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REVIEW OF WORK OF COMMITTEE ON EVALUATION

The Committee on Evaluation of Public Health Practices was appointed as a sub-committee of the Committee on Administrative Practice on December 5, 1929.

The creation of this committee followed the recognition by the Committee on Administrative Practice that, with the completion of the studies of administrative health functions and their performance by official and non-official health organizations, which led to the numerical expression of the quantity and to some extent the quality of usual public health activities in cities and rural areas in the United States by the use of the Appraisal Forms, some at least of the current and generally approved practices of health departments were not based on adequate evidence of necessity or effective results.

Our knowledge of the prevalent practice of techniques and methods by public health departments is now reasonably complete.

To ensure progress in public health practice it is necessary to test results of accepted or current methods objectively, to seek other effective methods which will give at least as good results with less expense to the taxpayer, to apply new resources of prevention and protection within existing available funds, and to demonstrate the possibilities of attaining higher levels of health protection by changes in method or by introduction of new procedures even if these involve an increase in public expenditures.

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Inasmuch as there was no established technique or methodology to which the committee could turn for procedure in evaluating the merits of many of the existing public health practices it seemed best to initiate our studies of quality and results, as distinct from quantity of health services, by sample inquiries where tradition and public acceptance had stamped present day activities with approval, and by testing a new procedure that appeared theoretically promising.

We chose to measure the validity of existing isolation practice for scarlet fever by the proved effect upon secondary cases among susceptible persons exposed to the initial case on its return home. We determined to test the relative advantages to the pregnant woman in terms of her survival of childbearing, and of morbidity during the puerperal state following prenatal care of different degrees of frequency and initiated early or later in pregnancy. We undertook to obtain exact proof of the relative value in the prevention of diphtheria of artificial active immunization of children of the pre-school and school age together with the effective percentage of immune child population in a community necessary for effective control of the disease, and of the superiority, if any, in the use of toxoid instead of toxin anti-toxin as immunizing agent.

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We have learned from the studies, carried out at our request, and to some degree under the supervision of the committee and the field secretary of the A.P.H.A. by highly qualified persons and groups with the aid of funds put at our disposal for this purpose, that exact answers to our questions can be obtained in some respects by the method of controlled laboratory experiments supplemented by tests on human beings under practical and usual field conditions, as shown by the studies of Dr. Park on diphtheria toxoid.

We have learned that the clinico-statistical method presents many difficulties, involves some fallacies, and gives to some degree equivocal answers to questions of public health method which involve also clinical practice and of medical/surgical specialties. This is illustrated in the only partially significant conclusions of the study of prenatal care.

We have learned that economies in communicable disease control can be safely made by modifying existing isolation procedures according to age of patient, season of year, and the clinical characteristics of the case in scarlet fever.

We have not yet been able to assure ourselves of the optimum percentage of children under five to be immunized in order to prevent the spread of diphtheria with the least expense to the public and the individual.

We have not yet learned whether an isolation practice in large northern industrial cities which appears to be safe and effective for the control of scarlet fever will be similarly successful under other climatic and urban conditions in this country.

We have discovered the inadequacy of the routine records of many health departments upon which our objective opinion as to the results of present isolation and immunization practices and with regard to the causes of the results claimed or acknowledged depends.

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While much has been learned as to limitation of available facts, as to methods suitable for testing efficiency of health department practices, and in the matter of relative merits of more and less intensive services, it is apparent that we have only scratched the surface of inquiry in fields of public health in which large sums are annually spent for the public in a manner and by means not wholly convincing as to direct and indirect health profits from the expenditure.

To review briefly the possibilities and pressing necessities for profitable evaluation of health practices we may agree that for vital statistics there is little that offers hope of economy except in the matter of duplicating records and transcripts for local, state and federal needs, and little that can be done to improve accuracy of certification except by freedom from politics, by better qualification of personnel and by extending the principle of confidential certification of death as used successfully in some other countries.

In communicable disease control we may consider ourselves at the threshold of accomplishment, and realize that only by persistent testing of theory against fact, of record against record, of laboratory experience against

field practice can we close the gap between what we know and what we can use, and learn to discard the unprofitable in favor of the effective, regardless of traditional usage or the apparent hindrance of existing laws. The very unevenness of performance and variation in regulation and practices among our states and in cities within the same state convict us of an inconsistency in the application of medical science to public service.

The existing recommended procedure for control of each communicable disease should be periodically reviewed to secure better results at less unit cost, or superior performance if need be at higher cost. Specifically we should test performance in measles, whooping cough, scarlet fever and diphtheria and undertake a complete review of our procedures for the control of tuberculosis, syphilis and gonorrhea.

