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1. Introduction

The primary objective of this report is to investigate reasons for incomplete reporting of noninstitutional deaths in household surveys when the household reports:¹

- deaths that occurred in the dwelling unit the household occupies,
- (2) deaths that occurred in the unit adjacent to the dwelling unit the household occupies,
- (3) deaths of parents that occurred in a different dwelling unit than the one the household occupies,
- (4) deaths of siblings that occurred in a different dwelling unit than the one the household occupies.

Why investigate the incomplete reporting of deaths in household surveys under the alternative conditions listed above? This question needs to be discussed first. Then, we will describe the design of a survey experiment to investigate incomplete reporting of deaths. Finally, we will analyze some preliminary statistics derived from the survey experiment.

2. Counting rules

In mortality surveys, households report retrospectively about deaths that occurred during a prior calendar period. Since decedents are not residents of households when the survey is conducted, it is essential to adopt counting rules for linking deaths to households or dwelling units that will report them in the survey. The counting rule conventionally adopted in the mortality survey links each death to the decedent's former dwelling unit, that is, the dwelling unit that was the decedent's place of residence at the time of death. Thus, in the conventional survey, a household reports about deaths that occurred in the dwelling unit it is occupying.

In addition to the counting rule of the conventional survey, there are other possible rules for linking deaths to dwelling units. For example, deaths may be linked to the dwelling units of neighbors. According to this rule, a household reports deaths of persons who formerly lived in a neighboring dwelling unit. There are also a large number of possible rules for linking deaths to households. For example, consanguine rules link deaths to households of specified surviving relatives, such as siblings or children, of the decedent. According to consanguine rules, a household reports deaths of surviving relatives who live in the household.

The survey estimator is unbiased, however, if and only if the counting rule assures that every death is linked to an existing household or dwelling unit when the survey is conducted. The conventional rule would appear to satisfy this condition for noninstitutional deaths barring the possibility that decedents were homeless or that their former dwelling units were demolished. The rule linking deaths to dwelling units of neighbors also comes close to satisfying the condition for an unbiased estimator since virtually every dwelling unit has a neighboring dwelling unit assuming that it is operationally feasible to uniquely define a "neighboring" dwelling unit. Neither of the consanguine rules previously mentioned would satisfy the condition because many decedents do not have surviving children or siblings. However, if a consanguine rule and the conventional counting rule were jointly adopted in a survey the condition for an unbiased estimator would be satisfied. Based on a multiplicity rule of this type, a household would report deaths that occurred in the dwelling unit it occupies as well as deaths of relatives that occurred in other dwelling units. A noteworthy difference between conventional and multiplicity counting rules is that the conventional rule links each death to one and only one household while the multiplicity rule links each death to at least one household. \mathbf{L}'

Incomplete reporting of deaths in household surveys based on conventional counting rules has been substantial. In household surveys that were conducted in several Asian countries the incompleteness ranged between 10 and 80 percent.²⁷ In a North Carolina survey experiment conducted by Horvitz,³⁷ 15-20 percent of the deaths were not reported. The underreporting would have been greater except that neighbors were used as proxy respondents whenever the information could not be obtained from households that occupied the decedents' former dwelling units.

We believe that bias due to incomplete reporting of deaths is greater in surveys based on a conventional counting rule than it would be in surveys based on alternative counting rules involving households of neighbors and/or relatives. However, this report has a more limited objective. We hypothesize that the level of incomplete reporting and the factors contributing to incomplete reporting of deaths are related to the kinds of deaths that households are eligible to report in the survey.

3. Survey experiment

Estimates presented in this report are based on a survey experiment involving a sample of 142 white noninstitutionalized adult deaths that occurred in Los Angeles County during the four month period July-October 1969. The sample was selected from the records of registered deaths filed in the County Health Department.

The field work, completed during the first three months of 1970 involved interviews with three kinds of households:

- (1) For each of the 142 sample deaths the interviewer visited the household occupying the decedent's former dwelling unit. Addresses for these dwelling units were obtained from the death records.
- (2) For a random subsample of 26 deaths the interviewer visited a household located adjacent to the decedent's former dwelling unit.
- (3) For 46 deaths the interviewer visited the household of a surviving sibling or child that had been reported by the household occupying the decedent's former dwelling unit.

In the survey experiment a household occupying the decedent's former dwelling unit and the household adjacent to it reported deaths that occurred in the decedent's former dwelling unit. The household of relatives not occupying the decedent's former dwelling unit reported deaths of siblings and parents. Any adult in a selected household was an acceptable respondent to report the eligible deaths that occurred during calendar year 1969. In this manner, the survey experiment simulated household surveys based on the conventional counting rule and on rules linking deaths to dwelling units of neighbors and to households of siblings and children.

Some limitations of the survey experiment design are noteworthy. (1) The sample is not representative of a well defined population because the selection was purposively limited to 10 sets of Census tracts in order to reduce field traveling costs. (2) The sample sizes are very small particularly with regard to the number of interviews that were attempted with neighbors and with relatives that did not reside at the decedents' former dwelling units. (3) Interviews were possible with relatives if and only if the decedent's former dwelling unit reported the death and reported the name and address of the decedent's relative who lived in Los Angeles. (4) Finally, the survey experiment did not measure erroneously reported deaths. It was limited to an investigation of missed deaths.

