FAMILY UNIT CONSTRUCTS, DYNAMICS, AND ANALYSIS IN THE HOUSEHOLD COMPONENT OF THE NMES

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1. Introduction

Family-level data collected in longitudinal, as opposed to cross-sectional surveys present special analytical problems due to the dynamic nature of family units over time. Family composition can change as a result of birth/adoption, death, marriage, divorce, migration, and situations such as institutionalization or attending college away from home. The two major complexities that affect the analysis of family level data in national longitudinal health care surveys are the changing structure of the family over time, and definitional problems in determining family continuation, dissolution, or formation.

Furthermore, the very definition of a family is not straightforward. There are nuclear families and extended families, multi-person and one-person families, families whose members live under the same roof and those whose members live separately. College students and others living away from the family's dwelling temporarily pose yet another problem in defining the family. There are people who consider themselves part of the same family, yet are not related by blood, marriage, or other legal means (adoption, guardianship). Families can also be defined to reflect external criteria such as tax filing status or health insurance coverage eligibility.

In addition, there is the issue of the "head of the household." Is this the oldest person in the family or the person who owns or rents the dwelling? If the owner or renter is married, is the head always the male, or can there be two heads of the family?

Different strategies for defining changing families for analytical purposes have been proposed, including cross-sectional, longitudinal, and dynamic approaches. Alternative definitions of family unit formation require rather complex weighting strategies to facilitate the derivation of national estimates of population parameters over a specified time interval. In this paper, the authors will describe how families were constructed, and the extent and type of change in family structure and composition, using the Household Survey component of the 1987 National Medical Expenditure Survey and the way these changes are incorporated into analytical plans. Alternative cross-sectional strategies for defining families which can change across time will be employed and evaluated. A few annualized outcome measures of interest at the family level will be explored using these various definitions.

2. Background

2.1 The Survey

The Household component of the 1987 National Medical Expenditure Survey (NMES), sponsored by AHCPR, is a national probability sample of the civilian, noninstitutionalized U.S. population. The household survey component was designed to provide statistically unbiased national estimates of health care utilization, expenditures, and access to care, and health insurance coverage for their respective target populations for calendar year 1987. To provide focused estimates of subpopulations of particular policy concern, the Household Survey (HHS) oversampled the elderly, those with difficulties in performing activities of daily living, poor and low-income families, and the black and Hispanic minorities (Edwards and Berlin, 1989).

To reduce the deleterious impact of long recall periods on measurement error, data collection specifications required four separate interviews conducted with selected households at three to four month intervals over a fifteen month period. The NMES data collection strategy for the Household Survey was motivated by the dual analytical goals of measuring health care utilization, expenditures, and health insurance coverage at both the individual and family levels for calendar year 1987 (Cohen, DiGaetano, and Waksberg, 1991). To satisfy this goal, the sampling and data collection plan had to result in data for a probability sample of all persons who were civilian noninstitutionalized residents of the United States for all or part of 1987, and a probability sample of all families residing in the U.S. during all or part of 1987 that contained at least one civilian, noninstitutionalized person. Obtaining accurate probability samples of these two groups required the development of inclusion rules to account for the many ways persons and families could enter and leave the target population at each round of data collection (Cox and Cohen, 1985).

The NMES probability sample of individuals was obtained in the following manner. First, a multi-stage national probability sample of dwelling units was selected (Cohen, DiGaetano and Waksberg, 1991). All civilian residents of these sampled dwelling units at the time of the first round of data collection were included in the NMES. The total round one HHS sample comprised 36,400 individuals in roughly 15,000 households.

In addition, persons were included in the NMES when they later joined a household containing one or more of the individuals initially sampled, but were not part of the U.S. civilian non-institutionalized population in round one (predominantly newborn babies). These two groups of individuals, referred to as "key" individuals, constituted the core sample for all person level analysis in the NMES. Key sample persons who moved were interviewed at their new location whenever possible. The probability sample of families was obtained by including a family and all its members when it contained one or more key NMES sample participants.

