Research/Recherche

Onchocerciasis distribution and severity in five West African countries*

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The Onchocerciasis Control Programme in West Africa recently extended its operation to Guinea, Guinea-Bissau, the western part of Mali, Senegal and Sierra Leone. To estimate the number of people infected and blinded by the disease and to determine its distribution and severity in the extension area, 215 villages were selected, using a stratified random sampling procedure, and surveyed. All the relevant entomological information available at the time was used in the sampling procedure and in the selection of 92 non-representative villages that were surveyed to confirm the findings. In addition, the populations of 608 villages were examined to map out in detail the distribution of onchocerciasis in the areas at a high risk of onchocercal blindness. The study estimated that 1 475 367 people were infected and 23 728 were blinded from onchocerciasis out of a rural population of 4 464 183. The northern and western part of the study area and the lower Niger basin presented a low or no risk of onchocercal blindness. The upper Niger basin, the south-central part of Sierra Leone, and three small foci in the Gambia, Bakoye, and lower Niger river basins were areas with a high risk of onchocercal blindness. The other parts of the study area presented a medium risk of onchocercal blindness. By detecting the communities at risk of onchocercal disease this study permits the selection of populations for disease control based on mass distribution of ivermectin, a microfilaricide.

Introduction

In 1974 the Onchocerciasis Control Programme (OCP) was launched in seven West African countries. The objective of the programme was to eliminate onchocerciasis as a disease of public health and socioeconomic importance and to ensure that there would be no recrudescence of the disease thereafter. This objective was pursued by vector control based on larviciding the breeding sites of *Simulium* species in order to interrupt transmission of *Onchocerca volvulus* over the OCP area for the duration of the reproductive life span of the parasite. Soon after the start of larviciding it became evident that the OCP area was invaded every year by flies coming from places outside the treated zone. To cope with this phenomenon and protect the local population, vector control was extended to the south and west of the original programme area.

In the Western extension the collection of baseline epidemiological information started in 1985. Villages were selected using the same criteria employed in the original OCP area.[a] In 1987, OCP became involved in the ivermectin community-based trials. The strong possibility of adding chemotherapy to

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[a] **Prost, A. et al.** *Méthodes d'évaluation épidémiologique de mass de l'onchocercose: leur utilisation au cours d'un programme de lutte contre le vecteur.* Communication to the WHO Expert Committee on Epidemiology of Onchocerciasis, Geneva, 10–18 November 1975. Unpublished document ONCHO/WP/75, 14, 1975.

vector control in the near future induced the technical units of OCP to reconsider the objectives and the method of village selection. The following objectives were selected:

— to provide reliable estimates of the number of people infected and blinded by *O. volvulus*;
— to describe the distribution and severity of onchocerciasis in the Western extension;
— to identify the areas and communities where the population is at risk of onchocercal blindness for treatment with ivermectin; and
— to collect baseline data for the evaluation of the impact of vector control and/or mass treatment with ivermectin.

To achieve these objectives an epidemiological mapping of the Western extension based on a representative sample of villages was planned.

Materials and methods

The sampling procedure was as follows.

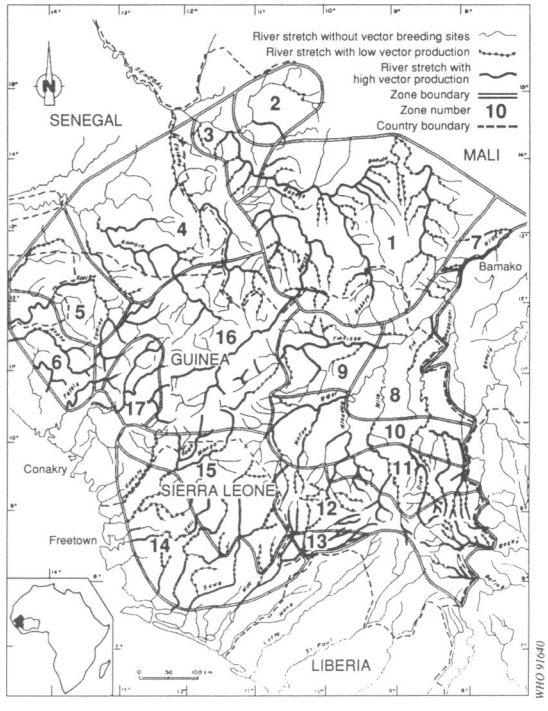
(1) *Stratification of the Western extension in zones.* The Western extension was subdivided into 17 zones characterized by ecological, entomological and demographic criteria (Fig. 1). The characteristics of each zone are depicted in Table 1. On the basis of the information available, the ecological, entomological and epidemiological features were believed to be largely uniform within a zone.

