

# Schistosomiasis in Suriname

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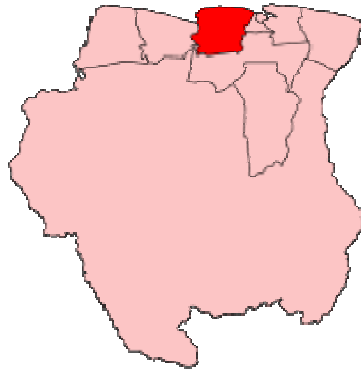
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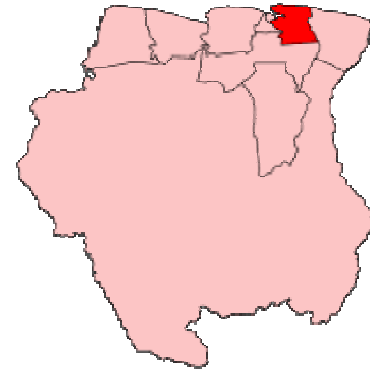
- Schistosomiasis in Suriname was confirmed in 1911 (FLU)
- Only occurring species in Suriname is *Schistosoma mansoni*
- Various studies performed to determine prevalence rates (1930-2004):
  - Occurs only in coastal areas associated with shell ridges
  - Prevalence rate as high as 45% in Saramacca (Godfried-Kranenburg, 1974)
  - Was frequently associated with severe morbidity in the past
  - Between 1973-1983: Phase 1 control program launched in Saramacca
  - Decrease in prevalence from 26% to 15% (Oostburg, SMB, 1998)
  - Surveys conducted from 1997 to 2001 to determine prevalence rates in Saramacca, Commewijne, Paramaribo, Wanica en Coronie. The highest prevalence shown in this study was 5% in Saramacca (the general prevalence varied between 0.3% and 4.7% in studied areas) (D. Panchoe 1997-2001)
  - Survey conducted under 3 primary public schools in the district of Wanica (D. Panchoe, 2003-2004)
  - In July of 2007 two studies were performed in the interior to determine prevalence rate in the villages of Djoemoe, Asindonhopo and Semoisie.

# Methods

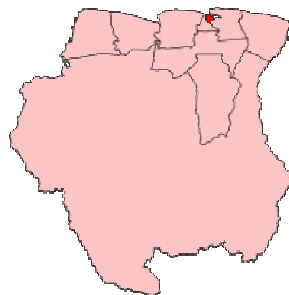
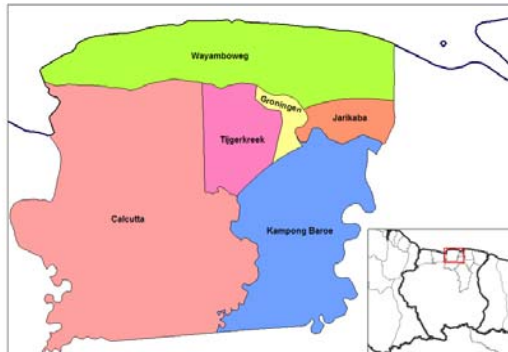
Locations were chosen based on earlier data and in cooperation with the regional physicians, authorities, health care facilities and other organisations (such as the union of agriculture)



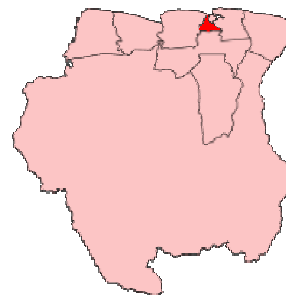
Saramacca



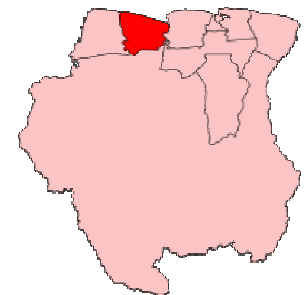
Commewijne



Paramaribo



Wanica



Coronie

# Methods

- House to house visits carried out by environmental inspectors :
  - Giving out information concerning schistosomiasis registration (personalia, profession)
  - Requesting and collecting stool samples for research
  - Living environment inspection (backyards, latrines and when needed giving advice in order to improve current situations)
- Stool sample analysis performed using the Kato-Katz method. Of the analysed batch 10% was rechecked by a second person.
- Positive cases were treated with praziquantel (50 mg/kg) free of charge. Follow up after 6 weeks.
- To a lesser extent snail research (*on Biomphalaria glabrata*) was committed.
- Vermox was used to treat other intestinal helminths (Necator, Ascaris, Trichurus Trichura and Enterococcus vermicularis (200 mg per day for 3 days))

# Results

- **Study period 1997-2001**
- 12.503 persons were given information and requested to cooperate with the research
- 8514 persons (68,1%) were enrolled into the study
  - Saramacca -> 3708
  - Commewijne -> 3471
  - Coronie -> 401
  - Paramaribo (Charlesburg) -> 335
  - Wanica (Weg naar Zee) -> 300