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In maternity and child hygiene and especially in that field of largest health expenditure and perhaps the least obvious progress, school health supervision, and in the realm of maternal mortality, the opportunities for test and measurement, for experiment and observation in results fairly crowd upon one, whether it be in the amount and character of prenatal care, the technique of baby and preschool supervision, or in the wholesale and largely mechanical unprofitable school health work. A recent partial analysis of the end results of the discovery of remediable defects among the school children of New York City suggests that nearly 80 per cent of such handicaps fail of correction because of conditions inherent in the methods of detection and subsequent action by public agents. Such performance would seem but a futile gesture which serves as a sort of anesthetic to the official and parental conscience. Evaluation of school health work would seem to offer perhaps the largest immediate opportunity for improving the results and credit in public health work.

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In the field of sanitation two matters appear to demand particular review although great progress is properly credited to existing efforts. Individual home sewage disposal and the control of milk by licensing and pasteurization ordinances are still open to analysis on the basis of results and the necessity of existing practices.

The people of this country still suffer massively from a great variety of infections and infestations directly related to the failure to separate their foods from their feces. What we can afford to do, and what we can not afford to do without, in the matter of individual home and farm disposal of human excreta are problems for which evaluation procedures are practicable.

While the cost of five cents per capita per annum to urban populations for sanitary control of milk supply seems sufficiently low, it is not yet proved to entire satisfaction that the price of milk to the consumer is not unfavorably affected by sanitary requirements which have but doubtful bearing upon the purity and wholesomeness of the product. And on the other hand it is not entirely clear that some increase in precaution might not reduce the present residual hazard from milk, or that abandonment of certain trade practices with the consent of health departments might not permit consumption of more milk with a reduction in retail cost.

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Public health education as the youngest of the accepted functions of the health departments has not crystallized out of its amorphous possibilities and practices any set or formula or performance. In no field is evaluation more difficult, or the hazard of misuse greater. We must admit a present lack of any method of analysis of results, or objective tests of effectiveness at all comparable in validity to those available for judging the other functions of a health department.

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The Committee on Evaluation of Public Health Practices has no independent sources of income with which to undertake or subsidize administrative

research. Our activities must for the present, therefore, be limited to two other possible directions, namely, the enlistment of capable permanent officers in health departments in individual, local or combined inquiries into the merits of their particular health functions, and secondly, the encouragement of national and local health agencies to do with private funds what health departments may have no resources to carry out. The committee considers itself obligated to plan and so far as its membership permits, to supervise evaluation studies in public health at the request of health officers and private agencies.

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The studies completed or partially so, with grants received during the pat three years from the Commonwealth Fund have been the following:

A. Studies on diphtheria toxin-antitoxin and toxoid.

The practical result of these studies has been to influence physicians and health officers to use toxoid in preference to toxin-antitoxin in children under school age, and to bring a desirable uniformity in higher antigenic potency of commercial toxoid preparations and the suitable labelling of such products on the basis of flocculation units. We have good reason to believe that the single toxoid inocculation at six months of age as advised by Dr. Park will generally prevail, with the result of a gradual increase in the percent of all children immunized in a community, especially among those under five years of age.

B. Epidemiological studies to determine (a) what effect active immunization has had on the incidence of diphtheria when applied to children of specific age groups and (b) what percentage of children of specific age groups need to be immunized in order to bring about satisfactory control of diphtheria.

The results of these studies, which are still being reviewed for continuing and corroborating evidence from additional cities and subsequent years, have been a diversion of emphasis from routine immunization of school children to special efforts in reaching and immunizing at least 30 per cent of the children under five years and especially those in the latter half of their first year of life. Efficiency in results, and economy in time and money have followed the introduction of this improved procedure in various cities.

Certain inconsistencies in results in one city are being subjected to further inquiry. An unexplored degree of inaccuracy in the claims of extent of immunization in communities by health officers required review of much previously accepted information. Large and small cities in various parts of the country have benefited practically from the principles of public action resulting from these studies by Dr. Godfrey.

Both Dr. Park and Dr. Godfrey are continuing to push inquiry further in diphtheria control, but limitation of funds is delaying progress at present.

The committee has been convinced by the work carried on under its auspices of the advisability of new and continued diphtheria studies in the following directions:

(1) The careful study and analysis of the diphtheria situations as they existed and have been affected by special programs in Detroit, Chicago, and Wilkes-Barre.

(2) The study and analysis of data which we hope will be submitted as a result of our past and future communications with health officers. (It is proposed to send another communication to health officers asking for data on diphtheria immunization).

