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BANKACILIK VE SİGORTACILIK ENSTİTUSU  
SİGORTACILIK ANABİLİM DALI

1980-1990 TÜRK MORTALİTE TABLOSUNDA  
MAKEHAM DÜZELTİMESİ  
YÜKSEK LİSANS TEZİ

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## 0. GİRİŞ

Geçmişte yeterli düzeyde nüfus istatistiklerinin olmaması nedeniyle Türkiye için oluşturulan mortalite tabloları yeterince sağlıklı sonuçlar vermemiştir. Bu yüzden sigorta şirketlerimiz yabancı ülkelerin, artık o ülkelerde kullanılan, mortalite tablolarını kullanmaya yönelmişlerdir.

Ölüm oranları doğal olarak farklı toplumlar için farklı sonuçlar ortaya çıkarmaktadırlar. Dolayısıyla Türkiye için kullanılan yabancı ülkelerin mortalite tabloları, Türk insanının ölüm özelliklerini yansıtmaktan uzak olacaktır. Bu durum sigorta şirketlerinin hayat branşında oluşturdukları teknik hesaplamaların Türk insanının ölüm özelliklerine göre hesaplanmamasına yol açacaktır. Bu durumda yapılacak tek şey Türk insanının ölüm özelliklerini yansıtan bir mortalite tablosu oluşturmaktır.

1980-90 ölüm istatistiklerinden hareketle 1993 yılında Yr. Doç. Dr. Levent Duransoy tarafından Türk Mortalite Tablosu (1980 - 1990) isimli doktora tezi olarak, Türk insanının ölüm özelliklerini yansıtan mortalite tablosu hazırlanmıştır.

Verilerin kısıtlı olması nedeniyle, hazırlanan diğer tablolarda da olduğu gibi, verilerde bir düzensizlik söz konusudur. Bu tür düzensizliklerin giderilmesi için değerler düzeltilerek (ajüste edilerek) kullanılırlar.

Bu tezde de amacımız, Türk Mortalite Tablosu (1980 - 1990)'a, hemen hemen tüm mortalite tablolarına uygulanan, Makeham düzeltilmesi uygulanarak düzeltme yapmaktır.

Bu amaçtan hareketle, birinci bölümde, mortalite tablosu, bu tabloyu etkileyen faktörler, bu tabloyu oluşturan elemanlar ve yukarıda adı geçen doktora tezinde yapılan düzeltmeler kısaca açıklanmıştır.

İkinci bölümde, Makeham formülü yardımıyla yapılan düzeltme, bu düzeltme sonucu oluşturulan mortalite tablosuna yer verilmiş ve % 5 ile % 4.5 faiz oranlarına göre komütasyon tabloları hazırlanmıştır.

Üçüncü bölümde, ülkemizde kullanılan, yabancı ülkelerin mortalite tabloları ile Düzeltilmiş Türk Mortalite Tablosu (1980 - 1990)'nın karşılaştırılmalarına yer verilmiştir.

## BİRİNCİ BÖLÜM

### 1. MORTALİTE TABLOSUNUN TANIMI, KAPSAMI, FONKSİYONEL BİLEŞENLERİ VE UYGULANAN DÜZELTME YÖNTEMLERİ

#### 1.1. MORTALİTE TABLOSUNUN TANIMI VE KAPSAMI <sup>(1)</sup>

Doğuşları aynı zamana rastlayan kişilerin oluşturduğu neslin yaşları ilerlerken ölüm nedeniyle azalışını gösteren tabloya mortalite tablosu denir. Gözleme tabii tutulan neslin her yaşta hangi oranda ölüm rizikosuna maruz bulduklarını gösteren bu şema, bir neslin doğumu ile başlar ve neslin son ferdi ölüncüye kadar sürer. Tablonun başlangıç yaşı, elde edilen verilere göre veya çalışmanın konusuna göre değişebilir.

#### 1.2. MORTALİTEYİ ETKİLEYEN FAKTÖRLER

Mortalite tablolarını etkileyen faktörleri açıklarken belli başlıcalarına değineceğiz.

##### 1.2.1. YAŞ

Yaş faktörü, ölüm olasılıklarında değişikliğe yol açan başlıca faktörlerden biridir. Genelde 0-11 yaş aralığında hızla azalan, 12-85 yaş aralığında artan ve 86-w (w = nesildeki en son kişinin yaşı) yaş aralığında hızla azalan bir seyir izlemektedir.

##### 1.2.2. CİNSİYET

Mortalite tabloları incelendiği takdirde kadın ölüm oranlarının, erkek ölüm oranlarından daha düşük çıktığı gözlenir. Bu sonuç erkeklerin daha zor ve tehlikeli işlerde çalışmış olmaları, erkeklerin daha fazla oranda zararlı maddeler (alkol, sigara v.b.) tükettikleri gibi nedenlerle açıklanmaktadır.

Bu nedenle iki cinsiyet için de farklı mortalite tabloları hazırlanmalıdır.

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(1) LEVENT DURANSOY, Türk Mortalite Tablosu (1980-1990), Yayınlanmamış Doktora Tezi, İstanbul, 1993, s. 2-31.

### 1.2.3. SAĞLIK

Sağlık faktörü en önemli faktörlerden biridir. Kişinin sağlık durumu kendi içinde bir çok faktöre bağlıdır. Bunlar, kişinin yaşadığı ülkenin iklimi, yaşadığı ülkenin beslenme, bakım, sağlık koşulları, tedavi olanaklarındaki gelişmeler, ırkının biyolojik etkileri v.b. gibi faktörlerdir. Bu faktörlerdeki farklılaşmalar kişinin mortalitesinde farklılaştırmaktadır.

### 1.2.4. MEDENİ DURUM

Evli kişilerin mortalitelerinin, bekar, dul, boşanmış kişilerin mortalitelerinden daha düşük çıktığı gözlenmektedir. Bu durum evli kişilerin, diğer kişilere göre, daha düzenli bir hayat yaşamalarından ileri geldiği görüşü ile açıklanabilir.

### 1.2.5. MESLEK

Farklı meslek grupları farklı derecelerde zor veya tehlikelidirler. Bu farklılıktan dolayı zor veya tehlikeli işlerde çalışan kişilerin mortaliteleri, kolay veya tehlikesiz işlerde çalışanlara nazaran daha yüksektir. Sigorta şirketleri hayat sigortalarında bu durumu dikkate alarak kişileri sigorta ederler.

## 1.3. MORTALİTE TABLOSUNUN FONKSİYONEL BİLEŞENLERİ

### 1.3.1. $l_x$ FONKSİYONU

$l_x$  yaşında yaşayanların sayısını gösterir.  $l_0$  0 yaşında yaşayanların sayısını vermekle birlikte radikls olarak isimlendirilir ve kolaylık sağlaması bakımından 10'nun üssü biçiminde ifade edilir. Bu fonksiyon;

$$l_{x+1} = l_x - d_x$$

şeklinde ifade edilir.

### 1.3.2. $d_x$ FONKSİYONU<sup>(2)</sup>

X ile X+1 yaşları arasındaki ölenlerin

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(2) FAZIL K. GULÇÜR, Sigorta Tekniği Aktüarya Hesapları, Fen Fakültesi Döner Sermaye Basımevi, İstanbul, 1971, s. 61.



sayısını verir. Bu fonksiyon;

$$d_x = l_x - l_{x+1}$$

şeklinde ifade edilir.

### 1.3.3. $q_x$ FONKSİYONU

X yaşındaki bir kişinin X ile X+1 yaşları arasındaki ölme olasılığını verir. Bu fonksiyon;

$$q_x = \frac{d_x}{l_x}$$

şeklinde ifade edilir.

### 1.3.4. $p_x$ FONKSİYONU

X yaşındaki bir kişinin X ile X+1 yaşları arasındaki yaşama olasılığını gösterir. Bu fonksiyon;

$$p_x = \frac{l_x - d_x}{l_x} = \frac{l_{x+1}}{l_x}$$

şeklinde ifade edilir.

### 1.3.5. $L_x$ FONKSİYONU

X ile X+1 yaşları arasında yaşayanların sayısını verir. X ile X+1 yaşları arasındaki ölümlerin yarısının ilk altı ayda ikinci yarısının ikinci altı ayda dağıldığı varsayımından hareketle  $L_x$  fonksiyonu;

$$L_x = \frac{l_x + l_{x+1}}{2}$$

şeklinde ifade edilir. Ancak bu varsayım 5'den küçük yaşlar için geçerliliğini sağlayamamaktadır. Çünkü 5'den küçük yaşlardaki ölümlerin dağılımında, ölümler yılın ilk altı aylık kısmında daha fazladır. Dolayısıyla yılın ilk altı aylık kısmında bir yığılma söz konusudur. 5'den küçük yaşlar için  $L_x$ 'in hesaplanması aşağıda açıklanmıştır

$$\begin{aligned}
L_0 &= 0.30 \cdot l_0 + 0.70 \cdot l_1 \\
L_1 &= 0.38 \cdot l_1 + 0.62 \cdot l_2 \\
L_2 &= 0.43 \cdot l_2 + 0.57 \cdot l_3 \\
L_3 &= 0.46 \cdot l_3 + 0.54 \cdot l_4 \\
L_4 &= 0.48 \cdot l_4 + 0.52 \cdot l_5
\end{aligned}$$

### 1.3.6. $T_x$ FONKSİYONU

Her yaş için  $T_x$  değeri,  $L_x$  sütununda aşağıdan yukarı doğru kümülasyon yapılmak suretiyle bulunur. Bu fonksiyon;

$$T_x = L_x + L_{x+1} + L_{x+2} + \dots + L_{\omega}$$

şeklinde ifade edilir.

### 1.3.7. $e_x^o$ FONKSİYONU<sup>(3)</sup>

Hayat ümidi olarak da adlandırılan bu fonksiyon X yaşındaki bir kişinin ortalama daha kaç yıl yaşayacağını gösterir. Bu fonksiyon;

$$e_x^o = \frac{T_x}{l_x}$$

şeklinde gösterilir.

## 1.4. TABLO DÜZENLEMESİNDE UYGULANAN DÜZELTME YÖNTEMLERİ

Türkiye için hazırlanan mortalite tablosunda kullanılan yöntem ölüm istatistiklerine dayanan mortalite tabloları yöntemidir. Tablonun oluşturulmasında kullanılan istatistikler, Devlet İstatistik Enstitüsü (D.İ.E.) tarafından derlenen, il ve ilçe merkezlerindeki ölüm olaylarını kapsamaktadır (Tablo 1-2-3-4-5-6).

Ölüm istatistiklerinden elde edilen bu bilgilerde hata olabileceğinden 1980-90 arası verilerin 11 yıllık aritmetik ortalaması alınarak düzenlenmiştir (Tablo 7-8-9).

1980-90 dönemi verilerinden hesaplanan aritmetik ortalama, bu dönemin orta yılı olan 1985 yılına karşılık gel-

(3) ALFRED ISAAC, Sigorta İşletmesi Cilt 3 : Sigorta Matema-

diğinden tabloların oluşturulmasında söz konusu yıl temel yıl alınacaktır.

Fiili ölümlerin durgun bir nüfusa tatbik edilmesi sonucu, ölüm kayıtlarına dayayan mortalite tablosunun oluşturulmasında, yaşlar itibari ile ölüm sayılarının, tablonun düzenlenmesinde tek başına bir sonuç vermeyeceği açıktır. Bunun için ölüm kayıtlarına dayayan mortalite tablosunda fiili ölümlerin durgun bir nüfusa dayandırılması bir hata teşkil edebilir. Bu hatanın giderilebilinmesi için 11 yıllık aritmetik ortalama değerlerine iki aşamalı düzeltme (ajüstman) yapılmıştır.

#### 1.4.1. HAREKETLİ ORTALAMALAR YÖNTEMİ

Bir zaman serisini periyodik ve devri hareketlerin etkisinden arındırmak için hareketli ortalamalar yöntemi kullanılmaktadır.<sup>(4)</sup>

Zaman serisinde hareketli ortalamaların kaç terim üzerinden hesaplanacağı, yani hareketli ortalamanın kaçarlı olacağı önemli bir sorundur. Çünkü, hesaplamada hareketli ortalamanın farklı terimden yapılmış olması, sonuçlarında farklı çıkmasına yol açacaktır.

Zaman serisinin, aynı uzunluğa sahip dalgalardan meydana gelmesi durumunda, ortak dalga uzunluğu kadar değer üzerinden hareketli ortalamalar hesaplanır. Ancak dalgaların aynı uzunlukta olmaması halinde dalga uzunluklarının aritmetik ortalamasına başvurularak, eşit sayıda terim üzerinden hareketli ortalamalar hesaplanır.

Biz serimizde periyodu 5 alacağız, böylelikle 5'erli hareketli ortalamayı kullanacağız. Ölüm bildirimlerinde, özellikle 10. yıldan başlayarak, yaşları genellikle sonu 0 veya 5'li yaşlara tamamlayarak beyan etme eğilimi vardır. Bunun sonucunda 0'lı veya 5'li yaşlarda olağan dışı bir birikme söz konusu olmaktadır. Bu yuvarlaklaştırılmış yaşlardaki yığılmayı önlemek için 5'erli hareketli ortalama yöntemi, 8 yaşından başlayarak, kullanılmıştır (Tablo 7-8-9-).

Simdi ilk 10 terim için bu düzeltmeyi anlatalım;

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(4) NECATİ İŞÇİL, İstatistik Metodları ve Uygulamaları, Ankara İktisadi ve Ticari İlimler Akademisi, Yayın No : 269, Ankara, 1973, s. 209.

YAŞLAR	VERİLER
6	381
7	358
8	287
9	247
10	241
11	213
12	241
13	234
14	252
15	291

Periyodik dalgalanmalar 5 devreyi kapsadığına göre, sırasıyla 5 terimden oluşan ilk kümenin ortalaması,

$$X_8 = \frac{381+358+287+247+241}{5} = 303$$

olarak hesaplanır. Hesaplanan bu değer kümenin orta değeri olarak işleme tabi tutulur. Bunu izleyen diğer küme ortalamaları da sırasıyla aynı şekilde hesaplanır (Tablo 7-8-9).

$$X_9 = \frac{358+287+247+241+213}{5} = 270$$

$$X_{10} = \frac{287+247+241+213+241}{5} = 246$$

$$X_{11} = \frac{247+241+213+241+234}{5} = 235$$

$$X_{12} = \frac{241+213+241+234+252}{5} = 236$$

$$X_{13} = \frac{213+241+234+252+291}{5} = 246$$

YAŞLAR	VERİLER	5'ERLİ HAR. ORT. VERİLERİ
6	381	---
7	358	---
8	287	303
9	247	270
10	241	246
11	213	235
12	241	236
13	234	246
14	252	---
15	291	---

5'erli hareketli ortalama yöntemiyle düzeltilen veriler 97 yıllık nesle aittir. 1980-90 dönemi için 1985 yılı temel yıl kabul edildiğinde; 0 yaş ölümler 1985 doğumluları, 1 yaş ölümler 1984 doğumluları, benzer şekilde 15 yaş ölümler 1970 doğumluları, son olarak 97 yaş ölümleri ise 1888 doğumluları göstermektedir.

Mortalite, doğumları aynı zamana rastlayan kişilerin oluşturduğu nesli incelediğinden birinci düzeltmeyle belirlenen 97 farklı neslin tek bir nesil olarak ifade edilmesi zorunludur. 97 neslin tek bir nesil olarak açıklanması ile ilgili düzeltme aşağıda açıklanmıştır.

#### 1.4.2. İKİNCİ DÜZELTME

97 nesli tek bir nesil olarak açıklamada nüfus artış hızı kullanılmıştır. Düzeltmenin amacı 1980-1990 dönemi esas olmak üzere 1985 neslini yaratmaktır. 1. uygulama 1985 yılı temel yıl kabul edildiğinde, 0 yaş ölümler 1985 doğumluları, 1 yaş ölümler ise 1984 doğumluları göstermektedir. 1984 neslinin 1985 nesline kaydırılması için 1984-85 yılı yıllık nüfus artış hızına gerek duyulmaktadır. Yani 1984 doğumlu 1 yaş ölümlerin 1985 nesline kaydırılması, 0 ile 1 yaş ölümlerin aynı genel nüfusa sahip olmasıyla mümkün olacaktır. Aynı nüfus anlayışı, nüfus artış hızı ile 1 yaş ölümlerin çarpılması ile oluşturulacak, böylece 1985 nesline ait 1 yaş ölümler meydana gelecektir. 1983 doğumlu 2 yaş ölümlerin 1984 nesline kaydırılması, 1983-84 nüfus artış hızının 2 yaş ölümler ile çarpılması ile, 1985 nesline kaydırılması ise bu çarpılan sayının tekrar 1984-85 nüfus artış hızı ile çar-

pılmasıyla bulunur. Bu işlemlerin tüm yaşlara uygulanması ile, tek bir nesle ait ölüm sayıları bulunmuş olur (Tablo 7-8-9).

Ancak D.I.E. ölüm istatistiklerinde ölüm sayılarını 97 yaşa kadar tek yaş olarak, 97 yaş sonrası ise bir grupta toplanmaktadır. 97 yaş sonrası grubun tek yaşlara dönüştürülmesi için ek bir düzeltmenin yapılması uygundur. Söz konusu düzeltmede kullanılan yöntem, noktalar arasından eğri geçirmek suretiyle yapılan interpolasyondur. Burada 97 yaş sonrası grup için dönüşüm uygulandıktan sonra, tek yaşlara karşılık gelen ölüm sayılarının ayrı ayrı belirlenmesi amaçlanmıştır.

Bu yöntemin açıklanması için örnek olarak 1980-90 dönemine ait ölüm sayıları dikkate alınmıştır. Interpolasyon, 1980 - 90 ölüm verilerine ilk düzeltme olan 5'erli hareketli ortalamalar yönteminin uygulanması sonrası gerçekleştirilmiştir. Interpolasyon uygulaması sonucunda, tüm mortalite tabloları için son ölüm yaşı en uygun 103 olarak bulunmuştur. 97 sonrası ölüm sayıları ile 98-103 arası tek yaşlar toplamı arasındaki mutlak fark maksimum 6 olarak belirlenmiş, buna göre son 9 ölüm verisi değerlendirmeye katılmıştır. 80 yaş sonrası ölüm sayılarının oluşturduğu eğri, en iyi üstel fonksiyonla açıklanmasını gerektirmektedir. Bu nedenle interpolasyonda aşağıda gösterilen üstel fonksiyon dikkate alınmıştır.

$$Y = a.b^x$$

Fonksiyonun tahminlenmesinde kullanılan X ve Y değerleri sırasıyla son 9 yaş ve onlara ait ölüm sayıları olup aşağıda gösterildiği gibidir.

X (YAŞLAR)	Y (VERİLER)
89	842
90	682
91	548
92	439
93	370
94	266
95	212
96	167
97	114

Fonksiyonun her iki tarafınında logaritmasını alırsak denklem aşağıdaki şeklini alır.

$$\log Y = \log a + X \cdot \log b$$

Bu denklemin en küçük karelerle ve kısa yoldan (yaşlar sütunu  $\sum X = 0$  olacak şekilde) hesaplanarak normal denklem kısalmakta ve a ve b parametreleri:

$$\log a = \frac{\sum \log Y}{n}$$

$$\log b = \frac{\sum X \cdot \log Y}{\sum X^2}$$

şeklinde hesaplanmaktadır.

Y	X	log Y	X · Log Y	X <sup>2</sup>
842	-4	2.92530	-11.70120	16
682	-3	2.83378	- 8.50134	9
548	-2	2.73878	- 5.47756	4
439	-1	2.64246	- 2.64246	1
370	0	2.51850	- 0	0
266	1	2.42488	2.42488	1
212	2	2.32630	4.65260	4
167	3	2.22270	6.66810	9
114	4	2.05690	8.22760	16
	0	22.68960	- 6.34938	60

$$\log a = \frac{\sum \log Y}{n} = \frac{22.6896}{9} = 2.52106 \quad \text{ise,}$$

$$\underline{a = 331.94}$$

$$\log b = \frac{\sum X \cdot \log Y}{\sum X^2} = \frac{- 6.34938}{60} = - 0.105823$$

$$\underline{b = 0.783749}$$

Buna göre interpolasyon denklemi:

$$Y = 331.94 * 0.783749^x$$

şeklinde elde edilir.

Bu denklemden hareketle aşağıdaki değerler bulunur (Tablo 7-8-9).

X (YAŞLAR)	Y (VERİLER)
98	98
99	77
100	60
101	47
102	37
103	29
	-----
	348

1980-90 ortalama ölüm verilerinde 97+ ile gösterilen grupta ölüm sayıları toplamı 343, 97+ grubunun tek yaşlara ayrılması için yapılan interpolasyonda ölüm sayıları 348 çıkmıştır. 3 adet mortalite tablosunda da aynı düzeltmenin yapıldığı ve hazırlanan tüm mortalite tablolarında neslin aynı yaşta sona ermesi bakımından, bu farkın sorun teşkil etmesi düşünülemez.



TABLO 1 :1980-1985 GENEL ÖLÜM SAYILARI  
TABLE 1 :1980-1985 GENERAL DEATH NUMBERS

YAS	1980	1981	1982	1983	1984	1985
0	31549	33572	30341	29917	26495	26050
1	3403	3685	2309	3138	2568	2567
2	1495	1875	1268	1485	1320	1306
3	867	1118	780	858	834	818
4	612	760	540	571	597	632
5	476	609	440	484	487	512
6	430	446	385	387	379	416
7	412	443	356	390	356	373
8	302	328	273	297	307	293
9	279	289	235	274	229	229
10	235	289	227	222	264	275
11	196	254	226	183	204	234
12	233	279	248	207	251	26
13	202	249	217	231	232	243
14	229	234	238	189	308	273
15	335	294	245	232	279	320
16	317	284	270	204	289	275
17	347	292	307	309	248	305
18	442	339	353	327	346	316
19	391	326	288	294	362	334
20	592	395	427	369	449	453
21	309	402	304	288	306	346
22	349	318	416	354	362	368
23	338	277	322	399	339	361
24	440	294	296	304	436	363
25	545	424	338	336	409	561
26	452	415	335	267	293	348
27	328	342	434	389	299	297
28	406	371	370	387	388	371
29	330	309	304	343	426	402
30	657	436	465	455	520	620
31	368	468	305	347	313	388
32	384	399	469	316	421	408
33	348	356	343	474	371	418
34	373	328	387	372	492	392
35	614	499	538	508	611	748
36	407	417	361	362	422	462
37	410	405	424	422	408	563
38	467	424	421	460	455	534
39	380	444	357	397	475	481
40	734	635	667	609	716	806
41	483	576	458	554	512	587
42	595	532	741	598	646	607
43	500	589	598	664	644	752
44	539	576	623	581	797	653
45	803	794	823	927	937	1182
46	681	599	723	698	747	789
47	919	791	601	709	734	945
48	915	1059	963	782	759	911
49	806	901	1029	849	758	931
50	1396	1298	1486	1604	1532	1395
51	914	1155	1043	1157	1415	1246

52	1196	1204	1287	1195	1422	1725
53	1232	1211	1215	1354	1401	1688
54	1438	1292	1189	1323	1637	1466
55	1544	1999	1645	1769	1988	2345
56	1282	1385	1792	1599	1604	1627
57	1083	1336	1514	1895	1676	1675
58	1203	1333	1504	1740	2078	1989
59	1047	1166	1233	1445	1657	2214
60	1865	1917	1961	2120	2440	2598
61	1089	1347	1352	1571	1695	2011
62	1091	1320	1513	1546	1556	1946
63	1339	1257	1360	1608	1670	1920
64	1524	1367	1259	1387	1674	1840
65	2584	2396	2141	1956	2239	2639
66	2280	1937	1792	1523	1492	1716
67	2141	2447	2116	1918	1737	1610
68	2349	2293	2585	2314	1883	1817
69	2074	2181	2222	2470	2205	1930
70	3236	3405	3582	3466	3535	3331
71	2371	2735	2561	2815	2649	2940
72	2331	2731	2974	2861	2787	2936
73	2026	2129	2671	2923	2865	3190
74	1893	2091	2348	2801	2917	3182
75	2476	2327	2508	2849	3316	3730
76	2673	2273	2106	2319	2615	3178
77	2028	2586	2007	2129	2061	2532
78	2340	2220	2614	2179	1952	2405
79	2048	2100	2011	2508	1952	1969
80	2856	2753	2701	2721	2852	2737
81	1892	2208	1961	2206	2116	2526
82	1534	1860	2140	2080	1957	2231
83	1357	1336	1681	2060	1862	2128
84	1279	1332	1321	1678	1789	1869
85	1353	1340	1321	1399	1751	2165
86	1203	1104	1045	1036	1145	1483
87	665	1014	1006	1008	919	1074
88	682	557	893	819	846	897
89	488	559	488	821	671	728
90	619	588	593	602	748	843
91	387	405	338	413	329	618
92	280	372	341	311	303	309
93	226	224	291	328	234	284
94	188	190	170	228	221	234
95	22	177	161	191	231	259
96	177	150	132	122	130	157
97	50	145	132	113	99	99
98+	139	164	367	341	308	409
Y.B	2148	2233	2272	1202	4310	400

TABLO 2 :1986-1990 GENEL ÖLÜM SAYILARI  
 TABLE 2 :1986-1990 GENERAL DEATH NUMBERS

YAŞ	1986	1987	1988	1989	1990
0	23226	21659	20581	23538	21871
1	1720	1674	1789	1616	1578
2	936	807	849	958	868
3	616	592	543	586	557
4	500	512	456	453	476
5	427	463	397	421	432
6	334	394	367	353	299
7	284	371	341	322	294
8	254	261	286	267	294
9	225	229	222	266	245
10	232	227	231	212	240
11	202	221	232	211	185
12	221	275	208	233	231
13	228	272	208	262	228
14	244	247	233	325	248
15	282	309	283	326	296
16	299	303	293	299	315
17	287	355	327	350	358
18	327	337	435	385	376
19	264	395	278	355	363
20	404	367	368	419	421
21	361	346	258	306	313
22	366	351	415	307	341
23	302	383	411	412	307
24	344	381	402	441	365
25	398	452	411	443	468
26	437	362	399	404	417
27	379	427	328	380	372
28	312	401	459	376	411
29	305	339	343	487	369
30	547	477	491	531	595
31	456	486	341	390	439
32	440	509	611	492	460
33	414	475	515	477	407
34	438	427	465	576	575
35	581	707	620	721	769
36	532	414	523	531	558
37	498	610	446	510	550
38	544	522	691	525	624
39	534	474	554	652	461
40	729	794	699	730	1032
41	579	578	548	616	690
42	645	690	649	629	730
43	645	704	741	673	732
44	686	683	727	767	736
45	1062	1029	891	1019	1154
46	937	776	978	889	874
47	859	959	849	995	969
48	999	963	1045	1572	1101
49	837	1004	919	1175	1177
50	1587	1539	1541	1482	1602
51	995	1120	1153	1330	1312

52	1347	1056	1311	1332	1565
53	1722	1439	1085	1302	1392
54	1656	1939	1520	1281	1430
55	1922	2264	2428	2166	1722
56	1848	1630	1944	2427	1994
57	1686	2026	1852	2150	2658
58	1844	1876	2088	2312	1465
59	1907	1861	1880	2309	2208
60	3281	2697	2726	3012	3209
61	1879	2640	2305	2422	2518
62	2219	2189	3022	2808	2913
63	1933	2180	2250	3183	2853
64	1858	1929	2281	2632	3335
65	2361	2731	2778	3656	3648
66	1814	1865	2075	2407	2812
67	1644	2097	2012	2430	2712
68	1628	1780	2053	2536	2526
69	1531	1561	1639	2181	2302
70	2901	2465	2362	2883	3203
71	2291	2071	1902	1875	2111
72	3118	2590	2270	2204	2124
73	2829	2940	2533	2407	2180
74	2948	2851	3134	2869	2486
75	3326	3607	3315	4061	3427
76	3090	3010	2986	3318	3570
77	2797	3009	2800	3219	3030
78	2598	2813	2989	3486	3322
79	2057	2392	2679	2898	2967
80	2402	2559	2977	3726	3933
81	1844	1802	2001	2591	2946
82	2462	1949	1856	2147	2491
83	1828	2188	1752	1950	2128
84	1832	1922	2178	1871	1892
85	1838	1991	1920	2456	2016
86	1635	1552	1639	1753	2041
87	1254	1448	1457	1584	1579
88	841	1138	1286	1461	1335
89	698	756	961	1245	1164
90	715	787	811	1122	1200
91	458	489	487	595	822
92	491	414	439	476	476
93	229	404	328	418	399
94	230	208	307	308	333
95	204	227	223	364	326
96	176	189	173	145	284
97	128	109	118	120	143
98+	305	302	334	592	513
Y.B.	1274	434	811	787	501

TABLO 3 : 1980-1985 ERKEK ÖLÜM SAYILARI  
 TABLE 3 : 1980-1985 MEN'S DEATH NUMBERS

YAS	1980	1981	1982	1983	1984	1985
0	17353	18541	16307	16592	14814	14492
1	1803	1884	1211	1667	1368	1346
2	778	976	666	757	734	721
3	467	588	419	437	451	446
4	341	414	302	324	336	368
5	277	329	251	288	282	297
6	215	243	212	242	228	244
7	248	239	191	235	212	221
8	186	187	162	168	178	171
9	164	180	146	158	136	141
10	133	166	141	132	158	180
11	136	144	131	104	125	140
12	143	170	135	115	154	159
13	134	155	119	157	143	140
14	148	136	125	121	191	169
15	198	178	146	147	175	202
16	205	179	152	126	167	172
17	228	192	211	187	155	210
18	297	224	221	209	221	195
19	266	216	182	182	252	211
20	399	255	271	239	282	272
21	209	262	194	178	215	236
22	232	214	254	226	246	236
23	236	195	216	252	231	241
24	303	201	176	198	286	238
25	355	277	210	199	240	352
26	309	277	219	174	197	230
27	229	213	271	257	186	190
28	294	234	235	251	245	229
29	223	211	196	224	288	256
30	437	265	259	266	315	352
31	250	322	192	227	210	241
32	265	256	310	214	257	242
33	243	203	221	310	257	264
34	235	220	253	235	315	270
35	404	288	306	301	349	442
36	278	273	214	236	253	303
37	274	259	267	280	257	356
38	289	277	258	293	278	352
39	254	304	223	264	324	335
40	441	391	417	383	425	497
41	329	385	290	377	353	407
42	419	380	484	402	444	392
43	333	397	379	456	444	522
44	372	389	426	403	557	450
45	522	538	522	583	602	760
46	486	393	460	462	530	526
47	677	539	401	483	502	633
48	630	757	668	543	533	619
49	589	642	739	600	498	666
50	892	871	997	1130	1012	888
51	664	793	733	805	1040	906

52	855	854	857	852	990	1242
53	857	837	820	941	1012	1224
54	1006	917	829	940	1161	1031
55	1038	1305	1078	1162	1312	1505
56	880	954	1176	1108	1127	1103
57	752	945	1059	1302	1165	1152
58	837	925	988	1175	1431	1389
59	728	803	847	969	1177	1506
60	1217	1217	1219	1408	1573	1657
61	748	878	903	1047	1135	1330
62	691	887	968	1001	1025	1281
63	879	863	814	1052	1150	1295
64	987	912	802	880	1062	1209
65	1615	1460	1296	1170	1321	1572
66	1460	1256	1122	982	924	1076
67	1328	1552	1288	1216	1084	1000
68	1411	1441	1618	1447	1175	1122
69	1287	1275	1279	1496	1347	1223
70	1731	1848	1921	1990	2021	1989
71	1270	1476	1411	1547	1541	1723
72	1283	1393	1524	1555	1557	1660
73	1044	1202	1305	1520	1573	1797
74	950	1092	1148	1394	1444	1686
75	1193	1113	1185	1425	1640	1869
76	1317	1120	998	1090	1304	1535
77	989	1231	908	987	974	1235
78	1092	1053	1199	1046	910	1148
79	976	957	981	1139	866	897
80	1170	1216	1177	1253	1232	1182
81	843	944	790	928	958	1137
82	655	734	809	889	822	990
83	535	546	610	808	764	891
84	472	510	518	656	698	766
85	467	428	456	535	668	848
86	382	375	354	374	457	585
87	245	340	314	357	346	366
88	224	214	282	252	269	332
89	161	188	164	245	210	236
90	170	160	191	184	240	272
91	124	119	112	142	108	178
92	77	95	102	101	99	96
93	71	92	94	95	81	99
94	60	63	52	73	63	70
95	67	57	50	58	54	69
96	42	52	41	48	27	54
97	20	40	40	39	22	35
98+	58	56	113	104	88	115
Y. B	1217	1301	1619	677	3882	234

