

4.6 SUMMARY AND CONCLUSIONS ON SERIOUS ILLNESS

In section 4 attention has been directed towards serious illness, including risks to life. The work builds on the investigation of the valuation of light symptom reduction, reported in section 3.

Section 4.2 addressed the problem of health measurement. It contained a discussion of different approaches to health measurement. The importance of recognizing that health is a state of mental as well as physical well being was emphasized. Self assessed health status was found to be the most widely used health status measurement technique. While this approach has limitations, it was seen to have an important role to play in health risk reduction benefit research. Its importance stems primarily from the role that self-assessment plays in the perception of benefits from improvements in health prospects.

Because health is a multi-dimensional condition, it is necessary to supplement self-assessment with other measures of health status. Further refinements in health status measurement are needed, including the possible use of the health risk assessment as an interactive health measurement tool.

It is in the valuation of serious illness and mortality that the fragmentary nature of much of the existing literature related to health values becomes most apparent. Progress has been made in valuing aspects of these experiences that are often more important than those that can be measured in terms of market transactions. An important research result reported in section 4 is the integration of serious illness and death as a single life experience. This integration is achieved by placing the experience in a life cycle setting.

Section 4.3 **modelled** the basic context in which people make decisions regarding serious threats to health. A person's position in his own life cycle is seen to be the relevant decision making context. People are seen to make decisions about health over their lifetimes, and life is viewed as a stream of experiences involving widely varying degrees of healthiness and sickness and uncertainty concerning length of life. The major challenge that arose out of this approach was to construct contingent markets that preserved the preference-formation and value-determining context. Isolating small parts of the context in the interest of simplicity was seen to be **theoretically** problematic and led to emphasis on life path scenarios.

Section 4.4 is another source of theoretical guidance to the development of the approach of this study. This section brings utility theory to bear on the problem of valuing small changes in events that are thought of only infrequently and involve low probabilities of occurrence. The model developed in this section

unfolds in a series of theorems. Several theorems address the problem of stimulating respondents to think carefully about their preferences. One theorem states that the closer the sum of money is to the (unknown) value of the program benefit, the harder the respondent will think about the choice. Iterative bidding begins with a rather arbitrary starting point. In subsequent bidding, however, the theorem is applied by taking account of previous completed bids on related programs. The starting point is made identical or close to the final bid on the similar previous program to encourage careful thinking from the beginning.

An important objective is to realistically relate the contingent market good to the respondent's own circumstances. This means tailoring the good to the respondents's endowment. An implication of the theorems is that introspection about preferences is much more effective when this is accomplished. Much progress has been made in tailoring contingent market goods to individual endowments. Nevertheless, more research is required in this area.

Based on the results of the preceding sections, an intensive interview approach to contingent valuation work, reported in section 4.5, proposed a four module interview scheme. The interview is designed to be conducted with from six to ten people and to last about four hours including breaks. The intensive encounter is necessary because of the great difficulty of achieving its central task--obtaining values of events that entail small changes in small probabilities.

The health status module is the first module. It establishes health endowments of respondents and begins the process of careful scrutinizing of preferences. Self-assessment was judged to be an appropriate method. Its brevity is a virtue in survey work, and subjective perception of health is an important determinant of willingness to pay. Detailed knowledge of respondents' symptoms or chronic ailments appropriate to the CV framework were judged to be essential. These health status questions served as explanatory variables as discussed in the health status literature, but they had other functions as well. The questions established the respondents' health endowments, permitting tailoring of the contingent **market** product to the circumstances of the respondent and, as explained in section 4.4, stimulating maximum reflection of the respondent on his preferences.

The second or defensive measures module examines averting behavior to preserve health. Averting behavior includes expenditures and also activities not measured by market transactions. Efforts people are willing to make to achieve better health prospects are probed, with a view to placing a monetary value on them.

