

Population and Health

Lecture 15. Reconstruction of continuous time series of deaths by cause

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FORSCHUNG



РЭШ

Российская
экономическая
школа

Available data

	Estonia	Latvia	Lithuania
1945			
1950	1947-1954 Soviet classific. 1940 (3rd classific. Second version in 1949). 84 items		
1955	1955-1964		
1960	Soviet classific. 1952 (4th classific, second version in 1957). 116 items	1956-1964 Soviet classific. 1952 (4th classific, second version in 1957). 116 items	1956-1964 Soviet classific. 1952 (4th classific, second version in 1957). 116 items
1965	1965-1969 Soviet classific. 1965 (based on ICD7). 210 it	1965-1969 Soviet classific. 1965 (based on ICD7). 210 it	1965-1969 Soviet classific. 1965 (based on ICD7). 210 it
1970	1970-1981	1970-1981	1970-1981
1975	Soviet classific. 1970 (based on ICD8). 185 items	Soviet classific. 1970 (based on ICD8). 185 items	Soviet classific. 1970 (based on ICD8). 185 items
1980			
1985	1981-1987 Soviet classific. 1981 (based on ICD9). 185 items	1981-1987 Soviet classific. 1981 (based on ICD9). 185 items	1981-1987 Soviet classific. 1981 (based on ICD9). 185 items
1990	1988-1993 Soviet classific. 1981 revised in 1988 175 items	1988-1995 Soviet classific. 1981 revised in 1988 (based on ICD9). 175 items	1988-1992 Soviet classific. 1981 revised in 1988 175 items
1995	1994-1996 ICD9. 5600 items		1993-1997 ICD9. 5600 items
2000	1997-	1996 -	1998-
2005	ICD10. > 10000 items	ICD10 > 10000 items	ICD10. > 10000 items
2010			



Different stages of the reconstruction

	SC 1952	SC 1965	SC 1970	SC 1981	SC 1988	ICD-9	ICD-10
Stage 0	<u>1956-1964</u>	<u>1965-1969</u>	<u>1970-1980</u>	<u>1981-1987</u>	<u>1988-1993</u>	<u>1994-1997</u>	<u>1998-</u>
Stage I	1956-1969						
Stage II	1956-1980						
Stage III	1956-1987						
Stage IV	1956-1993						
Stage IV	1956-1997						
Stage V	1956-2010						

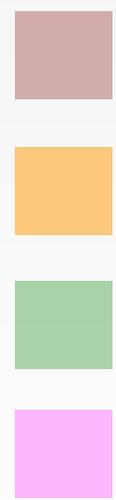


For each transition, three steps

1. Correspondence tables
2. Associations of items
3. Coefficients of transition

I. Correspondence table between 1965 items and 1952 items

1965 Revision		1952 Revision	
N°	Title	N°	Title
...			
3	Tuberculous meningitis and tuberculosis of central nervous system	26	Tuberculous meningitis and tuberculosis of central nervous system
...			
44	Shistosomiasis	35	Parasitic diseases
45	Echinococcosis	35	Parasitic diseases
46	Filariosis	35	Parasitic diseases
47	Ankylostomiasis	35	Parasitic diseases
48	Other helminthiases	35	Parasitic diseases
49	Other parasitic diseases	35	Parasitic diseases
...			
56	Cancer of larynx	54	Cancer of larynx and trachea
57	Cancer of trachea, bronchus, and lung	54	Cancer of larynx and trachea
		55	Cancer of bronchus and lung
...			
108	Other myocardial degenerescences	89	Other circulatory diseases
109	Other heart diseases	79	Subacute infect. endocarditis
		89	Other circulatory diseases
		83a	Atheroscler., other and unspec.
115	Other diseases of arteries	83a	Atheroscler., other and unspec.
116	Other circulatory diseases	89	Other circulatory diseases
117	Atherosclerosis, other and unspecified	89	Other circulatory diseases
		83a	Atheroscler., other and unspec.



