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Potential Savings through Prevention of Avoidable Chronic Illness among CalPERS State Active Members

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Introduction

The high and rising prevalence of chronic disease represents a substantial burden on the medical care system and a major cost for society, leaving aside its toll on individuals. Evidence comes from varied sources and is based on a range of methods. The burden is presented as rising rates of obesity,[1] increased prevalence of diabetes,[2] greater incidence of disability,[3] and the rising cost of medical care[4] and other disease-related costs.[5] And, while the age-adjusted mortality from coronary heart disease and stroke has fallen, the aging of the population and rising obesity portend increases in both incidence and prevalence of cardiovascular disease in the near future.[6]

The rise in obesity has been well documented in both the professional literature and the popular press. The Congressional Budget Office reports that medical spending on obese adults is 38 percent higher than on their normal-weight counterparts.[7] Absenteeism has been shown to be higher among severely obese working women.[8] Ormond and colleagues estimated the excess medical spending associated with uncomplicated diabetes and hypertension alone at $180 billion annually, with nearly three-quarters of this cost borne by private payers and individuals.[9] The cost of cardiovascular disease in medical treatment and lost productivity has been estimated at $400 billion per year, of which about one-quarter comes from lost productivity.[10]

There is widespread recognition that many of the most common chronic conditions could be largely prevented through changes in lifestyle-related behaviors such as reduced use of tobacco, improved diets, and increased physical activity.[11] The results from the Diabetes Prevention Program (DPP) argue strongly for the efficacy of lifestyle change in preventing the progression of pre-diabetes to diabetes,[12] and follow-on studies support the sustainability of the health gains.[13] Furthermore, recent studies have shown that the DPP protocol can be successfully implemented in a nonresearch setting at about one-tenth the cost of the original intervention.[14]

The debate about whether the benefits of prevention outweigh its costs continues.[15] The controversy stems in part from what is considered "prevention." Recent research focusing specifically on workplace wellness programs, however, has found that every dollar invested in these programs can reduce medical care costs by $3.27 and costs associated with absenteeism by $2.73.[16] Earlier research showed even greater returns using less strict criteria for study inclusion.[17] Goetzel and colleagues cite studies of programs at specific organizations, noting that most show positive financial returns but cautioning that program design and implementation are important components in successful programs.[18]

Chronic disease has complex etiologies and treatment protocols, and estimating medical costs associated with particular diseases is methodologically tricky. The estimated costs seen in the literature represent a range that depends in part on what costs are included or excluded, how diseases are classified, and over what time period costs are calculated. Most estimates rely on national data, and extrapolations to smaller jurisdictions or entities are subject to adjustment for local factors such as the demographic makeup of the population, insurance coverage, and local medical practice patterns and costs.

Despite these obstacles in quantifying the burden, the literature overwhelmingly supports the notion that the burden of chronic disease is large and growing. Often the costs are attributed broadly to society; some research is more specific, with medical costs assigned to different types of insurance. But there is little direct evidence available for the entities that might have the most to gain from reducing the costs imposed by chronic disease on the magnitude of their specific burden and the potential gains from reducing it. For example, state investments in prevention of chronic disease for their Medicaid populations may be offset by reduced Medicaid costs for care. Employers, both private and public, stand to gain from reduced medical care and health insurance costs and from reduced worker absenteeism and other improvements in efficiency associated with a healthier workforce.[19]

From an employer's perspective, the size of the burden associated with chronic disease represents the potential gain from reducing it and so gives an indication of how much it would be reasonable to invest

in prevention. Two factors influence the return on such investments: how effective prevention programs are in reducing chronic disease and how much such programs cost. The expansion of workplace wellness programs offers implicit evidence that many employers believe that prevention is a worthwhile investment. The state of Oregon has recently established a "Health Engagement" model for state employees.[20] Pitney Bowes has a long-standing prevention and wellness program for its employees.[21] America's Health Insurance Plans has developed online wellness programs that subscribers can purchase.[22] And entrepreneurs, such as Advancing Wellness,[23] have begun offering programs for employers that prefer not to develop their own. The striking range of these efforts suggests that employers see a benefit in such programs.

The California Public Employees' Retirement System (CalPERS) health program covers nearly 1.3 million active and retired state, local government, and school employees and their family members.[24] It spent almost $7 billion in 2011 to purchase health benefits for the State of California (which can be considered a single employer) and for more than 1,100 local and government agency and school employers. The program offers three health maintenance organization (HMO) plans, three self-funded preferred provider organization (PPO) plans, and three plans for members of several employee associations.[25]

Empirical Framework

The analyses conducted for this report are designed to estimate the burden of preventable chronic disease on CalPERS State Active members and to describe the distribution of that burden by demographic characteristics, across geographic areas, across agencies and departments within state government, and across the health plans offered by CalPERS. State Active members are current California state employees and their dependents.

