THE ECONOMICS OF SCHISTOSOMIASIS INTERVENTIONS
A case study of the Mwea irrigation scheme in Kenya

VOLUME II
APPENDICES

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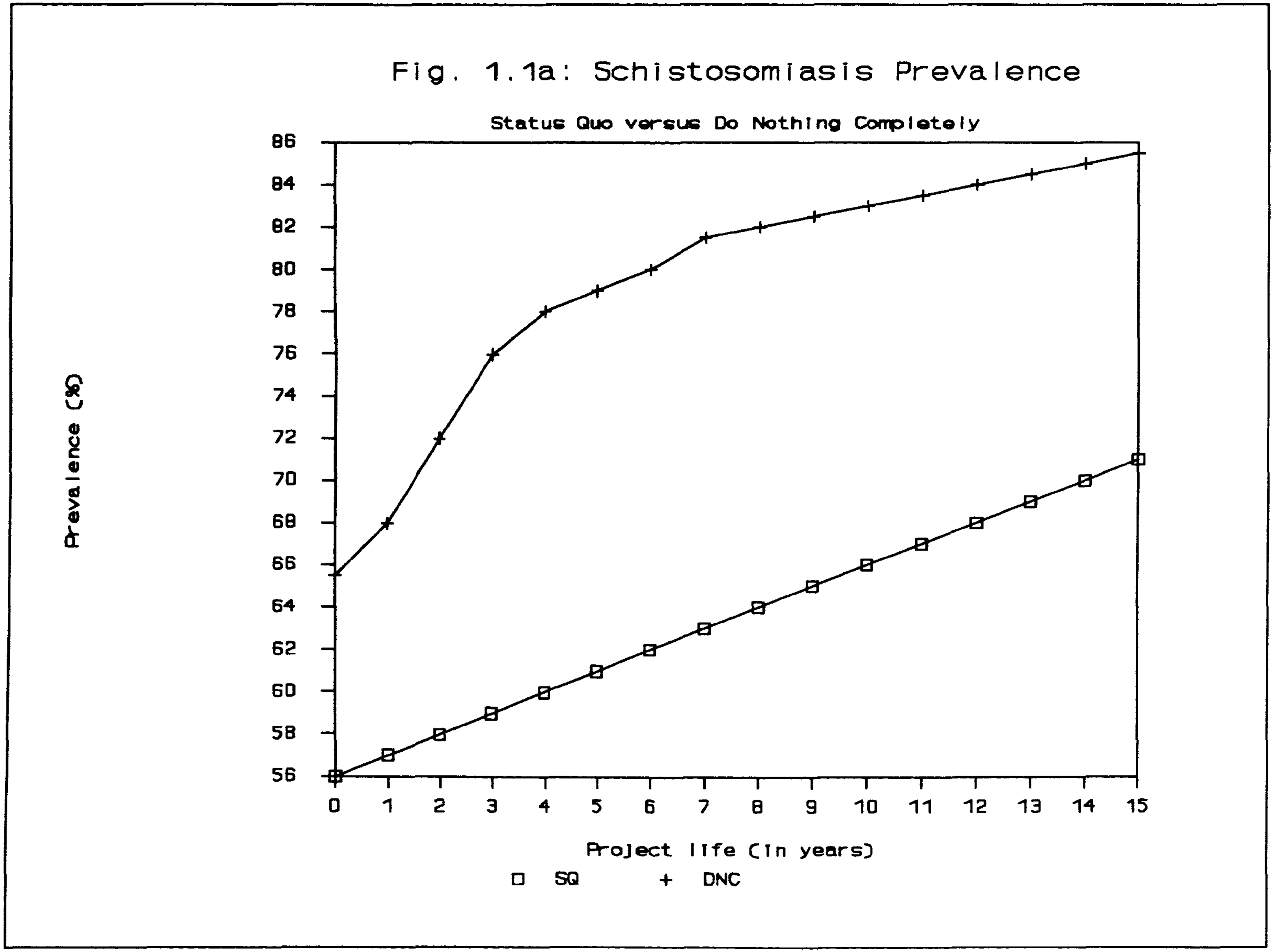


Fig. 1.1a: Schistosomiasis Prevalence
Status Quo versus Do Nothing Completely
Prevalence (%)
86
84
82
80
78
76
74
72
70
68
66
64
62
60
58
56
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Project life (in years)
SQ
DNC

Fig. 1.2a: Schistosomiasis Prevalence

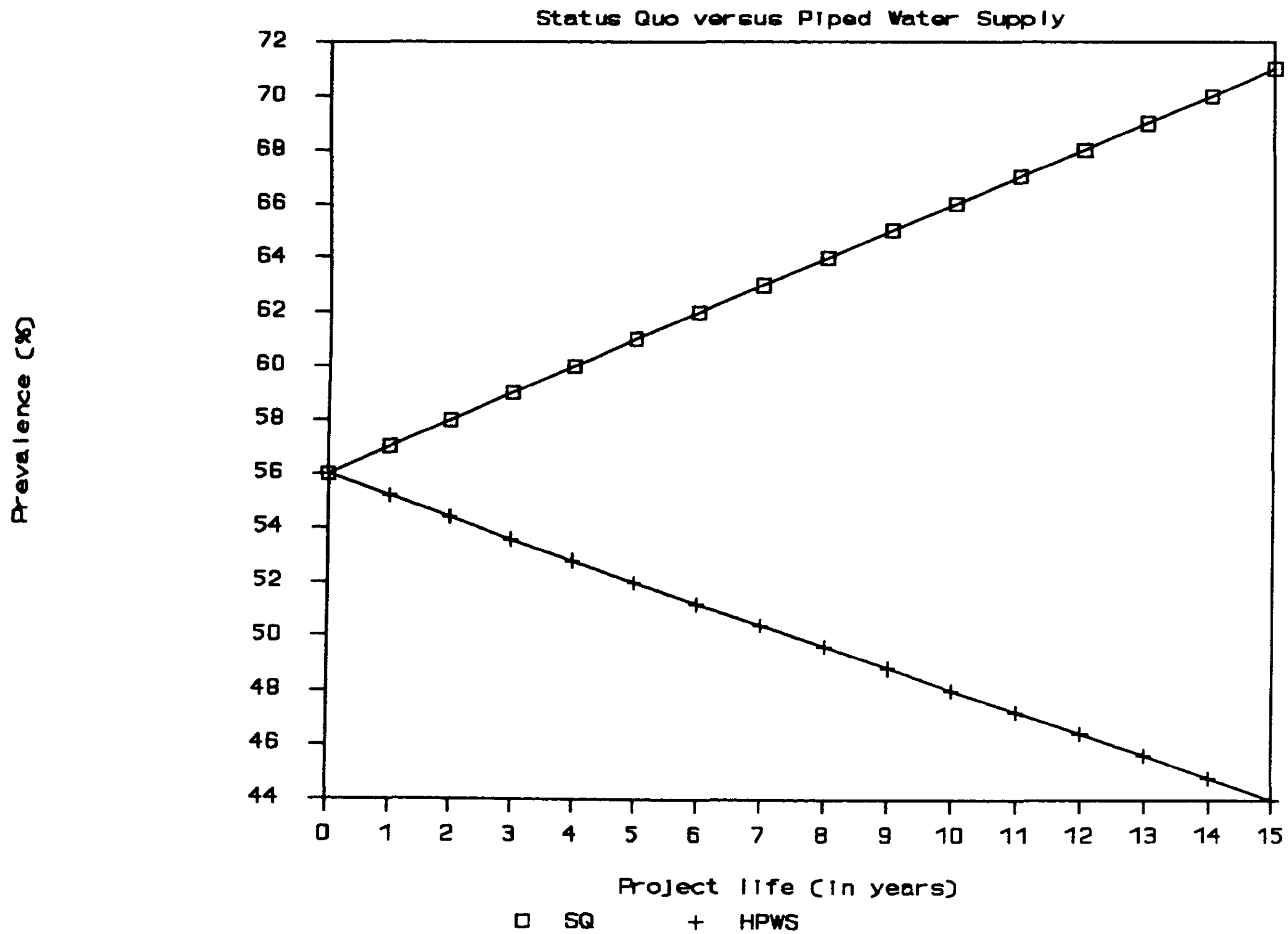
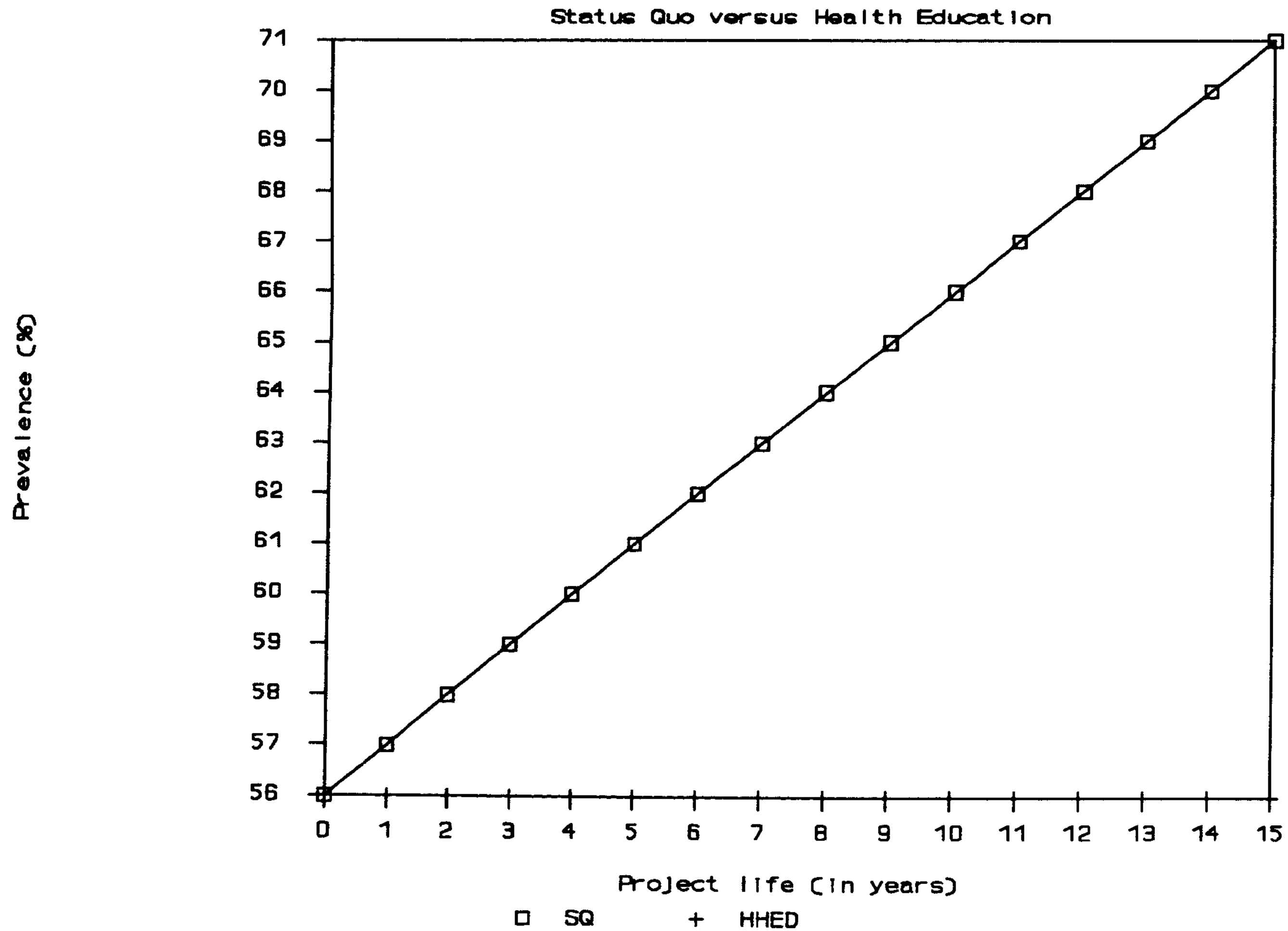


Fig. 1.3a: Schistosomiasis Prevalence



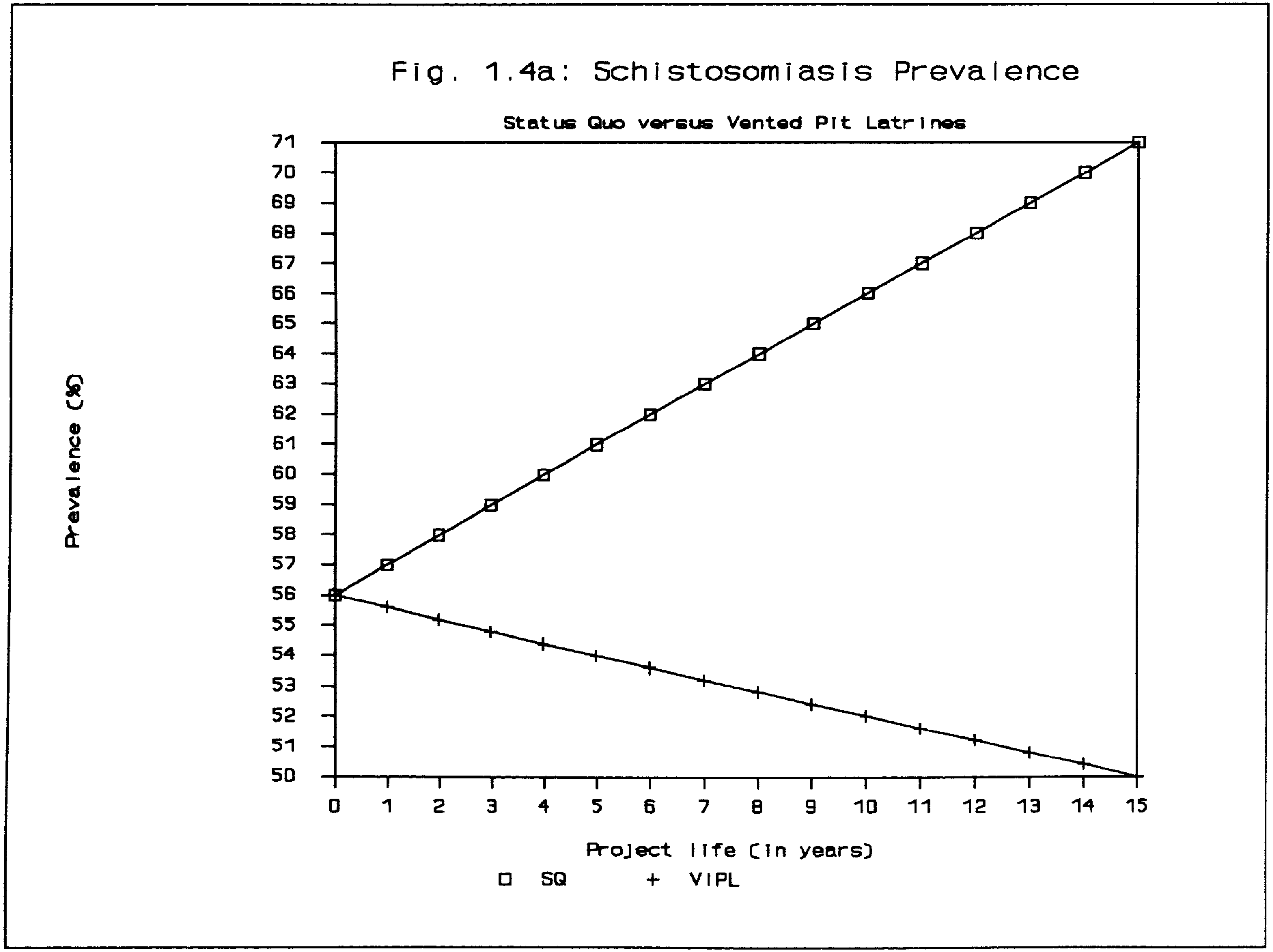


Fig. 1.4a: Schistosomiasis Prevalence
Status Quo versus Vented Pit Latrines
Prevalence (%)
71
70
69
68
67
66
65
64
63
62
61
60
59
58
57
56
55
54
53
52
51
50
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Project life (in years)
SQ
VIPL

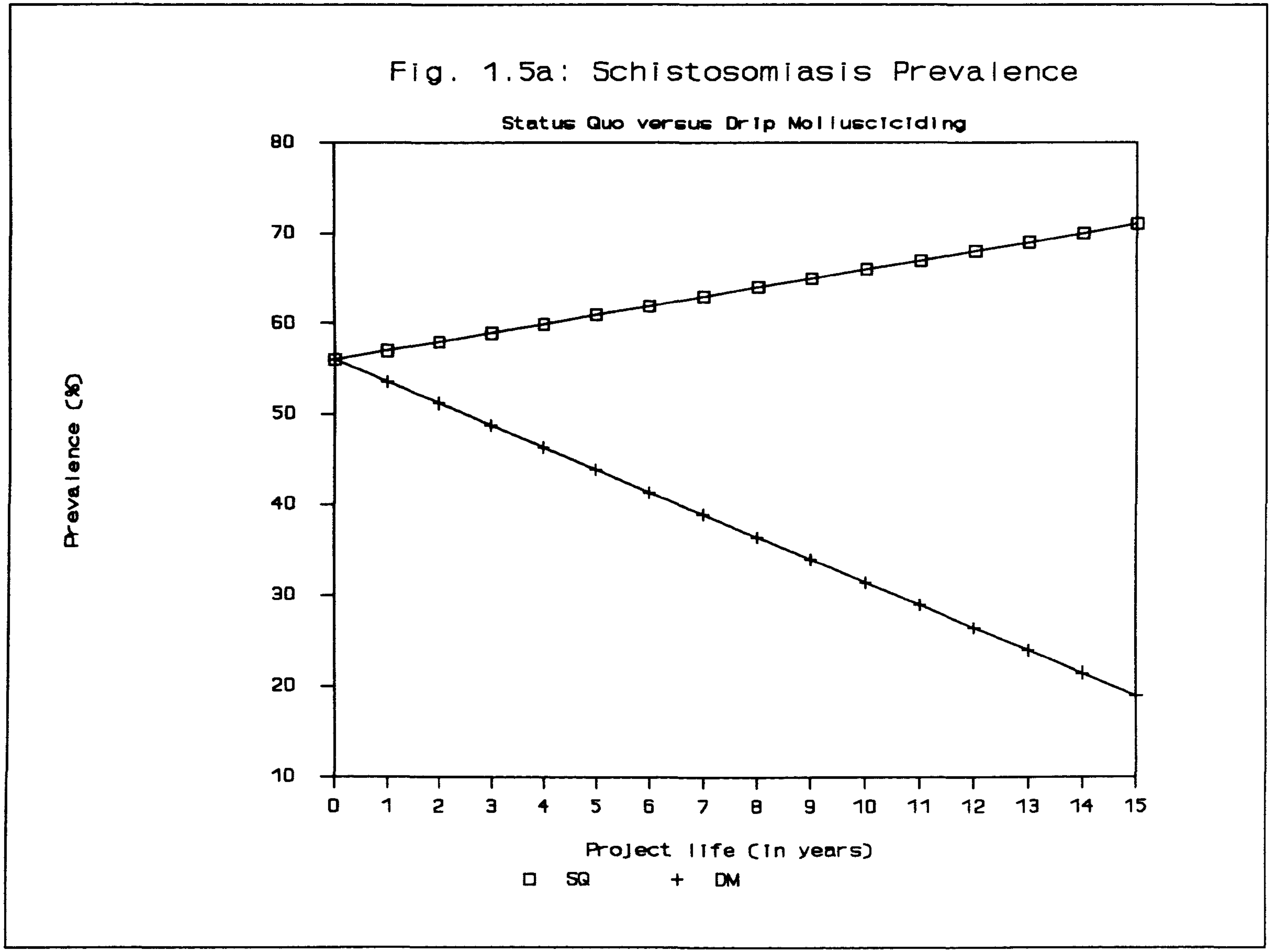


Fig. 1.5a: Schistosomiasis Prevalence
Status Quo versus Drip Molluscciding
Prevalence (%)
80
70
60
50
40
30
20
10
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Project life (in years)
SQ
DM

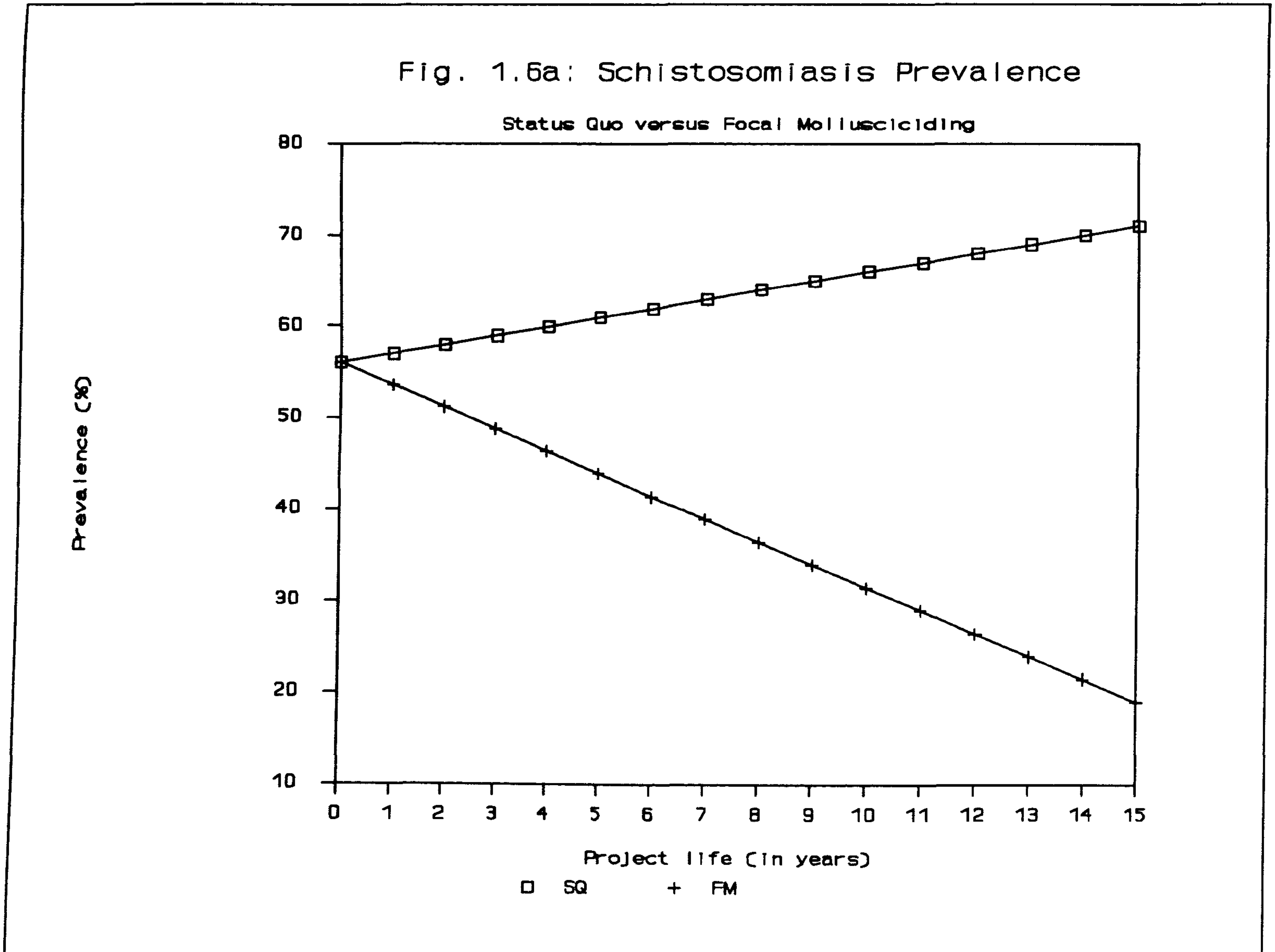


Fig. 1.6a: Schistosomiasis Prevalence
Status Quo versus Focal Mollusciciding
Prevalence (%)
80
70
60
50
40
30
20
10
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Project life (in years)
SQ
FM

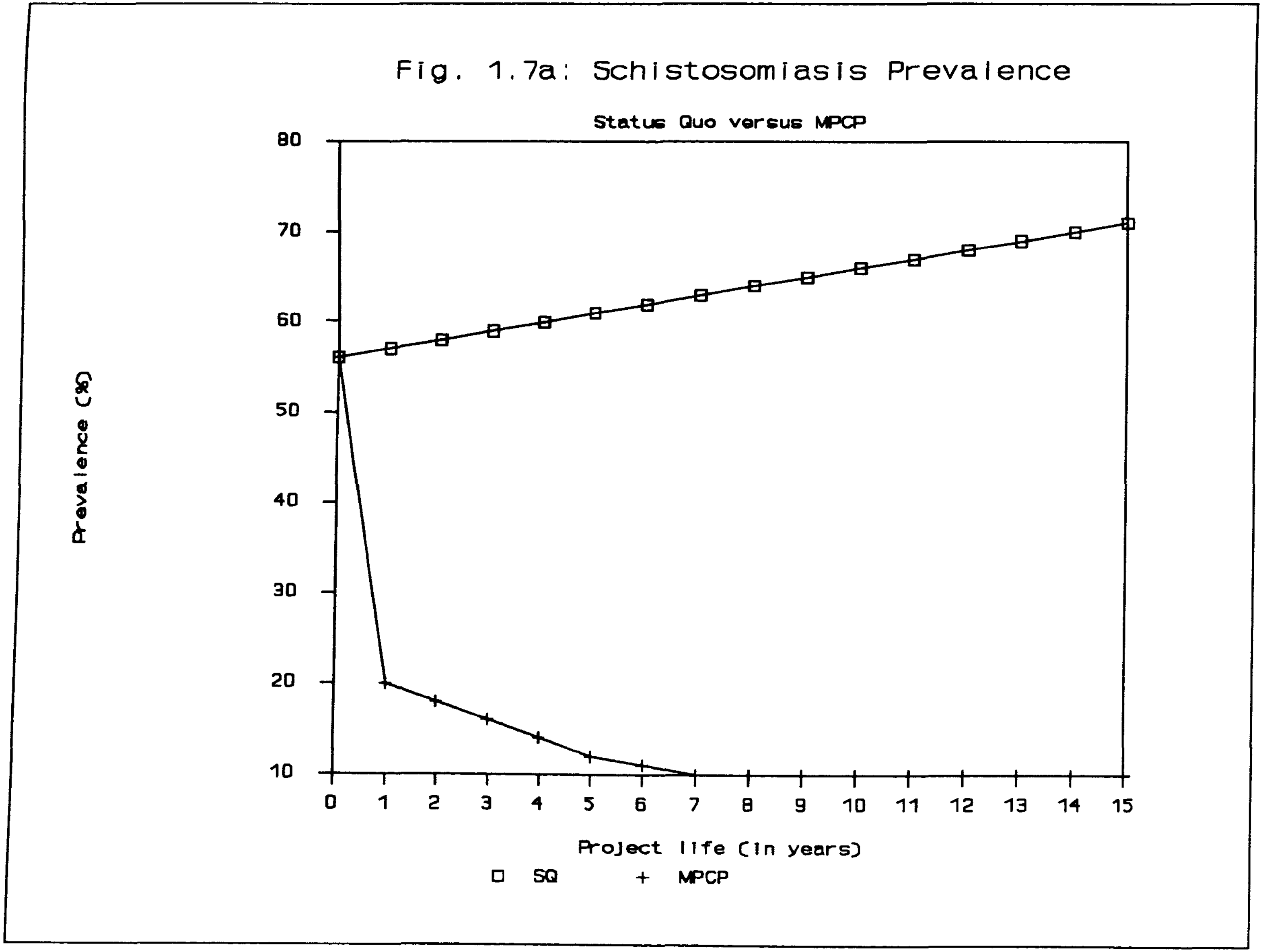
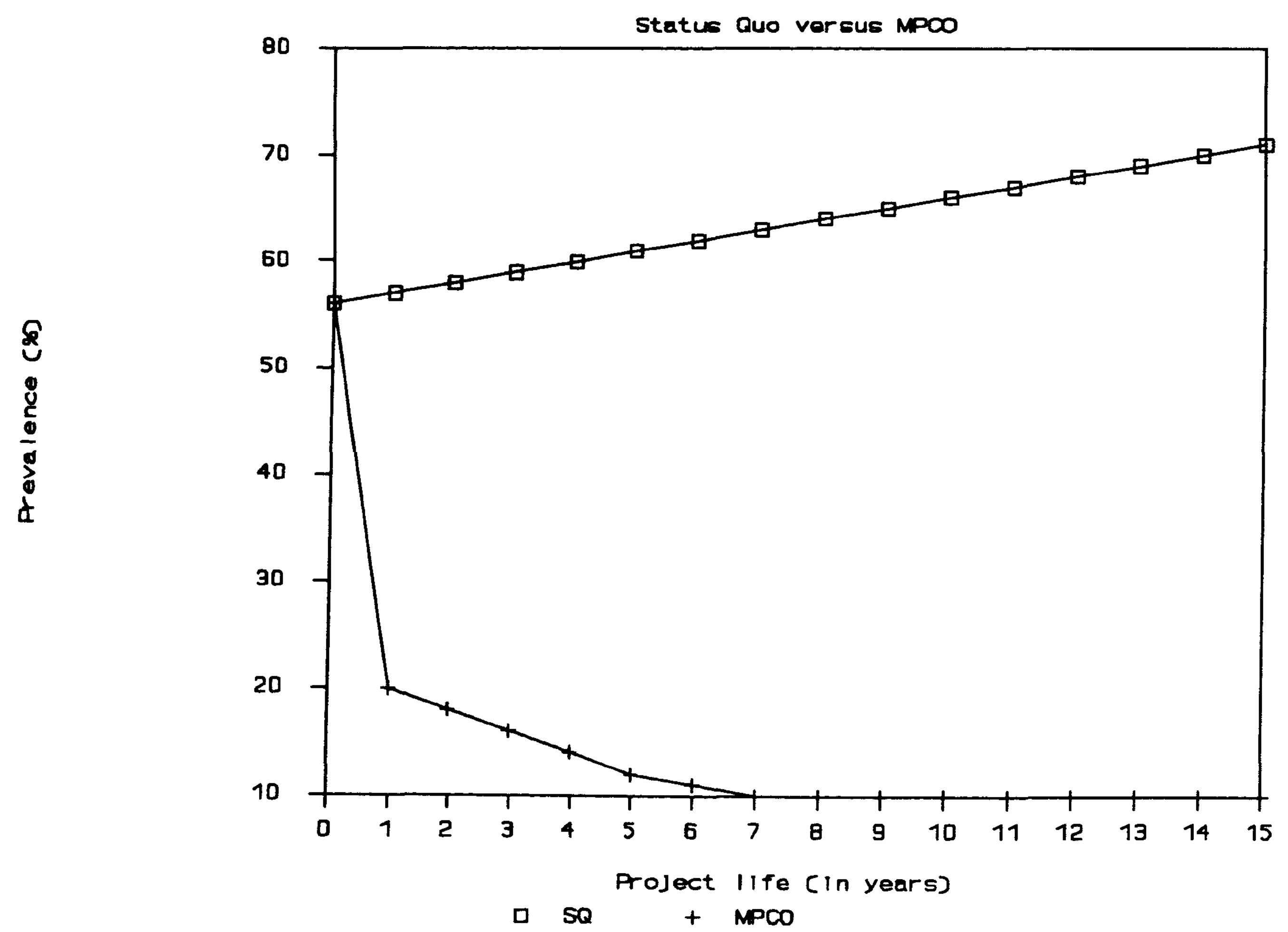


Fig. 1.7a: Schistosomiasis Prevalence
Status Quo versus MPCP
Prevalence (%)
80
70
60
50
40
30
20
10
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Project life (in years)
SQ
MPCP

Fig. 1.8a: Schistosomiasis Prevalence



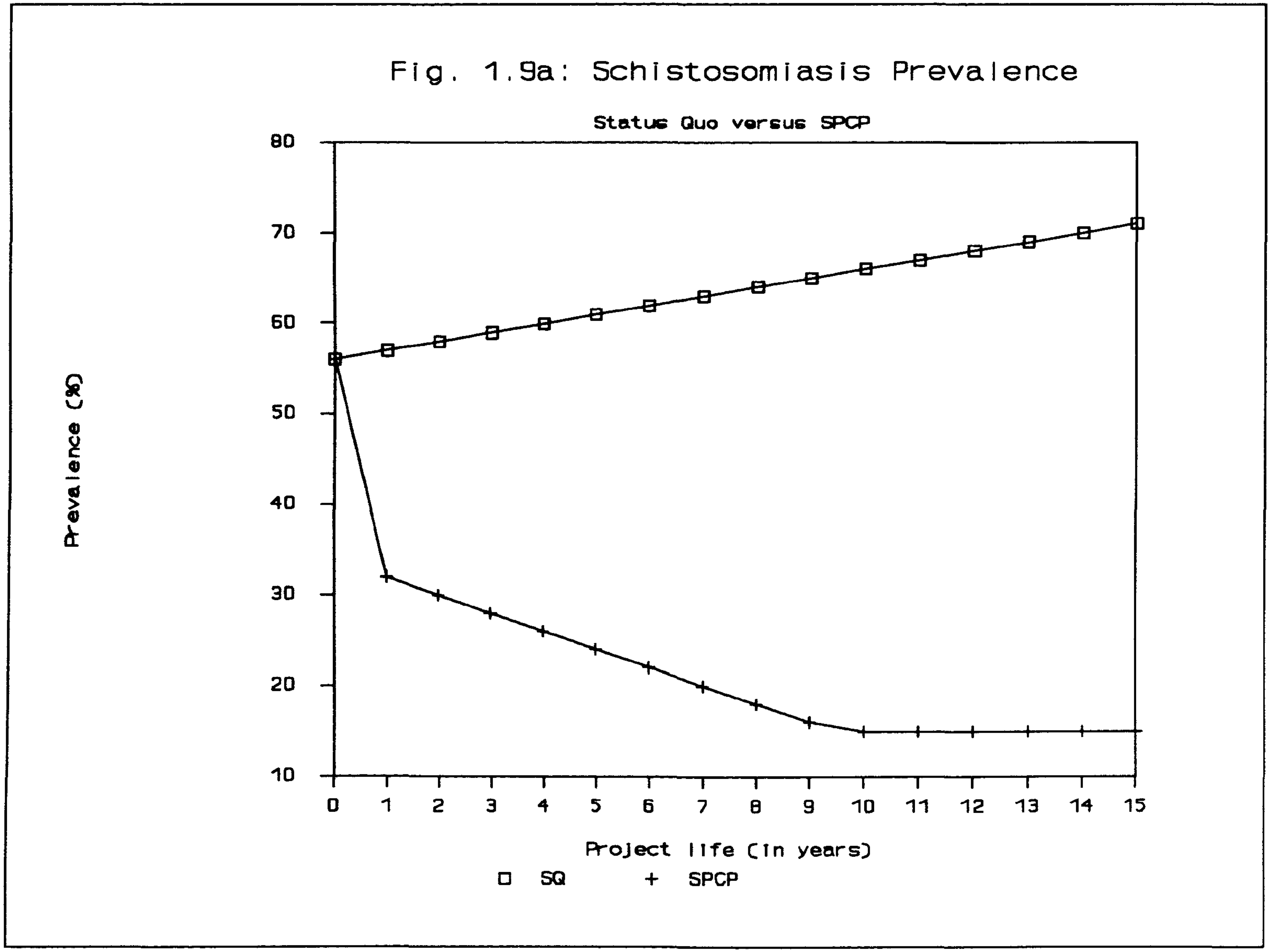


Fig. 1.9a: Schistosomiasis Prevalence
Status Quo versus SPCP
80
70
60
50
40
30
20
10
Prevalence (%)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Project life (in years)
SQ
SPCP

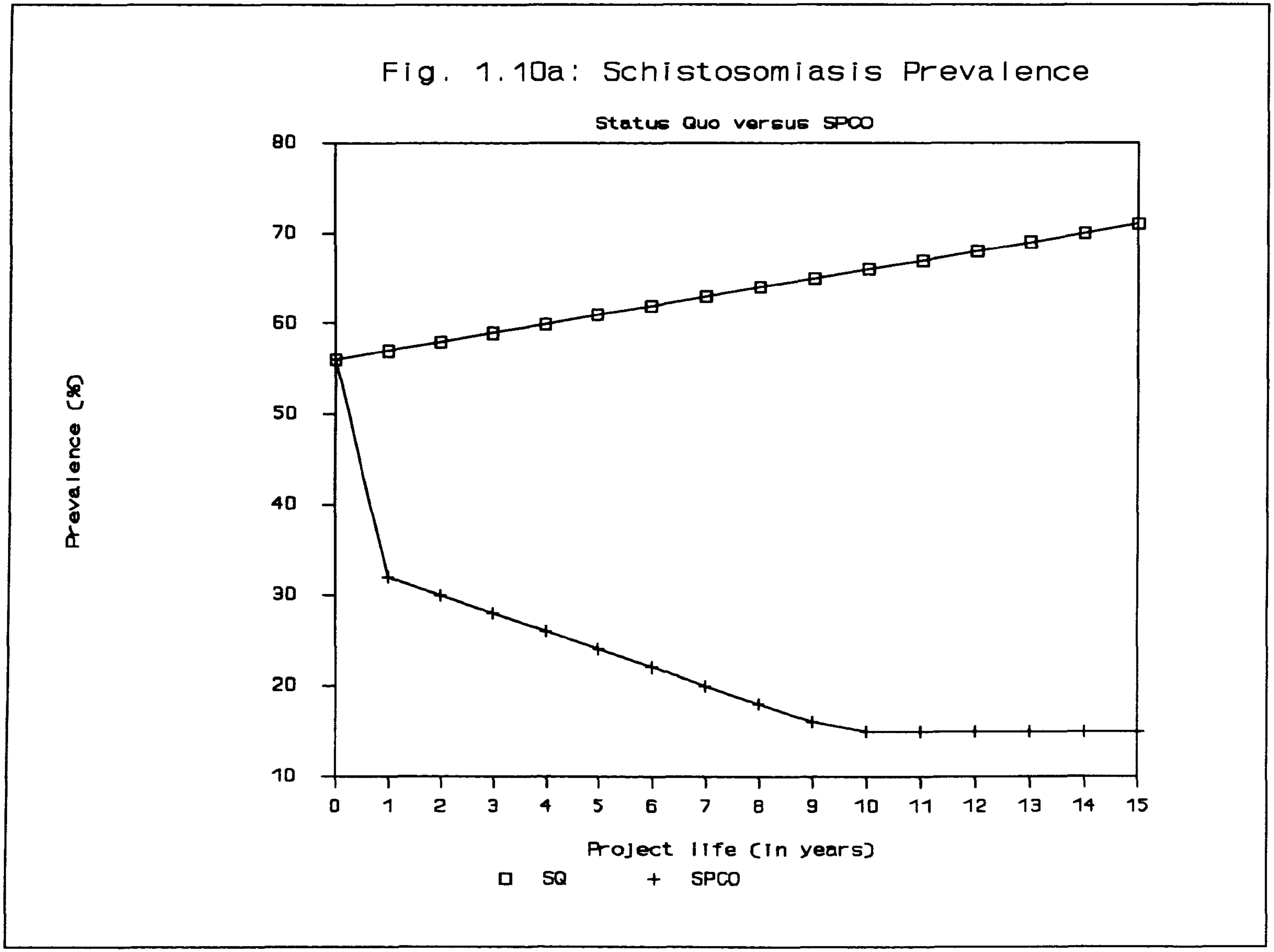


Fig. 1.10a: Schistosomiasis Prevalence
Status Quo versus SPCO
Prevalence (%)
80
70
60
50
40
30
20
10
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Project life (in years)
SQ
SPCO

Table 1a: Impacts of primary options on overall schistosomiasis prevalence											
Year	SQ	DNC	HPWS	HHED	VIPL	DM	FM	MPCP	MPCO	SPCP	SPCO
0	56	65.5	56	56	56	56	56	56	56	56	56
1	57	68	55.2	56	55.6	53.6	53.6	20	20	32	32
2	58	72	54.4	56	55.2	51.2	51.2	18	18	30	30
3	59	76	53.6	56	54.8	48.8	48.8	16	16	28	28
4	60	78	52.8	56	54.4	46.4	46.4	14	14	26	26
5	61	79	52	56	54	43.9	43.9	12	12	24	24
6	62	80	51.2	56	53.6	41.4	41.4	11	11	22	22
7	63	81.5	50.4	56	53.2	38.9	38.9	10	10	20	20
8	64	82	49.6	56	52.8	36.4	36.4	10	10	18	18
9	65	82.5	48.8	56	52.4	33.9	33.9	10	10	16	16
10	66	83	48	56	52	31.4	31.4	10	10	15	15
11	67	83.5	47.2	56	51.6	28.9	28.9	10	10	15	15
12	68	84	46.4	56	51.2	26.4	26.4	10	10	15	15
13	69	84.5	45.6	56	50.8	23.9	23.9	10	10	15	15
14	70	85	44.8	56	50.4	21.4	21.4	10	10	15	15
15	71	85.5	44	56	50	18.9	18.9	10	10	15	15

Appendix 1B Schistosomiasis Health States Prevalence Under Various Primary Options (International expert judgements)

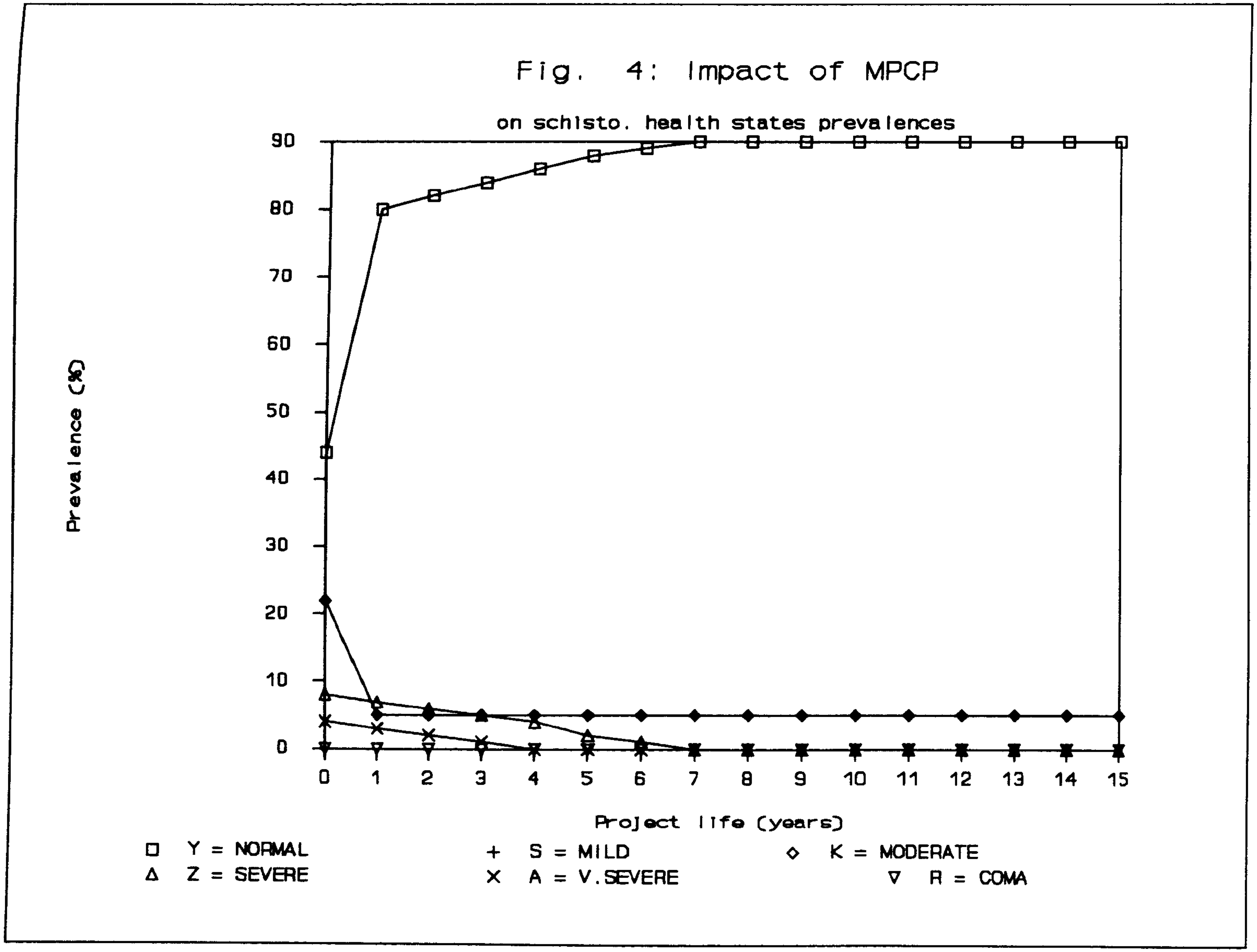


Fig. 4: Impact of MPCP
on schisto. health states prevalences
Prevalence (%)
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Project life (years)
Y = NORMAL
S = MILD
K = MODERATE
Z = SEVERE
A = V.SEVERE
R = COMA

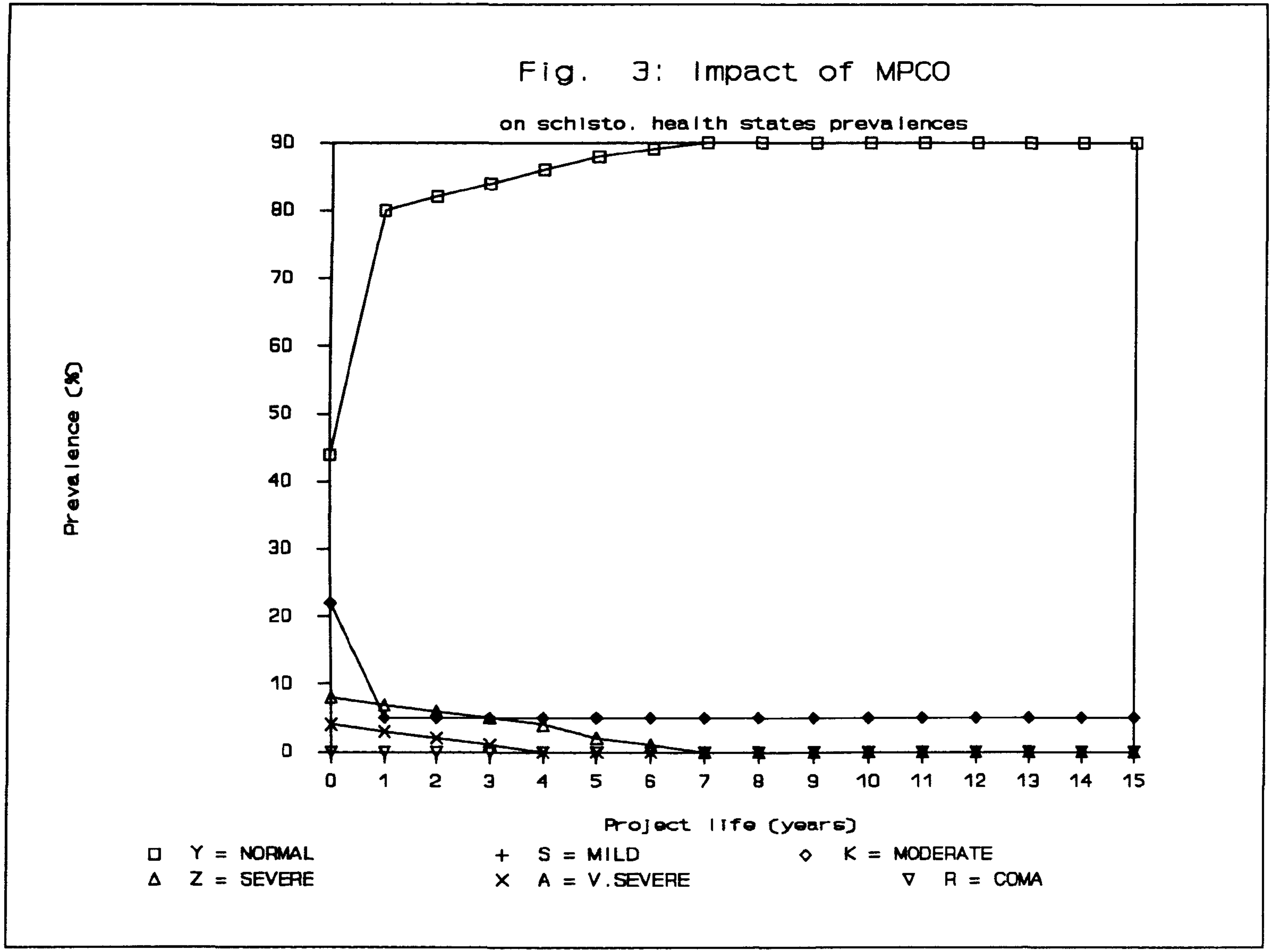


Fig. 3: Impact of MPCO
on schisto. health states prevalences
Prevalence (%)
90
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Project life (years)
Y = NORMAL
S = MILD
K = MODERATE
Z = SEVERE
A = V.SEVERE
R = COMA

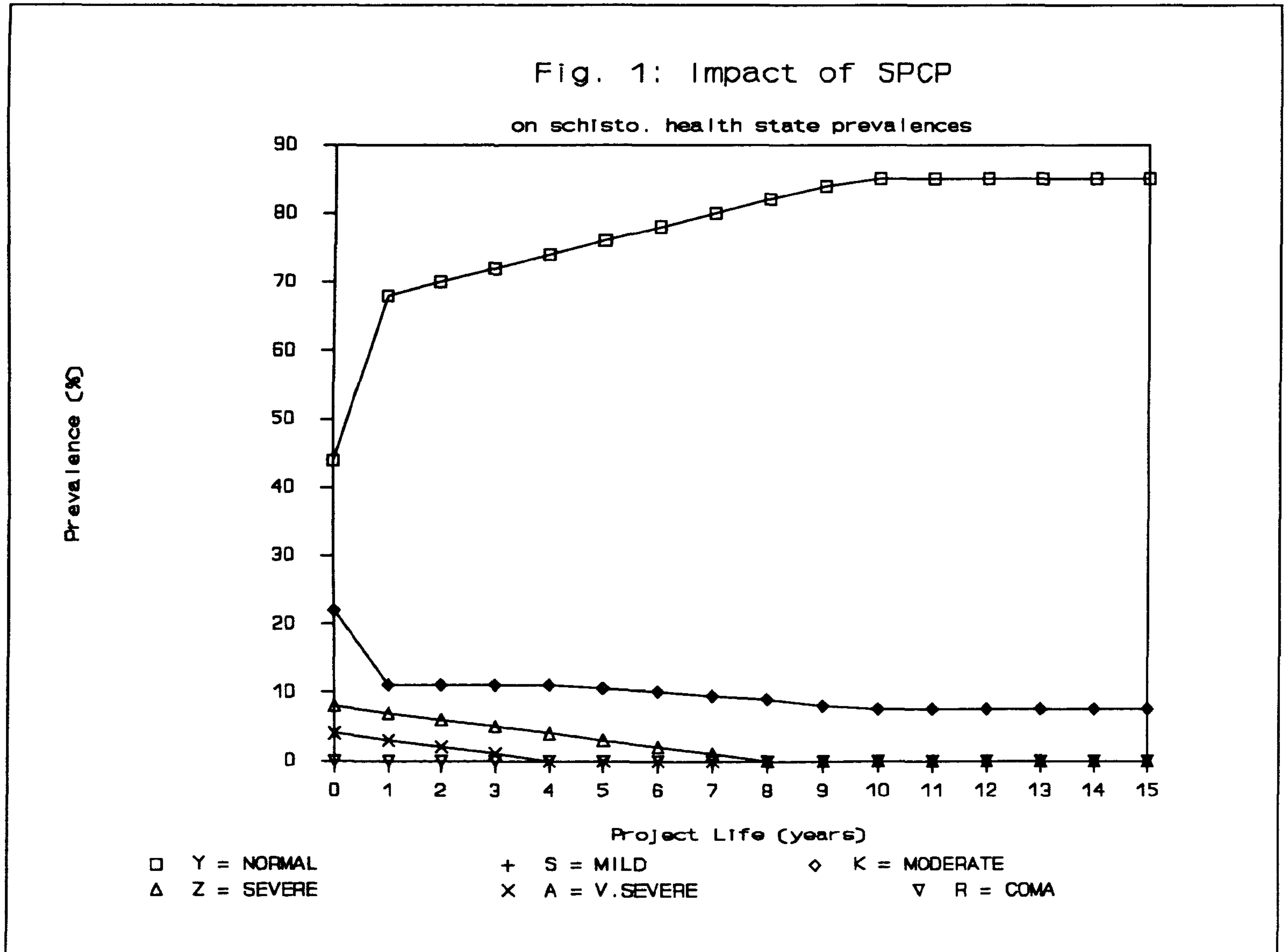


Fig. 1: Impact of SPCP
on schisto. health state prevalences
Prevalence (%)
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Project Life (years)
Y = NORMAL
S = MILD
K = MODERATE
Z = SEVERE
A = V.SEVERE
R = COMA

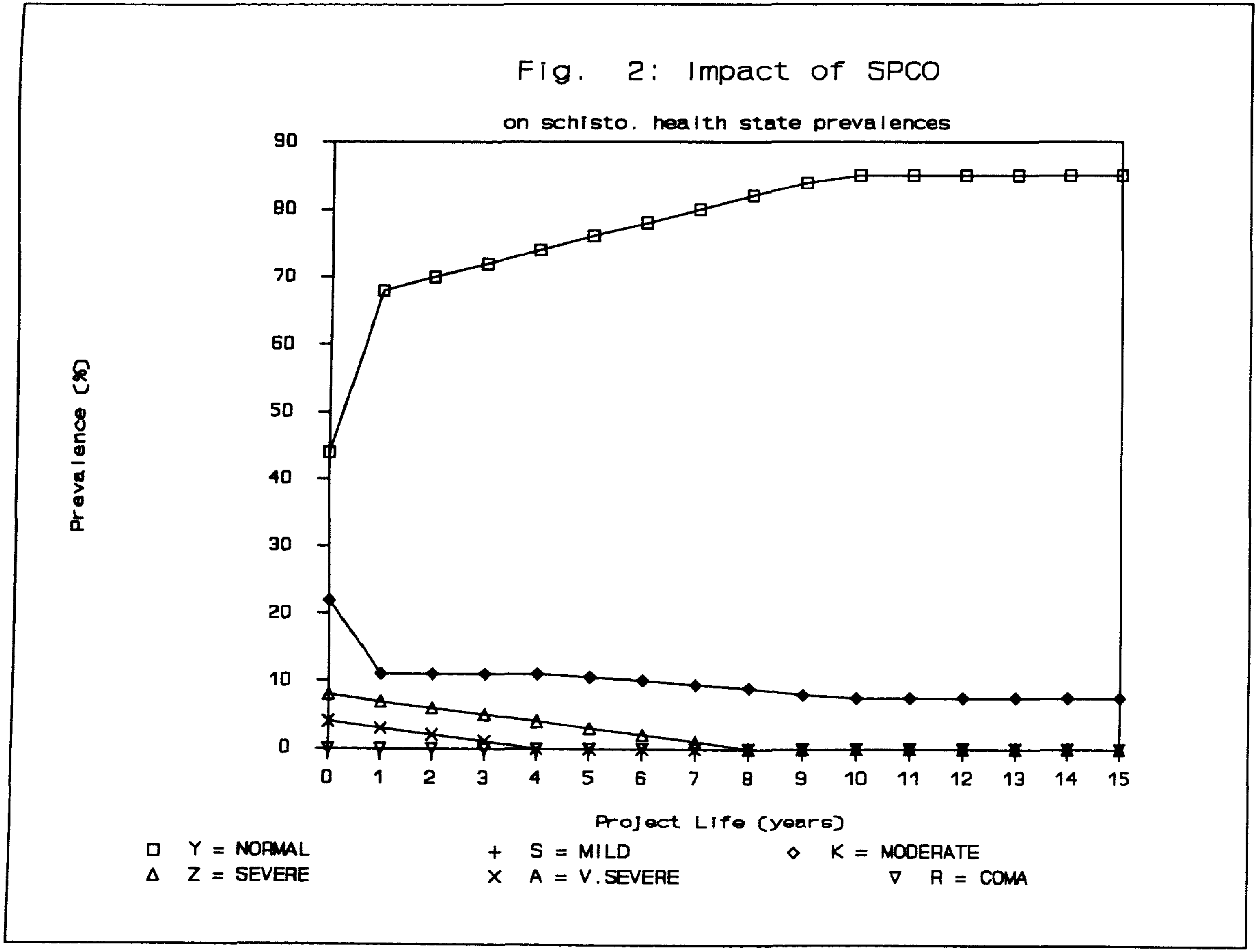


Fig. 2: Impact of SPCO
on schisto. health state prevalences
Prevalence (%)
0
10
20
30
40
50
60
70
80
90
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Project Life (years)
Y = NORMAL
S = MILD
K = MODERATE
Z = SEVERE
A = V.SEVERE
R = COMA

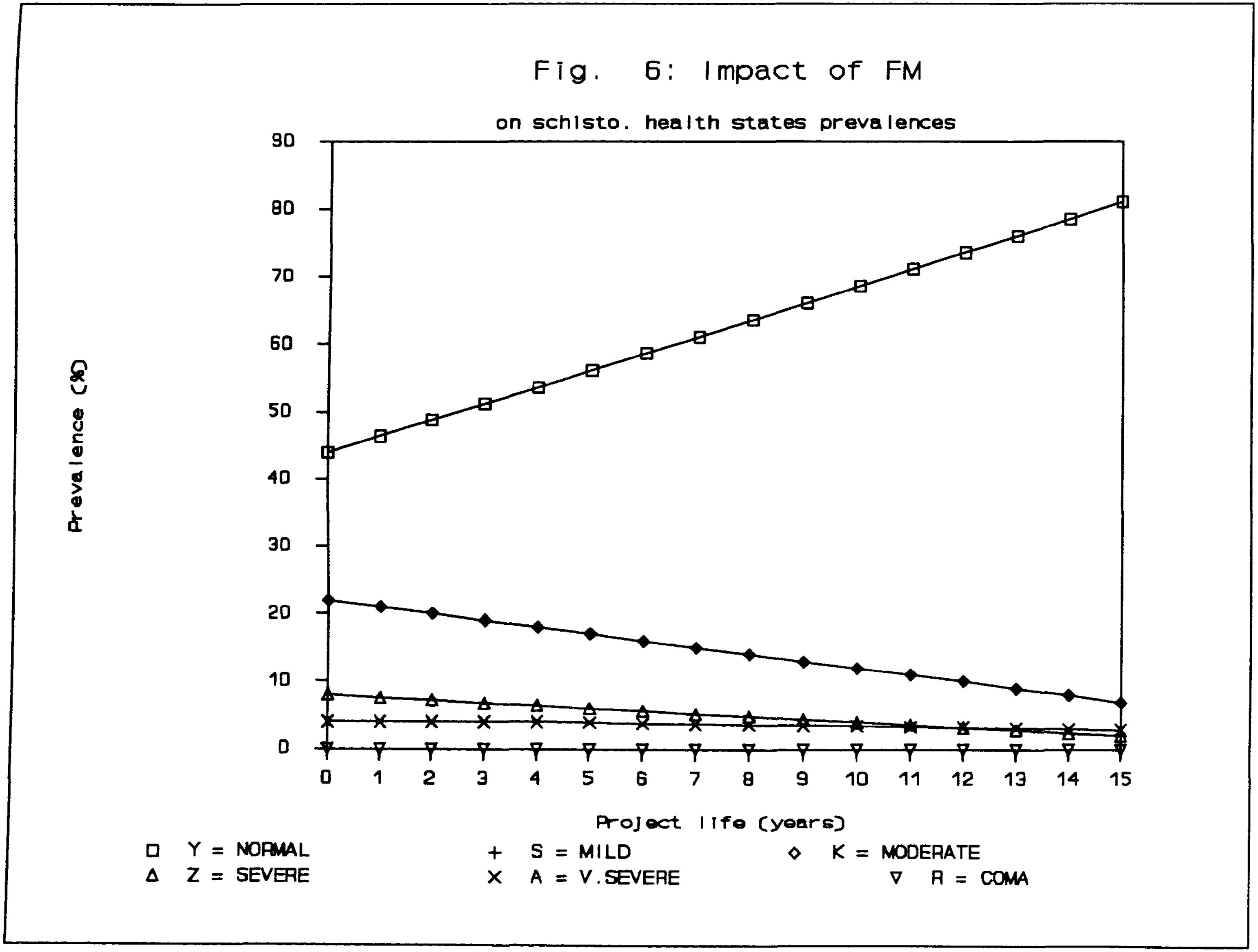


Fig. 6: Impact of FM
on schisto. health states prevalences
Prevalence (%)
0
10
20
30
40
50
60
70
80
90
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Project life (years)
Y = NORMAL
S = MILD
K = MODERATE
Z = SEVERE
A = V.SEVERE
R = COMA