Individuals who were part of the U.S. civilian non-institutionalized population in round one and who joined the sampled family after the first round, or into whose home a key person moved, were called "non-key". For non-key individuals, data were collected only for the time period in 1987 during which they belonged to a family containing a key person. The data collected for these non-key persons were to be used only in constructing data aggregations needed for family level analyses (e.g., the annual expenditures incurred by the family for health care in 1987).

2.2 Alternative strategies for family level analysis in national longitudinal health care surveys

Throughout the reference period of a particular survey, families change their composition and new families are created by life events such as birth, death, marriage, and divorce. Explicit rules that govern family formation, dissolution, and continuity must be developed prior to the specification of an estimation strategy.

A broad spectrum of alternative strategies have been considered to facilitate family level analysis of data from national longitudinal health related surveys. These approaches range from a strictly dynamic treatment of families to those which totally ignore the changing composition of families over the course of the survey. Perhaps the most radical departure from a direct analysis of data at the family level is the strategy proposed by Duncan and Hill (1985). Arguing that no single definition of a "longitudinal household" is appropriate for most analytic tasks, they contend that a superior alternative is the use of the individual as the unit of

analysis, while attributing to each individual the characteristics of the household in which he or she lives. While such an approach has merit in determining the impact of changes in family composition at the person level with respect to an individual's annual health care utilization, expenditures, or health insurance coverage, its restriction to person level analysis is insufficient for surveys with an explicit requirement to yield family level estimates of health care parameters.

As noted, one of the explicit analytical objectives of the NMES was to derive family level estimates of health care parameters. Health care parameters often make more sense at the family level, rather than the person level, since one can view the family unit as an informal caregiver as well as expending health care resources to address health care needs. More specifically, the following types of family level estimates of health care utilization, expenditure and insurance coverage measures will need to be derived from NMES data: mean number of ambulatory physician contacts per family; mean expenditures for ambulatory physician contacts per family; percent of families with no ambulatory physician contacts in 1987; percent of families with out of pocket expenditures for ambulatory physician contacts above $2,000; and percent of families with Medicaid coverage for at least one member at any time in 1987.

2.2.1. Cross-Sectional Treatment of Families

Perhaps the most straightforward of the alternatives for family level analysis of longitudinal data is to consider a cross-sectional approach. Based on the representation of families for a specific time point during the survey reference period (often a year in duration), or for a given round of data collection, the entire longitudinal data profile of all associated individuals is attributed to these time-specific families.

For longitudinal surveys comparable to the NMES, which collect health care data to derive annual estimates for relevant health care parameters, the time period covered by the initial interview or the final interview are the most viable choices for the time point or interval that defines families (DiGaetano and Brick, 1988). When the initial interview is selected as the time point, all the data for key members associated with the original family existing at this time point over the course of the year are aggregated to the family level to facilitate estimation. The original family serves as an "anchor" for all original key members in addition to newborns and other associated key persons not eligible for sample selection at the time of the first interview. Data for non-key persons that move into the set of original families over the course of the year are not included in the derivation of family level estimates . Since the non-key sample participants have already had a chance of selection for inclusion into the sample at the time of the initial interview, they are already represented in the original families by key survey participants.

