

RETURN RATES, POSTMASTER RETURNS, FOLLOW-UPS, AND FAIL-EDITS IN THE 1980  
NATIONAL NATALITY SURVEY (NNS) AND 1980 NATIONAL FETAL MORTALITY SURVEY (NFMS)  
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Abstract

The 1980 NNS and NFMS are nationally representative surveys conducted by the National Center for Health Statistics (NCHS). They are based on samples of 9,941 live birth (LB) and 6,387 fetal death (FD) vital records which are weighted up to reflect U.S. estimates of 3,612,258 LB's and 19,205 FD's of 28 weeks or more gestation in 1980. Four types of respondents associated with the sampled deliveries (mothers, hospitals, physicians, and other medical providers of ionizing radiation) were mailed 8-page questionnaires to greatly expand the information about LB's and FD's on social, demographic, maternal health, infant health, and radiation characteristics. Fifteen minute telephone interviews with mothers or five minute reminders with medical sources were done if there was no response to two waves of mailed questionnaires. This report describes response characteristics for all four types of respondents. For example, of the 85.5% return rate for mothers, 36.8% was due to first mailing, 20.8% was due to second mailing, 23.2% was due to telephone interview, and 4.7% was due to third mailing.

Background on The 1980 NNS/NFMS

Vital Statistics followback surveys are periodic data collections based on samples of registered births and deaths occurring during given time periods. (They are sometimes called "followback" surveys since they follow back one or more informants identified on a vital record.) The 1980 NNS is a national probability sample of all U.S. live births and the mothers, physicians, hospitals, and other medical sources associated with those births. This includes an oversampling of low-birth-weight infants (under 2,500 grams) in order to do detailed analyses of high-risk infants. The 1980 NFMS is a national probability sample of fetal deaths of 28 weeks or more gestation and the mothers, physicians, hospitals, and other medical sources associated with those fetal deaths (also called stillbirths). Both surveys studied 12 calendar months of births and fetal deaths from January 1980 through December 1980. The NNS studied 9,941 live births and the NFMS studied 6,387 late fetal deaths; NCHS conducted the field work. The pretest included 697 District of Columbia, Michigan, Montana, and New York State deliveries, and has been discussed elsewhere (Placek, 1983; Heuser and Jones, 1980).

The "M-CS" form, mailed to each married mother, collected information on her prenatal health practices such as smoking and drinking, a complete pregnancy history, and occupational and educational background of the mother and the father. An abbreviated "M-CS" telephone interview was attempted if the mother did not respond to two mailings. For reasons of privacy and confidentiality, no attempts were made to contact mothers who were not married at the time of delivery, either by mail or by telephone. The "M-CS" form also requested the names and addresses of medical sources seen by the mother for x-rays, ultrasound, and nuclear medicine during the 12 months before her delivery. Consent Statements from the last page of the "M-CS" form and signed by mothers, when available, were routinely included with questionnaires mailed to medical sources. Research on the NNS/NFMS has demonstrated that inclusion of the mother's Consent Statement with the questionnaires mailed to her medical sources significantly increased their response rates (Simpson, 1983). Therefore, we delayed mailing to medical sources until all followups with mothers were completed, and we had maximized the availability of Consent Statements to send to medical sources.

The attendant at delivery named on the vital record was mailed a "P-2" form if his/her address was different from that of the hospital where the delivery occurred. In addition, the hospital where the delivery occurred was mailed an "H" hospital form. If the delivery did not occur in a hospital, the attendant at delivery (but not the hospital) was mailed a questionnaire. The "H" and "P-2" questionnaires focus on the delivery episode, maternal health, prenatal and postpartum visits, characteristics of the infant, and x-ray, ultrasound, and nuclear medicine procedures received by the mother during the 12 months before her delivery. Also, the mother's medical sources may have provided names and addresses of other medical sources which gave ionizing radiation to the mother in the year preceding delivery. These sources of ionizing radiation, whether identified on "M-CS", "H", or "P-2" questionnaires, were mailed an "X" questionnaire to assess the date, type, and purpose of the x-ray, ultrasound, and/or nuclear medicine procedure performed. Identical questionnaires were used in the 1980 NNS and 1980 NFMS since the surveys are parallel in design and content, and telephone followup was used in the case of nonresponse to two waves of

the mailed questionnaire. Thus, the same "M-CS" form was mailed to an NNS mother who delivered a live birth as to an NFMS mother who delivered a late fetal death; appropriate skip patterns made this approach possible with the "H", "P-2", and "X" questionnaires as well.

