)
Malaria/fever in past week (self-reported)	0.37	0.38	0.40	-0.03 (0.03)	-0.02 (0.03)
Clean (observed by field workers)	0.60	0.66	0.67	-0.07** (0.03)	-0.01 (0.03)
Panel C: School characteristics					
District mock exam score 1996, grades 5-8[‡]	-0.10	0.09	0.01	-0.11 (0.12)	0.08 (0.12)
Distance to Lake Victoria	10.0	9.9	9.5	0.6 (1.9)	0.5 (1.9)
Pupil population	392.7	403.8	375.9	16.8 (57.6)	27.9 (57.6)
School latrines per pupil	0.007	0.006	0.007	0.001 (0.001)	-0.000 (0.001)
Proportion moderate-heavy infections in zone	0.37	0.37	0.36	0.01 (0.03)	0.01 (0.03)
Group 1 pupils within 3 km[††]	461.1	408.3	344.5	116.6 (120.3)	63.8 (120.3)
Total primary school pupils within 3 km	1229.1	1364.3	1151.9	77.2 (205.5)	212.4 (205.5)
Group 1 pupils within 3-6 km	844.5	652.0	869.7	-25.1 (140.9)	-217.6 (140.9)
Total primary school pupils within 3-6 km	2370.7	2324.2	2401.7	-31.1 (209.5)	-77.6 (209.5)

[†]School averages weighted by pupil population. Standard errors in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 (*) percent confidence. Data from the 1998 ICS Pupil Namelist, 1998 Pupil Questionnaire and 1998 School Questionnaire.

[‡]1996 District mock exam scores have been normalized to be in units of individual level standard deviations, and so are comparable in units to the 1998 and 1999 ICS test scores (under the assumption that the decomposition of test score variance within and between schools was the same in 1996, 1998, and 1999).

[††] This includes girls less than 13 years old, and all boys (those eligible for deworming in treatment schools).

Table 2: January 1998 helminth infections, pre-treatment, Group 1 schools[†]

	Prevalence of infection	Prevalence of moderate-heavy infection	Average infection intensity, in eggs per gram (s.e.)
Hookworm	0.77	0.15	426 (1055)
Roundworm	0.42	0.16	2337 (5156)
Schistosomiasis, all schools	0.22	0.07	91 (413)
Schistosomiasis, schools < 5km from Lake Victoria	0.80	0.39	487 (879)
Whipworm	0.55	0.10	161 (470)
At least one infection	0.92	0.37	-
Born since 1985	0.92	0.40	-
Born before 1985	0.91	0.34	-
Female	0.91	0.34	-
Male	0.93	0.38	-
At least two infections	0.31	0.10	-
At least three infections	0.28	0.01	-

[†]These are averages of individual-level data, as presented in Brooker, et al. (2000b); correcting for the oversampling of the (numerically smaller) upper grades does not substantially change the results. Standard errors in parentheses. Sample size: 1894 pupils. Fifteen pupils per standard in grades 3 to 8 for Group 1 schools were randomly sampled. The bottom two rows of the column "Prevalence of moderate-heavy infection" should be interpreted as the proportion with at least two or at least three moderate-to-heavy helminth infections, respectively.

The data were collected in January to March 1998 by the Kenya Ministry of Health, Division of Vector Borne Diseases (DVBD). The moderate infection thresholds for the various intestinal helminths are: 250 epg for *S. mansoni*, and 5,000 epg for Roundworm, both the WHO standard, and 750 epg for Hookworm and 400 epg for Whipworm, both somewhat lower than the WHO standard. Refer to Brooker, et al. (2000b) for a discussion of this parasitological survey and the infection cut-offs. All cases of schistosomiasis are *S. mansoni*.

Table 3: Proportion of pupils receiving deworming treatment in PSDP[†]

	Group 1		Group 2		Group 3	
	Girls < 13 years, and all boys	Girls ≥ 13 years	Girls < 13 years, and all boys	Girls ≥ 13 years	Girls < 13 years, and all boys	Girls ≥ 13 years
	Treatment		*Comparison*		*Comparison*	
Any medical treatment in 1998	0.78	0.19	0	0	0	0
(For grades 1-8 in early 1998)						
Round 1 (March-April 1998), Albendazole	0.69	0.11	0	0	0	0
Round 1 (March-April 1998), Praziquantel[‡]	0.64	0.34	0	0	0	0
Round 2 (Oct.-Nov. 1998), Albendazole	0.56	0.07	0	0	0	0
	Treatment		*Treatment*		*Comparison*	
Any medical treatment in 1999	0.59	0.07	0.55	0.10	0.01	0
(For grades 1-7 in early 1998)						
Round 1 (March-June 1999), Albendazole	0.44	0.06	0.35	0.06	0.01	0
Round 1 (March-June 1999), Praziquantel[‡]	0.47	0.06	0.38	0.06	0.01	0
Round 2 (Oct.-Nov. 1999), Albendazole	0.53	0.06	0.51	0.08	0.01	0

[†]Data for grades 1-8. Since month of birth information is missing for most pupils, precise assignment of treatment eligibility status for girls born during the "threshold" year is often impossible; all girls who turn 13 during a given year are counted as 12 year olds (eligible for deworming treatment) throughout for consistency.