(2) *Estimation of the rural population of each zone.* The rural population of a zone was defined as the total population living in the zone excluding those living in the district capital and villages with more than 800 inhabitants. This population in each zone was estimated from the most recent national census data (Table 2).

(3) *Mapping of river sections inside each zone.* The rivers of each zone were divided into sections with high vector production, low vector production, and no vector production (Fig. 1). This differentiation of river sections was based on the judgement and knowledge of the two most experienced OCP entomologists working in the Western extension. A more precise definition could not be used because of insufficient data at the time. The data on the vector production of each river of a zone were recorded on a map with scale 1:1 000 000. Any large area (approximately 2000 km^2) that was identified without breeding sites was called an empty area.

(4) *Number of river stretches and empty areas.* River sections were subdivided into stretches of about 50 km in length. The exact delimitation of the stretches was, however influenced by the need for a clear landmark such as a tributary, or a major bend of the river. Zone boundaries always delimited a stretch, country borders did not. Change in the type of vector production from high to low or nil always marked the borders of a stretch. The stretches of each zone were numbered, starting from one extreme point and following the river downstream. Stretches were numbered by zone and by type of stretch; empty areas were numbered by zone.

Fig. 1. **Stratification of the Western extension and vector production characteristics of the rivers.**



(5) *Random selection of river stretches and empty areas.* The river stretches and empty areas were selected using a table of random numbers. The selection was done by zone and the number of stretches and empty areas selected was related to the size of the rural population of the zones (Table 3). To ensure an even distribution of the sample villages the zones 1, 4, 12 and 16 were further subdivided by river basins. Zone 1 was divided into three subzones by the tributaries of the Senegal river. Zone 4 was divided into the Faleme and Gambia river basins. Zone 12 was divided into west and east sides. Zone 16 was divided into westerly bound rivers and the others.

(6) *Boundary of the area allocated to a selected river stretch or empty area.* Before proceeding to the choice of villages, the geographical area allocated to each selected stretch or empty area was identified on maps with scale 1 : 200 000, as follows.

Table 1: **Description of the Western extension zones using ecological, entomological and epidemiological criteria: savanna zones and intermediate zones**