The third or risk perception and risk behavior module begins by teaching respondents basic notions of probability as related to their everyday experiences. It then obtains information about their

perceptions of and attitudes towards risk in a variety of situations. Next it conveys an idea of the kinds of probabilities that are involved in matters that concern their health.

The fourth or contingent valuation module establishes contingent markets in health. Hypothetical life experiences involve both quality and length of life that people are asked to evaluate in comparison with their own prospects. Excess deaths, life expectancy, life shortening, a lottery wheel and card games were among the devices developed to present alternatives on which to bid. The module features evaluation of alternative life path scenarios values in a certainty and then in an uncertainty context.

It is believed that the survey **approach** developed in section 4, and the extensive preparation for obtaining expressions of willingness to pay described in the four proposed modules, constitute an advance in survey research on the value of health improvements, and that further empirical applications are needed.

APPENDIX. MANIPULATION OF LIFE TABLES: CANCER ILLUSTRATION

Numerous studies have estimated the effects of environmental and behavioral stressors or interventions on life expectancy. Limited results of uncertain epidemiological and other studies are described in following sections. Results based on assumed elimination of a specific reported disease **or** other reported cause of death are more illustrative. The following discussion describes results of mathematically changing the level of **death**-causing cancer while allowing other competing health risks to proceed at the same rates for each age interval. The results indicate that total removal of cancer would increase the percentage of the population reaching age 80 from 44.5 percent to 52.9 percent, or increase life expectancy by 2.7 years. This conclusion avoids all controversies regarding causes of cancer.

Further, this illustration utilizes available data for female deaths in 1964. The approach could be applied as readily to more recent results for another population category.

Table A-1 presents the mortality experience of an imaginary sample of 100,000 females subject to the death rates which prevailed in 1964. Column 1 lists five-year age intervals, minus the first five years of life. Columns 2 through 4 report deaths for several of the major causes (neoplasms, **cardiovascular** diseases, motor vehicle accidents, and other violence). In column 5 all other deaths are reported and total deaths appear in column 6. The final column contains the number of persons of an age period who survive to enter the next age group. Thus, of 100,000 born, a total of 2,107 do not survive the entire first year; the forces of mortality then act on the remaining 97,893 one-year **olds**, of whom 340 additional females do not survive the fifth birthday.

In Table A-2 the numbers of deaths (from Table A-1) are expressed as fractions of the total numbers of survivors who entered the age interval. Out of 100,000 newborns, 7 die of some neoplasm before the end of year one, for a probability of dying of 0.00007. The probabilities of death for the causes shown are then summed in column 7. The number entering the interval for the 1.0-4.9 age bracket is then

$$100,000 \cdot (100,000 \times 0.02107) = 97,893.$$

Another way of portraying the life experience is to focus on the chances of surviving from one age to another, rather than on the prospects of dying. Table A-3 contains the probabilities of surviving from one age (x) to another **age** (y) for selected ages. To determine the chances of a **20-year** old surviving to age 55, for example, first look at column 1, the goal age, then read across the table to the appropriate base age of 20. The probability is shown to be 0.9137. This **is** calculated by dividing the number of **survivors** to age 55 by the number of living 20-year

olds: 88,583 by 96,954. By this formula, the likelihood that a 10-year old will live to age 85 is 0.2792.

At this point it is possible to demonstrate the effect of removal of a specific cause of death on survival probabilities, while holding constant the death rates due to other causes. In table A-4, when the probability of dying of cancer is reduced to zero, the numbers of people surviving to an older age increases. This is calculated in the same manner as in table A-2; i.e., the number entering the 1.0-4.9 age interval is:

$$100,000 - (100,000 \times 0.02100) = 97,900.$$

Compare this figure to the corresponding number in table A-2; it represents an increase in survivors of 7 per 100,000. A comparison of the number of survivors to age 75 reveals an increase of 67,195 - 59,237 = 7,958.