The other alternative, defining the set of families in a longitudinal survey at the time of the final interview, is subject to greater complexities with respect to construction of the family unit. Families that are defined at the final core interview consist of both key and non-key sample participants. These non-key participants have experienced multiple opportunities for inclusion in a longitudinal survey. A determination of their overall probability of selection requires additional information on their status at the time of the initial interview. Since data were collected for the non-key participants only for the period of time they were associated with key members of originally selected households, an explicit determination of the overall selection probability for non-keys is problematic. A recommended approach for families consisting of both key and non-key sample participants at the final core interview is to determine the family status as a function of its reference person (the person who owns or rents the residence) (DiGaetano and Brick, 1988). When the reference person is a key

sample participant, the family is to be included in the derivation of national estimates, with data aggregated from all of its members. Alternatively, families with a non-key reference person are to be excluded from all analyses. This strategy allows families that exist at the last round of data collection only one chance of selection in the survey. Development of family level weights under this model would be straightforward, with the family taking on the sampling weight of the "household/dwelling unit" or householder, which reflects its probability of selection into the sample. The non-key persons in these families would still need to have their data annualized for the entire calendar year.

2.2.2. Longitudinal and Dynamic Household Concepts
An alternative approach suggested for adoption in national longitudinal household surveys is to restrict family level analyses to the subset that remain stable over the course of the survey reference period (Duncan and Hill, 1985; Citro et al., 1986). These families are often defined as "longitudinal households". For many policy relevant analyses, the households that experience a compositional change are often the most important to study. To minimize the loss in representation of a family analysis strategy that is limited to longitudinal families, rules are established to maximize the number of originally sampled households that continue as "longitudinal" families throughout the course of the survey (Citro et al., 1986). One set of these rules (Dicker and Casady, 1985) allows two families to be linked in time if they have a common reference person and/or spouse of the reference person, and allows for continuity of the family in the event of a split into two different households (Cohen, 1990).

A dynamic approach to family level analysis also requires an explicit set of rules for family continuity, dissolution, or formation. In the 1977 National Medical Care Expenditure Survey (Cox and Cohen, 1985) a family was defined to have changed composition when the household head or spouse departed, and thus two new families were formed and the original spawning family ceased to exist. Whenever there was a loss of the head or spouse due to death, institutionalization, or movement into the military, a new family was also formed and the original family ceased to exist. For changes in family composition concerning family members other than the household head or spouse, such as birth, death, movement out, or a member institutionalized or joining the military, the family was considered to be the same family, albeit with a different number of members. The strategy is then to use the fraction of days in 1987 that each family existed as part of the estimate, thereby avoiding the problems created by allowing people to be in multiple families over the course of the survey reference period. This method requires that significant data processing resources be expended (Cohen, 1990).

3. Methods

3.1 Family Construction

In the Household Component of NMES, a reporting unit consisted of all people living in the same dwelling who were related by blood, marriage, adoption, or foster status. More than one reporting unit could exist in a dwelling. Unmarried full-time college students living away from home were interviewed as a separate reporting unit. Families were then constructed by combining the reporting units of the college students with those of the rest of their family. A person living alone, or living with unrelated people, was considered to be a one-person family. Family units were redefined as needed at each round of data collection.

The Household Survey was a panel survey in which each family residing in a sampled dwelling unit in round one was followed throughout the reference year (1987) over the course of four rounds of interviews. When a family member or members moved away from the family after round one, the individual was still

followed as part of NMES, in addition to any related people into whose home the individual moved.

Births, deaths, migration in and out of the families, and in and out of the survey-eligible population can occur throughout the year. NMES had the opportunity to periodically observe what are in many cases dynamic families. Families were constructed at each round of data collection, allowing for changes in family composition to be documented. While this allows for the examination of changes in family structure, it creates problems for those interested in doing family-level analysis of health care utilization and expenditures, for example, since many families do not remain stable in composition throughout the year.

In this paper, three basic analytical questions are explored: (1) How does the choice of the family analytical unit affect estimation? (2) Is the stable family different in demographic composition than the dynamic family? (3) What differences are observed between the two types of families in terms of health care utilization and expenditures?

To try to investigate these methodological questions, the cross-sectional approach to longitudinal data analysis was used; i.e., cross-sectional families at the first and last (fourth) rounds of data collection were examined, as well as what we will call "annualized families." Cross-sectional family units are useful for cross-sectional types of estimates; e.g., marital status at time of interview, age, size of family. Round one cross-sectional families consist of all families in existence at the time of the round one interview. Round four cross-sectional families include all families in existence at the time of the round four interview, including people who joined the family after round one and excluding people who died or became ineligible during the year. Families at rounds two and three were not explored in this paper.