After data collection was completed, there were 25,433 "M-CS", "H", "P-2", and "X" questionnaires to merge (using an ID#) with the appropriate 9,941 Certificates of Live Birth, and 12,797 "M-CS", "H", "P-2", and "X" questionnaires to merge with the appropriate 6,387 Reports of Fetal Death. The "missing data gaps" caused by unit nonresponse (for example, the "H" questionnaire not returned, but the "M-CS", "P", and "X" questionnaire were available to merge with the Certificate of Live Birth) were filled with imputed data, or data obtained from similar respondents based on a matrix of data values appropriate for each delivery based on closely related social, demographic, and/or health characteristics. Imputation strategy and sampling variances have been discussed elsewhere (Botman, 1983).

These 1980 NNS/NFMS national followback surveys extend, for statistical purposes, the range of items which are not usually included on vital records. They provide national estimates of births and fetal deaths by numerous characteristics not available from the vital registration system. They also serve as a basis for evaluating the quality of information reported on the vital records, and permit trend studies with followback survey data collected in earlier years. There were NNS's in 1963, 1964-66, 1967-69, and 1972; the NFMS was the first ever conducted. NCHS will publish many of these research reports in late 1983 and 1984. A 1980 NNS/NFMS public use tape should be available about December 1983.

### Findings

The data presented here were obtained from computerized files maintained by a Survey Management System (SMS), which is an automated system of computer programs and data files used to tract receipt and control of questionnaires. The SMS is maintained by the Data Collection Branch, Division of Data Services, National Center for Health Statistics -- the organization which conducted all data collection for the 1980 NNS/NFMS. This SMS information will not be on the 1980 NNS/NFMS Public Use Tape, and will not duplicate information to be presented in a major methodological report to be published by NCHS in 1984 (Keppel et. al., no date).

The SMS generates return rates, in contrast to response rates. Response rates designate the number of completed questionnaires

in relation to the number of eligible units in the sample, and they were 5-10% lower than the return rates. Return rates, on the other hand, refer to how well a task has been accomplished in tracking and documenting all types of returned questionnaires - including completed questionnaires returned by the proper respondent, questionnaires returned by ineligible respondents, questionnaires returned blank accompanied by a note of refusal, and questionnaires returned by the Post Office as undeliverable (Council of American Survey Research Organizations, 1982). Thus, the return rate measures the effectiveness of followup efforts in that it quantifies the number of replies to a survey in such a way so as to allow cases to be closed out and not subject to a followup contact. The complement of the return rate, i.e., "not returned", reflects the proportion of the initial sample that the researcher must either recontact or give up on. For the "not returned" questionnaires, it is often presumed that potential respondents received the questionnaires and ignored them. However, research in Great Britain showed that of 300 postcards addressed to a fictitious person (all of which should have been returned by the Government Post Office), only 203 were returned. The other 93 were presumably accepted by the wrong person, lost, or deadlettered rather than returned to the British Institute for Manpower Studies (Survey Methods Newsletter, 1982).

Table 1 presents return rates for four types of respondents in the 1980 NNS/NFMS and distributes return rates according to whether the return was elicited by the first mailing, second mailing, telephone reminder or interview, or third mailing.

About 4-6 months after their 1980 deliveries occurred, mothers were mailed the "M-CS" questionnaire, and then a second "M-CS" questionnaire four weeks later if there was no reply to the first mailing. After 7 weeks (on the average), if there was no reply to the second mailing, the abbreviated "M-CS" telephone interview was attempted, including a consent statement read to the mother. If the mother could not be reached by phone, a third mailing was made one week after the telephone contact was determined to be unsuccessful. Table 1 shows that of 13,680 married mothers, 36.8% returned the "M-CS" form after the first mailing, 20.8% returned the form after the second mailing, 23.2% responded to the abbreviated "M-CS" telephone interview, and 4.7% returned the third "M-CS" form mailed -- for a total return rate of 85.5%; nothing was ever returned from 14.5% of married NNS/NFMS mothers. Most women having births are in their twenties, and having a birth may be an incentive to change their residences. Thus, the extent to which our return rates by follow-up contact are generalizable to other studies may depend on the similarity

of respondents being contacted and the nature of the study.

