

# **Moral hazard in Progressive-Era health insurance**

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## **Moral hazard in Progressive-Era health insurance**

ABSTRACT: According to Progressive reformers, private health insurance had failed to protect sick workers and needed to be replaced by compulsory government insurance. Their opponents claimed that sick pay benefits induced an absenteeism moral hazard that presaged disaster if states adopted Progressive insurance proposals. Progressives denied the existence of such a moral hazard. This essay uses worker and sickness fund surveys to test the veracity of these competing claims. It finds evidence of a sick pay moral hazard that was counterbalanced by medical control over absence duration. Overall, private sickness insurance funds capably provided income protection for covered workers.

SOCRATES: In a well-ordered state every man has a job to go to, and therefore lacks time to spend continually being ill....When a carpenter takes sick, he asks his physician for a quick cure: an emetic or purgative, surgery or cauterization; those are his preferred therapies. If the physician prescribes a long term treatment such as a special diet or bandaging his head or the like, the carpenter will tell him he doesn't have the time to be sick, he can't afford a life of sickness that entails neglect of his work, and he will dismiss that physician and get on with his life.

Plato  
*Republic* (Book III)

DR. O'LEARY (to Mr. Dooley): What d'ye mane be tyin' up wan iv th' gr-reat industhrees iv our nation be stayin' away fr'm wurruk fr a day?

Finley Peter Dunne  
*Mr. Dooley Says*

In the Progressive Era (1880-1920), as in classical antiquity, workers who stayed home when sick lost income. Unlike in Plato's time, however, a large minority of late nineteenth and early twentieth century American workers had hedged against such an outcome by joining a sickness fund. A worker who belonged to a sickness insurance fund lost less income during a prolonged illness than did an uninsured worker. The fund member could rest knowing that after a week or so he would collect a few dollars to keep the wolf from the door. Economists will recognize the potential for moral hazard here. Workers who were on the borderline of being too sick to work could easily be pushed over by the prospect of sick pay. That possibility was the subject of considerable debate during the late Progressive Era. The American Association for Labor Legislation (AALL), the leading sickness insurance reform organization, argued consistently that no moral hazard would ensue from government insurance. Were they correct? This essay

considers this Progressive claim using available sickness fund data, and in so doing offers a new explanation for the consistent failures of the AALL's health insurance proposals.<sup>1</sup>

Progressive reformers saw little difference between the situation of an insured worker and one who did not belong to a sickness insurance fund. With wages too low to allow for savings, a spell of sickness could impoverish uninsured workers—and their families. The relatively few insured workers, by slight contrast in the Progressives' eyes, were paid only a pittance in wage replacement benefits, and medically they faced the prospect of being hectored back to work too soon by a Dr. O'Leary who was in the insurance fund's pocket. Better treatment of sick workers was a pressing issue in reformers' eyes because of high rates of industrial diseases that affected a large share of the work force. Given the incompetence of private funds and the large share of the work force that was sick on any given day, the only solution, reformers urged, was government provision of health insurance.<sup>2</sup>

The reformers were opposed by a shifting coalition of insurers, manufacturers, physicians and others. They argued that government sickness insurance in the European style would aggravate an obvious problem of moral hazard. Making sick pay available to all was to court disaster, according to these opponents. It would only lead even more

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<sup>1</sup> In this essay *health insurance* and *sickness insurance* both refer to the same basic insurance contract described below. Progressives urged that government insurance advocates use the term *health insurance* after the British usage, rather than the German *sickness insurance*, which they believed to be a political liability in the years around the Great War. See Numbers, *Almost Persuaded*, pp. 25, 76.

<sup>2</sup> This paragraph summarizes arguments made in American Association for Labor Legislation, "Brief," Rubinow, *Social Insurance*, and Warren and Sydenstricker, *Health Insurance*.

workers into the temptation of “malingering,” if they could do so on the government’s nickel. Progressives denied that sick pay would induce an absenteeism moral hazard.<sup>3</sup>

Results of the Progressive Era struggle over state versus private health insurance are well known: the reformers were soundly defeated in every engagement. Scholarly assessments of this conflict are numerous, but generally consider the merits of arguments made for public consumption by reformers and political maneuvering by their opponents.<sup>4</sup> No study has considered on-the-ground effects of such private insurance as existed at the time on workers’ short-term labor supply decisions. Were workers completely oblivious to the incentive created by sick pay, as the Progressives insisted, or as their opponents claimed, were they all too aware, and happy to take time off even if they could maintain only part of their income flow? If the answer is that workers were subject to moral hazard under existing insurance, why should voters and legislators have believed the Progressives when they claimed their program would not create a moral hazard?

This essay considers arguments of reformers and their opponents in light of systematic study of late nineteenth and early twentieth-century absenteeism data, which appear in surveys of workers and of sickness insurance funds. Results reported here suggest that in fact, there was a statistically significant but small absenteeism moral hazard associated with paid sick leave. For small, private sickness funds this was not a fatal problem, because they limited their exposure to reserve-depleting long-term claims

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<sup>3</sup> Progressive opponents tended to press their arguments in pamphlets, popular magazine articles, and testimony before state commissions and legislatures rather than books or scholarly articles. A representative piece is Hoffman, “Some Fallacies.”

<sup>4</sup> The literature on this episode is large. See Anderson, “Health Insurance,” Hoffman, *Wages of Sickness*, Lubove, *Struggle*, and Numbers, *Almost Persuaded*.

by employing physicians who were unlikely to approve long absences for workers. Progressive proposals had no such brake on the moral hazard created by sick pay. It was also the case that sick pay benefits also enabled workers to substitute relatively frequent short-term absences for long-term debilitation. Contrary to Progressive claims, private health insurance funds were competent, stable, and humane institutions. Patterns in the sickness absence they funded suggested that the Progressive proposals carried greater potential liabilities than were advertised, and that the Progressives were unaware of the problems they proposed to create.<sup>5</sup>

### **Progressive Era views of sickness insurance funds**

The AALL, founded in 1906, had defeated business interests rather quickly over worker exposure to phosphorus, which resulted in the disfiguring condition of “phossy jaw” or phosphorus necrosis. After 1910 their struggle for government operated accident insurance (“workman’s compensation”) had begun to bear fruit. They agreed with the President of the American Medical Association who believed that “the next great step in social legislation” would be sickness insurance.<sup>6</sup> One reason, they argued, for the government to provide such insurance was the inadequacy of the existing system of small insurers. What was that system like?

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<sup>5</sup> This paper focuses on funds sponsored by companies. On the general competence of fraternal sickness funds, see Beito, *From Mutual Aid*, Emery and Emery, *Young Man’s Benefit*, and Emery, “Risky Business.”

<sup>6</sup> Walker, “The Next Great Step.”

Sickness insurance funds sponsored by employers, unions, and fraternal societies offered memberships to a large share of the working class.<sup>7</sup> By paying regular dues of about a dime per week, a member was eligible for cash payments when sick and in some cases free medical attention as well. A member who fell ill notified the fund, which then sent a visiting committee to assess the claimant's condition. In many cases a physician followed up, but his job was usually to determine whether the worker could come to work or not. Upon approval of the claim, members were then eligible for sick pay of five dollars a week and up, for three to six months. Some funds provided free medical treatment from a fund-employed physician for the duration of the illness.

Contemporary commentators reported that the most important part of the benefit package was the sick pay that provided some measure of security. "Cash benefits are thought of first when health insurance is mentioned," reported the Ohio Commission, implying that workers were doing the thinking.<sup>8</sup> The effect of those benefits was the subject of some debate. To Progressives, limiting sick benefits to a fraction of the worker's usual pay eliminated the incentive for unnecessary absenteeism. I.M. Rubinow, an economist and physician who was a tireless promoter of government insurance, scoffed at the idea that fractional sick pay would induce a moral hazard: "We must think the workingman a great deal less susceptible to physical discomfort and bodily pain than ourselves, if we believe that the few dollars of weekly allowance will reconcile him to

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<sup>7</sup> Standard estimates run to a third of industrial workers in the Northeast and Midwest; Lubove, *Struggle*, pp. 74-76.

