Decline in Statewide Mobile X-Ray Programs to Detect Tuberculosis

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FOR MANY years State health departments have been financing mobile X-ray programs for screening large populations to detect tuberculosis. The rationale is that mass mobile survey X-ray programs will result in discovering enough new, active cases of tuberculosis to make this effort worthwhile.

An evaluation of tuberculosis casefinding by mass small-film radiography (*1*) revealed that the yields of new cases are low and continue to decline. In the absence of comparative studies of all the casefinding methods for the detection of tuberculosis, one must rely on the evaluation of ongoing programs.

Review of Nassau County Program

A review of the new, active cases of tuberculosis was undertaken by the Nassau County Department of Health for the calendar year 1968. This department, the largest county health department in New York State, has more than 700 full-time employees and serves a population of 1.5 million. The survey program, using 70-mm. units, is conducted in cooperation with the Nassau Tuberculosis and Respiratory Diseases Association, under contract with Powers Company of Glen Cove, N.Y. Table 1 reveals that the overall yield is only 0.24 per 1,000 of survey films taken. A closer look, however, reveals that the yield is only 0.13 per 1,000 films among school and industrial personnel and only 0.26 per 1,000 among the entire community.

The exception to the low yields of cases was in the Salvation Army center which shelters vagrant, alcoholic, single men. The yield of three new cases of tuberculosis per 177 films indicated that such high-risk populations should be screened regularly and have a well-organized tuberculosis control program. Therefore the county introduced in this center a tightly run program of tuberculin testing and chest radiography of all new residents on their admission and X-rays at frequent intervals thereafter. The center's residents are driven to the nearby health department chest clinics. More men are being screened since the new program was introduced, and more cases of tuberculosis are being detected.

The yield of new, active cases of tuberculosis per 1,000 films taken with the stationary X-ray units using Odelca 100-mm. films in the chest clinics (0.17 cases per 1,000 films) is not really different from that obtained with the mobile X-ray unit (0.26 cases per 1,000 films). Of

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course, populations coming to the chest clinics may not be representative of the community at large, since they might be more symptomatic, more health conscious, or more prone to self-referral. However, this bias, we feel, is not large. The New York City Department of Health mobile program in 1965 reported a similar low yield of 0.6 per 1,000 films taken (*2*).

Nationwide Investigation

In order to assess the status of the statewide mobile X-ray programs across the nation, a letter of inquiry was sent to all 50 State health departments on January 9, 1970. Of the 45 that replied, 20 States had discontinued the program, four were limiting their programs to selective surveys, and 21 were continuing their programs.

Among the 20 States that did not have a mobile X-ray program were some which had discontinued their surveys in 1955. The number of States which have discontinued their mobile X-ray programs is shown by year in the following table.

Year discontinued	*Number of States*
Unknown	4
1955	2
1958	2
1960	2
1965	3
1967	1
1968	1
1969	4
1970	1
Total	20

The four States limiting their statewide X-ray programs are concentrating on high-risk populations, such as jail inmates, migrant workers, residents of nursing homes, and persons living in high-incidence areas. The 21 States which maintain a mobile statewide X-ray program use various types of units: 15 use 70-mm. units, three use 14- by 17-inch units, one uses 100-mm. units, one uses both 70-mm. and 100-mm. units, and one uses a 70-mm. unit that can also take 14- by 17-inch films.

The cost of detecting a new case depends on many variables. In Pennsylvania, the cost in certain counties in 1967 was as high as $9,165 for every new case detected (according to Dr. Oscar B. Griggs, of the Pennsylvania Department of Health), while in Nassau County the cost was as high as $12,000 in 1968.

Discussion

The purpose of this paper is not to discuss the technical differences and the performance of various types of X-ray equipment. However, special, well-designed tests must be devised if the variables that such a comparison requires are to be measured. From replies to letters sent to the 50 State health departments, as well as from a letter dated January 22, 1970, from Dr. R. T. Anderson, medical director of the American Thoracic Society, the consensus was that there was no substantial differences in the films between 70-mm. and 100-mm. units. These authorities felt that the clinician or radiologist who reads the films makes the greatest variation in interpretation. Most State health departments felt that a second reading by another physician does not justify the expense in terms of additional yield.

Why did the 20 health departments discontinue their statewide mobile X-ray programs, and why did the other four health departments strictly limit their programs to selected surveys? The reasons given are the very low yield of active cases of tuberculosis per 1,000 films taken. Table 2 lists the yields of new, active cases of tuberculosis found in three States, one county,

Table 1. Yields of new, active cases of tuberculosis, Nassau County Department of Health, by location of program, 1968

Location of program and size of film	Number of persons X-rayed	Suspects	Cases	Yield per 1,000 films
Mobile, 70-mm. film	30,065	69	8	0.26
Schools	13,941	21	2	.14
Industry	8,668	19	1	.12
Nursing homes	832	7	0	0
Salvation Army center	177	4	3	16.9
Nassau County Jail	407	3	0	0
Senior citizens' housing	71	0	0	0
Community	5,969	15	2	33
Stationary, 100-mm. films, health department clinics	11,814	24	2	.17
Total	41,879	93	10	0.24

Table 2. Yields of new, active cases of tuberculosis from mobile X-ray programs of various departments of health

Area	Year of report	Yield per 1,000 films
Wisconsin	1969	0. 05
Nassau County	1968	. 24
New York City	1965	. 6
Maine	1960–68	. 6
New York State (excluding New York City)	1952–58	. 7

and one city by their respective mobile X-ray programs.