Note that in the absence of information on disease interaction, the technique used in these calculations probably results in an incorrect estimate of the expected survivorship. As Preston, **Keyfitz** and Schoen (1972) point out, pneumonia, for example, may develop as a complication resulting from another illness, and increase the probability of death from the original illness. Eliminating pneumonia might result in 'an incorrect decrease of deaths from other causes.

In table A-5, the new probabilities of survival, cancer threat removed, are listed. In a comparison with table A-3, a 20-year old's chances of surviving to age 55 are increased from 0.9137 to 0.9402. In other words, the fraction of the population surviving from age 20 to age 55 with the elimination of cancer is 94 percent. In addition, the fraction of the population surviving to age 80 increases from 44.5 percent to 52.9 percent. Interpolation of these results indicates an increase in life expectancy of 2.7 years.

In table A-6, the new probabilities of survival are converted back to the numbers of deaths that would occur **at each** age interval, as in table A-1.

In tables A-7 to A-9, a scenario of altered mortality resulting from halving the cancer death rate is presented. Tables A-10 to A-12 portray the "life experience" with a doubling of the probability of dying of cancer. All six of these tables employ the same mathematical technique used to represent total elimination of cancer.

Table A-1. NUMBER OF PERSONS DYING (OUT OF 100,000 AT BIRTH) FROM ALL CAUSES U.S. FEMALES, 1964

Age	Causes					Total	Number Entering Interval
	Neoplasms	Cardio-vascular	Motor Veh. + Other	Veh. + Viol.	All Other + Unknown		
0 - .9	7	12	79		2009	2107	100000
1 - 4.9	33	9	109		189	340	97843
5 - 9.9	33	7	67		75	182	97553
10 - 14.9	28	11	51		60	150	97371
15 - 19.9	33	19	130		85	267	97931
20 - 24.9	42	42	150		114	348	96954
25 - 29.9	67	65	140		151	423	96606
30 - 34.9	133	110	152		210	607	96183
35 - 39.9	245	200	163		277	885	95576
40 - 44.9	426	350	166		354	1296	94691
45 - 49.9	640	595	177		471	1933	93395
50 - 54.9	1017	1067	178		617	2879	91462
55 - 59.9	1291	1736	197		786	3990	88583
60 - 64.9	1577	2967	204		1027	5775	84593
65 - 69.9	1933	4834	237		1353	8359	78818
70 - 74.9	2050	7175	278		1719	11222	70459
75 - 79.9	2063	10173	355		2044	14690	59237
80 - 84.9	1854	12734	478		2301	17364	44547
85 - 89.9	1086	12573	580		2071	16310	27103
90 - 94.9	543	6287	290		1033	8153	10873
95 - 99.9	181	2095	97		345	2718	2718
						100000	

TABLE A-2. PROBABILITY OF DYING FROM SELECTED CAUSES

Age Interval	Number Entering Interval	Neoplasms	Cardiovascular	Mot or Veh. + Other Violence	All Other + Unknown	Total
0-9	100000	0.00007	0.00012	0.00079	0.02009	0.02107
1-4.9	97893	0.00034	0.00009	0.00111	0.00193	0.00347
5-9.9	97553	0.00034	0.00007	0.00069	0.00077	0.00187
10-14.9	97371	0.00029	0.00011	0.00052	0.00062	0.00154
15-19.9	97221	0.00034	0.00020	0.00134	0.00087	0.00375
20-24.9	96954	0.00043	0.00043	0.04155	0.00118	0.00359
25-29.9	96600	0.00069	0.00067	0.00145	0.00156	0.00438
30-34.9	96183	0.00140	0.00114	0.00158	0.00218	0.00631
35-39.9	95576	0.00256	0.00209	0.00171	0.00290	0.00926
40-44.9	94691	0.00450	0.00370	0.00178	0.00374	0.01369
45-49.9	93395	0.00739	0.00637	0.00190	0.00504	0.02070
50-54.9	91462	0.01112	0.01167	0.00195	0.00675	0.03148
55-59.9	88583	0.01457	0.01937	0.00222	0.00887	0.04504
60-64.9	84593	0.01864	0.03307	0.00241	0.01214	0.06827
65-69.9	78818	0.02455	0.06133	0.00301	0.01717	0.10605
70-74.9	70459	0.02909	0.10183	0.00395	0.02440	0.15927
75-79.9	59237	0.03483	0.17173	0.00599	0.03543	0.24799
80-84.9	44547	0.04162	0.29586	0.01066	0.05165	0.38979
85-89.9	27183	0.03995	0.46253	0.02134	0.07619	0.60001
90-94.9	10873	0.04994	0.57822	0.02667	0.09519	0.75002
95-99.9	2718	0.06659	0.71079	0.03569	0.12693	1.00000

