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Ties that bind: A case study of the link between employers, families, and health benefits

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Abstract. Most US residents receive health benefits from their employer. Groups of employees and their families are therefore the basis for health care financing. Health care costs rose dramatically during the 1980s and employers looked for ways to control them. One approach is to control the size of the group provided health benefits by an employer. This paper uses a demographic perspective to explore the determinants of change in an employer's group. It examines the linkages among employer policies, employee turnover, and family dynamics. How much control does an employer have over group size? We identify the relative contributions of employment and demographic processes to changing group size. We use a decomposition technique based on matching individual records between consecutive years. We apply this technique to a case study of the health benefits group consisting of General Motors salaried employees and their families. We find that employers face limits to the control that they can exert over the size of the health benefits group associated with their active workforce. Demographic processes unrelated to employee turnover or transfers to layoff or retirement accounted for a large portion of the population change in the case study.

Key words: Applied demography, Employee benefits, Health care costs, Families

Introduction

Health care issues became very important in the USA during the 1980s. Health care providers were alarmed by the large number of people who, since they did not have health insurance, could not pay their hospital and other medical bills. Employers noticed that payroll costs were growing much more rapidly than inflation and traced it to skyrocketing health care costs. The American public worried about losing their health insurance when they lost their job. Politicians clamored for change; President Clinton ran on a platform to reform the health care system in 1992.

When health care providers, employers, the public, and policymakers tried to identify what to do about the health care system, they realized that it was difficult to predict what would happen to the uninsured and to costs, when the system changed. Employers wanted to quickly control their health care costs. What actions could they take today to control costs?

This paper focuses, not a single decision by a particular employer, but rather on a type of decision that many employers face. How do changes in workforce size affect health care costs? Does reducing the workforce by a certain percentage also reduce health care costs by the same percentage? Do employers have complete control over the number of persons provided health

benefits? Or are the size of health benefits groups determined by the demographic processes outside an employer's control?

This paper explores the linkages among families, employee turnover, and the size of the group for which an employer provides health benefits. The 1988 Employee Benefits Survey (US 1989) found that 90% of full-time employees in medium and large firms participated in medical insurance with most having family coverage. There are several reasons why health benefit groups should receive more attention: (1) the size of health benefits populations is closely related to employer health care costs, which have grown so large so quickly in the USA (Loomis 1989); (2) health benefits groups are the basis of health care financing in the USA (Esping-Andersen 1980; USA 1989; Employee Benefits Research Institute 1992; Zedlewski 1991); (3) the recent Financial Standards Accounting Board requirement to report liability for postretirement health benefits on the balance sheet (Employee Benefits Research Institute 1987) requires understanding group population dynamics; (4) understanding the link between employment and health benefits is critical to any effort at health care financing reform (Hing 1994). Roughly 37 million Americans, about one sixth of the population, lack health insurance (Short 1992; Short et al. 1989; Sullivan & Rice 1991).

Why do health benefits groups change size? How much can employers change group size? These questions require analysis of population change and identification of the relative contributions of possible sources of change. We examine the relative impact of three possible sources of change in a health benefits group: flows into and out of an organization related to employment processes, flows into and out of the group related to demographic processes, and transfers from active employment to retirement and layoff.

We hypothesize that each of these sources contributes to changes in group size. Our hypothesis is based on the following. First, health benefits groups in the USA have been shown not to grow at the same rate as the US population does (Kintner 1989). This finding suggests that flows of individuals into and out of organizations (new hires and turnover) may be an important influence on the size of an employer's group. Second, business plans about the number of employees ('head count') and the means chosen to obtain this goal (e.g., special incentive programs like window retirements) clearly affect workforces, and hence, health benefits groups. Third, vital processes obviously play a role as employees marry and raise families, children grow up, and couples divorce.

This study analyzes changes in the health benefits group associated with General Motors (GM) salaried employees from 1983 to 1990. We focus on a group consisting of employees and dependents (but excluding retirees and surviving spouses), the common form among medium and large firms. This study concerns GM's salaried employees rather than its entire salaried and hourly workforce because of data availability.

The GM salaried employees group includes employees and their dependents. Employees become eligible for benefits through hiring and lose

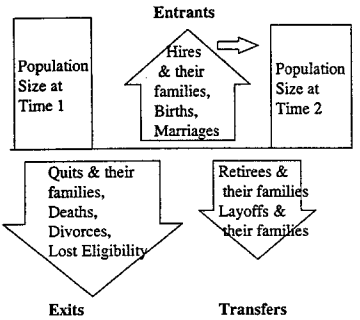

Figure 1. Flows into and out of health benefits group.

benefits through quits, discharges, and deaths. Employees also leave the group examined in this study through layoff or retirement (although they may still be eligible for health benefits outside the group). It is important to note that employee choice plays no role in determining entrance into the group – that is, employees are not permitted to choose to be eligible. Dependents receive health benefits if two sets of conditions are met: first, they must be attached to an eligible GM employee and second, the dependent must satisfy eligibility criteria such as age, marital status, and financial support (General Motors 1988a).