# schistosomiasis prevalence rate in various residential districts in Saramacca (1997)

Groningen

Residential District	notified	Analysed samples	Bilharzia		Other intestinal worm infections				
			No. of positive diagnoses	% pos.	Nec+	Asc+	Trich +	Ent+	Total (%)
Tambaredje/ Josikreek	200	172	9	5.5	4	0	1	0	5 (2,9)
Damboentong	583	514	41	7.8	23	4	2	2	31 (3,1)
Dammalang	272	223	18	8.1	0	0	0	3	3 (1,3)
Sidodadiweg	356	263	17	6.5	4	1	3	0	8 ( 3,0)
Groningen/ Kochwegfruidorp/ Paloeloeuweg	481	338	2	0.6	2	3	1	3	9 (2,7)
Muloschool (Groningen)	238	205	3	1.4	12	2	3	2	19 (9,3)
Total	2130	1715	90	5.2%	45	10	10	10	75 (4,4)

# schistosomiasis prevalence rate in various residential districts in Saramacca (1997)

Tijgerkreek

Residential District	notified	Analysed samples	Bilharzia		Other intestinal worm infections				
			No. of positive diagnoses	% pos.	Nec+	Asc+	Trich+	Ent+	Total (%)
Catharina Sophia	451	362	21	5.8	5	7	2	1	15 (4,1)
Sidoredjo / Tijgerkreek	462	323	5	1.5	17	5	3	4	29 (8,9)
Peperhol	630	477	32	6.7	30	3	3	6	42 (8.8)
Calcutta/ Weg naar Copenname	564	363	8	2.2	13	2	3	3	21 (5.8)
Bomeoweg	250	177	9	5.1	21	8	1	1	31 (17.5)
West Tijgerkreek	93	76	2	2.6	4	0	0	0	4 (5,3)
Staatsolie fieldworkers (living outside of Saramacca)	367	215	9	4.2	7	4	0	2	13 (8.0)
<b>Total</b>	<b>2807</b>	<b>1993</b>	<b>86</b>	<b>4,3</b>	<b>97</b>	<b>25</b>	<b>12</b>	<b>15</b>	<b>155 (7.8)</b>