TABLE A-3. PROBABILITY OF SURVIVAL FROM ONE AGE (x) TO ANOTHER AGE (y)

Goal Age (y)	Number Entering Interval	Age (x)										
		10	20	30	40	50	60	70	80	90		
0	100000	1.0000										
1	97893	0.9789										
5	97533	0.9753										
10	97371	0.9737	1.0000									
15	97221	0.9722	0.9985									
20	96954	0.9695	0.9957	1.0000								
25	96606	0.9661	0.9921	0.9964								
30	96183	0.9618	0.9878	0.9920	1.0000							
35	95576	0.9558	0.9816	0.9858	0.9937							
40	94491	0.9469	0.9725	0.9767	0.9845	1.0000						
45	93395	0.9340	0.9592	0.9633	0.9710	0.9863						
50	91462	0.9146	0.9390	0.9434	0.9509	0.9659	1.0000					
55	88583	0.8858	0.9097	0.9137	0.9210	0.9335	0.9685					
60	84593	0.8459	0.8688	0.8725	0.4795	0.8934	0.9249	1.0000				
65	78818	0.7842	0.8095	0.8129	0.8195	0.8324	0.8618	0.9317				
70	70459	0.7046	0.7236	0.7267	0.7326	0.7441	0.7704	0.8329	1.0000			
75	59237	0.5924	0.6084	0.6110	0.6159	0.6256	0.6477	0.7003	0.8447			
80	44347	0.4453	0.4575	0.4595	0.4631	0.4704	0.4871	0.4266	0.6322	1.0000		
85	27183	0.2718	0.2792	0.2804	0.2426	0.2871	0.2972	0.3213	0.3858	0.6102		
90	10873	0.1087	0.1117	0.1121	0.1130	0.1148	0.1189	0.1285	0.1543	0.2441	1.0000	
95	2718	0.0272	0.0270	0.0200	0.0243	0.0247	0.0297	0.0321	0.0386	0.0610	0.2500	
100	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE A-4. PROBABILITY OF DEATH WITH NEOPLASMS ELIMINATED

Age Interval	Number Entering Interval	Neoplasms	Cardio-vascular	Motor Veh. + Other Violence	All other + Unknown	New Total
0-.9	100000	0.00000	0.00012	0.00979	0.02009	0.02100
1-4.9	97900	0.00000	0.00009	0.00111	0.00193	0.00314
5-9.9	97593	0.00000	0.00007	0.00069	0.00077	0.00153
10-14.9	97444	0.00000	0.00011	0.00052	0.00062	0.00125
15-19.9	97322	0.00000	0.00020	0.00134	0.00087	0.00241
20-24.9	97088	0.00000	0.00043	0.00155	0.00118	0.00316
25-29.9	96781	0.00000	0.00067	0.00145	0.00156	0.00369
30-34.9	96425	0.00000	0.00114	0.00158	0.00218	0.00491
35-39.9	95951	0.00000	0.00209	0.00171	0.00290	0.00670
40-44.9	95309	0.00000	0.00370	0.00175	0.00374	0.00919
45-49.9	94433	0.00000	0.00637	0.00190	0.00504	0.01331
50-54.9	93176	0.00000	0.01167	0.00195	0.00675	0.02036
55-59.9	91279	0.00000	0.01951	0.00222	0.00887	0.03047
60-64.9	88498	0.00000	0.03507	0.00241	0.01214	0.04963
65-69.9	84106	0.00000	0.06133	0.00301	0.01717	0.08150
70-74.9	77251	0.00000	0.10183	0.00395	0.02440	0.13017
75-79.9	67195	0.00000	0.17173	0.00599	0.03543	0.21326
80-84.9	52872	0.00000	0.28586	0.01066	0.05165	0.34817
85-89.9	34463	0.00000	0.46253	0.02134	0.07619	0.56006
90-94.9	15162	0.00000	0.57822	0.02667	0.09519	0.70008
95-99.9	4547	0.00009	0.82578	0.03823	0.13599	1.00000