(3) The specific study of the relationship between diphtheria incidence and immunization status in Peoria and Decatur, Ill. and in other communities having significant increases in diphtheria (notification of such increases will come by wire from the United States Public Health Service), together with the observation and stimulation of such measures as will tend to control the disease and furnish information which will help to substantiate or refute tentative conclusions reached.

(4) The institution of careful epidemiological studies in those communities visited in connection with (3). Such studies would involve the investigation of such factors as:

(a) The frequency with which diphtheria bacilli are found in children having discharging noses (but no other clinical symptoms of diphtheria) and the role played by those children in the transmission of the disease.

(b) The frequency with which individual sources of infection can be located by intensive work and the prevalence among them of

1. Missed cases, by age groups,

2. Carriers by age groups, with the determination of virulence or avirulence.

(c) The determination of the immunization status, by Schick test, of children by age groups (both preschool and school ages to be included):

1. Among those who have had the proper dosage of an approved immunizing agent.

2. Among those to whom no immunizing agent has been given.

(All the above studies, in cities having relatively high incidences of diphtheria to be carried out within the individual city by (a) areas reporting unusually high incidence of diphtheria and (b) areas reporting little or no diphtheria).

(5) In selected cities having had no, or very little diphtheria reported for at least five years, the institution of studies to determine

(a) Carriers of diphtheria bacilli morphologically identified by age groups, with the determination of virulence or non-virulence of such carriers.

(b) The immunization status, by Schick test, of children by age groups (both preschool and school ages to be included):

1. Among those who have had the proper dosage of an approved immunizing agent.

2. Among those to whom no active immunizing agent has been given.

C. Studies in Scarlet Fever control by Dr. John E. Gordon while still undergoing test for corroboratiom of consistency in results or procedure recommended, have produced sufficient proof of benefit to be expected from modifying our present isolation practice to more than justify the time and money spent in the study. It may not be until 1936 when the third decennial revision of standard communicable disease control practice will be published, that there will be wide spread acceptance of the innovations proposed, but benefit to patient, quarantined households, and health departments is certain to result from the less arbitrary period of isolation which seem to have been well justified by Dr. Gordon's observations.

The results of the studies and the logical extension of them for the purpose of greater accuracy and corroboration are as follows:

The tentative conclusions reached, which must be tested before they can be made a part of accepted scarlet fever control methods, are:

(1) That the communicability of scarlet fever is not fixed, and that no single specified isolation period will serve to control adequately and economically the incidence of secondary cases.

(2) That the following factors influence the communicability of the disease and must therefore be taken into consideration in establishing isolation periods which will effectively and economically prevent the spread of scarlet fever:

(a) Age. Children under fifteen years of age having scarlet fever have a longer period of communicability than do adults.

(b) Season. Scarlet fever, in the individual patient - child or adult - is communicable or transmissible for a longer period of time in winter than in summer.

(c) Climatic conditions. It seems quite probable that communicability as well as susceptibility, in fact perhaps the entire epidemiology of scarlet fever, may differ in various parts of the country because of a difference in climatic conditions. The evidence here is not conclusive but it is to be hope that the studies in Richmond, Va., and Tacoma, Wash., will furnish definite evidence regarding this problem.

(d) Condition of patient. The incidence of scarlet fever among persons exposed varies in accordance with the type of complications to which they are exposed.

(3) That carriers and missed cases play an important role in spreading scarlet fever and that carriers and missed cases can be detected by careful clinical observation, and by periodic culturing.

Additional studies, as yet incompleted, include:

(a) A study to determine how the organism responsible for scarlet fever is carried over from one season to another, that is, what type of individual serves as a reservoir for the organism during the period of low prevalence of disease.

A survey made in one school has brought to light several individuals who had scarlet fever a year ago and still harbored the organism. Their role in the spread of the disease is as yet uncertain, but probably very real.

(b) The use of convalescent serum as a means of giving temporary protection to susceptible contacts.

Indications are that one dose if given early enough will protect a large proportion of those to whom it is given. A study has been made of 500 scarlet fever contacts who received convalescent serum and a similar number of contacts who did not receive the serum. Information gathered as a result of this study is at present being analyzed.

(c) Immuno-transfusion as a means of treating serious cases of scarlet fever (Clinical problem)

(d) A study to determine the factors which govern the problem of ear infection in scarlet fever.