# schistosomiasis prevalence in Saramacca (1997)

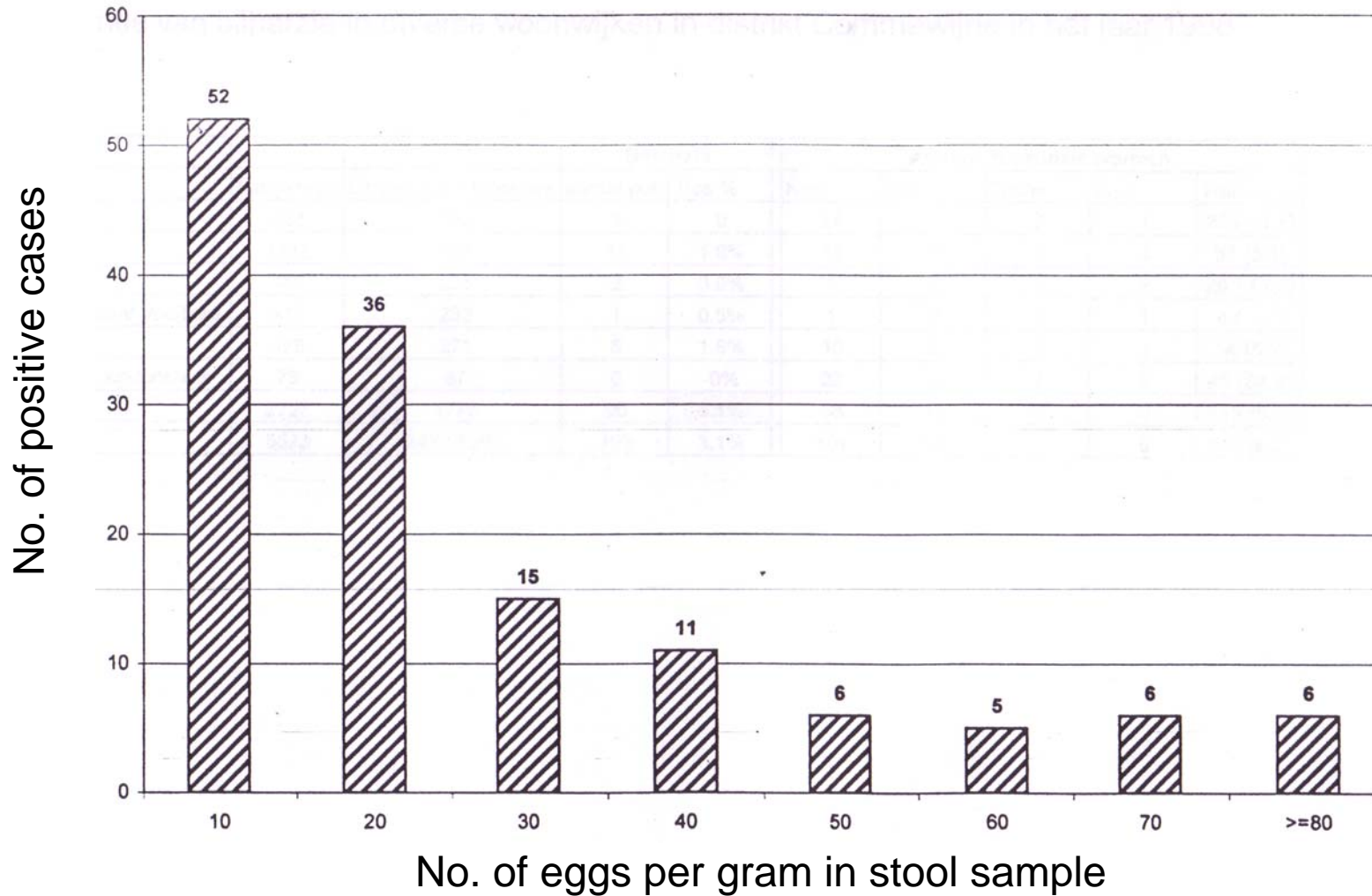
Sections Groningen and Tijgerkreek

	Notified	Analyzed Samples	schistosomiasis	Other intestinal worm infections			
				Nec +	Asc. +	Trich.+	Ent+
<b>Total</b>	4937	3708	<b>176</b>	142	39	22	25
<b>Percentage</b>		75.1	<b>4.7</b>	3.9	1.1	0.6	0.7

## Age and Sex specific prevalence of bilharzia infection in residents of Saramacca in 1997

Age group years	Males			Females			Both sexes		
	Num. Exam.	Num. Pos.	Pos %	Num. Exam	Num. Pos.	Pos %	Num. Exam.	Num. Pos.	Pos %
<1	13	0	0.0	25	0	0.0	38	0	0.0
1-4	128	2	1.6	96	0	0.0	224	2	0.9
5-9	187	3	1.6	179	1	0.6	366	4	1.0
10-14	204	6	2.9	208	5	2.4	412	11	2.7
15-19	161	12	7.5	178	5	2.8	339	17	5.0
20-29	343	22	6.4	315	9	2.9	658	31	4.7
30-39	461	34	7.4	297	12	4.0	758	46	6.1
40-49	168	11	6.5	149	7	4.7	317	18	5.7
50-59	103	13	12.6	136	5	3.7	239	18	7.5
>60	177	22	12.4	180	7	3.9	357	28	8.1
all ages(year s)	1945	125	6.4	1761	51	2.9	3706	176	4.7

# Intensity of egg secretion in schistosomiasis positives (n=176) in district of Saramacca (1997)



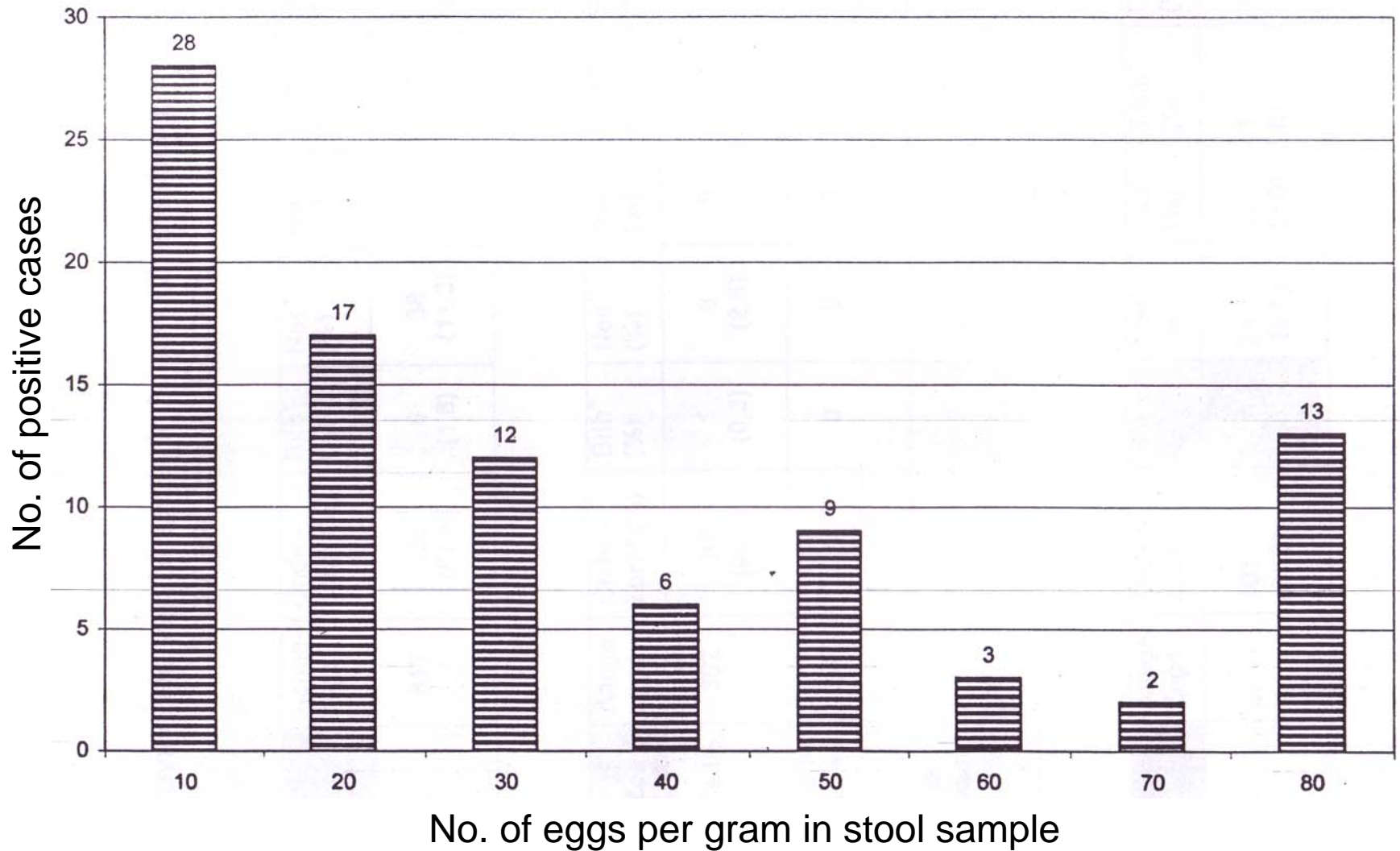
# schistosomiasis prevalence in various residential districts in Commewijne in 1998