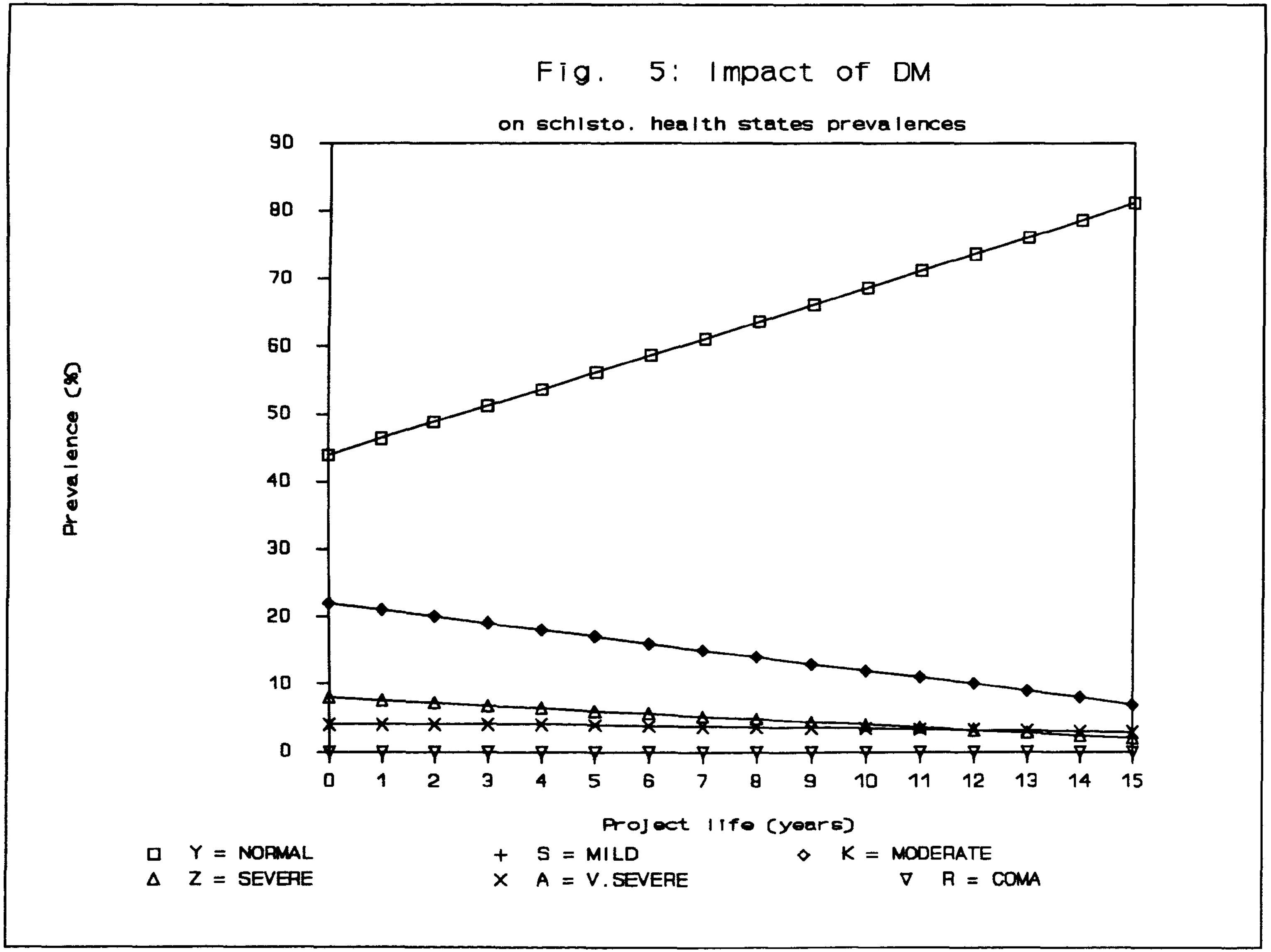


Fig. 5: Impact of DM
on schisto. health states prevalences
Prevalence (%)
90
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Project life (years)
Y = NORMAL
S = MILD
K = MODERATE
Z = SEVERE
A = V.SEVERE
R = COMA

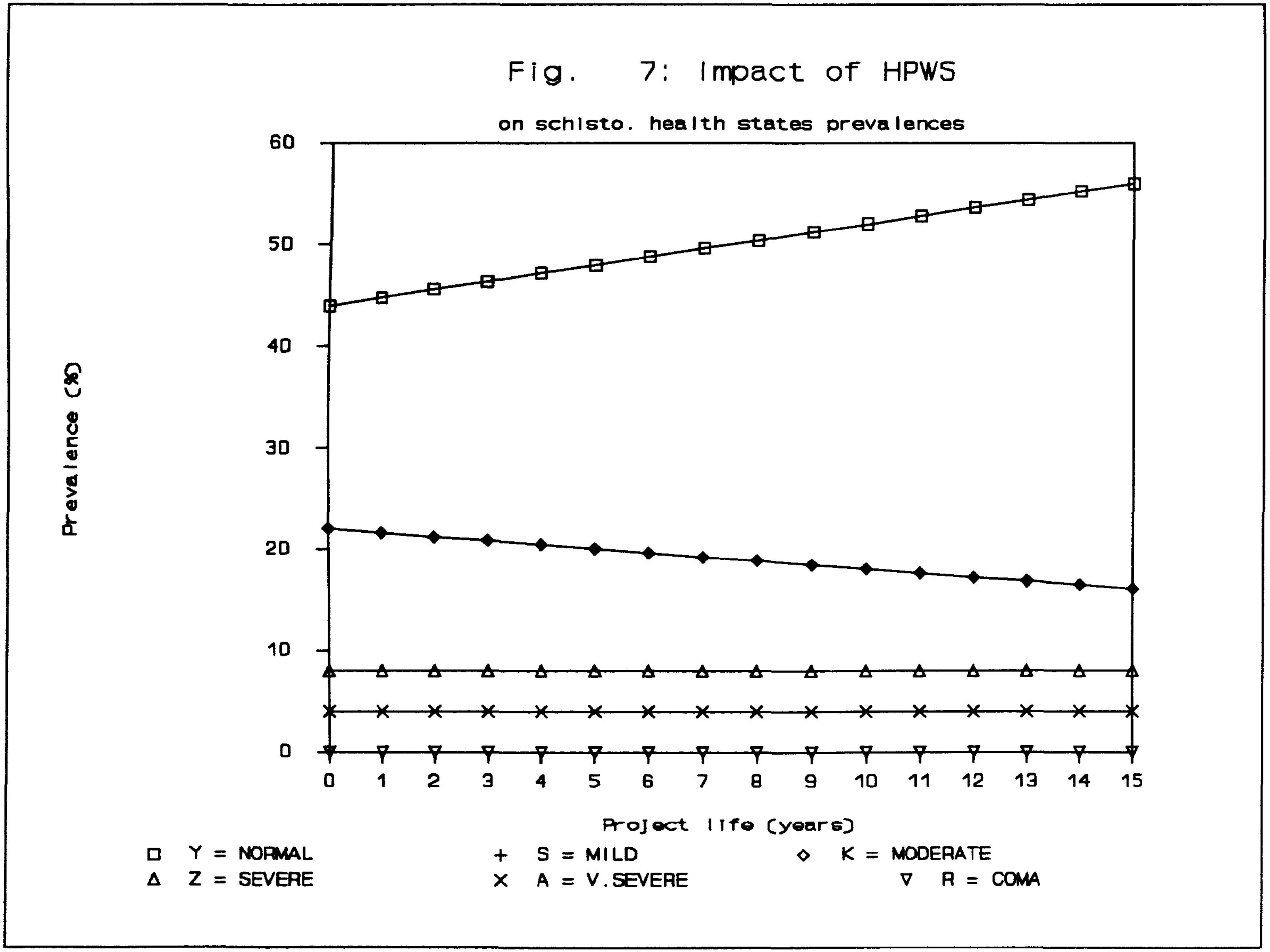


Fig. 7: Impact of HPWS
on schisto. health states prevalences
Prevalence (%)
0
10
20
30
40
50
60
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Project life (years)
Y = NORMAL
S = MILD
K = MODERATE
Z = SEVERE
A = V.SEVERE
R = COMA

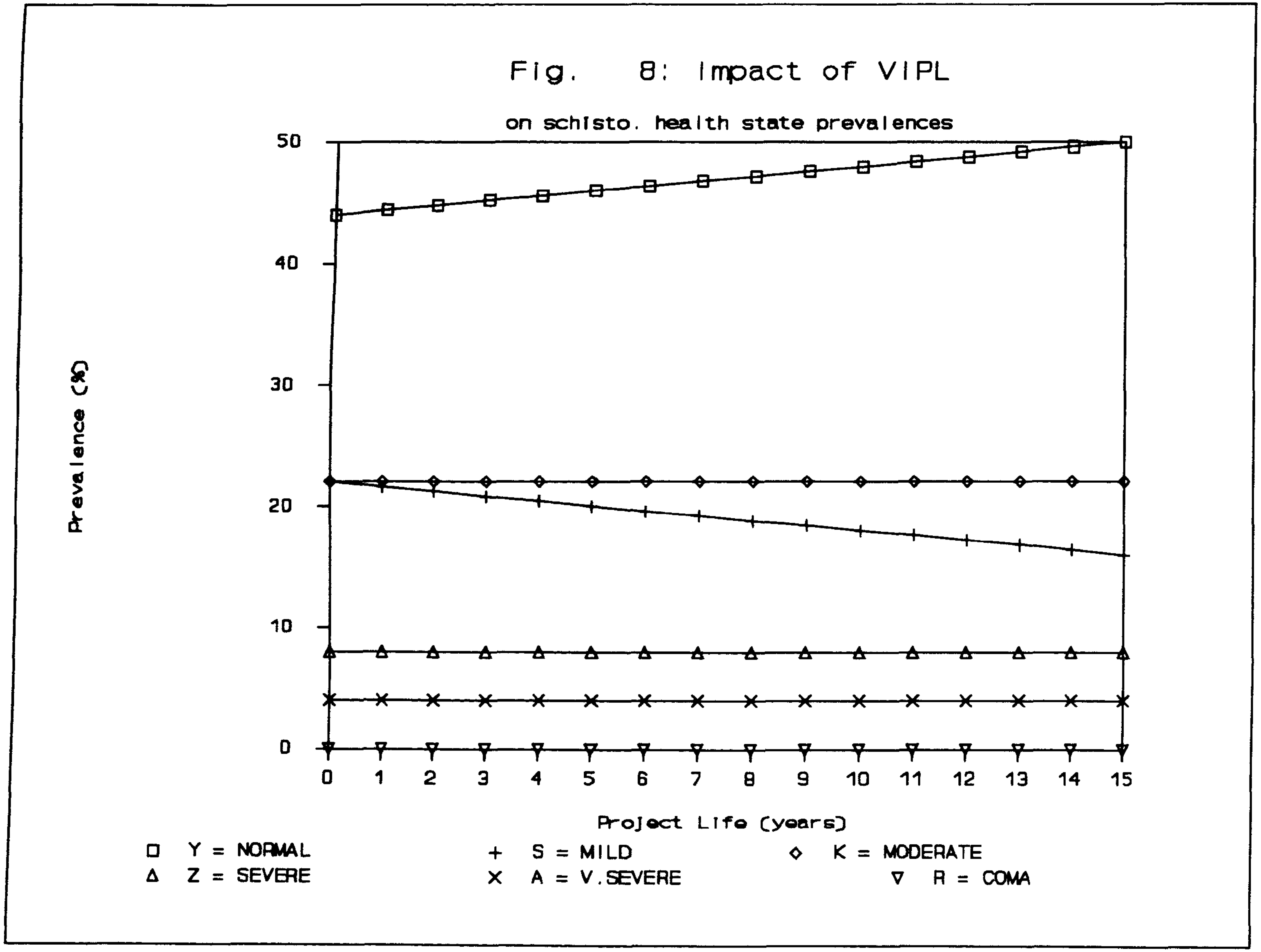


Fig. 8: Impact of VIPL
on schisto. health state prevalences
Prevalence (%)
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Project Life (years)
Y = NORMAL
S = MILD
K = MODERATE
Z = SEVERE
A = V.SEVERE
R = COMA

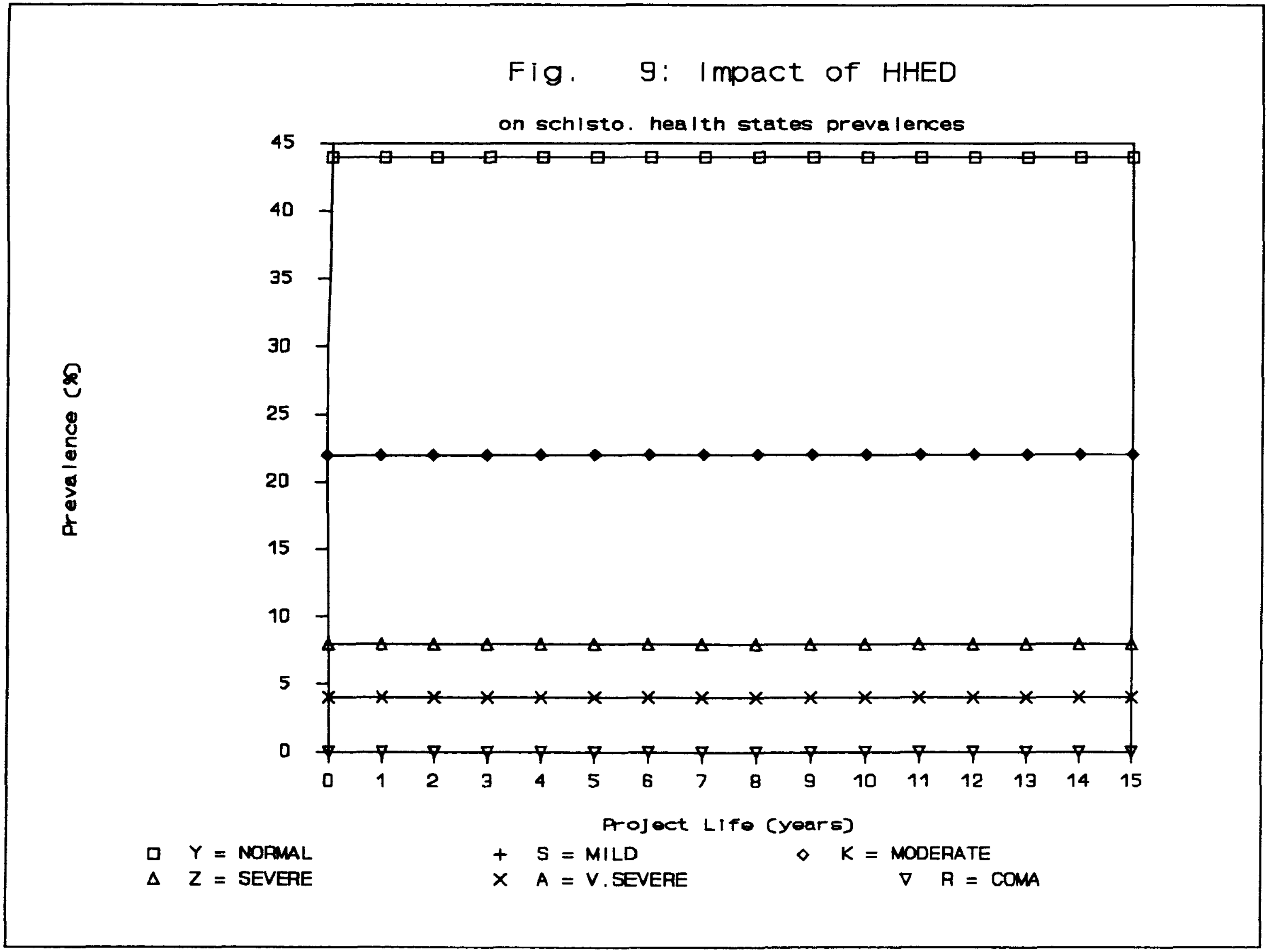


Fig. 9: Impact of HHED
on schisto. health states prevalences
45
40
35
30
25
20
15
10
5
0
Prevalence (%)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Project Life (years)
Y = NORMAL
S = MILD
K = MODERATE
Z = SEVERE
A = V.SEVERE
R = COMA

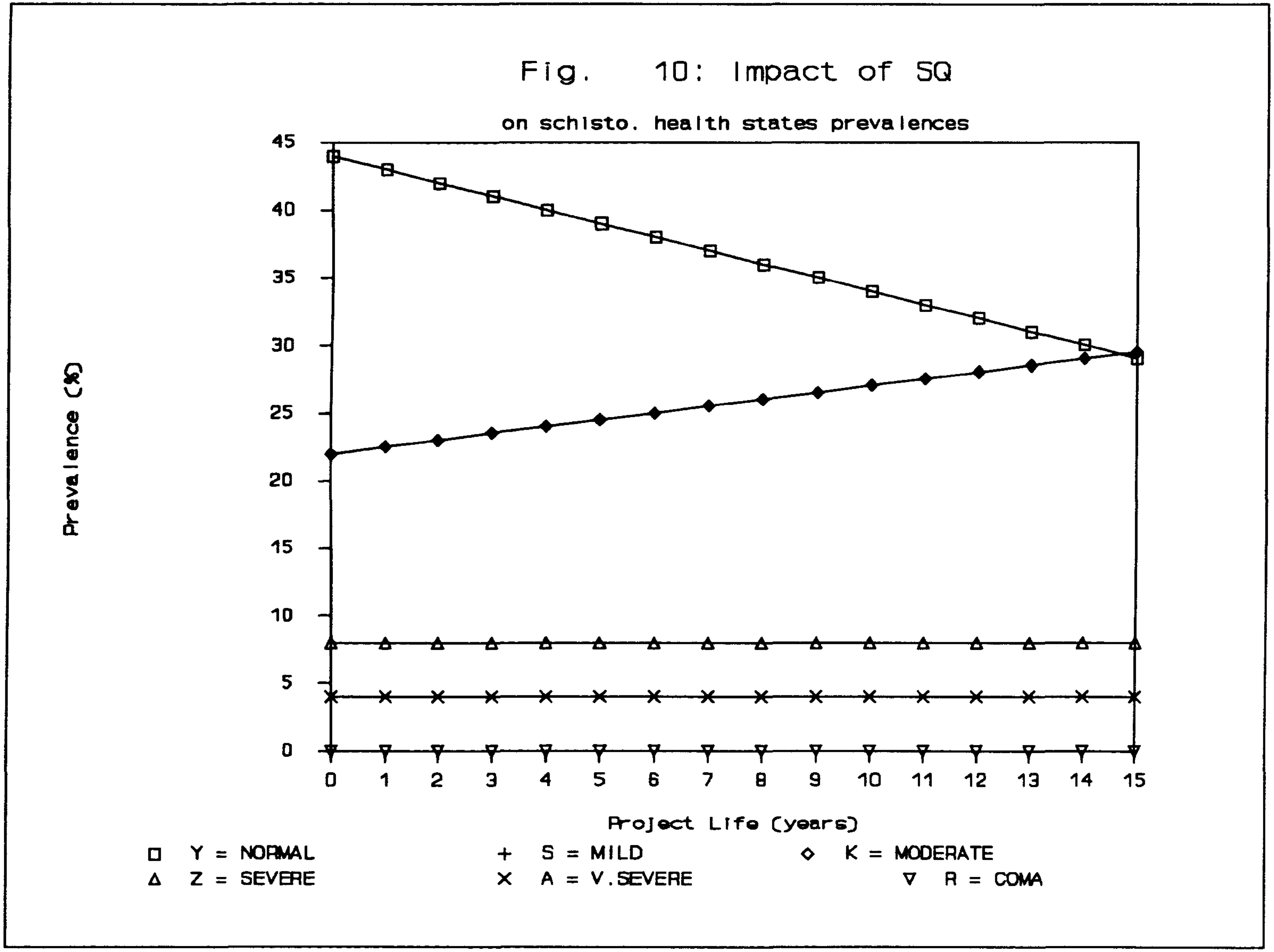


Fig. 10: Impact of SQ
on schisto. health states prevalences
Prevalence (%)
45
40
35
30
25
20
15
10
5
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Project Life (years)
Y = NORMAL
S = MILD
K = MODERATE
Z = SEVERE
A = V.SEVERE
R = COMA

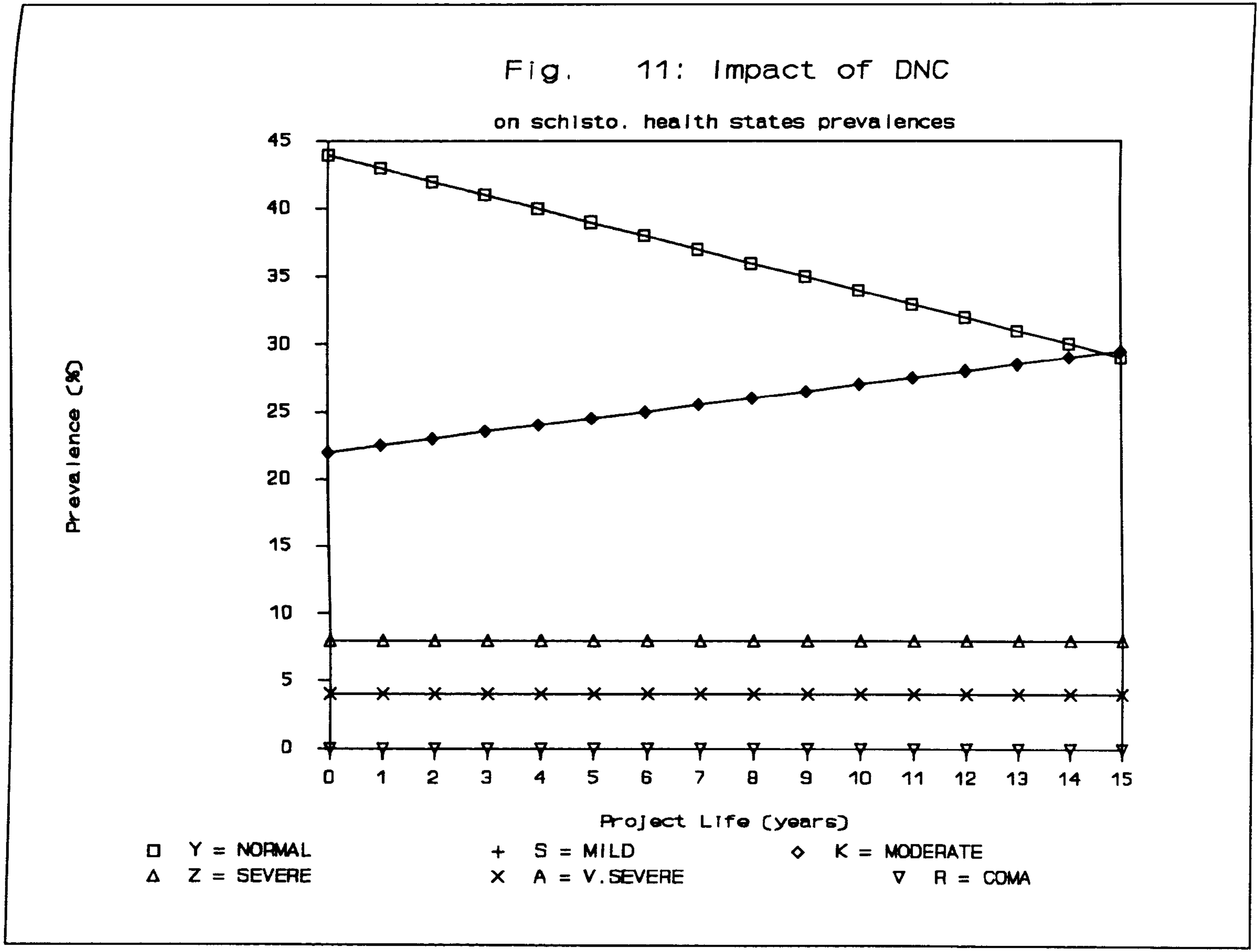


Fig. 11: Impact of DNC
on schisto. health states prevalences
Prevalence (%)
45
40
35
30
25
20
15
10
5
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Project Life (years)
Y = NORMAL
S = MILD
K = MODERATE
Z = SEVERE
A = V.SEVERE
R = COMA

Table 1.1B: Impacts of mass population chemotherapy (MPCP) option on health states prevalence rates over the project period

	Health States Prevalence (%)						
Year	Normal	Mild	Moderate	Severe	V.severe	Comatose	TOTALS
0	44	22	22	8	4	0	100
1	80	5	5	7	3	0	100
2	82	5	5	6	2	0	100
3	84	5	5	5	1	0	100
4	86	5	5	4	0	0	100
5	88	5	5	2	0	0	100
6	89	5	5	1	0	0	100
7	90	5	5	0	0	0	100
8	90	5	5	0	0	0	100
9	90	5	5	0	0	0	100
10	90	5	5	0	0	0	100
11	90	5	5	0	0	0	100
12	90	5	5	0	0	0	100
13	90	5	5	0	0	0	100
14	90	5	5	0	0	0	100
15	90	5	5	0	0	0	100

Table 1.2B: Impacts of mass population chemotherapy (MPCO) option on health states prevalence rates over the project period

	Health States Prevalence (%)						
Year	Normal	Mild	Moderate	Severe	V.severe	Comatose	TOTALS
0	44	22	22	8	4	0	100
1	80	5	5	7	3	0	100
2	82	5	5	6	2	0	100
3	84	5	5	5	1	0	100
4	86	5	5	4	0	0	100
5	88	5	5	2	0	0	100
6	89	5	5	1	0	0	100
7	90	5	5	0	0	0	100
8	90	5	5	0	0	0	100
9	90	5	5	0	0	0	100
10	90	5	5	0	0	0	100
11	90	5	5	0	0	0	100
12	90	5	5	0	0	0	100
13	90	5	5	0	0	0	100
14	90	5	5	0	0	0	100
15	90	5	5	0	0	0	100

Table 1.3B: Impacts of selective population chemotherapy with praziquantel (SPCP) option on health states prevalence rates over the project period

	Health States Prevalence (%)						
Year	Normal	Mild	Moderate	Severe	V.severe	Comatose	TOTALS
0	44	22	22	8	4	0	100
1	68	11	11	7	3	0	100
2	70	11	11	6	2	0	100
3	72	11	11	5	1	0	100
4	74	11	11	4	0	0	100
5	76	10.5	10.5	3	0	0	100
6	78	10	10	2	0	0	100
7	80	9.5	9.5	1	0	0	100
8	82	9	9	0	0	0	100
9	84	8	8	0	0	0	100
10	85	7.5	7.5	0	0	0	100
11	85	7.5	7.5	0	0	0	100
12	85	7.5	7.5	0	0	0	100
13	85	7.5	7.5	0	0	0	100
14	85	7.5	7.5	0	0	0	100
15	85	7.5	7.5	0	0	0	100

Table 1.4B: Impacts of selective population chemotherapy with oxamniquine (SPCO) option on health states prevalence rates over the project period

	Health States Prevalence (%)						
Year	Normal	Mild	Moderate	Severe	V.severe	Comatose	TOTALS
0	44	22	22	8	4	0	100
1	68	11	11	7	3	0	100
2	70	11	11	6	2	0	100
3	72	11	11	5	1	0	100
4	74	11	11	4	0	0	100
5	76	10.5	10.5	3	0	0	100
6	78	10	10	2	0	0	100
7	80	9.5	9.5	1	0	0	100
8	82	9	9	0	0	0	100
9	84	8	8	0	0	0	100
10	85	7.5	7.5	0	0	0	100
11	85	7.5	7.5	0	0	0	100
12	85	7.5	7.5	0	0	0	100
13	85	7.5	7.5	0	0	0	100
14	85	7.5	7.5	0	0	0	100
15	85	7.5	7.5	0	0	0	100

Table 1.5B: Impacts of drip molluscicididing (DM) option on health state prevalence rates over the project period

	Health States Prevalence (%)						
Year	Normal	Mild	Moderate	Severe	V.severe	Comatose	TOTALS
0	44	22	22	8	4	0	100
1	46.4	21	21	7.6	4	0	100
2	48.8	20	20	7.2	4	0	100
3	51.2	19	19	6.8	4	0	100
4	53.6	18	18	6.4	4	0	100
5	56.1	17	17	6	3.9	0	100
6	58.6	16	16	5.6	3.8	0	100
7	61.1	15	15	5.2	3.7	0	100
8	63.6	14	14	4.8	3.6	0	100
9	66.1	13	13	4.4	3.5	0	100
10	68.6	12	12	4	3.4	0	100
11	71.1	11	11	3.6	3.3	0	100
12	73.6	10	10	3.2	3.2	0	100
13	76.1	9	9	2.8	3.1	0	100
14	78.6	8	8	2.4	3	0	100
15	81.1	7	7	2	2.9	0	100

Table 1.6B: Impacts of focal mollusciciding (FM) option on health state prevalence rates over the project period

	Health States Prevalence (%)						
Year	Normal	Mild	Moderate	Severe	V.severe	Comatose	TOTALS
0	44	22	22	8	4	0	100
1	46.4	21	21	7.6	4	0	100
2	48.8	20	20	7.2	4	0	100
3	51.2	19	19	6.8	4	0	100
4	53.6	18	18	6.4	4	0	100
5	56.1	17	17	6	3.9	0	100
6	58.6	16	16	5.6	3.8	0	100
7	61.1	15	15	5.2	3.7	0	100
8	63.6	14	14	4.8	3.6	0	100
9	66.1	13	13	4.4	3.5	0	100
10	68.6	12	12	4	3.4	0	100
11	71.1	11	11	3.6	3.3	0	100
12	73.6	10	10	3.2	3.2	0	100
13	76.1	9	9	2.8	3.1	0	100
14	78.6	8	8	2.4	3	0	100
15	81.1	7	7	2	2.9	0	100

Table 1.7B: Impacts of household water supply (HPWS) option on health state prevalence rates over the project period

	Health States Prevalence (%)						
Year	Normal	Mild	Moderate	Severe	V.severe	Comatose	TOTALS
0	44	22	22	8	4	0	100
1	44.8	21.6	21.6	8	4	0	100
2	45.6	21.2	21.2	8	4	0	100
3	46.4	20.8	20.8	8	4	0	100
4	47.2	20.4	20.4	8	4	0	100
5	48	20	20	8	4	0	100
6	48.8	19.6	19.6	8	4	0	100
7	49.6	19.2	19.2	8	4	0	100
8	50.4	18.8	18.8	8	4	0	100
9	51.2	18.4	18.4	8	4	0	100
10	52	18	18	8	4	0	100
11	52.8	17.6	17.6	8	4	0	100
12	53.6	17.2	17.2	8	4	0	100
13	54.4	16.8	16.8	8	4	0	100
14	55.2	16.4	16.4	8	4	0	100
15	56	16	16	8	4	0	100

Table 1.8B: Impacts of household vented improved pit latrines (VIPL) option on health state prevalence rates over the project period

	Health States Prevalence (%)						
Year	Normal	Mild	Moderate	Severe	V.severe	Comatose	TOTAL
0	44	22	22	8	4	0	100
1	44.4	21.6	22	8	4	0	100
2	44.8	21.2	22	8	4	0	100
3	45.2	20.8	22	8	4	0	100
4	45.6	20.4	22	8	4	0	100
5	46	20	22	8	4	0	100
6	46.4	19.6	22	8	4	0	100
7	46.8	19.2	22	8	4	0	100
8	47.2	18.8	22	8	4	0	100
9	47.6	18.4	22	8	4	0	100
10	48	18	22	8	4	0	100
11	48.4	17.6	22	8	4	0	100
12	48.8	17.2	22	8	4	0	100
13	49.2	16.8	22	8	4	0	100
14	49.6	16.4	22	8	4	0	100
15	50	16	22	8	4	0	100

Table 1.9B: Impacts of household health education visits (HHED) at the community level option on health state prevalence rates over the project period

	Health States Prevalence (%)						
Year	Normal	Mild	Moderate	Severe	V.severe	Comatose	TOTALS
0	44	22	22	8	4	0	100
1	44	22	22	8	4	0	100
2	44	22	22	8	4	0	100
3	44	22	22	8	4	0	100
4	44	22	22	8	4	0	100
5	44	22	22	8	4	0	100
6	44	22	22	8	4	0	100
7	44	22	22	8	4	0	100
8	44	22	22	8	4	0	100
9	44	22	22	8	4	0	100
10	44	22	22	8	4	0	100
11	44	22	22	8	4	0	100
12	44	22	22	8	4	0	100
13	44	22	22	8	4	0	100
14	44	22	22	8	4	0	100
15	44	22	22	8	4	0	100

Table 1.10B: Impacts of status quo (SQ) option at the community level on health state prevalence rates over the project period

	Health States Prevalence (%)						
Year	Normal	Mild	Moderate	Severe	V.severe	Comatose	TOTALS
0	44	22	22	8	4	0	100
1	43	22.5	22.5	8	4	0	100
2	42	23	23	8	4	0	100
3	41	23.5	23.5	8	4	0	100
4	40	24	24	8	4	0	100
5	39	24.5	24.5	8	4	0	100
6	38	25	25	8	4	0	100
7	37	25.5	25.5	8	4	0	100
8	36	26	26	8	4	0	100
9	35	26.5	26.5	8	4	0	100
10	34	27	27	8	4	0	100
11	33	27.5	27.5	8	4	0	100
12	32	28	28	8	4	0	100
13	31	28.5	28.5	8	4	0	100
14	30	29	29	8	4	0	100
15	29	29.5	29.5	8	4	0	100

Table 1.11B: Impacts of do nothing completely (DNC) option at the community level on health state prevalence rates over the project period

	Health States Prevalence (%)						
Year	Normal	Mild	Moderate	Severe	V.severe	Comatose	TOTALS
0	34.5	31.5	22	8	4	0	100
1	32	33	23	8	4	0	100
2	28	33	27	8	4	0	100
3	24	33	31	8	4	0	100
4	22	33	33	8	4	0	100
5	21	33	34	8	4	0	100
6	20	33	35	8	4	0	100
7	18.5	33	36	8.5	4	0	100
8	18	33	36	9	4	0	100
9	17.5	33	36	9.5	4	0	100
10	17	33	36	10	4	0	100
11	16.5	33	36	10.5	4	0	100
12	16	33	36	11.5	4	0	100
13	15.5	33	36	12	4	0	100
14	15	33	36	12	4	0	100
15	14.5	33	36	12.5	4	0	100

Appendix 1C): Transition or outcome probabilities with different facility level interventions (international expert judgments)

Table 2F: Transition or outcome probabilities with different facility level interventions (external expert judgments)

S	OUTCOMES	SQD	PCD	OCD
	Y	0.2	1	1
	S	0.6	0	0
	Q	0.0	0	0
	K	0.2	0	0
K	OUTCOMES	SQHC	PCHC	OCHC
	Y	0.15	0.70	0.70
	S	0.15	0.20	0.20
	K	0.60	0.10	0.10
	Q	0.00	0.00	0.00
	Z	0.10	0.00	0.00
Z	OUTCOMES	SQDH	PCDH	OCDH
	Y	0.10	0.15	0.15
	K	0.20	0.40	0.40
	Z	0.60	0.40	0.40
	Q	0.00	0.00	0.00
	A	0.10	0.05	0.05
A	OUTCOMES	PGHSQ	PGHDM	PGHSO
	Y	0.00	0.05	0.05
	Z	0.10	0.40	0.40
	A	0.80	0.50	0.50
	Q	0.10	0.05	0.05
	R	0.00	0.00	0.00

Appendix 2A Present QALYs Expected from Mild Schistosomiasis State Policy Combinations

Table 2a: Present QALYs expected from mild schistosomiasis state policy combinations								
YEAR	SQ+Y	SQ+SQD	SQ+PCD	SQ+OCD	HPWS+Y	HPWS+SQD	HPWS+PCD	HPWS+OCD
0	11,623	5,307	6,503	6,503	11,623	5,307	6,503	6,503
1	10,716	5,131	6,288	6,288	11,208	4,926	6,037	6,037
2	9,565	4,386	5,375	5,375	9,638	4,386	5,375	5,375
3	9,095	4,791	5,871	5,871	10,411	4,240	5,196	5,196
4	8,371	4,626	5,669	5,669	10,030	3,932	4,818	4,818
5	7,700	4,464	5,471	5,471	9,660	3,644	4,466	4,466
6	7,078	4,307	5,278	5,278	9,301	3,377	4,138	4,138
7	6,502	4,154	5,091	5,091	8,954	3,128	3,833	3,833
8	5,968	3,927	4,813	4,813	8,615	2,895	3,548	3,548
9	5,474	3,858	4,729	4,729	8,289	2,679	3,283	3,283
10	5,016	3,716	4,554	4,554	7,972	2,533	3,104	3,104
11	4,551	3,579	4,386	4,386	7,666	2,291	2,807	2,807
12	4,202	3,445	4,222	4,222	7,370	2,116	2,593	2,593
13	3,841	3,316	4,064	4,064	7,085	1,955	2,396	2,396
14	3,506	3,189	3,909	3,909	5,919	1,804	2,210	2,210
15	34,098	32,717	40,095	40,095	59,785	17,745	21,746	21,746
Total EQALYS	137,305	94,915	116,317	116,317	193,525	66,957	82,055	82,055

Table 2a: Continued								
YEAR	HHED+Y	HHED+SQD	HHED+PCD	HHED+OCD	VIPL+Y	VIPL+SQD	VIPL+PCD	VIPL+OCD
0	11,623	5,307	6,503	6,503	11,623	5,307	6,503	6,503
1	10,989	5,017	6,149	6,149	11,098	4,926	6,037	6,037
2	9,606	4,386	5,375	5,375	9,622	4,386	5,375	5,375
3	9,823	4,485	5,496	5,496	10,116	4,240	5,196	5,196
4	9,287	4,240	5,196	5,196	9,657	3,932	4,818	4,818
5	8,780	4,009	4,913	4,913	9,218	3,644	4,466	4,466
6	8,301	3,790	4,645	4,645	8,875	3,377	4,138	4,138
7	7,849	3,584	4,392	4,392	8,399	3,128	3,833	3,833
8	7,420	3,388	4,152	4,152	8,014	2,895	3,548	3,548
9	7,016	3,203	3,926	3,926	7,648	2,679	3,283	3,283
10	6,632	3,028	3,711	3,711	7,297	2,478	3,036	3,036
11	6,271	2,863	3,509	3,509	6,963	2,291	2,807	2,807
12	5,929	2,707	3,317	3,317	6,642	2,116	2,593	2,593
13	5,606	2,560	3,137	3,137	6,338	1,955	2,396	2,396
14	5,299	2,420	2,965	2,965	6,045	1,804	2,210	2,210
15	53,439	24,399	29,901	29,901	61,501	17,745	21,746	21,746
Total EQALY	173,872	79,386	97,287	97,287	189,058	66,902	81,988	81,988

Table 2a: Continued

YEAR	DM+Y	DM+SQD	DM+PCD	DM+OCD	MPCP+Y	MPCP+SQD	MPCP+PCD	MPCP+OCD
0	11,623	5,307	6,503	6,503	11,623	5,307	6,503	6,503
1	11,647	4,789	5,869	5,869	21,509	1,140	1,397	1,397
2	9,704	4,386	5,375	5,375	10,382	4,386	5,375	5,375
3	11,605	3,873	4,747	4,747	20,347	1,019	1,249	1,249
4	11,544	3,469	4,252	4,252	19,773	964	1,181	1,181
5	11,483	3,098	3,796	3,796	19,204	911	1,117	1,117
6	11,399	2,757	3,378	3,378	18,398	861	1,056	1,056
7	11,296	2,444	2,995	2,995	17,626	815	998	998
8	11,173	2,156	2,642	2,642	16,663	770	944	944
9	11,035	1,893	2,320	2,320	15,754	728	892	892
10	10,881	1,652	2,024	2,024	14,893	688	843	843
11	10,718	1,432	1,755	1,755	14,082	651	798	798
12	10,541	1,230	1,508	1,508	13,313	615	754	754
13	10,358	1,047	1,283	1,283	12,589	582	713	713
14	10,163	880	1,078	1,078	11,900	550	674	674
15	106,268	7,763	9,514	9,514	119,999	5,545	6,796	6,796
Total EQALYS	271,439	48,175	59,039	59,039	358,054	25,532	31,289	31,289

Table 2a: Continued								
YEAR	MPCO+Y	MPCO+SQD	MPCO+PCD	MPCO+OCD	SPCP+Y	SPCP+SQD	SPCP+PCD	SPCP+OCD
0	11,623	5,307	6,503	6,503	11,623	5,307	6,503	6,503
1	21,509	1,140	1,397	1,397	17,849	2,509	3,074	3,074
2	10,382	4,386	5,375	5,375	10,137	4,386	5,375	5,375
3	20,347	1,019	1,249	1,249	17,031	2,242	2,748	2,748
4	19,773	964	1,181	1,181	16,615	2,120	2,598	2,598
5	19,204	911	1,117	1,117	16,198	1,913	2,345	2,345
6	18,398	861	1,056	1,056	15,780	1,723	2,111	2,111
7	17,626	815	998	998	15,364	1,548	1,897	1,897
8	16,663	770	944	944	14,946	1,386	1,699	1,699
9	15,754	728	892	892	14,533	1,165	1,427	1,427
10	14,893	688	843	843	13,929	1,032	1,265	1,265
11	14,082	651	798	798	13,171	976	1,196	1,196
12	13,313	615	754	754	12,451	923	1,131	1,131
13	12,589	582	713	713	11,775	873	1,069	1,069
14	11,900	550	674	674	11,130	825	1,011	1,011
15	119,999	5,545	6,796	6,796	112,234	8,318	10,194	10,194
Total EQALYS	358,054	25,532	31,289	31,289	324,767	37,245	45,644	45,644

Table 2a: Continued				
YEAR	SPCO+Y	SPCO+SQD	SPCO+PCD	SPCO+OCD
0	11,623	5,307	6,503	6,503
1	17,849	2,509	3,074	3,074
2	10,137	4,386	5,375	5,375
3	17,031	2,242	2,748	2,748
4	16,615	2,120	2,598	2,598
5	16,198	1,913	2,345	2,345
6	15,780	1,723	2,111	2,111
7	15,364	1,548	1,897	1,897
8	14,946	1,386	1,699	1,699
9	14,533	1,165	1,427	1,427
10	13,929	1,032	1,265	1,265
11	13,171	976	1,196	1,196
12	12,451	923	1,131	1,131
13	11,775	873	1,069	1,069
14	11,130	825	1,011	1,011
15	112,234	8,318	10,194	10,194
Total EQALYS	324,767	37,245	45,644	45,644

Appendix 2B Present QALYs Expected from the Moderate Schistosomiasis State Policy Combinations

TABLE 2B: Present QALYs expected from moderate schistosomiasis interventions

YEAR	SQ+SQHC	SQ+PCHC	SQ+OCHC	HPWS+SQHC	HPWS+PCHC	HPWS+OCHC
0	4,621	6,029	6,029	4,621	6,029	6,029
1	4,468	5,829	5,829	4,289	5,596	5,596
2	3,819	4,982	4,982	3,819	4,982	4,982
3	4,171	5,442	5,442	3,692	4,817	4,817
4	4,028	5,255	5,255	3,424	4,467	4,467
5	3,887	5,072	5,072	3,173	4,140	4,140
6	3,750	4,893	4,893	2,940	3,836	3,836
7	3,617	4,719	4,719	2,723	3,553	3,553
8	3,419	4,461	4,461	2,521	3,289	3,289
9	3,360	4,383	4,383	2,333	3,044	3,044
10	3,236	4,222	4,222	2,205	2,877	2,877
11	3,116	4,066	4,066	1,995	2,602	2,602
12	3,000	3,914	3,914	1,843	2,404	2,404
13	2,887	3,767	3,767	1,702	2,221	2,221
14	2,777	3,623	3,623	1,570	2,049	2,049
15	27,319	37,168	37,168	14,817	20,159	20,159
Total EQALYS	81,475	107,826	107,826	57,667	76,065	76,065

Table 2b: Continued						
YEAR	HHED+SQHC	HHED+PCHC	HHED+OCHC	VIP+SQHC	VIP+PCHC	VIP+OCHC
0	4621	6029	6029	4621	6029	6029
1	4369	5700	5700	4369	5700	5700
2	3819	4982	4982	3819	4982	4982
3	3905	5095	5095	3905	5095	5095
4	3692	4817	4817	3692	4817	4817
5	3491	4554	4554	3491	4554	4554
6	3300	4306	4306	3300	4306	4306
7	3120	4071	4071	3120	4071	4071
8	2950	3849	3849	2950	3849	3849
9	2789	3639	3639	2789	3639	3639
10	2637	3440	3440	2637	3440	3440
11	2493	3253	3253	2493	3253	3253
12	2357	3075	3075	2357	3075	3075
13	2229	2908	2908	2229	2908	2908
14	2107	2749	2749	2107	2749	2749
15	20374	27718	27718	20374	27718	27718
Total EQALY	68,251	90,185	90,185	68,251	90,185	90185

Table 2b: Continued						
YEAR	DMSC+SQHC	DMSC+PCHC	DMSC+OCHC	MPCP+SQHC	MPCP+PCHC	MPCP+OCHC
0	4,621	6,029	6,029	4,621	6,029	6,029
1	4,170	5,441	5,441	993	1,295	1,295
2	3,819	4,982	4,982	3,819	4,982	4,982
3	3,373	4,400	4,400	888	1,158	1,158
4	3,021	3,941	3,941	839	1,095	1,095
5	2,697	3,519	3,519	793	1,035	1,035
6	2,400	3,132	3,132	750	979	979
7	2,128	2,776	2,776	709	925	925
8	1,877	2,449	2,449	670	875	875
9	1,648	2,150	2,150	634	827	827
10	1,438	1,876	1,876	599	782	782
11	1,247	1,626	1,626	567	739	739
12	1,071	1,398	1,398	536	699	699
13	912	1,190	1,190	507	661	661
14	766	1,000	1,000	479	625	625
15	6,482	8,819	8,819	4,630	6,300	6,300
Total EQALYS	41,670	54,729	54,729	22,033	29,005	29,005

Table 2b: Continued						
YEAR	MPCO+SQHC	MPCO+PCHC	MPCO+OCHC	SPCP+SQHC	SPCP+PCHC	SPCP+OCHC
0	4,621	6,029	6,029	4,621	6,029	6,029
1	993	1,295	1,295	2,184	2,850	2,850
2	3,819	4,982	4,982	3,819	4,982	4,982
3	888	1,158	1,158	1,953	2,547	2,547
4	839	1,095	1,095	1,846	2,409	2,409
5	793	1,035	1,035	1,666	2,174	2,174
6	750	979	979	1,500	1,957	1,957
7	709	925	925	1,347	1,758	1,758
8	670	875	875	1,207	1,575	1,575
9	634	827	827	1,014	1,323	1,323
10	599	782	782	899	1,173	1,173
11	567	739	739	850	1,109	1,109
12	536	699	699	803	1,048	1,048
13	507	661	661	760	991	991
14	479	625	625	718	937	937
15	4,630	6,300	6,300	6,946	9,449	9,449
Total EQALYS	22,033	29,005	29,005	32,133	42,312	42,312

Table 2b: Continued			
YEAR	SPCO+SQHC	SPCO+PCHC	SPCO+OCHC
0	4,621	6,029	6,029
1	2,184	2,850	2,850
2	3,819	4,982	4,982
3	1,953	2,547	2,547
4	1,846	2,409	2,409
5	1,666	2,174	2,174
6	1,500	1,957	1,957
7	1,347	1,758	1,758
8	1,207	1,575	1,575
9	1,014	1,323	1,323
10	899	1,173	1,173
11	850	1,109	1,109
12	803	1,048	1,048
13	760	991	991
14	718	937	937
15	6,946	9,449	9,449
Total EQALYS	32,133	42,312	42,312

Appendix 2C Present QALYs Expected from the Severe Schistosomiasis Policy Combinations

Table 2c: Present QALYs expected from policy options available to severe schistosomiasis cases						
YEAR	SQ+SQDH	SQ+PCDH	SQ+OCDH	HPWS+SQDH	HPWS+PCDH	HPWS+OCDH
0	1,317	1,472	1,472	1,317	1,472	1,472
1	1,245	1,392	1,392	1,245	1,392	1,392
2	1,089	1,217	1,217	1,089	1,217	1,217
3	1,113	1,244	1,244	1,113	1,244	1,244
4	1,053	1,176	1,176	1,053	1,176	1,176
5	995	1,112	1,112	995	1,112	1,112
6	941	1,051	1,051	941	1,051	1,051
7	890	994	994	890	994	994
8	841	940	940	841	940	940
9	795	889	889	795	889	889
10	752	840	840	752	840	840
11	711	794	794	711	794	794
12	672	751	751	672	751	751
13	635	710	710	635	710	710
14	601	671	671	601	671	671
15	3,806	5,327	5,327	3,806	5,327	5,327
Total QALYS	17,455	20,581	20,581	17,455	20,581	20,581

Table 2c: Continued						
YEAR	HHED+SQDH	HHED+PCDH	HHED+OCDH	VIP+SQDH	VIP+PCDH	VIP+OCDH
0	1,317	1,472	1,472	1,317	1,472	1,472
1	1,245	1,392	1,392	1,245	1,392	1,392
2	1,089	1,217	1,217	1,089	1,217	1,217
3	1,113	1,244	1,244	1,113	1,244	1,244
4	1,053	1,176	1,176	1,053	1,176	1,176
5	995	1,112	1,112	995	1,112	1,112
6	941	1,051	1,051	941	1,051	1,051
7	890	994	994	890	994	994
8	841	940	940	841	940	940
9	795	889	889	795	889	889
10	752	840	840	752	840	840
11	711	794	794	711	794	794
12	672	751	751	672	751	751
13	635	710	710	635	710	710
14	601	671	671	601	671	671
15	3,806	5,327	5,327	3,806	5,327	5,327
Total QALYS	17,455	20,581	20,581	17,455	20,581	20,581

Table 2c: Continued						
YEAR	DMSC+SQDH	DMSC+PCDH	DMSC+OCDH	MPCP+SQDH	MPCP+PCDH	MPCP+OCDH
0	1,317	1,472	1,472	1,317	1,472	1,472
1	1,183	1,322	1,322	1,090	1,218	1,218
2	1,089	1,217	1,217	1,089	1,217	1,217
3	946	1,058	1,058	696	778	778
4	1,053	1,176	1,176	526	588	588
5	746	834	834	249	278	278
6	659	736	655	118	131	131
7	578	646	646	0	0	0
8	505	564	564	0	0	0
9	437	489	489	0	0	0
10	376	420	420	0	0	0
11	320	357	357	0	0	0
12	269	300	300	0	0	0
13	222	249	249	0	0	0
14	180	201	201	0	0	0
15	952	1,332	1,332	0	0	0
Total QALYS	10,831	12,373	12,292	5,084	5,682	5,682

Table 2c: Continued

YEAR	MPCO+SQDH	MPCO+PCDH	MPCO+OCDH	SPCP+SQDH	SPCP+PCDH	SPCP+OCDH
0	1,317	1,472	1,472	1,317	1,472	1,472
1	1,090	1,218	1,218	1,090	1,218	1,218
2	1,089	1,217	1,217	1,089	1,217	1,217
3	696	778	778	696	778	778
4	526	588	588	526	588	588
5	249	278	278	373	417	417
6	118	131	131	235	263	263
7	0	0	0	111	124	124
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	0	0	0	0	0	0
Total QALYS	5,084	5,682	5,682	5,437	6,077	6,077

Table 2c: Continued			
YEAR	SPCO+SQDH	SPCO+PCDH	SPCO+OCDH
0	1,317	1,472	1,472
1	1,090	1,218	1,218
2	1,089	1,217	1,217
3	696	778	778
4	526	588	588
5	373	417	417
6	235	263	263
7	111	124	124
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
Total QALYS	5,437	6,077	6,077

Appendix 2D Present QALYs Expected from Very Severe Schistosomiasis States Policy Combinations

Table 2d: Present QALYs expected from very severe schistosomiasis policy combinations

YEAR	SQ+PGHSQ	SQ+PGHPM	SQ+PGHSO	HPWS+PGHSQ	HPWS+PGHPM	HPWS+PGHSO
0	370	486	486	370	486	486
1	350	459	459	350	459	459
2	306	402	402	306	402	402
3	313	411	411	313	411	411
4	296	388	388	296	388	388
5	280	367	367	280	367	367
6	264	347	347	264	347	347
7	250	328	328	250	328	328
8	236	310	310	236	310	310
9	223	293	293	223	293	293
10	211	277	277	211	277	277
11	200	262	262	200	262	262
12	189	248	248	189	248	248
13	179	234	234	179	234	234
14	169	222	222	169	222	222
15	147	728	728	147	728	728
Total EQALYS	3,982	5,764	5,764	3,982	5,764	5,764

Table 2d: Continued

YEAR	HHED+PGHSQ	HHED+PGHPM	HHED+PGHSO	VIP+PGHSQ	VIP+PGHPM	VIP+PGHSO
0	370	486	486	370	486	486
1	350	459	459	350	459	459
2	306	402	402	306	402	402
3	313	411	411	313	411	411
4	296	388	388	296	388	388
5	280	367	367	280	367	367
6	264	347	347	264	347	347
7	250	328	328	250	328	328
8	236	310	310	236	310	310
9	223	293	293	223	293	293
10	211	277	277	211	277	277
11	200	262	262	200	262	262
12	189	248	248	189	248	248
13	179	234	234	179	234	234
14	169	222	222	169	222	222
15	147	728	728	147	728	728
Total EQALYS	3,982	5,764	5,764	3,982	5,764	5,764

Table 2d: Continued						
YEAR	DMSC+PGHSQ	DMSC+PGHPM	DMSC+PGHSO	MPCP+PGHSQ	MPCP+PGHPM	MPCP+PGHSO
0	370	486	486	370	486	486
1	350	459	459	262	345	345
2	306	402	402	306	402	402
3	313	411	411	78	103	103
4	296	388	388	0	0	0
5	273	358	358	0	0	0
6	251	330	330	0	0	0
7	231	304	304	0	0	0
8	213	279	279	0	0	0
9	195	257	257	0	0	0
10	180	236	236	0	0	0
11	165	216	216	0	0	0
12	151	198	198	0	0	0
13	138	182	182	0	0	0
14	127	166	166	0	0	0
15	106	528	528	0	0	0
Total EQALYS	3,664	5,199	5,199	1,017	1,335	1,335

Table 2d: Continued

YEAR	MPCO+PGHSQ	MPCO+PGHPM	MPCO+PGHSO	SPCP+PGHSQ	SPCP+PGHPM	SPCP+PGHSO
0	370	486	486	370	486	486
1	262	345	345	262	345	345
2	306	402	402	306	402	402
3	78	103	103	78	103	103
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	0	0	0	0	0	0
Total EQALYS	1,017	1,335	1,335	1,017	1,335	1,335

Table 2d: Continued						
YEAR	MPCO+PGHSQ	MPCO+PGHPM	MPCO+PGHSO	SPCP+PGHSQ	SPCP+PGHPM	SPCP+PGHSO
0	370	486	486	370	486	486
1	262	345	345	262	345	345
2	306	402	402	306	402	402
3	78	103	103	78	103	103
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	0	0	0	0	0	0
Total EQALYS	1,017	1,335	1,335	1,017	1,335	1,335

Appendix 2F: Expert Assessments of Life Expectancy at Various Health States

Table 2F: Expert Assessments of life expectancy at various health states			
Health States	Expectancy at Birth	Expectancy at base age	Remaining Life Expectancy at year 15
Y	57	52	37
S	57	52	37
K	57	52	37
Z	35	30	15
A	21	16	1
R	0	0	0
Q	0	0	0

Normal life expectancy = 57 years
Base year = Age 5

Appendix 2H: Cut-Off Ratio Calculations

Appendix 2H: Cut-off ratio calculations		
POLICY	EQALYS	COST
SQ+Y	137305	11441109
SQ+SQD	94915	12891639
SQ+SQHC	81475	17730658
SQ+SQDH	17455	28684098
SQ+PGHSQ	3982	276800712
SQ+PGHSQR	0	0
SQ TOTALS	335132	347548217
DNCS EQALYs	318209	0
CHANGE IN QALYS=		16923
CHANGE IN COST=		347548217
COST PER QALY= (dQALY/dTC)		20537

Appendix 3A Present Expected Monetary Values of Schistosomiasis Policy Combinations (using WTP values to avoid advancing to the next state)

Table 3A: Mild schistosomiasis policy combinations expected monetary values (with WTP to avoid advancing)

YEAR	SQ+Y	SQ+SQD	SQ+PCD	SQ+OCD	HPWS+Y	HPWS+SQD
0	1,552,359,590	733,077,209	832,327,202	832,327,202	1,552,359,590	733,077,209
1	1,432,454,212	708,832,397	804,799,930	804,799,930	1,495,892,001	680,479,102
2	1,279,633,082	605,851,659	687,876,816	687,876,816	1,285,599,185	605,851,659
3	1,217,741,359	661,778,599	751,375,603	751,375,603	1,387,777,278	585,744,462
4	1,121,780,457	638,993,331	725,505,479	725,505,479	1,336,076,119	543,144,331
5	1,032,729,895	616,722,386	700,219,311	700,219,311	1,285,925,204	503,446,846
6	950,131,952	594,986,124	675,540,216	675,540,216	1,237,324,914	466,469,121
7	873,602,031	573,831,447	651,521,446	651,521,446	1,190,333,768	432,061,325
8	802,502,256	542,478,692	615,923,898	615,923,898	1,144,619,928	399,945,075
9	736,702,362	533,010,622	605,173,964	605,173,964	1,100,507,753	370,090,394
10	675,654,713	513,385,503	582,891,835	582,891,835	1,057,695,784	349,862,713
11	613,352,690	494,432,303	561,372,596	561,372,596	1,016,552,101	316,436,674
12	566,944,469	475,905,467	540,337,445	540,337,445	976,545,670	292,341,930
13	518,701,360	458,081,634	520,100,475	520,100,475	938,220,900	270,027,068
14	473,852,733	440,588,764	500,239,278	500,239,278	783,298,810	249,160,543
15	432,572,234	423,806,537	481,184,935	481,184,935	741,446,565	229,861,173
Total EMV	14,280,715,395	9,015,762,676	10,236,390,428	10,236,390,428	18,530,175,572	7,027,999,625

TABLE 3A: CONTINUE						
YEAR	HPWS+PCD	HPWS+OCD	HHED+Y	HHED+SQD	HHED+PCD	HHED+OCD
0	832,327,202	832,327,202	1,552,359,590	733,077,209	832,327,202	832,327,202
1	772,607,933	772,607,933	1,467,662,958	693,080,566	786,915,487	786,915,487
2	687,876,816	687,876,816	1,282,947,584	605,851,659	687,876,816	687,876,816
3	665,047,342	665,047,342	1,311,928,446	619,537,412	703,415,458	703,415,458
4	616,679,657	616,679,657	1,240,367,494	585,743,887	665,046,689	665,046,689
5	571,607,601	571,607,601	1,172,705,390	553,791,530	628,768,361	628,768,361
6	529,623,529	529,623,529	1,108,746,141	523,587,789	594,475,390	594,475,390
7	490,557,324	490,557,324	1,048,357,621	495,070,268	562,096,933	562,096,933
8	454,092,913	454,092,913	991,077,910	468,020,832	531,385,324	531,385,324
9	420,196,262	420,196,262	937,033,856	442,499,385	502,408,574	502,408,574
10	397,229,991	397,229,991	885,819,281	418,314,113	474,948,902	474,948,902
11	359,278,461	359,278,461	837,605,337	395,545,843	449,098,077	449,098,077
12	331,921,573	331,921,573	791,822,713	373,925,724	424,550,850	424,550,850
13	306,585,543	306,585,543	748,795,649	353,606,875	401,481,069	401,481,069
14	282,893,936	282,893,936	707,783,953	334,239,752	379,491,866	379,491,866
15	260,981,660	260,981,660	669,284,748	316,059,113	358,849,782	358,849,782
Total EMV	7,979,507,744	7,979,507,744	16,754,298,671	7,911,951,958	8,983,136,779	8,983,136,779

TABLE 3A: CONTINUED						
YEAR	VIPL+Y	VIPL+SQD	VIPL+PCD	VIPL+OCD	DM+Y	DM+SQD
0	1,552,359,590	733,077,209	832,327,202	832,327,202	1,552,359,590	733,077,209
1	1,481,770,585	680,479,102	772,607,933	772,607,933	1,552,515,544	661,576,904
2	1,284,273,384	605,851,659	687,876,816	687,876,816	1,290,902,388	605,851,659
3	1,349,797,400	585,744,462	665,047,342	665,047,342	1,540,806,042	535,055,038
4	1,288,128,585	543,144,331	616,679,657	616,679,657	1,529,730,691	479,244,998
5	1,229,177,584	503,446,846	571,607,601	571,607,601	1,518,569,646	427,929,819
6	1,182,958,795	466,469,121	529,623,529	529,623,529	1,504,497,247	380,791,119
7	1,119,104,397	432,061,325	490,557,324	490,557,324	1,487,944,360	337,547,910
8	1,067,550,975	399,945,075	454,092,913	454,092,913	1,468,828,078	297,831,439
9	1,018,414,282	370,090,394	420,196,262	420,196,262	1,447,866,490	261,476,909
10	971,341,438	342,257,002	388,594,556	388,594,556	1,424,959,295	228,171,335
11	926,602,649	316,436,674	359,278,461	359,278,461	1,400,875,163	197,772,921
12	883,648,596	292,341,930	331,921,573	331,921,573	1,375,146,998	169,966,238
13	842,913,850	270,027,068	306,585,543	306,585,543	1,348,776,776	144,657,358
14	803,637,159	249,160,543	282,893,936	282,893,936	1,320,869,610	121,541,728
15	766,445,511	229,861,173	260,981,660	260,981,660	1,292,733,196	100,564,263
Total EMV	17,768,124,780	7,020,393,914	7,970,872,309	7,970,872,309	23,057,381,113	5,683,056,848

TABLE 3A: CONTINUED						
YEAR	DM+PCD	DM+OCD	MPCP+Y	MPCP+SQD	MPCP+PCD	MPCP+OCD
0	832,327,202	832,327,202	1,552,359,590	733,077,209	832,327,202	832,327,202
1	751,146,601	751,146,601	2,792,570,591	157,518,311	178,844,429	178,844,429
2	687,876,816	687,876,816	1,345,923,116	605,851,659	687,876,816	687,876,816
3	607,495,168	607,495,168	2,634,003,129	140,803,957	159,867,150	159,867,150
4	544,129,109	544,129,109	2,555,884,637	133,123,611	151,146,975	151,146,975
5	485,866,461	485,866,461	2,478,717,159	125,861,711	142,901,900	142,901,900
6	432,345,738	432,345,738	2,373,056,147	118,997,225	135,108,043	135,108,043
7	383,247,909	383,247,909	2,271,787,527	112,515,970	127,749,303	127,749,303
8	338,154,297	338,154,297	2,147,662,581	106,368,371	120,769,392	120,769,392
9	296,877,793	296,877,793	2,030,549,294	100,568,042	114,183,767	114,183,767
10	259,063,038	259,063,038	1,919,567,477	95,071,389	107,942,932	107,942,932
11	224,549,038	224,549,038	1,815,088,019	89,896,782	102,067,745	102,067,745
12	192,977,659	192,977,659	1,715,877,223	84,983,119	96,488,829	96,488,829
13	164,242,255	164,242,255	1,622,637,716	80,365,199	91,245,697	91,245,697
14	137,997,042	137,997,042	1,533,765,506	75,963,580	86,248,151	86,248,151
15	114,179,476	114,179,476	1,450,337,853	71,831,616	81,556,769	81,556,769
Total EMV	6,452,475,604	6,452,475,604	32,239,787,567	2,832,797,752	3,216,325,100	3,216,325,100