II. Correspondence table between 1952 items and 1965 items

1952 Revision		1965 Revision	
N°	Title	N°	Title
...			
26	Tuberculous meningitis and tuberculosis of central nervous system	3	Tuberculous meningitis and tuberculosis of central nervous system
...			
36	Parasitic diseases	44	Shistosomiasis
		45	Echinococcosis
		46	Filariosis
		47	Ankylostomiasis
		48	Other helminthiases
		49	Other parasitic diseases
...			
54	Cancer of larynx and trachea	56	Cancer of larynx
		57	Cancer of trachea, bronchus, and lung
55	Cancer of bronchus and lung	57	Cancer of trachea, bronchus, and lung
...			
89	Other circulatory diseases	108	Other myoc.degenerescences
		109	Other heart diseases
		116	Other circulatory diseases
		117	Atheroscler., other and unspec.
79	Subacute infect. endocarditis	109	Other heart diseases
83a	Atheroscler., other and unspec.	109	Other heart diseases
		115	Other diseases of arteries
		117	Atheroscler., other and unspec.



Association of items

Simple association

1965 Revision		Deaths		1952 Revision		
N°	Title	1965	1964	N°	P/ T	Title

Association n° 2

3	Tuberculous meningitis and tuberculosis of the central nervous system	593	749	26	T	Tuberculous meningitis and tuberculosis of the central nervous system
2	3	593	749			26



Association of items

Splitting of items

1965 Revision		Deaths		1952 Revision		
N°	Title	1965	1964	N°	P/T	Title
Association n° 25						
44	Schistosomiasis	1	705	35	P	Parasitic diseases
45	Echinococcosis	564	“	35	P	
46	Filariosis	2	“	35	P	
47	Ankylostomiasis	4	“	35	P	
48	Other helminthiases	89	“	35	P	
49	Other parasitic diseases	70	“	35	P	
25	44 à 49	730	705			35



Association of items

Complex associations

1965 Revision		Deaths		1952 Revision		
N°	Title	1965	1964	N°	P / T	Title
Association n° 30						
56	Cancer of larynx	1826	2103	54	P	Cancer of larynx and trachea
57	Cancer of trachea, bronchus and lung	24447	“ 22851	54 55	P T	Cancer of bronchus, lung and pleura
30	56, 57	26273	24954			54, 55



Association of items

Complex associations

Association n° 46

108	Other myocardial degenerescences	5726	8336	89	P	Other diseases of the circulatory system
109	Other heart diseases	3646	“	89	P	Subacute septic endocarditis
			553	79	T	
			28812	83a	P	Atherosclerosis, other and unspecified
116	Other diseases of arteries	1523	“	89	P	
117	Other diseases of the circulatory system	2691	“	89	P	
			“	83a	P	
115	Atherosclerosis, other and unspecified	34218	“	83a	P	
46	108, 109, 115, 116, 117	47804	37701			79, 83a, 89



Coefficients of transition

1965 items	79	1952 items 83a	89	1965 deaths
108			5726	5726
109	701	228	2717	3646
116			1523	1523
117		2087	604	2691
115		34218		34218
<i>Deaths estimated in 1965</i>	<i>701</i>	<i>36533</i>	<i>10570</i>	<i>47804</i>
Deaths observed in 1964	553	28812	8336	37701

items	79	83a	89
108			0.54
109	1.00	0.01	0.26
116			0.14
117		0.06	0.06
115		0.94	
Total	1.00	1.00	1.00



How to apply coefficients of transition

$$D(3)^{SC65} = 1.000 * D(26)^{SC52}$$

$$D(44)^{SC65} = 0.001 * D(35)^{SC52}$$

$$D(45)^{SC65} = 0.773 * D(35)^{SC52}$$

$$D(46)^{SC65} = 0.003 * D(35)^{SC52}$$

$$D(47)^{SC65} = 0.005 * D(35)^{SC52}$$

$$D(48)^{SC65} = 0.122 * D(35)^{SC52}$$

$$D(49)^{SC65} = 0.196 * D(35)^{SC52}$$



How to apply coefficients of transition

items	79	83a	89
108			0.54
109	1.00	0.01	0.26
116			0.14
117		0.06	0.06
115		0.94	
Total	1.00	1.00	1.00

