The Effect of Mandatory Employer-Sponsored Insurance (ESI) on Health Insurance Coverage and Labor Force Utilization in Hawaii: Evidence from the Current Population Survey (CPS) 1994-2004*

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Working Paper No. 05-12
July 6, 2005

Abstract

Using data from the Current Population Surveys, we examine the impact of Hawaii's mandatory employer-sponsored insurance on health insurance coverage and employment structure in Hawaii. We find empirical evidence of three phenomena. First, private employer-sponsored insurance coverage for full-time workers (more than 20 hours per week) is more prevalent in Hawaii, other things held constant, than in other states and the U.S. as a whole. Second, there is avoidance of the employer-mandate in Hawaii by skirting the 20 hour rule, which changes the both the distribution of employment and the distribution of employment-based insurance coverage by hours worked. Third, Hawaii workers who match with part-time jobs without employer-sponsored health insurance obtain publicly provided health insurance or military coverage with higher probability than their counterparts elsewhere in the U.S. These results suggest that employer mandates induce both higher rates of coverage and labor market sorting.

JEL Classification: I18, J32
Keywords: health insurance, employer-sponsored insurance, Hawaii's labor market.

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* Financial support for this project was provided in part by the United States Department of Health and Human Services, Health Resources and Services Administration, State Planning Grant to the Hawaii State Department of Health.

One of the most distinctive features of health coverage in the U.S. is the strong link between health insurance and employment. With few pooling mechanisms available for insurance purchase outside of the workplace and strong tax incentives to acquire coverage at work, most individuals and families rely on group coverage sponsored by their employers. According to the Current Population Survey (CPS) Annual Social and Economic Supplement (March Demographic Supplement) in 2004, 68.6 percent of U.S. residents are covered by private health insurance and 88 percent of those obtain their insurance through their own employment or the employment of a family member. Thus, employer-sponsored insurance is the main source of private coverage in the U.S.

Attempting to build upon this foundation, federal and state policymakers have viewed mandating private employment-based health insurance as a mechanism to further increase the proportion of the population covered while limiting direct public expenditures. The Clinton Administration looked upon an employer mandate as a key feature in a universal coverage scheme (The White House Domestic Policy Council 1993). More recently, California policymakers, through the Health Insurance Act of 1993 (Senate Bill 2), attempted to expand coverage by mandating employers to provide health insurance (California HealthCare Foundation 2004; Butler 2004; Kapur, Marquis and Taylor 2004; Sinaiko 2004). Many other states have also floated various proposals to expand the employment-based health insurance system through mandates (Oliver 2004). Failing to overcome divergent political and economic interests, none of these proposals have been fully implemented. Furthermore, the states face an added regulatory hurdle in the form of the federal Employee Retirement Insurance Security Act (ERISA), which preempts state law and severely curtails the states' abilities to mandate health and retirement benefits on an employer-wide basis (Chirba-Martin and Brenan 1994). As a result,

Hawaii's Prepaid Health Care Act (PHCA) of 1974, which is sustained through a Congressional ERISA exemption, remains the only employer mandate in the nation. We exploit the unique nature of the Hawaii law to discover the effect of mandating employer-sponsored insurance by use of a quasi-experimental method which treats the other 49 States and the District of Columbia as "controls".

The link between health insurance and employment has a very important implication for the functioning of the U.S. health insurance system and labor market. Gruber (2000) and Currie and Madrian (1999) carefully review dozens of studies that have addressed the effect of employer-provided health insurance on labor market outcomes. While this literature has convincingly addressed the effect of employer-provided heath insurance on wages, job turnover, and employment, there are several important holes in the literature that remain. Although partially addressed (Dick 1994), one largely ignored question is whether state-mandated employer-provided health insurance is actually an effective tool to increase health insurance coverage. Perhaps more importantly, no research to date has focused on how the state-mandated employer-provided health insurance has affected the coverage of other types of insurance, such as publicly provided health insurance. Another under-researched, yet very important, question is the effect of state-mandated programs on the use of part-time workers.

Hawaii's mandated employer-provided health insurance system is best case-study to examine these issues. In 1974, the Hawaii state legislature passed the Prepaid Health Care Act (PHCA) which requires private-sector employers to provide health insurance to full-time workers (i.e., 20 or more hours per week) employed for at least four consecutive weeks. However, the Hawaii state law was subject to a series of court challenges following the enactment of Employee Retirement Income Security Act of 1974 (ERISA) by the U.S. Congress.

Initially, the courts ruled that ERISA preempted PHCA, but in 1983 Congress passed an exemption that allowed PHCA to take effect with limited future amendments to the act. Largely due to the preemption of ERISA, no other state has implemented mandatory employer-provided health insurance to date.

The study examines the impact of Hawaii's mandatory employer-provided health insurance on insurance coverage and employment structure in Hawaii. Our model-based results indicate that employer-based coverage is higher in Hawaii than in the rest of the U.S. only for workers who are employed more than 20 hours a week. At the same time, there is a clear result that the percentage of workers covered by employer-provided insurance is lower than the U.S. as a whole for those working less than 20 hours. However, those who are working less than 20 hours in Hawaii are much more likely to rely on publicly provided health insurance or military coverage than their counterparts in the other 49 states and the District of Columbia. As a consequence, the overall uninsured rate is lower in Hawaii than the rate in the U.S, regardless of hours worked. There is also avoidance of the employer-mandate in Hawaii by skirting the 20 hour rule, which changes the distribution of employment.

The Model and Data

Employer-provided insurance is attractive for at least three reasons. First, group coverage at work typically has lower administrative costs as employers process and maintain employee informational records as a matter of general business practice for variety of purposes. This generates economies of scope and economies of scale in insurance pool formation, which in turn renders low marginal cost of coverage. Second, employer-provided group coverage is less likely to be subject to adverse selection as the group is formed for a primary reason other than the

purchase of health insurance. Finally, and perhaps most importantly, the favorable tax-treatment of employer-provided health insurance provides a substantial subsidy to the purchase of coverage at work (Gruber 2002, 2000; Gruber and Poterba 1994; Pauly 1986; Feldstein and Friedman 1977). Together these various phenomena generate low effective premiums and provide a powerful incentive to obtain health insurance coverage at work. However, imposing mandatory employer-provided health insurance might well be paid for by workers in the form of lower future wage increases or by firms in higher labor costs, as voluntary transactions will have already exploited potential mutual gains. Workers might also place different value on employer-provided health insurance, depending on their preference, demographic characteristics, and level of earnings. Consider the following model.

Following Gruber and Krueger (1991), we assume that labor demand (L_d) for and supply (L_s) of *full-time* workers are repsectively given by:

$$(1) \qquad \begin{aligned} L_d &= f_d(W + C) \\ L_s &= f_s(W + \alpha C) \end{aligned}$$

where W is wages, C insurance costs, and αC is the monetary value that a worker places on employer-provided health insurance. Imposing the market equlibrium condition on the equations in (1) and totally differentiating with respect to W and C renders the following expression.

$$(2) \qquad \frac{dW}{dC} = -\frac{\eta^d - \alpha\eta^s}{\eta^d - \eta^s}$$

where η^d and η^s are the associated demand and supply elasticities, respectively. The change in employment of full-time workers is then:

$$(3) \qquad \frac{dL}{L} = \frac{-(\Delta C + \Delta W)}{W^e} * \eta^d$$

where W^e is original equilibrium wage for full-time workers. Thus, the change in wage and employment after implementation of the PHCA depends on α given η^d and η^s. If α=1, the wage will fall by exactly same amount as the fixed cost (health insurance) rise, with no effect on employment. If α>1, then full-time employment could even rise. If 0<α<1, then the reduction in wages will be less than the increase in costs; i.e., employers cannot fully shift the insurance cost to wages. Thus, employers tend to replace full-time workers with their (uninsured) part-time counterpart, leading to a decrease in employment for full-time workers. In practice, employers may not be able to fully shift the insurance cost to wages due to other market imperfections, such as minumum wage laws or union's resistance.[1]

In order to simplify our model we assume that there is no other publicly provided welfare program other than publicly provided health insurance. We further assume that the value of employer-provided health insurance is same as the value of publicly provided health insurance and employers cannot fully shift the insurance cost to wages. If there is an excess supply of labor for full-time employment after the imposition of PHCA, then some workers might move to part-time labor markets[2]. In our framework, workers face three prominent choices: i) working part-time and receiving publicly provided health insurance if they are eligible, ii) working full-time and receiving employer-provided health insurance, or iii) working part-time without health insurance.

Figures 1 and 2 summarize our main cases of insurance coverage using a exposition based on simple consumer theory with work-leisure choice. Because voluntary labor-market

[1] Currie and Madrian (1999) note that the empirical validity of the shifting the insurance cost to wages had been difficult to establish in part because of the fact that firms paying high wages are also more likely to offer good benefit packages. Using an instrument variables estimation, however, Olson (2002) finds that employers are able to shift some insurance cost to wages, suggesting that there is a trade-off between wage and insurance provision.
[2] These people could also become self-employed or drop out of the labor market. These cases are not considered in our graphical model.

contracts will have already satisfied most workers' desires for compenstion in the form of health insurance, we only consider the case in which employers cannot fully shift the insurance cost to wages. The original budget constraint without any health insurance is given by a straight line segment AA'. The publicly and the state-mandated employer-provided health insurance create two notches in this budget constraint for some workers. With less than H_1 hours of work (part-time), the worker receives publicly provided health insurance, which is a dominated part of the budget constraint. Many readers will recognize this is an adaption of Yelowitz's so-called *Medicaid notch* (Yelowitz 1995; Gruber 2000; Ham and Shore-Sheppard 2005). The worker will lose the publicly provided benefit if the worker works more than H_1 hours and thereby the person's income is above the eiligible state poverty line. The worker is eligible for state-mandated employer-provided health insurance program if he works more than H_2 hours (full-time), which we call *PHCA notch*.

<Figures 1 and 2 about here>

Individuals choose a point along the budget constraint with these two notches. In practice, the size of two notches as well as an individual's preference affects the choice of the worker. There are several possibilities. If α is close to 1, then the PHCA notch is small, and thus the employer can almost fully shift the fixed cost to wages. The worker has little incentive to change his behavior after the implementation of the PHCA. If this is the case, then the PHCA does not affect the percentage of people covered by publicly provided health insurance, although it may increase the percentage of people covered by employer-provided health insurance. Alternatively, if the worker voluntarily chooses to be a part-time worker both before and after the PHCA and relies on eligible publicly provided health insurance, then again the PHCA does not affect the

percentage of people covered by publicly provided health insurance. This is the case, illustrated in Figure 1.