TABLO 4 : 1986-1990 ERKEK ÖLÜM SAYILARI  
 TABLE 4 : 1986-1990 MEN'S DEATH NUMBERS

YAS	1986	1987	1988	1989	1990
0	13006	11973	11427	13268	12111
1	934	885	936	841	836
2	514	443	455	500	461
3	336	320	299	311	301
4	277	289	253	274	290
5	269	244	236	261	260
6	193	251	225	199	169
7	153	218	207	190	170
8	159	143	173	170	168
9	140	143	127	149	138
10	138	130	140	128	142
11	116	137	130	130	112
12	132	179	140	134	132
13	145	169	116	162	139
14	155	155	142	205	158
15	165	212	170	206	194
16	181	200	191	175	196
17	190	226	218	241	228
18	228	203	284	264	253
19	172	262	188	228	249
20	259	242	242	291	263
21	262	239	178	215	215
22	237	218	263	192	219
23	198	247	286	276	220
24	223	253	260	296	227
25	240	301	261	267	307
26	284	231	274	277	258
27	240	282	214	248	255
28	202	246	298	238	269
29	217	219	238	326	251
30	323	300	320	339	382
31	272	325	222	256	308
32	292	333	424	317	301
33	252	319	347	315	269
34	283	262	306	388	389
35	347	459	421	463	504
36	339	289	356	346	359
37	327	407	304	357	366
38	359	338	461	339	400
39	370	328	381	450	332
40	464	536	454	479	699
41	396	404	379	417	448
42	434	478	467	450	509
43	418	474	516	458	505
44	458	481	505	546	498
45	666	689	586	663	785
46	633	557	627	582	592
47	626	647	588	663	673
48	678	644	745	1142	790
49	594	654	627	804	825
50	954	982	1015	968	1045
51	694	759	794	902	894



52	978	699	880	902	1079
53	1230	1026	725	877	942
54	1143	1379	1050	846	956
55	1267	1507	1708	1489	1098
56	1262	1138	1364	1723	1421
57	1190	1405	1275	1489	1902
58	1218	1256	1384	1608	1684
59	1294	1274	1292	1552	1502
60	2091	1713	1763	1864	2043
61	1266	1714	1550	1600	1637
62	1452	1398	2001	1847	1922
63	1267	1420	1506	1999	1851
64	1227	1230	1443	1678	2100
65	1456	1660	1667	2199	2225
66	1140	1161	1315	1486	1736
67	1035	1239	1257	1481	1694
68	951	1053	1250	1620	1483
69	914	931	984	1330	1401
70	1618	1430	1319	1572	1782
71	1346	1203	1130	1081	1210
72	1796	1476	1265	1269	1212
73	2586	1615	1418	1337	1206
74	1546	1591	1740	1608	1398
75	1665	1793	1716	2102	1822
76	1488	1535	1531	1694	1862
77	1260	1437	1363	1571	1602
78	1231	1264	1337	1792	1582
79	885	1076	1140	1284	1407
80	999	1063	1304	1596	1705
81	780	743	828	1104	1201
82	1013	787	796	932	1051
83	798	901	706	783	836
84	763	776	860	739	744
85	730	804	815	947	759
86	644	648	626	710	754
87	442	533	588	625	622
88	319	404	466	559	510
89	258	265	323	467	447
90	227	289	268	378	420
91	131	160	168	208	292
92	131	119	139	166	164
93	82	110	95	133	140
94	65	73	82	81	114
95	63	78	65	95	101
96	51	66	40	45	82
97	44	35	40	39	50
98+	75	80	101	241	164
Y.B.	1118	262	441	428	305



TABLO 5 :1980-1985 KADIN ÖLÜM SAYILARI  
 TABLE 5 :1980-1985 WOMEN'S DEATH NUMBERS

YAS	1980	1981	1982	1983	1984	1985
0	14196	15031	14034	13325	11681	11558
1	1600	1801	1098	1471	1200	1221
2	717	899	602	728	586	585
3	400	530	361	421	383	372
4	271	346	238	247	261	264
5	199	280	189	196	205	215
6	215	203	173	145	151	172
7	164	204	165	155	144	152
8	116	141	111	129	129	122
9	115	109	89	116	93	88
10	102	123	86	90	106	95
11	60	110	95	79	79	94
12	90	109	113	92	97	107
13	68	94	98	74	89	103
14	81	98	113	68	117	104
15	137	116	99	85	104	118
16	112	105	118	78	122	103
17	119	100	96	122	93	95
18	145	115	132	118	125	121
19	125	110	106	112	110	123
20	193	140	156	130	167	181
21	100	140	110	110	91	110
22	117	104	162	128	116	132
23	102	82	106	147	108	120
24	137	93	120	106	150	125
25	190	147	128	137	169	209
26	143	138	116	93	96	118
27	99	129	163	132	113	107
28	112	137	135	136	143	142
29	107	98	108	119	138	146
30	220	171	206	189	205	268
31	118	146	113	120	103	147
32	119	143	159	102	164	166
33	105	153	122	164	114	154
34	138	108	134	137	177	122
35	210	211	232	207	262	306
36	129	144	147	126	169	159
37	136	146	157	142	151	207
38	178	147	163	167	177	182
39	126	140	134	133	151	146
40	293	244	250	226	291	309
41	154	191	168	177	159	180
42	176	152	257	196	202	215
43	167	192	219	208	200	230
44	167	187	197	178	240	203
45	281	256	301	344	335	422
46	195	206	263	236	217	263
47	242	252	200	226	232	312
48	285	302	295	239	226	292
49	217	259	290	249	260	265
50	504	427	489	474	520	507
51	250	362	310	352	375	340

52	341	350	430	343	432	483
53	375	374	395	413	389	646
54	432	375	360	383	476	435
55	506	694	567	607	676	840
56	402	431	617	491	477	524
57	331	391	455	593	511	523
58	366	408	516	565	647	600
59	319	363	386	476	480	708
60	648	700	742	712	867	941
61	341	469	449	524	560	681
62	400	433	545	545	531	665
63	460	394	546	556	520	625
64	537	455	457	507	612	631
65	969	936	845	786	918	1067
66	820	681	670	541	568	640
67	813	895	828	702	653	610
68	938	852	967	867	708	695
69	787	906	943	974	858	707
70	1505	1557	1661	1476	1514	1342
71	1101	1259	1150	1268	1108	1217
72	1048	1338	1450	1306	1230	1276
73	982	1127	1366	1403	1292	1393
74	943	999	1200	1407	1473	1496
75	1283	1214	1323	1424	1676	1861
76	1356	1153	1108	1229	1311	1643
77	1039	1355	1099	1142	1087	1297
78	1248	1167	1415	1133	1045	1257
79	1072	1143	1030	1369	1086	1072
80	1686	1537	1524	1468	1620	1555
81	1049	1264	1171	1278	1158	1389
82	879	1126	1331	1191	1135	1241
83	822	790	1071	1252	1098	1237
84	807	822	803	1022	1091	1103
85	886	912	865	864	1083	1317
86	821	729	691	662	688	898
87	420	674	692	651	573	708
88	458	343	611	567	577	565
89	327	371	324	576	461	492
90	449	428	402	418	508	571
91	263	286	226	271	221	440
92	203	277	239	210	204	213
93	155	132	197	233	153	185
94	128	127	118	155	158	164
95	155	120	111	133	177	190
96	135	98	91	74	103	103
97	30	105	92	74	77	64
98+	81	108	254	237	220	294
Y.B	931	932	653	525	428	166

TABLO 6 :1986-1990 KADIN ÖLÜM SAYILARI  
 TABLE 6 :1986-1990 WOMEN'S DEATH NUMBERS

YAS	1986	1987	1988	1989	1990
0	10220	9686	9154	10270	9760
1	786	789	853	775	742
2	422	364	394	458	407
3	280	272	244	275	256
4	223	223	203	179	186
5	158	219	161	160	172
6	141	143	142	154	130
7	131	153	134	132	124
8	95	118	113	97	126
9	85	86	95	117	107
10	94	97	91	84	98
11	86	84	102	81	73
12	89	96	68	99	99
13	83	103	92	100	89
14	89	92	91	120	90
15	117	97	113	120	102
16	118	103	102	124	119
17	97	129	109	109	130
18	99	134	151	121	123
19	92	133	90	127	114
20	145	125	126	128	158
21	99	107	80	91	98
22	129	133	152	115	122
23	104	136	125	136	87
24	121	128	142	145	138
25	158	151	150	176	161
26	153	131	125	127	159
27	139	145	114	132	117
28	110	155	161	138	142
29	88	120	105	161	118
30	224	177	171	192	213
31	184	161	119	134	131
32	148	176	187	175	159
33	162	156	168	162	138
34	155	165	159	188	186
35	234	248	199	258	265
36	193	125	167	185	199
37	171	203	142	153	184
38	185	184	230	186	224
39	164	146	173	202	129
40	265	258	245	251	333
41	183	174	169	199	242
42	211	212	182	179	221
43	227	230	225	215	227
44	228	202	222	221	238
45	396	340	305	356	369
46	304	219	351	307	282
47	233	312	261	332	296
48	321	319	300	430	311
49	243	350	292	371	352
50	633	557	526	514	557
51	301	361	359	428	418

52	369	357	431	430	486
53	492	413	360	425	450
54	513	560	470	435	474
55	655	757	720	677	624
56	586	492	580	704	573
57	496	621	577	661	756
58	626	620	704	704	781
59	613	587	588	757	706
60	1190	984	963	1148	1166
61	613	956	755	822	881
62	767	788	1021	961	991
63	666	760	744	1184	1002
64	631	699	838	954	1235
65	905	1071	1111	1457	1423
66	674	704	760	921	1076
67	609	858	755	949	1018
68	677	727	803	916	1043
69	617	630	655	851	901
70	1283	1035	1043	1311	1421
71	945	868	772	794	901
72	1322	1114	1005	935	912
73	1243	1325	1115	1070	974
74	1402	1260	1394	1261	1088
75	1661	1814	1599	1959	1605
76	1602	1475	1455	1624	1708
77	1537	1572	1437	1648	1428
78	1367	1549	1652	1694	1740
79	1372	1316	1539	1614	1560
80	1403	1496	1673	2130	2228
81	1064	1059	1173	1487	1745
82	1449	1162	1060	1215	1440
83	1030	1287	1046	1167	1292
84	1069	1146	1318	1132	1148
85	1108	1187	1105	1509	1257
86	991	904	1013	1043	1287
87	812	915	869	959	957
88	522	734	820	902	825
89	440	491	638	778	717
90	488	498	543	744	780
91	327	329	319	387	530
92	360	295	300	313	315
93	147	294	233	285	259
94	165	135	225	227	219
95	141	149	158	269	225
96	125	123	133	100	202
97	84	74	78	81	93
98+	230	222	233	351	349
Y.B.	156	172	370	359	196

TABLO 7 : 1980-1990 GENEL  
TABLE 7 : 1980-1990 GENERAL

YAS AGE	ORTALAMA MEAN	5' li MOV.	H.O. AVE.	ÇARPAN MULTIPLIER	ÇARPAN* MULTIPLIER*	D D
0	26254	26254		1	1	26254
1	2368	2368		1.02489	1.02489	2426.939
2	1197	1197		1.04952835	1.02404	1256.285
3	743	743		1.07386691	1.02319	797.8831
4	555	555		1.09785710	1.02234	609.3106
5	468	468		1.12145005	1.02149	524.8386
6	381	381		1.14459678	1.02064	436.0913
7	358	358		1.16921706	1.02151	418.5797
8	287	302.8		1.19539583	1.02239	361.9658
9	247	269.2		1.22322464	1.02328	329.2920
10	241	245.8		1.25277775	1.02416	307.9327
11	213	235.2		1.28413477	1.02503	302.0285
12	241	236.2		1.31630235	1.02505	310.9106
13	234	246.2		1.34931521	1.02508	332.2014
14	252	260.8		1.38319652	1.02511	360.7376
15	291	276		1.41798391	1.02515	391.3635
16	286	301.6		1.45368875	1.02518	438.4325
17	317	317.6		1.49011819	1.02506	473.2615
18	362	344.2		1.52726683	1.02493	525.6852
19	332	351.4		1.56515832	1.02481	549.9966
20	424	359.8		1.60378643	1.02468	577.0423
21	322	357.4		1.64317543	1.02456	587.2708
22	359	365		1.68486279	1.02537	614.9749
23	350	367.2		1.72897249	1.02618	634.8787
24	370	377.8		1.77562017	1.02698	670.8293
25	435	378.2		1.82496466	1.02779	690.2016
26	375	385.6		1.87715865	1.0286	723.8323
27	361	383.6		1.93037609	1.02835	740.4922
28	387	402		1.98460036	1.02809	797.8093
29	360	405.2		2.03985163	1.02784	826.5478
30	527	422.2		2.09611074	1.02758	884.9779
31	391	428.4		2.15339745	1.02733	922.5154
32	446	444.2		2.21001027	1.02629	981.6865
33	418	464.6		2.26583513	1.02526	1052.707
34	439	477.2		2.32073631	1.02423	1107.455
35	629	483.4		2.37457739	1.0232	1147.870
36	454	502.8		2.42722178	1.02217	1220.407
37	477	509.8		2.47542640	1.01986	1261.972
38	515	532.2		2.51884538	1.01754	1340.529
39	474	553.8		2.55720739	1.01523	1416.181
40	741	586.8		2.59024651	1.01292	1519.956
41	562	615.4		2.61770313	1.0106	1610.934
42	642	654.6		2.65018882	1.01241	1734.813
43	658	699.6		2.68784801	1.01421	1880.418
44	670	745.2		2.73090733	1.01602	2035.072
45	966	786.4		2.77957210	1.01782	2185.855
46	790	856		2.83407951	1.01961	2425.972
47	848	910.8		2.88962747	1.0196	2631.872
48	1006	1017		2.94623527	1.01959	2996.321
49	944	1092.4		3.00392256	1.01958	3281.485
50	1497	1189		3.06270932	1.01957	3641.561
51	1167	1261.2		3.12733249	1.0211	3944.191

52	1331	1366.4	3.19331920	1.0211	4363.351
53	1367	1463.2	3.26069824	1.0211	4771.053
54	1470	1577.6	3.32949897	1.0211	5252.617
55	1981	1666.8	3.39975140	1.0211	5666.705
56	1739	1764.8	3.47148615	1.0211	6126.478
57	1777	1815	3.54473451	1.0211	6433.693
58	1857	1924.8	3.61952841	1.0211	6966.868
59	1721	1955.8	3.70096780	1.0225	7238.352
60	2530	2002.6	3.78423958	1.0225	7578.318
61	1894	2023	3.86938497	1.0225	7827.765
62	2011	2062.2	3.95644613	1.0225	8158.983
63	1959	2085.8	4.04546617	1.0225	8438.033
64	1917	2101.8	4.13648916	1.0225	8694.072
65	2648	2115.4	4.22956016	1.0225	8947.211
66	1974	2155.6	4.32472527	1.0225	9322.377
67	2079	2177.6	4.42203158	1.0225	9629.415
68	2160	2272.8	4.52152729	1.0225	10276.52
69	2027	2356.6	4.62326166	1.0225	10895.17
70	3124	2466.8	4.72728505	1.0225	11661.26
71	2393	2560.2	4.83364896	1.0225	12375.10
72	2630	2691.6	4.94240606	1.0225	13302.98
73	2627	2702.2	5.05361020	1.0225	13655.86
74	2684	2789.8	5.16731643	1.0225	14415.77
75	3177	2776.4	5.28358105	1.0225	14669.33
76	2831	2776.6	5.40246162	1.0225	15001.55
77	2563	2705.2	5.52401701	1.0225	14943.57
78	2629	2655.6	5.64830739	1.0225	14999.64
79	2326	2527.4	5.77539431	1.0225	14596.73
80	2929	2427.6	5.90534068	1.0225	14335.80
81	2190	2270.4	6.03821084	1.0225	13709.15
82	2064	2150	6.17407059	1.0225	13274.25
83	1843	1919.6	6.31298718	1.0225	12118.41
84	1724	1765.8	6.45502939	1.0225	11398.29
85	1777	1589.6	6.60026755	1.0225	10491.78
86	1421	1416.6	6.74877357	1.0225	9560.312
87	1183	1227.8	6.90062097	1.0225	8472.582
88	978	1029.2	7.05588495	1.0225	7261.916
89	780	842.2	7.21464236	1.0225	6076.171
90	784	682.2	7.37697181	1.0225	5032.570
91	486	547.8	7.54295368	1.0225	4132.030
92	383	439.4	7.71267014	1.0225	3388.947
93	306	329.6	7.88620521	1.0225	2599.293
94	238	265.8	8.06364483	1.0225	2143.316
95	235	212	8.24507684	1.0225	1747.956
96	167	167	8.43059107	1.0225	1407.908
97	114	114	8.62027937	1.0225	982.7118
98	343	97	8.81423565	1.0225	854.9808
99	1488	76	9.01255596	1.0225	684.9542
100		59	9.21533847	1.0225	543.7049
101		47	9.42268358	1.0225	442.8661
102		37	9.63469396	1.0225	356.4836
103		29	9.85147458	1.0225	285.6927



TABLO 8 : 1980-1990 ERKEK  
TABLE 8 : 1980-1990 MEN'S

YAŞ AGE	ORTALAMA MEAN	5'li H.O. MOV.AVE.	ÇARPAN MULTIPLIEM	ÇARPAN* MULTIPLIE*	D D
0	14535	14535	1	1	14535
1	1246	1246	1.02465	1.02465	1277
2	637	637	1.048534	1.02331	668
3	398	398	1.071581	1.02198	426
4	315	315	1.093698	1.02064	345
5	272	272	1.114818	1.01931	303
6	220	220	1.134851	1.01797	250
7	208	208	1.157593	1.02004	240
8	170	177.8	1.183188	1.02211	210
9	147	159.4	1.211785	1.02417	193
10	144	146.8	1.243583	1.02624	183
11	128	141.6	1.278789	1.02831	181
12	145	143.2	1.313802	1.02738	188
13	144	150.6	1.348552	1.02645	203
14	155	160.4	1.382980	1.02553	222
15	181	173	1.417002	1.0246	245
16	177	191.4	1.450542	1.02367	278
17	208	204.2	1.485080	1.02381	303
18	236	222.8	1.520632	1.02394	339
19	219	231	1.557234	1.02407	360
20	274	235.6	1.594935	1.02421	376
21	218	235.6	1.633755	1.02434	385
22	231	240.2	1.675138	1.02533	402
23	236	240.2	1.719245	1.02633	413
24	242	246.2	1.766215	1.02732	435
25	274	247	1.816216	1.02831	449
26	248	249.6	1.869431	1.0293	467
27	235	249.4	1.924168	1.02928	480
28	249	259.2	1.980469	1.02926	514
29	241	261	2.038359	1.02923	532
30	323	272.4	2.097899	1.02921	572
31	257	277.2	2.159116	1.02918	598
32	292	286.4	2.219247	1.02785	636
33	273	299.6	2.278102	1.02652	682
34	287	307.2	2.335487	1.02519	718
35	389	311.6	2.391188	1.02385	745
36	295	323.2	2.445110	1.02255	791
37	314	330.6	2.495014	1.02041	825
38	331	347	2.540648	1.01829	882
39	324	364	2.581756	1.01618	940
40	471	389.6	2.618055	1.01406	1021
41	380	412.6	2.649315	1.01194	1093
42	442	440.2	2.686750	1.01413	1183
43	446	471.8	2.730598	1.01632	1288
44	462	502.2	2.781141	1.01851	1396
45	629	530.8	2.838711	1.0207	1506
46	532	582.4	2.903660	1.02288	1691
47	585	621.6	2.970096	1.02288	1846
48	704	691.4	3.038052	1.02288	2100
49	658	748.4	3.107562	1.02288	2325
50	978	816.6	3.178664	1.02288	2596

52	926	939.6	3.314218	1.0211	3114
53	954	1007	3.384148	1.0211	3408
54	1023	1084.6	3.455554	1.0211	3748
55	1315	1147.4	3.528466	1.0211	4049
56	1205	1209.2	3.602917	1.0211	4357
57	1240	1240	3.678938	1.0211	4562
58	1263	1300	3.756564	1.0211	4883
59	1177	1310	3.841087	1.0225	5032
60	1615	1325.2	3.927511	1.0225	5205
61	1255	1328.8	4.015880	1.0225	5336
62	1316	1339.4	4.106237	1.0225	5500
63	1281	1337.2	4.198628	1.0225	5615
64	1230	1334.6	4.293097	1.0225	5729
65	1604	1329.2	4.389692	1.0225	5834
66	1242	1338	4.488460	1.0225	6004
67	1289	1336.8	4.589450	1.0225	6134
68	1325	1365.4	4.692713	1.0225	6407
69	1224	1388.6	4.798299	1.0225	6663
70	1747	1421.6	4.906260	1.0225	6975
71	1358	1440.2	5.016651	1.0225	7226
72	1454	1479	5.129526	1.0225	7587
73	1418	1448.2	5.244940	1.0225	7596
74	1418	1458	5.362951	1.0225	7819
75	1593	1413.6	5.483618	1.0225	7752
76	1407	1378.2	5.606999	1.0225	7728
77	1232	1305.6	5.733157	1.0225	7486
78	1241	1239.6	5.862153	1.0225	7268
79	1055	1144.6	5.994051	1.0225	6863
80	1263	1070.6	6.128917	1.0225	6563
81	932	971	6.266818	1.0225	6086
82	862	896.4	6.407821	1.0225	5745
83	743	779.4	6.551997	1.0225	5107
84	682	700.4	6.699417	1.0225	4693
85	678	614.8	6.850154	1.0225	4213
86	537	535.8	7.004283	1.0225	3754
87	434	453.2	7.161879	1.0225	3247
88	348	368.4	7.323021	1.0225	2700
89	269	292.6	7.487789	1.0225	2194
90	254	229.2	7.656265	1.0225	1757
91	158	179.4	7.828531	1.0225	1407
92	117	140	8.004673	1.0225	1123
93	99	103	8.184778	1.0225	845
94	72	81.4	8.368935	1.0225	682
95	69	65.4	8.557236	1.0225	560
96	50	50	8.749774	1.0225	436
97	37	37	8.946644	1.0225	329
98+	109	31	9.147944	1.0225	274
Y.B.	1044	24	9.353772	1.0225	215
		19	9.564232	1.0225	172
		15	9.779427	1.0225	137
		12	9.999465	1.0225	110
		8	10.22445	1.0225	82



TABLO 9 : 1980-1990 KADIN  
TABLE 9 : 1980-1990 WOMEN'S

YAŞ AGE	ORTALAMA MEAN	5'li H.D.	ÇARPAN MULTIPLIEMULTIPLIE	ÇARPAN* MULTIPLIE	D D
0	11720	11720	1	1	11720
1	1121	1121	1.02513	1.02513	1149.170
2	560	560	1.050542	1.02479	588.3040
3	345	345	1.076239	1.02446	371.3025
4	240	240	1.102198	1.02412	264.5275
5	196	196	1.128419	1.02379	221.1702
6	161	161	1.154880	1.02345	185.9358
7	151	151	1.181535	1.02308	178.4118
8	118	125.4	1.208356	1.0227	151.5278
9	100	110.4	1.235338	1.02233	136.3814
10	97	99.4	1.262454	1.02195	125.4879
11	86	93.8	1.289698	1.02158	120.9737
12	96	93.2	1.318858	1.02261	122.9176
13	90	95.8	1.350049	1.02365	129.3347
14	97	100.4	1.383382	1.02469	138.8915
15	110	103	1.418962	1.02572	146.1531
16	109	110.2	1.456934	1.02676	160.5541
17	109	113.4	1.495339	1.02636	169.5714
18	126	121.4	1.534173	1.02597	186.2486
19	113	120.2	1.573417	1.02558	189.1247
20	150	124	1.613035	1.02518	200.0164
21	103	121.6	1.653022	1.02479	201.0075
22	128	124.6	1.695009	1.0254	211.1982
23	114	126.8	1.739113	1.02602	220.5196
24	128	131.6	1.785426	1.02663	234.9621
25	161	131.2	1.834079	1.02725	240.6312
26	127	135.8	1.885176	1.02786	256.0070
27	126	134	1.936774	1.02737	259.5277
28	137	142.4	1.988834	1.02688	283.2100
29	119	143.8	2.041319	1.02639	293.5418
30	203	149.4	2.094169	1.02589	312.8689
31	134	151	2.147361	1.0254	324.2516
32	154	157.6	2.200358	1.02468	346.7765
33	145	164.8	2.253101	1.02397	371.3110
34	152	169.6	2.305485	1.02325	391.0103
35	239	171.4	2.357428	1.02253	404.0632
36	158	179.2	2.408843	1.02181	431.6648
37	163	178.6	2.455310	1.01929	438.5184
38	184	184.8	2.496510	1.01678	461.3551
39	149	189.4	2.532110	1.01426	479.5817
40	270	196.8	2.561863	1.01175	504.1746
41	181	202.6	2.585509	1.00923	523.8241
42	200	214.4	2.613070	1.01066	560.2423
43	213	227.8	2.644636	1.01208	602.4481
44	208	243.2	2.680365	1.01351	651.8649
45	337	255.8	2.720410	1.01494	695.8809
46	258	273.6	2.764916	1.01636	756.4810
47	263	289.2	2.810150	1.01636	812.6954
48	302	325.6	2.856124	1.01636	929.9540
49	286	344.2	2.902850	1.01636	999.1611
50	519	372.6	2.9	1.0	1099.297

51	351	395	3.012593	1.0211	1189.974
52	405	427.2	3.076158	1.0211	1314.135
53	414	456.6	3.141065	1.0211	1434.210
54	447	493.2	3.207342	1.0211	1581.861
55	666	519.8	3.275017	1.0211	1702.353
56	534	555.8	3.344120	1.0211	1858.661
57	538	575.2	3.414681	1.0211	1964.124
58	594	625	3.486730	1.0211	2179.206
59	544	645.8	3.565182	1.0225	2302.394
60	915	677.2	3.645398	1.0225	2468.664
61	638	694	3.727420	1.0225	2586.829
62	695	722.6	3.811287	1.0225	2754.036
63	678	748.4	3.897041	1.0225	2916.545
64	687	767.2	3.984724	1.0225	3057.080
65	1044	786.2	4.074381	1.0225	3203.278
66	732	817.8	4.166054	1.0225	3406.999
67	790	841	4.259790	1.0225	3582.484
68	836	907.6	4.355636	1.0225	3953.175
69	803	968.2	4.453637	1.0225	4312.012
70	1377	1045.4	4.553844	1.0225	4760.589
71	1035	1119.8	4.656306	1.0225	5214.131
72	1176	1212.4	4.761073	1.0225	5772.325
73	1208	1253.8	4.868197	1.0225	6103.745
74	1266	1331.6	4.977731	1.0225	6628.347
75	1584	1362.6	5.089730	1.0225	6935.267
76	1424	1398.6	5.204249	1.0225	7278.663
77	1331	1399.4	5.321345	1.0225	7446.690
78	1388	1415.6	5.441075	1.0225	7702.386
79	1270	1382.4	5.563499	1.0225	7690.982
80	1665	1356.8	5.688678	1.0225	7718.399
81	1258	1299	5.816673	1.0225	7555.859
82	1203	1253.4	5.947548	1.0225	7454.657
83	1099	1140.2	6.081368	1.0225	6933.976
84	1042	1065.4	6.218199	1.0225	6624.869
85	1099	974.4	6.358109	1.0225	6195.341
86	884	880.4	6.501166	1.0225	5723.627
87	748	774	6.647442	1.0225	5145.120
88	629	660.2	6.797010	1.0225	4487.386
89	510	548.8	6.949943	1.0225	3814.128
90	530	452.4	7.106316	1.0225	3214.897
91	327	368	7.266208	1.0225	2673.964
92	266	299.2	7.429698	1.0225	2222.965
93	207	226.4	7.596866	1.0225	1719.930
94	166	184.4	7.767796	1.0225	1432.381
95	166	146.6	7.942571	1.0225	1164.381
96	117	117	8.121279	1.0225	950.1897
97	77	77	8.304008	1.0225	639.4086
98	234	70	8.490848	1.0225	594.3593
99	444	52	8.681892	1.0225	451.4584
100	37	39	8.877235	1.0225	346.2121
101	29	29	9.076973	1.0225	263.2322
102		22	9.281204	1.0225	204.1865
103		16	9.490032	1.0225	151.8405

## İKİNCİ BÖLÜM

### 2. DÜZELTİLMİŞ TÜRK MORTALİTE TABLOSUNUN (D.T.M.T.) VE KOMUTASYON TABLOLARININ HAZIRLANMASI

#### 2.1. MORTALİTE TABLOLARINDA KULLANILAN DÜZELTMELER

Ölüm oranları  $X$  yaşının bir fonksiyonu olarak düşünülüp fonksiyonun seyri incelendiğinde, fonksiyonun düzensiz bir seyir izlediği gözlenir. Bunun sebebi ise sınırlı sayıda gözlemden hareket edildiği için tesadüfi farkların bulunmasıdır. Bu farkların ortadan kaldırılması için, gözlem değerleri artıkça tesadüfi farkların ortadan kalktığı ve de fonksiyonun düzenli bir seyir izlediği hipotezi kabul edilir.

Düzeltilme (ajüstman) yöntemleri başlıca üç grupta incelenirler.<sup>(5)</sup>

- 1- Grafik ajüstman
- 2- Mekanik ajüstman
- 3- Analitik ajüstman

##### 2.1.1. GRAFİK AJÜSTMAN

Grafik ajüstman da gözlem sonuçlarının grafiğine bakılır ve bu eğriye en uygun eğri elle veya teknik bir araçla çizilir. Çizilen eğri üzerindeki herhangi bir noktanın ordinatından hareketle yıllık ölüm olasılığı belirlenir.

Bu düzeltme yöntemi artık, yalnızca çabuk ve de yaklaşık değerler elde etmek için kullanılırlar.

##### 2.1.2. MEKANİK AJÜSTMAN

Fonksiyonun seçimi önceden saptanan koşullara dayanır; örneğin ajüste edilen değerlerin parabolün bir yayı üzerinde bulunmasını önceden saptamak gibi.

Bu düzeltme,  $q_x$  fonksiyonunun önemli olabilecek değişimlerini azaltır; çünkü ardışık  $q_x$  frekanslarının ağırlıklı ortalaması bulunarak, şekilde düzenlilik sağlanmaktadır. Bu sakınca analitik düzeltmeler de ortadan kalk-

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(5) KENAN URAL, Yaşam Sigortalarının Aktüaryel Prensipleri, Aktüerler Derneği Yayını, İstanbul, 1994, s. 30-36.

mıştır.

### 2.1.3. ANALİTİK AJÜSTMAN

Bu düzeltmede  $q_x = f(x)$  alınır.  $f(x)$  parametreleri,  $q_x$  gözlem değerlerinden elde edilen bir fonksiyondur ve düzeltme  $l_x$  fonksiyonundan hareketle yapılır.

Uygulayacağımız ajüstman, analitik ajüstmanlardan olan Makeham ajüstmanıdır.

#### 2.1.3.1. MAKEHAM FORMULU VE UYGULANIŞI<sup>(6)</sup>

$$l_x = k \cdot s^x \cdot g^{c^x}$$

$l_x$  fonksiyonundaki parametrelerin ( $k, s, g, c$ ) bulunmasında birçok yöntem vardır. Biz bu yöntemlerden King ve Hardy yöntemi olarak adlandırılan yöntemi kullanacağız.

Bu yöntem öncelikle,  $p_x$  değerlerinden hareketle  $s, g$  ve  $c$  parametre değerlerini bulunmasını sağlar.

$$p_x = \frac{l_{x+1}}{l_x} = \frac{k \cdot s^{x+1} \cdot g^{c^{x+1}}}{k \cdot s^x \cdot g^{c^x}} = s \cdot g^{(c-1) \cdot c^x}$$

Her iki tarafın logaritması alınır;

$$\log p_x = \log s + (c-1) \cdot c^x \cdot \log g$$

Bu formülden hareketle parametre değerlerine ulaşılır. Fonksiyon bu yöntemle çözüldüğünde belirlenen yaş sınırı 3'e bölünür ve bu 3 eşit sayıdaki yaş kümesinden hareketle fonksiyonun parametre değerleri bulunur.

Yukarıdaki formülde;

$$\log p_x = P_x$$

$$\log s = a$$

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(6) MUHTEREM ÖCAL, Türkiye Ölüm Oranları Tablosu, Yayınlanmamış Docentlik Tezi, İstanbul, 1974, s. 30.

$(c-1) \cdot \log g = b$  denirse, formül;

$P_x = a + b \cdot c^x$  şeklini alır<sup>(7)</sup>(Tablo 10).

