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Item ID Number	02288
Author	Fitzgerald, Edward F.
Corporate Author	
Report/Article Title	Typescript: Summary of Binghamton State Office Building Medical Surveillance Program: Design and Implementation, [nd]
Journal/Book Title	
Year	
Month/Day	
Color	☐
Number of Images	5
Description Notes	

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SUMMARY OF BINGHAMTON STATE OFFICE BUILDING MEDICAL SURVEILLANCE PROGRAM: DESIGN AND IMPLEMENTATION

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Protocol

A plan was established in June, 1981, to help assess the health consequences of the Binghamton State Office Building (BSOB) fire, which occurred on February 5, 1981. It was proposed to extend and follow-up preliminary efforts conducted by the Broome County Health Department soon after the fire. The New York State Department of Health administers the BSOB Medical Surveillance Program and implements the protocol. The supervision and direction of the program, however, is the responsibility of the National Institute of Occupational Safety and Health (NIOSH).

The plan entails a multi-stage process contigent upon an individual's probable level of exposure. Anyone who entered the BSOB on or after the date of the fire was requested to have a series of laboratory tests performed. Physical examinations and interval medical histories were additionally conducted on those persons who remained in the BSOB for at least 25 hours. Laboratory tests were also offered as a public service to those not in the BSOB since the fire, but who had similar tests performed per order of the Broome County Health Department in February or March, 1981, because they felt that they nevertheless may have been exposed to contaminants from the BSOB.

The rationale for this schema is the belief that if health problems did occur as a result of exposure to PCB, dioxin, or dibenzofurans released by the fire, they would most probably be apparent among persons who actually entered the BSOB, since contamination was largely an intra-building problem. The likelihood of contamination should also increase with duration of exposure, so the most intensive efforts are focused upon individuals who were in the BSOB for 25 or more hours. Additional consideration is being given to a more sophisticated index of exposure, one which will incorporate measures of intensity (e.g., use of protective gear, date of exposure, floor and location of exposure) as well as duration.

The laboratory tests were performed at Binghamton General Hospital (BGH), which is operated by United Health Services, Inc (UHS). They involve a serum biochemistry profile of 20 analyses. Included were liver function tests linked to PCB exposure in the literature (e.g., SGOT and GGPT), triglycerides, and a variety of other procedures. A complete blood count with platelets and differential was also conducted. These tests are nearly identical to those ordered by the Broome County Health Department and performed at BGH on most of the program participants soon after the fire. They will provide for the examination of change in physiologic processes over time.

The interval medical history consisted of the person's responses to a nurse-administered questionnaire of 34 symptoms which he or she may have first experienced since the date of the fire. Illustrative items included skin rash, headaches, swollen eyelids, and other problems which may be related to PCB exposure, in addition to control items. The physical examination was performed at Wilson Memorial Hospital in Johnson City by licensed physicians board-certified or eligible for certification in internal medicine or family practice and employed by UHS. It focused upon the skin, since chloracne and other dermatologic conditions have been linked to PCB exposure in the literature. The nervous system was also carefully examined, because PCB's may have neural and sensory effects. The other organ systems, however, were also reviewed to complete the examination and to reassure the individual. The attending physician was encouraged to make recommendations or referrals for any conditions he detects. Referrals for dermatologic or neurologic disorders which the attending physician felt may be related to exposure to contaminants from the BSOB were made to specialists provided by NIOSH and the New York State Department of Health. All other referrals were made through the worker's personal physician.

The consulting physician for dermatologic conditions was Dr. Steven Cohen. He is associated with the Occupational Skin Clinic of the Yale University School of Medicine, and is well experienced in the diagnosis of chloracne and other skin lesions associated with PCB exposure. Dr. Jeffrey Ribner is a board-certified neurologist who maintains a practice in Binghamton, and he provided neurologic consultations.

The protocol also provides for the determination of serum PCB levels. Serum was saved from all persons in the program and will be sent to Hazelton Raltech, Inc., in Madison, WI, a laboratory well-equipped and qualified in the detection of PCB in human blood. The type of PCB under investigation is Aroclor 1254, since this was the type contained in the transformer fluid which was released, and the type identified in the soot retrieved from the BSOB for testing. Samples of serum saved from those drawn in February and March, 1981, will also be sent for analysis together with the follow-up samples to provide for an investigation of change in serum PCB levels over time. All samples will be labelled so that the laboratory is unaware of when they were drawn and the patient's exposure status. Control samples will be added without the laboratory's knowledge to provide quality assurance, and all analyses will be conducted during the same time period. This assessment of serum PCB levels will provide important objective evidence of exposure, and will be examined in relation to self-reported exposure, laboratory test results, and clinical findings.