In Figure 2, the represented worker maximizes utility as a full-time worker before the implementation of the PHCA along the budget segment A'E. After the implementaion of the PHCA, some workers will achieve full-time employment with ESI and be able to optimize along the segment GF. This however, raises the effective cost to frims which in turn reduces the demand for full-time workers. As a result some workers will be rationed by the market and only be able to match with a part-time jobs, achieving utility I', as the illustrated boundary solution indicates. Thus, the PHCA may increase the percentage of part-time workers covered by publicly provided health insurance. That is, those who are unable to find full-time jobs with employer-provided health insurance may switch to publicly provided health insurance with part-time jobs. A third case is (not shown in figures), although it is less likely, that, depending on the size of notch and shape of the indifference curve, some part-time workers who are eligible for publicly provided health insurance choose along the segment DE, losing both publicly-provided and employer-provided health insurance.

Based on our two-notch model, the effect of the PHCA on the health insurance coverage and employment structure can be summarized as follows. First, it might increase the health insurance coverage for full-time workers. Second, there might be changes in the distribution of health insurance by hours worked due to employers' eligibility avoidance. Third, some people who are unable to find full-time jobs with health insurance will switch to other types of insurance, such as publicly provided health insurance.

Some literature is of relevance to our present work, but the number of studies is quite limited and the results are mixed. Gruber (1994a, 1994b) finds no significant effect of state-

mandated maternity benefits on employment, which also offers evidence to support the view of full shifting the cost of insurance to wages. Galloway (1995) and Scott, Berger, and Black (1989) find a positive relationship between the share of fringe benefits in compensation and the fraction of part-time workers, while Ehrenberg, Rosenberg, and Li (1988) find no effect of variations in the eligibility of part-time workers for benefits on the use of part-time workers. While Buchmueller (1999) finds that an increase in the fringe benefits for full-time employees increases the share of part-time workers employed, Montgomery and Cosgrove (1993) find that increases in benefits decrease the share of hours in their sample of childcare centers that are worked by part-time workers. These studies generally look at US data.

In one of the few studies to focus on Hawaii, Thurston (1997) shows that Hawaii has significantly higher rates of persons covered by employer-provided insurance as compared to the U.S. as a whole. Perhaps even more interesting, he finds a substantial *coat-tail effect* that implies a 1-to-1 spillover effect from full time workers (working at least 20 hours per week) to part-time workers (working less than 20 hours); i.e., he finds that even though part-time workers are excluded from the PHCA, approximately 11% more part-time workers in Hawaii have employer-provided health insurance than in the U.S. as a whole. However, he only compares the mean values of employer-provided health insurance coverage and working hours between Hawaii and U.S. [3] This might be problematic because Hawaii has unique demographics and industrial structure which may have affected health insurance rates in the absence of state-mandated programs. Nor does he consider the effect of the state-mandated health program on other

[3] This is also true for some other evidences. Although there are some studies which discuss the effect of the PHCA on insurance coverage, they just compare the mean of the percentage insured in Hawaii with those in other states, even without distinguishing full-time from part-time workers. The results are also mixed. While Lewin and Sybinsky (1993) and Neubauer (1993) claim that PHCA might be an effective tool in increasing insurance coverage rate, Dick (1994) argues that the PHCA has little impact on employer-provided health insurance coverage simply because it does not target a large portion of the uninsured.

insurance such as publicly provided insurance. Little systematic effort has been made to assess his results to date.

We test our hypothesis using the Current Population Survey (CPS) March Demographic Supplement for the years 1994-2004, which is conducted by the U.S. Census Bureau.[4] Among the sample, we select persons aged 19-64 years who are employed, but not self-employed. The total number of observations used in our sample is 7,228 for Hawaii and 622,877 for U.S. as a whole. We measure an insurance status which indicates whether a person had any type of health insurance during last year at any point in time (even for one day). Dental and vision coverage are excluded under the CPS definition of health insurance. The number of hours worked is measured as the usual hours of work at the main job held last week.

Ideally an analysis would include random samples of the Hawaiian population both before and after the PHCA implemenation, January 1975. Such data simply does not exist.[5] As an alternative, we analyze the performance of Hawaiian system after implementation of the PHCA relative to other states and U.S. as a whole and conduct counter-factual analyses. If we view the provision of the state-mandated employer-provided health insurance in Hawaii as a constraint model relative to U.S. nationwide, it follows that at least some of the deviations from the U.S. outcomes might imply the effect of the PHCA. We not only compare Hawaii with U.S., but we compare it with selected other states. We select four comparative states in all (Nevada,

[4] Although the information on health insurance becomes available a few years before 1994, we only use data since 1994 because the phase-in new sample started in 1994. We found that there are some inconsistencies in variables before and after 1994.

[5] The CPS does not include health insurance coverage information prior to 1980, nor was it identified Hawaii from other states in any of the pre-program years. To show how wage and health insurance coverage has changed before and after the PHCA, Thurston (1997) tries to use 1970 Census data and 1969 hospital enrollment data and compare it with CPS 1990-93. However, any two numbers before and after the PHCA were not directly comparable. Unfortunately, there is a substantial difference in numbers between self-reported survey data and estimates based on hospital enrollment data which Thurston used. Furthermore, only bracketed working hours and weeks worked are reported in the 1970 Census, preventing us making any direct comparisons between CPS and the Census for our purpose.

Michigan, California, and Florida), ranging from one with a very similar industrial structure to that of Hawaii (Nevada), to another which is most divergent (Michigan) to compare the results.

We assume that the selection of workers into each type of insurance has the structure of a multinomial logit model. The probability that each alternative *s* will be chosen can be calculated by

$$(4) \qquad \Pr(I_i = s) = \frac{\exp(Z\beta_s)}{(1+\sum_{s\in S}\exp(Z\beta_s))}$$

where I_i is an indicator of each worker's type of insurance, and Z is the set of variables in the multinomial logit equation. The dependent variable is essentially a categorical probability that a person with specific characteristic will end up in a particular category. The model predicted over three categories: uninsured, employer-provided insurance, and other insurance.[6,7] The independent variables of baseline specification include age of an individual, sex, ratio of household income to state poverty line and its squared term, hours worked, education, race, 14 dummy variables for type of industry in which the worker is employed, marital status, establishment size, and the presence of a collective bargaining agreement. All estimates in this paper were obtained using the consistent variance-covariance matrix estimator of White (1980). The standard errors are thus robust to heteroskedasticity. The March Supplement final weight, which is the product of several adjustments of the CPS, is used to produce population estimates for the various estimates. After estimation, we conduct counter-factual analysis. For example, we measure what would be the insurance coverage by type of insurance of Hawaii and other states if

[6] Other insurance includes Medicaid, Medicare, CHAMPUS/Tricare, private non-group coverage, and other forms of public and private insurance.

[7] There are some people who are covered by two or even three different insurance. We tried to separate or drop this group, but it barely affected results. We also tried four categorical model, i.e., i) uninsured, ii) employer-provided, iii) publicly provided, and iv) others (other private insurance). The results are qualitatively same, and the results are not reported here.

they have same socio-economic and demographic characteristics. We predict the effect of hours worked on the probability of coverage holding other variables constant.

Table 1 present the percentage of insured by type of insurance for five states and U.S. as a whole. 15.6 percent of the U.S. population had no health insurance in survey year 2004. Hawaii (10.1%) and Michigan (10.9%) have much less uninsured than U.S. as a whole, while Nevada (18.9%), California (18.4%), and Florida (18.2%) are characterized by much higher percentage of uninsured in year 2004. The 11-year average shows very similar pattern as well. The table also clearly indicates that the coverage of insurance by type of insurance is very different across states. For example, Hawaii is characterized by a high percentage of CHAMPUS/TRICARE coverage due to a large proportion of active duty military personnel, retirees and military dependents. Thus, it is necessary to take this into consideration, for example by doing analysis, first with CHAMPUS/TRICARE and then without it. The table also shows a higher percentage of employment based health insurance for Hawaii and Michigan. However, we cannot draw any rigorous conclusions based on these summarized data. What our model should predict is an effect of *PHCA notch*, but the insurance coverage depends on several other factors such as age structure, income distribution, industry structure, and many other factors which previous studies also neglected. To gain better insight, therefore, we turn to regression results discussed in the next section.

<Table 1 about here>

Evidence on Insurance Coverage

Since the goal of the PHCA was to reduce the number of uninsured in the state of Hawaii, it is necessary to analyze insurance rates to determine whether it has been an effective tool or not. For

this purpose, we run regressions using samples from Hawaii, Nevada, Michigan, California, Florida, and the U.S., and compare the results. Our multinomial logit results are presented in Table 2 where the base category is the uninsured. The coefficients are presented as relative risk ratios. For example, the coefficient of male dummy in the employer-provided health insurance in Hawaii sample is 0.709 suggesting that the odd of having employer-provided health insurance over being uninsured (base category) is 0.709 for male workers relative to female workers. Most variables in all categories are significant at the 5% significant level. The regression coefficient of working hours is especially significant in all samples. This suggests that working hours is a strong predictor of the type of insurance.

<Table 2 about here>

Using 5-hour ranges for hours worked, the counterfactual analysis predicts that the insurance coverage of Hawaii is higher than that the rest of the U.S. in general (Figure 3). This appears to support Thurston's contention that there are positive spillovers (coat-tail effect) to workers employed for less than 20 hours per week. However, when we looked at the predicted percentage of workers covered only under employer-provided insurance, we see somewhat different pattern (Figure 4. See Figure A1 for graph using single hours worked). There is a clear trend that the percentage of workers covered by employer-provided insurance in Hawaii is in fact *lower* than the U.S. and other states for workers working less than 20 hours. At the same time, for all workers over 20 hours, the model predicts levels of employer-based insurance coverage that are higher in Hawaii than in the U.S. If the positive spillovers that Thurston suggests exist, one would think that they would largely appear in the predictions of employer-provided insurance. Since this is not the case, this casts doubt on the claim for positive spillovers to part-time employees.

<Figures 3 and 4 about here>

To see why this is the case, we predict the percentage of other insurance. The result is somewhat striking (Figure 5. Figure A2 for single hours worked). Those who are working less than 20 hours in Hawaii are much more likely to rely on the other types of insurances, especially publicly provided health insurance than in the rest of the U.S. That is, our evidence suggests that the lower rate of uninsurance of part-time workers in Hawaii is not due to the spillover effect. On the contrary, it is because people who could not find a full-time job have switched to the other types of insurance, such as publicly provided health insurance.

<Figure 5 about here>

Our method for discerning the impact of the PHCA is to compare the probability of being covered by employer-provided health insurance in Hawaii with the probabilities of being covered in the U.S. and selected states. In making our comparison we control for characteristics of the workforce and labor market including age, sex, education, marital status, race, income, hours-worked, size of establishment, industrial structure and collective bargaining. The remaining difference we infer is due to the presence of the PHCA employer-mandate, as Hawaii is the only state in the U.S. to have such a mandate. Our method, therefore, is essentially a residual method, which we often employ to calculate wage differential between men and women or between union and non-union members. That is, we infer the residual difference is due to the PHCA, assuming other things are held constant. If our maintained hypothesis, that other factors have been properly controlled, is false, our results may bias the estimated impact of the PHCA.