<sup>8</sup> Ohio Commission, *Health*, p. 160. The Commission, like those in several other states, was charged by the legislature with investigating the state's potential role in providing health insurance. Their reports are important sources of statistical, political, and historical information.

disease or injury.”<sup>9</sup> Opponents claimed that many beneficiaries really could work but preferred leisure with less income thanks to their sickness funds. In this view, widespread malingering posed a threat to productivity and worker morality in general.<sup>10</sup>

Progressive Era concern about worker “malingering” is what health economists recognize as moral hazard. Absenteeism cost the worker his lost wage; sickness insurance reduced those costs; therefore more valuable sickness insurance benefits and greater coverage would lead to increased absenteeism. Progressive rhetoric emphasized how absence enabled sick workers to regain their health. Their opponents protested that a worker who went to work to avoid losing a day’s pay was well enough to work, period. They argued that insurance benefits would lead to widespread and common feigning of sickness, to the extent of wrecking the finances of a government insurance program. State-level workers’ compensation programs offered some experience in dealing with moral hazard, which led employers to expect that “the majority of labor today, will do as little [work] as they possibly can.”<sup>11</sup>

Opponents of government insurance argued that Europe provided examples of worker malingering following the introduction of government health insurance. The Insurance Economics Society was among the most prominent of these groups. They have not been judged kindly in the historical literature. Klein claimed that their summaries of

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<sup>9</sup> Rubinow, “Labor Insurance,” p. 371; present day tests for moral hazard of sick benefits have been inconclusive. Allen, “Empirical Model,” and Vistnes, “Gender Differences,” found no relationship between paid sick leave and absenteeism; and Gilleskie, “Dynamic Stochastic,” and Henrekson and Persson, “Effects of Sick Leave,” found a strong relationship between sick benefits and absence.

<sup>10</sup> E.g., Boston Chamber of Commerce, “Non-Contributory.”

<sup>11</sup> Hoffman, *Wages of Sickness*, pp. 101-104. On the political economy of worker’s compensation development, see Fishback and Kantor, *Prelude to the Welfare State*.

European sickness insurance data were mere propaganda that “distorted” the true picture.<sup>12</sup> To be sure, the group received its funding from commercial insurers, and did not always put its best foot forward in public. Testifying before the Ohio Commission, its chairman, William Gale Curtis, claimed that European sickness insurance programs were riddled with moral hazard problems. He proposed that somewhere “abroad” the share of workers making a claim for sick pay to their government insurer had increased from 36.7 percent to 45.6 percent (no years given) which by his calculations added up to a 40 percent increase. In addition, overall days missed had risen from just over five to just over nine days per year (again, no years given).<sup>13</sup> For all the sloppiness in his figures, Curtis was fundamentally correct in terms of the general trends and levels. Sickness absence rates in Germany definitely rose after the establishment of compulsory sickness insurance. From 1885 to 1908 the number of days missed per worker increased by about 50 percent.<sup>14</sup> Curtis blamed all of these increases—which were close to the German experience—on malingering rather than justifiable sickness. But distinguishing between the two causes was not so straightforward, and whether or to what extent moral hazard really was a problem was not so clear.

The Progressive case against the existence of a sick benefit moral hazard had three parts. First, they claimed that attributing increased absenteeism under government insurance to moral hazard was a fallacy of composition. Expansion of coverage by government insurers would bring into the risk pool workers who had been screened out of

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<sup>12</sup> Klein, *For All These Rights*, pp. 33-34.

<sup>13</sup> Ohio Commission, *Health*, p. 438.

<sup>14</sup> Murray, “Social Insurance Claims,” p. 232. Absence rates in Austria, another early adopter of compulsory insurance also rose over this period.

private insurance precisely because of their high-risk status. The newly covered workers would then make claims at higher rates, raising the overall average. For example, if government insurance covered women workers who were excluded from private sickness insurance, overall claims would rise because women were more likely to make claims than men.<sup>15</sup>

Second, Progressives argued by assertion both that there simply was no absenteeism moral hazard associated with better sick pay. In many public statements, advocates of state provided insurance argued that malingering simply would not be the problem their opponents (who were equally lacking in firm evidence) claimed it would be.<sup>16</sup> The Ohio Commission, while acknowledging that “we know very little about malingering at present,” still claimed that “the fear that obligatory health insurance will increase malingering is however an exaggerated one, due in part to failure to understand the nature of malingering.”<sup>17</sup> Whether the failure to understand the nature of malingering might have led Progressives to *understate* the problem was left unaddressed. New York nurse and settlement house worker Lillian Wald proposed that the real problem was the “malingering of health rather than the malingering of sickness,” a formula that never caught on.<sup>18</sup> The rhetorical reversal hinted at a question revisited below: Was the greater problem paying for the laziness of healthy workers, or forcing sick workers to continue at their posts? A priori the answer was not at all clear.

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<sup>15</sup> Warren and Sydenstricker, “Health Insurance,” pp. 27-33.

<sup>16</sup> E.g., Warren and Sydenstricker, “Health Insurance,” p. 61.

<sup>17</sup> Ohio Commission, *Health*, p. 171.

<sup>18</sup> Hoffman, *Wages of Sickness*, p. 104.

Third, Progressives claimed that labor supply was wage-inelastic. Discounted sick pay of less than 100 percent of a regular pay packet would remove the incentive of workers to malingering, simply because it would reduce the claimant's income. Ignoring the possibility that some workers might prefer no work with some income to a typical work week, Progressives repeated many times that two-thirds pay would not cause malingering.<sup>19</sup> The American Association for Labor Legislation, a leading Progressive advocacy group for health insurance reform, was quite certain that sick pay of only two-thirds of a worker's usual income "offer[ed] a direct financial incentive to return to work as soon as possible, an incentive which would be absent if full wages were paid during illness."<sup>20</sup>

Some businessmen concurred in the belief that sick benefits could be managed to prevent malingering. The National Industrial Conference Board reported that it was the few funds that offered sick pay of two-thirds or greater that ran the risk of encouraging malingering. The key response by sickness funds was to monitor claimants. Firms that wanted to offer more generous sick pay needed to exercise the "strictest supervision... over all benefit claims" to keep malingering under control. That supervision worked for some firms. A publishing plant in Pennsylvania that provided full sick pay found little "'soldiering' to draw benefits" thanks to close monitoring of sick members by the fund's visiting committee.<sup>21</sup>

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<sup>19</sup> E.g., Rubinow, *Social Insurance*, pp. 495-496; Warren and Sydenstricker, "Health Insurance," p. 61.

<sup>20</sup> American Association for Labor Legislation, *Brief*, p. 220.

<sup>21</sup> National Industrial Conference Board, *Experience*, p. 144.

Another effective form of loss control was to require that a claimant provide a certificate of disability signed by a physician. Contemporaries recognized that this introduced an agency problem: The outcome of the claim might depend on who was paying the doctor. A reformer in New York City recognized the agency problem inherent in the medical insurance contract when she wrote, “The sort of physician supplying this certificate is considered important because, it is argued, a private physician may be in some cases more lenient than a lodge or society physician.”<sup>22</sup> The benefit society physician who worked for the insurance fund had less need to keep his patient happy because he was the fund’s agent and not the patient’s. This agency could play neatly into the hands of sickness funds, because from the insurance fund’s perspective the physician’s primary job was to get the worker back to work. To some extent, this was a humane goal, since the worker’s return correlated to some degree with recovery of his health.

Even so, all parties recognized the financial consequences of extended absences. The reform-oriented Ohio Commission recommended that a government sickness insurance program include medical benefits “to restore disabled workers to their original working power as completely and as quickly as possible,” so that “the drain upon the funds may be stopped at the earliest possible moment.”<sup>23</sup> According to the National Industrial Conference Board, no ally of Progressives, paying for medical attention for incapacitated fund members would do much “to arrest development of disability and thereby lessen the amount that the [benefit] association might otherwise have to pay out

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<sup>22</sup> Kalet, “Voluntary Health Insurance,” p. 148.

<sup>23</sup> Ohio Commission, *Health*, pp. 161-162.

in benefits.”<sup>24</sup> Thus, insurers who paid directly for physician services might well see an immediate return on their investment, and those who did not, intending that beneficiaries pay for medical care out of their sick benefit, might have been pursuing a false economy.

Given fear of malingering and a rather mechanistic view of the medical arts, it may not be surprising that contemporary commentators had mixed impressions of the influence of existing sickness insurance benefits on actual absenteeism behavior. On the one hand, benefits might increase absenteeism by rewarding malingerers. On the other, insurance enabled workers to begin to rest early in the course of an ailment, thereby preventing it from becoming much more serious. Reformers believed that workers could be dogged in their persistence at work despite physical disabilities, to their ultimate detriment. “Anyone familiar with the poor knows with what grim determination half-sick workmen labor,” wrote Robert Hunter in his 1904 book *Poverty*.<sup>25</sup> From their experience with workmen’s compensation, some employers believed that getting injured workers treated more quickly would result in a shorter spell of absence, which overall would reduce the total bill they were liable for.<sup>26</sup> With sickness benefits, workers could opt to recuperate at home, presumably in less time than if they continued at work in order to maintain their income. Amy Maher of the Consumers’ League testified to the Ohio Commission that “malingering under health insurance is apparent, not real. People were availing themselves for the first time of medical care and perhaps, a few days rest, which

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<sup>24</sup> National Industrial Conference Board, *Experience*, p. 12.

<sup>25</sup> Quoted in Derickson, *Health Security for All*, p. 4. Compare similar statements by union officials in Hoffman, *Wages of Sickness*, p. 118.