[‡]Praziquantel figures in Table 3 refer only to children in schools meeting the schistosomiasis treament threshold (30 percent prevalence) in that year.

Table 4: Proportion of pupil transfers across schools

School in early 1998 (pre-treatment)	1998 transfer to a			1999 transfer to a		
	Group 1 School	Group 2 School	Group 3 school	Group 1 school	Group 2 school	Group 3 school
Group 1	0.005	0.007	0.007	0.032	0.026	0.027
Group 2	0.006	0.007	0.008	0.026	0.033	0.027
Group 3	0.010	0.010	0.006	0.022	0.036	0.022
Total transfers	0.021	0.024	0.021	0.080	0.095	0.076

Table 5: January to March 1999, Health and Health Behavior Differences Between Group 1 (1998 Treatment) and Group 2 (1998 Comparison) Schools [†]

	Group 1	Group 2	Group 1 – Group 2
Panel A: Helminth Infection Rates			
Any moderate-heavy infection, January – March 1998	0.38	-	-
Any moderate-heavy infection, 1999	0.27	0.52	-0.25[***]
			(0.06)
Hookworm moderate-heavy infection, 1999	0.06	0.22	-0.16[***]
			(0.03)
Roundworm moderate-heavy infection, 1999	0.09	0.24	-0.15[***]
			(0.04)
Schistosomiasis moderate-heavy infection, 1999	0.08	0.18	-0.10[*]
			(0.06)
Whipworm moderate-heavy infection, 1999	0.13	0.17	-0.04
			(0.05)
Panel B: Other Nutritional and Health Outcomes			
Sick in past week (self-reported), 1999	0.41	0.45	-0.04[**]
			(0.02)
Sick often (self-reported), 1999	0.12	0.15	-0.03[**]
			(0.01)
Height-for-age Z-score, 1999	-1.13	-1.22	0.09[*]
(low scores denote undernutrition)			(0.05)
Weight-for-age Z-score, 1999	-1.25	-1.25	-0.00
(low scores denote undernutrition)			(0.04)
Hemoglobin concentration (g/L), 1999	124.8	123.2	1.6
			(1.4)
Proportion anemic (Hb < 100g/L), 1999	0.02	0.04	-0.02[**]
			(0.01)
Panel C: Worm Prevention Behaviors			
Clean (observed by field worker), 1999	0.59	0.60	-0.01
			(0.02)
Wears shoes (observed by field worker), 1999	0.24	0.26	-0.02
			(0.03)
Days contact with fresh water in past week	2.4	2.2	0.2
(self-reported), 1999			(0.3)

[†]These are averages of individual-level data for grade 3-8 pupils; disturbance terms are clustered within schools. Robust standard errors in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 (*) percent confidence.
Obs. for parasitological results: 2328 (862 Group 1,1467 Group 2).
Obs. for hemoglobin results: 778 (292 Group 1, 486 Group 2).
Obs. for 1999 Pupil Questionnaire health outcomes: 9,102 (3562 Group 1, 5540 Group 2 and Group 3).
Following Brooker et al. (2000b), moderate-to-heavy infection thresholds for the various intestinal helminths are: 250 epg for *S. mansoni*, and 5,000 epg for Roundworm, both the WHO standard, and 750 epg for Hookworm and 400 epg for Whipworm, both somewhat lower than the WHO standard. Kenya Ministry of Health officials collected the parasitological data from January to March 1998 in Group 1 schools, and from January to March 1999 in Group 1 and Group 2 schools. A random subset of the original 1998 Group 1 parasitological sample was re-surveyed in 1999. Hb data were collected by Kenya Ministry of Health officials and ICS field officers using the portable Hemocue machine. The self-reported health outcomes were collected for all three groups of schools as part of Pupil Questionnaire administration.