Grafik 1 incelendiğinde eğrinin 3 farklı eğimi olduğu gözlenir. Bunun yüzden 3 farklı fonksiyon için parametre değerleri bulunacaktır. Birinci fonksiyonumuzun sınırları 0-11 yaş, ikinci fonksiyonumuzun sınırları 12-77 yaş, üçüncü fonksiyonumuzun sınırları 78-101 yaşlarıdır. 102 ve 103 yaşları 3. fonksiyondan hareketle tahmin edilmiştir.

Şimdi genel ölüm verilerinin birinci fonksiyonu için hesaplamaları yapalım.

Öncelikle fonksiyonumuz 3'e bölünür, 3'e bölümdeki amaç, fonksiyonu 3 denklem biçimine dönüştürerek çözümü kolaylaştırmaktır. 0-11 yaşlar arası 3 eşit gruba ayrılırsa formül aşağıdaki gibi uygulanır.

$$\begin{array}{l} 1. \text{ grup:} \\ P_0 = a + b c^0 \\ P_1 = a + b c^1 \\ P_2 = a + b c^2 \\ P_3 = a + b c^3 \end{array} \left. \vphantom{\begin{array}{l} 1. \text{ grup:} \\ P_0 = a + b c^0 \\ P_1 = a + b c^1 \\ P_2 = a + b c^2 \\ P_3 = a + b c^3 \end{array}} \right\} \sum_{i=0}^3 P_i = 4 \cdot a + b \sum_{i=0}^3 c^i$$

$$\begin{array}{l} 2. \text{ grup:} \\ P_4 = a + b c^4 \\ P_5 = a + b c^5 \\ P_6 = a + b c^6 \\ P_7 = a + b c^7 \end{array} \left. \vphantom{\begin{array}{l} 2. \text{ grup:} \\ P_4 = a + b c^4 \\ P_5 = a + b c^5 \\ P_6 = a + b c^6 \\ P_7 = a + b c^7 \end{array}} \right\} \sum_{i=4}^7 P_i = 4 \cdot a + b \sum_{i=4}^7 c^i$$

$$\begin{array}{l} 3. \text{ grup:} \\ P_8 = a + b c^8 \\ P_9 = a + b c^9 \\ P_{10} = a + b c^{10} \\ P_{11} = a + b c^{11} \end{array} \left. \vphantom{\begin{array}{l} 3. \text{ grup:} \\ P_8 = a + b c^8 \\ P_9 = a + b c^9 \\ P_{10} = a + b c^{10} \\ P_{11} = a + b c^{11} \end{array}} \right\} \sum_{i=8}^{11} P_i = 4 \cdot a + b \sum_{i=8}^{11} c^i$$

Bu toplamlar sonucunda c'lerin toplamı şu şekilde ifade edilirler,

$$\begin{aligned} \sum_{i=0}^3 c^i &= c^0 + c^1 + c^2 + \dots + c^3 \\ &= \frac{(c^4 - 1)}{c - 1} \cdot c^0 \end{aligned}$$

aynı şekilde diğer gruplar içinde c'lerin toplamı aşağıdaki şekilde oluşur;

$$\sum_{i=4}^7 c^i = c^4 \cdot \frac{(c^4 - 1)}{c - 1}$$

$$\sum_{i=8}^{11} c^i = c^8 \cdot \frac{(c^4 - 1)}{c - 1}$$

koyarsak;

Bu değerleri  $\sum P_x$ 'lerde yerine

$$1. \text{ grup için: } \sum_{i=0}^3 P_x = 4 \cdot a + c^0 \cdot \frac{(c^4 - 1)}{c - 1} \cdot b = -0.02795 \quad (\text{I})$$

$$2. \text{ grup için: } \sum_{i=4}^7 P_x = 4 \cdot a + c^4 \cdot \frac{(c^4 - 1)}{c - 1} \cdot b = -0.00187 \quad (\text{II})$$

$$3. \text{ grup için: } \sum_{i=8}^{11} P_x = 4 \cdot a + c^8 \cdot \frac{(c^4 - 1)}{c - 1} \cdot b = -0.00122 \quad (\text{III})$$

(II)'den (I)'i ve (III)'den (II)'yi çıkartırsak iki denklem bulunur.

$$\sum_{i=4}^7 P_x - \sum_{i=0}^3 P_x = b \cdot \frac{(c^4 - 1)^2}{c - 1} = 0.02608 \quad (\text{IV})$$

$$\sum_{i=8}^{11} P_x - \sum_{i=4}^7 P_x = b \cdot \frac{(c^4 - 1)^2}{c - 1} \cdot c^4 = 0.00065 \quad (\text{V})$$

(V'i (IV)'e bölersek;

$$\frac{\sum_{i=8}^{41} P_i - \sum_{i=4}^7 P_i}{\sum_{i=4}^7 P_i - \sum_{i=0}^3 P_i} = \frac{c^4 \cdot \frac{(c^4 - 1)^2}{c - 1} \cdot b}{c^0 \cdot \frac{(c^4 - 1)^2}{c - 1} \cdot b} = \frac{c^4}{c^0} = c^4$$

$$c^4 = \frac{0.00065}{0.02608} = 0.0249233$$

$c_g = 0.39733$  olarak bulunur.

Bulunan  $c_g$  değeri (I) ve (II) numaralı denklemlerde yerine konup birlikte çözümlerse denklemin diğer parametreleri de şu şekilde belirlenir.

$$4 \cdot a + \frac{((0.397339)^4 - 1)}{0.397339 - 1} \cdot b = -0.02795 \quad (I)$$

$$4 \cdot a + 0.397339 \cdot \frac{((0.397339)^4 - 1)}{0.397339 - 1} = -0.00187 \quad (II)$$

$$4 \cdot a + 1.618 \cdot b = -0.02795$$

$$4 \cdot a + 0.040324 \cdot b = -0.00187$$

$$\underline{b = -0.0165304} \quad \underline{a = -0.000301}$$

$g_g = 1.0652$
$s_g = 0.999307$

Bu parametre değerlerini bulduktan sonra  $k$  değeri kolaylıkla bulunacaktır. Bunun için sınırın ilk yaşından yararlanılır.

$l_x = k \cdot s^x \cdot g^{c^x}$  formülünde sınırın ilk yaşı yerine konur ve  $k$  değeri bulunur.

$$l_0 = k \cdot s^0 \cdot g^{c^0}$$

$$k = \frac{l_0}{g} = \frac{100000}{1.0652}$$

$$k_g = 93879.084$$

Aynı işlemler genel ölüm verilerinin diğer 2 fonksiyonu, erkek ve kadın ölüm verilerinin 3 fonksiyonu için yapıldı, genel, erkek ve kadın ölüm verilerinin 3 fonksiyonunun parametreleri için şu sonuçlar elde edilmiştir.

GENEL (Tablo 14)

PARAMETRE	I (0-11 Yaş)	II (12-77 Yaş)	III (78-101 Yaş)
$s_g$	0.9993070	0.999407173	1.218422015
$g_g$	1.0652000	0.998936000	0.400670000
$c_g$	0.3973300	1.091900000	1.030662200
$k_g$	93879.084	94053.44830	102.3733505

ERKEK (Tablo 15)

PARAMETRE	I (0-11 Yaş)	II (12-77 Yaş)	III (78-101 Yaş)
$s_E$	0.9992640	0.99950300	1.271050
$g_E$	1.0647900	0.99836400	0.143510
$c_E$	0.3947700	1.08945000	1.025586
$k_E$	93915.232	94076.0431	205.9040



KADIN (Tablo 16)

PARAMETRE	I (0-11 Yaş)	II (12-77 Yaş)	III (78-101 Yaş)
$s_k$ :	0.999364577	0.99930310	1.08683100
$g_k$ :	1.065392000	0.99962350	0.91952500
$c_k$ :	0.397026000	1.10235000	1.04903653
$k_k$ :	93862.16530	94045.5575	2122.53600

Bulunan bu parametre değerleri yardımı ile  $p_x$ ,  $q_x$ ,  $l_x$ ,  $d_x$ ,  $L_x$ ,  $T_x$  ve  $e_x$ 'e ait değerler bulunur.

$$p_x = s \cdot g^{(c-1)c^x} : \text{Yaşam olasılıkları.}$$

$$q_x = 1 - p_x : \text{Ölüm olasılıkları.}$$

$$l_x = k \cdot s^x \cdot g^{c^x} : \text{Yaşayanların sayısı.}$$

$$d_x = l_x - l_{x+1} : \text{Ölenlerin sayısı.}$$

$$L_x = \frac{l_x + l_{x+1}}{2} : \text{X ile X+1 yaşları arasında yaşayanlar.}$$

$$T_x = L_x + L_{x+1} + L_{x+2} + \dots + L_w$$

$$e_x^o = \frac{T_x}{l_x} : \text{Ortalama yaşanacak yıl.}$$

Bu değerler tüm yaşlar için bulunduğundan sonra düzeltilmiş Türk mortalite tablosu tamamlanmış olur (Tablo 14-15-16).

Kadın ölüm fonksiyonunun grafiği incelendiğinde, 77. yaş ile 78. yaş arasında ufak bir fark söz konusudur. Bu farklılığın, iki farklı eğimdeki 2 fonksiyonunun birleştirilmesinden yada veriler toplanırken, bahsedilen yaşlarda hatalı beyanın fazla olmasından kaynaklandığı kanısındayız. Bu farkın, küçük bir fark olması nedeniyle, diğer değerlere olan etkisi önemsenmemiştir. Aynı durum daha da

ufak bir fark olarak genel ölüm fonksiyonunda da ortaya çıkmaktadır. Burada ki fark, bahsedilen yaştaki kadın ölüm verilerinin hatalı olmasının sonucudur. Çünkü genel ölüm verileri kadın ölüm verileri ile erkek ölüm verilerinin toplanmasından oluşmaktadır. Dolayısıyla kadın veya erkek verilerindeki bir hata genel verilere yansiyacaktır.

## 2.2. KOMUTASYON TABLOLARI

Faiz tutarlarının peşin değerleri tablolarında verilen, ölüm ve hayat tablolarının kombinezonları neticesinde, elde edilen peşin değerler serisine, komütasyon sayıları denir<sup>(8)</sup>

Hayat ve ölüm verilerinden hareketle iki tür komütasyon sayıları serisi oluşturulur.

- 1- Yaşama Komütasyon Sayıları
- 2- Ölüm Komütasyon Sayıları

### 2.2.1. YAŞAMA VE ÖLÜM KOMUTASYON SAYILARI (D, N, S, C, M, R)

Yaşama ve ölüm komütasyon sayıları şu şekilde elde edilirler<sup>(9)</sup>(Tablo 17-18-19-20-21-22).

Yaşama komütasyon sayıları:

$$D_x = v^x \cdot l_x, \quad v^x = \frac{1}{(1+i)^x} \quad (i: \text{faiz oranı})$$

$$N_x = D_x + D_{x+1} + D_{x+2} + \dots$$

$$S_x = N_x + N_{x+1} + N_{x+2} + \dots$$

Ölüm komütasyon sayıları:

$$C_x = v^{x+1} \cdot d_x$$

$$M_x = C_x + C_{x+1} + C_{x+2} + \dots$$

$$R_x = M_x + M_{x+1} + M_{x+2} + \dots$$

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(8) FAZIL K. GULCUR, a.g.e., s. 86.

(9) MUHTEREM ÖCAL, a.g.e., s. 57.

TABLO 10: Log (Fx)

TABLE 10: Log (Fx)

YAŞLAR AGES	log (P (x)) log (P (x))	YAŞLAR AGES	log (P (x)) log (P (x))
0	-0.02376	51	-0.00418
1	-0.00226	52	-0.00467
2	-0.00117	53	-0.00517
3	-0.00074	54	-0.00576
4	-0.00057	55	-0.00630
5	-0.00049	56	-0.00692
6	-0.00040	57	-0.00738
7	-0.00039	58	-0.00814
8	-0.00033	59	-0.00862
9	-0.00031	60	-0.00922
10	-0.00029	61	-0.00973
11	-0.00028	62	-0.01038
12	-0.00029	63	-0.01100
13	-0.00031	64	-0.01163
14	-0.00034	65	-0.01231
15	-0.00036	66	-0.01321
16	-0.00041	67	-0.01408
17	-0.00044	68	-0.01555
18	-0.00050	69	-0.01712
19	-0.00052	70	-0.01910
20	-0.00055	71	-0.02123
21	-0.00056	72	-0.02405
22	-0.00058	73	-0.02615
23	-0.00060	74	-0.02943
24	-0.00064	75	-0.03215
25	-0.00066	76	-0.03555
26	-0.00069	77	-0.03856
27	-0.00071	78	-0.04248
28	-0.00077	79	-0.04577
29	-0.00080	80	-0.05020
30	-0.00085	81	-0.05413
31	-0.00089	82	-0.05973
32	-0.00095	83	-0.06280
33	-0.00102	84	-0.06871
34	-0.00108	85	-0.07458
35	-0.00112	86	-0.08129
36	-0.00119	87	-0.08745
37	-0.00124	88	-0.09219
38	-0.00132	89	-0.09572
39	-0.00140	90	-0.09928
40	-0.00151	91	-0.10282
41	-0.00160	92	-0.10734
42	-0.00173	93	-0.10518
43	-0.00189	94	-0.11144
44	-0.00205	95	-0.11798
45	-0.00221	96	-0.12583
46	-0.00247	97	-0.11682
47	-0.00270	98	-0.13671
48	-0.00310	99	-0.15372
49	-0.00342	100	-0.17871
50	-0.00382	101	-0.22847
		102	-0.35051

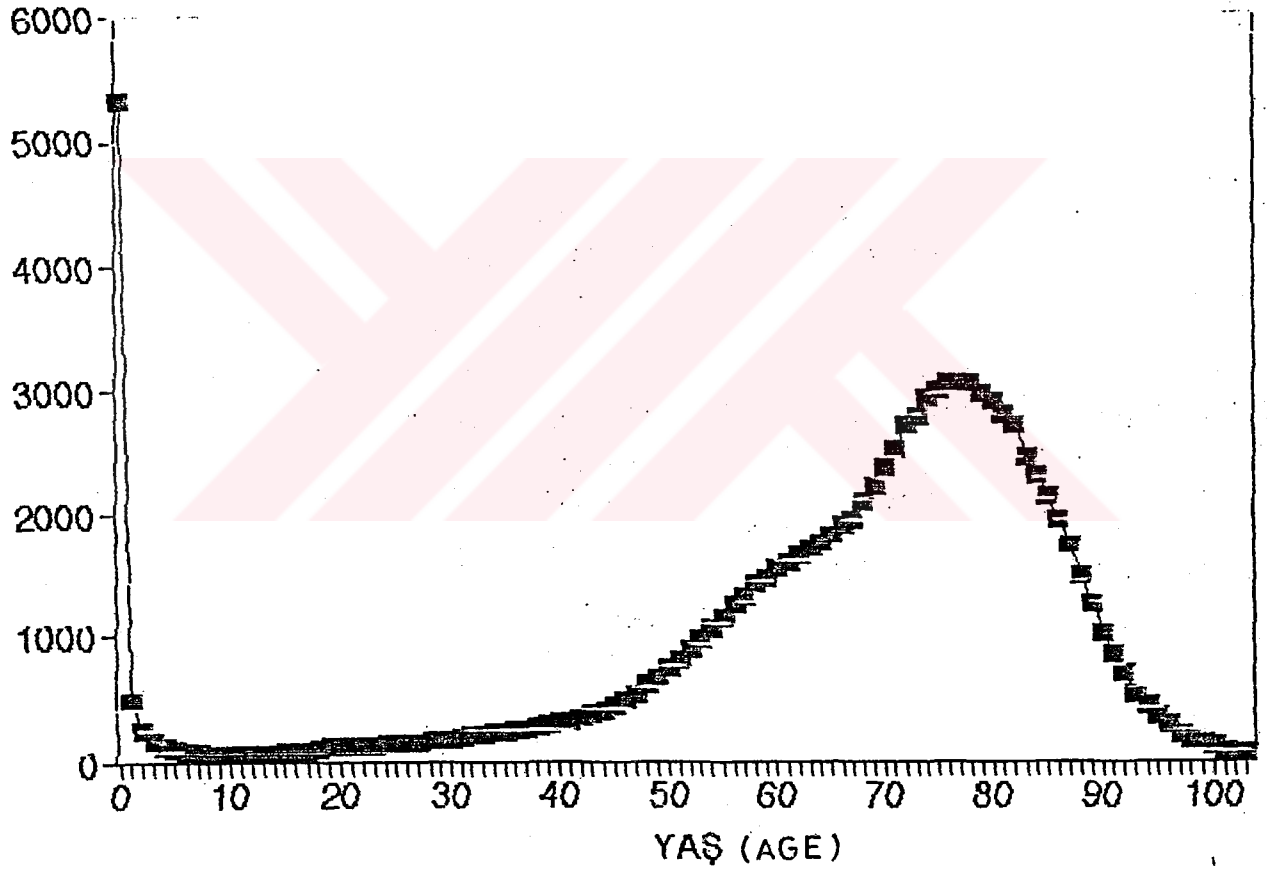
TABLO 11:1980-1990 TÜRK MORTALİTE TABLOSU (GENEL)  
 TABLE 11:MORTALITY TABLE OF TURKEY 1980-1990 (GENERAL)

YAS	$l(x)$	$d(x)$	$q(x)$	$p(x)$	$L(x)$	$T(x)$	$e_x$
0	100000	5325	0.05325	0.94675	96272.5	6569076.	65.69076
1	94675	492	0.005196	0.994803	94369.96	6472803.	68.36866
2	94183	255	0.002707	0.997292	94037.65	6378433.	67.72383
3	93928	162	0.001724	0.998275	93840.52	6284396.	66.90652
4	93766	124	0.001322	0.998677	93701.52	6190555.	66.02132
5	93642	106	0.001131	0.998868	93589	6096854	65.10811
6	93536	88	0.000940	0.999059	93492	6003265	64.18133
7	93448	85	0.000909	0.999090	93405.5	5909773	63.24129
8	93363	73	0.000781	0.999218	93326.5	5816367.	62.29842
9	93290	67	0.000718	0.999281	93256.5	5723041	61.34677
10	93223	63	0.000675	0.999324	93191.5	5629784.	60.39050
11	93160	61	0.000654	0.999345	93129.5	5536593	59.43101
12	93099	63	0.000676	0.999323	93067.5	5443463.	58.46962
13	93036	67	0.000720	0.999279	93002.5	5350396	57.50887
14	92969	73	0.000785	0.999214	92932.5	5257393.	56.54996
15	92896	79	0.000850	0.999149	92856.5	5164461	55.59400
16	92817	89	0.000958	0.999041	92772.5	5071604.	54.64090
17	92728	96	0.001035	0.998964	92680	4978832	53.69286
18	92632	107	0.001155	0.998844	92578.5	4886152	52.74799
19	92525	112	0.001210	0.998789	92469	4793573.	51.80841
20	92413	117	0.001266	0.998733	92354.5	4701104.	50.87059
21	92296	119	0.001289	0.998710	92236.5	4608750	49.93445
22	92177	125	0.001356	0.998643	92114.5	4516513.	48.99826
23	92052	129	0.001401	0.998598	91987.5	4424399	48.06412
24	91923	136	0.001479	0.998520	91855	4332411.	47.13087
25	91787	140	0.001525	0.998474	91717	4240556.	46.19996
26	91647	147	0.001603	0.998396	91573.5	4148839.	45.26977
27	91500	150	0.001639	0.998360	91425	4057266	44.34170
28	91350	162	0.001773	0.998226	91269	3965841	43.41369
29	91188	168	0.001842	0.998157	91104	3874572	42.48993
30	91020	179	0.001966	0.998033	90930.5	3783468	41.56743
31	90841	187	0.002058	0.997941	90747.5	3692537.	40.64835
32	90654	199	0.002195	0.997804	90554.5	3601790	39.73117
33	90455	213	0.002354	0.997645	90348.5	3511235.	38.81748
34	90242	225	0.002493	0.997506	90129.5	3420887	37.90792
35	90017	233	0.002588	0.997411	89900.5	3330757.	37.00142
36	89784	247	0.002751	0.997248	89660.5	3240857	36.09615
37	89537	256	0.002859	0.997140	89409	3151196.	35.19434
38	89281	272	0.003046	0.996953	89145	3061787.	34.29383
39	89009	287	0.003224	0.996775	88865.5	2972642.	33.39710
40	88722	308	0.003471	0.996528	88568	2883777	32.50351
41	88414	327	0.003698	0.996301	88250.5	2795209	31.61500
42	88087	352	0.003996	0.996003	87911	2706958.	30.73051
43	87735	381	0.004342	0.995657	87544.5	2619047.	29.85179
44	87354	413	0.004727	0.995272	87147.5	2531503	28.97981
45	86941	443	0.005095	0.994904	86719.5	2444355.	28.11510
46	86498	492	0.005687	0.994312	86252	2357636	27.25653
47	86006	534	0.006208	0.993791	85739	2271384	26.40959
48	85472	608	0.007113	0.992886	85168	2185645	25.57147
49	84864	666	0.007847	0.992152	84531	2100477	24.75109
50	84198	739	0.008776	0.991223	83828.5	2015946	23.94292

51	83459	800	0.009585	0.990414	83059	1932117.	23.15049
52	82659	885	0.010706	0.989293	82216.5	1849058.	22.36971
53	81774	968	0.011837	0.988162	81290	1766842	21.60640
54	80806	1065	0.013179	0.986820	80273.5	1685552	20.85924
55	79741	1150	0.014421	0.985578	79166	1605278.	20.13115
56	78591	1243	0.015816	0.984183	77969.5	1526112.	19.41841
57	77348	1305	0.016871	0.983128	76695.5	1448143	18.72243
58	76043	1413	0.018581	0.981418	75336.5	1371447.	18.03515
59	74630	1468	0.019670	0.980329	73896	1296111	17.36715
60	73162	1537	0.021008	0.978991	72393.5	1222215	16.70559
61	71625	1588	0.022171	0.977828	70831	1149821.	16.05335
62	70037	1655	0.023630	0.976369	69209.5	1078990.	15.40600
63	68382	1711	0.025021	0.974978	67526.5	1009781	14.76676
64	66671	1763	0.026443	0.973556	65789.5	942254.5	14.13289
65	64908	1815	0.027962	0.972037	64000.5	876465	13.50318
66	63093	1891	0.029971	0.970028	62147.5	812464.5	12.87725
67	61202	1953	0.031910	0.968089	60225.5	750317	12.25968
68	59249	2084	0.035173	0.964826	56207	690091.5	11.64731
69	57165	2210	0.038660	0.961339	56060	631884.5	11.05369
70	54955	2365	0.043035	0.956964	53772.5	575824.5	10.47810
71	52590	2510	0.047727	0.952272	51335	522052	9.926830
72	50080	2698	0.053873	0.946126	48731	470717	9.399301
73	47382	2769	0.058439	0.941560	45997.5	421986	8.906040
74	44613	2924	0.065541	0.934458	43151	375988.5	8.427778
75	41689	2975	0.071361	0.928638	40201.5	332837.5	7.983820
76	38714	3043	0.078602	0.921397	37192.5	292636	7.558919
77	35671	3031	0.084970	0.915029	34155.5	255443.5	7.161097
78	32640	3042	0.093198	0.906801	31119	221288	6.779656
79	29598	2961	0.100040	0.899959	28117.5	190169	6.425062
80	26637	2908	0.109171	0.890828	25183	162051.5	6.083699
81	23729	2781	0.117198	0.882801	22338.5	136868.5	5.767984
82	20948	2692	0.128508	0.871491	19602	114530	5.467347
83	18256	2458	0.134640	0.865359	17027	94928	5.199824
84	15798	2312	0.146347	0.853652	14642	77901	4.931067
85	13486	2128	0.157793	0.842206	12422	63259	4.690716
86	11358	1939	0.170716	0.829283	10388.5	50837	4.475876
87	9419	1718	0.182397	0.817602	8560	40448.5	4.294351
88	7701	1473	0.191273	0.808726	6964.5	31888.5	4.140825
89	6228	1232	0.197816	0.802183	5612	24924	4.001926
90	4996	1021	0.204363	0.795636	4485.5	19312	3.865492
91	3975	838	0.210817	0.789182	3556	14826.5	3.729937
92	3137	687	0.218999	0.781000	2793.5	11270.5	3.592763
93	2450	527	0.215102	0.784897	2186	8477	3.46
94	1922	435	0.226326	0.773673	1705	6291	3.273152
95	1488	354	0.237903	0.762096	1310.5	4586	3.081989
96	1133	285	0.251544	0.748455	990.5	3275.5	2.890997
97	848	200	0.235849	0.764150	746	2285	2.694575
98	646	175	0.270061	0.729938	560.5	1537	2.371913
99	473	141	0.298097	0.701902	402.5	976.5	2.064482
100	332	112	0.337349	0.662650	276	574	1.728915
101	220	90	0.409090	0.590909	175	298	1.354545
102	130	72	0.553846	0.446153	94	123.0000	0.946153
103	58	58	1	0	29	29.00000	0.5

GRAFİK 1 : TURK MORTALITE GRAFIGI  
1980 - 1990 GENEL

GRAPH 1 : GRAPH OF TURK MORTALITY  
1980 - 1990 GENERAL





TABLO 12: TÜRK MORTALİTE TABLOSU 1980-1990 (ERKEK)  
TABLE 12: MORTALITY TABLE OF TURKEY 1980-1990 (MEN'S)

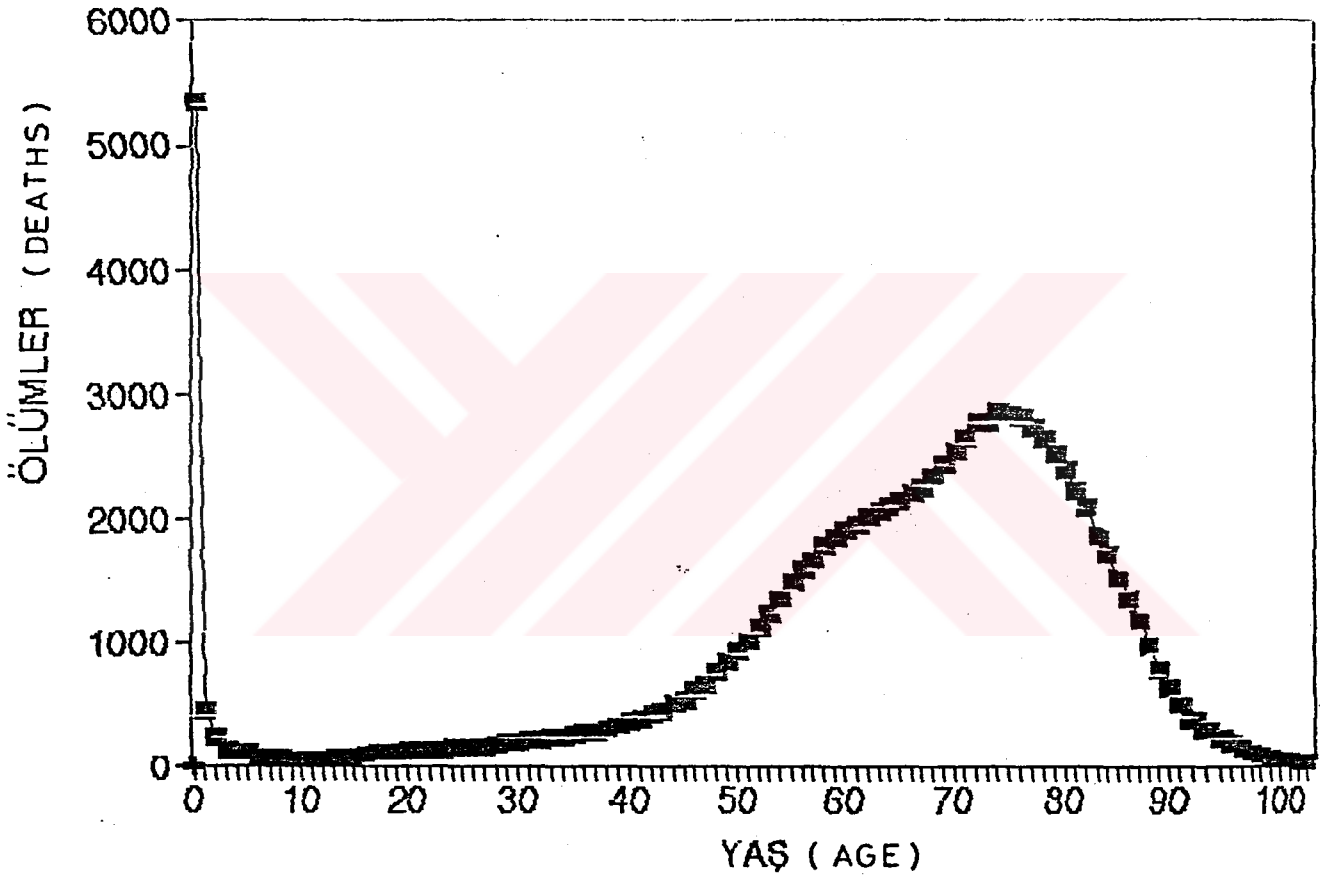
YASLAR	$l(x)$	$d(x)$	$q(x)$	$p(x)$	$L(x)$	$T(x)$	$e_x^o$
0	100000	5345	0.05345	0.94655	96258.5	6307687.	63.076
1	94655	470	0.004965	0.995034	94363.6	6211429.	65.621
2	94185	246	0.002611	0.997388	94044.78	6117065.	64.947
3	93939	157	0.001671	0.998328	93854.22	6023020.	64.116
4	93782	127	0.001354	0.998645	93715.96	5929166.	63.222
5	93655	112	0.001195	0.998804	93599	5835450.	62.307
6	93543	92	0.000983	0.999016	93497	5741851.	61.381
7	93451	88	0.000941	0.999058	93407	5648354.	60.441
8	93363	77	0.000824	0.999175	93324.5	5554947.	59.498
9	93286	71	0.000761	0.999238	93250.5	5461623	58.547
10	93215	67	0.000718	0.999281	93181.5	5368372.	57.591
11	93148	67	0.000719	0.999280	93114.5	5275191	56.632
12	93081	69	0.000741	0.999258	93046.5	5182076.	55.672
13	93012	75	0.000806	0.999193	92974.5	5089030	54.713
14	92937	81	0.000871	0.999128	92896.5	4996055.	53.757
15	92856	90	0.000969	0.999030	92811	4903159	52.803
16	92766	102	0.001099	0.998900	92715	4810348	51.854
17	92664	111	0.001197	0.998802	92608.5	4717633	50.911
18	92553	125	0.001350	0.998649	92490.5	4625024.	49.971
19	92428	132	0.001428	0.998571	92362	4532534	49.038
20	92296	138	0.001495	0.998504	92227	4440172	48.107
21	92158	142	0.001540	0.998459	92087	4347945	47.179
22	92016	148	0.001608	0.998391	91942	4255858	46.251
23	91868	152	0.001654	0.998345	91792	4163916	45.324
24	91716	160	0.001744	0.998255	91636	4072124	44.399
25	91556	165	0.001802	0.998197	91473.5	3980488	43.475
26	91391	172	0.001882	0.998117	91305	3889014.	42.553
27	91219	176	0.001929	0.998070	91131	3797709.	41.632
28	91043	189	0.002075	0.997924	90948.5	3706578.	40.712
29	90854	196	0.002157	0.997842	90756	3615630	39.796
30	90658	210	0.002316	0.997683	90553	3524874	38.881
31	90448	220	0.002432	0.997567	90338	3434321	37.970
32	90228	234	0.002593	0.997406	90111	3343983	37.061
33	89994	251	0.002789	0.997210	89868.5	3253872	36.156
34	89743	264	0.002941	0.997058	89611	3164003.	35.256
35	89479	274	0.003062	0.996937	89342	3074392.	34.358
36	89205	291	0.003262	0.996737	89059.5	2985050.	33.462
37	88914	303	0.003407	0.996592	88762.5	2895991	32.570
38	88611	324	0.003656	0.996343	88449	2807228.	31.680
39	88287	346	0.003919	0.996080	88114	2718779.	30.794
40	87941	375	0.004264	0.995735	87753.5	2630665.	29.913
41	87566	402	0.004590	0.995409	87365	2542912	29.039
42	87164	435	0.004990	0.995009	86946.5	2455547	28.171
43	86729	474	0.005465	0.994534	86492	2368600.	27.310
44	86255	513	0.005947	0.994052	85998.5	2282108.	26.457
45	85742	554	0.006461	0.993538	85465	2196110	25.613
46	85188	622	0.007301	0.992698	84877	2110645	24.776
47	84566	679	0.008029	0.991970	84226.5	2025768	23.954
48	83887	772	0.009202	0.990797	83501	1941541.	23.144
49	83115	855	0.010286	0.989713	82687.5	1858040.	22.355