The variables being considered include the clinical form of scarlet fever, method of management, seasonal variation, age, sex and color of patient. (Clinical problem)

(e) A study of the incidence and management of streptococcus meningitis during the course of scarlet fever. (Clinical problem)

(f) A study of surgical scarlet fever and its management. (Clinical problem)

The next important step, aside from the perfectly obvious one of continuing to gather information which will tend to support or refute tentative conclusions already reached, is to test their validity by instituting control measures based on them.

One important step has already been taken in the inauguration of modified scarlet fever regulations in Detroit. A regulation of the Board of Health of Detroit provides that uncomplicated cases of scarlet fever shall be released from isolation:

In winter and spring (January to July)

At the end of twenty one days for patients over 15 years of age.

At the end of 28 days for patients under 15 years of age.

In the summer and fall months (July to January)

At the end of 14 days for patients over 15 years of age.

At the end of 21 days for patients under 15 years of age.

Obviously these regulations are based on the tentative conclusions that the disease is communicable for a longer period of time in winter than in summer, and longer in children than in adults.

These regulations have now been in effect for more than a year.

Thus far in no instance has a patient released under these modified regulations given rise to a return or secondary case. (this means that no secondary cases occurred, because of the changed regulations which would not have occurred under the former regulations, which provided that all uncomplicated cases of scarlet fever be isolated for 28 days regardless of age or time of year.)

It is particularly significant that in no instance has a secondary case developed following a 14 day release. If this continues for another year the recommendation that a 14 day period of isolation for adults be used in other communities will seem justified.

Further studies should include:

(1) The extension of the application of regulations designed to reduce periods of isolation for scarlet fever.

(a) The institution of a year round period of isolation of 14 days for uncomplicated cases of adults.

(b) The institution of a 21 day period of isolation, both summer and winter, for children under 15 years of age.

(c) Studies designed to test the feasibility of still further reducing the isolation periods of summe r cases (14 days for adults and 21 days for children).

(2) The continuation of careful epidemiological studies of all scarlet fever cases and contacts, in a section of Detroit comprising approximately 100,000 persons, and in Richmond, Va., and Tacoma, Wash., and if possible in one or more rural areas, to determine the role of missed cases and carriers in the transmission of scarlet fever, and to institute measures designed for their proper management.

(a) After the role of the missed case and carrier has been reasonably determined, to institute administrative practices designed to prevent the spread of the disease from these sources.

(3) The continuation of the studies in other areas particularly in Richmond, Va. and Tacoma, Wash., and if possible the institution of studies in one or more additional rural areas, primarily to determine the effect of climatic and rural conditions on the epidemiology of scarlet fever, but also as a means of supporting or refuting tentative conclusions reached principally as a result of the Detroit studies.

(4) The continuation of such studies as give promise of bringing about a more scientific and effective management of scarlet fever, such as:

(a) The determination of and control of persons acting as reservoirs for the disease during periods of low prevalence.

(b) The use of convalescent serum and immuno-transfusion in the prevention and treatment of disease. (Clincial problem)

(c) The factors involved in the development of various complications of scarlet fever and the more effective prevention and treatment of such complications. (Clincial problem)

D. The study of maternal mortality and morbidity related to variable amounts and quality of prenatal care by Dr. Margaret Tyler and J. H. Watkins, Ph.D. and H. H. Walker, Ph.D. resulted in a few positive findings and recommendations affecting public health practice, and in some negative oberservations which will save subsequent students of this problem much loss of time.

To have discovered that much of the profit of prenatal care can be obtained by using the nurse instead of the physician, and that the outcome of childbirth to the mother is probably affected to a greater degree by the quality of obstetrical attendance than by any other factor, and this to a greater degree in women presenting some abnormality of structure or function, fully justified the meticulous care with which all factors in this most complicated of health techniques were analyzed, and the grant of funds for the purpose of this study.

We have learned that there is a limit beyond which frequency of medical and of nurse attention during pregnancy produces a corresponding increase in safety to the mother, and that even a certain minimum of prenatal care, if it includes a competent medical examination of the patient, is a substantial safeguard to the expectant mother. We have learned in this as in many another clinical situation that routine practices are of less value than selective services, which only education of prospective patients will cause to be sought and obtained.

Much superfluous service will certainly be avoided in the future and many misdirected efforts and expenditures will be spared if the lessons of this study are taken to heart by both public and private agencies interested in the health hazards of maternity.

Further study of this particular topic, by the method used, does not at present offer probability of practical benefit for health administrators.

While there has been prompt and effective publication of the essential conclusions and recommendations of the first three studies above described A., B., and C., the full effect and benefit from the last study D. will not accrue until those interested in and critical of their own prenatal practices have access to this statistical report of Tyler, Watkins and Walker in its entirety.

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