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# HOMING IN ON HELMINTHS*

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I am honored to give this lecture dedicated to the memory of Dr. Fred Soper, whose pioneering efforts against the insect vectors of malaria and yellow fever are legendary. Soper and his colPan American Health Organization (PAHO) and the region of the Americas have led so visibly in the campaigns to eradicate smallpox, polio, and other diseases. Despite the risk of failure in such

TABLE 1
*Major helminthic infections*

| Parasitic infection | Estimated worldwide prevalence (millions) |
|---|---|
| Ascariasis | 1,000 |
| Hookworm | 900 |
| Trichuriasis | 750 |
| Enterobiasis | 400 |
| Schistosomiasis | 200 |
| Filariasis | 90 |
| Strongyloidiasis | 80 |
| Taeniasis | 70 |
| Clonorchiasis/ opisthorchiasis | >30 |
| Onchocerciasis | 18 |
| Fascioliasis | 17 |
| Diphyllobothriasis | 9 |
| Dracunculiasis | 3 |

TABLE 2
*Geographic distribution of onchocerciasis**

| Area | Case prevalence (%) | Main intervention |
|---|---|---|
| OCP region | 2.3 million (13) | Vector control, ivermectin |
| Nigeria | 7.0 million (39) | Ivermectin |
| Other areas of Africa | 8.4 million (47) | Ivermectin |
| Americas | 0.1 million (1) | Ivermectin |

* OCP = onchocerciasis control program (in West Africa).

still extant in the American tropics (Table 2).[6] An estimated 340,000 persons are blind from

population and up to 40% of the adult male

directly, this disease's socioeconomic effects are

TABLE 3

Comparison of onchocerciasis and dracunculiasis

| | Onchocerciasis | Dracunculiasis |
|---|---|---|
| Regions affected | Africa, Americas | Africa, southern Asia |
| Estimated prevalence | 18 million | 3 million |
| Human impact | Blindness | Crippling |
| Control effort | Regional OCP* ~$120 million 1974 | Global eradication by 1995 ~$75 mil |
| | ication in the Americas by 2000 | |
| Cost effectiveness† | $300 per healthy life-year gained (vector control) | $25 per healthy life-year gained (water supply) |

* OCP = Onchocerciasis Control Program.
† World Bank estimates, 1991.

petus for initiating this program was the visit by then World Bank president Robert S. McNamara to an endemic area of West Africa, which

turer, Merck, to donate the drug for treatment of onchocerciasis patients worldwide beginning in 1987. This has provided more security against

TABLE 4

*Status of dracunculiasis eradication by country, December 1991*

| Country | Status |
|---|---|
| [redacted] | |
| Cameroon, Kenya, Pakistan | Intensive case containment strategy now appropriate |
| [redacted] | |
| Benin, Burkina Faso, Cote d'Ivoire, Niger, Mauritania, Senegal, Togo | Completed nationwide search |
| Chad, Mali, Uganda | Nationwide search underway |
| [redacted] | |

1991. Nigeria and Ghana, which conducted their first national searches for cases in 1988 and 1989, respectively, and which have more cases of dracunculiasis than any other country, are well-advanced in their programs to eradicate the disease. These two highly endemic countries reduced the combined total of their cases by more than 30%

this year of materials and printing for health education posters and other paper products by Georgia-Pacific and the Communicorp Company have encouraged the internal efforts of several African countries. Some endemic countries are now using the presence of dracunculiasis to successfully solicit more external assistance for

between 1989 and 1990, from about 820,000 cases to approximately 520,000 cases.[20]

providing safe water supplies to rural populations. The main needs in Africa now are to achieve

In the Nanumba District of Ghana's Northern Region, over 70% of all villages had at least one

similar levels of public awareness and urgency about dracunculiasis prevention in the endemic

paign against the same pest when it threatened livestock in Mexico.[23] Humans deserve at least as much protection as cattle.

Some lessons of the dracunculiasis eradication campaign are already apparent. They include the power of relatively inexpensively acquired data

rates of approximately 25–31% among 10–24-year-old individuals in the Upper Western Region in the late 1960s,[25] to rates of over 70% among 10–20-year-old individuals in a village of Volta Region surveyed in 1979–1980.[26] In general, schistosomiasis hematobium is widely dis-