We expect employee turnover to be low because this is a large organization with a well-educated, well-paid middle-aged workforce with long average length of service (Villemez & Bridges 1988; Terborg & Lee 1984). Therefore, we hypothesize that the impact of vital rates is larger than the contribution of employment.

We base this hypothesis on the fact that there are relatively few employees compared to dependents. In 1987 the General Motors hourly and salaried plans combined provided health benefits to 2,140,314 persons (Kintner 1989), including only 451,571 employees (General Motors 1988b). In addition, the percentage of the combined group that is employees fell from 24.4 in 1983 (Kintner & Smith 1987), to 21.1 in 1987 (Kintner 1989).

This finding suggests that only a limited number of people in the combined health benefits group are affected directly by employment processes. Furthermore, in 1983 the combined group contained many children ages 15–24 who would be expected to leave the group via marriage, becoming financially self-sufficient, and exceeding the age criteria. These considerations lead us to hypothesize that the impact of demographic processes on the change in this group will be larger than the influence of employment.

Figure 1 summarizes the flows into and out of the health benefits group. As the population changes between time periods, persons are added by the processes above the line, and persons are subtracted by the processes below the line. Additions to the group include newly hired employees and their families, as well as births and marriages to employees already belonging to

the group. The group loses members to exits and transfers to retirement or layoff. Exiting members include employees who quit (and their families), deaths, divorces, and those who lose eligibility. Again, we emphasize that employees cannot choose to be eligible or not eligible for health benefits.

This study also addresses issues in the practice of managing benefits. Although nearly all employers monitor the total health care costs, few maintain administrative records with demographic information about their entire health benefits group, not just its employees. General Motors is therefore in an unique position to study the drivers of change in a health benefits group. In addition, most analyses of health benefits groups focus on the number of persons at particular time points. Unlike the typical human resource management database, insurance administration databases do not contain information about moves into and out of the group. This paper presents a method for estimating such flows using record matching techniques. Entrants to the group are identified as those who lacked inforce health benefits in the first year and did have them in the next year. Exits are individuals who had benefits in the first year and lacked them in the second year. Information about these flows is then used to identify the relative contributions of employment and demographic processes to changing group size.

Data and methods

Data are from year-end snapshots of GM's salaried payroll database during 1983–1985 and insurance administration database during 1986–1990. We removed duplicate records to prevent mismatching records across years. The payroll database also served as the basis for insurance administration until 15 April 1987 when a separate system came on-line. Both databases have a master record for each employee and satellite records for each dependent. Both databases are distributed databases. Staff at each GM plant location are responsible for data entry and verification. Both databases are live (continuously updated). Although these databases are compiled monthly from computerized plant records, we used only the tapes for 31 December (referred to as yearend tapes).

We describe the group at a particular time in terms of employees and dependents. We define employees as anyone with a master record on the database who are not retired, laid-off, a surviving spouse, or deceased. This definition includes not only full-time employees but also part-time employees, co-op students, flexible service employees, and employees on special leaves. Employees were identified according to several fields on the databases, including Status of Employment, Status Change Code, and the fields indicating health benefits (Table 1).

Dependents are those with health benefits who are not employees or other enrollees. General Motors provides health benefits for all spouses of active employees, retirees, and certain laid-off personnel. Children of enrollees are

Table 1. Variables from payroll and insurance administration databases

Variables	Definitions
Social Security Number	Social Security Number
Service Date	Date joined General Motors
Birthdate	Day, month and year of birth
Gender	Male or female
Hospital Surgical Medical Plan Code	Carrier providing HSM coverage
Hospital Surgical Medical Suffix	Shows HSM coverage before 1986
Hospital Rate Indicator	Shows HSM coverage after 1986
Status of Employment code	Describes status (e.g., regular active)
Status Change Code*	How attained status (e.g., new hire)
Status Change Date	Date status change code changed
Dependent Relationship Code	Dependent relationship to enrollee (pre-1986)
Dependent Health Cancellation Code	Dependent HSM coverage (pre-1986)
Dependent Number	Dependent HSM coverage (pre-1986)
Member Hospital Indicator	Dependent HSM coverage (after 1986)
Member Relationship Code	Dependent relationship to enrollee (after 1986)
Member Number	Dependent HSM coverage (pre-1986)

* The payroll database contains the last three while the insurance administration database has only one.

provided benefits under certain conditions (see Kintner 1989 for details). Dependents are included if they are related to an employee, if their own coverage has not been cancelled or waived, and if they are not sponsored dependents (whose coverage is not paid by GM).