Table 6: Deworming health externalities within schools, January to March 1999 [†]

	Group 1, Treated in 1998	Group 1, Untreated in 1998	Group 2, Treated in 1999	Group 2, Untreated in 1999	(Group 1 Treated 1998) – (Group 2, Treated 1999)	(Group 1, Untreated 1998) – (Group 2, Untreated 1999)
Panel A: Selection into Treatment						
Any moderate-heavy infection, 1998	0.39	0.44	-	-	-	-
Proportion of 1998 parasitological sample tracked to 1999 sample[‡]	0.36	0.36	-	-	-	-
Access to latrine at home, 1998	0.84	0.80	0.81	0.86	0.03 (0.04)	-0.06 (0.05)
Grade progression [=Grade – (Age – 6)], 1998	-2.0	-1.8	-1.8	-1.8	-0.2** (0.1)	-0.0 (0.2)
Weight-for-age (Z-score), 1998 (low scores denote undernutrition)	-1.58	-1.52	-1.57	-1.46	-0.01 (0.06)	-0.06 (0.11)
Malaria/fever in past week (self-reported), 1998	0.37	0.41	0.40	0.39	-0.03 (0.04)	-0.01 (0.06)
Clean (observed by field worker), 1998	0.53	0.59	0.60	0.66	-0.07 (0.05)	-0.07 (0.10)
Panel B: Health Outcomes						
Girls < 13 years, and all boys						
Any moderate-heavy infection, 1999	0.24	0.34	0.51	0.55	-0.27*** (0.06)	-0.21** (0.10)
Hookworm moderate-heavy infection, 1999	0.04	0.11	0.22	0.20	-0.19*** (0.03)	-0.09* (0.05)
Roundworm moderate-heavy infection, 1999	0.08	0.12	0.22	0.30	-0.14*** (0.04)	-0.18** (0.07)
Schistosomiasis moderate-heavy infection, 1999	0.09	0.08	0.20	0.13	-0.11* (0.06)	-0.05 (0.06)
Whipworm moderate-heavy infection, 1999	0.12	0.16	0.16	0.20	-0.04 (0.16)	-0.05 (0.09)
Girls ≥ 13 years						
Any moderate-heavy infection, 1998	0.31	0.28	-	-	-	-
Any moderate-heavy infection, 1999	0.27	0.43	0.32	0.54	-0.05 (0.17)	-0.10 (0.09)
Panel C: School Participation						
School participation rate, May 1998 to March 1999[††]	0.872	0.764	0.808	0.684	0.064** (0.032)	0.080** (0.039)

[†] These are averages of individual-level data for grade 3-8 pupils in the parasitological survey subsample; disturbance terms are clustered within schools. Robust standard errors in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 (*) percent confidence. The data are described in the footnote to Table 5. Obs. for the 1999 parasitological survey: 670 Group 1 treated 1998, 77 Group 1 untreated 1998, 873 Group 2 treated 1999, 352 Group 2 untreated 1999.

[‡] We attempted to track a random sample of half of the original 1998 parasitological sample. Because some pupils were absent, had dropped out, or had graduated, we were only able to re-survey 72 percent of this subsample.

[††] School averages weighted by pupil population. The participation rate is computed among pupils enrolled in the school at the start of 1998. Pupils present in school during an unannounced NGO visit are considered participants. Pupils had 3.8 participation observations per year on average. Participation rates are for grades 1 to 7; grade 8 pupils are excluded since many graduated after the 1998 school year, in which case their 1999 treatment status is irrelevant. Preschool pupils are excluded since they typically have missing compliance data. All 1998 pupil characteristics in Panel A are for grades 3 to 7, since younger pupils were not administered the Pupil Questionnaire.

Table 6: Deworming health externalities within schools, January to March 1999 [†]