TABLE 3A: CONTINUED

YEAR	MPCO+Y	MPCO+SQD	MPCO+PCD	MPCO+OCD	SPCP+Y	SPCP+SQD	SPCP+PCD
0	1,552,359,590	733,077,209	832,327,202	832,327,202	1,552,359,590	733,077,209	832,327,202
1	2,792,570,591	157,518,311	178,844,429	178,844,429	2,338,525,465	346,540,283	393,457,743
2	1,345,923,116	605,851,659	687,876,816	687,876,816	1,326,036,106	605,851,659	687,876,816
3	2,634,003,129	140,803,957	159,867,150	159,867,150	2,224,439,478	309,768,706	351,707,729
4	2,555,884,637	133,123,611	151,146,975	151,146,975	2,166,913,295	292,871,943	332,523,345
5	2,478,717,159	125,861,711	142,901,900	142,901,900	2,109,311,663	264,309,594	300,093,991
6	2,373,056,147	118,997,225	135,108,043	135,108,043	2,051,828,672	237,994,450	270,216,086
7	2,271,787,527	112,515,970	127,749,303	127,749,303	1,994,744,533	213,780,343	242,723,676
8	2,147,662,581	106,368,371	120,769,392	120,769,392	1,937,672,213	191,463,068	217,384,905
9	2,030,549,294	100,568,042	114,183,767	114,183,767	1,881,314,577	160,908,867	182,694,027
10	1,919,567,477	95,071,389	107,942,932	107,942,932	1,801,872,334	142,607,084	161,914,398
11	1,815,088,019	89,896,782	102,067,745	102,067,745	1,703,798,864	134,845,174	153,101,617
12	1,715,877,223	84,983,119	96,488,829	96,488,829	1,610,671,015	127,474,679	144,733,244
13	1,622,637,716	80,365,199	91,245,697	91,245,697	1,523,148,336	120,547,798	136,868,546
14	1,533,765,506	75,963,580	86,248,151	86,248,151	1,439,725,181	113,945,370	129,372,227
15	1,450,337,853	71,831,616	81,556,769	81,556,769	1,361,412,758	107,747,425	122,335,153
TOTAL EMV	32,239,787,567	2,832,797,752	3,216,325,100	3,216,325,100	29,023,774,081	4,103,733,652	4,659,330,706

TABLE 3A: CONTINUED						
YEAR	SPCP+PCD	SPCP+OCD	SPCO+Y	SPCO+SQD	SPCO+PCD	SPCO+OCD
0	832,327,202	832,327,202	1,552,359,590	733,077,209	832,327,202	832,327,202
1	393,457,743	393,457,743	2,338,525,465	346,540,283	393,457,743	393,457,743
2	687,876,816	687,876,816	1,326,036,106	605,851,659	687,876,816	687,876,816
3	351,707,729	351,707,729	2,224,439,478	309,768,706	351,707,729	351,707,729
4	332,523,345	332,523,345	2,166,913,295	292,871,943	332,523,345	332,523,345
5	300,093,991	300,093,991	2,109,311,663	264,309,594	300,093,991	300,093,991
6	270,216,086	270,216,086	2,051,828,672	237,994,450	270,216,086	270,216,086
7	242,723,676	242,723,676	1,994,744,533	213,780,343	242,723,676	242,723,676
8	217,384,905	217,384,905	1,937,672,213	191,463,068	217,384,905	217,384,905
9	182,694,027	182,694,027	1,881,314,577	160,908,867	182,694,027	182,694,027
10	161,914,398	161,914,398	1,801,872,334	142,607,084	161,914,398	161,914,398
11	153,101,617	153,101,617	1,703,798,864	134,845,174	153,101,617	153,101,617
12	144,733,244	144,733,244	1,610,671,015	127,474,679	144,733,244	144,733,244
13	136,868,546	136,868,546	1,523,148,336	120,547,798	136,868,546	136,868,546
14	129,372,227	129,372,227	1,439,725,181	113,945,370	129,372,227	129,372,227
15	122,335,153	122,335,153	1,361,412,758	107,747,425	122,335,153	122,335,153
Total EMV	4,659,330,706	4,659,330,706	29,023,774,081	4,103,733,652	4,659,330,706	4,659,330,706

TABLE 3B: MODERATE SCHISTOSOMIASIS POLICY COMBINATIONS EXPECTED MONETARY VALUES						
YEAR	SQ+SQHC	SQ+PCHC	SQ+OCHC	HPWS+SQHC	HPWS+PCHC	HPWS+OCHC
0	669,588,546	792,728,528	792,728,528	669,588,546	792,728,528	792,728,528
1	647,443,474	766,510,889	766,510,889	621,545,735	735,850,454	735,850,454
2	553,381,454	655,150,492	655,150,492	553,381,454	655,150,492	655,150,492
3	604,464,803	715,628,270	715,628,270	535,015,655	633,407,150	633,407,150
4	583,652,869	690,988,939	690,988,939	496,104,938	587,340,598	587,340,598
5	563,310,714	666,905,782	666,905,782	459,845,481	544,412,884	544,412,884
6	543,456,936	643,400,816	643,400,816	426,070,238	504,426,240	504,426,240
7	524,134,375	620,524,759	620,524,759	394,642,353	467,218,642	467,218,642
8	495,496,947	586,620,795	586,620,795	365,307,553	432,489,057	432,489,057
9	486,848,866	576,382,298	576,382,298	338,038,458	400,205,067	400,205,067
10	468,923,394	555,160,260	555,160,260	319,562,609	378,331,437	378,331,437
11	451,611,649	534,664,818	534,664,818	289,031,456	342,185,483	342,185,483
12	434,689,343	514,630,432	514,630,432	267,023,453	316,130,122	316,130,122
13	418,409,155	495,356,253	495,356,253	246,641,186	291,999,476	291,999,476
14	402,431,267	476,439,969	476,439,969	227,581,820	269,435,017	269,435,017
15	387,102,477	458,292,153	458,292,153	209,953,886	248,565,236	248,565,236
Total EMV	8,234,946,270	9,749,385,453	9,749,385,453	6,419,334,822	7,599,875,881	7,599,875,881

TABLE 3B: CONTINUED						
YEAR	HHED+SQHC	HHED+PCHC	HHED+OCHC	VIPL+SQHC	VIPL+PCHC	VIPL+OCHC
0	669,588,546	792,728,528	792,728,528	669,588,546	792,728,528	792,728,528
1	633,055,841	749,477,314	749,477,314	633,055,841	749,477,314	749,477,314
2	553,381,454	655,150,492	655,150,492	553,381,454	655,150,492	655,150,492
3	565,881,943	669,949,870	669,949,870	565,881,943	669,949,870	669,949,870
4	535,015,130	633,406,528	633,406,528	535,015,130	633,406,528	633,406,528
5	505,830,029	598,854,172	598,854,172	505,830,029	598,854,172	598,854,172
6	478,242,104	566,192,718	566,192,718	478,242,104	566,192,718	566,192,718
7	452,194,363	535,354,694	535,354,694	452,194,363	535,354,694	535,354,694
8	427,487,562	506,104,215	506,104,215	427,487,562	506,104,215	506,104,215
9	404,176,417	478,506,059	478,506,059	404,176,417	478,506,059	478,506,059
10	382,085,728	452,352,805	452,352,805	382,085,728	452,352,805	452,352,805
11	361,289,320	427,731,854	427,731,854	361,289,320	427,731,854	427,731,854
12	341,541,626	404,352,482	404,352,482	341,541,626	404,352,482	404,352,482
13	322,982,506	382,380,266	382,380,266	322,982,506	382,380,266	382,380,266
14	305,292,686	361,437,218	361,437,218	305,292,686	361,437,218	361,437,218
15	288,686,593	341,777,199	341,777,199	288,686,593	341,777,199	341,777,199
Total EMV	7,226,731,848	8,555,756,412	8,555,756,412	7,226,731,848	8,555,756,412	8,555,756,412

TABLE 3B: CONTINUED						
YEAR	DM+SQHC	DM+PCHC	DM+OCHC	MPCP+SQHC	MPCP+PCHC	MPCP+OCHC
0	669,588,546	792,728,528	792,728,528	669,588,546	792,728,528	792,728,528
1	604,280,576	715,410,163	715,410,163	143,876,328	170,335,753	170,335,753
2	553,381,454	655,150,492	655,150,492	553,381,454	655,150,492	655,150,492
3	488,716,223	578,593,069	578,593,069	128,609,532	152,261,334	152,261,334
4	437,739,651	518,241,704	518,241,704	121,594,348	143,956,029	143,956,029
5	390,868,659	462,750,951	462,750,951	114,961,370	136,103,221	136,103,221
6	347,812,439	411,776,522	411,776,522	108,691,387	128,680,163	128,680,163
7	308,314,338	365,014,564	365,014,564	102,771,446	121,671,521	121,671,521
8	272,037,540	322,066,319	322,066,319	97,156,264	115,023,685	115,023,685
9	238,831,519	282,753,580	282,753,580	91,858,277	108,751,377	108,751,377
10	208,410,397	246,737,893	246,737,893	86,837,665	102,807,456	102,807,456
11	180,644,660	213,865,927	213,865,927	82,111,209	97,211,785	97,211,785
12	155,246,194	183,796,583	183,796,583	77,623,097	91,898,291	91,898,291
13	132,129,207	156,428,290	156,428,290	73,405,115	86,904,606	86,904,606
14	111,015,522	131,431,716	131,431,716	69,384,701	82,144,822	82,144,822
15	91,854,825	108,747,291	108,747,291	65,610,589	77,676,636	77,676,636
Total EMV	5,190,871,751	6,145,493,593	6,145,493,593	2,587,461,329	3,063,305,700	3,063,305,700

TABLE 3B: CONTINUED						
YEAR	MPCO+SQHC	MPCO+PCHC	MPCO+OCHC	SPCP+SQHC	SPCP+PCHC	SPCP+OCHC
0	669,588,546	792,728,528	792,728,528	669,588,546	792,728,528	792,728,528
1	143,876,328	170,335,753	170,335,753	316,527,921	374,738,657	374,738,657
2	553,381,454	655,150,492	655,150,492	553,381,454	655,150,492	655,150,492
3	128,609,532	152,261,334	152,261,334	282,940,971	334,974,935	334,974,935
4	121,594,348	143,956,029	143,956,029	267,507,565	316,703,264	316,703,264
5	114,961,370	136,103,221	136,103,221	241,418,878	285,816,764	285,816,764
6	108,691,387	128,680,163	128,680,163	217,382,775	257,360,326	257,360,326
7	102,771,446	121,671,521	121,671,521	195,265,747	231,175,891	231,175,891
8	97,156,264	115,023,685	115,023,685	174,881,275	207,042,634	207,042,634
9	91,858,277	108,751,377	108,751,377	146,973,243	174,002,203	174,002,203
10	86,837,665	102,807,456	102,807,456	130,256,498	154,211,183	154,211,183
11	82,111,209	97,211,785	97,211,785	123,166,813	145,817,678	145,817,678
12	77,623,097	91,898,291	91,898,291	116,434,645	137,847,437	137,847,437
13	73,405,115	86,904,606	86,904,606	110,107,672	130,356,909	130,356,909
14	69,384,701	82,144,822	82,144,822	104,077,052	123,217,233	123,217,233
15	65,610,589	77,676,636	77,676,636	98,415,884	116,514,954	116,514,954
Total EMV (KSH)	2,587,461,329	3,063,305,700	3,063,305,700	3,748,326,940	4,437,659,087	4,437,659,087

TABLE 3B: CONTINUED			
YEAR	SPCO+SQHC	SPCO+PCHC	SPCO+OCHC
0	669,588,546	792,728,528	792,728,528
1	316,527,921	374,738,657	374,738,657
2	553,381,454	655,150,492	655,150,492
3	282,940,971	334,974,935	334,974,935
4	267,507,565	316,703,264	316,703,264
5	241,418,878	285,816,764	285,816,764
6	217,382,775	257,360,326	257,360,326
7	195,265,747	231,175,891	231,175,891
8	174,881,275	207,042,634	207,042,634
9	146,973,243	174,002,203	174,002,203
10	130,256,498	154,211,183	154,211,183
11	123,166,813	145,817,678	145,817,678
12	116,434,645	137,847,437	137,847,437
13	110,107,672	130,356,909	130,356,909
14	104,077,052	123,217,233	123,217,233
15	98,415,884	116,514,954	116,514,954
Total EMV	3,748,326,940	4,437,659,087	4,437,659,087

TABLE 3C: SEVERE SCHISTOSOMIASIS POLICY COMBINATIONS EXPECTED MONETARY VALUES						
YEAR	SQ+SQHC	SQ+PCDH	SQ+OCDH	HPWS+SQDH	HPWS+PCDH	HPWS+OCDH
0	206,406,490	222,149,614	222,149,614	206,406,490	222,149,614	222,149,614
1	195,144,966	210,029,147	210,029,147	195,144,966	210,029,147	210,029,147
2	170,584,644	183,595,549	183,595,549	170,584,644	183,595,549	183,595,549
3	174,438,028	187,742,840	187,742,840	174,438,028	187,742,840	187,742,840
4	164,923,064	177,502,147	177,502,147	164,923,064	177,502,147	177,502,147
5	155,926,504	167,819,397	167,819,397	155,926,504	167,819,397	167,819,397
6	147,422,286	158,666,542	158,666,542	147,422,286	158,666,542	158,666,542
7	139,392,843	150,024,674	150,024,674	139,392,843	150,024,674	150,024,674
8	131,776,757	141,827,690	141,827,690	131,776,757	141,827,690	141,827,690
9	124,590,894	134,093,744	134,093,744	124,590,894	134,093,744	134,093,744
10	117,781,247	126,764,709	126,764,709	117,781,247	126,764,709	126,764,709
11	111,370,573	119,865,077	119,865,077	111,370,573	119,865,077	119,865,077
12	105,283,175	113,313,379	113,313,379	105,283,175	113,313,379	113,313,379
13	99,562,165	107,156,013	107,156,013	99,562,165	107,156,013	107,156,013
14	94,109,124	101,287,056	101,287,056	94,109,124	101,287,056	101,287,056
15	88,990,152	95,777,647	95,777,647	88,990,152	95,777,647	95,777,647
Total EMV	2,227,702,912	2,397,615,224	2,397,615,224	2,227,702,912	2,397,615,224	2,397,615,224

TABLE 3C: CONTINUED

YEAR	HHED+SQDH	HHED+PCDH	HHED+OCDH	VIPL+SQDH	VIPL+PCDH	VIPL+OCDH
0	206,406,490	222,149,614	222,149,614	206,406,490	222,149,614	222,149,614
1	195,144,966	210,029,147	210,029,147	195,144,966	210,029,147	210,029,147
2	170,584,644	183,595,549	183,595,549	170,584,644	183,595,549	183,595,549
3	174,438,028	187,742,840	187,742,840	174,438,028	187,742,840	187,742,840
4	164,923,064	177,502,147	177,502,147	164,923,064	177,502,147	177,502,147
5	155,926,504	167,819,397	167,819,397	155,926,504	167,819,397	167,819,397
6	147,422,286	158,666,542	158,666,542	147,422,286	158,666,542	158,666,542
7	139,392,843	150,024,674	150,024,674	139,392,843	150,024,674	150,024,674
8	131,776,757	141,827,690	141,827,690	131,776,757	141,827,690	141,827,690
9	124,590,894	134,093,744	134,093,744	124,590,894	134,093,744	134,093,744
10	117,781,247	126,764,709	126,764,709	117,781,247	126,764,709	126,764,709
11	111,370,573	119,865,077	119,865,077	111,370,573	119,865,077	119,865,077
12	105,283,175	113,313,379	113,313,379	105,283,175	113,313,379	113,313,379
13	99,562,165	107,156,013	107,156,013	99,562,165	107,156,013	107,156,013
14	94,109,124	101,287,056	101,287,056	94,109,124	101,287,056	101,287,056
15	88,990,152	95,777,647	95,777,647	88,990,152	95,777,647	95,777,647
Total EMV	2,227,702,912	2,397,615,224	2,397,615,224	2,227,702,912	2,397,615,224	2,397,615,224

TABLE 3C: CONTINUED						
YEAR	MPCO+SQDH	MPCO+PCDH	MPCO+OCDH	SPCP+SQDH	SPCP+PCDH	SPCP+OCDH
0	206,406,490	222,149,614	222,149,614	206,406,490	222,149,614	222,149,614
1	170,751,845	183,775,503	183,775,503	170,751,845	183,775,503	183,775,503
2	170,584,644	183,595,549	183,595,549	170,584,644	183,595,549	183,595,549
3	109,023,767	117,339,275	117,339,275	109,023,767	117,339,275	117,339,275
4	82,461,532	88,751,074	88,751,074	82,461,532	88,751,074	88,751,074
5	38,981,626	41,954,849	41,954,849	58,472,439	62,932,274	62,932,274
6	18,427,786	19,833,318	19,833,318	36,855,571	39,666,635	39,666,635
7	0	0	0	17,424,105	18,753,084	18,753,084
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	0	0	0	0	0	0
Total EMV	796,637,690	857,399,182	857,399,182	851,980,394	916,963,008	916,963,008

TABLE 3C: CONTINUED			
YEAR	SPCO+SQDH	SPCO+PCDH	SPCO+OCDH
0	206,406,490	222,149,614	222,149,614
1	170,751,845	183,775,503	183,775,503
2	170,584,644	183,595,549	183,595,549
3	109,023,767	117,339,275	117,339,275
4	82,461,532	88,751,074	88,751,074
5	58,472,439	62,932,274	62,932,274
6	36,855,571	39,666,635	39,666,635
7	17,424,105	18,753,084	18,753,084
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
Total EMV	851,980,394	916,963,008	916,963,008

TABLE 3D: VERY SEVERE SCHISTOSOMIASIS POLICY COMBINATIONS EXPECTED MONETARY VALUES						
YEAR	SQ+PGHSQ	SQ+PGHDM	SQ+PGHSO	HPWS+PGHSQ	HPWS+PGHDM	HPWS+PGHSO
0	68,006,736	82,476,786	82,476,786	68,006,736	82,476,786	82,476,786
1	64,296,293	77,976,858	77,976,858	64,296,293	77,976,858	77,976,858
2	56,204,167	68,162,940	68,162,940	56,204,167	68,162,940	68,162,940
3	57,473,779	69,702,692	69,702,692	57,473,779	69,702,692	69,702,692
4	54,338,792	65,900,662	65,900,662	54,338,792	65,900,662	65,900,662
5	51,374,608	62,305,778	62,305,778	51,374,608	62,305,778	62,305,778
6	48,572,642	58,907,626	58,907,626	48,572,642	58,907,626	58,907,626
7	45,927,104	55,699,187	55,699,187	45,927,104	55,699,187	55,699,187
8	43,417,758	52,655,919	52,655,919	43,417,758	52,655,919	52,655,919
9	41,050,163	49,784,561	49,784,561	41,050,163	49,784,561	49,784,561
10	38,806,523	47,063,533	47,063,533	38,806,523	47,063,533	47,063,533
11	36,694,336	44,501,929	44,501,929	36,694,336	44,501,929	44,501,929
12	34,688,663	42,069,501	42,069,501	34,688,663	42,069,501	42,069,501
13	32,803,706	39,783,475	39,783,475	32,803,706	39,783,475	39,783,475
14	31,007,040	37,604,526	37,604,526	31,007,040	37,604,526	37,604,526
15	29,320,443	35,559,065	35,559,065	29,320,443	35,559,065	35,559,065
Total EMV	733,982,753	890,155,038	890,155,038	733,982,753	890,155,038	890,155,038

TABLE 3D: CONTINUED						
YEAR	HHED+PGHSQ	HHED+PGHDM	HHED+PGHSO	VIPL+PGHSQ	VIPL+PGHDM	VIPL+PGHSO
0	68,006,736	82,476,786	82,476,786	68,006,736	82,476,786	82,476,786
1	64,296,293	77,976,858	77,976,858	64,296,293	77,976,858	77,976,858
2	56,204,167	68,162,940	68,162,940	56,204,167	68,162,940	68,162,940
3	57,473,779	69,702,692	69,702,692	57,473,779	69,702,692	69,702,692
4	54,338,792	65,900,662	65,900,662	54,338,792	65,900,662	65,900,662
5	51,374,608	62,305,778	62,305,778	51,374,608	62,305,778	62,305,778
6	48,572,642	58,907,626	58,907,626	48,572,642	58,907,626	58,907,626
7	45,927,104	55,699,187	55,699,187	45,927,104	55,699,187	55,699,187
8	43,417,758	52,655,919	52,655,919	43,417,758	52,655,919	52,655,919
9	41,050,163	49,784,561	49,784,561	41,050,163	49,784,561	49,784,561
10	38,806,523	47,063,533	47,063,533	38,806,523	47,063,533	47,063,533
11	36,694,336	44,501,929	44,501,929	36,694,336	44,501,929	44,501,929
12	34,688,663	42,069,501	42,069,501	34,688,663	42,069,501	42,069,501
13	32,803,706	39,783,475	39,783,475	32,803,706	39,783,475	39,783,475
14	31,007,040	37,604,526	37,604,526	31,007,040	37,604,526	37,604,526
15	29,320,443	35,559,065	35,559,065	29,320,443	35,559,065	35,559,065
Total EMV	733,982,753	890,155,038	890,155,038	733,982,753	890,155,038	890,155,038

TABLE 3D: CONTINUED						
YEAR	DM+PGHSQ	DM+PGHDM	DM+PGHSO	MPCP+PGHSQ	MPCP+PGHDM	MPCP+PGHSO
0	68,006,736	82,476,786	82,476,786	68,006,736	82,476,786	82,476,786
1	64,296,293	77,976,858	77,976,858	48,222,220	58,482,644	58,482,644
2	56,204,167	68,162,940	68,162,940	56,204,167	68,162,940	68,162,940
3	57,473,779	69,702,692	69,702,692	14,368,445	17,425,673	17,425,673
4	54,338,792	65,900,662	65,900,662	0	0	0
5	50,090,243	60,748,133	60,748,133	0	0	0
6	46,144,010	55,962,245	55,962,245	0	0	0
7	42,482,571	51,521,748	51,521,748	0	0	0
8	39,075,983	47,390,327	47,390,327	0	0	0
9	35,918,892	43,561,491	43,561,491	0	0	0
10	32,985,544	40,004,003	40,004,003	0	0	0
11	30,272,827	36,714,091	36,714,091	0	0	0
12	27,750,930	33,655,600	33,655,600	0	0	0
13	25,422,872	30,832,193	30,832,193	0	0	0
14	23,255,280	28,203,394	28,203,394	0	0	0
15	21,257,321	25,780,322	25,780,322	0	0	0
Total EMV	674,976,241	818,593,488	818,593,488	186,801,567	226,548,043	226,548,043

TABLE 3D: CONTINUED

YEAR	MPCO+PGHSQ	MPCO+PGHPM	MPCO+PGHSO	SPCP+PGHSQ	SPCP+PGHDM
0	68,006,736	82,476,786	82,476,786	68,006,736	82,476,786
1	48,222,220	58,482,644	58,482,644	48,222,220	58,482,644
2	56,204,167	68,162,940	68,162,940	56,204,167	68,162,940
3	14,368,445	17,425,673	17,425,673	14,368,445	17,425,673
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	0	0	0	0	0
15	0	0	0	0	0
Total EMV	186,801,567	226,548,043	226,548,043	186,801,567	226,548,043

TABLE 3D: CONTINUED				
YEAR	SPCP+PGHSO	SPCO+PGHSQ	SPCO+PGHPM	SPCO+PGHSO
0	82,476,786	68,006,736	82,476,786	82,476,786
1	58,482,644	48,222,220	58,482,644	58,482,644
2	68,162,940	56,204,167	68,162,940	68,162,940
3	17,425,673	14,368,445	17,425,673	17,425,673
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
Total EMV	226,548,043	186,801,567	226,548,043	226,548,043

Appendix 3(B) Present Expected Monetary Values of Schistosomiasis States Policy Combinations (with WTP for return to normal health)

TABLE 3A: MILD SCHISTOSOMIASIS POLICY COMBINATIONS EXPECTED MONETARY VALUES (with WTP for return to normal state)								
YEAR	SQ+Y	SQ+SQD	SQ+PCD	SQ+OCD	HPWS+Y	HPWS+SQD	HPWS+PCD	HPWS+OCD
0	359,714,566	178,780,316	181,295,839	181,295,839	359,714,566	178,780,316	181,295,839	181,295,839
1	332,311,808	172,867,576	175,299,904	175,299,904	346,311,558	165,952,873	168,287,908	168,287,908
2	297,201,182	147,752,993	149,831,946	149,831,946	297,354,040	147,752,993	149,831,946	149,831,946
3	283,152,824	161,392,260	163,663,125	163,663,125	320,693,378	142,849,319	144,859,276	144,859,276
4	261,141,082	155,835,468	158,028,146	158,028,146	308,463,542	132,460,148	134,323,924	134,323,924
5	240,689,026	150,404,108	152,520,364	152,520,364	296,613,711	122,778,863	124,506,420	124,506,420
6	221,695,257	145,103,144	147,144,813	147,144,813	285,142,924	113,760,865	115,361,533	115,361,533
7	204,074,987	139,944,015	141,913,093	141,913,093	274,063,611	105,369,611	106,852,211	106,852,211
8	187,683,805	132,297,814	134,159,306	134,159,306	263,298,361	97,537,212	98,909,606	98,909,606
9	172,495,482	129,988,774	131,817,777	131,817,777	252,920,855	90,256,356	91,526,306	91,526,306
10	158,385,832	125,202,668	126,964,329	126,964,329	242,860,810	85,323,300	86,523,839	86,523,839
11	143,892,925	120,580,428	122,277,051	122,277,051	233,201,795	77,171,474	78,257,313	78,257,313

12	133,212,802	116,062,168	117,695,217	117,695,217	223,821,001	71,295,332	72,298,490	72,298,490
13	122,019,965	111,715,353	113,287,241	113,287,241	214,842,330	65,853,261	66,779,847	66,779,847
14	111,600,389	107,449,253	108,961,115	108,961,115	179,204,594	60,764,405	61,619,389	61,619,389
15	101,997,731	103,356,462	104,810,736	104,810,736	169,476,269	56,057,742	56,846,501	56,846,501
Total EMV	3,331,269,663	2,198,732,802	2,229,670,003	2,229,670,003	4,267,983,344	1,713,964,072	1,738,080,350	1,738,080,350

Table 3A: Continued								
YEAR	HHED+Y	HHED+SQD	HHED+PCD	HHED+OCD	VIPL+Y	VIPL+SQD	VIPL+PCD	VIPL+OCD
0	359,714,566	178,780,316	181,295,839	181,295,839	359,714,566	178,780,316	181,295,839	181,295,839
1	340,088,564	169,026,075	171,404,351	171,404,351	343,199,884	165,952,873	168,287,908	168,287,908
2	297,286,103	147,752,993	149,831,946	149,831,946	297,320,071	147,752,993	149,831,946	149,831,946
3	304,001,582	151,090,626	153,216,542	153,216,542	312,346,059	142,849,319	144,859,276	144,859,276
4	287,419,395	142,849,179	144,859,134	144,859,134	297,939,080	132,460,148	134,323,924	134,323,924
5	271,740,654	135,056,750	136,957,061	136,957,061	284,173,654	122,778,863	124,506,420	124,506,420
6	256,919,942	127,690,767	129,487,435	129,487,435	273,363,066	113,760,865	115,361,533	115,361,533
7	242,926,644	120,736,013	122,434,825	122,434,825	258,488,945	105,369,611	106,852,211	106,852,211
8	229,653,723	114,139,291	115,745,284	115,745,284	246,468,409	97,537,212	98,909,606	98,909,606
9	217,130,572	107,915,209	109,433,626	109,433,626	235,016,579	90,256,356	91,526,306	91,526,306
10	205,263,072	102,016,989	103,452,416	103,452,416	224,051,280	83,468,446	84,642,886	84,642,886
11	194,090,881	96,464,343	97,821,641	97,821,641	213,634,141	77,171,474	78,257,313	78,257,313

12	183,482,078	91,191,703	92,474,813	92,474,813	203,637,817	71,295,332	72,298,490	72,298,490
13	173,511,797	86,236,413	87,449,800	87,449,800	194,161,834	65,853,261	66,779,847	66,779,847
14	164,008,519	81,513,227	82,660,156	82,660,156	185,030,205	60,764,405	61,619,389	61,619,389
15	155,087,438	77,079,396	78,163,939	78,163,939	176,386,753	56,057,742	56,846,501	56,846,501
Total EMV	3,882,325,530	1,929,539,288	1,956,688,810	1,956,688,810	4,104,932,342	1,712,109,217	1,736,199,397	1,736,199,397

Table 3A: Continued						
Year	DM+Y	DM+SQD	DM+PCD	DM+OCD	MPCP+Y	MPCP+SQD
0	359,714,566	178,780,316	181,295,839	181,295,839	359,714,566	178,780,316
1	358,761,785	161,343,071	163,613,244	163,613,244	621,522,225	38,415,017
2	297,489,913	147,752,993	149,831,946	149,831,946	298,899,603	147,752,993
3	354,111,073	130,487,359	132,323,377	132,323,377	583,682,342	34,338,779
4	350,609,158	116,876,601	118,521,110	118,521,110	565,144,211	32,465,723
5	347,068,105	104,362,034	105,830,457	105,830,457	546,896,759	30,694,716
6	342,884,171	92,866,012	94,172,680	94,172,680	523,019,067	29,020,629
7	338,160,665	82,320,009	83,478,290	83,478,290	500,160,037	27,440,003
8	332,883,295	72,634,094	73,656,090	73,656,090	472,832,509	25,940,748
9	327,218,948	63,768,078	64,665,325	64,665,325	447,048,678	24,526,184
10	321,148,208	55,645,630	56,428,591	56,428,591	422,614,760	23,185,679
11	314,847,173	48,232,171	48,910,821	48,910,821	399,612,411	21,923,714
12	308,213,018	41,450,774	42,034,006	42,034,006	377,770,018	20,725,387
13	301,472,408	35,278,533	35,774,918	35,774,918	357,242,273	19,599,185
14	294,426,703	29,641,173	30,058,239	30,058,239	337,676,038	18,525,733
15	287,369,057	24,525,262	24,870,344	24,870,344	319,308,485	17,518,044
Total EMV	5,236,378,244	1,385,964,111	1,405,465,276	1,405,465,276	7,133,143,982	690,852,850

Table 3A: Continued

Year	MPCP+PCD	MPCP+OCD	MPCO+Y	MPCO+DNS	MPCO+PCD	MPCO+OCD	SPCP+Y
0	181,295,839	181,295,839	359,714,566	178,780,316	181,295,839	181,295,839	359,714,566
1	38,955,534	38,955,534	621,522,225	38,415,017	38,955,534	38,955,534	527,393,066
2	149,831,946	149,831,946	298,899,603	147,752,993	149,831,946	149,831,946	298,390,077
3	34,821,941	34,821,941	583,682,342	34,338,779	34,821,941	34,821,941	499,446,545
4	32,922,530	32,922,530	565,144,211	32,465,723	32,922,530	32,922,530	485,458,389
5	31,126,605	31,126,605	546,896,759	30,694,716	31,126,605	31,126,605	471,515,462
6	29,428,963	29,428,963	523,019,067	29,020,629	29,428,963	29,428,963	457,660,706
7	27,826,097	27,826,097	500,160,037	27,440,003	27,826,097	27,826,097	443,955,854
8	26,305,746	26,305,746	472,832,509	25,940,748	26,305,746	26,305,746	430,313,923
9	24,871,279	24,871,279	447,048,678	24,526,184	24,871,279	24,871,279	416,890,202
10	23,511,913	23,511,913	422,614,760	23,185,679	23,511,913	23,511,913	398,852,985
11	22,232,191	22,232,191	399,612,411	21,923,714	22,232,191	22,232,191	377,143,957
12	21,017,003	21,017,003	377,770,018	20,725,387	21,017,003	21,017,003	356,529,666
13	19,874,955	19,874,955	357,242,273	19,599,185	19,874,955	19,874,955	337,156,107
14	18,786,399	18,786,399	337,676,038	18,525,733	18,786,399	18,786,399	318,689,996
15	17,764,532	17,764,532	319,308,485	17,518,044	17,764,532	17,764,532	301,355,169
Total EMV	700,573,473	700,573,473	7,133,143,982	690,852,850	700,573,473	700,573,473	6,480,466,671

Table 3A: Continued							
YEAR	SPCP+SQD	SPCP+PCD	SPCP+OCD	SPCO+SQD	SPCO+SQD	SPCO+PCD	SPCO+OCD
0	178,780,316	181,295,839	181,295,839	359,714,566	178,780,316	181,295,839	181,295,839
1	84,513,037	85,702,175	85,702,175	527,393,066	84,513,037	85,702,175	85,702,175
2	147,752,993	149,831,946	149,831,946	298,390,077	147,752,993	149,831,946	149,831,946
3	75,545,313	76,608,271	76,608,271	499,446,545	75,545,313	76,608,271	76,608,271
4	71,424,590	72,429,567	72,429,567	485,458,389	71,424,590	72,429,567	72,429,567
5	64,458,903	65,365,870	65,365,870	471,515,462	64,458,903	65,365,870	65,365,870
6	58,041,258	58,857,925	58,857,925	457,660,706	58,041,258	58,857,925	58,857,925
7	52,136,006	52,869,584	52,869,584	443,955,854	52,136,006	52,869,584	52,869,584
8	46,693,346	47,350,343	47,350,343	430,313,923	46,693,346	47,350,343	47,350,343
9	39,241,894	39,794,046	39,794,046	416,890,202	39,241,894	39,794,046	39,794,046
10	34,778,519	35,267,869	35,267,869	398,852,985	34,778,519	35,267,869	35,267,869
11	32,885,571	33,348,287	33,348,287	377,143,957	32,885,571	33,348,287	33,348,287
12	31,088,081	31,525,505	31,525,505	356,529,666	31,088,081	31,525,505	31,525,505
13	29,398,777	29,812,432	29,812,432	337,156,107	29,398,777	29,812,432	29,812,432
14	27,788,600	28,179,599	28,179,599	318,689,996	27,788,600	28,179,599	28,179,599
15	26,277,067	26,646,797	26,646,797	301,355,169	26,277,067	26,646,797	26,646,797
Total EMV (Ksh)	1,000,804,271	1,014,886,056	1,014,886,056	6,480,466,671	1,000,804,271	1,014,886,056	1,014,886,056

TABLE 3B: MODERATE SCHISTOSOMIASIS POLICY COMBINATIONS EXPECTED MONETARY VALUES						
YEAR	SQ+SQHC	SQ+PCHC	SQ+OCHC	HPWS+SQHC	HPWS+PCHC	HPWS+OCHC
0	176,923,915	180,294,963	180,294,963	176,923,915	180,294,963	180,294,963
1	171,072,571	174,332,130	174,332,130	164,229,668	167,358,844	167,358,844
2	146,218,770	149,004,772	149,004,772	146,218,770	149,004,772	149,004,772
3	159,716,411	162,759,593	162,759,593	141,366,015	144,059,555	144,059,555
4	154,217,319	157,155,723	157,155,723	131,084,721	133,582,365	133,582,365
5	148,842,356	151,678,348	151,678,348	121,503,964	123,819,059	123,819,059
6	143,596,436	146,332,474	146,332,474	112,579,606	114,724,659	114,724,659
7	138,490,878	141,129,636	141,129,636	104,275,485	106,262,314	106,262,314
8	130,924,073	133,418,656	133,418,656	96,524,415	98,363,558	98,363,558
9	128,639,010	131,090,053	131,090,053	89,319,161	91,021,018	91,021,018
10	123,902,601	126,263,399	126,263,399	84,437,328	86,046,168	86,046,168
11	119,328,357	121,601,999	121,601,999	76,370,149	77,825,279	77,825,279
12	114,857,013	117,045,459	117,045,459	70,555,022	71,899,354	71,899,354
13	110,555,335	112,661,818	112,661,818	65,169,460	66,411,177	66,411,177
14	106,333,532	108,359,575	108,359,575	60,133,446	61,279,208	61,279,208
15	102,283,240	104,232,110	104,232,110	55,475,655	56,532,670	56,532,670
Total EMV	2,175,901,819	2,217,360,708	2,217,360,708	1,696,166,782	1,728,484,964	1,728,484,964

TABLE 3B: Continued					
YEAR	HHED+OCHC	VIPL+SQHC	VIPL+PCHC	VIPL+OCHC	DM+SQHC
0	180,294,963	176,923,915	180,294,963	180,294,963	176,923,915
1	170,458,082	167,270,959	170,458,082	170,458,082	159,667,733
2	149,004,772	146,218,770	149,004,772	149,004,772	146,218,770
3	152,370,683	149,521,747	152,370,683	152,370,683	129,132,417
4	144,059,413	141,365,876	144,059,413	144,059,413	115,662,989
5	136,200,965	133,654,361	136,200,965	136,200,965	103,278,370
6	128,772,577	126,364,864	128,772,577	128,772,577	91,901,719
7	121,758,902	119,482,326	121,758,902	121,758,902	81,465,222
8	115,106,291	112,954,102	115,106,291	115,106,291	71,879,883
9	108,829,478	106,794,650	108,829,478	108,829,478	63,105,929
10	102,881,288	100,957,675	102,881,288	102,881,288	55,067,823
11	97,281,599	95,462,686	97,281,599	97,281,599	47,731,343
12	91,964,289	90,244,796	91,964,289	91,964,289	41,020,362
13	86,967,018	85,340,960	86,967,018	86,967,018	34,912,211
14	82,203,816	80,666,818	82,203,816	82,203,816	29,333,388
15	77,732,421	76,279,026	77,732,421	77,732,421	24,270,599
Total EMV	1,945,886,557	1,909,503,530	1,945,886,557	1,945,886,557	1,371,572,675

TABLE 3B: Continued					
YEAR	HHED+OCHC	VIPL+SQHC	VIPL+PCHC	VIPL+OCHC	DM+SQHC
0	180,294,963	176,923,915	180,294,963	180,294,963	176,923,915
1	170,458,082	167,270,959	170,458,082	170,458,082	159,667,733
2	149,004,772	146,218,770	149,004,772	149,004,772	146,218,770
3	152,370,683	149,521,747	152,370,683	152,370,683	129,132,417
4	144,059,413	141,365,876	144,059,413	144,059,413	115,662,989
5	136,200,965	133,654,361	136,200,965	136,200,965	103,278,370
6	128,772,577	126,364,864	128,772,577	128,772,577	91,901,719
7	121,758,902	119,482,326	121,758,902	121,758,902	81,465,222
8	115,106,291	112,954,102	115,106,291	115,106,291	71,879,883
9	108,829,478	106,794,650	108,829,478	108,829,478	63,105,929
10	102,881,288	100,957,675	102,881,288	102,881,288	55,067,823
11	97,281,599	95,462,686	97,281,599	97,281,599	47,731,343
12	91,964,289	90,244,796	91,964,289	91,964,289	41,020,362
13	86,967,018	85,340,960	86,967,018	86,967,018	34,912,211
14	82,203,816	80,666,818	82,203,816	82,203,816	29,333,388
15	77,732,421	76,279,026	77,732,421	77,732,421	24,270,599
Total EMV	1,945,886,557	1,909,503,530	1,945,886,557	1,945,886,557	1,371,572,675

TABLE 3B: CONTINUED						
YEAR	DM+PCHC	DM+OCHC	MPCP+SQHC	MPCP+PCHC	MPCP+OCHC	MPCO+SQHC
0	180,294,963	180,294,963	176,923,915	180,294,963	180,294,963	176,923,915
1	162,709,988	162,709,988	38,016,127	38,740,473	38,740,473	38,016,127
2	149,004,772	149,004,772	146,218,770	149,004,772	149,004,772	146,218,770
3	131,592,862	131,592,862	33,982,215	34,629,701	34,629,701	33,982,215
4	117,866,793	117,866,793	32,128,608	32,740,776	32,740,776	32,128,608
5	105,246,201	105,246,201	30,375,991	30,954,765	30,954,765	30,375,991
6	93,652,783	93,652,783	28,719,287	29,266,495	29,266,495	28,719,287
7	83,017,433	83,017,433	27,155,074	27,672,478	27,672,478	27,155,074
8	73,249,458	73,249,458	25,671,387	26,160,521	26,160,521	25,671,387
9	64,308,328	64,308,328	24,271,511	24,733,972	24,733,972	24,271,511
10	56,117,066	56,117,066	22,944,926	23,382,111	23,382,111	22,944,926
11	48,640,800	48,640,800	21,696,065	22,109,454	22,109,454	21,696,065
12	41,801,950	41,801,950	20,510,181	20,900,975	20,900,975	20,510,181
13	35,577,416	35,577,416	19,395,673	19,765,231	19,765,231	19,395,673
14	29,892,297	29,892,297	18,333,368	18,682,685	18,682,685	18,333,368
15	24,733,043	24,733,043	17,336,142	17,666,459	17,666,459	17,336,142
Total EMV	1,397,706,152	1,397,706,152	683,679,241	696,705,831	696,705,831	683,679,241

TABLE 3B: CONTINUED

YEAR	MPCO+PCHC	MPCO+OCHC	SPCP+SQHC	SPCP+PCHC	SPCP+OCHC
0	180,294,963	180,294,963	176,923,915	180,294,963	180,294,963
1	38,740,473	38,740,473	83,635,479	85,229,041	85,229,041
2	149,004,772	149,004,772	146,218,770	149,004,772	149,004,772
3	34,629,701	34,629,701	74,760,873	76,185,341	76,185,341
4	32,740,776	32,740,776	70,682,938	72,029,707	72,029,707
5	30,954,765	30,954,765	63,789,581	65,005,006	65,005,006
6	29,266,495	29,266,495	57,438,574	58,532,989	58,532,989
7	27,672,478	27,672,478	51,594,641	52,577,707	52,577,707
8	26,160,521	26,160,521	46,208,496	47,088,937	47,088,937
9	24,733,972	24,733,972	38,834,418	39,574,356	39,574,356
10	23,382,111	23,382,111	34,417,389	35,073,166	35,073,166
11	22,109,454	22,109,454	32,544,097	33,164,181	33,164,181
12	20,900,975	20,900,975	30,765,271	31,351,462	31,351,462
13	19,765,231	19,765,231	29,093,509	29,647,847	29,647,847
14	18,682,685	18,682,685	27,500,052	28,024,028	28,024,028
15	17,666,459	17,666,459	26,004,213	26,499,689	26,499,689
Total EMV (KSH)	696,705,831	696,705,831	990,412,219	1,009,283,195	1,009,283,195

TABLE 3B: CONTINUED			
YEAR	SPCO+SQHC	SPCO+PCHC	SPCO+OCHC
0	176,923,915	180,294,963	180,294,963
1	83,635,479	85,229,041	85,229,041
2	146,218,770	149,004,772	149,004,772
3	74,760,873	76,185,341	76,185,341
4	70,682,938	72,029,707	72,029,707
5	63,789,581	65,005,006	65,005,006
6	57,438,574	58,532,989	58,532,989
7	51,594,641	52,577,707	52,577,707
8	46,208,496	47,088,937	47,088,937
9	38,834,418	39,574,356	39,574,356
10	34,417,389	35,073,166	35,073,166
11	32,544,097	33,164,181	33,164,181
12	30,765,271	31,351,462	31,351,462
13	29,093,509	29,647,847	29,647,847
14	27,500,052	28,024,028	28,024,028
15	26,004,213	26,499,689	26,499,689
Total EMV	990,412,219	1,009,283,195	1,009,283,195

TABLE 3C: SEVERE SCHISTOSOMIASIS POLICY COMBINATIONS EXPECTED MONETARY VALUES						
YEAR	SQ+SQDH	SQ+PCDH	SQ+OCDH	HPWS+SQDH	HPWS+PCDH	HPWS+OCDH
0	61,406,711	62,747,952	62,747,952	61,406,711	62,747,952	62,747,952
1	58,056,365	59,324,428	59,324,428	58,056,365	59,324,428	59,324,428
2	50,749,576	51,858,045	51,858,045	50,749,576	51,858,045	51,858,045
3	51,895,972	53,029,481	53,029,481	51,895,972	53,029,481	53,029,481
4	49,065,235	50,136,915	50,136,915	49,065,235	50,136,915	50,136,915
5	46,388,724	47,401,944	47,401,944	46,388,724	47,401,944	47,401,944
6	43,858,687	44,816,646	44,816,646	43,858,687	44,816,646	44,816,646
7	41,469,897	42,375,680	42,375,680	41,469,897	42,375,680	42,375,680
8	39,204,083	40,060,376	40,060,376	39,204,083	40,060,376	40,060,376
9	37,066,262	37,875,861	37,875,861	37,066,262	37,875,861	37,875,861
10	35,040,366	35,805,716	35,805,716	35,040,366	35,805,716	35,805,716
11	33,133,166	33,856,859	33,856,859	33,133,166	33,856,859	33,856,859
12	31,322,142	32,006,279	32,006,279	31,322,142	32,006,279	32,006,279
13	29,620,120	30,267,081	30,267,081	29,620,120	30,267,081	30,267,081
14	27,997,820	28,609,347	28,609,347	27,997,820	28,609,347	28,609,347
15	26,474,906	27,053,170	27,053,170	26,474,906	27,053,170	27,053,170
Total EMV	662,750,033	677,225,779	677,225,779	662,750,033	677,225,779	677,225,779

TABLE 3C: CONTINUED						
YEAR	HHED+SQDH	HHED+PCDH	HHED+OCDH	VIPL+SQDH	VIPL+PCDH	VIPL+OCDH
0	61,406,711	62,747,952	62,747,952	61,406,711	62,747,952	62,747,952
1	58,056,365	59,324,428	59,324,428	58,056,365	59,324,428	59,324,428
2	50,749,576	51,858,045	51,858,045	50,749,576	51,858,045	51,858,045
3	51,895,972	53,029,481	53,029,481	51,895,972	53,029,481	53,029,481
4	49,065,235	50,136,915	50,136,915	49,065,235	50,136,915	50,136,915
5	46,388,724	47,401,944	47,401,944	46,388,724	47,401,944	47,401,944
6	43,858,687	44,816,646	44,816,646	43,858,687	44,816,646	44,816,646
7	41,469,897	42,375,680	42,375,680	41,469,897	42,375,680	42,375,680
8	39,204,083	40,060,376	40,060,376	39,204,083	40,060,376	40,060,376
9	37,066,262	37,875,861	37,875,861	37,066,262	37,875,861	37,875,861
10	35,040,366	35,805,716	35,805,716	35,040,366	35,805,716	35,805,716
11	33,133,166	33,856,859	33,856,859	33,133,166	33,856,859	33,856,859
12	31,322,142	32,006,279	32,006,279	31,322,142	32,006,279	32,006,279
13	29,620,120	30,267,081	30,267,081	29,620,120	30,267,081	30,267,081
14	27,997,820	28,609,347	28,609,347	27,997,820	28,609,347	28,609,347
15	26,474,906	27,053,170	27,053,170	26,474,906	27,053,170	27,053,170
Total EMV	662,750,033	677,225,779	677,225,779	662,750,033	677,225,779	677,225,779

TABLE 3C: CONTINUED						
YEAR	DM+SQDH	DM+PCDH	DM+OCDH	MPCP+SQDH	MPCP+PCDH	MPCP+OCDH
0	61,406,711	62,747,952	62,747,952	61,406,711	62,747,952	62,747,952
1	55,153,546	56,358,207	56,358,207	50,799,319	51,908,875	51,908,875
2	50,749,576	51,858,045	51,858,045	50,749,576	51,858,045	51,858,045
3	44,111,576	45,075,059	45,075,059	32,434,983	33,143,426	33,143,426
4	49,065,235	50,136,915	50,136,915	24,532,617	25,068,457	25,068,457
5	34,791,543	35,551,458	35,551,458	11,597,181	11,850,486	11,850,486
6	30,701,081	31,371,652	27,000,981	5,482,336	5,602,081	5,602,081
7	26,955,433	27,544,192	27,544,192	0	0	0
8	23,522,450	24,036,226	24,036,226	0	0	0
9	20,386,444	20,831,723	20,831,723	0	0	0
10	17,520,183	17,902,858	17,902,858	0	0	0
11	14,909,925	15,235,587	15,235,587	0	0	0
12	12,528,857	12,802,512	12,802,512	0	0	0
13	10,367,042	10,593,478	10,593,478	0	0	0
14	8,399,346	8,582,804	8,582,804	0	0	0
15	6,618,727	6,763,292	6,763,292	0	0	0
Total EMV	467,187,675	477,391,960	473,021,289	237,002,723	242,179,322	242,179,322

TABLE 3B: CONTINUED						
YEAR	MPCO+SQDH	MPCO+PCDH	MPCO+OCDH	SPCP+SQDH	SPCP+PCDH	SPCP+OCDH
0	61,406,711	62,747,952	62,747,952	61,406,711	62,747,952	62,747,952
1	50,799,319	51,908,875	51,908,875	50,799,319	51,908,875	51,908,875
2	50,749,576	51,858,045	51,858,045	50,749,576	51,858,045	51,858,045
3	32,434,983	33,143,426	33,143,426	32,434,983	33,143,426	33,143,426
4	24,532,617	25,068,457	25,068,457	24,532,617	25,068,457	25,068,457
5	11,597,181	11,850,486	11,850,486	17,395,771	17,775,729	17,775,729
6	5,482,336	5,602,081	5,602,081	10,964,672	11,204,161	11,204,161
7	0	0	0	5,183,737	5,296,960	5,296,960
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	0	0	0	0	0	0
Total EMV (KSH)	237,002,723	242,179,322	242,179,322	253,467,386	259,003,606	259,003,606

TABLE 3C: CONTINUED			
YEAR	SPCO+SQDH	SPCO+PCDH	SPCO+OCDH
0	61,406,711	62,747,952	62,747,952
1	50,799,319	51,908,875	51,908,875
2	50,749,576	51,858,045	51,858,045
3	32,434,983	33,143,426	33,143,426
4	24,532,617	25,068,457	25,068,457
5	17,395,771	17,775,729	17,775,729
6	10,964,672	11,204,161	11,204,161
7	5,183,737	5,296,960	5,296,960
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
Total EMV (KSH)	253,467,386	259,003,606	259,003,606

TABLE 4D: VERY SEVERE SCHISTOSOMIASIS POLICY COMBINATIONS EXPECTED MONETARY VALUES						
YEAR	SQ+PGHSQ	SQ+PGHDM	SQ+PGHSO	HPWS+PGHSQ	HPWS+PGHDM	HPWS+PGHSO
0	22,099,449	25,932,387	25,932,387	22,099,449	25,932,387	25,932,387
1	20,893,704	24,517,518	24,517,518	20,893,704	24,517,518	24,517,518
2	18,264,090	21,431,821	21,431,821	18,264,090	21,431,821	21,431,821
3	18,676,662	21,915,951	21,915,951	18,676,662	21,915,951	21,915,951
4	17,657,918	20,720,515	20,720,515	17,657,918	20,720,515	20,720,515
5	16,694,678	19,590,210	19,590,210	16,694,678	19,590,210	19,590,210
6	15,784,151	18,521,762	18,521,762	15,784,151	18,521,762	18,521,762
7	14,924,458	17,512,963	17,512,963	14,924,458	17,512,963	17,512,963
8	14,109,022	16,556,097	16,556,097	14,109,022	16,556,097	16,556,097
9	13,339,649	15,653,284	15,653,284	13,339,649	15,653,284	15,653,284
10	12,610,556	14,797,737	14,797,737	12,610,556	14,797,737	14,797,737
11	11,924,181	13,992,316	13,992,316	11,924,181	13,992,316	13,992,316
12	11,272,418	13,227,511	13,227,511	11,272,418	13,227,511	13,227,511
13	10,659,883	12,508,738	12,508,738	10,659,883	12,508,738	12,508,738
14	10,076,039	11,823,631	11,823,631	10,076,039	11,823,631	11,823,631
15	9,527,963	11,180,497	11,180,497	9,527,963	11,180,497	11,180,497
Total EMV	238,514,819	279,882,937	279,882,937	238,514,819	279,882,937	279,882,937

TABLE 4D: CONTINUED						
YEAR	HHED+PGHSQ	HHED+PGHDM	HHED+PGHSO	VIPL+PGHSQ	VIPL+PGHDM	VIPL+PGHSO
0	22,099,449	25,932,387	25,932,387	22,099,449	25,932,387	25,932,387
1	20,893,704	24,517,518	24,517,518	20,893,704	24,517,518	24,517,518
2	18,264,090	21,431,821	21,431,821	18,264,090	21,431,821	21,431,821
3	18,676,662	21,915,951	21,915,951	18,676,662	21,915,951	21,915,951
4	17,657,918	20,720,515	20,720,515	17,657,918	20,720,515	20,720,515
5	16,694,678	19,590,210	19,590,210	16,694,678	19,590,210	19,590,210
6	15,784,151	18,521,762	18,521,762	15,784,151	18,521,762	18,521,762
7	14,924,458	17,512,963	17,512,963	14,924,458	17,512,963	17,512,963
8	14,109,022	16,556,097	16,556,097	14,109,022	16,556,097	16,556,097
9	13,339,649	15,653,284	15,653,284	13,339,649	15,653,284	15,653,284
10	12,610,556	14,797,737	14,797,737	12,610,556	14,797,737	14,797,737
11	11,924,181	13,992,316	13,992,316	11,924,181	13,992,316	13,992,316
12	11,272,418	13,227,511	13,227,511	11,272,418	13,227,511	13,227,511
13	10,659,883	12,508,738	12,508,738	10,659,883	12,508,738	12,508,738
14	10,076,039	11,823,631	11,823,631	10,076,039	11,823,631	11,823,631
15	9,527,963	11,180,497	11,180,497	9,527,963	11,180,497	11,180,497
Total EMV	238,514,819	279,882,937	279,882,937	238,514,819	279,882,937	279,882,937

TABLE 4D: CONTINUED						
YEAR	DM+PGHSQ	DM+PGHDM	DM+PGHSO	MPCP+PGHSQ	MPCP+PGHDM	MPCP+PGHSO
0	22,099,449	25,932,387	25,932,387	22,099,449	25,932,387	25,932,387
1	20,893,704	24,517,518	24,517,518	15,670,278	18,388,138	18,388,138
2	18,264,090	21,431,821	21,431,821	18,264,090	21,431,821	21,431,821
3	18,676,662	21,915,951	21,915,951	4,669,166	5,478,988	5,478,988
4	17,657,918	20,720,515	20,720,515	0	0	0
5	16,277,311	19,100,455	19,100,455	0	0	0
6	14,994,944	17,595,674	17,595,674	0	0	0
7	13,805,124	16,199,491	16,199,491	0	0	0
8	12,698,120	14,900,487	14,900,487	0	0	0
9	11,672,193	13,696,623	13,696,623	0	0	0
10	10,718,973	12,578,076	12,578,076	0	0	0
11	9,837,449	11,543,661	11,543,661	0	0	0
12	9,017,934	10,582,009	10,582,009	0	0	0
13	8,261,409	9,694,272	9,694,272	0	0	0
14	7,557,029	8,867,724	8,867,724	0	0	0
15	6,907,773	8,105,860	8,105,860	0	0	0
Total EMV	219,340,080	257,382,523	257,382,523	60,702,982	71,231,335	71,231,335

TABLE 4D: CONTINUED						
YEAR	MPCO+PGHSQ	MPCO+PGHDM	MPCO+PGHSO	SPCP+PGHSQ	SPCP+PGHDM	SPCP+PGHSO
0	22,099,449	25,932,387	25,932,387	22,099,449	25,932,387	25,932,387
1	15,670,278	18,388,138	18,388,138	15,670,278	18,388,138	18,388,138
2	18,264,090	21,431,821	21,431,821	18,264,090	21,431,821	21,431,821
3	4,669,166	5,478,988	5,478,988	4,669,166	5,478,988	5,478,988
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	0	0	0	0	0	0
Total EMV	60,702,982	71,231,335	71,231,335	60,702,982	71,231,335	71,231,335

TABLE 4D: CONTINUED			
YEAR	SPCO+PGHSQ	SPCO+PGHDM	SPCO+PGHSO
0	22,099,449	25,932,387	25,932,387
1	15,670,278	18,388,138	18,388,138
2	18,264,090	21,431,821	21,431,821
3	4,669,166	5,478,988	5,478,988
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
Total EMV (KSH)	60,702,982	71,231,335	71,231,335

Appendix 4A Present Cost of Mild Schistosomiasis State (S) Policy Combinations

Table 4a: Present cost for the mild schistosomiasis (S) intervention combinations						
YEARS	SQ+SQD	SQD+PCD	SQD+OCD	HPWS+SQD	HPWS+PCD	HPWS+OCD
0	1,767,945	3,650,811	3,870,606	5,069,255	6,909,721	7,129,807
1	1,572,442	3,275,932	3,470,581	2,693,536	4,546,830	4,762,960
2	1,328,408	2,684,426	2,837,080	2,503,223	4,259,552	4,460,692
3	1,114,249	2,159,232	2,275,069	2,409,411	4,200,555	4,402,939
4	959,666	1,808,957	1,900,852	2,267,695	3,981,510	4,171,955
5	817,576	1,473,278	1,534,591	2,137,103	3,775,340	3,954,543
6	715,163	1,158,836	1,205,846	2,028,711	3,636,803	3,810,902
7	621,389	941,190	973,624	1,943,198	3,664,452	3,847,400
8	558,916	742,536	761,303	2,145,952	3,781,870	3,959,760
9	504,401	633,799	645,748	1,655,545	3,240,772	3,405,403
10	475,065	539,781	545,654	1,540,864	3,066,771	3,222,958
11	467,598	529,297	534,724	1,464,489	2,908,055	3,054,210
12	492,206	546,210	551,102	1,379,695	2,667,051	2,795,528
13	484,426	535,919	540,441	1,381,785	2,515,234	2,627,113
14	510,170	555,245	559,320	1,321,065	2,035,949	2,106,059
15	502,020	545,001	548,767	1,166,610	1,253,273	1,261,035
Total cost	12,891,639	21,780,448	22,755,308	33,108,138	56,443,738	58,973,265

Table 4a: Continued						
YEARS	HHED+SQD	HHED+PCD	HHED+OCD	VIPL+SQD	VIPL+PCD	VIPL+OCD
0	2,074,980	3,915,445	4,135,530	16,963,614	18,846,644	19,066,729
1	1,917,740	3,779,366	3,996,461	11,504,535	13,419,731	13,640,184
2	1,830,450	3,718,259	3,935,255	9,844,017	11,841,222	12,066,556
3	1,738,733	3,636,682	3,851,829	8,619,178	10,593,108	10,808,457
4	1,570,041	3,351,403	3,549,924	7,560,646	9,482,482	9,692,247
5	1,516,671	3,395,301	3,577,200	6,493,068	8,382,702	10,471,205
6	1,416,610	3,208,949	3,402,462	5,718,146	7,554,984	7,749,379
7	1,315,971	3,055,062	3,239,906	5,060,299	6,826,544	7,010,573
8	1,247,220	3,001,185	3,185,536	4,624,529	6,671,837	6,882,567
9	1,184,681	2,868,151	3,044,895	4,098,830	6,051,842	6,251,060
10	1,074,851	2,717,393	2,885,597	3,406,987	4,970,439	5,109,763
11	999,087	2,574,076	2,733,482	3,043,265	4,529,597	4,660,593
12	938,306	2,428,638	2,578,016	2,779,900	4,178,443	4,315,764
13	874,304	2,271,842	2,410,319	2,624,897	3,907,472	4,031,731
14	779,840	1,964,415	2,080,455	2,615,398	3,618,851	3,715,166
15	578,793	1,276,794	1,344,166	2,568,358	2,955,319	2,991,729
Total cost	21,058,278	47,162,960	49,951,035	97,525,666	123,831,218	128,463,704

Table 4a: Continued						
YEARS	FM+SQD	FM+PCD	FM+OCD	DM+SQD	DM+PCD	DM+OCD
0	1,811,824	3,695,916	3,916,002	1,653,139	3,537,231	3,757,316
1	1,645,348	3,485,053	3,695,429	1,508,809	3,348,514	3,558,890
2	1,494,434	3,285,560	3,486,244	1,377,148	3,168,274	3,368,958
3	1,380,169	3,137,714	3,328,964	1,279,594	3,037,138	3,228,389
4	1,253,985	2,923,272	3,105,268	1,167,916	2,837,203	3,019,199
5	1,147,530	2,790,277	2,965,957	1,074,940	2,717,687	2,893,366
6	1,058,735	2,629,057	2,795,568	996,932	2,567,254	2,733,764
7	992,961	2,573,925	2,739,013	943,226	2,524,191	2,689,279
8	917,741	2,462,543	2,621,796	877,514	2,422,316	2,581,569
9	830,827	2,310,027	2,460,707	797,548	2,276,748	2,427,428
10	663,229	2,053,079	2,192,852	634,992	2,024,842	2,164,615
11	593,844	1,884,955	2,013,590	569,251	1,860,362	1,988,997
12	588,787	1,737,370	1,850,008	565,901	1,714,484	1,827,122
13	473,994	1,392,431	1,481,692	452,195	1,370,632	1,459,893
14	306,016	863,593	917,094	285,049	842,626	896,127
15	73,958	116,123	119,750	54,022	96,187	99,814
Total Cost	15,233,381	37,340,893	39,689,932	14,238,176	36,345,688	38,694,726