Zone number and name	Country	Vegetation	Vector spp.	River[a]	Flow	Tributaries	Breeding sites	Transmission[a]	Population	Special features
A. *Savanna zones:*										
1. Upper Senegal basin	Mali	Savanna	Savanna	Temp.	+ + +	+ + +	+ + +	+ + +	+ + +	Invaded zone
2. Kolimbine	Mali	Savanna	Savanna	Very temp.	+ + +	+ + +	+ + +	+ + ? Temp.	+ +	Northern limit of OCP, zoophilic vectors, short transmission season
3. Lower Senegal basin	Mali	Savanna	Savanna	Perm.	+ + +	+ + +	+ + +	+ + + Seas.	+ +	Zoophily, big variations in discharge and temperature
4. Faleme and Gambia basins	Mali/ Senegal	Savanna	Savanna	Mostly temp.	+ + +	+ + +	+ + +	+ + + Seas.	+ +	Gambia and Faleme are permanent rivers, presence of mining communities
5. Tomine and Geba basins	Senegal/ Guinea/ G. Bissau	Savanna	Savanna	Perm.	+ + +	+ + +	+ + +	+ + + Perm.	+	Major breeding sites in upper Tomine, lesser breeding sites downstream
6. Western coastal rivers	Guinea	Intermediate	Mixed	Perm.	+ + +	+ + +	+ + +	+	+ +	Extensive vector breeding but low biting rates and transmission
7. Niger basin near Bamako	Mali	Savanna	Savanna	Perm.	+ + +	+ +	+ + +	+ + +	+ + +	Whole zone affected by enormous Niger breeding sites
8. Niger valley	Mali/ Guinea	Savanna	Savanna	Perm.	+	+	+	+ Seas.	+ + +	Uniform zone with few breeding sites
9. Tinkisso below Dabola	Guinea	Savanna	Savanna	Perm.	+ +	+ +	+	+ + +	+	Few rapids but high productivity in rainy season and high transmission
10. Middle Niger basin	Guinea	Savanna	Savanna soubrense	Perm.	+ + +	+ +	+ + +	+ + +	+	Major source of invading flies
B. *Intermediate zones:*										
11. Milo, Niandan and Sankarani basins	Guinea	Intermediate	Soubrense mixed	Perm.	+ + +	+ +	+ + +	+ + + Perm.	+ +	Savanna flies common in dry season, very large breeding sites
12. Southern mountains	Guinea/ S. Leone	Intermediate	Squamousum mixed	Perm.	+ + +	+ + +	+ + +	+ + + Perm.	+ +	Low number of blind seen in villages close to major rapids
13. Moa basin	Guinea/ S. Leone	Forest	Mixed	Perm.	+ + +	+ + +	+ + +	+ + Perm.	+ +	Zone which could be extended south-west to include others
14. Central Sierra Leone	S. Leone	Intermediate	Soubrense mixed	Perm.	+ + +	+ + +	+ + +	+ + + Perm.	+ + +	High number of blind seen in first-line villages
15. Northern Sierra Leone	S. Leone/ Guinea	Intermediate	Mixed	Perm.	+ + +	+ + +	+ + +	+ + + Perm.	+ + +	A hilly region taking in the southern foothills of the Fouta
16. Fouta Djalon	Guinea/ Mali/ Senegal	Intermediate	Mixed	Perm.	+ + +	+ + +	+ + +	+ + + Perm.	+ + +	Mountainous area, dense hydrographic network
17. Konkoure and High Fouta Djalon	Guinea	Intermediate	Mixed	Perm.	+ + +	+ + +	+ + +	+ + + Perm.	+ + +	High mountain plateau area and Konkoure basin, dense population

[a] Temp. = temporary. Perm. = permanent. Seas. = seasonal.

Table 2: **Relationship between the number of randomly selected river stretches and empty areas and the size of the zone population**

Population size	Stretches		Empty areas
	High	Low	
< 150 000	1	1	1[a]
150 000–500 000	2	2	1
> 500 000	3	3	2

[a] If present.

— *Stretches*: the upstream and downstream borders of a selected river stretch were marked. A line was then traced from each border till the next river with breeding sites, located to one side of the selected stretch. The area so delimited was then divided into half. The half adjacent to the selected river stretch constituted one side of the area allocated to it. The process was then repeated for the other side of the river stretch.

— *Empty areas*: empty areas were areas without known breeding sites. They were bordered by areas assigned to river stretches or other empty areas. A zone boundary always delimited the area allocated to an empty area.

(7) *Random selection of villages.* Within the area allocated to a selected river stretch all the first-line villages, i.e., those closest to the river and within 5 km of its banks, were numbered and two of them were selected using a table of random numbers. Thereafter, all the other villages within the allocated area were numbered and two were similarly selected. The location of the selected villages is depicted in Fig. 2. Because of the inaccuracy of the maps a number of changes in the selected villages were foreseen and were made using the following rules:

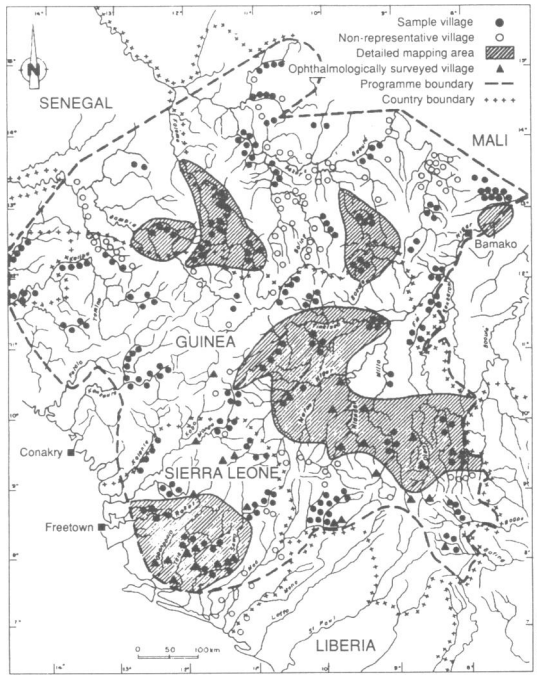
(*a*) A village has disappeared: It should be replaced by the nearest village with at least 100 people of the same category. If in a selected river stretch there are only two villages in one category, both are automatically selected, but if one of them has disappeared it cannot be replaced.