To calculate these burdens, we estimate the per capita effect of two clusters of preventable chronic disease. With well-targeted interventions, the prevalence of Cluster I conditions—hypertension and type 2 diabetes without the presence of related comorbidities—has been shown to be modifiable in a relatively short period (one to two years).[26] The second cluster, Cluster II, adds heart disease, stroke, and renal disease either alone or in combination with hypertension and diabetes. Because the risk of onset for the diseases in the second cluster is closely linked to the prevalence of the first cluster conditions, interventions targeted at Cluster I will likely have downstream effects on Cluster II. We assume these Cluster II effects can be expected in a slightly longer time horizon (five to ten years). Using regression analysis of the all payments made to providers by CalPERS on behalf of individual members over the full year, we calculate the fraction of those payments that are uniquely associated with each cluster of diagnoses. The resulting estimates give the fraction of these payments that would be eliminated in the absence of each cluster, holding constant all other factors, including other illnesses. These proportions can be interpreted as the share of expenditures that are amenable to reduction through proven prevention strategies targeting diet, exercise, and smoking behavior.

Data

Data for these analyses are derived from individual annual summary records of health care spending, demographics, and diagnoses for each State Active employee and his/her dependents covered by CalPERS between 2004 and 2008. The data exclude state retirees and their dependents, public agency active employees and their dependents, and public agency retirees and their dependents.

Data on state employee race and ethnicity were provided by the California State Controller's Office (SCO); no race/ethnicity data were available for dependents. To combine these records, Thomson Reuters (TR), the administrator of the CalPERS Health Care Decision Support System, generated a random identifier for each state employee and sent a finder file containing the random identifier and the employee's Social Security number to SCO. SCO then added data on employee race/ethnicity and a salary range indicator, removed the Social Security number, and returned the file to TR, which matched the SCO records to the CalPERS records. In this way, no personal identifiers were provided to the research team. The resulting data files contained 2,691,551 records. The large sample size results in highly precise estimates, as evidenced by the narrowness of the confidence intervals also shown in the table.

Method

The outcome variable was total CalPERS spending during the year paid to providers on behalf of the member. Ordinary least squares regression (OLS) was used to estimate the unique contribution of each explanatory factor in the model to total health spending. The key explanatory factors in the regression model were indicators for the Cluster I and Cluster II conditions. We also controlled for other factors that have been shown to contribute to variation in health spending. These include age; sex; employment tenure in four categories—< 1 year, 1–5 years, 5–10 years, > 10 years; race/ethnicity in seven groups—American Indian, Asian, black, Filipino, Hispanic, non-Hispanic white, other, and missing.[27] To control for geographic differences in health care prices, we included 28 indicators for residing in each of the metropolitan statistical areas in the state. Finally, to control for changes over time in medical practice and prices, we included indicators for each year.

We defined "excess expenditures" for a condition as CalPERS health expenditures on behalf of a member

with the condition beyond that predicted for someone without the condition but with other characteristics unchanged. The estimates for excess expenditures for each disease indicator in this model are shown in table 1. For example, a person with diabetes (only) has estimated excess annual spending averaging $2,863 more than someone with none of the target conditions. In the remaining tables, we label excess spending attributable to the Cluster I and Cluster II conditions as the "Preventable Costs."

The calculations presented in the rest of this report are made by multiplying these estimates by the number of members with the listed diagnoses in each subgroup (e.g., by age/sex, race/ethnicity, county, agency/ department, or health plan).

Table 1: CalPERS State Active Excess Expenditures (Per Person Per Year) of Selected Preventable Conditions

Condition	Annual Excess Expenditure Per Person
Cluster I	
Diabetes only	$2,863
Hypertension only	$1,595
Diabetes and Hypertension only	$3,920
Cluster II	
Diabetes with Heart, Cerebrovascular, or Renal Disease	$21,181
Hypertension with Heart, Cerebrovascular, or Renal Disease	$14,576
Diabetes, Hypertension, and Heart, Cerebrovascular, or Renal Disease	$24,215
Heart, Cerebrovascular, or Renal Disease without Diabetes or Hypertension	$10,743

Results

Overall, our analysis finds that of the $1.6 billion spent by CalPERS in 2008 on the health care services used by its State Active members, $362 million (22.4%) was attributable to Cluster I and II chronic diseases that are amenable to prevention through changes in diet and physical activity. As a guide to targeting interventions to effect such changes, our analysis also pinpointed groups of members—identifiable by demographic characteristics, agency/department, county of residence, and health plan—with notably high or low shares of spending due to these conditions.