50	82260	954	0.011597	0.988402	81783	1775353	21.582
51	81306	1034	0.012717	0.987282	80789	1693570	20.829
52	80272	1145	0.014264	0.985735	79699.5	1612781	20.091
53	79127	1253	0.015835	0.984164	78500.5	1533081.	19.374
54	77874	1378	0.017695	0.982304	77185	1454581	18.678
55	76496	1489	0.019465	0.980534	75751.5	1377396	18.006
56	75007	1602	0.021358	0.978641	74206	1301644.	17.353
57	73405	1677	0.022845	0.977154	72566.5	1227438.	16.721
58	71728	1795	0.025025	0.974974	70830.5	1154872	16.100
59	69933	1850	0.026453	0.973546	69008	1084041.	15.501
60	68083	1914	0.028112	0.971887	67126	1015033.	14.908
61	66169	1962	0.029651	0.970348	65188	947907.5	14.325
62	64207	2022	0.031491	0.968508	63196	882719.5	13.748
63	62185	2065	0.033207	0.966792	61152.5	819523.5	13.178
64	60120	2107	0.035046	0.964953	59066.5	758371	12.614
65	58013	2145	0.036974	0.963025	56940.5	699304.5	12.054
66	55868	2208	0.039521	0.960478	54764	642364	11.497
67	53660	2255	0.042023	0.957976	52532.5	587600	10.950
68	51405	2356	0.045832	0.954167	50227	535067.5	10.408
69	49049	2450	0.049950	0.950049	47824	484840.5	9.8848
70	46599	2565	0.055044	0.944955	45316.5	437016.5	9.3782
71	44034	2657	0.060339	0.939660	42705.5	391700	8.8953
72	41377	2790	0.067428	0.932571	39982	348994.5	8.4345
73	38587	2793	0.072381	0.927618	37190.5	309012.5	8.0082
74	35794	2875	0.080320	0.919679	34356.5	271822	7.5940
75	32919	2850	0.086576	0.913423	31494	237465.5	7.2136
76	30069	2842	0.094515	0.905484	28648	205971.5	6.8499
77	27227	2753	0.101112	0.898887	25850.5	177323.5	6.5127
78	24474	2672	0.109177	0.890822	23138	151473	6.1891
79	21802	2524	0.115769	0.884230	20540	128335	5.8863
80	19278	2413	0.125168	0.874831	18071.5	107795	5.5916
81	16865	2238	0.132700	0.867299	15746	89723.5	5.3201
82	14627	2112	0.144390	0.855609	13571	73977.5	5.0575
83	12515	1878	0.150059	0.849940	11576	60406.5	4.8267
84	10637	1726	0.162263	0.837736	9774	48830.5	4.5906
85	8911	1549	0.173830	0.826169	8136.5	39056.5	4.3829
86	7362	1380	0.187449	0.812550	6672	30920	4.1999
87	5982	1194	0.199598	0.800401	5385	24248	4.0534
88	4788	993	0.207393	0.792606	4291.5	18863	3.9396
89	3795	807	0.212648	0.787351	3391.5	14571.5	3.8396
90	2988	646	0.216198	0.783801	2665	11180	3.7416
91	2342	517	0.220751	0.779248	2083.5	8515	3.6357
92	1825	413	0.226301	0.773698	1618.5	6431.5	3.5241
93	1412	311	0.220254	0.779745	1256.5	4813	3.4086
94	1101	251	0.227974	0.772025	975.5	3556.5	3.2302
95	850	206	0.242352	0.757647	747	2581	3.0364
96	644	160	0.248447	0.751552	564	1834	2.8478
97	484	121	0.25	0.75	423.5	1270	2.6239
98	363	101	0.278236	0.721763	312.5	846.5	2.3319
99	262	79	0.301526	0.698473	222.5	534	2.0381
100	183	63	0.344262	0.655737	151.5	311.5	1.7021
101	120	50	0.416666	0.583333	95	160	1.3333
102	70	40	0.571428	0.428571	50	65	0.9285
103	30	30	1	0	15	15	0.5



GRAFİK 2 : TURK MORTALİTE GRAFİĞİ  
1980 - 1990 ERKEK

GRAPH 2 : GRAPH OF TURK MORTALITY  
1980 - 1990 MEN'S



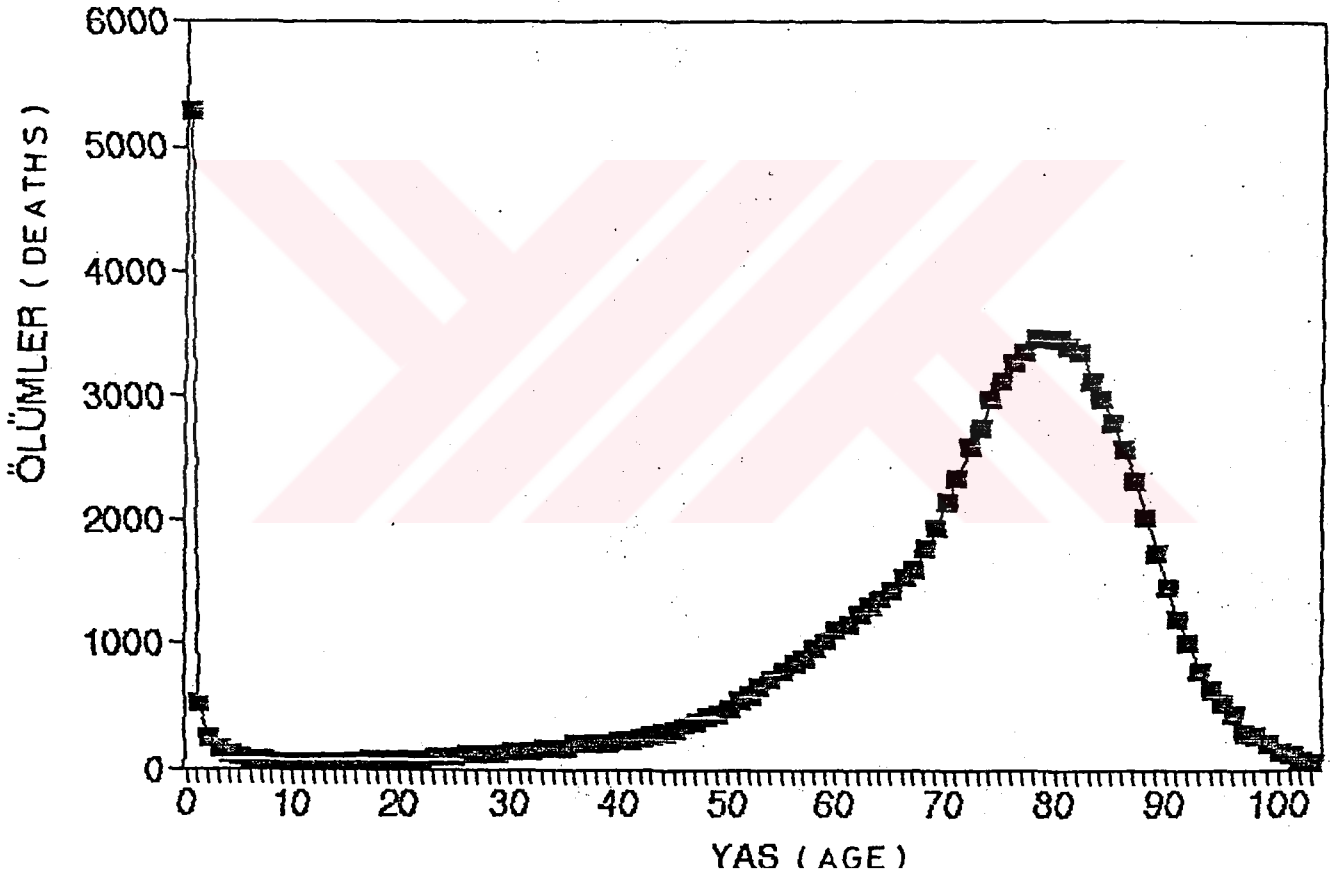
TABLO 13 : TÜRK MORTALİTE TABLOSU 1980-1990 (KADIN)  
 TABLE 13 : MORTALITY TABLE OF TURKEY 1980-1990 (WOMEN'S)

AS	l(x)	d(x)	q(x)	p(x)	L(x)	T(x)	e <sub>x</sub>
0	100000	5280	0.0528	0.9472	96304	6870886.1	68.708
1	94720	518	0.00547	0.99453	94398.84	6774582.1	71.522
2	94202	265	0.00281	0.99719	94050.95	6680183.3	70.913
3	93937	167	0.00178	0.99822	93846.28	6586132.4	70.112
4	93769	119	0.00127	0.99873	93707.12	6492286.1	69.237
5	93650	100	0.00106	0.99894	93600	6398579	68.324
6	93550	84	0.00089	0.99911	93508.5	6304979	67.396
7	93467	80	0.00086	0.99914	93427	6211470.5	66.456
8	93387	68	0.00073	0.99927	93352.5	6118043.5	65.512
9	93318	61	0.00066	0.99934	93287.5	6024691	64.560
10	93257	57	0.00061	0.99939	93229	5931403.5	63.602
11	93201	55	0.00059	0.99941	93173.5	5838174.5	62.640
12	93146	55	0.00059	0.99941	93118.5	5745001	61.677
13	93091	58	0.00063	0.99937	93061.5	5651882.5	60.713
14	93032	63	0.00067	0.99933	92851	5558821	59.751
15	92670	66	0.00071	0.99929	92787	5465970	58.983
16	92904	72	0.00078	0.99922	92868	5373183	57.835
17	92832	76	0.00082	0.99918	92793.5	5280315	56.880
18	92755	84	0.0009	0.9991	92713	5187521.5	55.927
19	92671	85	0.00092	0.99908	92628.5	5094808.5	54.977
20	92586	90	0.00097	0.99903	92541	5002180	54.027
21	92496	91	0.00098	0.99902	92450.5	4909639	53.079
22	92405	95	0.00103	0.99897	92357.5	4817188.5	52.131
23	92310	99	0.00108	0.99892	92260.5	4724831	51.184
24	92211	106	0.00115	0.99885	92158	4632570.5	50.238
25	92105	109	0.00118	0.99882	92050.5	4540412.5	49.296
26	91996	116	0.00126	0.99874	91938.5	4448362	48.353
27	91881	117	0.00128	0.99872	91822.5	4356423.5	47.413
28	91764	128	0.00139	0.99861	91700	4264601	46.473
29	91636	132	0.00145	0.99855	91569.5	4172901	45.537
30	91503	141	0.00154	0.99846	91432.5	4081331.5	44.603
31	91362	146	0.0016	0.9984	91289	3989899	43.671
32	91216	156	0.00171	0.99829	91138	3898610	42.740
33	91060	167	0.00184	0.99816	90976	3807472	41.812
34	90892	176	0.00194	0.99806	90804	3716496	40.889
35	90716	182	0.00201	0.99799	90625	3625692	39.967
36	90534	195	0.00215	0.99785	90436.5	3535067	39.046
37	90339	198	0.00219	0.99781	90240	3444630.5	38.130
38	90141	208	0.00231	0.99769	90037	3354390.5	37.212
39	89933	216	0.0024	0.9976	89825	3264353.5	36.297
40	89717	227	0.00253	0.99747	89603.5	3174528.5	35.383
41	89490	236	0.00264	0.99736	89372	3084925	34.472
42	89254	252	0.00283	0.99717	89127.5	2995553	33.562
43	89001	271	0.00305	0.99695	88865.5	2906425.5	32.656
44	88730	294	0.00331	0.99669	88583	2817560	31.754
45	88436	314	0.00355	0.99645	88279.5	2728977	30.858
46	88123	341	0.00387	0.99613	87952.5	2640697.5	29.966
47	87782	366	0.00417	0.99583	87599	2552745	29.080
48	87416	419	0.0048	0.9952	87206	2465146	28.200
49	86996	450	0.00517	0.99483	86771	2377940	27.333

50	86546	495	0.00572	0.99428	86298.5	2291169	26.473
51	86051	536	0.00623	0.99377	85783	2204870.5	25.622
52	85515	592	0.00692	0.99308	85219.5	2119087.5	24.780
53	84924	646	0.0076	0.9924	84601	2033868	23.949
54	84278	712	0.00845	0.99155	83922	1949267	23.129
55	83566	767	0.00917	0.99083	83182.5	1865345	22.321
56	82799	837	0.01011	0.98989	82380.5	1782162.5	21.523
57	81962	885	0.0108	0.9892	81519.5	1699782	20.738
58	81077	982	0.01211	0.98789	80586	1618262.5	19.959
59	80095	1037	0.01295	0.98705	79576.5	1537676.5	19.198
60	79058	1112	0.01407	0.98593	78501.5	1458100	18.443
61	77945	1165	0.01495	0.98505	77362.5	1379598.5	17.699
62	76780	1241	0.01616	0.98384	76159.5	1302236	16.960
63	75539	1314	0.0174	0.9826	74882	1226076.5	16.231
64	74225	1378	0.01856	0.98144	73536	1151194.5	15.509
65	72847	1443	0.01981	0.98019	72125.5	1077658.5	14.793
66	71404	1535	0.0215	0.9785	70636.5	1005533	14.082
67	69869	1614	0.0231	0.9769	69062	934896.5	13.380
68	68255	1781	0.02609	0.97391	67364.5	865834.5	12.685
69	66474	1942	0.02922	0.97078	65502.5	798470	12.011
70	64531	2145	0.03323	0.96677	63459	732967.5	11.358
71	62387	2349	0.03765	0.96235	61212	669508.5	10.731
72	60037	2601	0.04332	0.95668	58737	608296.5	10.132
73	57437	2750	0.04787	0.95213	56062	549559.5	9.5680
74	54687	2986	0.0546	0.9454	53194	493497.5	9.0240
75	51701	3124	0.06043	0.93957	50139	440303.5	8.5163
76	48577	3279	0.0675	0.9325	46937	390164.5	8.0318
77	45297	3355	0.07407	0.92593	43620	343227.5	7.5772
78	41943	3471	0.08275	0.91725	40207.5	299607.5	7.1432
79	38472	3465	0.09008	0.90992	36739	259400	6.7425
80	35006	3478	0.09934	0.90066	33267.5	222661	6.3606
81	31529	3405	0.10798	0.89202	29826.5	189393.5	6.0069
82	28124	3359	0.11943	0.88057	26444.5	159567	5.6736
83	24765	3124	0.12615	0.87385	23203	133122.5	5.3754
84	21641	2985	0.13793	0.86207	20148.5	109919.5	5.0792
85	18656	2792	0.14965	0.85035	17260	89771	4.8119
86	15864	2579	0.1626	0.8374	14574.5	72511	4.5707
87	13285	2319	0.17457	0.82543	12125.5	57936.5	4.3610
88	10966	2023	0.18445	0.81555	9954.5	45811	4.1775
89	8943	1719	0.19224	0.80776	8083.5	35856.5	4.0094
90	7224	1449	0.20062	0.79938	6499.5	27773	3.8445
91	5775	1205	0.20868	0.79132	5172.5	21273.5	3.6837
92	4570	1001	0.21911	0.78089	4069	16101	3.5231
93	3568	775	0.21713	0.78287	3181	12032	3.3721
94	2794	645	0.23093	0.76907	2471	8851	3.1678
95	2148	524	0.24412	0.75588	1886	6380	2.9702
96	1624	428	0.26362	0.73638	1410	4494	2.7672
97	1196	290	0.24232	0.75768	1051	3084	2.5785
98	906	268	0.29555	0.70445	772	2033	2.2439
99	638	203	0.31867	0.68133	536.5	1261	1.9764
100	435	156	0.35869	0.64131	357	724.5	1.6655
101	279	119	0.42525	0.57475	219.5	367.5	1.3172
102	160	92	0.57392	0.42608	114	148	0.925
103	68	68	1	0	34	34	0.5

GRAFİK 3 : TURK MORTALITE GRAFIGI  
1980 - 1990 KADIN

GRAPH 3 : GRAPH OF TURK MORTALITY  
1980 - 1990 WOMEN'S



TABLO 14 : DÜZELTİLMİŞ TÜRK MORTALİTE TABLOSU 1980-1990 (GENEL)  
 TABLE 14: CORRECTION MORTALITY TABLE OF TURKEY 1980-1990 (GENERAL)

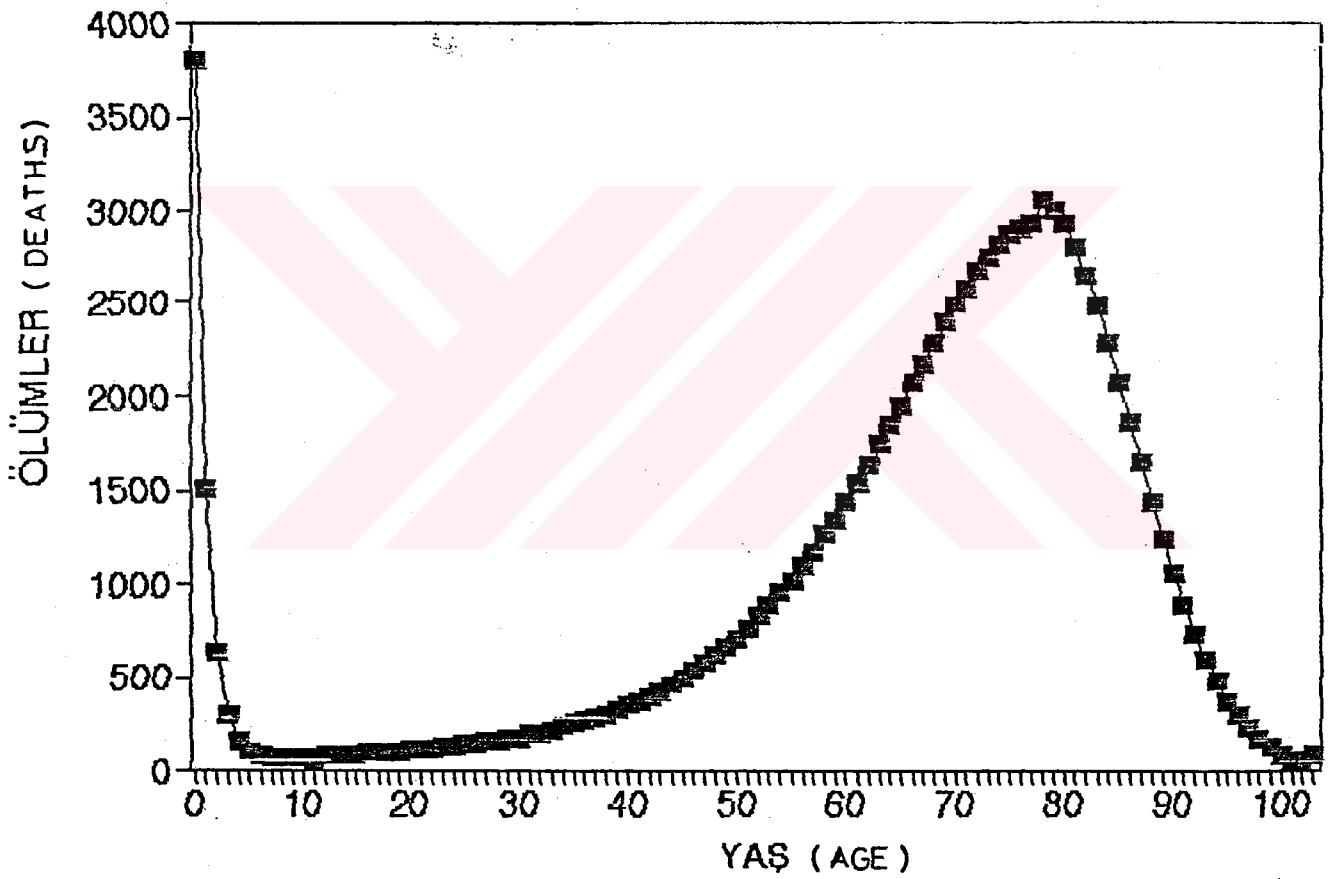
YAŞ	$l(x)$	$d(x)$	$q(x)$	$p(x)$	$L(x)$	$T(x)$	$e^{\circ}_x$
0	100000	3801.789	0.038017	0.961982	97338.74	6568613.	65.686
1	96198.21	1509.699	0.015693	0.984306	95262.19	6471274.	67.270
2	94688.51	632.5551	0.006680	0.993319	94327.95	6376012.	67.336
3	94055.95	289.3419	0.003076	0.996923	93899.71	6281684.	66.786
4	93766.61	153.8361	0.001640	0.998359	93686.61	6187784.	65.991
5	93612.77	100.1309	0.001069	0.998930	93562.71	6094098.	65.099
6	93512.64	78.79963	0.000842	0.999157	93473.24	6000535.	64.168
7	93433.84	70.30600	0.000752	0.999247	93398.69	5907062.	63.221
8	93363.54	66.90701	0.000716	0.999283	93330.08	5813663.	62.269
9	93296.63	65.53048	0.000702	0.999297	93263.86	5720333.	61.313
10	93231.10	64.95694	0.000696	0.999303	93198.62	5627069.	60.356
11	93166.14	64.70454	0.000694	0.999305	93133.79	5533871.	59.397
12	93101.44	61.33394	0.000673	0.999126	93060.77	5440737.	58.438
13	93020.10	63.66277	0.000899	0.999100	92978.27	5347676.	57.489
14	92936.44	66.20553	0.000927	0.999072	92893.34	5254698.	56.540
15	92850.24	68.98143	0.000958	0.999041	92805.74	5161804.	55.592
16	92761.25	92.01138	0.000991	0.999008	92715.25	5068999.	54.645
17	92669.24	95.31814	0.001028	0.998971	92621.58	4976283.	53.699
18	92573.92	98.92644	0.001068	0.998931	92524.46	4883662.	52.754
19	92475.00	102.8631	0.001112	0.998887	92423.57	4791137.	51.810
20	92372.13	107.1576	0.001160	0.998839	92318.56	4698714.	50.867
21	92264.98	111.8415	0.001212	0.998787	92209.06	4606395.	49.925
22	92153.14	116.9493	0.001269	0.998730	92094.66	4514186.	48.985
23	92036.19	122.5186	0.001331	0.998668	91974.93	4422091.	48.047
24	91913.67	128.5899	0.001399	0.998600	91849.37	4330117.	47.110
25	91785.08	135.2074	0.001473	0.998526	91717.47	4238267.	46.175
26	91649.87	142.4187	0.001553	0.998446	91578.66	4146550.	45.243
27	91507.45	150.2757	0.001642	0.998357	91432.31	4054971.	44.313
28	91357.18	158.8344	0.001738	0.998261	91277.76	3963539.	43.385
29	91198.34	168.1551	0.001843	0.998156	91114.26	3872261.	42.459
30	91030.19	178.3035	0.001958	0.998041	90941.03	3781147.	41.537
31	90851.88	189.3500	0.002084	0.997915	90757.21	3690206.	40.617
32	90662.53	201.3709	0.002221	0.997778	90561.85	3599448.	39.701
33	90461.16	214.4481	0.002370	0.997629	90353.94	3508887.	38.788
34	90246.71	228.6698	0.002533	0.997466	90132.38	3418533.	37.879
35	90018.04	244.1306	0.002712	0.997287	89895.98	3328400.	36.974
36	89773.91	260.9320	0.002906	0.997093	89643.45	3238504.	36.074
37	89512.98	279.1828	0.003118	0.996881	89373.39	3148861.	35.177
38	89233.80	298.9988	0.003350	0.996649	89084.30	3059487.	34.286
39	88934.80	320.5036	0.003603	0.996396	88774.55	2970403.	33.399
40	88614.30	343.8285	0.003880	0.996119	88442.38	2881629.	32.518
41	88270.47	369.1127	0.004181	0.995816	88085.91	2793186.	31.643
42	87901.35	396.5030	0.004510	0.995489	87703.10	2705100.	30.774
43	87504.85	426.1539	0.004870	0.995129	87291.77	2617397.	29.911
44	87078.70	458.2271	0.005262	0.994737	86849.58	2530105.	29.055
45	86620.47	492.8912	0.005690	0.994309	86374.02	2443256.	28.206
46	86127.58	530.3207	0.006157	0.993842	85862.42	2356882.	27.365
47	85597.26	570.6950	0.006667	0.993332	85311.91	2271019.	26.531
48	85026.56	614.1972	0.007223	0.992776	84719.46	2185707.	25.706
49	84412.37	661.0119	0.007830	0.992169	84081.86	2100988.	24.889



50	83751.35	711.3234	0.008493	0.991506	83395.69	2016906.	24.082
51	83040.03	765.3124	0.009216	0.990783	82657.37	1933510.	23.284
52	82274.72	823.1528	0.010004	0.989995	81863.14	1850853.	22.496
53	81451.57	885.0073	0.010865	0.989134	81009.06	1768990.	21.718
54	80566.56	951.0223	0.011804	0.988195	80091.05	1687981.	20.951
55	79615.54	1021.321	0.012828	0.987171	79104.87	1607890.	20.195
56	78594.21	1096.000	0.013945	0.986054	78046.21	1528785.	19.451
57	77498.21	1175.116	0.015163	0.984836	76910.65	1450739.	18.719
58	76323.10	1258.678	0.016491	0.983508	75693.76	1373828.	18.000
59	75064.42	1346.639	0.017939	0.982060	74391.10	1298134.	17.293
60	73717.78	1438.881	0.019518	0.980481	72998.34	1223743.	16.600
61	72278.90	1535.202	0.021239	0.978760	71511.30	1150745.	15.920
62	70743.69	1635.306	0.023115	0.976884	69926.04	1079233.	15.255
63	69108.39	1738.777	0.025160	0.974839	68239.00	1009307.	14.604
64	67369.61	1845.076	0.027387	0.972612	66447.07	941068.8	13.968
65	65524.53	1953.512	0.029813	0.970186	64547.78	874621.8	13.348
66	63571.02	2063.233	0.032455	0.967544	62539.41	810074.0	12.742
67	61507.79	2173.210	0.035332	0.964667	60421.18	747534.6	12.153
68	59334.58	2282.222	0.038463	0.961536	58193.47	687113.4	11.580
69	57052.36	2388.844	0.041871	0.958128	55857.93	628919.9	11.023
70	54663.51	2491.450	0.045577	0.954422	53417.79	573062.0	10.483
71	52172.06	2588.206	0.049609	0.950390	50877.96	519644.2	9.9602
72	49583.85	2677.091	0.053991	0.946008	48245.31	468766.2	9.4540
73	46906.76	2755.912	0.058752	0.941247	45528.81	420520.9	8.9650
74	44150.85	2822.343	0.063925	0.936074	42739.68	374992.1	8.4934
75	41328.50	2873.980	0.069539	0.930460	39891.51	332252.4	8.0393
76	38454.52	2908.405	0.075632	0.924367	37000.32	292360.9	7.6027
77	35546.12	2923.284	0.082239	0.917760	34084.48	255360.6	7.1839
78	32622.83	3050.958	0.093522	0.906477	31097.36	221276.1	6.7828
79	29571.88	3007.611	0.101705	0.898294	28068.07	190178.7	6.4310
80	26564.26	2923.708	0.110061	0.889938	25102.41	162110.6	6.1025
81	23640.56	2803.608	0.118593	0.881406	22238.75	137008.2	5.7954
82	20836.95	2652.557	0.127300	0.872699	19510.67	114769.5	5.5079
83	18184.39	2476.443	0.136185	0.863814	16946.17	95258.85	5.2384
84	15707.95	2281.538	0.145247	0.854752	14567.18	78312.68	4.9855
85	13426.41	2074.219	0.154487	0.845512	12389.30	63745.49	4.7477
86	11352.19	1860.708	0.163907	0.836092	10421.83	51356.19	4.5239
87	9491.485	1646.828	0.173505	0.826494	8668.071	40934.35	4.3127
88	7844.656	1437.794	0.183283	0.816716	7125.759	32266.28	4.1131
89	6406.862	1238.059	0.193239	0.806760	5787.832	25140.52	3.9239
90	5168.802	1051.200	0.203374	0.796625	4643.202	19352.69	3.7441
91	4117.602	879.8745	0.213686	0.786313	3677.664	14709.49	3.5723
92	3237.727	725.8167	0.224174	0.775825	2874.619	11031.82	3.4072
93	2511.910	589.8934	0.234838	0.765161	2216.964	8157.006	3.2473
94	1922.017	472.1934	0.245675	0.754324	1685.920	5940.041	3.0905
95	1449.823	372.1481	0.256685	0.743314	1263.749	4254.121	2.9342
96	1077.675	288.6701	0.267863	0.732136	933.3407	2990.371	2.7748
97	789.0056	220.2975	0.279209	0.720790	678.8569	2057.030	2.6071
98	568.7081	165.3339	0.290718	0.709281	486.0412	1378.173	2.4233
99	403.3742	121.9756	0.302388	0.697611	342.3864	892.1326	2.2116
100	281.3965	88.41971	0.314215	0.685784	237.1887	549.7462	1.9536
101	192.9788	62.94873	0.326194	0.673805	161.5044	312.5575	1.6196
102	130.0301	43.99219	0.338323	0.661676	108.0340	151.0530	1.1616
103	86.03793	86.03793	1	0	43.01896	43.01896	0.5

GRAFİK 4 : DÜZELTİLMİŞ TÜRK MORTALİTE GRAFİĞİ  
1980 - 1990 GENEL

GRAPH 4 : GRAPH OF CORRECTION TÜRK MORTALITY  
1980 - 1990 GENERAL



TABLO 15 : DÜZELTİLMİŞ TÜRK MORTALİTE TABLOSU 1980-1990 (ERKEK)  
 TABLE 15 : CORECTION MORTALITY TABLE OF TURKEY 1980-1990 (MEN'S)