TABLE A-5. PROBABILITY OF SURVIVAL FROM ONE AGE (x) TO ANOTHER AGE (y) WITH NEOPLASMS ELIMINATED

Goal Age	New Number Entering Interval	Age (x)																			
		0	10	20	30	40	50	60	70	80	90										
0	100000	1.0000																			
1	97900	0.9790																			
5	97593	0.9759																			
10	97444	0.9744	1.0008																		
15	97322	0.9732	0.9987																		
20	97088	0.9709	0.9963	1.0000																	
25	96781	0.9678	0.9932	0.9968																	
50	96425	0.9642	0.9895	0.9932	1.0000																
35	95951	0.9595	0.9847	0.9883	0.9951																
40	95309	0.9531	0.9781	0.9817	0.9884	1.0000															
45	94433	0.9443	0.9691	0.9727	0.978	0.9908															
50	93176	0.9318	0.9562	0.9597	0.9663	0.9776	1.0000														
55	91279	0.9128	0.9367	0.9402	0.9466	0.9577	0.9796														
60	88498	0.483	0.9082	0.9115	0.9178	0.9285	0.9498	1.0000													
65	84106	0.4411	0.8631	0.8663	0.4723	0.8823	0.9027	0.9504													
70	77251	0.7725	0.7928	0.7937	0.9012	0.9105	0.9291	0.9729	1.0000												
75	67195	0.6720	0.6896	0.6921	0.6969	0.7050	0.7212	0.7593	0.8698												
80	52872	0.5287	0.5426	0.5446	0.5483	0.5547	0.5674	0.5974	0.6844	1.0000											
85	34463	0.3446	0.3537	0.3550	0.3574	0.3616	0.1699	0.194	0.4461	0.6518											
90	15162	0.1516	0.1556	0.1562	0.1572	0.1591	0.1627	0.1713	0.1963	0.2868	1.0000										
95	4547	0.0455	0.0467	0.0468	0.0472	0.0477	0.0448	0.0514	0.0589	0.0860	0.2399										
100	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE A-6. NUMBER OF PERSONS DYING (OUT OF 100,000 AT BIRTH) FROM ALL CAUSES WITH NEOPLASMS ELIMINATED

Age	Causes				Total	Number Entering Interval
	Neoplasms	Cardio-vascular Other	Motor Veh. Viol.	All Other + Unknown		
0 - .9	0	12	79	2009	2100	100000
1 - 4.9	0	9	109	189	307	97900
5 - 9.9	0	7	67	75	149	97593
10 - 14.9	0	11	51	60	122	97444
15 - 19.9	0	19	130	85	234	97322
20 - 24.9	0	42	150	114	306	97088
25 - 29.9	0	65	140	151	357	96781
30 - 34.9	0	110	152	211	473	96425
35 - 39.9	0	201	164	278	643	95951
40 - 44.9	0	352	167	356	876	95309
45 - 49.9	0	602	179	476	1257	94433
50 - 54.9	0	1087	181	629	1897	93376
55 - 59.9	0	1768	203	810	2781	91279
60 - 64.9	0	3104	213	1074	4592	88498
65 - 69.9	0	5158	253	1444	6855	84106
70 - 74.9	0	7067	305	1885	10056	77251
75 - 79.9	0	11540	403	238 1	14323	67195
80 - 84.9	0	15114	564	2731	18408	52972
85 - 89.9	0	15940	733	2626	19301	34463
90 - 94.9	0	8767	404	1443	10615	15162
95 - 99.9	0	3753	174	618	4547	4547