Demographics

Table 2 shows the total payments made by CalPERS and the portion of those payments that is attributable to the preventable conditions we include, by sex and age. One striking finding in this table is the much larger share of spending on preventable causes for males (27.9%) than for females (18.2%). While total CalPERS spending on females ($914 million) exceeds that on males ($702 million), the difference in the share attributable to preventable chronic disease makes the amount of preventable costs larger among men ($195 million) than women ($166 million). The age pattern of this disparity suggests that part of this difference in shares is due to the portion of total spending on women that is due to childbirth. However, the share of male spending on preventable causes exceeds that of women in every age group except for children. The second pattern that emerges from this table is the increasing fraction of medical spending on preventable causes that is

Table 2. CalPERS State Active Health Expenditures Attributable to Chronic Diseases Targetable by Lifestyle Interventions, by Sex and Age, 2008

Sex / Age	Number of Persons Covered	Average Spending per Person ($)	Total CalPERS Payments ($000)	Share Attributable to Preventable Diseases			Preventable Costs ($000)
				Cluster I[a]	Cluster II[b]	Total	
Total	**555,770**	**2,908**	**1,616,103**	**6.5%**	**15.9%**	**22.4%**	**362,047**
0–19	181,369	1,475	267,582	0.5%	4.6%	5.1%	13,565
20–29	60,494	2,137	129,262	1.7%	7.2%	8.8%	11,417
30–39	77,484	2,625	203,406	4.8%	10.4%	15.2%	30,913
40–49	105,362	3,285	346,161	8.1%	15.9%	24.0%	83,168
50–59	98,793	4,553	449,793	9.8%	20.7%	30.5%	137,121
60–69	29,726	6,438	191,363	9.2%	29.5%	38.7%	74,007
70 +	2,542	11,226	28,537	5.8%	35.7%	41.5%	11,856
Female	**285,226**	**3,205**	**914,013**	**5.3%**	**13.0%**	**18.2%**	**166,462**
0–19	88,693	1,532	135,845	0.4%	4.4%	4.9%	6,622
20–29	31,274	2,807	87,786	1.2%	6.5%	7.7%	6,742
30–39	42,063	3,425	144,065	3.1%	8.9%	12.0%	17,262
40–49	56,637	3,825	216,634	5.9%	13.4%	19.3%	41,906
50–59	52,209	4,604	240,347	8.7%	17.9%	26.6%	63,909
60–69	13,501	5,999	80,998	9.4%	24.1%	33.4%	27,065
70 +	849	9,821	8,338	7.1%	28.4%	35.5%	2,956
Male	**270,543**	**2,595**	**702,090**	**8.0%**	**19.9%**	**27.9%**	**195,585**
0–19	92,676	1,421	131,737	0.5%	4.8%	5.3%	6,943
20–29	29,220	1,419	41,476	2.7%	8.6%	11.3%	4,675
30–39	35,421	1,675	59,341	8.8%	14.2%	23.0%	13,651
40–49	48,725	2,658	129,527	11.8%	20.1%	31.9%	41,262
50–59	46,584	4,496	209,446	10.9%	24.0%	35.0%	73,212
60–69	16,225	6,802	110,365	9.1%	33.4%	42.5%	46,943
70 +	1,692	11,938	20,199	5.3%	38.8%	44.1%	8,900

a. Uncomplicated hypertension and/or diabetes
b. Heart disease, cerebrovascular disease, or renal disease, with or without hypertension or diabetes

Table 3. CalPERS State Active Health Expenditures Attributable to Chronic Diseases Targetable by Lifestyle Interventions, by Race and Ethnicity, 2008 (Employees Only)

Race / Ethnicity	Number of Persons Covered	Average Spending per Person ($)	Total CalPERS Payments ($000)	Share Attributable to Preventable Diseases: Cluster I[a]	Cluster II[b]	Total	Preventable Costs ($000)
Total	**224,465**	**3,500**	**785,635**	**8.9%**	**19.5%**	**28.4%**	**222,851**
Native American	1016	3,773	3,833	9.3%	20.3%	29.6%	1,136
Asian	19,379	2,612	50,625	10.7%	23.5%	34.2%	17,304
African American	23,285	3,700	86,149	11.1%	18.3%	29.3%	25,283
Filipino	9,790	3,020	29,566	15.8%	22.7%	38.5%	11,379
Latino	45,249	2,928	132,471	11.7%	18.4%	30.1%	39,908
Pacific Islander	629	4,340	2,730	10.6%	16.2%	26.7%	730
Non-Hispanic White	110,639	3,867	427,797	7.2%	19.2%	26.4%	112,967
Other	5,732	3,457	19,814	8.0%	19.5%	27.5%	5,448
Unknown	8,746	3,733	32,651	6.2%	20.4%	26.6%	8,696

a. Uncomplicated hypertension and/or diabetes
b. Heart disease, cerebrovascular disease, or renal disease, with or without hypertension or diabetes

associated with age. Where "preventable" spending by women and men in their 30s is 12.0 and 23.0 percent of total spending, respectively, the shares for those in their 60s are 33.4 and 42.5 percent, respectively.