<sup>26</sup> National Industrial Conference Board, *Experience*, p. 135.

had been impossible before.”<sup>27</sup> This paper provides empirical evidence of both the resolution of the agency problem and the recuperative powers of rest.

### **Progressive Era worker absenteeism data**

Exactly how workers might have responded to hypothetical government health insurance programs, of course, will never be known. However, we can study worker absenteeism behavior in samples of workers that consisted of both members and non-members of those sickness insurance funds that did exist at the time, and see what kind of incentives these funds created and how they managed member responses to those incentives. Surveys conducted by state labor bureaus in Michigan and California provide excellent data with which to test for sickness insurance moral hazard among Progressive Era workers as well as efforts to control it by insurance funds.<sup>28</sup> These state agencies surveyed several thousand workers and asked dozens of questions of each regarding age, nativity, occupation, industry, earnings, and budgets. A few asked about benefit society membership, and a few about inability to work due to sickness in the previous year. Whether the root motivation was to recover or to slack off, the influence of sickness insurance on worker behavior expressed itself through absence from work. The only surveys with more than a few hundred respondents that asked about both absenteeism and the value of sickness benefits were those of Michigan iron and agricultural implement

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<sup>27</sup> Ohio Commission, *Health*, p. 432.

<sup>28</sup> Available at [www.eh.net/databases/labor](http://www.eh.net/databases/labor).

and furniture manufacturing workers in 1889-1890 and the more general California survey of 1892.<sup>29</sup>

The representativeness of these surveys is worth considering. Figure 1 shows the age distribution of male respondents to the surveys compared to estimates of the age distributions of gainfully employed men in the 1890 Census. The distributions are roughly similar, and in particular the difference between the two states within each sample is small. While the surveys appear to skew younger than the gainfully employed, the difference could have been due to the inclusion of disproportionately older agricultural workers among the gainfully employed. The age distributions in the two worker surveys are quite similar to each other.

In addition to the state labor bureau surveys, there is an additional source of information at the fund level. Unfortunately the labor bureau surveys are largely silent on characteristics of the sickness funds to which covered workers belonged. On that topic the U.S. Commissioner of Labor survey of sickness funds, published in 1908, is invaluable.<sup>30</sup> The federal survey published responses by company-sponsored sickness insurance funds (“establishment funds”) and railroad funds to questions about number of members, income, and benefits, eliminating the name and location of the fund but identifying the industry. Published results also included information on claims: the share of members in funds who made a claim in the previous year, and the number of days for

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<sup>29</sup> Carter, et al, “Codebooks.” The Michigan and California surveys are the best available to consider the benefits-absenteeism relationship. Some Kansas and Maine surveys asked about benefit society membership but not about benefit values; results from a Missouri survey that asked about benefit values were similar to those of the Michigan and California surveys but came from a small sample.

<sup>30</sup> U.S. Commissioner of Labor, *Twenty-Third Annual Report*.

which a fund paid sick benefits, as well as the value of dues payments and benefits. Information on requirements to make a claim included length of the probationary membership period and length of the waiting period between onset of ill-health and eligibility for sick pay. Between the two kinds of surveys, information is available on workers, including both members and non-members of sickness insurance funds, and on the funds themselves. By using both sources I hope to combine the best of each and consider how sick fund benefits influenced worker behavior holding first individual characteristics and then fund characteristics constant.

The state labor bureau surveys of workers and the federal survey of sickness funds provide an opportunity to test whether and how sick pay, medical benefits, and fund characteristics influenced worker absenteeism behavior.<sup>31</sup> The individual level labor bureau surveys asked respondents about work days missed in the previous year due to sickness; thus absence among the insured and uninsured can be compared. The federal survey of sickness funds reported the share of members who made a claim in the previous year and the number of compensated days each fund paid for. In both cases, then, it is possible to estimate the probability of any absence, the number of days missed for a typical worker/member, and the number of days per absence spell. We cannot tell why workers absented themselves—if they were “really” sick or if they were motivated primarily by the opportunity to collect sick pay. In the empirical tests that follow we will

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<sup>31</sup> A third potential source of absenteeism data, company personnel records, may not be very accurate. A contemporary observer claimed that firm-level absenteeism estimates were biased by the tendency of workers simply to walk off the job without giving notice. The first few days after a worker had in fact quit in this fashion were then recorded as absences. Frankel, “Labor Absenteeism,” p. 487. See also James and Thomas, “A Golden Age?” on short term employment at this time, and Fishback, “Operations” and Rosenbloom, *Looking for Work*, on Progressive Era labor markets generally.

simply test whether changes in absence behavior were associated with changes in paid sick leave. If absenteeism measures differed in response to varying levels of paid sick leave (set equal to zero dollars for uninsured workers), that would be potential evidence of moral hazard. Circumstantial statistical evidence suggests that some of this behavior may have been due more to the incentive provided by sick pay than by physical health more narrowly defined.

Perhaps the most obvious influence on a worker's tendency to miss work due to ill-health was his age. Common sense suggests that older workers would be at higher risk of sickness, a hypothesis borne out by the data. Figure 2 shows the incidence of absenteeism in the Michigan and California samples, by age of the male respondent. Michigan workers clearly display an increasing frequency of taking time off specifically due to ill-health (which could have been either sickness or injury) as they aged. The tendency among Californians was in the same direction but slightly flatter.<sup>32</sup>

The industry in which a worker toiled also contributed to the risk of sickness. Figure 3 shows incidence rates of compensated absenteeism for workers in several industries as identified in the Commissioner of Labor survey. The survey of sickness funds did not include absence spells that were too brief for the worker to qualify for benefits, since no claims were made in those cases. Given that bias, it is clear that absence rates varied considerably by industry. Less than one in five workers in printing

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<sup>32</sup> There is no obvious explanation for the greater frequency of absence in each age group among Californians. Part may be due to differences in the questions asked in each survey. The California survey asked about sickness absence as part of a triplet in which the respondent was asked about "days lost by cause" including sickness, lack of work, and other. The Michigan workers were asked about "causes for loss of time" and allowed to respond in open-ended fashion. See Carter, et al., "Codebooks."

and lithography and electrical apparatus manufacturing (1,937 and 7,339 covered workers respectively) received sickness benefits in the previous year, while in iron and steel and agricultural implement manufacturing (30,365 and 7,948 workers respectively) nearly half did so.

### **Influences on individual worker absenteeism**

Using standard regression analysis, I consider first the sample of Michigan agricultural implement, iron, and furniture workers. These data come from three separate surveys that asked similar questions, and so were pooled into one sample.<sup>33</sup> These surveys provided only the incidence of absence per respondent—whether he had missed any work at all in the previous year due to ill-health. The survey asked the respondent whether he had missed any work days in the previous year and the reason for the absence.

Responses to the latter question included those unrelated to health (e.g., “no work,” “shut down,” “baseball”), those referring only to health (“sickness,” “accident & sick”), and some that combined health and other reasons (“no work & sick”). Responses that combined health with unrelated considerations did not report the number of days lost due to each cause, only a total number of lost days, which prevented inclusion of a variable for days missed solely due to ill health. As a result the overall average number of days lost per worker and days per spell cannot be estimated with these surveys. However, the Michigan surveys all reported value of sickness benefits as well as the worker’s usual

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<sup>33</sup> For an early analysis of a subsample drawn from the agricultural implement and iron worker sample, see Hannon, “City Size.” A previous study that analyzed the furniture worker sample is Whaples and Buffum, “Fraternalism.”

earnings, which allowed inclusion of both the absolute value of benefits and of the replacement rate (benefits divided by wages).

Table 1 shows the mean values of worker characteristics in the pooled sample of about 14,000 Michigan working men. The median worker was 27 years of age, married, and had been born in the United States. On average he earned about \$40 per month, which was consistent with other estimates of worker income at the time.<sup>34</sup> Among covered workers, the average value of benefits was over \$6 per week, which was about 54 percent of his regular pay. About 25 percent of the sample belonged to benefit societies.

Two logit regressions investigated the effects of age, industry and location, nativity and family status, income, and benefits on the incidence of absence. Not surprisingly, the risk of absence increased with age, although the effect was not large even after age 50. A man in his fifties was about four percent more likely to be absent due to sickness than a man with identical characteristics in his twenties.<sup>35</sup>

The availability of sick pay benefits was best estimated by their value, both absolutely in terms of dollars per week and relative to the worker's usual income. Workers who were not covered by sickness insurance were assigned zero values for

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<sup>34</sup> The Aldrich Committee estimated in 1892 that the minimum income a working family needed to insure a basic standard of living was \$500. Chapin, *Standard of Living*, pp. 5, 246.