	Group 1, Treated in 1998	Group 1, Untreated in 1998	Group 2, Treated in 1999	Group 2, Untreated in 1999	(Group 1 Treated 1998) – (Group 2, Treated 1999)	(Group 1, Untreated 1998) – (Group 2, Untreated 1999)
Panel A: Selection into Treatment						
Any moderate-heavy infection, 1998	0.39	0.44	-	-	-	-
Proportion of 1998 parasitological sample tracked to 1999 sample[‡]	0.36	0.36	-	-	-	-
Access to latrine at home, 1998	0.84	0.80	0.81	0.86	0.03 (0.04)	-0.06 (0.05)
Grade progression [=Grade – (Age – 6)], 1998	-2.0	-1.8	-1.8	-1.8	-0.2** (0.1)	-0.0 (0.2)
Weight-for-age (Z-score), 1998 (low scores denote undernutrition)	-1.58	-1.52	-1.57	-1.46	-0.01 (0.06)	-0.06 (0.11)
Malaria/fever in past week (self-reported), 1998	0.37	0.41	0.40	0.39	-0.03 (0.04)	-0.01 (0.06)
Clean (observed by field worker), 1998	0.53	0.59	0.60	0.66	-0.07 (0.05)	-0.07 (0.10)
Panel B: Health Outcomes						
Girls < 13 years, and all boys						
Any moderate-heavy infection, 1999	0.24	0.34	0.51	0.55	-0.27*** (0.06)	-0.21** (0.10)
Hookworm moderate-heavy infection, 1999	0.04	0.11	0.22	0.20	-0.19*** (0.03)	-0.09* (0.05)
Roundworm moderate-heavy infection, 1999	0.08	0.12	0.22	0.30	-0.14*** (0.04)	-0.18** (0.07)
Schistosomiasis moderate-heavy infection, 1999	0.09	0.08	0.20	0.13	-0.11* (0.06)	-0.05 (0.06)
Whipworm moderate-heavy infection, 1999	0.12	0.16	0.16	0.20	-0.04 (0.16)	-0.05 (0.09)
Girls ≥ 13 years						
Any moderate-heavy infection, 1998	0.31	0.28	-	-	-	-
Any moderate-heavy infection, 1999	0.27	0.43	0.32	0.54	-0.05 (0.17)	-0.10 (0.09)
Panel C: School Participation						
School participation rate, May 1998 to March 1999[††]	0.872	0.764	0.808	0.684	0.064** (0.032)	0.080** (0.039)

[†] These are averages of individual-level data for grade 3-8 pupils in the parasitological survey subsample; disturbance terms are clustered within schools. Robust standard errors in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 (*) percent confidence. The data are described in the footnote to Table 5. Obs. for the 1999 parasitological survey: 670 Group 1 treated 1998, 77 Group 1 untreated 1998, 873 Group 2 treated 1999, 352 Group 2 untreated 1999.

[‡] We attempted to track a random sample of half of the original 1998 parasitological sample. Because some pupils were absent, had dropped out, or had graduated, we were only able to re-survey 72 percent of this subsample.

[††] School averages weighted by pupil population. The participation rate is computed among pupils enrolled in the school at the start of 1998. Pupils present in school during an unannounced NGO visit are considered participants. Pupils had 3.8 participation observations per year on average. Participation rates are for grades 1 to 7; grade 8 pupils are excluded since many graduated after the 1998 school year, in which case their 1999 treatment status is irrelevant. Preschool pupils are excluded since they typically have missing compliance data. All 1998 pupil characteristics in Panel A are for grades 3 to 7, since younger pupils were not administered the Pupil Questionnaire.

Table 8: School participation, school-level data[†]

	Group 1 (25 schools)	Group 2 (25 schools)	Group 3 (25 schools)		
Panel A: First year post-treatment (May 1998 to March 1999)	*1st Year Treatment*			*Group 1 – (Groups 2 & 3)*	*Group 2 – Group 3*
		Comparison	*Comparison*		
Girls < 13 years, and all boys	0.841	0.731	0.767	0.093***	-0.037
				(0.031)	(0.036)
Girls ≥ 13 years	0.864	0.803	0.811	0.057**	-0.008
				(0.029)	(0.034)
Preschool, Grade 1, Grade 2 in early 1998	0.795	0.688	0.703	0.100***	-0.018
				(0.037)	(0.043)
Grade 3, Grade 4, Grade 5 in early 1998	0.880	0.789	0.831	0.070***	-0.043
				(0.024)	(0.029)
Grade 6, Grade 7, Grade 8 in early 1998	0.934	0.858	0.892	0.059***	-0.034
				(0.021)	(0.026)
Recorded as "dropped out" in early 1998	0.064	0.050	0.030	0.022	0.020
				(0.018)	(0.017)
Females[‡]	0.855	0.771	0.789	0.076***	-0.018
				(0.027)	(0.032)
Males	0.844	0.736	0.780	0.088***	-0.044
				(0.031)	(0.037)
Panel B: Second year post-treatment (March to November 1999)	*2nd Year Treatment*	*1st Year Treatment*	*Comparison*	*Group 1 – Group 3*	*Group 2 – Group 3*
Girls < 13 years, and all boys	0.713	0.717	0.663	0.050*	0.055*
				(0.028)	(0.028)
Girls ≥ 14 years[††]	0.627	0.649	0.588	0.039	0.061*
				(0.035)	(0.035)
Preschool, Grade 1, Grade 2 in early 1998	0.692	0.726	0.641	0.051	0.085**
				(0.034)	(0.034)
Grade 3, Grade 4, Grade 5 in early 1998	0.750	0.774	0.725	0.025	0.049**
				(0.023)	(0.023)
Grade 6, Grade 7, Grade 8 in early 1998	0.770	0.777	0.751	0.020	0.026
				(0.027)	(0.028)
Recorded as "dropped out" in early 1998	0.176	0.129	0.056	0.120*	0.073
				(0.063)	(0.053)
Females[‡]	0.716	0.746	0.648	0.067**	0.098***
				(0.027)	(0.027)
Males	0.698	0.695	0.655	0.043	0.041
				(0.028)	(0.029)