(*b*) A village is too large: Villages that are administrative centres or with a population of more than 800 people should not be part of the sample. If a village presents one or both of these characteristics, it should be replaced following rule (*a*).

(*c*) A village is too small: If a village has a population of 100 or less, an extra village should be added. This should be the nearest one to the selected small village and of the same category.

Skin snip survey. During this survey, a census of the village population, parasitological examinations and

Fig. 2. **Distribution of the villages surveyed for the epidemiological mapping of the Western extension.**



the visual acuity test were all carried out (*1*). The parasitological examination included taking a skin snip from each iliac crest of every inhabitant of the village, incubating it for 30 minutes in distilled water and examining it with a microscope to count the number of *O. volvulus* microfilariae present. The visual acuity test was conducted at 5 metres using Sjögren's hand test. The data were recorded on standard OCP forms. In a number of villages a complete and standardized ophthalmological examination of the population aged ≥ 5 years, as described elsewhere, was also done (*2*).

Data analysis. The data from skin snip and ophthalmological surveys were processed and analysed on personal computers using programs developed by OCP. The villages were characterized by their standardized prevalence of infection and blindness and by their community microfilarial load (CMFL), which is the geometric mean number of microfilariae per snip in adults aged ≥ 20 years (*3*). Onchocercal infection and total blindness were estimated for the rural population of the zones using the most recent national census data. The estimates of onchocercal blindness in all the extension areas, except Sierra Leone, were calculated by multiplying the CMFLs of the area by a factor derived from the regression line

describing the relationship between the prevalence of blindness (excluding causes definitely not due to onchocerciasis) and the CMFL. This information was obtained from the analysis of the results of 33 villages with 10870 inhabitants located in the savanna zone of the original OCP area (*4*). The estimate of onchocercal blindness in Sierra Leone was calculated by applying the factor obtained from the regression line describing a similar relationship for 17 villages with 3252 inhabitants (*5*).

Results

The location of the surveyed villages is depicted in Fig. 2. Included are 215 sample villages selected according to the methodology described above, 92 non-representative villages selected for the survey to clarify the disease distribution of specific areas, and 608 villages surveyed in the course of the detailed mapping activities with the aim of targeting for large-scale ivermectin treatment the population that was at risk of onchocercal blindness. The non-representative villages were located near major breeding sites.

Quality of the data. The villages selected were surveyed by national teams who were trained and supervised by OCP personnel. To ensure the maintenance of the same level of performance as the more experienced OCP teams, yearly quality control tests were introduced. A manual for the quality control test was prepared and the responsibility for the execution of the test was given to an OCP technician who also served as the standard. The results of the senior microscopists of the national teams of Guinea, Mali, Senegal and Sierra Leone for the year 1987 are shown in Fig. 3. The data in Guinea-Bissau were collected by an OCP microscopist. With very few exceptions, probably due to mislabelling, the scattergrams indicate high levels of agreement between the national team technicians and the OCP standard.

Estimated onchocercal infection and blindness. In Table 3 the estimated number of people infected and blinded from onchocerciasis are shown by zone. In zones where the parasite is largely transmitted by savanna species of the vector, 355968 people were estimated to be infected and 9710 blind from onchocerciasis out of a rural population of 1644734. In the zones where the parasite is transmitted by mixed forms of the vector, 1119399 people were estimated to be injected and 14018 blind from onchocerciasis out of a rural population of 2819449. In zones 10, 14 and 15 the number of people estimated to be blind from onchocerciasis was higher