<sup>35</sup> The source of the negative and significant earnings coefficient is unclear. Because furniture workers reported an odd variety of time periods over which they were paid, monthly earnings for them were computed by dividing annual earnings by 12, whereas for the agricultural implement and iron workers monthly earnings equaled their regular weekly wage times 4.33. The negative coefficient might have been due to better paid workers being less likely to absent themselves, indicating an income effect, or to greater absence resulting in more days without pay, which would directly have reduced earnings.

sickness benefits per week. It is possible that workers who believed they were at higher than average risk of making claims were especially likely to join benefit societies, which would create a problem with endogeneity that would have no obvious solution in terms of instrumental variables.<sup>36</sup> To limit such problems, the value of benefits rather than a dummy for benefit society membership was employed here. Benefit coefficients supported the hypothesis of a sick pay moral hazard. The effect of both absolute and relative values of sick pay benefits was positive and significant, indicating that the sick pay benefit-absence relationship was robust to the measure of benefits. The magnitude of the effect, though, was not very large. Granting an average level of benefits to a worker who previously had none would only increase the probability of absence by one percentage point. So here the evidence suggested the existence of a significant but small moral hazard of sick pay for covered workers.

The California survey offers a richer set of variables to measure absenteeism and its influences. Beyond Figure 1, the composition of the sample and the universe it was drawn from has been the subject of some scholarly debate, which should not affect the results derived here. The main questions involved the highly transient nature of the California work force, which created problems for the generalization of job tenure

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<sup>36</sup> Whaples and Buffum, "Fraternalism," p. 112, found no significant relationship between incidence of sickness and sickness and accident insurance purchases in the furniture worker sample. Vistnes, "Gender Differences," p. 307 and Gilleskie, "Dynamic," p. 20, separately examined the 1987 NMES and noted the possibility of endogeneity bias without attempting either formally to test for such bias or to correct for it. Fishback and Kantor, "Square Deal" also note the difficulty of correcting for endogeneity with the state labor surveys, and present OLS estimates of hedonic wage regressions in their tests for compensating wage differentials.

estimates from hazard regression models.<sup>37</sup> The scholars who digitized this sample acknowledged a lack of ethnic and union member representativeness in the original sample but “concluded that the sample is reasonably representative of the manufacturing labor force as a whole except for a slight overrepresentation of brewery and construction workers and of workers in light manufacturing.”<sup>38</sup>

The California survey was the only one of the digitized state surveys to do all of the following: Include men and women, ask specifically about the number of work days missed due to sickness, and provide a dollar value of sick pay benefits. Table 2 provides mean values of variables used in this analysis. The overall length of workday was about 9.6 hours, typical of the time.<sup>39</sup> Among the 26 percent of the sample who were eligible for sick pay benefits, the replacement rate was just over half, very similar to the Michigan surveys. Only about five percent of the California sample reported eligibility for medical benefits; this constituted 16 percent of benefit society members.

Results of logit regressions of incidence of absence appear in Table 2. In these regressions, as in Table 1, the dependent variable was set equal to one for respondents who reported any work days lost due to illness and zero otherwise. At least one result supported Progressive arguments. The effect of longer workdays was to increase the

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<sup>37</sup> See Carter and Savoca, “Labor Mobility” and Jacoby and Sharma, “Employment Duration,” both of which consider the California sample. For an early analysis of a subsample drawn from this sample, see Eichengreen, “Experience.”

<sup>38</sup> Carter, et al., “Codebook...California, 1892,” p. 4.

<sup>39</sup> Costa, “Wage and Length.” The Michigan surveys did not ask about hours per work day.

probability of absence, which supported a common Progressive claim that worker exhaustion was partly behind what they saw as excessive absence rates.<sup>40</sup>

The California results were largely consistent with those from the Michigan analysis. The value of sick benefits, whether estimated in absolute terms or relative to wages, was positive and significant, again suggesting a degree of moral hazard. The relationship was robust to use of absolute and relative measures of sick benefits. The magnitude of the sick pay effect was larger in California than in Michigan: granting average sickness benefits to a worker who previously had none increased the probability of absence by 5.5 percentage points, a not inconsequential increase from a base of 28 percent. The magnitude of the effect of the same change in replacement rate terms was four percent.

As in Michigan, California workers were more likely to absent themselves if they were eligible for higher sickness benefits, which is consistent with the hypothesis that sick pay induced a moral hazard. The California question about baseline health status allows a tentative inference regarding the worker's financial versus physical health for his absence. It seems clear that workers who were eligible for sick pay were more likely to experience some absence, holding the critical factor of age constant. Although we cannot compare absence behavior of two typical workers holding the severity of their ill-health constant, we can control for their self-reported baseline health status. Not surprisingly, those workers who reported that their health was worse were more likely to be absent at all and to suffer longer spells of absence, so this is quite a powerful variable. But even controlling for this baseline health, workers with absolutely and relatively more valuable

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<sup>40</sup> Hoffman, *Wages of Sickness*, p. 8.

sick pay were more likely to absent themselves. That is not exactly the test we would wish to make, and controlling for the pre-treatment severity of a patient's condition remains a problem in contemporary medical research, but what we have here is probably as good a test as can be made for moral hazard with historical data.

Since the California survey reported days missed due to illness alone, it is possible to go deeper and estimate influences on prevalence and duration of sickness absence. Since the concept of duration of an illness spell applied only to those workers who reported any absence at all, those 809 workers form the subsample for these regressions. Duration here cannot be estimated as precisely as we would like, but the available variable of days missed per worker who missed any days comes close to the ideal. As it turns out, sick pay benefits had no significant effect on the duration of an illness spell. If malingering were defined as staying away from work a few days longer than necessary thanks to the availability of sick pay, there is no evidence of malingering here. Workers whose physician certification was paid for by their sickness fund, however, experienced decisively shorter durations of illness, even while holding constant the absolute or relative value of sick pay benefits.<sup>41</sup> Workers who were ill at some point in the previous year and were eligible for medical benefits from their sickness fund experienced spells of illness that were a third shorter than those endured by workers without medical benefits. Assessment of the relative strengths of the curative powers of early twentieth century medicine and the agency effects created by fund payments to physicians that could be behind this result will be considered below.

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<sup>41</sup> Availability of medical benefits was defined as eligibility for the following: "doctor" (n=14), "doctor and medicines" (n=162), "doctor and burial expenses" (n=1), "expenses" (n=2) or "free hospital" (n=6).

The remaining two models report influences on the overall number of work days missed due to illness for each worker. Since only 28 percent of respondents reported any lost work days, the large proportion of zeroes in the dependent variable indicated the use of Tobit models. These results incorporate the effects on both the probability of any absence and given some absence from work, the duration of that absence. Measured both absolutely and relatively the effect of sick pay to increase days missed was significant. However, the effect of medical benefits on overall absence was insignificant, probably because its effect was concentrated on a small proportion of the sample, those who had experienced absence and had sickness insurance. To summarize, membership in a sickness fund did influence worker absenteeism. Sick pay increased the probability of an absence, and medical benefits reduced durations of sickness spells.

### **Influences on absenteeism compensated by sickness funds**

The individual level results are so striking it is worthwhile asking whether they can be replicated from a different angle. The answer is they can be. In the next set of regressions, the data come from the federal survey of sickness insurance funds. Although these records of necessity do not include workers who were not members of funds, absence measures were comparable to those in the individual worker surveys: claims per member, days per claim, and overall missed work days per member. There is a tradeoff, though. Individual level data allow for control of an important worker characteristic—his age, which cannot be controlled for here. Nor was any information on worker wages or earnings reported in the sickness fund survey. However, in fund level data the effect of

fund characteristics as well as benefit levels on those absenteeism measures can be estimated.

The Commissioner of Labor's report listed characteristics of establishment funds sponsored by particular employers, and then railroad funds separately. Railroad funds covered nearly as many workers as establishment funds, but were few in number: there were only 29 of them. The small number was a function of the number of roads in business. The large number of covered railroad workers reflected in part a few huge funds; the mean fund size that was two orders of magnitude beyond the average establishment fund. It also was a function of the highly developed culture of corporate welfare in the railroads, which in turn stemmed in part from the geographically far-flung nature of their operations. Railroad workers could become ill or injured long distances from home, in areas with few residents and no medical services.<sup>42</sup>

Many sickness funds reported a range of sick pay benefit values. For example, one fund at an agricultural implement manufacturer paid between \$2.50 and \$7.50 per week of absence, depending on the employee's wage level.<sup>43</sup> Other funds reduced benefits for later weeks, and still others offered lower benefits in the first period and then raised them. Many offered more generous benefits to married men or workers in particular occupations. Given this level of complexity, modeling the expected sick benefits for a particular worker did not seem feasible; instead, the wage measures used here were simply the lowest and highest weekly benefits offered in the first benefit

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<sup>42</sup>Starr, *Social Transformation*, pp. 201-202. See also Kim and Fishback, "Institutional Change."

