RELATION OF ACCIDENT STATISTICS TO INDUSTRIAL ACCIDENT PREVENTION

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Industrial accident prevention has far outgrown its swaddling clothes and has reached the stage where the services of statisticians may be employed to good advantage in determining what has already been accomplished and in indicating what further action is needed to increase the effectiveness of safety work. Statistical data are of value only as they are used, and the form in which they are to be presented should therefore be determined by the purpose for which they are compiled.

Information relating to industrial accidents is gathered for several purposes. From the cost of the accidents we obtain casualty pure premiums upon which base rates are calculated. From accident-cost data we also obtain differentiation in rate by classification of industry. Experience rating and schedule rating in compensation insurance are directly governed by statistical assignment of costs to classifications and to individual risks within classifications.

Heretofore, the statistical recording of accidents according to the machine or other agency or means by which they occurred has been the basis of the factors, charges, and credits that appear in the industrial compensation-rating schedules by which the individual risk is measured and either credited or penalized. But more important to insurance and to society as a whole is that phase of statistics which deals with accident prevention. Unfortunately this phase is one which has been slow to develop and even now stands in need of careful consideration.

Bear in mind that insurance is a business and like other kinds of business can endure only so long as a profit is forthcoming. Happily, our business is one that is more beneficial to the individual and to the community than it is to itself. Although we

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collect dollars from policyholders, we return dollars to them when misfortunes occur. A still more gratifying result (paradoxical though it may seem) consists in the fact that when we spend a sum of money in the prevention of accidents, to guard ourselves against loss, we at the same time save approximately four times the amount of the loss for the policyholder; because by preventing accidents we eliminate the hidden costs associated with them, which as careful research has proved, are in the aggregate several times greater than the first or direct cost as represented by compensation benefits.

In illustration, assume that we in this room are employees, all busily engaged earning wages or salary and producing a profit for our employer. Certain fixed expenses for light, heat, power, executive salaries, and non-productive payroll are incurred and are ordinarily lumped together under the term "overhead cost". Suppose that one man receives an injury and cries out in pain, surprise, and fright. Quite naturally, one or more of his fellow employees will go to his assistance, and several or all of the workmen in the near vicinity may stop work for a while. Meanwhile overhead cost goes merrily on. Therefore, when an accident occurs it is fair to say that a portion of the annual overhead cost divided by the total number of man-hours worked (overhead cost per man-hour) is unearned, is not compensated by productive work for which it is expended, and is therefore wasted and should be charged to the accident.

The same reasoning applies to production profit or machine profit. Further incidental cost is created by breakage of tools and equipment, lowered morale, training new men, loss of orders, clerical work, delays, and a host of other things that constitute an almost endless train of events originated by the accident itself. It is no longer a mere theory but an established truth that the employer (and ultimately the general public as well) pays at least four dollars for every one dollar that is expended in compensation benefits for accidents.

Casualty companies that write compensation insurance use the Workmen's Compensation Statistical Plan issued by the National Council and effective January 1, 1923. The "cause-of-accident" part of this plan is admittedly for the purpose of producing data needed for determining values required in schedule rating. It is not designed primarily for accident prevention, yet the "cause-of-

accident" code is amplified by "manner of occurrence," which may be of little assistance in schedule rating.

An employee, in direct violation of instructions, may remove a guard from the gears of a lathe and be injured. With our present system that injury and accident would be recorded under Section 2 of the Statistical Plan as a working-machine accident and be charged successively to metal-working machines, to lathes, and to gears. All of these data are helpful from the viewpoint of classification, manual rating, and schedule rating, but are of relatively little value to accident-prevention engineers. The machine was guarded, but the employee violated instructions when he removed the guard. The cause, therefore, which we must of necessity determine before we can hope to remove it, must be recorded as disregard of instruction.

In short, the so-called cause-of-accident code is not a cause code at all. The title is misleading. Nor are there any other codes that deal with actual accident causes. The code advocated by the International Association of Industrial Accident Boards and Commissions, as printed in Bulletin No. 276 of the United States Department of Labor, likewise contains a list of causes. Here again the term is misleading because the list merely gives names of machines and parts of machines, and other physical hazards. In the case of this particular code and other codes used by the Labor Departments of individual states, the primary purpose is "accident prevention." Notwithstanding this expressed purpose, the data derived are meager and are of little value to the accident-prevention engineer, chiefly because they do not supply the information implied by the name "accident-cause data." An accident-cause sub-committee is now functioning under the direction of the Committee on Statistics and Compensation Insurance Cost, which is considering the practicability of such revision as will produce data on real causes.

It may be of interest at this point to discuss what I have referred to as real accident causes. An injury is almost invariably preceded by (1) a cause and (2) an accident. These three things —namely, cause, accident, and injury,—are separate and distinct. There is no overlapping. An employee wilfully indulges in an unsafe practice—that is the cause; as a result he collides with a fixed object—that is the accident; he sustains a broken arm—that is the injury. Information concerning the nature and

severity of the injury, the operation being performed, the machine and part of machine or other object with which he came in contact, the industrial classification of the risk, and the cost of the injury, is interesting and valuable to raters and underwriters but is of little use in accident prevention.

The occurrence of accidents involving personal injury or property damage (or both) is the foundation upon which casualty insurance is based. It is the reason for the existence of your work and mine. We know that we can never attain perfection—that we can never achieve the ideal; and we know, therefore, that accidents will continue to occur in sufficient numbers to keep the wheels of insurance turning. But more to the point is the fact that because of their broad experience with accidents and the claims resulting from them, casualty-insurance companies have a moral and a legal obligation (as well as a sincere desire) to serve their policyholders—and through them the public—by putting their knowledge to work in preventing accidental deaths, injuries, and property damage. Incidentally, we all know that profit to insurance carriers is greater when insurance rates are on a downward trend than when the opposite is true. We, therefore, have a double incentive for our efforts in preventing accidents.

Accident-prevention engineers are seriously handicapped by the lack of suitable and definite accident-cause statistics. The engineer approaches a huge steel mill or a small bake shop with no statistical knowledge whatever concerning the causes of accidents in these places. He is not forewarned and consequently is not forearmed. To be sure, it is possible for him to learn from statistical records that slips and falls or burns predominate or that certain machines are more frequently involved, but he does not know why. Nevertheless, he must determine probable causes of accidents before he can hope to service the risk intelligently. His field and his exposure are confined to the one risk that he is then visiting, and the probability of error is increased by his lack of statistical cause-data applying to the classification as a whole.

The thoughts I have expressed in this discussion may be summarized as follows:

Accident occurrence is the reason for the existence of casualty insurance.

Compensation for the losses sustained in accidents is our contractual obligation. It is our moral duty to do as much as we can

to prevent accidents; and therefore all of us—whether we be underwriters, actuaries, statisticians, or engineers—are faced with the necessity of playing our parts in such manner as to accomplish this laudable end as quickly and effectively as possible.

Accident prevention is handicapped by lack of statistics. We now have an abundance of data to assist us in rating and classification, but rating and classification are merely the mechanics of insurance. Thousands of lives and billions of dollars are lost annually because of accidents. I assert, therefore, that prevention is the all-important function of casualty insurance.

The insurance companies are anxious to prevent accidents, for their own good, and are morally obligated to do as much as possible in that direction. Furthermore, they realize that however much their own interests may be advanced, the benefits to their policyholders will be immensely greater.

There exists, therefore, a splendid opportunity for the statistician to consider further the purposes and the uses of statistical accident data, so that no opportunity for practicable improvement may be overlooked.