Residential district	Notified	Analysed sample	schistosomiasis		Other intestinal worm infections				Totaal
			No. of positives	Pos %	Nec+	Asc+	Trich+	Ent+	
Ellen	338	192	0	0	14	4	3	1	22 (175)
Marienburg	1142	704	11	1.6%	17	10	5	4	36 (5,1)
Zoelen	448	225	2	0.9%	9	7	8	2	26 (11,5)
Nw. Amsterdam/ Voorburg	419	233	1	0.5%	1	2	0	1	4 ( 1,7)
Lust en Rust	426	271	5	1.8%	10	2	1	1	14 (5,2)
Lust en Rust kindertehuis	73	67	0	0%	22	14	7	0	43 (64.2)
Meerzorg	2727	1779	90	5.1%	88	14	17	0	119 (6,7)
<b>Total</b>	<b>5573</b>	<b>3471(62%)</b>	<b>109</b>	<b>3.1%</b>	<b>161</b>	<b>55</b>	<b>41</b>	<b>9</b>	<b>214 (6,2)</b>

# Age and Sex specific prevalence of bilharzia in residents of Meerzorg in 1998

Age group (years)	Males			Females			Both sexes		
	Num. Exam.	Num. Pos.	Pos %	Num. Exam	Num. Pos.	Pos %	Num. Exam.	Num. Pos.	Pos %
<1	7	0	0	4	0	0	11	0	0
1-4	55	0	0	40	0	0	95	0	0
5-9	73	1	1.4	74	0	0	147	1	0.7
10-14	89	2	2.2	86	3	3.5	175	5	2.9
15-19	78	2	2.6	90	4	4.4	168	6	3.6
20-29	160	25	15,6	153	4	2.6	313	29	9.3
30-39	155	13	8,4	160	4	2.5	315	17	5,4
40-49	112	3	2.7	95	2	2.1	207	5	2.4
50-59	89	11	12,4	70	7	10	159	18	11.3
>60	91	8	8.8	98	1	1	189	9	4.8
<b>all ages</b>	909	65	7.2	870	25	2.9	1779	90	5.1