Fig. 3. **Quality control test of national team technicians.**

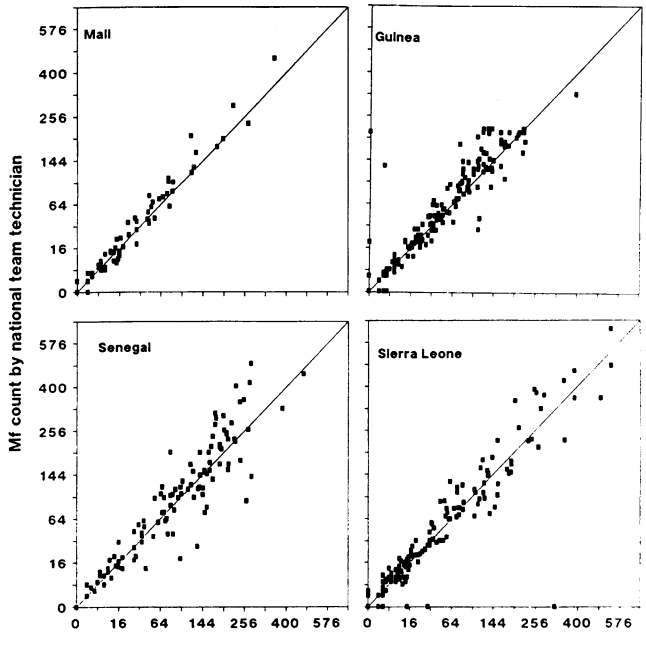


Table 3: **Estimated onchocercal infection and blindness in the 17 zones of the Western extension area**

Zone	Population		Corrected estimates		
	National census	Sample estimate	No. infected	Total blindness	Onchocercal blindness
Savanna:					
1	549 210	549 216 (100)[a]	159 012 (28.95)	10 750 (1.96)	3454 (0.63)
2	157 752	100 525 (64)	17 319 (10.98)	428 (0.27)	80 (0.05)
3	71 841	46 088 (64)	13 716 (19.09)	889 (1.24)	101 (0.14)
4	173 599	97 014 (56)	72 666 (41.86)	3271 (1.88)	2788 (1.61)
5	146 636	51 858 (35)	3575 (2.44)	936 (0.64)	0 (0)
6	164 190	39 106 (24)	2891 (1.76)	823 (0.50)	0 (0)
7	139 726	75 088 (54)	6346 (4.54)	774 (0.55)	65 (0.05)
8	101 852	113 039 (111)	10 319 (10.13)	575 (0.56)	176 (0.17)
9	77 255	45 188 (58)	26 031 (33.70)	1071 (1.39)	467 (0.60)
10	62 673	27 664 (44)	44 094 (70.36)	1333 (2.13)	2579 (4.12)
Subtotal	1 644 734	1 144 784 (70)	355 968 (21.64)	20 849 (1.27)	9710 (0.59)
Mixed:					
11	54 260	35 851 (66)	28 089 (51.77)	890 (1.64)	883 (1.63)
12	260 918	236 611 (91)	121 155 (46.43)	2362 (0.91)	2263 (0.87)
13	24 094	15 315 (64)	2068 (8.58)	333 (1.38)	10 (0.04)
14	859 287	327 401 (38)	483 354 (56.25)	3858 (0.45)	5527 (0.64)
15	524 088	180 716 (34)	283 586 (54.11)	1943 (0.37)	2723 (0.52)
16	540 856	157 037 (29)	159 978 (29.58)	3291 (0.61)	2363 (0.44)
17	555 946	98 775 (18)	41 168 (7.41)	2912 (0.52)	248 (0.04)
Total	4 464 183	2 196 488 (49)	1 475 367 (33.05)	36 438 (0.82)	23 728 (0.53)

[a] Figures in parentheses are percentages.

