Kentucky Dysentery and Diarrhea Fly Control Program (F.Y.1951)

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In May 1950, aid for a cooperative program to control dysentery and diarrhea, through fly control measures, was made available to Kentucky by the Communicable Disease Center.

In setting up the program the Communicable Disease Center recommended that an area of high endemicity be selected. In view of the relatively high incidence of these diseases in eastern Kentucky, it was proposed that the project be set up in a city in that part of the State. To participate in the program, the city was expected to provide for sanitation activities, labor for spraying, maintenance and storage of equipment, and insecticides. Federal funds were to be utilized to provide for vehicular equipment, spray machines, and technical and supervisory personnel as required. CDC participation in the program was contingent upon continued Federal appropriations.

During the latter part of May and in June 1950, health departments in eastern Kentucky were contacted and the program was outlined to them. These contacts were made to select a city that could meet the above requirements and that would be interested in the program. The city of Harlan was finally selected since it was the only city in a position to provide the necessary cooperation, and since it had a sufficiently high incidence of dysentery and diarrhea to qualify.

On June 28, 1950, representatives of CDC and of the State Department of Health were invited to meet with the Harlan City Council to explain the program. The council accepted the program and on that date voted an appropriation for fly control for the remainder of calendar year 1950. At that meeting, the council agreed to furnish two laborers for spraying; storage facilities for trucks, equipment, chemicals, and supplies; and maintenance of trucks in lieu of the purchase of chemicals. The Harlan County Health Department agreed to furnish office space and clerical assistance. CDC agreed to furnish trucks, spray machines and equipment, and an area supervisor and other technical assistance.

During the council meeting it was emphasized that to obtain fly control, principal emphasis should be placed upon the elimination of fly breeding foci through the improvement of municipal practices presently employed in the collection, storage, and disposal of refuse. Chemical treatment should be employed only as a supplement to improved sanitation.

In a special meeting in March 1951, the Harlan City Council accepted a program for calendar year 1951, essentially the same as that for calendar year 1950.

Harlan lies at the junction of Martins Fork and Clover Fork Creeks, headwaters of the Cumberland River. The business district and much of the residential districts are in a valley almost entirely surrounded by mountains. The city is located on U. S. Highway 119 and State Highways 66 and 257. It is served by a branch of the Louisville and Nashville Railroad.

Harlan has a population of 4,779 inhabitants (1950 preliminary census). In the outlying areas adjacent to the city there are approximately 2,000 people, making an over-all population of approximately 6,779 in the area. The chief industry in the area is coal mining. Although some farming is practiced, it is of little consequence.

The city is served by the Harlan County Health Department with both office and clinic located in the city. The County Health Department was organized in August 1920. Prior to that date there had never been an organized city- or county-wide health or sanitation program. At present the County Health Department is staffed by a part-time health officer, one full-time sanitarian, one field nurse, and two clerks.

In July the Communicable Disease Center assigned Mr. Henry B. White, Jr. to the Kentucky

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State Department of Health to serve as an area supervisor in fly control activities in the State. Since Mr. White had a background of 8 years experience in vector control operations, he received only a brief orientation in Louisville and proceeded to Harlan on July 17 to supervise the progress in that city. With assistance from CDC headquarters, he spent the remainder of July in setting up office space, holding conferences with health and city officials, arranging for storage of equipment and supplies, and selecting and mapping a check city.

For inspectional and operational purposes Harlan was divided into sections based upon fly densities, sanitation levels, and socioeconomic conditions. The city has a compact, well-defined business district, two widely separated low-class residential areas, and single middle- and high-class residential districts. Boundary lines were established for these five sections and each block was assigned a number. Each section was then divided into evaluative units consisting of approximately 10 contiguous blocks in the business districts and the low- and middle-class residential districts, and approximately 20 homogeneous blocks in the high class residential district. Within each evaluative unit, the block that had the greatest density of flies or fly breeding conditions was designated as a fixed block station. In addition to the fixed block a second block was selected at random in the evaluative units and inspected weekly.

To provide information on the normal trends of fly prevalence in a city in the area in which fly control practices are not employed, the city of Cumberland, situated 22 miles northeast of Harlan, was selected as a check city. Selection of Cumberland over other cities in the area was based on its similarity to Harlan in socioeconomic, industrial, and sanitation levels; fly prevalence; and its proximity to Harlan. The city was divided into sections and evaluative units the same as was done for Harlan.

Grill surveys were made at weekly intervals in all fixed and random blocks. Inspection of comparable sections in both cities was scheduled insofar as possible on the same day to minimize the effect of daily variations in weather conditions. Under normal conditions, less than 2 days was required for the inspection work and adjustment of the schedule was made whenever disrupted by weather. For all regular surveys the Scudder grill* was used.