TABLE A-7. PROBABILITIES OF DEATH WITH NEOPLASMS REDUCED BY 50%

Age Interval	Number Entering Interval	Neoplasms	Cardio-vascul. r	Motor Veh. + Other Violence	All Other + Unknown	New Total
0-.9	100000	0.00004	0.00012	0.00079	0.02009	0.02104
1 4 . 9	97897	0.00017	0.00009	0.00111	0.00193	0.00330
s-9.9	97373	0.00017	0.00007	0.0006'9	0.00077	0.00170
10-14.9	97407	0.00014	0.00011	0.00052	0.00062	0.00149
15-19.9	97271	0.00017	0.00020	0.00134	0.00087	0.00258
20-24.9	97021	0.00022	0.00043	0.00155	0.00118	0.00337
25-29.9	96694	0.0003s	0.00067	0.00145	0.00156	0.00403
30-34.9	96304	0.00070	0.00114	0.00158	0.00218	0.00561
35.39.9	95764	0.00128	0.00209	0.00171	0.00290	0.00798
4 0 4 4 . b	95000	0.00225	0.00370	0.0017s	0.00374	0.01144
45-49.9	93913	0.00369	0.00637	0.00190	0.00504	0.01700
50-54.9	92316	0.00556	0.01167	0.0019s	0.00673	0.02592
55-59.9	89924	0.00729	0.01937	0.00222	0.00887	0.03776
60-64.9	86528	0.00932	0.05507	0.00241	0.01214	0.05895
65-69.9	81428	0.01228	0.06133	0.00301	0.01717	0.09378
70-74.9	73792	0.014535	0.10183	0.60395	0.02449	0.14472
75-79.9	63112	0.01741	0.17273	0.00599	0.03343	0.23057
80-84.9	48560	0.02081	0.28586	0.01066	0.05163	0.36898
85-89.9	30642	0.01998	0.46253	0.02134	0.07619	0.58003
90-94.9	12869	0.02497	0.57822	0.02667	0.09519	0.72505
95-99.9	3338	0.03330	0.77079	0.03569	0.16023	1.00000

TABLE A-8. PROBABILITY OF SURVIVAL FROM ONE AGE (x) TO ANOTHER AGE (y) WITH NEOPLASMS REDUCED BY 50%

Goal Age m	New Number Entering (y)	Interval	Age (x)											
			0	10	20	30	40	50	60	70	80	90		
0	100000	1.0000												
1	97897	0.9790												
5	97573	0.9757												
10	97407	0.9741	1.0000											
15	97271	0.9727	0.9986											
20	97021	0.9102	0.990	1.0000										
25	96694	0.9669	0.9927	0.9966										
30	96304	0.9630	0.9887	0.9926	1.0000									
35	95764	0.9576	0.9832	0.9870	0.9944									
40	95000	0.9500	0.9753	0.9792	0.9865	1.0000								
45	93913	0.9392	0.9641	0.9600	0.9752	0.9826								
50	92316	0.9232	0.9477	0.9315	0.9586	0.9718	1.0000							
55	89924	0.8-m	0.9232	0.9268	0.9337	0.9466	0.9741							
60	86528	0.8653	0.8883	0.8929	0.8985	0.9108	0.9373	1.0000						
65	81428	0.3243	0.8360	0.8393	0.8455	0.8571	0.8821	0.0412						
70	73792	0.7379	0.7576	0.7606	0.7662	0.7768	0.7993	0.8528	1.0000					
75	63112	0.6312	0.6479	0.6505	0.6553	0.6643	0.6837	0.7294	0.8553					
80	48560	0.4856	0.4985	0.5005	0.5042	0.5112	0.5260	0.5612	0.6581	1.0000				
as	30642	0.3064	0.3146	0.3158	0.3102	0.3226	0.3319	0.3341	0.4153	0.6310				
90	12869	0.1287	0.1321	0.1326	0.1336	0.1355	0.1394	0.1487	0.1744	0.2650	1.0000			
95	3538	0.0354	0.0363	0.0365	0.0367	0.0372	0.0383	0.0409	0.0479	0.0729	0.2749			
100	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5000		