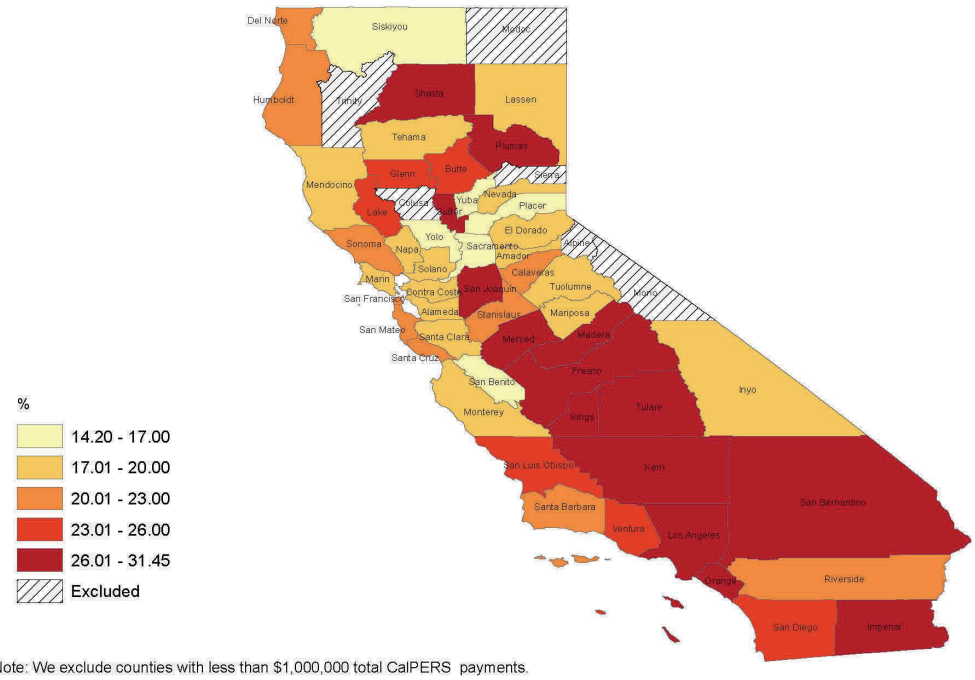
Table 3 shows the same calculations by race and ethnicity. The groups with the highest shares of spending that is attributable to preventable causes are Filipinos (38.5%) and Asians (34.2%), and the groups with the lowest such shares are non-Hispanic whites (26.4%) and Pacific Islanders (26.7%). However, the largest portion of preventable expenditures ($113 million) was spent on behalf of non-Hispanic white employees because of their greater representation in the state workforce.

Geography

A second set of analyses examined geographic differences in expenditures on the included preventable illnesses. Table 4 displays these calculations by county of residence of CalPERS members. Figure 1 displays the total share of expenditures attributable to Cluster I and II diseases.

The counties with the highest total spending on these conditions were Sacramento ($63.7 million), Los Angeles ($43.8 million), San Bernardino ($19.7 million), Orange ($16.7 million), and San Diego ($16.1 million), where there are the largest numbers of CalPERS members. The share of all expenditures that are

Figure 1. Percent of CalPERS expenditures attributable to diseases targetable by lifestyle interventions, by county, 2008



Note: We exclude counties with less than $1,000,000 total CalPERS payments.

Table 4. CalPERS State Active Health Expenditures Attributable to Chronic Diseases Targetable by Lifestyle Interventions, by County of Residence, 2008