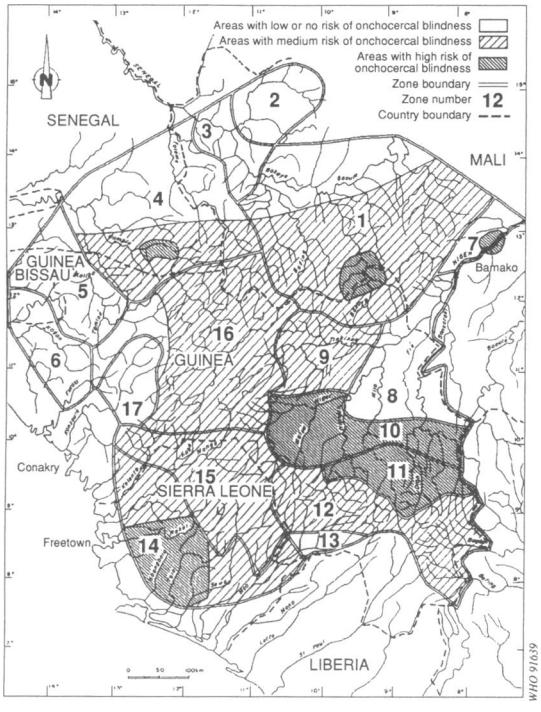
than the estimated number of blind from all causes. This awkward result is explained by the fact that the number of blind from all causes was directly estimated from the prevalences of blind people in the sample village of these zones, while the number of people blind from onchocerciasis was indirectly estimated from the CMFL of the same villages, as described in the data analysis section.

Distribution and severity of onchocerciasis. The distribution and severity of onchocerciasis in the study area is described in Fig. 4 and is based on the results of the 915 villages surveyed. The severity of the disease in a zone or subzone is determined by the estimated prevalence of onchocercal blindness (Table 3). A zone or subzone with an estimated $\geqslant 1\%$ prevalence of onchocercal blindness is at high risk of onchocercal blindness. A zone or subzone with a prevalence of onchocercal blindness between 0.2% and 0.9% is at medium risk of onchocercal blindness. A zone or subzone with a prevalence of onchocercal blindness below 0.2% is at low or no risk of onchocercal blindness. There are a few exceptions to this classification based on the sample villages, when strong evidence from the non-representative villages and the detailed mapping indicate a different distribution of the disease. Therefore, zones 1 and 4 are divided into a northern part with low or no risk of onchocercal blindness and a southern part with medium risk of onchocercal blindness. The villages with an appreciable risk of blindness or a CMFL of >10 in the Bakoye, Baffing and Faleme rivers are located in the southern part of their respective zones. In addition, all the non-representative villages surveyed in this area had CMFLs <10 although they were selected for their closeness to major breeding sites. These findings are supported by the reported high percentage of animal larvae in the flies captured in this area (*6*).

Furthermore, the areas with high risk of onchocercal blindness are limited to the southern part of the Bakoye river basin and a short stretch of the Gambia river (*7*).[b] Zone 14 is divided into a central part with a high risk of onchocercal blindness and a northern and eastern part with a medium risk of onchocercal blindness. All the villages surveyed in the northern and eastern parts of the zone have a CMFL <27 whereas in the central part several villages have a CMFL >30 and up to 67.[b] In the degraded forest of Sierra Leone onchocerciasis is significantly less blinding than in the West African savanna. However, prevalences of onchocercal blind-

[b] **De Sole, G. et al.** *Distribution of onchocerciasis in selected river basins of four West African countries.* Unpublished OCP report.

Fig. 4. **Risk of onchocercal blindness in the Western extension.**



ness of up to 6% were recorded in the most infected villages (*5*). A small focus with high risk of onchocercal blindess is added to zone 7. This focus, Tienfala, is on the border with the original OCP area and was known well before the beginning of this study. For this reason it was not included in the sampling, but was one of the areas selected for the ivermectin community trials and therefore studied in detail (*6*). The northern, western and eastern parts of the Western extension are therefore classified as areas with low or no risk of onchocercal blindness. These areas include zones 2, 3, 5, 6, 7, 8, 13, 17, subzone 16 west, and the northern part of zones 1 and 4. The southern part of the Bakoye and Gambia rivers, the Niger basin within zones 10 and 11, and the Rokel, Gbangbaia, Taia and part of the Sewa rivers in zone 14 are classified as areas at high risk of onchocercal blindness. The remainder of the Western extension is classified as an area with medium risk of onchocercal blindness.