For estimates of annual types of variables, such as health care utilization, expenditures, and disability days over the course of the year, families needed to be expanded. "Annualized families" were created in two ways. The first annualized family type was anchored to round one; i.e., it included round one cross-sectional families plus any babies born later in the year. In addition, any other key individuals who later joined the family were brought in to these annualized families. Non-key individuals who joined the family during the course of the year were not included in these round one-anchored families.

The second annualized family type was anchored to round four. Like the round one annualized families, the round four annualized families consisted of the round four cross-sectional families (including non-keys), plus any other individuals who were key. This includes people who died, left the country, or became institutionalized before round four.

A "head of household" was defined for each family as the reference person; i.e., the person who owns or rents the dwelling. For the subgroup variables presented in the Tables, demographic information relates to the head of the family. However, for several issues related to weighting and defining family stability, the spouse of the reference person, if present in the dwelling, was considered another head of household.

3.2 Stable versus Dynamic Families

In order to classify a family as either stable or dynamic in composition over the course of the survey year, it was decided that the round one and round four cross-sectional families be compared. If the round one and round four families looked the same, then the family was classified as stable, even though there could have been some change in composition in the interim rounds. Any one-person families were considered stable, even if the person died or otherwise became ineligible by round four. All other families were considered dynamic.

Dynamic families were further subdivided into those where the change involved the head of the household or his/her spouse versus those where the change involved others in the family. If the (multi-person) family existed in round one but not in round four, or existed in round four but not in round one, then it was placed in the "change involving reference person/spouse" category. For space considerations, this will be referred to as the "reference person change" category in the tables and the corresponding results section. This type of family would most likely be excluded from analysis in the longitudinal approach described in section 2.2.2.

Any families in which the reference person or spouse in round one was not part of the family in round four (due to death or institutionalization, for example) were placed in the "change involving reference person/spouse" category. Any other dynamic families were placed in the "other change" category. Note that whether the round one reference person was still the reference person in round four was irrelevant to this categorization. The round one reference person needs only to be present in round four, and likewise for the round one spouse, to be excluded from the "change involving reference person/spouse" category. In applying the longitudinal approach, this type of family would probably be included in the analysis.

3.3 Estimation and Weighting Strategy

For the purposes of family-level estimation, only certain families were considered to be "key responding families" and therefore eligible for family-level analysis. All families considered unacceptable for family-level analysis were not given family-level weights and are adjusted for in the weighting strategy.

For round one cross-sectional and annualized families, in order for the family to be eligible for family-level analysis, all key individuals within the family had to have responded for their full period of eligibility in 1987. In addition, any families with any out-of-scope (military) person responding for less than one third of his/her eligible days were excluded from the family-level estimation strategy. Out of a total of 13,657 cross-sectional families in round one (with at least one key full-year respondent), 199 were excluded by these criteria (Table 1, not shown). Out of a total of 13,662 annualized families anchored to round one (with at least one key full-year respondent), 198 were excluded from family-level analysis.

For round four cross-sectional and annualized families, the family's reference person (who owns or rents the dwelling) or the reference person's spouse had to be key, and all key individuals in the family had to have responded for their full period of eligibility. As with the round one families, any non-key or out-of-scope person responding for less than one third of his/her eligible days rendered the family unacceptable for family-level analysis. Out of a total of 14,027 cross-sectional families in round four (with a head or spouse who was a key full-year respondent), 311 families were excluded from family-level analysis. Out of a total of 14,198 annualized families anchored to round four (with a head or spouse who was a key full-year respondent), 450 were excluded by these criteria.