<sup>43</sup> U.S. Commissioner of Labor, *Twenty-third Annual Report*, p. 440, Table II and p. 488, Table IV. This survey did not report wage information, so that replacement rates could not be estimated.

period. While historians suggest that few funds provided medical care, 42 percent of workers insured by establishment funds were provided with medical services.<sup>44</sup> Also, about 90 percent of funds imposed waiting periods of one to fourteen days between the first report of illness to fund officials and the day on which the fund issued sick benefits. Thus spells of sickness that resolved before the waiting period ended (on average, six days) would not have been reported, and so the analysis below considers effects of benefits on spells of absence that lasted at least a week. Excluded were short term absence spells, which were a small but important share of all absence; in the California sample 11 percent of respondents who reported any sickness absence missed six or fewer days of work.

Fund level semilog regression results appear in Table 4. Again, value of sick benefits influenced worker absence rates, and in ways very similar to the results of the individual level regressions, suggesting robust benefit-absence relationships. Increases in the lowest value of sick pay significantly increased the frequency of claims in both establishment and railroad funds. For both funds, this effect was strong enough that lower level of sick pay and overall days missed per worker were significantly and positively related. For both funds, variation in sick pay left duration of sickness unaffected. Similar to the California results, availability of medical benefits reduced the average duration of illness in establishment funds. In the fund level data the effect was strong enough to reduce prevalence. The consistency of these findings is noteworthy. In four independent datasets—Michigan workers, California workers, establishment sick funds, and railroad sick funds—similar relationships between sickness fund benefits and

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<sup>44</sup>Starr, *Social Transformation*, 203; Hoffman, *Wages*, 16-17.

frequency and duration of absence and overall absenteeism rates appeared. Sick pay increased frequency of absences, and medical benefits reduced their duration.

Assessment of the state of American medicine at this time by historians suggests that it was not the therapeutic value of a visit to the doctor that best explains the shorter duration of absences. Medical advances in surgical technique and diagnostics occurred throughout the late nineteenth and early twentieth century, but in curative terms there was little a physician could do for a sick person at that time.<sup>45</sup> If medical benefits enabled workers to have greater access physicians, but the benefit of that greater access in health terms is not at all clear. In addition at least among insured workers the difference in access may not have been great. All covered workers had to be examined by a physician to get their initial claim approved, and that approval had to be renewed by the physician every week or two that the worker claimed to be incapacitated.<sup>46</sup> Thus it seems likely that insured workers with and without medical benefits were probably examined by physicians about equally often.

A better explanation for shorter durations for workers with medical benefits is a principal-agent conflict. Who paid the physician determined how long the worker would be absent. If the worker paid the physician out-of-pocket, the physician was more likely to approve the worker's claim for more compensated absence days. When it was the insurance fund that paid the physician, he was more likely to do the fund's bidding and get the worker back to his job sooner. The ambiguous pronoun referent in a statement by a Rhode Island foundry executive was telling. The fund's physician, he said, "tends to

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<sup>45</sup> Starr, *Social Transformation*, pp. 134-140.

<sup>46</sup> National Industrial Conference Board, *Experience*, p. 11.

bring the man back to work as soon as he is able.”<sup>47</sup> Did he mean the worker returned to his job as soon as the worker was physically able to work, or that the worker returned as soon as the physician could get him there? If the physician was paid by the insurance fund, the latter seems quite likely. One fictional result was Mr. Dooley’s image of his physician Dr. O’Leary in the epigraph, whose nagging to return to work gave the good Mr. Dooley one more reason to feel miserable.

An important therapeutic effect of sickness insurance benefits was the ability to take time off when moderately ill. The negative and significant coefficient for the claim rate (as an independent variable) in the establishment fund duration regression (Table 5) suggests an important role for rest that is quite similar to findings in the European past and the American present.<sup>48</sup> The more claims that were filed, the shorter each spell of absence averaged--holding constant the length of the waiting period imposed by the fund. This result suggested that the easier it was for workers to take time off when moderately ill, the less likely a spell would develop into a grave illness from which a worker needed weeks and weeks to recover.<sup>49</sup> That is, Amy Maher’s testimony to the Ohio Commission on the importance of workers’ newly acquired ability to rest was fundamentally correct.

Information asymmetries were present as well, but insurance funds were able to mitigate these problems with various strategies.<sup>50</sup> Sickness funds encountered adverse selection. According to Table 5, workers who joined their funds voluntarily were more

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<sup>47</sup> National Industrial Conference Board, *Experience*, p. 142.

<sup>48</sup> Murray, “Social Insurance Claims”; Gilleskie, “Dynamic.”

<sup>49</sup> Hoffman, *Wages*, p. 118; National Industrial Conference Board, *Experience*, pp. 119-120.

<sup>50</sup> “Asymmetric Information,” *Explorations*; Thomasson, “Early Evidence.”

likely to experience any absence in both establishment and railroad funds.<sup>51</sup> This is consistent with voluntary funds drawing in a disproportionate share of high-risk members. One way to deal with this problem was a probationary or trial period in which a new fund member was ineligible for benefits. The effect of a trial period was to screen out some selection risks, since longer probationary periods were associated with significantly lower frequency of absenteeism.<sup>52</sup> Longer waiting periods also reduced the frequency of absenteeism in establishment funds, exactly as expected. In general, fund characteristics that were intended to relieve problems of selection bias and moral hazard--medical benefits, waiting periods, trial membership periods--all seem to have worked quite effectively.

### **Trends in absenteeism and its components**

The net effect of these forces—moral hazard, recuperative power of rest, and requirements of physician approval—on absenteeism was unclear to observers at that time. Some employers believed that their firm’s sickness insurance program caused absenteeism to decline and productivity to increase. A New York City manufacturer reported that it had recouped the costs of its benefit association through diminished

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<sup>51</sup> In establishments with voluntary sickness insurance funds, about 45 percent of workers joined.

<sup>52</sup> In regressions not reported here, exclusion of the trial period variable in establishment funds (but not railroad funds) resulted in a voluntary membership parameter twice as large and far more significant. Apparently trial periods counteracted selection problems induced by voluntary membership.

absenteeism.<sup>53</sup> The Bureau of Labor Statistics claimed that sickness funds and other such welfare work reduced sickness and accident rates.<sup>54</sup>

Other firms believed that sick funds increased absenteeism, not so much due to malingering per se but to the strategic behavior of some workers who subscribed to more than one fund. The prospect of sick pay that exceeded an ordinary pay packet offered an irresistible moral hazard for workers who had so strategized. Still other employers concurred with Progressive reformers and reported that sick benefits worth less than a regular wage had no effect on absence.<sup>55</sup> Reports of no change in absenteeism behavior, despite the clear cut effects of sick pay and medical benefits reported here, may reflect the net effect of each was to cancel the other out, leaving prevalence constant.

Broader surveys of American workers found similar rates of absenteeism prevalence during the Progressive Era. Table 6 shows estimated values of absenteeism measures culled from a variety of sources during the Progressive period and later.<sup>56</sup> The Progressive period was marked by stability. Twenty to twenty five percent of workers missed any work at all due to sickness in a typical year, and those workers missed five to six weeks. The net effect was that the typical worker missed six to seven days in a given year due to ill health—far fewer than Progressive claims of 10 to 14 days, or as much as

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<sup>53</sup> Henderson, *Industrial Insurance*, p. 209.

<sup>54</sup> U.S. Bureau of Labor Statistics, *Welfare Work*, p. 13.

<sup>55</sup> National Industrial Conference Board, *Experience*, pp. 136-144.

<sup>56</sup> The types of historical sources included digitized state surveys that reported on work missed specifically due to sickness, data from a large sickness insurance society that paid benefits from the first day of sickness, the Metropolitan Life Insurance Company sickness surveys, and the Committee on the Cost of Medical Care survey. None attempted to collect a representative sample; all aimed to study the white working class.

five percent of the work year.<sup>57</sup> At 300 days to the work year, the Progressive Era estimates in Table 6 indicated a prevalence rate of about two percent.<sup>58</sup> Business executives and reform opponents, who guessed that absence rates were two to three percent, were much closer to the mark than Progressive activists.<sup>59</sup>

After the Progressive Era the trends in incidence and duration were consistent with a story of insurance benefits and absence behavior as outlined above, combined with an increase in the value of benefits and an expansion of coverage. According to Table 6 over the course of the 1920s the incidence of absence rose by a factor of about 50 percent (from one-fourth to one-third), and duration declined by about a third (from 25-35 days to 17 days per claiming worker). Over this period typical weekly sick pay benefits increased by nearly 50 percent, the availability of medical benefits expanded, and the share of firms providing such benefits grew.<sup>60</sup> If the parameters in this paper are correct in sign, these trends would have led to higher incidence rates and briefer durations of absence over the 1920s, as Table 6 reports actually happened. The growth of private sick pay and medical benefits over this period, then, led not to increased malingering but to a

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<sup>57</sup> Rubinow, *Social Insurance*, p. 222. Regarding work time lost to a variety of causes see Rosenbloom, "Male Labor Supply."