We study flows in order to identify the relative contributions of employment and demographic processes on population change. Since the databases do not record who entered or exited the group, we must estimate the number of entrants and exits indirectly by record matching between consecutive years. We define entrants as persons who have benefits in one year but not in the preceding year. We define exits as persons who have benefits in one year but not in the succeeding year. We must make assumptions about the reasons why persons entered or exited the group because these databases contain insufficient information on them. For instance, entrants who are active employees at year-end are considered new hires. It is possible to make this assumption because employees cannot choose to be eligible or not eligible for health benefits. Exits who are active employees are assumed to be quits, discharges, or deaths. While these reasons for entrance or exit are perhaps not as precise as would be desired for some purposes, they do permit us to distinguish employment processes from demographic processes.

We distinguish dependents accompanying entrants from those brought in for demographic reasons on the basis of the status of the employee to which the dependent is related. We define dependents entering for reasons of employment as those whose employee either entered or exited the group. We define dependents who entered for demographic reasons as those whose employee stayed in the group during the time period.

Employee records for consecutive years were matched on the basis of social security number only. The social security number is the best maintained field in the databases because it is used to generate paychecks and the list of eligible members that is sent to the health plans. If a social security number in the live database is incorrect, employees quickly discover it when they use their health benefits. Since record matching on the basis of a single variable can be problematic, we examined the extent of agreement about age and sex for records matched on the basis of social security number. We found remarkably little disagreement. Less than 0.2% of the records matched on the basis of social security number disagreed on either birthdate or sex.

We matched dependent records using two fields – the employee social security number and the dependent number. We checked the validity of these matches by also matching by birth date and, for the years where insurance administration database is the data source, by sex. Less than 1% of the dependent records matched by employee social security number and dependent number disagreed on birthdate or sex, except for 1985–1986 when the databases changed.

Decomposition to estimate effects of employment and demographics on group size

In this paper we adapt the familiar component model (Shyrock and Siegel 1976) to the following balancing equation:

$$P(t) = P(0) + N - X \tag{1}$$

where $P(t)$ is the population size at time t, $P(0)$ is the population at the beginning of the time period, N is the number of entrants, and X is the number exiting. In this paper we separate the stock of population at a time point ($P(t)$) from the flows into (N) and out of (X) the population between time points 0 and t. An *entrant* is a person who is in the population at time t who was not in it during the previous time period 0. An *exit* is the opposite-someone who was in the population during time 0 but who was not in it at time t.

Then we distinguish population stocks and flows by member type using a subscript. Let A represent active employees, SP be spouses, and C represents children. Thus, N_A is entering active employees (new hires), N_{SP} is entering spouses, and N_C is entering children.

We also distinguish three sources of flows into and out of the population: employment, demographic processes, and transfers to layoff or retirement. We introduce superscripts to make this distinction. Superscript D represents demographic processes while superscript E is for employment, and F is for transfers. The balancing equation can therefore be rewritten as:

$$P(t) = P(0) + N^D + N^E - X^D - X^E \tag{2}$$

$$\begin{aligned} P(t) = {} & P_A(0) + P_L(0) + P_R(0) + P_{SS}(0) + P_{SP}(0) + P_C(0) \\ & + N_A^E + N_L^E + N_R^E + N_{SS}^E + N_{SP}^E + N_C^E \\ & + N_A^D + N_L^D + N_R^D + N_{SS}^D + N_{SP}^D + N_C^D \\ & - (X_A^E + X_L^E + X_R^E + X_{SS}^E + X_{SP}^E + X_C^E) \\ & - (X_A^D + X_L^D + X_R^D + X_{SS}^D + X_{SP}^E + X_C^E) \end{aligned} \tag{3}$$

By a flow due to employment we mean both flows affecting an employee (who is hired, for instance) and, consequently, their families. N_{SP}^E and N_C^E represent spouses and children added to the health benefits group because they are related to a newly hired employee.

Flows due to demographics are entrants or exits which are independent of any change in the employee's status. For instance, if a child exits because his/her parent quits, then it is considered a flow due to employment. On the other hand, if a child exits (and there is no change in the parent's status) then it is considered a flow due to demographics because it presumably resulted from the child's loss of eligibility (due to age or dependent status).

N_{SP}^D represents spouses added to the group by marrying a GM employee. They become members of the GM health benefits group only by virtue of this demographic event. Similarly, N_C^D is children added by births or marriages.

We assume that no employees enter or exit because of demographic processes. That is, we set N_A^D and X_A^D equal to zero. The insurance administration database contains insufficient information to distinguish deaths from other exits. Note that it is necessary to identify individual employees who have died in order to attach their dependents. However, other analyses indicate that mortality rates among GM active salaried employees are quite low (Kintner & Swanson 1992).