County	Number of Persons Covered	Average Spending per Person ($)	Total CalPERS Payments ($000)	Share Attributable to Preventable Diseases			Preventable Costs ($000)
				Cluster I[a]	Cluster II[b]	Total	
Total	**555,770**	**2,908**	**1,616,103**	**6.5%**	**15.9%**	**22.4%**	**362,047**
Alameda	13,967	3,388	47,321	6.0%	13.9%	19.9%	9,415
Alpine	44	2,538	112	*	*	*	*
Amador	2,286	2,985	6,824	5.9%	13.6%	19.5%	1,330
Butte	6,385	3,110	19,860	6.4%	18.6%	25.0%	4,958
Calaveras	1,284	3,638	4,672	5.5%	16.3%	21.8%	1,018
Colusa	221	4,267	943	*	*	*	*
Contra Costa	9,119	3,228	29,434	5.9%	14.0%	19.9%	5,866
Del Norte	3,394	3,693	12,535	5.2%	14.9%	20.1%	2,520
El Dorado	6,939	3,214	22,301	5.0%	12.8%	17.8%	3,959
Fresno	22,113	2,524	55,813	7.3%	19.6%	26.9%	15,011
Glenn	335	4,159	1,393	4.9%	18.7%	23.6%	329
Humboldt	4,530	2,653	12,017	7.2%	15.1%	22.3%	2,681
Imperial	7,893	1,976	15,599	10.5%	19.9%	30.4%	4,743
Inyo	692	3,865	2,674	6.5%	11.7%	18.3%	489
Kern	22,052	2,174	47,940	8.5%	21.2%	29.7%	14,219
Kings	8,433	2,508	21,149	8.6%	19.4%	28.1%	5,937
Lake	693	3,209	2,224	5.4%	17.7%	23.1%	514
Lassen	6,002	2,793	16,766	4.8%	12.9%	17.8%	2,982
Los Angeles	59,104	2,406	142,223	9.0%	21.9%	30.8%	43,841
Madera	4,062	2,418	9,824	7.7%	23.8%	31.5%	3,090
Marin	1,941	3,563	6,915	3.2%	15.4%	18.6%	1,289
Mariposa	466	2,561	1,193	4.1%	15.3%	19.4%	232
Mendocino	1,018	3,368	3,429	5.8%	12.5%	18.3%	627
Merced	2,842	2,914	8,282	7.6%	22.4%	30.0%	2,484
Modoc	270	1,920	518	*	*	*	*
Mono	193	3,909	754	*	*	*	*
Monterey	7,867	4,054	31,896	6.8%	12.9%	19.7%	6,298
Napa	3,809	3,273	12,466	4.9%	12.6%	17.6%	2,194
Nevada	1,374	3,135	4,307	5.9%	13.0%	18.9%	815
Orange	20,409	2,786	56,855	8.0%	21.4%	29.4%	16,728
Placer	12,972	3,826	49,629	3.2%	11.0%	14.2%	7,050
Plumas	398	3,055	1,216	4.0%	22.1%	26.1%	317
Riverside	25,266	2,457	62,071	7.1%	15.6%	22.7%	14,097
Sacramento	112,369	3,350	376,450	4.9%	12.0%	16.9%	63,715
San Benito	473	3,352	1,585	5.0%	12.0%	17.0%	269
San Bernardino	31,560	2,348	74,109	8.4%	18.2%	26.6%	19,730
San Diego	25,020	2,641	66,074	6.8%	17.6%	24.4%	16,147
San Francisco	7,064	2,912	20,570	6.6%	15.8%	22.4%	4,608
San Joaquin	10,207	2,955	30,160	7.3%	19.1%	26.4%	7,950
San Luis Obispo	16,886	2,905	49,052	6.7%	17.8%	24.5%	12,025
San Mateo	4,844	3,235	15,669	7.5%	15.1%	22.6%	3,544
Santa Barbara	2,366	3,252	7,694	6.4%	14.4%	20.8%	1,602
Santa Clara	9,508	3,465	32,947	6.1%	13.8%	19.9%	6,559
Santa Cruz	1,772	3,493	6,190	4.6%	15.9%	20.5%	1,268
Shasta	4,312	2,342	10,100	7.5%	18.6%	26.0%	2,628
Sierra	77	4,130	318	*	*	*	*
Siskiyou	1,073	3,121	3,348	3.7%	11.4%	15.2%	509
Solano	14,477	3,184	46,089	6.2%	11.1%	17.3%	7,958
Sonoma	7,955	3,311	26,336	5.0%	15.3%	20.2%	5,327
Stanislaus	5,355	2,790	14,940	5.6%	17.3%	22.9%	3,417
Sutter	2,389	3,183	7,603	5.7%	24.3%	29.9%	2,276
Tehama	927	3,015	2,795	6.2%	12.0%	18.2%	509
Trinity	236	1,608	380	*	*	*	*
Tulare	15,099	2,556	38,591	7.9%	22.6%	30.4%	11,749
Tuolumne	1,862	3,003	5,591	5.2%	14.7%	19.9%	1,114
Ventura	6,238	2,856	17,815	7.9%	17.8%	25.7%	4,576
Yolo	9,739	3,531	34,392	4.2%	11.7%	15.9%	5,475
Yuba	1,633	3,532	5,768	4.6%	10.6%	15.2%	879
Other Place (incl. other states)	3,963	2,620	10,383	7.6%	18.0%	25.6%	2,656

a. Uncomplicated hypertension and/or diabetes

b. Heart disease, cerebrovascular disease, or renal disease, with or without hypertension or diabetes

** Due to potentially unreliable estimates, we exclude counties with less than $1,000,000 total CalPERS payments from these calculations.*

attributable to preventable illness, excluding counties with less than $1 million in total CalPERS expenditures, ranged from 14.2 percent in Placer to 31.5 percent in Madera. The five counties with the largest proportions were Madera (31.5%), Los Angeles (30.8%), Tulare (30.4%), Imperial (30.4%), and Merced (30.0%). Counties with the lowest proportions were Placer (14.2%), Siskiyou (15.2%), Yuba (15.2%), Yolo (15.9%), and Sacramento (16.9%).

Department/Agency

Table 5a displays these calculations across the 19 largest agencies/departments covered by CalPERS. The three departments with the largest shares of total expenditures for the selected preventable diseases, counting both employees and dependents, are the Department of Developmental Services (27.3%), the California State University system (26.1%), and the Department of Mental Health (25.5%). The three departments with highest total expenditures on preventable disease are the Department of Corrections ($83.0 million), the California State University system ($54.1 million), and the Department of Transportation ($33.7 million). The departments with the lowest percentage of expenditures on these illnesses are the California Highway Patrol (16.4%), the Department of Forestry and Fire Protection (16.7%), the Department of Justice (19.1%), and the Department of Water Resources (19.2%).

To aid in determining the desirability of using workplace prevention interventions in these agencies and departments, we have also made these calculations for employees separately from their dependents, shown in tables 5b and 5c. For employees (table 5b), the average share of total spending attributable to preventable illness statewide is 28.4%. The departments with the highest shares for employees are the Departments of Developmental Services (37.4%), Transportation (32.1%), and Corrections (31.8%). The departments with the lowest shares are the Franchise Tax Board (22.7%), the Department of Health Care Services (24.0%), and the Department of Public Health (24.1%).