"P-2", "H", and "X" (attendants at delivery, hospitals, and radiation) medical sources were all contacted in an identical manner. They were mailed a questionnaire, and then a second one four weeks later if there was no reply to the first mailing. After 12 weeks (on the average) if there was no reply to the second mailing, telephone reminders were conducted. No questionnaire data was collected by telephone; if the medical sources said that they needed another questionnaire, it was mailed to them. Total return rates for medical sources are in the 82-91% range and therefore similar to mothers' rates, but a greater portion of the total return rate for medical sources as compared with mothers was obtained from the first mailing. Telephone reminders to medical sources accounted for about 10% of the returned questionnaires, and telephone interviews with mothers accounted for more than 20% of the return rate.

Table 2 shows data on "fail-edits" in the 1980 NNS/NFMS. All returned questionnaires were physically inspected for completeness and consistency of response, and those which did not measure up to standards are said to have failed the edit. In some cases we recontacted the respondent to obtain more complete and consistent responses. Fail-editing and re-contacting of respondents to obtain data items missing from the returned questionnaire as determined by a manual edit of responses is a seldom-reported practice in the survey methods literature. Manual fail-edit and recontact of respondents is very labor intensive, time-consuming, and nets only a small additional information benefit for considerable labor expended. Data items which failed the manual edit were identified on all returned questionnaires and appropriately keyed, but recontact of respondents was done for only a minority of these cases, as staff time permitted. Of 42 questions on the "M-CS" form, 6 were key questions which could trigger a fail-edit and recontact (pregnancy history, maternal occupation, national origin of mother and father, and exposure to radiation). Of 19 questions on the "P-2" form, 13 could trigger fail-edit and recontact (prenatal care, diagnostic tests, exposure to radiation). Of 48 questions on the "H" form, 13 were key questions (prenatal care, diagnostic tests, exposure to radiation). Of 16 questions on the "X" form, 12 were key questions (all about radiation). Fail-edit mailings consisted of another blank questionnaire with key items circled in red, and a special cover letter; this was done only once. Table 2 shows that 6.3% of all 38,230 NNS/NFMS questionnaires failed manual edit on one or more key items. The percent of questionnaires which failed the manual edit was much higher for "M-CS" forms

(11.0%) than for "P-2" forms (2.4%), "H" forms (6.2%), or "X" forms (0.1%). These differences may be accounted for by the fact that mothers were less accustomed to completing questionnaires than were medical professionals, our choice of key fail-edit questions, and the extent to which these key questions could be answered with the data at hand. Our degree of success in obtaining the missing key information is also shown in Table 2. Overall, of 378 fail-edit mailings made, the majority of the time respondents returned the questionnaire with the missing information provided; only rarely were forms returned without information. We also tabulated the time interval between mail-out of the fail-edit form and its return; for the 229 forms returned by mail, 11.4% were returned in 7 days or less, 50.2% in 8-14 days, 12.7% in 15-21 days, 12.7% in 22-30 days, 9.2% in 31-60 days, 0.9% in 61-90 days, and 3.1% in 91 days or over.

In a mail survey, the resolution of postmaster returns (PMR's) must be considered. Lag time of 4-6 months between date of delivery and date of mailing may have particularly affected mothers' PMR's since they are relatively young and mobile. The percent distribution of PMR reasons is shown in Table 3. Of 13,680 "M-CS" forms mailed, 9.1% were PMR's. Staff shortages plagued us, but we attempted to resolve 11.7% of "M-CS" PMR's as follows: we called directory assistance, the Post Office, the attendant at delivery, the hospital billing office, hospital medical records, and "the relative who will always know how to reach you" as shown in her medical providers' records. We were able to obtain a new "M-CS" address and remail to nearly half (47.9%) of the 146 PMR mothers who we tried to get a new address for. Mothers whose PMR's could not be resolved were dropped from the surveys, as were their medical sources. The post-stratified ratio estimation weighting procedure later allowed us to compensate for this bias (Botman, 1983).