# Intensity of egg secretion in schistosomiasis positives (n=90) in district of Commewijne (1998)

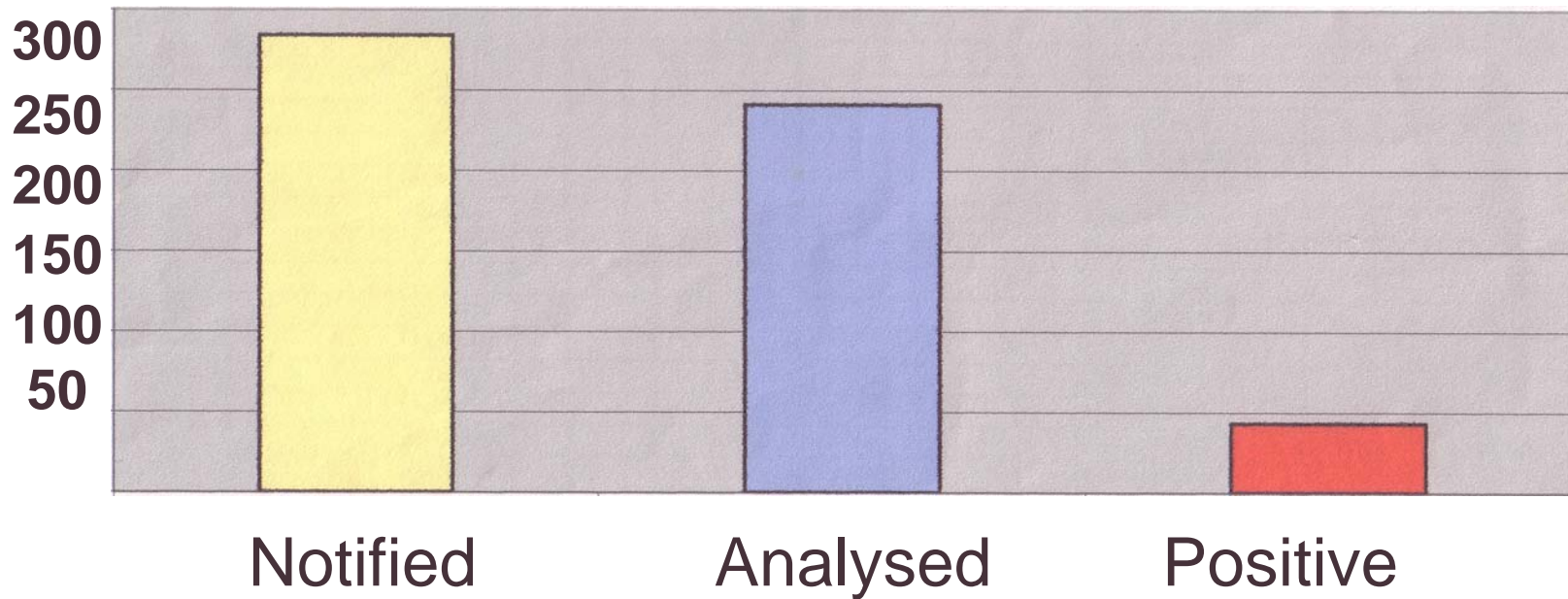


# schistosomiasis prevalence in Nieuw Charlesburg, Weg naar Zee and Coronie

	Notified	Analysed (%)	schistosomiasis+ (%)	Nec +	Asc+	Trich+	Ent+
<b>Charlesburg</b>							
	617	335 (57,5)	6 (1,8)	38 (11,3)	20 (6,0)	12 (3,6)	2 (0,6)
<b>Weg naar Zee</b>							
Public school Bolletrie	302	300 (99,3)	1 (0,3)	8 (2,6)	0	3 (1,0)	7 (2,3)
Public school Bolletrie (teachers and their families)	24	24 (100)	0	0	0	0	0
Residents living near the school	32	32 (100)	0	0	0	0	0
<b>Coronie</b>							
	654	401 (61,3)	10 (2,5)	24 (6,0)	12 (3,0)	1 (0,2)	0