One possible source of major structural difference between Hawaii and the U.S. overall is the presence of a disproportionately large military complex including all branches of the U.S. military services with combat units, support units & facilities, and command & control

infrastructure. This has significant impacts on the Hawaii economy, labor market, health delivery system and insurance coverage. While 3-4% of the population nationwide is covered by military health insurance through CHAMPUS/TRICARE, 8-9% of the Hawaii population is so covered. Perhaps this explains the effects we observe, rather than PHCA.

To see if our results are possibly driven by this structural difference, we re-estimate our models omitting all observations relating to military health insurance. The results are essentially unchanged further strengthening our conclusion that the PHCA increases coverage for full-time workers and decreasing employer-provided insurance coverage for part-time workers (Figure A3). We believe, however, that the large presence of CHAMPUS/TRICARE in Hawaii is part of the PHCA labor market interactions and our preferred model includes these observations. For example, military spouses are more likely to accept part-time private-sector employment without health insurance, but with higher cash wages in the knowledge that they can draw upon family coverage through TRICARE. It is this type of equilibrium response we believe our model captures.

In addition to our model variants with and without CHAMPUS/TRICARE beneficiaries, we conduct three other sensitivity checks to confirm the robustness of our results. First, we utilize two questions from the CPS on the number of hours worked per week—usual hours worked per week at all jobs held last year and last week. Second, we simulate the counterfactual estimates with the Hawaii means and overall U.S. means. Finally, we simulate the counterfactual estimates using Caucasian sample only, excluding Asian and Pacific Islanders. All results are quite robust to the hours measured used, choice of mean, and sub-group of sample

(e.g. Figure A4). These additional checks confirm our conclusions are based on real underlying phenomenon and not mere remnants of the specification or particular data values employed.[8]

Evidence on Labor Force Utilization

One way in which the PHCA may impact the labor market in the state of Hawaii is by causing a sectoral shift of labor from full-time to part-time labor. The benefit of such a shift to employers is that part-time employees are exempt from the PHCA, thus reducing the employers' insurance liability. Some results from the previous section, suggesting that insurance is lower than the U.S. for those who work less than or equal to 20 hours, is consistent with this view. One way to examine whether the PHCA has had an impact on full-time versus part-time labor markets in the economy is to compare the distribution of hours worked in Hawaii to those of the other states and the U.S. as a whole. Figure 6 presents a result for five states as well as the U.S. There appears to be a clear difference in the pattern of hours worked between Hawaii and other states.[9]

<Figure 6 about here>

One might argue that businesses affiliated with the tourism industry in Hawaii are very different from that in other states, which is conducive to employing part-time labor. Again, the striking feature of the figure is that Nevada and Michigan, which respectively have the most similar and different industry structure as that of Hawaii, have very similar distributions of workers by hours worked. Their pattern is not different from the U.S. as a whole, either. Especially, the percentage of people working 16-19 hours is almost identical across state and in

[8] Workers' unobserved characteristics might be correlated with working hours. Working hours are not randomly assigned across the population; rather, individuals make their own choice of working hours. Depending on how these choices are made, measured probability of specific type of insurance between workers with different working hours may bias the true probability. However, it might be very difficult to find compelling identifying assumptions in this case, and using irrelevant identifying variables does harm rather than does good (Bound, Jaeger, and Baker 1995). We left this issue for future studies.

[9] In order to show the differences between Hawaii and the other states more clearly, we only report working hours less than 40. Because substantial percentage (50-60%) of workers report working hours at 40, adjusting scales of

the U.S., while it is in the spike in Hawaii. In addition, Hawaii appears to have higher percentage of employees at exactly 20 hour categories as well. Considering there is often a substantial reporting error due to rounding-off (reporting 20 hours when it is slightly less than 20 hours), some people in this group could also belong to 16-19 working hours group. This is indicative of employers in Hawaii employ more part-time workers not because of industry structure but because of employer's effort to reduce cost by employing more part-time workers.

This pattern of employment could be more dramatically seen by looking at the cumulative distribution of working hours (Figure 7). Again, there is small but clear difference between Hawaii and other states. However, there could be other exogenous factors that contributed to the spike of part-time workers in Hawaii. For example, Hawaii's population is, on average, older than the U.S. average, so larger numbers of retirees who are covered by Medicare have little need for health insurance benefits. If elderly labor force is larger in Hawaii than in other states it would affect the distribution of working hours in Hawaii. To explore this issue, we redrew the Figure 6 using U.S. population age structure as a weight (not shown). Again, the results are not qualitatively different, implying that age structure in Hawaii is little to do with the pattern shown in Figure 6.

<Figure 7 about here>

Although the distribution of workers by hours worked indicates a disproportionate number of Hawaii workers in the vicinity of 20-hours per week, implying a PHCA effect, we may not draw a rigorous conclusion based on the summarized data. Thus, we have constructed a *matched sample* to investigate the issue further. Again using 11-years of the CPS 1994-2004, we selected 4,642 private-sector workers age 19-64 from the Hawaii sample who reported at least some hours at the main job. We matched these observations on the basis of age (5-year

increments), sex, education, marital status, survey year (3-year increments), industry of employment and unionization with an equal number of selected observations from the other 49 States and the District of Columbia. If more than one match occurred, we randomly selected among the exact matches to generate an exactly balanced matched sample.

Table 3 presents the tabulated distribution of workers by hours worked per week (1-19, 20-35, 36+) split between those with ESI and those without based on these matched samples. Overall the results indicate labor market sorting between workers with ESI and workers without ESI, with more full-time with ESI and more part-time without. This is the case for both the USA and Hawaii. However, the evidence suggests that the PHCA is accentuating the differences between part-time and full-time. The results indicate that Hawaii has fewer workers with ESI, as a proportion of total private-sector workers, working 20-35 hours per week than the USA and more workers above 35 hours. We hypothesize that the fixed-cost per worker nature of health insurance makes workers in the range 20-35 hours the most expensive. For workers below 20 hours, PHCA does not apply, so voluntary fringe benefit packages will arise. For some workers above 20 hours, the PHCA will be a binding constraint, and firms will be forced to cover some workers who would not otherwise be covered. As a consequence, it now becomes cheaper on the margin to increase the hours of existing full-time workers and substitute this time for the workers in the 20-35 range. Similar results have been found by Cutler and Madrian (1998) with regard to rising premiums in the USA overall (i.e., rising premiums induced more full-time workers). This in precisely the pattern we see in Table 3 with regard to PHCA. However, we do not find that Hawaii has a disproportionate number of part-time workers (1-19 hours.) Similar results are found when we look at all workers combined (i.e., public and private sector workers) (See Table 4). Results based on total labor utilization as measured by total hours worked (not shown)

rendered the same pattern. That is, the PHCA has generated an increase in the utilization of labor coming from workers at 36+ hours and a decrease in the utilization of labor coming from workers in the 20-35 hour range, with a negligible impact on workers below 20 hours.

<Table 3 and 4 about here>

Conclusion

The relationship between health insurance coverage and employment was the central concern of Clinton Administration's proposed universal employer-provided mandated program. The debate is still on-going especially at the state level and the debate will certainly reappear in the near future. This paper tries to shed a light on the debate by examining the case of Hawaii's state-mandated employer-provided health insurance.

The evidence in this paper suggests that levels of employer-based coverage are higher in Hawaii than in the rest of the U.S. for workers who are working more than 20 hours a week. At the same time, there is a clear indication that the percent of workers covered by employer-provided insurance is *lower* than the U.S. for those who work less than or equal to 20 hours, suggesting that there might be substantial eligibility avoidance. However, those who are working less than 20 hours in Hawaii are much more likely to rely on other insurance such as publicly provided health insurance than in the rest of the U.S. Our results also suggest that employer mandates has generated a decrease in the utilization of labor coming from workers in the 20-35 working hour range. The results are robust after controlling the difference in industry structure and demographic characteristics across states. The estimation used in the paper relies on a residual method. One may even attribute everything we have observed to the use of residual

method itself. However, a more natural and simpler way to interpret the results is that the PHCA did have distinct effects on insurance coverage and distribution of workers by hours worked.

The implication of our evidence on social welfare and economy is complex. Some studies claim that the mandate will be an efficient and equitable policy if the mandate is simply a means of financing (Gruber, 2000). Meanwhile, Thurston (1997) argues that there is a coat-tail effect of the mandate on part-time workers. However, our evidence suggests that eligibility avoidance of employers might offset the beneficial effect of mandate on government budget financing. Nor do our results suggest that the lower percentage of uninsurance of part-time workers in Hawaii is a coat-tail effect.

Is there any other labor market related implication of the state mandate? One interesting research topic that we did not address here is to test so called “wife-lock” hypothesis (Gruber 2000). Because the PHCA discourage double coverage and thereby dependent coverage, people have wondered that state-mandated health insurance such as the PHCA may encourage spouse’s labor force participation. This might be an interesting extension of this paper.

References

Buchmueller, Thomas C. 1999. "Fringe Benefits and the Demand for Part-Time Workers," *Applied Economics*, Vol. 31, No. 5, pp. 551-63.

Butler, Patricia A. March 2004. *ERISA Implications for SB 2: Full Report.* Oakland, CA: California HealthCare Foundation.

Bound, John, David A. Jaeger, and Regina M. Baker. 1995. "Problems with Instrumental Variables Estimation when the Correlation between the Instruments and the Endogenous Explanatory Variables is Weak", *Journal of American Statistical Association,* Vol. 90, No.430, pp. 443-50.

California HealthCare Foundation. October 2004. "The Health Insurance Act of 2003: An Overview of SB 2," Fact Sheet.

Chirba-Martin, Mary Ann, and Troyen A. Brennan. 1994. "The Critical Role of ERISA in State Health Reform," *Health Affairs*, Vol. 13, No. 2, pp. 142-56.

Currie, Janet, and Brigitte C. Madrian. 1999. "Health, Health Insurance and the Labor Market,' in: Orley Ashenfelter and Davd Card eds. *Handbook of Labor Economics*, Vol. 3C, Amsterdam: North Holland, pp. 3309-416.

Cutler, David M., and Brigitte C. Madrian. 1998. "Labor Market Responses to Rising Health Insurance Costs: Evidence on Hours Worked," *RAND Journal of Economics*, Vol. 29, No.3 (Autumn) pp. 509-30.

Dick, Andrew W. 1994. "Will Employer Mandates Really Work? Another Look at Hawaii," *Health Affairs*, Vol. 13, No. 1, pp. 343-9.

Ehrenberg, Ronald G., Pamela Rosenberg, and Jeanne C. Li. 1988. "Part-Time Employment in the United States," in R.A. Hart ed. *Employment, Unemployment and Labor Utilization*, Boston: Unwin Hyman, pp. 256-81.

Feldstein, Martin, and Bernard Friedman. 1977. "Tax Subsidies, the Rational Demand for Insurance, and the Health Care Crisis," *Journal of Public Economics*, Vol. 7, No. 2, pp. 155-78.

