APPENDIX F: ANALYSIS OF PREVENTIVE SERVICE USE BY OLDER ADULTS IN A HEALTH MAINTENANCE ORGANIZATION

Methods

The Data

OTA contracted with a health maintenance organization (HMO) to provide data on the use of eight preventive services by their over-65 year old enrollees:

- Check-up visit,
- Cholesterol measurement,
- Eye examination,
- Fecal occult blood test,
- Pap smear,
- Influenza immunization,
- Pneumococcal immunization, and
- Tetanus immunization.

OTA chose these services in consultation with the HMO to meet the following criteria:

- they are services often included among discussions or recommendations for elderly preventive health; and
- the HMO's data system routinely records their use as distinct services.

To examine how use varies with age, the HMO also provided comparable data for enrollees between the ages of 40 and 64. The HMO measured the proportions of enrollees using each service within the periods of time presented in table 8.

The HMO is a large, urban, staff model health maintenance organization located in the Northeastern United States. It serves enrollees through private employers, government agencies, and individual accounts. Since January 1976, the HMO has served Medicare beneficiaries, initially under a plan where the HMO billed Medicare for Medicare-covered procedures on a fee-for-service basis. The HMO provided non-covered procedures, including the preventive services examined in this study, through a "wraparound" or "Medi-gap" policy purchased by or for the enrollee.

Beginning in July 1985, the HMO entered into a Medicare demonstration risk contract with over 80 percent of its 2500 existing Medicare enrollees transferring into this plan within the first three months. All of the services covered under the HMO's basic benefit package, including preventive services, were included in the risk contract plan.

The HMO has traditionally encouraged the use of preventive services by at-risk populations through clinical guidelines for preventive care and coverage of regular check-ups. Before October 1987, the monitoring of compliance with these guidelines was limited to pediatric screening and immunization, prenatal screening, and influenza immunization. Since that date, the HMO has adopted a program to monitor and inform clinicians at each visit of a patient's compliance with the HMO's preventive guidelines. Since OTA believed that this program is not typical of most HMOs, this HMO used October 1987 as the endpoint for measuring rates of use for each preventive services studied. Hence, during the periods of time examined, only influenza immunizations reflect any monitoring by the HMO, and for that service, clinicians only received information on aggregate rates of compliance among all enrollees.

Methods of Analysis

The base population for this study is all present and former HMO enrollees who were age 40 or older as of October 1, 1987. The HMO identified the base population through a computerized search of enrollment records and separated the population into four subgroups on the basis of age:

- 40 to 49 years old,
- 50 to 64 years old,
- 65 to 74 years old, and
- 75 years and older.

Because the HMO calculated age at the end of the observation period, some of the enrollees in each group fell below the low age threshold at the time they actually used a specific service.

Through computer searches of this base population, the HMO defined a "denominator population" for each age group and observation period over which the use of a specific preventive service was to be measured. Each "denominator poplation" consisted of all persons of appropriate age continuously enrolled in the HMO during the observation period. Since two of the HMO's ten clinics did not have computerized records at the level of specific clinical services, enrollees from these sites were excluded from the analysis. Enrollees excluded from the denominator files because they came from one of the non-computerized sites or because they were not continuous members represented 20 percent of the base population in each age group.

The "denominator" file for the over-65 age groups consists of *all* continuously enrolled individuals from the eight sites. The denominator population for the 40 to 64 age groups were so large that the HMO used a random sample of these groups for the analysis. They chose a 10-percent random sample for all but the 10-year observation period, where they chose a 20-percent random sample. Table 13 presents the number of observations in each "denominator" file used to calculate the rates of use.

In order to measure the use of each service for each age group, the HMO searched the base population to form "numerator" files consisting of persons who met *both* of the following criteria:

- the individual was enrolled in one of the eight sites at the time the analysis was conducted (June through September 1988); and
- the individual received the specific preventive service within the observation period.

To calculate rates of use, each "numerator" file was compared to its corresponding "denominator" file. Individuals in the numerator file who did not appear in the denominator file were discarded. Stratifying by gender, the HMO tallied the number of individuals remaining in each "numerator" file and divided that number by the number in the corresponding "denominator" file to calculate a rate of use for each service and age-gender group. Table 14 presents the results of this analysis.

It is possible that a few continuously enrolled members transferred from one of the two excluded sites to one of the eight included sites before October 1, 1987. While such individuals would be included in the "denominator" files, they would not appear in the "numerator" file if they received a preventive service at the excluded site. This would deflate the use rate. However, because the two excluded sites serve geographically distinct communities with most members living in close proximity to the clinic, transfer to another site is relatively rare. Therefore, OTA and the HMO concluded that the potential undercounting in the use rates is minimal.

Table 13---Sample Sizes for Each Measurement Period in OTA'S Analysis of
Preventive Service Use in One HMO

Age	10 yr. period (10/77-10/88)			5 yr. period** (10/82-10/87)			3 yr. and 2 yr. ** (10/84-10/87) and (10/85-10/87)			1 yr. period** (10/86-10/87)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
40-4P	250	260	510	455	507	962	725	797	1522	995	1068	2063
50-64'	246	227	473	282	331	613	466	518	984	654	784	1438
65-74**	329	307	636	849	,956	1805	1265	1440	2705	1902	2219	4128
75+**	113	145	258	204	313	517	271	395	666	514	752	1266

● The n for 40-49 and 50-64 age groups represent a 20 percent sample of members continuously enrolled during each period at the eight sites studied. The 65-74 and 75+ age groups represent all members.
● *The n for 40-49 and 50-64 age groups represent a 10 percent sample of members continuously enrolled during each period at the eight sites studied. The 65-74 and 75+ age groups represent all members.

Table 14--- Percents of Continuously Enrolled Members Receiving Eight Preventive Services
During Specified Periods of Time

Age	Check-up visit (1 year period)			Cholesterol (5 year period)			Eye exam (2 year period)			Fecal occult blood (1 year period)			Pap smear (3 year period)			Influenza vaccine (1 year period)			Pneunococcal vaccine (lifetime)			Tetanus vaccine (10 year period)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
40-49 yrs.	24%	39%	32X	68%	67%	67%	39%	50%	44%	21%	32%	27%	N/A	80%	N/A	4%	5%	4%	1%	1%		20%	17	18%
50-64 yrs.	38	49	44	80	77	78	51	55	53	36	46	41	N/A	73	N/A	14	12	13	7	5	6	13	13	13
Subtotal 40-64	29	43	37	73	71	72	44	52	48	27	38	33	N/A	77	N/A	8	8	8	3	2	3	17	15	16
65-74 yrs.	48	52	50	77	76	76	70	74	72	49	53	51	N/A	75	N/A	55	55	55	29	27	28	47	40	44
75+ yrs.	52	47	49	69	64	66	80	79	79	51	46	48	N/A	60	N/A	67	63	64	47	42	44	40	35	37
Subtotal 65+	49	51	50	75	73	74	72	75	73	49	52	50	N/A	71	N/A	58	57	57	33	30	31	45	38	42

Abbreviation: N/A = Not applicable.

SOURCE: Office of Technology Assessment, 1989.