In analyzing variables such as total health care utilization or expenditures over the year, it was necessary to annualize the values obtained for people who responded for only a part of the survey year. As stated above, there are no families included in the analysis who have anyone who responded for less than one third of the year. Note that such variables were sometimes annualized to less than 365 days, since some people had days in 1987 during which they were ineligible for the survey: not yet born, died, lived outside of the U.S., non-civilian, or institutionalized. Utilization and expenditure data for out-of-scope individuals (those household members who were in the military the entire year) were excluded from family-level totals. Those people were counted, however, in other demographic-type variables in the tables.

Family-level weights were constructed for each of the four family types and were based on the person-level weight of the family's

reference person and then post-stratified so as to correspond to the March 1987 and November 1987 Current Population Survey (CPS) family totals for round one and round four families, respectively. Post-stratification categories were based on family type (head married, single female-headed, single male-headed), family size, race/ethnicity of head, and age of head.

3.4 Standard Errors and Significance Testing

All standard errors of weighted estimates presented in the tables have been adjusted to allow for design complexities using the Taylor Series method (Shah, 1981). When testing differences between round one and round four family types, since the two family types were mostly comprised of the same people, the independence assumption of the standard T-test was clearly violated. Instead, a 95% confidence interval was calculated around the round one family value, and a determination made whether the round four family value fell within this interval. Round four is often considered to be the best round for cross-sectional analysis in the NMES, since the income questions were asked in this round. This method of determining significance assumes that the round four value has no error, and determines whether the round one value approximates this "known value."

When comparing stable families to the two types of dynamic families, one is dealing with mutually exclusive categories. For comparisons of demographic variables and their proportions, a Chi-square test, adjusting for design complexities (Shah et al., 1989), was carried out for each variable. Standard t-tests were carried out for health care utilization and expenditures in a pairwise fashion, comparing stable families to families with a change involving the original reference person or spouse, and then comparing stable families to families with other types of compositional change.

4. Results

There were 33,558 people in the 13,458 responding round one cross-sectional families (Table 1, not shown) representing a weighted national estimate of 96.9 million families. The 13,716 responding round four cross-sectional families comprising 34,102 people represent an estimated 97.4 million families. Slightly higher numbers are found in the annualized families, since additional key individuals are added to the cross-sectional families to which they link, and others who do not link to such a family are designated as a separate family.

It can be seen in Table 2 that whether one chooses round one or round four cross-sectional families, estimates regarding the family's demographic characteristics are stable. Family type, size, and poverty status did not differ significantly between round one and round four. Characteristics of the head of the family (race/ethnicity, age, education, employment, health status, marital status, and insurance status) had similar distributions between the two cross-sectional families.

Similarly, when one examines health care utilization and expenditures (not shown) using round one-anchored families versus round four-anchored families (Table 3), no significant differences were found. Whether one anchors annualized families to the beginning or the end of the survey year, the number of family visits to doctor's offices, outpatient departments, emergency rooms, and their associated expenditures yielded statistically similar estimates. The same was true of inpatient hospital stays and prescriptions purchased over calendar year 1987. Note that only facility charges were included in the hospital inpatient stay expenditures.

As one can see from Table 4 (not shown), out of the 14,143 eligible families in existence in either round one or round four, 81.5% had no change in members between the first and fourth rounds (ignoring any change in rounds two and three). This represents 81.8 million families out of the 100.4 million families that existed at either the beginning or end of 1987. Slightly more than five percent of families existed in one but not both of the

rounds being examined, and about thirteen percent had either an addition of a member or a loss of a member, or both. Note that, in this table, the round four family weight was used for all families except those which were not present in round four, in which case the round one family weight was used.

