

Why Men Die Younger: Causes of Mortality Differences by Sex

APPENDIX A MORTALITY BY SEX DURING PRE-HISTORIC TO PRE-MODERN TIMES

Location	Type	Period	Findings				Source
			Age	Male Life Expectancy	Female Life Expectancy	Difference (Female–Male)	
Various sites in Europe	20 skeletal remains of Neanderthal	Roughly 150,000 to 30,000 years ago	20	15	5	(10)	Vallois 1937
Solo River at Ngandong, Java	11 skeletal remains of Solo man (<i>Homo soloensis</i> or <i>Javanthropus soloensis</i>)	Late Pleistocene (about 15,000 to 20,000 years ago)	20	23	23	—	Acsádi and Nemeskéri 1970
Eurasia	76 skeletal remains	Upper Paleolithic Period (35,000 to 8300 BCE)	20	15.5	9.8	(5.7)	Vallois 1937
Vassilievka III near Dniepropetrovsk of former USSR	35 skeletal remains of Cromagnon	Mesolithic (c8000–c2700 BCE)	20–24 25–29 30–35 35–39 40–44 45–49 50–54 55–59 60–64 65–69 70–74 75–79 80+	23.96 22.25 21.28 20.25 17.82 14.29 13.59 13.86 11.55 7.45 4.62 3.03 2.50	20.33 18.27 18.04 18.11 16.71 13.01 12.19 12.19 8.50 4.93 3.09 2.50 —	(3.63) (3.98) (3.24) (2.14) (1.11) (1.28) (1.40) (1.67) (3.05) (2.52) (1.53) (0.53) (2.50)	Acsádi and Nemeskéri 1970
Fofonovo in the Transbaikal region of Siberia	20 skeletal remains	End of Mesolithic (c8000–c2700 BCE) Early Neolithic	20–24 25–29 30–35 35–39 40–44 45–49 50–54 55–59 60–64 65–69 70–74 75–79 80+	35.85 30.85 25.85 20.85 16.44 12.40 9.70 9.45 7.97 6.02 3.74 3.00 0.50	22.74 24.45 21.59 18.49 15.10 11.89 8.45 6.66 6.94 6.57 4.51 2.50 —	(13.11) (6.40) (4.26) (2.36) (1.34) (0.51) (1.25) (2.79) (1.03) 0.55 0.77 (0.50) (0.50)	Acsádi and Nemeskéri 1970
				Male Average Age at Death	Female Average Age at Death	Difference (Female–Male)	
Khirokitia on Cyprus	121 skeletal remains	4000–3000 BCE		35.2	33.6	(1.6)	Angel 1953

Note: Positive differences indicate greater male mortality, negative differences indicate greater female mortality.

APPENDIX A—Continued
MORTALITY BY SEX DURING PRE-HISTORIC TO PRE-MODERN TIMES

Location	Type	Period	Findings				Source
			Age	Male Life Expectancy	Female Life Expectancy	Difference (Female–Male)	
Vovnigi near Dniepropetrovsk of former USSR	161 Sets of Bones; 36 Male, 15 Female & 110 Sex Unknown	Neolithic (4th millenium BCE)	20	21	14	(7)	Acsádi and Nemeskéri 1970
Volni in Ukraine	45 Sets of Bones	c3500 BCE–c2500 BCE	20–24	15.84	16.80	0.96	Acsádi and Nemeskéri 1970
			25–29	11.80	14.39	2.59	
			30–35	9.49	12.58	3.09	
			35–39	7.37	11.65	4.28	
			40–44	5.39	11.08	5.69	
			45–49	4.29	9.70	5.41	
			50–54	2.68	8.80	6.12	
			55–59	0.50	8.21	7.71	
			60–64		9.53	9.53	
			65–69		7.50	7.50	
			70–74		5.00	5.00	
			75–79		2.50	2.50	
Japan	235 Sets of Bones; 133 Male & 102 Female	Jonan Age (c8000 BCE–c1000 BCE)	0	14.6	14.6	—	Kobayashi 1964
			5	21.9	22.0	0.1	
			10	20.5	20.7	0.2	
			15–19	16.1	16.3	0.2	
			20–24	12.6	13.1	0.5	
			25–29	9.9	11.1	1.2	
			30–34	8.1	10.1	2.0	
			35–29	7.6	10.1	2.5	
			40–44	5.7	8.7	3.0	
			45–49	5.3	6.5	1.2	
			50–54	5.1	5.3	0.2	
			55–59	4.8	4.3	(0.5)	
			60+	4.2	3.6	(0.6)	

Note: Positive differences indicate greater male mortality, negative differences indicate greater female mortality.

APPENDIX A—Continued
MORTALITY BY SEX DURING PRE-HISTORIC TO PRE-MODERN TIMES

Location	Type	Period	Findings			Source
			Male Average Age at Death	Female Average Age at Death	Difference (Female-Male)	
Greece	44 skulls; 27 Male & 17 Female	Neolithic-Early Bronze (3500 BCE–2000 BCE)	34.7	29.6	(5.1)	Angel 1947
	36 skulls; 23 Male & 13 Female	Middle Bronze (2000 BCE–1400 BCE)	39.3	30.1	(9.2)	
	68 skulls; 41 Male & 27 Female	Late Helladic III (1400 BCE–1150 BCE)	40.0	28.3	(11.7)	
	41 skulls; 30 Male & 11 Female	Cephalenia, Submycenaean (1200 BCE–1050 BCE)	40.7	32.1	(8.6)	
	43 skulls; 27 Male & 16 Female	Early Iron Central Greece (1150 BCE–650 BCE)	38.3	31.9	(6.4)	
	79 skulls; 52 Male & 27 Female	Classical Period (650 BCE–150 BCE)	42.6	33.7	(8.9)	
	33 skulls; 18 Male & 15 Female	Roman Period (150 BCE–450 CE)	42.1	31.6	(10.5)	
	40 skulls; 31 Male & 9 Female	Byzantine Period (450 CE–1300 CE)	36.5	31.0	(5.5)	
Lowland Austria	273 Unearthed Skeletons; 120 Male, 108 Female & 45 Sex Unknown	Bronze Age	20.0	21.8	1.8	Franz & Winkler 1936
Egypt	141 Mummies; 82 Male & 59 Female	Roman Period	34.2	26.1	(8.2)	Author's calculations based on data from Pearson 1901
Rome	Tombstone	Roman Period	22.1	19.7	(2.4)	Étienne 1957 & Moretti 1959
Spain	Inscriptions		37.7	34.0	(3.7)	
Africa			47.4	44.1	(3.3)	
Bordeaux			37.2	34.6	(2.6)	

Note: Positive differences indicate greater male mortality, negative differences indicate greater female mortality.

APPENDIX A—Continued
MORTALITY BY SEX DURING PRE-HISTORIC TO PRE-MODERN TIMES

Location	Type	Period	Findings				Source		
			Age	Male Life Expectancy	Female Life Expectancy	Difference (Female–Male)			
Rome	8065 Epitaphs; 4575 Male & 3490 Female	Roman Period	0	22	21	(1)	Hishinuma 1976 citing MacDonell's 1913 unadjusted calculations		
			0	16.4	14.3	(2.1)			
			5	25.7	21.4	(4.3)			
			10	25	20	(5)			
			0	15.3	16.3	1.0			
			5	22.4	20.0	(2.4)	Hishinuma 1976 citing Acsádi and Nemeskéri		
			10	22.5	18.1	(4.4)			
			15–19	20.7	15.5	(5.2)			
			20–24	20.6	14.5	(6.1)			
			25–29	20.5	14.5	(6.0)			
					30–34	20.1	15.1	(5.0)	Hishinuma 1976 using data from MacDonell 1913
					35–29	19.6	15.9	(3.7)	
					40–44	19.6	16.5	(3.1)	
					45–49	19.6	16.7	(2.9)	
					50–54	18.7	16.5	(2.2)	
		55–59	16.7	15.4	(1.3)				
		60–64	15.2	13.9	(1.3)				
		65–69	13.9	12.3	(1.6)				
		70–74	12.5	10.8	(1.7)				
		75–79	10.3	8.7	(1.6)				
		80–84	8.3	7.2	(1.1)				
		85+	7.0	6.9	(0.1)				
Iberia (Hispania & Lusitania)	1996 Epitaphs; 1111 Males & 885 Females	Roman Period	0	40	35	(5)	Hishinuma 1976 citing MacDonell's 1913 unadjusted calculations		
Africa	10,697 Epitaphs; 6238 Males & 4459 Female	Roman Period	0	48	45	(3)	Hishinuma 1976 citing MacDonell's 1913 unadjusted calculations		

Note: Positive differences indicate greater male mortality, negative differences indicate greater female mortality.

APPENDIX A—Continued
MORTALITY BY SEX DURING PRE-HISTORIC TO PRE-MODERN TIMES

Location	Type	Period	Findings			Source
			Male Average Age at Death	Female Average Age at Death	Difference (Female-Male)	
	Epitaphs					
Roma	9980	Roman Period	23.9	20.7	(3.2)	Hishinuma 1976 citing Acsádi and Nemeskéri's calculations, based on data from Szilagyí
Ostia	649		18.6	18.8	0.2	
Puteoli	626		24.6	25.6	1.0	
Misenum	244		39.2	23.7	(15.5)	
Aquilcia	236		21.4	21.2	(0.2)	
Brundisium	213		39.7	37.8	(1.9)	
Carales (Sardinia)	178		38.0	37.0	(1.0)	
Capua	147		28.7	23.5	(5.2)	
Mediolanum	139		34.5	28.0	(6.5)	
Tarquinius	129		47.2	43.2	(4.0)	
Ravenna	124		36.0	20.5	(15.5)	
Beneventum	100		24.3	21.3	(3.0)	
Italia, other parts including Sardinia	3350		29.1–28.8	24.9–25.1	(3.9)–(4.0)	
Catina	100		30.0	28.6	(1.4)	
Sicilia	200		28.1	28.7	0.6	
Salonae	577		25.6	23.4	(2.2)	
Dalmatia	578		33.7	30.6	(3.1)	
Viminacium	50		41.2	30.0	(11.2)	
Moesia	419		42.5	31.4	(11.1)	
Sarmizegetusa	74		40.7	33.9	(6.8)	
Apulum	61		38.4	32.8	(5.6)	
Dacia	273		35.9	31.3	(4.6)	
Carnuntum	204		34.5	30.9	(3.6)	
Aquincum	162		36.7	21.3	(15.4)	
Emona	116		40.9	42.1	1.2	
Brigetio	99		35.4	29.8	(5.6)	
Intercisa	89		38.6	26.9	(11.7)	
Pannonia	583		37.6	32.8	(4.8)	
Celeia	206		41.5	39.7	(1.8)	
Flavia Sova	74		35.9	29.6	(6.3)	
Virunum	65		17.8	18.5	0.7	
Noricum	356		36.6	38.3	1.7	
Raetia	87		39.3	33.1	(6.2)	
Mogontiacum	242		31.7	28.3	(3.4)	
Colonia Cl. Ara	57		31.7	13.4	(18.3)	
Germania	249		35.6	32.7	(2.9)	
Lugdunum (Lyon)	225		30.9	23.7	(7.2)	
Burdigala	179		37.5	37.5	—	
Treveri	126		26.0	21.1	(4.9)	
Vienna	123		32.9	27.5	(5.4)	
Arelate	93		30.5	25.7	(4.8)	
Gallia	458		28.9	25.6	(3.3)	
Britannia	221		34.6	27.8	(6.8)	
Augusta Emerita	144		40.9	34.5	(6.4)	
Gades	137		41.4	40.6	(0.8)	
Saguntum	133		38.5	36.1	(2.4)	
Olisippo	80		28.4	29.5	1.1	
Hispania	1893		39.0	33.8	(5.2)	
Japan	11 Sets of Bones; 8 Male & 3 Female	Yayoi Age (c200 BCE–c250 BCE)	30.0	29.2	(0.8)	Hishinuma 1976 using data from Kobayashi 1967

Note: Positive differences indicate greater male mortality, negative differences indicate greater female mortality.

APPENDIX A—Continued
MORTALITY BY SEX DURING PRE-HISTORIC TO PRE-MODERN TIMES

Location	Type	Period	Findings				Source
			Male Average Age at Death	Female Average Age at Death	Difference (Female-Male)		
Japan	Epitaphs 26 Sets of Bones; 21 Male & 5 Female	Ancient Sepulchral Age (c200 BCE–c250 BCE)	30.6	34.5	3.9	Hishinuma 1976 using data from Kobayashi 1967	
Westerhus, Sweden	Epitaphs 364 sets of Bones; 179 Male & 185 Female	1200–1400	17.0	18.4	1.4	Gejvall 1960 using Moller-Christensen Method	
			Age	Male Life Expectancy	Female Life Expectancy	Difference (Female–Male)	
Halimba-Cseres in Hungary	932 Skeletons; 932 Male, 291 Female & 332 Sex Unknown	Medieval (800–1120 CE)	20	29.8	25.4	(4.4)	Hishinuma 1976 citing Acsádi and Nemeskéri
Zalavár Castle in Hungary	Skeletons		20	28.9	26.6	(2.3)	
Zalavár Village in Hungary	Skeletons		20	28.3	28.1	(0.2)	
Fiod-Kérpuszta in Hungary	Skeletons		20	27.1	26.4	(0.7)	
Zalavár Chapel in Hungary	Skeletons		20	25.8	25.4	(0.4)	
			Male Average Age at Death	Female Average Age at Death	Difference (Female-Male)		
Tokyo, Japan	21 Skeletons; 12 Male & 9 Female	Muromachi Era (1338–1573)	35.8	36.7	0.9	Kobayashi 1967	
Tokyo, Japan	49 Skulls; 23 Male & 26 Female	Muromachi Era (1338–1573)	33.1	32.8	(0.3)	Kobayashi 1967	
Fukagawa Ward, Tokyo, Japan	166 Skeletons; 116 Male & 50 Female	Edo Period (1603–1867)	43.9	40.6	(3.3)	Kobayashi 1956	

Note: Positive differences indicate greater male mortality, negative differences indicate greater female mortality.

APPENDIX A—Continued
MORTALITY BY SEX DURING PRE-HISTORIC TO PRE-MODERN TIMES

Location	Type	Period	Findings			Source		
			Male Average Age at Death of persons aged 15+	Female Average Age at Death of persons aged 15+	Difference (Female-Male)			
Le Vieuxbourg, Flanders	1,594 males; 1,599 females	1700–1719	46.1	47.4	1.3	Deprez 1965		
Le Vieuxbourg, Flanders	1,841 males; 2,101 females	1720–1739	48.0	48.4	0.4			
Le Vieuxbourg, Flanders	1,924 males; 1,970 females	1740–1759	48.4	49.2	0.8			
Le Vieuxbourg, Flanders	1,997 males; 2,165 females	1760–1779	51.0	50.7	(0.3)			
Le Vieuxbourg, Flanders	1,958 males; 2,024 females	1780–1796	52.2	51.9	(0.3)			
Elversele, Flanders	225 males; 167 females	1650–1699	53.6	51.3	(2.3)		Deprez 1965 citing an unpublished study of F. Verhoeyen	
Elversele, Flanders	337 males; 320 females	1700–1749	50.2	51.1	0.9			
Elversele, Flanders	272 males; 359 females	1750–1796	56.3	56.4	0.1			
			Age	Male Life Expectancy	Female Life Expectancy		Difference (Female–Male)	
Geneva		Seventeenth Century	0	26.2	25.4		(0.8)	Perrenoud 1975
Toraiwamura, Nagano, Japan	Necrology (Bills of Mortality) of 169 Deaths; 88 Male & 81 Female	1812–1815	0	36.8	36.5	(0.3)	Kobayashi 1967	
			Male Average Age at Death	Female Average Age at Death	Difference (Female-Male)			
Oenji Temple, Ono County, Gifu Prefecture, Japan	Necrology of 849 Deaths	1801–1810	28	26	(2)	Suda 1973		

Note: Positive differences indicate greater male mortality, negative differences indicate greater female mortality.