Unfortunately, due to delays in the arrival of equipment, chemicals, and other supplies, the control and inspection activities did not get under way until the first week in August 1950. A pretreatment grill survey was made in Harlan the week of August 6. Chemical treatment was begun in the business section of the city during the same week. The chemical treatment was extended to all sections of the city and treatment was continued until the middle of October. During this 2½-month period some of the sections were treated at least three times based on the fly prevalence as determined by the posttreatment grill surveys. Cold weather curtailed fly activity and weekly grill surveys were discontinued in both the treated and untreated city at the end of October 1950.

The weekly grill surveys were resumed in Harlan and Cumberland during the week of May 14, 1951, and chemical treatment was begun in Harlan during the week of June 4 (see table 1). Treatment was extended to all sections of the city by the end of the month. The grill surveys and chemical treatment were performed in the same manner as during the previous season.

A 2½-percent oil emulsion solution of chlordan was used in the chemical treatment. This chemical was selected since it was desirable to conduct control from a residual spray standpoint and also to use the chemical as a larvicide. The chemical treatment was applied to garbage stations, garbage cans, and areas adjacent to garbage cans where flies were likely to congregate. Animal shelters also were treated. In the lower economic housing areas, back porches were sprayed along with garbage stations. Outside and underneath insanitary privies were also sprayed. Due to the insanitary conditions existing in some areas, it was necessary to spray both scattered garbage and human feces. This was especially true along the river banks where the houses were elevated. A summary of residual spray operations is given in table 2.

In November 1950, activities of the area supervisor were concentrated on making environmental sanitary surveys in Harlan. These surveys were completed in March of 1951. As a result of the surveys, a much clearer picture of sanitation conditions in Harlan was obtained. Many insanitary conditions were uncovered that the health department or the city council had not known were exist-

*Pub. Health Rep. 62: 681-686 (1947).

Table 1

GRILL AVERAGES BY WEEKS

Date 1950	Week No.	Harlan (Treated City) Grill Average	Cumberland (Untreated City) Grill Average
August 6-12	32	6.9 (Pre-spray	7.7
August 13-19	33	4.2 inspection)	8.7
August 21-25	34	4.1	7.9
August 28 to Sept 1	35	1.5	6.1
September 4-9	36	2.2	No inspection
September 11-16	37	No inspection	No inspection
September 18-22	38	1.9	7.0
September 25-30	39	1.1	4.4
October 2-6	40	1.4	7.2
October 9-13	41	1.0	4.6
October 16-20	42	1.5	5.9
October 23-27	43	1.0	5.4
1951			
May 14-19	20	0.6	0.9
May 21-26	21	2.0	1.5
May 28 to June 2	22	1.4	2.0
June 4-9	23	2.1	3.2
June 11-15	24	2.0	3.3
June 18-22	25	1.6	2.0
June 25-30	26	1.2	5.3

ent. A report of the findings was presented to the mayor of Harlan and to the Harlan County Health Officer. Table 3 gives a summary of the sanitary survey in the Harlan area.

Following the environmental sanitation survey, a survey of garbage and refuse storage, collection, and disposal was made. The city maintains a regular system of garbage and refuse collections, collection being made on the fee system. The fee for residences was increased from $1.50 to $2.00 per month in the early part of 1951, about 60 percent of the residents subscribing for this service.

Table 2

SUMMARY OF RESIDUAL SPRAY OPERATIONS

Number of Premises Treatments	4,258
Number of Gallons 2½ percent Chlordan used	2,282
Man-hours: CDC (Supervision and Inspection)	554*
Local	875
Total Man-hours Expended	**1,429**
Cost of Chlordan (2½ percent solution)	$411.83
Maintenance of Vehicles, Gas, Oil, and Miscellaneous Expenses (local)	51.80
Man-hours, Local, per Premises Treatment	0.21
Man-hours, Local, per Gallon - 2½ percent Chlordan	0.38
Gallons of 2½ percent Chlordan per Premises Treatment	0.54

*One CDC Fly Control Aid was employed in May 1951 to assist with grill inspections and other activities.

Table 3

SUMMARY OF SANITARY SURVEY HARLAN AREA

Type of Facilities	In City	Outside City	Total
Number of Dwellings	1,109	471	1,580
Number of Restaurants	29	3	32
Number of Grocery Stores	33	16	49
Number of Dwellings with no Toilet Facilities	15	?	?
Number of Dwellings with Private Sewers	19	?	?
Number of Dwellings with Privies	80	365	445
Number of Homes with no Garbage Container	446	305	751
Number of Hog Pens	9	47	56
Number of Other Animal Pens	82	116	198

Garbage and refuse collected from the city is disposed of at the municipally owned and operated incinerator, and at an open dump within the city limits. The dump is used mostly by people who do not subscribe to the municipal collection system. The dumping area supposedly is the landfill operated in connection with the incinerator. Promiscuous dumping is practiced by some of the inhabitants throughout the city. The city operates two trucks in the city collections; one is a 2-ton truck equipped with a K-9-X Dempster-Dumpster* unit, and one is a 1½-ton open dump truck. Collections are made daily in the commercial district, and twice weekly in the residential area. A report of the garbage and refuse survey was presented to the health department and the city council.