Table 3 shows reasons stamped on the outside of the envelope by the Post Office for the questionnaires being undeliverable. If the addressee had left a forwarding address with the Post Office, the Post Office was supposed to forward the NCHS questionnaire to the new address without notifying us. Thus, the return of the PMR to NCHS theoretically meant that the addressee had left no forwarding address. However, almost half of the PMR's for mothers, and most of the PMR's for medical sources, proved to be remailable. We therefore believe that the Post Office had erred in returning many of the PMR's to NCHS, and should have forwarded them. The post card experiment in Great Britain, discussed earlier, reinforces this conclusion.

PMR's for "P-2" attendants at delivery was much less of a problem; only 3.9% were returned by the Post Office as undeliverable. "P-2"

names were obtained from vital records; frequently there was only the physician's signature, and we often had to look up the physician's address after guessing the name from the signature. "P-2" PMR's proved easier to resolve than mothers' "M-CS" PMR's since doctors leave forwarding addresses or can be located through information obtained from the hospital. When we made the attempt to get a new address, we successfully obtained a new address for 71.8% of "P-2's" as compared with 47.9% for "M-CS's".

PMR's for "H" hospitals were negligible -- only 0.3% -- and 94.7% were resolved and remailed. Most of the 0.3% "H" PMR's were due to typographical errors in our address labels, and a few hospitals had been closed.

Of 2,552 "X" forms, 2.8% were PMR's. Part of this is because many "X" names and addresses were furnished by mothers on returned "M-CS" forms with misspelled names and incomplete addresses, although we routinely used medical directories throughout the survey to verify medical names and addresses. Also, "X" medical sources had been seen by mothers up to a year preceding delivery, and the passage of time probably accounted for some PMR returns.

#### Conclusions and Implications

In the interest of brevity, we'll bypass discussion of the usual caveats on type of survey, length of questionnaire, sponsoring organization, relevance of survey items to respondent, etc. and highlight our findings and their implications.

- Return rates (not response rates) in the 1980 NNS/NFMS ranged from 82% to 91% for all types of respondents -- mothers, hospitals, doctors, and other medical sources who gave radiation diagnosis or treatment to the mother.
- The first mailing brought in the bulk of the returns -- more than second mailings, telephone reminders, or telephone interviews.
- For mothers, the telephone interview brought in about as much of the return rate (23%) as did the second mailing (21%) -- and the third mailing was worth doing since it brought in 5% of the returns.

- For medical sources, the telephone reminders accounted for 9% to 14% of the returns. They were useful in "troubleshooting", i.e. determining who had the questionnaire, overcoming objections, extracting a promise to complete it soon, etc.
- Total return rates were similar for all types of respondents, whether they were associated with live births (NNS) or late fetal deaths (NFMS).
- The percent of questionnaires which failed the manual edit of one or more items varied, and was less than 1%, 2%, 6%, and 11% for "X", "P-2", "H", and "M-CS" forms, respectively. When a new form was mailed with the fail edit (FE) items circled (and in some cases, mothers were telephoned for the FE information), the missing information was provided about 75% of the time. We conclude that while the fail-edit procedure is relatively labor intensive for a relatively small increment in information obtained, it is a very feasible procedure.
- About 75% of the fail-edit questionnaires returned came back within 3 weeks of our mailing; this information may be useful in planning future surveys, deciding whether to followup the first fail-edit with a reminder, etc.
- PMR's ranged from less than 1% for hospitals up to 9% for mothers. Post Office error in not forwarding our questionnaires to addressees who had moved may have occurred often. The persistence of the NCHS telephone staff in seeking new addresses for PMR's allowed us to re-mail almost half of the "M-CS" forms, when this labor intensive effort was made. Generally, 60% to 96% of the "X", "P-2", and "H" PMR's could be remailed with corrected names and addresses; we relied heavily on medical directories for these.

Our hope is that the procedures discussed here, and relative successes and limitations of our efforts, help others plan mail and telephone surveys involving diverse types of respondents such as mothers, doctors, hospitals, and other medical sources.