APPENDIX B

LIFE EXPECTANCY AT BIRTH BY SEX FOR 154 COUNTRIES AND 27 REGIONS

In Decreasing Difference Order				In Decreasing Male Life Expectancy Order				In Decreasing Female Life Expectancy Order				In Alpha Order			
Country/Region*	Male	Female	Difference (Female-Male)	Country/Region*	Male	Female	Difference (Female-Male)	Country/Region*	Male	Female	Difference (Female-Male)	Country/Region*	Male	Female	Difference (Female-Male)
Russian Federation	58.0	71.5	13.5	Japan	76.9	82.9	6.0	France	74.6	82.9	8.3	Afghanistan	45.0	46.0	1.0
Latvia	62.5	74.3	11.8	Sweden	76.2	80.0	3.8	Japan	76.9	82.9	6.0	Africa	52.3	55.3	3.0
Eastern Europe	61.8	73.0	11.2	Canada	76.1	81.8	5.7	Switzerland	75.3	81.8	6.5	Albania	68.0	74.0	6.0
Estonia	63.9	75.0	11.1	Hong Kong, China	76.1	81.8	5.7	Canada	76.1	81.8	5.7	Algeria	67.5	70.3	2.8
Lithuania	64.9	76.0	11.1	Israel	75.7	79.5	3.8	Hong Kong, China	76.1	81.8	5.7	Angola	44.9	48.1	3.2
Ukraine	63.6	74.0	10.4	Greece	75.5	80.6	5.1	Spain	74.5	81.5	7.0	Argentina	69.6	76.8	7.2
Belarus	64.4	74.8	10.4	Australia	75.4	81.2	5.8	Italy	75.1	81.4	6.3	Armenia	67.2	74.0	6.8
Kazakhstan	62.8	72.5	9.7	Switzerland	75.3	81.8	6.5	Australia	75.4	81.2	5.8	Austria	64.8	67.6	2.8
Hungary	64.5	73.8	9.3	Australia & New Zealand	75.3	80.9	5.6	Western Europe	74.0	80.9	6.9	Australia	75.4	81.2	5.8
Poland	66.7	75.7	9.0	Italy	75.1	81.4	6.3	Australia & New Zealand	75.3	80.9	5.6	Australia & New Zealand	75.3	80.9	5.6
Slovakia	67.0	75.8	8.8	Singapore	75.1	79.5	4.4	Belgium	73.9	80.6	6.7	Austria	73.7	80.1	6.4
Europe	68.3	77.0	8.7	Netherlands	75.0	80.6	5.6	Norway	74.8	80.6	5.8	Azerbaijan	66.5	74.5	8.0
Slovenia	69.2	77.8	8.6	Norway	74.8	80.6	5.8	Netherlands	75.0	80.6	5.6	Bangladesh	58.1	58.2	0.1
Kyrgyzstan	63.4	71.9	8.5	New Zealand	74.7	79.7	5.0	Greece	75.5	80.6	5.1	Belarus	64.4	74.8	10.4
Croatia	68.1	76.5	8.4	France	74.6	82.9	8.3	Puerto Rico	72.5	80.5	8.0	Belgium	73.9	80.6	6.7
France	74.6	82.9	8.3	Spain	74.5	81.5	7.0	Northern America	73.6	80.3	6.7	Belize	73.4	76.1	2.7
Georgia	68.5	76.7	8.2	United Kingdom	74.5	79.8	5.3	Finland	73.0	80.1	7.1	Benin	52.4	57.2	4.8
Puerto Rico	72.5	80.5	8.0	Costa Rica	74.5	79.2	4.7	United States	73.4	80.1	6.7	Bhutan	51.6	54.9	3.3
Azerbaijan	66.5	74.5	8.0	Cuba	74.2	78.0	3.8	Southern Europe	73.6	80.1	6.5	Bolivia	59.8	63.2	3.4
Republic of Moldova	63.5	71.5	8.0	Kuwait	74.1	78.2	4.1	Austria	73.7	80.1	6.4	Bosnia & Herzegovina	70.5	75.9	5.4
More Developed Regions	70.6	78.4	7.8	Western Europe	74.0	80.9	6.9	Sweden	76.2	80.0	3.8	Botswana	48.9	51.7	2.8
Brazil	63.4	71.2	7.8	Ireland	74.0	79.4	5.4	Germany	73.4	79.9	6.5	Brazil	63.4	71.2	7.8
Central America	66.8	74.6	7.8	Belgium	73.9	80.6	6.7	United Kingdom	74.5	79.8	5.3	Bulgaria	67.8	74.9	7.1
Argentina	69.6	76.8	7.2	United Arab Emirates	73.9	76.5	2.6	New Zealand	74.7	79.7	5.0	Burkina Faso	45.1	47.0	1.9
Rep of Korea	68.8	76.0	7.2	Austria	73.7	80.1	6.4	Singapore	75.1	79.5	4.4	Burundi	45.5	48.8	3.3
Romania	66.0	73.2	7.2	Northern America	73.6	80.3	6.7	Israel	75.7	79.5	3.8	Cambodia	52.6	55.4	2.8
Portugal	71.8	78.9	7.1	Southern Europe	73.6	80.1	6.5	Ireland	73.5	79.4	5.9	Cameroon	54.5	57.2	2.7
Bulgaria	67.8	74.9	7.1	Northern Europe	73.5	79.4	5.9	Israel	74.0	79.4	5.4	Canada	76.1	81.8	5.7
Finland	73.0	80.1	7.1	United States	73.4	80.1	6.7	Costa Rica	74.5	79.2	4.7	Caribbean	67.0	71.4	4.4
Spain	74.5	81.5	7.0	Germany	73.4	79.9	6.5	Portugal	71.8	78.9	7.1	Central African Republic	46.4	51.0	4.6
South America	65.6	72.6	7.0	Belize	73.4	76.1	2.7	More Developed Regions	70.6	78.4	7.8	Central America	66.8	74.6	7.8
Western Europe	74.0	80.9	6.9	Finland	73.0	80.1	7.1	Chile	72.3	78.3	6.0	Chad	46.3	49.3	3.0
Armenia	67.2	74.0	6.8	Denmark	73.0	78.3	5.3	Denmark	73.0	78.3	5.3	Chile	72.3	78.3	6.0
Turkmenistan	61.2	68.0	6.8	Puerto Rico	72.5	80.5	8.0	Kuwait	74.1	78.2	4.1	China	68.2	71.7	3.5
Northern America	73.6	80.3	6.7	Jamaica	72.4	76.8	4.4	Cuba	74.2	78.0	3.8	Colombia	68.2	73.7	5.5
Mauritius	68.3	75.0	6.7	Chile	72.3	78.3	6.0	Slovenia	69.2	77.8	8.6	Congo, Dem Rep of	51.3	54.5	3.2
Belgium	73.9	80.6	6.7	Portugal	71.8	78.9	7.1	Europe	68.3	77.0	8.7	Congo, Rep of	48.6	53.4	4.8
United States	73.4	80.1	6.7	Panama	71.8	76.4	4.6	Argentina	69.6	76.8	7.2	Costa Rica	74.5	79.2	4.7
Switzerland	75.3	81.8	6.5	Oceania	71.5	76.4	4.9	Jamaica	72.4	76.8	4.4	Cote d'Ivoire	50.0	52.2	2.2
Southern Europe	73.6	80.1	6.5	Trinidad & Tobago	71.5	76.2	4.7	Georgia	68.5	76.7	8.2	Croatia	68.1	76.5	8.4
Germany	73.4	79.9	6.5	New Caledonia	70.9	75.9	5.0	New Caledonia	68.1	76.5	8.4	Cuba	74.2	78.0	3.8
Uruguay	69.6	76.1	6.5	Sri Lanka	70.9	75.4	4.5	United Arab Emirates	73.9	76.5	2.6	Czech Republic	69.8	76.0	6.2

APPENDIX B—Continued

LIFE EXPECTANCY AT BIRTH BY SEX FOR 154 COUNTRIES AND 27 REGIONS

In Decreasing Difference Order				In Decreasing Male Life Expectancy Order				In Decreasing Female Life Expectancy Order				In Alpha Order					
Country/Region*		Male	Female	Difference (Female-Male)		Country/Region*		Male	Female	Difference (Female-Male)		Country/Region*		Male	Female	Difference (Female-Male)	
Latin America & Caribbean		66.4	72.9	6.5	70.6	78.4	7.8	71.5	76.4	4.9	Dem Peo Rep of Korea	68.9	75.1	6.2			
Uzbekistan		64.3	70.7	6.4	70.5	75.9	5.4	71.8	76.4	4.6	Denmark	73.0	78.3	5.3			
Austria		73.7	80.1	6.4	70.3	74.7	4.4	71.5	76.2	4.7	Dominican Republic	68.9	73.1	4.2			
Italy		75.1	81.4	6.3	70.0	75.7	5.7	69.6	76.1	6.5	Eastern Africa	47.8	50.3	2.5			
Czech Republic		69.8	76.0	6.2	69.9	74.3	4.4	73.4	76.1	2.7	Eastern Asia	69.1	73.1	4.0			
Dem Peo Rep of Korea		68.9	75.1	6.2	69.9	73.4	3.5	64.9	76.0	11.1	Eastern Europe	61.8	73.0	11.2			
Japan		76.9	82.9	6.0	69.8	76.0	6.2	68.8	76.0	7.2	Ecuador	67.3	72.5	5.2			
Chile		72.3	78.3	6.0	69.8	75.3	5.5	69.8	76.0	6.2	Egypt	64.7	67.3	2.6			
Mexico		69.5	75.5	6.0	69.6	76.8	7.2	70.5	75.9	5.4	El Salvador	66.5	72.5	6.0			
Albania		68.0	74.0	6.0	69.6	76.1	6.5	70.9	75.9	5.0	Eritrea	49.1	52.1	3.0			
El Salvador		66.5	72.5	6.0	69.5	75.5	6.0	67.0	75.8	8.8	Estonia	63.9	75.0	11.1			
Thailand		66.3	72.3	6.0	69.2	77.8	8.6	66.7	75.7	9.0	Ethiopia	48.4	51.6	3.2			
Tajikistan		64.2	70.2	6.0	69.1	73.1	4.0	70.0	75.7	5.7	Europe	68.3	77.0	8.7			
South Africa		62.3	68.3	6.0	68.9	75.1	6.2	69.5	75.5	6.0	Finland	73.0	80.1	7.1			
Northern Europe		73.5	79.4	5.9	68.9	73.3	4.4	70.9	75.4	4.5	France	74.6	82.9	8.3			
Australia		75.4	81.2	5.8	68.9	73.1	4.2	69.8	75.3	5.5	Gabon	53.8	57.2	3.4			
Norway		74.8	80.6	5.8	68.8	76.0	7.2	68.9	75.1	6.2	Georgia	68.5	76.7	8.2			
Canada		76.1	81.8	5.7	68.5	76.7	8.2	63.9	75.0	11.1	Germany	73.4	79.9	6.5			
Hong Kong, China		76.1	81.8	5.7	68.5	70.0	1.5	68.3	75.0	6.7	Ghana	56.2	59.9	3.7			
Venezuela		70.0	75.7	5.7	68.4	70.7	2.3	67.8	74.9	7.1	Greece	75.5	80.6	5.1			
Australia & New Zealand		75.3	80.9	5.6	68.3	77.0	8.7	64.4	74.8	10.4	Guatemala	64.7	69.8	5.1			
Netherlands		75.0	80.6	5.6	68.3	75.0	6.7	70.3	74.7	4.4	Guinea	46.0	47.0	1.0			
Yugoslavia		69.8	75.3	5.5	68.2	73.7	5.5	66.8	74.6	7.8	Guinea-Bissau	42.4	45.2	2.8			
Colombia		68.2	73.7	5.5	68.2	71.7	3.5	66.5	74.5	8.0	Haiti	52.8	56.0	3.2			
Southern Africa		61.3	66.8	5.5	68.1	76.5	8.4	62.5	74.3	11.8	Honduras	67.5	72.3	4.8			
Ireland		74.0	79.4	5.4	68.1	71.7	3.6	69.9	74.3	4.4	Hong Kong, China	76.1	81.8	5.7			
Bosnia & Herzegovina		70.5	75.9	5.4	68.0	74.0	6.0	63.6	74.0	10.4	Hungary	64.5	73.8	9.3			
United Kingdom		74.5	79.8	5.3	67.8	74.9	7.1	67.2	74.0	6.8	India	62.1	62.7	0.6			
Denmark		73.0	78.3	5.3	67.7	71.8	4.1	68.0	74.0	6.0	Indonesia	63.3	67.0	3.7			
Ecuador		67.3	72.5	5.2	67.5	72.3	4.8	64.5	73.8	9.3	Iran	68.5	70.0	1.5			
Turkey		66.5	71.7	5.2	67.5	72.0	4.5	68.2	73.7	5.5	Iraq	60.9	63.9	3.0			
Greece		75.5	80.6	5.1	67.5	70.3	2.8	69.9	73.4	3.5	Ireland	74.0	79.4	5.4			
Guatemala		64.7	69.8	5.1	67.3	72.5	5.2	68.9	73.3	4.4	Israel	75.7	79.5	3.8			
New Zealand		74.7	79.7	5.0	67.2	74.0	6.8	66.0	73.2	7.2	Italy	75.1	81.4	6.3			
New Caledonia		70.9	75.9	5.0	67.0	75.8	8.8	68.9	73.1	4.2	Jamaica	72.4	76.8	4.4			
Peru		65.9	70.9	5.0	67.0	71.4	4.4	69.1	73.1	4.0	Japan	76.9	82.9	6.0			
Oceania		71.5	76.4	4.9	66.8	74.6	7.8	61.8	73.0	11.2	Jordan	67.7	71.8	4.1			
Benin		52.4	57.2	4.8	66.7	75.7	9.0	66.4	72.9	6.5	Kazakhstan	62.8	72.5	9.7			

APPENDIX B—Continued
LIFE EXPECTANCY AT BIRTH BY SEX FOR 154 COUNTRIES AND 27 REGIONS

In Decreasing Difference Order			In Decreasing Male Life Expectancy Order			In Decreasing Female Life Expectancy Order			In Alpha Order		
Country/Region*	Difference (Female-Male)		Country/Region*	Difference (Female-Male)		Country/Region*	Difference (Female-Male)		Country/Region*	Difference (Female-Male)	
	Male	Female		Male	Female		Male	Female		Male	Female
Honduras	67.5	72.3	Syrian Arab Rep	66.7	71.2	South America	65.6	72.6	Kenya	52.3	55.7
Nicaragua	65.8	70.6	Philippines	66.6	70.2	Kazakhstan	62.8	72.5	Kuwait	74.1	78.2
Congo, Rep of	48.6	53.4	Azerbaijan	66.5	74.5	El Salvador	66.5	72.5	Kyrgyzstan	63.4	71.9
Costa Rica	74.5	79.2	El Salvador	66.5	72.5	Ecuador	67.3	72.5	Lao Pao Dem Republic	52.0	55.0
Trinidad & Tobago	71.5	76.2	Turkey	66.5	71.7	Thailand	66.3	72.3	Latin America & Caribbean	66.4	72.9
Viet Nam	64.9	69.6	Latin America & Caribbean	66.4	72.9	Honduras	67.5	72.3	Latvia	62.5	74.3
Panama	71.8	76.4	Thailand	66.3	72.3	Paraguay	67.5	72.0	Least Developed Regions	50.9	53.0
Central African Republic	46.4	51.0	Romania	66.0	73.2	Kyrgyzstan	63.4	71.9	Lebanon	68.1	71.7
Sri Lanka	70.9	75.4	Peru	65.9	70.9	Jordan	67.7	71.8	Lesotho	57.3	59.9
Paraguay	67.5	72.0	Western Asia	65.9	70.3	Turkey	66.5	71.7	Less Developed Regions	62.1	65.2
Syrian Arab Rep	66.7	71.2	Nicaragua	65.8	70.6	Lebanon	68.1	71.7	Liberia	50.0	53.0
Singapore	75.1	79.5	South America	65.6	72.6	China	68.2	71.7	Libyan Arab Jamahiriya	63.9	67.5
Macedonia	70.3	74.7	Vanuatu	65.5	69.5	Russian Federation	58.0	71.5	Lithuania	64.9	76.0
Caribbean	67.0	71.4	Lithuania	64.9	76.0	Republic of Moldova	63.5	71.5	Macedonia	70.3	74.7
Jamaica	72.4	76.8	Viet Nam	64.9	69.6	Moldova	67.0	71.4	Madagascar	57.0	60.0
Malaysia	69.9	74.3	Morocco	64.8	68.5	Brazil	63.4	71.2	Malawi	40.3	41.1
Oman	68.9	73.3	Asia	64.8	67.6	Syrian Arab Rep	66.7	71.2	Malaysia	69.9	74.3
Western Asia	65.9	70.3	Guatemala	64.7	69.8	Peru	65.9	70.9	Mali	46.4	49.7
World Total	63.4	67.7	Egypt	64.7	67.3	Uzbekistan	64.3	70.7	Mauritania	51.9	55.1
Dominican Republic	68.9	73.1	Mongolia	64.6	67.7	Tunisia	68.4	70.7	Mauritius	68.3	75.0
Kuwait	74.1	78.2	Hungary	64.5	73.8	Nicaragua	65.8	70.6	Melanesia	60.0	62.2
Southwestern Asia	63.6	67.7	Belarus	64.4	74.8	Western Asia	65.9	70.3	Mexico	69.5	75.5
Jordan	67.7	71.8	Uzbekistan	64.3	70.7	Algeria	67.5	70.3	Middle Africa	50.2	53.4
Eastern Asia	69.1	73.1	Tajikistan	64.2	70.2	Tajikistan	64.2	70.2	Mongolia	64.6	67.7
Vanuatu	65.5	69.5	Estonia	63.9	75.0	Philippines	66.6	70.2	More Developed Regions	70.6	78.4
Sweden	76.2	80.0	Libyan Arab Jamahiriya	63.9	67.5	Iran	68.5	70.0	Morocco	64.8	68.5
Israel	75.7	79.5	Ukraine	63.6	74.0	Guatemala	64.7	69.8	Mozambique	45.5	48.4
Cuba	74.2	78.0	Southwestern Asia	63.6	67.7	Viet Nam	64.9	69.6	Myanmar	58.5	61.8
Morocco	64.8	68.5	Republic of Moldova	63.5	71.5	Vanuatu	65.5	69.5	Namibia	54.7	56.6
Indonesia	63.3	67.0	Kyrgyzstan	63.4	71.9	Morocco	64.8	68.5	Nepal	57.6	57.1
Ghana	56.2	59.9	Brazil	63.4	71.2	South Africa	62.3	68.3	Netherlands	75.0	80.6
Lebanon	68.1	71.7	World Total	63.4	67.7	Turkmenistan	61.2	68.0	New Caledonia	70.9	75.9
Philippines	66.6	70.2	Indonesia	63.3	67.0	World Total	63.4	67.7	New Zealand	74.7	79.7
Libyan Arab Jamahiriya	63.9	67.5	Northern Africa	63.2	66.1	Southeastern Asia	63.6	67.7	Nicaragua	65.8	70.6
Saudi Arabia	69.9	73.4	Pakistan	62.9	65.1	Mongolia	64.6	67.7	Niger	46.9	50.2
China	68.2	71.7	Kazakhstan	62.8	72.5	Asia	64.8	67.6	Nigeria	50.8	54.0
Bolivia	59.8	63.2	Latvia	62.5	74.3	Libyan Arab Jamahiriya	63.9	67.5	Northern Africa	63.2	66.1