Rearranging terms and incorporating the preceding assumptions into Equation (3), we identify the three sources of net change:

Net gain from employment is:

$$(N^E - X^E) = (N_A^E + N_{SP}^E + N_C^E) - (X_A^E + X_{SP}^E + X_C^E) \tag{4}$$

Net gain from demographic processes is:

$$(N^D - X^D) = (N_A^D + N_{SP}^D + N_C^D) - (X_A^D + X_{SP}^D + X_C^D) \tag{5}$$

Net gain from transfers to layoffs and retirements is:

$$(N^F - X^F) = (N_A^F + N_{SP}^F + N_C^F) - (X_A^F + X_{SP}^F + X_C^F) \tag{6}$$

Results

Table 2 shows how the health benefits group associated with active employees

Table 2. Counts of employees, spouses, and children, GM salaried employee health benefits group, 1983–1990

Snapshot date*	Member type			
	Employees	Spouses	Children	Total
1983	124,175	97,847	180,036	402,058
1984	123,640	95,084	163,887	382,611
1985	125,840	95,581	161,199	382,620
1986	124,627	93,675	156,773	375,075
1987	112,945	84,790	137,452	335,187
1988	102,756	76,188	117,753	296,697
1989	101,123	75,564	118,023	294,710
1990	99,928	74,664	112,729	287,321

*Dates per 31 December.
Counts exclude sponsored dependents and COBRA enrollees.
Sources: Payroll Database (1983–1985) and Insurance Administration Database (1986–1990).

Table 3. Flows into GM salaried employee health benefits group, 1983–1990

Period*	Employees	Spouses		Children		Total
		Acc. Empl.	Other	Acc. Empl.	Other	
1983–1984	9,512	4,726	2,669	7,192	8,012	32,111
1984–1985	10,432	4,986	2,812	7,388	7,003	32,621
1985–1986	7,421	3,095	2,891	4,224	12,181	29,812
1986–1987	3,294	1,112	2,435	1,405	4,991	13,237
1987–1988	3,245	1,245	2,314	1,475	4,855	13,134
1988–1989	4,745	2,092	2,425	2,689	4,982	16,933
1989–1990	5,162	2,205	2,125	2,725	4,298	16,515
Total	43,811	19,461	17,671	27,098	46,322	154,363

* Dates per 31 December.
Counts exclude sponsored dependents and COBRA enrollees.
Sources: Payroll Database (1983–1985) and Insurance Administration System (1986–1989).

fell from 402,058 in 1983 to 287,321 in 1990. What caused this large (28.5%) reduction? How much of it was due to employment factors 'controlled' by the employer? As was shown in Figure 1, yearly changes in group counts can occur for different reasons. The number of employees can fall either because there was a hiring freeze (and consequently no newly hired employees) or because there were incentive programs to encourage them to leave the corporation (and this group) by resigning. The decline in the number of children could result from employees with children leaving the group or from children becoming ineligible for health benefits because of age or marriage. We now examine how these net changes in counts (differences between consecutive years) came about by examining flows. We identify who entered and left the group.

Table 3 shows the number of entrants by member type and separates

Table 4. Flows out of GM salaried employee health benefits group, 1983–1990

Period*	Employees	Spouses		Children		Total
		Acc. Empl.	Other	Acc. Empl.	Other	
1983–1984	8,274	5,440	3,201	9,570	21,120	47,605
1984–1985	5,393	3,146	1,736	5,339	10,534	26,148
1985–1986	3,849	2,045	1,877	3,192	15,605	26,568
1986–1987	5,644	3,045	1,397	4,974	16,606	31,666
1987–1988	8,897	5,422	2,974	9,027	15,012	41,332
1988–1989	4,400	2,295	1,215	3,311	3,635	14,856
1989–1990	3,636	1,923	1,100	2,749	8,658	18,066
Total	40,093	23,316	13,500	38,162	91,170	206,241

* Dates per 31 December.
Counts exclude sponsored dependents and COBRA enrollees.
Sources: Payroll Database (1983–1985) and Insurance Administration System (1986–1989).

dependents who enter because they accompany an employee from those who enter for other reasons. Total entrants fell from a high of 32,621 in 1984–1985 to 16,515 in 1989–1990. This reduction reflects primarily decreases in employees and in the number of children entering for reasons other than employment, which probably reflects the drop in U.S. birth rates during this time. The number of employees entering each year has declined considerably (by 59%) from the peak in 1984–1985. Trends in the number of spouses and children accompanying employees entering mirror the trend in entering employees.

Table 4 shows flows out of the salaried employee health benefits group. Although total exits fell from 47,065 in 1983–1984 to 18,066 in 1989–1990, the number of exits has fluctuated dramatically over time. Family members (spouses and children) who exit because they accompany an exiting employee are reported separately from those who exit for other reasons, such as spouses departing because of divorce or children leaving because they lose eligibility by marrying, moving out of the parental home or exceeding the age limits.

Nearly half of all exits are children leaving the group independently of their employee. Exit rates, calculated from Tables 2 and 4 (available from authors but not shown) indicate that dependents (especially children) are more likely to exit than employees. In every year except 1988–1989 dependents are more likely to leave independent of enrollees than they are to accompany enrollees out of the population. Note however that this result is due entirely to children, who are far more likely to leave independently than they are to accompany. Spouses, on the other hand, are more likely to leave because they accompany a departing employee than they are to leave for other reasons.