Galloway, Lowell. 1995. "Public Policy and Part-Time Employment," *Journal of Labor Research*, Vol. 16, No. 3, pp. 305-13.

Gruber, Jonathan. 2002. "Taxes and Health Insurance," In James Poterba ed., *Tax Policy and the Economy 16*. Cambridge: MIT Press, pp. 37-66.

_____. 2000. "Health Insurance and the Labor Market," in Joseph P. Newhouse and Anthony J. Culyer eds. *Handbook of Health Economics*, Vol. 1A, Amsterdam: North Holland, pp.

645-706.

_____. 1994a. “The Incidence of Mandated Maternity Benefits,” *American Economic Review*, Vol. 84, No. 3, pp. 622-41.

_____. 1994b. “State Mandated Benefits and Employer Provided Insurance,” *Journal of Public Economics*, Vol. 55, No. 3, pp. 433-64.

Gruber, Jonathan, and Alan B. Krueger. 1991. “The Incidence of Mandated Employer-Provided Insurance: Evidence from Workers Compensation,” in D. Bradford ed. *Tax Policy and Economy,* Cambridge: MIT Press, pp. 111-43.

Gruber, Jonathan, and James Poterba. 1994. “Tax Incentives and the Decision to Purchase Health Insurance: Evidence from the Self-Employed,” *Quarterly Journal of Economics*, Vol. 108, No. 2, pp. 701-33.

Ham, John C., and Lara D. Shore-Sheppard. 2005. “Did Expanding Medicaid Affect Welfare Participation?,” *Industrial and Labor Relations Review*, Vol.58, No.3, pp. 452-70.

Kapur, Kanika, M. Susan Marquis, and Lynn Taylor. 2004. “SB2: Effects on Employers and Employees.” California HealthCare Foundation.

Lewin, John C., and Peter A. Sybinsky. 1993. “Hawaii’s Employer Mandate and Its Contribution to Universal Access,” *Journal of the American Medical Association*, Vol. 269, No. 19, pp. 2538-43.

Montgomery, Mark, and James Cosgrove. 1993. “The Effect of Employee Benefits on the Demand for Part-Time Workers,” *Industrial and Labor Relations Review*, Vol. 47, No. 1, pp. 87-98
.

Neubauer, Deane. 1993. “Hawaii: a Pioneer in Health System Reform,” *Health Affairs*, Vol. 12, No. 2, pp. 31-9.

Oliver, Thomas. March 2004. “State Employer Health Insurance Mandates: A Brief History,” California HealthCare Foundation.

Olson, Craig A. 2002. “Do Workers Accept Lower Wages in Exchange for Health Benefits?” *Journal of Labor Economics,* Vol. 20, No. 2, pp. S91-S114.

Pauly, Mark V. 1986. “Taxation, Health Insurance, and Market Failure in the Medical Economy,” *Journal of Economic Literature*, Vol. 24, No. 2, pp. 629-75.

Scott, Frank A., Mark C. Berger, and Dan A. Black. 1989. “Effects of the Tax Treatment of Fringe Benefits on Labor Market Segmentation,” *Industrial and Labor Relations Review*, Vol. 42, No. 2, pp. 216-29.

Sinaiko, Anna D. 13 October 2004. “Employers’ Responses to a Play-or-Pay: An Analysis of California’s Health Insurance Act of 2003,” *Health Affairs –Web Exclusives*, W4-469-79.

Thurston, Norman K. 1997. “Labor Market Effects of Hawaii’s Mandatory Employer-Provided Health Insurance,” *Industrial and Labor Relations Review*, Vol. 51, No. 1, pp. 117-35.

White, Halbert. 1980. “A Heteroskedasticity-Consistent Covariance Matrix Estimator and Direct Test for Heteroskedasticity,” *Econometrica*, Vol. 48, No. 4, pp. 817-38.

The White House Domestic Policy Council. 1993. *The President’s Health Security Plan.* New York, NY: Times Books.

Yelowitz, Aaron S. 1995. “The Medicaid Notch, Labor Supply and Welfare Participation: Evidence from Eligibility Expansions,” *Quarterly Journal of Economics*, Vol. 110, No. 4, pp. 909-940.

Table 1. Insured and Uninsured by Types of Insurance: CPS 1994-2004 (%)

	Insured								
	Public				Private				
Year	Medicare	Medicaid	CHAMPUS/ TRICARE	Sub-total	ESI	Sub-total	Insured Total	Uninsured	Total
U.S.									
1994	12.7	12.2	3.7	26.4	57.1	70.2	84.7	15.3	100.0
1995	12.9	12.1	4.3	26.8	60.9	70.3	84.8	15.2	100.0
1996	13.1	12.1	3.5	26.4	61.1	70.3	84.6	15.4	100.0
1997	13.2	11.8	3.3	25.9	61.2	70.2	84.4	15.6	100.0
1998	13.2	10.8	3.2	24.8	61.4	70.1	83.9	16.1	100.0
1999	13.2	10.3	3.2	24.3	62.0	70.2	83.7	16.3	100.0
2000	13.2	10.3	3.1	24.3	63.5	72.1	85.7	14.3	100.0
2001	13.4	10.3	3.0	24.2	64.1	72.4	86.0	14.0	100.0
2002	13.5	11.2	3.4	25.3	62.6	70.9	85.4	14.6	100.0
2003	13.4	11.6	3.5	25.7	61.3	69.6	84.8	15.2	100.0
2004	13.7	12.4	3.5	26.6	60.4	68.6	84.4	15.6	100.0
1994-2004	13.2	11.4	3.4	25.5	61.4	70.4	84.8	15.2	100.0
Hawaii									
1994	12.4	7.7	14.4	33.2	60.4	72.4	88.9	11.1	100.0
1995	14.3	9.5	13.8	34.2	67.4	74.8	90.9	9.1	100.0
1996	11.6	14.6	13.2	36.1	62.2	71.8	91.1	8.9	100.0
1997	12.3	14.3	12.4	36.1	60.5	69.1	91.4	8.6	100.0
1998	13.9	10.9	11.1	33.7	64.2	72.4	92.5	7.5	100.0
1999	13.4	10.4	9.2	31.5	69.3	74.6	90.0	10.0	100.0
2000	11.4	10.2	6.5	27.1	71.3	76.8	89.7	10.3	100.0
2001	13.2	10.5	5.6	26.5	68.4	77.7	89.9	10.1	100.0
2002	14.4	11.5	10.0	32.9	66.1	73.2	90.4	9.6	100.0
2003	14.1	10.5	8.5	30.2	67.6	73.5	90.0	10.0	100.0
2004	14.1	10.6	8.3	30.5	67.9	74.0	89.9	10.1	100.0
1994-2004	13.2	11.0	10.2	32.0	66.0	73.7	90.4	9.6	100.0
Nevada									
1994	11.7	5.9	6.2	21.7	60.9	72.6	81.9	18.1	100.0
1995	12.6	6.8	5.3	22.4	66.3	73.4	84.3	15.7	100.0
1996	13.3	8.9	4.2	22.4	64.0	71.4	81.3	18.7	100.0
1997	12.4	9.0	4.5	23.3	67.3	72.4	84.4	15.6	100.0
1998	13.1	6.7	5.1	22.3	64.2	72.7	82.5	17.5	100.0
1999	11.5	4.5	3.4	17.2	63.7	70.2	78.8	21.2	100.0
2000	11.9	6.2	3.5	19.6	62.7	70.8	81.7	18.3	100.0
2001	12.9	8.3	3.4	21.8	63.9	71.4	84.4	15.6	100.0
2002	11.8	6.3	4.1	19.4	67.1	72.8	83.9	16.1	100.0
2003	12.5	6.0	4.0	19.8	63.1	69.0	80.3	19.7	100.0
2004	12.4	8.3	4.0	21.5	60.7	67.5	81.1	18.9	100.0
1994-2004	12.4	7.0	4.3	20.9	63.9	71.1	82.2	17.8	100.0
Michigan									
1994	12.2	14.8	1.7	26.9	64.1	74.6	88.8	11.2	100.0
1995	13.1	13.7	3.2	28.0	68.4	76.2	89.2	10.8	100.0
1996	13.6	11.2	1.4	24.9	71.4	77.9	90.3	9.7	100.0

1997	13.8	12.6	1.1	25.2	71.3	78.6	91.1	8.9	100.0
1998	13.9	12.8	1.3	25.7	68.3	75.7	88.4	11.6	100.0
1999	12.7	11.3	0.9	23.2	69.6	74.9	86.8	13.2	100.0
2000	12.3	10.3	1.0	21.8	71.5	78.6	89.9	10.1	100.0
2001	13.0	10.0	0.9	22.2	72.5	79.1	90.1	9.9	100.0
2002	14.0	10.1	1.2	23.5	72.3	78.2	89.6	10.4	100.0
2003	12.9	11.7	0.9	24.0	68.9	75.6	88.3	11.7	100.0
2004	14.1	12.7	1.4	25.8	69.0	76.2	89.1	10.9	100.0
1994-2004	13.2	11.9	1.3	24.6	69.8	76.9	89.2	10.8	100.0
California									
1994	10.7	16.5	3.3	27.8	50.9	62.2	80.3	19.7	100.0
1995	11.3	16.4	4.4	28.7	52.9	60.1	78.9	21.1	100.0
1996	11.1	15.9	3.0	27.5	53.3	61.0	79.4	20.6	100.0
1997	10.9	14.5	2.4	25.5	53.7	62.2	79.9	20.1	100.0
1998	11.0	13.5	2.7	24.6	54.1	61.5	78.5	21.5	100.0
1999	11.3	12.8	2.9	24.5	54.1	61.3	77.9	22.1	100.0
2000	10.8	13.3	2.8	24.4	57.3	64.9	81.0	19.0	100.0
2001	11.0	13.5	2.9	24.7	57.3	65.1	81.9	18.1	100.0
2002	10.2	13.9	2.9	24.1	55.9	63.6	80.5	19.5	100.0
2003	10.7	14.2	3.0	24.8	56.9	65.1	81.8	18.2	100.0
2004	11.7	15.1	2.7	26.3	55.5	63.8	81.6	18.4	100.0
1994-2004	11.0	14.5	3.0	25.7	54.8	62.9	80.2	19.8	100.0
Florida									
1994	16.4	12.2	5.0	31.1	49.1	64.2	80.4	19.6	100.0
1995	17.6	11.5	5.7	31.8	53.0	64.9	82.8	17.2	100.0
1996	17.4	11.2	5.3	31.0	52.8	64.8	81.7	18.3	100.0
1997	18.2	11.9	4.4	31.6	52.7	64.4	81.1	18.9	100.0
1998	19.0	9.0	3.9	28.9	53.1	64.2	80.4	19.6	100.0
1999	19.8	8.5	3.8	29.1	55.4	66.6	82.5	17.5	100.0
2000	18.1	9.2	3.6	27.8	55.7	65.9	82.0	18.0	100.0
2001	18.2	10.5	3.1	28.0	56.5	66.7	82.7	17.3	100.0
2002	17.7	10.9	4.0	29.1	55.9	65.7	82.5	17.5	100.0
2003	18.4	10.7	5.0	29.9	53.4	64.9	82.7	17.3	100.0
2004	18.4	11.2	4.7	30.3	54.2	64.7	81.8	18.2	100.0
1994-2004	18.1	10.6	4.4	29.9	53.8	65.2	81.9	18.1	100.0

Note: Weighted Tabulations. Year refers to CPS survey year.