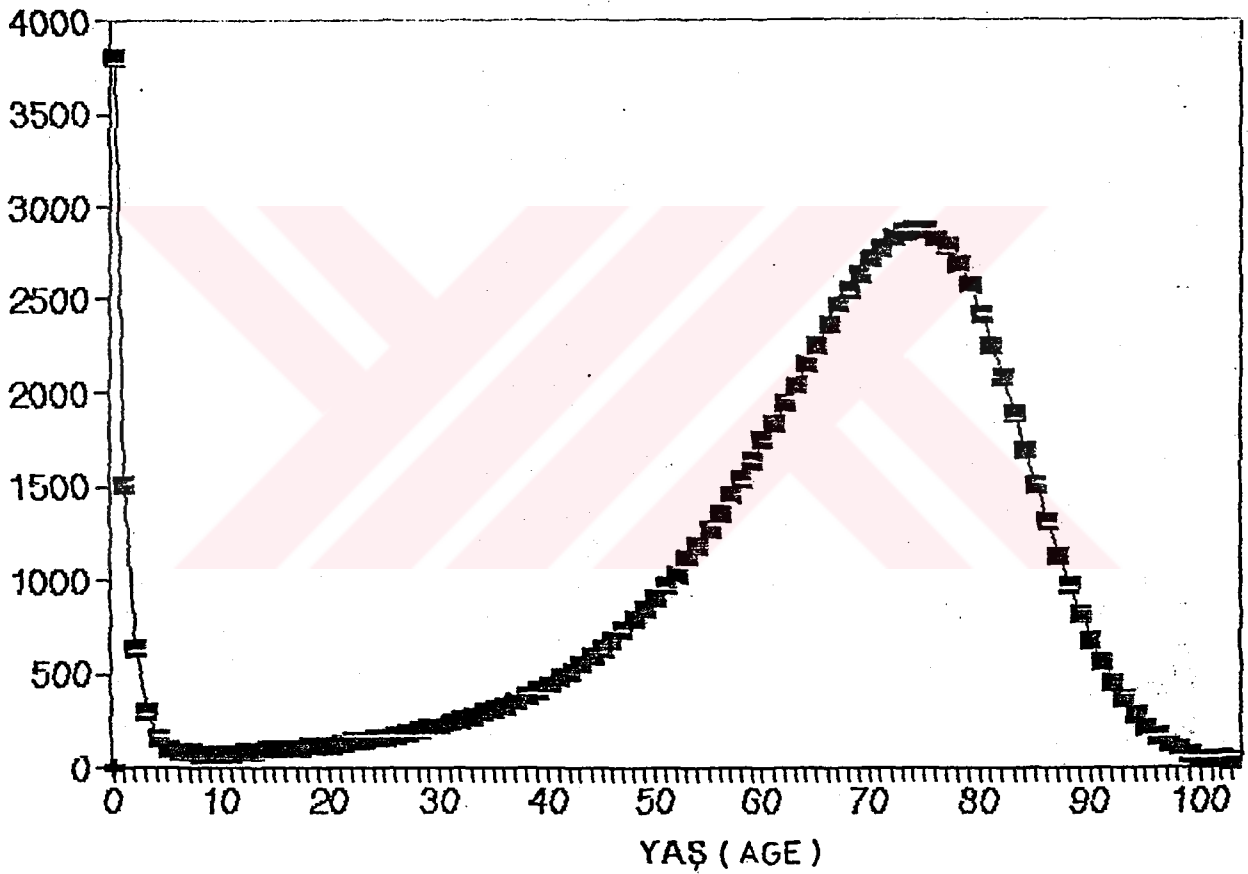
YAS	$l(x)$	$d(x)$	$q(x)$	$p(x)$	$L(x)$	$T(x)$	$e_x^o$
0	100000	3799.069	0.037990	0.962009	97340.65	6315155.	63.151
1	96200.93	1501.923	0.015612	0.984387	95269.73	6217814.	64.633
2	94699.00	628.3666	0.006635	0.993364	94340.83	6122545.	64.652
3	94070.64	288.7106	0.003069	0.996930	93914.73	6028204.	64.081
4	93781.93	155.4607	0.001657	0.998342	93701.09	5934289.	63.277
5	93626.46	102.9848	0.001099	0.998900	93574.97	5840588.	62.381
6	93523.48	82.27205	0.000879	0.999120	93482.34	5747013.	61.449
7	93441.21	74.07352	0.000792	0.999207	93404.17	5653531.	60.503
8	93367.13	70.80918	0.000758	0.999241	93331.73	5560126.	59.551
9	93296.32	69.49093	0.000744	0.999255	93261.58	5466795.	58.596
10	93226.83	68.94033	0.000739	0.999260	93192.36	5373533.	57.639
11	93157.89	68.69256	0.000737	0.999262	93123.65	5280341.	56.681
12	93089.41	84.35467	0.000906	0.999093	93047.23	5187217.	55.722
13	93005.05	87.68147	0.000942	0.999057	92961.21	5094170.	54.773
14	92917.37	91.30282	0.000982	0.999017	92871.72	5001209.	53.824
15	92826.07	95.24431	0.001026	0.998973	92778.45	4908337.	52.876
16	92730.82	99.53368	0.001073	0.998926	92681.06	4815558.	51.930
17	92631.29	104.2010	0.001124	0.998875	92579.19	4722877.	50.985
18	92527.09	109.2788	0.001181	0.998818	92472.45	4630298.	50.042
19	92417.81	114.8025	0.001242	0.998757	92360.41	4537826.	49.101
20	92303.01	120.8102	0.001308	0.998691	92242.60	4445465.	48.161
21	92182.20	127.3434	0.001381	0.998618	92118.53	4353223.	47.224
22	92054.85	134.4466	0.001460	0.998539	91987.63	4261104.	46.288
23	91920.41	142.1683	0.001546	0.998453	91849.32	4169116.	45.355
24	91778.24	150.5607	0.001640	0.998359	91702.96	4077267.	44.425
25	91627.68	159.6799	0.001742	0.998257	91547.84	3985564.	43.497
26	91468.00	169.5869	0.001854	0.998145	91383.21	3894016.	42.572
27	91298.41	180.3468	0.001975	0.998024	91208.24	3802633.	41.650
28	91118.07	192.0302	0.002107	0.997892	91022.05	3711425.	40.732
29	90926.04	204.7127	0.002251	0.997748	90823.68	3620403.	39.817
30	90721.32	218.4753	0.002408	0.997591	90612.08	3529579.	38.905
31	90502.85	233.4052	0.002578	0.997421	90386.14	3438967.	37.998
32	90269.44	249.5953	0.002765	0.997234	90144.64	3348581.	37.095
33	90019.85	267.1452	0.002967	0.997032	89886.27	3258436.	36.196
34	89752.70	286.1608	0.003188	0.996811	89609.62	3168550.	35.303
35	89466.54	306.7549	0.003428	0.996571	89313.16	3078940.	34.414
36	89159.79	329.0471	0.003690	0.996309	88995.26	2989627.	33.531
37	88830.74	353.1641	0.003975	0.996024	88654.16	2900632.	32.653
38	88477.57	379.2393	0.004286	0.995713	88287.95	2811978.	31.781
39	88098.33	407.4130	0.004624	0.995375	87894.63	2723690.	30.916
40	87690.92	437.8321	0.004992	0.995007	87472.01	2635795.	30.057
41	87253.09	470.6495	0.005394	0.994605	87017.76	2548323.	29.206
42	86782.44	506.0236	0.005830	0.994169	86529.43	2461305.	28.361
43	86276.42	544.1175	0.006306	0.993693	86004.36	2374776.	27.525
44	85732.30	585.0976	0.006824	0.993175	85439.75	2288772.	26.696
45	85147.20	629.1324	0.007388	0.992611	84832.63	2203332.	25.876
46	84518.07	676.3905	0.008002	0.991997	84179.87	2118499.	25.065
47	83841.68	727.0382	0.008671	0.991328	83478.16	2034319.	24.263
48	83114.64	781.2369	0.009399	0.990600	82724.02	1950841.	23.471
49	82333.40	839.1392	0.010191	0.989808	81913.83	1868117.	22.689



50	81494.26	900.8852	0.011054	0.988945	81043.82	1786203.	21.918
51	80593.38	966.5974	0.011993	0.988006	80110.08	1705159.	21.157
52	79626.78	1036.374	0.013015	0.986984	79108.59	1625049.	20.408
53	78590.41	1110.286	0.014127	0.985872	78035.26	1545941.	19.670
54	77480.12	1188.363	0.015337	0.984662	76885.94	1467905.	18.945
55	76291.76	1270.591	0.016654	0.983345	75656.46	1391020.	18.232
56	75021.16	1356.897	0.018086	0.981913	74342.72	1315363.	17.533
57	73664.27	1447.142	0.019645	0.980354	72940.70	1241020.	16.846
58	72217.12	1541.108	0.021339	0.978660	71446.57	1168080.	16.174
59	70676.02	1638.483	0.023183	0.976816	69856.77	1096633.	15.516
60	69037.53	1738.849	0.025187	0.974812	68168.11	1026776.	14.872
61	67298.68	1841.668	0.027365	0.972634	66377.85	958608.7	14.244
62	65457.01	1946.266	0.029733	0.970266	64483.88	892230.8	13.630
63	63510.75	2051.820	0.032306	0.967693	62484.84	827746.9	13.033
64	61458.93	2157.345	0.035102	0.964897	60380.25	765262.1	12.451
65	59301.58	2261.683	0.038138	0.961861	58170.74	704881.8	11.886
66	57039.90	2363.495	0.041435	0.958564	55858.15	646711.1	11.337
67	54676.40	2461.262	0.045015	0.954984	53445.77	590852.9	10.806
68	52215.14	2553.282	0.048899	0.951100	50938.50	537407.1	10.292
69	49661.86	2637.686	0.053112	0.946887	48343.01	486468.6	9.7956
70	47024.17	2712.459	0.057682	0.942317	45667.94	438125.6	9.3170
71	44311.71	2775.472	0.062635	0.937364	42923.98	392457.7	8.8567
72	41536.24	2824.529	0.068001	0.931998	40123.97	349533.7	8.4151
73	38711.71	2857.427	0.073812	0.926187	37283.00	309409.7	7.9926
74	35854.28	2872.036	0.080103	0.919896	34418.26	272126.7	7.5897
75	32982.25	2866.390	0.086907	0.913092	31549.05	237708.4	7.2071
76	30115.86	2838.795	0.094262	0.905737	28696.46	206159.4	6.8455
77	27277.06	2787.945	0.102208	0.897791	25883.03	177462.9	6.5059
78	24489.00	2694.130	0.110013	0.889986	23141.93	151579.9	6.1897
79	21794.87	2573.810	0.118092	0.881907	20507.96	128437.9	5.8930
80	19221.05	2427.651	0.126301	0.873698	18007.23	107930.0	5.6151
81	16793.40	2261.088	0.134641	0.865358	15662.86	89922.79	5.3546
82	14532.31	2079.748	0.143111	0.856888	13492.44	74259.93	5.1099
83	12452.57	1889.217	0.151713	0.848286	11507.96	60767.48	4.8799
84	10563.35	1694.832	0.160444	0.839555	9715.936	49259.52	4.6632
85	8868.520	1501.495	0.169306	0.830693	8117.772	39543.58	4.4588
86	7367.025	1313.520	0.178297	0.821702	6710.264	31425.81	4.2657
87	6053.504	1134.532	0.187417	0.812582	5486.238	24715.54	4.0828
88	4918.971	967.3935	0.196665	0.803334	4435.275	19229.31	3.9092
89	3951.578	814.1889	0.206041	0.793958	3544.463	14794.03	3.7438
90	3137.389	676.2434	0.215543	0.784456	2799.267	11249.55	3.5856
91	2461.145	554.1768	0.225170	0.774829	2184.057	8450.285	3.4334
92	1906.968	447.9866	0.234920	0.765079	1662.975	6266.227	3.2859
93	1458.982	357.1491	0.244793	0.755206	1280.407	4583.252	3.1414
94	1101.833	280.7318	0.254786	0.745213	961.4672	3302.844	2.9975
95	821.1012	217.5075	0.264897	0.735102	712.3474	2341.377	2.8515
96	603.5937	166.0635	0.275124	0.724875	520.5619	1629.029	2.6988
97	437.5301	124.9000	0.285466	0.714533	375.0801	1108.467	2.5334
98	312.6300	92.51311	0.295918	0.704081	266.3735	733.3875	2.3458
99	220.1169	67.46147	0.306480	0.693519	186.3862	467.0140	2.1216
100	152.6555	48.41425	0.317147	0.682852	128.4483	280.6278	1.8383
101	104.2412	34.18244	0.327916	0.672083	87.15003	152.1794	1.4598
102	70.05881	40.05881	0.338785	0.661214	50.02940	65.02940	0.9282
103	30.00000	30	0.349749	0.650250	15.00000	15.00000	0.5000

GRAFİK 5 : DÜZELTİLMİŞ TÜRK MORTALİTE GRAFİĞİ  
1980 - 1990 ERKEK

GRAPH 5 : GRAPH OF CORRECTION TÜRK MORTALITY  
1980 - 1990 MEN'S



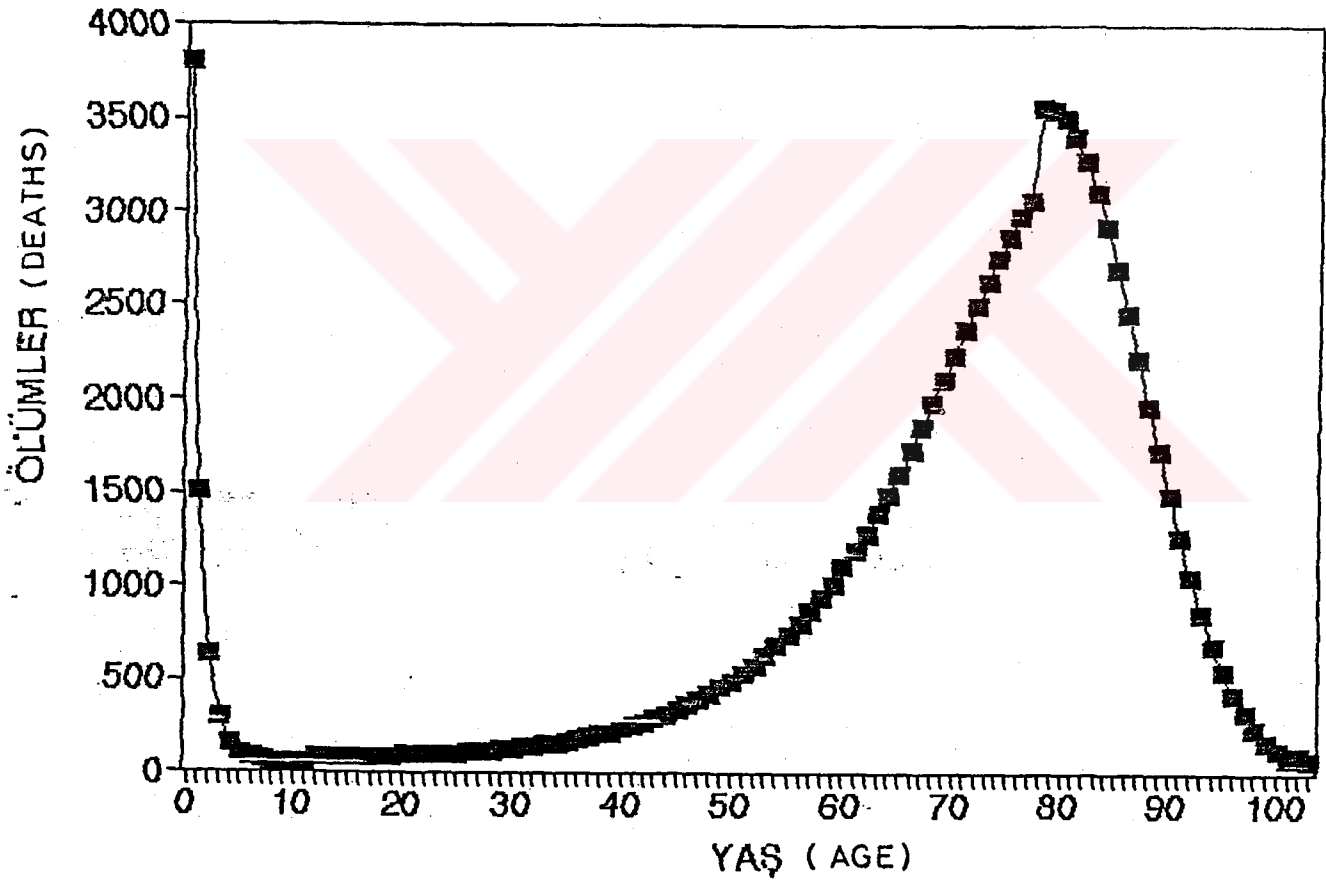
TABLO 16 : DÜZELTİLMİŞ TÜRK MORTALİTE TABLOSU 1980-1990 (KADIN)  
 TABLE 16 : CORRECTION MORTALITY TABLE OF TURKEY 1980-1990 (WOMEN'S)

YAS	$l(x)$	$d(x)$	$q(x)$	$p(x)$	$L(x)$	$T(x)$	$e^o_x$
0	100000.0	3808.548	0.038085	0.961914	97334.01	6861921.	68.619
1	96191.45	1507.849	0.015675	0.984324	95256.58	6764587.	70.324
2	94683.60	628.1347	0.006634	0.993365	94325.56	6669330.	70.438
3	94055.46	284.1747	0.003021	0.996978	93902.01	6575004.	69.905
4	93771.29	148.4757	0.001583	0.998416	93694.08	6481102.	69.116
5	93622.81	94.73646	0.001011	0.998988	93575.44	6387408.	68.224
6	93528.08	73.41104	0.000784	0.999215	93491.37	6293833.	67.293
7	93454.66	64.93002	0.000694	0.999305	93422.20	6200342.	66.345
8	93389.73	61.54271	0.000658	0.999341	93358.96	6106919.	65.391
9	93328.19	60.17605	0.000644	0.999355	93298.10	6013560.	64.434
10	93268.02	59.61109	0.000639	0.999360	93238.21	5920262.	63.475
11	93208.40	59.36422	0.000636	0.999363	93178.73	5827024.	62.516
12	93149.06	76.46653	0.000820	0.999179	93110.83	5733845.	61.555
13	93072.60	77.58494	0.000833	0.999166	93033.81	5640734.	60.605
14	92995.01	78.82125	0.000847	0.999152	92955.60	5547701.	59.655
15	92916.19	80.18734	0.000863	0.999136	92876.10	5454745.	58.706
16	92836.00	81.69630	0.000880	0.999119	92795.16	5361869.	57.756
17	92754.31	83.36254	0.000898	0.999101	92712.63	5269074.	56.806
18	92670.95	85.20188	0.000919	0.999080	92628.34	5176361.	55.857
19	92585.74	87.23176	0.000942	0.999057	92542.13	5083733.	54.908
20	92498.51	89.47131	0.000967	0.999032	92453.78	4991191.	53.959
21	92409.04	91.94159	0.000994	0.999005	92363.07	4898737.	53.011
22	92317.10	94.66574	0.001025	0.998974	92269.77	4806374.	52.063
23	92222.43	97.66919	0.001059	0.998940	92173.60	4714104.	51.116
24	92124.76	100.9798	0.001096	0.998903	92074.27	4621930.	50.170
25	92023.78	104.6284	0.001136	0.998863	91971.47	4529856.	49.224
26	91919.16	108.6486	0.001182	0.998817	91864.83	4437885.	48.280
27	91810.51	113.0774	0.001231	0.998768	91753.97	4346020.	47.336
28	91697.43	117.9553	0.001286	0.998713	91638.45	4254266.	46.394
29	91579.47	123.3268	0.001346	0.998653	91517.81	4162627.	45.453
30	91456.15	129.2407	0.001413	0.998586	91391.53	4071110.	44.514
31	91326.91	135.7504	0.001486	0.998513	91259.03	3979718.	43.576
32	91191.16	142.9143	0.001567	0.998432	91119.70	3888459.	42.640
33	91048.24	150.7966	0.001656	0.998343	90972.84	3797339.	41.706
34	90897.44	159.4671	0.001754	0.998245	90817.71	3706366.	40.775
35	90737.98	169.0023	0.001862	0.998137	90653.48	3615549.	39.846
36	90568.98	179.4856	0.001981	0.998018	90479.23	3524895.	38.919
37	90389.49	191.0082	0.002113	0.997886	90293.99	3434416.	37.995
38	90198.48	203.6691	0.002258	0.997741	90096.65	3344122.	37.075
39	89994.81	217.5761	0.002417	0.997582	89886.02	3254025.	36.157
40	89777.24	232.8466	0.002593	0.997406	89660.81	3164139.	35.244
41	89544.39	249.6075	0.002787	0.997212	89419.59	3074479.	34.334
42	89294.78	267.9966	0.003001	0.996998	89160.78	2985059.	33.429
43	89026.79	288.1626	0.003236	0.996763	88882.70	2895898.	32.528
44	88738.62	310.2660	0.003496	0.996503	88583.49	2807015.	31.632
45	88428.36	334.4794	0.003782	0.996217	88261.12	2718432.	30.741
46	88093.88	360.9876	0.004097	0.995902	87913.38	2630171.	29.856
47	87732.89	389.9891	0.004445	0.995554	87537.89	2542257.	28.977
48	87342.70	421.6941	0.004828	0.995171	87132.05	2454720.	28.104
49	86921.21	456.3265	0.005249	0.994750	86693.04	2367587.	27.238

50	86464.88	494.1220	0.005714	0.994285	86217.82	2280894.	26.379
51	85970.76	535.3281	0.006226	0.993773	85703.09	2194677.	25.528
52	85435.43	580.2027	0.006791	0.993208	85145.33	2108974.	24.685
53	84855.23	629.0122	0.007412	0.992587	84540.72	2023828.	23.850
54	84226.21	682.0291	0.008097	0.991902	83885.20	1939287.	23.024
55	83544.19	739.5288	0.008851	0.991148	83174.42	1855402.	22.208
56	82804.66	801.7854	0.009682	0.990317	82403.76	1772228.	21.402
57	82002.87	869.0661	0.010597	0.989402	81568.34	1689824.	20.606
58	81133.80	941.6245	0.011605	0.988394	80662.99	1608256.	19.822
59	80192.18	1019.692	0.012715	0.987284	79682.33	1527593.	19.049
60	79172.49	1103.469	0.013937	0.986062	78620.75	1447910.	18.288
61	78069.02	1193.112	0.015282	0.984717	77472.46	1369290.	17.539
62	76875.91	1288.716	0.016763	0.983236	76231.55	1291817.	16.803
63	75587.19	1390.303	0.018393	0.981606	74892.04	1215586.	16.081
64	74196.89	1497.800	0.020186	0.979813	73447.99	1140694.	15.373
65	72699.09	1611.015	0.022160	0.977839	71893.58	1067246.	14.680
66	71088.07	1729.617	0.024330	0.975669	70223.26	995352.4	14.001
67	69358.45	1853.104	0.026717	0.973282	68431.90	925129.2	13.338
68	67505.35	1980.776	0.029342	0.970657	66514.96	856697.3	12.690
69	65524.57	2111.703	0.032227	0.967772	64468.72	790182.3	12.059
70	63412.87	2244.699	0.035398	0.964601	62290.52	725713.6	11.444
71	61168.17	2378.288	0.038881	0.961118	59979.02	663423.1	10.845
72	58789.88	2510.682	0.042706	0.957293	57534.54	603444.0	10.264
73	56279.20	2639.762	0.046904	0.953095	54959.32	545909.5	9.7000
74	53639.44	2763.069	0.051511	0.948488	52257.90	490950.2	9.1527
75	50876.37	2877.810	0.056564	0.943435	49437.46	438692.3	8.6227
76	47998.56	2980.884	0.062103	0.937896	46508.11	389254.8	8.1097
77	45017.67	3068.931	0.068171	0.931828	43483.45	342746.7	7.6136
78	41949.23	3568.197	0.085059	0.914940	40165.13	299263.2	7.1339
79	38381.04	3559.900	0.092751	0.907248	36601.08	259098.1	6.7506
80	34821.13	3508.260	0.100750	0.899249	33067.00	222497.0	6.3897
81	31312.87	3415.192	0.109066	0.890933	29605.28	189430.0	6.0495
82	27897.68	3283.770	0.117707	0.882292	26255.80	159824.7	5.7289
83	24613.91	3118.146	0.126682	0.873317	23054.84	133568.9	5.4265
84	21495.76	2923.400	0.135998	0.864001	20034.06	110514.0	5.1412
85	18572.36	2705.353	0.145665	0.854334	17219.69	90480.02	4.8717
86	15867.01	2470.335	0.155689	0.844310	14631.84	73260.33	4.6171
87	13396.68	2224.915	0.166079	0.833920	12284.22	58628.48	4.3763
88	11171.76	1975.629	0.176841	0.823158	10183.95	46344.26	4.1483
89	9196.136	1728.703	0.187981	0.812018	8331.784	36160.30	3.9321
90	7467.432	1489.797	0.199505	0.800494	6722.533	27828.52	3.7266
91	5977.635	1263.790	0.211419	0.788580	5345.739	21105.99	3.5308
92	4713.844	1054.616	0.223727	0.776272	4186.536	15760.25	3.3433
93	3659.228	865.1589	0.236432	0.763567	3226.648	11573.71	3.1628
94	2794.069	697.2217	0.249536	0.750463	2445.458	8347.066	2.9874
95	2096.847	551.5579	0.263041	0.736958	1821.068	5901.607	2.8145
96	1545.289	427.9646	0.276947	0.723052	1331.307	4080.539	2.6406
97	1117.324	325.4255	0.291254	0.708745	954.6121	2749.232	2.4605
98	791.8993	242.2878	0.305957	0.694042	670.7554	1794.619	2.2662
99	549.6115	176.4554	0.321054	0.678945	461.3838	1123.864	2.0448
100	373.1561	125.5817	0.336539	0.663460	310.3652	662.4806	1.7753
101	247.5744	87.24613	0.352403	0.647596	203.9513	352.1154	1.4222
102	160.3282	92.3282	0.575869	0.424130	114.1641	148.1641	0.9241
103	68	68	1	0	34	34.00000	0.5

GRAFIK 6 : DÜZELTİLMİŞ TÜRK MORTALİTE GRAFIGİ  
1980 - 1990 KADIN

GRAPH 6 : GRAPH OF CORECTION TÜRK MORTALITY  
1980 - 1990 WOMEN'S





TABLO 17 : T.M.T. 1980-1990 %5 KOMÜTASYON TABLOSU (GENEL)  
 TABLE 17 : T.M.T. 1980-1990 %5 COMMUTATION TABLE (GENERAL)

'AŞLAR	D(x)	N(x)	S(x)	C(x)	M(x)	R(x)
0	100000	1881408.39	34458235.69	3620.75	10409.1	240540.03
1	91617.34	1781408.39	32576827.29	1369.34	6788.37	230130.90
2	85885.27	1689791.05	30795418.89	546.424	5419.03	223342.53
3	81249.07	1603905.78	29105627.84	238.042	4872.60	217923.50
4	77142.02	1522656.71	27501722.06	120.534	4634.56	213050.89
5	73348.06	1445514.68	25979065.35	74.7192	4514.02	208416.33
6	69780.57	1372166.62	24533550.66	56.0014	4439.30	203902.30
7	66401.69	1302386.04	23161384.04	47.5858	4383.30	199462.99
8	63192.12	1235984.35	21858997.99	43.1288	4335.72	195079.68
9	60139.84	1172792.23	206223013.63	40.2300	4292.59	190743.96
10	57235.81	1112652.39	19450221.40	37.9789	4252.36	186451.37
11	54472.31	1055416.58	18337569.01	36.0299	4214.38	182199.01
12	51842.36	1000944.26	17282152.42	43.1331	4178.35	177984.62
13	49330.54	949101.898	16281208.16	42.2553	4135.22	173806.27
14	46939.22	899771.348	15332106.26	41.4663	4092.96	169671.05
15	44662.55	852832.128	14432334.91	40.7634	4051.49	165578.08
16	42495.00	808169.575	13579502.78	40.1442	4010.73	161526.58
17	40431.28	765674.573	12771333.21	39.6066	3970.59	157515.84
18	38466.37	725243.287	12005658.63	39.1485	3930.98	153545.25
19	36595.49	686776.907	11280415.35	38.7680	3891.83	149614.27
20	34814.08	650181.409	10593638.44	38.4634	3853.06	145722.43
21	33117.81	615367.320	9943457.033	38.2330	3814.60	141869.36
22	31502.53	582249.510	9328089.712	38.0753	3776.37	138054.76
23	29964.34	550746.970	8745840.202	37.9890	3738.29	134278.38
24	28499.48	520782.627	8195093.231	37.9729	3700.30	130540.09
25	27104.38	492283.147	7674310.603	38.0258	3662.33	126839.78
26	25775.67	465178.757	7182027.456	38.1466	3624.30	123177.45
27	24510.11	439403.079	6716848.698	38.3343	3586.16	119553.14
28	23304.63	414892.961	6277445.619	38.5882	3547.82	115966.97
29	22156.30	391588.325	5862552.657	38.9073	3509.23	112419.15
30	21062.33	369432.022	5470964.332	39.2908	3470.33	108909.91
31	20020.07	348369.689	5101532.309	39.7381	3431.04	105439.57
32	19026.99	328349.615	4753162.619	40.2485	3391.30	102008.53
33	18080.70	309322.616	4424813.004	40.8212	3351.05	98617.234
34	17178.89	291241.912	4115490.388	41.4556	3310.23	95266.180
35	16319.39	274063.016	3824248.475	42.1509	3268.77	91955.946
36	15500.13	257743.619	3550185.458	42.9065	3226.62	88687.168
37	14719.12	242243.486	3292441.839	43.7215	3183.72	85460.541
38	13974.49	227524.362	3050198.352	44.5950	3139.99	82276.821
39	13264.44	213549.869	2822673.990	45.5261	3095.40	79136.822
40	12587.27	200285.424	2609124.120	46.5136	3049.87	76041.418
41	11941.37	187698.145	2408838.696	47.5563	3003.36	72991.541
42	11325.17	175756.774	2221140.550	48.6526	2955.80	69988.177
43	10737.23	164431.597	2045383.775	49.8009	2907.15	67032.369
44	10176.13	153694.366	1880952.178	50.9990	2857.35	64125.214
45	9640.556	143518.232	1727257.812	52.2448	2806.35	61267.860
46	9129.237	133877.676	1583739.579	53.5354	2754.11	58461.505
47	8640.976	124748.438	1449861.903	54.8678	2700.57	55707.395
48	8174.633	116107.462	1325113.464	56.2382	2645.70	53006.821
49	7729.127	107932.828	1209006.002	57.6427	2589.46	50361.114

50	7303.430	100203.701	1101073.173	59.0762	2531.82	47771.645
51	6896.571	92900.2711	1000869.471	60.5334	2472.74	45239.820
52	6507.630	86003.6991	907969.2005	62.0079	2412.21	42767.070
53	6135.735	79496.0687	821965.5013	63.4928	2350.20	40354.854
54	5780.064	73360.3335	742469.4326	64.9799	2286.71	38004.646
55	5439.843	67580.2690	669109.0990	66.4602	2221.73	35717.930
56	5114.343	62140.4256	601528.8300	67.9236	2155.27	33496.195
57	4802.879	57026.0826	539388.4044	69.3587	2087.35	31340.920
58	4504.811	52223.2033	482362.3218	70.7532	2017.99	29253.569
59	4219.543	47718.3914	430139.1184	72.0930	1947.23	27235.576
60	3946.520	43498.8476	382420.7269	73.3630	1875.14	25288.336
61	3685.227	39552.3275	338921.8793	74.5468	1801.78	23413.190
62	3435.193	35867.0999	299369.5517	75.6263	1727.23	21611.407
63	3195.986	32431.9063	263502.4518	76.5823	1651.61	19884.170
64	2967.214	29235.9197	231070.5454	77.3944	1575.02	18232.560
65	2748.524	26268.7053	201834.6257	78.0409	1497.63	16657.532
66	2539.600	23520.1813	175565.9203	78.4992	1419.59	15159.899
67	2340.168	20980.5803	152045.7390	78.7461	1341.09	13740.307
68	2149.985	18640.4119	131065.1587	78.7582	1262.34	12399.213
69	1968.847	16490.4263	112424.7467	78.5121	1183.58	11136.666
70	1796.580	14521.5792	95934.32044	77.9851	1105.07	9953.2783
71	1633.043	12724.9990	81412.74115	77.1559	1027.09	8848.2018
72	1478.123	11091.9553	68687.74212	76.0054	949.935	7821.1105
73	1331.731	9613.83165	57595.78675	74.5173	873.929	6871.1751
74	1193.798	8282.10018	47981.95509	72.6795	799.412	5997.2451
75	1064.271	7088.30183	39699.85491	70.4850	726.733	5197.8325
76	943.1065	6024.03061	32611.55307	67.9327	656.247	4471.0995
77	830.2640	5080.92403	26587.52246	65.0287	588.315	3814.8515
78	725.6988	4250.66000	21506.59842	64.6370	523.286	3226.5362
79	626.5046	3524.96115	17255.93841	60.6845	458.649	2703.2498
80	535.9866	2898.45645	13730.97726	56.1824	397.964	2244.6003
81	454.2809	2362.46982	10832.52080	51.3091	341.782	1846.6355
82	381.3393	1908.18884	8470.050975	46.2330	290.473	1504.8530
83	316.9472	1526.84944	6561.862132	41.1080	244.240	1214.3798
84	260.7464	1209.90216	5035.012685	36.0692	203.132	970.13965
85	212.2606	949.155702	3825.110522	31.2302	167.062	767.00758
86	170.9228	736.895006	2875.954819	26.6814	135.832	599.94477
87	136.1022	565.972175	2139.059812	22.4900	109.151	464.11218
88	107.1311	429.869972	1573.087637	18.7003	86.6611	354.96103
89	83.32930	322.738855	1143.217664	15.3357	67.9607	268.29991
90	64.02550	239.409551	820.4788093	12.4010	52.6250	200.33913
91	48.57559	175.384041	581.0692578	9.88565	40.2239	147.71407
92	36.37682	126.808442	405.6852158	7.76644	30.3383	107.49009
93	26.87815	90.4316173	278.8767734	6.01145	22.5718	77.151770
94	19.58678	63.5534651	188.4451561	4.58265	16.5604	54.579886
95	14.07122	43.9666784	124.8916909	3.43987	11.9775	38.019455
96	9.961286	29.8954552	80.92501249	2.54120	8.53769	26.041883
97	6.945733	19.9341691	51.02955720	1.84696	5.99648	17.504190
98	4.768020	12.9884358	31.09538803	1.32014	4.14952	11.507703
99	3.220828	8.22041495	18.10695222	0.92756	2.82937	7.3581791
100	2.139892	4.99958675	9.886537273	0.64036	1.90181	4.5287992
101	1.397624	2.85969405	4.886950517	0.43418	1.26144	2.6269821
102	0.896882	1.46206943	2.027256465	0.28898	0.82726	1.3655334
103	0.565187	0.56518703	0.565187035	0.53827	0.53827	0.5382733

TABLO 18 : T.M.T. 1980-1990 %4.5 KOMÜTASYON TABLOSU (GENEL)  
 TABLE 18 : T.M.T. 1980-1990 %4.5 COMMUTATION TABLE (GENERAL)