<sup>58</sup> Costa, "Wage," uses 309 work days per year as a standard; earlier in the nineteenth century this figure was subject to seasonal variation, especially in manufacturing. See Atack et al., "Part Year Operation."

<sup>59</sup> H.G. Barr of National Cash Register, Dayton, in testimony to the Ohio Commission, *Health*, p. 447; a detailed analysis of NCR's benefit programs is in Tone, *Business of Benevolence*. A similar estimate of 2.1 percent for the Hood Rubber Co. (1919-1921) in Massachusetts appears in Quinby, "Study." Opponents: Hoffman, "Fallacies," guessed a maximum of three percent and probably closer to two percent.

<sup>60</sup> National Industrial Conference Board, *Present Status*, pp. 12, 64; NICB, *Experience*, p. 117, Dobbin, "Origins of Private Social Insurance."

steady share of the work year lost due to sickness. Whether government insurance could have done the same is open to speculation.

## **Conclusions**

Although Progressive reformers asserted that their proposals were immune to such problems, the statistical analysis in this paper indicates that private health insurance in the Progressive Era was in fact subject to a small but detectable moral hazard. Workers who were eligible for higher rates of sick pay, whether measured in dollars or as a share of their usual wage, were more likely to miss work due to sickness. The sickness insurance funds that underwrote such absenteeism were aware of this incentive and aimed to reduce its effect by imposing various rules on members in order to qualify for benefits. The most important, and the one most widely understood to be effective at the time, was the requirement that all claims be approved by a physician. Funds that paid physicians to make these assessments found that doctors in their employ ended compensated absence spells sooner than doctors who were paid by the worker-claimant. By such methods, some private funds were able to maintain a constant level of absence, in terms of days missed per worker, throughout the Progressive Era.

The effects of sick pay and medical benefits on absenteeism are good examples of moral hazard and principal-agent problems, but their significance goes beyond verification of economic hypotheses. These relationships address important political claims of the day. We can never know how viable Progressive health insurance reform proposals would have been, but we can compare the workings of such insurance operations as actually existed to characteristics of Progressive proposals and then

speculate on what might have happened under hypothesized state insurance programs. Progressive reformers who wanted state governments to provide health insurance in place of private sickness funds claimed that the sickness benefits they advocated would not induce a moral hazard. In the AALL proposal, sickness benefits were to be paid at two-thirds the worker's usual wage, a higher replacement rate than most insured workers actually enjoyed. At two-thirds pay, the inducement to absence would have been stronger than existing sickness insurance funds had offered, and there is no sign that Progressive proposals had taken the additional costs of this moral hazard into account. Their opponents' claim that moral hazard was a problem that the Progressives had failed to address was a valid concern.<sup>61</sup>

Existing insurance funds recognized the moral hazard and aimed to counter it through a variety of strategies, including physician approval of claims, probationary membership periods, and waiting periods before claims were paid. Progressive proposals ignored the importance of the first of these and omitted the other two. Indeed, Progressive insurance proposals seem to have intentionally obfuscated compensation and supervision of physicians, hoping to bring them on board during the campaign for government insurance and then address these issues after the fact. But what Progressives saw as finesse others saw as confusion.<sup>62</sup> Politically, the omission of cost controls may have made sense since the Progressive goal was, more or less, to compensate a larger

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<sup>61</sup> The necessity of dealing with moral hazard was not universally clear at that time. Around 1920 American actuaries were first searching for claims tables to use in group health insurance. They examined and then discarded British tables, which consistently underestimated claim rates. The Americans reported that the gap between expected and actual claims occurred because the British actuaries had failed to account for the moral hazard induced by benefits. See Cammack, "Premiums and Reserves," p. 279.

<sup>62</sup> Numbers, *Almost Persuaded*.

number of workers, for longer spells of sickness absence, at higher rates, and to provide medical care for them as well. But to do so created incentives for ever greater spending, and Progressive proposals again failed to show any awareness of the need to check these incentives or budget for their consequences.

The Progressive failure to persuade legislators and voters that reformers had adequately reckoned the costs of expanded insurance may help explain why their proposals gained no political purchase. By contrast, a deeper understanding of economic forces enabled private sickness insurance funds to provide a modest but very real degree of income security to their members. At the end of the Progressive Era, it was the benefit societies that survived reform efforts to replace them. The actual accomplishments of private insurance funds in balancing income, benefits, and incentives kept them at the forefront of workplace based health insurance for another two decades.

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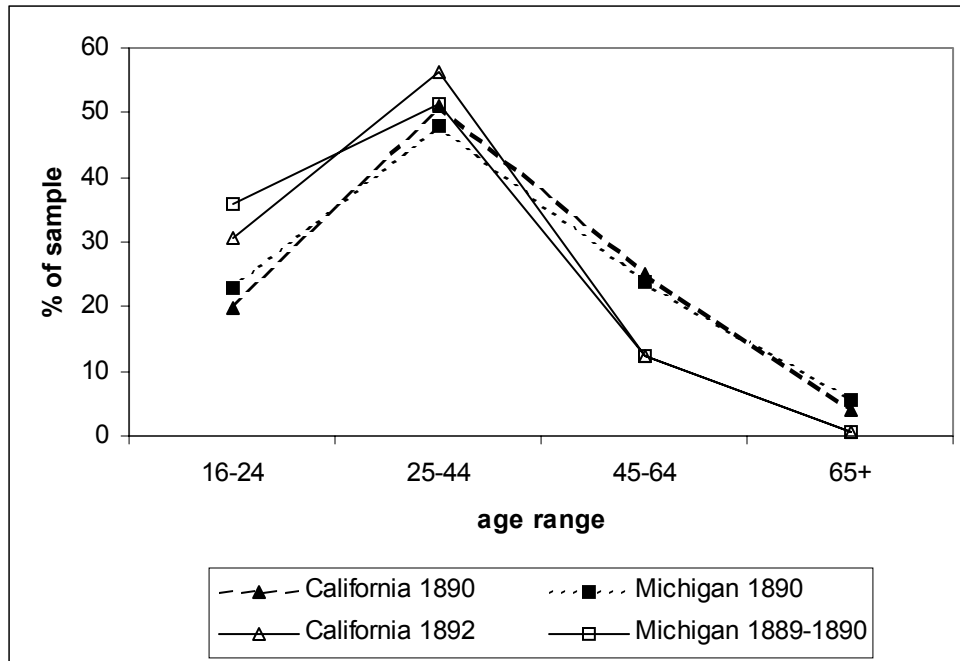


Figure 1. Age distributions of survey respondents and the gainfully employed according to the 1890 Census.

Sources: Carter et al, “Codebook...Survey of 3,920 Male Workers in the Agricultural Implement and Iron Industries of Detroit, 1890,” “Codebook...Survey of 4,918 Male Workers in the Agricultural Implement and Iron Industries in Michigan Outside of Detroit, 1890,” Carter, et al, “Codebook...Survey of 5,419 Workers in the Furniture Industry of Michigan, 1889,” Carter, et al, “Codebook...Survey of 3,494 Wage-Earners in California, 1892”; Lee et al, *Population Redistribution*, pp. 521, 533.

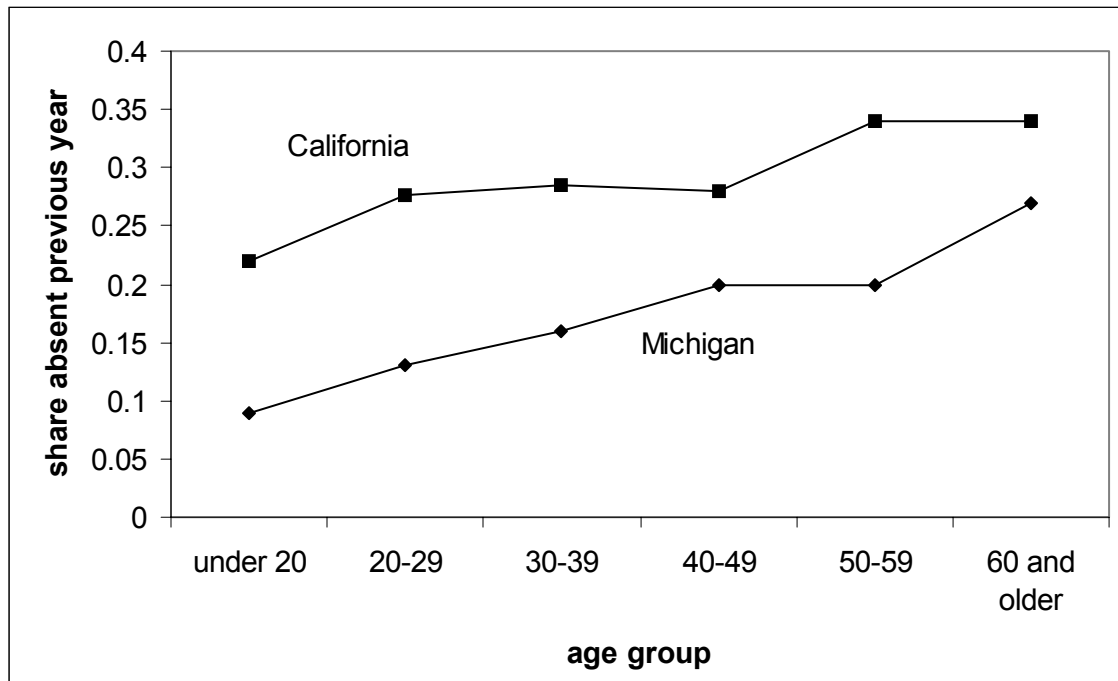


Figure 2. Incidence of sickness by age, men.