Table 2. Multinomial Logit Results (Base=Uninsured), CPS 1994-2004

Status	U.S.	Hawaii	Nevada	Michigan	California	Florida
Employer sponsored						
Age	1.049	1.015	1.066	1.033	1.056	1.056
	(16.62)	(0.49)	(3.19)	(1.89)	(6.12)	(5.00)
Age squared	1.000	1.000	0.999	1.000	1.000	1.000
	(10.06)	(0.34)	(2.33)	(0.93)	(4.26)	(3.47)
Male	0.709	0.622	0.741	0.735	0.685	0.740
	(34.08)	(4.77)	(4.42)	(5.26)	(13.04)	(7.70)
Married	2.064	2.248	2.234	2.370	1.988	1.834
	(65.84)	(6.48)	(10.95)	(12.89)	(21.30)	(14.19)
College	1.623	1.140	1.616	1.529	1.786	1.578
	(45.62)	(1.16)	(6.26)	(7.32)	(17.75)	(11.14)
FPL	1.670	1.506	1.412	1.648	1.658	1.617
	(82.21)	(8.07)	(3.62)	(15.98)	(25.81)	(19.55)
FPL squared	0.987	0.988	0.995	0.987	0.987	0.988
	(43.71)	(5.58)	(0.44)	(9.71)	(12.77)	(9.50)
Non-white	0.732	1.066	1.058	0.614	0.876	0.881
	(22.69)	(0.49)	(0.53)	(6.51)	(3.24)	(2.31)
Hours Worked	1.012	1.040	1.019	1.008	1.017	1.019
	(22.21)	(6.28)	(3.93)	(3.02)	(9.43)	(8.17)
Union	2.193	3.240	2.286	1.859	1.966	1.703
	(20.50)	(2.97)	(3.44)	(3.97)	(6.10)	(2.52)
Firm Size (1-9)	0.271	0.402	0.247	0.302	0.239	0.277
	(90.31)	(6.34)	(12.93)	(13.92)	(33.68)	(22.74)
Firm Size (10-499)	0.609	0.860	0.517	0.727	0.560	0.522
	(45.30)	(1.18)	(8.63)	(5.25)	(17.78)	(14.45)
Others						
Age	0.916	1.024	0.864	0.907	0.954	0.918
	(21.55)	(0.58)	(4.19)	(4.16)	(3.79)	(5.62)
Age squared	1.001	0.999	1.002	1.001	1.001	1.001
	(23.06)	(1.04)	(4.44)	(4.25)	(4.22)	(6.20)
Male	0.651	0.517	0.743	0.598	0.606	0.676
	(28.33)	(4.74)	(2.44)	(6.00)	(11.39)	(6.85)
Married	1.139	1.657	1.458	1.029	1.224	1.318
	(7.85)	(3.05)	(2.80)	(0.28)	(4.28)	(4.46)
College	1.661	0.876	2.177	1.348	1.596	1.567
	(33.03)	(0.85)	(5.53)	(3.64)	(10.01)	(7.65)
FPL	1.061	1.055	1.128	0.872	1.069	1.146
	(8.49)	(0.91)	(1.39)	(2.98)	(3.47)	(5.10)
FPL squared	0.999	0.999	0.999	1.003	0.999	0.997
	(7.46)	(0.63)	(2.17)	(3.47)	(2.88)	(4.66)
Non-white	0.848	0.697	1.497	1.053	0.949	0.823
	(8.40)	(2.15)	(2.27)	(0.51)	(0.88)	(2.50)
Hours Worked	0.977	0.977	0.984	0.966	0.974	0.978
	(31.35)	(3.04)	(1.70)	(8.64)	(11.27)	(6.93)

Union	0.929	0.636	1.899	0.794	0.852	1.045
	(1.15)	(0.79)	(1.55)	(0.95)	(0.87)	(0.13)
Firm Size (1-9)	0.853	0.613	1.079	0.760	0.795	0.837
	(7.95)	(2.53)	(0.43)	(2.28)	(3.91)	(2.31)
Firm Size (10-499)	0.822	0.717	0.629	0.866	0.789	0.794
	(11.98)	(1.96)	(3.23)	(1.63)	(4.75)	(3.50)

Relative risk ratio form. t-values are in parenthesis. The underlined estimates are *not* significant at the 5% level. All the other estimates are significant at the 5% level. Other variables include industry and year dummy variables. Age, FPL, and hours worked are continuous variables, while all the other variables are binary indicators.

Table 3. Percent Distribution of Private-Sector Workers by Hours-Worked, Hawaii and USA 1994-2004.

Hours per Week	Private Workers with ESI		Private Workers without ESI		All Private Workers	
	Hawaii	USA	Hawaii	USA	Hawaii	USA
1-19	2.39%	2.83%	13.29%	9.30%	4.07%	4.42%
20-35	10.42%	12.33%	35.55%	28.90%	14.89%	16.42%
36+	87.19%	84.84%	51.16%	61.79%	81.04%	79.17%

Based on usual hours worked per week at main job. Highlighted values indicate differences between Hawaii and USA are significant at the 5% level. Sample size—Hawaii (n=4,642), USA (n=4,642).

Table 4. Percent Distribution of Public-Sector and Private-Sector Workers Combined by Hours-Worked, Hawaii and USA 1994-2004.

Hours per Week	Workers with ESI		Workers without ESI		All Workers	
	Hawaii	USA	Hawaii	USA	Hawaii	USA
1-19	2.96%	2.96%	14.19%	9.68%	4.94%	4.65%
20-35	9.83%	11.61%	32.21%	25.45%	13.94%	15.49%
36+	87.21%	85.40%	53.60%	64.86%	81.12%	79.86%

Based on usual hours worked per week at main job. Highlighted values indicate differences between Hawaii and USA are significant at the 5% level. Sample size—Hawaii (n=6,340), USA (n=6,340).

Figure 1. A Two-Notch Budget Constraint for Hawaii Workers before and after the PHCA: Voluntary Part-Time Workers with Publicly Provided Health Insurance

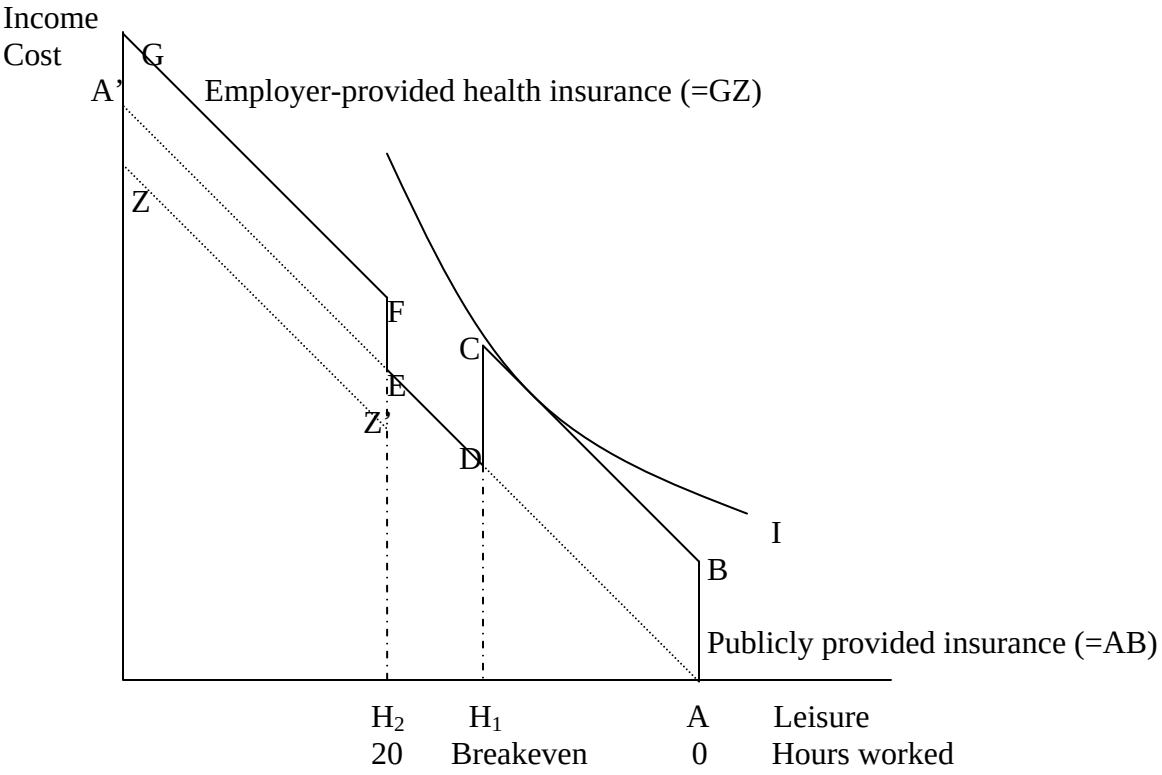

Figure 2. A Two Notch Budget Constraint for Hawaii Workers before and after the PHCA: Involuntary Part-Time Workers with Publicly Provided Health Insurance.

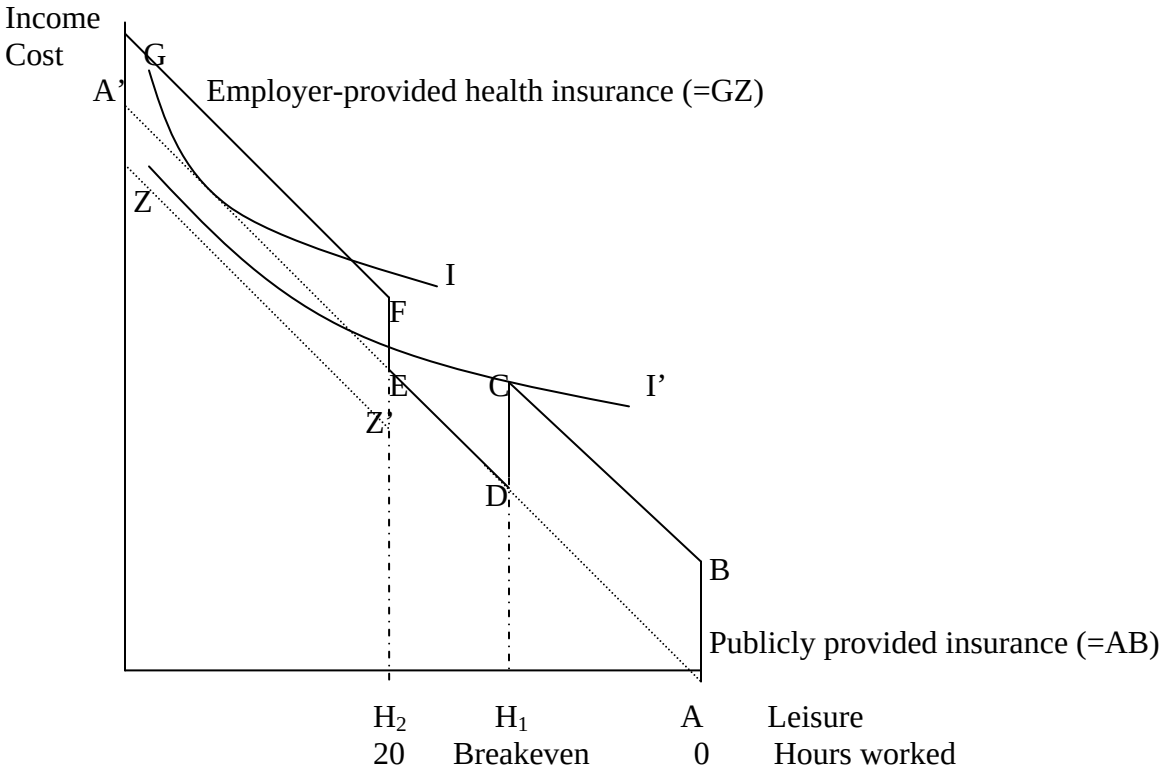

Figure 3. The effect of PHCA on the percent uninsured.