YASLAR	D(x)	N(x)	S(x)	C(x)	M(x)	R(x)
0	100000	2049607.88	40137664.64	3638.07	11739.3	321191.7005
1	92055.70	1949607.88	38088056.76	1382.47	8101.29	309452.3270
2	86709.10	1857552.17	36138448.88	554.305	6718.82	301351.0294
3	82420.91	1770843.07	34280896.70	242.630	6164.51	294632.2086
4	78629.05	1688422.15	32510053.63	123.445	5921.88	288467.6937
5	75119.67	1609793.09	30821631.47	76.8900	5798.43	282545.8097
6	71807.96	1534673.42	29211838.37	57.9042	5721.54	276747.3717
7	68657.85	1462865.46	27677164.95	49.4381	5663.64	271025.8238
8	65651.85	1394207.61	26214299.48	45.0220	5614.20	265362.1801
9	62779.71	1328555.75	24820091.87	42.1968	5569.18	259747.9745
10	60034.08	1265776.04	23491536.11	40.0263	5526.98	254178.7909
11	57408.86	1205741.95	22225760.07	38.1539	5486.96	248651.8043
12	54898.55	1148333.08	21020018.12	45.8944	5448.80	243164.8440
13	52488.60	1093434.53	19871685.03	45.1756	5402.91	237716.0377
14	50183.15	1040945.92	18778250.50	44.5441	5357.73	232313.1258
15	47977.61	990762.763	17737304.58	43.9985	5313.19	226955.3895
16	45867.59	942785.146	16746541.81	43.5376	5269.19	221642.1974
17	43848.89	896917.549	15803756.67	43.1600	5225.65	216373.0039
18	41917.50	853068.649	14906839.12	42.8650	5182.49	211147.348
19	40069.58	811151.140	14053770.47	42.6514	5139.63	205964.8521
20	38301.44	771081.556	13242619.33	42.5187	5096.97	200825.2213
21	36609.58	732780.107	12471537.77	42.4663	5054.46	195728.2420
22	34990.62	696170.523	11738757.66	42.4935	5011.99	190673.7815
23	33441.36	661179.894	11042587.14	42.6001	4969.50	185661.7873
24	31958.70	627738.531	10381407.25	42.7858	4926.90	180692.2867
25	30539.70	595779.828	9753668.718	43.0503	4884.11	175765.3862
26	29181.54	565240.123	9157888.889	43.3937	4841.06	170881.2715
27	27881.53	536058.575	8592648.766	43.8160	4797.67	166040.2072
28	26637.07	508177.042	8056590.191	44.3171	4753.85	161242.5367
29	25445.70	481539.966	7548413.148	44.8974	4709.53	156488.6822
30	24305.06	456094.258	7066873.182	45.5569	4664.63	151779.1449
31	23212.87	431789.195	6610778.924	46.2960	4619.08	147114.5051
32	22166.98	408576.319	6178989.728	47.1150	4572.78	142495.4222
33	21165.30	386409.337	5770413.408	48.0140	4525.67	137922.6354
34	20205.86	365244.028	5384004.071	48.9935	4477.65	133396.9636
35	19286.76	345038.159	5018760.042	50.0536	4428.66	128919.3059
36	18406.18	325751.392	4673721.883	51.1946	4378.61	124490.6416
37	17562.37	307345.210	4347970.490	52.4166	4327.41	120112.0311
38	16753.68	289782.833	4040625.280	53.7197	4274.99	115784.6152
39	15978.51	273029.147	3750842.447	55.1037	4221.27	111509.6160
40	15235.34	257050.631	3477813.300	56.5684	4166.17	107288.3366
41	14522.70	241815.290	3220762.668	58.1132	4109.60	103122.1609
42	13839.21	227292.584	2978947.378	59.7373	4051.49	99012.55374
43	13183.52	213453.371	2751654.793	61.4397	3991.75	94961.05973
44	12554.37	200269.842	2538201.422	63.2190	3930.31	90969.30308
45	11950.53	187715.465	2337931.579	65.0731	3867.09	87038.98623
46	11370.84	175764.926	2150216.113	66.9997	3802.02	83171.88840
47	10814.19	164394.077	1974451.186	68.9957	3735.02	79369.86371
48	10279.31	153579.881	1810057.109	71.0574	3666.02	75634.83874
49	9765.800	143300.364	1656477.227	73.1803	3594.97	71968.80949



50	9272.083	133534.563	1513176.862	75.3592	3521.79	68373.83769
51	8797.448	124262.480	1379642.299	77.5874	3446.43	64852.04629
52	8341.023	115465.032	1255379.818	79.8577	3368.84	61405.61409
53	7901.982	107124.009	1139914.786	82.1612	3288.98	58036.76938
54	7479.544	99222.0264	1032790.777	84.4879	3206.82	54747.78243
55	7072.970	91742.4819	933568.7512	86.8261	3122.33	51540.95675
56	6681.567	84669.5110	841826.2693	89.1625	3035.51	48418.61902
57	6304.681	77987.9438	757156.7583	91.4820	2946.34	45383.10741
58	5941.706	71683.2623	679168.8144	93.7677	2854.86	42436.75833
59	5592.075	65741.5562	607485.5521	96.0005	2761.09	39581.89134
60	5255.267	60149.4809	541743.9958	98.1592	2665.09	36820.79213
61	4930.805	54894.2132	481594.5149	100.220	2566.93	34155.69350
62	4618.253	49963.4082	426700.3016	102.158	2466.71	31588.75412
63	4317.223	45345.1548	376736.8933	103.944	2364.56	29122.03505
64	4027.369	41027.9317	331391.7384	105.549	2260.61	26757.47408
65	3748.392	37000.5622	290363.8067	106.940	2155.06	24496.85760
66	3480.038	33252.1693	253363.2445	108.082	2048.12	22341.79044
67	3222.097	29772.1308	220111.0751	108.941	1940.04	20293.66346
68	2974.405	26550.0332	190338.9443	109.479	1831.10	18353.61939
69	2736.841	23575.6280	163788.9111	109.659	1721.62	16522.51701
70	2509.326	20838.7869	140213.2830	109.444	1611.96	14800.89440
71	2291.824	18329.4601	119374.4961	108.799	1502.51	13188.93162
72	2084.334	16037.6354	101045.0359	107.689	1393.71	11686.41375
73	1886.888	13953.3009	85007.40053	106.086	1286.02	10292.69518
74	1699.548	12066.4122	71054.09958	103.965	1179.94	9006.666300
75	1522.397	10366.8635	58987.68736	101.308	1075.97	7826.723869
76	1355.530	8844.46636	48620.82385	98.1071	974.668	6750.746675
77	1199.051	7488.93543	39776.35748	94.3627	876.561	5776.077939
78	1053.055	6289.88379	32287.42205	94.2430	782.198	4899.516342
79	913.4652	5236.82867	25997.53825	88.9034	687.955	4117.317453
80	785.2259	4323.36345	20760.70958	82.7017	599.052	3429.361610
81	668.7106	3538.13750	16437.34612	75.8894	516.350	2830.309199
82	564.0250	2869.42682	12899.20862	68.7088	440.461	2313.958511
83	471.0280	2305.40178	10029.78179	61.3846	371.752	1873.497309
84	389.3598	1834.37376	7724.380008	54.1181	310.367	1501.744958
85	318.4749	1445.01392	5890.006245	47.0818	256.249	1191.377296
86	257.6788	1126.53895	4444.992316	40.4167	209.167	935.1277980
87	206.1659	868.860073	3316.453365	34.2306	168.750	725.9601679
88	163.0573	662.694139	2449.593292	28.5987	134.520	557.2092613
89	127.4369	499.636785	1786.899152	23.5654	105.921	422.6889749
90	98.38385	372.199790	1287.262367	19.1471	82.3561	316.7674398
91	75.00011	273.815939	915.0625764	15.3363	63.2090	234.4113306
92	56.43409	198.815819	641.2466372	12.1063	47.8726	171.2023282
93	41.89760	142.381722	442.4308174	9.41547	35.7663	123.3296774
94	30.67792	100.484116	300.0490952	7.21227	26.3508	87.56334164
95	22.14459	69.8061893	199.5649791	5.43941	19.1385	61.21248209
96	15.75158	47.6615980	129.7587898	4.03758	13.6991	42.07389896
97	11.03570	31.9100137	82.09719177	2.94858	9.66158	28.37472797
98	7.611898	20.8743122	50.18717803	2.11762	6.71300	18.71314192
99	5.166487	13.2624137	29.31286576	1.49501	4.59537	12.00013720
100	3.448997	8.09592586	16.05045204	1.03705	3.10036	7.404758069
101	2.263416	4.64692851	7.954526188	0.70652	2.06330	4.304389107
102	1.459427	2.38351234	3.307597676	0.47249	1.35678	2.241079908
103	0.924085	0.92408533	0.924085332	0.88429	0.88429	0.884292188

TABLO 19 : T.M.T. 1980-1990 %5 KOMÜTASYON TABLOSU (ERKEK)  
 TABLE 19 : T.M.T. 1980-1990 %5 COMMUTATION TABLE (MEN'S)

YAS	D(x)	N(x)	S(x)	C(x)	M(x)	R(x)
0	100000	1870432.01	33801737.78	3618.16	10931.92	260826.63
1	91619.93	1770432.01	31931305.76	1362.28	7313.760	249894.71
2	85894.79	1678812.08	30160873.75	542.806	5951.471	242580.95
3	81261.75	1592917.29	28482061.67	237.522	5408.664	236629.48
4	77154.62	1511655.53	26889144.38	121.807	5171.141	231220.81
5	73358.78	1434500.90	25377488.84	76.8488	5049.334	226049.67
6	69788.66	1361142.11	23942987.93	58.4692	4972.485	221000.34
7	66406.92	1291353.45	22581845.81	50.1358	4914.016	216027.85
8	63194.55	1224946.53	21290492.36	45.6442	4863.880	211113.83
9	60139.64	1161751.97	20065545.83	42.6614	4818.236	206249.95
10	57233.19	1101612.32	18903793.85	40.3079	4775.574	201431.72
11	54467.49	1044379.13	17802181.52	38.2505	4735.266	196656.14
12	51835.66	989911.643	16757802.38	44.7350	4697.016	191920.88
13	49322.56	938075.975	15767890.74	44.2851	4652.281	187223.86
14	46929.58	888753.407	14829814.77	43.9182	4607.995	182571.58
15	44650.92	841823.817	13941061.36	43.6325	4564.077	177963.58
16	42481.06	797172.889	13099237.54	43.4262	4520.445	173399.51
17	40414.72	754691.827	12302064.65	43.2976	4477.018	168879.06
18	38446.91	714277.099	11547372.82	43.2453	4433.721	164402.04
19	36572.86	675830.180	10833095.72	43.2678	4390.475	159968.32
20	34788.03	639257.312	10157265.54	43.3639	4347.208	155577.84
21	33088.09	604469.277	9518008.235	43.5323	4303.844	151230.64
22	31468.94	571381.179	8913538.957	43.7719	4260.311	146926.79
23	29926.64	539912.237	8342157.778	44.0818	4216.539	142666.48
24	28457.48	509985.588	7802245.540	44.4609	4172.457	138449.94
25	27057.90	481528.099	7292259.952	44.9085	4127.996	134277.48
26	25724.52	454470.190	6810731.852	45.4235	4083.088	130149.49
27	24454.12	428745.662	6356261.661	46.0053	4037.664	126066.40
28	23243.63	404291.534	5927515.999	46.6530	3991.659	122028.73
29	22090.14	381047.894	5523224.465	47.3659	3945.006	118037.07
30	20990.86	358957.747	5142176.570	48.1431	3897.640	114092.07
31	19943.16	337966.878	4783218.823	48.9838	3849.497	110194.43
32	18944.50	318023.717	4445251.944	49.8872	3800.513	106344.93
33	17992.49	299079.214	4127228.227	50.8523	3750.626	102544.41
34	17084.85	281086.718	3828149.012	51.8781	3699.773	98793.793
35	16219.41	264001.859	3547062.294	52.9635	3647.895	95094.019
36	15394.09	247782.444	3283060.434	54.1070	3594.932	91446.123
37	14606.95	232388.345	3035277.990	55.3073	3540.825	87851.190
38	13856.06	217781.405	2802889.644	56.5627	3485.517	84310.365
39	13139.68	203925.342	2585108.238	57.8712	3428.955	80824.847
40	12456.11	190785.654	2381182.896	59.2306	3371.083	77395.892
41	11803.73	178329.536	2190397.242	60.6383	3311.853	74024.809
42	11181.01	166525.798	2012067.705	62.0913	3251.214	70712.955
43	10586.49	155344.780	1845541.907	63.5863	3189.123	67461.741
44	10018.79	144758.284	1690197.127	65.1193	3125.537	64272.617
45	9476.586	134739.492	1545438.843	66.6859	3060.417	61147.080
46	8958.634	125262.905	1410699.350	68.2810	2993.731	58086.662
47	8463.752	116304.271	1285436.444	69.8989	2925.450	55092.930
48	7990.817	107840.519	1169132.173	71.5331	2855.551	52167.479
49	7538.769	99849.7017	1061291.654	73.1760	2784.018	49311.928

50	7106.603	92310.9327	961441.9525	74.8195	2710.842	46527.909
51	6693.374	85204.3287	869131.0198	76.4543	2636.023	43817.066
52	6298.188	78510.9541	783926.6910	78.0699	2559.568	41181.043
53	5920.204	72212.7658	705415.7369	79.6549	2481.498	38621.474
54	5558.635	66292.5613	633202.9710	81.1966	2401.843	36139.976
55	5212.741	60733.9263	566910.4096	82.6808	2320.647	33738.132
56	4881.834	55521.1848	506176.4833	84.0924	2237.966	31417.485
57	4565.274	50639.3500	450655.2984	85.4145	2153.873	29179.518
58	4262.465	46074.0760	400015.9484	86.6292	2068.459	27025.645
59	3972.861	41811.6105	353941.8724	87.7170	1981.829	24957.185
60	3695.960	37838.7489	312130.2618	88.6573	1894.112	22975.355
61	3431.305	34142.7881	274291.5129	89.4282	1805.455	21081.243
62	3178.481	30711.4829	240148.7247	90.0070	1716.027	19275.787
63	2937.118	27533.0015	209437.2418	90.3699	1626.020	17559.760
64	2706.885	24595.8833	181904.2403	90.4930	1535.650	15933.740
65	2487.493	21888.9979	157308.3569	90.3520	1445.157	14398.089
66	2278.688	19401.5049	135419.359	89.9232	1354.605	12952.932
67	2080.256	17122.8160	116017.8540	89.1837	1264.881	11598.127
68	1892.013	15042.5592	98895.03806	88.1124	1175.698	10333.245
69	1713.804	13150.5461	83852.47877	86.6906	1087.585	9157.5474
70	1545.504	11436.7412	70701.93264	84.9030	1000.695	8069.9616
71	1387.006	9891.23678	59265.19138	82.7384	915.9921	7069.0665
72	1238.219	8504.23077	49373.95459	80.1913	833.2536	6153.0743
73	1099.065	7266.01111	40869.72382	77.2621	753.0623	5319.8207
74	969.4668	6166.94560	33603.71270	73.9592	675.8001	4566.7583
75	849.3425	5197.47874	27436.76709	70.2989	601.8409	3890.9581
76	738.5987	4348.13622	22239.28834	66.3068	531.5419	3289.1172
77	637.1205	3609.53751	17891.15211	62.0181	465.2351	2757.5752
78	544.7606	2972.41697	14281.61460	57.0773	403.2170	2292.3400
79	461.7423	2427.65630	11309.19762	51.9317	346.1396	1889.1230
80	387.8228	1965.91399	8881.541321	46.6501	294.2079	1542.9834
81	322.7049	1578.09114	6915.627323	41.3804	247.5577	1248.7755
82	265.9576	1255.38619	5337.536182	36.2492	206.1773	1001.2178
83	217.0437	989.428590	4082.149987	31.3603	169.9280	795.04049
84	175.3479	772.384882	3092.721397	26.7939	138.5677	625.11243
85	140.2041	597.036939	2320.336514	22.6070	111.7737	486.54472
86	110.9206	456.832830	1723.299575	18.8351	89.16671	374.77094
87	86.80361	345.912174	1266.466744	15.4938	70.33161	285.60423
88	67.17629	259.108555	920.5545704	12.5821	54.83778	215.27262
89	51.39524	191.932265	661.4460150	10.0852	42.25561	160.43483
90	38.86256	140.537017	469.5137498	7.97768	32.17032	118.17921
91	29.03428	101.674449	328.9767327	6.22634	24.19264	86.008891
92	21.42535	72.6401654	227.3022827	4.79358	17.96630	61.816247
93	15.61152	51.2148065	154.6621173	3.63961	13.17272	43.849943
94	11.22849	35.6032858	103.4473108	2.72463	9.533104	30.677223
95	7.969174	24.3747863	67.84402502	2.01048	6.808470	21.144118
96	5.579200	16.4056122	43.46923863	1.46188	4.797981	14.335648
97	3.851642	10.8264114	27.06362642	1.04715	3.336098	9.5376672
98	2.621075	6.97476924	16.23721499	0.73869	2.288943	6.2015684
99	1.757571	4.35369410	9.262445748	0.51301	1.550252	3.9126251
100	1.160867	2.59612289	4.908751645	0.35063	1.037242	2.3623727
101	0.754953	1.43525563	2.312628754	0.23577	0.686608	1.3251304
102	0.483230	0.68030176	0.877373114	0.26314	0.450835	0.6385220
103	0.197071	0.19707134	0.197071349	0.18768	0.187686	0.1876869



TABLO 20 : T.M.T. 1980-1990 %4.5 KOMÜTASYON TABLOSU (ERKEK)  
 TABLE 20 : T.M.T. 1980-1990 %4.5 COMMUTATION TABLE (MEN'S)

YAS	D(x)	N(x)	S(x)	C(x)	M(x)	R(x)
0	100000	2035033.49	39248903.74	3635.47	12367.0	344890.479
1	92058.30	1935033.49	37213870.25	1375.35	8731.62	332523.382
2	86718.71	1842975.18	35278836.76	550.635	7356.26	323791.758
3	82433.78	1756256.46	33435861.57	242.101	6805.63	316435.490
4	78641.90	1673822.68	31679605.11	124.749	6563.53	309629.857
5	75130.65	1595180.78	30005782.42	79.0816	6438.78	303066.327
6	71816.28	1520050.12	28410601.64	60.4558	6359.69	296627.545
7	68663.26	1448233.83	26890551.52	52.0873	6299.24	290267.846
8	65654.38	1379570.57	25442317.68	47.6478	6247.15	283968.602
9	62779.51	1313916.19	24062747.10	44.7471	6199.50	277721.445
10	60031.34	1251136.67	22748830.91	42.4809	6154.76	271521.937
11	57403.77	1191105.33	21497694.23	40.5055	6112.28	265367.175
12	54891.46	1133701.55	20306588.89	47.5989	6071.77	259254.895
13	52480.11	1078810.09	19172887.33	47.3456	6024.17	253183.120
14	50172.86	1026329.97	18094077.24	47.1780	5976.83	247158.944
15	47965.13	976157.115	17067747.26	47.0953	5929.65	241182.113
16	45852.55	928191.985	16091590.15	47.0969	5882.55	235252.461
17	43830.94	882339.435	15163398.16	47.1822	5835.45	229369.904
18	41896.30	838508.493	14281058.72	47.3507	5788.27	223534.444
19	40044.80	796612.190	13442550.23	47.6020	5740.92	217746.166
20	38272.78	756567.385	12645938.04	47.9360	5693.32	212005.239
21	36576.73	718294.599	11889370.66	48.3524	5645.38	206311.914
22	34953.31	681717.860	11171076.06	48.8512	5597.03	200666.525
23	33399.29	646764.548	10489358.19	49.4324	5548.18	195069.489
24	31911.61	613365.254	9842593.650	50.0961	5498.75	189521.304
25	30487.33	581453.640	9229228.395	50.8425	5448.65	184022.551
26	29123.63	550966.306	8647774.755	51.6716	5397.81	178573.894
27	27817.84	521842.666	8096808.448	52.5838	5346.14	173176.080
28	26567.35	494024.826	7574965.782	53.5793	5293.55	167829.937
29	25369.73	467457.467	7080940.956	54.6582	5239.97	162536.379
30	24222.59	442087.737	6613483.488	55.8209	5185.32	157296.399
31	23123.69	417865.141	6171395.751	57.0675	5129.50	152111.078
32	22070.87	394741.444	5753530.610	58.3981	5072.43	146981.578
33	21062.05	372670.572	5358789.165	59.8127	5014.03	141909.146
34	20095.26	351608.519	4986118.592	61.3112	4954.22	136895.111
35	19168.60	331513.257	4634510.073	62.8934	4892.91	131940.890
36	18280.26	312344.652	4302996.815	64.5587	4830.01	127047.979
37	17428.52	294064.383	3990652.163	66.3067	4765.45	122217.962
38	16611.70	276635.861	3696587.779	68.1362	4699.15	117452.504
39	15828.23	260024.157	3419951.917	70.0459	4631.01	112753.352
40	15076.58	244195.925	3159927.759	72.0343	4560.96	108122.337
41	14355.32	229119.338	2915731.833	74.0991	4488.93	103561.368
42	13663.05	214764.017	2686612.495	76.2378	4414.83	99072.4331
43	12998.45	201100.966	2471848.478	78.4469	4338.59	94657.5974
44	12360.26	188102.514	2270747.511	80.7226	4260.15	90318.9994
45	11747.28	175742.251	2082644.997	83.0601	4179.42	86058.8484
46	11158.35	163994.970	1906902.746	85.4538	4096.36	81879.4200
47	10592.39	152836.614	1742907.775	87.8972	4010.91	77783.0517
48	10048.36	142244.215	1590071.161	90.3825	3923.01	73772.1374
49	9525.282	132195.845	1447826.946	92.9008	3832.63	69849.1203

50	9022.201	122670.562	1315631.100	95.4416	3739.73	66016.4857
51	8538.244	113648.360	1192960.537	97.9937	3644.29	62276.7520
52	8072.574	105110.116	1079312.176	100.543	3546.29	58632.4601
53	7624.408	97037.5417	974202.0602	103.075	3445.75	55086.1619
54	7193.009	89413.1331	877164.5184	105.573	3342.67	51640.4072
55	6777.689	82220.1237	787751.3853	108.017	3237.10	48297.7279
56	6377.809	75442.4343	705531.2615	110.387	3129.08	45060.6218
57	5992.780	69064.6245	630088.8272	112.659	3018.70	41931.5331
58	5622.058	63071.8444	561024.2026	114.807	2906.04	38912.8315
59	5265.152	57449.7858	497952.3581	116.805	2791.23	36006.7891
60	4921.617	52184.6333	440502.5723	118.622	2674.42	33215.5547
61	4591.059	47263.0157	388317.9389	120.226	2555.80	30541.1261
62	4273.131	42671.9567	341054.9232	121.583	2435.57	27985.3203
63	3967.536	38398.8256	298382.9664	122.658	2313.99	25549.7414
64	3674.027	34431.2888	259984.1408	123.412	2191.33	23235.7464
65	3392.402	30757.2612	225552.8519	123.810	2067.92	21044.4096
66	3122.508	27364.8582	194795.5906	123.812	1944.11	18976.4858
67	2864.234	24242.3499	167430.7324	123.381	1820.30	17032.3723
68	2617.512	21378.1158	143188.3824	122.482	1696.91	15212.0709
69	2382.313	18760.6034	121810.2666	121.082	1574.43	13515.1511
70	2158.643	16378.2896	103049.6632	119.153	1453.35	11940.7139
71	1946.533	14219.6464	86671.37355	116.671	1334.20	10487.3597
72	1746.040	12273.1125	72451.72711	113.620	1217.52	9153.15898
73	1557.231	10527.0720	60178.61452	109.994	1103.90	7935.62951
74	1380.179	8969.84048	49651.54242	105.795	993.914	6831.72060
75	1214.950	7589.66088	40681.70193	101.040	888.119	5837.80586
76	1061.590	6374.71058	33092.04105	95.7590	787.078	4949.68686
77	920.1174	5313.11964	26717.33046	89.9940	691.319	4162.60879
78	790.4973	4393.00219	21404.21082	83.2207	601.325	3471.28976
79	673.2360	3602.50483	17011.20862	76.0805	518.104	2869.96475
80	568.1644	2929.26881	13408.70378	68.6699	442.023	2351.86051
81	475.0281	2361.10431	10479.43497	61.2042	373.353	1909.83678
82	393.3680	1886.07619	8118.330659	53.8714	312.149	1536.48300
83	322.5573	1492.70811	6232.254463	46.8288	258.278	1224.33351
84	261.8384	1170.15078	4739.546352	40.2014	211.449	966.055483
85	210.3616	908.312344	3569.395570	34.0818	171.247	754.606315
86	167.2211	697.950740	2681.083225	28.5311	137.165	583.358639
87	131.4890	530.729603	1963.132485	23.5821	108.634	446.192797
88	102.2446	399.240555	1432.402882	19.2421	85.0525	337.558133
89	78.59967	296.995862	1033.162327	15.4974	65.8103	252.505617
90	59.71758	218.396190	736.1664650	12.3174	50.3129	186.695241
91	44.82857	158.678601	517.7702750	9.65938	37.9955	136.382273
92	33.23876	113.850028	359.0916736	7.47222	28.3361	98.3867505
93	24.33520	80.6112621	245.2416447	5.70057	20.8639	70.0506168
94	17.58670	56.2760569	164.6303826	4.28789	15.1633	49.1867100
95	12.54149	38.6893498	108.3543258	3.17914	10.8754	34.0233738
96	8.822279	26.1478597	69.66497606	2.32270	7.69629	23.1479323
97	6.119666	17.3255801	43.51711628	1.67172	5.37358	15.4516371
98	4.184410	11.2059134	26.19153612	1.18492	3.70185	10.0780480
99	2.819296	7.02150260	14.98562269	0.82685	2.51693	6.37618859
100	1.871041	4.20220590	7.964120081	0.56784	1.69008	3.85925326
101	1.222627	2.33116439	3.761914177	0.38365	1.12224	2.16916802
102	0.786323	1.10853653	1.430749781	0.43024	0.73858	1.04692525
103	0.322213	0.32221323	0.322213247	0.30833	0.30833	0.30833799

TABLO 21 : T.M.T. 1980-1990 %5 KOMÜTASYON TABLOSU (KADIN)  
 TABLE 21 : T.M.T. 1980-1990 %5 COMMUTATION TABLE (WOMEN'S)

A5	D(x)	N(x)	S(x)	C(x)	M(x)	R(x)
0	100000.0	1874854.18	35234053.39	3627.18	9768.87	217043.13
1	91610.90	1794854.18	33339199.21	1367.66	6141.68	207274.25
2	85880.81	1703243.27	31544345.02	542.606	4774.02	201132.57
3	81248.64	1617362.45	29841101.75	233.791	4231.41	196358.55
4	77145.87	1536113.80	28223739.29	116.334	3997.62	192127.14
5	73355.92	1458967.93	26687625.48	70.6938	3881.28	188129.51
6	69792.09	1385612.00	25228657.55	52.1718	3810.59	184248.22
7	66416.48	1315819.91	23843045.54	43.9471	3758.42	180437.63
8	63209.85	1249403.42	22527225.63	39.6709	3714.47	176679.21
9	60160.18	1186193.57	21277822.21	36.9428	3674.80	172964.73
10	57258.47	1126033.38	20091628.64	34.8533	3637.86	169289.93
11	54497.02	1068774.90	18965595.25	33.0562	3603.00	165652.07
12	51868.88	1014277.88	17896820.34	40.5518	3569.95	162049.06
13	49358.38	962408.995	16882542.46	39.1856	3529.39	158479.11
14	46968.80	913050.606	15920133.46	37.9143	3490.21	154949.71
15	44694.27	866081.803	15007082.86	36.7347	3452.29	151459.50
16	42529.24	821387.524	14141001.05	35.6438	3415.56	148007.20
17	40468.39	778858.278	13319613.53	34.6388	3379.92	144591.63
18	38506.69	738389.878	12540755.25	33.7172	3345.28	141211.71
19	36639.32	699883.184	11802365.37	32.8767	3311.56	137866.43
20	34861.71	663243.860	11102482.19	32.1150	3278.68	134554.86
21	33169.52	628382.142	10439238.33	31.4302	3246.57	131276.18
22	31558.59	595212.620	9810856.190	30.8204	3215.14	128029.60
23	30024.97	563654.030	9215643.569	30.2840	3184.32	124814.46
24	28564.93	533629.051	8651989.539	29.8196	3154.03	121630.14
25	27174.87	505064.116	8118360.487	29.4257	3124.21	118476.10
26	25851.41	477889.236	7613296.371	29.1013	3094.79	115351.88
27	24591.29	452037.824	7135407.134	28.8453	3065.69	112257.09
28	23391.43	427446.533	6683369.310	28.6568	3036.84	109191.40
29	22248.89	404055.100	6255922.777	28.5350	3008.18	106154.55
30	21160.89	381806.203	5851867.676	28.4794	2979.65	103146.36
31	20124.75	360645.312	5470061.472	28.4894	2951.17	100166.71
32	19137.93	340520.562	5109416.160	28.5646	2922.68	97215.535
33	18198.04	321382.622	4768895.598	28.7048	2894.12	94292.849
34	17302.76	303184.578	4447512.975	28.9098	2865.41	91398.728
35	16449.91	285881.812	4144328.397	29.1795	2836.50	88533.312
36	15637.40	269431.897	3858446.585	29.5138	2807.32	85696.806
37	14863.25	253794.491	3589014.687	29.9129	2777.81	82889.480
38	14125.56	238931.237	3335220.195	30.3768	2747.89	80111.667
39	13422.54	224805.670	3096288.957	30.9057	2717.52	77363.767
40	12752.46	211383.126	2871483.287	31.4998	2686.61	74646.244
41	12113.70	198630.657	2660100.160	32.1593	2655.11	71959.627
42	11504.70	186516.948	2461469.502	32.8843	2622.95	69304.509
43	10923.97	175012.241	2274952.554	33.6750	2590.07	66681.551
44	10370.11	164088.262	2099940.312	34.5315	2556.39	64091.477
45	9841.767	153718.148	1935852.049	35.4537	2521.86	61535.079
46	9337.658	143876.380	1782133.901	36.4414	2486.41	59013.212
47	8856.566	134538.721	1638257.521	37.4943	2449.97	56526.798
48	8397.331	125682.154	1503718.799	38.6119	2412.47	54076.826
49	7958.846	117284.823	1378036.644	39.7933	2373.86	51664.349



50	7540.060	109325.977	1260751.820	41.0374	2334.07	49290.483
51	7139.972	101785.917	1151425.843	42.3425	2293.03	46956.411
52	6757.631	94645.9451	1049639.925	43.7065	2250.69	44663.376
53	6392.132	87888.3139	954993.9807	45.1270	2206.98	42412.684
54	6042.618	81496.1814	867105.6667	46.6005	2161.85	40205.698
55	5708.273	75453.5632	785609.4853	48.1231	2115.25	38043.840
56	5388.328	69745.2892	710155.9221	49.6899	2067.13	35928.581
57	5082.051	64356.9611	640410.6328	51.2948	2017.44	33861.447
58	4788.753	59274.9099	576053.6717	52.9308	1966.15	31844.002
59	4507.787	54486.1559	516778.7618	54.5897	1913.21	29877.851
60	4238.540	49978.3687	462292.6058	56.2617	1858.62	27964.632
61	3980.443	45739.8279	412314.2370	57.9354	1802.36	26106.003
62	3732.963	41759.3841	366574.4091	59.5979	1744.43	24303.635
63	3495.605	38026.4207	324815.0250	61.2342	1684.83	22559.203
64	3267.913	34530.8154	286788.6043	62.8274	1623.60	20874.368
65	3049.471	31262.9018	252257.7888	64.3585	1560.77	19250.768
66	2839.899	28213.4305	220994.8870	65.8062	1496.41	17689.996
67	2638.860	25373.5307	192781.4564	67.1471	1430.60	16193.582
68	2446.053	22734.6705	167407.9257	68.3555	1363.46	14762.974
69	2261.218	20288.6174	144673.2551	69.4035	1295.10	13399.513
70	2084.138	18027.3986	124384.6376	70.2615	1225.70	12104.408
71	1914.631	15943.2605	106357.2390	70.8981	1155.43	10878.706
72	1752.560	14028.6286	90413.97850	71.2808	1084.54	9723.2669
73	1597.824	12276.0679	76385.34983	71.3767	1013.26	8638.7251
74	1450.360	10678.2433	64109.28191	71.1531	941.884	7625.4642
75	1310.142	9227.88233	53431.03860	70.5789	870.730	6683.5800
76	1177.176	7917.73936	44203.15626	69.6256	800.151	5812.8490
77	1051.494	6740.56313	36285.41690	68.2687	730.526	5012.6971
78	933.1656	5689.06854	29544.85376	75.5952	662.257	4282.1707
79	813.1339	4755.90289	23855.78521	71.8280	586.662	3619.9131
80	702.5852	3942.76890	19099.88231	67.4153	514.834	3033.2506
81	601.7135	3240.18361	15157.11341	62.5018	447.419	2518.4162
82	510.5586	2638.47008	11916.92980	57.2349	384.917	2070.9972
83	429.0114	2127.91139	9278.459718	51.7601	327.682	1686.0799
84	356.8222	1698.89992	7150.548328	46.2165	275.922	1358.3976
85	293.6140	1342.07771	5451.648399	40.7328	229.705	1082.4754
86	238.8996	1048.46361	4109.570684	35.4231	188.972	852.76976
87	192.1003	809.563950	3061.107066	30.3847	153.549	663.79693
88	152.5680	617.463580	2251.543115	25.6955	123.164	510.24723
89	119.6073	464.895561	1634.079535	21.4133	97.4694	387.08224
90	92.49843	345.288235	1169.183974	17.5752	76.0561	289.61280
91	70.51851	252.789798	823.8957389	14.1990	58.4809	213.55666
92	52.96143	182.271279	571.1059404	11.2846	44.2818	155.07575
93	39.15477	129.309847	388.8346605	8.81661	32.9971	110.79390
94	28.47364	90.1550773	259.5248129	6.76686	24.1805	77.796748
95	20.35089	61.6814327	169.3697356	5.09821	17.4136	53.616203
96	14.28358	41.3305413	107.6883028	3.76743	12.3154	36.202524
97	9.835976	27.0469587	66.35776150	2.72835	8.54802	23.887062
98	6.639245	17.2109823	39.31080279	1.93459	5.81967	15.339037
99	4.388491	10.5717372	22.09982040	1.34185	3.88507	9.5193633
100	2.837661	6.18324588	11.52808316	0.90950	2.54322	5.6342885
101	1.793025	3.34558402	5.344837274	0.60177	1.63371	3.0910674
102	1.105863	1.55255823	1.999253251	0.60650	1.03193	1.4573556
103	0.446695	0.44669501	0.446695019	0.42542	0.42542	0.4254238