Dividing all families into stable or dynamic families as described in the Methods section, 82.6% of all families were considered stable; i.e., they had no change in members between round one and round four, or they were one-person families who may have become ineligible during the course of the year. Slightly more than six percent of families had a change involving the loss of the round one reference person or spouse (i.e., the family's original reference person or spouse died or otherwise became ineligible before round four) or were a family newly-formed during the year. Almost two-thirds of the families with a change involving the reference person were new families that broke off from original families sometime during the year. Eleven percent of families experienced some sort of loss or addition of members not involving the original reference person or spouse. About one quarter of this last type of family had a newborn baby during the year.

As one can see from Table 5, there are significant differences between stable and dynamic families in terms of demographics. Note that, in this table, round four cross-sectional families were examined, plus round one cross-sectional families that no longer existed in round four. Although there were no significant differences found with respect to Census region and metropolitan status, stable families tend to be characterized as headed by a married couple, as are those with a change other than in the reference person, presumably since one quarter of the latter contain families with a birth during the year. Families with a change involving the reference person are more often single-headed households by round four, more often female-headed than male-headed. Such families also tend to be one-person families in round four, whereas families with other changes tend to be larger families (with four or more people) in round four.

Stable families have a slightly higher representation of non-black non-Hispanic heads of family, whereas families experiencing changes other than those involving the reference person or spouse have a somewhat higher representation of round four household heads who are Hispanic or black. The age of the family's head differed significantly between the three types of families. Stable families are represented by heads spanning all four age groups fairly evenly, with the highest percent of family heads age 65 or older. Families with a change involving the original reference person or spouse are characterized predominantly by younger heads in round four (ages 0 to 34), and families with other changes tend to be headed in round four by younger (ages 0 to 34) and middle-aged (ages 45-64) people.

With respect to the educational level of the family head, families with a change involving the original reference person or spouse have a higher propensity than the other family types to have between 9 and 15 years of education, and are less likely to have less than 9 or more than 15 years of education than the other two family types. Stable families are least likely to have an employed family head in round four, perhaps due to the higher percentage of retirement aged heads, and families with changes other than those involving the reference person or spouse are most likely to have an employed head.

While interpreting differences in the health status of the family head is not straightforward, it appears that the heads of stable families tend to be less healthy than those dynamic families with changes other than those involving the original reference person or spouse, who are most likely to be in excellent health. Once again, this may be attributable to the higher percentage of elderly represented in stable families. For stable families, the marital

status of the family head in round four is most likely to be married, but is also slightly more likely to be widowed and divorced and less likely to be separated than the other two family types. Families with a change involving the original reference person or spouse are most often characterized by round four heads who have never been married, and are more likely than the other two family types to be separated. They are less likely to be headed by married or divorced people than the other two family types. And heads of families experiencing other types of changes tend to be overwhelmingly married and less likely to be never married or widowed than the other types of families.

The head of a stable family was more likely to have had private insurance during round four than dynamic families, whereas those families experiencing a change involving the original reference person or spouse was more likely than the other two family types to be headed by an uninsured person in round four.

One can see from Table 6 that stable families differed significantly from those with a change involving the original reference person or spouse with respect to health care utilization and expenditures (not shown) for medical office visits, hospital stays, and prescriptions purchased. Stable families had more medical office visits and prescriptions and fewer hospital stays. Expenditure differences following the pattern found with utilization. Note that, in this table, round four-anchored annualized families were examined.

Stable families differed significantly from families experiencing other types of compositional change in terms of health care utilization and expenditures. Dynamic families of this type experienced significantly more medical office visits, outpatient visits, emergency room visits, and hospital stays (and related expenditures) than did stable families. However, the difference in outpatient visit expenditures was not significant. These dynamic families spend significantly less on prescription medicines than stable families. One could argue that these differences are likely attributable to the larger family sizes found in these dynamic families. In order to explore that possibility, *per person* utilization and expenditures within a family were examined as well.

Stable families had significantly higher per person utilization and expenditures for outpatient visits and prescription medicines, and significantly higher per person expenditures for medical provider visits, than dynamic families with a compositional change not involving the reference person. Stable families had significantly fewer hospitalizations per person in the family.