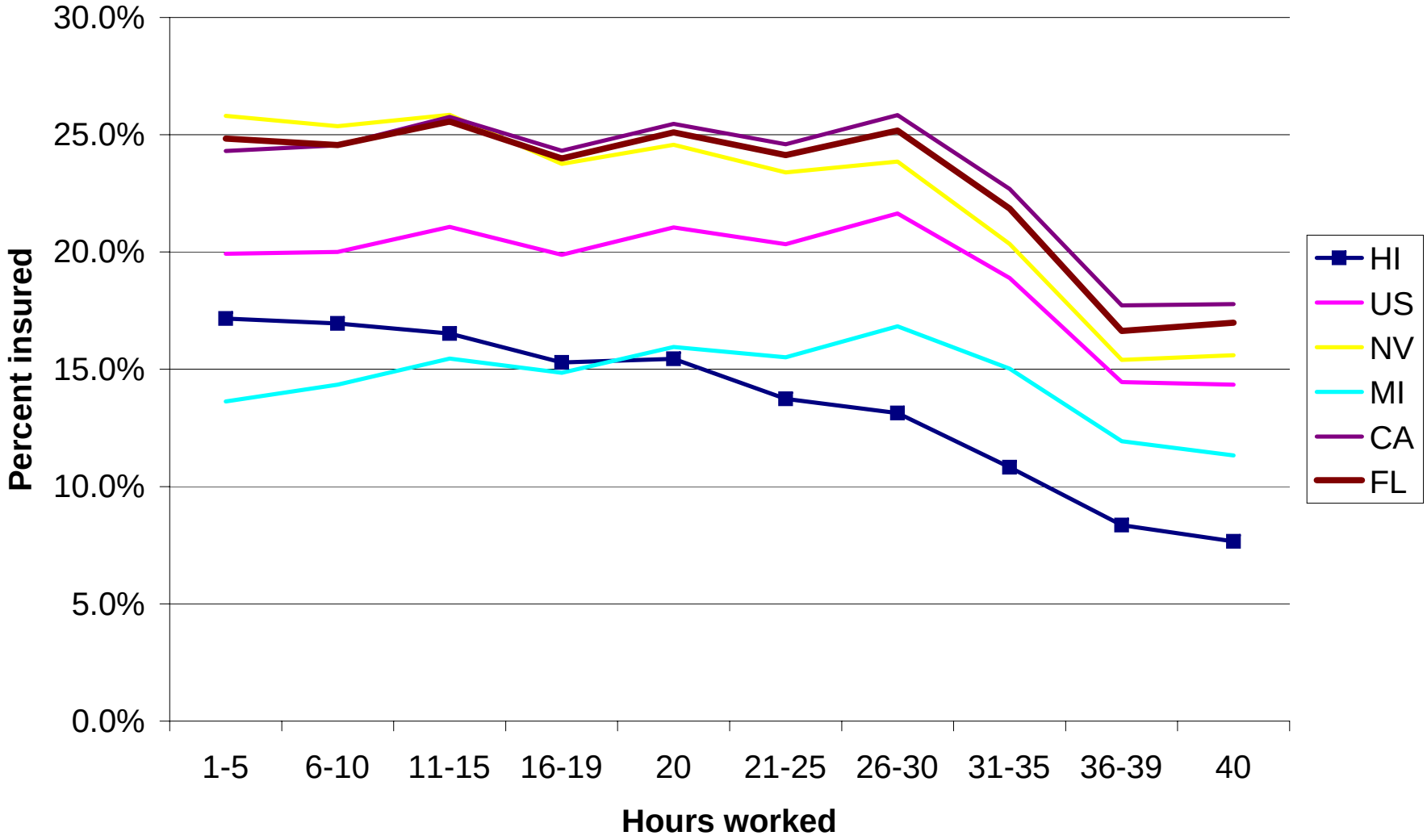

Figure 4. The effect of PHCA on the percent covered by employer-provided insurance.

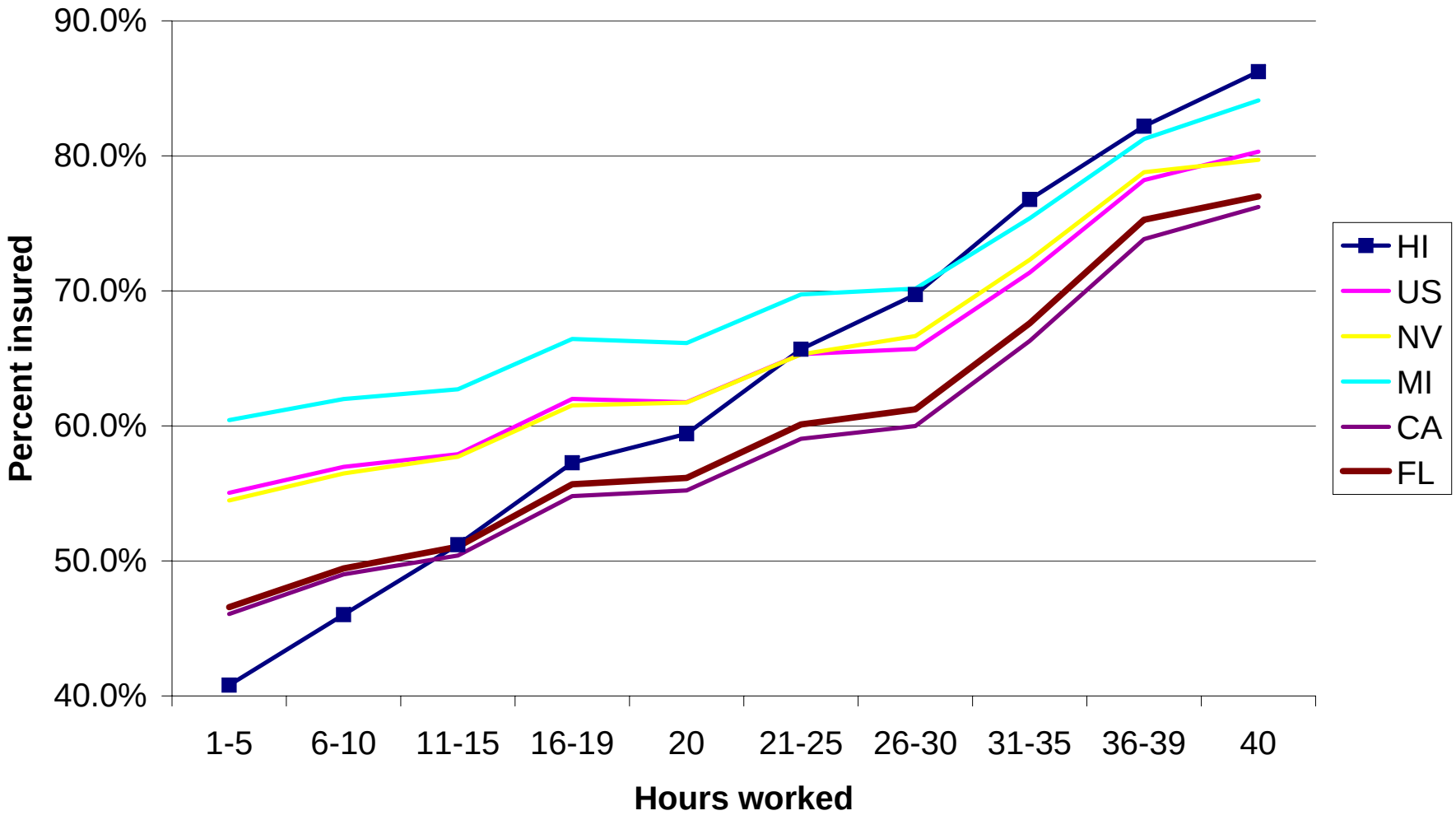

Figure 5. The effect of PHCA on the percent covered by non-employment based insurance.