For dependents (table 5c), the average share attributable to preventable disease is 16.8%, smaller than the 28.4% for employees. Rankings of departments also show somewhat different patterns. The department where dependents have the highest share of spending attributable to preventable causes is the Department of Health Care Services (22.3%), which has one of the lowest shares for employees. The Cal State System (22.1%) and the State Compensation Insurance Fund (21.3%) also have relatively high shares for dependents. The departments with the lowest shares for dependents are the Department of California Highway Patrol (11.1%), the Department of Forestry and Fire Protection (11.3%), and the Departments of Justice and Water Resources (13.4% each).

Table 5a. CalPERS State Active Health Expenditures Attributable to Chronic Diseases Targetable by Lifestyle Interventions, for Largest Departments and Agencies, for Employees and Dependents, 2008

Department / Agency	Number of Persons Covered	Average Spending per Person ($)	Total CalPERS Payments ($000)	Share Attributable to Preventable Diseases			Preventable Costs ($000)
				Cluster I[a]	Cluster II[b]	Total	
Total	**555,777**	**2,908**	**1,616,103**	**6.5%**	**15.9%**	**22.4%**	**362,047**
Board of Equalization	7,435	2,805	20,857	6.7%	13.6%	20.3%	4,238
California State University System	75,899	2,727	206,939	6.7%	19.4%	26.1%	54,069
Dept of California Highway Patrol	30,039	2,552	76,656	4.2%	12.2%	16.4%	12,574
Dept of Corrections	139,811	2,628	367,420	6.8%	15.7%	22.6%	82,950
Dept of Developmental Services	11,267	3,226	36,351	7.8%	19.5%	27.3%	9,909
Dept of Forestry and Fire Protection	15,074	2,290	34,525	4.7%	12.0%	16.7%	5,749
Dept of General Services	6,365	2,934	18,674	6.5%	16.6%	23.1%	4,318
Dept of Health Care Services	5,438	3,571	19,417	6.3%	16.9%	23.2%	4,511
Dept of Justice	9,491	3,160	29,996	5.1%	14.0%	19.1%	5,721
Dept of Mental Health	20,897	3,004	62,779	7.8%	17.8%	25.5%	16,030
Dept of Motor Vehicles	17,055	3,157	53,846	7.5%	15.1%	22.6%	12,164
Dept of Public Health	5,524	3,697	20,422	5.7%	15.1%	20.8%	4,247
Dept of Social Services	7,355	3,460	25,445	6.5%	14.7%	21.1%	5,382
Dept of Transportation	49,392	2,881	142,290	7.1%	16.6%	23.7%	33,743
Dept of Water Resources	6,086	3,018	18,366	5.8%	13.3%	19.2%	3,519
Dept of Youth Authority	6,581	2,969	19,540	6.8%	14.6%	21.4%	4,187
Employment Development Dept	14,332	3,700	53,026	6.8%	16.4%	23.2%	12,321
Franchise Tax Board	9,729	2,904	28,257	6.5%	13.6%	20.0%	5,660
State Compensation Insurance Fund	15,498	3,262	50,560	7.2%	16.9%	24.1%	12,189
Other Agencies	102,509	3,226	330,738	5.7%	15.0%	20.7%	68,566

a. Uncomplicated hypertension and/or diabetes

b. Heart disease, cerebrovascular disease, or renal disease, with or without hypertension or diabetes

Table 5b. CalPERS State Active Health Expenditures Attributable to Chronic Diseases Targetable by Lifestyle Interventions, for Largest Departments and Agencies 2008 (Employees Only)

Department / Agency	Number of Persons Covered	Average Spending per Person ($)	Total CalPERS Payments ($000)	Share Attributable to Preventable Diseases			Preventable Costs ($000)
				Cluster I[a]	Cluster II[b]	Total	
Total (Employees)	**224,465**	**3,500**	**785,635**	**8.9%**	**19.5%**	**28.4%**	**222,851**
Board of Equalization	3,182	3,518	11,194	8.3%	16.1%	24.4%	2,732
California State University System	34,105	3,321	113,272	8.2%	21.2%	29.4%	33,331
Dept of California Highway Patrol	9,989	2,417	24,146	8.7%	19.2%	27.9%	6,728
Dept of Corrections	49,614	3,155	156,539	10.9%	20.9%	31.8%	49,778
Dept of Developmental Services	4,453	3,733	16,621	11.5%	25.9%	37.4%	6,212
Dept of Forestry and Fire Protection	6,358	1,681	10,688	9.4%	19.1%	28.5%	3,045
Dept of General Services	2,726	3,364	9,171	9.4%	19.7%	29.1%	2,671
Dept of Health Care Services	2,509	4,423	11,097	7.2%	16.8%	24.0%	2,658
Dept of Justice	4,068	3,813	15,510	7.0%	17.4%	24.4%	3,780
Dept of Mental Health	8,704	3,763	32,757	10.3%	20.2%	30.5%	9,979
Dept of Motor Vehicles	7,093	4,121	29,229	9.9%	17.3%	27.1%	7,929
Dept of Public Health	2,549	4,442	11,324	6.7%	17.4%	24.1%	2,733
Dept of Social Services	3,272	3,773	12,344	8.7%	18.6%	27.3%	3,375
Dept of Transportation	18,675	3,614	67,491	10.0%	22.0%	32.1%	21,631
Dept of Water Resources	2,377	3,275	7,785	8.5%	18.5%	27.0%	2,101
Dept of Youth Authority	2,505	3,899	9,767	9.4%	18.0%	27.4%	2,674
Employment Development Dept	6,402	4,789	30,660	8.2%	18.0%	26.2%	8,021
Franchise Tax Board	4,143	3,804	15,760	7.5%	15.2%	22.7%	3,575
State Compensation Insurance Fund	6,650	4,253	28,282	8.4%	17.9%	26.3%	7,444
Other Agencies	45,091	3,814	171,996	7.3%	17.4%	24.7%	42,453