*The trade name is carried as a means of identifying the product under discussion, and does not represent endorsement of the product by the Public Health Service.

Since the reports of the environmental sanitary survey and the garbage and refuse survey were presented, some slight progress has been made in sanitation activities in the city, such as improved garbage and refuse storage, collection and disposal, and elimination of a few animal pens and insanitary privies. However, much work is needed to effect environmental sanitation in the city. It was estimated that over 300 garbage cans were sold by local hardware stores during the sanitary

Table 4

SPECIES OF FLIES TRAPPED IN BUSINESS AND RESIDENTIAL SECTIONS OF HARLAN, KY., FROM AUGUST 14 TO OCTOBER 24, 1950

Species	Number of Specimens*	Percent
Calliphoridae		
Calliphora vicina	48	2.3
Callitroga macellaria	44	2.1
Lucilia illustris	12	0.6
Phaenicia caeruleiviridis	92	4.4
Phaenicia pallescens	132	6.3
Phaenicia sericata	203	9.7
Phormia regina	422	20.2
Minor species (1)	1	
Total	**954**	**45.6**
Muscidae		
Musca domestica	175	8.4
Muscina stabulans	102	4.9
Ophyra leucostoma	219	10.5
Fannia canicularis	88	4.2
Minor species (13)	145	6.9
Total	**729**	**34.9**
Sarcophagidae		
Sarcophaga haemorrhoidalis	158	7.6
Sarcophaga pusiola	63	3.0
Sarcophaga rapax	25	1.2
Sarcophaga ventricosa	49	2.3
Minor species (16)	64	3.1
Total	**359**	**17.2**
Minor families (10)	68	2.3
Grand Total	**2,090**	**100.0**

*Total number of collections - 32

survey. During the month of April a spring clean-up campaign, sponsored by a civic group, was conducted in Harlan. Approximately 200 truck loads of refuse were removed from the city during the campaign.

In addition to the personal contacts, radio and newspaper publicity was employed to keep the public informed concerning the program and the necessity of practicing general sanitation as a means of fly control. Twenty-six newspaper articles appeared in the local paper, 90 radio talks and spot announcements were made, and 16 talks were given to schools and civic groups. Two films were used, "Fly Control Through Basic Sanitation" and "Insects as Carriers of Disease."

In connection with the entomological activities, fly-trap collections were made in Harlan and Cumberland. The traps were operated for periods of 24 hours, using a bait composed of meat or fish, and decaying vegetables and fruit. The flies collected in the traps were killed, stored in containers, and identified during the winter months. Table 4 lists the species of flies recovered from fly traps operated from August 14 to October 24, 1950, in Harlan. The bait-pan type trap was used for trapping.

Interdepartmental Committee on Pest Control

A STATEMENT ON THE HEALTH HAZARDS OF THERMAL GENERATORS AS USED FOR THE CONTROL OF FLYING INSECTS

The Interdepartmental Committee on Pest Control composed of representatives of the Departments of Agriculture, Interior, and Defense, and the Federal Security Agency held its regular third quarterly meeting on September 21, 1951 at Washington, D. C. This Committee agreed upon the following release relative to the use of insecticidal vaporizing devices:

> "It is the considered opinion of the Interdepartmental Committee on Pest Control that there are at present no data to indicate that the use of thermal generators dispensing only lindane, DDT, or mixtures of the two, for the control of flying insects is unsafe when the following restrictions are enforced:
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> 1. The insecticide shall be released at the rate not to exceed 1 gram per 15,000 cubic feet per 24 hours.
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> 2. Installation shall be made only in commercial or industrial premises, mess halls, and similar locations where human exposure will be on a working day basis – not continuous.
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> 3. The devices should not be used in homes or sleeping quarters.
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> 4. Devices shall be so constructed that output in excess of that recommended is impossible. Fuses to protect against overloading and high temperatures, and a pilot light to indicate whether or not the unit is operating should be 'built-in' features.
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> 5. Units should be mounted above head height and 3 feet or more from the ceiling.
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> 6. Installation shall be such that any material which might condense on nearby equipment, walls, or ceiling cannot be dislodged and fall into or otherwise contaminate food.
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> Since DDT and lindane are poisons, it is the opinion of the Committee that danger will arise from deliberate or unintentional violation of these basic principles."