$$D(108)^{SC65} = 0.54 * D(89)^{SC52}$$

$$D(109)^{SC65} = 1.00 * D(79)^{SC52} + 0.01 * D(83a)^{SC52} + 0.26 * D(89)^{SC52}$$

$$D(115)^{SC65} = 0.94 * D(83a)^{SC52}$$

$$D(116)^{SC65} = 0.14 * D(89)^{SC52}$$

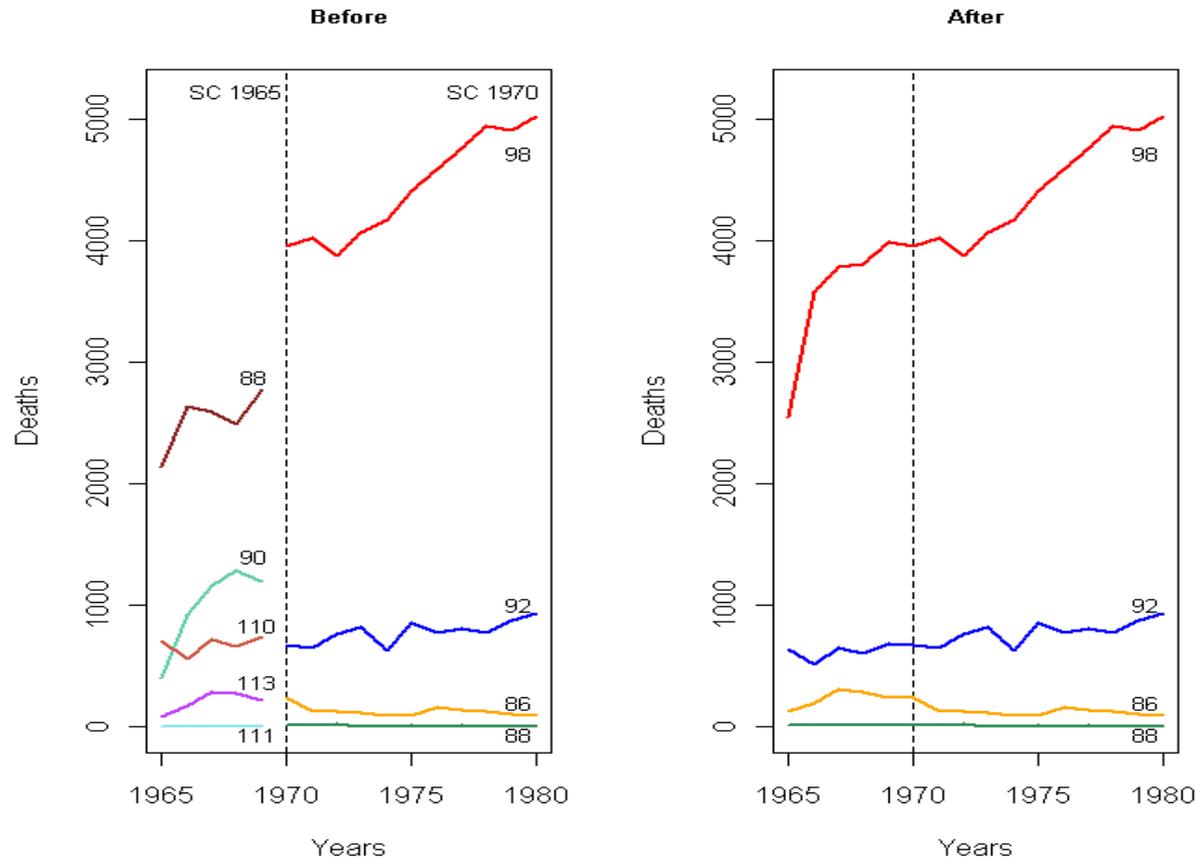
$$D(117)^{SC65} = 0.06 * D(83a)^{SC52} + 0.06 * D(89)^{SC52}$$



Continuity of series for each item:

1. Total of deaths
2. By age groups

An example of reconstructed series for Belarus



Items of SC 1965

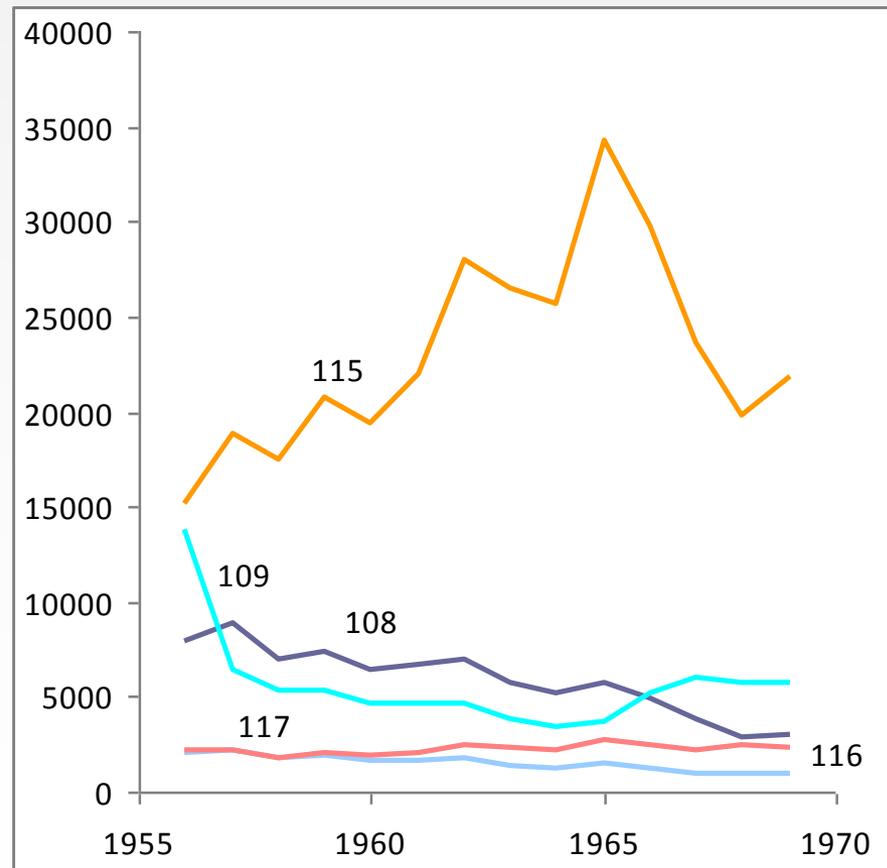
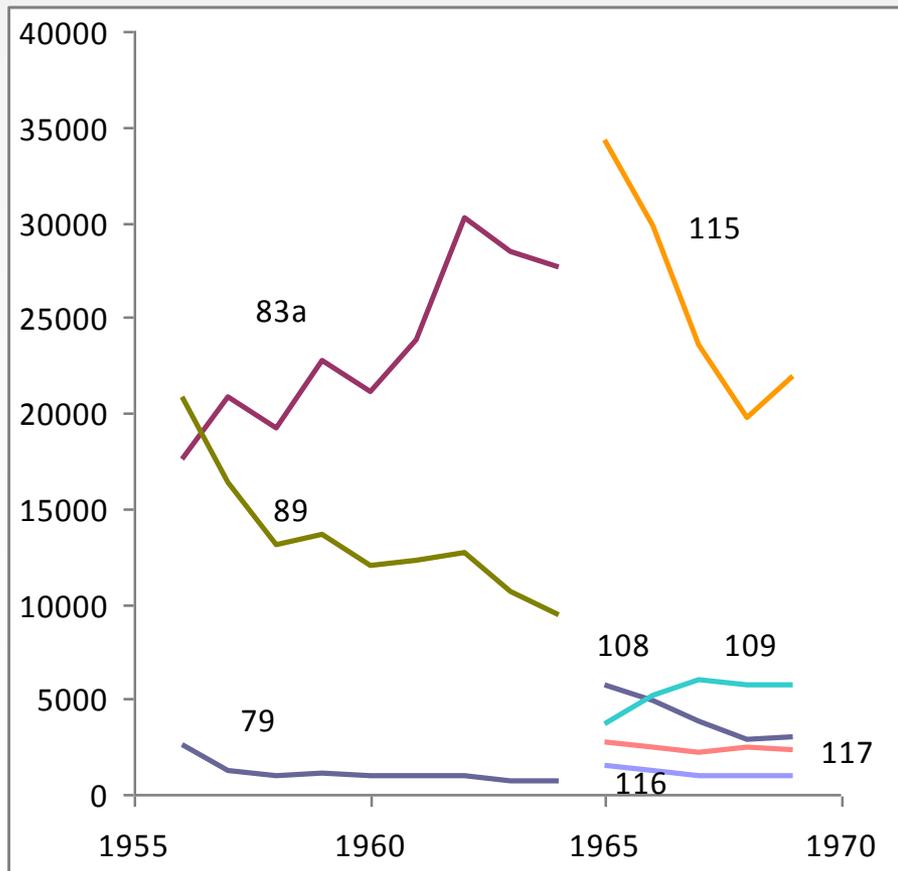
- 88 Cerebrovascular disorders with hypertension
- 90 Cerebrovascular disorders with hypertension and cerebral arteriosclerosis
- 110 Hypertensive heart disease except myocardial infarction
- 111 Cerebral hypertensive disease except disorders of the central nervous system
- 113 Heart and cerebral hypertensive disease