APPENDIX B—Continued

LIFE EXPECTANCY AT BIRTH BY SEX FOR 154 COUNTRIES AND 27 REGIONS

	In Decreasing Difference Order				In Decreasing Male Life Expectancy Order				In Decreasing Female Life Expectancy Order				In Alpha Order			
	Difference (Female-Male)		Difference (Female-Male)		Difference (Female-Male)		Difference (Female-Male)		Difference (Female-Male)		Difference (Female-Male)		Difference (Female-Male)		Difference (Female-Male)	
	Country/Region*	Male	Female	Country/Region*	Male	Female	Country/Region*	Male	Female	Country/Region*	Male	Female	Country/Region*	Male	Female	
Gabon	53.8	57.2	3.4	South Africa	62.3	68.3	6.0	Egypt	64.7	67.3	2.6	Northern America	73.6	80.3	6.7	
Kenya	52.3	55.7	3.4	Less Developed Regions	62.1	65.2	3.1	Indonesia	63.3	67.0	3.7	Northern Europe	73.5	79.4	5.9	
Niger	46.9	50.2	3.3	India	62.1	62.7	0.6	Southern Africa	61.3	66.8	5.5	Norway	74.8	80.6	5.8	
Mali	46.4	49.7	3.3	Eastern Europe	61.8	73.0	11.2	Northern Africa	63.2	66.1	2.9	Oceania	71.5	76.4	4.9	
Myanmar	58.5	61.8	3.3	South Central Asia	61.7	62.9	1.2	Less Developed Regions	62.1	65.2	3.1	Oceania	68.9	73.3	4.4	
Bhutan	51.6	54.9	3.3	Southern Africa	61.3	66.8	5.5	Pakistan	62.9	65.1	2.2	Pakistan	62.9	65.1	2.2	
Burundi	45.5	48.8	3.3	Turkmenistan	61.2	68.0	6.8	Iraq	60.9	63.9	3.0	Panama	71.8	76.4	4.6	
Haiti	52.8	56.0	3.2	Iraq	60.9	63.9	3.0	Bolivia	59.8	63.2	3.4	Papua New Guinea	57.2	58.7	1.5	
Mauritania	51.9	55.1	3.2	Melanesia	60.0	62.2	2.2	South Central Asia	61.7	62.9	1.2	Guinea	67.5	72.0	4.5	
Congo, Dem Rep of	51.3	54.5	3.2	Bolivia	59.8	63.2	3.4	India	62.1	62.7	0.6	Paraguay	65.9	70.9	5.0	
Nigeria	50.8	54.0	3.2	Myanmar	58.5	61.8	3.3	Melanesia	60.0	62.2	2.2	Philippines	66.6	70.2	3.6	
Ethiopia	48.4	51.6	3.2	Bangladesh	58.1	58.2	0.1	Myanmar	58.5	61.8	3.3	Poland	66.7	75.7	9.0	
Somalia	47.4	50.6	3.2	Russian Federation	58.0	71.5	13.5	Madagascar	57.0	60.0	3.0	Portugal	71.8	78.9	7.1	
Angola	44.9	48.1	3.2	Nepal	57.6	57.1	-0.5	Ghana	56.2	59.9	3.7	Puerto Rico	72.5	80.5	8.0	
Middle Africa	50.2	53.4	3.2	Yemen	57.4	58.4	1.0	Lesotho	57.3	59.9	2.6	Rep of Korea	68.8	76.0	7.2	
Mongolia	64.6	67.7	3.1	Lesotho	57.3	59.9	2.6	Papua New Guinea	57.2	58.7	1.5	Republic of Moldova	63.5	71.5	8.0	
Less Developed Regions	62.1	65.2	3.1	Papua New Guinea	57.2	58.7	1.5	Yemen	57.4	58.4	1.0	Romania	66.0	73.2	7.2	
Sierra Leone	36.0	39.1	3.1	Madagascar	57.0	60.0	3.0	Bangladesh	58.1	58.2	0.1	Russian Federation	58.0	71.5	13.5	
Iraq	60.9	63.9	3.0	Ghana	56.2	59.9	3.7	Benin	52.4	57.2	4.8	Rwanda	40.8	43.4	2.6	
Madagascar	57.0	60.0	3.0	Namibia	54.7	56.6	1.9	Gabon	53.8	57.2	3.4	Saudi Arabia	69.9	73.4	3.5	
Eritrea	52.3	55.3	3.0	Cameroon	54.5	57.2	2.7	Cameroon	54.5	57.2	2.7	Senegal	50.3	52.3	2.0	
Chad	46.3	49.3	3.0	Gabon	53.8	57.2	3.4	Nepal	57.6	57.1	-0.5	Sierra Leone	36.0	39.1	3.1	
Mozambique	45.5	48.4	2.9	Sudan	53.6	56.4	2.8	Namibia	54.7	56.6	1.9	Singapore	75.1	79.5	4.4	
Northern Africa	63.2	66.1	2.9	Haiti	52.8	56.0	3.2	Sudan	53.6	56.4	2.8	Slovakia	67.0	75.8	8.8	
Botswana	48.9	51.7	2.8	Cameroon	52.6	55.4	2.8	Haiti	52.8	56.0	3.2	Slovenia	69.2	77.8	8.6	
Guinea-Bissau	42.4	45.2	2.8	Benin	52.4	57.2	4.8	Kenya	52.3	55.7	3.4	Somalia	47.4	50.6	3.2	
Algeria	67.5	70.3	2.8	Kenya	52.3	55.7	3.4	Cambodia	52.6	55.4	2.8	South Africa	62.3	68.3	6.0	
Asia	64.8	67.6	2.8	Africa	52.3	55.3	3.0	Africa	52.3	55.3	3.0	South America	65.6	72.6	7.0	
Sudan	53.6	56.4	2.8	Lao Pao Dem Republic	52.0	55.0	3.0	Mauritania	51.9	55.1	3.2	South Central Asia	61.7	62.9	1.2	
Cambodia	52.6	55.4	2.8	Mauritania	51.9	55.1	3.2	Lao Pao Dem Republic	52.0	55.0	3.0	Southeastern Asia	63.6	67.7	4.1	
United Rep of Tanzania	50.0	52.8	2.8	Bhutan	51.6	54.9	3.3	Bhutan	51.6	54.9	3.3	Southern Africa	61.3	66.8	5.5	
Cameroon	54.5	57.2	2.7	Congo, Dem Rep of	51.3	54.5	3.2	Congo, Dem Rep of	51.3	54.5	3.2	Southern Europe	73.6	80.1	6.5	
Togo	48.8	51.5	2.7	Least Developed Regions	50.9	53.0	2.1	Nigeria	50.8	54.0	3.2	Spain	74.5	81.5	7.0	
				Nigeria	50.8	54.0	3.2	Congo, Rep of	48.6	53.4	4.8	Sri Lanka	70.9	75.4	4.5	
				Nigeria	50.3	52.3	2.0	Middle Africa	50.2	53.4	3.2	Sudan	53.6	56.4	2.8	
				Senegal	50.2	53.4	3.2	Liberia	50.0	53.0	3.0	Sweden	76.2	80.0	3.8	
				Middle Africa	50.0	53.0	3.0	Liberia	50.9	53.0	2.1	Switzerland	75.3	81.8	6.5	
				Liberia	50.0	53.0	3.0	Least Developed Regions	50.9	53.0	2.1					

APPENDIX B—Continued
LIFE EXPECTANCY AT BIRTH BY SEX FOR 154 COUNTRIES AND 27 REGIONS

Country/Region*	In Decreasing Difference Order			In Decreasing Male Life Expectancy Order			In Decreasing Female Life Expectancy Order			In Alpha Order					
	Male	Female	Difference (Female-Male)	Country/Region*	Male	Female	Difference (Female-Male)	Country/Region*	Male	Female	Difference (Female-Male)	Country/Region*	Male	Female	Difference (Female-Male)
Belize	73.4	76.1	2.7	United Rep of Tanzania	50.0	52.8	2.8	Western Africa	49.8	52.8	3.0	Syrian Arab Rep	66.7	71.2	4.5
Lesotho	57.3	59.9	2.6	Cote d'Ivoire	50.0	52.2	2.2	United Rep of Tanzania	50.0	52.8	2.8	Tajikistan	64.2	70.2	6.0
Rwanda	40.8	43.4	2.6	Western Africa	49.8	52.8	3.0	Senegal	50.3	52.3	2.0	Thailand	66.3	72.3	6.0
United Arab Emirates	73.9	76.5	2.6	Eritrea	49.1	52.1	3.0	Cote d'Ivoire	50.0	52.2	2.2	Togo	48.8	51.5	2.7
Egypt	64.7	67.3	2.6	Botswana	48.9	51.7	2.8	Eritrea	49.1	52.1	3.0	Trinidad & Tobago	71.5	76.2	4.7
Eastern Africa	47.8	50.3	2.5	Togo	48.8	51.5	2.7	Botswana	48.9	51.7	2.8				
Tunisia	68.4	70.7	2.3	Congo, Rep of	48.6	53.4	4.8	Ethiopia	48.4	51.6	3.2	Turkey	66.5	71.7	5.2
Melanesia	60.0	62.2	2.2	Ethiopia	48.4	51.6	3.2	Togo	48.8	51.5	2.7	Turkmenistan	61.2	68.0	6.8
Cote d'Ivoire	50.0	52.2	2.2	Eastern Africa	47.8	50.3	2.5	Central African Republic	46.4	51.0	4.6	Uganda	40.4	42.3	1.9
Pakistan	62.9	65.1	2.2	Zimbabwe	47.6	49.4	1.8	Somalia	47.4	50.6	3.2	Ukraine	63.6	74.0	10.4
Senegal	50.3	52.3	2.0	Somalia	47.4	50.6	3.2	Eastern Africa	47.8	50.3	2.5	United Arab Emirates	73.9	76.5	2.6
Namibia	54.7	56.6	1.9	Niger	46.9	50.2	3.3	Niger	46.9	50.2	3.3	United Kingdom	74.5	79.8	5.3
Burkina Faso	45.1	47.0	1.9	Central African Republic	46.4	51.0	4.6	Mali	46.4	49.7	3.3	United Rep of Tanzania	50.0	52.8	2.8
Uganda	40.4	42.3	1.9	Mali	46.4	49.7	3.3	Zimbabwe	47.6	49.4	1.8	United States	73.4	80.1	6.7
Zimbabwe	47.6	49.4	1.8	Chad	46.3	49.3	3.0	Chad	46.3	49.3	3.0	Uruguay	69.6	76.1	6.5
Iran	68.5	70.0	1.5	Guinea	46.0	47.0	1.0	Burundi	45.5	48.8	3.3	Uzbekistan	64.3	70.7	6.4
Papua New Guinea	57.2	58.7	1.5	Burundi	45.5	48.8	3.3	Mozambique	45.5	48.8	3.3	Vanuatu	65.5	69.5	4.0
Zambia	42.2	43.7	1.5	Mozambique	45.5	48.8	3.3	Angola	44.9	48.1	3.2	Venezuela	70.0	75.7	5.7
South Central Asia	61.7	62.9	1.2	Burkina Faso	45.1	47.0	1.9	Burkina Faso	45.1	47.0	1.9	Viet Nam	64.9	69.6	4.7
Yemen	57.4	58.4	1.0	Afghanistan	45.0	46.0	1.0	Guinea	46.0	47.0	1.0	Western Africa	49.8	52.8	3.0
Guinea	46.0	47.0	1.0	Angola	44.9	48.1	3.2	Afghanistan	45.0	46.0	1.0	Western Asia	65.9	70.3	4.4
				Guinea-Bissau	42.4	45.2	2.8	Guinea-Bissau	42.4	45.2	2.8	Western Europe	74.0	80.9	6.9
Afghanistan	45.0	46.0	1.0	Zambia	42.2	43.7	1.5	Zambia	42.2	43.7	1.5	World Total	63.4	67.7	4.3
Malawi	40.3	41.1	0.8	Rwanda	40.8	43.4	2.6	Rwanda	40.8	43.4	2.6	Yemen	57.4	58.4	1.0
India	62.1	62.7	0.6	Uganda	40.4	42.3	1.9	Uganda	40.4	42.3	1.9	Yugoslavia	69.8	75.3	5.5
Bangladesh	58.1	58.2	0.1	Malawi	40.3	41.1	0.8	Malawi	40.3	41.1	0.8	Zambia	42.2	43.7	1.5
Nepal	57.6	57.1	-0.5	Sierra Leone	36.0	39.1	3.1	Sierra Leone	36.0	39.1	3.1	Zimbabwe	47.6	49.4	1.8

*Regions are in *italics*, **United States and Canada are bold**
Source of data: United Nations Population Fund 1998.

APPENDIX C

VALUES OF q_x , THE PROBABILITY OF DYING WITHIN ONE YEAR FOR A PERSON AGED x EXACTLY, OF AUSTRALIAN MORTALITY DURING 1970–72 USING HELIGMAN-POLLARD FORMULA

Age	Male q_x	Female q_x	Age	Male q_x	Female q_x
0	0.020124	0.015390	51	0.008777	0.005104
1	0.001680	0.001383	52	0.009653	0.005612
2	0.001014	0.000792	53	0.010617	0.006171
3	0.000752	0.000566	54	0.011675	0.006786
4	0.000612	0.000448	55	0.012839	0.007462
5	0.000527	0.000376	56	0.014117	0.008205
6	0.000472	0.000329	57	0.015521	0.009021
7	0.000435	0.000297	58	0.017063	0.009918
8	0.000411	0.000276	59	0.018755	0.010904
9	0.000396	0.000261	60	0.020612	0.011987
10	0.000387	0.000252	61	0.022649	0.013176
11	0.000387	0.000251	62	0.024883	0.014482
12	0.000401	0.000261	63	0.027332	0.015915
13	0.000451	0.000292	64	0.030014	0.017487
14	0.000572	0.000352	65	0.032951	0.019213
15	0.000796	0.000438	66	0.036165	0.021105
16	0.001121	0.000535	67	0.039681	0.023179
17	0.001499	0.000620	68	0.043523	0.025452
18	0.001847	0.000676	69	0.047718	0.027942
19	0.002089	0.000696	70	0.052297	0.030668
20	0.002184	0.000685	71	0.057288	0.033651
21	0.002136	0.000655	72	0.062725	0.036913
22	0.001986	0.000618	73	0.068640	0.040478
23	0.001787	0.000587	74	0.075069	0.044372
24	0.001587	0.000568	75	0.082047	0.048622
25	0.001420	0.000562	76	0.089612	0.053256
26	0.001301	0.000572	77	0.097799	0.058305
27	0.001235	0.000595	78	0.106648	0.063800
28	0.001218	0.000630	79	0.116194	0.069775
29	0.001242	0.000676	80	0.126474	0.076265
30	0.001300	0.000731	81	0.137522	0.083304
31	0.001386	0.000794	82	0.149370	0.090928
32	0.001496	0.000866	83	0.162048	0.099176
33	0.001625	0.000946	84	0.175579	0.108082
34	0.001774	0.001035	85	0.189985	0.117684
35	0.001941	0.001134	86	0.205278	0.128017
36	0.002127	0.001243	87	0.221466	0.139114
37	0.002333	0.001364	88	0.238548	0.151007
38	0.002561	0.001496	89	0.256513	0.163723
39	0.002813	0.001643	90	0.275342	0.177286
40	0.003090	0.001804	91	0.295005	0.191715
41	0.003396	0.001981	92	0.315460	0.207023
42	0.003733	0.002177	93	0.336657	0.223217
43	0.004103	0.002392	94	0.358533	0.240293
44	0.004511	0.002629	95	0.381013	0.258241
45	0.004960	0.002889	96	0.404015	0.277041
46	0.005455	0.003176	97	0.427448	0.296662
47	0.005999	0.003492	98	0.451210	0.317063
48	0.006598	0.003839	99	0.475197	0.338193
49	0.007256	0.004221	100	0.499299	0.359989
50	0.007981	0.004641			

Source: Derived from formula and parameter values in Heligman & Pollard 1980.