5. Discussion

No significant differences were found between estimates resulting from families defined at the beginning of the year versus the end of the year. Demographic comparisons were made using cross-sectional families at rounds one and four, and annual health care utilization and expenditure comparisons were made using annualized families anchored at round one and at round four. This is a reassuring finding for advocates of the cross-sectional approach to family estimation in a longitudinal survey.

The longitudinal method of family-level analysis in essence excludes some families which are more dynamic in nature. While eighty-three percent of families were considered "stable" by our definition, when comparing round one to round four, and an additional eleven percent might be included in a longitudinal family definition, significant differences were found between stable and the remaining six percent of dynamic families in terms of demographic characteristics and health care utilization and expenditures.

Dynamic families that experience a change involving the original reference person or spouse, or that involve newly-spawned families, tend to be headed by single rather than married persons, are more likely to be one-person families, and are somewhat more likely to be headed by black or Hispanic individuals than stable families. They are headed by much younger people, with a high school or college level of education, and more than half of these households are headed by people who have never been married or who are separated. These households are also headed by uninsured individuals more so than stable families or families with other types of change.

While this type of family can either result from the loss by death or institutionalization of the original reference person or spouse, it appears that these newly-spawned families of young adults (comprising 64% of this group) are influencing the demographic characteristics observed. Ignoring such families in a longitudinal approach would likely yield biased results, even though these families comprise slightly more than six percent of all families.

Families experiencing changes other than those involving the reference person or spouse, and other than newly-formed families, tend to be more like stable families, except that they are larger in size, presumably due to the birth of children (24% of this group), which landed these families in this category. This type of family has a slightly higher representation of blacks and Hispanics than the other two family types, and have a higher representation of employed family heads. They also have a higher representation of family heads in excellent health and being married. These families would most likely be included in a longitudinal approach to family-level analysis.

Stable families were different than dynamic families in terms of the family's health care utilization and expenditures. Stable families had significantly more expenditures related to medical office visits and prescriptions and significantly fewer hospital stays than families with a change involving the original reference person or spouse or newly-spawned families.

Families with additional members joining them during the year, or with the loss of someone other than the original reference person or spouse, had significantly more medical office visits, outpatient visits, emergency room visits, and hospital stays than stable families.

6. Summary

Longitudinal family analysis is problematic due to the fact that families can change in composition over time. Using the 1987 NMES data, it has been shown that using a cross-sectional approach to analysis is a viable option, yielding similar results when one chooses the first or the last round of data collection. Annualized families can be formed, anchored to a particular round, for estimating annual types of variables, such as health care utilization and expenditures over the course of the year.

Although more than eighty percent of families remained stable of the course of the year, those that changed in composition over the year, or those that were newly formed during the year, were significantly different than stable families in terms of demographics and health care utilization and expenditures. While these differences were not surprising, ignoring these families in any longitudinal approach to family level analysis, particularly families newly-created during the year, is ill-advised.

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8. Tables

Table 2. Demographics for Round 1 versus Round 4 Cross-sectional Families | Table 5. Demographics for Stable vs. Dynamic Families