Table 4a: Continued						
YEARS	MPCP+SQD	MPCP+PCD	MPCP+OCD	MPCO+SQD	MPCO+PCD	MPCO+OCD
0	3,073,810	4,956,839	5,152,489	3,181,465	5,064,492	5,260,142
1	879,421	1,613,539	1,697,690	879,569	1,616,862	1,701,012
2	743,092	1,362,434	1,430,169	807,222	1,457,368	1,531,116
3	649,459	1,124,483	1,176,774	713,266	1,302,620	1,366,619
4	541,507	901,884	939,735	630,743	1,087,336	1,136,759
5	488,783	777,742	807,513	597,141	1,035,233	1,081,980
6	420,214	585,532	602,912	590,314	958,742	997,784
7	355,830	473,602	484,716	435,687	645,397	667,200
8	371,565	523,442	537,292	409,696	610,527	631,068
9	350,514	495,840	510,613	386,297	578,584	598,026
10	329,256	468,410	482,352	362,680	546,619	564,966
11	310,189	443,220	456,374	341,469	517,371	534,782
12	292,219	419,445	431,892	321,555	489,706	506,127
13	275,533	397,131	408,923	303,042	463,733	479,279
14	259,738	375,827	386,953	285,519	438,971	453,661
15	245,014	355,840	366,353	269,258	415,751	429,660
Total Cost	9,586,145	15,275,210	15,872,751	10,514,924	17,229,313	17,940,182

Table 4a: Continued						
YEARS	SPCP+SQD	SPCP+PCD	SPCP+OCD	SPCO+SQD	SPCO+PCD	SPCO+OCD
0	2,588,186	4,471,214	4,666,865	2,633,023	4,516,050	4,711,700
1	937,268	1,718,748	1,808,328	989,492	1,774,353	1,863,931
2	762,966	1,421,425	1,493,438	864,508	1,556,152	1,634,608
3	633,480	1,137,886	1,193,411	730,702	1,357,278	1,425,319
4	499,508	881,726	921,871	628,803	1,113,639	1,166,119
5	412,934	717,786	749,194	533,993	996,926	1,046,324
6	313,060	486,481	504,713	509,688	896,913	937,947
7	230,401	353,317	364,918	308,083	527,136	549,911
8	246,543	404,377	418,770	278,817	487,602	508,957
9	213,610	363,210	378,417	234,559	432,557	452,577
10	191,868	334,433	348,717	211,302	399,794	418,595
11	180,826	317,118	330,594	198,862	379,118	396,959
12	170,480	300,823	313,576	187,284	359,598	376,425
13	160,969	285,547	297,628	176,616	341,285	357,215
14	152,020	270,955	282,353	166,578	323,829	338,883
15	143,728	257,271	268,042	157,351	307,471	321,723
Total Cost	7,837,846	13,722,318	14,340,835	8,809,662	15,769,699	16,507,194

Appendix 4B Present Cost of Moderate Schistosomiasis Policy Combinations

Table 4b: Present cost of moderate schistosomiasis intervention combinations

YEARS	SQ+SQHC	SQ+PCHC	SQ+OCHC	HPWS+SQHC	HPWS+PCHC	HPWS+OCHC
0	1,610,586	5,911,962	6,110,409	5,010,951	9,312,327	9,510,774
1	1,607,479	5,725,271	5,924,076	2,582,534	6,589,571	6,776,340
2	1,580,469	5,505,202	5,703,319	2,454,627	6,171,010	6,347,999
3	1,518,974	5,268,981	5,465,601	2,334,857	5,784,428	5,949,963
4	1,489,259	5,063,360	5,257,660	2,224,302	5,404,273	5,558,565
5	1,458,008	4,864,343	5,055,650	2,121,553	5,095,117	5,241,828
6	1,395,724	4,601,881	4,783,727	2,064,069	4,781,060	4,930,291
7	1,025,417	4,240,811	4,404,621	1,870,842	4,210,230	4,315,613
8	1,233,616	4,889,648	5,036,790	1,768,916	3,782,621	3,865,273
9	966,863	3,087,224	3,187,959	1,691,007	3,449,708	3,515,412
10	853,632	2,618,442	2,685,642	1,560,301	3,019,557	3,064,013
11	647,400	1,915,491	1,941,799	1,463,184	2,628,658	2,652,814
12	597,536	1,623,341	1,633,634	1,388,739	2,369,003	2,383,012
13	592,548	1,543,766	1,553,310	1,360,694	2,264,511	2,277,425
14	578,371	1,426,316	1,434,823	1,302,951	2,107,615	2,119,112
15	574,773	1,361,027	1,368,914	1,276,208	2,018,156	2,028,755
Total cost	17,730,658	59,647,067	61,547,933	32,475,735	68,987,848	70,537,190

Table 4b: Continued						
YEARS	HHED+SQHC	HHED+PCHC	HHED+OCHC	VIP+SQHC	VIP+PCHC	VIP+OCHC
0	1,886,146	6,187,860	6,386,308	17,466,864	21,768,240	21,966,687
1	1,780,097	5,840,893	6,033,683	12,273,264	16,334,129	16,526,919
2	1,614,969	5,239,455	5,408,169	11,740,324	15,644,683	15,829,406
3	1,559,763	5,087,727	5,259,926	10,712,203	14,350,992	14,525,604
4	1,462,987	4,753,105	4,916,023	9,473,257	12,682,810	12,836,786
5	1,352,531	4,389,386	4,539,170	8,704,101	11,663,897	14,064,158
6	1,272,057	4,105,432	4,247,066	7,994,639	10,718,336	10,847,550
7	1,204,747	3,811,170	3,941,274	7,342,018	9,845,457	9,963,525
8	1,033,723	3,201,661	3,305,152	6,832,431	9,611,479	9,741,621
9	941,059	2,930,301	3,015,932	6,345,987	8,804,206	8,900,695
10	818,000	2,505,406	2,569,659	5,805,105	7,578,703	7,651,550
11	720,910	2,161,252	2,209,268	5,423,237	6,865,933	6,913,950
12	641,454	1,889,523	1,934,110	5,030,261	6,190,985	6,219,178
13	510,728	1,494,151	1,512,249	4,618,826	5,558,022	5,570,188
14	457,241	1,271,383	1,280,091	4,247,184	5,016,658	5,021,054
15	407,956	1,111,932	1,168,204	3,908,146	4,683,980	4,688,412
Total cost	17,664,367	55,980,635	57,726,284	127,917,847	167,318,509	171,267,282

Table 4b: Continued						
YEARS	FM+SQHC	FM+PCHC	FM+OCHC	DMSC+SQHC	DMSC+PCHC	DMSC+OCHC
0	1,656,301	5,957,677	6,156,124	1,490,716	5,792,092	5,990,539
1	1,526,928	5,508,816	5,694,413	1,382,803	5,364,691	5,550,289
2	1,393,086	5,063,183	5,236,822	1,267,803	4,937,900	5,111,540
3	1,283,339	4,627,869	4,785,729	1,173,408	4,517,938	4,675,798
4	1,146,313	4,195,765	4,336,160	1,049,998	4,099,450	4,239,845
5	1,001,982	3,744,119	3,869,528	916,845	3,658,982	3,784,391
6	870,477	3,326,195	3,435,133	557,299	2,420,701	2,491,748
7	752,325	2,899,680	3,001,173	436,284	1,984,243	2,036,789
8	616,456	2,479,858	2,550,906	557,299	2,420,701	2,491,748
9	489,017	2,036,976	2,089,522	436,284	1,984,243	2,036,789
10	365,953	1,614,799	1,640,405	319,186	1,568,032	1,593,637
11	251,665	1,212,652	1,221,999	210,424	1,171,412	1,180,758
12	182,181	942,439	946,530	163,442	992,123	996,583
13	175,012	928,554	932,609	152,515	981,197	985,656
14	169,534	797,885	801,266	132,977	805,312	808,930
15	162,474	785,236	788,587	123,086	795,422	799,039
Total cost	12,043,045	46,121,705	47,486,906	10,370,372	43,494,440	44,774,079

Table 4b: Continued						
YEARS	MPCP+SQHC	MPCP+PCHC	MPCP+OCHC	MPCO+SQHC	MPCO+PCHC	MPCO+OCHC
0	2,973,156	7,227,384	7,425,832	6,428,106	15,291,082	15,704,513
1	866,589	3,574,901	3,646,236	1,824,716	7,526,425	7,676,604
2	781,685	3,152,324	3,207,458	795,155	3,165,794	3,220,928
3	2,179,013	2,667,055	2,700,678	724,209	2,857,996	2,904,065
4	571,092	2,379,137	2,404,817	658,923	2,573,107	2,610,823
5	512,197	2,115,242	2,133,621	566,979	2,225,063	2,249,299
6	483,774	1,895,554	1,907,234	507,033	1,919,743	1,931,423
7	426,563	1,667,834	1,672,758	478,953	1,770,050	1,781,125
8	469,692	1,659,192	1,669,032	452,994	1,636,195	1,646,681
9	412,642	1,448,350	1,452,458	429,545	1,630,425	1,641,260
10	450,289	1,433,410	1,441,542	403,097	1,392,418	1,401,756
11	397,754	1,253,800	1,257,195	384,157	1,291,354	1,300,186
12	434,264	1,246,931	1,253,651	403,097	1,392,418	1,401,756
13	385,456	1,093,085	1,095,892	384,157	1,291,354	1,300,186
14	421,017	1,092,786	1,098,340	326,619	1,018,735	1,025,721
15	375,282	960,126	962,445	309,269	942,826	948,602
Total cost	12,140,465	34,867,112	35,329,189	15,077,007	47,924,986	48,744,927

Table 4b: Continued						
YEARS	SPCP+SQHC	SPCP+PCHC	SPCP+OCHC	SPCO+SQHC	SPCO+PCHC	SPCO+OCHC
0	2,466,417	6,720,646	6,919,093	2,513,203	6,767,432	6,965,879
1	922,453	3,801,816	3,877,656	1,439,657	4,319,020	4,394,860
2	802,442	3,319,719	3,378,263	850,274	3,367,551	3,426,095
3	2,251,966	2,769,291	2,804,931	740,116	3,004,543	3,053,432
4	528,775	2,444,229	2,471,435	657,107	2,687,302	2,727,304
5	435,136	2,124,620	2,143,990	497,062	2,245,438	2,270,993
6	378,311	1,858,624	1,870,871	415,526	1,896,814	1,909,061
7	302,733	1,597,713	1,602,850	350,075	1,697,580	1,709,138
8	293,861	1,489,026	1,498,912	320,681	1,549,831	1,560,724
9	241,166	1,291,669	1,295,836	275,705	1,389,056	1,399,193
10	274,366	1,262,168	1,270,339	249,426	1,262,760	1,272,325
11	226,065	1,094,340	1,097,784	239,502	1,168,718	1,177,765
12	258,264	1,074,801	1,081,554	227,684	1,080,367	1,088,917
13	213,591	931,330	934,176	216,568	996,686	1,004,748
14	244,954	919,922	925,502	206,104	915,019	922,174
15	203,272	796,470	798,823	195,913	844,848	850,763
Total cost	10,043,772	33,496,384	33,972,015	9,394,602	35,192,965	35,733,374

Appendix 4C Present Cost of Severe Schistosomiasis Policy Combinations

Table 4c: Present cost for the severe schistosomiasis state intervention combinations						
YEAR	SQ+SQDH	SQ+PCDH	SQ+OCDH	HPWS+SQDH	HPWS+PCDH	HPWS+OCDH
0	2,389,231	8,456,971	8,557,574	3,638,607	9,706,347	9,806,950
1	2,283,992	7,910,310	7,987,161	2,646,461	8,379,966	8,460,076
2	2,246,656	7,633,319	7,737,902	2,521,142	7,929,561	8,005,263
3	2,197,868	7,626,669	7,740,239	2,403,729	7,506,775	7,578,450
4	2,125,722	7,336,406	7,452,461	1,992,462	6,356,963	6,418,518
5	2,017,203	6,934,860	7,048,388	1,903,352	6,021,802	6,080,091
6	2,125,722	7,336,406	7,452,461	2,041,153	6,210,493	6,261,128
7	2,017,203	6,934,860	7,048,388	1,920,858	5,774,514	5,807,321
8	2,125,722	7,336,406	7,452,461	1,757,259	5,156,151	5,171,963
9	2,017,203	6,934,860	7,048,388	1,395,645	4,584,250	4,594,387
10	1,546,561	5,264,286	5,358,364	1,610,716	4,615,576	4,620,435
11	1,411,938	4,791,845	4,858,147	1,526,017	4,283,595	4,288,054
12	1,177,170	4,134,156	4,170,292	1,429,934	3,913,358	3,917,343
13	1,023,999	3,651,538	3,663,343	1,360,183	3,639,414	3,643,099
14	1,086,290	3,752,185	3,784,764	1,280,498	3,332,844	3,336,163
15	891,616	3,124,979	3,135,013	1,222,988	3,106,481	3,109,526
Total cost	28,684,098	99,160,054	100,495,344	30,651,006	90,518,090	91,098,767

Table 4c: Continued

YEAR	HHED+SQDH	HHED+PCDH	HHED+OCDH	VIPL+SQDH	VIPL+PCDH	VIPL+OCDH
0	2,490,602	8,558,343	8,658,946	8,215,211	14,282,952	14,383,555
1	2,303,592	7,977,988	8,057,272	6,240,545	11,920,370	11,993,958
2	2,220,968	7,686,760	7,768,562	5,746,030	11,110,786	11,186,890
3	2,094,841	7,251,116	7,328,409	5,294,845	10,351,178	10,416,962
4	3,904,164	8,312,308	8,385,403	4,880,796	9,651,956	9,714,154
5	1,842,658	6,386,079	6,450,185	4,191,725	8,718,699	12,339,081
6	1,683,980	5,945,104	6,005,454	4,155,775	8,310,771	8,356,170
7	1,624,024	5,635,171	5,687,772	3,832,987	7,719,604	7,757,552
8	1,496,572	5,200,595	5,240,606	3,802,746	8,184,473	8,222,050
9	1,369,791	4,789,500	4,818,883	3,552,982	7,632,775	7,662,682
10	1,253,227	4,400,276	4,419,101	3,002,836	6,149,886	6,168,710
11	1,138,964	4,039,499	4,048,951	2,765,611	5,699,113	5,712,606
12	1,062,418	3,735,826	3,740,325	2,539,689	5,236,172	5,240,523
13	1,065,058	3,763,687	3,768,229	2,333,363	4,808,165	4,812,158
14	903,694	3,113,074	3,116,792	2,379,635	4,608,085	4,611,680
15	835,591	2,863,374	2,866,787	2,186,420	4,231,528	4,234,827
Total cost	27,290,144	89,658,700	90,361,676	65,121,196	128,616,513	132,813,558

Table 4c: Continued

YEAR	FM+SQDH	FM+PCDH	FM+OCDH	DM+SQDH	DM+PCDH	DM+OCDH
0	2,416,396	8,489,598	8,574,371	2,355,556	8,428,758	8,513,531
1	2,301,625	7,963,108	8,050,205	2,248,587	7,910,070	7,997,167
2	2,095,883	7,459,565	7,534,770	2,049,726	7,413,408	7,488,613
3	1,939,091	6,933,510	6,998,489	1,898,576	6,892,995	6,957,973
4	1,789,681	6,430,088	5,909,471	1,754,197	6,394,604	6,450,190
5	1,653,414	5,966,546	6,013,607	1,622,417	5,935,549	5,982,609
6	1,521,580	5,529,041	5,568,182	1,494,582	5,502,043	5,541,184
7	1,077,276	4,835,994	4,862,868	1,053,611	4,812,329	4,839,203
8	1,242,981	4,613,692	4,629,169	1,222,334	4,593,045	4,608,522
9	1,142,657	4,275,182	4,284,975	1,124,913	4,257,438	4,267,231
10	1,055,087	3,960,183	3,964,861	1,039,939	3,945,035	3,949,713
11	963,098	3,619,823	3,624,101	950,269	3,606,995	3,611,272
12	866,439	3,248,734	3,252,569	854,414	3,236,710	3,240,545
13	790,450	2,969,366	2,972,874	780,550	2,959,466	2,962,974
14	710,100	2,663,484	2,666,629	784,304	2,845,568	2,848,886
15	647,220	2,433,804	2,436,680	708,726	2,582,887	2,585,904
Total cost	22,212,979	81,391,720	81,343,820	21,942,702	81,316,899	81,845,517

Table 4c: Continued						
YEAR	MPCP+SQDH	MPCP+PCDH	MPCP+OCDH	MPCO+SQDH	MPCO+PCDH	MPCO+OCDH
0	2,879,503	8,957,890	9,042,664	2,920,777	8,999,164	9,083,938
1	2,498,096	7,667,093	7,698,079	2,511,877	8,026,868	8,086,376
2	2,152,278	6,853,781	6,868,613	2,242,001	7,272,753	7,315,332
3	1,928,626	6,342,179	6,356,055	1,988,130	6,550,102	6,577,229
4	1,730,534	5,866,591	5,879,517	1,794,225	6,065,186	6,083,068
5	1,444,899	5,216,058	5,221,464	1,475,196	5,315,692	5,325,187
6	1,284,220	4,818,099	4,823,737	1,288,736	4,822,616	4,828,253
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	0	0	0	0	0	0
Total cost	13,918,155	45,721,691	45,890,129	14,220,942	47,052,382	47,299,383

Table 4c: Continued						
YEAR	SPCP+SQDH	SPCP+PCDH	SPCP+OCDH	SPCO+SQDH	SPCO+PCDH	SPCO+OCDH
0	2,693,315	8,771,702	8,856,476	2,710,505	8,788,892	8,873,666
1	2,179,919	7,348,915	7,379,902	2,239,070	7,754,061	7,813,568
2	1,877,065	6,578,567	6,593,400	1,986,039	7,016,790	7,059,370
3	1,698,520	6,112,074	6,125,950	1,765,103	6,327,076	6,354,202
4	1,549,335	5,685,392	5,698,319	1,601,136	5,829,811	5,847,515
5	1,392,129	5,200,627	5,206,086	1,407,490	5,247,986	5,257,480
6	1,272,944	4,842,162	4,847,857	1,279,905	4,849,123	4,854,817
7	1,250,918	4,820,136	4,825,830	1,252,294	4,821,513	4,827,207
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	0	0	0	0	0	0
Total cost	13,914,145	49,359,576	49,533,819	14,241,541	50,635,251	50,887,826

Appendix 4D Present Cost of Very Severe Schistosomiasis Policy Combinations

Table 4d: Present cost of intervention combinations into very severe schistosomiasis cases						
Years	SQ+PGHSQ	SQ+PGHDM	SQ+PGHSO	HPWS+PGHSQ	HPWS+PGHDM	HPWS+PGHSO
0	9,772,910	9,926,967	9,758,846	10,394,070	10,552,127	10,382,188
1	10,746,955	10,920,635	10,734,883	9,103,357	9,250,675	9,089,762
2	12,523,243	12,709,069	12,489,920	8,552,119	8,692,234	8,540,180
3	14,772,320	14,978,269	14,710,802	8,043,121	8,176,596	8,032,785
4	15,986,673	16,202,145	15,910,740	7,569,065	7,696,372	7,560,404
5	16,723,872	16,944,900	16,639,941	7,127,285	7,248,888	7,120,338
6	18,263,881	18,507,597	18,176,815	5,708,446	5,814,886	5,712,584
7	19,688,829	19,947,550	19,586,790	4,372,812	4,463,955	4,386,569
8	20,585,794	20,855,427	20,474,832	3,209,276	3,286,874	3,231,428
9	21,952,326	22,244,071	21,838,550	2,344,412	2,237,498	2,536,195
10	22,843,577	23,145,832	22,719,764	1,234,605	1,252,641	1,302,967
11	22,350,129	22,650,346	22,232,608	1,163,975	1,181,252	1,227,453
12	21,096,075	21,388,918	20,994,011	1,082,117	1,098,385	1,139,977
13	19,971,297	20,260,470	19,887,017	1,024,045	1,039,700	1,077,887
14	18,148,727	18,419,990	18,085,330	956,069	970,876	1,005,249
15	11,374,105	11,424,738	11,217,056	908,281	922,594	954,150
Total Cost	276,800,712	280,526,925	275,457,905	72,793,055	73,885,555	73,300,119

Table 4d: Continued						
Years	HHED+PGHSQ	HHED+PGHDM	HHED+PGHSO	VIPL+PGHSQ	VIPL+PGHDM	VIPL+PGHSO
0	9,815,769	9,973,226	9,804,589	12,707,581	12,865,039	12,696,402
1	9,204,915	9,340,146	9,208,821	11,173,011	11,308,242	11,176,916
2	8,621,171	8,763,833	8,613,178	9,089,619	9,223,398	9,096,499
3	8,104,844	8,227,341	8,111,277	8,475,897	8,603,275	8,483,302
4	7,598,045	7,728,076	7,593,329	7,907,104	8,028,550	7,915,161
5	7,138,801	7,263,178	7,135,825	6,264,501	6,368,863	6,282,193
6	6,711,471	6,830,651	6,710,227	5,845,245	5,944,903	5,862,994
7	6,314,476	6,428,818	6,314,958	5,458,923	5,554,208	5,476,755
8	5,020,752	5,122,498	5,031,864	4,726,699	4,819,311	4,751,269
9	3,841,179	3,928,897	3,859,033	3,357,241	3,436,043	3,393,280
10	2,765,237	2,838,913	2,789,339	2,780,102	2,844,460	2,811,094
11	1,810,434	1,872,533	1,840,981	1,760,007	1,802,617	1,786,469
12	922,218	964,354	961,726	2,541,846	2,599,105	2,570,989
13	857,712	897,174	894,761	1,720,581	1,756,142	1,742,666
14	958,502	1,002,546	999,910	2,299,843	2,350,190	2,326,954
15	884,739	925,719	923,322	1,603,573	1,632,959	1,621,823
Total cost	80,570,264	82,107,903	80,793,141	87,711,775	89,137,305	87,994,765

Table 4d: Continued						
Years	FM+PGHSQ	FM+PGHDM	FM+PGHSO	DM+PGHSQ	DM+PGHDM	DM+PGHSO
0	9,819,214	9,976,671	9,808,034	9,773,113	9,930,571	9,761,934
1	9,212,356	9,347,587	9,216,261	9,169,877	9,305,108	9,173,782
2	8,627,286	8,769,948	8,619,293	8,588,102	8,730,764	8,580,109
3	8,109,831	8,232,328	8,116,265	8,073,639	8,196,136	8,080,073
4	7,602,080	7,732,111	7,597,364	7,546,199	7,676,230	7,541,483
5	7,134,751	7,259,001	7,131,779	7,082,005	7,206,254	7,079,032
6	6,700,347	6,819,283	6,699,105	6,650,499	6,769,436	6,649,258
7	4,771,541	4,846,881	4,772,975	4,750,694	4,826,034	4,752,128
8	2,103,016	2,173,357	2,136,183	2,108,262	2,178,603	2,141,429
9	1,028,142	1,075,812	1,057,959	1,044,442	1,092,112	1,074,259
10	1,781,731	1,843,899	1,812,636	1,776,603	1,837,569	1,806,910
11	863,604	903,309	888,438	882,035	921,356	906,630
12	1,504,435	1,558,719	1,532,931	1,532,535	1,586,819	1,561,031
13	729,769	762,523	750,256	755,134	787,888	775,621
14	1,275,593	1,323,366	1,302,095	1,301,885	1,349,659	1,328,388
15	619,227	646,242	636,124	642,910	669,924	659,807
Total cost	71,882,921	73,271,037	72,077,698	71,677,933	73,064,463	71,871,872

Table 4d: Continued						
Years	MPCP+PGHSQ	MPCP+PGHDM	MPCP+PGHSO	MPCO+PGHSQ	MPCO+PGHDM	MPCO+PGHSO
0	10,017,461	10,174,919	10,006,282	10,038,311	10,195,769	10,027,132
1	3,323,031	3,421,481	3,367,219	9,228,060	9,361,911	9,231,925
2	3,118,739	3,212,112	3,160,809	5,839,971	5,958,301	5,857,796
3	2,815,940	2,903,727	2,855,714	5,507,950	5,648,146	5,576,925
4	1,412,619	1,475,203	1,452,305	2,660,856	2,744,253	2,698,860
5	1,331,142	1,388,024	1,370,368	1,333,844	1,392,798	1,371,119
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	0	0	0	0	0	0
Total cost	22,018,933	22,575,467	22,212,697	34,608,992	35,301,177	34,763,756

Table 4d: Continued						
Years	SPCP+PGHSQ	SPCP+PGHDM	SPCP+PGHSO	SPCO+PGHSQ	SPCO+PGHDM	SPCO+PGHSO
0	9,923,407	10,080,865	9,912,228	9,932,091	10,089,549	9,920,912
1	3,173,580	3,269,078	3,216,443	9,113,504	9,247,355	9,117,370
2	3,030,530	3,123,903	3,072,600	5,756,357	5,874,686	5,774,181
3	2,771,706	2,859,493	2,811,480	5,464,669	5,604,865	5,533,644
4	1,329,644	1,391,601	1,368,932	2,561,724	2,644,278	2,599,344
5	1,252,103	1,308,416	1,290,936	1,250,051	1,308,416	1,286,953
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	0	0	0	0	0	0
Total cost	21,480,970	22,033,356	21,672,620	34,078,396	34,769,150	34,232,404

Appendix 4F Cost-Effectiveness Analysis of Mild Schistosomiasis Policy Combinations

Table 4.1(F): Mild schistosomiasis (S) policy combinations unit cost per EQALY			
Policy Combination	Cost per QALY	Policy Combination	Cost per QALY
SQ+SQD	136	DMSC+SQD	296
SQ+PCD	187	DMSC+PCD	616
SQ+OCD	196	DMSC+OCD	655
HPWS+SQD	494	MPCP+SQD	375
HPWS+PCD	688	MPCP+PCD	488
HPWS+OCD	719	MPCP+OCD	507
HHED+SQD	265	MPCO+SQD	412
HHED+PCD	485	MPCO+PCD	551
HHED+OCD	513	MPCO+OCD	573
VIP+SQD	1458	SPCP+SQD	210
VIP+PCD	1510	SPCP+PCD	301
VIP+OCD	1567	SPCP+OCD	314
FM+SQD	316	SPCO+SQD	237
FM+PCD	632	SPCO+PCD	345
FM+OCD	672	SPCO+OCD	362

Table 4.2(F): Mild schistosomiasis policy combinations incremental cost per QALY			
Policy Combination	Incremental cost per QALY	Policy Combination	Incremental cost per QALY
SQ+SQD	-	DM+SQD	-
SQ+PCD	415	DM+PCD	2035
SQ+OCD	461	DM+OCD	2251
HPWS+SQD	-	MPCP+SQD	-
HPWS+PCD	1546	MPCP+PCD	988
HPWS+OCD	1713	MPCP+OCD	1092
HHED+SQD	-	MPCO+SQD	-
HHED+PCD	1458	MPCO+PCD	1166
HHED+OCD	1614	MPCO+OCD	1290
VIP+SQD	-	SPCP+SQD	-
VIP+PCD	1744	SPCP+PCD	701
VIP+OCD	2051	SPCP+OCD	774
FM+SQD	-	SPCO+SQD	-
FM+PCD	2035	SPCO+PCD	829
FM+OCD	2251	SPCO+OCD	917

Appendix 4G Cost-Effectiveness Analysis of Moderate Schistosomiasis Policy Combinations

Table 4.1(G): Moderate schistosomiasis policy combinations unit cost per EQALY			
Policy Combinations	AC per QALY	Policy Combinations	AC per QALY
SQ+SQHC	218	DMSC+SQHC	249
SQ+PCHC	553	DMSC+PCHC	795
SQ+OCHC	571	DMSC+OCHC	818
H2O+SQHC	563	MPCP+SQHC	551
H2O+PCHC	907	MPCP+PCHC	1202
H2O+OCHC	927	MPCP+OCHC	1218
HHED+SQHC	259	MPCO+SQHC	684
HHED+PCHC	621	MPCO+PCHC	1652
HHED+OCHC	640	MPCO+OCHC	1681
VIP+SQHC	1874	SPCP+SQHC	313
VIP+PCHC	1855	SPCP+PCHC	792
VIP+OCHC	1899	SPCP+OCHC	803
FM+SQHC	289	SPCO+SQHC	292
FM+PCHC	843	SPCO+PCHC	832
FM+OCHC	868	SPCO+OCHC	845

Table 4.2(G): Moderate schistosomiasis policy combinations incremental cost per QALY			
Policy Combination	Incremental cost per QALY	Policy Combination	Incremental cost per QALY
SQ+SQHC	-	DMSC+SQHC	-
SQ+PCHC	1591	DMSC+PCHC	2536
SQ+OCHC	1663	DMSC+OCHC	2634
H2O+SQHC	-	MPCP+SQHC	-
H2O+PCHC	1985	MPCP+PCHC	3260
H2O+OCHC	2069	MPCP+OCHC	3326
HHED+SQHC	-	MPCO+SQHC	-
HHED+PCHC	1747	MPCO+PCHC	4711
HHED+OCHC	1826	MPCO+OCHC	4829
VIP+SQHC	-	SPCP+SQHC	-
VIP+PCHC	1796	SPCP+PCHC	2304
VIP+OCHC	1976	SPCP+OCHC	2351
FM+SQHC	-	SPCO+SQHC	-
FM+PCHC	2610	SPCO+PCHC	2535
FM+OCHC	2714	SPCO+OCHC	2588

Appendix 4H Cost-Effectiveness Analysis of Severe Schistosomiasis Policy Combinations

Table 4.1(H): Severe schistosomiasis policy combinations unit cost per EQALY			
Policy Combinations	AC per QALY	Policy Combinations	AC per QALY
SQ+SQDH	1643	DMSC+SQDH	2026
SQ+PCDH	4818	DMSC+PCDH	6572
SQ+OCDH	4883	DMSC+OCDH	6658
HPWS+SQDH	1756	MPCP+SQDH	2738
HPWS+PCDH	4398	MPCP+PCDH	8047
HPWS+OCDH	4426	MPCP+OCDH	8077
HHED+SQDH	1563	MPCO+SQDH	2797
HHED+PCDH	4356	MPCO+PCDH	8281
HHED+OCDH	4391	MPCO+OCDH	8325
VIP+SQDH	3731	SPCP+SQDH	2559
VIP+PCDH	6249	SPCP+PCDH	8123
VIP+OCDH	6453	SPCP+OCDH	8152
FM+SQDH	2051	SPCO+SQDH	2619
FM+PCDH	6578	SPCO+PCDH	8333
FM+OCDH	6617	SPCO+OCDH	8375

Table 4.2(H): Severe schistosomiasis policy combinations incremental cost per QALY			
Policy Combination	Incremental cost per QALY	Policy Combination	Incremental cost per QALY
SQ+SQDH	-	DMSC+SQDH	-
SQ+PCDH	22550	DMSC+PCDH	38508
SQ+OCDH	22977	DMSC+OCDH	40998
H2O+SQDH	-	MPCP+SQDH	-
H2O+PCDH	19155	MPCP+PCDH	53197
H2O+OCDH	19341	MPCP+OCDH	53479
HHED+SQDH	-	MPCO+SQDH	-
HHED+PCDH	19956	MPCO+PCDH	54916
HHED+OCDH	20181	MPCO+OCDH	55330
VIP+SQDH	-	SPCP+SQDH	-
VIP+PCDH	20316	SPCP+PCDH	55437
VIP+OCDH	21659	SPCP+OCDH	55710
FM+SQDH	-	SPCO+SQDH	-
FM+PCDH	38381	SPCO+PCDH	56921
FM+OCDH	40470	SPCO+OCDH	57316

Appendix 4I Cost-Effectiveness Analysis of Very Severe Schistosomiasis Policy Combinations

Table 4.1(I): Very severe schistosomiasis policy combinations unit cost per EQALY			
Policy Combinations	AC per QALY	Policy Combinations	AC per QALY
SQ+PGHSQ	69519	DMSC+PGHSQ	19562
SQ+PGHPM	48672	DMSC+PGHPM	14053
SQ+PGHSO	47792	DMSC+PGHSO	13823
H2O+PGHSQ	18282	MPCP+PGHSQ	21659
H2O+PGHPM	12819	MPCP+PGHPM	16912
H2O+PGHSO	12718	MPCP+PGHSO	16640
HHED+PGHSQ	20235	MPCO+PGHSQ	34044
HHED+PGHPM	14246	MPCO+PGHPM	26445
HHED+PGHSO	14018	MPCO+PGHSO	26042
VIP+PGHSQ	22029	SPCP+PGHSQ	21130
VIP+PGHPM	15465	SPCP+PGHPM	16506
VIP+PGHSO	15267	SPCP+PGHSO	16235
FM+PGHSQ	19618	SPCO+PGHSQ	33522
FM+PGHPM	14092	SPCO+PGHPM	26046
FM+PGHSO	13863	SPCO+PGHSO	25644

Table 4.2(I): Very schistosomiasis policy combinations incremental cost per QALY			
Policy Combination	Incremental cost per QALY	Policy Combination	Incremental cost per QALY
SQ+PGHSQ	-	DMSC+PGHSQ	-
SQ+PGHDM	2091	DMSC+PGHDM	903
SQ+PGHSO	-754	DMSC+PGHSO	126
H2O+PGHSQ	-	MPCP+PGHSQ	-
H2O+PGHDM	613	MPCP+PGHDM	1748
H2O+PGHSO	285	MPCP+PGHSO	609
HHED+PGHSQ	-	MPCO+PGHSQ	-
HHED+PGHDM	863	MPCO+PGHDM	2175
HHED+PGHSO	125	MPCO+PGHSO	486
VIP+PGHSQ	-	SPCP+PGHSQ	-
VIP+PGHDM	800	SPCP+PGHDM	1735
VIP+PGHSO	159	SPCP+PGHSO	602
FM+PGHSQ	-	SPCO+PGHSQ	-
FM+PGHDM	904	SPCO+PGHDM	2170
FM+PGHSO	127	SPCO+PGHSO	484

Appendix 4J Cost-Effectiveness Analysis of Community Schistosomiasis Intervention Options

Table 4(J): Cost effectiveness analysis of community level schistosomiasis interventions					
Primary Option	Total Cost (Ksh)	Total EQALYs	AC per EQALY	Incremental cost (in Ksh.) per EQALY	Incremental cost (in US$) per EQALY
SQ	11,441,109	137,305	83	-	-
HPWS	72,271,530	193,525	373	1,082	27
HHED	18,155,072	173,872	104	184	4.6
VIPL	302,602,731	189,058	1,601	5,626	141.7
DM	11,122,422	271,439	41	-2	-0.05
MPCP	94,658,500	358,054	264	377	9.4
MPCO	104,655,610	358,054	292	422	10.6
SPCP	33,747,846	324,767	104	119	3
SPCO	38,323,714	324,767	118	143	3.6

Appendix 5 Mwea Irrigation Scheme Study

This is the questionnaire that were used to collect both health state willingness to pay and utility valuations.

INTRODUCTION: Hallo, I hope you are okey. My name is ________ from Mwea. I am helping a team from Kenyatta University, which is conducting an educational survey on impacts of bilharzia on welfare of Mwea Irrigation scheme farmers (and their household members). The results of this study will be shared with Ministry of Health and the Kenya National Irrigation Board Management. The only way of knowing or discovering impacts of Bilharzia disease on lives of people living in endemic areas is to ask them. Your answers to the questions we are going to ask you would enable us to make appropriate recommendations on how better the Bilharzia Control Programme can control the disease. Please feel free to ask me any questions during the interview.

1. TYPE OF QUESTIONNAIRE: Household Survey
2. DATE OF INTERVIEW:____________________
3. INTERVIEWERS NAME:____________________
4. NAME OF RESPONDENT:____________________
5. TIME INTERVIEW STARTED:__________A.M./P.M.
6. TIME INTERVIEW ENDED:____________A.M./P.M.
7. NAME OF LOCATION:____________________
8. NAME OF SUB-LOCATION:__________________
9. VILLAGE NAME:________________________
10. NAME OF VILLAGE HEAD:________________

SOCIO-DEMOGRAPHIC CHARACTERISTICS

9. List all the members of the household starting with the household head (enter the appropriate codes in the table below)

Household members names	Household members AGE	Household members SEX	Household members MARITAL STATUS	Highest education attained	Main occupation
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

CODES TO BE USED IN QUESTION 9 ABOVE			
SEX	MARITAL STATUS	HIGHEST EDUCATION	OCCUPATION
0=Female 1=Male	1=married 2=single 3=divorced 4=widowed 5=separated	1=university 2=college 3=high school 4=secondary 5=primary 6=adult literacy 7=none	1=farmer 2=housewife 3=trader 4=casual worker 5=civil servant 6=private sector employee 7=student 9=unemployed 10=other (specify) 00=missing

HOUSEHOLD HEALTH VARIABLES

10: Has anybody in your household fallen sick due to bilharzia infection during the last four months? 1 = YES 0 = NO (if YES please fill in the details for each concerned household member in the table below)

Persons Number	No. of bilharzia sickness spells last year 0=none -1=don't know	Where taken for treatment (use code A)	No. of persons accompany-ing the sick to the health facility	Travel time per visit (minutes)	Waiting time per visit (minutes)	No. of days kept in hospital	Transport cost per visit (KSH)	User fees per visit or per day if kept in hospital (Ksh)	Cost of drugs per visit (Ksh)	Costs of bilharzia tests per visit (Ksh)
1.	1st.									
	2nd.									
	3rd.									
	4th.									
2.	1st.									
	2nd.									
	3rd.									
	4rd.									
3.	1st.									
	2nd.									
	3rd.									
	4th.									

4.	1st.										
	2nd.										
	3rd.										
	4th.										
5.	1st.										
	2nd.										
	3rd.										
	4th.										
6.	1st.										
	2nd.										
	3rd.										
	4th.										
7.	1st.										
	2nd.										
	3rd.										
	4th.										

8.	1st.										
	2nd.										
	3rd.										
	4th.										
9.	1st.										
	2nd.										
	3rd.										
	4th.										
10.	1st.										
	2nd.										
	3rd.										
	4th.										
11.	1st.										
	2nd.										
	3rd.										
	4th.										

CODE A
00 = None 01 = Government hospital 02 = Government Health Centre 03 = Government Dispensary 04 = Private Hospital 05 = Private Dispensary or clinic 06 = Mission Hospital 07 = Mission Dispensary / clinic 08 = Chemist / Pharmacy 09 = Shop medicine 10 = Home remedies 11 = Traditional spiritual healer 12 = Religious spiritual healer 13 = Herbalist 14 = Other (specify)

MOCK RANKING EXERCISE

11. Now I would like us to do the following exercise before proceeding to the next question. I have with me five pictures of rice sack:

PICTURE A = Empty

PICTURE B = filled 1/4 with rice

PICTURE C = filled 1/2 with rice

PICTURE D = filled 3/4 with rice

PICTURE E = filled completely with rice

11(a) Please arrange the rice sack pictures in increasing order of preferred quantities of rice (the interviewer should record rankings).

PICTURE RANKINGS AND VALUATIONS		
PICTURE LABELS	PICTURE RANK	PICTURE VALUE
A		
B		
C		
D		
E		

11(b) This is a picture of a rice-scale numbered from **0** (representing least preferred rice sack) to **100** (representing the most preferred rice sack). Please indicate on that line where you would wish to place the most preferred and least preferred rice sacks.

11(c) Locate the remaining sacks on the same rice-sack scale relative to each other.

Our next exercise is quite similar to what we have already done but instead of 'rice' we shall have health state descriptions.

12. Here, I have with me five cards of different colours, each with a bilharzia health state description. I will read each health state description at a time before giving you the card.

STATE Y:

Your normal state of health.

STATE S:

You have bilharzia germs, but your mobility, livelihood activities, self-care, social participation are normal, except for occasional mild bladder and stomach pain

- You will proceed to the next more severe state, in 3 years, without intervention.

STATE K:

You have bilharzia germs, but your mobility, self-care, and social participation are normal, except for:

- frequent moderate bladder and stomach pains
- slight reduction in energy causing moderate reduction in capacity for livelihood activities, but no absence from livelihood activities - work, school
- you will proceed to the next more severe state in 3 years, without intervention.

STATE Z:

You have bilharzia germs, but you have no difficulty with self-care, except for:

- slightly impaired mobility, can only walk for more than 1 mile with difficulty
- persistent moderate bladder and stomach pains
- moderate reduction in energy causing frequent absence from livelihood activities - school, work, etc.
- frequent absence from social community activities, e.g., church, peer get-together meetings, public *baraza*, etc
- you will proceed to the next more severe state in 3 years, without intervention.

STATE A:

Due to bilharzia germs, you have:

- severely impaired mobility: bed-ridden most of the time
- moderate lack of control of urination and defecation
- severe reduction in energy causing total absence from livelihood activities - work, school, etc.
- total absence from social activities - church, public *baraza*, peer get-together meetings, beer drinking, etc.
- severe body pain
- you will proceed to the next more severe state in 3 years, without health intervention.

STATE R:

You are unconscious because of bilharzia germs

- you will proceed to the next more severe state in 3 years, without health intervention.

STATE Q: Death

EXERCISE:

12(a) Please rank the health states, from least severe to most severe (i.e. from best to worst).

12(b) Choose the best and the worst health states; and then map them on our rice-sack scale (Best = 100 and Worst = 0).

12(c) Please locate the remaining health states on the rice-scale relative to each other.

HEALTH STATES RANKINGS AND UTILITY VALUES		
HEALTH STATE LABEL	RANKINGS	UTILITY VALUES
Q		
R		
A		
Z		
K		
S		
Y		

(13) WILLINGNESS TO PAY FOR A RETURN TO NORMAL HEALTH

Let us refer again to the health states described on our cards (A, S, Q, K, R, Z, and Y): rank the cards again in order of preference, starting with most preferred to the least preferred. A person can only be one health state at time.

13(a) Suppose you are in health state described on card____, how much money (or rice) would you be willing to pay for treatment that would return you to your best health state?

Health state	Willingness to pay in Shillings	Willingness to pay in kilos of rice
S		
K		
Z		
A		
R		

13(b) Suppose you are not yet infected by bilharzia, how much money (or rice) would you be willing to pay per year to prevent infection? KSH. ―――――――― or ―――――――― KG. of rice

13(c) Suppose you knew for certain that a member of your household would die during the coming year from schistosomiasis infection; what is the maximum amount of money or rice would be willing and able to pay to prevent his / her death? KSH. ―――――――― or ―――――――― KG. of rice

13(d) Suppose you knew for certain that one unknown person in your neighbourhood would die during the coming year from schistosomiasis infection: What is the maximum amount of money or rice would you be willing and able to pay to save his or her life? SH. ―――――――― or ―――――――― KG. of rice

(14) Willingness to pay to avoid advancing to the next state

Suppose there was no intervention which would enable you to return to your normal health state (unless if you are already in normal health state Y). Assume that the available interventions can only prevent you from proceeding to the next more severe health state.

14(a) If you are currently experiencing health state described on card______, much money or rice would you be willing to pay to insure yourself from proceeding to the next more severe state_____?

Health state	Willingness to pay in Shillings	Willingness to pay in kilos of rice
Y		
S		
K		
Z		
A		
R		

14(b) Schistosomiasis interventions not only decrease risk (of infection, reinfection, and complicated disease), but could have some other benefits. When deciding on the amounts of money or rice you would be willing to pay did you take any of the following factors into consideration? (Yes/No)

Other effects	YES = 1	NO = 0
Medical expenses (user fees, drug costs, and transport costs)		
Loss of working/ leisure time		
Loss of earnings/ productivity		
Children's absenteeism from school		
Anxiety caused by health state to you and others in your household		

Risk posed by your state to other people		

(15) HOUSEHOLD ASSETS

Does your household own any of the following assets? Please give me the quantities of those assets. (DO NOT ASK THE RESPONDENTS FOR PRICES)

Name of asset	Quantity	Price per unit of asset (Ksh)
Land (in acres)		
Cattle		
Goats		
Sheep		
Donkeys		
Ox or donkey drawn ploughs		
Chicken		
Radio/record player		
Tractor		
Motor vehicle		
House 1=permanent, 2=semi-permanent, 3=temporary 4=none		

(16) HOUSEHOLD INCOME

How much income does your household earn from the following sources per month?

Source of income	Amount of income per month in Kenya Shillings
Business (shop, kiosk, matatu, ploughing oxen, tractor)	
Rice	
Coffee	
Tea	
Milk	
Household head salary	
Wife's salary	
Remittances from children / relatives	
Pension / Interest income	
Others (specify)	

17(a) How did you find the whole interview?

1 = I found it difficult

2 = I found it very easy

3 = I found it just easy

4 = I found it not very difficult

17(b) Would you be willing to take part in a similar exercise in future? 1 = YES; 0 = NO

Appendix 6 The Delphi Expert Panel Questionnaire

This is the instrument that was used to elicit schistosomiasis interventions effectiveness data from a Delphi panel of experts.

INTRODUCTION:

The results from this Delphi Panel exercise will be an invaluable input into my thesis work on "**ECONOMICS OF SCHISTOSOMIASIS INTERVENTIONS:** a case study of Mwea irrigation scheme in Kenya". Since quality epidemiological randomized controlled trial data on tropical diseases is often not readily available in Developing Countries (and when available, it's frequently not in the right form for incorporation in economic appraisals), I am exploring (besides other things) the feasibility of utilizing the wealth of epidemiological expertise currently available, to make evaluations (provide subjective judgement of facts) of expected effectiveness of disparate disease interventions in attenuating burden of illness, which can be used in economic appraisal studies to guide allocation of scarce resources. Delphi Technique is a method of structuring expert group communication process, and it involves: a sample of experts; anonymity of individual responses is considered paramount (even individual panellists are not supposed to know who other group members are); and there is more than one round of filling of mailed questionnaires, subsequent rounds are meant to provide individual panellists with an opportunity to revise their estimates in the light of a summary of group responses. Since the money allocated to the current research is very limited, I will not be able to compensate the panellists for their valuable time spent on the Delphi exercise. However, the least I can do is to acknowledge your help, and to give each participant a copy of the finished thesis.

Name of Respondent:________________________________

Address:________________________________

Telephone No:________________Facsimile:__________

(Q1) Please code the schistosomiasis intervention in which you have greatest expertise in.__________

(A) chemotherapy

(B) mollusciciding

(C) water supply

(D) health education

(E) sanitation

(Q2) How long have you been working on intervention coded in Q1?________years

Please read the seven health state descriptions (Y, S, K, Z, A, R and Q) given below before proceeding to Q3. Those health states with exception of normal health state Y represent a continuum of social dysfunctions at different severity stages of schistosomiasis disease.

STATE Y: Your normal state of health.

STATE S: You have bilharzia germs, but your mobility, livelihood activities, self-care, social participation are normal, except for occasional mild bladder and stomach pain - You will proceed to the next more severe state, in 3 years, without intervention.
STATE K: You have bilharzia germs, but your mobility, self-care, and social participation are normal, except for: - frequent moderate bladder and stomach pains - slight reduction in energy causing moderate reduction in capacity for livelihood activities, but no absence from livelihood activities - work, school - you will proceed to the next more severe state in 3 years, without intervention.

STATE Z:

You have bilharzia germs, but you have no difficulty with self-care, except for:

- slightly impaired mobility, can only walk for more than 1 mile with difficulty
- persistent moderate bladder and stomach pains
- moderate reduction in energy causing frequent absence from livelihood activities - school, work, etc.
- frequent absence from social community activities, e.g., church, peer get-together meetings, public *baraza*, etc
- you will proceed to the next more severe state in 3 years, without intervention.

STATE A:

Due to bilharzia germs, you have:

- severely impaired mobility: bed-ridden most of the time
- moderate lack of control of urination and defecation
- severe reduction in energy causing total absence from livelihood activities - work, school, etc.
- total absence from social activities - church, public *baraza*, peer get-together meetings, beer drinking, etc.
- severe body pain
- you will proceed to the next more severe state in 3 years, without health intervention.

STATE R:

You are unconscious because of bilharzia germs

- you will proceed to the next more severe state in 3 years, without health intervention.

STATE Q: Death

(Q3) Are you acquainted with decision-tree analysis ? YES=1, NO=2 If Yes, GO TO Q4. If NO, interviewer should explain with the aid of a simplified decision tree.

Answer questions 4 to 9 assuming: no schistosomiasis intervention is implemented, and the current (1992) overall schistosomiasis prevalence rate in Mwea irrigation scheme is about 75 percent. Please use the decision tree diagram provided.

(Q4) Suppose towards the end of 1992 a random sample of 100 persons is drawn from Mwea Scheme, what percentage would you expect to be in mild health state S.

(Q5) Suppose at the chance **node S** you are given 100 persons randomly drawn from Mwea Scheme, what percentage would you expect to:

(a) Have spontaneous recovery to Y;

(b) Remain in state S;

(c) Die in health state S; and

(d) Advance to moderate state K?

(Q6) Suppose at the chance node **K** you are given 100 persons randomly drawn from Mwea Scheme, what percentage would you expect to:

(a) Have spontaneous recovery to Y;

(b) Recede to the preceding state S;

(c) Remain in state K;

(d) Die in health state K; and

(e) Advance to severe state Z?

(Q7) Suppose at the chance node **Z** you are given 100 persons randomly drawn from Mwea Scheme, what percentage would you expect to:

(a) Have spontaneous recovery to Y;

(b) Recede to the preceding state K;

(c) Remain in state Z;

(d) Die in health state Z; and

(e) Advance to very severe state A?

(Q8) Suppose at the chance node **A** you are given 100 persons randomly drawn from Mwea Scheme, what percentage would you expect to:

(a) Have spontaneous recovery to Y;

(b) Recede to the preceding state Z;

(c) Remain in state A;

(d) Die in health state A; and

(e) Advance to unconscious state R?

(Q9) Suppose at the chance node **R** you are given 100 persons randomly drawn from Mwea Scheme, what percentage would you expect to:

(a) Have spontaneous recovery to Y;

(b) Recede to the preceding state A;

(c) Remain in state R; and

(d) Die in health state R (i.e. go into state Q)?

MILD HEALTH STATE S PREVALENCE

(Q10) Suppose all the current schistosomiasis intervention activities in Mwea irrigation scheme (where current schistosomiasis prevalence is about 75%) are discontinued for a period of 15 years. Draw on graph paper 1, a line graph showing the best trend of mild schistosomiasis health state (S) prevalence rate that can be expected.

(Q11) Suppose the current schistosomiasis intervention activities in Mwea irrigation scheme are continued over the next 15 years. Draw on graph paper 2, a line graph showing the best trend of mild schistosomiasis health state (S) prevalence that can be expected.

(Q12) Suppose focal molluscíciding option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 3, a line graph showing the best trend of mild schistosomiasis health state (S) prevalence that can be expected.

(Q13) Suppose drip molluscíciding option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 4, a line graph showing: the best trend of mild schistosomiasis health state (S) prevalence that can be expected.

(Q14) Suppose household piped water supply option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 5, a line graph showing the best trend of mild schistosomiasis health state (S) prevalence that can be expected.

(Q15) Suppose home health education visits option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 6, a line graph showing the best trend of mild schistosomiasis health state (S) prevalence that can be expected.

(Q16) Suppose the household vented improved pit latrine option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 7, a line graph showing the best trend of mild schistosomiasis health state (S) prevalence that can be expected.

(Q17) Suppose mass population praziquantel chemotherapy option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 8, a line graph showing the best trend of mild schistosomiasis health state (S) prevalence that can be expected.

(Q18) Suppose selective population praziquantel chemotherapy option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 9, a line graph showing the best trend of mild schistosomiasis health state (S) prevalence that can be expected.

(Q19) Suppose mass population oxamniquine chemotherapy option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 10, a line graph showing the best trend of mild schistosomiasis health state (S) prevalence that can be expected.

(Q20) Suppose selective population oxamniquine chemotherapy option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 11, three line graphs showing the best trend of mild schistosomiasis health state (S) prevalence that can be expected.

MODERATE HEALTH STATE K PREVALENCE RATES

(Q21) Suppose all the current schistosomiasis intervention activities in Mwea irrigation scheme (where current schistosomiasis prevalence is about 75%) are stopped for a period of 15 years. Draw on graph paper 12, a line graph showing the best trend of moderate schistosomiasis health state **(K)** prevalence rate that can be expected.

(Q22) Suppose the current schistosomiasis intervention activities in Mwea irrigation scheme are continued over the next 15 years. Draw on graph paper 13, a line graph showing the best trend of moderate schistosomiasis health state **(K)** prevalence that can be expected.

(Q23) Suppose focal molluscciciding option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 14, a line graph showing the best trend of moderate schistosomiasis health state **(K)** prevalence that can be expected.

(Q24) Suppose drip molluscciciding option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 14, a line graph showing the best trend of moderate schistosomiasis health state (**K**) prevalence that can be expected.

(Q25) Suppose household piped water supply option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 15, a line graph showing the best trend of moderate schistosomiasis health state (**K**) prevalence that can be expected.

(Q26) Suppose home health education visits option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 16, a line graph showing the best trend of moderate schistosomiasis health state (**K**) prevalence that can be expected.

(Q27) Suppose the household vented improved pit latrine option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 17, a line graph showing the best trend of moderate schistosomiasis health state (**K**) prevalence that can be expected.

(Q28) Suppose mass population praziquantel chemotherapy option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 18, a line graph showing the best trend of moderate schistosomiasis health state (K) prevalence that can be expected.

(Q29) Suppose selective population praziquantel chemotherapy option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 19, a line graph showing the best trend of moderate schistosomiasis health state (**K**) prevalence that can be expected.

(Q30) Suppose mass population oxamniquine chemotherapy option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 20, a line graph showing the best trend of moderate schistosomiasis health state (**K**) prevalence that can be expected.

(Q31) Suppose selective population oxamniquine chemotherapy option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 21, three line graphs showing the best trend of moderate schistosomiasis health state (**K**) prevalence that can be expected.

SEVERE HEALTH STATE Z PREVALENCE RATES

(Q32) Suppose all the current schistosomiasis intervention activities in Mwea irrigation scheme (where current schistosomiasis prevalence is about 75%) are stopped for a period of 15 years. Draw on graph paper 22, a line graph showing the best trend of severe schistosomiasis health state (**Z**) prevalence rate that can be expected.

(Q33) Suppose the current schistosomiasis intervention activities in Mwea irrigation scheme are continued over the next 15 years. Draw on graph paper 23, a line graph showing the best trend of severe schistosomiasis health state (**Z**) prevalence that can be expected.

(Q34) Suppose focal molluscicīding option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 24, a line graph showing the best trend of severe schistosomiasis health state (**Z**) prevalence that can be expected.

(Q35) Suppose drip molluscicīding option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 25, a line graph showing the best trend of severe schistosomiasis health state (**Z**) prevalence that can be expected.

(Q36) Suppose household piped water supply option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 26, a line graph showing the best trend of severe schistosomiasis health state (**Z**) prevalence that can be expected.

(Q37) Suppose home health education visits option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 27, a line graph showing the best trend of severe schistosomiasis health state (**Z**) prevalence that can be expected.

(Q38) Suppose the household vented improved pit latrine option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 28, a line graph showing the best trend of severe schistosomiasis health state (**Z**) prevalence that can be expected.

(Q39) Suppose mass population praziquantel chemotherapy option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 29, a line graph showing the best trend of severe schistosomiasis health state (**Z**) prevalence that can be expected.

(Q40) Suppose selective population praziquantel chemotherapy option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 30, a line graph showing the best trend of severe schistosomiasis health state (**Z**) prevalence that can be expected.

(Q41) Suppose mass population oxamniquine chemotherapy option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 31, a line graph showing the best trend of schistosomiasis health state (**Z**) prevalence that can be expected.

(Q42) Suppose selective population oxamniquine chemotherapy option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 32, a line graph showing the best trend of severe schistosomiasis health state (Z) prevalence that can be expected.

POLICY IMPACT ON VERY SEVERE HEALTH STATE (A) PREVALENCE

(Q43) Suppose all the current schistosomiasis intervention activities in Mwea irrigation scheme (where current schistosomiasis prevalence is about 75%) are stopped for a period of 15 years. Draw on graph paper 33, a line graph showing the best trend of very severe schistosomiasis health state (A) prevalence rate that can be expected.

(Q44) Suppose the current schistosomiasis intervention activities in Mwea irrigation scheme are continued over the next 15 years. Draw on graph paper 34, a line graph showing the best trend of very severe schistosomiasis health state (A) prevalence that can be expected.

(Q45) Suppose focal mollusciciding option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 35, a line graph showing the best trend of very severe schistosomiasis health state (A) prevalence that can be expected.

(Q46) Suppose drip mollusciciding option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 36, a line graph showing the best trend of very severe schistosomiasis health state (A) prevalence that can be expected.

(Q47) Suppose household piped water supply option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 37, a line graph showing the best trend of very severe schistosomiasis health state (A) prevalence that can be expected.

(Q48) Suppose home health education visits option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 38, a line graph showing the best trend of very severe schistosomiasis health state (A) prevalence that can be expected.

(Q49) Suppose the household vented improved pit latrine option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 39, a line graph showing the best trend of very severe schistosomiasis health state (A) prevalence that can be expected.

(Q50) Suppose mass population praziquantel chemotherapy option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 40, a line graph showing the best trend of very severe schistosomiasis health state (A) prevalence that can be expected.

(Q51) Suppose selective population praziquantel chemotherapy option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 41, a line graph showing the best trend of very severe schistosomiasis health state (A) prevalence that can be expected.

(Q52) Suppose mass population oxamniquine chemotherapy option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 42, a line graph showing the best trend of very severe schistosomiasis health state (A) prevalence that can be expected.

(Q53) Suppose selective population oxamniquine chemotherapy option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 43, a line graph showing the best trend of very severe schistosomiasis health state (A) prevalence that can be expected.

POLICY IMPACTS ON COMATOSE STATE (R) PREVALENCE RATE

(Q54) Suppose all the current schistosomiasis intervention activities in Mwea irrigation scheme (where current schistosomiasis prevalence is about 75%) are stopped for a period of 15 years. Draw on graph paper 44, a line graph showing the best trend of comatose schistosomiasis health state (**R**) prevalence rate that can be expected.

(Q55) Suppose the current schistosomiasis intervention activities in Mwea irrigation scheme are continued over the next 15 years. Draw on graph paper 45, a line graph showing the best trend of comatose schistosomiasis health state (**R**) prevalence that can be expected.

(Q56) Suppose focal molluscicidng option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 46, a line graph showing the best trend of comatose schistosomiasis health state (**R**) prevalence that can be expected.

(Q57) Suppose drip molluscicidng option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 47, a line graph showing the best trend of comatose schistosomiasis health state (**R**) prevalence that can be expected.

(Q58) Suppose household piped water supply option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 48, a line graph showing the best trend of comatose schistosomiasis health state (R) prevalence that can be expected.

(Q59) Suppose home health education visits option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 49, a line graph showing the best trend of comatose schistosomiasis health state (**R**) prevalence that can be expected.

(Q60) Suppose the household vented improved pit latrine option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 50, a line graph showing the best trend of comatose schistosomiasis health state (**R**) prevalence that can be expected.

(Q61) Suppose mass population praziquantel chemotherapy option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 51, a line graph showing the best trend of comatose schistosomiasis health state (**R**) prevalence that can be expected.

(Q62) Suppose selective population praziquantel chemotherapy option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 52, a line graph showing the best trend of comatose schistosomiasis health state (**R**) prevalence that can be expected.

(Q63) Suppose mass population oxamniquine chemotherapy option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 53, a line graph showing the best trend of comatose schistosomiasis health state (**R**) prevalence that can be expected.

(Q64) Suppose selective population oxamniquine chemotherapy option is implemented in Mwea irrigation scheme over the next 15 years. Draw on graph paper 54, a line graph showing the best trend of comatose schistosomiasis health state (**R**) prevalence that can be expected.

Appendix 7 Schistosomiasis Interventions Costing Instruments

* A prospective costing approach will be adopted in this study due to unavailability of quality retrospective economic cost data. The quantities of resource inputs that will be needed to implement disparate schistosomiasis control options under evaluation will be obtained through interactive interviews with MoH and KNIB personnel running schistosomiasis control activities. Those estimates will be verified by some researchers in Kenya Medical Research Institute.

7.1 Selective Population Chemotherapy Interventions

Personnel Needs

Screening Phase

(1) What is the current population of Mwea Irrigation Scheme?

(2) What is the annual population growth rate in Mwea?

(3) What percentage of the Mwea population would be willing to submit specimens for screening?

(4) What number of stool specimens should be screened per person?

(5) What is the current rate of schistosomiasis prevalence in Mwea Scheme?

(6) What is the expected Kato-test sensitivity rate?

(7) How many specimen receiving centres should be established (with a view to minimizing walking distances)?

(8) List all categories of personnel (technical and non-technical staff) who would be needed in collecting specimens.

(9) How many households can a person distributing specimen containers cover per day using a motor cycle?

(10) Estimate the number of man-days per category (cadre) of staff needed to collect specimens.

Specimen Screening Phase

(11) List all categories of personnel (technical and non-technical) who would be needed in specimen screening.

(12) How many specimens can one technical person prepare and screen per day?

(13) Estimate the number of man days needed per category of staff to screen all the specimens?

Therapy Phase

(14) What percentage of individuals who participate in the screening phase is likely to

test positive?

(15) What percentage of those who test positive is likely to be females?

(16) What percentage of females who test positive is likely to test pregnant?

(17) What percentage of females who test positive is likely to be lactating?

(18) What percentage of those who test positive is likely to be in very severe and coma schistosomiasis states?

(19) What percentage of those who test positive is likely to accept treatment?

(20) What percentage of those who test positive are likely to be on other schistosomiasis treatment?

(22) What percentage of those who test positive are likely to be away from Mwea during treatment?

(23) What percentage of Mwea population is aged 2 years and below?