The yield of these programs was as low as 0.05 per 1,000 films in Wisconsin, and no higher than 0.7 for New York State, excluding New York City. In view of these low yields it seems that the expenditure for these programs is not really justified. A comparison of the yields of the mobile X-ray programs with the stationary screening programs (table 3) lends weight to the claim that it pays to place X-ray screening units in areas with a high incidence of tuberculosis.

Some State health departments have moved to tuberculin testing as the mass screening tool. For example, the Massachusetts Department of Public Health embarked on a campaign to promote the tuberculin test in 1967.

One might advance the argument that the mobile X-ray program should not be replaced with a screening program of tuberculin testing, since tuberculosis can be present and the patient can have a negative reaction to the tuberculin test. However, tuberculosis in a person who reacts negatively to the tuberculin test obviously is rare. It is mostly in symptomatic patients who might also be under treatment for other conditions and who are prone to seek medical care anyway. Therefore, the remote possibility of active tuberculosis in a negative reactor to the tuberculin test does not justify the monetary expenditure to maintain a mobile X-ray program with a very low yield.

The Pennsylvania Department of Health supported the law that makes it compulsory for all children entering school and all ninth graders to be tuberculin tested. Such a compulsory measure goes a long way in controlling tuberculous infection of any magnitude.

As tuberculosis control becomes an increasingly local, urban problem, the States as political units will be relieved of the burden of planning and implementing statewide mobile X-ray programs for screening large populations. Consequently, local health authorities are being charged with deciding whether to run mobile programs. Such decisions, obviously, must be influenced by factors such as the incidence of tuberculosis, priorities, and budgetary allocations.

The leadership of Massachusetts, Pennsylvania, and Utah—this last State is trying to eradicate tuberculosis (*3*)—toward mass screening by tuberculin testing instead of mobile X-ray programs is bound to have an impact on the rest of the nation. From our data, it is evident that such a trend is emerging.

Summary

Statewide mobile X-ray programs for screening large populations to detect tuberculosis are based on the rationale of discovering enough new cases to make the effort worthwhile. It is known that the yields are low and continue to decline. A review of the X-ray program in Nassau County during 1968 revealed an overall yield of only 0.24 case per 1,000 films taken. The exception was at the Salvation Army center which

Table 3. Comparison of yields from X-ray screening, by type of unit

Type of unit	Health departments	Years of report	Yield per 1,000 films
Statewide mobile	Various	1952–69	0. 05–0. 7
Stationary:			
Chest clinics	Nassau County	1968	. 17
Grady Memorial Hospital outpatient clinic	Atlanta, Ga	1969	1. 6
Municipal hospitals' admission program	New York City	1965	3. 1

shelters vagrant, alcoholic, single men whose yield was 16.9 cases per 1,000 films taken. A program of tuberculin testing and chest radiography at nearby health department chest clinics was introduced for the center's residents.

A nationwide investigation of mass screenings was conducted by sending a letter of inquiry to all 50 State health departments. From the 45 replies, we learned that 20 States had discontinued their statewide mobile X-ray programs, four States limited their programs to selective surveys of high-risk populations, and 21 States were continuing their programs.

The reasons given for discontinuing the statewide mobile X-ray programs were the very low yields of active cases per 1,000 films taken. The yields were as low as 0.05 and no higher than 0.7 per 1,000 films.

A comparison of the yields from mobile programs with those of stationary programs shows that it pays to place X-ray screening units in areas with a high incidence of tuberculosis. The emerging trend is to discontinue mobile X-ray programs at the State level and leave the responsibility of whether to sponsor such programs to local health authorities.

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Tearsheet Requests

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Review of Care Given Medicaid Patients in Institutions

States with Medicaid plans will be required to set up regular programs under which medical teams will review the appropriateness and adequacy of care being given Medicaid patients in nursing homes and mental hospitals and ascertain the need for continuing such care. The proposed regulations containing these requirements have been published in the *Federal Register* by the Social and Rehabilitation Service. They will not be in effect until published in final form at a later date.

Other proposed requirements are that teams reviewing nursing homes must include one or more physicians and other health and social service personnel, such as professional registered nurses, social workers, registered physical therapists, pharmacists, and dietitians. Teams reviewing care in mental hospitals must include one or more psychiatrists or physicians familiar with mental institutions and other mental health and social service personnel.

The proposed regulations will require that patients receive complete medical evaluations before they are admitted to nursing homes or mental hospitals under Medicaid or, if they are already there, before Medicaid payments are authorized. The evaluation would be made by the patient's attending physician for nursing home care and by the attending physician or a staff physician for care in mental hospitals.

The evaluation will include diagnosis, summary of present medical findings, medical history, mental and physical functional capacity, prognosis, and an explicit recommendation that admission or continued care is necessary. The attending physician or a staff physician will also have to prepare a written plan of care and, where applicable, a plan of rehabilitation.

Each institution will have to be inspected at least once within a year of the date of publication of final regulations in the *Federal Register*, and at least annually thereafter. Complete reports on each inspection will be submitted to the State Medicaid agency, with copies going to all other interested agencies and to the administrator of the facility concerned.