References

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Table 1. Percent Distribution of Questionnaire Return Status by Follow-up Contact: 1980 National Natality Survey (NNS) and 1980 National Fetal Mortality Survey (NFMS)

Type of Questionnaire and Survey	Total		Returned Questionnaires					Not returned
	Number	Percent	(Return rate) Total returned <sup>a</sup>	Returned after first mailing	Returned after second mailing	Returned after telephone reminder <sup>b</sup> or responded to telephone interview	Returned after third mailing	
All Questionnaires	44,126	100.0	86.6	43.1	26.2	15.9	1.5	13.4
Live Births (NNS)	26,915	100.0	86.9	43.2	25.9	16.2	1.6	13.1
Fetal Deaths (NFMS)	17,211	100.0	86.3	42.8	26.7	15.4	1.3	13.7
M-CS Questionnaires	13,680	100.0	85.5	36.8	20.8	23.2	4.7	14.5
Live Births (NNS)	8,326	100.0	86.0	35.6	21.5	23.8	5.1	14.0
Fetal Deaths (NFMS)	5,354	100.0	84.9	38.8	19.7	22.3	4.1	15.1
P-2 Questionnaires	12,346	100.0	82.4	43.9	24.6	13.9	c	17.6
Live Births (NNS)	7,636	100.0	82.6	45.1	23.6	13.9	c	17.4
Fetal Deaths (NFMS)	4,710	100.0	82.0	41.8	26.2	13.9	c	18.0
H Questionnaires	15,548	100.0	90.8	48.0	30.6	12.1	c	9.2
Live Births (NNS)	9,500	100.0	90.8	48.2	30.2	12.4	c	9.2
Fetal Deaths (NFMS)	6,048	100.0	90.7	47.8	31.3	11.7	c	9.3
X Questionnaires	2,552	100.0	88.0	42.4	36.2	9.4	c	12.0
Live Births (NNS)	1,453	100.0	88.8	44.3	35.1	9.4	c	11.2
Fetal Deaths (NFMS)	1,099	100.0	86.9	39.8	37.8	9.4	c	13.1

NOTES: <sup>a</sup> Refusals constitute the following portions of total returned: M-CS - 3.6%; P-2 - 5.4%; H - 11.9%; X - 6.2%. Most M-CS refusals were due to "information requested is too personal" and "questionnaire too long". Most P-2, H, and X refusals were due to lack of a consent statement from the mother.

<sup>b</sup> Mothers received telephone interviews; medical sources received telephone reminders.

<sup>c</sup> No third mailing for medical sources.

Table 2. Percent of Returned Questionnaires Which Failed Manual Edit, and Percent Distribution of Response To Mailed Fail-Edit Forms According to Type of Questionnaire: 1980 National Natality Survey (NNS) and 1980 National Fetal Mortality Survey (NFMS)

Type of Questionnaire and Survey	Total Returned Questionnaires	Percent of Questionnaires Which Failed Manual Edit <sup>a</sup>	Percent Distribution of Response to Mailed Fail-Edit Forms				
			Number	Percent	Returned Form and Provided Missing Information	Returned Form But Provided No Information	Did Not Return Form
All Returned Questionnaires	38,230	6.3	378	100.0	58.5	2.1	39.4
Live Births (NNS)	25,453	5.6	238	100.0	53.8	2.5	43.7
Fetal Deaths (NFMS)	12,797	7.8	140	100.0	66.4	1.4	32.1
M-CS Questionnaires	11,702	11.0	221 <sup>b</sup>	100.0	46.6 <sup>c</sup>	1.4	52.0
Live Births (NNS)	7,157	11.0	146	100.0	43.2	0.7	56.2
Fetal Deaths (NFMS)	4,545	11.1	75	100.0	53.3	2.7	44.0
P-2 Questionnaires	10,173	2.4	42	100.0	73.8	2.4	23.8
Live Births (NNS)	8,364	2.0	22	100.0	68.2	4.6	27.3
Fetal Deaths (NFMS)	1,809	4.7	20	100.0	80.0	0.0	20.0
H Questionnaires	14,110	6.2	115	100.0	75.7	3.5	20.9
Live Births (NNS)	8,622	5.5	70	100.0	71.4	5.7	22.9
Fetal Deaths (NFMS)	5,488	7.4	45	100.0	82.2	0.0	17.8
X Questionnaires	2,245	0.1	-	-	-	-	-
Live Births (NNS)	1,290	0.0	-	-	-	-	-
Fetal Deaths (NFMS)	955	0.2	-	-	-	-	-

<sup>a</sup> Of respondent questionnaires which failed the manual edit, only a small percentage of respondents were recontacted for the missing information due to staff shortages during data collection. The percentages of fail-edit respondents recontacted are as follows: M-CS/NNS - 44.7%; M-CS/NFMS - 41.6%; P/NNS - 15.6%; P/NFMS - 30.8%; H/NNS - 17.2%; and H/NFMS - 12.5%.