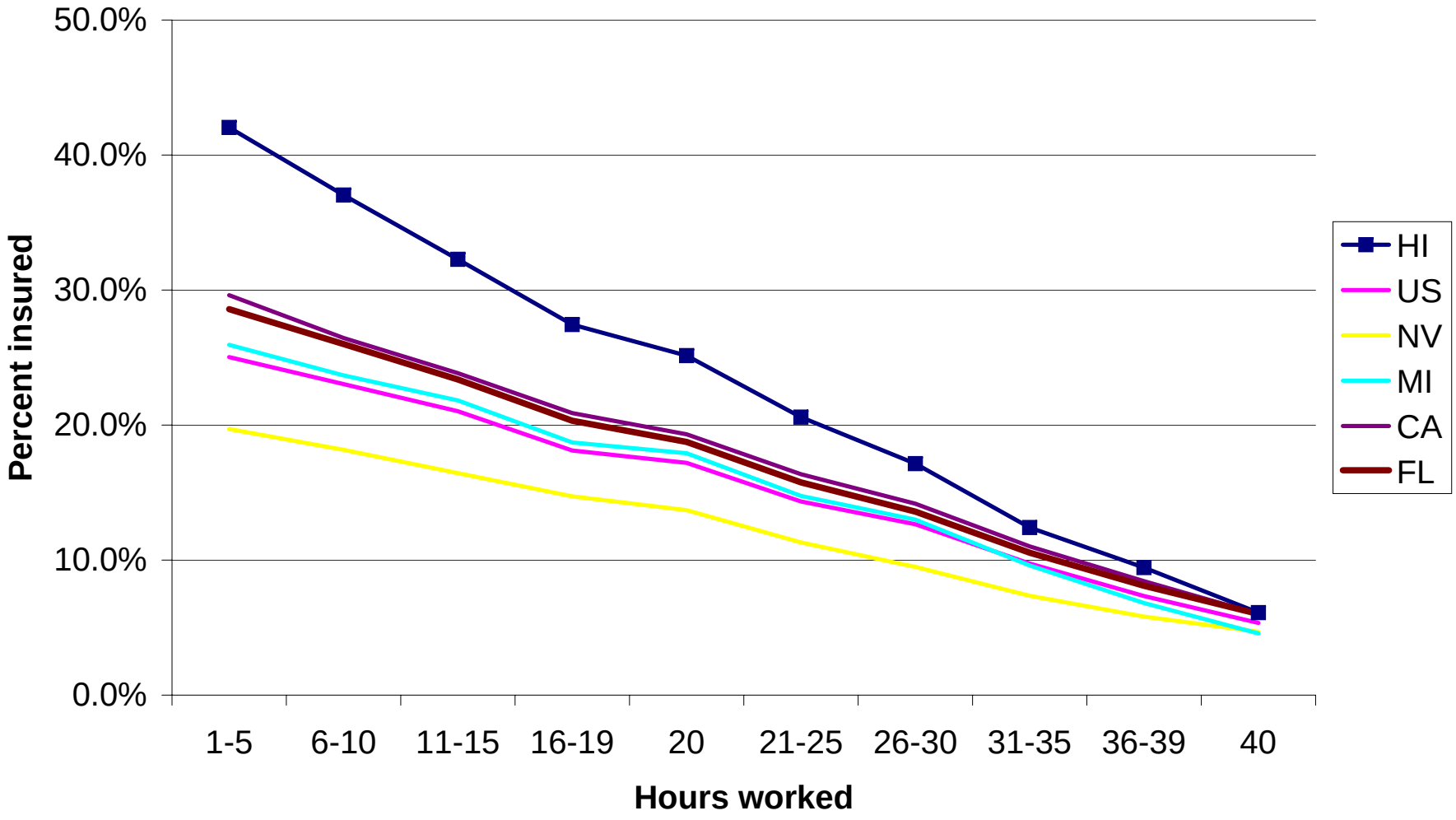

Figure 6. Percent distribution of employees by hours worked.

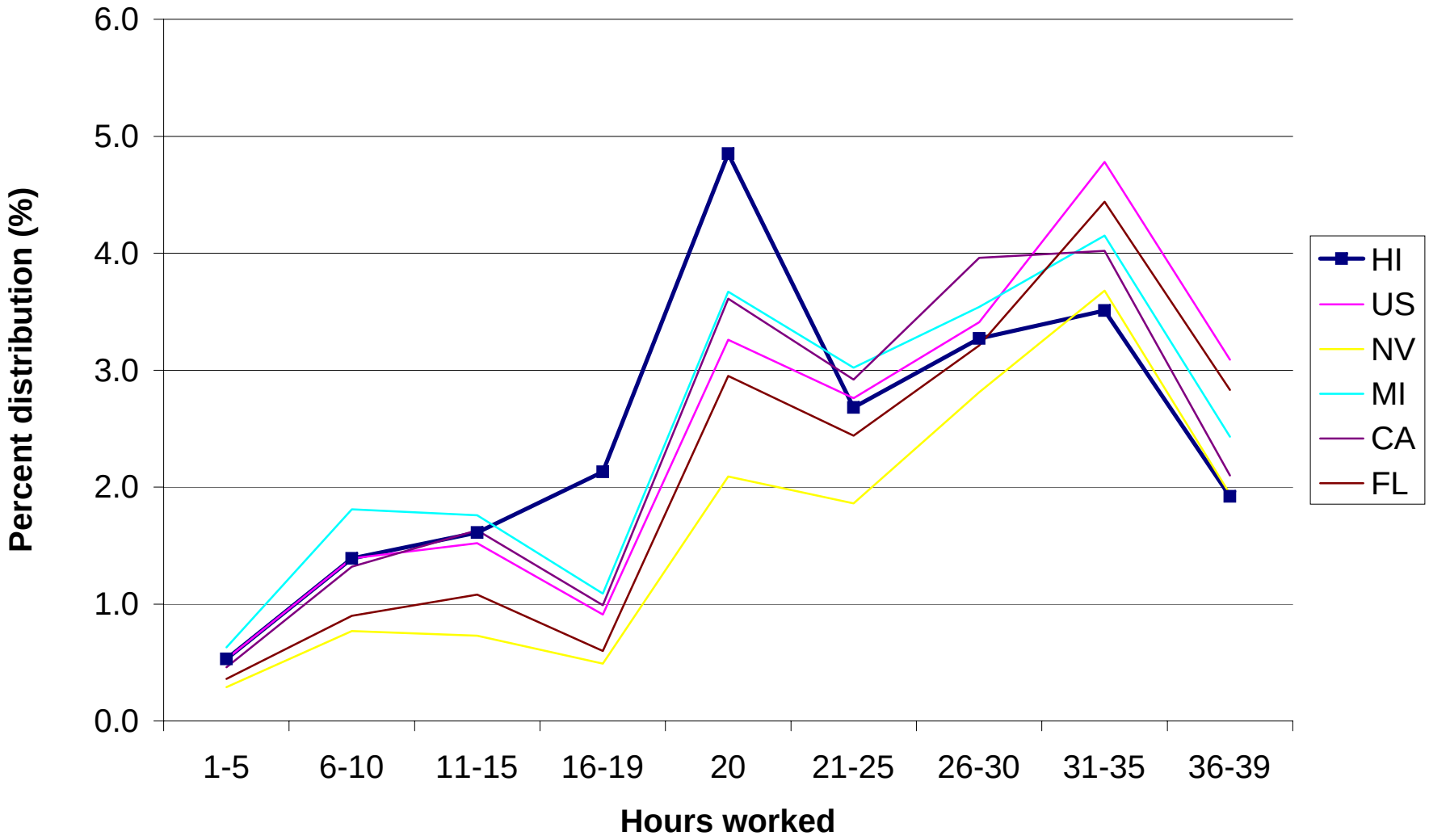

Figure 7. Cumulative distribution of employees by hours worked (single hours).

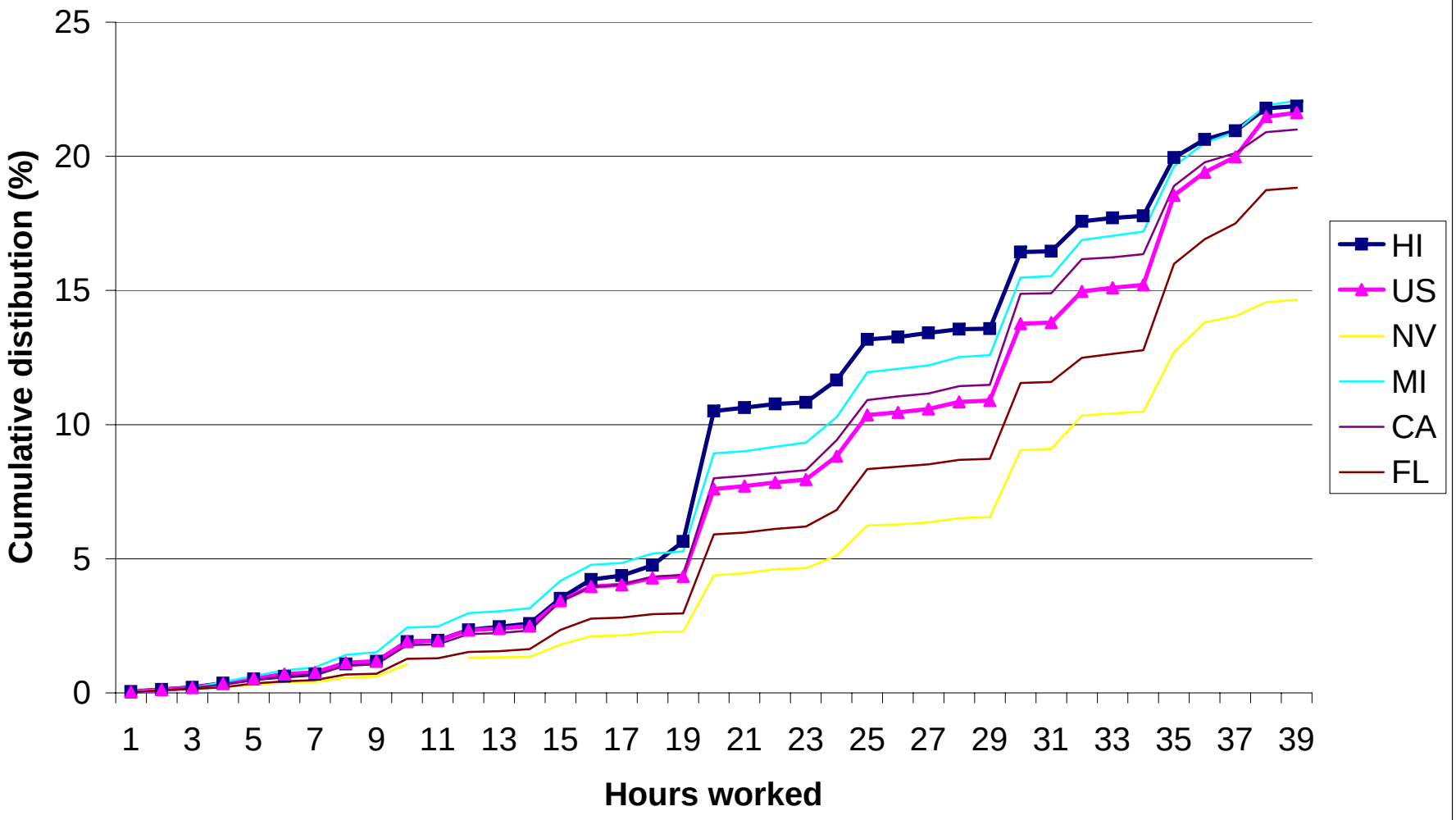

Figure A1. The effect of PHCA on the percent covered by employer-provided insurance (using single hours worked).