(24) What percentage of Mwea population is likely to be 5 years old and below?

(25) What categories of personnel (technical and non-technical) would constitute the therapy administering team?

(26) How minutes is a clinician likely to spend treating a single patient?

(27) What is the best time interval for population chemotherapy campaigns?

(28) Extract gross or pre-tax salaries and fringe benefits for each cadre of staff from MoH records.

Personnel needed to implement either of the selective population chemotherapy options				
Cadre of personnel	Number of personnel	Time in months	Monthly pay (Ksh.)	Fringe benefits (Ksh.)
Epidemiologists				
Clinic officers				
Nurses				
Village health workers				
Laboratory technologists				
Laboratory technicians				
Laboratory attendants				
Secretaries				
Massagers				
Drivers				
Casual workers/ volunteers				
Others (specify)				

Travel

(29) Which would be the most appropriate place to perform the screening phase.

(a) in the field

(b) in the nearest health facility with a laboratory

(c) public health laboratories in Nairobi

(d) at KEMRI

(30) Where should the stool collection, specimen screening and treatment administering teams be constituted from?

(a) Kirinyaga District Hospital

(b) Kenya Medical Research Centre

(c) Kimbimbi Health Centre

(d) Nyeri Provincial General Hospital

(e) All the above

(31) How days would personnel from KEMRI spend in Mwea?

(31) What are the per diem rates for doctors and drivers?

PER DIEM OR DAILY ALLOWANCE FOR SPENDING NIGHTS OUTSIDE ONES WORKING STATION		
Personnel to travel	Number of days	Per Diem (Ksh.)
Consultants from KEMRI		
Supervisors from KNIB		
Driver(s)		

Transport

(32) Name the type, number and engine capacity of motor vehicles needed in:

(a) specimen collecting phase;

(b) screening phase; and

(c) treatment phase.

(33) Approximately how many trips is each of the three teams likely to make from its home institution to Mwea irrigation scheme during a single round of chemotherapy (specimen collection, specimen screening and treatment)?

(34) What would be the cost of fuel and oil per kilometre by a vehicle with an engine capacity of _____? (collect from KAA)

TRANSPORTATION RELATED TO SPECIMEN COLLECTION PHASE			
PURPOSE OF TRANSPORT	ITINERARY		NUMBER OF KILOMETRES
	FROM:	TO:	
Specimen collection			

TRANSPORTATION RELATED TO SPECIMEN SCREENING PHASE			
PURPOSE OF TRANSPORT	ITINERARY		NUMBER OF KILOMETRES
	FROM:	TO:	
Specimen Screening			

TRANSPORTATION RELATED TO TREATMENT PHASE			
PURPOSE OF TRANSPORT	ITINERARY		NUMBER OF KILOMETRES
	FROM:	TO:	
Treatment Phase			

Material and Supplies

(35) List all the types and quantities materials, drugs and utilities that would be used during the first round of specimen collection, screening and treatment.

Materials and supplies costs		
DESCRIPTION	Quantity	Price per unit (Ksh)
Specimen containers		
Container labels		
Microscope slides		
Cellophane rolls		
Plastic screen (m^2)		
Glycerine/malachite green		
Emulsifying glass rod		
Sedimentation glass		
Deposit transferring straws		
Sieves		
Syringes		
Injecting Needles		
Praziquantel		
Oxamniquine		
Chlorpheniramine		
Pregnancy test kits		
Staff uniforms		
Patient cards		
Ball-pens		
Reams of papers		
Hard cover books		
Pairs of hand gloves		
Towels		
Soap		
Water cans		
Disposable glasses		
Plastic washing basins		
Plastic pails		

(36) Estimate quantities of utilities likely to be consumed.

Quantities of utilities needed under SPC options		
Item Names	Quantity	Unit price
Electricity		
Water		
Postage		
Telephone		

(37) List all the types and quantities of equipment that would be needed in selective population chemotherapy options.

Equipment needed in selective population chemotherapy					
Type	Quantity	Useful life (years)	Annual maintenance Cost	Replacement value (Ksh)	SPC Share
Metal containers					
Plastic containers					
Coulter counter					
Electric microscopes					
Weighing scales					
Electric centrifuge					
White trays					
Examination couch					
Analytic balances					
Stethoscopes					
Blood pressure machines					
Refuse containers					
Desks					
Foldable chairs					

(38) List all types and numbers of vehicles likely to be needed to implement selective population chemotherapy option.

Vehicles needed under selective population chemotherapy					
Types	Quantities	Useful life	Replacement value (Ksh)	Annual maintenance cost (Ksh)	SPC share
Bicycles					
Motor Cycles					
Toyota Hilux 4WD/DC					
Toyota Coaster Mini-Buses					
Others (specify)					

(39) List all types and numbers of buildings likely to be needed to implement selective population chemotherapy option.

Buildings needed under SPC options						
Phase buildings Needed	Number of offices	Dimensions (sq. ft.)	Annual maintenance cost (Ksh)	Replacement value (Ksh)	Useful life (years)	SPC share
Specimen collecting						
Specimen screening						
Treatment						

Community resource inputs

Community resource input into selective population chemotherapy				
Items	No. of persons	Time in hours	Hourly pay/person	SPC share
Stool collection Information:				
Village heads				
Household heads				
Specimen Packaging:				
Adult patients				
Young patients				
Child company				
Specimen Delivery:				
Household head				
#Travel time				
#Waiting time				
#Instruction time				

Community resource input into selective population chemotherapy				
Therapy Phase: Information dispatch time	Number of persons	Time in hours per person	Pay per person per hour	SPC options share
Village heads				
Household heads				
Travel Time:				
Adult patients				
Children				
Child company				
Treatment Time:				
Adult patients				
Children				
Child company				
Externality monitoring Time:				
Adult patients				
Children				
Child company				

Community resource inputs into selective population chemotherapy options				
Items description	No. of persons	Hours per person	Hourly pay/person	SPC Share
Externality treatment Time:				
Adult patients				
Children				
Child company				
Waiting/Queuing time:				
Adult patients				
Children				
Child company				

7.2 Mass Population Chemotherapy Interventions

Personnel costs

(1) What is the current population of Mwea Irrigation Scheme?

(2) What is the annual population growth rate in Mwea?

(3) What percentage of eligible females is likely to test pregnant?

(4) What percentage of eligible females is likely to be lactating?

(5) What percentage of eligible Mwea residents is likely to be in very severe and coma schistosomiasis states?

(6) What percentage of eligible patients is likely to accept treatment?

(7) What percentage of eligible patients is likely to be on other schistosomiasis treatment?

(8) What percentage of eligible patients is likely to be away from Mwea during treatment?

(9) What percentage of Mwea population is aged 2 years and below?

(10) What percentage of Mwea population is likely to be 5 years old and below?

(11) What categories of personnel (technical and non-technical) would constitute the therapy administering team?

(12) How minutes is a clinician likely to spend treating a single patient?

(13) How long should a patient be detained to monitor negative effects of anti-schistosome drugs?

(14) What is the best time interval for population chemotherapy campaigns?

(15) Extract gross or pre-tax salaries and fringe benefits for each cadre of staff from MoH records.

Personnel needed to implement either of the selective population chemotherapy options				
Cadre of personnel	Number of personnel	Time in months	Monthly pay (Ksh.)	Fringe benefits (Ksh.)
Schistosomiasis epidemiologists				
Clinic officers				
Nurses				
Village health workers				
Secretaries				
Massagers				
Drivers				
Casual workers/ volunteers				
Others (specify)				

Travel

(16) Where should treatment administering teams be constituted from?

(a) Kirinyaga District Hospital

(b) Kenya Medical Research Centre

(c) Kimbimbi Health Centre

(d) Nyeri Provincial General Hospital

(e) All the above

(17) How days would personnel from KEMRI spend in Mwea?

(18) Where would the team be residing?

(19) What are the per diem rates for doctors and drivers?

PER DIEM OR DAILY ALLOWANCE FOR SPENDING NIGHTS OUTSIDE ONES WORKING STATION		
Personnel to travel	Number of days	Per Diem (Ksh.)
Consultants from KEMRI		
Supervisors from KNIB		
Driver(s)		

Transport

(20) Name the type, number and engine capacity of motor vehicles needed in:

(a) specimen collecting phase;

(b) screening phase; and

(c) treatment phase.

(21) Approximately how many trips is each of the three teams likely to make from its home institution to Mwea irrigation scheme during a single round of chemotherapy (specimen collection, specimen screening and treatment)?

(22) What would be the cost of fuel and oil per kilometre by a vehicle with an engine capacity of _____? (collect from KAA)

TRANSPORTATION RELATED TO TREATMENT PHASE			
PURPOSE OF TRANSPORT	ITINERARY		NUMBER OF KILOMETRES
	FROM:	TO:	
Treatment Phase			

MATERIAL AND SUPPLIES

(23) List all the types and quantities materials, drugs and utilities that would be used during the first round of treatment.

MATERIALS AND SUPPLIES COSTS		
DESCRIPTION	Quantity	Price per unit (Ksh)
Syringes		
Injecting Needles		
Praziquantel		
Oxamniquine		
Chlorpheniramine		
Pregnancy test kits		
Staff uniforms		
Patient cards		
Ball-pens		
Reams of papers		
Hard cover books		
Pairs of hand gloves		
Towels		
Soap		
Water cans		
Disposable glasses		
Plastic washing basins		
Plastic pails		

(24) Estimate quantities of utilities likely to be consumed.

Quantities of utilities needed under mass population chemotherapy options		
Item Names	Quantity	Unit price
Electricity		
Water		
Postage		
Telephone		

(25) List all the types and quantities of equipment that would be needed in mass population chemotherapy (MPC) options.

Equipment needed in mass population chemotherapy					
Type	Quantity	Useful life (years)	Annual maintenance Cost	Replacement value (Ksh)	MPC Share
Weighing scales					
Examination couch					
Analytic balances					
Stethoscopes					
Blood pressure machines					
Refuse containers					
Desks					
Foldable chairs					

(38) List all types and numbers of vehicles likely to be needed to implement mass population chemotherapy option.

Vehicles needed under mass population chemotherapy						
Types	Quantities	Useful life	Replacement value (Ksh)	Annual maintenance cost	Annual maintenance cost (Ksh)	MPC share
Bicycles						
Motor Cycles						
Toyota Hilux 4WD/DC						
Toyota Coaster Mini-Buses						
Others (specify)						

(39) List all types and numbers of buildings likely to be needed to implement selective population chemotherapy option.

Buildings needed under MPC options							
Phase buildings Needed	Number of offices	Dimensions (sq. ft.)	Annual maintenance cost (Ksh)	Replacement value (Ksh)	Annual maintenance cost	Useful life (years)	MPC share
Treatment							

Community resource inputs

Community resource input into mass population chemotherapy				
Therapy Phase: Information dispatch time	Number of persons	Time in hours per person	Pay per person per hour	SPC options share
Village heads				
Household heads				
Travel Time:				
Adult patients				
Children				
Child company				
Treatment Time:				
Adult patients				
Children				
Child company				
Externality monitoring Time:				
Adult patients				
Children				
Child company				

Community resource inputs into mass population chemotherapy options				
Items description	No. of persons	Hours per person	Hourly pay/person	SPC Share
Externality treatment Time:				
Adult patients				
Children				
Child company				
Waiting/Queuing time:				
Adult patients				
Children				
Child company				

7.3 Focal Mollusciciding Option

Personnel needs

(1) What would be the optimal number of snail treatment sites in Mwea irrigation scheme with geographical area of_______KM^2 and total length of canals and drains of _______KM?

(Q2) What would be the optimal (BEST) number of snail site treatment rounds per year?

(3) What would be the optimal (best) number of snail surveillance rounds in Mwea per year?

(4) Assuming that the mode of molluscicide delivery would be focal-hand-spraying:

(4a) List all the categories of personnel who would be needed to carry out all activities related to focal molluscicciding.

Personnel needs under focal molluscciding				
Cadre of personnel	No. of personnel	Time in Months	Monthly pay per person (Ksh.)	Mollusciciding policy share
Field officer/ senior supervisor				
Assistant field officer/ supervisors				
Driver				
Snail samplers				
Spray-men				
Laboratory technologists				
Laboratory technicians				
Laboratory assistants				
Massagers				
Secretaries				
Casuals				
Volunteers				
Other (specify)				

Travel

Expected travel under focal molluscíciding (FM)				
Cadre of personnel travelling	Number of days to be spent on FM	ITINERARY		Per Diem/ Daily allowance
		FROM:	TO:	

Expected transport needs under focal molluscicimding (FM)							
Purpose	Type and engine capacity of the mode	Number of vehicles	ITINERARY		Number of Kilometres to be covered per year	KAA rate per KM (insurance, oil, fuel)	FM policy share
			FROM:	TO:			

8. **MATERIALS AND SUPPLY COSTS**

Expected materials and supplies needs under focal mollusciciding			
Item Name	Quantities	Unit costs	FM policy share
Niclosamide (molluscicide)			
Labels			
Uniforms for sprayers			
Rubber boots			
Towels			
Gloves and masks			
Plastic pails			
Slides (SOPCs)			
Ruled paper reams			
Box files			
Rulers			
Plastic bags			
Stiring rods			
Graduated glass cylinders			
Graduated plastic cylinders			

Expected materials and supplies needs under focal molluscicidi ng			
Item name	Quantity	Unit cost	FM policy share
70% ethanol			
Specimen containers			
Test tubes			
Test tube cleaners			
Detergent (Kgs)			
Plastic basins			
Mops			
Floor drying rugs			
Brooms			

Capital Inputs

Equipment needed in focal molluscicidng option						
Name of capital items	Quantity	Replacement cost per unit (Ksh)	Annual maintenance cost	Life Expectancy (years)	Discount factor	FM share (proportion)
Long forceps						
Short forceps						
Conical flasks						
White trays						
Measuring tapes						
Thermometers						
Spatulas (scoops)						
Cages for snails						
Spring balance						
White traps						
Electric microscopes						
Magnifying lenses						
Eclipse sprayer(s)						

Equipment needed in focal molluscicidng option						
Name of items	Quantities	Replacement cost	Annual maintenance cost	Useful life (years)	Discount factor	FM share
Snail identification key						
Counters						
Scientific calculators						
Crocodile chips						
Electric centrifuge						
Mechanical centrifuge						
Desks						
Stools						
Chairs						

Expected vehicles needs under focal molluscicIding						
Name of Item	Quantity	Replacement value	Annual maintenance cost	Life expectancy	Discount factor	FM policy share
Motor vehicles:						
Motor cycles:						
Bicycles						

Building space needed under focal molluscicIding option						
Item	Quantity	Replacement cost	Annual maintenance cost	Useful life (years)	Discount factor	FM policy share
Stores						
Offices						
Laboratory						

Community resources used

Community resources consumption under mollusciciding			
Description	Number of units	Cost Per Unit	FM policy share
Volunteer labour			
Others (specify)			

7.4 Drip Mollusciciding Option

Personnel needs

(1) What would be the optimal number of drip-tanks in Mwea irrigation scheme with geographical area of_______KM^2 and total length of canals and drains of ________KM?

(2) What would be the optimal (best) number of snail surveillance rounds in Mwea per year?

(3) Assuming that the mode of molluscicide delivery would be drip-method, list all the categories of personnel who would be needed to carry out all activities related to drip mollusciciding.

Personnel needs under drip molluscicidng (DM)				
Cadre of personnel	No. of personnel	Time in Months	Monthly pay per person (Ksh.)	DM policy share
Field officer/ senior supervisor				
Assistant field officer/ supervisors				
Driver				
Snail samplers				
Laboratory technologists				
Laboratory technicians				
Laboratory assistants				
Massagers				
Secretaries				
Casuals				
Volunteers				
Other (specify)				

Travel

Expected travel under drip mollusciciding (DM)				
Cadre of personnel travelling	Number of days to be spent on FM	ITINERARY		Per Diem/ Daily allowance
		FROM:	TO:	

Expected transport needs under drip molluscicIding (DM)							
Purpose	Type and engine capacity of the mode	Number of vehicles	ITINERARY		Number of Kilometres to be covered per year	KAA rate per KM (insurance, oil, fuel)	DM policy share
			FROM:	TO:			

8. **MATERIALS AND SUPPLY COSTS**

Expected materials and supplies needs under drip mollusciciding			
Item Name	Quantities	Unit costs	FM policy share
Niclosamide (molluscicide)			
Labels			
Uniforms for sprayers			
Rubber boots			
Towels			
Gloves and masks			
Plastic pails			
Slides (SOPCs)			
Ruled paper reams			
Box files			
Rulers			
Plastic bags			
Stiring rods			
Graduated glass cylinders			
Graduated plastic cylinders			

Expected materials and supplies needs under drip molluscicidng			
Item name	Quantity	Unit cost	FM policy share
70% ethanol			
Specimen containers			
Test tubes			
Test tube cleaners			
Detergent (Kgs)			
Plastic basins			
Mops			
Floor drying rugs			
Brooms			

Capital Inputs

Equipment needed in drip molluscicidng option						
Name of capital items	Quantity	Replacement cost per unit (Ksh)	Annual maintenance cost	Life Expectancy (years)	Discount factor	DM share (proportion)
Long forceps						
Short forceps						
Conical flasks						
White trays						
Measuring tapes						
Thermometers						
Spatulas (scoops)						
Cages for snails						
Spring balance						
White traps						
Electric microscopes						
Magnifying lenses						
Drip tanks						

Equipment needed in drip mollusciciding option						
Name of items	Quantities	Replacement cost	Annual maintenance cost	Useful life (years)	Discount factor	FM share
Automatic dispensers						
Snail identification key						
Counters						
Scientific calculators						
Crocodile chips						
Electric centrifuge						
Artificial illumination lights						
Mechanical centrifuge						
Desks						
Stools						
Chairs						

Expected vehicles needs under drip molluscicidng						
Name of Item	Quantity	Replacement value	Annual maintenance cost	Life expectancy	Discount factor	FM policy share
Motor vehicles:						
Motor cycles:						
Bicycles						

Building space needed under drip molluscicidng option						
Item	Quantity	Replacement cost	Annual maintenance cost	Useful life (years)	Discount factor	DM policy share
Stores						
Offices						
Laboratory						

Community resources used

Community resources consumption under drip molluscicciding			
Description	Number of units	Cost Per Unit	DM policy share
Volunteer labour			
Others (specify)			

7.5 Household Piped Water Supply (HPWS)

Personnel needed to implement household piped water supply option						
Cadre of personnel	Number of personnel	Time in months	Monthly pay (Ksh)	Fringe benefits (ksh)	Discount factor	HPWS option share
Land Survey:						
Surveyors						
Assistant supervisors (PHTs)						
Supervisors						
Casual workers						
Excavation:						
Irrigation engineers						
Assistants (PHTs)						
Casual workers						
Valve chambers & anchor blocks construction:						
Irrigation engineers						
Assistant supervisors (PHTs)						
Masons						
Casual workers						

Personnel needed to implement household piped water supply option						
Cadre of personnel	Number of personnel	Time in months	Monthly pay (Ksh)	Fringe benefits (ksh)	Discount factor	HPWS option share
Laying Pipes & Connecting:						
Irrigation engineers						
Assistant supervisors (PHTs)						
Plumbers						
Casual workers						
Burring Pipes:						
Irrigation officers						
Assistants supervisors (PHTs)						
Casual workers						
Store Keeping:						
Store Keeper						
Casual workers						
Driving:						
Drivers						

Travel

Expected travel under household piped water supply (HPWS) option					
Cadre of personnel travelling	Number of days to be spent on HPWS	ITINERARY		Per Diem/ Daily allowance	HPWS option share
		FROM:	TO:		

Expected transport needs under household piped water supply (HPWS) option							
Purpose	Type and engine capacity of the mode	Number of vehicles	ITINERARY		Number of Kilometres to be covered per year	KAA rate per KM (insurance, oil, fuel)	HPWS policy share
			FROM:	TO:			

Materials Needs

Expected materials needs under household piped water supply option				
Inputs names	Quantities	Unit cost (Ksh)	Discount factor	HPWS Share
Construction:				
Cement				
Lorries of coarse aggregate				
Lorries of sand				
Lorries of bricks				
Wire-mesh				
Lintel iron-bars				
Timber				
Corrugated iron-sheets				
Pangas				
Water drums/tanks (200lt)				
Metal basins				
Spades/shovels				
20lt water pails				
Wheel burrows				

Expected materials needs under household piped water supply option				
Inputs names	Quantities	Unit cost (Ksh)	Discount factor	HPWS Share
Excavating materials:				
Pangas				
Fork Jembes				
Spades/shovels				
Trench Filling:				
Spades/shovels				
Surveying materials:				
Nylon string (metres)				
Pegs				

Pipes and fittings needed in household piped water supply option							
Name of items	Size (mm)	Quantities	Replacement cost	Annual maintenance cost	Useful life (years)	Discount factor	HPWS share
U.P.V.C. pipes - class B	250						
G.I. pipes	250						
U.P.V.C. pipes - class C	200						
G.I. pipes - class C	200						
U.P.V.C. pipe - class D	150						
G.I. pipe - class B	150						
U.P.V.C. pipes - class D	100						
G.I. pipes class B	100						
U.P.V.C. pipes - class D	75						
G.I. pipes - class B	75						
U.P.V.C. pipes - class E	50						
G.I. pipes - class B	50						
U.P.V.C. pipes class E	13						
G.I. pipes - class B	13						
Valve sockets	50						

Pipes and fittings needed in household piped water supply option							
Name of items	Size (mm)	Quantities	Replacement cost	Annual maintenance cost	Useful life (years)	Discount factor	HPWS share
Viking Johnson Coupling	250						
Viking Johnson Coupling	200						
Viking Johnson Coupling	150						
Viking Johnson Coupling	100						
End Caps (P.V.C.)	50						
Valve socket (1/2")	13						
Elbow (G.I.) (1/2")	13						
Gate Valves (1/2")	13						
Taps (BIP) (1/2")	13						
Litres of solvent cement							
Sluice valves	250						
Sluice valves	200						
Sluice valves	150						
Gate valves (4")	100						
Gate valves (3")	75						

Pipes needed in household piped water supply option							
Name of items	Size (mm)	Quantities	Replacement cost	Annual maintenance cost	Useful life (years)	Discount factor	HPWS share
TEE (EQUAL) G.I.	250						
TEE (EQUAL) G.I.	200						
TEE (EQUAL) G.I.	150						
TEE (EQUAL) G.I.	100						
TEE (EQUAL) G.I.	75						
TEE	250*150*150						
TEE	200*200*150						
TEE	150*150*100						
TEE	150*150*75						
TEE	100*100*75						
TEE	100*100*50						
TEE	50*50*13						

Pipes needed in household piped water supply option							
Name of items	Size (mm)	Quantities	Replacement cost	Annual maintenance cost	Useful life (years)	Discount factor	HPWS share
Sandle connector	250*100						
Sandle connector	200*100						
Sandle connector	150*100						
Adaptors	250*150						
Adaptors	200*150						
Adaptors	150*100						
Red Socket (P.V.C.)	100*75						
Air valve (double)	25						
Air valve (single)	25						
Bends (P.V.C.)	250						
Bends (P.V.C.)	200						
Bends (P.V.C.)	150						
Bends (P.V.C.)	100						
Bends (P.V.C.)	75						
Valve sockets	100						
Valve sockets	75						

Equipment needed in household piped water supply option						
Name of items	Quantities	Replacement cost	Annual maintenance cost	Useful life (years)	Discount factor	HPWS share
Surveyors tool set						
Masons tool set						
Plumbers tool set						

Expected vehicles needed in household piped water supply option						
Name of Item	Quantity	Replacement value	Annual maintenance cost	Life expectancy	Discount factor	HPWS policy share
Motor vehicles:						
Motor cycles:						
Bicycles						

Building space needed in household piped water supply option						
Item	Quantity	Replacement cost	Annual maintenance cost	Useful life (years)	Discount factor	HPWS policy share
Stores						
Offices						
Other (specify)						

COMMUNITY RESOURCES

Expected community inputs in the implementation and maintenance of HPWS option				
Resource type	Number of units used	Cost/value per unit	Discount factor	HPWS option share
Volunteer time				
Others (specify)				

7.6 Household Health Education Visits (HHED) Option
Personnel Needs

Personnel needed to implement household health education visits option						
Cadre of personnel	Number of personnel	Time in months	Monthly pay (Ksh)	Fringe benefits (ksh)	Discount factor	HHED option share
District Field Health Educator						
Public Health Officer						
Field Health Educators						
Public Health Technicians						
Village Health Workers						
Copy Typists						
Massager						
Drivers						
Cleaners						

Travel

Expected travel under household health education (HHED) visits option					
Cadre of personnel travelling	Number of days to be spent on HHED	ITINERARY		Per Diem/ Daily allowance	HHED option share
		FROM:	TO:		

Expected transport needs under household health education (HHED) option							
Purpose	Type and engine capacity of the mode	Number of vehicles	ITINERARY		Number of Kilometres to be covered per year	KAA rate per KM (insurance, oil, fuel)	HHED policy share
			FROM:	TO:			

Materials Needs

Expected materials needs under household health education option				
Inputs names	Quantities	Unit cost (Ksh)	Discount factor	HHED Share
Reams of ruled papers				
Packets of computer fan-fold papers				
Large cards (30*90cm) with schistosome life cycle				
Large cards (30*90cm) with health and economic implications				
Large cards (30*90cm) with preventive and curative measures				
Ink jet cartridges				
Floppy disks (3.5")				
Floppy disks (5.25")				
Ball pens				
Box files				
Spring files				
Pencils				
Rubbers				

Expected utilities needs under household health education option				
Inputs names	Quantities	Unit cost (Ksh)	Discount factor	HHED Share
Water (litres)				
Electricity (KWs)				
Telephone (minutes)				
Postage (weight)				

Equipment needed in household health education option						
Name of items	Quantities	Replacement cost	Annual maintenance	Useful life (years)	Discount factor	HHED share
Computer(s)						
Computer soft ware						
Printers						
Surge protectors						
PC parallel printer leads						
Disk storage boxes						
Personal computer table						
Swivel chair						
Office desks						
Office chairs						
Type writer(s)						

Expected vehicles needed in household health education option						
Name of Item	Quantity	Replacement value	Annual maintenance cost	Life expectancy	Discount factor	HHED policy share
Motor vehicles:						
Motor cycles:						
Bicycles						

Building space needed in household health education option							
Item	Dimensions	Quantity	Replacement cost	Annual maintenance cost	Useful life (years)	Discount factor	HPWS policy share
Supervisors offices							
F.H.E. & P.H.T.							
Others (specify)							

COMMUNITY RESOURCES

Expected community inputs in the implementation and maintenance of HPWS option				
Resource type	Number of units used	Cost/value per unit	Discount factor	HPWS option share
Volunteer time				
Others (specify)				

7.7 Vented improved pit latrines (VIPL) Option
Personnel Needs

Personnel needed to implement household VIPL option						
Cadre of personnel	Number of personnel	Time in months	Monthly pay (Ksh)	Fringe benefits (ksh)	Discount factor	VIPL option share
Senior supervisor (FMT)						
Supervisors (PHT)						
Pit Digging:						
Pit diggers						
Pit Lining:						
Mason/carpenters						
Casuals						
Slab Making:						
Masons						
Casual workers						
Building Superstructures:						
Mason/carpenters						
Casual workers						
Others: copy-typists						
Drivers						
Cleaners, messengers						

Travel

Expected travel under VIPL option					
Cadre of personnel travelling	Number of days to be spent on VIPL	ITINERARY		Per Diem/ Daily allowance	VIPL option share
		FROM:	TO:		

Transportation

Expected transport needs under VIPL option							
Purpose	Type and engine capacity of the mode	Number of vehicles	ITINERARY		Number of Kilometres to be covered per year	KAA rate per KM (insurance, oil, fuel)	VIPL policy share
			FROM:	TO:			

Materials Needs

Expected materials needs under VIPL option				
Inputs names	Quantities	Unit cost (Ksh)	Discount factor	VIPL Share
Pit Digging:				
Fork Jembe				
Mattock				
Spades				
Metal Buckets				
Rope (ft)				
Pit Lining:				
Lorries of bricks				
Bags of cement				
Lorries of sand				
Lorries of aggregate				
Metal basins				
Water pails				
Water drums				
Water (litres)				

Expected materials needs under VIPL option				
Inputs names	Quantities	Unit cost (Ksh)	Discount factor	VIPL Share
Slab/squatting plate:				
Bags of Cement				
Lorries of sand				
Lorries of aggregate				
Weld-Mesh				
Litres of water				
Pine timber				
Water drums/tanks				
water pails				
Metal basins				
Shovels/spades				
Superstructure/Hut:				
Bags of cement				
Lorries of sand				
Lorries of bricks				
Wheel burrows				
Water pails				
Water drums/tanks				

Expected materials needs under VIPL option				
Inputs names	Quantities	Unit cost (Ksh)	Discount factor	VIPL Share
Hut Roofing:				
G-32 iron sheets (2m)				
Timber frames (ft)				
Roofing nails (Kgs.)				
Wire nails (Kgs.)				
Doors:				
Timber				
Wire nails				
Internal lock				
Hinges (3 per door)				
Vent pipe with fry screen (4" wide*10ft)				
Hole Covers:				
Covers				
Cover handle (ft)				
Wire nails				
Disinfectants (litres)				

Utilities

Expected utilities needs under VIPL option				
Inputs names	Quantities	Unit cost (Ksh)	Discount factor	VIPL Share
Electricity (KWs)				
Telephone (minutes)				
Postage (weight)				

Equipment

Equipment needed in vented improved pit latrines option						
Name of items	Quantities	Replacement cost	Annual maintenance cost	Useful life (years)	Discount factor	VIPL share
Trowels						
Hummers						
Masons level devise						
Masons alignment devise						
Masons square						
Office desks						
Office chairs						
Type writer(s)						

Vehicles

Expected vehicles needed in VIPL option						
Name of Item	Quantity	Replacement value	Life expectancy	Annual Maintenance cost	Discount factor	VIPL policy share
Motor vehicles:						
Motor cycles:						
Bicycles						

Buildings

Building space needed in VIPL option							
Item	Dimensions	Quantity	Replacement cost	Cost of maintenance	Useful life (years)	Discount factor	VIPL policy share
Offices							
Stores							
Others (specify)							

Community resources

Expected community inputs in the implementation and maintenance of VIPL option				
Resource type	Number of units used	Cost/value per unit	Discount factor	VIPL option share
Community Labour:				
Households Labour				
Community Materials:				
Litre of water				
Brooms				
Drying rugs				
Pairs of hand gloves				
Water pails				
Latrine space (acres)				
Community Land:				
Latrine Space (acres)				
Transport Cost:				
Travel time (hours)				
Shopping time (hours)				
Bus (matatu) trips to shopping centre on VIPL related matters				
Others (specify)				

Appendix 8: Exhibits of Schistosomiasis Cost Data Forms

Table 8.1: Cost of household water supply (HPWS) plus various dispensary options.

COST CATEGORIES	YEAR:		
	HPWS + SQD	HPWS + PCD	HPWS + OCD
Personnel			
Inservice training			
Transport			
Materials			
Antischistosome			
Chlorpheniramine			
Utilities			
Maintenance:			
Vehicles			
Equipment			
Buildings			
Community resources:			
Travel time value			
Waiting time value			
Treatment time value			
Bus Fare			
Externality monitoring			
Externality treatment			
Subtotal (Ksh)			
CAPITAL COST			
Vehicles			
Equipment			
Buildings			

Table 8.2: Cost of household water supply (HPWS) to households and do something at health centre level for those suffering health state K.			
COST CATEGORIES	HPWS +SQHC	HPWS + PCHC	HPWS+ OCHC
Personnel			
Inservice training			
Transport			
Materials			
Antischistosome			
Chlorpheniramine			
Utilities			
Maintenance:			
Vehicles			
Equipment			
Buildings			
Community resources:			
Travel time			
Waiting time			
Treatment time			
Externality monitoring			
Externality treatment			
Bus Fare			
Registration Fees			
Laboratory fees			
Subtotal (Ksh)			
CAPITAL COST			
Vehicles			
Equipment			
Buildings			

Table 8.3: Cost of household water supply (HPWS) option plus do something at the District Hospital outpatient department for those suffering health state Z.

COST CATEGORIES	YEAR:______		
	HPWS+ SQDH	HPWS+ PCDH	HPWS+ OCDH
Personnel			
Inservice training			
Transport			
Materials			
Antischistosome			
Chlorpheniramine			
Utilities			
Maintenance:			
Vehicles			
Equipment			
Buildings			
COMMUNITY RESOURCES:			
Travel time value			
Waiting time value			
X-ray time value			
Treatment time value			
Externality monitoring			
Externality treatment			
Bus Fare			
Registration Fees			
X-ray fees			
Mortuary Fees			
Mortuary Bribes			
CAPITAL COST:			
Vehicles			
Equipment			
Buildings			

Table 8.4: Cost of household water supply (HPWS) plus do something at the Nyeri Provincial General Hospital Inpatient department for those suffering health state A.

COST CATEGORIES	YEAR:____		
	HPWS+ PGHSQ	HPWS+ PGHDM	HPWS+ PGHSO
Personnel			
Inservice training			
Transport			
Materials			
Drugs			
Administration			
Utilities			
Maintenance:			
Vehicles			
Equipment			
Buildings			
Community resources:			
TRAVEL TIME OF:			
Escorts Bus Return			
Escorts car hire return			
Visitors return			
Live discharges			
Body escorts			
WAITING TIME OF:			
Escort admissions			
Visitors with patients			
FARE OF:			
Home to hospital bus fare			
Home to hospital vehicle hire cost			
Visitors bus fare			
Live discharges bus fare home			
Bodies home transport cost			
Hospital Fees			
Endoscopy fees			

Mortuary official fees			
Mortuary Bribes			
CAPITAL COST			
Vehicles			
Equipment			
Buildings			

Table 8.5: Cost of household water supply (HPWS) plus do something at the Nyeri PGH intensive care unit for those in health state R		
COST CATEGORIES	YEAR:____	
	HPWS+ PGHSQR	HPWS+ PGHIUC
Personnel		
Inservice training		
Transport		
Materials		
Drugs		
Administration		
Utilities:		
Maintenance:		
Vehicles		
Equipment		
Buildings		
Community resources:		
TRAVEL TIME OF:		
Escorts Bus Return		
Escorts car hire return		
Visitors return		
Live discharges		
Body escorts		
WAITING TIME OF:		
Escort admissions		
Visitors with patients		
FARE OF:		
Home to PGH by bus		
Home/PGH car hire		
Visitors bus fare		
Live discharges home		
Bodies to home		
Hospital Fees		
Endoscopy fees		

Mortuary official fees		
Mortuary Bribes		
CAPITAL COST		
Vehicles		
Equipment		
Buildings		

Appendix 10(A): Optimal strategy choice sensitivity to changes in EQALYs holding opportunity cost, expected cost constant, and effectiveness of other strategies

Table 10(A): Optimal strategy choice sensitivity to changes in EQALYs holding opportunity cost, expected cost constant, and effectiveness of other strategies

Strategy Labels	1% decrease	5% decrease
SQS	7	7
HPWSS	8	8
HHEDS	6	6
VIPLS	9	9
DMS	5	5
MPCPS	4	4
MPCOS	3	3
SPCPS	1	1
SPCOS	2	2

Appendix 10(B): Optimal strategy choice sensitivity to changes in EQALYs holding opportunity cost, and expected cost constant

Table 10(B): Optimal strategy choice sensitivity to changes in EQALYs holding opportunity cost, and expected cost constant							
Strategy Labels	1% decrease	5% decrease	25% decrease	40% decrease	40.5% decrease	50% decrease	90% decrease
SQS	7	7	7	7	7	8	8
HPWSS	8	8	8	8	8	7	7
HHEDS	6	6	6	6	6	6	6
VIPLS	9	9	9	9	9	9	9
DMS	5	5	5	5	5	5	5
MPCPS	1	1	1	1	1	2	3
MPCOS	2	2	3	4	4	4	4
SPCPS	3	3	2	2	2	1	1
SPCOS	4	4	4	3	3	3	2

Appendix 10(C): Sensitivity analysis of strategy rankings to changes in the expected monetary values (using WTP for return to normal)

Table 10(C): Sensitivity analysis of strategy rankings to changes in the expected monetary values (using WTP for return to normal)

Strategy Labels	5% decrease	25% decrease	50% decrease	90% decrease	95% decrease
SQS	8	8	8	8	8
HPWSS	7	7	7	7	7
HHEDS	6	6	6	6	6
VIPLS	9	9	9	9	9
DMS	5	5	4	3	3
MPCPS	3	3	3	4	4
MPCOS	4	4	5	5	5
SPCPS	1	1	1	1	1
SPCOS	2	2	2	2	2

Appendix 10(D): Sensitivity analysis of strategy rankings to changes in the expected monetary values (using WTP to avoid advancing to the following states)

Table 10(D): Sensitivity analysis of strategy rankings to changes in the expected monetary values (using WTP to avoid advancing to the following states)

Strategy Labels	5% decrease	25% decrease	50% decrease	90% decrease	95% decrease
SQS	8	7	8	8	8
HPWSS	7	8	7	7	7
HHEDS	6	6	6	6	6
VIPLS	9	9	9	9	9
DMS	4	5	5	5	5
MPCPS	5	1	1	3	3
MPCOS	1	2	2	4	4
SPCPS	2	3	3	1	1
SPCOS	3	4	4	2	2

Appendix 10(E): Sensitivity analysis of changes in EMV of MPCPS holding other strategies constant (with WTP to avoid advancing)

Table 10(E): Sensitivity analysis of changes in EMV of MPCPS holding other strategies constant (with WTP to avoid advancing)				
Strategy Labels	1% decrease	5% decrease	10% decrease	50% decrease
SQS	8	8	6	6
HPWSS	7	7	7	7
HHEDS	6	6	5	5
VIPLS	9	9	8	9
DMS	5	4	4	4
MPCPS	4	5	9	8
MPCOS	1	1	1	1
SPCPS	2	2	2	2
SPCOS	3	3	3	3

Appendix 10(f): Sensitivity analysis of strategy rankings of changes in the EMV (using WTP for return to normal state)

Table 10(f): Sensitivity analysis of strategy rankings of changes in the EMV (using WTP for return to normal state)				
Strategies Labels	1% decrease	5% decrease	10%	50%
SQS	8	7	7	7
HPWSS	7	6	6	6
HHEDS	6	5	5	5
VIPLS	9	9	8	8
DMS	4	4	4	4
MPCPS	5	8	9	9
MPCOS	1	1	3	3
SPCPS	2	2	1	1
SPCOS	3	3	2	2

Appendix 11 Primary Interventions Cost Assumptions

Primary Interventions Cost Assumptions

The primary interventions cost estimates are based on the assumptions provided below.

11.1 Focal Molluscicidirig (FM) Assumptions

General assumptions

(a) The optimal number of snail treatment sites in Mwea irrigation scheme with a geographical area of 121.4 sq. kilometres and a total length of canals and drains of 165 kilometres, would be 84 sites (Table 7.1).

TABLE 11.1: Optimal number of snail treatment sites in Mwea Irrigation Scheme under focal mollusciciding option.

SECTIONS	TREATMENT SITES PER YEAR
TEBERE	20
MWEA	25
THIBA	20
WAMUMU	11
KARABA	8
TOTAL SITES	84

(b) The optimal (best) number of snail surveillance rounds in Mwea irrigation scheme would be 52 rounds per year (Table 11.2).

TABLE 11.2 : Number of treatment rounds in Mwea Irrigation Scheme.			
	TREATMENT ROUNDS		
SECTIONS	WEEKLY	MONTHLY	ANNUALLY
TEBERE	1	4	48
MWEA	2	8	52
THIBA	1	4	48
WAMUM U	1	4	48
KARABA	1	4	48

11.1.1 *Personnel needs*

The following assumptions were made when estimating personnel needs of the FM policy:

(a) 1 Field Medical Technologist (FMT) would be required to supervise the molluscicіding activities in the whole of Mwea Irrigation Scheme. However, the FMT will have to be assisted by 5 Assistant Field Medical Technologists.

(b) Two drivers will be required to both Drive the FMT and to distribute the material inputs. The services of 6 messenger- cleaners will also be needed in the in the implementation of the policy.

(c) 1 secretary / copy typist will be needed in the project.

(d) 10 snail samplers will be needed for routine snail surveillance and site spraying activities.

(e) 1 laboratory technologist and 3 laboratory technicians will be needed to do the snail screening job.

(f) Each of the technical and supportive staff will work in the focal molluscicіding intervention throughout the year.

(h) The personnel would be remunerated at the Government corporations rates.

(i) Since the length of canals and drains will remain constant over the project life, demand of personnel time would also remain constant.

11.1.2 *Travel and Transport*

The estimates of travel and transport needs of the FM policy are based on following assumptions:

(a) The Mwea Irrigation Scheme laboratory would be the ideal place to screen snails for schistosome parasite (cercariae).

(b) The FMT and his driver will make 12 trips per year to the Kenya National Irrigation Board (KNIB) either to collect the material inputs and / for consultations with the NIB headquarters in Nairobi.

(c) No consumable inputs will have to be imported by the policy implementing agency. All the inputs will be available either at Ngurubani town (the biggest town within Mwea Scheme) or at Nairobi.

(d) 1 motor vehicle (a Toyota Hilux 4WD) and 5 motor cycles for use by the supervisors and for transportation of the material inputs will be used in FM intervention throughout the year. Thus, the travel and transportation cost need not be apportioned.

(e) Since there is no planned change in the length of canals and drains during the assumed project life (T), the travel and transport will remain constant.

11.1.3 *Material and Supplies*

The laboratory and field materials and supplies estimates were based on following assumptions:

(a) The analysis for each of the 84 sites will have to be done separately for the purpose of comparing effectiveness of the molluscicide in each of the sites. Thus, there will be need for labelling differently the samples from disparate sites. Since an average of 49 samples will have to be analyzed from each of the sections per year, a total of 4116 labels will be required annually (i.e. 49 x 84).

(b) Each of the 26 technical and cleaning support staff will need two pairs of rubber gloves per year (assuming each glove will have a 6 months life span).

(c) About 10 reams of A4 size papers will be needed per year.

(d) Each of the 26 technical personnel will need a box file for project related documents.

The secretary will need a file for each of the five irrigation scheme sections.

(e) Each of the 20 technical staff and the secretary will need a ruler.

(f) Each of the 20 technical personnel and 6 cleaners will need a pair of gum-boots.

(g) Each of the 26 personnel (including the secretary) will need 2 medium size towels per year.

(h) Each of the 10 snail sampler cum sprayers will need a protective mask, especially when preparing and spraying molluscicide solution.

(i) Each of the five sections will need about 104 plastic bags per year, for putting samples.

(j) Each of the 10 snail sampler cum sprayers will need a rod for stirring molluscicide / water solution.

(k) Each of the sampler cum sprayer will need a graduated pail for measuring appropriate water quantities to be mixed with molluscicide.

(l) About 40 glass cylinders and 10 plastic cylinders will be required in the laboratory.

(m) About 50 litres of ethanol (70%) be required per year in the laboratory.

(n) Approximately 1500 microscope slides (SOPCs) will be required.

(o) Each of the 26 personnel will need two overcoats per year.

(p) At least one specimen container will be required for each of the 84 treatment sites. Breakage has been taken care of by inflating the estimate by ten percent.

(q) About 60 test tubes and 10 test tube cleaners will be required.

(r) About 15 killogrammes of detergent will be needed per year for use in the laboratory and the field.

(s) Each of the 26 personnel will need a plastic washing basin.

(t) About 100 killogrammes of niclosamide will be needed in a year.

(u) Since the total length of the irrigation canals and drains would not change in fifteen years time, real cost of materials and supplies would also remain constant.

11.1.4 *Utilities*

Utilities include - telephone services, electricity supply and water supply. The Mwea Scheme engineer estimated that either of the mollusciciding options will consume quantities of utilities worth Ksh. 38379 during year zero. He also thought that the demand for those services would remain fairly constant over the mollusciciding options life.

11.1.5 *Capital Commodities*

The Kenya Medical Research Institute Parasitologist and laboratory technologists identified the equipment that would be needed for mollusciciding options as: long forceps, short forceps, conical flasks, Kantax flasks, white trays, measuring tapes, thermometers, spatulas, spraying pumps, cages for snails, spring balances, white traps, stereo microscopes, magnifying lenses, snail Identification keys, counters, scientific calculators, crocodile chips, electric centrifuge, mechanical centrifuge, artificial illumination lights, desks, chairs and stools. The Mwea scheme civil engineer estimated that 6 offices (each 10sq. ft.) and a laboratory would needed. The transport officer in Kenya National Irrigation Board estimated that one 4-Wheel drive vehicle, 5 motor cycles and ten bicycles would needed.

The estimates of the above capital commodities were based on the following assumptions:

(a) Market prices of the equipment reflect their opportunity cost.

(b) Vehicles and motor cycles are valued at border prices and then converted to Kenya Shillings using a shadow exchange rate.

(c) Since the buildings will be built with locally available materials, their replacement cost was based on domestic market prices.

(d) All the capital inputs will not be shared with any other project.

(e) The focal mollusciciding equipment will have a life expectancy ranging from 3 years to 10 years depending on the perceived rate of wear and tear of the commodity in question.

(f) The buildings will have a life expectancy of 30 years.

(g) Bicycles, motor cycles and motor vehicles will have a life expectancy of 5 years, 5 years and 10 years respectively.

(h) 10% interest rate reflects opportunity cost of capital.

11.1.5 *Maintenance Needs*

The FMSC policy maintenance estimates were based on the following assumptions:

(a) The equipment, buildings and vehicles will be used 100% of the time in a year for focal mollusciciding purposes. In other words, pro rating of the maintenance cost is not necessary.

(b) The maintenance of equipment and buildings would cost 2 % of their replacement value each year (MPoW, 1992). While bicycles, motor cycles and vehicles maintenance will cost 11 %, 4.3% and 6.4 % of their replacement value respectively (KAA, 1992).

(c) The real cost of maintaining vehicles, equipment and vehicles would remain constant over focal mollusciciding option.

11.1.6 *Community Resource Inputs*

According to the officer in charge of mollusciciding activities in the Mwea Scheme, mollusciciding policy option entails no local community resource input.

11.2 Drip Mollusciciding Option

The officer in charge of drip mollusciciding (DM) activities in Mwea Scheme estimated the optimal number of main automatic molluscicide installations in Mwea irrigation scheme would be seven; and the optimal (best) number of snail surveillance rounds in Mwea irrigation scheme would be 52 rounds per year (Table 11.2).

11.2.1 *Personnel Needs*

The DMSC policy personnel needs estimates were based on the following assumptions:

(a) 1 Field Medical Technologist (FMT) and 2 Assistant Field Medical Technologists would be required to supervise the mollusciciding activities in the whole of Mwea Irrigation Scheme.

(b) 2 drivers will be required to both Drive the FMT and to distribute the material inputs.

(c) 6 messenger / cleaners will also be needed.

(c) 1 secretary / copy typist services will be needed.

(d) 5 snail samplers will be needed for routine snail surveillance activities. The same workers would be required to refill the drip tanks with molluscicide solution.

(e) 1 laboratory technologist and 3 laboratory technicians will be needed to do the snail screening job.

(f) Each of the technical and supportive staff will work in the drip mollusciciding intervention throughout the year.

(g) The size of Mwea Scheme is unlikely to change over the project life, so the demand on personnel time would remain constant.

11.2.2 *Travel and Transport Needs*

(a) The Mwea Irrigation Scheme laboratory would be the most appropriate place to screen snails for schistosome parasite.

(b) The FMT and his driver will make 12 trips per year to the KNIB headquarters in Nairobi, to collect the material inputs and for consultations.

(c) All the inputs will be locally available in Ngurubani (the biggest town within Mwea Scheme) or Nairobi.

(d) 1 motor vehicle (a Toyota Hilux 4WD) and 2 motor cycles will be used in DM intervention throughout the year. Thus, the travel and transportation cost need not be apportioned.

(e) Since there is no planned change in the length of canals and drains during the assumed project life (T), the travel and transport will remain constant.

11.2.3 *Materials and Supplies*

(a) Since an average of 49 samples will have to be analyzed from each of the 84 sites per year, a total of 4116 labels will be required annually (i.e. 49 x 84).

(b) Each of the 18 technical and cleaning support staff will need two pairs of gloves per year (assuming each glove will have a 6 months life span).

(c) About 10 reams of A4 size papers be needed per year.

(d) Each of the 12 technical personnel will need a box file for project related documents. The secretary will need a file for each of the five irrigation scheme sections.

(e) Each of the 12 technical staff and the secretary will need a ruler.

(f) Each of the 12 technical personnel and 6 cleaners will need a pair of gum-boots.

(g) Each of the 19 personnel (including the secretary) will need 2 medium size towels per year.

(i) Safety Masks

Each of the 5 snail samplers/molluscicide mixers will need a protective mask.

(j) Each of the five sections will need about 104 plastic bags per year.

(k) Each of the 5 snail samplers will need a rod for stirring molluscicide / water solution.

(l) Each of the sampler will need a graduated pail for measuring appropriate water quantities to be mixed with molluscicide.

(m) About 40 glass cylinders and 10 plastic cylinders will be required in the laboratory.

(n) About 50 litres of ethernal (70%) would be required per year in the laboratory.

(o) Approximately 1500 slides will be required.

(p) Each of the 18 personnel will need two overcoats per year.

(q) At least one specimen container will be required for each of the 84 treatment sites. Breakage has been taken care of by inflating the estimate by ten percent.

(r) About 60 test tubes and 10 test tube cleaners will be required.

(s) About 15 killogrammes of detergent will be needed per year for use in the laboratory and the field.

(t) Each of the 18 personnel will need a plastic washing basin.

(u) About 100 killogrammes of niclosamide will be needed in a year.

(v) Since the number of drip dispensers would not change in fifteen years time, real cost of materials and supplies would also remain constant.

11.2.4 *Utilities*

Utilities include - telephone services, electricity supply and water supply. The Mwea Scheme engineer estimated that either of the mollusciciding options will consume quantities of utilities worth Ksh. 38379 during year zero. He also thought that the demand for those services would remain fairly constant over the mollusciciding options life.

11.2.5 *Capital Commodities*

The same type of equipments as those identified under the focal molluscicidng would be needed for drip molluscicidng option. The Mwea scheme civil engineer estimated that 4 offices (each 10sq. ft.), a laboratory and 7 automatic dispenser installations would be needed. The transport officer in Kenya National Irrigation Board estimated that 1 4-Wheel drive vehicle, 2 motor cycles and 5 bicycles would needed.

The capital commodity estimates were based on the following assumptions:

(a) All the capital inputs listed in table 4 will not be shared with any other project.

(b) The drip molluscicidng equipment will have a life expectancy ranging from 3 years to 10 years depending on the perceived rate of wear and tear of the commodity in question.

(c) The buildings will have a life expectancy of 30 years.

(d) Bicycles, motor cycles and motor vehicles will have a life expectancy of 5 years, 5 years and 10 years respectively.

(e) 10% rate of interest.

11.2.6 *Maintenance needs*

(a) The equipment, buildings and vehicles will be used 100% of the time in a year for drip molluscicidng purposes. In other words, pro rating of the maintenance cost is not necessary.

(b) The maintenance of equipment and buildings would cost 2 % of their replacement value each year. While bicycles, motor cycles and vehicles maintenance will cost 11 %, 4.3% and 6.4 % of their replacement value respectively (MPOW, 1992).

(c) The maintenance needs of drip molluscicidng would remain constant over the project life.

11.2.7 *Community resource inputs*

The supervisor of current molluscicicing activities in Mwea expert, thought that there would be no local community input into molluscicicing options.

11.3 Home Health Education Option

11.3.1 *Personnel needs*

(a) The district field health educator (DFHE) and Public Health Officer (PHO) would be the appropriate persons to supervise the implementation of health education policy. The two would be involved in six broad activities: antenatal care and family planning, Kenya Expanded Immunization Programme, Nutrition Improvement Programme, Malaria Control Programme, Implementation of the Public Health Act, and the Schistosomiasis Health Education Programme (HHED).
(b) The DFHE and PHO would spend equal amounts of time on each of the six activities. Thus, in the estimations for supervisory / administrative effort, supervisors and their support staff would spend about 17 % of their time on the HED. Except the shared driver who has to spend 34% of his time on the two supervisors HHED activities.
(c) The fringe benefits would be about 50% of gross annual salary of each personnel.
(d) Estimated three categories of staff would be required: field health educators (FHEs), public health technicians (PHTs), and village health workers (VHWs) would be needed in implementing the HHED.
(e) The FHEs and PHTs would be working in pairs. Each pair would be expected to conduct HHED activities in three villages.
(f) FHEs, PHTs and VHWs would spend about 50% of their time on schistosomiasis disease related health education activities.
(g) 1 VHW would be needed in each of the 38 villages to reinforce and monitor the use of the knowledge imparted by FHTs and PHTs.
(h) Since the number of farmers in Mwea Scheme would remain constant over the project period, the HHED personnel time needs, and hence costs, would remain constant.

11.3.2 *In-service Training*

(a) Supervisors, FHEs and PHTs need 10 days of in-service training on schistosomiasis health education intervention contents (cause, symptoms, preventive and curative intervention options), and subject matter dissemination methods. The latter would involve imparting of basic community psychology, sociology, teaching skills, preparation and use of appropriate teaching aids, and evaluation of both the understanding and use of knowledge acquired.
(b) The FHEs and PHTs would then train the VHWs on the job.
The average cost per training day was obtained from AMREF (1992).
(C) Since the number of farmers household would remain constant over the project period, in-service training cost would remain constant.

11.3.3 *Travel and Transport*

Travel needs

(a) One of the two supervisors would need to go to the Ministry of Health (MoH) and Kenya National Irrigation Board (KNIB) headquarters in Nairobi once per month for debriefing and collection of inputs.
(b) The visits to the MoH and NIB headquarters would be sorely for HED related reasons.

Transport needs

The following assumptions were when estimating the HED transport needs:
(a) The two supervisors would share one *Toyota Hilux*, to be used 34 % of the time for HED activities.
(b) Each of the 13 pairs of PHTs and FHEs would need a motor cycle, to be used 50% of the time for SHEO activities.
(c) Each of the 38 VHWs will require a bicycle - to be used 50% of the time on HED related activities.
The cost per kilometre estimate was obtained from the Kenya Automobile Association

(1992).

(d) The cost of transport under health education will not increase with annual increases in population, because education sessions would be household and not individual based. Thus, demand on educators and supervisors time, hence use of vehicles, bicycles and motor cycles would remain constant throughout project life.

11.3.4 *Materials needs*

(a) The 28 technical health personnel need approximately 28 reams of paper per year.
(b) Each VHW need about 100 pages per year. Since each ream of papers has 500 papers, about 8 reams would be needed by all VHWs.
(c) Each of the households (4223) and health staff (66) need three large (30 cm by 90 cm) sheets of paper containing schistosome parasite life cycle, health implications, preventive and curative measures.
(d) 3 ink jet cartridges would be required per year.
(e) 3 packets of floppy diskettes would be required per year.
(f) Each of the 66 health workers need about 5 ball pens per year.
(g) Each of the health workers need a box-file for filing project information. The copy typists need approximately 20 spring files.
(h) The HED material needs would remain invariant to changes in population and schistosomiasis prevalence over the project life.

11.3.5 *Utilities needs*

Water

About 20 litres of water would be required daily for washing the two supervisors offices. And a total of 5200 litres (i.e. 20 litre times 261 working days) in a year.

Electricity

(a) The electricity consumed by computers would be measured in kilowatts per hour.
(b) The 75 watt bulbs would be used for lighting offices.

The hourly electric power consumption estimates for a personal computer, a printer and a 75 watt bulb, were obtained from the Department of Electrical Engineering, University of Nairobi.

Since the number of offices used by HED officers would not change over the project period, electricity consumption is also unlikely to vary.

Telephone

The Kerugoya District Education Officer, estimated that each of the two supervisors would need about 10 minutes of telephone services per week. Implying that a total of 1040 minutes (2 persons times 10 minutes per week times 52 weeks) of telephone services will be needed per year.

11.3.6 *Capital commodities*

Vehicles

(a) Each of the 38 VHWs will need a bicycle. Bicycles were assumed to have a life span of 5 years.

(b) Since there are 13 pairs of PHTs and FHEs, about 13 motor cycles will be needed. Motor cycles were assumed to have a life expectancy of 5 years.

(c) The two supervisors will need to share one 4 Wheel Drive Toyota Hilux. The vehicle were assumed to have a life expectancy of 10 years.

(d) The replacement cost of vehicles would be equal to their C.i.f. prices.

Equipment

The following equipment would be needed: a personal computer, a 24-pin dot-matrix printer, a surge protector, PC parallel printer lead, disk storage box, PC table, swivel chair, desks and chairs.

(a) Expected life of a personal computer (PC) and other related pieces of equipment is 10 years.

(b) The computer will be used 17 % of the time on HHED related activities.

(c) Each of the 28 health workers (supervisors, PHTs and FHWs) and 2 copy typists will require a working desk.
(d) The PHTs and FHEs will use their desks 50 % of the time for schistosomiasis health education policy related work.
(e) The supervisors and copy typists will use their desks and chairs 17% of the time for HHED purposes.
(f) Life expectancy of desks and chairs is 15 years.
(g) The replacement cost of each equipment item would be equal to it's C.i.f. price.

Buildings

(a) The technical health workers and copy typists will need a total of 17 offices.
(b) Supervisors and copy typists will use their offices 17 % of the time for HHED related works.
(c) PHTs and FHEs will use their offices 50% of the time for HHED related work.
(d) Office buildings will have a life expectancy of 30 years.
(e) 10% interest rate.

11.3.7 *Maintenance needs*

11.3.8 *Community resource inputs*

The community inputs into the schistosomiasis health education policy would be: time, space and health staff lunch.

Community time

(a) there would be 13 pairs of PHT/FHE;
(a) PHTs and FHEs would spend 50 % of their annual working time on HED activities;
(b) PHTs and FHEs would spend 75% of their HED time in the field with the community and 25% of that time doing HED office work;
(c) casual wage rate (WAGE) of Ksh. 40 per day reflects the opportunity cost of individuals time;

(d) VHWs would spend 50 % of their time educating household on schistosomiasis preventive matters;
(d) the time of household members over the age of 9 years was valued at the casual labour wage rate; and
(e) members of age 9 and below commanded an opportunity cost of zero;
(f) mwea population would grow at a constant annual rate of 4%;
(g) and the community time input would grow with population growth.

Community lunch

Health education is an intervention whose effectiveness depends partly on the rapport established between health educators and the community. Establishment of a good rapport requires an understanding of the culture of the community in question. Giving is one of those key cultural elements of the Mwea Community. If an individual health worker is offered lunch or tea and he refuses, the refusal would be in bad taste, and it is likely to affect adversely the teacher-student relationship. During the estimations of lunch cost following assumptions were made:
(a) the health workers would have lunch in the households where they would be conducting education sessions; and
(b) the cost of a basic lunch in Mwea hotels was Ksh. 25.

Space

Space where education sessions would be taking place, would not be costless. It was assumed that the market price of a semi-permanent 10 ft by 10 ft room in Mwea of Ksh. 300 per month, reflected the opportunity cost of space.

11.4 Vented Improved Pit Latrine (VIPL)

11.4.1 *Personnel needs*

Since there are 4223 households in Mwea scheme, the same number of vented improved pit (VIP) latrines need to be built. The task of building a VIP latrine can be divided into four parts, namely: pit digging, pit lining, slab making and building super structure.

Pit Digging

(a) Pit diggers would work in pairs; one would excavate, while his partner removes the earth;

(b) The pair would take on average seven days to excavate one pit of 3 sq. ft. width and 15 ft. depth;

(c) A pit would be dug for each of the 4223 VIP latrines;

(d) The 4223 pits would be done within 365 days;

(e) Each pit digger would be paid a market wage rate of Ksh. 43;

(f) since a pit latrine has a useful life of 5 years, the cost of excavation would recur every five years.

The following expression were used in estimating the cost of pit excavation in year zero:

$CEX_{t0} = [(PITS \times D_P) \ / \ D_Y] \times (W \times 2 \text{ excavators})$

Cost of excavation — No. of Pits — Days per Pit — Days Per year — Daily Wage

The first expression in the above equation gives the number of pairs of excavators needed to do the whole job in a year.

Pit Lining

The pit-mouth has to be lined with bricks and concrete to obviate the possibility of sinking.

(a) 1 mason / carpenter would take an average of 2 days to line a single pit with the assistance of one casual worker;

(b) the market wage rate of Ksh. 150 reflects the opportunity cost of masons time; and

(c) the market wage rate of Ksh. 40 reflects the opportunity cost of casual labour.

The following expression were used in estimating masons cost of pit lining in year zero:

$CL_{t0} = [(PITS \times D_L) \ / \ D_Y] \times W$

Masons   No. of   Days per   Days   Daily

Cost   Pits   Pit   Per year   Wage

The following expression were used in estimating the cost casual labour needed in pit lining in year zero:

$CL_{t0} \quad = [(PITS \quad x \quad D_L) \quad / \quad D_Y] \quad x \quad W$

Casuals   No. of   Days per   Days   Daily

Cost   Pits   Pit   Per year   Wage

Since the pit latrines have a useful life of 5 years, the cost of lining would recur every five years.

Slab Making

The squatting slabs are for covering the pits. Each pit requires a slab. (a) A single slab requires one day of a mason and a casual worker;

(b) 4223 slabs would be needed for the 4223 latrines; and

(c) all slabs must be made within 365 days.

The following expression were used in estimating masons cost of slab making in year zero:

$SC_{t0} \quad = [(SLABS \quad x \quad D_L) \quad / \quad D_Y] \quad x \quad W$

Masons   No. of   Days per   Days   Daily

Cost   slabs   slab   Per year   Wage

The following expression were used in estimating the cost casual labour needed in slab making in year zero:

$SC_{t0} \quad = [(SLABS \quad x \quad D_L) \quad / \quad D_Y] \quad x \quad W$

Casuals   No. of   Days per   Days   Daily

Cost   slabs   slabs   Per year   Wage

Since the pit latrines have a useful life of five years, the cost of slab making would recur every five years.