4. Findings

Estimates of incomplete reporting of white deaths by resident and nonresident respondents were derived from the survey experiment. These estimates as well as statistics on the reasons that deaths were missed are presented in Table 1.

Nearly 40 percent of the deaths were missed in the survey of households occupying the decedents' former dwelling units. A smaller percentage of deaths was missed by households of neighbors. Households of children and of siblings respectively that were not occupying the decedents' former dwelling units missed about 20 percent of their parents' deaths and about 40 percent of their siblings' deaths.

Basically one of two conditions accounted for deaths that were missed in the survey. Either the interview was completed and the death was not reported or the death was not reported

Table l.	Reasons white deaths were missed by type of deaths that	it
	households reported in the survey.	

<u> </u>	Deaths reported by the household						
Reasons deaths were missed	Deaths in the dwelling unit occupied by the bousebold	Deaths in the dwelling unit adjacent to the household	Deaths of relatives in a dwelling unit not occupied by the household				
	che nousenoiu		Total	Sibling	Parent		
Number of deaths	142	26	46	16	30		
Total percent	100	100	100	100	100		
Deaths reported Deaths missed	63 37	69 31	74 26	62 38	80 20		
Interview completed Interview not completed	19 18	27 4	13 13	25 13	7 13		

because the interview was not completed. Noninterviews account for about half the deaths missed by households occupying the decedents' former dwelling units, for more than half the deaths missed by neighbors and by households of siblings, and for less than half the deaths missed by households of children.

Principal reasons for noninterview were refusals and no one was found at home. The refusals and not-at-home rates were about six and ten percent respectively for households occupying decedents' former dwelling units. The comparable rates were smaller for households of neighbors and relatives. The proportion of deaths that were missed in interviews completed with each type of household is presented in Table 2. Deaths of parents were reported in over 90 percent of the interviews completed with childrens' households that were not occupying the decedents' former dwelling units. Deaths were reported in 70 to 80 percent of the interviews completed with each of the other kinds of households. The reasons deaths were missed in completed interviews varied considerably by the kind of deaths the household reported.

Table 2.	Percent o	f white	deaths	that were	missed	in co	ompleted	interviews
	by type o	f deaths	s that	households	reporte	d in	the surv	zey.

	Deaths reported by the household					
Reporting status of death	Deaths in the dwelling unit occupied by household	Deaths in the dwelling unit adjacent to the household	Deaths of relatives in a dwelling unit not occupied by the household			
	nousenord	the household	Total	Sibling	Parent	
Number of completed interviews	117	25	40	14	26	
Total percent	100	100	100	100	100	
Deaths reported	77	72	85	71	92	
Deaths not reported	23	28	15	29	8	

Of the 117 completed interviews with households occupying the decedent's former dwelling units, 91 were former households of the decedent and 26 were households that had moved into the dwelling units after the deaths occurred. All but one of the former households reported the death but none of the latter households reported the death in the survey. Thus, changes in the household occupying the decedents' former dwelling units between the date of death and the date of the interview accounted for all but one of the 27 deaths that were not reported in completed interviews with these dwelling units. (In addition, three interviews were not completed because the decedents' former dwelling unit was vacant when the survey was conducted.)

If neighbors did not know of the death next door, it was not because they had moved there after the death occurred. Twenty-three of the twenty-five neighbors who did not report deaths in completed interviews had lived in the same dwelling unit prior to July 1969, the earliest month of any death in the survey experiment.

Why were deaths of siblings and parents missed in interviews completed with relatives' households not occupying the decedents' former dwelling units? Since these relatives were reported by the decedents' former household, it seems almost certain that the relatives knew of the death. It is noteworthy that proxy respondents such as in-laws were interviewed in about half the relatives' households. However, proxy respondents missed a smaller fraction of deaths than self-responding relatives although the difference is not statistically significant.

We can only speculate why deaths of parents were reported more completely than the deaths of siblings. The small number of households of siblings and parents in the survey experiment precludes reaching any statistical conclusions. A case study review indicated, however, that the age of the respondent may be a factor. For example, neither of the two respondents in households of surviving sibling who were over 70 years old reported the sibling's death. On the other hand, none of the respondents in households of surviving children were in the oldest age grouping.

5. Conclusions

We have shown that the completeness of death reporting and the reasons deaths are missed in single retrospective surveys vary according to the kinds of deaths that households are eligible to report. These findings imply that the completeness of death reporting can be improved by adopting appropriate rules for linking dwelling units to the deaths they report in the survey. The appropriateness of the rules would probably vary from survey to survey depending on the population being studied.

Footnote

¹An understanding of the difference between a household and a dwelling unit is critical in reading this report. A <u>dwelling unit</u> is a separate and independent enclosure such as a house or apartment occupied or intended for occupancy as living quarters by a group of persons living together or by a person living alone. The person or group of persons residing in the dwelling unit comprise the household. A dwelling unit may be occupied by the same or different households at two points in time.

References

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