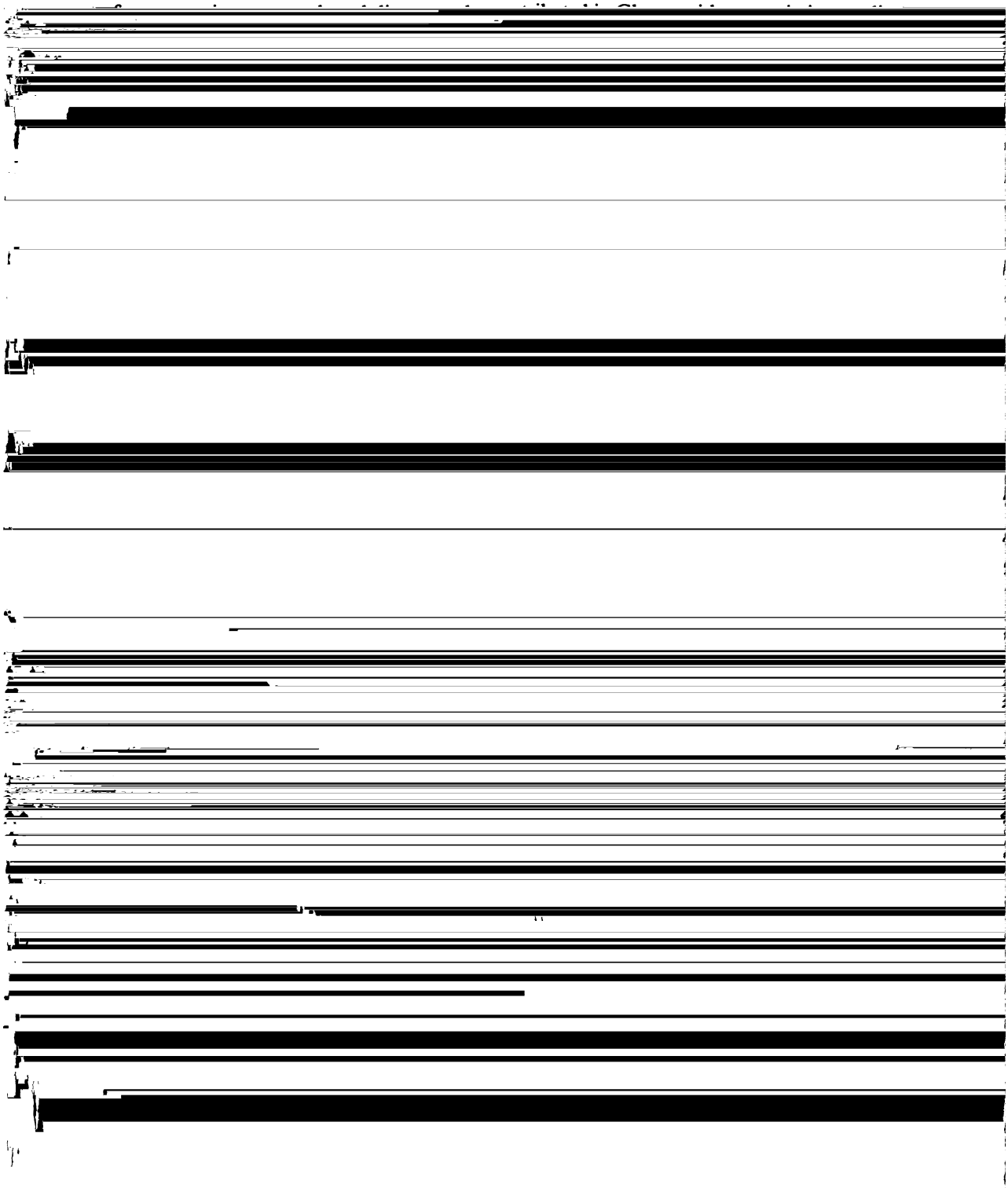

TABLE 5

*Comparison of Expanded Program on Immunization (EPI) and Expanded Program of Chemotherapy*

| | | |
|---|---|---|
| Target diseases | Measles<br>Polio<br>Pertussis<br>Tetanus<br>Diphtheria | Schistosomiasis<br>Ascariasis<br>Hookworm<br>Strongyloidiasis<br>Trichuriasis |
| Target population | Nationwide<br><2 years old | Nationwide<br>5–14 years old |
| Distribution | Clinic based | School based |
| Benefits | Reduced deaths<br>Reduced crippling<br>Indirect herd effect | Improved nutrition<br>Improved growth and development<br>Indirect community effect |
| Logistics | Injections | Oral administra- |

liasis, diphyllobothriasis, and paragonimiasis (praziquantel), as well as ascariasis, hookworm, trichuriasis, enterobiasis, strongyloidiasis, and

The main target population initially will be the 2.3 million 6–14-year-old children enrolled in primary and secondary schools, representing about two-thirds of all Ghanaian children in this age group (Ghana's total population is approximately 14 million persons). The decision to target school children was judged to be the most cost-effective approach, since all the target diseases except hookworm, which reaches a maximum at slightly older ages, are most prevalent in 6–14-year-old children; this age group is often the one most responsible for contaminating the environment and thus maintaining transmis-

sion, and many of these children are accessible

ulations for these and other expected outcomes. Additional studies of safety and efficacy of the drug combinations used, and their timing and sequencing may also be necessary before the drugs

2. Mahler H, 1980. Introduction. *The Work of WHO, 1978–1979.* Geneva: The World Health Organization, xii.
3. Goodfield J, 1991. *A Chance to Live.* New York: Macmillan, 178.
4. CDC, 1990. International task force for disease

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*Rural Health and Family Planning Project—Fi-*

the control of human helminth infections. *Trans*

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