Superstructure Building

The superstructure is a 3 ft. by 4 ft. by 6.8 ft. hut. The job involves building of three 6.8 ft. walls, constructing and installing a 2.5 ft. by 6 ft. door, and roofing.

(a) Each of the 4223 would require a superstructure;

(b) a single superstructure would take one mason and a casual worker 7 days; and

(c) all superstructure must be built in 365 days.

The following expression were used in estimating the cost of masons time in huts building in year zero:

$SSMC_{t0}$	$= [(SS$	$x \; D_L)$	$/ \; D_Y]$	$x \; W$
Masons Cost	No. of Huts	Days per Hut	Days Per year	Daily Wage

The following expression were used in estimating the cost casual labour needed in year zero's huts building:

$SSCC_{t0}$	$= [(SS$	$x \; D_L)$	$/ \; D_Y]$	$x \; W$
Casuals Cost	No. of Huts	Days per Huts	Days Per year	Daily Wage

Since the pit latrines have a useful life of five years, the cost of huts building would recur every five years.

Supervision

The whole process, from pit excavating to the construction of superstructure has to be supervised.

(a) The senior supervisor would be the field medical technologist (FMT);

(b) the FMT would be required to invest approximately 75 per cent of his time on the overall supervision of the sanitation project;

(c) the FMT would be assisted by five other supervisors (probably public health technicians), working on full-time basis. The supervisors would be required to continue monitoring the cleanliness of VIP latrines over the project life. However, since the number of VIP latrines would remain fairly constant over the project life, the supervision cost element would not change.

11.4.2 *Travel and Transport Needs*

Travel

(a) The public health officer or field medical technologist would visit the Kenya National Irrigation Board and Ministry of Health Headquarters, 12 times in a year, for consultations.

(b) The officer would be driven there.

(c) About 75% of the twelve 12 days spent at the headquarters would spent on VIP related matter.

(d) The number of trips to the headquarters would remain fairly constant over the VIP project life.

Transport

(a) The Toyota Hilux 4WD (petrol) pick-up would be used 75% of the time for VIPL policy activities.

(b) The 5 motor cycles (175cc) would be used sorely in VIPL.

(c) The 5 three-ton Mitsubishi Canter trucks would be used only during year zero, and at 5 year intervals thereafter.

(d) The cost per kilometre estimate obtained from the Kenya Automobile Association (1992), reflects the opportunity cost.

(e) The five three-ton trucks would be needed only during year zero and at five years intervals thereafter. Thus, the cost of running these trucks would recur every five years of the assumed project life. The real cost of operating the pick-up and motor cycles would not vary over the project period.

11.4.3 *Material needs*

Pit digging

The following assumptions were made when estimating the quantities of materials needed in pit digging:

(a) 1 fork jembe can be used to excavate 5 pits. Thus, the total number of fork jembes required are 845; that is, 4223 divided by 5.
(b) Since the wear and tear of mattocks is quite minimal, each pair of excavators need 1 mattock; thus, a total of 81 mattocks would be required.
(c) The public health officer estimated that a single spade (shovel) can be used in excavation of approximately 26 pits. Thus, about 162 spades would be needed to excavate 4223 pits; which is approximately 2 spades per pair of pit diggers.
(d) 1 tin bucket can be used in removing earth from just two pits. Thus, 2112 buckets would be required to remove earth from 4223 pits (i.e. 4223/2).
(e) One 30 ft. rope can be used in removing earth from about 5 pits. Thus, approximately 253380 ft. of rope would be required to remove earth from 4223 pits [(4223 pits x 30 ft)/5 pits per rope].
(f) All the materials would be used in only VIP policy.

Lining of pit mouth

The following assumptions were made when estimating quantities of materials needed for lining of pit mouths:
(a) Lorries of Bricks
The pit is 3 feet by 3 feet wide. Each of the four sides of the pit must have a 1.5 feet deep lining. The appropriate bricks would be 1 feet long and 6 inches thick. The bricks needed would be 36ft [i.e. 1.5 ft (depth) x 3 ft (width) x 2 x 4 sides]. The total number of lorries of bricks required to do lining of the 4223 pits would be about 380 (i.e. 36 ft per pit x 4223 pits) / 400 ft per lorry).
(b) Bags of Cement
Lining of a single pit-mouth would take approximately 2 bags of cement (i.e. approximately 100 kg or 1 wheel burrow). Thus, the total number of bags of cement needed would be 8446 bags, which is about 42.23 lorries (4223 pits x 2 bags per pit - which is approximately 8446 bags x 50 kg per bags = 422300 kg / 10000 kg per Ten-ton lorry).
(c) Lorries of sand
Since the appropriate mix of cement and sand is 1 to 2; about 2 wheel burrows of sand would be required per pit. So the total number of wheel burrows of sand would be 8446;

i.e., 2 wheel burrows per pit time 4223 pits. [1 WB of sand weighs about 100 kg; 1 ten-ton dump truck has a capacity of 100 WB, which is equivalent to 10 000 kg]. If 1 ten-ton lorry has a capacity for 100 WB of sand; total number of sand lorries required would be 8446 WB / 100 WB per lorry equals 85 lorries of sand.

(d) Lorries of Aggregate

Remember, as mentioned earlier cement, sand and aggregate are mixed in the ratio: 1:2:4. Since the total number of ten-ton lorries of sand required are 85, the lorries of aggregate required would be 170 (i.e. 85 sand lorries times 2).

(e) Metal Basins

Metal basins have very gradual wear and tear, thus I assumed that a single metal basin can be used for at least one year. Since there will be 23 masons doing the lining job, each of them requires a single metal basin. Thus, a total of 23 metal basins would be required.

(f) Water Drums

To ensure that the lining work proceeds smoothly there ought to be adequate water supply near the construction sites. Thus, it is vital that each of the masons have a 200 litre drum for storing water for mixing cement, sand and aggregate. Thus, a total of 23 water drums would be needed.

Slab or squatting plate materials

The quantities of materials required in making squatting plates were estimated as follows:

(a) Cement Bags

Since each slab requires 12.5 kg of cement, 52787.5 kg will be needed to make all the 4223 slabs (12.5 kg x 4223 slabs). Since one bag of cement weighs 50 kg, the total number of bags required would be 1055.75 (that is 52787.5 kg / 50 kg per bag).

(b) Lorries of Sand

Each slab requires 1/4 WB of sand. Thus, 4223 slabs require: 1056 WB (i.e. 0.25 WB x 4223). Since the capacity of a ten-ton dump truck is 100 WB, the total number of lorries of sand required would be 11 lorries (1056 WB / 100 WB per lorry).

(c) Lorries of Aggregate

One wheel burrow of aggregate is needed per slab; and 4223 slabs will need 4223 WB (i.e. 1 WB x 4223 slabs). That is equivalent to 42 lorries (4223 WB / 100 WB per lorry).

(d) Weld-Mesh

Each slab requires one 8 ft by 4 ft weld mesh piece. Thus, a total of 4223 weld mesh pieces would be required to make 4223 slabs.

(e) Litres of Water

About 40 litres (2 buckets) of water would be required in mixing materials for one slab. Thus, a total of 168920 litres (i.e. 40 litres per slab x 4223 slabs) would be required.

(f) Pine Timber

The timber required for making one slab frame is 68.83 ft. {i.e. main frame: [(8 ft + 5 ft) x 2 sides]; hole frame: [(6 inches x 2 sides) + (11 inches x 2 sides) / 12 inches per foot)]. I assumed that one slab frame can be used to make 20 squatting slabs. Thus, the total feet of timber required is 14534.2 feet (i.e. 68.83 ft x 4223 slabs / 20 slabs per frame).

(g) Water drums, water pails, metal basins and shovels / spades. Each mason requires one water drum, one water pail, one metal basin and a shovel. Thus, since 12 masons would be required to make all the slabs, 12 of each of the above mentioned items would be required to make 4223 slabs.

Superstructure materials

The materials needed in building VIP latrines were estimated as follows:

(a) Bags of cement

Building of a single superstructure (hut) would require about 3 bags of cement. Thus, 4223 huts need 12669 bags of cement (i.e. 3 bags per hut x 4223 huts). That is equivalent to 63.35 lorries (i.e. 12669 bags x 50 kg per bag / 10000 kg per ten-ton truck).

(b) Lorries of Sand

Since the recommended ratio of cement to sand is 1 lorry of cement to 2 lorries of sand, the total number of ten ton lorries of sand required to build 4223 huts would be approximately 127 (i.e. 63.35 lorries of cement x 2).

(c) Lorries of stones / bricks

One hut requires 74.8 feet of bricks; implying 4223 huts will require 315880.4 feet (i.e.

74.8 ft x 4223 huts). Lorries of stones required would be about 790 (i.e. 315880.4 ft / 400ft per lorry).

(d) Wheel burrows, water pails, water drums or tanks

Each of the estimated 81 masons will require one wheel burrow, a water pail and a 200 litre water tank. Each of those items expected life span is one year.

Superstructure roofing materials

The roofing materials were estimated as follows:

(a) Gauge 32 iron sheets (2M)

Each hut requires one 2 metre iron sheet. Thus, a total of 4223 iron sheets would be needed.

(b) Timber Frames (ft)

Each hut requires 20.4 ft of timber frames for roofing. Thus, 4223 roofs would require 86149.2ft of frames (20.4 ft per roof * 4223 roofs).

(c) Roofing nails

Each roof requires 6 roofing nails. So 4223 huts would require 25338 nails (i.e. 6 nails per roof * 4223 roofs). Assuming a kilogramme of nails contains 100 nails, about 253.4 killogrammes of roofing nails would be needed.

(d) Wire Nails (Kgs)

Each roof requires 8 wire nails; and 4223 roofs would require 33784 nails (i.e. 4223 roofs * 8 nails per roof). Assuming one kilogramme of 6 inch wire nails contains 50 wire nails, about 675.7 killogrammes would be required (i.e. 8 wire nails per roof / 50 nails per kg).

Huts doors making materials

The doors making materials were estimated as follows:

(a) Timber (ft)

Each hut would have a 6 feet long by 2.4 feet wide door. The total feet of timber needed for making 4223 doors would be 60811.2 ft. (2.4ft x 6ft x 4223 doors). Each door need to be fitted into a door frame. One door frame would require 16.8 feet of timber frames. Thus, the 4223 huts would require 70946.4 ft (16.8 ft. per frame x 4223 huts) of door frame. Total feet of timber required to make and install 4223 doors would be 131757.6 ft.

(b) Wire Nails

Joining the pieces of timber to make a single door would require 9 four inch wire nails. Thus, making 4223 doors would take about 38007 nails (4223 doors x 9 nails); that's equivalent to 380.1 killogrammes.

Joining the pieces of timber frames to form a door frame would take 8 three inch wire nails. Thus, 4223 frames would require 33784 wire nails (i.e. 4223 frames x 8 nails per frame); equivalent to 337.84 killogrammes.

Assuming that fixing a single frame to the superstructure would take 8 six inch wire nails; thus, the total killogrammes of wire nails required to fix the all frames would be 675.7 kg [(4223 x 8 six inch nails) / 50 nails per kg].

Each door would be attached to a frame by 3 hinges; each hinge requires 4 nails; thus fixing each door would require 12 two and half inch nails. Fixing 4223 doors to the frame would take about 507 kg [(12 nails x 4223 doors) / 100 nails per kg). Total of 2069.32 kg of nails would be needed.

(c) Internal Lock

Each hut requires one simple and cheap internal lock. Thus, 4223 internal locks would be required for the whole policy.

(d) Hinges

Each door requires 3 hinges. Thus, 12669 (4223 x 3) hinges would be required for the 4223 huts. Since the pit latrines have a useful life of five years, the cost of the above doors making materials would recur every five years.

Vent pipes

Each VIP latrine requires one 10 ft. vent pipe; thus, a total of 4223 vent pipes would be needed. I assumed that each vent pipe would have a useful life of 15 years; thus, cost of pipes would be incurred only during year zero.

Hole cover

The materials needed for making hole covers were estimated as follows:

Timber

Each hole cover requires 1 square foot of timber. Thus, 4223 covers will require 4223 sq. ft. Each cover handle will be 1 foot long (and 3 inches wide); thus a total of 4223 ft will be needed.

Wire nails

Assuming that 4 two and half inch nails will be required to fix one handle firmly to the cover; a total of 169 kg of wire nails [(4223 * 4)/100 kg] will be needed to make 4223 hole covers.

Since the pit latrines were assumed to have a useful life of five years, the cost of pit excavating, lining, slab making, and superstructure building roofing materials would recur every five years.

11.4.4 *Capital Commodities*

The capital commodities needed in the VIP option were estimated as follows:

(a) Trowels

Each of the 116 masons needed to implement the VIP latrine option would require a trowel. The assumed life expectancy of a trowel was 3 years.

(b) Hummer

The 12 and 81 masons making slabs and superstructures, would each need a hummer. Thus, approximately 93 hummers would be needed. The assumed life expectancy of a hummer was 10 years.

(c) Masons Level Devise

Each of the 116 masons would require a level devise; with an expected life of 5 years.

(d) Masons Alignment Devise

Each of the 81 masons building the superstructure would need an alignment devise; with a life expectancy of 15 years.

(e) Masons Square Devise

Each of the 104 masons doing the lining and construction of the huts will require a masons level devise; with a life expectancy of 15 years.

Vehicles

The transport needs estimates were based on following assumptions:
(a) 1 Toyota Hilux pick-up would be required for the use by the senior supervisor.
(b) The 5 assistant supervisors working on full-time basis would each need a motor cycle.
(c) Each irrigation scheme section would need a 3 ton truck for transporting materials from the reception stores to the villages.
(d) Vehicles have a life expectancy of 10 years and motor cycles a life expectancy of 5 years.

Buildings

(a) 1 store (each 40 ft. by 40 ft) would be needed in each of the five sectional reception centres, for storing project materials.
(b) Each with a life expectancy of 30 years.

11.4.5 ***Maintenance needs***

11.4.6 ***Community resources input***

The community input into the VIP latrine option would essentially be in maintenance of latrines. The input will take the form of labour, materials and transport cost.

Community labour

The community labour input into VIP policy were estimated as follows:
(a) Each household will spend about 15 minutes per day maintaining latrine cleanliness; thus, a total of 48168.6 days would be spent on maintenance [(i.e. 15 minutes per day x 365 days per year x 4223 households) / 60 minutes per hour / 8 hours].
(b) The market wage rate of unskilled labour (i.e. Ksh 40 per day) reflects the opportunity cost of individual household members time in Mwea Scheme.

(c) Since the number of latrines would not change, the labour input into VIP policy would remain constant over the project period. Thus: $CL_{t-1} = CL_{t+1}(df_{t+1})=....= CL_{t+15}(df_{t+15})$. Where CL_{t-1} is the value of community time in year 0; and df_{t+n} is the discount factor of n^{th} year.

Community materials

The community material input into VIP policy were estimated as follows:

(a) Each household in Mwea would need a broom, whose expected useful life is estimated at 1 year. Thus, a total of 4223 brooms would be needed in the VIP latrine option per year, if the option is implemented.

(b) Assuming that a rug has a useful life of 3 months, each household will require 4 rugs per year; implying a total of 16892 rugs will be required per year.

(c) Each household would require a water pail or bucket for fetching water to be used in cleaning the latrines. Thus, assuming a bucket has a useful life of 1 year, about 4223 buckets would be needed in the VIP latrine option per year.

(d) Each household would need at least two hand gloves to be worn when washing latrine. Thus, a total of 8446 hand gloves would be needed per year.

(e) The Public Health Officer estimated that each household would use about 20 litres of water per day on latrine cleansing. The annual water consumption would be 30827900 litres per year.

(f) The Detto manufacturer recommends that 45ml of Detto be mixed with 1 gallon of water. A single lavatory will need about 238.5 millilitres of the disinfectant per day (i.e. 45 ml x 5.3 gallons of water per day). A total of 367622.7 litres of disinfectant will be required per year [(238.5 ml per day x 365 days per year x 4223 lavatories) / 1000ml per litre].

(g) This cost component would recur every year, thus:

$CSC_{t-1} = CSC_{t+1}(d_t) =........= CSC_{t+15}(d_t)$.

Community land space

The land space on which latrines would be built is not costless. The following assumptions were made when estimating the cost of space:

(a) Since each VIP latrine would occupy 40 square feet (5ft by 8ft) of land, a total of 3.9 acres of community land will be needed (4223 latrine x 40 sq. ft. = 168920 sq. ft.; since 1 sq. yd. equals 9 sq. ft., 168920 sq. ft. / 9 sq. ft. = 18769 sq. yd.; 1 acre = 4840 sq. yd., 18769 sq. yd. / 4840 sq. yd. = 3.9 acres).

(b) The rent of Ksh. 6400 per acre of land per year in Mwea Scheme reflects the opportunity cost of using land.

(c) This cost component would recur every year, thus:

$CSC_{t-1} = CSC_{t+1}(df_t) = \ldots\ldots\ldots = CSC_{t+1}(df_t)$

11.5 Household Pipe Water Policy (HPWS)

11.5.1 *Personnel needs*

Personnel time would be needed in the following phases of the water supply policy: land survey, pipe-trench excavation, valve chambers and anchor blocks construction, pipe laying and connection, and trench refilling.

Land survey

The job of the land surveyor is to identify and mark the appropriate place to lay the pipes. The length of the mains, service and feeder were estimated at 162.352 kilometres (i.e. 162352 metres). The surveyor estimated that with the help of 4 causal workers he can survey approximately 5 KM per day and fix beacons. Thus, the surveying and marking of the 162.4 KM pipe system would take about 1.08 months of a surveyor, four casual workers and a driver.

Excavation

Since Mwea scheme has got five sections (Mwea, Thiba, Wamumu, Tebere and Karaba), the chief irrigation engineer thought that there should be at least one irrigation engineer in each section to oversee the excavation; and each of them should be assisted by three public health technicians to supervise the casual workers. He estimated that one casual worker can excavate 2 metres per day. Thus, based on that estimate, 451 casual workers would be needed to excavate the 162.4 KM trench.

Valve chambers and anchor blocks construction

An engineer and 3 assistants (PHTs) would supervise the construction of valve chambers and anchor blocks in each section. The chief engineer estimated that 117 masons' each assisted by 3 casual workers would be required to accomplish the job in 2 months time.

Laying pipes and connecting

The 5 engineers and 15 assistants would be required to supervise the laying of pipes and connecting. The chief engineer estimated that a ratio of 1 plumber to 2 casual workers would be appropriate. The job of laying and connecting pipes would take 169 plumbers and 338 casual workers approximately 2 months.

Burying pipes

To obviate the possibility of theft or damage; and for the safety of people working in the paddy fields, the pipe trenches will have to be refilled with earth. The chief engineer thought that the pipe trench covering can be supervised by section irrigation officers, each assisted by 3 public health technicians. Assuming one casual worker can bury approximately 4 metres per day, 1353 casual workers would be required to accomplish the job in one months time. There ought to be a store keeper in each section storage yard to keep records of the incoming and outgoing pipes, fittings and other materials.

The cost of personnel (land survey, excavation, valve chambers and anchors construction, laying pipes and connecting and burying pipes) would be incurred only during year zero. Once the piped water system has been installed, only a small element of supervision services (ÙPC) would recur over the project period. Thus: $\grave{U}PC_{t-1}$ = $\grave{U}PC_{t+1}(df_{t+1})$ =...= $\grave{U}PC_{t+15}(df_{t+15})$.

The casual labour, plumbers and masons time were valued at the local 1992 constant wage rates. Since the wage rates for those categories are above the legislated minimum wage rate and they do not belong to trade unions, it was assumed that the market wage rates reflect their opportunity cost.

The time of surveyors, irrigation officers and public health technicians was valued at the 1992 constant civil service wage rates.

11.5.2 *Material needs*

(a) The following construction materials would be needed: 100 bags (50 kg @) of cement; 2.1 lorries (10 ton @) of sand; 8 lorries (10 ton @) of coarse aggregate; 117 pangas; 117 water tanks (200 lt. @); 117 metal basins; 117 shovels; 117 water pails (20 lt. @); and 117 wheel burrows.

(b) The following excavating equipment would be needed: 451 pangas; 451 fork jembes; and 451 shovels - have a life expectancy of 1 year or less.

(c) 902 spades/shovels would be needed for filling trenches.

(d) The surveying phase would require: 162353 metres of nylon string and 8118 pegs.

(e) The material cost (MAC) would be incurred only during year zero of the H20 policy. Thus: $MAC_{t=n} = 0$; $n = 1,....,15$.

11.5.3 *Travel and transport needs*

Travel

(a) A per diem rate of Ksh. 500 per night for the surveyor and engineers from the Ministry of Water Resources headquarters.

(b) The surveyor would stay in Mwea for about 32 nights.

(c) Each of the 5 engineers would stay in Mwea for 310 nights.

Transport

(a) 10 lorries would be hired for transporting pipes, fittings and materials from Nairobi to Mwea; at a market hire price of Ksh. 15000 each for return trip.

(b) The hired lorries would each make 5 return trips.

(c) The 5 *Toyota Landcruiser* and 5 *Toyota Hilux* would be used for transporting pipes, fittings, materials and personnel within the scheme. Each of those vehicles would cover an average of 10,000 KM. per year. According to the KAA (1992), petrol, oil and insurance would cost Ksh. 4.464 per kilometre.

(c) The 10 *Yamaha* (175cc) motor cycles would be used by assistant supervisors. Each would cover an average of 10,000 KM. per year; and petrol, oil and insurance would cost Ksh. 0.4464 per kilometre.

(d) After year zero, only 5 motor cycles (ÙTRC) would be used by the Public Health Technicians supervising the maintenance plumbers, and monitoring water consumption behaviour, would be used over the project period. Thus: $\grave{U}TRC_{t-1} = \grave{U}TRC_{t+1}(df_{t+1}) = ... = \grave{U}TRC_{t+15}(df_{t+15})$.

11.5.4 *Maintenance needs*

Repairs and preventive maintenance of the water system, especially within the villages, would be vital. The engineer estimated that 10 plumbers working full-time would be enough to do repairs and preventive maintenance. The plumbers would be supervised by 10 public health technicians working in various villages. The maintenance labour cost component would recur every year, over the project period.

11.5.5 *Capital resources*

The capital equipment under the water supply option include land (for storage of pipes fittings and other materials), pipes and fittings, vehicles, motor cycles, bicycles, and buildings. In each of the five irrigation sections, the water project will require 1.048 acres of land for storage of pipes, fittings and other materials, and for building store keepers offices (each 10 sq. ft.). Since the irrigation scheme already has adequate land in each of its five sectional reception centres, it would not be necessary to purchase land for the water project. Thus, a total of 5.24 acres of land will have to be rented from the National Irrigation Board at the market rate.

The other assumptions made when estimating the cost of capital commodities were:

(a) pipes and fittings have a 20 years life span;

(b) vehicles have a 10 years life span;

(c) motor cycles 5 years life span;

(d) bicycles - 5 years life span; and

(e) buildings - 30 years life span.

(f) 10 % discount rate

11.5.6 *Community resource inputs*

There would be no local community resource input into the water supply option. And on the event that the community will provide the labour needed in excavation and refilling of trenches, the opportunity cost would be equal to the estimates already made of the casual labour time required.

11.6 *Selective Population Chemotherapy Options*

Selective population chemotherapy (SPC) regimes involve stool specimen collection, specimen screening and treatment of all those who test positive and are willing to participate.

11.6.1 *Personnel needs*

(a) There ought to be 1 laboratory technician in each of the 5 rice collecting centres in Mwea Scheme, manning specimen collection activity.

(b) Each technician should have 2 casual workers to assist with the distribution of specimen containers to those participating in the screening exercise.

(c) Since only 1 motor vehicle would be required to transport the sample containers to and from collecting stations, 1 driver would be needed.

(d) 1 technician can prepare and screen approximately 48 specimens per day.

(e) Approximately 554 man days would be needed to screen all the stool specimens from 26610 persons, i.e. 26610 persons divided by 48 specimens per man day.

(f) A 28 day period was considered to be a reasonable duration for preparation and screening of the specimens. Thus, the number of technical laboratory staff needed to do the screening in 28 working days would be 20.

(g) Each technical staff will take on average 10 minutes to take history and treat a single

patient. A total of 296 days would be needed to treat all the eligible patients equals. The number of days were obtained by multiplying 14201 patients by 10 minutes and dividing the product by 60 minutes per hour and then by 8 hours per working day. A team of 25 medical personnel will take approximately 12 working days.
(h) Mwea population would grow at a constant annual rate of 4%, over the project life.
(i) The personnel cost component behaviour would be dependent on annual changes in the population and the overall schistosomiasis prevalence rate with the respective SPC regime.

11.6.2 *Materials needs*

Stool collection phase

(a) Since the total number of people likely to submit stool specimens for screening, in year zero, would be 26610 (assuming a screening compliance rate of 90%) in year zero, a similar number of specimen containers would be bought. However, the estimate would be adjusted by a breakage rate of approximately 4%. Thus, approximately 27674 containers would be required.
(b) Each of the 26610 containers must have a label.
(c) Each of the 15 persons collecting specimens requires a pairs of rubber hand gloves and 2 towels.
(d) About 20 toilet soap would be needed.
(e) 6 hard cover note books, to act as registers.

Kato Specimen Screening

During year zero following materials would be needed: 20 sieves; 40 emulsifying rods; 53220 microscope slides; 26610 Kato-Katz templates; 18 cellophane rolls; 2129 m_2 of plastic screen; and 266 litres of glycerine/ malachite green.

Therapy phase materials

During year zero following materials would be needed in the treatment phase: 30 hard cover note books; 30 ball pens; 30 water cans; 26610 disposable drinking glasses; 60 towels; 104 soap; 260 pregnapharm pregnancy kits; 2130 disposable injecting needles; 1065 small syringes (2ml); 1065 big size syringes (80ml); 30 white overcoats; 10 blue overcoats; 30 plastic pails; 30 plastic washing basins; 20 pairs of surgical gloves; and 14201 prescription cards.

The maxim of the SPC regimes is to screen the whole population at risk irrespective of the changes in diseases prevalence rates. Thus, no-matter how effective an intervention is, the cost of screening at the community level will grow at the rate of population growth rate. However, the changes in cost materials during the treatment phase depends on both changes in schistosomiasis prevalence rate and population growth.

11.6.3 *Drug needs estimates under SPC regimes*

The assumptions upon which drug needs estimates were based are provided in the Volume 1.

11.6.4 *Utilities needs*

Water

(a) Stool Collecting Phase

There will be approximately 15 persons involved directly in collecting the specimens. Each will require approximately 5 litres of water per day for washing hands. Thus, the total water consumption by the stool collecting team would be 1125 litres, i.e. 15 persons x 5 litres per day x 15 days.

(b) Screening Phase

Approximately 26610 persons will submit their stool specimens for screening in year zero. Since the amount of water required in the preparation of a single stool is approximately 985ml, about 26211 litres will be required in screening all the stools. The

30 persons who will be directly handling the stools will require approximately 5 litres per day for washing hands during and after the tests; that constitutes an additional 4200 litres (i.e. 30 x 5lt x 28 days). That makes a grand total of 30411 litres of water.

(c) Treatment Phase

There will be 40 persons (technical and support staff) participating in the treatment phase, each will need 5 litres for drinking and washing hands over a period of 12 days. That gives us a total of 2400 litres of water. In addition, the 14201 patients who will be treated will require about 250ml of water each for swallowing the tablets. So the treatment phase will require a grand total of 5950 litres of water. The price per litre of treated water in Mwea was Ksh. 0.05 in 1992.

Electricity

Since the stool collection and treatment phases will be carried out in sunshine-lit rice storage sheds, no electricity would be required. However, since the screening phase has to be done in a standard laboratory (which is well lit with electricity and equipped with electric gadgets, e.g. electric microscopes and centrifuge, approximately 2000 KW of electricity would be required during the 28 day screening period. The price per kilowatt of electricity was Ksh. 1.00 in 1992.

Telephone

(a) Stool Collection Phase

The stool collection activities will be conducted from the 5 headquarters of the 5 sections which constitute the Mwea Irrigation Scheme. The personnel coordinating the specimen collection activities in their respective stations ought to be in constant communication with their counter-parts in other sections. Thus, each of the five technicians will have a maximum of 15 minutes of telephone services per day, for the 15 days they will be conducting the specimen collection exercise. Thus, the stool collecting staff will have a total of 1125 minutes of telephone services (i.e. 15 days x 15 minutes x 5 persons).

(b) Stool Screening Phase

The two laboratory technologists heading the screening team will each have access to a maximum of 15 minutes of telephone services per day for the 28 day screening period. Thus, a total of 840 minutes of telephone services will be used (28 days x 2 persons x 15 minutes per day).

(c) Treatment Phase

The treatment will take place simultaneously in the five stations. Treatment activities in each station will be supervised by 1 schistosomiasis expert. Thus, it is necessary that each expert have an access to the 15 minute telephone services per day over the 12 days period. The five experts will use approximately 900 minutes within the 12 day treatment period, i.e. 12 days x 5 persons x 15 minutes. The market price per minute of telephone service was Ksh. 4.00. The cost of telephone were obtained by multiplying the expected telephone time (in minutes) with the price of telephone per minute. That cost would be constant throughout the project life.

11.6.5 *Travel and transport needs*

(a) Kimbimbi Health Centre, the nearest facility with a laboratory, would be the most appropriate place to perform stool specimen screening.

(b) Stool collection, screening and treatment administering teams would be constituted from: Kerugoya District Hospital; Kimbimbi Health Centre; and Kenya Medical Research Institute.

(c) All casual workers would be recruited in the vicinity where the relevant activities would be taking place.

(d) The five laboratory technicians needed in the stool collection phase will be commuting daily from Kimbimbi Health Centre using motor cycles.

(e) Fifteen of the specimen examining team will be from Kerugoya District Hospital. The remainder from Kimbimbi Health Centre.

(f) The five schistosomiasis experts will come Kenya Medical Research Institute.

(g) Five clinic officers and eighteen community nurses will be deployed from Kerugoya

District Hospital. The remainder from Kimbimbi Health Centre.

(h) Experts from KEMRI and their driver will be residing in Ngurubani town (i.e. the nearest town with reasonable accommodation facilities). Each expert will be required to provide technical advise pertaining to complicated cases, multiple infection cases and cases suffering from negative drug side effects.

(i) Staff from Kerugoya District Hospital will have to be transported daily to and from Mwea. One 26-seater mini-bus would be adequate.

(j) Specimen collecting team will need: 1 Toyota Hilux 4WD-DC for transporting specimen containers to and from different specimen collecting centres; and 5 Yamaha motor cycles to be used by the five laboratory technicians.

(k) Specimen screening team will require 1 Mini-bus (26 seater) to be able to commute daily from their residence in the District Hospital, to Kimbimbi H.C. where screening will be done. The same mini-bus will be used to ferry therapy team from Kerugoya.

(l) Therapy team will require 5 Toyota Hilux 4WD / DC to be able to commute daily from Kimbimbi H.C. (which will be operating as the headquarters) to their respective treatment centres. An additional Hilux pick-up will be needed for transporting experts from Nairobi.

(m) All inputs are locally available, there is no need for imports.

(n) Since stool collection will take place over a period of 15 days, the vehicle and motor cycles will be used 6 % of the working year (261 days) for stool collection purposes.

(o) Stool screening will be done for a period of 28 days. Thus, the means of transport will be used 11 % of a working year for screening purpose.

(p) The vehicles and motor cycles designated for therapy phase will be 5 % of the working year for that purpose.

(q) The travel and transport cost for the stool and screening collection phases would be dependent on only population growth rate.

(r) The staff lunch, per diem and transport cost under the treatment phase, were assumed to be dependent upon the annual population growth rates and annual changes in overall schistosomiasis prevalence rates.

11.6.6 *Maintenance needs*

(a) 2 % of the replacement cost of equipments and buildings, would be required annually for their maintenance (MOPW, 1992).

(b) 6.4% and 4.3 % of the replacement cost of vehicles and motor cycles would needed annually for their maintenance (KAA, 1992).

(c) The apportionment of maintenance cost were based upon the period of time equipment, vehicles and buildings were expected to be used in the SPC programmes.

(d) The trend of therapy phase maintenance cost depends on population growth and annual changes in schistosomiasis prevalence.

11.6.7 *Community resource inputs*

The assumptions underlying community inputs estimations are in Volume 1.

11.6.8 *Capital commodities needs*

(a) Buildings: 1 specimen collecting office in each of the 5 rice collection centres - to be used 6 % of the year for SPC purposes; 1 laboratory for specimen screening to be used 11 % of the year for SPC activities; and 1 treatment building in each of the rice collection centres - to be used 5 % of the year. Each building was assumed to have a life expectancy of 30 year.

(b) Equipments: 5 specimen collecting 3ft by 4ft metal container; five 1.5ft by 2.5ft plastic containers; 20 coulter counter; 20 electric microscopes; 20 weighing scales; 10 electric centrifuge; 20 white trays; 5 examination couches; 30 weighing scales; 5 stethoscopes; 5 blood pressure machines; 30 refuse containers; 30 desks (2ft. by 3 ft.); and 60 foldable chairs.

(c) Vehicles: 6 Toyota Hilux 4WD/DC; 2 Toyota Coaster Bus; and 5 motor cycles would be needed. The vehicles and motor cycles were assumed to have useful life spans of 10 and 5 years respectively.

11.7 Mass Population Chemotherapy

There are two alternative mass population chemotherapy regimes: mass population praziquantel chemotherapy (MPCP) and mass oxamniquine population oxamniquine chemotherapy (MPCO). The mass population chemotherapy (MPC) does not involve screening; treatment is given to every eligible and willing person living within a given endemic geographical area. This characteristic of MPC regimes implies their cost behaviour would be **independent** of overall schistosomiasis prevalence trend; and largely dependent on annual population growth rate.

11.7.1 *Personnel needs*

Each technical staff would take on average 10 minutes to take history and treat a single patient. About 3506 hours would be needed to treat a total number of 21034 patients (21034 patients x 0.1667 hour per patient) during year zero. A team of 25 medical personnel (i.e. clinical officers and nurses), excluding the five experts whose role would be consultative and treatment of those suffering side effects, would take about 18 days (438.3 days / 8 hour working days).

The personnel cost component behaviour would be dependent on annual changes in the population growth rate.

11.7.2 *Material needs*

The year zero material needs estimates were based on the following assumptions:

(a) Assuming one book has 400 pages and one patient requires a page, a total of 52 hard cover books would be required (i.e. 21034 persons divided by 400 pages).

(b) Assuming one ball pen would be used to take details for 473 patients, the medics would require 45 ball pens to attend to 21034 patients (21034/473).

(c) The 25 medics would treat an average of 1200 patients per day; and each of the patients would require about 1 litre of water. Since a standard water can has a 20 litre capacity, a total of 60 cans would be needed (1200/20).

(d) About 21034 disposable drinking glasses would be needed, since each patient would require one.

(e) Each of the 30 medical personnel (including the experts) would need two towels.

(f) Assuming that a medic would require a soap after attending to every 137 patients, 154 pieces of soap would be required (21034/137).

(g) Assuming all those expected to suffer side effects of schistosomal drugs (about 15%) would need an injection, 3155 disposable needles would be required.

(h) About 1578 small syringes (2 ml) would be required; and an equal number of big size syringes (80 ml).
(i) Each of the 30 technical and 10 support staff would require a pair of overcoats.
(j) Each of the 30 medics would require a plastic pail and a washing basin.
(k) Each of the five experts would need approximately four pairs of surgical gloves.
(l) Each of the clinical officers and experts would need a thermometer.
(m) Each of the 21034 patients would need a prescription card.
(n) All women above the age of 15 years would have to take a pregnancy test. Fifty percent (10701) of the population is above 15 years. Assuming fifty per cent of those aged above 15 years are women, then 5351 women would have to take the test.
(o) The cost of materials (MAC) would grow at the rate of population growth rate.

11.7.3 *Schistosome drug needs*

The estimates of drug needs under MPC regimes are independent of the behaviour of schistosomiasis prevalence rates; they are dependent on annual population growth rate. The drug needs assumptions are given in Volume 1.

11.7.4 *Travel and transport needs*

(a) The medical personnel would be given a field lunch allowance of Ksh. 50 each per day.
(b) The 5 schistosomiasis experts (from KEMRI) would be paid a per diem of Ksh. 500 for the 18 days spent in the field.
(c) 1 mini-bus would be required for transporting medical staff who will be commuting daily from Kerugoya District Hospital. Each of the five treatment stations would require a 4 wheel drive pick-up with a capacity for 6 passengers.
(d) The vehicles would be in use for 7 percent of a working year, i.e. 18 working days divided by 261 day work year. Since the maintenance cost is for the whole year, cost attributable to mass population chemotherapy programme were pro rated using the percentage of days the vehicles will be used for the project (i.e. 7 %).
(e) The travel and transport cost (TRC) for the mass population chemotherapy regimes would be dependent on population growth rate.

11.7.5 *Maintenance needs*

The assumptions made under SPC do apply to MPC maintenance.

11.7.6 *Capital commodity needs*

(a) 5 offices would be used each with a useful life expectancy of 30 years.

(b) Most of the medical equipment have been assumed to have to have a life expectancy of 10 years.

(c) Vehicles have been assumed to have life expectancy of 10 years.

(d) In this study the interest rate has been assumed to be 10%.

(e) The buildings, equipment and vehicles will be used for MPC programme only for 18 days in a working year of 261 days. That factor were used to pro rate the capital costs.

(f) By the end of their useful life, capital inputs would have no salvage value.

11.7.7 *Community resource inputs*

The community time input into MPC regimes would occur during therapy information dispatch, travel, waiting / queuing, treatment, externality monitoring and externality treatment. The assumptions are in the text.

Appendix 12 Dispensary-Based Treatment Options for State s Cases

12.1 *Personnel needs*

(a) According to the MoH (1989), a dispensary ought to have 3 enroled nurses (EN), 1 public health technician (PHT) and 2 subordinate staff (SS).
(b) The 1992 average monthly salaries of an EN, PHT and SS are Ksh. 4700, Ksh. 2890 and Ksh. 1340 respectively. The 1992 constant wage rates were used to value labour inputs. The implicit assumption is that those wages are equal to the marginal physical product of respective cadre times price.
(c) The fringe benefits are equivalent to 50% of ones earnings.
(d) An efficiently operating dispensary should attend to a total of 24000 cases per year.
(e) There exists a direct relationship between the demand of personnel time and caseload.
(f) The personnel cost component behaviour would be dependent on annual changes in the mild health state (S) prevalence rate and population growth rate.

12.2 *Inservice training needs*

(a) The Ministry of Health would organize (probably through a non-profit making organization like the African Medical Research Foundation) for the following courses: 5 day course on planning and management (PM); 10 day course on water and sanitation (WS); 6 day course on community drug distribution (CDD) course; 14 day course on primary health care (PHC); 5 day course on essential drugs (ED).
(b) 1 person would be nominated to participate in the courses.
(c) The PM, WS, CDD, PHC and ED would cost Ksh. 843, Ksh. 744, Ksh. 993, Ksh. 358 and Ksh. 347 respectively, per trainee per day (AMREF, 1992).
(d) The training acquired would not only be beneficial to schistosomiasis patients but also to patients suffering from other diseases.

12.3 *Material needs*

With the help of a nurse in charge of one dispensary, the following materials needs were identified: 12 uniforms, @ Ksh. 295; patients cards equal to N_t x SP_{tj}, @

Ksh. 3; 96 ballpens, @ Ksh. 10; 1 hard cover register, @ Ksh. 200; 3 reams of ruled A4 papers, @ Ksh. 150; 6 pairs of rubber gloves, @ Ksh. 125; 12 towels, @ Ksh. 100; 288 toilet soap, @ Ksh. 9.5; 12 water can, @ Ksh. 200; 12 washing plastic basins, @ Ksh. 100; 8 trash containers, @ Ksh. 100; 24 mops, @ Ksh. 50; 24 drying rugs, @ Ksh. 24; Disposable drinking glasses equal to N_t x SP_{tj}, @ Ksh. 5; and 6 thermometer, @ Ksh. 275.

12.4 *Antischistosome drug needs*

The assumptions made in dispensary drug estimations are in the text.

12.5 *Community resource inputs*

The assumptions made in dispensary community input estimations are in the text.

12.6 *Transport and travel needs*

The dispensaries do not have vehicles on site; instead they share the vehicle and motor cycle allocated to the health centre. The percentage of dispensary cases to the total number of health centre and dispensary cases (S) were used to prorate the travel and transportation cost for the dispensary. The dispensary cases constitute 40 percent of the total number of health centre and dispensary patients (24000 annual dispensary cases plus 36000 health centre cases). The schistosomiasis treatment policy share of transport cost in n^{th} year were apportioned using proportion of n^{th} years mild schistosomiasis cases to the total annual dispensary cases.

12.7 *Maintenance needs*

(a) maintenance of equipment and buildings would require 2 percent of their replacement cost (MOPW, 1992);

(b) maintenance of the motor cycle would require 4.32% of its replacement value (KAA, 1992);

(c) maintenance of motor vehicles would need 6.74 % of their replacement cost (KAA, 1992).

12.8 *Capital commodity needs*

(a) interest rate of 10 %;

(b) 1 type D1 dispensary with a replacement value of Ksh. 1860000 and an expected life of 30 years;

(c) 1 Toyota Hilux 4WD (2000cc) petrol vehicle with a border (C.i.f) replacement value of Ksh. 441660; and an expected life of 10 years, after which it becomes write-off with zero salvage value;

(d) 1 motor cycle worth Ksh. 155000; with an expected life of 5 years, and zero salvage value;

(d) an optimally equipped dispensary would have equipment with a border value of Ksh. 434000 (Forgey et. al., 1990), all with expected life of 10 years;

(e) the Toyota Hilux and motor cycle would be used 40% of the time in the dispensary and the rest of the time the H.C.;

(f) Prorated the annual capital cost to the schistosomiasis policies using the proportion of mild schistosomiasis cases to the total annual number of dispensary patients.

APPENDIX 13 Health Centre-based Moderate Schistosomiasis Options

Health Centre-based Moderate Schistosomiasis Options

The appropriate place to treat patients suffering moderate schistosomiasis state (K) would be the health centre. The health centre, unlike the dispensary, has a laboratory where parasitological screening could be done.

13.1 *Personnel needs*

(a) The expected number of moderate schistosomiasis cases, were obtained by multiplying each years projected population of Mwea scheme by the respective policy's health state prevalence.
(b) The health centre ought to treat 36000 cases annually; all those cases will have to undergo screening for schistosomiasis.
(c) 100% screening and treatment compliance.
(d) The screening and treatment will go on throughout the year (12 months).
(e) Direct relationship between personnel time and caseload.
(e) An health centre ought to be staffed with 1 clinical officer earning Ksh. 4700; 1 public health officer earning Ksh. 6860; 2 field health educators @ earning Ksh. 3890; 9 Kenya enroled nurses @ earning Ksh. 4700; 1 public health technician @ earning 2890; 3 laboratory technician @ earning 3890; 2 clerks @ earning Ksh. 2410; 1 driver earning Ksh. 2400; and 8 subordinate staff @ earning Ksh. 1340. The above salaries were per month.
(f) Each personnel fringe benefits were assumed to be 50% of ones earnings.
(g) Each schistosomiasis policy combinations personnel cost were apportioned using the relevant proportions of expected number of moderate schistosomiasis cases to total expected number of health centre cases.

13.2 *In-service training needs*

The assumptions made in-service training needs estimations are in Volume 1.

13.3 *Materials and supplies needs*

(a) 1 stool specimen would be screened per person.

(b) All patients presenting themselves at Kimbimbi Health Centre, will have to be screened for moderate schistosomiasis disease.

(c) The cost of materials likely to be shared with other disease programmes, were apportioned using the percentage of schistosomiasis cases to the total number of health centre patients.

(d) 36000 specimen containers @ Ksh. 60

(e) 36000 specimen container labels @ Ksh. 3.5

(f) 36000 microscope slides @ Ksh. 5

(g) 6 Kato-Katz Templates / Spatula @ Ksh. 120

(h) Since 1 cellophane roll can be used in screening 1500 specimens, 24 rolls would be needed to screen 36000 specimens (36000 / 1500); @ Ksh. 550.

(i) Since one metre of plastic screen is used to screen 12.5 specimens, 2880 square metres would be required to screen 36000 specimens (i.e. 36000 specimens / 12.5 specimens); @ metre Ksh. 1.

(j) Since 10 millilitres of malachite green / glycerine would be required to screen a single stool, a total of 360 litres would be required to screen 36000 specimens; @ Ksh. 50.

(k) Assuming that preparing a single specimen for screening requires 985 millilitres of water, 35460 litres will be required to screen 36000 specimens (36000 specimens times 985ml); @ Ksh. 0.25.

(l) 54 staff uniforms, @ Ksh. 295; 76 ballpens @ Ksh. 10; 90 registers @ Ksh. 200; 5 reams of A4 papers @ Ksh. 150; 22 pairs of rubber gloves @ 125; 54 towels @ 100; 262 toilet soap @ Ksh. 9.5; 35 water cans @ Ksh. 200; 11 washing basins @ Ksh. 100; 19 trash containers @ Ksh. 100; 96 mops @ Ksh. 50; 96 drying rugs @ Ksh. 35; 54 cups @ Ksh. 25; 20 thermometers Ksh. 275; disposable glasses (@ Ksh. 5) and patient cards (@ Ksh. 3) as many as the expected number of patients.

13.4 *Drug needs*

The assumptions are in the volume 1.

13.5 *Travel and transport needs*

(a) The health centre motor cycle and motor vehicle would be used 60% (i.e. 36000 H.C. cases / 60000 H.C. plus dispensary cases) of the time in the health centre and 40% in the dispensaries.
(b) The total health centre annual travel and transport cost were apportioned using ratios of expected number of moderate state cases (with the combination being evaluated in place) to total annual number of health centre cases.

13.6 *Capital commodity needs*

(a) Current replacement value of an health centre buildings is Ksh. 9,920,000; with an expected life of 30 years.
(b) Current replacement border value of health centre equipment is Ksh. 868,000; with expected life of 10 years.
(c) 1 motor vehicle (a Toyota Hilux 4WD) with a C.i.f. value of Ksh. 441660 and a life expectancy of 10 years.
(d) 1 motor cycle (a Yamaha 175cc) with a C.i.f. value of Ksh. 155000 and a life expectancy of 5 years.
(e) 10% interest rate.
(f) Whereas the equipment and buildings are used sorely for health centre activities, transport facilities are used 60% of the time for health centre activities.
(g) The capital cost of buildings, equipment and transport facilities were apportioned to schistosomiasis policy combinations using the proportion of expected number of moderate state cases to the total number of health centre cases.

13.7 *Maintenance needs*

(a) The equipment and buildings maintenance norm is 2% of their replacement value per year (MOPW, 1992).
(b) Maintenance of vehicles would cost 6.4% of their replacement value every year (KAA, 1992).
(c) Maintenance of motor cycles would cost 4.3% of their replacement value every year (KAA, 1992).
(d) 60% of the motor vehicle and motor cycle maintenance cost were apportioned to the

health centre.

(e) The buildings, equipment, and transport facilities maintenance cost were apportioned to the schistosomiasis intervention policies using the proportion of expected number of moderate state cases to the total number of health centre cases.

13.8 *Community resource inputs*

The assumptions upon which expected community input estimates were based are in Volume 1.

Appendix 14 District Hospital-Based Severe State Options

District Hospital-Based Severe State Options

The Kerugoya District Hospital Outpatient Department is the appropriate place to treat the patients suffering severe schistosomiasis disease. It is the nearest public health facility with a radiology department.

14.1 *Personnel needs*

(a) The expected number of severe schistosomiasis cases, were obtained by multiplying each years projected population of Mwea scheme by the respective policy's health state prevalence or probability.

(b) The hospital ought to treat 107391 curative outpatient cases.

(c) The OPD occupies about 13.8% of the hospital space. Assuming a proportionate relationship between hospital space and personnel time, each category of staff time were apportioned to the OPD using the percentage of floor space it occupies.

(d) A district hospital ought to be staffed with 7 doctors earning @ Ksh. 10990; 17 clinical officers earning @ Ksh. 4700; 2 public health officers earning @ Ksh. 6860; 3 field health educators earning @ Ksh. 3890; 30 Kenya enroled nurses earning @ Ksh. 4700; 3 public health technicians earning @ Ksh. 2890; 16 laboratory technicians earning @ Ksh. 3890; 3 pharmacists earning @ Ksh. 7950; 17 pharmaceutical technologists each earning Ksh. 4700; 5 occupation therapists earning @ Ksh. 4700; 2 nutrition officers earning @ Ksh. 4700; 4 nutrition field workers earning @ Ksh. 4700; 1 community oral health education officer earning @ Ksh. 2890; 1 health education officer earning @ Ksh. 3890; 3 medical social workers earning @ Ksh. 3890; 7 physiotherapists earning @ 3867; 11 laboratory technologists earning @ Ksh. 6860; 3 medical records officers earning @ Ksh. 3890; 3 hospital secretaries earning @ Ksh. 6860; 11 clerks earning @ Ksh. 2410; 5 secretaries earning @ Ksh. 2890; 9 drivers earning @ Ksh. 2410; and 98 subordinate staff earning @ Ksh. 1340. Those are monthly salaries. The fringe benefits are equal to 50% of an individuals earnings.

(e) Each cadres time cost were then apportioned to specific severe schistosomiasis disease policy combinations using the proportion of severe schistosomiasis cases to the annual total number of OPD cases.

(f) All the patients visiting the District Hospital from Mwea Division would undergo special x-ray for severe schistosomiasis clinical symptoms, to identify those suffering severe schistosomiasis disease.

(g) 100% screening compliance with x-ray activity.

(h) The screening and treatment will go on throughout the year (12 months).

(i) Direct relationship between personnel time and caseload.

14.2 *In-service training needs*

(a) There is a direct relationship between the number of patients treated and the personnel in-service training costs.

(b) The share of OPD in-service training cost were derived using OPD hospital space 13.8%.

(c) OPD share of in-service training cost were then apportioned to specific severe schistosomiasis disease policy combinations using the proportion of severe schistosomiasis cases to the annual total number of OPD cases.

(d) 2 persons would participate in the 5 day planning and management course - costing Ksh. 843 per trainee per day; 6 persons would participate in the 10 day water and sanitation course - costing Ksh. 744 per trainee per day; 6 persons would participate in the 6 day community drug distribution course - costing Ksh.992 per trainee per day; 16 persons would participate in the 14 day primary health care course - costing Ksh. 358 per trainee per day; and 6 persons would participate in the 5 day primary health care course - costing Ksh. 347 per trainee per day.

14.3 *Materials and supplies needs*

(a) The following screening materials would be needed in year zero: 10742 specimen containers @ Ksh. 60; 10742 specimen container labels @ Ksh. 3.5; 10742 microscope slides @ Ksh. 5; 27 Kato-Katz Templates / Spatula @ Ksh. 120; 7.2 cellophane rolls @ Ksh. 550; 859 sq. metres of plastic screen @ Ksh. 15; and 107420 ml of glycerine @ Ksh. 1. The screening materials are specifically for schistosomiasis policies, thus there was no need of apportioning them.

(b) Other materials: x-ray materials 11210 @ Ksh. 535; 512 staff uniforms @ Ksh. 295; patient cards 10742 @ Ksh. 3; 6048 ball pens @ Ksh. 10; 10 registers @ Ksh. 200; 25 reams of papers @ Ksh. 150; 232 pairs of hand gloves @ Ksh. 125; 464 towels @ Ksh.

100; 6264 toilet soap @ Ksh. 9.5; 98 washing basins @ Ksh. 100; 326 trash containers @ Ksh. 100; 1176 mops @ Ksh. 50; 1176 drying rugs @ Ksh. 35; 10742 disposable drinking glasses @ Ksh. 5; 522 cups @ Ksh. 25; 59 thermometers @ Ksh. 275.

(c) Expected life of all materials is less than one year.

(d) The cost of materials likely to be shared with other disease programmes, were apportioned using the proportion of schistosomiasis cases to the total number of hospital curative OPD cases.

14.4 *Drug needs*

The assumptions are in volume 1.

14.5 *Travel and transport needs*

(a) The District Hospital requires a minimum fleet of six vehicles - ambulance, utility vehicle (for supplies), rural health services, MCH/FP (KEPI) services, administration (staff-car), and general duties vehicle.

(b) The district hospital motor vehicles and motor cycles are used 49% of the time for outpatient department (OPD) activities (Forgey et al., 1990). That percentage were used to prorate the travel and transportation cost to the OPD.

(c) Existence of a direct relationship between the number of patients and the usage of the transport facilities.

(d) The proportion of expected severe schistosomiasis cases to the average annual OPD cases were used to prorate travel and transport cost to schistosomiasis policies.

(e) cost of fuel and oil per kilometre was estimated at Ksh. 4.5 for motor vehicles and Ksh. 0.4464 for motor cycles (KAA, 1992).

14.6 *Capital commodities needs*

(a) The replacement value of a District Hospital buildings was Ksh. 62,000,000 in 1992 (MoH, 1992).

(b) The replacement value (c.i.f.) of all District Hospital equipment was Ksh. 30,992,560 in 1992 (MoH, 1992).

(c) The District Hospital is supposed to have 6 motor vehicles and one motor cycle.
(d) C.i.f. values of each of the following vehicles: Toyota Hilux, Toyota Hi-ace ambulance and Toyota Hi-ace 15 seater minibus is Ksh. 441660.
(e) C.i.f. value of 3 ton Isuzu Elfu is Ksh. 645660.
(f) C.i.f. value of a Yamaha Motor cycle is Ksh. 155000.
(g) Buildings have a life expectancy of 30 years.
(h) Equipment have a life expectancy of 10 years.
(i) Vehicles have a life expectancy of 10 years.
(j) 10% discount rate.
(k) Motor cycles have a life expectancy of 5 years.
(l) The equipment and buildings are used 13.8% (i.e. the percentage of hospital space occupied by OPD) of the time for OPD activities.
(m) The transport facilities are used 49% of the time for OPD activities (Forgey et al., 1990).
(n) The annual capital commodities cost of buildings, equipment and transport facilities was apportioned to schistosomiasis policies using the expected severe schistosomiasis cases to the average annual OPD cases.

14.7 *Maintenance needs*

(a) The maintenance cost for each vehicle were assumed to be 6.4% of its replacement value; and for motor cycles 4.3%. The maintenance cost were prorated to the OPD based on the assumption that the vehicles would be used for OPD purposes 49% of the time. The OPD vehicle maintenance cost were then allocated to the schistosomiasis treatment policies using the percentage of expected number of severe schistosomiasis state cases to the total number of curative outpatients.
(b) The maintenance costs for equipment and buildings were assumed to be 2% of their replacement value. Equipment and building maintenance costs were then prorated to the OPD using the percentage of floor space it occupies (i.e. 13.8%). Then the percentage of the expected number of severe schistosomiasis state cases were used to prorate schistosomiasis intervention policies.

14.8 *Community resources inputs*

The assumptions are in the Volume 1.

Appendix 15 Provincial General Hospital-Based Interventions for the Very Severe State Cases

15.1 *Personnel needs*

(a) The Nyeri Provincial General Hospital (PGH) inpatient department (IPD) is the appropriate health facility to treat the patients suffering very severe schistosomiasis disease.

(b) A Provincial General Hospital ought to be staffed with 55 doctors earning @ Ksh. 10990; 27 clinical officers earning @ Ksh. 4700; 11 dentists earning @ Ksh. 7950; 22 dental technicians earning @ Ksh. 3890; 2 public health officers earning @ Ksh. 6860; 5 radiologist earning @ Ksh. 5680; 10 radio film processors earning @ Ksh. 3890; 2 field health educators earning @ Ksh. 3890; 334 Kenya enroled nurses earning @ Ksh. 4700; 74 public health technicians earning @ Ksh. 2890; 14 laboratory technologists earning @ Ksh. 6860; 28 laboratory technicians earning @ Ksh. 3890; 4 pharmacists earning @ Ksh. 7950; 27 pharmaceutical technologists each earning Ksh. 4700; 8 occupation therapists earning @ Ksh. 4700; 3 nutrition officers earning @ Ksh. 4700; 14 nutrition field workers earning @ Ksh. 4700; 1 community oral health education officer earning @ Ksh. 2890; 1 health education officer earning @ Ksh. 3890; 6 medical social workers earning @ Ksh. 3890; 12 physiotherapists earning @ 3867; 6 medical records officers earning @ Ksh. 3890; 44 medical records technicians earning @ Ksh. 2890; 7 hospital secretaries earning @ Ksh. 6860; 20 clerks earning @ Ksh. 2410; 6 secretaries earning @ Ksh. 2890; 9 drivers earning @ Ksh. 2410; 3 tailors earning @ Ksh. 2890; 6 cooks earning @ Ksh. 1340 and 124 subordinate staff earning @ Ksh. 1340 per month. The fringe benefits were assumed to be equal to 50% of an individuals earnings.

(c) The average number of curative inpatient admissions per year in the PGH are 27366 (in year zero). All other factors held constant, the annual trend of number of admissions is dependent on population growth.

(d) The number of patients expected suffer very severe schistosomiasis state per year, were derived by multiplying the specific year's Mwea population projection by health state prevalence or probability, assuming the policy combination being evaluated is already in place.

(e) The IPD occupies about 86.2% of the hospital space. Assuming a proportionate relationship between hospital space and personnel time, each category of staff time were apportioned to the IPD using the percentage of floor space it occupies.

(f) IPD personnel time cost were then apportioned to the specific very severe schistosomiasis state palliative drug management policy combinations using the proportion of schistosomiasis patients to the annual total number of IPD admissions.

(g) About 27.1% of the Nyeri PGH IPD cases are surgical cases (interactive interview with Dr. Shariff, 1992). That percentage were used to prorate the personnel cost of the surgical department. The surgical department personnel time cost were then apportioned to the specific very severe schistosomiasis state surgical operation policy combinations using the proportion of very severe schistosomiasis patients to the annual total number of surgical department cases.

(h) All the 6842 patients visiting the PGH from Mwea Irrigation Scheme will undergo special x-ray for very severe schistosomiasis clinical symptoms. It is the only way of identifying those suffering very severe schistosomiasis disease.

(i) 100% screening compliance with x-ray activity.

(j) The screening and treatment will go on throughout the year (12 months).

15.2 *In-service training needs*

(a) There is a direct relationship between the number of patients attended to and the personnel in-service training costs.

(b) 8 persons would participate in the 5 day planning and management course - costing Ksh. 843 per trainee per day; and 2 persons would participate in the 5 day essential drugs course - costing Ksh. 347 per trainee per day.

(c) The share of IPD in-service training cost were derived using IPD hospital space 86.2% (Forgey et al., 1990).

(d) IPD in-service training cost were then apportioned to specific very severe schistosomiasis state palliative drug management policy combinations using the proportion of severe schistosomiasis cases to the annual total number of IPD cases.

(e) About 27.1% of the Nyeri PGH IPD cases are surgical cases (interactive interview with Dr. Shariff, 1992). That percentage were used to prorate the in-service training cost of the surgical department. The surgical department in-service training cost were then apportioned to the specific very severe schistosomiasis state surgical operation policy combinations using the proportion of very severe schistosomiasis patients to the annual total number of surgical department cases.

15.3 *Materials and supplies needs*

The assumptions are in Volume 1.

15.4 *Travel and transport needs*

(a) The Provincial General Hospital (PGH) requires a minimum fleet of six vehicles - ambulance, utility vehicle (for supplies), rural health services, MCH/FP (KEPI) services, Administration (staff-car), and general duties vehicle.
(b) The PGH motor vehicles and motor cycles are used 51% of the time for inpatient department (IPD) activities (Forgey et al, 1990). That percentage were used to prorate the travel and transportation cost to the IPD.
(c) Existence of a direct relationship between the number of patients and the usage of the transport facilities.
(d) The cost of fuel and oil per kilometre was estimated at Ksh. 4.5 for motor vehicles and Ksh. 0.4464 for motor cycles (KAA, 1992).
(e) IPD travel and transport cost were then apportioned to specific very severe schistosomiasis state palliative drug management policy combinations using the proportion of severe schistosomiasis cases to the annual total number of IPD cases.
(f) About 27.1% of the Nyeri PGH IPD cases are surgical cases
(interactive interview with Dr. Shariff, 1992). That percentage were used to prorate the travel and transport cost of the surgical department. The surgical department travel and transport cost were then apportioned to the specific very severe schistosomiasis state surgical operation policy combinations using the proportion of very severe schistosomiasis patients to the annual total number of surgical department cases.

15.5 *Drug needs*

(a) Since 63% of total drug expenditure goes to the purchase of drugs for inpatient departments (Forgey et al., 1990), that percentage was used to prorate IPD drug and dressings expenditure.

(b) Since drugs are available 69% of the time in hospitals; drug expenditure estimates were inflated by 31% to cater for shortages in the course of the year.

(c) Drugs and dressing constitutes 12% of the total recurrent expenditure in PGH (PADS, 1989).

(d) Total PGH expenditure during financial year 1991/92 was about Ksh. 79,767,685.

(f) The cost of drugs needed in specific schistosomiasis policy combinations were prorated using the proportion of admissions due to very severe schistosomiasis disease infection to the total number of inpatient department admissions.

The PGH estimate of annual expenditure on drugs and dressings in general were obtained as follows:

Ksh. 79,767,685	x	12%	=	Ksh. 9572122
Total PGH Expenditure		Share of drugs		Estimate of drugs for 69% of time

Level of expenditure needed to operate the PGH pharmacy throughout the financial year were obtained by inflating the above estimate by 31%.

Ksh.9572122	+	(31%	x	Ksh.9572122)	=	Ksh. 12539480
Drugs & Dressings Expenditure		Time not in stock		D & D Expenditure		Level of expenditure Required.