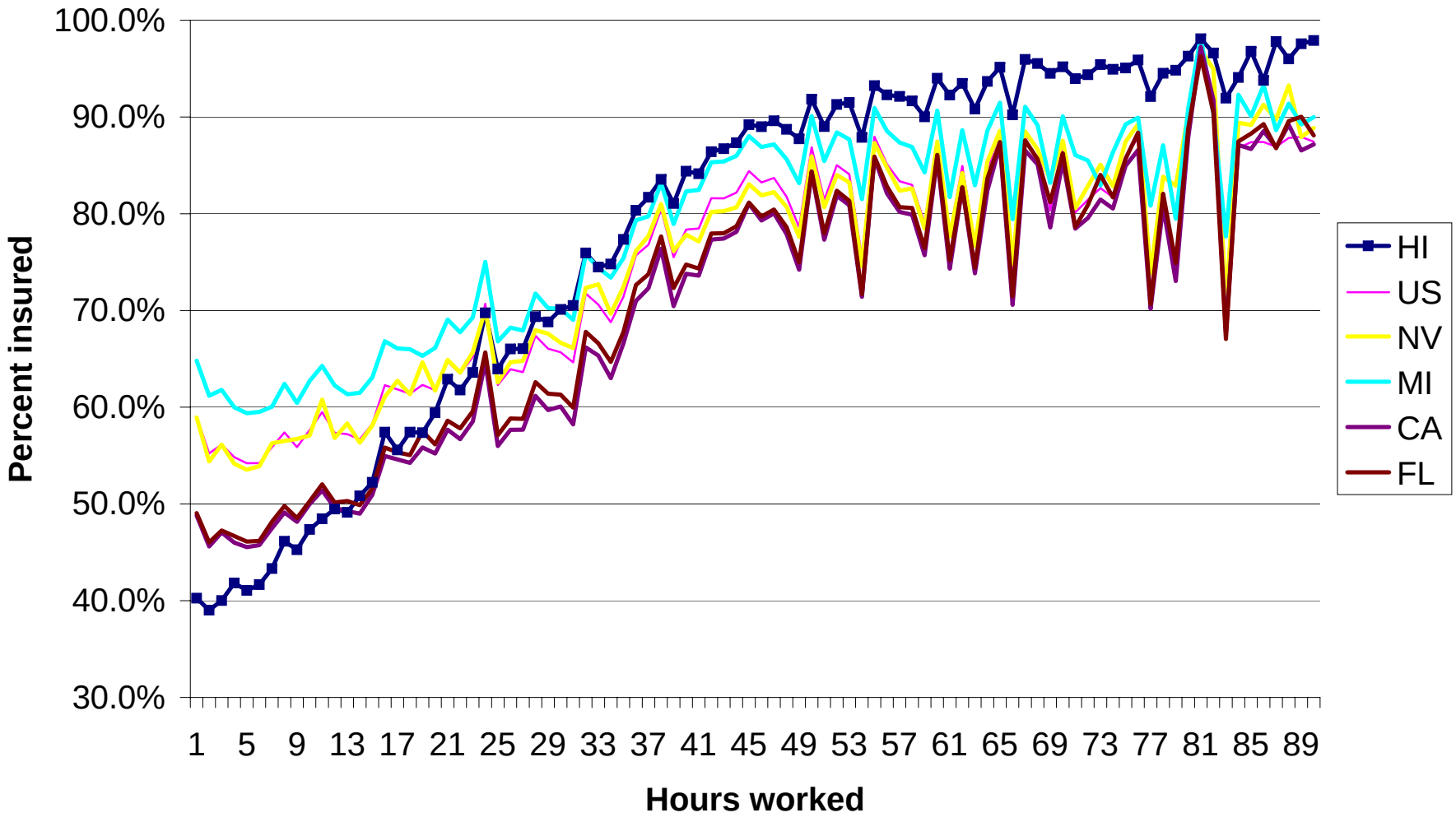

Figure A2. The effect of PHCA on the percent covered by non-employment based insurance (using single hours worked).

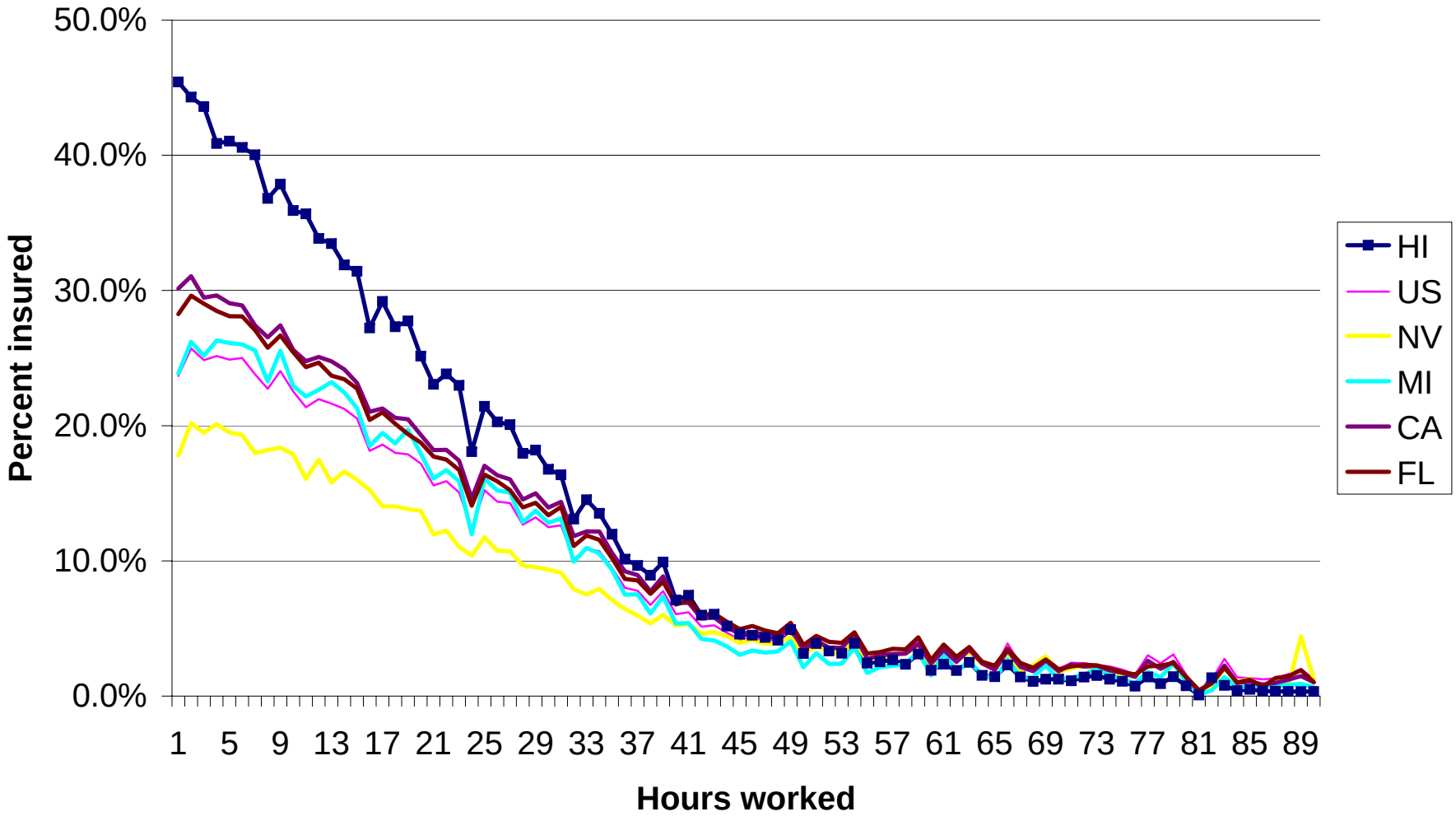

Figure A3. The effect of PHCA on the percent covered by employer-provided insurance (without CHAMPUS/TRICARE)

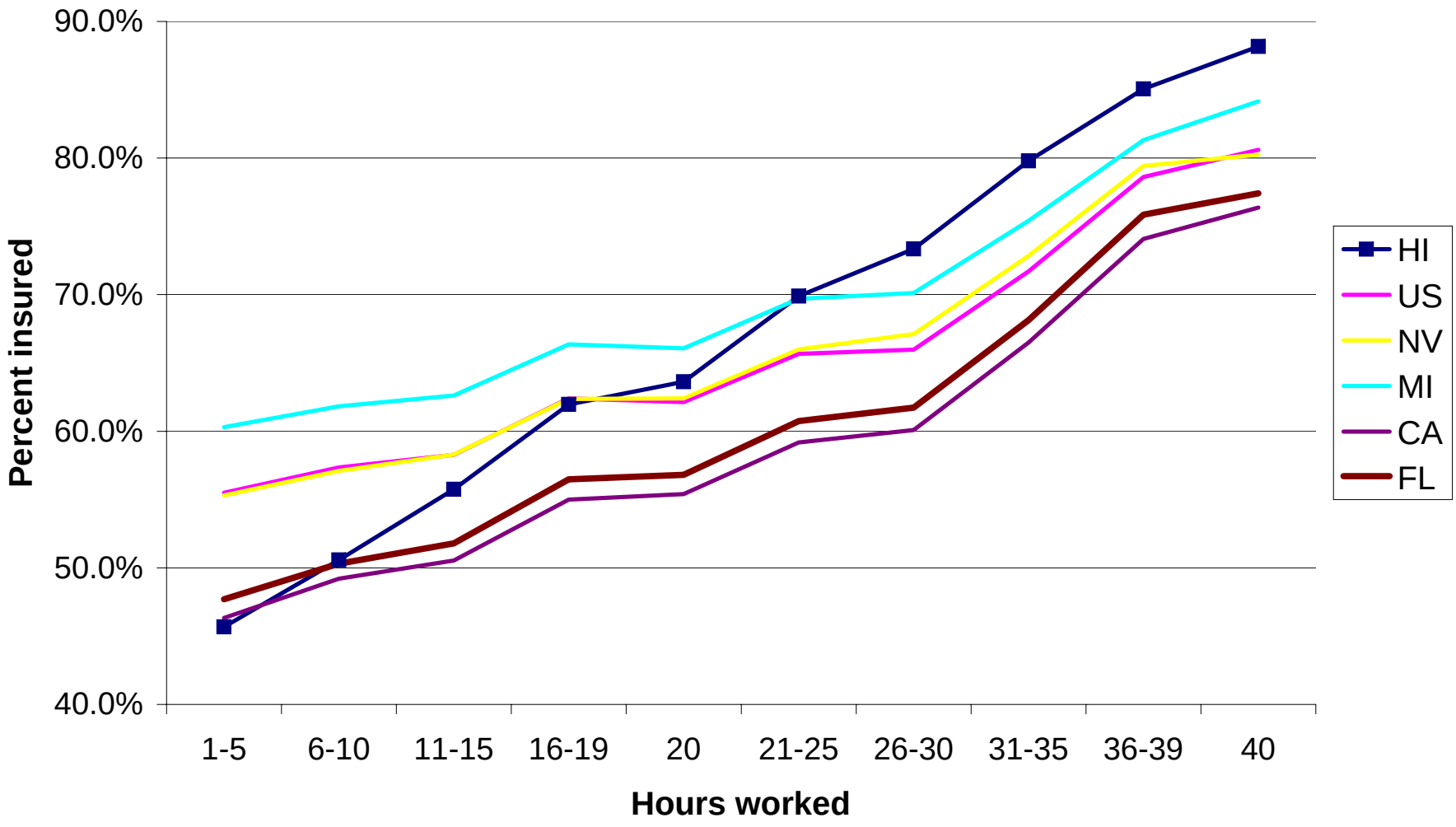

Figure A4. The effect of PHCA on the percent covered by employer-provided insurance using Hawaii mean.