Items of SC 1970

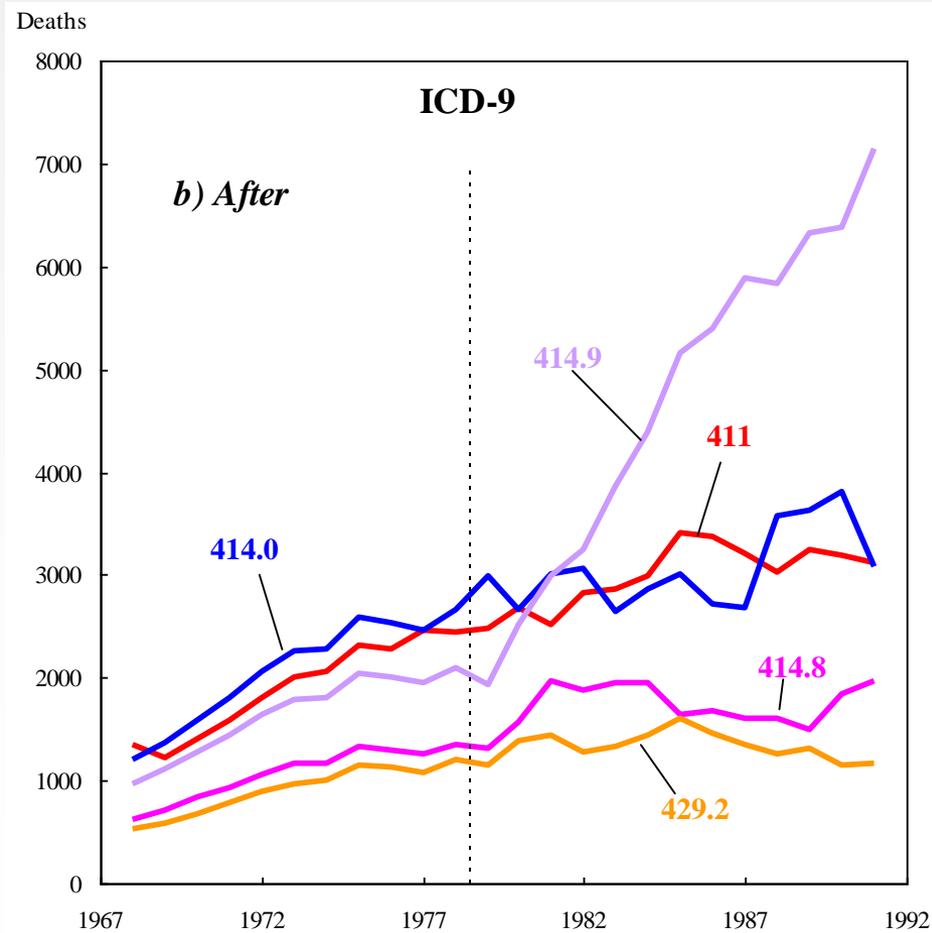
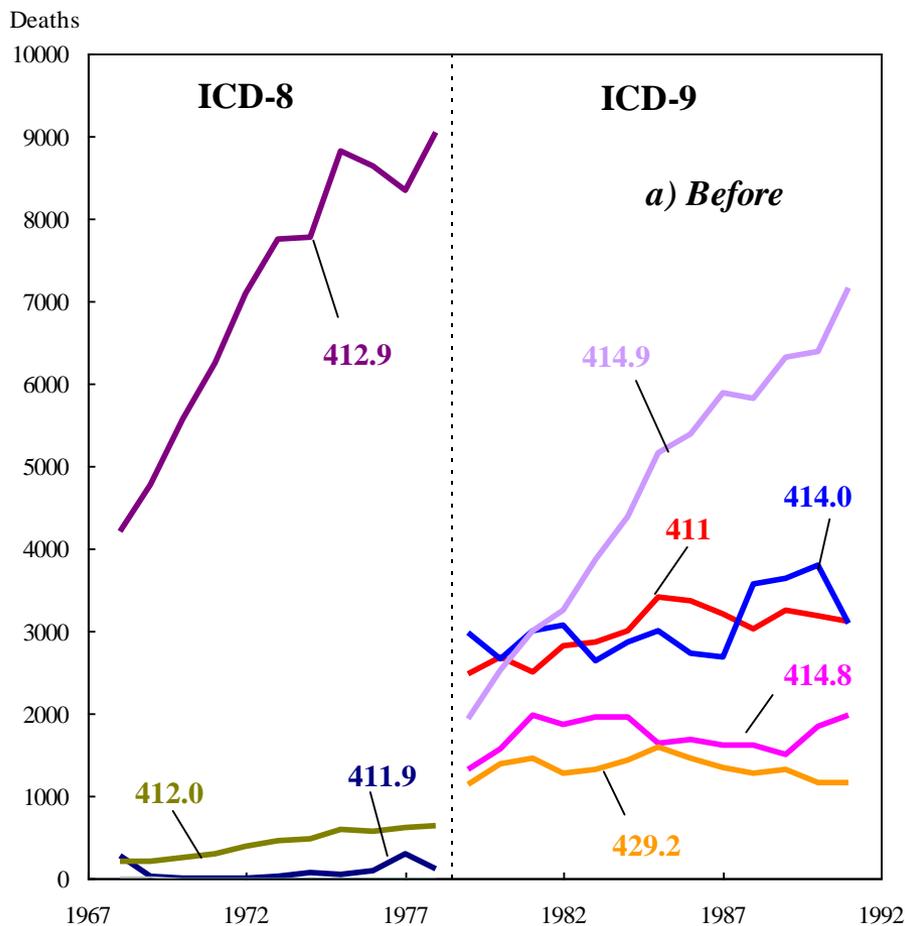
- 86 Hypertensive heart disease
- 88 Hypertensive heart and renal disease
- 92 Atherosclerotic cardiosclerosis with hypertensive disease
- 98 Cerebrovascular disorders with hypertensive disease