Table 5 shows transfers out of the salaried employees health benefits group. These transfers are primarily (96%) retirements but some are layoffs.

Table 5. Net transfers from employed status to layoff and retirement, GM salaried employee health benefits group, 1983–1990

Period*	Employees	Spouses	Children	Total
1983–1984	1,773	1,517	663	3,953
1984–1985	2,839	2,419	1,206	6,464
1985–1986	4,785	3,970	2,034	10,789
1986–1987	9,332	7,990	137	21,459
1987–1988	4,537	3 765	1,990	10,292
1988–1989	1,978	1,631	455	4,064
1989–1990	2,715	2,207	910	5,832
Total	27,959	23,499	11,395	62,853

* Dates per 31 December.
Counts exclude sponsored dependents and COBRA enrollees.
Sources: Payroll Database (1983–1985) and Insurance Administration Database (1986–1989).

They are the difference between entrants and exits (since some persons return from layoff to active status). In most years, the total persons affected by transfers is much smaller than either exits or entrants. However, in 1986–1987, transfers exceeded entrants, probably because of a window retirement program.

Combining Tables 3, 4 and 5 indicates that gross flows are much larger than net flows. For instance, total population size fell by only 1,987 between 1988 and 1989. But there were 16,933 entrants, 14,856 exits, and 4,064 transfers. These roughly 35,000 gross flows (flows in any direction) represent part of the administrative burden of maintaining the database up to date. In other words, gross flows are about 17 times the net change. This means that even small net changes in population size require considerable administrative effort, since gross flows are a measure of the number of transactions that must be entered into the on-line distributed database by the staff in each plant.

Employees account for only a small part of entrants and exits because they are only one third of the population. They represent about one fourth of entrants and one fifth of exits. In every year children represent the most entrants and exits – around 30% of entrants and about 45% of exits. Interestingly, most children leave the population because of demographic reasons, such as marriage, moving out of the parental home, or exceeding the age limit for eligibility, not because their parents leave employment.

Changes in population counts, such as the decline in population size between 1983 and 1990, can occur for different reasons. The decline resulted because nearly twice as many persons left the population as entered it (206,241 exits and 62,853 transfers versus 154,363 entrants). Exits consisted of departing employees (19.4%), dependents accompanying enrollees (29.8%), children of parents staying in the population (44.2%), and spouses of enrollees staying in the population (6.5%). Entrants consisted of enrollees

Table 6. Sources of net change in GM salaried employee health benefits group, 1983–1990

Member type	Total net change	Net change from employment	Net change from demographics	Net change from transfers
Employees	– 24,247	3,718	0	–27,959
Spouses	– 23,183	– 3,855	4,171	–23,499
Children	– 67,307	–11,064	–44,848	–11,395
Total	–114,737	–11,201	–40,677	–62,853

Sources: Tables 2, 3, 4, 6.

(28.4%), their accompanying dependents (30.2%), and other additions (41.4%). Nearly all transfers were employees (44.5%) or spouses (37.4%).

Decomposition

Earlier in this paper we presented a method of decomposing net change into three sources: employment, demographic processes, and transfers. These equations require distinguishing dependents who enter or exit because they are related to an enrollee who moved into or out of the population for reasons of employment from dependents who enter or exit for demographic reasons. This method assumes that active enrollees enter or exit only for reasons of employment. Note that the employment effect includes the impact of the mortality rates on active and laid off enrollees, which we cannot distinguish from the impact of employment.

Table 6 presents the results of the decomposition combining results for all years by adding the periods together. The column headed Total Net Change is the change in the total population size during the year (the difference between consecutive rows of Table 2). A negative number in this column means that the population fell between year t and year $t + 1$. It is this net change that we seek to explain.

The active salaried health benefits population fell from 402,058 in 1983 to 287,321 in 1990. We find that the 114,737 reduction was due primarily to changes other than employment. Over half (54.8%) was due to net transfers while about one third (35.4%) was due to demographics. Employment processes accounted for little (9.8%) of the reduction.

To shed light on how employment could have such a small impact on population changes, we also decompose the net change in employees, spouses, and children separately. The top row of Table 6 presents the decomposition for employees, which experienced an overall reduction. However the net change due to employment was positive, indicating that programs used to reduce the workforce did not offset the hiring that was done earlier in the time period. Despite the positive contribution of employment, it was

offset by the large negative net change from transfers, which reflects primarily window retirement programs.

The second row of Table 6 presents the net change in spouses for all the periods combined. The total net change in spouses was –23,183. Nearly all the negative net change was due to transfers. Employment also contributed to the reduction. On the other hand, demographic processes contributed a net gain which partially offset the reductions from transfers and employment.

The third row of Table 6 shows the decomposition of net change in children. The number of children fell from 180,036 in 1983 to 112,729 in 1990. We find that two-thirds (66.7%) of the reduction was due to demographics with the remainder nearly equally split between transfers and demographics.