a. Uncomplicated hypertension and/or diabetes

b. Heart disease, cerebrovascular disease, or renal disease, with or without hypertension or diabetes

Table 5c. CalPERS State Active Health Expenditures Attributable to Chronic Diseases Targetable by Lifestyle Interventions, for Largest Departments and Agencies, 2008 (Dependents Only)

Department / Agency	Number of Persons Covered	Average Spending per Person ($)	Total CalPERS Payments ($000)	Share Attributable to Preventable Diseases			Preventable Costs ($000)
				Cluster I[a]	Cluster II[b]	Total	
Total (Dependents)	331,312	2,507	830,469	4.1%	12.6%	16.8%	139,197
Board of Equalization	4,253	2,272	9,663	4.9%	10.7%	15.6%	1,507
California State University System	41,794	2,241	93,667	4.9%	17.2%	22.1%	20,738
Dept of California Highway Patrol	20,050	2,619	52,509	2.1%	9.0%	11.1%	5,846
Dept of Corrections	90,197	2,338	210,881	3.8%	11.9%	15.7%	33,172
Dept of Developmental Services	6,814	2,895	19,730	4.7%	14.1%	18.7%	3,697
Dept of Forestry and Fire Protection	8,716	2,735	23,837	2.5%	8.8%	11.3%	2,704
Dept of General Services	3,639	2,611	9,503	3.7%	13.6%	17.3%	1,647
Dept of Health Care Services	2,929	2,840	8,320	5.1%	17.2%	22.3%	1,853
Dept of Justice	5,423	2,671	14,486	3.1%	10.3%	13.4%	1,941
Dept of Mental Health	12,193	2,462	30,022	5.0%	15.1%	20.2%	6,050
Dept of Motor Vehicles	9,962	2,471	24,617	4.7%	12.5%	17.2%	4,235
Dept of Public Health	2,975	3,058	9,098	4.5%	12.2%	16.6%	1,515
Dept of Social Services	4,083	3,209	13,101	4.4%	10.9%	15.3%	2,007
Dept of Transportation	30,717	2,435	74,799	4.4%	11.8%	16.2%	12,112
Dept of Water Resources	3,709	2,853	10,580	3.8%	9.5%	13.4%	1,417
Dept of Youth Authority	4,076	2,398	9,772	4.2%	11.3%	15.5%	1,513
Employment Development Dept	7,930	2,820	22,366	5.0%	14.2%	19.2%	4,300
Franchise Tax Board	5,586	2,237	12,497	5.2%	11.5%	16.7%	2,085
State Compensation Insurance Fund	8,848	2,518	22,279	5.6%	15.7%	21.3%	4,746
Other Agencies	57,418	2,765	158,742	4.1%	12.4%	16.5%	26,113

a. Uncomplicated hypertension and/or diabetes

b. Heart disease, cerebrovascular disease, or renal disease, with or without hypertension or diabetes

Table 6. CalPERS State Active Health Expenditures Attributable to Chronic Diseases Targetable by Lifestyle Interventions, by Health Plan, 2008

Health Plan	Number of Persons Covered	Average Spending per Person ($)	Total CalPERS Payments ($000)	Share Attributable to Preventable Diseases			Preventable Costs ($000)
				Cluster I[a]	Cluster II[b]	Total	
Total	**555,777**	**2,908**	**1,616,103**	**6.5%**	**15.9%**	**22.4%**	**362,047**
Blue Shield Access+	129,955	3,311	430,292	6.9%	18.1%	25.0%	107,541
Blue Shield NetValue	65,875	3,141	206,915	7.2%	18.2%	25.4%	52,600
CAHP	20,789	2,376	49,395	3.6%	12.9%	16.5%	8,128
CCPOA	32,616	2,000	65,243	7.6%	15.5%	23.2%	15,128
Kaiser	209,416	2,528	529,386	5.6%	9.3%	14.9%	78,787
PERS Choice	90,934	3,353	304,888	7.0%	22.4%	29.5%	89,843
PERS Select	2,521	2,468	6,222	7.0%	17.4%	24.4%	1,520
PERSCare	3,192	7,050	22,503	6.6%	30.0%	36.7%	8,252
PORAC	454	2,768	1,257	4.2%	15.4%	19.6%	247

a. Uncomplicated hypertension and/or diabetes

b. Heart disease, cerebrovascular disease, or renal disease, with or without hypertension or diabetes