# Public School Bolletriehe

Oct /Nov / 2003



Notified	Analysed	Positive
284	241	43
	100%	17,8%

# Results Public School

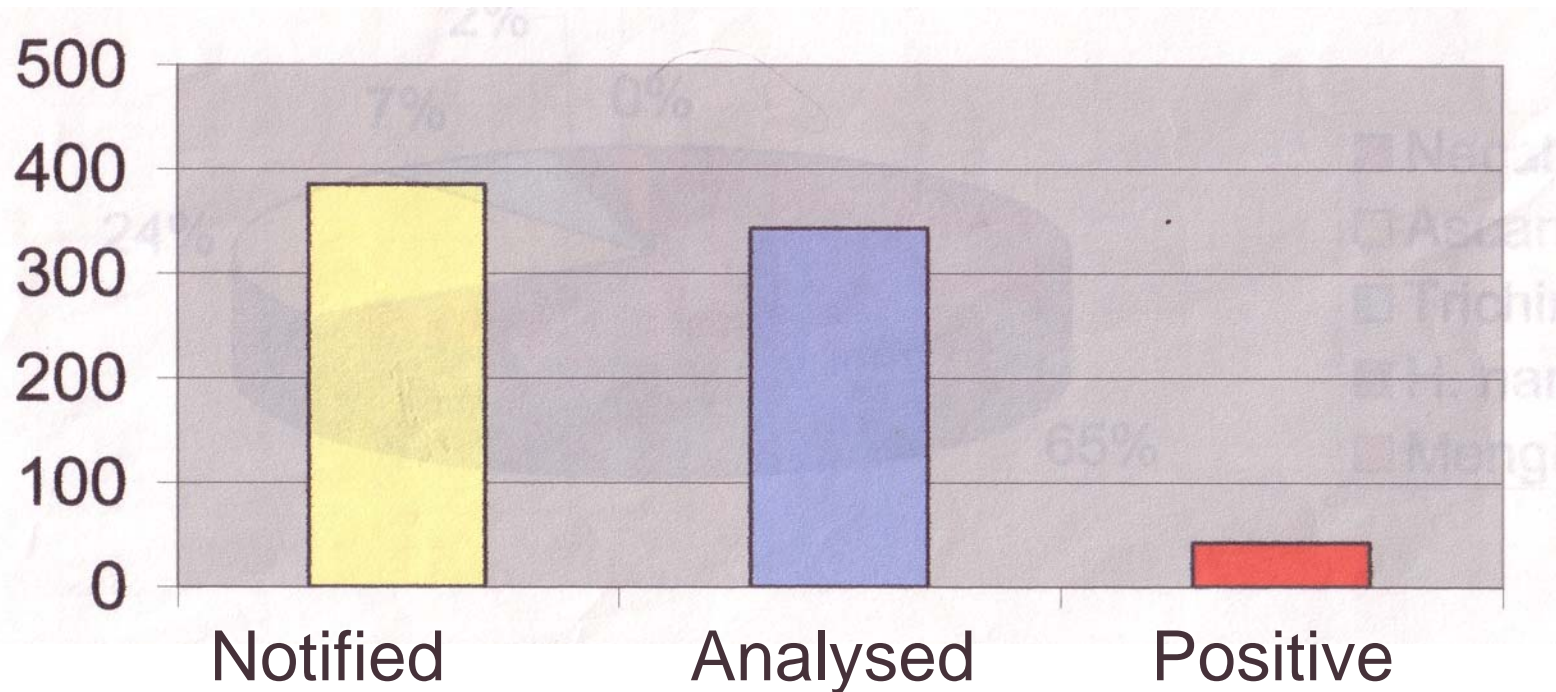
## Bolletriehe

Table 1: positive cases

	Total	% of total positive cases
<b>Bilharzia</b>	4	9%
<b>Necator</b>	30	70%
<b>Ascaris</b>	3	7%
<b>Trichirus</b>	3	7%
<b>Meninf</b>	3	7%
<b>Total</b>	43	100%

Prevalence rate 17.8 %

# Public School Middenpad Kwatta darmworm ) juli - aug - 2004



Notified	Analysed	Positive
385	343	42
	100%	12,2%

# Results public school Middenpad kwatta Study

Table: positive cases      42      Prevalence rate 12.2 %

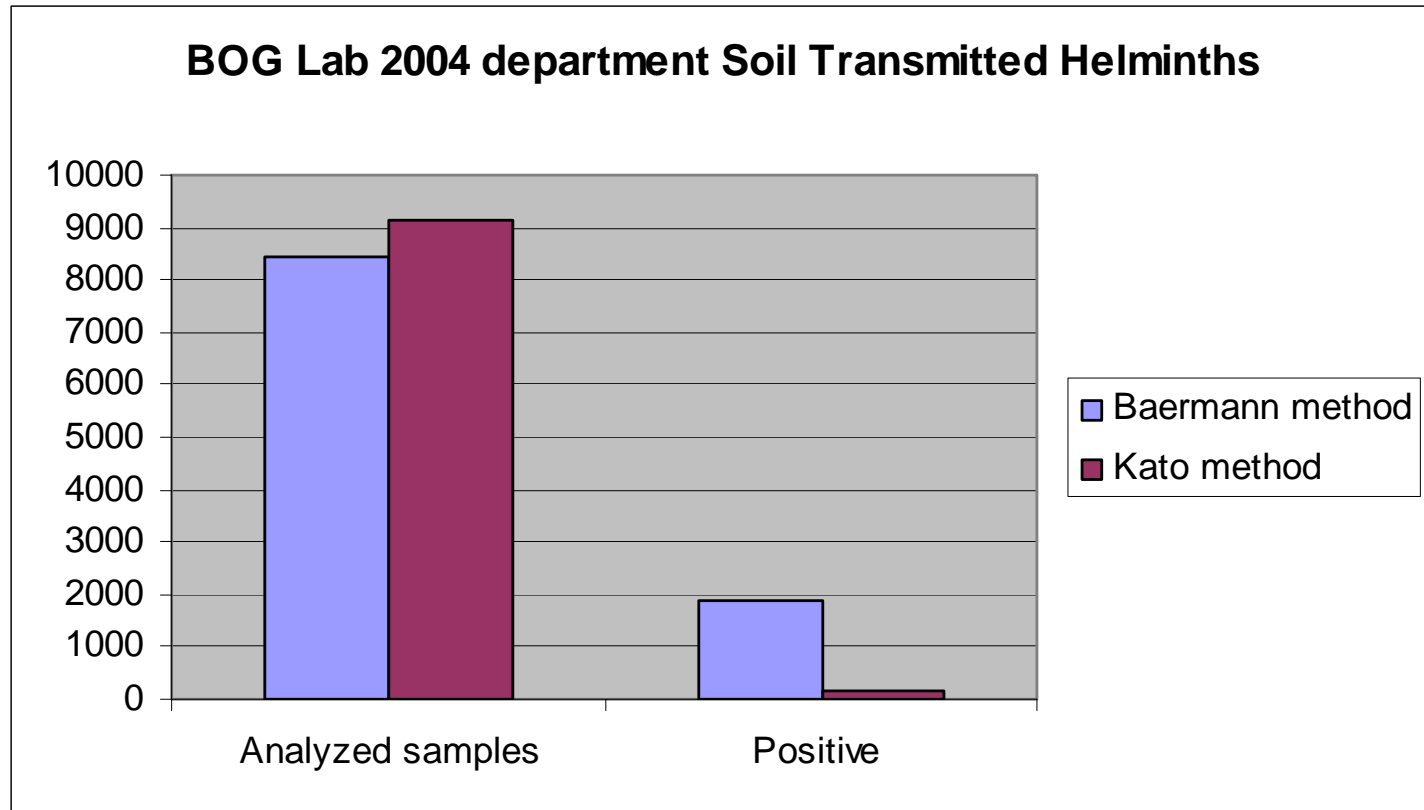
	Total	% of total positive cases
<b>Bilharzia</b>	<b>0</b>	<b>0%</b>
<b>Necator</b>	<b>26</b>	<b>61,9%</b>
<b>Ascaris</b>	<b>11</b>	<b>26,2%</b>
<b>Trichirus</b>	<b>3</b>	<b>7,1%</b>
<b>H. nana</b>	<b>1</b>	<b>2,4%</b>
<b>Mixed infection</b>	<b>1</b>	<b>2,4%</b>
<b>Total</b>	<b>42</b>	<b>100%</b>