[†]The results are school averages weighted by pupil population. Standard errors in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 (*) percent confidence. The participation rate is computed among all pupils enrolled in the school at the start of 1998. Pupils who are present in school on the day of an unannounced NGO visit are considered participants. Pupils had 3.8 participation observations per year on average. The figures for the "Preschool-Grade 2"; "Grade 3-5"; "Grade 6-8"; and "Dropout" rows are for girls < 13 years, and all boys.

[‡]396 pupils in the sample are missing information on gender. For this reason, the average of the female and male participation rates does not equal the overall average.

[††]Examining girls ≥14 years old eliminates the cohort of girls in Group 1 schools (12 year olds in 1998) who were supposed to receive deworming treatment in 1998.

Table 9: School participation, direct effects and externalities[†]
Dependent variable: Average individual school participation, by year

	OLS (1)	OLS (2)	OLS (3)	OLS (4) May 98- March 99	OLS (5) May 98- March 99	OLS (6) May 98- March 99	IV-2SLS (7) May 98- March 99
Treatment school (T)	0.051*** (0.022)						
First year as treatment school (T1)		0.062*** (0.015)	0.060*** (0.015)	0.062* (0.022)	0.056*** (0.020)		
Second year as treatment school (T2)		0.040* (0.021)	0.034* (0.021)				
Treatment school pupils within 3 km (per 1000 pupils)			0.044** (0.022)		0.023 (0.036)		
Total pupils within 3 km (per 1000 pupils)			-0.033** (0.013)		-0.035* (0.019)		
Treatment school pupils within 3-6 km (per 1000 pupils)			-0.014 (0.015)		-0.041 (0.027)		
Total pupils within 3-6 km (per 1000 pupils)			-0.010 (0.012)		0.022 (0.027)		
Indicator received first year of deworming treatment, when offered (1998 for Group 1, 1999 for Group 2)					0.100*** (0.014)		
(First year as treatment school Indicator)∗ (Received treatment, when offered)					-0.012 (0.020)		
Moderate-heavy infection, early 1999						-0.028*** (0.010)	-0.169* (0.088)
1996 district mock exam score, school average	0.063*** (0.021)	0.071*** (0.020)	0.063*** (0.020)	0.058 (0.032)	0.091** (0.038)	0.013 (0.023)	-0.007 (0.021)
Grade indicators, school assistance controls, and time controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R²	0.23	0.23	0.24	0.33	0.36	0.27	-
Root MSE	0.273	0.272	0.272	0.223	0.219	0.151	0.072
Number of observations	56487	56487	56487	18264	18264	2327	49 (schools)
Mean of dependent variable	0.747	0.747	0.747	0.784	0.784	0.884	0.884

[†] The dependent variable is average individual school participation in each year of the program (Year 1 is May 1998 to March 1999, and Year 2 is May 1999 to November 1999); disturbance terms are clustered within schools. Robust standard errors in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 (*) percent confidence. Additional explanatory variables include an indicator variable for girls < 13 years and all boys, and the rate of moderate-heavy infections in geographic zone, by grade (zonal infection rates among grade 3 and 4 pupils are used for pupils in grades 4 and below and for pupils initially recorded as drop-outs as there is no parasitological data for pupils below grade 3; zonal infection rates among grade 5 and 6 pupils are used for pupils in grades 5 and 6, and similarly for grades 7 and 8). Participation is computed among all pupils enrolled at the start of the 1998 school year. Pupils present during an unannounced NGO school visit are considered participants. Pupils had approximately 3.8 attendance observations per year. Regressions 6 and 7 include pupils with parasitological information from early 1999, restricting the sample to a random subset of Group 1 and Group 2 pupils. The number of treatment school pupils from May 1998 to March 1999 is the number of Group 1 pupils, and the number of treatment school pupils after March 1999 is the number of Group 1 and Group 2 pupils. The instrumental variables in regression 7 are the Group 1 (treatment) indicator variable, Treatment school pupils within 3 km, Treatment school pupils within 3-6 km, Total primary school pupils within 3 km, and Total primary school pupils within 3-6 km. We use the number of girls less than 13 years old and all boys (the pupils eligible for deworming in the treatment schools) as the school population for all schools.