APPENDIX D
MALE AND FEMALE DEATH RATES PER 100,000 POPULATION BY FIVE-YEAR AGE GROUPS
FOR MAJOR CAUSES OF DEATH IN THE U. S. IN 1998

Cause of Death	Ninth Revision, International Classification of Diseases, 1975	Age-Adjusted	Males									
			Under 1 year	1-4 years	5-9 years	10-14 years	15-19 years	20-24 years	25-29 years	30-34 years	35-39 years	
Major Cardiovascular Diseases	390-448	205.3	26.0	1.8	1.2	1.3	3.3	5.4	9.3	17.1	35.4	
Heart Diseases	390-398, 402, 404-429	166.9	16.2	1.5	1.0	0.9	2.7	4.4	7.5	13.8	29.1	
Cerebrovascular Diseases	430-438	26.6	9.0	0.3	0.3	0.4	0.7	1.2	1.2	2.2	4.3	
All Other Major Cardiovascular Diseases		11.8	0.8	-	0.2	0.1	0.2	0.3	0.6	1.1	2.0	
All Cancers	140-208	147.7	2.2	2.4	2.7	3.1	4.4	6.5	8.4	13.1	22.5	
Respiratory & Intrathoracic Organ Cancer	160-165	51.7	-	-	-	-	-	0.3	0.3	1.0	3.5	
Digestive Organ Cancer	150-159	36.2	-	-	-	-	-	0.6	1.2	2.5	4.9	
Genital Organ Cancer	179-187	13.6	-	-	-	-	-	0.3	0.5	0.6	0.6	
Breast Cancer	174-175	0.2	-	-	-	-	-	-	-	-	-	
All Other Cancer		82.2	2.2	2.4	2.7	3.1	4.4	5.9	7.6	11.5	18.4	
Accidents & Adverse Effects	E800-E978, E980-E999	73.4	34.0	18.1	10.2	16.1	80.8	114.5	96.5	87.4	89.2	
Motor Vehicle Accidents	E810-E825	21.6	4.6	5.4	4.8	6.6	33.9	41.2	29.8	24.4	22.5	
Suicide	E950-E959	17.2	-	-	-	2.4	14.6	23.0	23.6	22.2	23.7	
Homicide & Legal Intervention	E960-E978	11.3	8.9	2.9	0.8	1.8	19.6	30.6	22.3	15.5	12.5	
All Other Accidents & Adverse Effects		23.3	20.5	9.8	4.6	5.3	12.7	19.7	20.8	25.3	30.5	
Chronic Obstructive Pulmonary Diseases	490-496	25.9	1.2	0.4	0.3	0.6	0.6	1.0	0.9	0.9	1.5	
Infectious & Parasitic Diseases	001-018, 020-066, 070-088, 090-139, 590	16.6	20.8	1.5	0.4	0.3	0.7	1.7	7.1	17.6	24.7	
Pneumonia & Influenza	480-487	16.3	12.4	0.9	0.3	0.3	0.4	0.8	1.1	2.0	2.7	
Diabetes mellitus	250	15.2	-	-	-	-	0.2	0.5	1.1	2.5	3.7	
Chronic Liver Diseases & Cirrhosis	571	10.3	-	-	-	-	-	-	0.7	2.6	6.3	
All others		78.7	721.6	12.5	4.9	5.2	8.3	11.9	14.3	19.9	27.5	
Total		589.4	818.2	37.6	20.0	26.9	98.7	142.3	139.4	163.1	213.5	
% from Accidents & Adverse Effects		12%	4%	48%	51%	60%	82%	80%	69%	54%	42%	

APPENDIX D—Continued
MALE AND FEMALE DEATH RATES PER 100,000 POPULATION BY FIVE-YEAR AGE GROUPS
FOR MAJOR CAUSES OF DEATH IN THE U. S. IN 1998

Cause of Death	Ninth Revision, International Classification of Diseases, 1975	Males									
		40-44 years	45-49 years	50-54 years	55-59 years	60-64 years	65-69 years	70-74 years	75-79 years	80-84 years	85+ years
Major Cardiovascular Diseases	390-448	70.5	134.5	230.1	374.1	620.2	955.0	1,519.9	2,403.6	4,133.6	8,201.0
Heart Diseases	390-398, 402, 404-429	59.5	114.1	198.2	319.8	523.2	793.6	1,229.3	1,889.9	3,205.0	6,330.6
Cerebrovascular Diseases	430-438	8.2	14.8	22.9	37.5	64.2	104.0	193.1	357.5	673.6	1,347.2
All Other Major Cardiovascular Diseases		2.8	5.6	9.0	16.8	32.8	57.4	97.5	156.2	255.0	523.2
All Cancers	140-208	46.6	96.4	185.0	338.4	567.2	871.7	1,243.4	1,572.4	2,039.9	2,562.6
Respiratory & Intrathoracic Organ Cancer	160-165	11.6	27.4	63.2	131.8	231.1	353.4	488.1	535.5	583.1	535.5
Digestive Organ Cancer	150-159	12.0	28.1	53.0	88.1	142.4	215.0	291.8	373.5	477.8	598.8
Genital Organ Cancer	179-187	0.8	1.3	4.2	12.0	30.0	63.8	125.3	226.7	401.7	705.0
Breast Cancer	174-175	-	-	0.3	0.4	0.6	0.8	1.0	2.1	3.2	4.0
All Other Cancer		34.2	67.7	117.3	194.2	305.5	453.7	629.0	808.1	1,051.9	1,321.1
Accidents & Adverse Effects	E800-E978, E980-E999	90.9	85.5	75.3	74.1	74.0	83.6	107.1	147.6	248.0	426.7
Motor Vehicle Accidents	E810-E825	20.8	20.5	20.2	20.3	20.8	22.0	25.2	33.7	49.8	61.2
Suicide	E950-E959	24.3	23.9	22.0	22.1	20.4	23.4	29.3	35.9	52.4	57.8
Homicide & Legal Intervention	E960-E978	11.0	8.4	6.9	5.8	4.8	3.9	3.4	3.7	3.2	3.3
All Other Accidents & Adverse Effects		34.8	32.7	26.2	25.9	28.0	34.3	49.2	74.3	142.6	304.4
Chronic Obstructive Pulmonary Diseases	490-496	2.4	5.0	11.9	30.7	72.8	147.0	262.9	394.5	602.3	869.8
Infectious & Parasitic Diseases	001-018, 020-066, 070-088, 090-139, 590	29.2	30.3	25.6	25.0	29.2	38.5	55.2	79.9	128.9	228.5
Pneumonia & Influenza	480-487	4.6	6.5	9.2	15.8	27.8	50.7	107.6	210.0	467.5	1,252.4
Diabetes mellitus	250	6.7	11.5	18.6	33.7	54.5	81.7	118.5	161.6	232.1	317.1
Chronic Liver Diseases & Cirrhosis	571	15.0	24.1	27.0	31.9	37.9	39.8	42.7	38.6	38.0	32.5
All others		39.4	57.0	71.4	98.7	150.4	240.6	409.7	711.5	1,336.3	2,872.7
Total		305.3	450.8	654.1	1,022.4	1,634.0	2,508.6	3,867.0	5,719.7	9,226.6	16,763.3
% from Accidents & Adverse Effects		30%	19%	12%	7%	5%	3%	3%	3%	3%	3%

APPENDIX D—Continued
MALE AND FEMALE DEATH RATES PER 100,000 POPULATION BY FIVE-YEAR AGE GROUPS
FOR MAJOR CAUSES OF DEATH IN 1998

Cause of Death	Ninth Revision, International Classification of Diseases, 1975	Females										
		Age- Adjusted	Total	Under 1 year	1-4 years	5-9 years	10-14 years	15-19 years	20-24 years	25-29 years	30-34 years	35-39 years
Major Cardiovascular Diseases	390-448	124.5	361.1	23.3	1.8	0.8	1.1	1.8	3.7	6.1	10.0	17.9
Heart Diseases	390-398, 402, 404-429	193.3	268.3	16.1	1.3	0.6	0.8	1.5	2.8	4.2	7.3	12.5
Cerebrovascular Diseases	430-438	23.6	70.4	6.6	0.4	-	-	0.2	0.6	1.3	2.1	4.3
All Other Major Cardiovascular Diseases		7.6	22.4	0.6	0.1	0.2	0.3	0.1	0.3	0.6	0.6	1.1
All Cancers	140-208	105.5	187.7	1.9	2.4	2.1	2.4	2.9	4.5	7.6	15.6	30.1
Respiratory & Intrathoracic Organ Cancer	160-165	27.6	46.6	-	-	-	-	-	-	0.2	1.0	3.1
Digestive Organ Cancer	150-159	21.4	43.5	-	-	-	-	-	0.5	1.0	1.9	3.7
Genital Organ Cancer	179-187	11.1	18.5	-	-	-	-	-	0.4	1.2	2.8	5.0
Breast Cancer	174-175	18.8	30.2	-	-	-	-	-	-	0.9	4.1	9.6
All Other Cancer		48.0	92.4	1.9	2.4	2.1	2.4	2.9	4.1	5.3	7.7	12.4
Accidents & Adverse Effects	E800-E978, E980-E999	25.8	33.5	26.7	12.9	6.9	8.3	28.1	26.0	24.9	26.6	30.9
Motor Vehicle Accidents	E810-E825	9.9	10.5	4.0	4.6	3.5	4.0	18.5	13.3	10.3	9.5	10.1
Suicide	E950-E959	4.0	4.4	-	-	-	0.9	2.9	3.8	4.6	5.3	6.8
Homicide & Legal Intervention	E960-E978	3.2	3.1	8.1	2.4	0.9	1.2	3.6	5.1	5.1	4.7	4.7
All Other Accidents & Adverse Effects		8.7	15.5	14.6	5.9	2.5	2.2	3.1	3.8	4.9	7.1	9.3
Chronic Obstructive Pulmonary Diseases	490-496	18.1	40.2	-	-	0.3	0.4	0.4	0.6	0.7	0.8	1.5
Infectious & Parasitic Diseases	001-018, 020-066, 070-088, 090-139, 590	9.4	17.0	17.1	1.2	0.4	0.4	0.4	1.7	4.2	7.4	8.8
Pneumonia & Influenza	480-487	11.0	36.8	10.9	1.0	0.4	0.2	0.4	0.8	0.8	1.4	2.0
Diabetes mellitus	250	12.3	25.4	-	-	-	-	0.2	0.6	1.0	1.8	2.5
Chronic Liver Diseases & Cirrhosis	571	4.4	6.4	-	-	-	-	-	-	0.3	1.4	3.5
All others		61.5	145.4	601.4	12.1	4.4	4.4	6.6	8.6	10.7	14.0	18.9
Total		372.5	853.5	681.3	31.4	15.3	17.2	40.8	46.5	56.3	79.0	116.1
% from Accidents & Adverse Effects		7%	4%	4%	41%	45%	48%	69%	56%	44%	34%	27%

APPENDIX D—Continued
MALE AND FEMALE DEATH RATES PER 100,000 POPULATION BY FIVE-YEAR AGE GROUPS
FOR MAJOR CAUSES OF DEATH IN THE U. S. IN 1998

Cause of Death	Ninth Revision, International Classification of Diseases, 1975	Females									
		40-44 years	45-49 years	50-54 years	55-59 years	60-64 years	65-69 years	70-74 years	75-79 years	80-84 years	85+ years
Major Cardiovascular Diseases	390-448	30.8	52.9	92.4	164.3	292.4	496.7	881.8	1,556.8	3,009.8	7,936.2
Heart Diseases	390-398, 402, 404-429	22.1	39.0	69.3	127.5	229.2	383.9	668.4	1,149.9	2,190.1	5,876.6
Cerebrovascular Diseases	430-438	7.1	11.2	18.8	28.4	45.7	81.1	155.3	307.8	634.2	1,563.3
All Other Major Cardiovascular Diseases		1.6	2.7	4.3	8.4	17.5	31.7	58.1	99.1	185.5	496.3
All Cancers	140-208	54.4	96.3	166.2	266.8	408.7	569.6	786.3	956.2	1,179.8	1,412.5
Respiratory & Intrathoracic Organ Cancer	160-165	8.1	17.1	38.1	74.5	129.7	185.7	246.4	260.4	266.0	202.5
Digestive Organ Cancer	150-159	7.6	15.3	27.5	47.4	77.7	117.6	170.8	231.5	328.2	469.9
Genital Organ Cancer	179-187	7.9	13.2	20.7	29.7	41.6	56.8	72.8	87.4	102.6	114.6
Breast Cancer	174-175	17.3	28.8	44.2	56.4	69.1	82.0	105.2	120.4	147.1	194.7
All Other Cancer		21.1	37.2	63.2	106.2	168.3	245.1	361.9	488.0	664.1	900.7
Accidents & Adverse Effects	E800-E978, E980-E999	30.9	28.5	26.3	26.9	28.5	35.2	48.9	72.4	120.9	255.5
Motor Vehicle Accidents	E810-E825	9.3	9.0	8.5	10.0	10.3	12.7	16.5	20.3	23.9	19.2
Suicide	E950-E959	6.9	7.0	7.0	6.0	5.0	4.4	4.2	4.7	5.3	5.8
Homicide & Legal Intervention	E960-E978	4.0	3.0	1.8	1.7	1.4	1.5	1.7	1.7	2.7	2.2
All Other Accidents & Adverse Effects		10.7	9.5	9.0	9.2	11.8	16.6	26.5	45.7	89.0	228.3
Chronic Obstructive Pulmonary Diseases	490-496	2.6	4.9	12.1	26.1	57.6	108.9	178.8	255.8	352.5	444.7
Infectious & Parasitic Diseases	001-018, 020-066, 070-088, 090-139, 590	10.1	10.0	10.6	14.5	20.2	29.5	42.6	62.1	103.2	215.5
Pneumonia & Influenza	480-487	3.2	4.0	6.0	9.5	17.7	30.6	61.5	128.5	299.4	985.8
Diabetes mellitus	250	4.0	7.5	14.6	26.0	43.8	66.4	98.6	137.5	195.0	285.7
Chronic Liver Diseases & Cirrhosis	571	5.8	7.6	8.9	11.5	14.7	19.8	24.9	26.7	25.3	17.5
All others		25.9	35.0	47.3	70.6	109.8	173.5	304.4	548.2	1,092.0	2,874.0
Total		167.7	246.7	384.4	616.2	993.4	1,530.2	2,427.8	3,744.2	6,377.9	14,427.4
% from Accidents & Adverse Effects		18%	12%	7%	4%	3%	2%	2%	2%	2%	2%

APPENDIX D—Continued
MALE AND FEMALE DEATH RATES PER 100,000 POPULATION BY FIVE-YEAR AGE GROUPS
FOR MAJOR CAUSES OF DEATH IN THE U.S. IN 1998