Discussion

The mapping of onchocerciasis prevalences in the five countries of the Western extension of OCP represents an exceptional effort. Rarely, if ever, has the distribution and severity of an endemic disease over a vast area been described in comparable detail and the estimates of infection and disease calculated from a random sampling procedure. In the original OCP area the villages were selected, from historical records, for their hyperendemicity and other criteria that aimed to ensure a valid evaluation of vector control over a long period of time. The selection of the villages was rather independent of the entomological evaluation network.[c] Though the village network was successful in evaluating the vector control campaign, it could not describe the distribution and the severity of the disease adequately and did not allow correct estimates of the number of people infected and blind from onchocerciasis. The epidemiological mapping of the Western extension was conceived to avoid these limitations.

Onchocerciasis is a focal disease depending on the presence of a specific ecology, including among others, fast-flowing waters and the characteristics of the vectors involved in the transmission. Therefore all the entomological information available at the time was utilized in the stratification of the area and the selection of the villages. This information has proved to be both abundant and accurate. The distribution and severity of the disease was largely uniform within the zone and subzone boundaries, indicating that the assumption of homogeneity of the zones was correct (Fig. 4). The major misfit was in the northern part of zones 1 and 4, which should have been separated from the rest of the two zones. This error was caused by a misunderstanding, at the time, of an important transmission factor. In the Western extension some larvae are found which are of animal origin; the percentage of these in the vector population in the northern areas is greater because the cattle population is larger (*6*). The division of river stretches into high-producing and low-producing was generally correct, with the villages in the former being more infected than the villages in the latter. The only exception was the area with low or no risk of onchocercal blindness, where the prevalences and CMFLs of the surveyed villages were very low in both the high- and low-producing river stretches.

The study was limited to the rural population or the population living in villages with less than 800 inhabitants. The decision to limit the study to such a population was taken because a lot was gained in the accuracy of the information collected and little lost, since large villages are rare in onchocerciasis-infested areas. Large villages have a heterogeneous population that do not adequately represent the local risk of onchocercal infection and blindness.

[c] See footnote *a*, page 689.

Only 7 of the 215 sample villages were substituted because their population exceeded 800 inhabitants. With two exceptions, the population of the zones estimated from the sample villages was always less than the figures obtained from the national census. Underestimation of the sampled population was most probably due to inaccuracy of the available maps. This underestimation, however, should have hardly affected the estimation of onchocercal infection and blindness.

The division of representative villages into first line and other than first line was another strength of the sampling design. The prevalences and CMFLs were constantly higher in the first-line villages. Only in the area with very low infections was this difference not noticeable. Furthermore, the extensive detailed mapping which was carried out confirmed the higher risk of onchocerciasis in first-line villages. Because first-line villages were generally a small proportion of the total, their likelihood to have been randomly selected would have been low if no distinction had been made between them and the others. Therefore the partial estimates of people infected and blinded by onchocerciasis would have been unreliable.

The estimates of the number of people affected by onchocercal infection and blindness were based on the results from the representative villages. The results from the non-representative villages and villages with detailed mapping supported these estimates except in two instances. In the Gambia and Bakoye subzones detailed mapping showed that the two stretches randomly selected in each river basin were the most infected causing overestimation of the disease. The above-mentioned erroneous classification of the northern part of the Bokoye river in zone 1 worsened the overestimation.

In this paper the severity of onchocerciasis is described on the basis of the risk of onchocercal blindness instead of the traditional endemicity levels based on prevalence. We used this new classification based on CMFL values because it better satisfies the objectives of the mapping effort, namely it describes the distribution and severity of the disease and selects the areas in need of mass treatment with ivermectin. The old classification distinguishes hyper-, meso- and hypoendemic villages on the basis of prevalence and was based on the observation that high prevalences of total blindness were generally found in villages with a prevalence of onchocercal infection of $\geqslant 60\%$ (*8*). However, it has recently been clearly demonstrated that in the West African savanna onchocercal blindness and eye lesions are linearly related to the intensity of infection as measured by the CMFL (*4*). The above-mentioned relationship between a high prevalence of onchocercal infection and blindness was therefore due to the fact that, generally, communities with high prevalences had also high CMFLs.