TABLE A-9. NUMBER OF PERSONS DYING (OUT OF 100,000 AT BIRTH) FROM ALL CAUSES WITH NEOPLASMS REDUCED BY 50%

Age	Causes					Total	Number Entering Interval
	Neoplasms -&I--III--	Cardio-vascular	Motor Other	Ven.+ Viol.	Al 1 + Unknown		
0 - .9	4	12	79		2009	2104	100000
1 - 4.9	17	9	109		189	324	97897
5 - 9.9	17	7	67		78	166	97573
10 - 14.9	14	11	51		60	136	97407
15 - 19.9	17	19	130		88	251	97271
20 - 24.9	21	42	150		114	327	97021
25 - 29.9	34	65	140		151	390	96894
30 - 34.9	68	110	152		210	540	96304
35 - 39.9	123	200	163		278	764	95764
40 - 44.9	214	351	167		355	1087	95000
45 - 49.9	347	598	178		474	1597	93913
50 - 54.9	513	1077	180		623	2393	92316
55 - 59.9	653	1742	200		738	3395	89924
60 - 64.9	807	3033	209		1050	5101	86528
65 - 69.9	1000	4994	245		1398	7636	81428
70 - 74.9	1073	7514	291		1800	10679	75792
75 - 79.9	1099	10839	378		2236	14552	63112
80 - 84.9	1011	13881	518		2508	17918	48560
85 - 89.9	612	14173	654		2333	17774	30642
90 - 94.9	321	7441	343		1225	9331	12869
95 - 99.9	118	2727	126		567	3538	3538

TABLE A-10. PROBABILITIES OF DEATH WITH NEOPLASMS INCREASED BY 100%

Age Interval	Number Entering Interval	Neoplasms	Cardio-vascular	Motor Veh. + Other Violence	All Other + Unknown	New Total
0-9	100000	0.40014	0.00012	0.00079	0.02009	0.02114
1-4.9	97886	0.00067	0.0000~	0.00111	0.00195	0.09381
5-9.9	97513	0.00068	0.00047	0.00069	0.00077	0.00220
10-14.9	97298	0.00058	0.00011	0.00052	0.00062	0.00183
15-19.9	97120	0.00068	0.00020	0.00134	0.00087	0.00309
20-24.9	96821	0.00087	0.00043	0.00155	0.00118	0.00402
25-29.9	96431	0.00133	0.00067	0.00148	0.00156	0.00507
30-34.9	95942	0.00281	0.00114	0.00158	0.00218	0.00771
35-39.9	95202	0.00513	0.00209	0.00171	0.00290	0.01182
40-44.9	94076	0.00900	0.00370	0.00175	0.00374	0.01819
45-49.9	92365	0.01478	0.006~7	0.00190	0.00504	0.02909
50-54.9	89771	0.02224	0.01167	0.00198	0.00675	0.04260
55-59.9	85947	0.02915	0.01937	0.00222	0.00887	0.05962
60-64.9	80824	0.03728	0.03507	0.00241	0.01214	0.08691
65-69.9	73799	0.04910	0.06133	0.00301	0.01717	0.13060
70-74.9	64161	0.05819	0.10183	0.00395	0.02430	0.18826
75-79.9	52075	0.06965	0.17173	0.00599	0.03543	0.28291
80-84.9	37348	0.08324	0.28586	0.01066	0.05165	0.43141
85-89.9	21235	0.07990	0.46253	0.02134	0.07619	0.63996
90-94.9	7646	0.09988	0.57822	0.02667	0.09519	0.79996
95-99.9	2529	0.13319	0.77079	0.03569	0.06034	1.00000