The top panel in Figure 2 shows the trends in the number of employees and members in the salaried health benefits population from 1983 to 1990. Management 'controls' only the number of employees, which rose slightly and then declined. The member population, on the other hand, declined throughout the period.

The bottom figure presents the amount of net change (the difference between population counts for consecutive years) due to employment processes, demographic processes, and transfers to retirements and layoffs. Bars above the line indicate growth while those below the line show reductions in population size. For example, between 1983 and 1984, the top figure shows that the population fell by about 20,000. The first three bars in the bottom figure decompose this net change: the gray shaded bar indicates that about 1,000 persons were lost to employment processes, the black bar shows that almost 14,000 were lost from demographic processes, and the striped bar indicates that nearly 5,000 left the population because of transfers to retirement or layoff.

The bottom figure demonstrates that employment processes do not account for most of the change. When the size of the employment, demographics and transfer bars for the same consecutive years are compared to each other, the employment bar is the largest (in absolute size) for only 2 periods (1984–1985 and 1987–1988). The employment bar is the smallest of the three bars during four periods. Demographic processes have a larger effect than employment processes in four of the seven periods.

Therefore we conclude that corporate downsizing had a limited impact on the size of the health benefits population and that its effects can be offset by changes due to demographic and other processes. Employment had a small impact on net change in the total population because it accounted for little of the net change in children, which represent the largest number of members. Also, its impact on employees was more than offset by the effect of transfers.

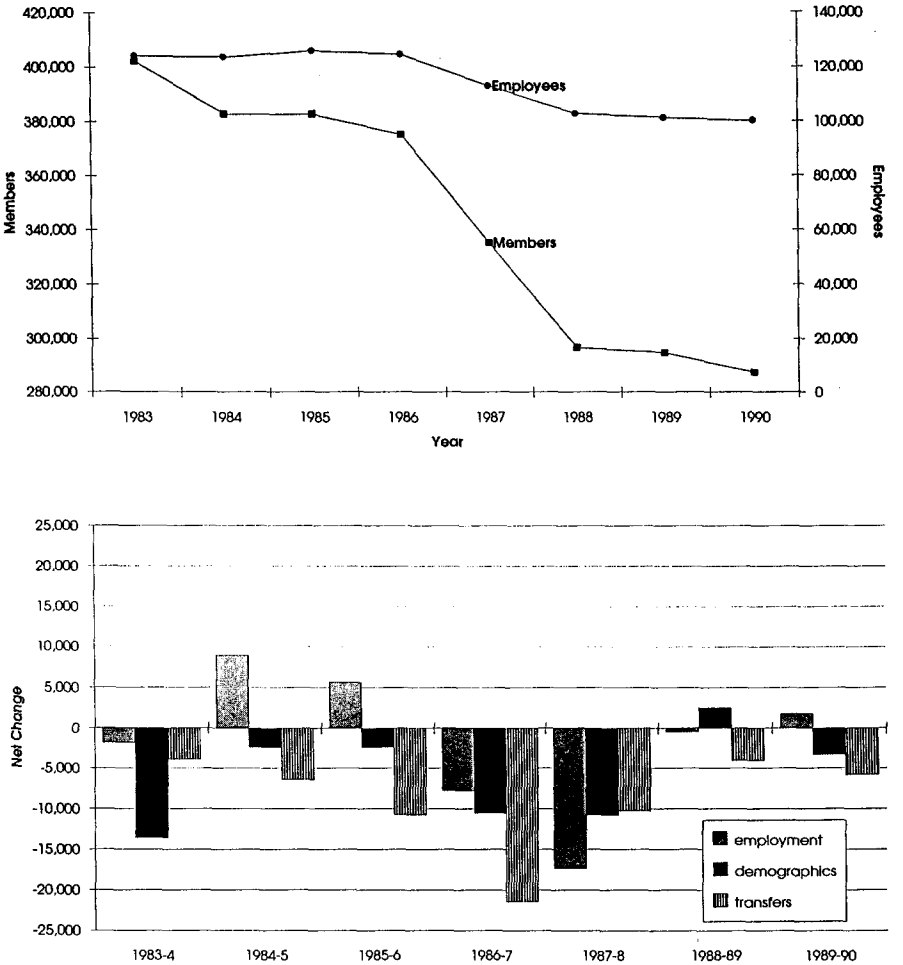

Figure 2. Employees, members, and contribution to net change in GM-salaried health benefits group, 1983–1990.

Employee-dependent link

This section examines the tie between employee and dependents more closely to demonstrate how it can be used in practice. One method of forecasting health benefits populations is to first forecast employees and then apply the ratio of dependents per employees to obtain the total population size. These calculations assume that those entering or leaving the population have the same number of dependents, on average, as employees currently in the population.