TABLO 22 : T.M.T. 1980-1990 %4.5 KOMÜTASYON TABLOSU (KADIN)  
 TABLE 22 : T.M.T. 1980-1990 %4.5 COMMUTATION TABLE (WOMEN'S)

YAS	D(x)	N(x)	S(x)	C(x)	M(x)	R(x)
0	100000.0	2067293.53	41183482.82	3644.54	10977.8	293843.528
1	92049.23	1967293.53	39116189.29	1380.78	7333.27	282865.708
2	86704.61	1875244.29	37148895.76	550.432	5952.49	275532.431
3	82420.48	1788539.66	35273651.46	238.297	5402.06	269579.937
4	78632.98	1706119.19	33485111.77	119.144	5163.76	264177.876
5	75127.72	1627486.21	31778992.58	72.7477	5044.61	259014.112
6	71819.81	1552358.48	30151506.36	53.9445	4971.87	253969.493
7	68673.15	1480538.67	28599147.87	45.6578	4917.92	248997.622
8	65670.27	1411865.52	27118609.19	41.4123	4872.26	244079.695
9	62800.95	1346195.24	25706743.67	38.7490	4830.85	239207.426
10	60057.86	1283394.29	24360548.42	36.7322	4792.10	234376.569
11	57434.90	1223336.43	23077154.13	35.0049	4755.37	229584.462
12	54926.64	1165901.52	21853817.70	43.1478	4720.37	224829.086
13	52518.23	1110974.88	20687916.17	41.8937	4677.22	220108.716
14	50214.78	1058456.65	19576941.29	40.7285	4635.32	215431.493
15	48011.69	1008241.86	18518484.63	39.6501	4594.60	210796.165
16	45904.55	960230.171	17510242.76	38.6567	4554.94	206201.565
17	43889.15	914325.612	16550012.59	37.7465	4516.29	201646.615
18	41961.44	870436.461	15635686.98	36.9181	4478.54	197130.321
19	40117.57	828475.021	14765250.52	36.1700	4441.62	192651.775
20	38353.84	788357.450	13936775.50	35.5010	4405.45	188210.146
21	36666.74	750003.601	13148418.05	34.9103	4369.95	183804.688
22	35052.88	713336.854	12398414.44	34.3968	4335.04	179434.730
23	33509.03	678283.968	11685077.59	33.9599	4300.65	175099.683
24	32032.10	644774.933	11006793.62	33.5990	4266.69	170799.033
25	30619.13	612742.830	10362018.69	33.3139	4233.09	166532.343
26	29267.28	582123.700	9749275.863	33.1043	4199.77	162299.252
27	27973.87	552856.411	9167152.162	32.9700	4166.67	158099.474
28	26736.28	524882.540	8614295.750	32.9113	4133.70	153932.801
29	25552.04	498146.256	8089413.210	32.9282	4100.79	149799.098
30	24418.79	472594.206	7591266.954	33.0213	4067.86	145698.307
31	23334.24	448175.412	7118672.747	33.1909	4034.84	141630.444
32	22296.23	424841.166	6670497.335	33.4378	4001.65	137595.602
33	21302.66	402544.935	6245656.168	33.7627	3968.21	133593.951
34	20351.56	381242.267	5843111.232	34.1665	3934.45	129625.737
35	19441.01	360890.702	5461868.965	34.6502	3900.28	125691.287
36	18569.19	341449.686	5100978.263	35.2149	3865.63	121791.003
37	17734.34	322860.493	4759528.577	35.8618	3830.41	117925.370
38	16934.80	305146.146	4436648.083	36.5923	3794.55	114094.951
39	16168.96	288211.340	4131501.937	37.4075	3757.96	110300.394
40	15435.28	272042.377	3843290.597	38.3091	3720.55	106542.430
41	14732.29	256607.092	3571248.219	39.2982	3682.24	102821.873
42	14058.59	241874.794	3314641.126	40.3765	3642.94	99139.6254
43	13412.82	227816.200	3072766.332	41.5452	3602.57	95496.6760
44	12793.69	214403.376	2844950.132	42.8056	3561.02	91894.1030
45	12199.96	201609.683	2630546.755	44.1590	3518.22	88333.0752
46	11630.44	189409.720	2428937.072	45.6065	3474.06	84814.8531
47	11084.00	177779.273	2239527.352	47.1487	3428.45	81340.7901
48	10559.55	166695.266	2061748.079	48.7864	3381.30	77912.3336
49	10056.05	156135.709	1895052.812	50.5197	3332.52	74531.0259



50	9572.497	146079.656	1738917.103	52.3483	3282.00	71198.5047
51	9107.935	136507.159	1592837.446	54.2716	3229.65	67916.5032
52	8661.456	127399.223	1456330.287	56.2880	3175.38	64686.8501
53	8232.167	118737.767	1328931.063	58.3955	3119.09	61511.4686
54	7819.295	110505.580	1210193.296	60.5908	3060.69	58392.3753
55	7421.988	102686.284	1099687.715	62.8699	3000.10	55331.6774
56	7039.511	95264.2962	997001.4311	65.2273	2937.23	52331.5704
57	6671.147	88224.7847	901737.1349	67.6562	2872.00	49394.3333
58	6316.216	81553.6374	813512.3501	70.1482	2804.35	46522.3235
59	5974.078	75237.4207	731958.7126	72.6928	2734.20	43717.9700
60	5644.128	69263.3424	656721.2919	75.2777	2661.51	40983.7647
61	5325.802	63619.2139	587457.9495	77.8881	2586.23	38322.2522
62	5018.573	58293.4118	523838.7355	80.5064	2508.34	35736.0176
63	4721.955	53274.8386	465545.3236	83.1126	2427.84	33227.6711
64	4435.505	48552.8827	412270.4850	85.6830	2344.72	30799.8310
65	4158.819	44117.3772	363717.6023	88.1910	2259.04	28455.1036
66	3891.540	39958.5574	319600.2251	90.6063	2170.85	26196.0593
67	3633.356	36067.0166	279641.6677	92.8949	2080.24	24025.2060
68	3384.000	32433.6605	243574.6511	95.0191	1987.35	21944.9591
69	3143.259	29049.6596	211140.9905	96.9376	1892.33	19957.6071
70	2910.965	25906.4005	182091.3309	98.6055	1795.39	18065.2743
71	2687.007	22995.4347	156184.9303	99.9750	1696.78	16269.8793
72	2471.324	20308.4271	133189.4956	100.995	1596.81	14573.0898
73	2263.907	17837.1030	112881.0684	101.615	1495.81	12976.2753
74	2064.803	15573.1952	95043.96538	101.781	1394.20	11480.4565
75	1874.106	13508.3917	79470.77010	101.443	1292.42	10086.2531
76	1691.960	11634.2848	65962.37839	100.552	1190.97	8793.83151
77	1518.548	9942.32471	54328.09350	99.0641	1090.42	7602.85333
78	1354.108	8423.77607	44385.76878	110.220	991.362	6512.42716
79	1185.577	7069.66772	35961.99270	105.228	881.141	5521.06514
80	1029.294	5884.09063	28892.32498	99.2366	775.912	4639.92351
81	885.7343	4854.79591	23008.23435	92.4441	676.676	3864.01068
82	755.1485	3969.06159	18153.43843	85.0590	584.232	3187.33456
83	637.5710	3213.91306	14184.37684	77.2908	499.172	2603.10256
84	532.8250	2576.34197	10970.46377	69.3431	421.882	2103.92964
85	440.5372	2043.51696	8394.121800	61.4077	352.538	1682.04758
86	360.1590	1602.97971	6350.604837	53.6585	291.131	1329.50867
87	290.9912	1242.82069	4747.625123	46.2466	237.472	1038.37750
88	232.2139	951.829435	3504.804423	39.2966	191.226	800.904831
89	182.9176	719.615506	2552.974988	32.9044	151.929	609.678774
90	142.1363	536.697885	1833.359481	27.1359	119.024	457.749381
91	108.8797	394.561530	1296.661596	22.0280	91.8890	338.724419
92	82.16304	285.681818	902.1000654	17.5905	69.8609	246.835396
93	61.03437	203.518775	616.4182470	13.8090	52.2704	176.974441
94	44.59702	142.484403	412.8994715	10.6493	38.4613	124.704036
95	32.02722	97.8873801	270.4150682	8.06171	27.8119	86.2427065
96	22.58634	65.8601592	172.5276880	5.98587	19.7502	58.4307324
97	15.62785	43.2738130	106.6675287	4.35567	13.7643	38.6804705
98	10.59921	27.6459603	63.39371570	3.10326	9.40871	24.9160841
99	7.039520	17.0467490	35.74775540	2.16274	6.30544	15.5073695
100	4.573635	10.0072281	18.70100637	1.47292	4.14270	9.20192004
101	2.903757	5.43359310	8.693778233	0.97922	2.66977	5.05921908
102	1.799485	2.52983518	3.260185123	0.99164	1.69054	2.38944444
103	0.730349	0.73034993	0.730349935	0.69889	0.69889	0.69889946

## UÇUNCU BÖLÜM

### 3. DÜZELTİLMİŞ TÜRK MORTALİTE TABLOSU (1980-90) İLE TÜRKİYE'DE KULLANILAN MORTALİTE TABLOLARININ KARŞILAŞTIRILMASI

#### 3.1. S.M. (İSVİÇRE) MORTALİTE TABLOSU 1948-53 İLE KARŞILAŞTIRMA

Ölüm olasılıkları incelendiğinde, 0-4 yaş arası değerlerin D.T.M.T.'da azda olsa, S.M. değerlerine göre yüksek olduğu gözlenir. 5-14 yaş arası değerler ise paralellik göstermektedir. 15-31 yaş arasında, D.T.M.T. değerlerinin S.M.'ye göre düşük, 32-65 yaş arası paralellik gözlenmekte, 66-85 yaşları arasında D.T.M.T. değerlerinin düşük, S.M. değerlerinin yüksek olduğu, 86-w yaşları arasında D.T.M.T. değerlerinin yüksek S.M. değerlerinin düşük olduğu gözlenmektedir (Grafik 7).

#### 3.2. C.S.O. (AMERİKAN) MORTALİTE TABLOSU 1953-58 İLE KARŞILAŞTIRMA

İlk yaştan başlayarak ölüm oranları incelendiğinde, 0-4 yaş arası oranların D.T.M.T.'da, C.S.O.'ya göre yüksek olduğu, 5-33 yaşları arasında, C.S.O.'da yüksek D.T.M.T. düşük olduğu, 34-49 yaşları arasındaki oranlarda D.T.M.T. değerlerinin C.S.O. değerlerine paralel olduğu, 50-77 yaşları arasında D.T.M.T. değerlerinin düşük, C.S.O. değerlerinin yüksek, 78-w yaşları arasındaki oranlarda D.T.M.T. değerlerinin C.S.O. değerlerine paralel olduğu gözlenmektedir (Grafik 8).

#### 3.3. A.D.S.T. (ALMAN) MORTALİTE TABLOSU 1949-51 İLE KARŞILAŞTIRMA

İlk yaştan başlayarak ölüm oranları incelendiğinde, 0 yaş oranının, D.T.M.T.'nda düşük A.D.S.T.'da yüksek olduğu, bu oranın, 1-4 arası yaşlarda D.T.M.T.'nda yüksek A.D.S.T.'da düşük olduğu, 5-35 arası yaşlarda D.T.M.T.'de düşük A.D.S.T.'de yüksek olduğu, 36-50 arası yaşlarda D.T.M.T.'de yüksek A.D.S.T.'de düşük olduğu, 51-71 arası yaşlarda bir paralellik olduğu, 72-85 arası yaşlarda D.T.M.T.'de düşük A.D.S.T.'de yüksek olduğu, 86-w arası yaşlarda D.T.M.T.'de yüksek A.D.S.T.'de düşük olduğu gözlenmektedir (Grafik 9).

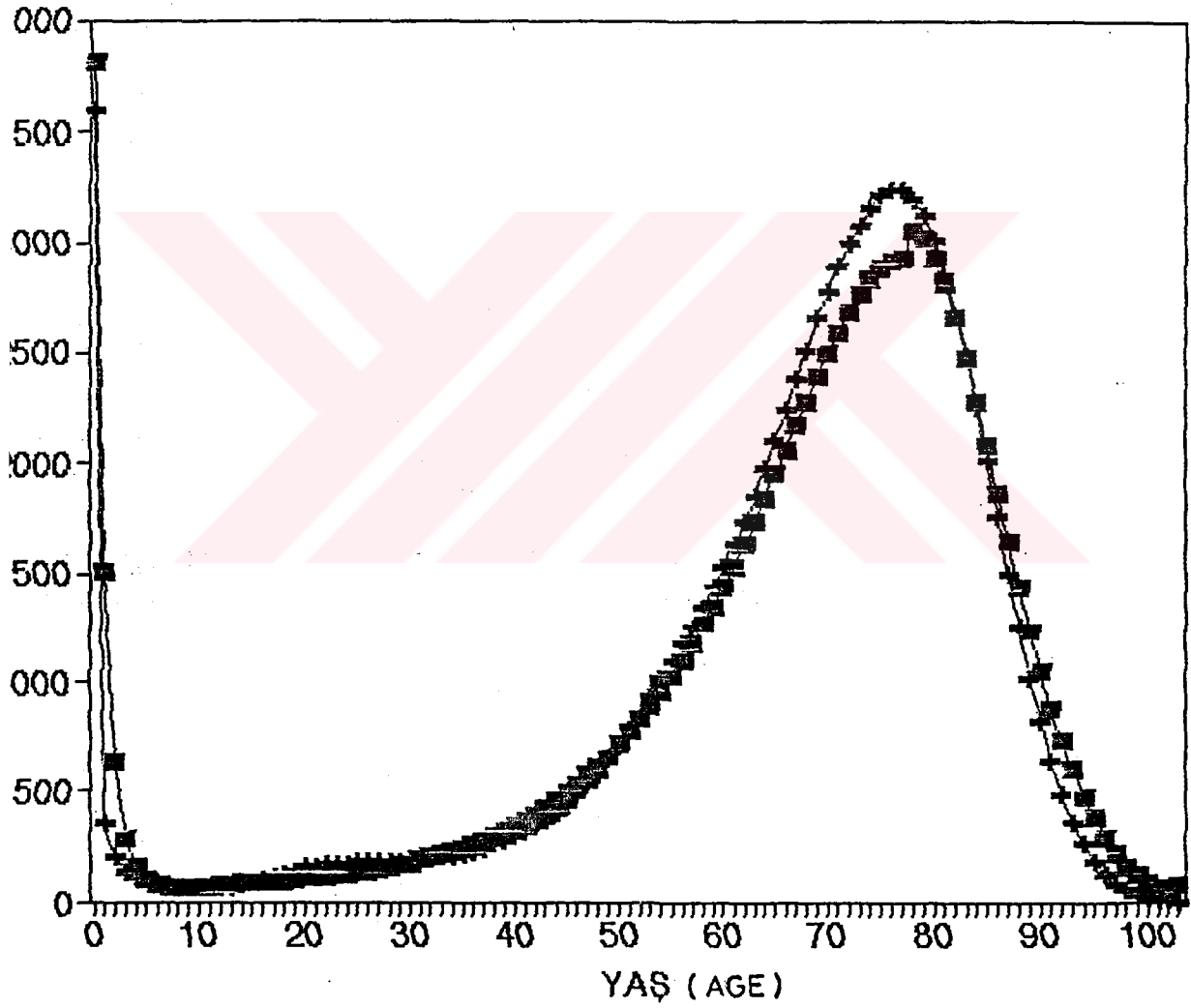
TABLO 23 : S.M. (İSVİÇRE) MORTALİTE TABLOSU 1948-53  
 TABLE 23 : S.M. (SWITZERLAND) MORTALITY TABLE 1948-53

YAŞ	$l(x)$	$d(x)$	$q(x)$	$p(x)$	$L(x)$	$T(x)$	$e_x^0$
0	100000	3591	0.03591	0.96409	98506	6636073	66.36
1	96409	353	0.003661	0.996338	95979	6537494	67.80
2	96056	211	0.002196	0.997803	96576	6441515	67.05
3	95845	144	0.001502	0.998497	95664	6344939	66.2
4	95701	119	0.001243	0.998756	95706	6249275	65.29
5	95582	103	0.001077	0.998922	95427	6153569	64.37
6	95479	89	0.000932	0.999067	95435	6058143	63.45
7	95390	77	0.000807	0.999192	95352	5962829	62.51
8	95313	70	0.000734	0.999265	95278	5867468	61.55
9	95243	64	0.000671	0.999328	95211	5771726	60.60
10	95179	61	0.000640	0.999359	95149	5676476	59.64
11	95118	61	0.000641	0.999358	95088	5581524	58.67
12	95057	64	0.000673	0.999326	95025	5486690	57.71
13	94993	68	0.000715	0.999284	94959	5391803	56.76
14	94925	77	0.000811	0.999188	94887	5296815	55.8
15	94848	87	0.000917	0.999082	94805	5201464	54.83
16	94761	100	0.001055	0.998944	94711	5106670	53.88
17	94661	115	0.001214	0.998785	94604	5012300	52.95
18	94546	130	0.001374	0.998625	94481	4917337	52.00
19	94416	144	0.001525	0.998474	94344	4822769	51.07
20	94272	154	0.001633	0.998366	94195	4728684	50.16
21	94118	161	0.001710	0.998289	94038	4634370	49.23
22	93957	167	0.001777	0.998222	93874	4540942	48.33
23	93790	173	0.001844	0.998155	93704	4446584	47.41
24	93617	177	0.001890	0.998109	93529	4353191	46.50
25	93440	179	0.001915	0.998084	93351	4259930	45.59
26	93261	181	0.001940	0.998059	93171	4165969	44.67
27	93080	182	0.001955	0.998044	92989	4073181	43.76
28	92898	183	0.001969	0.998030	92807	3979750	42.83
29	92715	185	0.001995	0.998004	92623	3887540	41.93
30	92530	187	0.002020	0.997979	92437	3794655	41.00
31	92343	190	0.002057	0.997942	92248	3702031	40.09
32	92153	194	0.002105	0.997894	92056	3609633	39.16
33	91959	200	0.002174	0.997825	91859	3517432	38.25
34	91759	207	0.002255	0.997744	91656	3426281	37.33
35	91552	218	0.002381	0.997618	91443	3334324	36.42
36	91334	230	0.002518	0.997481	91219	3243270	35.50
37	91104	244	0.002678	0.997321	90982	3151287	34.58
38	90860	260	0.002861	0.997138	90730	3061073	33.68
39	90600	278	0.003068	0.996931	90461	2969868	32.78
40	90322	298	0.003299	0.996700	90173	2879465	31.87
41	90024	319	0.003543	0.996456	89865	2788944	30.98
42	89705	342	0.003812	0.996187	89534	2699223	30.08
43	89363	369	0.004129	0.995870	89179	2610293	29.20
44	88994	402	0.004517	0.995482	88793	2521200	28.32
45	88592	440	0.004966	0.995033	88372	2431850	27.44
46	88152	482	0.005467	0.994532	87911	2343962	26.59
47	87670	529	0.006033	0.993966	87406	2255749	25.72
48	87141	581	0.006667	0.993332	86851	2168068	24.87
49	86560	640	0.007393	0.992606	86240	2081768	24.05

50	85920	705	0.008205	0.991794	85568	1995062	23.21
51	85215	777	0.009118	0.990881	84827	1909668	22.40
52	84438	853	0.010102	0.989897	84012	1824705	21.60
53	83585	932	0.011150	0.988849	83119	1741076	20.83
54	82653	1013	0.012256	0.987743	82147	1658019	20.05
55	81640	1092	0.013375	0.986624	81094	1575652	19.3
56	80548	1170	0.014525	0.985474	79963	1494165	18.54
57	79378	1251	0.015760	0.984239	78753	1414516	17.82
58	78127	1338	0.017125	0.982874	77458	1335972	17.10
59	76789	1434	0.018674	0.981325	76072	1258572	16.39
60	75355	1533	0.020343	0.979656	74589	1182320	15.69
61	73822	1632	0.022107	0.977892	73006	1107330	15
62	72190	1737	0.024061	0.975938	71322	1034483	14.33
63	70453	1851	0.026272	0.973727	69528	963093	13.67
64	68602	1977	0.028818	0.971181	67614	893884	13.02
65	66625	2111	0.031684	0.968315	65570	802165	12.04
66	64514	2244	0.034783	0.965216	63392	760620	11.78
67	62270	2379	0.038204	0.961795	61081	697424	11.2
68	59891	2515	0.041992	0.958007	58634	636042	10.61
69	57376	2651	0.046203	0.953796	56051	577203	10.06
70	54725	2778	0.050762	0.949237	53336	521529	9.529
71	51947	2889	0.055614	0.944385	50503	468042	9.009
72	49058	2988	0.060907	0.939092	47564	417484	8.510
73	46070	3076	0.066767	0.933232	44532	369942	8.029
74	42994	3151	0.073289	0.926710	41419	325465	7.570
75	39843	3207	0.080490	0.919509	38240	284081	7.130
76	36636	3232	0.088219	0.911780	35020	245828	6.710
77	33404	3226	0.096575	0.903424	31791	210779	6.309
78	30178	3188	0.105639	0.894360	28584	178956	5.930
79	26990	3116	0.115450	0.884549	25432	150334	5.569
80	23874	3001	0.125701	0.874298	22374	125100	5.240
81	20873	2845	0.136300	0.863699	19451	102695	4.919
82	18028	2673	0.148269	0.851730	16692	83109	4.609
83	15355	2477	0.161315	0.838684	14117	66487	4.329
84	12878	2255	0.175104	0.824895	11751	52413	4.069
85	10623	2013	0.189494	0.810505	9617	40580	3.820
86	8610	1757	0.204065	0.795934	7732	30996	3.6
87	6853	1499	0.218736	0.781263	6104	23232	3.390
88	5354	1248	0.233096	0.766903	4730	17133	3.200
89	4106	1018	0.247929	0.752070	3597	12441	3.029
90	3088	813	0.263277	0.736722	2682	8832	2.860
91	2275	635	0.279120	0.720879	1958	6143	2.700
92	1640	484	0.295121	0.704678	1398	4182	2.55
93	1156	361	0.312283	0.687716	976	2786	2.410
94	795	262	0.329559	0.670440	664	1813	2.280
95	533	185	0.347091	0.652908	441	1151	2.159
96	348	127	0.364942	0.635057	285	710	2.040
97	221	85	0.384615	0.615384	179	427	1.932
98	136	55	0.404411	0.595588	109	248	1.823
99	81	34	0.419753	0.580246	64	139	1.716
100	47	21	0.446808	0.553191	37	75	1.59
101	26	12	0.461538	0.538461	20	38	1.47
102	14	7	0.5	0.5	11	18	1.3
103	7	4	0.571428	0.428571	5	8	1.1
104	3	2	0.666666	0.333333	2	3	1

GRAFİK 7 : D.T.M.T. 1980-1990 İLE S.M. 1948-1953  
KARŞILAŞTIRMASI (GENEL)

GRAPH 7 : D.T.M.T. 1980-1990 WITH S.M. 1948-1953  
COMPARISON (GENERAL)



— S.M. 1948 - 1953

— D.T.M.T. 1980 - 1990



TABLO 24 : C.S.O. (AMERIKA) MORTALITE TABLOSU 1953-58  
 TABLE 24 : C.S.O. (AMERIKA) MORTALITY TABLE 1953-58

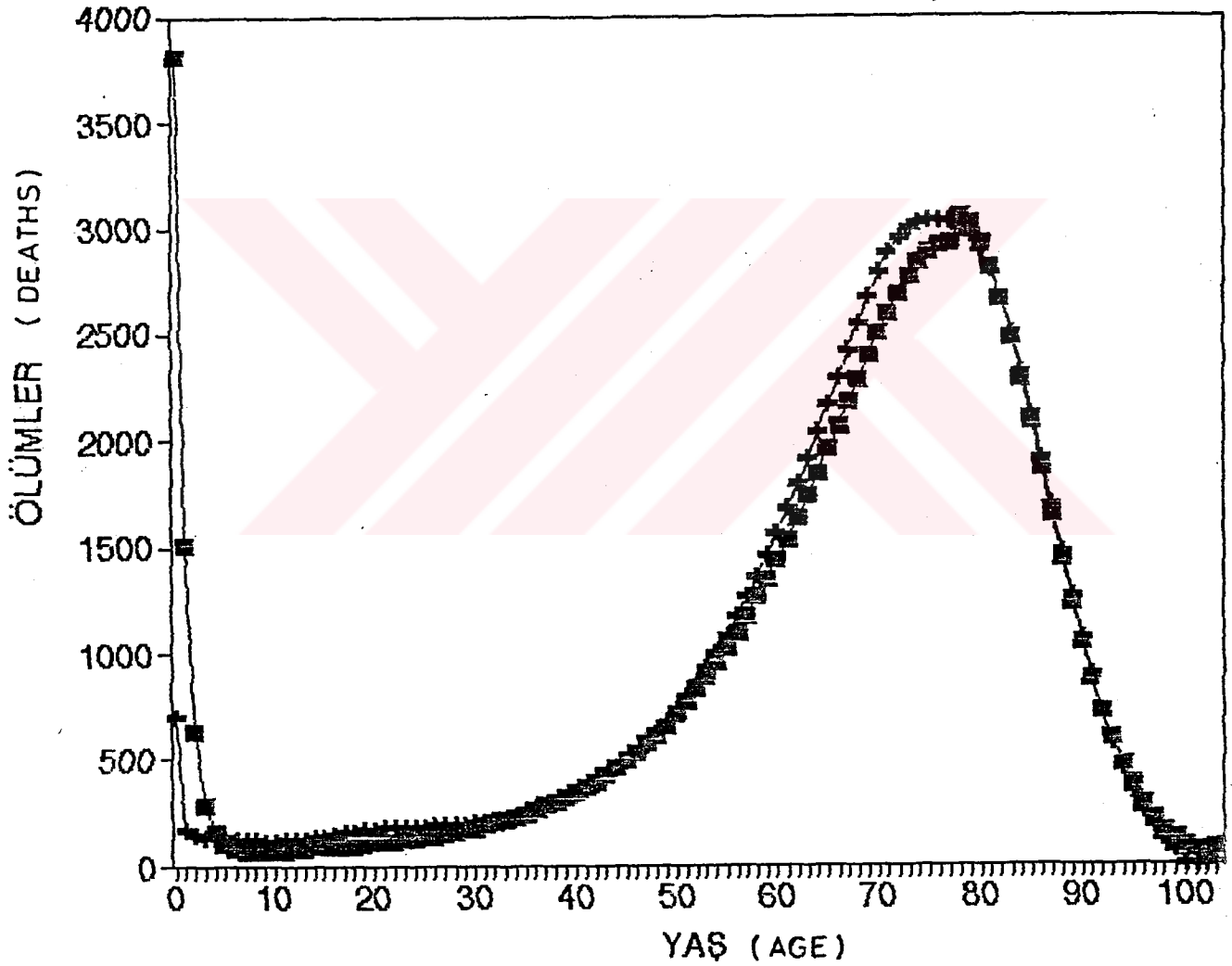
YAS	I(x)	d(x)	q(x)	p(x)	L(x)	T(x)	e <sub>x</sub>
0	10000000	70800	0.00708	0.99292	9998824	683000000	68.3
1	9929200	17475	0.001759	0.998240	9906774	673001176	67.78
2	9911725	15066	0.001520	0.998479	9914909	663094403	66.90
3	9896659	14449	0.001459	0.998540	9847623	653179494	66
4	9882210	13835	0.001399	0.998600	9880880	643331871	65.1
5	9868375	13322	0.001349	0.998650	9921788	633450991	64.18
6	9855053	12812	0.001300	0.998699	9865477	623529203	63.26
7	9842241	12401	0.001259	0.998740	9816655	613663726	62.34
8	9829840	12091	0.001230	0.998769	9775079	603847071	61.42
9	9817749	11879	0.001209	0.998790	9838257	594071992	60.51
10	9805870	11865	0.001209	0.998790	9815341	584233735	59.58
11	9794005	12047	0.001230	0.998769	9803775	574418393	58.64
12	9781958	12325	0.001259	0.998740	9797158	564614616	57.72
13	9769633	12896	0.001320	0.998679	9708562	554817458	56.78
14	9756737	13562	0.001390	0.998609	9721430	545108896	55.86
15	9743175	14225	0.001459	0.998540	9732298	535387466	54.94
16	9728950	14983	0.001540	0.998459	9746381	525655168	54.02
17	9713967	15737	0.001620	0.998379	9758164	515908787	53.10
18	9698230	16390	0.001689	0.998310	9665869	506150624	52.19
19	9681840	16846	0.001739	0.998260	9659007	496484755	51.27
20	9664994	17000	0.001758	0.998241	9650803	486825748	50.37
21	9647994	17955	0.001861	0.998138	9636552	477174945	49.45
22	9630039	17912	0.001860	0.998139	9616663	467538393	48.54
23	9612127	18167	0.001890	0.998109	9595979	457921730	47.63
24	9593960	18324	0.001909	0.998090	9570109	448325751	46.73
25	9575636	18481	0.001930	0.998069	9639382	438755642	45.82
26	9557155	18732	0.001959	0.998040	9521032	429116260	44.90
27	9538423	18981	0.001989	0.998010	9497666	419595228	43.99
28	9519442	19324	0.002029	0.997970	9572586	410097561	43.07
29	9500118	19760	0.002079	0.997920	9460207	400524975	42.16
30	9480358	20193	0.002129	0.997870	9441711	391064768	41.25
31	9460165	20718	0.002190	0.997809	9425661	381623056	40.33
32	9439447	21239	0.002250	0.997749	9502205	372197395	39.42
33	9418208	21850	0.002319	0.997680	9392129	362695190	38.50
34	9396358	22551	0.002399	0.997600	9378082	353303061	37.60
35	9373807	23528	0.002509	0.997490	9371996	343924979	36.69
36	9350279	24685	0.002640	0.997359	9276264	334552983	35.78
37	9325594	26112	0.002800	0.997199	9373315	325276719	34.88
38	9299482	27991	0.003009	0.996990	9295196	315903404	33.97
39	9271491	30132	0.003249	0.996750	9221275	306608208	33.07
40	9241359	32622	0.003530	0.996469	9245552	297386933	32.18
41	9208737	35362	0.003840	0.996159	9179047	288141381	31.29
42	9173375	38253	0.004170	0.995829	9110830	278962334	30.41
43	9135122	41382	0.004529	0.995470	9133978	269851504	29.54
44	9093740	44741	0.004919	0.995080	9064864	260717526	28.67
45	9048999	48412	0.005349	0.994650	9086843	251652662	27.80
46	9000587	52473	0.005829	0.994170	8930563	242565819	26.94
47	8948114	56910	0.006359	0.993640	8954531	233635256	26.10
48	8891204	61794	0.006950	0.993049	8801651	224680725	25.26
49	8829410	67104	0.007600	0.992399	8825784	215879075	24.45