The annual cost of drugs and dressings for schistosomiasis intervention policies (PGHDM or PGHSO) were obtained by multiplying drugs and dressings expenditure by 63% (IPD share) and then by proportion of expected number of very severe schistosomiasis cases by expected total number of IPD cases.

15.6 *Capital commodity needs*

(a) The replacement value of a PGH buildings was Ksh. 62,000,000 in 1992 (MoH, 1992).

(b) The replacement value (c.i.f.) of all District Hospital equipment was Ksh. 30,992,560 in 1992 (MoH, 1992).

(c) The PGH is also supposed to have 6 motor vehicles and one motor cycle.

(d) C.i.f. values of each of the following vehicles: Toyota Hilux, Toyota Hi-ace ambulance and Toyota Hi-ace 15 seater minibus is Ksh. 441660.

(e) C.i.f. value of 3 ton Isuzu Elfu is Ksh. 645660.

(f) C.i.f. value of a Yamaha Motor cycle is Ksh. 155000.

(g) Buildings have a life expectancy of 30 years.

(h) Equipment have a life expectancy of 10 years.

(i) Vehicles have a life expectancy of 10 years.

(j) 10% interest rate.

(k) Motor cycles have a life expectancy of 5 years.

(l) The equipment and buildings are used 86.2% of the time for IPD activities.

(m) The transport facilities are used 51% of the time for IPD activities.

(n) The annual capital commodities cost of buildings, equipment and transport facilities were apportioned to severe state policy combinations using the proportion of expected number of very severe schistosomiasis cases by expected total number of IPD cases.

15.7 *Maintenance needs*

Equipment

(a) The maintenance norm for PGH equipment is 2.4% of their total replacement value; that were used to derive PGH equipment annual maintenance cost.
(b) Equipment maintenance cost were then apportioned to the IPD using the percentage of floor space occupied it occupies (i.e. 86.2%).
(c) That cost were subsequently allotted to the schistosomiasis policies using the ratio of schistosomiasis inpatients at the PGH to the total number of annual admissions at the PGH.

Vehicles

(a) The maintenance cost for each vehicle were assumed to be 6.4% of its replacement value; and for motor cycles 4.3%.
(b) The maintenance cost were prorated to the IPD on the basis of the time transport facilities would be used for IPD purposes (i.e. 51% of the time).
(c) The IPD vehicle maintenance cost were then allocated to the schistosomiasis treatment policies using the expected percentage of schistosomiasis patients to the annual

number of the PGH inpatients.

Buildings

(a) The maintenance cost for buildings were assumed to be 2% of their replacement value.

(b) Building maintenance cost were then prorated to the IPD using the percentage of floor space it occupies (i.e. 86.2%). (c) Then the expected percentage of the schistosomiasis inpatients were used to prorate schistosomiasis intervention policies.

15.9 *Community resources*

The assumptions are in Volume 1.

Appendix 16A Local Expert Probabilistic Effectiveness Judgements and Results

Impacts of Primary Policies on Overall Schistosomiasis Prevalence

Fig. 7.2: Schistosomiasis Prevalence

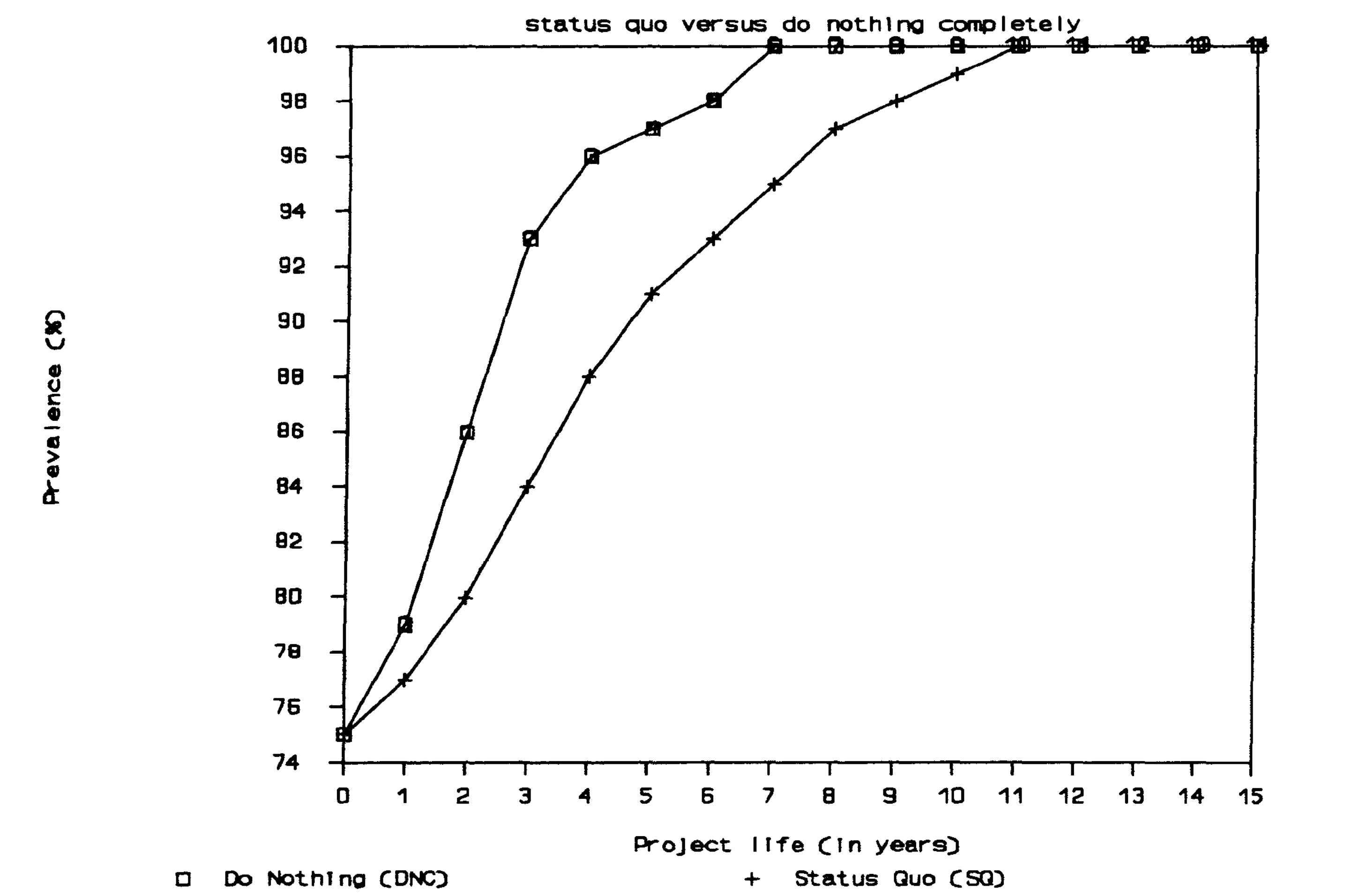


FIG. 7.3: Schistomiasis Prevalence

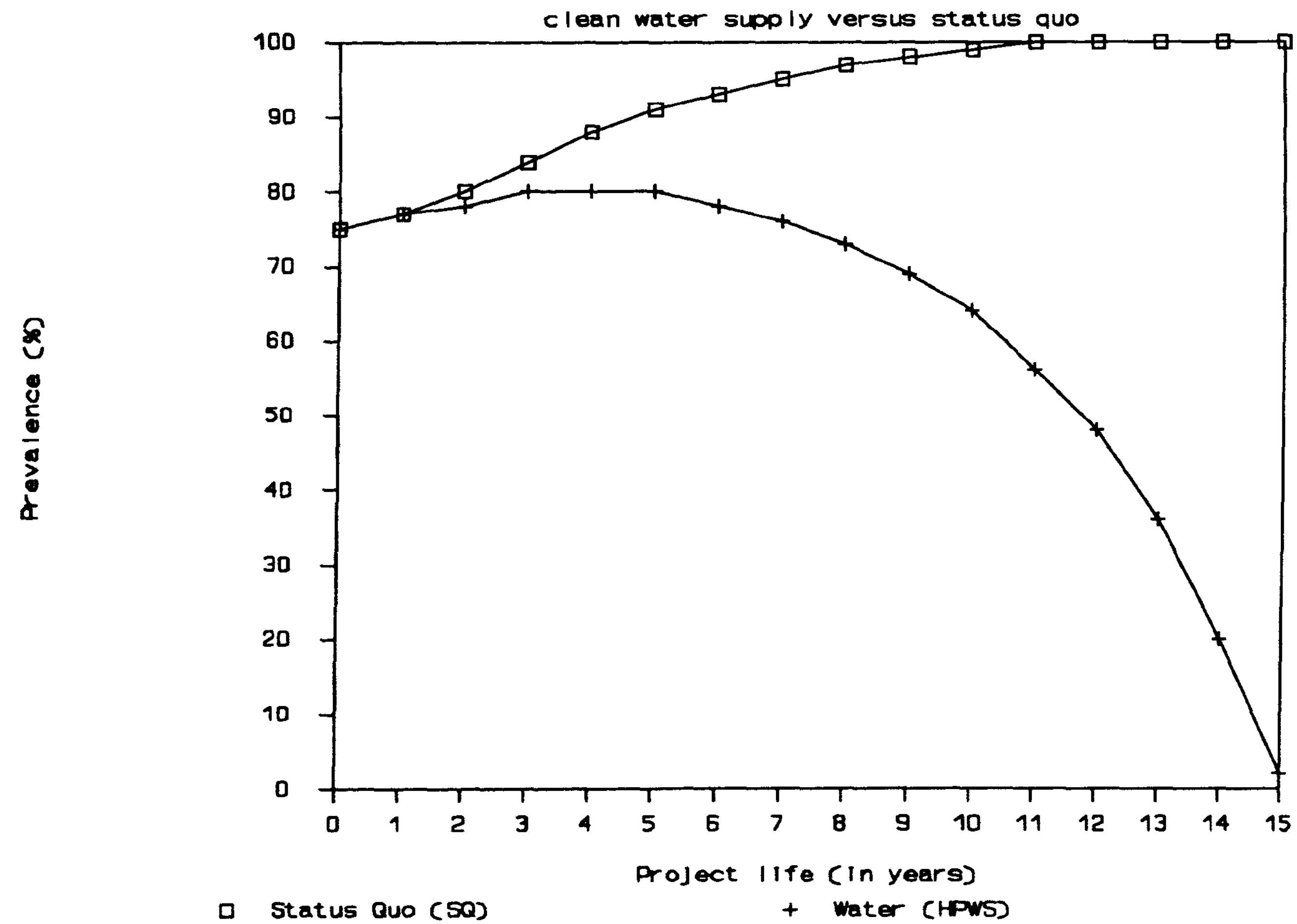
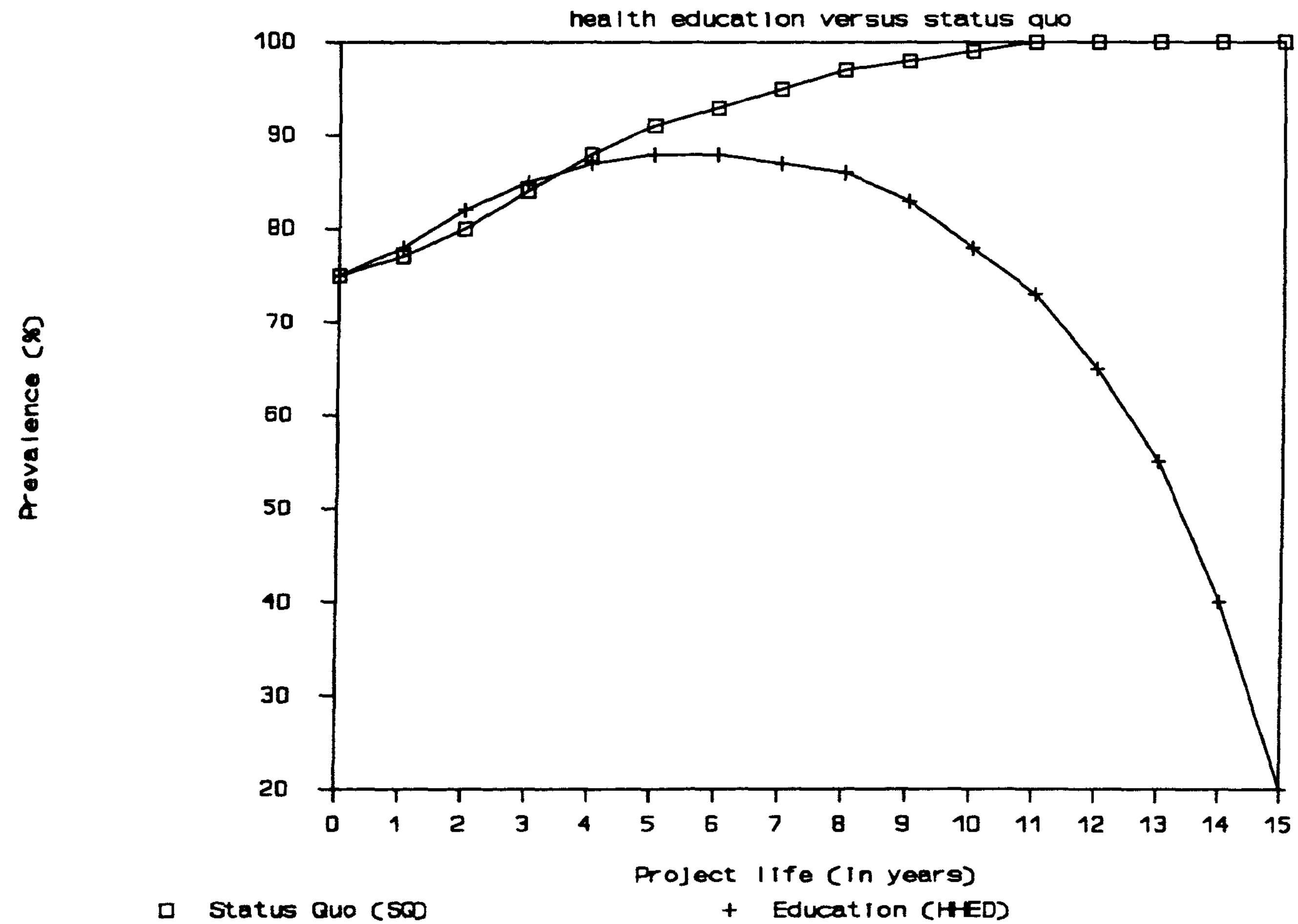


FIG. 7.4: Schistomiasis Prevalence



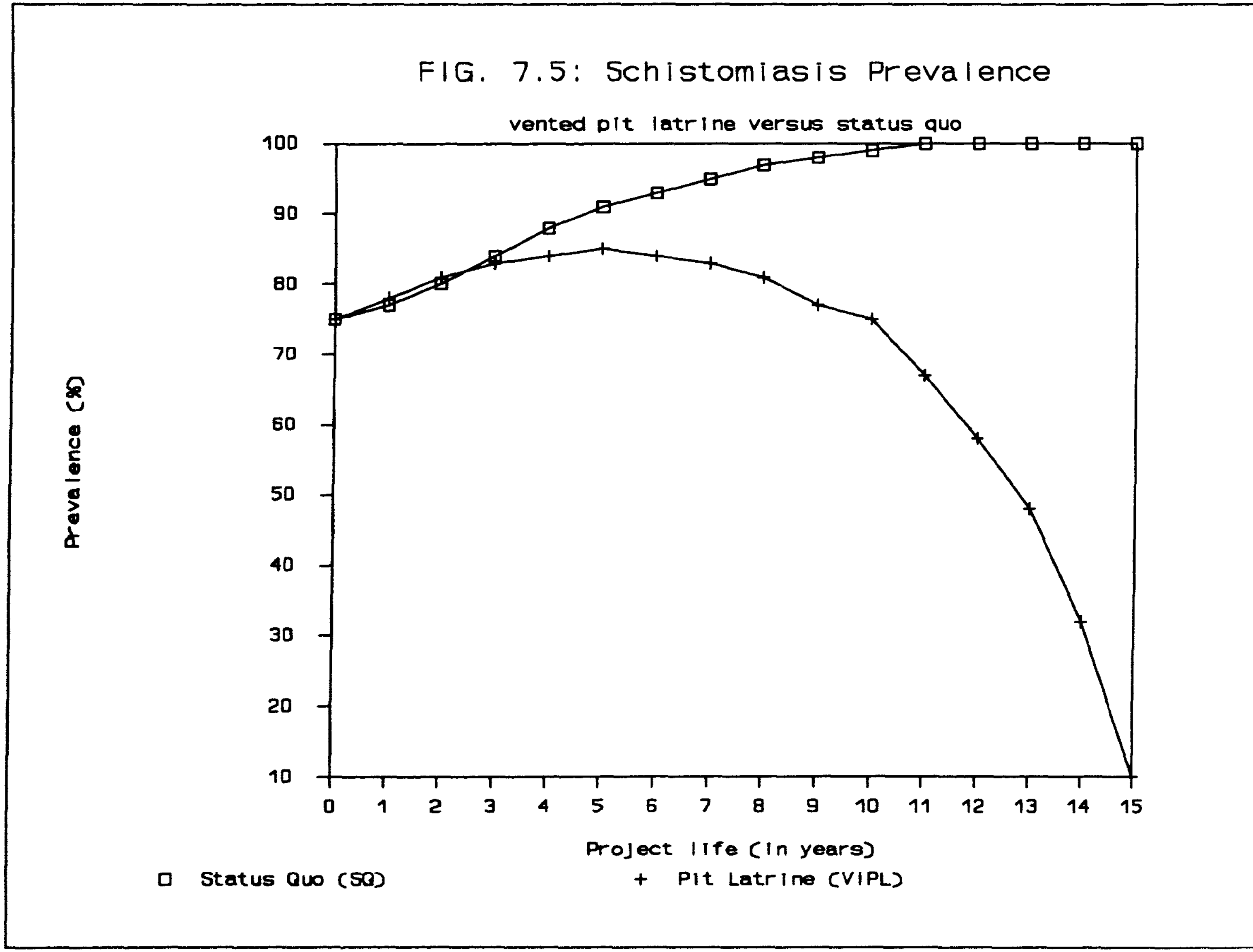


FIG. 7.5: Schistomiasis Prevalence
vented pit latrine versus status quo
Prevalence (%)
100
90
80
70
60
50
40
30
20
10
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Project life (in years)
Status Quo (SQ)
Pit Latrine (VIPL)

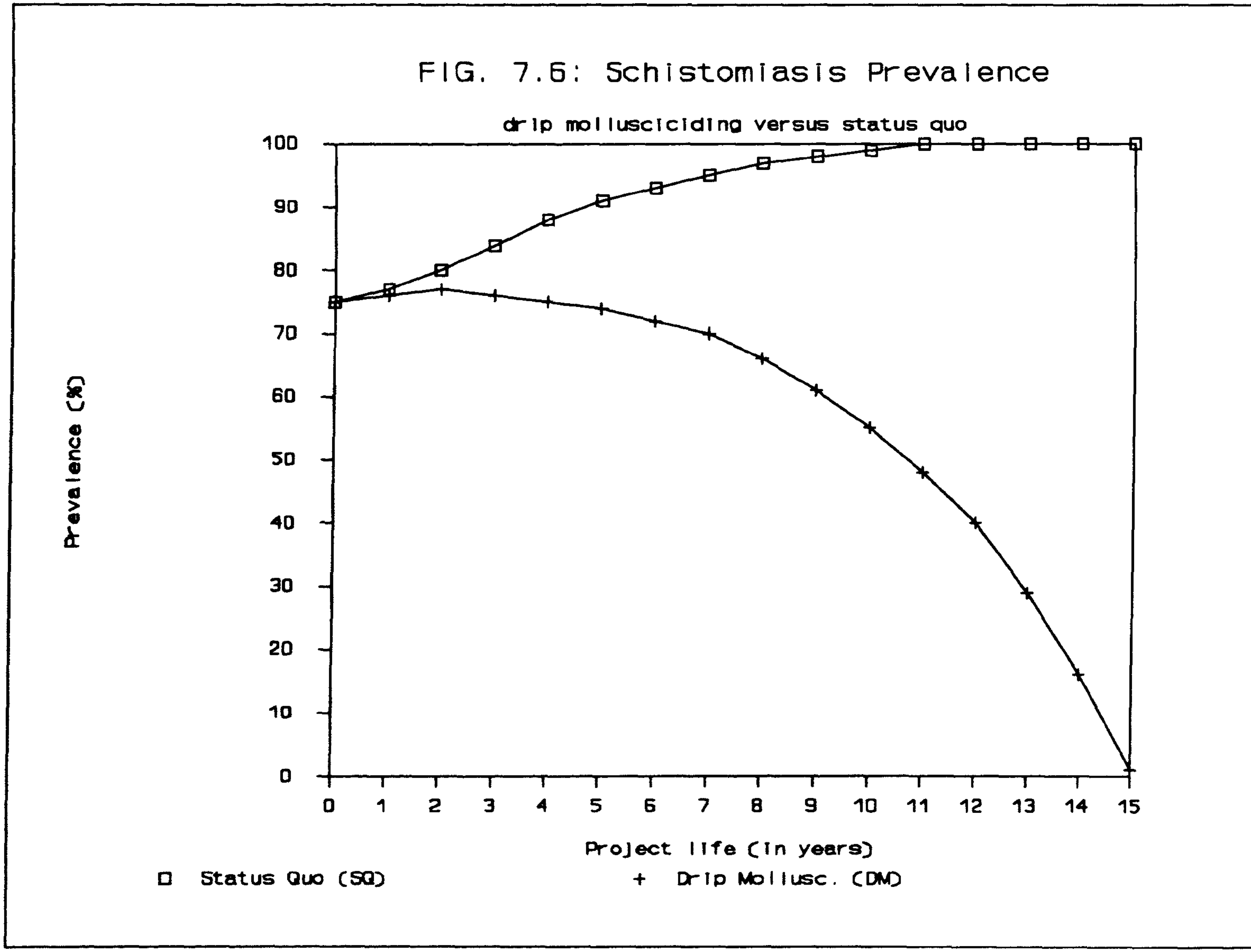


FIG. 7.6: Schistomiasis Prevalence
drip mollusciciding versus status quo
Prevalence (%)
100
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Project life (in years)
Status Quo (SQ)
+ Drip Mollusc. (DM)

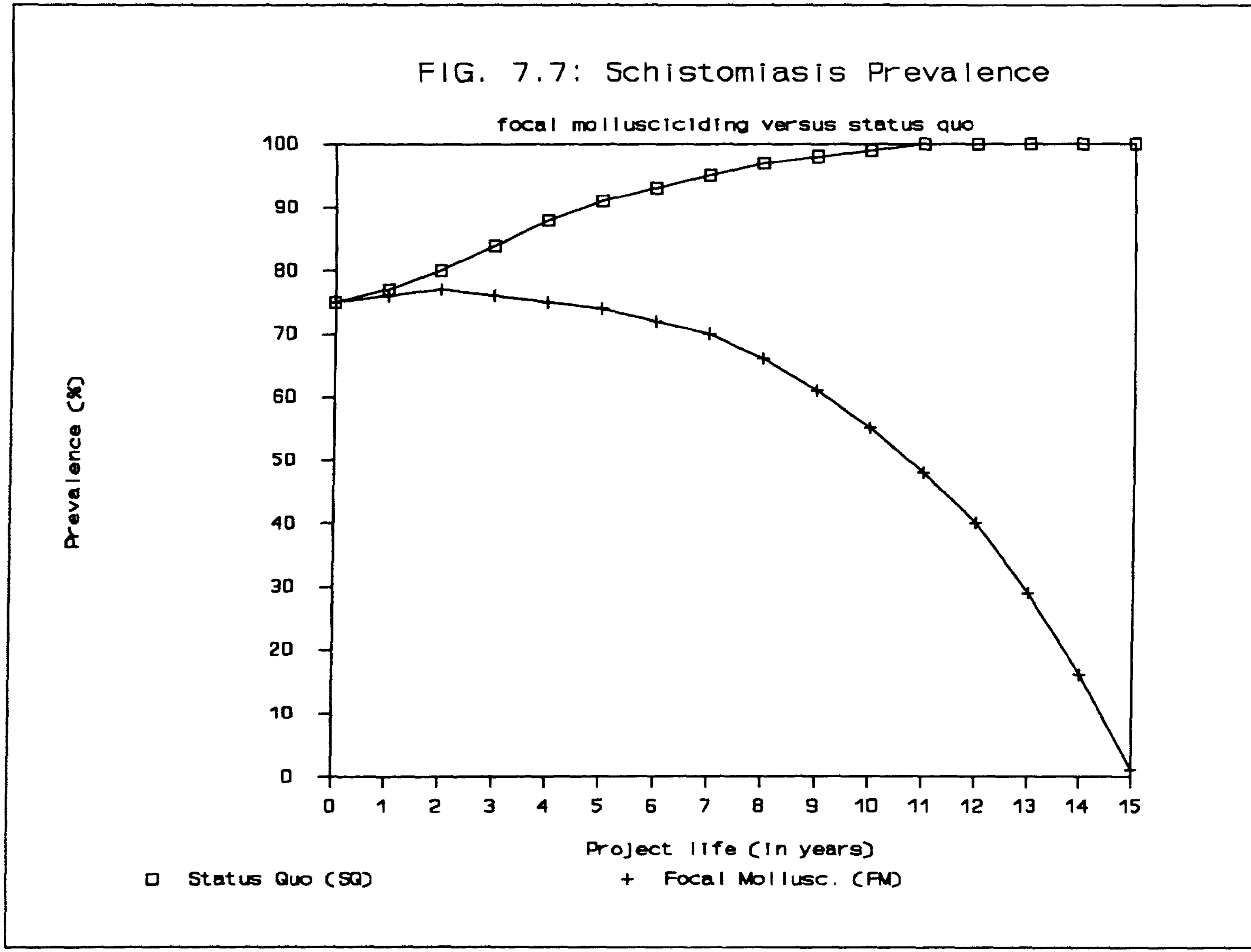
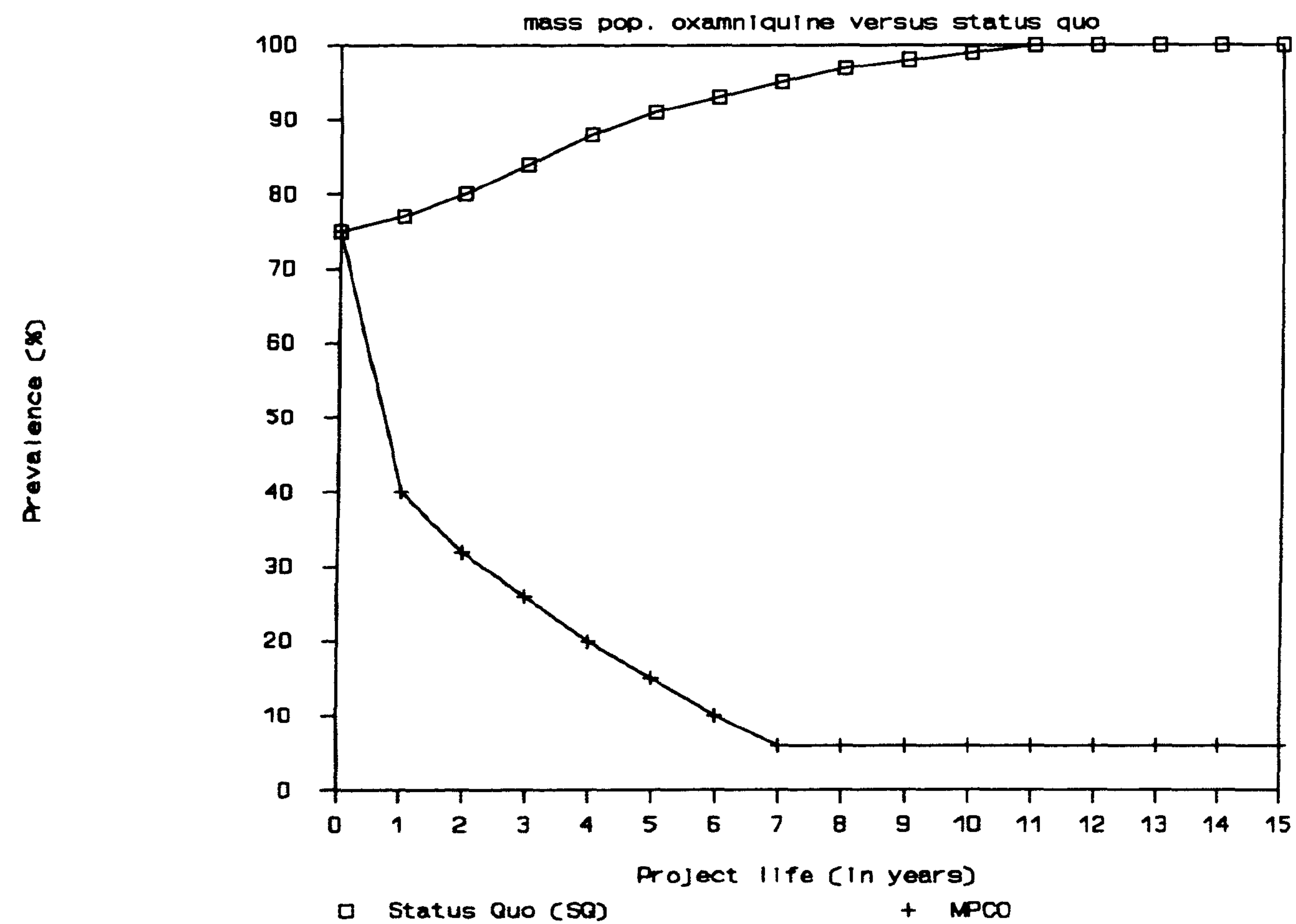


FIG. 7.7: Schistomiasis Prevalence
focal molluscicIdIng versus status quo
Prevalence (%)
100
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Project life (in years)
Status Quo (SQ)
+ Focal Mollusc. (FM)

FIG. 7.8: Schistomiasis Prevalence



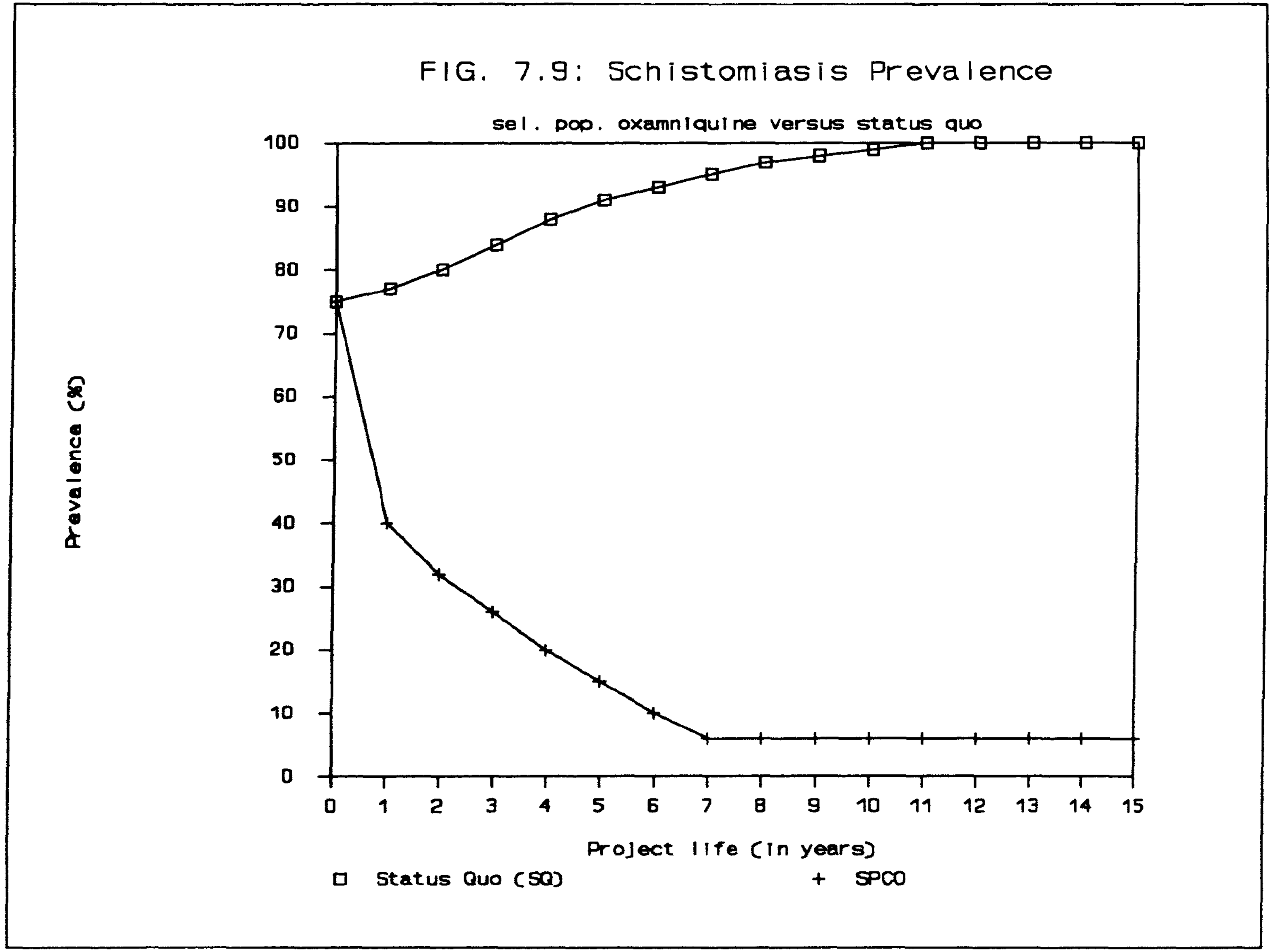


FIG. 7.9: Schistomiasis Prevalence
sel. pop. oxamniquine versus status quo
Prevalence (%)
100
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Project life (in years)
Status Quo (SQ)
SPCO

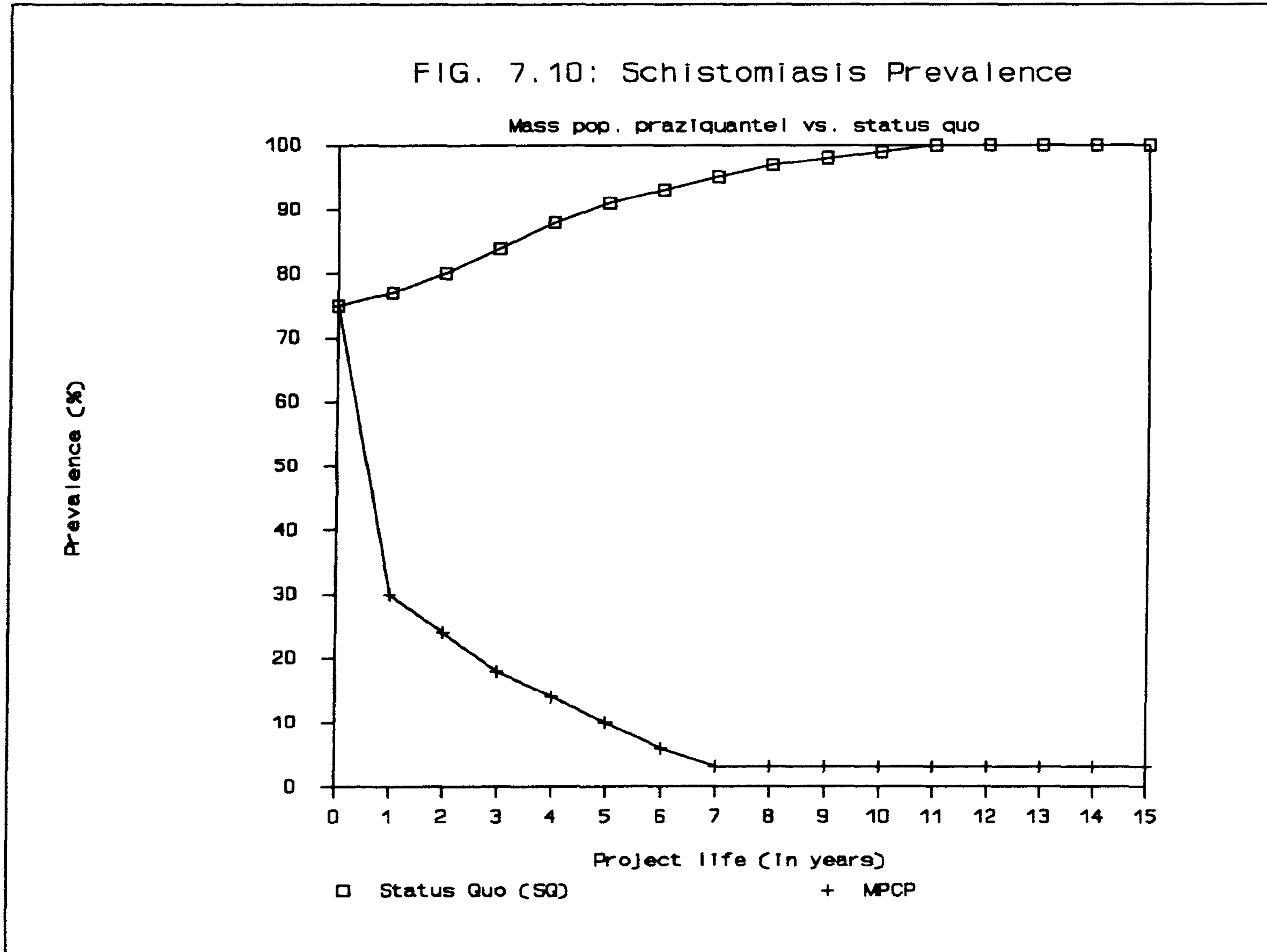


FIG. 7.10: Schistomiasis Prevalence
Mass pop. praziquantel vs. status quo
Prevalence (%)
100
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Project life (in years)
Status Quo (SQ)
MPCP

FIG. 7.11: Schistomiasis Prevalence

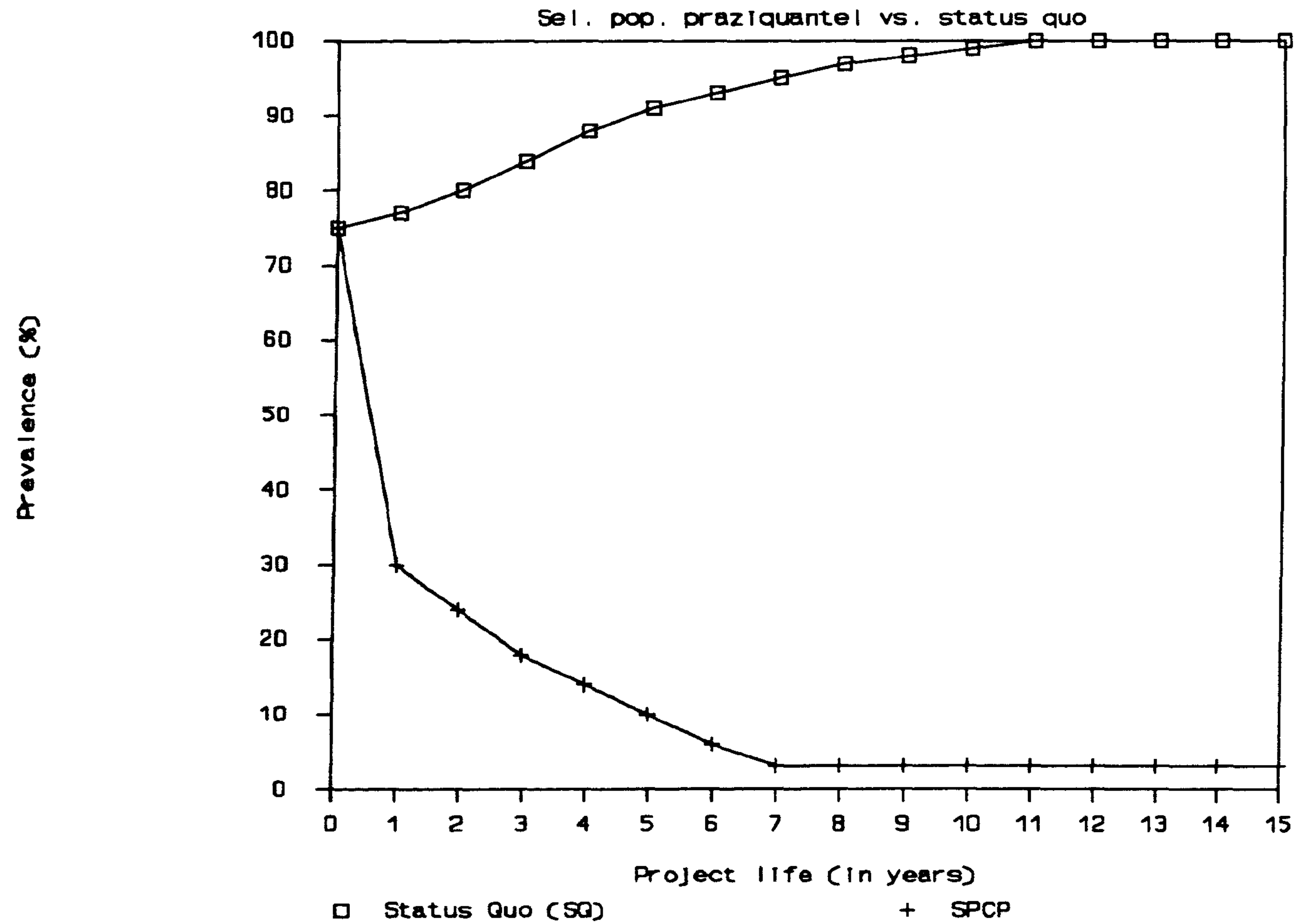
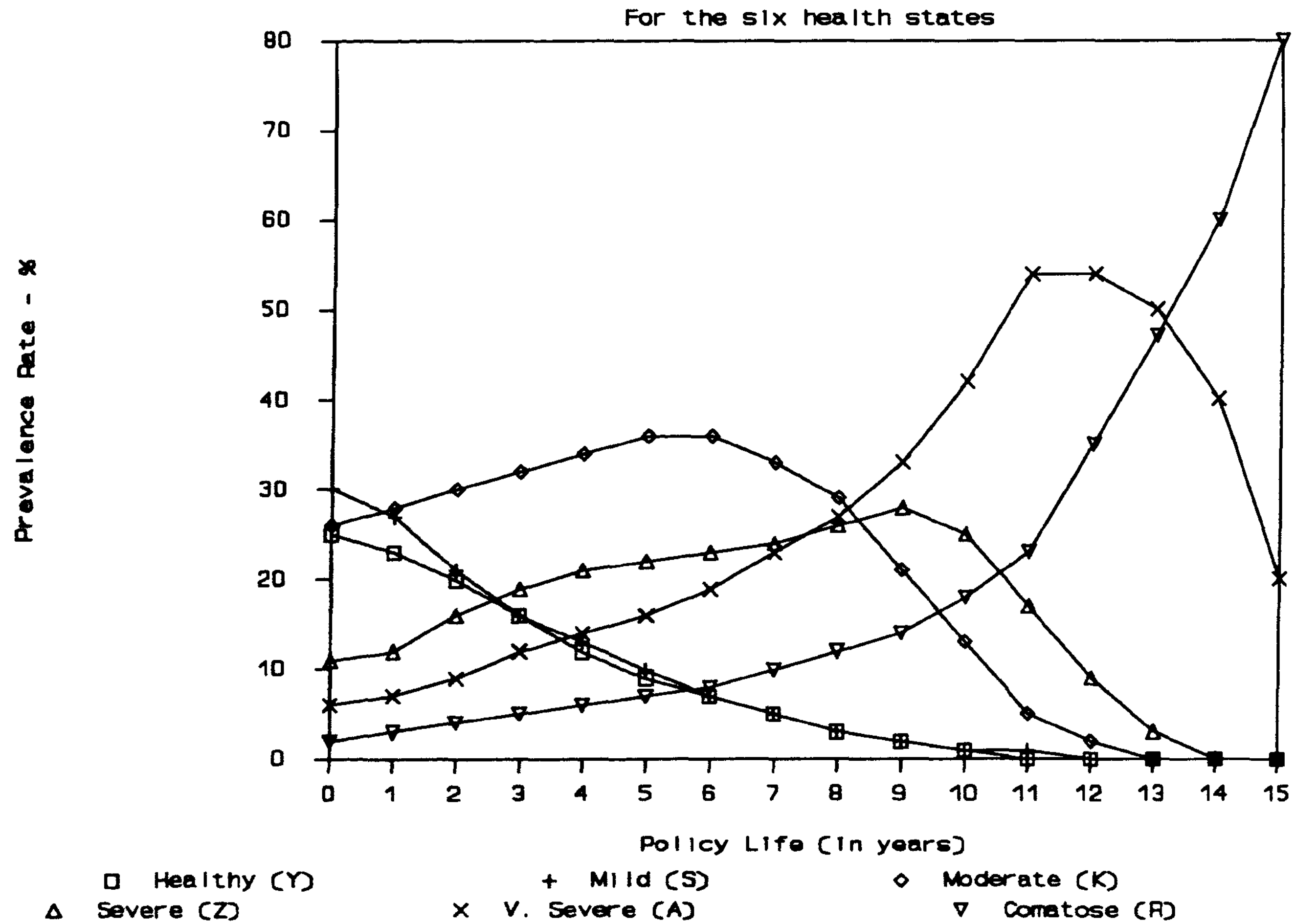


Table 1a: Overall schistosomiasis prevalence with various primary preventive policies										
YEAR	DNC	SQ	HPWS	HHED	VIPL	DM	FM	MPCO	SPCO	MPCP	SPCP
0	75	75	75	75	75	75	75	75	75	75	75
1	79	77	77	78	78	76	76	40	40	30	30
2	86	80	78	82	81	77	77	32	32	24	24
3	93	84	80	85	83	76	76	26	26	18	18
4	96	88	80	87	84	75	75	20	20	14	14
5	97	91	80	88	85	74	74	15	15	10	10
6	98	93	78	88	84	72	72	10	10	6	6
7	100	95	76	87	83	70	70	6	6	3	3
8	100	97	73	86	81	66	66	6	6	3	3
9	100	98	69	83	77	61	61	6	6	3	3
10	100	99	64	78	75	55	55	6	6	3	3
11	100	100	56	73	67	48	48	6	6	3	3
12	100	100	48	65	58	40	40	6	6	3	3
13	100	100	36	55	48	29	29	6	6	3	3
14	100	100	20	40	32	16	16	6	6	3	3

15	100	100	2	20	10	1	1	6	6	3	3

Schistosomiasis Health States Prevalence Under Various Primary Policies

FIG. 1: STATUS QUO PREVALENCE RATES:



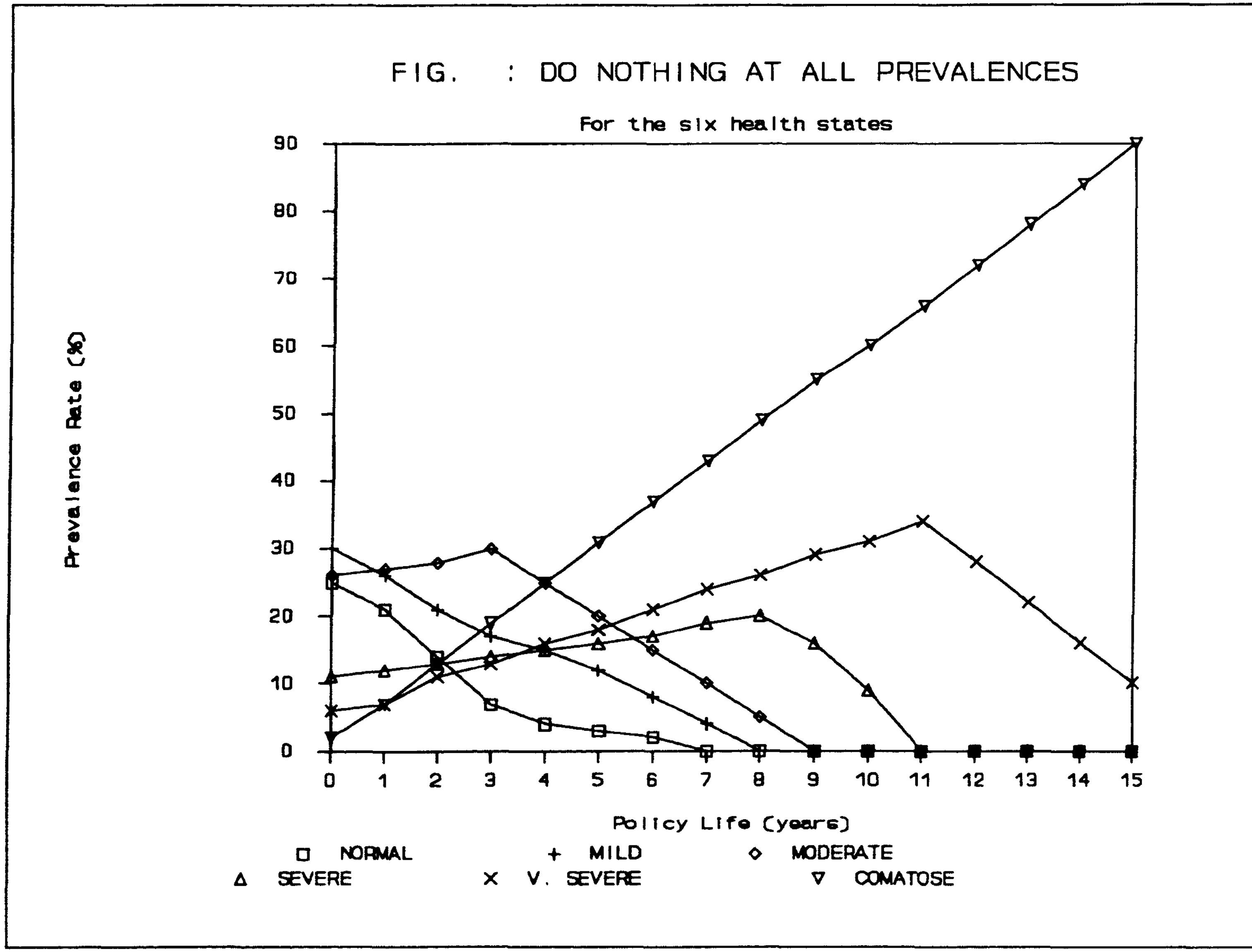


FIG. : DO NOTHING AT ALL PREVALENCES
For the six health states
Prevalence Rate (%)
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Policy Life (years)
NORMAL
MILD
MODERATE
SEVERE
V. SEVERE
COMATOSE

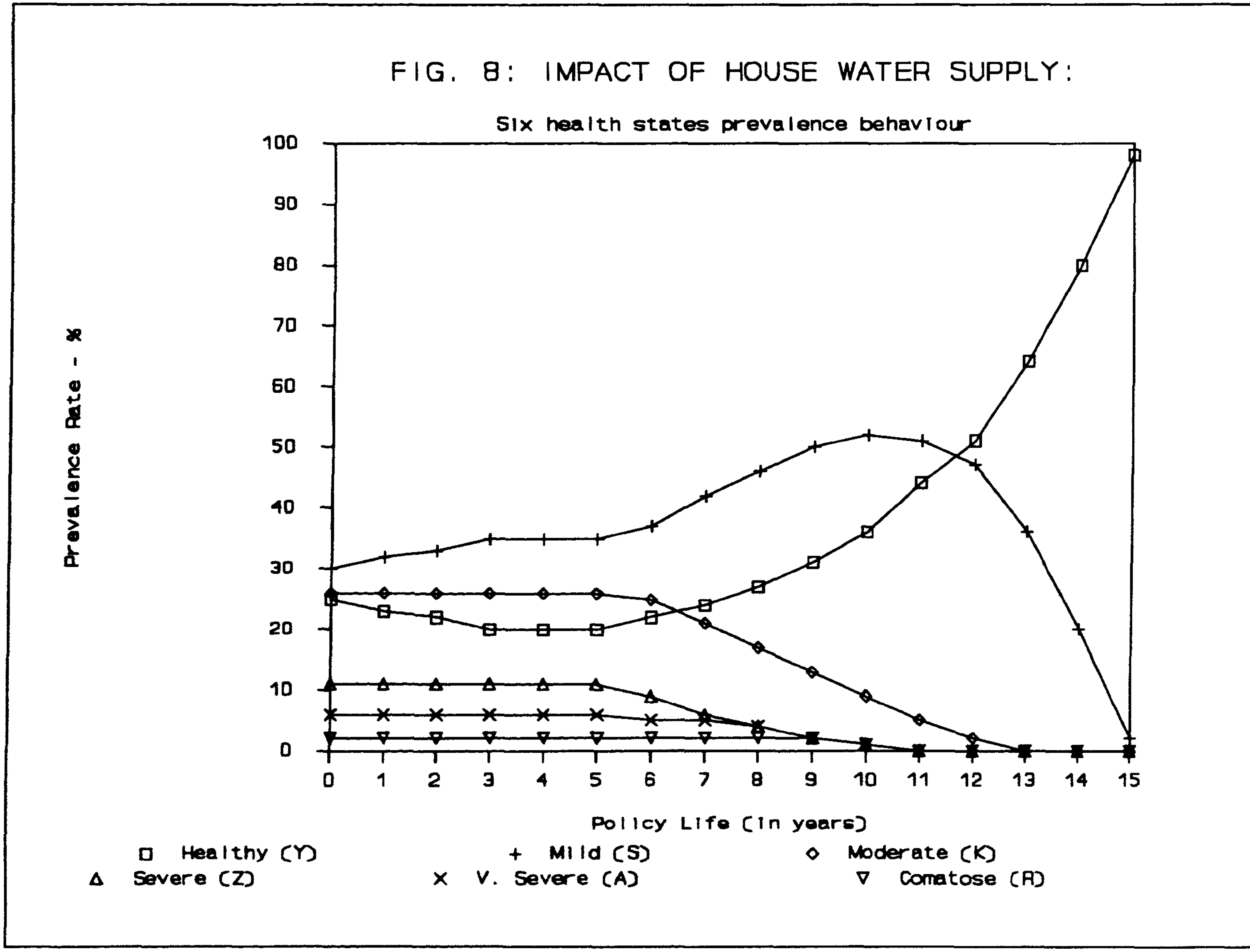
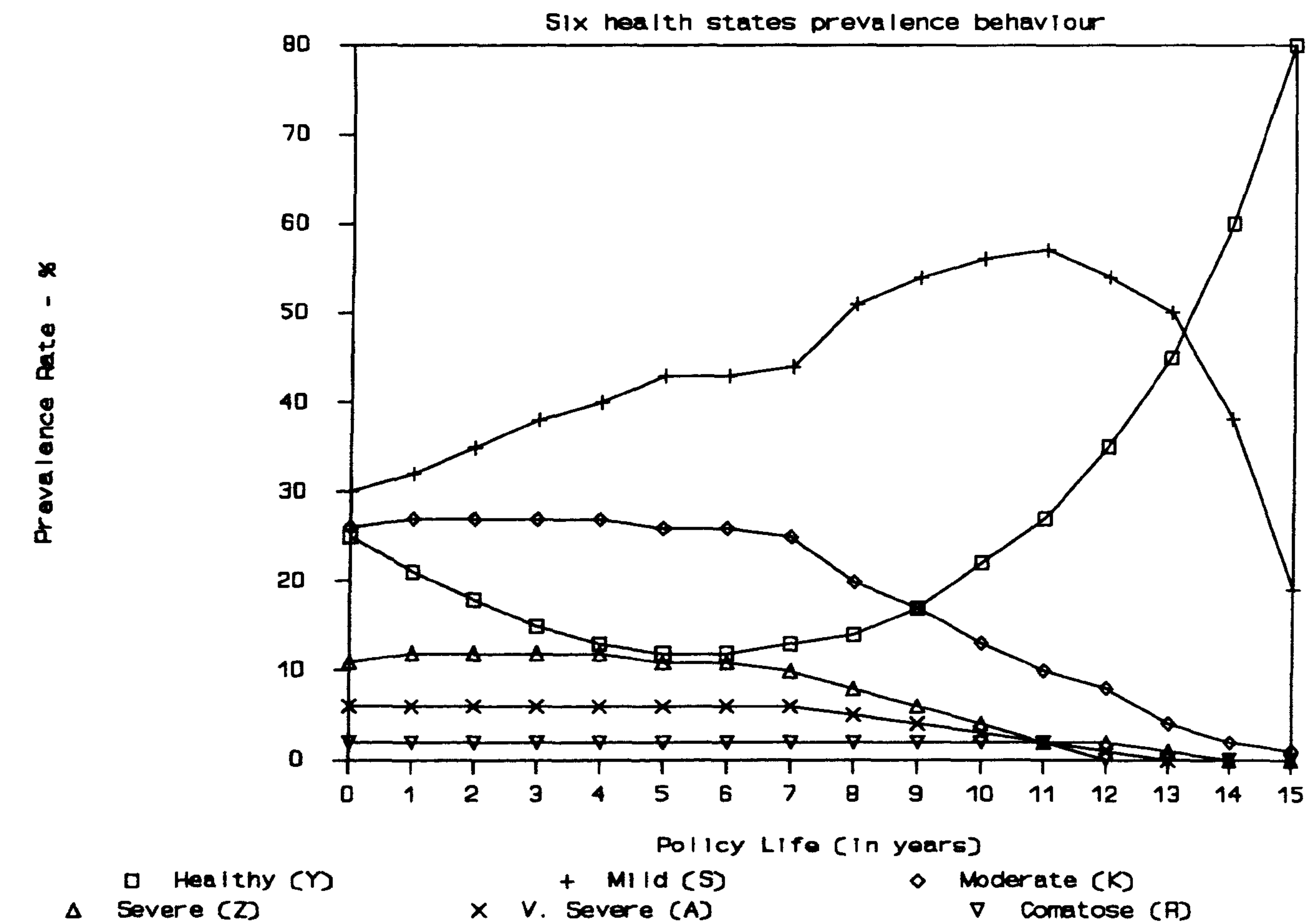


FIG. 8: IMPACT OF HOUSE WATER SUPPLY:
Six health states prevalence behaviour
Prevalence Rate - %
Policy Life (in years)
Healthy (Y)
Mild (S)
Moderate (K)
Severe (Z)
V. Severe (A)
Comatose (R)

FIG. 10: IMPACT OF HEALTH EDUCATION:



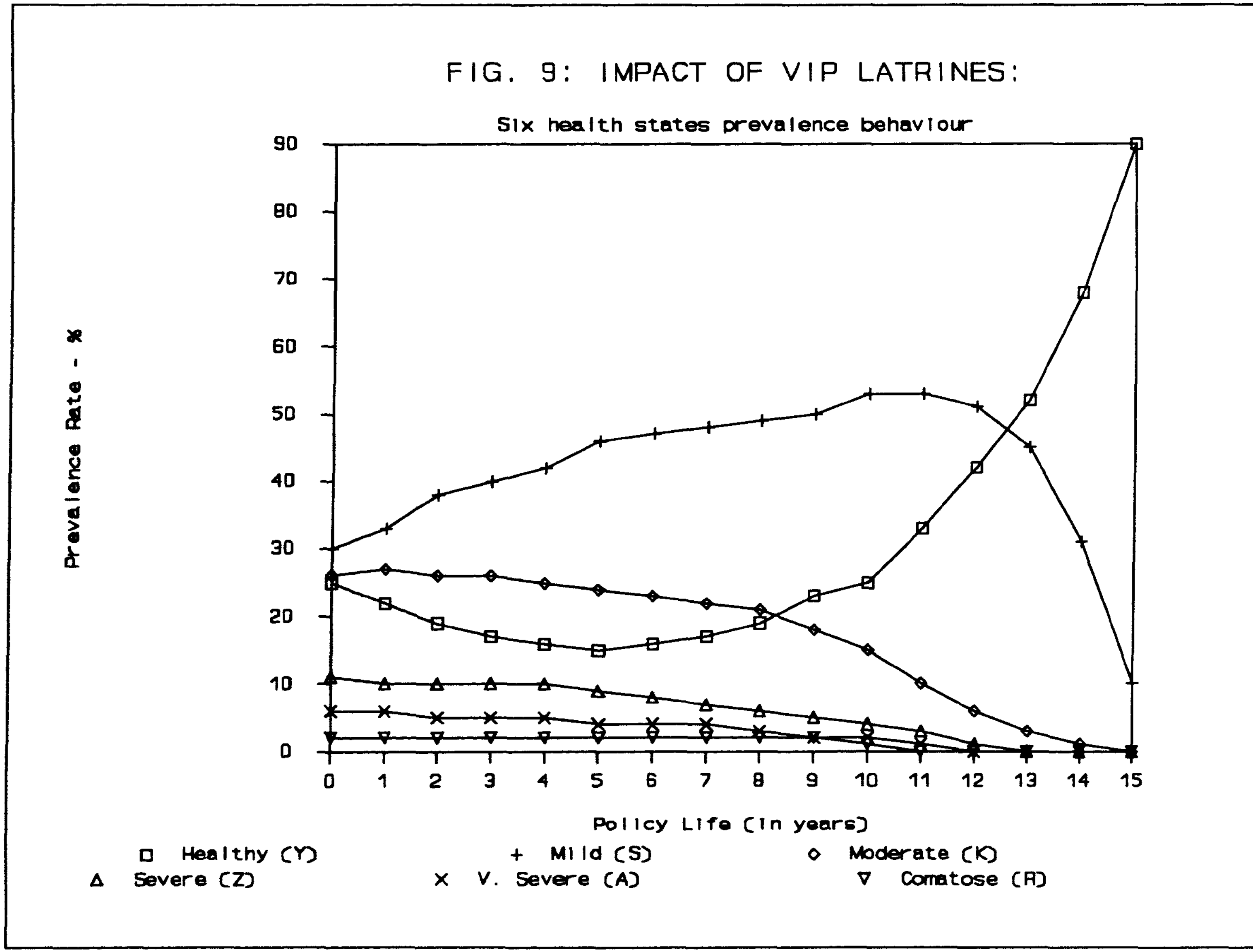


FIG. 9: IMPACT OF VIP LATRINES:
Six health states prevalence behaviour
Prevalence Rate - %
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Policy Life (in years)
Healthy (Y)
Mild (S)
Moderate (K)
Severe (Z)
V. Severe (A)
Comatose (R)