Cause of Death	Ninth Revision, International Classification of Diseases, 1975	Ratio (Male/Female)										
		Age-Adjusted	Total	Under 1 year	1–4 years	5–9 years	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35–39 years
Major Cardiovascular Diseases	390–448	1.6	0.9	1.1	1.0	1.5	1.2	1.8	1.5	1.5	1.7	2.0
Heart Diseases	390–398, 402, 404–429	1.8	1.0	1.0	1.2	1.7	1.1	1.8	1.6	1.8	1.9	2.3
Cerebrovascular Diseases	430–438	1.1	0.7	1.4	0.8	N/A	N/A	2.0	1.2	0.9	1.0	1.0
All Other Major Cardiovascular Diseases		1.6	0.9	1.3	–	1.0	0.3	2.0	1.0	1.0	1.8	1.8
All Cancers	140–208	1.4	1.1	1.2	1.0	1.3	1.3	1.5	1.4	1.1	0.8	0.7
Respiratory & Intrathoracic Organ Cancer	160–165	1.9	1.5	N/A	N/A	N/A	N/A	N/A	N/A	1/5	1.0	1.1
Digestive Organ Cancer	150–159	1.7	1.2	N/A	N/A	N/A	N/A	N/A	1.2	1.2	1.3	1.3
Genital Organ Cancer	179–187	1.2	1.3	N/A	N/A	N/A	N/A	N/A	0.8	0.4	0.2	0.1
Breast Cancer	174–175	–	–	N/A	N/A	N/A	N/A	N/A	N/A	–	–	–
All Other Cancer		1.7	1.3	1.2	1.0	1.3	1.3	1.5	1.4	1.4	1.5	1.5
Accidents & Adverse Effects	E800–E978, E980–E999	2.8	2.4	1.3	1.4	1.5	1.9	2.9	4.4	3.9	3.3	2.9
Motor Vehicle Accidents	E810–E825	2.2	2.1	1.2	1.2	1.4	1.7	1.8	3.1	2.9	2.6	2.2
Suicide	E950–E959	4.3	4.2	N/A	N/A	N/A	2.7	5.0	6.1	5.1	4.2	3.5
Homicide & Legal Intervention	E960–E978	3.5	3.4	1.1	1.2	0.9	1.5	5.4	6.0	4.4	3.3	2.7
All Other Accidents & Adverse Effects		2.7	1.8	1.4	1.7	1.8	2.4	4.1	5.2	4.2	3.6	3.3
Chronic Obstructive Pulmonary Diseases	490–496	1.4	1.1	N/A	N/A	1.0	1.5	1.5	1.7	1.3	1.1	1.0
Infectious & Parasitic Diseases	001–018, 020–066, 070–088, 090–139, 590	1.8	1.3	1.2	1.3	1.0	0.8	1.8	1.0	1.7	2.4	2.8
Pneumonia & Influenza	480–487	1.5	0.8	1.1	0.9	0.8	1.5	1.0	1.0	1.4	1.4	1.4
Diabetes mellitus	250	1.2	0.9	N/A	N/A	N/A	N/A	1.0	0.8	1.1	1.4	1.5
Chronic Liver Diseases & Cirrhosis	571	2.3	1.9	N/A	N/A	N/A	N/A	N/A	N/A	2.3	1.9	1.8
All others		1.3	0.8	1.2	1.0	1.1	1.2	1.3	1.4	1.3	1.4	1.5
Total		1.6	1.0	1.2	1.2	1.3	1.6	2.4	3.1	2.5	2.1	1.8
% from Accidents & Adverse Effects		1.8	2.3	1.1	1.2	1.1	1.2	1.2	1.4	1.6	1.6	1.6

APPENDIX D—Continued
MALE AND FEMALE DEATH RATES PER 100,000 POPULATION BY FIVE-YEAR AGE GROUPS
FOR MAJOR CAUSES OF DEATH IN THE U.S. IN 1998

Cause of Death	Ninth Revision, International Classification of Diseases, 1975	Ratio (Male/Female)									
		40-44 years	45-49 years	50-54 years	55-59 years	60-64 years	65-69 years	70-74 years	75-79 years	80-84 years	85+ years
Major Cardiovascular Diseases	390-448	2.3	2.5	2.5	2.3	2.1	1.9	1.7	1.5	1.4	1.0
Heart Diseases	390-398, 402, 404-429	2.7	2.9	2.9	2.5	2.3	2.1	1.8	1.6	1.5	1.1
Cerebrovascular Diseases	430-438	1.2	1.3	1.2	1.3	1.4	1.3	1.2	1.2	1.1	0.9
All Other Major Cardiovascular Diseases		1.8	2.1	2.1	2.0	1.9	1.8	1.7	1.6	1.4	1.1
All Cancers	140-208	0.9	1.0	1.1	1.3	1.4	1.5	1.6	1.6	1.7	1.8
Respiratory & Intrathoracic Organ Cancer	160-165	1.4	1.6	1.7	1.8	1.8	1.9	2.0	2.1	2.2	2.6
Digestive Organ Cancer	150-159	1.6	1.8	1.9	1.9	1.8	1.8	1.7	1.6	1.5	1.3
Genital Organ Cancer	179-187	0.1	0.1	0.2	0.4	0.7	1.1	1.7	2.6	3.9	6.2
Breast Cancer	174-175	—	—	—	—	—	—	—	—	—	—
All Other Cancer		1.6	1.8	1.9	1.8	1.8	1.9	1.7	1.7	1.6	1.5
Accidents & Adverse Effects	E800-E978, E980-E999	2.9	3.0	2.9	2.8	2.6	2.4	2.2	2.0	2.1	1.7
Motor Vehicle Accidents	E810-E825	2.2	2.3	2.4	2.0	2.0	1.7	1.5	1.7	2.1	3.2
Suicide	E950-E959	3.5	3.4	3.1	3.7	4.1	5.3	7.0	7.6	9.9	10.0
Homicide & Legal Intervention	E960-E978	2.8	2.8	3.8	3.4	3.4	2.6	2.0	2.2	1.2	1.5
All Other Accidents & Adverse Effects		3.3	3.4	2.9	2.8	2.4	2.1	1.9	1.6	1.6	1.3
Chronic Obstructive Pulmonary Diseases	490-496	0.9	1.0	1.0	1.2	1.3	1.3	1.5	1.5	1.7	2.0
Infectious & Parasitic Diseases	001-018, 020-066, 070-088, 090-139, 590	2.9	3.0	2.4	1.7	1.4	1.3	1.3	1.3	1.2	1.1
Pneumonia & Influenza	480-487	1.4	1.6	1.5	1.7	1.6	1.7	1.7	1.6	1.6	1.3
Diabetes mellitus	250	1.7	1.5	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.1
Chronic Liver Diseases & Cirrhosis	571	2.6	3.2	3.0	2.8	2.6	2.0	1.7	1.4	1.5	1.9
All others		1.5	1.6	1.5	1.4	1.4	1.4	1.3	1.3	1.2	1.0
Total		1.8	1.8	1.7	1.7	1.6	1.6	1.6	1.5	1.4	1.2
% from Accidents & Adverse Effects		1.6	1.6	1.7	1.7	1.6	1.4	1.4	1.3	1.4	1.4

Source of data: National Center for Health Statistics 2000a and Murphy 2000.

APPENDIX E
MALE AND FEMALE DEATH RATES PER 100,000 POPULATION BY FIVE-YEAR AGE GROUPS
FOR MAJOR CAUSES OF DEATH IN CANADA IN 1994

Cause of Death	Ninth Revision, International Classification of Diseases, 1975	Age- Adjusted	Total	Males																	
				Under 1 Year	1-4 Years	5-9 Years	10-14 Years	15-19 Years	20-24 Years	25-29 Years	30-34 Years	35-39 Years	40-44 Years								
				13.6	1.9	0.5	1.6	2.2	3.4	4.7	9.2	18.9	46.2								
Circulatory Diseases	390-459	325.4	275.2																		
Heart Diseases	410-414, 427-428	224.4	191.1	3.5	0.4	0.1	0.5	0.7	1.1	2.3	4.2	11.7	33.8								
Cerebrovascular Disease	430-438	54.3	44.4	2.5	0.4	0.1	0.5	0.3	1.1	0.3	1.6	5.8	5.8								
All Other Circulatory Diseases		46.7	39.7	7.6	1.1	0.3	0.6	1.2	1.2	2.1	3.4	1.4	6.6								
All Cancers	140-208	239.0	214.0	2.0	2.6	3.5	3.2	5.2	4.6	8.1	9.3	22.6	44.0								
Respiratory & Intrathoracic Organ Cancer	162	74.7	68.3	—	—	—	—	—	—	0.2	0.8	3.0	10.5								
Digestive Organ Cancer	150-154, 157	51.9	46.4	—	—	—	—	—	0.1	0.4	1.1	4.5	9.7								
Genital Organ Cancer	179-183, 185	30.3	25.0	—	—	—	—	—	—	—	—	—	—								
Breast Cancer	174-175	0.2	0.2	—	—	—	—	—	—	—	—	—	—								
All Other Cancer		81.9	74.1	2.0	2.6	3.5	3.2	5.2	4.5	7.5	7.4	15.1	23.8								
Accidents & Adverse Effects	E800-E999	65.0	62.4	15.7	13.6	8.5	12.5	65.3	79.6	67.2	66.1	71.0	68.6								
Motor Vehicle Accidents	E810-E825, E929.0	15.8	15.5	3.5	4.0	4.3	5.0	30.6	30.9	19.0	16.4	14.4	13.6								
Suicide	E950-E959	20.6	20.5	—	—	—	3.6	20.4	28.8	24.3	26.0	30.7	26.9								
Homicide	E960-E969	2.3	2.3	2.5	1.0	0.4	0.3	2.9	3.8	4.1	3.4	2.7	2.7								
All Other Accidents & Adverse Effects		26.3	24.1	9.7	8.6	3.8	3.6	11.4	16.1	19.8	20.3	23.2	25.4								
Chronic Obstructive Pulmonary Diseases	490-493, 496	45.7	37.6	1.0	0.2	0.1	0.4	0.2	0.6	0.3	0.3	0.5	1.3								
Infectious & Parasitic Diseases	001-139	16.3	15.9	9.6	1.2	0.5	0.6	0.7	1.2	10.9	24.1	28.4	29.1								
Pneumonia & Influenza	480-487	30.6	23.8	6.1	1.0	0.2	0.5	0.1	0.9	0.9	1.4	2.7	2.7								
Diabetes mellitus	250	20.0	17.3	—	—	—	0.1	0.4	0.7	1.0	2.3	3.7	3.7								
Chronic Liver Diseases & Cirrhosis	571	10.7	10.3	1.0	—	—	—	—	0.2	0.4	1.2	3.3	5.5								
All others		118.2	100.7	645.3	14.7	5.0	5.4	10.3	11.3	13.6	15.7	17.9	27.7								
Total	001-799, E800-E999	870.9	757.2	694.3	35.2	18.3	24.2	84.1	102.2	106.8	128.3	167.6	228.8								
% from Accidents & Adverse Effects		7%	8%	2%	39%	46%	52%	78%	78%	63%	52%	42%	30%								

APPENDIX E—Continued
MALE AND FEMALE DEATH RATES PER 100,000 POPULATION BY FIVE-YEAR AGE GROUPS
FOR MAJOR CAUSES OF DEATH IN CANADA IN 1994

Cause of Death	Ninth Revision, International Classification of Diseases, 1975	Males									
		45-49 Years	50-54 Years	55-59 Years	60-64 Years	65-69 Years	70-74 Years	75-79 Years	80-84 Years	85-89 Years	90+ Years
Circulatory Diseases	390-459	81.2	163.4	281.1	523.5	875.7	1,443.6	2,523.4	4,188.1	6,555.5	10,834.0
Heart Diseases	410-414, 427-428	62.5	125.4	215.6	389.9	648.2	1,017.6	1,747.2	2,760.6	4,244.0	7,001.0
Cerebrovascular Disease	430-438	7.2	15.3	29.9	57.4	102.7	213.5	436.3	845.7	1,412.3	2,154.6
All Other Circulatory Diseases		11.5	22.7	35.6	76.2	124.8	212.5	339.9	581.8	899.2	1,678.4
All Cancers	140-208	86.3	176.0	348.3	612.2	932.4	1,300.6	1,764.6	2,375.2	2,944.7	2,970.2
Respiratory & Intrathoracic Organ Cancer	162	27.2	58.1	121.2	238.2	358.3	464.9	564.6	616.8	593.2	363.6
Digestive Organ Cancer	150-154, 157	18.3	42.6	85.4	129.9	200.6	278.3	380.1	519.2	664.7	679.6
Genital Organ Cancer	179-183, 185	0.5	2.7	12.7	31.1	79.6	150.6	272.3	467.1	774.8	900.6
Breast Cancer	174-175	—	0.4	0.2	0.5	0.2	3.1	1.5	3.1	1.4	—
All Other Cancer		40.3	72.2	128.8	212.5	293.7	403.7	546.1	769.0	910.6	1,026.4
Accidents & Adverse Effects	E800-E999	59.8	63.8	65.1	63.8	66.8	88.3	135.8	234.4	400.2	744.2
Motor Vehicle Accidents	E810-E825, E929.0	12.6	12.4	15.1	13.9	13.1	19.7	25.6	33.8	25.7	30.6
Suicide	E950-E959	25.1	26.3	23.6	23.3	21.2	19.4	28.7	30.7	38.6	23.8
Homicide	E960-E969	2.2	1.7	2.5	1.2	1.5	0.7	2.6	1.8	—	—
All Other Accidents & Adverse Effects		19.9	23.4	23.9	25.4	31.0	48.5	78.9	168.1	335.9	689.8
Chronic Obstructive Pulmonary Diseases	490-493, 496	1.3	5.4	19.1	44.4	110.2	223.6	436.3	709.5	1,062.1	1,495.2
Infectious & Parasitic Diseases	001-139	23.3	14.2	15.1	13.2	19.5	30.2	43.4	61.4	122.9	166.5
Pneumonia & Influenza	480-487	2.9	5.1	9.0	21.4	38.0	81.3	188.9	452.9	1,012.1	2,062.8
Diabetes mellitus	250	5.9	10.3	21.9	35.3	61.5	101.5	156.9	236.3	370.2	411.2
Chronic Liver Diseases & Cirrhosis	571	11.3	17.5	26.9	37.7	52.6	52.3	44.9	43.6	45.7	17.0
All others		37.7	53.4	78.6	132.3	215.5	399.4	716.8	1,334.2	2,428.6	4,305.8
Total	001-799, E800-E999	309.7	509.1	865.1	1,483.8	2,372.2	3,720.8	6,011.0	9,635.6	14,942.0	23,006.9
% from Accidents & Adverse Effects		19%	13%	8%	4%	3%	2%	2%	2%	3%	3%

APPENDIX E—Continued
MALE AND FEMALE DEATH RATES PER 100,000 POPULATION BY FIVE-YEAR AGE GROUPS
FOR MAJOR CAUSES OF DEATH IN CANADA IN 1994

Cause of Death	International Classification of Diseases, 1975	Females											
		Age-Adjusted	Total	Under 1 year	1-4 years	5-9 years	10-14 years	15-19 years	20-24 years	25-29 years	30-34 years	35-39 years	40-44 years
Circulatory Diseases	390-459	199.0	262.2	10.2	1.4	0.4	2.0	1.0	1.9	3.2	5.5	9.2	15.8
Heart Diseases	410-414, 427-428	122.6	161.5	1.1	0.4	0.2	0.6	0.2	0.8	0.6	1.1	3.6	7.0
Cerebrovascular Disease	430-438	45.2	60.1	0.5	—	—	0.5	0.4	0.3	0.8	2.4	3.1	5.4
All Other Circulatory Diseases		31.2	40.6	8.6	1.0	0.2	0.9	0.4	0.8	1.8	2.0	2.5	3.4
All Cancers	140-208	153.9	178.3	1.6	2.4	2.5	3.0	2.3	4.1	6.6	13.1	31.9	58.5
Respiratory & Intrathoracic													
Organ Cancer	162	31.7	35.7	—	—	—	—	—	—	0.1	0.5	4.1	9.0
Digestive Organ Cancer	150-154, 157	30.8	37.0	—	—	—	0.1	0.1	0.1	0.5	1.0	3.7	6.3
Genital Organ Cancer	179-183, 185	13.9	15.8	—	—	—	—	—	0.4	0.9	2.3	4.0	6.4
Breast Cancer	174-175	29.8	33.8	—	—	—	—	—	—	0.7	3.3	12.2	22.3
All Other Cancer		47.7	56.0	1.6	2.4	2.5	2.9	2.2	3.6	4.4	6.0	7.9	14.5
Accidents & Adverse Effects	E800-E999	25.0	28.1	17.7	10.4	5.1	7.5	20.5	18.9	17.5	17.5	18.9	21.0
Motor Vehicle Accidents	E810-E825, E929.0	6.3	6.4	2.1	4.0	2.1	3.0	11.5	7.9	6.6	5.9	4.2	5.4
Suicide	E950-E959	5.2	5.3	—	—	—	1.2	4.9	5.7	5.0	5.9	8.4	8.1
Homicide	E960-E969	1.2	1.2	5.3	0.4	0.5	0.7	1.3	2.3	1.9	1.4	1.5	0.9
All Other Accidents & Adverse Effects		12.3	15.2	10.3	6.0	2.5	2.6	2.8	3.0	4.0	4.3	4.8	6.6
Chronic Obstructive Pulmonary Diseases	490-493, 496	17.8	22.3	0.5	0.1	—	0.1	0.2	0.3	0.4	0.3	0.1	0.5
Infectious & Parasitic Diseases	001-139	5.1	6.1	6.4	1.5	0.7	0.4	0.5	1.1	1.3	3.1	3.0	2.6
Pneumonia & Influenza	480-487	18.8	26.1	2.7	0.9	0.3	0.2	0.1	—	0.4	0.6	0.9	1.4
Diabetes mellitus	250	14.4	18.0	—	0.3	0.1	0.2	—	—	0.7	0.4	1.8	1.7
Chronic Liver Diseases & Cirrhosis	571	4.4	4.9	—	0.1	—	—	—	—	0.1	0.6	1.1	2.5
All others		90.2	113.6	517.9	28.5	13.8	16.7	31.0	34.0	37.6	49.8	78.8	119.4
Total	001-799, E800-E999	528.6	659.6	557.0	28.5	13.8	16.7	31.0	34.0	37.6	49.8	78.8	119.4
% from Accidents & Adverse Effects		5%	4%	3%	36%	37%	45%	66%	56%	47%	35%	24%	18%