Sources: Carter et al, “Codebook...Survey of 3,920 Male Workers in the Agricultural Implement and Iron Industries of Detroit, 1890,” “Codebook...Survey of 4,918 Male Workers in the Agricultural Implement and Iron Industries in Michigan Outside of Detroit, 1890,” Carter, et al, “Codebook...Survey of 5,419 Workers in the Furniture Industry of Michigan, 1889,” Carter, et al, “Codebook... Survey of 3,494 Wage-Earners in California, 1892,” Available at [www.eh.net/databases/labor](http://www.eh.net/databases/labor).

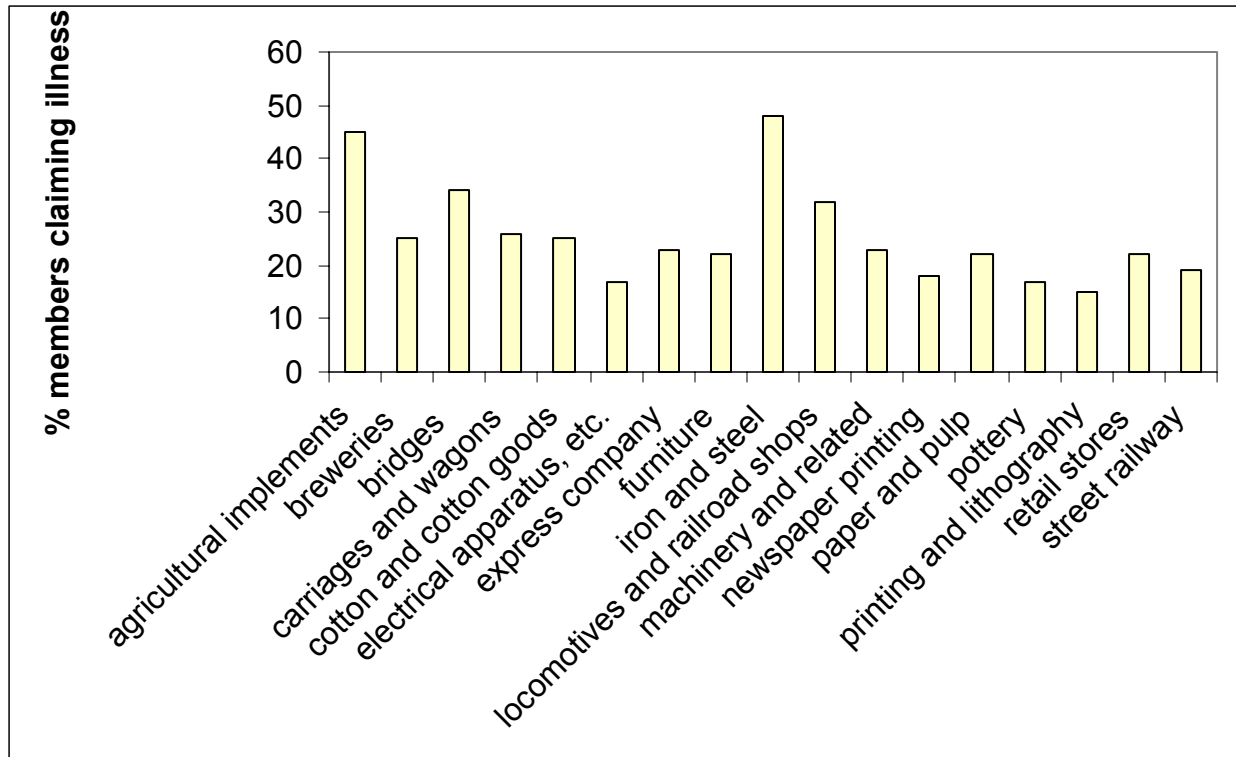


Figure 3. Risk of sickness by industry, 1908.

Source: U.S. Commissioner of Labor, *Twenty-Third Annual Report*.

Table 1. Influences on incidence of absence: Michigan.

	Mean (standard deviation)	Model 1	Model 2
Intercept		-1.06*** (0.10)	-1.08*** (0.10)
Married	0.54	0.26*** (0.08)	0.26*** (0.08)
Number of dependents	1.76 (1.99)	-0.004 (0.02)	-0.004 (0.02)
Born in U.S.	0.54	0.22*** (0.05)	0.22*** (0.05)
Age less than 20 years	0.20	-0.18** (0.09)	-0.18* (0.09)
Age 20-29	0.37	Omitted	Omitted
Age 30-39	0.23	0.09 (0.07)	0.09 (0.07)
Age 40-49	0.12	0.24*** (0.09)	0.24*** (0.09)
Age over 50 years	0.07	0.31*** (0.10)	0.31*** (0.10)
Detroit iron and agricultural implement workers	0.33	-1.38*** (0.07)	-1.67*** (0.07)
Other Michigan iron and agricultural implement workers	0.35	Omitted	Omitted
Furniture workers	0.37	-1.36*** (0.06)	-1.36*** (0.06)
Monthly earnings	\$40.29 (17.82)	-0.006*** (0.002)	-0.006*** (0.002)
Value of sick benefit (mean: among those covered)	\$6.37 (3.65)	0.013* (0.0078)	
Replacement rate (mean: among those covered)	0.54 (0.22)		0.18* (0.10)
Pseudo R <sup>2</sup>		0.11	0.11

Sources: State labor bureau surveys of Michigan iron, agricultural implement, and furniture workers, 1889-1890. See Carter et al, "Codebooks."

Notes: Dependent variable = 1 if respondent reported any absence due to illness in previous year. Mean value of dependent variable = 0.147. N = 14,018. Method: Logit. Omitted categories include age 20-29, worker in iron and agricultural implement manufacturing outside Detroit, born outside the U.S., single or widowed.

Table 2. Influences on incidence of absence: California

	mean values	Model 1	Model 2	Model 3	Model 4
Intercept		-1.94*** (0.53)	-1.98*** (0.53)	-2.34*** (0.55)	-2.38*** (0.54)
Male	0.80	-0.49*** (0.14)	-0.49*** (0.14)	-0.46*** (0.14)	-0.46*** (0.14)
Married	0.31	0.18 (0.13)	0.19 (0.13)	0.20 (0.13)	0.21 (0.13)
Number of dependents	0.96 (1.66)	-0.001 (0.03)	-0.0001 (0.03)	-0.02 (0.04)	0.01 (0.03)
Age unknown	0.02	-0.86** (0.43)	-0.89** (0.43)	-1.01** (0.45)	-1.03** (0.45)
Age less than 20 years	0.25	-0.02 (0.13)	0.003 (0.13)	0.09 (0.14)	0.11 (0.14)
Age 20-29	0.39	Omitted	Omitted	Omitted	Omitted
Age 30-39	0.20	0.04 (0.13)	0.04 (0.13)	0.05 (0.13)	0.05 (0.13)
Age 40-49	0.10	0.09 (0.16)	0.09 (0.16)	0.08 (0.17)	0.08 (0.17)
Age 50 or older	0.06	0.41** (0.21)	0.40** (0.21)	0.34 (0.21)	0.33 (0.21)
Length of workday (hours)	9.50 (1.07)	0.09** (0.05)	0.09** (0.05)	0.09* (0.05)	0.09* (0.05)
Self-reported bad health	0.11			1.17*** (0.13)	1.17*** (0.13)
Weekly wage	13.39 (7.03)	0.00009 (0.009)	0.003 (0.009)	0.003 (0.009)	0.007 (0.009)
Value of sick benefit (mean: among those covered)	9.07 (3.13)	0.03** (0.01)		0.03** (0.01)	
Replacement rate of sick pay (mean: among those covered)	0.56 (0.19)		0.37** (0.18)		0.38** (0.19)
Eligible for medical benefits	0.05	0.20 (0.20)	0.22 (0.20)	0.20 (0.20)	0.23 (0.20)
Pseudo R <sup>2</sup>		0.03	0.03	0.05	0.05

Source: Carter et al., "Codebook...California, 1892."