50	8762306	72902	0.008319	0.991680	8761092	207053291	23.63
51	8689404	79160	0.009109	0.990890	8608524	198292199	22.81
52	8610244	85758	0.009959	0.990040	8538348	189683675	22.02
53	8524486	92832	0.010890	0.989109	8549370	181145328	21.25
54	8431654	100337	0.011900	0.988099	8385699	172595957	20.46
55	8331317	108307	0.012999	0.987000	8219758	164210258	19.70
56	8223010	116849	0.014210	0.985789	8215185	155990500	18.97
57	8106161	125970	0.015540	0.984459	8042171	147775315	18.22
58	7980191	135663	0.016999	0.983000	7866629	139733144	17.50
59	7844528	145830	0.018590	0.981409	7763504	131866516	16.81
60	7698698	156592	0.020340	0.979659	7652895	124103012	16.12
61	7542106	167736	0.022239	0.977760	7456928	116450117	15.44
62	7374370	179271	0.024310	0.975689	7254489	108993189	14.78
63	7195099	191174	0.026570	0.973429	7115673	101738700	14.14
64	7003925	203394	0.029040	0.970959	6896177	94623027	13.51
65	6800531	215917	0.031750	0.968249	6670252	87726850	12.90
66	6584614	228749	0.034739	0.965260	6502302	81056598	12.30
67	6355865	241777	0.038039	0.961960	6259933	74554296	11.72
68	6114088	254835	0.041679	0.958320	5951991	68294363	11.17
69	5859253	267241	0.045610	0.954389	5751290	62342452	10.64
70	5592012	278426	0.049789	0.950210	5421328	56591161	10.11
71	5313586	287731	0.054150	0.945849	5183260	51169833	9.629
72	5025855	294766	0.058649	0.941350	4873410	45986573	9.149
73	4731089	299289	0.063260	0.936739	4595131	41113163	8.689
74	4431800	301894	0.068119	0.931880	4263466	36518032	8.24
75	4129906	303011	0.073369	0.926630	3973812	32254566	7.810
76	3826895	303014	0.079180	0.920819	3684065	28280754	7.389
77	3523881	301997	0.085700	0.914299	3396693	24596689	6.979
78	3221884	299829	0.093060	0.906939	3054035	21199997	6.580
79	2922055	295683	0.101190	0.898809	2781685	18145962	6.210
80	2626372	288848	0.109979	0.890020	2484519	15364276	5.849
81	2337524	278983	0.119349	0.880650	2195929	12879757	5.509
82	2058541	265902	0.129170	0.870829	1917823	10683828	5.190
83	1792639	249858	0.139379	0.860620	1669212	8766005	4.890
84	1542781	231433	0.150010	0.849989	1431769	7096793	4.600
85	1311348	211311	0.161140	0.838859	1198873	5665023	4.319
86	1100037	190108	0.172819	0.827180	1008420	4466150	4.059
87	909929	168455	0.185129	0.814870	825498	3457730	3.799
88	741474	146997	0.198249	0.801750	664514	2632233	3.550
89	594477	126303	0.212460	0.787539	535106	1967719	3.310
90	468174	106809	0.228139	0.771860	413563	1432612	3.059
91	361365	88813	0.245770	0.754229	315865	1019049	2.819
92	272532	72480	0.265930	0.734069	237016	703184	2.579
93	200072	57881	0.289300	0.710699	171832	466168	2.330
94	142191	45026	0.316658	0.683341	117438	294335	2.069
95	97165	34128	0.351237	0.648762	79711	174897	1.8
96	63037	25250	0.400558	0.599441	50597	95186	1.510
97	37787	18456	0.488421	0.511578	28544	44589	1.180
98	19331	12916	0.668149	0.331850	12837	16045	0.830
99	6415	6415	1	0	3208	3208	0.500

GRAFİK 8 : D.T.M.T. 1980-1990 İLE C.S.O. 1953-1958  
KARSILASTIRMASI (GENEL)

GRAPH 8 : D.T.M.T. 1980-1990 WITH C.S.O. 1953-1958  
COMPARISON (GENERAL)



— C.S.O. 1953 - 1958

— D.T.M.T. 1980 - 1990

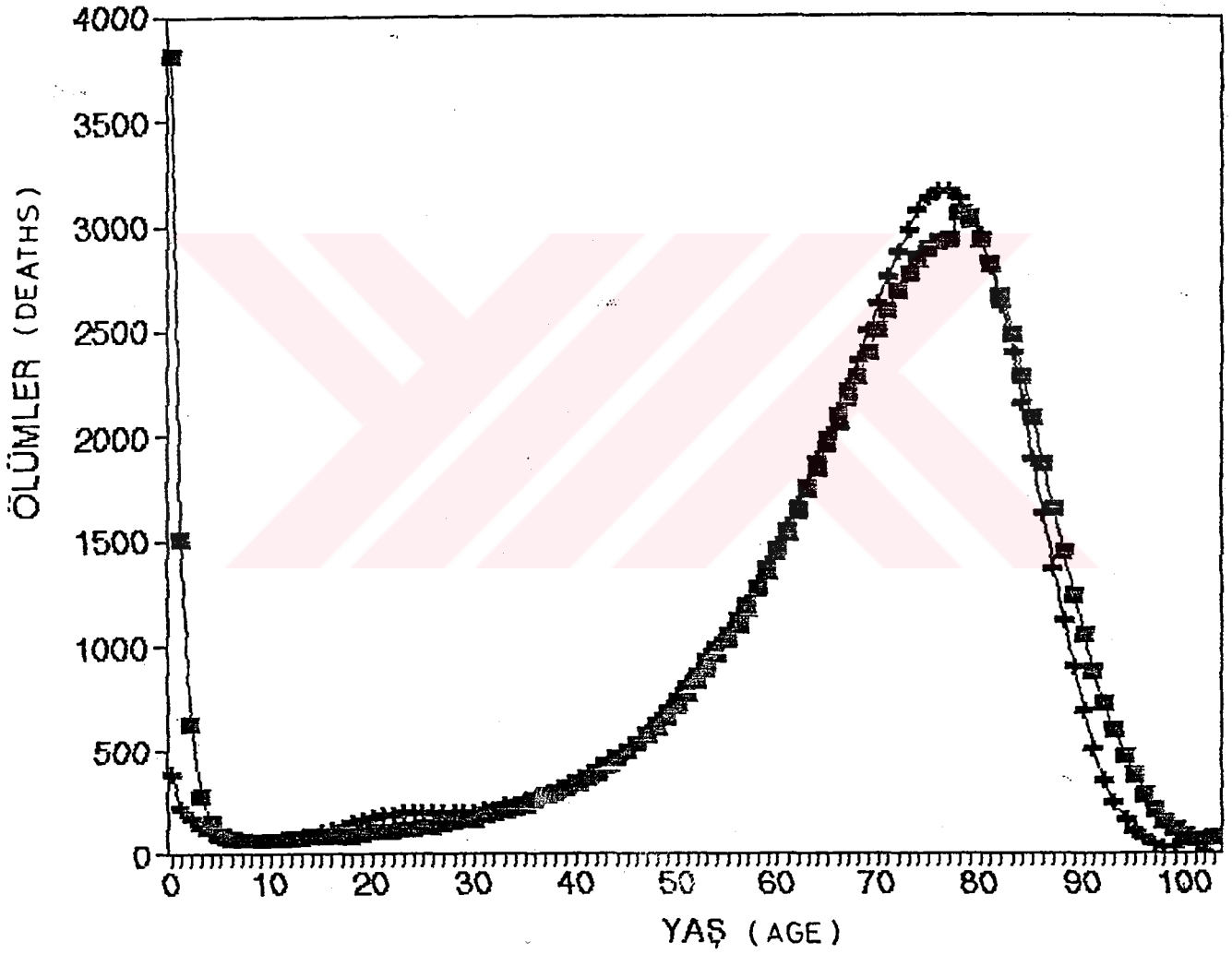
TABLO 25 : A.D.S.T. (UMUMİ ALMAN) MORTALİTE TABLOSU 1949-51  
 TABLE 25 : A.D.. (GENERAL GERMAN) MORTALITY TABLE 1949-51

YAS	$l(x)$	$d(x)$	$q(x)$	$p(x)$	$L(x)$	$T(x)$	$e_x$
0	100000	6177	0.06177	0.93823	96801	6458000	64.58
1	93823	390	0.004156	0.995843	93714	6361199	67.79
2	93433	230	0.002461	0.997538	93719	6267486	67.08
3	93203	181	0.001941	0.998058	92919	6173767	66.24
4	93022	142	0.001526	0.998473	92875	6080848	65.36
5	92880	112	0.001205	0.998794	93495	5987974	64.47
6	92768	95	0.001024	0.998975	92222	5894479	63.54
7	92673	87	0.000938	0.999061	92478	5802257	62.61
8	92586	73	0.000788	0.999211	92389	5709779	61.67
9	92513	69	0.000745	0.999254	92936	5617389	60.71
10	92444	65	0.000703	0.999296	92568	5524453	59.75
11	92379	64	0.000692	0.999307	92386	5431885	58.79
12	92315	65	0.000704	0.999295	92320	5339500	57.84
13	92250	72	0.000780	0.999219	91664	5247180	56.88
14	92178	81	0.000878	0.999121	92022	5155516	55.93
15	92097	96	0.001042	0.998957	92679	5063493	54.97
16	92001	109	0.001184	0.998815	91349	4970814	54.02
17	91892	125	0.001360	0.998639	91981	4879465	53.09
18	91767	142	0.001547	0.998452	91703	4787484	52.16
19	91625	159	0.001735	0.998264	91383	4695781	51.24
20	91466	172	0.001880	0.998119	91736	4604398	50.33
21	91294	181	0.001982	0.998017	90949	4512662	49.42
22	91113	189	0.002074	0.997925	91004	4421714	48.53
23	90924	194	0.002133	0.997866	90897	4330710	47.62
24	90730	199	0.002193	0.997806	90777	4239813	46.73
25	90531	202	0.002231	0.997768	90554	4149036	45.83
26	90329	204	0.002258	0.997741	90278	4058482	44.93
27	90125	203	0.002252	0.997747	89868	3968204	44.03
28	89922	202	0.002246	0.997753	89460	3878336	43.13
29	89720	202	0.002251	0.997748	89992	3788876	42.23
30	89518	204	0.002278	0.997721	89705	3698884	41.32
31	89314	210	0.002351	0.997648	88680	3609179	40.41
32	89104	217	0.002435	0.997564	89461	3520499	39.50
33	88887	225	0.002531	0.997468	88481	3431038	38.59
34	88662	234	0.002639	0.997360	88407	3342557	37.69
35	88428	244	0.002759	0.997240	88345	3254150	36.79
36	88184	254	0.002880	0.997119	88256	3165806	35.90
37	87930	264	0.003002	0.996997	88139	3077550	35
38	87666	275	0.003136	0.996863	87155	2989411	34.10
39	87391	289	0.003306	0.996693	87118	2902255	33.20
40	87102	307	0.003524	0.996475	87170	2815137	32.32
41	86795	327	0.003767	0.996232	86369	2727967	31.43
42	86468	348	0.004024	0.995975	86417	2641597	30.54
43	86120	374	0.004342	0.995657	85696	2555180	29.66
44	85746	404	0.004711	0.995288	85883	2469485	28.80
45	85342	440	0.005155	0.994844	85305	2383602	27.92
46	84902	485	0.005712	0.994287	84039	2298297	27.06
47	84417	534	0.006325	0.993674	84469	2214258	26.23
48	83883	589	0.007021	0.992978	83256	2129789	25.38
49	83294	646	0.007755	0.992244	83644	2046534	24.57

50	82648	703	0.008505	0.991494	82252	1962890	23.75
51	81945	759	0.009262	0.990737	81556	1880638	22.95
52	81186	815	0.010038	0.989961	80750	1799082	22.16
53	80371	874	0.010874	0.989125	79899	1718332	21.38
54	79497	935	0.011761	0.988238	78977	1638433	20.60
55	78562	1002	0.012754	0.987245	78060	1559456	19.85
56	77560	1070	0.013795	0.986204	77040	1481396	19.1
57	76490	1138	0.014877	0.985122	75901	1404356	18.35
58	75352	1211	0.016071	0.983928	74731	1328456	17.63
59	74141	1289	0.017385	0.982614	73522	1253724	16.90
60	72852	1378	0.018915	0.981084	72355	1180202	16.19
61	71474	1471	0.020580	0.979419	70403	1107847	15.5
62	70003	1566	0.022370	0.977629	69061	1037444	14.81
63	68437	1665	0.024328	0.975671	67629	968384	14.15
64	66772	1773	0.026553	0.973446	66167	900754	13.48
65	64999	1889	0.029061	0.970938	64014	834587	12.83
66	63110	2006	0.031785	0.968214	61767	770573	12.20
67	61104	2119	0.034678	0.965321	60565	708806	11.59
68	58985	2234	0.037874	0.962125	57467	648245	10.98
69	56751	2357	0.041532	0.958467	55541	590778	10.41
70	54394	2491	0.045795	0.954204	53577	535237	9.840
71	51903	2625	0.050575	0.949424	50477	481660	9.280
72	49278	2749	0.055785	0.944214	47784	431183	8.750
73	46529	2863	0.061531	0.938468	44987	383399	8.240
74	43666	2966	0.067924	0.932075	42116	338412	7.750
75	40700	3056	0.075085	0.924914	39187	296296	7.28
76	37644	3120	0.082881	0.917118	36155	257109	6.830
77	34524	3152	0.091298	0.908701	33035	220954	6.400
78	31372	3150	0.100408	0.899591	29875	187918	5.989
79	28222	3116	0.110410	0.889589	26488	158043	5.599
80	25106	3047	0.121365	0.878634	23687	131555	5.239
81	22059	2941	0.133324	0.866675	20499	107868	4.889
82	19118	2794	0.146144	0.853855	17829	87369	4.569
83	16324	2609	0.159826	0.840173	14955	69540	4.259
84	13715	2394	0.174553	0.825446	12585	54586	3.980
85	11321	2153	0.190177	0.809822	10188	42001	3.710
86	9168	1894	0.206588	0.793411	8245	31813	3.470
87	7274	1619	0.222573	0.777426	6433	23568	3.240
88	5655	1361	0.240671	0.759328	4983	17135	3.030
89	4294	1119	0.260596	0.739403	3738	12152	2.829
90	3175	897	0.282519	0.717480	2742	8414	2.650
91	2278	689	0.302458	0.697541	1922	5672	2.489
92	1589	507	0.319068	0.680931	1337	3750	2.359
93	1082	363	0.335489	0.664510	903	2413	2.230
94	719	253	0.351877	0.648122	597	1510	2.100
95	466	172	0.369098	0.630901	378	913	1.959
96	294	113	0.384353	0.615646	238	535	1.819
97	181	73	0.403314	0.596685	143	297	1.640
98	108	45	0.416666	0.583333	86	153	1.416
99	63	27	0.428571	0.571428	49	67	1.063
100	36	36	1	0	18	18	0.5

GRAFİK 9 : D.T.M.T. 1980-1990 İLE A.D.S.T. 1949-1951  
KARŞILASTIRMASI (GENEL)

GRAPH 9 : D.T.M.T. 1980-1990 WITH A.D.S.T. 1949-1951  
COMPARISON (GENERAL)



■ — A.D.S.T. 1949 - 1951  
■ — D.T.M.T. 1980 - 1990



#### 4. SONUÇ

Türkiye'de kullanılan mortalite tablolarına alternatif olarak, 1993 yılında oluşturulan mortalite tablosuna, hemen bütün mortalite tablolarında yapılmış olan düzeltmenin, Makeham formülü ile yapılmasının amaçlandığı giriş bölümünde açıklanmıştır.

Düzeltilme işlemi için, ölüm verilerinin seyrinden hareketle, veriler üçe ayrılmış ve her bölüm için ayrı ayrı Makeham düzeltilmesi uygulanmıştır.

D.T.M.T.'su ile ülkemizde kullanılan diğer yabancı mortalite tabloları arasında, ufak farklılıkların dışında, bir paralellik gözlenmektedir. Bu durumda, ülkemizdeki yaşam standardının Amerika, İsviçre ve Almanya'daki yaşam standardının yaklaşık olarak 30 yıl gerisinde olduğu sonucu ortaya çıkmaktadır.

Türk insanın yaşam standardının gelişmiş ülkelerin seviyesine çıkarabilmek için yaşam koşullarının dolayısıyla sağlık standartlarının geliştirilmesi gerekmektedir.

Ülkeler arası bu tür demografik karşılaştırmalar yaparak ülkemiz standartlarının ne düzeyde olduğunu tespit etmek, bu sonuçlardan hareketle gerekli tedbirleri almak ve sigorta şirketlerimizin buldukları dönemde daha sağlıklı teknik hesaplamalar yapmalarını sağlamak için objektif mortalite tablolarının periyodik zaman aralıkları içerisinde yapılması gereklidir.

Sigorta şirketlerimizin yabancı mortalite tabloları yerine artık, Türk insanının gerçek özelliklerini yansıtan Türk mortalite tablolarını kullanmaları gerektiği kanısındayız.

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## O. INTRODUCTION

Mortality tables which were prepared for Turkey were not enough because, population statistics were not enough. So Turk insurance companies have begun to use foreign mortality tables.

Death rate gives different result for different country so these tables are not fit characteristics of death of Turkish people for this reason, mortality tables must be prepared for Turkish people.

Turkish Mortality Table (1980-1990) which is prepared by Yr. Doc. Dr. Levent Duransoy has been used in this thesis.

In part one, mortality table factors which affecting the table, elements which were found in this table and correction which was used the mortality table had been explained in briefly.

In part two, the mortality table has been corrected with Makeham formula and %5, %4.5 commutation tables have been prepared.

In part three, the mortality table has been compared with foreign mortality tables in Turkey.

## FIRST CHAPTER

### 1. DEFINITION AND FUNCTIONAL COMBINATIONS OF MORTALITY TABLE

#### 1.1. THE DEFINITION OF MORTALITY TABLE

The table, which indicates decrement of people because of death were born at the same time is called mortality table.

#### 1.2. FACTORS WHICH AFFECTS MORTALITY

- Age
- Sexuality
- Health
- Marital status
- Occupation

#### 1.3. FUNCTIONAL COMBINATIONS OF MORTALITY TABLE

##### 1.3.1. $l_x$ Function

It is the number of lives who survive to exact age  $x$ .

$$l_{x+1} = l_x - d_x$$

##### 1.3.2. $d_x$ Function

It is the number dying exact age  $x$  and  $x+1$ .

$$d_x = l_x - l_{x+1}$$

##### 1.3.3. $q_x$ Function

$q_x$  is the proportion of lives of exact age  $x$  who die before attaining exact age  $x+1$ .

$$q_x = \frac{l_x - l_{x+1}}{l_x} = \frac{d_x}{l_x}$$

##### 1.3.4. $p_x$ Function

$p_x$  is the proportion surviving at least one year after attaining exact age  $x$  ( $p_x + q_x = 1$ ).

$$p_x = \frac{l_{x+1}}{l_x}$$

### 1.3.5. $L_x$ and $T_x$ Functions

$L_x$  is the average number alive between  $x$  and  $x+1$ , or, alternatively, the number of years of lived by  $l_x$  during the year of age  $x$  to  $x+1$ , so that,

$$L_x = \frac{l_x + l_{x+1}}{2}$$

$T_x$  is total population aged  $x$  and over in a stationary population generated by constant births and subject to the life table mortality, so that,

$$T_x = L_x + L_{x+1} + L_{x+2} + \dots + L_w$$

### 1.3.6. $e_x^o$ Function

$e_x$  is the average life time after age  $x$  of  $l_x$  who survive to age  $x$ . It is referred to as the expectation of life at age  $x$ , so that,

$$e_x^o = \frac{T_x}{l_x}$$

## 1.4. CORRECTION METHODS WHICH IS USED AT TABLE ARRANGEMENT

The method which used in mortality table prepared for Turkey is based on death statistics.

Statistics which is used preparing the table has been collected by D.I.E. and it contains of death events in village and city (Table 1-2-3-4-5-6 Page 12).

That statistics can be wrong, because of this reason the average of statistics, which is between 1980 and 1990, had been calculated.

### 1.4.1. MOVING AVERAGE METHOD

This method is used to purify time series effect of periodic movement for this process, 10 term have been taken as example.

There are accumulation the years which ending 0 and 5 (10-15-20-25-...).

To correct this accumulation moving average method that has 5 period is used (Table 7-8-9 Page 24).

AGES	DATAS
6	381
7	358
8	287
9	247
10	241
11	213
12	241
13	234
14	252
15	291

$$X_8 = \frac{381+358+287+247+241}{5} = 303$$

$$X_9 = \frac{358+287+247+241+213}{5} = 270$$

$$X_{10} = \frac{287+247+241+213+241}{5} = 246$$

$$X_{11} = \frac{247+241+213+241+234}{5} = 235$$

$$X_{12} = \frac{241+213+241+234+252}{5} = 236$$

$$X_{13} = \frac{213+241+234+252+291}{5} = 246$$

AGES	DATAS	5 PERIODIC MOV. AVE. DATAS
6	381	---
7	358	---



8	287	303
9	247	270
10	241	246
11	213	235
12	241	236
13	234	246
14	252	---
15	291	---

#### 1.4.2. SECOND CORRECTION

To explain 97 generation as a generation increament speed of population have been used.

For example, people who was born in 1984 and died 1 age to transfer to 1985 generation, increament speed of population with the number of people who died 1 age is multiplied.

If this process is used for every ages, the death number of 1985 generation is calculated (Table 7-8-9 Page 24).

Death statistics are given as only one age until 97 age by D.I.E. (0, 1, 2, ... 97). After 97 age, they have been picked as 98 age. To correct this, function of death events which occur after 80 age is examined and with this function, death events which occur after 97 age is determined.

The function of after 80 age is,

$$Y = a * b^x.$$

The parametres of this function are determined like this,

$$\log Y = \log a + X \log b$$

$$\log a = \frac{\sum \log Y}{n}$$

$$\log b = \frac{\sum X \cdot \log Y}{\sum X^2}$$

Y	X	log Y	X Log Y	X <sup>2</sup>
842	-4	2.92530	-11.70120	16
682	-3	2.83378	- 8.50134	9
548	-2	2.73878	- 5.47756	4
439	-1	2.64246	- 2.64246	1
370	0	2.51850	- 0	0
266	1	2.42488	2.42488	1
212	2	2.32630	4.65260	4
167	3	2.22270	6.66810	9
114	4	2.05690	8.22760	16
	0	22.68960	- 6.34938	60

$$\log a = \frac{\sum \log Y}{n} = \frac{22.6896}{9} = 2.52106$$

$$a = 331.94$$

$$\log b = \frac{\sum X \cdot \log Y}{\sum X^2} = \frac{- 6.34938}{60} = - 0.105823$$

$$b = 0.783749$$

$$Y = 331.94 * 0.783749^X$$

X (AGES)	Y (DATAS)
98	98
99	77
100	60
101	47
102	37
103	29

## SECOND CHAPTER

### 2. PREPARING OF CORRECTED TURK MORTALITY TABLE (D.T.-M.T.) AND COMMUTATION TABLES

#### 2.1. CORRECTIONS WHICH IS USED IN MORTALITY TABLE

Correction methods is examined in 3 groups.

- 1- Graphic correction methods
- 2- Mechanic correction methods
- 3- Analytic correction methods

##### 2.1.1. GRAPHIC CORRECTION METHOD

This correction method is used to find quick and approxitame values.

##### 2.1.2. MECHANIC CORRECTION METHOD

This correction decreases important variation of  $q_x$  function, because average of consecutive  $q_x$  frekans is calculated and correct function is found by using this average.

##### 2.1.3. ANALYTIC CORRECTION METHOD

In this method,

$$d_x = f(x)$$

Parameters of  $f(x)$  is a function which is found from  $q_x$  observation values and it's correction is made by using  $l_x$  function.

###### 2.1.3.1. MACEHAM FORMULA AND IT'S USAGE

$$l_x = k \cdot s^x \cdot g^{c^x}$$

There are several methods to find parameters of  $l_x$  function ( $k, s, g, c$ ). In this study, King and Hardy methods had been used.

This method provides to find the values of parameters  $s$ ,  $g$  and  $c$  by using  $p_x$  values.

$$p_x = \frac{l_{x+1}}{l_x} = \frac{k \cdot s^{x+1} \cdot g^{c^{x+1}}}{k \cdot s^x \cdot g^{c^x}} = s \cdot g^{(c-1) \cdot c^x}$$

$$\log p_x = \log s + (c-1) \cdot c^x \cdot \log g$$

$$\log p_x = P_x$$

$$\log s = a$$

$$(c-1) \cdot \log g = b$$

$$P_x = a + b \cdot c^x$$

When first graphic is viewed, three different slopes are observed.

The limits of the functions;

For first function 0-11 age.

For second function 12-77 age.

For third function 78-101 age.

The ages 102 and 103 are forecasted by using third function.

The value of parameters for functions are found like this,

$$1. \text{ group: } \left. \begin{array}{l} P_0 = a + b \cdot c^0 \\ P_1 = a + b \cdot c^1 \\ P_2 = a + b \cdot c^2 \\ P_3 = a + b \cdot c^3 \end{array} \right\} \sum_{i=0}^3 P_i = 4 \cdot a + b \cdot \sum_{i=0}^3 c^i$$

$$2. \text{ group: } \left. \begin{array}{l} P_4 = a + b \cdot c^4 \\ P_5 = a + b \cdot c^5 \\ P_6 = a + b \cdot c^6 \\ P_7 = a + b \cdot c^7 \end{array} \right\} \sum_{i=4}^7 P_i = 4 \cdot a + b \cdot \sum_{i=4}^7 c^i$$

3. group:

$$\left. \begin{aligned} P_0 &= a + b c^0 \\ P_4 &= a + b c^4 \\ P_{10} &= a + b c^{10} \\ P_{14} &= a + b c^{14} \end{aligned} \right\} \sum_{i=0}^{14} P_i = 4a + b \cdot \sum_{i=0}^{14} c^i$$

$$\begin{aligned} \sum_{i=0}^3 c^i &= c^0 + c^1 + c^2 + \dots + c^3 \\ &= \frac{(c^4 - 1)}{c - 1} c^0 \end{aligned}$$

$$\sum_{i=4}^7 c^i = c^4 \frac{(c^4 - 1)}{c - 1}$$

$$\sum_{i=8}^{11} c^i = c^8 \frac{(c^4 - 1)}{c - 1}$$

$$\text{for 1. group: } \sum_{i=0}^3 P_i = 4 \cdot a + c^0 \cdot \frac{(c^4 - 1)}{c - 1} \cdot b = -0.02795 \quad (\text{I})$$

$$\text{for 2. group: } \sum_{i=4}^7 P_i = 4 \cdot a + c^4 \cdot \frac{(c^4 - 1)}{c - 1} \cdot b = -0.00187 \quad (\text{II})$$

$$\text{for 3. group: } \sum_{i=8}^{11} P_i = 4 \cdot a + c^8 \cdot \frac{(c^4 - 1)}{c - 1} \cdot b = -0.00122 \quad (\text{III})$$

$$\sum_{i=4}^7 P_i - \sum_{i=0}^3 P_i = b \cdot \frac{(c^4 - 1)^2}{c - 1} = 0.02608 \quad (\text{IV})$$

$$\sum_{i=8}^{11} P_i - \sum_{i=4}^7 P_i = b \cdot \frac{(c^4 - 1)^2}{c - 1} \cdot c^4 = 0.00065 \quad (\text{V})$$



$$\frac{\sum_{i=8}^{11} P_i - \sum_{i=4}^7 P_i}{\sum_{i=4}^7 P_i - \sum_{i=0}^3 P_i} = \frac{c^4 \cdot \frac{(c^4 - 1)^2}{c - 1}}{c^0 \cdot \frac{(c^4 - 1)^2}{c - 1}} = \frac{c^4}{c^0} c^4$$

$$c^4 = \frac{0.00065}{0.02608} = 0.0249233$$

$$c_6 = 0.39733$$

$$4 \cdot a + \frac{((0.397339)^4 - 1)}{0.397339 - 1} \cdot b = -0.02795 \quad (I)$$

$$4 \cdot a + 0.397339 \cdot \frac{((0.397339)^4 - 1)}{0.397339 - 1} = -0.00187 \quad (II)$$

$$4 a + 1.618 b = -0.02795$$

$$4 a + 0.040324 b = -0.00187$$

$$\underline{b = -0.0165304} \quad \underline{a = -0.000301}$$

$g_6 = 1.0652$
$s_6 = 0.999307$

$$l^0 = k s^0 g^{c^0}$$

$$k_6 = \frac{l_0}{g} = \frac{100000}{1.0652}$$

$$k_e = 93879.084$$

GENERAL (Table 14 Page 48)

PARAMETRE	I (0-11 age)	II (12-77 age)	III (78-101 age)
$s_e$ :	0.9993070	0.999407173	1.218422015
$g_e$ :	1.0652000	0.998936000	0.400670000
$c_e$ :	0.3973300	1.091900000	1.030662200
$k_e$ :	93879.084	94053.44830	102.3733505

MEN'S (Table 15 Page 51)

PARAMETRE	I (0-11 age)	II (12-77 age)	III (78-101 age)
$s_m$ :	0.9992640	0.99950300	1.271050
$g_m$ :	1.0647900	0.99836400	0.143510
$c_m$ :	0.3947700	1.08945000	1.025586
$k_m$ :	93915.232	94076.0431	205.9040

KADIN (Table 16 Page 54)

PARAMETRE	I (0-11 age)	II (12-77 age)	III (78-101 age)
$s_k$ :	0.999364577	0.99930310	1.08683100
$g_k$ :	1.065392000	0.99962350	0.91952500
$c_k$ :	0.397026000	1.10235000	1.04903653
$k_k$ :	93862.16530	94045.5575	2122.53600

## 2.2. COMMUTATION TABLES

The series of advance values which is formed and death resulting of the combinations of life tables and which is given the tables which contain the advance value, of interest are called commutation tables.

There are two types of commutation numbers series.

- 1- Life Commutation Numbers
- 2- Death Commutation Numbers

### 2.2.1. LIFE AND DEATH COMMUTATION NUMBERS (D, N, S, C, M, R)

Life and death commutation numbers are found like this (Table 17, 18, 19, 20, 21, 22 Page 57).

Life commutation numbers;

$$D_x = v^x \cdot l_x, \quad v^x = \frac{1}{(1+i)^x} \quad (i : \text{rate of interest})$$

$$N_x = D_x + D_{x+1} + D_{x+2} + \dots$$

$$S_x = N_x + N_{x+1} + N_{x+2} + \dots$$

Death commutation numbers:

$$C_x = v^{x+1} \cdot d_x$$

$$M_x = C_x + C_{x+1} + C_{x+2} + \dots$$

$$R_x = M_x + M_{x+1} + M_{x+2} + \dots$$

### THIRD CHAPTER

#### 3. COMPARISON OF D.T.M.T. (1980-1990) WITH OTHER TABLES WHICH ARE USED IN TURKEY

##### 3.1. COMPARISON WITH S.M. (1948-1953)

When the rates of death are examined between 0 age and 4 age D.T.M.T. values are higher than S.M. values. Between 5 age and 14 age two tables are parallel each other and between 15 age and 31 age D.T.M.T. values are lower than S.M. values. Between 32 age and 65 age two tables are parallel and between 66 age and 85 age D.T.M.T. values are lower than S.M. values. Between 86 age and w age D.T.M.T. values are higher than S.M. values (Graphic 7 Page 72).

##### 3.2. COMPARISON WITH C.S.O. (1953-1958)

When rates of death are examined between 0 and 4 age D.T.M.T. values are higher than C.S.O. values. Between 5 age and 31 age C.S.O. values are higher than D.T.M.T., between 34 age and 49 age they are parallel each other. Between 50 age and 77 age D.T.M.T. values are lower than C.S.O. values. Between 78 and w age they are age parallel each other (Graphic 8 Page 75).

##### 3.3. COMPARISON WITH A.D.S.T. (1949-1951)

When the rate of death are examined rate of 0 age is low in D.T.M.T. value and it is high in A.D.S.T. value. Between 1 age and 4 age D.T.M.T. values are higher than A.D.S.T. values. Between 5 age and 35 age D.T.M.T. values are lower than A.D.S.T. values, between 36 ages and 50 age D.T.M.T. values are higher than A.D.S.T. values, between 51 age and 71 age they are parallel each other. Between 72 age and 85 age D.T.M.T. values are lower than A.D.S.T. values, between 86 age and w age D.T.M.T. values are higher than A.D.S.T. values (Graphic 9 Page 78).

#### 4. CONCLUSION

To correction the values of death had been separated to three fuction. Macheam correction had been made for these function.

There are small differences between D.T.M.T. and other foreign mortality tables, however they are more parallel each other. For this reason, life standart in Turkey is iower than 30 years, the life standart of Switzerland, Germany and America.

Healt standart must be developed to increase life standart in Turkey.

Objective mortality tables must be made in periodic time to fix level of life standart and to make technique calculations of life insurance branch.

Turk insurance companies must use T.M.T. instead of foreign mortality tables.