APPENDIX E—Continued
MALE AND FEMALE DEATH RATES PER 100,000 POPULATION BY FIVE-YEAR AGE GROUPS
FOR MAJOR CAUSES OF DEATH IN CANADA IN 1994

Cause of Death	Ninth Revision, International Classification of Diseases, 1975	Females									
		45-49 years	50-54 years	55-59 years	60-64 years	65-69 years	70-74 years	75-79 years	80-84 years	85-89 years	90+ years
Circulatory Diseases	390-459	26.4	54.5	100.8	201.6	378.0	740.0	1,435.3	2,844.4	5,298.4	10,399.0
Heart Diseases	410-414, 427-428	12.4	30.1	61.0	132.1	241.9	472.1	908.4	1,770.3	3,206.6	6,355.0
Cerebrovascular Disease	430-438	8.3	13.5	19.0	34.6	72.1	145.5	319.5	683.9	1,326.0	2,409.7
All Other Circulatory Diseases		5.7	10.9	20.8	34.9	64.0	122.4	207.4	390.2	765.8	1,634.3
All Cancers	140-208	111.8	185.6	300.1	414.8	578.4	749.8	964.8	1,196.6	1,437.3	1,684.3
Respiratory & Intrathoracic											
Organ Cancer	162	22.1	39.2	77.0	112.5	147.6	188.3	185.0	182.5	152.5	107.4
Digestive Organ Cancer	150-154,157	14.4	26.3	45.1	68.6	110.8	154.5	224.9	314.5	426.5	544.4
Genital Organ Cancer	179-183,185	14.6	23.3	31.8	38.0	51.2	62.7	81.2	92.5	85.0	98.6
Breast Cancer	174-175	34.5	51.4	73.7	76.3	103.2	116.8	144.7	181.8	221.3	313.4
All Other Cancer		26.2	45.4	72.5	119.4	165.6	227.5	329.0	425.3	552.0	620.5
Accidents & Adverse Effects	E800-E999	18.9	22.9	26.0	24.7	28.8	40.6	65.8	135.7	280.7	636.8
Motor Vehicle Accidents	E810-E825,E929.0	5.4	6.2	6.3	6.6	9.7	10.9	12.8	14.6	10.1	6.2
Suicide	E950-E959	8.1	8.1	9.4	5.5	5.1	5.2	5.2	3.7	4.0	1.2
Homicide	E960-E969	0.8	1.2	1.1	0.6	0.3	0.4	1.0	1.5	1.3	—
All Other Accidents & Adverse Effects		4.6	7.4	9.2	12.0	13.7	24.1	46.8	115.9	265.3	629.4
Chronic Obstructive Pulmonary Diseases	490-493,496	1.3	5.0	11.0	27.8	54.8	98.3	171.9	247.6	299.7	432.0
Infectious & Parasitic Diseases	001-139	3.8	2.5	5.5	5.5	10.0	20.0	23.8	43.5	75.6	136.1
Pneumonia & Influenza	480-487	1.8	2.2	4.1	8.6	20.0	43.1	109.7	257.1	587.1	1,675.5
Diabetes mellitus	250	3.1	6.7	12.2	23.8	39.9	65.7	117.3	188.3	279.4	405.8
Chronic Liver Diseases & Cirrhosis	571	5.3	6.8	9.9	12.8	20.9	21.7	23.3	21.6	14.2	16.2
All others		24.2	32.4	53.1	84.2	148.1	266.2	534.0	989.2	2,064.0	4,397.3
Total	001-799,E800-E999	196.6	318.6	522.7	803.8	1,278.9	2,045.4	3,445.9	5,924.0	10,336.4	19,783.0
% from Accidents & Adverse Effects		10%	7%	5%	3%	2%	2%	2%	2%	3%	3%

APPENDIX E—Continued
MALE AND FEMALE DEATH RATES PER 100,000 POPULATION BY FIVE-YEAR AGE GROUPS
FOR MAJOR CAUSES OF DEATH IN CANADA IN 1994

Cause of Death	Ninth Revision, International Classification of Diseases, 1975	Age-Adjusted	Total	Under 1 year	1-4 years	5-9 years	10-14 years	15-19 years	20-24 years	25-29 years	30-34 years	35-39 years	Ratio (Male/Female)	
Circulatory Diseases	390-459	1.6	1.0	1.3	1.4	1.3	0.8	2.2	1.8	1.5	1.7	2.1		
Heart Diseases	410-414, 427-428	1.8	1.2	3.2	1.0	0.5	0.8	3.5	1.4	3.8	3.8	3.3		
Cerebrovascular Disease	430-438	1.2	0.7	5.0	N/A	N/A	1.0	0.8	3.7	0.4	0.7	1.9		
All Other Circulatory Diseases		1.5	1.0	0.9	1.1	1.5	0.7	3.0	1.5	1.2	1.7	0.6		
All Cancers	140-208	1.6	1.2	1.3	1.1	1.4	1.1	2.3	1.1	1.2	0.7	0.7		
Respiratory & Intrathoracic Organ Cancer	162	2.4	1.9	N/A	N/A	N/A	N/A	N/A	N/A	2.0	1.6	0.7		
Digestive Organ Cancer	150-154,157	1.7	1.3	N/A	N/A	N/A	—	—	1.0	0.8	1.1	1.2		
Genital Organ Cancer	179-183,185	2.2	1.6	N/A	N/A	N/A	N/A	N/A	—	—	—	—		
Breast Cancer	174-175	—	—	N/A	N/A	N/A	N/A	N/A	N/A	—	—	—		
All Other Cancer		1.7	1.3	1.3	1.1	1.4	1.1	2.4	1.3	1.7	1.2	1.9		
Accidents & Adverse Effects	E800-E999	2.6	2.2	0.9	1.3	1.7	1.7	3.2	4.2	3.8	3.8	3.8		
Motor Vehicle Accidents	E810-E825,E929,0	2.5	2.4	1.7	1.0	2.0	1.7	2.7	3.9	2.9	2.8	3.4		
Suicide	E950-E959	4.0	3.9	N/A	N/A	N/A	3.0	4.2	5.1	4.9	4.4	3.7		
Homicide	E960-E969	1.9	1.9	0.5	2.5	0.8	0.4	2.2	1.7	2.2	2.4	1.8		
All Other Accidents & Adverse Effects		2.1	1.6	0.9	1.4	1.5	1.4	4.1	5.4	5.0	4.7	4.8		
Chronic Obstructive Pulmonary Diseases	490-493,496	2.6	1.7	2.0	2.0	N/A	4.0	1.0	2.0	0.8	1.0	5.0		
Infectious & Parasitic Diseases	001-139	3.2	2.6	1.5	0.8	0.7	1.5	1.4	1.1	8.4	7.8	9.5		
Pneumonia & Influenza	480-487	1.6	0.9	2.3	1.1	0.7	2.5	1.0	N/A	2.3	2.3	3.0		
Diabetes mellitus	250	1.4	1.0	N/A	—	—	—	N/A	N/A	1.0	2.5	1.3		
Chronic Liver Diseases & Cirrhosis	571	2.4	2.1	N/A	—	N/A	N/A	N/A	N/A	4.0	2.0	1.5		
All others		1.3	0.9	1.2	1.3	1.1	1.6	1.6	1.5	1.8	1.8	1.5		
Total	001-799,E800-E999	1.6	1.1	1.2	1.2	1.3	1.4	2.7	3.0	2.8	2.6	2.1		
% from Accidents & Adverse Effects		1.6	1.9	0.7	1.1	1.3	1.2	1.2	1.4	1.4	1.5	1.8		

APPENDIX E—Continued
MALE AND FEMALE DEATH RATES PER 100,000 POPULATION BY FIVE-YEAR AGE GROUPS
FOR MAJOR CAUSES OF DEATH IN CANADA IN 1994

Cause of Death	Ninth Revision, International Classification of Diseases, 1975	Ratio (Male/Female)										
		40-44 years	45-49 years	50-54 years	55-59 years	60-64 years	65-69 years	70-74 years	75-79 years	80-84 years	85-89 years	90+ years
Circulatory Diseases	390-459	2.9	3.1	3.0	2.8	2.6	2.3	2.0	1.8	1.5	1.2	1.0
Heart Diseases	410-414, 427-428	4.8	5.0	4.2	3.5	3.0	2.7	2.2	1.9	1.6	1.3	1.1
Cerebrovascular Disease	430-438	1.1	0.9	1.1	1.6	1.7	1.4	1.5	1.4	1.2	1.1	0.9
All Other Circulatory Diseases		1.9	2.0	2.1	1.7	2.2	2.0	1.7	1.6	1.5	1.2	1.0
All Cancers	140-208	0.8	0.8	0.9	1.2	1.5	1.6	1.7	1.8	2.0	2.0	1.8
Respiratory & Intrathoracic Organ Cancer	162	1.2	1.2	1.5	1.6	2.1	2.4	2.5	3.1	3.4	3.9	3.4
Digestive Organ Cancer	150-154,157	1.5	1.3	1.6	1.9	1.9	1.8	1.8	1.7	1.7	1.6	1.2
Genital Organ Cancer	179-183,185	—	—	0.1	0.4	0.8	1.6	2.4	3.4	5.0	9.1	9.1
Breast Cancer	174-175	—	—	—	—	—	—	—	—	—	—	—
All Other Cancer		1.6	1.5	1.6	1.8	1.8	1.8	1.7	1.7	1.8	1.6	1.7
Accidents & Adverse Effects	E800-E999	3.3	3.2	2.8	2.5	2.6	2.3	2.2	2.1	1.7	1.4	1.2
Motor Vehicle Accidents	E810-E825,E929.0	2.5	2.3	2.0	2.4	2.1	1.4	1.8	2.0	2.3	2.5	4.9
Suicide	E950-E959	3.3	3.1	3.2	2.5	4.2	4.2	3.7	5.5	8.3	9.7	19.8
Homicide	E960-E969	3.0	2.8	1.4	2.3	2.0	5.0	1.8	2.6	1.2	—	N/A
All Other Accidents & Adverse Effects		3.8	4.3	3.2	2.6	2.1	2.3	2.0	1.7	1.5	1.3	1.1
Chronic Obstructive Pulmonary Diseases	490-493,496	2.6	1.0	1.1	1.7	1.6	2.0	2.3	2.5	2.9	3.5	3.5
Infectious & Parasitic Diseases	001-139	11.2	6.1	5.7	2.7	2.4	2.0	1.5	1.8	1.4	1.6	1.2
Pneumonia & Influenza	480-487	1.9	1.6	2.3	2.2	2.5	1.9	1.9	1.7	1.8	1.7	1.2
Diabetes mellitus	250	2.2	1.9	1.5	1.8	1.5	1.5	1.5	1.3	1.3	1.3	1.0
Chronic Liver Diseases & Cirrhosis	571	2.2	2.1	2.6	2.7	2.9	2.5	2.4	1.9	2.0	3.2	1.0
All others		1.8	1.6	1.6	1.5	1.6	1.5	1.5	1.3	1.3	1.2	1.0
Total	001-799,E800-E999	1.9	1.6	1.6	1.7	1.8	1.9	1.8	1.7	1.6	1.4	1.2
% from Accidents & Adverse Effects		1.7	2.0	1.7	1.5	1.4	1.3	1.2	1.2	1.1	1.0	1.0

Source of data: Statistics Canada 1996, Tables 3 & 5.

APPENDIX F
MORTALITY OF ANIMALS BY SEX

Animal	Results			Source
	Sex with Apparent Lower Mortality	Detail		
Mealworms	Female	Males averaged 60 days and females averaged 111 days.		Rockstein 1974
Nematodes				
<i>Anguillula aceti</i>	Female	Males appear to be shorter-lived than females.		Geiser 1924
<i>Echinorhynchus</i>	Female	Males appear to be shorter-lived than females.		Geiser 1924
<i>Ascaris</i>	Female	Males appear to be shorter-lived than females.		Geiser 1924
Crustaceans				
<i>Daphnia magna</i> (parthogenetic)	Female	Of 4,000 animals kept at 18° C, the average duration of life was 39 days in males, 45 days in females; at 28° C it was 22 days in males, 29 days in females.		MacArthur & Baillie 1929
<i>Moina rectirostris</i> (parthogenetic)	Female	Duration of life in males was 20-25 days, in females 25-30 days.		Papanicolaou 1910
<i>Simocephalus vetulus</i> (parthogenetic)	Female	Duration of life in males was 1 1/2 months, in females 2 1/2 months.		Papanicolaou 1910
Shore Crab (<i>Carcinides moenas</i>)	Female	Males were shorter-lived than females.		Punnett 1904b
<i>Gammarus locusta</i>	Female	In aquaria, of 50 males and 50 females, the mortality rate was much higher in males than in females.		Blegvad 1922
<i>Mysis neglecta</i>	Female	In Nyborg Fjord, males apparently die before females.		Blegvad 1922
<i>Mysis inermis</i>	Female	In Nyborg Fjord, males die before females.		Blegvad 1922
<i>Mysis flexuosa</i>	Female	In Nyborg Fjord, males apparently die before females.		Blegvad 1922
Mollusks				
		<u>Average age in years</u>		<u>Conditions</u>
		<u>Male</u>	<u>Female</u>	
<i>Littorina scabra</i>	Female	4	5	wild
<i>Paludina contectoides</i>	Female	1	3	wild
<i>Paludina contecta</i>	Female	4.5	5	captivity
	Female	3.5	4.5	captivity
<i>Paludina benalensis</i>	Female	1	3	wild & captivity
<i>Paludina malleata</i>	Female	4	7	wild
<i>Lioplax</i> sp.	Female	In captivity, males live to be about 1 year of age, while females live to be about 2 years of age.		Van Cleave & Chambers 1935
Insects				
Parasitic Wasp (<i>Habrobracon Juglandis</i> Ashmead)	Female	Of 2,546 wasps, the wild-type males lived on average 24.1 days, the wild-type females 29.3 days, and the double mutant males lived on average 19.9 days, the double mutant females 24.0 days.		Georgiana 1949
<i>Orthoptera</i>	Female	Males have lesser viability.		Carothers 1923
Flies				
NAIDM strain of Common House Fly (<i>Musca domestica</i> L.)	Female	Of over 8,200 flies, the male average life expectancy was 18.74 days, while female's was 28.74 days.		Rockstein & Lieberman 1959
NAIDM strain of Common House Fly (<i>Musca domestica</i> L.)	Female	Female average longevity is considerably greater than that of males under various dietary conditions.		Rockstein 1957
Common House Fly (<i>Musca domestica</i>)	Female	Male average life expectancy was 28 days, while female's was 30 days.		Rockstein 1974