Table 7 shows that this assumption is inappropriate. The left hand panel

Table 7. Employee-dependent ties, GM salaried employee health benefits group, 1983–1990

Period*	Dependents per enrollee				%Employees with no dependents		
	corp. avg. in base year	entering employees	Exiting employees	transfer-ring employees	corp. avg. in base year	entering employees	exiting employees
1983–1984	2.24	1.25	1.81	1.23	15.6	45.5	27.6
1984–1985	2.09	1.19	1.57	1.28	16.9	47.3	35.1
1985–1986	2.04	0.99	1.36	1.25	17.8	53.3	40.9
1986–1987	2.01	0.76	1.42	1.30	18.5	61.2	39.4
1987–1988	1.97	0.84	1.62	1.27	18.6	56.5	32.2
1988–1989	1.89	1.01	1.27	1.05	18.6	50.9	43.0
1989–1990	1.91	0.96	1.28	1.15	18.7	52.6	40.9
Total	2.01	1.06	1.53	1.25	17.8	50.6	35.5

* Dates per 31 December.

compares the number of dependents per enrollee for entering employees, exiting employees, and transferring employees to the corporate average in the base year. It shows that, for every time period, employees who undergo any type of move (entrance, exit, or transfer) have fewer dependents than the corporate average. This comparison holds for every time period even though the corporate average number of dependents per enrollee fell from 2.24 in 1983 to 1.91 in 1989. For nearly all periods, entering employees have the fewest dependents, followed by transfers, and then exiting employees. Entering employees have, on average, one less dependent than the corporate average. In contrast, exiting employees have, on average, one half less dependent than the corporate average.

The percentage of employees who have no dependents is greater among employees undergoing a move than for the workforce as a whole. The right hand panel of Table 7, which displays the percentage of employees who had no dependents at all, shows that slightly over half of all entering employees have no dependents at all. Furthermore, this percentage has increased over time from 45.5% to 52.6%. Nearly one third percent of exiting employees had no dependents and this percentage has also increased. This information is not available for transfers. In contrast, less than one fifth of employees in the corporate average had no dependents.

One reason for the low ratio of dependents to enrollees for entering employees is that, among those with any dependents, entrants have nearly one third fewer dependents than the corporate average (2.14 versus 2.44). In contrast, the number of dependents per enrollees among only those exiting employees who have any dependents is nearly the same for exits and the corporate average. After making this adjustment, there were 2.44 dependents per enrollee (with any dependents) compared to 2.37 for exiting employees (with any dependents).

This section demonstrates that the family structure of employees undergoing some kind of organizational flow is different from the average em-

ployee. These findings indicate that it is not appropriate to forecast population size assuming that this ratio is identical for all employees. Instead, it shows that a workforce forecast should be performed that predicts both new hires and turnover, and that the health benefits population be predicted from the workforce using separate dependent-enrollee ratios for entrants and exits.

We illustrate how this information can be used to evaluate the impact of alternative downsizing strategies on the size of the health benefits population. First, consider a hiring freeze in which 2,000 persons are not hired. How many dependents are 'averted' from joining the health benefits population? Assuming that each new hire would have had 1.06 dependents, this strategy averts 4,120 persons from being added to the population. Second, consider an action that results in the turnover of 2,000 employees. Assuming that each of these employees had 1.53 dependents, this strategy reduces the population by 5,060 persons. Third, consider a window retirement program in which 2,000 persons retire early. If we assume that each affected employee has 1.25 dependents, then this strategy removes 4,500 persons from the population. This evaluation of three hypothetical downsizing strategies indicates that increased attrition would result in the greatest reduction in population size.

Discussion

This study has explored how links among employers, their employees, and the families of these employees affect changes in the size and composition of a health benefits group. Attention to this type of population is important because it is directly tied to health care costs, which currently have a major impact on the profitability of many US corporations and the well-being of those receiving health benefits from them.

This paper has examined the possibility that both employment flows and demographic processes contributed to change in health benefits populations. We followed the health benefits group associated with active salaried employees of the General Motors Corporation from 1983 to 1990. This population fell sharply, by roughly one fourth during this period. This large reduction dramatically changed the composition of the group among employees, spouses, and children.

We estimated the relative contributions of three possible sources of change – employment, demographic processes, and transfers to layoff and retirement. We chose these sources because previous research indicated that changes in health benefits groups are not identical to those in the US population. We identified entrants and exits to the group by matching records of individuals between consecutive years because they are not otherwise identified in the insurance administration system.

While we expected each source of change to make some contribution to population change for theoretical reasons, we anticipated that the contribu-

tion of demographic processes would be the largest because of the characteristics of the specific workforce analyzed – a middle age workforce with long tenure. We did not formulate a specific hypothesis about the magnitude of the contribution from transfers to layoff and retirement because we viewed this as a control variable.

As hypothesized, we found that demographic processes made a larger contribution to the reduction in the size of the health benefits group than did employment processes. However, neither of these sources made the largest contribution. The largest contribution was the control variable (net transfers to layoff and retirement).