TABLE A-11. PROBABILITY OF SURVIVAL FROM ONE AGE (x) TO ANOTHER AGE (y) WITH NEOPLASMS INCREASED BY 100%

Goal Age (y)	New Number Entering Interval	Age (x)																			
		0	10	20	30	40	50	60	70	80	90										
0	100000	1.0000																			
1	97886	0.9789																			
5	97513	0.9751																			
10	97298	0.9730	1.0000																		
15	97120	0.9712	0.9982																		
20	96821	0.9682	0.9931	1.0000																	
25	96431	0.9643	0.9911	0.9960																	
30	95942	0.9594	0.9861	0.9909	1.0000																
35	95202	0.9520	0.9783	0.9833	0.9923																
40	94076	0.9408	0.9669	0.9717	0.9806	1.0000															
45	92365	0.9237	0.9493	0.9540	0.9627	0.9818															
50	89771	0.8977	0.9226	0.9272	0.9357	0.9542	2.0000														
55	85947	0.8595	0.8833	0.8877	0.8958	0.9150	0.9574														
60	80824	0.8082	0.8307	0.8348	0.8424	0.8591	0.9003	1.0000													
65	73799	0.7300	0.7585	0.7622	0.7692	0.7845	0.8221	0.913;													
70	64161	0.6416	0.6594	0.6627	0.6687	0.6820	0.7147	0.7938	1.0000												
75	52075	0.5207	0.5352	0.5379	0.5428	0.5535	0.5801	0.6443	0.8116												
80	37348	0.3735	0.3838	0.3857	0.3893	0.3970	0.4160	0.4621	0.5821	1.0000											
as	21235	0.2124	0.2183	0.2193	0.2213	0.2257	0.2366	0.2627	0.5310	0.5686											
90	7646	0.0765	0.0786	0.0790	0.0797	0.0813	0.0852	0.0944	0.1192	0.2047	1.0000										
95	1529	0.0153	0.0157	0.0158	0.0159	0.0163	0.0170	0.0189	0.0238	0.0410	0.2000										
100	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE A-12. NUMBER OF PERSONS DYING (OUT OF 100,000 AT BIRTH) FROM ALL CAUSES WITH NEOPLASMS INCREASED BY 100%

Age	Causes				Total	Number Entering Interval
	Neoplasms	Cardio-vascular	Motor Vehicle + Other	All Other + Unknown		
0 - .9	14	12	79	2009	2114	100000
1 - 4.9	66	9	109	189	373	97886
5 - 9.9	66	7	67	75	215	97513
10 - 14.9	56	11	51	60	178	97298
15 - 19.9	66	19	130	85	300	97120
20 - 24.9	84	42	150	114	389	96821
25 - 29.9	134	65	140	151	489	96431
30 - 34.9	269	110	152	209	740	95942
35 - 39.9	488	199	162	276	1126	95202
40 - 44.9	846	348	165	352	1711	94076
45 - 49.9	1365	588	175	466	2594	92363
50 - 54.9	1996	1047	175	606	3824	89771
55 - 59.9	2505	1665	191	763	5124	85947
60 - 64.9	3013	2835	195	981	7024	80824
65 - 69.9	5624	4526	222	1267	9639	73799
70 - 74.9	3733	6534	253	1565	12086	64161
75 - 79.9	3627	8943	312	1845	14727	52075
80 - 84.9	3109	10676	398	1329	16112	37348
85 - 89.9	1697	9822	453	1618	13590	21235
90 - 94.9	764	4421	204	728	6116	7656
95 - 99.9	204	1179	55	92	1529	1529