APPENDIX F—Continued
MORTALITY OF ANIMALS BY SEX

Animal	Sex with Apparent Lower Mortality	Results Detail	Source			
<i>Drosophila melanogaster</i>	Male	Of 11,772 flies, the long-winged males lived on average 41.0 days, the long-winged females 38.8 days, and the short-winged males lived on average 14.2 days, the short-winged females 15.8 days.	Pearl & Parker 1921			
<i>Drosophila melanogaster</i>	Female	Average length of life of 2,620 males was 31 days, while average length of life of 3,216 females was 33 days.	Pearl 1922			
<i>Drosophila melanogaster</i>	Female	The average duration of life was 28.9 days in normal males, and 33.1 days in both normal females (2 X chromosomes) and triploid females (3 X chromosomes).	Gowen 1931			
<i>Drosophila melanogaster</i> (vestigial strain)	Female	In 980 files of a vestigial strain, the greater male mortality rates than female mortality rates were much more pronounced than in normal flies.	Pearl & Parker 1924			
Mediterranean fruit fly (<i>Ceratitis capitata</i>)	Male	Of 1.2 million flies, males had a greater expectation of life at birth, but did not consistently have lower mortality at all ages.	Carey et al. 1995			
Dragonflies	Female	For those dragonflies for which there are data, males apparently have higher mortality rates than females.	Corbet et al. 1960			
Wild type D <i>Calliphora</i>	Female	70 males averaged 46.8 days, while 70 females averaged 52.8 days, in captivity.	Tribe 1967			
Wild type S <i>Calliphora</i>	Male	145 males averaged 55.3 days, while 100 females averaged 49.9 days, in captivity.	Tribe 1967			
C-mutant <i>Calliphora</i>	Female	194 males averaged 44.5 days, while 32 females averaged 51.3 days, in captivity.	Tribe 1967			
W-mutant <i>Calliphora erythrocephala</i>	Female	68 males averaged 35.5 days, while 63 females averaged 43.4 days, in captivity.	Tribe 1967			
Moths and Butterflies						
		Average duration of life	No. of animals			
		Male Female	Male Female			
<i>Samia cecropia</i>	Male	10.4	10.1	744	709	Rau & Rau 1914
<i>Samia californica</i>	Female	8.7	8.8	6	6	Rau & Rau 1914
<i>Tropaea luna</i>	Female	5.9	6.0	35	25	Rau & Rau 1914
<i>Philosamia cynthia</i>	Female	5.9	7.1	204	155	Rau & Rau 1914
<i>Telea polyphemus</i>	Female	8.1	10.0	399	338	Rau & Rau 1914
<i>Callosamia promethea</i>	Female	4.6	7.0	162	112	Rau & Rau 1914
<i>Carpocapsa</i>	Female	6.0	6.9	8009	9657	MacArthur & Baillie 1932
Lotus Borer (<i>Pyrausta penitalis</i>)	Female	6.8	7.7	27	43	Ainslie & Cartwright 1922
<i>Pyrausta nubilalis</i>	Female	13.0	17.0	—	—	Crawford & Spencer 1921
<i>Porthetria dispar</i>	Female	Males are so short-lived that many die before females are sufficiently mature to be fertilized.				Goldschmidt 1917
<i>Pthorimaea operculella</i>	Female	Males lived less than females in 271 of 275 pairs of isolated adults. Of the few females that died before the males, most were abnormal.				Graf 1917
<i>Colias</i>	Female	The imaginal life is shorter in males than in females.				Gerould 1926
Beetles						
<i>Tenebrio molitor</i>	Female	In a large number of beetles the average length of life was 60 days in males, 111 days in females. The sex ratio of the pupae was approximately equal.				Hein 1920

APPENDIX F—Continued
MORTALITY OF ANIMALS BY SEX

Animal	Results		Source
	Sex with Apparent Lower Mortality	Detail	
4 species of <i>Dytiscus</i>	Female	Of the 58 longest-lived beetles, recorded, the females consistently outlived the males.	Blunck 1924
Flour Beetle <i>Tribolium confusum</i> (Duval)	Female	Of 800 beetles, the average lifespan was 178 days in males and 199 days in females.	Pearl et al. 1941
Rusty Grain Beetle (<i>Cryptolestes ferrugineus</i> Stephens) (Coleoptera: Cucujidae)	—	Survival rate for females was higher at -1° C, and lower at 35° C than that for males, and there were no significant sex differences in survival at 0, 10, 15, 20, 25, 35 or 45° C.	Kawamoto et al. 1989
19 species of insects raised in captivity	—	Since sample sizes were so small (33 at most), this author performed statistical tests (permutation tests) by species and found that none of the results by species by sex were statistically significant at the 0.05 level.	Labitte 1916
Arachnids (Spiders)			
<u>Maximum Adult Longevity</u>			
		<u>Female</u>	<u>Male</u>
<i>Mygalomorphae</i>			
<i>Theraposa</i> spp.	Female	25 yr	2 mo
<i>Ummidia</i> spp.	Female	13+ yr	6 mo
<i>Uagrus mexicanus</i>	Female	7+ yr	3 mo
<i>Araneomorphae</i>			
<i>Frontinella pyramitela</i>	Female	3 mo	1 mo
<i>Pisaura mirabilis</i>	Female	4 mo	1 mo
<i>Nephila clavipes</i>	Female	4 mo	2 mo
Black Widow (<i>Latrodectus mactans</i>)	Female	28.3 mo	4.2 mo
<i>Filistata hibernalis</i>	Female	10+ yr	2 mo
Black Widow (<i>Latrodectus mactans</i>)	Female	As adults, males are shorter-lived than females.	
Black Widow (<i>Latrodectus mactans</i>)	Female	The average length of life was 100 days in males and 271 days in females, of 82 males and 45 females.	
Black Widow (<i>Latrodectus mactans</i>)	Female	Females lived longer than males.	
<i>Dermacentor variabilis</i>	Female	Of 462 engorged nymphs, 46% were males.	
Reptiles			
Side-blotched lizards (<i>Uta stansburiana</i>)	Female	Males apparently have higher mortality rates than females.	Tinkle 1967
Rainbow lizards	Female	Males apparently have higher mortality rates than females.	Harris 1964
2 lizard species	Female	Males apparently have higher mortality rates than females.	Hirth 1963
Rusty lizards	Female	Males apparently have higher mortality rates than females.	Blair 1960

APPENDIX F—Continued
MORTALITY OF ANIMALS BY SEX

Animal	Sex with Apparent Lower Mortality	Results Detail	Source
Musk turtles (<i>Sternotherus odoratus</i>)	Female	A collection of 255 adult turtles in Michigan had 70% females.	Risley 1933
Diamond back terrapins (<i>Malaclemmys centrata centrata</i> ; <i>Malaclemmys centrata concentrata</i>)	Female	Of 1,442 mature turtles grown in captivity, 85% were females. The proportion of females in broods hatched in different years varied from 63% to 100%. In 139 immature animals, however, the percentage of females was only 38%.	Hildebrand 1932, 1933
Snapping Turtles (<i>Chelydra serpentina</i>)	Male	Intermediate incubation temperatures produced mostly, with higher embryo and hatching survival, than the mostly females from extreme temperatures.	Bobyn & Brooks 1994
Alligators	Female	Of 166 alligators bought from dealers after collection and examined when 19 months or less of age, 67% were females.	Forbes 1940
Snakes (<i>Crotalus and Sistrurus</i>)	Male	Of 453 snakes observed at or near the time of birth, 47% were males. Of 625 wild animals collected as adults, 51% were males.	Klauber 1936
Pig Frogs (<i>Rana grylio</i>)	Female	In north central Florida, adult females had greater survival than adult males.	Wood et al. 1998
Birds			
European Startlings (<i>Sturnus vulgaris</i>)	Male	Mortality during the first year of life was 39% in males and 70% in females. They tend to be monogamous.	Coulson 1960; Gowaty 1996
Shags (<i>Phalacrocorax aristotelis</i>)	Male	Annual survival of females (80%) is about 5% less than that of the males.	Potts 1969
Yellow-eyed Penguin (<i>Medadypetes antipodes</i>)	Male	Annual survival of females is about 5% less than that of the males. They are generally monogamous and both parents tend the young.	Richdale 1957; Williams 1996
Great Tits (<i>Parus major</i>)	Male	Females have a greater adult mortality rate than males. They tend to be monogamous.	Perrins 1965; Dhondt et al. 1996
Pied Flycatcher (<i>Ficedula hypoleuca</i>)	Female	Based on 953 males and 1,298 females, after the first year males had greater mortality. About 5% of breeding males were polygynous.	Sternberg 1989
House Martin (<i>Delichon urbica</i>)	Male	After their first summer, males have annual survival of 46%, while females have 33%. Male breeders have a lifespan of 1–6 years, while female breeders' lifespan is 1–5 years. Both sexes build the nest and raise the young.	Bryant 1988, 1989
Kingfishers (<i>Alcedo atthis</i>)	—	Of 74 males and 51 females, there were no significant differences in longevity between males and females. They are essentially monogamous.	Bunzel & Drüke 1989
Meadow Pipit (<i>Anthus pratensis</i> L.)	Male	Males probably have lower mortality rates than females. They are essentially monogamous.	Hötker 1989
Song Sparrow (<i>Melospiza melodia</i>)	—	The median number of breeding seasons for both sexes is two. They are typically monogamous. Only the female builds the nest and incubates the eggs.	Hochachka et al. 1989

APPENDIX F—Continued
MORTALITY OF ANIMALS BY SEX

Animal	Sex with Apparent Lower Mortality	Results Detail	Source
Red-winged Blackbird (<i>Agelaius phoeniceus</i>)	—	Mortality for males and females is probably similar. They are strongly polygamous.	Orians & Beletsky 1989
Florida Scrub Jay (<i>Aphelocoma c. caerulescens</i>)	Male	In the wild, 20% of males and 35% of females die between their first and second birthdays. Older helpers have 16% annual mortality for males, and 26% for females. Breeders of both sex have 21% annual mortality. They are monogamous.	Fitzpatrick & Woolfenden 1989
Splendid Fairy-wren (<i>Mallurus splendens</i>)	Male	Breeding males have annual survival of 72%, breeding females 65%. Mean lifespan for male breeders is 5.0 years, 4.2 years for female breeders. Mean lifespan for male nestlings is 1.9 years, for female nestlings 1.7 years. Pairs remain together for life.	Rowley & Russell 1989
Sparrowhawks (<i>Accipiter nisus</i>)	Female	In south Scotland, survival in the first year was 31% for males and 49% for females; thereafter survival was 67–69% per year for males and 64–71% per year for females. There was no difference between the sexes in Britain. They are primarily monogamous.	Newton 1986, 1989
Barnacle Geese (<i>Branta leucopsis</i>)	Male	Female mortality is consistently higher than male mortality. In one sample, the median lifespan was 10 years for males and eight years for females. They are lifelong monogamous.	Owen 1982; Owen & Black 1989
Mute Swan (<i>Cygnus olor</i>)	Female	There were no survival differences between the sexes in two samples, while in a third sample the females survived better than did the males. They are strictly monogamous.	Bacon & Andersen-Harild 1989
Red-billed Gulls (<i>Larus novaehollandiae scopulinus</i>)	Female	Male annual survival averaged 84.4%, while female average annual survival was 89.4%. The sex ratio widened with age. They are monogamous.	Mills 1989
Color-Ringed Herring Gulls (<i>Larus Argentatus</i>)	Female	In northeast England, female survival was higher than that of males in most years, but the difference was not significant.	Coulson & Butterfield 1986
Quail, Partridge	Male	Autumn hunters' bags favored males: 58–66% male in eight cases; young shot were 47–54% males in seven cases	Hickey 1955
California quail (<i>Lophortyx californica</i>)	Male	Of 17,632 birds, mortality is greater in females than in males.	Emlen 1940
Japanese Quail (<i>Coturnix Japonica</i>)	Male	Males live longer than females in captivity.	Daniels 1968
Ring-necked pheasant	Female	Bags were 26% males. Pheasant fathers are neglectful of their young.	Einarsen 1945; Skutch 1976
Ring-necked pheasant	Male	Sex ratio favored males by almost 2:1 after three years of prohibited hunting on Protection Island, Washington. Pheasant fathers are neglectful of their young.	Einarsen 1945; Skutch 1976
Pheasant hybrids	Female	Of 514 males and 252 females hatched, 70% of the males and 51% of the females died within six months. Pheasant fathers are neglectful of their young.	Thomas & Huxley 1927; Skutch 1976

APPENDIX F—Continued
MORTALITY OF ANIMALS BY SEX

Animal	Sex with Apparent Lower Mortality	Results Detail	Source
Grey Ducks (<i>Anas superciliosa</i>)	—	In New Zealand, there was no evidence of sex-specific survival differences.	Caithness et al. 1991
Mallards (<i>Anas platyrhynchos</i>)	Male	In New Zealand and North America, survival rates of males were higher than those in females.	Caithness et al. 1991
Leghorn and hybrid chickens	Female	The male/female ratio in 5,683 deaths, which occurred within the first eight weeks after hatching, was 52.7%, while the ratio at hatching was 48.8%.	Landauer & Landauer 1931
Several breeds of domestic fowls	—	No sex difference in numbers that hatch or that die shortly thereafter.	Byerly & Jull 1935
Poultry	Female	In experimental breeding poultry, males were very much shorter-lived than females.	Pease 1947
Pigeons	Male	Of 570 birds, the mortality rates of the sexes were similar until adulthood; then, during first two years of life, they were higher for females than for males.	Cole & Kirkpatrick 1915
Pigeons	Male	Males live longer than females.	Levi 1957
Bengalese Finch (<i>Lonchura striata</i> : Fam. <i>Estrildidae</i>)	Male	15 males averaged 57.3 months of life, while 24 females averaged 47.5 months of life in captivity.	Eisner 1967
House finches (<i>Carpodacus mexicanus</i>)	Female	In an epidemic killing millions of birds, proportionately more males were killed.	Nolan et al. 1998
Fish			
<i>Cynolebias adloffii</i>	Female	21 males averaged 10.1 months of life while 23 females averaged 11.5 months of life, in captivity.	Walford & Liu 1965
<i>Cymatogaster</i>	Female	At birth, the sex ratio was about equal, but most adults are females.	Eigenmann 1896
Dogfish (<i>Spinax niger</i>)	Female	Of 308 embryos, the ratio of males to females was approximately equal; in adults there were twice as many females as males.	Punnett 1904a
Plaice (<i>Pleuronectes platessa</i> L.)	Female	Of 179,118 animals caught in the North Sea, the percentage of males was 55% in the youngest age group and gradually decreased in collections of older series of fish, until it was only 8% in the oldest group.	Hefford 1909, 1916
Plaice (<i>Pleuronectes platessa</i> L.)	Female	In the Barents Sea, an unfished area, 47% of the catch of young fish were males, while only 2% of the old fish were males.	Atkinson 1908
Plaice (<i>Pleuronectes platessa</i> L.)	Female	Males constituted about 45% of all fish caught in North Sea, but only 20% or less of those were at least seven years old.	Wallace 1914
Plaice (<i>Pleuronectes platessa</i> L.)	Female	The trend of data in fish obtained from the North Sea and elsewhere is similar to that stated above.	Wallace 1907; Petersen et al. 1907
Witch (<i>Pleuronectes cynoglossus</i> L.)	Female	Of 2,748 young fish mostly 25–32 cm. long, 66% were males, whereas of 422 fish over 34 cm. long, 27% were males.	Fulton 1904
Canadian Plaice (<i>Hippoglossoides platessoides</i> Fabr.)	Female	In three-year-old fish from the Gulf of St. Lawrence, the number of males exceeded that of females, but the proportion decreased in older fish until in the 14–24-year groups practically only females were found.	Huntsman 1918
Salmon (<i>Salmo salar</i> L.)	Female	Males were 42% of 1,294 one-year-old fish, but were only 30% of 347 two-year-old fish.	Menzies 1916, 1921