<sup>b</sup> Mothers were first fail-edited by telephone (N = 340) if possible, and by mail (N = 221) if they could not be reached by phone. Of 340 telephone fail-edits, 314 or 92.4% yielded missing information.

<sup>c</sup> If telephone and mail fail-edits are combined, 74.3% (417 of 561) of mothers provided missing information, thus making mothers' fail-edit response rate equivalent to those of hospitals and doctors.

Table 3. Percent of Questionnaires Returned by Post Office as Undeliverable, Reasons for Postmaster Returns, and Percent of Questionnaires Which Could be Remailed According to Type of Questionnaire: 1980 National Natality Survey (NNS) and 1980 National Fetal Mortality Survey (NFMS)

Type of Questionnaire and Survey	Number of Questionnaires Mailed	Percent of Questionnaires Returned by Post Office as Undeliverable	Percent Distribution of Reasons for Post Master Undeliverable Returns for Which Attempts Were Made to Obtain a New Address <sup>a</sup>							Percent of Questionnaires for Which New Address Was Obtained and Remailed	
			Total Number	Percent	Moved, No Forwarding Address	Addressee Unknown	No Such Address	Insufficient Address	Refused		Other, Not Specified
All Questionnaires	44,126	4.2	645	100.0	25.6	27.8	21.4	19.7	0.9	4.7	67.4
Live Births (NNS)	26,915	3.4	309	100.0	26.5	25.9	21.7	20.4	1.0	4.5	72.8
Fetal Deaths (NFMS)	17,211	5.4	336	100.0	24.7	29.5	21.1	19.1	0.9	4.8	62.5
M-CS Questionnaires	13,680	9.1	146	100.0	25.3	24.7	13.0	22.6	1.4	13.0	47.9
Live Births (NNS)	8,326	7.5	71	100.0	31.0	19.7	11.3	22.5	2.8	12.7	49.3
Fetal Deaths (NFMS)	5,354	11.6	75	100.0	20.0	29.7	14.7	22.7	0.0	13.3	46.7
P-2 Questionnaires	12,346	3.9	408	100.0	30.1	24.8	24.8	14.5	0.5	1.7	71.8
Live Births (NNS)	7,636	2.8	182	100.0	31.3	26.9	26.9	12.6	0.6	1.7	78.6
Fetal Deaths (NFMS)	4,710	5.8	226	100.0	29.2	29.7	23.0	15.9	0.4	1.8	66.4
H Questionnaires	15,548	0.3	38	100.0	10.5	18.4	10.5	50.0	5.3	5.3	94.7
Live Births (NNS)	9,500	0.4	25	100.0	12.0	20.0	16.0	48.0	0.0	4.0	96.0
Fetal Deaths (NFMS)	6,048	0.2	13	100.0	7.7	15.4	0.0	53.9	15.4	7.7	92.3
X Questionnaires	2,552	2.8	53	100.0	1.9	37.7	26.4	30.2	0.0	3.8	67.9
Live Births (NNS)	1,453	2.8	31	100.0	0.0	38.7	19.4	38.7	0.0	3.2	74.2
Fetal Deaths (NFMS)	1,099	2.9	22	100.0	4.6	36.4	36.6	18.2	0.0	4.6	59.1

<sup>a</sup> Of questionnaires returned by the Post Office as undeliverable, an attempt was made to obtain a new address for the following percentages of them: M-CS - 11.7%; P-2 - 85.0%; H - 74.5%; X - 73.6%. If the M-CS questionnaires could not be remailed, the mother's P-2, H, and X sources were also excluded from the NNS/NFMS. A post-stratified ratio estimation procedure was later used to weight the samples to national estimates and counter the bias introduced by this exclusion procedure.