After reconstruction

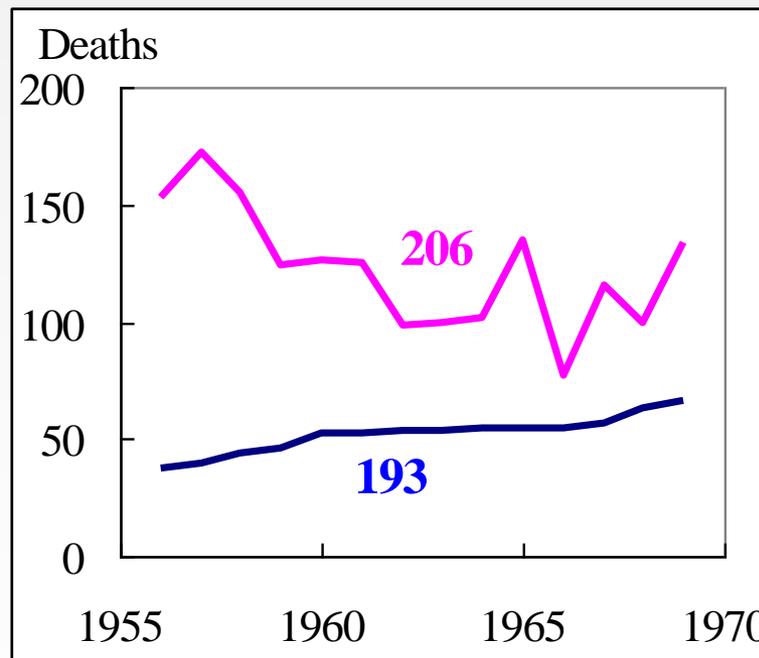
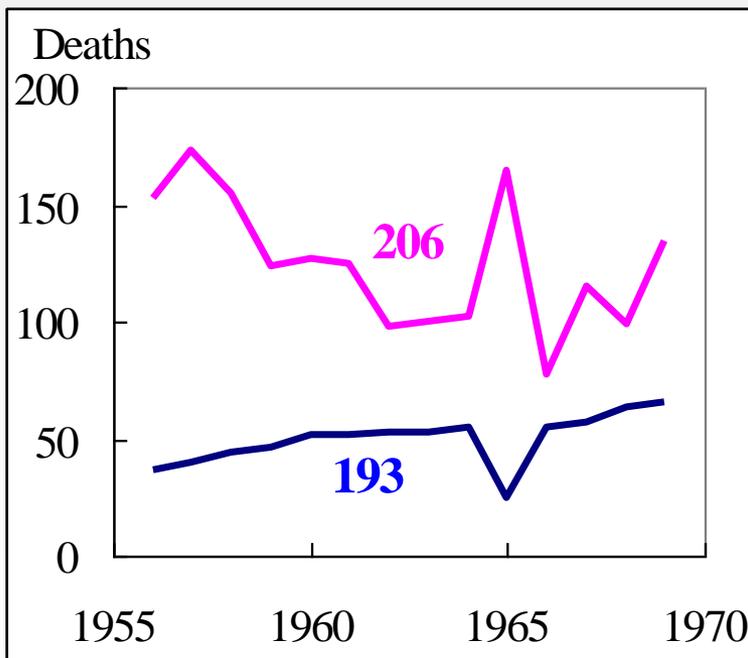