Program Participants

The most recent enumeration revealed that the target population consists of 521 individuals (Figure 1). This total represents an increase of 42 from the original estimate of 479. Three hundred and eighteen of this number actually entered the BSOB during or after the fire. The remaining 203 persons were predominately those who worked in the adjacent City and County Office Buildings and felt that they were exposed through secondary sources.

One hundred and eighty-five of the 318 persons who had entered the BSOB remained there for at least 25 hours. This group included approximately 47 employees of the New York State Office of General Services who were involved in the initial clean-up, approximately 33 private electricians who removed and replaced the destroyed transformer, and 48 professional pollution control workers. The latter group are routinely exposed to toxic substances as a function of their occupation. Data will be collected from these individuals by their employer (New England Pollution Control Company), and analyzed separately from the other persons in the program. The effective size of the target population is therefore reduced to 473.

The 33 firemen who extinguished the fire were also considered eligible for physicial examinations. Although they were not in the BSOB for 25 or more hours, they were exposed soon after the PCB's were released from the transformer oil and while the chemicals were in a volatile state. The unique nature of their exposure warranted their inclusion in the group receiving physical examinations.

Conduct of Examinations, Histories, and Labortory Tests

The program officially began in September, 1981, with the receipt of budget approval for five staff positions and for maintenance and operation. The worker lists were reviewed and updated. Copies were sent to each person's employer to notify the organization of the program and to assure that the lists were complete. NIOSH and New York State Department of Health representatives held an informational meeting in Binghamton to instruct the panel of examining physicians on the clinical effects of PCB exposure. Certified letters were sent to the workers informing them of the arrangements and asking them to take part. The lists of workers were sent to the hospital to arrange for appointments, and the first persons were scheduled for October 30, 1981.

The majority of physical examinations, interval medical histories, and laboratory tests were completed by the end of January, 1982. The numbers of examinations and histories currently performed are 139, and, for the laboratory tests, the number is 430. These totals represent 94% and 91%, respectively, of the persons eligible for these services. Additional efforts were made to contact the non-participants and to gain their cooperation. Saturday appointments have been offered to persons who were unable to visit the hospital for the necessary procedures during the week. Seven of 14 dermatology and two of three neurology consultations have been performed. Serum samples are currently being prepared for shipment to Hazelton Raltech for PCB analyses.

Conduct of Interviews

All persons in the program are also being interviewed. The information collected includes sociodemographic characteristics, pervious medical problems, tobacco and alcohol consumption, medication currently used, and allergies. The main purpose of the interview, however, is to gather data concerning the exposure status of each individual. They are asked whether

they entered the BSOB on or after the date of the fire, and if so, the dates of their entry, the length of their stay, and their activities. They are also queried concerning the floors of the BSOB they visited, the use of protective gear, and likely routes of exposure. Similar questions are posed concerning the surrounding City and County Buildings and parking garage. The interview additionally contains the patient's report of previous or subsequent chemical exposures.

This information is necessary to update, standardize, and extend similar data gathered by the Broome County Health Department last February and March. Those who received physical examinations were interviewed in Johnson City as they arrived for their examination and interval medical history. The remaining patients are interviewed by telephone from Albany. Approximately 250 interviews have been completed to date, or more than 50% of those eligible.

Public Services

Copies of the results are sent to the personal physicians of the persons in the program. The workers are sent letters asking them to contact their physician and discuss the significance of the findings. Informational brochures concerning the program and the health effects of PCB's and dioxin are enclosed with this correspondence. Persons without a physician are referred to the Broome County Health Department. The New York State Health Department's Communications Office has compiled a binder of materials relating to all aspects of the BSOB Project (clean-up, medical surveillance, environmental sampling, animal toxicity experiments, etc.), which is made available to the public at libraries, the SUNY campus, and other locations. Meetings have been held with the Broome County Medical Society and other groups to inform them of the program. A New York State Department of Health representative travels to Binghamton from Albany twice a week to serve as a liason between the community and the State Health Department and to answer questions concerning the program.