Health Plan

Finally, table 6 disaggregates expenditures across the nine health plans available to employees within CalPERS[28] in 2008. There may be opportunities for individual plans within the CalPERS system to increase member participation in prevention programs, as UnitedHealth has done by reimbursing providers of lifestyle coaching to improve diet and increase physical activity to reduce type 2 diabetes among their members. Therefore, we identify plans with the most to gain from supporting members' efforts to improve their health. Kaiser, the largest plan offered by CalPERS in terms of total payments, has the lowest share of expenditures going to preventable illness. Thus, it is only the third largest in terms of excess dollars spent on members with preventable illness ($78.8 million). Blue Shield Access+ has the highest expenditures ($107.5 million) on preventable illness. The plan with the highest proportion spent on these illnesses is PERSCare (36.7%), followed by PERS Choice (29.5%).

Discussion

This analysis provides parameters that could be useful to CalPERS in setting priorities and targeting initiatives to improve its members' health while restraining medical care cost growth. Our excess spending estimates measure the potential benefits that could accrue to CalPERS from reduced medical care costs. They suggest that even a 1 percent reduction among State Active members in the prevalence of the common conditions we include in our analysis ultimately could save $3.6 million per year. The literature suggests that actual reductions of 5 percent to 15 percent are feasible,[29] depending on how well-designed and targeted interventions are, indicating potential savings of $18 million to $54 million annually.

Our estimates are conservative because they do not include other diseases that may be affected by interventions to improve diet, increase exercise, and reduce smoking, and we do not capture medical costs associated with "predisease," or reduced severity of the conditions we include. Interventions available to the whole CalPERS population, or even to those at high risk for disease onset, could affect these other costs, as well as those associated with diagnosed disease.

The estimates also do not include any savings from productivity gains in a healthier workforce. Other research suggests that other benefits, such as improved productivity at work and reduced absenteeism costs, could be nearly as large, as noted above. These benefits would largely accrue to state government and other CalPERS employers.

Finally, these estimates are also conservative because they are limited to current employees and their dependents and exclude retirees. Even if interventions are targeted only at active employees, those receiving the intervention who are close to retirement will likely have lower rates of health spending in retirement. While we do not have direct evidence in these data on the health of CalPERS retirees compared to workers at similar ages, we can make informed speculation as to the size of this impact. Higher per capita spending and the larger share of spending on preventable disease at older ages (table 2) suggest that savings from prevention efforts among retirees could be substantial and that prevention activities for active employees have the potential to reduce the cost of retiree health care in the long run.

It is beyond the scope of this report to identify which interventions might be most appropriate for the various CalPERS populations. Different interventions have different costs and benefits. The Community Preventive Services Task Force web site has a carefully selected list of effective interventions.[30] In addition, the reviews cited in the introduction to this report provide analysis of programs and extensive bibliographies to help guide program decisions.[31] The most effective interventions are those that are carefully tailored to the target population. The breakdowns of the CalPERS population

by demographics, geography, health plan, and agency/ department provide ways for CalPERS to make decisions about programs that will best suit the target populations.

The populations with the highest share of spending related to preventable conditions have the potential to yield the greatest return on investment in prevention. However, populations with low shares of spending on preventable conditions may also provide valuable information about prevention by shedding light on what works. For example, health plans or employers with low shares of spending on preventable conditions may already have in place wellness promotion benefits or workplace programs that support employees' health. CalPERS members in counties with low shares may have greater access to fitness opportunities or recreation activities. By identifying such characteristics, CalPERS may better understand what might benefit other health plans, employers, or geographic areas. In this sense, this analysis provides a starting point for CalPERS as it seeks to understand and promote ways to improve the health of its members and so help limit the growth of medical care costs.

The rates of effectiveness demonstrated by the YMCA implementation of the Diabetes Prevention Program are consistent with prevalence reductions of 15%. http://www.thecommunityguide.org/worksite/index.html See especially Baicker et al. 2010 (footnote 16) and Goetzel et al., 2008 (footnote 18).

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27. Because the race and ethnicity data are obtained from the State Controller's Office, we have this information for employees but not for dependents. Thus a large portion of observations are reported as having "Unknown" race and ethnicity.

28. Note that the three plans for Association members are not available to all CalPERS members.

29. The rates of effectiveness demonstrated by the YMCA implementation of the Diabetes Prevention Program are consistent with prevalence reductions of 15%.

30. The Community Guide, Worksite Health Promotion, available at http://www.thecommunityguide.org/worksite/index.html

31. See especially Baicker et al. 2010 (footnote 16) and Goetzel et al., 2008 (footnote 18).

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