In each of the countries of the Western extension fragmentary information on the presence and distribution of onchocerciasis was available. The methodology used by the various workers was different from the standard OCP methodology and CMFLs were not calculated. Furthermore, the criteria used to select the surveyed villages are not always described. McMahon et al. (*9–11*) were correct in stressing the importance of onchocerciasis infection and blindness in the south of Sierra Leone, an unexpected result that has been confirmed by the mapping. Knuettgen (*12–14*) reported hyperendemic onchocerciasis from most of the Niger basin. The importance of the disease in the Senegal basin and Guinea-Bissau was overstated (*15–17*).[d] The recent drought in West Africa may have reduced transmission during the past decade and may partly explain the difference in the findings. None of the previous works gave a complete and accurate assessment of the situation.

The mapping was not an academic exercise. It provided key information in the planning and monitoring of onchocerciasis control activities. The sharp definition of the areas at risk of onchocercal blindness described in Fig. 4 have permitted a rational approach to disease control with the recently introduced microfilaricide, ivermectin. Considering the wealth of entomological and epidemiological information collected, it is most unlikely that a substantial focus of blinding onchocerciasis has been missed by the mapping. However, isolated villages at risk of onchocercal blindness could have escaped detection. The relatively low number of rural communities targeted for mass treatment has kept the cost down to a manageable level and helped ensure during the first three years of treatment a 60% coverage, compatible with the morbidity control objective, as documented by the ophthalmological evaluation (*1*, *18*). The mapping has also contributed important information for the formulation of vector control strategies.

[d] **Sainte-Marie, F.F. & Negrel, D.** *Endemicity of onchocerciasis along the river Faleme, East Senegal.* Unpublished technical document, OCCGE 7090, 1979.

Acknowledgements

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Résumé

Répartition géographique et gravité de l'onchocercose dans cinq pays de l'Afrique de l'Ouest

Le Programme de lutte contre l'onchocercose (OCP) en Afrique de l'Ouest a récemment étendu ses activités à la Guinée, à la Guinée-Bissau, à l'ouest du Mali, à l'est du Sénégal et à la Sierra Leone pour faire face à l'invasion annuelle de la zone d'activité initiale de l'OCP par des simulies provenant de régions non traitées.

Maintenant que l'on peut espérer compléter dans un proche avenir les méthodes de lutte antivectorielle par une chimiothérapie, une cartographie épidémiologique de la zone d'extension du programme a été effectuée avec les objectifs suivants:

—évaluer de façon fiable le nombre de personnes infectées par *Onchocerca volvulus* et de celles qui sont aveugles;
—établir la répartition géographique et la gravité de l'onchocercose dans la région;
—repérer les zones et les communautés où le risque de cécité due à l'onchocercose est élevé afin d'y entreprendre un traitement à grande échelle par l'ivermectine, un microfilaricide disponible depuis peu;
—recueillir des données de base pour évaluer les effets de la lutte antivectorielle et/ou des traitements à grande échelle par l'ivermectine.

Pour réaliser ces objectifs, 215 villages ont été choisis selon une méthode d'échantillonnage aléatoire après stratification et ont été soumis à un protocole d'enquête normalisé. Toutes les informations entomologiques, écologiques et démographiques pertinentes dont on disposait à l'époque ont été utilisées pour la sélection de ces villages et de 92 autres villages non représentatifs choisis pour confirmer les résultats de l'étude. En outre, la population de 608 villages a été examinée pour établir la répartition géographique exacte de la maladie dans les régions où le risque de cécité due à l'onchocercose est élevé. Selon cette étude, sur une population rurale de 4 464 183 personnes, 1 475 367 seraient infectées et 23 728 seraient aveugles. Il a été estimé que la prévalence de la cécité due à l'onchocercose dans les 17 secteurs constituant la zone d'extension du programme variait de 0,0% à 4,1%.

Le risque de cécité est faible ou nul dans le nord et l'ouest de la zone étudiée ainsi que dans le bassin inférieur du Niger, alors qu'il est élevé dans le bassin supérieur du Niger, le centre-sud de la Sierra Leone, et dans trois petits foyers situés en Gambie, dans le bassin du Bakoye et dans le bassin inférieur du Niger. Dans les autres parties de la région à l'étude, le risque peut être qualifié de moyen.

En identifiant les communautés où il existe un risque de cécité due à l'onchocercose, cette étude a permis de choisir les populations qui devront faire l'objet d'un traitement à grande échelle par l'ivermectine.

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