The chief limitations of this study are that it concerns only one group and only for a seven year time span in the 1980s. Yet this is probably the longest time period of data available for any large group. The particular set of findings (that employment processes had relatively little impact) would probably not hold for younger workforces (who have younger children and spouses). Under these conditions, retirements would not be the major tool for accomplishing downsizing, as they were for this workforce. Furthermore, a younger workforce would have fewer children ages 15–24, who depart because they exceeded age eligibility rules, became financially self-sufficient, or married. In this case study, almost half of all exits were children.

Further research is needed to assess the assumption that dependents who enter or exit the group even though their employee stayed in the population were doing so because of a demographic process like marriage or divorce. This assumption should be examined by comparing the age pattern of entrants and exits to the age pattern expected by the demographic processes. Research is also required to examine the impact of initial starting conditions on the relative contributions of employment and demographic processes. For instance, change in other health benefits groups may be more or less influenced by employment processes (even though they have similar rates of employee entry and exit) because of the initial distribution of employees by age and length of service.

These findings indicate that employers face limits to the control that they can exert over the size of the health benefits group associated with their active workforce. In this case study, the employer used window retirement packages in order to downsize; in this regard it had some control. It also had control over hiring and over some sources of employee turnover, such as discharges. However, demographic processes unrelated to turnover or to transfers to layoff or retirement accounted for a large portion of the population change during the period.

This study has several implications for the practice of managing health benefits. The expense and workload of maintaining the administrative record database is much larger than is apparent from net changes in population size. We found that about 17 times as many more transactions were processed then net changes in group size. It also suggests ways to evaluate the effects

of various employer policies (such as downsizing) on the size and composition of the employer's health benefits group.

Much remains to be learned about other characteristics of health benefits groups, such as aging, as well as about the antecedents of long-term changes in the size of health benefits groups. The latter is particularly important since many employers are now required to forecast their liability for future health care costs. Calculation of this liability requires a forecast of the group over a twenty year time horizon, a period almost three times as long as the time period studied here.

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References

Employee Benefits Research Institute (1987). *Measuring and funding corporate liabilities for retiree health benefits*. Washington, DC: Employee Benefit Research Institute.

Employee Benefits Research Institute (1992). *Source of health insurance and characteristics of the uninsured, analysis of the March 1991 Current Population Survey*. Washington, DC: Employee Benefits Research Institute.

Esping-Anderson, G. (1980). *The three worlds of welfare capitalism*. London: Polity.

General Motors Corporation (1988a). *Guide to dependent eligibility for General Motors health care programs*. GHC 902 GM Supp (5–88). Detroit: General Motors Corporation.

General Motors Corporation (1988b). *Public interest report*. Detroit: General Motors Corporation.

Hannan, M. & Freeman, J. (1989). *Organizational ecology*. Cambridge, MA: Harvard University Press.

Hing, E. (1994). Overview of the 1994 National Employer Health Insurance Survey (NEHIS). Discussion paper presented at the annual meeting of the American Statistical Association, Toronto, Canada.

Kintner, H.J. & Smith, E.B. (1987). General Motors provides health care benefits to millions. *American Demographics*, May: 44–45.

Kintner, H.J. (1989). Demographic change in corporate health benefits population, *American Journal of Public Health* 79: 1655–1656.

Kintner, H.J. & Swanson, D.A. (1992). Estimating demographic rates from employer administrative data bases. Discussion Paper. GM Research Laboratories Research Publication No. 30–75.

Loomis, C. (1989). The killer cost stalking business, *Fortune*, 27 February 1989: 58–68.

Short, K. (1992). *Health insurance coverage 1987–1990 (selected data from the survey of income and program participation)*. US Bureau of the Census Current Population Reports Series P-70, No. 29. Washington, DC: US Government Printing Office.

Short, P., Monheit, A. & Beauregard, K. (1989). *A profile of uninsured Americans*. (DHHS Pub. No. (PHS) 89–3443). National Medical Expenditure Survey Research Findings 1,

National Center for Health Services Research and Health Care Technology Assessment. Rockville, MD: Public Health Service.

Shyrock, H.S., Siegel, J. & Associates (1976). *The methods and materials of demography*. Washington, DC: US Government Printing Office.

Sullivan, C.B. & Rice, T. (1991). Data watch: The health insurance picture in 1990, *Health Affairs* 10: 104–115.

Terborg, J.R. & Lee, T. (1984). A predictive study of organizational turnover rates, *Academy of Management Journal* 27: 793–810.

US Department of Labor, Bureau of Labor Statistics (1989). *Employee benefits in medium and large firms, 1988*. Bulletin 2336. Washington, DC: US Government Printing Office.

Villemez, W. & Bridges, W. (1988). When bigger is better: Differences in the individual-level effect of firm and establishment size, *American Sociological Review* 53: 237–255.

Zedlewski, S.R. (1991). *Expanding the employer-provided health insurance system: Effects on workers and their employers*. Washington, DC: Urban Institute Press.

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