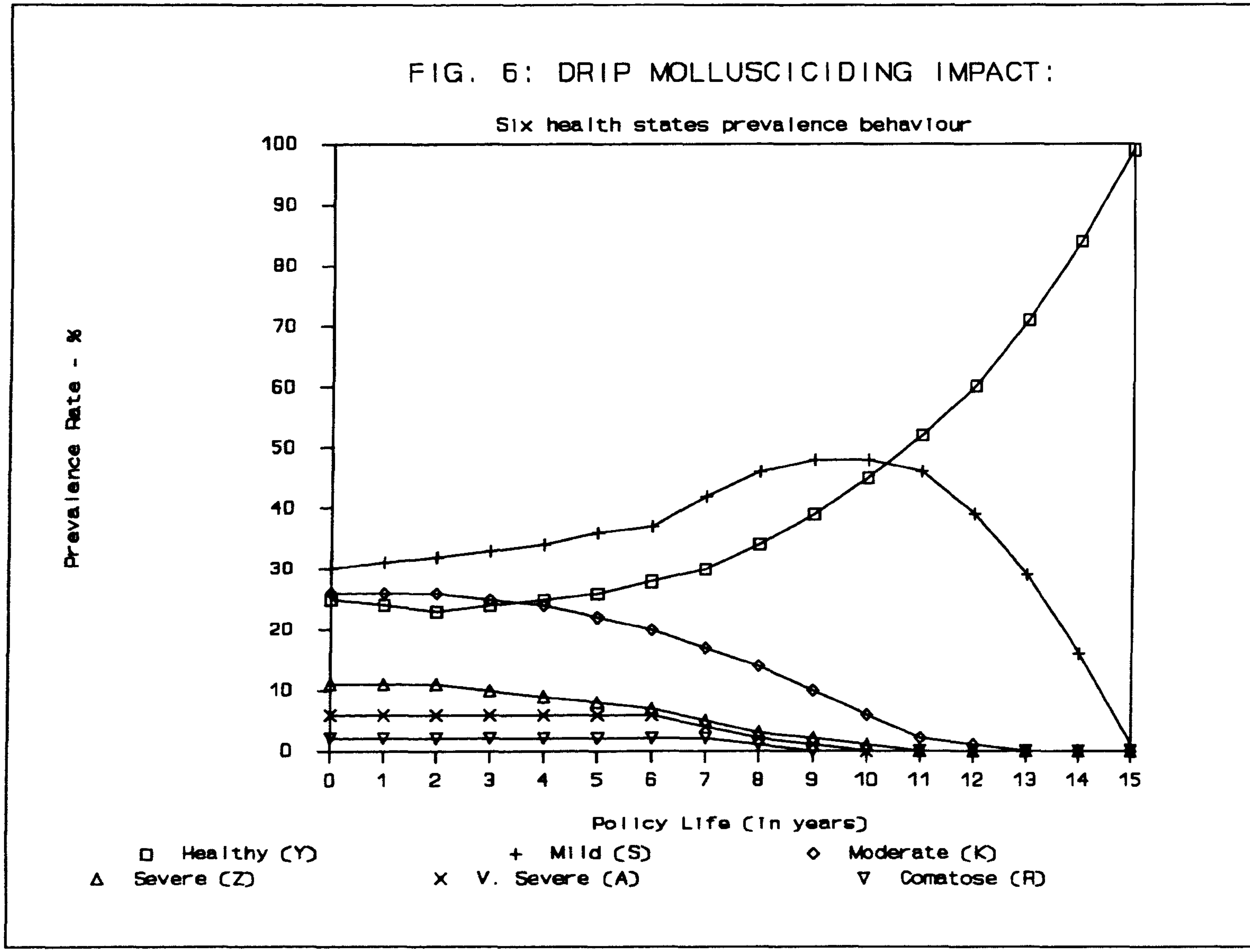
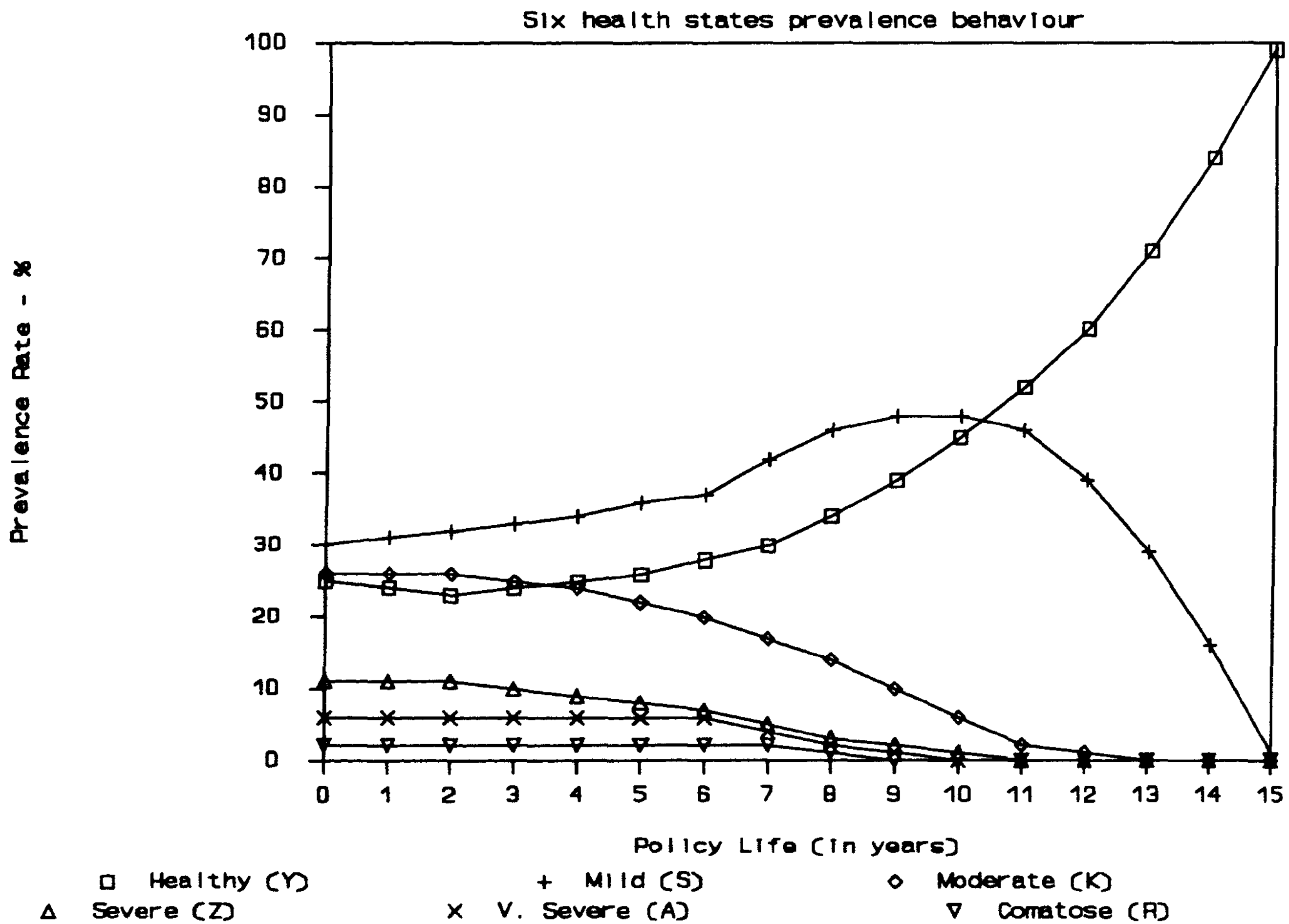


FIG. 6: DRIP MOLLUSCICIDING IMPACT:
Six health states prevalence behaviour
Prevalence Rate - %
100
90
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Policy Life (in years)
Healthy (Y)
Mild (S)
Moderate (K)
Severe (Z)
V. Severe (A)
Comatose (R)

FIG. 7: FOCAL MOLLUSCICIDING IMPACT:



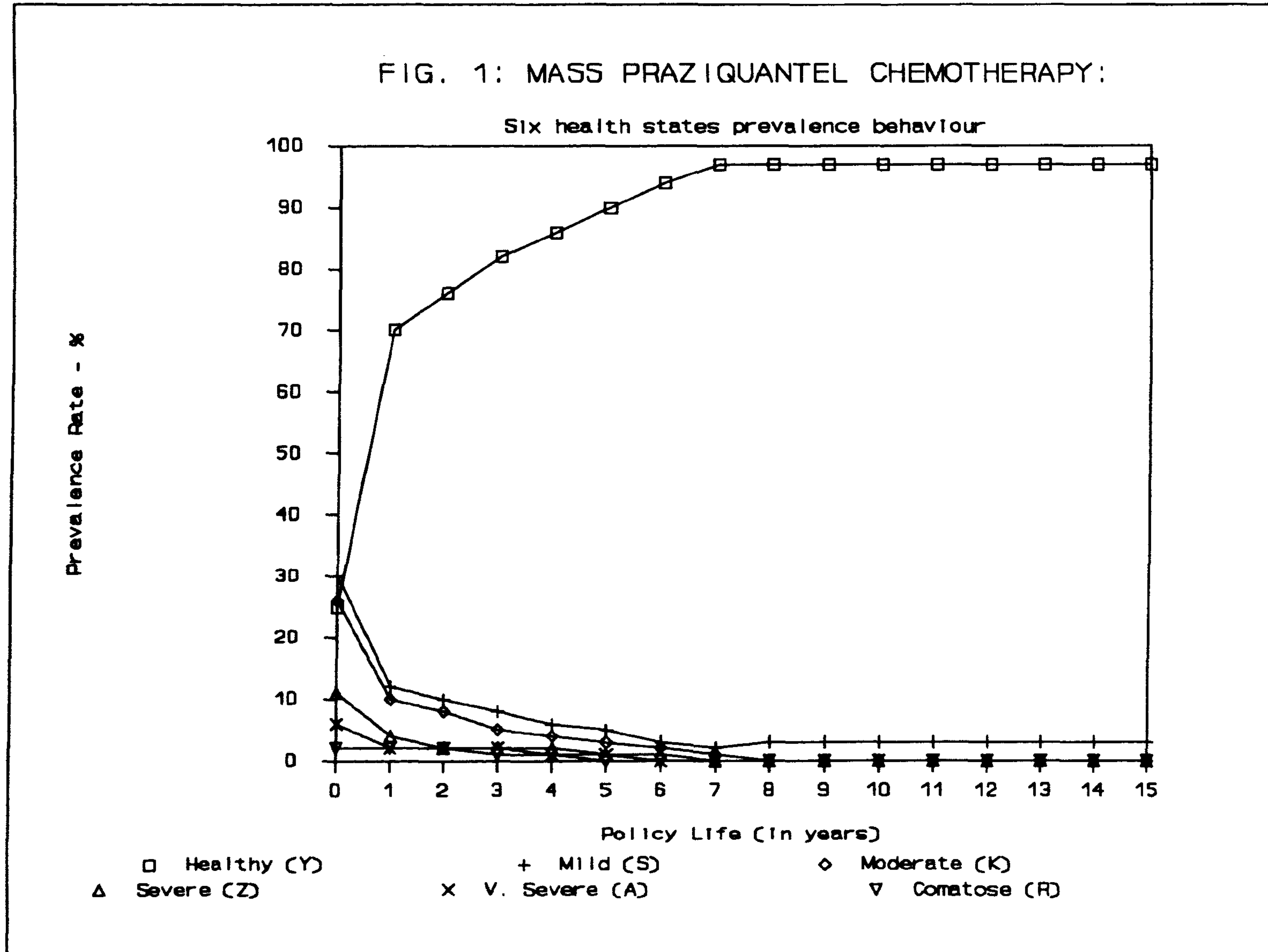


FIG. 1: MASS PRAZIQUANTEL CHEMOTHERAPY:
Six health states prevalence behaviour
Prevalence Rate - %
100
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Policy Life (in years)
Healthy (Y)
Mild (S)
Moderate (K)
Severe (Z)
V. Severe (A)
Comatose (R)

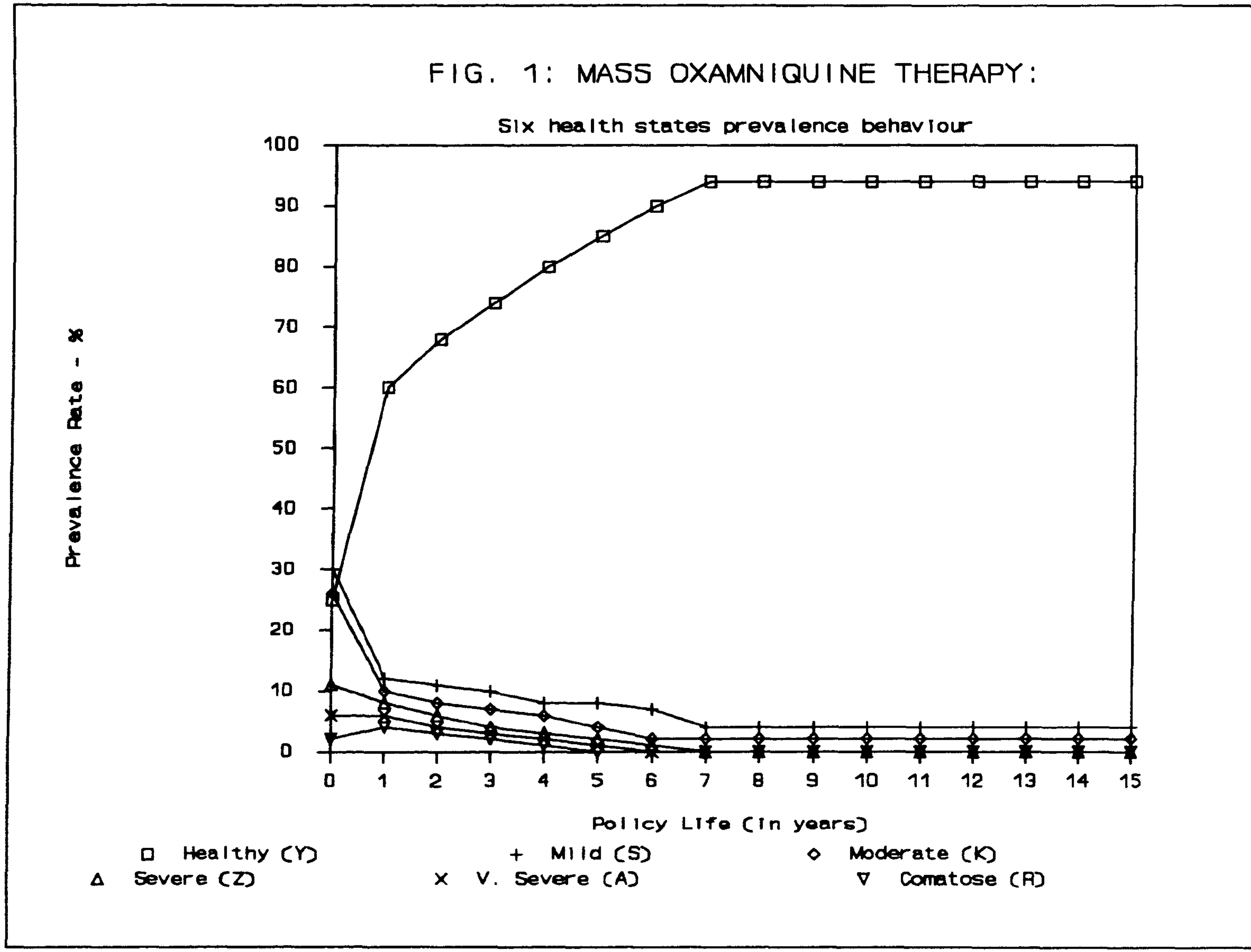
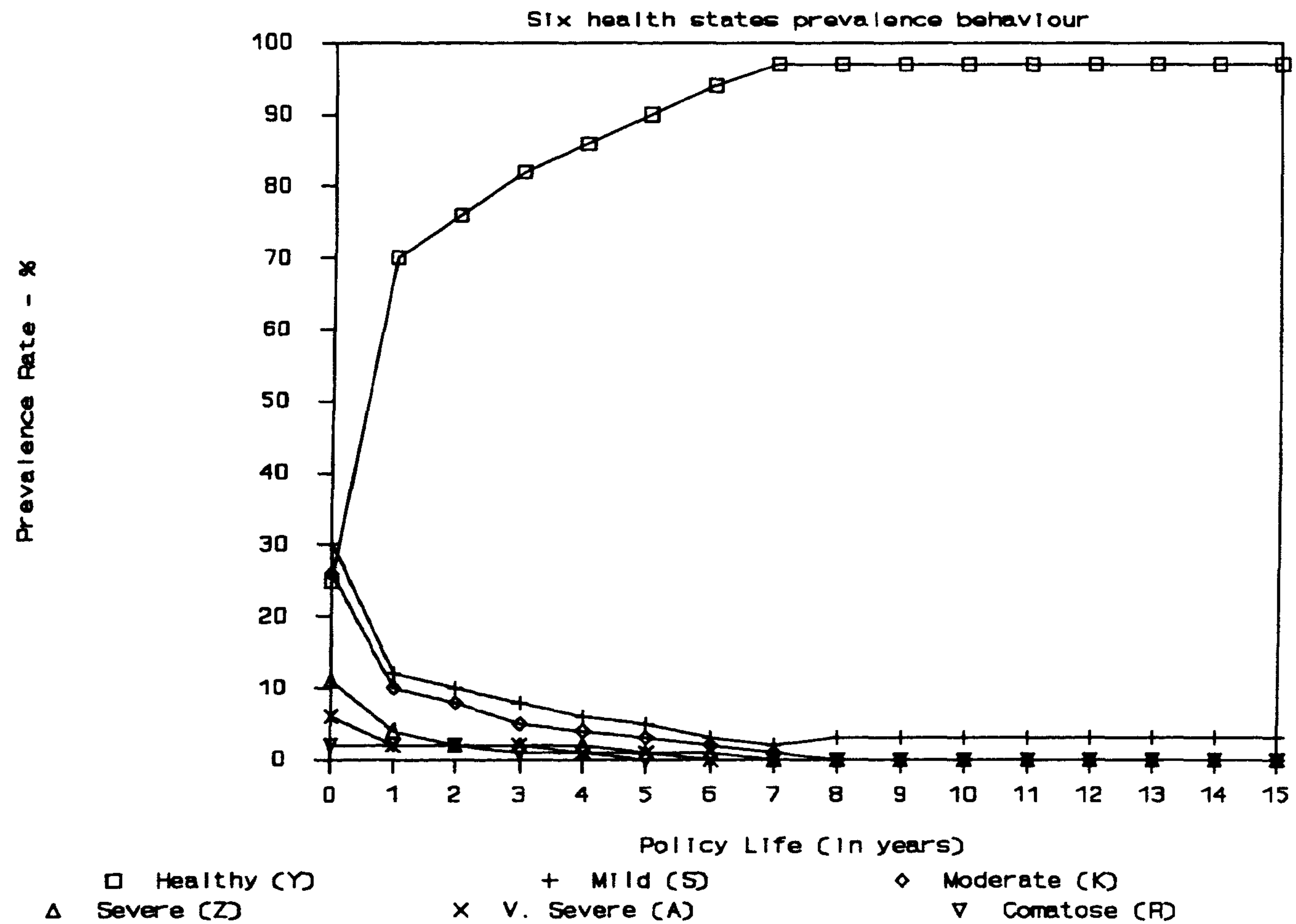


FIG. 1: MASS OXAMNIQUINE THERAPY:
Six health states prevalence behaviour
Prevalence Rate - %
100
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Policy Life (in years)
Healthy (Y)
Mild (S)
Moderate (K)
Severe (Z)
V. Severe (A)
Comatose (R)

FIG. 1: SELECTIVE PRAZIQUANTEL THERAPY:



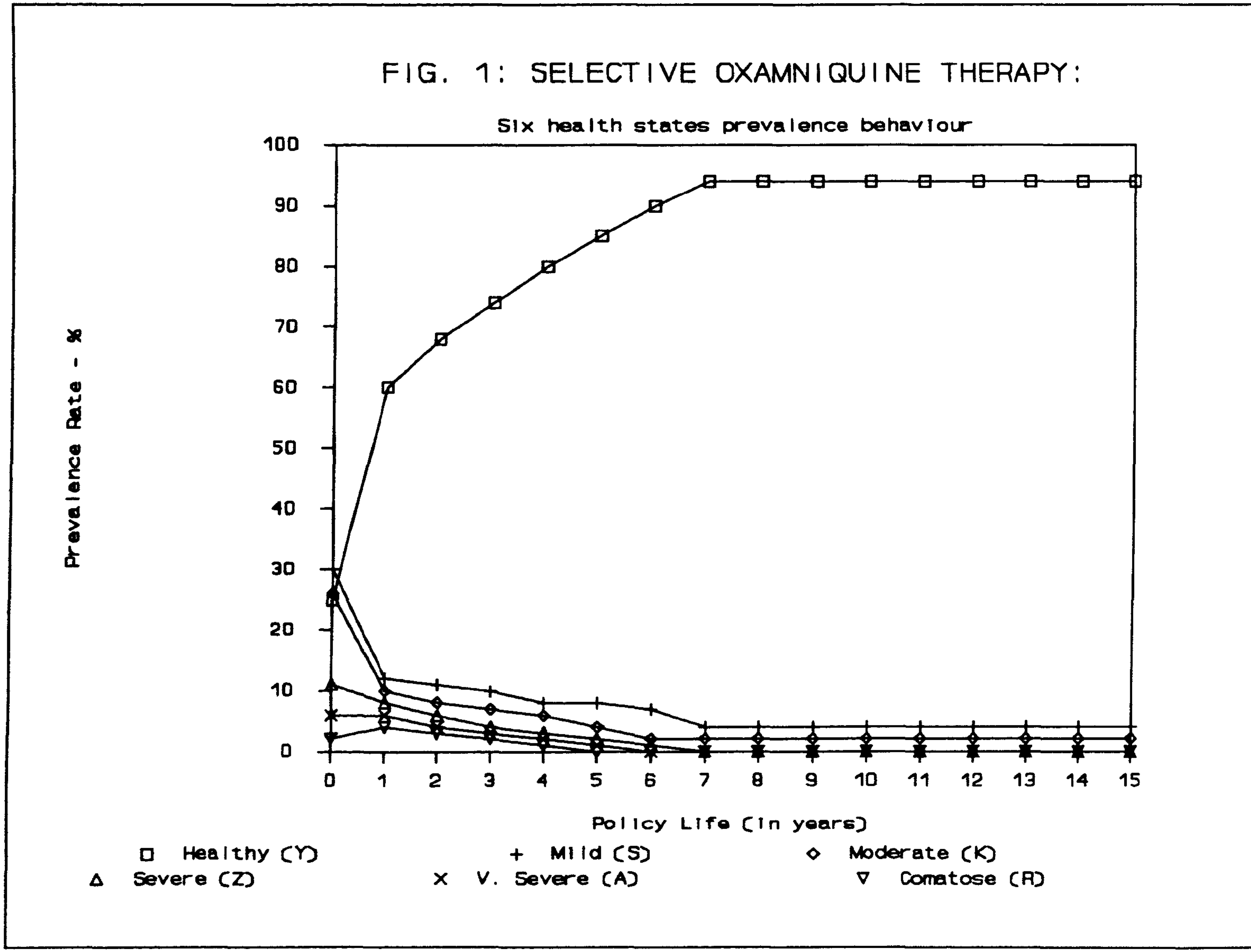


FIG. 1: SELECTIVE OXAMNIQUINE THERAPY:
Six health states prevalence behaviour
Prevalence Rate - %
100
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Policy Life (in years)
Healthy (Y)
Mild (S)
Moderate (K)
Severe (Z)
V. Severe (A)
Comatose (R)

TABLE 16.1b: Impacts of status quo (SQ) at the community level policy on health state prevalence rates over the project period

	HEALTH STATES PREVALENCE (%)					
YEAR	Normal	Mild	Moderate	Severe	V.severe	Comatose
0	25	30	26	11	6	2
1	23	27	28	12	7	3
2	20	21	30	16	9	4
3	16	16	32	19	12	5
4	12	13	34	21	14	6
5	9	10	36	22	16	7
6	7	7	36	23	19	8
7	5	5	33	24	23	10
8	3	3	29	26	27	12
9	2	2	21	28	33	14
10	1	1	13	25	42	18
11	0	1	5	17	54	23
12	0	0	2	9	54	35
13	0	0	0	3	50	47
14	0	0	0	0	40	60
15	0	0	0	0	20	80

Table 16.2b: Impacts of do-nothing-completely (DNC) at all levels policy on health state prevalence rates over the project period						
YEAR	HEALTH STATES PREVALENCE (%)					
	Normal	Mild	Moderate	Severe	V.severe	Comatose
0	25	30	26	11	6	2
1	21	26	27	12	7	7
2	14	21	28	13	11	13
3	7	17	30	14	13	19
4	4	15	25	15	16	25
5	3	12	20	16	18	31
6	2	8	15	17	21	37
7	0	4	10	19	24	43
8	0	0	5	20	26	49
9	0	0	0	16	29	55
10	0	0	0	9	31	60
11	0	0	0	0	34	66
12	0	0	0	0	28	72
13	0	0	0	0	22	78
14	0	0	0	0	16	84
15	0	0	0	0	10	90

Table 16.3b: Impacts of household water supply (HPWS) preventive intervention on health state prevalence rates over the project period

YEAR	HEALTH STATES PREVALENCE (%)					
	Normal	Mild	Moderate	Severe	V.severe	Comatose
0	25	30	26	11	6	2
1	23	32	26	11	6	2
2	22	33	26	11	6	2
3	20	35	26	11	6	2
4	20	35	26	11	6	2
5	20	35	26	11	6	2
6	22	37	25	9	5	2
7	24	42	21	6	5	2
8	27	46	17	4	4	2
9	31	50	13	2	2	2
10	36	52	9	1	1	1
11	44	51	5	0	0	0
12	51	47	2	0	0	0
13	64	36	0	0	0	0
14	80	20	0	0	0	0
15	98	2	0	0	0	0

Table 16.4b: Impact of household health education visits (HHED) preventive intervention on health states prevalence rates over the project period

YEAR	HEALTH STATES PREVALENCE (%)					
	Normal	Mild	Moderate	Severe	V.severe	Comatose
0	25	30	26	11	6	2
1	21	32	27	12	6	2
2	18	35	27	12	6	2
3	15	38	27	12	6	2
4	13	40	27	12	6	2
5	12	43	26	11	6	2
6	12	43	26	11	6	2
7	13	44	25	10	6	2
8	14	51	20	8	5	2
9	17	54	17	6	4	2
10	22	56	13	4	3	2
11	27	57	10	2	2	2
12	35	54	8	2	1	0
13	45	50	4	1	0	0
14	60	38	2	0	0	0
15	80	19	1	0	0	0

Table 16.5b: Impact of vented improved pit latrine (vipl) preventive intervention on health states prevalence rates over the project period

YEAR	HEALTH STATES PREVALENCE (%)					
	Normal	Mild	Moderate	Severe	V.severe	Comatose
0	25	30	26	11	6	2
1	22	33	27	10	6	2
2	19	38	26	10	5	2
3	17	40	26	10	5	2
4	16	42	25	10	5	2
5	15	46	24	9	4	2
6	16	47	23	8	4	2
7	17	48	22	7	4	2
8	19	49	21	6	3	2
9	23	50	18	5	2	2
10	25	53	15	4	2	1
11	33	53	10	3	1	0
12	42	51	6	1	0	0
13	52	45	3	0	0	0
14	68	31	1	0	0	0
15	90	10	0	0	0	0

Table 16.6b: Impacts of drip molluscicidng (DM) intervention on health state prevalence rates over the project period

	HEALTH STATES PREVALENCE (%)					
YEAR	Normal	Mild	Moderate	Severe	V.severe	Comatose
0	25	30	26	11	6	2
1	24	31	26	11	6	2
2	23	32	26	11	6	2
3	24	33	25	10	6	2
4	25	34	24	9	6	2
5	26	36	22	8	6	2
6	28	37	20	7	6	2
7	30	42	17	5	4	2
8	34	46	14	3	2	1
9	39	48	10	2	1	0
10	45	48	6	1	0	0
11	52	46	2	0	0	0
12	60	39	1	0	0	0
13	71	29	0	0	0	0
14	84	16	0	0	0	0
15	99	1	0	0	0	0

Table 16.7b: Impacts of focal molluscipiding (FM) intervention on health state prevalence rates over the project period

YEAR	HEALTH STATES PREVALENCE (%)					
	Normal	Mild	Moderate	Severe	V.severe	Comatose
0	25	30	26	11	6	2
1	24	31	26	11	6	2
2	23	32	26	11	6	2
3	24	33	25	10	6	2
4	25	34	24	9	6	2
5	26	36	22	8	6	2
6	28	37	20	7	6	2
7	30	42	17	5	4	2
8	34	46	14	3	2	1
9	39	48	10	2	1	0
10	45	48	6	1	0	0
11	52	46	2	0	0	0
12	60	39	1	0	0	0
13	71	29	0	0	0	0
14	84	16	0	0	0	0
15	99	1	0	0	0	0

Table 16.8b: Impacts of mass population chemotherapy with oxamniquine (MPCO) on health state prevalence rates over the project period

	HEALTH STATES PREVALENCE (%)					
YEAR	Normal	Mild	Moderate	Severe	V.severe	Comatose
0	25	30	26	11	6	2
1	60	12	10	8	6	4
2	68	11	8	6	4	3
3	74	10	7	4	3	2
4	80	8	6	3	2	1
5	85	8	4	2	1	0
6	90	7	2	1	0	0
7	94	4	2	0	0	0
8	94	4	2	0	0	0
9	94	4	2	0	0	0
10	94	4	2	0	0	0
11	94	4	2	0	0	0
12	94	4	2	0	0	0
13	94	4	2	0	0	0
14	94	4	2	0	0	0
15	94	4	2	0	0	0

Table 16.9b: Impacts of selective population chemotherapy with oxamniquine option (SPCO) on health state prevalence rates over the project period

	HEALTH STATES PREVALENCE (%)					
YEAR	Normal	Mild	Moderate	Severe	V.severe	Comatose
0	25	30	26	11	6	2
1	60	12	10	8	6	4
2	68	11	8	6	4	3
3	74	10	7	4	3	2
4	80	8	6	3	2	1
5	85	8	4	2	1	0
6	90	7	2	1	0	0
7	94	4	2	0	0	0
8	94	4	2	0	0	0
9	94	4	2	0	0	0
10	94	4	2	0	0	0
11	94	4	2	0	0	0
12	94	4	2	0	0	0
13	94	4	2	0	0	0
14	94	4	2	0	0	0
15	94	4	2	0	0	0

Table 16.10b: Impacts of mass population with praziquantel chemotherapy option (MPCP) on health state prevalence rates over the project period

	HEALTH STATES PREVALENCE (%)					
YEAR	Normal	Mild	Moderate	Severe	V.severe	Comatose
0	25	30	26	11	6	2
1	70	12	10	4	2	2
2	76	10	8	2	2	2
3	82	8	5	2	2	1
4	86	6	4	2	1	1
5	90	5	3	1	1	0
6	94	3	2	1	0	0
7	97	2	1	0	0	0
8	97	3	0	0	0	0
9	97	3	0	0	0	0
10	97	3	0	0	0	0
11	97	3	0	0	0	0
12	97	3	0	0	0	0
13	97	3	0	0	0	0
14	97	3	0	0	0	0
15	97	3	0	0	0	0

Table 16.11b: Impacts of selective population chemotherapy praziquantel (SPCP) on health state prevalence rates over the project period

	HEALTH STATES PREVALENCE (%)					
YEAR	Normal	Mild	Moderate	Severe	V.severe	Comatose
0	25	30	26	11	6	2
1	70	12	10	4	2	2
2	76	10	8	2	2	2
3	82	8	5	2	2	1
4	86	6	4	2	1	1
5	90	5	3	1	1	0
6	94	3	2	1	0	0
7	97	2	1	0	0	0
8	97	3	0	0	0	0
9	97	3	0	0	0	0
10	97	3	0	0	0	0
11	97	3	0	0	0	0
12	97	3	0	0	0	0
13	97	3	0	0	0	0
14	97	3	0	0	0	0
15	97	3	0	0	0	0

Table 16.1: Net effectiveness of schistosomiasis intervention strategies (estimated using local experts subjective judgements)

Strategies	NE (in Ksh.)	Local Experts Rankings	International Experts Rankings
SQS	3,649,372,531	9	7
HPWSS	10,082,140,562	6	8
HHEDS	9,913,796,503	7	6
VIPLS	9,718,322,311	8	9
DMS	10,320,356,437	5	5
MPCPS	11,058,229,275	2	1
MPCOS	10,809,359,975	4	2
SPCPS	11,104,370,577	1	3
SPCOS	10,870,208,676	3	4

Table 16.2: Net effectiveness of secondary options under the optimal schistosomiasis intervention strategy - SPCPS (estimated using local experts' subjective probabilities)				
Health State	Secondary Options	NE (in Ksh.)	Value of EQALYs (in Ksh.)	Cost (Ksh.)
Y	SPCP+Y	9,999,188,546	10026848331	27,659,785
S	SPCP+SQD	549,293,710	556542659	7,248,949
	SPCP+PCD	703,138,050	716318825	13,180,776
	SPCP+OCD	697,166,405	710970976	13,804,571
K	SPCP+SQHC	262,135,086	267919997	5,784,911
	SPCP+PCHC	373,714,960	397062507	23,347,547
	SPCP+OCHC	361,197,192	384976526	23,779,334
Z	SPCP+SQDH	47,354,921	59592558	12,237,637
	SPCP+PCHC	41,628,209	85279005	43,650,796
	SPCP+OCHC	40,398,731	84218403	43,819,672
A	SPCP+PGHSQ	-20,489,005	1657045	22,146,050
	SPCP+PGHDM	-20,055,413	2651271	22,706,684
	SPCP+PGHSO	-19,025,899	3314089	22,339,988
R	SPCP+PGHSQR	-18,584,491	0	18,584,491
	SPCP+PGHIUC	-18,691,125	0	18,691,125

Table 16.3: NPVs of the optimal strategy (with WTP for return to normal and local expert subjective probabilities)		
STRATEGIES	NPV (KSh.)	RANKING
SQS	18,737,340,419	9
HPWSS	33,341,577,395	6
HHEDS	33,052,510,874	8
VIPLS	33,248,100,973	7
DMS	33,616,998,833	5
MPCPS	34,183,958,967	2
MPCOS	33,752,690,816	4
SPCPS	34,224,591,286	1
SPCOS	33,814,011,315	3

Table 16.4: NPVs of the optimal strategy (with WTP for return to normal and local expert subjective probabilities)

HEALTH STATE	OPTION	NPV (Ksh.)	GPV(EMV)	GPV(COST)
Y	SPCP+DNY	30,578,687,893	30,606,347,678	27,659,785
S	SPCP+SQD	1,887,899,215	1,895,148,163	7,248,949
	SPCP+PCD	2,165,424,299	2,178,605,074	13,180,776
	SPCP+OCD	2,155,339,647	2,169,144,218	13,804,571
K	SPCP+SQHC	1,008,971,699	1,014,756,611	5,784,911
	SPCP+PCHC	1,220,324,600	1,243,672,147	23,347,547
	SPCP+OCHC	1,198,895,371	1,222,674,705	23,779,334
Z	SPCP+SQDH	234,736,841	246,974,478	12,237,637
	SPCP+PCDH	280,405,021	324,055,817	43,650,796
	SPCP+OCDH	277,822,624	321,642,296	43,819,672
A	SPCP+PGHSQ	(12,256,051)	9,889,999	22,146,050
	SPCP+PGHDM	(7,955,434)	14,751,251	22,706,684
	SPCP+PGHSO	(1,666,035)	20,673,953	22,339,988
R	SPCP+PGHSQR	(18,584,491)	0	18,584,491
	SPCP+PGHIUC	(18,691,125)	0	18,691,125

Table 16.5: NPVs of the optimal strategy secondary options (with WTP to avoid advancing to the next state and local experts subjective probabilities)		
STRATEGIES	NPV (KSh.)	RANKING
SQS	21,157,840,508	9
HPWSS	36,132,712,380	6
HHEDS	35,607,451,037	8
VIPLS	35,894,894,094	7
DMS	36,524,548,280	5
MPCPS	39,277,310,989	2
MPCOS	38,502,517,360	4
SPCPS	39,317,943,308	1
SPCOS	38,563,837,859	3

Table 16.6: NPVs of the optimal strategy secondary options (with WTP to avoid advancing to the next state and local experts subjective probabilities)

HEALTH STATE	OPTION	NPV (Ksh.)	GPV(EMV)	GPV(COST)
Y	SPCP+DNY	33,874,832,351	33,902,492,136	27,659,785
S	SPCP+SQD	2,602,085,900	2,609,334,849	7,248,949
	SPCP+PCD	3,037,309,387	3,050,490,163	13,180,776
	SPCP+OCD	3,021,961,577	3,035,766,148	13,804,571
K	SPCP+SQHC	1,540,370,210	1,546,155,122	5,784,911
	SPCP+PCHC	1,950,799,580	1,974,147,127	23,347,547
	SPCP+OCHC	1,911,117,793	1,934,897,126	23,779,334
Z	SPCP+SQDH	367,115,875	379,353,512	12,237,637
	SPCP+PCDH	465,207,596	508,858,392	43,650,796
	SPCP+OCDH	460,647,462	504,467,135	43,819,672
A	SPCP+PGHSQ	(7,499,035)	14,647,015	22,146,050
	SPCP+PGHDM	(981,272)	21,725,412	22,706,684
	SPCP+PGHSO	8,378,885	30,718,874	22,339,988
R	SPCP+PGHSQR	(18,584,491)	0	18,584,491
	SPCP+PGHIUC	(18,691,125)	0	18,691,125

Appendix 17: The Study Area

The Republic of Kenya lies in East Africa, between latitudes 5° North and 5° South of Equator, stretching from longitude 34° E and 42° E. It is bordered in the East by the Indian Ocean, and in the West by Lake Victoria, and the equator runs straight across its territory of 582,647Km^2. It is entirely within the confines of the tropical zone, but its topography, particularly the Rift valley and the highlands, create considerable climatic differences, which are important for the distribution of the country's water resources, agricultural activities as well as for certain disease patterns.

The Irrigation Schemes

Towards realizing her goal of self-sufficiency in food production, Kenya is vigorously reclaiming more arid, semi-arid, and swampy areas through irrigation and drainage respectively. The country has so far been able to utilize only 4% of her irrigation potential, estimated at 540,000 hectares (Kenya Government, 1989). Kenya today has seven large scale irrigation schemes, namely: Mwea-Tebere, West Kano, Bunyala, Perkerra, Bura, Hola and Ahero (Table 1.1). The schemes account for almost all rice production in Kenya. Mwea alone produces about 78% of national rice output. These national irrigation schemes (with exception of Burra which is under the Ministry of Agriculture) are managed by the National Irrigation Board (NIB).

The Ministry of Agriculture monitors and promotes through its irrigation and drainage branch, the development of smallholder irrigation schemes (with technical and advisory support). In principle, these are constructed, controlled, operated and maintained by local farmers. Some 4750 hectares have been brought under smallholder irrigation so far (Table 1.2). By the end of the Sixth Plan Period (1989-93), the government expected to have expanded the land under irrigation to 45,550 hectares.

Selection of Study Area

Currently, the main threats to realizing the Kenyan goal of self-sufficiency in food production through irrigation are schistosomiasis and malaria. Generally, malaria is the main cause of morbidity (accounting for over 20% of outpatient cases in health facilities) in Kenya. The disease is also the main cause of morbidity in Kirinyaga District (Table 1.13). However, the implication of current and planned land reclamation projects is that schistosomiasis is likely to become the major cause of ill health in areas concerned. Thus, schistosomiasis is seen by the National Irrigation Board as a major health hazard in irrigation schemes. It is for these reasons that I decided to focus current study on schistosomiasis and on an irrigation scheme.

Due to scarcity of research resources (time and money), it was not feasible to study the benefits and costs of schistosomiasis interventions in all irrigation schemes. It was also considered unwise to sample the schemes randomly since not all irrigation schemes have a schistosomiasis problem (and in others it is insignificant). Thus, the following criteria was used to select one scheme from the seven national irrigation schemes: high schistosomiasis endemicity, greatest estimated capacity to benefit from intervention, highest expected productivity gains, availability of intervention efficacy data, sensitized population (used to survey interviews), security of researchers and accessibility. It is only the Mwea irrigation scheme that met these criteria.

The Mwea Irrigation Scheme

Kenya is made up of 8 administrative provinces (Nairobi, Central, Eastern, N.Eastern, Rift Valley, Coast, Western and Nyanza) and 41 districts. This study was conducted in the Mwea Division of the Kirinyaga District in the Central Province. A small pilot irrigation scheme was established by the then colonial government at Tebere in 1951 and in 1954 it was decided to proceed with the construction of the main irrigation scheme. The decision was prompted by the need to occupy several thousands of Kenyans detained under the colonial emergency regulations.

Location

The Mwea Irrigation Scheme (MIS) is the largest irrigation project in the country, situated on the Mwea Plains south of Mt. Kenya. MIS is located about 60 miles North East of Nairobi. The scheme is situated in Mwea Division of Kirinyaga District in Central Province. It lies between latitudes 0° and 1° South of Equator, and longitudes 37° E and 38° E. The scheme has a gravity water supply system consisting of two main canals fed by the river Thiba (with a catchment area of 140 square miles) and the river Nyamindi (with a catchment are of 110 square miles), which originate at the foot of Mt. Kenya.

Climate

Maximum rainfall occurs in April/May and October/November. The average temperature is 26.5 degrees celsius. Average relative humidity in the morning is 79.7% and 54.8% in the afternoon.

Soils

The soils in Mwea consist of free-draining reddish brown lateritic clay loam and impervious heavy clay. They are generally rather shallow and underlaid by ferricate (murram) and volcanic tuff. Although irrigation initially started in Tebere, it subsequently expanded to the adjoining Mwea section. By the end of financial year 1959 a total of 5,020 acres of black cotton soil had been level terraced into one acre units, and had been provided with a complete irrigation water distribution system for rice cultivation.

In 1963 (eve of independence), the new government embarked on another phase of development in the Thiba and Wamumu sections and, by January, 1973, a total of 11,770 acres were under rice cultivation.

Scheme Lay-out

MIS is divided into five sections: Tebere (3,170 acres), Mwea (3,007 acres), Thiba (2,813 acres), Wamumu (2,703 acres) and Karaba (2,554 acres) (Fig. 17.1). Thus, the total acreage under paddy cultivation is 14,247 acres. This amounts to 15,753 acres of land which is utilized by tenant villages, school, dispensaries, business plots, roads, swamps and red soil patches rain-dependent subsistence farming is done by tenants.

Settlements

After independence in 1963, the political prisoners whom the colonial government used to work in MIS were freed and went back to their home districts. The main post-independence government policy became that of resettling poor people who had been made landless as a result of the colonial government policies. Thus, the only criterion for admission to tenancy in MIS was landlessness, not previous experience in rice cultivation.

MIS accommodates 3,236 tenants and about 987 households of married siblings. Tenants live in the 38 villages which are located as close as possible to the tenants holdings (to minimize commuting distances) (Table 1.14). The majority of the tenants were recruited from Kirinyaga District whilst a small group of tenants came from neighbouring Kiambu, Embu, Nyeri and Muranga Districts.

Sources of Livelihood

The two species of rice grown in MIS are *Sindano* and *Basmati*. Rice is the main source of income for the MIS tenants. It is also the staple food, which is supplemented with beans, maize, sorghum, green peas and vegetables (carrots, cabbages, tomatoes and French beans) and fruits (avocados, oranges, mangoes, etc.). The main types of livestock kept by households are chicken, cattle, sheep, goats and donkeys.

Each tenant grows rice on 4 acres. 1/8 of an acre is used as a nursery for germinating rice. Each nursery is cultivated manually and dressed with 25 kilograms of sulphate of ammonia. Each nursery takes 75 kg. of pre-germinated seed. Seedlings are transplanted after 4 weeks. The recommended spacing is 4" x 4". Transplanting of rice is done during the short rainy season, i.e. between August and December.

Prior to transplanting, the land is flooded and then cultivated with tractors within 126 working days. At transplanting, double superphosphate fertilizer is applied at a rate of 50kg. per acre. Sulphate of ammonia is applied at a rate of 100kg. per acre. The crop is transplanted, weeded, harvested, threshed, winnowed and packed in sacks manually by tenants' households.

Each acre of paddy yields an average 29.3 bags (each weighing 75kg) per year. The tenants are allowed to retain 12 bags for domestic consumption and private sale if they so wish.

The role of National Irrigation Board (NIB)

The NIB is a public corporation body under the Ministry of Regional Development and was established by Act of Parliament, the 1966 Irrigation Act, chapter 357. The Board is responsible for development, control and improvement of national irrigation schemes; providing technical know-how to the farmers; providing tractors for cultivating; providing rice seeds for germinating; providing fertilizers and other agrochemicals; collecting and transporting rice to the 5 collecting centres (Mwea, Tebere, Thiba, Wamumu and Karaba) where it is weighed, dried, cleaned and packed in standard 75kg. bags; operating paddy mills in Mwea where the rice is processed, sorted out into various grades and packaged for final distribution; marketing rice and paying the tenants; carrying out pest control activities; running schistosomiasis and malaria preventive activities; and levying service charges (about Ksh. 280 per acre) for maintenance of irrigation infrastructure (canals and drains), land preparation and for other services it provides

Rice crop pests

The key pest is the Leaf Miner which attacks rice during the nursery stage and a few weeks after transplanting. Minor infestations of grass-hoppers, army worms and rice-borers have also be observed. Those pests are easily controlled with D.D.T.

Large numbers of qualia birds usually appear at the time of grain ripening. The farmers use various methods for scaring them off.

Social amenities

Housing

Most of the farmers have semi-permanent houses (roofed with corrugated iron sheets and with temporary mud walls). NIB make arrangements with local banks to advance small loans to the tenants for building and maintaining their houses.

Health

In 1992 health indicators in Kirinyaga were as follows:

Crude birth rate = 49.7 per 1000

Crude death rate = 10.8 per 1000

Life expectancy = 57 years

Infant mortality = 58 per 1000 live births

Population growth rate = 4% per year

Health Facilities

There are 39 health facilities in Kirinyaga; 23% and 77% are owned by the NGO and the Government (GoK) respectively. Out of the total number of health facilities 5%, 15% and 80% are hospitals, health centres and dispensaries (Table 1.4). In addition, there are 21, 5 and 7 private outpatient clinics in Ndia, Mwea and Gichugu Divisions respectively. Minor surgery theatres and X-ray facilities are available only in the two hospitals: Mwea Mission and Kirinyaga District. Laboratory equipment are available in the two hospitals and in all health centres except the Baricho Health Centre in the Ndia Division. Refrigeration facilities are available in 29 health facilities. Only 6 health facilities have electricity: Kirinyaga District Hospital; Mwea Mission Hospital; Kianyaga, Kimbimbi, and Sagana Health Centres; and Gatugura Dispensary. Table 1.5 shows the ratio of health facilities to population (using 1979 census data).

The low-level facilities are supposed to refer complicated cases to upper-level facilities. The District Hospital refers cases in need of major surgery to the Nyeri Provincial General Hospital (PGH), which is better equipped and manned (by consultants) for such kind of procedures. Those cases which cannot be adequately treated in the PGH are referred to the Kenyatta National Hospital in Nairobi (this is the tertiary care hospital).

Table 1.5 shows the distribution of inpatient beds across various health facilities in Kirinyaga District. The distribution of beds is skewed towards hospitals.

Health personnel in Kirinyaga District

Table 1.6 shows actual levels of personnel in all (Non-Governmental Organizations and Government of Kenya) health facilities of Kirinyaga District. The table also portrays the staff/population ratios. The health centres and dispensaries are managed by clinic officers and Kenya registered nurses. Thus, only the hospitals have medical doctors.

Disease prevention and health promotion activities

Child welfare, ante-natal and family planning

The District has a child welfare, ante-natal and family planning coverage of 98%, 63% and 19% respectively (Table 1.7). The low family planning coverage partly accounts for the high annual population growth rate (of about 4%) in the district.

A public health nurse with the assistance of 92 enroled nurses runs the Maternal Care/Child Health/Family Planning activities, besides running the rural health facilities (health centres and dispensaries). Shortages of staff, lack of transport, and occasional shortages of other inputs were indicated in the District Development Plan (1989-93) as the major reasons for the failure to realize 100% coverage.

Environmental Health

Environmental health activities are mainly carried out by communities supervised by Public Health Officers (PHOs), Public Health Technicians (PHTs), Health Education Officers (HEOs) and Artisans (Table 1.8). Examples of the public health activities involved are: protection of springs and wells, building and maintenance of latrines, and vector control activities (e.g. clearing of vegetation around houses, spraying of water pools near houses using insecticides, and so on).

Health Education

Health education revolves around preventing disease, and improving nutrition.

Health information is disseminated through public meetings (Barazas), women's group meetings, outpatient departments and schools. The Health Education Officer co-ordinates health education activities with the assistant of the Family Field Health Educators. The services of health educators are also supplemented with those of environmental health. The effectiveness of health education activities is greatly hampered by chronic shortages in complementary inputs (especially means of transportation, stationery and visual teaching aids).

Malaria control

Malaria control activities involve the distribution of antimalarial drugs to all children under the age of 10 years, to pregnant women, NIB staff and their families; and

selective application of larvicides. These activities are not coordinated.

The history of schistosomiasis in Mwea

In Mwea prevalence of schistosomiasis increased from 0% in 1956 to 70% in the 1980s. In 1986 schistosomiasis screening was conducted in two villages, Thiba and Mahigaini, in Mwea irrigation scheme by Muthami et al. (1986). The average screening compliance rates were 81% and 86% respectively for Thiba and Mahigaini. About 76% and 59% of those screened tested positive for *Schistosoma mansoni*. The majority of those infected were in the age bracket 5-19 years. The results also show that schistosomiasis prevalence is not evenly distributed in Mwea irrigation scheme.

Mass population chemotherapy was given in the two villages. About 85% of Thiba's total population of 2,222 were treated with praziquantel (40mg/kg). Treatment was not given to some for the following reasons: lactating mothers (2%), children under 2 years of age (4%), away from home (6%), expectant women (0.9%), treatment refusal (2%) and "on other treatment" (0.09%).

About 64.2% of Mahigaini's total population of 2,365 were treated with praziquantel. Exclusions were similar to Thiba: lactating mothers (4%), children under 2 years of age (6%), away from home (19%), expectant women (2%), treatment refusal (6%) and "on other treatment" (0%). The patients were detained for 30 minutes to monitor side-effects of antischistosomes.

Apart from the occasional experimental chemotherapy sessions by KEMRI (and affiliate centres), schistosomiasis patients refer themselves to the health facilities within Kirinyaga District after self-diagnosis.

Preventive measures

NIB carries out following preventive activities: molluscíciding, environmental management, health education and sanitation. The molluscicide in current use is Bayluscide of 70% w.p. and is applied at a concentration of 1 ppm using drip-feed method and spot or focal treatment by spraying.

Environmental management entails clearing of weeds and other aquatic vegetation in the main canals, which is done by the NIB while the farmers clear the feeder canals around their plots. Other measures taken involve filling of scattered water pools that collect around the scheme villages.

Each household in the irrigation scheme is required by NIB to build a latrine. The medical technicians and health educators carry out regular inspection tours of all villages to see that latrines are dug and that those which are full are treated with disinfectant and properly filled up with soil (Kimani, 1990). That represents the official position. However, the reality is that virtually all latrines are poorly maintained. The fact that most of the latrines are fouled probably reduces usage.

Although there are a few experimental boreholes constructed by Kenya Medical Research Institute, irrigation canals still remain as the major source of water for domestic use.

Health office in Mwea Scheme Headquarters dispenses oxamniquine and praziquantel drugs to farmers who present themselves. The main problems are: frequent shortages of drugs, lack of diagnostic facilities within the scheme and shortages of manpower.

In short, the current schistosomiasis preventive activities are conducted haphazardly. The NIB has no clear schistosomiasis control policy in the scheme. Due to the lack of such a policy there is virtually no co-ordination between NIB, DVBD, KEMRI and MoH. This results in duplication of services, and hence wastage of the scarce disease control resources.

Table 1.1: Large scale irrigation schemes	
Names of schemes	Scheme attributes
Mwea (*Schistosoma mansoni*, malaria)	5799 hectares
	3236 tenants
	28,000 tons of rice/year
Ahero (No schistosomiasis, malaria, O'nyong-nyong virus)	1277 hectares
	519 tenants
	3780 tons of rice/year
West Kano (*Schistosoma haematobium*, malaria, O'nyong-nyong virus)	900 hectares
	553 tenants
	2500 tons of rice/year
	1200 tons of sugar cane
Hola (Schistosomiasis, malaria, leishmaniasis)	874 hectares
	678 households
	Cotton, groundnut, maize
Bura (Schistosomiasis, malaria, leishmaniasis)	2010 hectares
	1626 tenants
	Cotton
Perkerra (No schistosomiasis)	690 hectares
	431 households
	Onions, chillies, watermelons, pawpaws
Bunyala (No Schistosomiasis)	213 hectares
	131 households
	1261 tons of rice per year

Source: National Irrigation Board (1991)

Table 1.2: Small-scale smallholder irrigation schemes		
District	Project Name	Hectares
Turkana	Katil	220
	Turkwell	35
West Pokot	Amolem	40
Isiolo	Merti	35
	MalkaDaka	40
	Garfassa	200
Mandera	Border Point	100
	Shantole	160
Samburu	Amaya	25
Narok	Narosura	60
Baringo	Eldume	100
	Barwesa	15
	Sandai	90
	Endao	50
Tana River	Mnazini	40
	Hewani	30
	Wema	60
Garissa	Jara Jara	60
	Hodan Farm	27
	First Farm	14
	Sankuri	4
	Umoja	4

Table 1.2: Continued

District	Project Name	Hectares
Machakos	Muka Mukuu	550
Meru	Mitunguu	440
East Marakwet	Chesoi	150
Kajiado	Kimana	100
	Rombo	60
Laikipia	New Mutaro	140
	Kiamarigo	40
Nakuru	Lari Wendani	16
Kirinyaga	Kibirigwi	100
Embu	Ishiara	35
	Rupingazi	80
Nyeri	Mathina	100
Kisumu	Alungo	70
	Awach	110
	Kore	150
	Wasare	125
	Nyachoda	50
Taita/Taveta	Kimorigo	140
	Kimala	180
	Kitobo	160
	Njukini	145
Others		400

Source: Osoro, 1990

Table 1.3: Irrigation Development Targets for 1989-93					
	Hectares expected to be under irrigation				
Targets	1989	1990	1991	1992	1993
Present	33,000	34,380	35,760	38,440	41,880
Increment	1,380	1,380	2,680	3,440	3,670
TOTAL	34,380	35,760	38,440	41,880	45,550

Source: Kenya Government, 1989.

Table 1.4: Ratio of health facilities to population in Kirinyaga District	
Health Facilities	Hospitals
Hospitals	1:145491
Health Centres	1:48497
Dispensaries	1:9387
Grand Total	1:7461

Table 1.5: Availability of inpatient beds in Kirinyaga District		
Health Facility	Number of beds	bed/pop. ratio
Kerugoya District Hospital	200	1:2,212
Karira Mission Hospital	100	1:4,423
Kimbimbi Health Centre	16	1:27,643
Kianyaga Health Centre	8	1:55,286
Sagana Health Centre	12	1:36,858
Baricho Health Centre	8	1:55,286
Kagumo Maternity Home	14	1:31,592
Kianyaga Mission Health Centre	12	1:36,858
Kutus Maternity Home	10	1:44,229
Baragwi Maternity Home	13	1:34,022
Baricho Mission Health Centre	14	1:31,592
TOTAL	407	1:1,087

Source: Kenya Government (1992)

Table 1.6: Staff/population ratios in Kirinyaga District using population projection for 1992 (442,291 people)

Staff category	No. of personnel	Staff/pop. ratios
Medical Officers	8 (NGO=1)	1:55,286
Clinical Officers	26 (NGO=0)	1:17,011
Health Education officers	1 (NGO=0)	1:442,291
Family Health Field Educators	30 (NGO=2)	1:14,743
Public Health Officers	6 (NGO=0)	1:88,458
Public Health Technicians	64 (NGO=0)	1:6,911
Laboratory Technologists	5 (NGO=2)	1:88,458
Registered Nurses	39 (NGO=3)	1:11,341
Enroled Nurses	228 (NGO=29)	1:1,940
Radiographers	4 (NGO=0)	1:110,573
Laboratory Technicians	17 (NGO=0)	1:26,017
Radio Film Processors	3 (NGO=0)	1:147,430
Occupational Therapists	5 (NGO=0)	1:88,458
Medical Records Assistants	15 (NGO=0)	1:29,486
Nutrition Field Workers	10 (NGO=0)	1:44,229
Physiotherapists	4 (NGO=0)	1:110,573
Pharmacist	2 (NGO=0)	1:221,146
Pharmaceutical Technologists	6 (NGO=0)	1:73,715
Ent. Laboratory Technicians	12 (NGO=0)	1:36,858
Plaster Technicians	6 (NGO=0)	1:73,715

Source: Kenya Government (1992)

Table 1.7: Child welfare, ante-natal and family planning services coverage			
Activity	Target population	Number covered	Percent coverage
Child welfare	67,335	66,162	98
Ante-natal clinic	97,454	61,254	63
Family planning	89,545	17,245	19

Source: Kenya Government (1992)

Table 1.8: Environmental health staff	
Cadre	Actual number
PHO	6
PHT	65
HEO	1
Artisans	2

Source: Kenya Government, 1992

Table 1.9: Results of a schistosomiasis screening survey conducted in Thiba village of Mwea Scheme in 1986			
Age group (years)	No. expected for screening	Compliance rate (%)	% positive for schisto.
5-19	237	79.3	90.4
20-59	115	84.3	61.9
TOTAL	352	81.8	76.2
Source: Muthami et al. (1986)			

Table 1.10: Results of a schistosomiasis screening survey conducted in Mahigaini village of Mwea Scheme in 1986			
Age group (years)	No. expected for screening	Compliance rate (%)	% positive for schisto.
5-19	276	81.5	63.6
20-59	121	89.3	53.7
TOTAL	397	85.4	58.7
Source: Muthami et al. (1986)			

Table 1.11: Composition of Kirinyaga District population			
Age Group	Male	Female	TOTAL
0-4	26,779 (50%)	26502 (50%)	53281 (100%)
5-9	24438 (50%)	24428 (50%)	48866 (100%)
10-14	21817 (50%)	21669 (50%)	43486 (100%)
15-19	17500 (50%)	17247 (50%)	34747 (100%)
20-24	10689 (50%)	10719 (50%)	21408 (100%)
25-29	8599 (49%)	9040 (51%)	17639 (100%)
30-34	6652 (47%)	7416 (53%)	14068 (100%)
35-39	4675 (46%)	5601 (54%)	10276 (100%)
40-44	4039 (43%)	5406 (57%)	9445 (100%)
45-49	3541 (47%)	3949 (53%)	7490 (100%)
50-54	3598 (45%)	4477 (55%)	8075 (100%)
55-59	2633 (48%)	2871 (52%)	5504 (100%)
60-64	1937 (45%)	2374 (55%)	4311 (100%)
65-69	2030 (51%)	1948 (49%)	3978 (100%)
70-74	1415 (47%)	1593 (53%)	3008 (100%)
75 and above	2423 (45%)	2976 (55%)	5399 (100%)
	142765 (49%)	148216 (51%)	290981 (100%)

Table 1.12: Distribution of health facilities by division				
Division	Proprietor	Hospitals	Health Centres	Dispen-saries
Gichugu	GoK	0 (0%)	1 (16.7%)	7 (23%)
	NGO	0 (0%)	1 (16.7%)	1 (3%)
Ndia	GoK	1 (50%)	2 (33.2%)	8 (26%)
	NGO	0 (0%)	1 (16.7%)	4 (13%)
Mwea	GoK	0 (0%)	1 (16.7%)	10 (32%)
	NGO	1 (50%)	0 (0%)	1 (3%)
Grand Total		2 (5%)	6 (15%)	31 (80%)

Table 1.13: Ten main causes of illness in Kirinyaga District	
Disease	Cases (in 1987)
Malaria	165,582 (27%)
Upper respiratory tract infections	182,455 (30%)
Skin diseases	40,955 (7%)
Diarrhoea diseases	42,232 (7%)
Intestinal worms	56,197 (9%)
Accidents (including burns)	22,962 (4%)
Acute eye infections	22,242 (4%)
Rheumatism, joint pains	18,047 (3%)
Ear infections	12,368 (2%)
Pneumonia	40,290 (7%)
Source: Kenya Government, 1992	

Table 1.14: Mwea scheme villages	
Village names	No. of households
Matandara (*)	57
Mwathaini (*)	30
Mahigaini (*)	131
Kirogo	180
Kiriko	140
Kamuchege	130
Kiarukungu	108
Karira (*)	249
Karatina	152
Kiuria	145
Kwibota	33
Kiandegwa	87
Kimuri	147
Murubara	155
Nyamindi	104
Karima	80
Ndorome (*)	84
Nguka	204

Table 1.14: Continued	
Gathigiriri	118
Gatuiri	168
Gituto (*)	110
Nyakio	82
Maendeleo	163
Munyaka	74
Makongeni (*)	90
Mbui Njeru	72
Haraka	77
Rurumi	52
Rueiria	86
Rurumi (B) (*)	42
Waakara	126
Jogoo	134
Thiba South	103
Thiba North	85
Jericho (*)	126
Ciagiini	147
Mathangauta (*)	76
Bahati	83

Note: The (*) indicates the village was among the villages surveyed in this thesis.
Source: NIB (1992)