Note: N = 2872. Method: Logit. Mean value of dependent variable = 0.28. Standard deviations (column 1) and standard errors in parentheses. \*\*\* = significant at 0.01 level; \*\* = at 0.05 level; \* = at 0.10 level. Dummies included for industry, years in California, and years at employer, but were not reported here to save space.

Table 3. Influences on prevalence and duration of absence: California

	duration of absence (log of days absent   any days absent)	duration of absence (log of days absent   any days absent)	overall absence rate (number of absent days in year)	overall absence rate (number of absent days in year)
Method	OLS	OLS	Tobit	Tobit
Intercept	1.59*** (0.52)	1.56*** (0.52)	-71.12*** (14.48)	-71.99*** (14.47)
Male	0.12 (0.14)	0.11 (0.14)	-8.43** (3.71)	-8.63** (3.71)
Married	-0.10 (0.13)	-0.11 (0.13)	3.10 (3.46)	3.22 (3.45)
Number of dependents	0.03 (0.03)	0.03 (0.03)	-0.29 (0.92)	-0.25 (0.92)
Age unknown	-0.17 (0.48)	-0.18 (0.48)	-21.57* (11.22)	-22.12** (11.22)
Age 19 or less	-0.09 (0.13)	-0.08 (0.13)	3.55 (3.61)	4.03 (3.63)
Age 20-29	Omitted	Omitted	Omitted	Omitted
Age 30-39	0.10 (0.12)	0.09 (0.12)	3.66 (3.38)	3.59 (3.38)
Age 40-49	0.43*** (0.16)	0.42*** (0.16)	8.98** (4.35)	8.94** (4.35)
Age 50 or older	0.14 (0.20)	0.15 (0.20)	11.17** (5.55)	11.08** (5.55)
Length of workday (hours)	0.02 (0.04)	0.03 (0.04)	2.10* (1.21)	2.10* (1.21)
Self-reported bad health	0.66*** (0.11)	0.66*** (0.11)	38.10*** (3.41)	38.00*** (3.41)
Weekly wage	0.02 (0.01)	0.02* (0.01)	0.13 (0.24)	0.21 (0.24)
Value of sick benefit	0.005 (0.01)		0.64** (0.31)	
Replacement rate of sick pay		0.24 (0.18)		9.58* (4.95)
Eligible for medical benefits	-0.33* (0.18)	-0.38** (0.19)	0.28 (5.41)	0.45 (5.42)
Adjusted R <sup>2</sup>	0.11	0.11		
N	809	809	2872	2872

Source: Carter, et al., "Codebook...California, 1892."

Note: Standard deviations (column 1) and standard errors in parentheses. White tests indicated homoskedastic residuals. \*\*\*=significant at 0.01 level; \*\*=at 0.05 level; \*=at 0.10 level. Dummies included for industry, years in California, and years at employer, but were not reported here to save space.

Table 4. Mean values of U.S. Commissioner of Labor survey (weighted by membership).

	Establishment funds		Railroad funds
	Reported	Corrected for waiting period	
Days lost to sickness per worker	4.99 (2.13)	6.76	9.40 (3.01)
Share of workers reporting any absence	0.20	0.33	
Cases per worker	0.23 (0.22)		0.53 (0.16)
Days lost per case	25.33 (11.55)	20.30	18.21 (10.76)
Number of members	691 (1992)		56,718 (48,372)
Age of fund (years)	12.16 (8.48)		21.74 (9.55)
Employee managed	0.39		0.03
Jointly managed	0.46		0.97
Firm managed	0.15		0.00
Voluntary membership	0.70		0.77
Compulsory membership	0.30		0.23
Trial period (weeks of membership with no benefits)	3.61 (8.25)		1.43 (12.17)
Waiting period (days of sickness before benefits)	5.86 (3.44)		5.04 (2.27)
Maximum weeks of benefits per year	18.61 (9.85)		50.05 (18.50)
Medical benefits available	0.42		N/A
High sick pay (\$ per week)	6.25 (2.42)		16.33 (4.99)
Low sick pay (\$ per week)	4.06 (1.87)		2.35 (1.62)
N (funds)	394		29
N (workers)	272,134		262,747

Source: U.S. Commissioner of Labor, *Twenty-Third Annual Report*.

Note: since these means were weighted by fund membership, the proportions represent the share of workers (not of funds) with the given characteristic.

Table 5. Fund level regressions, weighted by membership size.

Log of:	Establishment funds			Railroad funds		
	days missed per member year	claims per member year	days missed per claim	days missed per member year	claims per member year	days missed per claim
Intercept	1.36*** (0.14)	-1.89*** (0.14)	2.41*** (0.14)	-0.05 (0.90)	-3.08*** (0.67)	2.93*** (0.96)
Number of members	0.02 (0.02)	-0.05*** (0.02)	0.05*** (0.01)	0.01 (0.02)	0.03** (0.01)	-0.01 (0.01)
Members <sup>2</sup>	-0.05 (0.06)	0.18*** (0.06)	-0.15*** (0.05)	-0.05 (0.10)	-0.14* (0.08)	0.08 (0.08)
Employee mgmt of fund	-0.05 (0.06)	-0.11 (0.06)	0.02 (0.05)	-0.72* (0.35)	-0.70** (0.26)	-0.05 (0.29)
Voluntary	0.04 (0.06)	0.20*** (0.06)	-0.07 (0.05)	0.83** (0.33)	0.69** (0.24)	0.16 (0.28)
Age of fund	0.008*** (0.003)	0.013*** (0.003)	0.0005 (0.002)	0.004 (0.01)	-0.004 (0.009)	0.007 (0.008)
Trial period	-0.003 (0.004)	-0.009** (0.004)	0.002 (0.003)	-0.11* (0.06)	-0.11** (0.05)	-0.01 (0.05)
Waiting period	-0.02* (0.01)	-0.04*** (0.01)	0.001 (0.009)	0.02 (0.08)	0.03 (0.06)	-0.01 (0.06)
Maximum benefit period	0.001 (0.002)	0.002 (0.002)	0.0003 (0.002)	0.02 (0.02)	0.03** (0.01)	-0.01 (0.01)
Medical benefits	-0.15*** (0.005)	0.004 (0.05)	-0.15*** (0.04)	N/A	N/A	N/A
High sick pay	-0.01 (0.01)	0.01 (0.01)	-0.01 (0.01)	-0.07 (0.08)	-0.12* (0.06)	0.05 (0.06)
Low sick pay	0.04*** (0.01)	0.06*** (0.01)	0.01 (0.01)	0.19** (0.09)	0.20*** (0.07)	-0.004 (0.08)
Log claim rate			-0.45*** (0.04)			-0.03 (0.23)
Industry dummies?	Yes	Yes	Yes	N/A	N/A	N/A
Adjusted R <sup>2</sup>	0.40	0.57	0.38	0.78	0.90	0.72
N	394			28		

Source: U.S. Commissioner of Labor, *Twenty-Third Annual Report*.

Note: White tests indicated no heteroskedasticity in any regressions. Standard errors in italics. \*\*\*=significant at 0.01 level; \*\*=at 0.05 level; \*=at 0.10 level.

Table 6.  
Mean values of sickness absence measures (men only)

Years	1888-1899	1912-1916	1915-1917	1928-1931	1987
Days missed per worker-year	6.62	6.11	7.17	6.04	3.44
Share of workers missing any days	0.24	0.23	0.20	0.36	0.40
Days per absence spell	28.17	26.17	36.51	17.00	8.61
N (workers)	5,968	81,607*	55,157	8,956	4,992

Note: \* = worker-years of exposure. Prevalence measured by days missed due to ill-health per worker year. Incidence measured by cases per worker (1912-1916, 1928-1931) or share of workers reporting any days off (1888-1899, 1915-1917, and 1987). Duration measured by days missed per sick worker.

Sources:

1888-1899 from state labor surveys, available at <http://www.eh.net/databases/labor/>. Michigan (stone workers), 1888; California, 1892; Kansas, 1895, 1896, 1899; Maine 1890.

1912-1916: Collins, "Economic Status and Health." Data from records of the Workmen's Sick and Death Benefit Society.

1915-1917: Frankel, "Comment," pp. 642-643. Data from Metropolitan Life Insurance Company surveys for white males aged 15-64, number sick and unable to work: Boston, North Carolina, Rochester, Trenton.

1928-31: Collins, "Cases and Days." Data from Committee on the Cost of Medical Care survey.

1987: Vistnes, "Gender Differences." Data from National Medical Expenditure Survey.