An example of reconstructed series for France (transition from ICD-8 to ICD-9)





LITHUANIA



193. Accidental fall

206. Other accidents

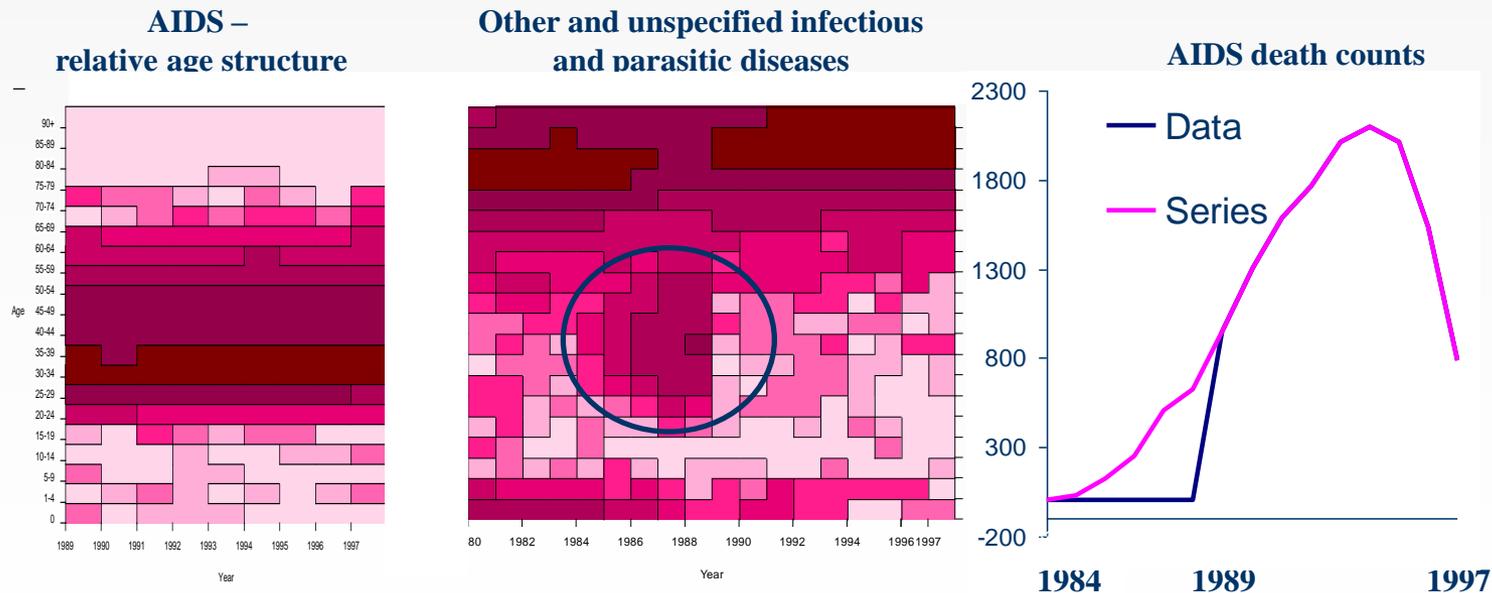


SPECIAL CASE OF AIDS

1986 – AIDS was implemented in ICD9

■ 1989 – adopted in West Germany

Where the AIDS deaths were classified before 1989?



NOTE: In France, AIDS deaths were classified under “Deficiency of cell-mediated immunity”