# Results Public School Vishnudatt

Table: Positive cases 57 Prevalence rate 10 %  
tested 534 people

<b>Age group</b>	<b>Total</b>	<b>% of total positive cases</b>
<b>Bilharzia</b>	3	5,3%
<b>Necator</b>	38	66,6%
<b>Ascaris</b>	9	15,8%
<b>Trichirus</b>	4	7,0%
<b>Enterobius</b>	1	1,8%
<b>Menginf</b>	2	3,5%
<b>Totat</b>	57	100%

# BOG department soil transmitted diseases 2004



Samples were received from general physicians, hospitals, specialists and volunteers

Baermann method	
Analysed	Positive
8465	1900
100%	22.5%

Kato Katz Method	
Analysed	Positive
9162	135
100%	1.5%

# Results BOG department soil transmitted diseases 2004

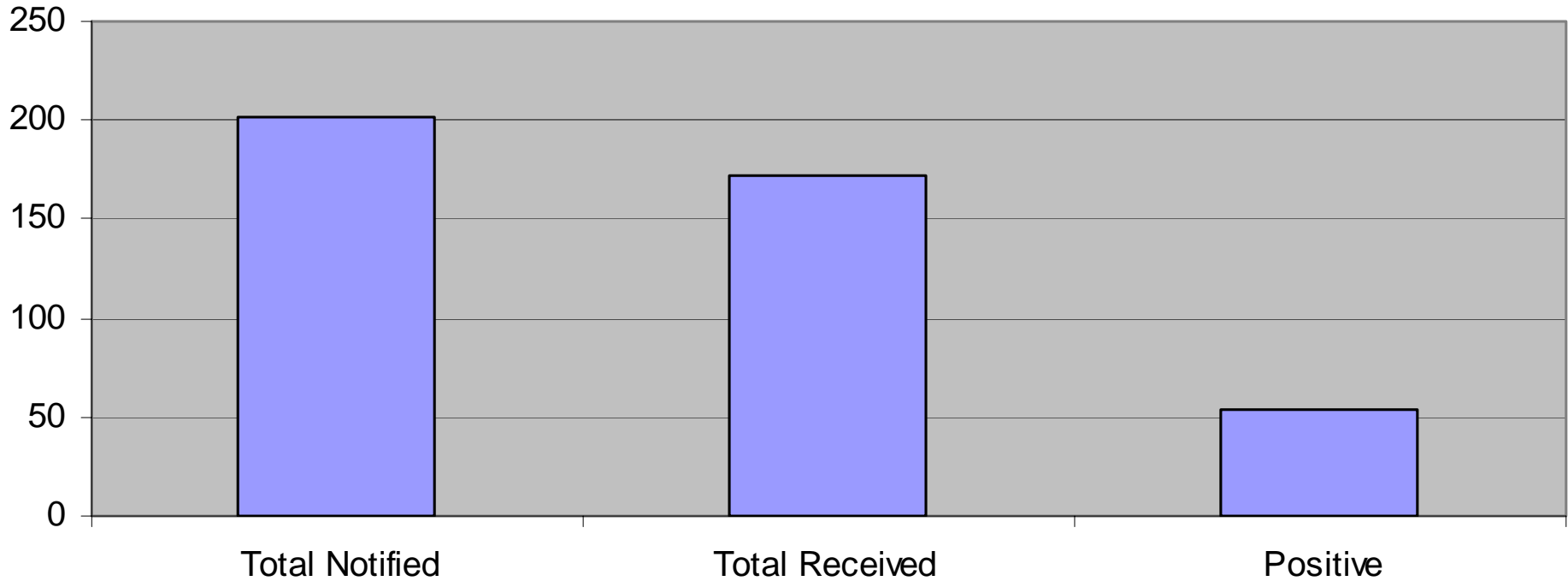
## Baermann method

	positive	% of total positive
Strongyloides stercoralis	1715	90.3
Hookworm	159	8.4
Schistosoma mansoni	8	0.4
Ascaris lumbricoides	9	0.5
Trichuris trichura	2	0.1
Enterobrus venricularis	2	0.1

## Kato method

	positive	% of total positive
Schistosoma mansoni	20	11
Necator americanus	29	15
Ascaris lumbricoides	51	27
Trichuris trichura	29	15
Enterobrus vernicularis	3	2