APPENDIX F—Continued
MORTALITY OF ANIMALS BY SEX

Animal	Results		Source
	Sex with Apparent Lower Mortality	Detail	
Salmon (<i>Salmo salar</i> L.)	Female	During early life there were more males than females, while in older age groups there were more females than males.	Masterman 1913
<i>Plecoglossia altivelis</i>	Female	This annual fresh-water fish in Japan and Formosa occasionally survives for two years; all such survivors were reported to be females.	Nomura 1921
Smelt (<i>Osmerus eperlanus</i> L.)	Female	There were more males among the young and more females among the old.	Masterman 1913
Common Top-minnow (<i>Gambusia affinis</i> B. & G.)	Female	Females survive transit better than males.	Geiser 1921
Top-minnow (<i>Gambusia holbrooki</i> Grd.)	Female	At 4 weeks of age, the sexes were approximately equal, while in old fish females greatly outnumbered males.	Geiser 1921, 1924
<i>Amphigonopterus aurora</i>	Female	Males were 53% of 630 embryos, but only 34% of 403 adults.	Hubbs 1921
<i>Lebistes reticulatus</i> (Peters)	Female	Among 67 fish, the ratio of males to females at birth was 1 to 2.3. If a greater proportion of males is added to the aquarium, the ratio comes to an equilibrium at one male to two females. The sex ratio in aged populations was not reported.	Breder & Coates 1932
Poor cod (<i>Gadiformes minutus</i>)	Female	Males in the English Channel had greater mortality than did females.	Menon 1950
Hake (<i>Merluccius merluccius</i>)	Female	Males in the Marmora Sea had greater mortality than did females.	Akyuz 1959
Butter sole (<i>Isopsetta isolepis</i>)	Female	Males on the west coast of Canada had greater mortality than did females.	Hart 1948
<i>Platypoecilus</i> , <i>Xiphophorus</i> and their hybrids	Female	In the laboratory, 23 males lived on average 19.5 months, while 49 females lived on average 20.8 months.	Bellamy 1934
Mammals	Female	Males have total male mortality soon after mating, at about 11.5 months, while female <i>A. minimus</i> die at about 1.5 years.	Diamond 1982
Marsupial mice (<i>Antechinus</i>)	Female	Males apparently have higher mortality rates than females.	Wood 1970
Marsupial glider (<i>Schoinobates volans</i> (Kerr))	Female	Males apparently have higher mortality rates than females.	Tyndale-Biscoe & Smith 1969
Mice—crosses of dba females and C ₅₇ black males	Male	The virgin females in the F ₁ generation lived an average of 27 months and males 29 months.	Woolley 1946
Mice—crosses of dba males and C ₅₇ black females	Male	The length of life in the F ₁ generation was 30 months in females, 33 months in males.	Woolley 1946
C57BL/6J inbred strain of laboratory mice	Male	Females apparently have higher mortality rates than males.	Committee on Animal Models for Research on Aging 1981
DBA2/J inbred strain of laboratory mice	Female	Males apparently have higher mortality rates than females.	Committee on Animal Models for Research on Aging 1981

APPENDIX F—Continued
MORTALITY OF ANIMALS BY SEX

Animal	Results		Source
	Sex with Apparent Lower Mortality	Detail	
B6D2 F ₁ inbred strain of laboratory mice	Male	Females apparently have higher mortality rates than males.	Committee on Animal Models for Research on Aging 1981
BALB/cAnBd _f inbred strain of laboratory mice	Female	Males apparently have higher mortality rates than females.	Committee on Animal Models for Research on Aging 1981
C3H _f /Bd inbred strain of laboratory mice	Female	Males apparently have higher mortality rates than females.	Committee on Animal Models for Research on Aging 1981
C3C F ₁ inbred strain of laboratory mice	Male	Females apparently have higher mortality rates than males.	Committee on Animal Models for Research on Aging 1981
CBA strain of mice	—	Younger males have lower mortality, older males have greater mortality.	Zurcher et al. 1982
RFM strain of mice	—	No significant differences in male and female longevity.	Zurcher et al. 1982
C57BL strain of mice	Male	Females apparently have higher mortality rates than males.	Zurcher et al. 1982
NZB strain of mice	Male	Females apparently have higher mortality rates than males.	Zurcher et al. 1982
Mice (<i>Mus musculus</i>)	Female	Life expectancy from birth was 19 months for males and 22 months for females.	Masoro 1990
Mice (<i>Peromyscus leucopus</i>)	Male	Life expectancy from birth was 48 months for males and 46 months for females.	Masoro 1990
White Mouse	Female	Average length of life of 23 males was 712 days, 773 days for 24 females.	Robertson et al. 1934
Rats	Female	Higher male prenatal mortality.	King 1921
Rats	Female	In 11 strains of rats, the males were shorter-lived than the females. The difference was 0.06–2.44 months of male lifespans of 0.59–21.59 months.	Curtis et al. 1933
Rats	Female	Average length of life of 76 males was 622 days, 687 days for 76 females.	McCay et al. 1943
Rats	Female	Average length of life of 14 males was 612 days, 688 days for 19 females.	Carlson & Hoelzel 1946
Albino Rats (<i>Rattus norvegicus</i>)	Female	Expectation of life at 31 days of age, under laboratory conditions, was 669.4 days for males and 693.1 days for females.	Wiesner & Sheard 1934-35
Domesticated strain of wild brown rat	Male	There was little difference in survival from weaning to age 20 months between the sexes, but slightly better for males.	King 1939
Sprague-Dawley inbred strain of laboratory rats	Female	Females have a longer life expectancy than males.	Simms 1967, Wexler 1970, & Hoffman 1979
Long-Evans inbred strain of laboratory rats	—	No significant differences in male and female longevity.	Hoffman 1979
F344 inbred strain of laboratory rats	Male	The median length of life of males is 27.5, 26.5 for females.	Sass et al. 1975
WAG-Rij strain of rats	Female	Females have significantly longer life expectancy and maximum life span than do males.	Masoro 1990
BN/Bi strain of rats	Female	Females have slightly greater survival rates at most ages than do males.	Burek & Hollander 1980

APPENDIX F—Continued
MORTALITY OF ANIMALS BY SEX

Animal	Results		Source
	Sex with Apparent Lower Mortality	Detail	
Rats (<i>Rattus rattus diardii</i>)	Female	Average length of life of males in Malaya was 3.0 months and 3.5 months for females.	Harrison 1956
Short-tailed shrews (<i>Blarina brevicauda</i>)	Male	Males lived, on average, 4.6 months, while females lived on average 4.4 months, in captivity.	Blus 1971
Orkney Vole (<i>Microtus orcadensis</i>)	Female	Mortality rates were determined to be greater for males than for females.	Leslie et al. 1955
Syrian hamsters (<i>Mesocricetus auratus</i> , Sch:SYR)	Male	In captivity, the median survival time of 771 males was 550 days, while the median survival time of 454 females was 390 days.	Redman et al. 1979
Chinese hamsters	Male	Mean survival time for males was 38.8 months and 35.3 months for females.	Committee on Animal Models for Research on Aging 1981
Guinea pigs (<i>Cavia porcellus</i>)	Male	Males live longer than females in laboratories.	Committee on Animal Models for Research on Aging 1981
Mongolian Gerbil (<i>Meriones unguiculatus</i>)	Female	In captivity, mean survival of 35 males was 110 weeks and of 33 females was 139 weeks.	Troup et al. 1969
Mongolian Gerbil (<i>Meriones unguiculatus</i>)	Female	Males had a mean life span of 1,062 days, while females had a mean life span of 1,146 days. Infant mortality was not considered.	Arrington et al. 1973
Mastomys (<i>Praomys natalensis</i>)	Female	Mean (50% survival) ages for males was 21 months and 23 months for females.	Committee on Animal Models for Research on Aging 1981
Wild Rabbit (<i>Oryctolagus cuniculus cuniculus</i> L.)	Female	Males apparently have higher mortality rates than females.	Stephens 1952
Martens (<i>Martes americana</i>)	Female	In an intensively trapped area in Maine, survival from May 1 to December 15 was higher for adult females than adult males.	Hodgman et al. 1994
Platypuses	Female	Males live for approximately 5 years, females live to over 8 years.	Moyal 2001
Pigs	Female	The ratio of males to females among 538 fetuses was 131%, while the ratio of males to females at birth varied between 95% and 103%.	Parkes 1925
Pigs	Female	Of over 2,000, the mortality between birth and weaning was 39% for males and 34% for females.	Crew 1925
Cattle	Female	The ratio of males to females among 1,000 embryos was 123%, while the ratio of males to females at birth varied between 100% and 113%.	Jewell 1921
Horses	Female	The ratio of males to females born dead was 107%, while the ratio of males to females born alive was 97%.	Goehlert 1888
Horses	—	Data of English thoroughbred racehorses listed in the General Stud Book showed that stallions and mares had similar life expectancy.	Comfort 1959
Irish Wolfhounds	Female	The mean ages at death of animals surviving to one year were 4.95 years for 39 males and 6.59 years for 44 females.	Comfort 1956

APPENDIX F—Continued
MORTALITY OF ANIMALS BY SEX

Animal	Sex with Apparent Lower Mortality	Results Detail	Source
Dall Sheep (<i>Ovis dalli</i>)	Male	From carcasses in Mount McKinley National Park where most were killed by wolves, mortality rates were determined to be greater for females than for males.	Caughley 1966
Bighorn Sheep (<i>Ovis canadensis</i>)	Female	Male survival was lower than female survival, and the sex difference increased with age.	Loison et al. 1999
Roe Deer (<i>Capreolus capreolus</i>)	Female	Male survival was lower than female survival, and the sex difference increased with age.	Loison et al. 1999
Columbian Black-Tailed Deer (<i>Odocoileus hemionus columbianus</i> [Richardson])	Female	Among young deer, males have greater mortality than females.	Taber & Dasmann 1954
Mule & Black-Tailed Deer (<i>Odocoileus hemionus</i> spp.)	Female	Males appear to have greater mortality during prenatal and early postnatal periods and among yearlings.	Robinette et al. 1957
Isard (<i>Rupicapra pyrenaica</i>)	Female	Male survival was lower than female survival, and the sex difference increased with age.	Loison et al. 1999
Polar Bears (<i>Ursus maritimus</i>)	—	In western Hudson Bay, Canada, there were no differences in survival of cubs or yearlings between males and females.	Derocher & Stirling 1996
Harbor Seals	Female	After reaching adulthood, males can live 2 decades, females can live 3 decades.	Dietrich 2001
Hawaiian Monk Seals (<i>Monachus schauinslandi</i>)	Female	At French Frigate Shoals and Laysan Island, survival of immature females appears to be better than males.	Gilmartin et al. 1993
Bottleneck Dolphins	—	Survival rates are similar for males and females.	Demaster & Drevenak 1988
White Whales	—	Survival rates are similar for males and females.	Demaster & Drevenak 1988
Sperm Whales	Female	Females outlive males by 30 years on average.	Perls et al. 1999
Killer Whales (<i>Orcinus orca</i>)	Female	In coastal waters of British Columbia and Washington State, resident female mean life expectancy is 50.2 years, resident male mean life expectancy is 29.2 years.	Olesiuk et al. 1990
Primates			
Simangs (<i>Hylobates syndactylus</i>)	Male	Females have greater mortality than males.	Allman et al. 1998
Spider Monkeys (<i>Ateles</i>)	Female	Males have greater mortality than females.	Allman et al. 1998
Owl Monkeys (<i>Actus</i>)	Male	Females have greater mortality than males.	Allman et al. 1998
Titi Monkeys (<i>Callicebus</i>)	Male	Females have greater mortality than males.	Allman et al. 1998
Goeldi's Monkeys (<i>Callimico</i>)	Female	Males have slightly greater mortality than females.	Allman et al. 1998
Capuchin Monkeys (<i>Cebus olivaceus</i>)	Female	In a natural population, females have a substantial survival advantage.	Robinson 1988
Marmosets	—	Males and females have similar survival.	Allman 1999
Tamarins	—	Males and females have similar survival.	Allman 1999
Rhesus Monkeys (<i>Macaca mulatta</i>)	Female	In a large captive population, females had lower mortality than males up to about age nine, but greater mortality thereafter.	Dyke, Gage, Mamelka et al. 1986

APPENDIX F—Continued
MORTALITY OF ANIMALS BY SEX

Animal	Results		Source
	Sex with Apparent Lower Mortality	Detail	
Macaque Monkeys	Female	Females live, on average, eight years longer than males.	Perls et al. 1999
Pigtail Macaques (<i>Macaca nemestrina</i>)	—	Of 1,174 animals in captivity over eight years, mortality of males from birth to 30 days of age was greater than for females. Between 30 and 180 days, female mortality was greater than males mortality, but this was likely due to external circumstances.	Dazey & Erwin 1976
Crab-eating Macaques (<i>Macaca fascicularis</i>)	Female	In zoo colonies, male mortality during the first year of life is higher than is female mortality.	Angst 1976
Toque Macaques (<i>Macaca sinica</i>)	Female	If free-ranging, mortality of female infants and juveniles is greater than males, due to exclusion from food, but by age four to five years, male mortality surpasses female. After reaching maturity, females live 17 years on average, and males live 10 1/2 years	Dittus 1975a, 1975b; & Dittus 1977
Baboons (<i>Papio papio</i>)	Female	More males are born than females, but by adulthood, more females than males are still alive.	Masure & Bourliere 1971
Olive Baboons (<i>Papio anubis</i> (J. P. Fisher))	Female	In free-ranging animals, males have greater mortality than females.	Berger 1972
Gelada Baboons (<i>Theropithecus gelada</i>)	Female	Females older than 8.5 years have lower mortality than males of the same age.	Dunbar 1980
Gibbons (<i>Hylobates tar</i>)	Female	Males have greater mortality than females except for extremely high ages.	Allman et al. 1998
Orangutans (<i>Pongo pygmaeus</i>)	Female	Males have greater mortality than females.	Allman et al. 1998
Gorillas (<i>Gorilla gorilla</i>)	Female	Males have greater mortality than females.	Allman et al. 1998
Chimpanzees (<i>Pan troglodytes</i>)	Female	From three captive populations of 1,488 chimpanzees, male life expectancy at birth was 20.7573 years and female life expectancy at birth was 29.4441 years.	Dyke, Gage, Alford et al. 1995
Chimpanzees (<i>Pan troglodytes</i>)	Female	In a 22-year study of 228 animals in the Mahale Mountains, there was an equivalent number of male and female births, but three times as many adult females as adult males, which was not due to differential migration.	Nishida 1990
Chimpanzees	Female	At Gombe, males have greater mortality than females.	Goodall 1986

APPENDIX G
CORRELATION OF THE DIFFERENCE IN MALE/FEMALE LIFE EXPECTANCY WITH THE
DIFFERENCE IN PERCENTAGE OF MALE/FEMALE DEATHS ATTRIBUTABLE TO SMOKING IN
44 DEVELOPED COUNTRIES

Country	Life Expectancy			% of Deaths Attributable to Smoking		
	Male	Female	Difference (Female–Male)	Male	Female	Difference (Male-Female)
Russian Federation	58.0	71.5	13.5	30	4	26.0
Latvia	62.5	74.3	11.8	25	3	22.0
Estonia	63.9	75.0	11.1	26	3	23.0
Lithuania	64.9	76.0	11.1	25	3	22.0
Ukraine	63.6	74.0	10.4	28	4	24.0
Belarus	64.4	74.8	10.4	26	0.7	25.3
Kazakhstan	62.8	72.5	9.7	28	7	21.0
Hungary	64.5	73.8	9.3	29	9	20.0
Poland	66.7	75.7	9.0	29	5	24.0
Slovakia	67.0	75.8	8.8	26	3	23.0
Slovenia	69.2	77.8	8.6	26	4	22.0
Kyrgyzstan	63.4	71.9	8.5	17	4	13.0
France	74.6	82.9	8.3	21	0.9	20.1
Georgia	68.5	76.7	8.2	15	0.6	14.4
Azerbaijan	66.5	74.5	8.0	14	0	14.0
Republic of Moldova	63.5	71.5	8.0	20	3	17.0
Romania	66.0	73.2	7.2	18	3	15.0
Portugal	71.8	78.9	7.1	13	0	13.0
Bulgaria	67.8	74.9	7.1	17	2	15.0
Finland	73.0	80.1	7.1	21	3	18.0
Spain	74.5	81.5	7.0	23	0	23.0
Armenia	67.2	74.0	6.8	23	3	20.0
Turkmenistan	61.2	68.0	6.8	9	0	9.0
Belgium	73.9	80.6	6.7	31	2	29.0
United States	73.4	80.1	6.7	26	17	9.0
Switzerland	75.3	81.8	6.5	21	4	17.0
Germany	73.4	79.9	6.5	22	3	19.0
Uzbekistan	64.3	70.7	6.4	8	2	6.0
Austria	73.7	80.1	6.4	20	5	15.0
Italy	75.1	81.4	6.3	26	4	22.0
Czech Republic	69.8	76.0	6.2	29	5	24.0
Japan	76.9	82.9	6.0	15	5	10.0
Tajikistan	64.2	70.2	6.0	5	0	5.0
Australia	75.4	81.2	5.8	22	9	13.0
Norway	74.8	80.6	5.8	14	5	9.0
Canada	76.1	81.8	5.7	27	14	13.0
Netherlands	75.0	80.6	5.6	32	4	28.0
Yugoslavia	69.8	75.3	5.5	23	4	19.0
Ireland	74.0	79.4	5.4	25	16	9.0
United Kingdom	74.5	79.8	5.3	28	15	13.0
Denmark	73.0	78.3	5.3	25	15	10.0
Greece	75.5	80.6	5.1	21	3	18.0
New Zealand	74.7	79.7	5.0	22	11	11.0
Sweden	76.2	80.0	3.8	11	4	7.0

Source of data: United Nations Population Fund 1998 and smoking deaths data from Peto, et al. 1994.