Family type:	Round 1 Families proport'n	s.e.	Round 4 Families proport'n	s.e.	Stable Families proport'n	s.e.	Ref Psn Change proport'n	s.e.	Other Change proport'n	s.e.
Head married with spouse present	.532	.007	.523	.007	.523	.008	.260	.018	.687	.014
Male head, no spouse present	.177	.005	.181	.005	.182	.005	.320	.019	.084	.009
Female head, no spouse present	.291	.006	.295	.005	.294	.006	.420	.016	.230	.012
Number of persons in family:										
1	.328	.007	.335	.007	.353	.007	.413	.018	.000	.000
2	.275	.005	.270	.004	.276	.005	.278	.017	.176	.013
3	.161	.004	.160	.004	.148	.004	.141	.012	.278	.013
4 +	.236	.005	.235	.005	.223	.005	.168	.013	.546	.016
Race/ethnicity of head:										
Hispanic	.064	.006	.064	.006	.061	.005	.075	.011	.089	.011
Black, non-Hispanic	.111	.006	.110	.006	.107	.006	.119	.014	.141	.012
Other	.825	.008	.826	.008	.833	.008	.806	.018	.769	.014
Age of head (in round):										
0 to 34	.320	.007	.316	.007	.282	.007	.691	.020	.390	.015
35 to 44	.203	.005	.206	.004	.212	.005	.116	.014	.205	.012
45 to 64	.276	.005	.275	.005	.277	.005	.113	.013	.333	.013
65 or older	.200	.005	.203	.005	.230	.006	.080	.010	.073	.006
Years of education of head:										
0 to 8	.130	.005	.126	.005	.132	.005	.079	.010	.115	.010
9 to 11	.132	.004	.137	.004	.129	.004	.216	.020	.164	.010
12	.339	.007	.339	.007	.337	.007	.371	.018	.341	.016
13 to 15	.179	.004	.182	.004	.179	.004	.210	.018	.182	.013
16 to 18	.210	.007	.205	.006	.213	.007	.108	.012	.189	.014
Unknown	.010	.001	.010	.001	.010	.001	.016	.004	.009	.003
Employment status of head (in round):										
Employed	.683	.007	.676	.007	.661	.008	.714	.017	.757	.013
Not employed	.317	.007	.324	.007	.339	.008	.286	.017	.243	.013
Health status of head:										
Excellent	.242	.006	.244	.005	.241	.006	.230	.017	.259	.011
Good	.464	.005	.467	.005	.466	.005	.437	.019	.461	.014
Fair	.170	.005	.171	.005	.176	.005	.103	.011	.152	.009
Poor	.041	.002	.041	.002	.043	.002	.029	.007	.035	.004
Unknown	.083	.003	.076	.003	.075	.003	.202	.017	.092	.009
Marital status of head (in round):										
Never married	.168	.006	.172	.005	.171	.006	.356	.020	.092	.008
Married	.540	.007	.533	.007	.530	.008	.236	.019	.694	.014
Widowed	.125	.004	.124	.003	.133	.004	.120	.011	.070	.007
Separated	.036	.002	.040	.002	.029	.002	.193	.018	.036	.005
Divorced	.130	.004	.131	.004	.137	.005	.093	.012	.108	.009
Insurance Status of head (in round):										
Ever private	.757	.007	.764	.007	.776	.007	.634	.020	.714	.015
Ever public, never private	.107	.005	.104	.005	.105	.005	.107	.011	.106	.009
Uninsured during round	.136	.005	.132	.004	.119	.004	.259	.016	.180	.011

Table 3. Health Care Utilization for Rd 1-Anchored vs. Rd 4-Anchored Families | Table 6. Stable vs. Dynamic Families

Family-Level Totals for 1987:		Round 1-Anchored mean	s.e.	Round 4-Anchored mean	s.e.	Stable Families mean	s.e.	Ref Psn Change mean	s.e.	Other Change mean	s.e.
No. visits to:	Medical Provider Office	11.02	0.20	10.90	0.19	10.66	.21	6.79	.43	15.75	.59
	Outpatient Department	1.41	0.06	1.39	0.06	1.34	.06	1.43	.29	1.82	.17
	Emergency Room	0.55	0.02	0.54	0.01	0.51	.02	0.58	.05	0.81	.04
Number of:	Hospital Inpatient Stays	0.32	0.01	0.32	0.01	.25	.01	0.40	.03	0.88	.04
	Prescriptions Purchased	12.70	0.21	12.63	0.22	13.05	.24	7.37	.58	12.10	.48

Tables 1 and 4, and the expenditure portions of Tables 3 and 6 can be obtained from the authors.