## Djoemoe and Asindonhopo july 2007



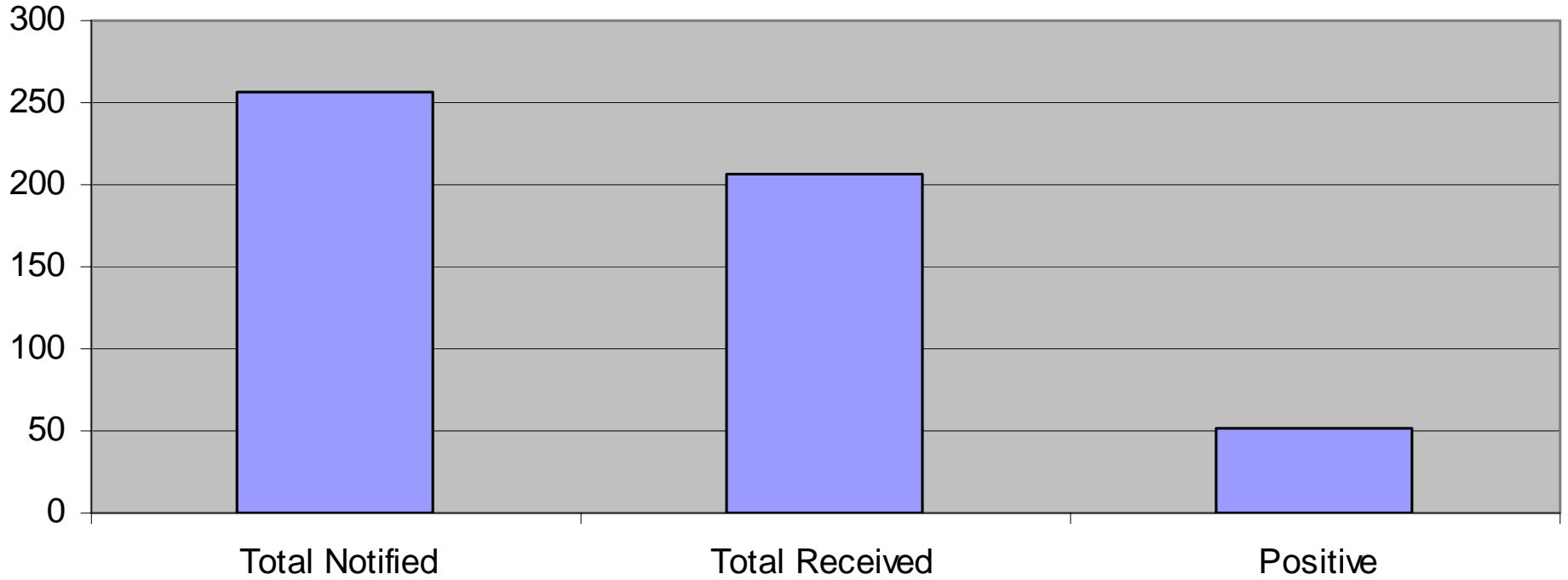
<b>Notified</b>	<b>Analysed</b>	<b>Positive</b>
201	172	54
	100%	31.3%

Samples were collected in the interior of Surinam in the villages of Djoemoe and Asindonhopo

# Results Djoemoe and Asindonhopo july 2007

	positive	% of total positive
Schistosoma mansoni	0	0
Necator americanus	20	37.0%
Ascaris lumbricoides	17	31.5%
Strongyloides stercoralis	5	9.3%
Mixed infections	12	22.2%

## Semoisie 2007



Notified	Analysed	Positive
256	206	52
	100%	25.2%

Samples were collected in the interior of Surinam in the village of Semoisie

# Results Semoisie 2007

	positive	% of total positive
Schistosoma mansoni	0	0
Necator americanus	31	59.6
Ascaris lumbricoides	6	11.5
Strongyloides stercoralis	2	3.8
Hymenolepes diminuta	1	1.9
Mixed infections	12	23.0

# CONCLUSIONS

- Schistosomiasis is still endemic in Suriname
- Generally low prevalence rates. Some locations however show a high prevalence rate (8%) and in certain age groups as high as 16%
- Use of a single stool sample analysis is relatively insensitive
- Prevalence rate under children younger than 14 years of age is low (in Saramacca as in Commewijne)
- Relatively strong increase in age groups 15-40 and above 50 year indicates an increased risk when engaging in agricultural or fishing activities
- Majority of patients suffering from a minor infection
- Cure rate when using Praziquantel (50 mg/kg) in Saramacca is high (95%, n=176)
- Other worm infections occur more frequently than schistosomiasis with higher prevalence rates (33%)
- General schistosomiasis prevalence in studies areas varies between 0.3% and 4.7%.

# Recommendations

- Intensify information campaigns:
  - Reduce contamination of water (disposal of faeces, construction latrines)
  - Reduce contact with contaminated water (avoiding skin contact with possibly contaminated water)
- Adequate treatment of positive persons
- Monitoring of persons living in a high prevalence area by using stool and blood sample analysis
- Reinforcement of infrastructure in order to trace schistosoma infections in RGD district poli clinics by improving the health workers' tools and education
- Reporting of positive schistosoma cases to a central location (BOG)

Thank you for your time  
and attention

# Schistosome life cycle animation

**Schistosomiasis life cycle**

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**click to play**