Data Management and Analysis

The physical examinations, interval medical histories, and laboratory tests (including those conducted last winter by the Broome County Health Department) have been coded, keypunched, and placed on computer tapes. Edit programs are being developed to detect errors in processing, logical inconsistencies, duplicate or missing records, and other problems. The interviews that have been completed are currently being coded and will shortly be ready for entry into the computer. A plan to analyze the data is being developed for NIOSH, and will be implemented by the New York State Department of Health as soon as possible upon receipt.

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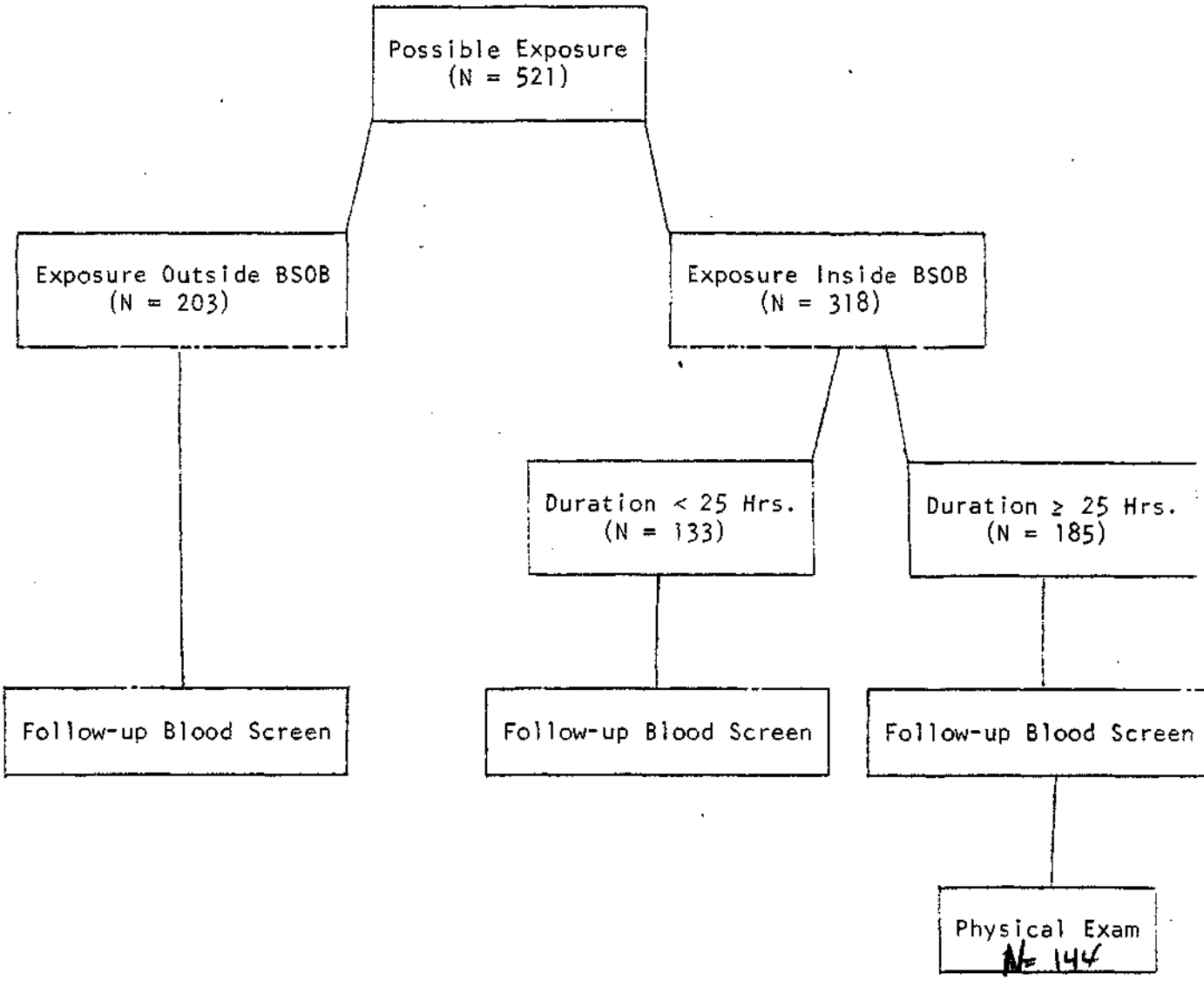
Figure 1



Serum for PCB - Hazelton Labs

Emphasis → Skin/Liver/Nervous System