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**CIRCULATORY SYSTEM – MORTALITY IN RELATION TO PREVENTIVE  
PHYSICAL ACTIVITIES**

INTRODUCTION

Programs propagating physical activity often refer to the necessity to “fight” against death caused by cardiovascular diseases, as a result of the unhealthy lifestyle of modern man. Epidemiologists claim that about one half of all people die from this type of modern epidemic. In contrast, the WHO reports that, “the general increase in life expectancy has also meant a general increase in healthy years of life” (related to non-fatal health problems) “and the proportion of life spent in less-than-perfect health has decreased” [3].

Question: What about cardiovascular mortality as “modern epidemic” in comparison to the epidemics of the middle age with reference to preventive medicine for the elderly?

METHODS

The study consisted of an analysis of annual reports of the “Statistisches Bundesamt” (German Federal Statistical Office) combined with epidemiological data as well as reports of the WHO (available on the Internet).

RESULTS

The study of literature yielded the following results with reference to life expectancy and mortality in Germany. For comparison, data concerning Poland as reported by the WHO were added.

1. The life expectancy in Germany increased between 1991/93 and 2001/03 at +2.9% for female (f) and +4.3% for male (m) newborns (Table 1). Relevant increases in Poland are also described (Table 1). The

healthy life expectancy (HALE) in 2003, in the context of non-fatal health problems [3], reached a high value of years and, in relation to the total life expectancy, for about 90% (Table 2).

**Table 1.** Life expectancy of newborns in Germany, comparison 1991/93 and 2001/2003 [1], p. 76, 56 and for Poland: [3], \* p. 104 and \*\* p. 23

Life expectancy	female	male
1991/93	79.01	72.47
2001/03	81.34 ~ + 2.9%	75.59 ~ +4.3%
Poland* 2003	79	71
Poland (f & m)**	(f & m) 1990: 71.0	(f & m) 2002: 74.7

**Table 2.** Left: Healthy life expectancy (HALE) lived at birth 2003, in the context of non-fatal health problems [3], p. 29. Right: in relation to life expectancy (values from Table 1)

HALE '03	female	male	female	male
Germany	74.0	69.6	74.0:81.34 = 91%	69.6:75.59 = 92%
Poland	68.5	63.1	68.5:79 = 87%	63.1:71.0 = 89%

2. The mortality with reference to the circulatory system amounted to about 50%, (Table 3). Ischemic heart diseases showed amounted to 19% in 2003, with only 8% of acute and recurrent myocardial infarction. Cerebrovascular diseases amounted to merely 9% (Table 3).

**Table 3.** Mortality in Germany with reference to the circulatory system [1], p. 440, 242. For comparison: Poland 2005 [4]

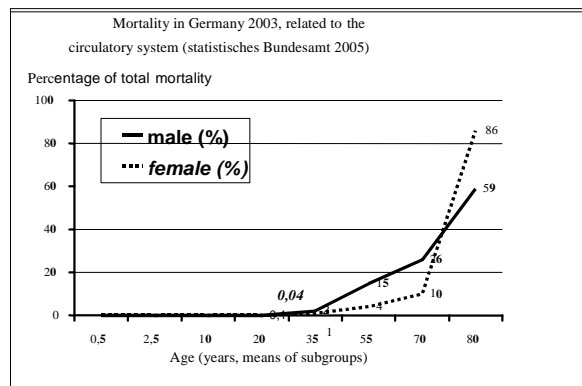
		female & male	female	male
1993	total	897.270	481.396	415.874
	circulatory system	440.896	257.184	183.712
	relation	49%	53%	44%
2003	total	853.946	457.676	396.270
	circulatory system	396.622	234.412	162.210
	relation	46%(PL: 46.4)	51%	41%
only ischemic heart disease		163.445		
2003 related to „total“		19% (PL: 14.1)		
<i>Among them:</i>		69.362		
acute & recurrent myocardial infarction		~ 8%		
only cerebro-vascular diseases		75.114		
		9% (PL: 11.1)		

3. Mortality and dependency on age show that most of lethal cases with reference to the circulatory system occur beyond the age of 65 years (Table 4, Figure 1), for females in 96% for all three types of diseases. The “long-life-status” of those who die from diseases of the

circulatory system will be more distinct in Table 5. The mean age of death, classified for 21 causes of death was 80.6 years for the category “circulatory system”, the second-highest rank (Table 5).

**Table 4.** Mortality and age (years) in Germany in 2003 [1], p. 242

Circulatory system	(f): 65 – 75 (y): 10%, ≥ 75 (y): 86%. – ≥ <b>65 (y): 96%</b>
	(m): 65 – 75 (y): 26%, ≥ 75 (y): 59%. – ≥ <b>65 (y): 85%</b>
Cardiac ischemia	(f): 65 – 75 (y): 11%, ≥ 75 (y): 85%. – ≥ <b>65 (y): 96%</b>
	(m): 65 – 75 (y): 28%, ≥ 75 (y): 54%. – ≥ <b>65 (y): 82%</b>
Cerebrovascular system	(f): 65 – 75 (y): 10%, ≥ 75 (y): 86%. – ≥ <b>65 (y): 96%</b>
	(m): 65 – 75 (y): 24%, ≥ 75 (y): 63%. – ≥ <b>65 (y): 87%</b>



**Figure 1.** Percentage of total mortality from diseases of the circulatory system in Germany, related to age

**Table 5.** Mean age of death and associated causes of death, female & male together, Germany, 2004 [2]

1. Urogenital system (maximum of 21 classified causes of death):	80.9 years
2. Circulatory system (next range):	80.6 years
3. Skin and subcutis (next range)	79.9 years
4. Respiratory system (next range):	79.3 years

## DISCUSSION

Cardiovascular diseases are frequent but they are diseases of the elderly population and not comparable to the epidemics of the middle age.

On the basis of the collected data it seems that the advantages of modern civilization (e.g. health care, nutrition, public hygiene) are obviously more effective than the disadvantages of the “modern”, often lamented, unhealthy lifestyle. Not only did the life expectancy increase over the last years in Poland and Germany (Table 1), but also the quality of life, as can be seen in daily activities of the elderly people or in the percentage of healthy life expectancy (HALE) in Table 2. The resulting *demographic factor* is a serious problem for life annuity insurance and health insurance companies and, consequently, a tremendous stress to the policymakers.

The “fight” against the high percentage of cardiovascular diseases has to account for the fact that the percentage is high, but, indeed, associated with the second highest rank of the age of death from among 21 classified causes of death in Germany (Table 5). The following questions need, therefore, to be addressed:

1. How effective may preventive physical and other activities to prolong life be, especially with reference to the cardiovascular system?
2. How many years can we gain by practicing physical activities?
3. Is it an advantage to gain more years, if these are associated with the possibility of cerebral insufficiency (Alzheimer’s disease), increasing with age?
4. Is risky behaviour a risk factor? *No risk, no fun* is a well known motto in Germany with reference to sports, but fun by which type of risk for older people?

As for other aspects of preventive sports related to “aging and physical activity” two guidelines must be taken into consideration: 1. Be careful with regard to the damages to the muscular-skeletal system; 2. Acute and chronic damages are not desired but unavoidable side effects of physical activities.

For comparison, occupational health preventive medicine means also: 1. Prevention of accidents; 2. Avoidance of accidents. But is this realistic in sports?

What is the common sense of no risk, no fun for the aging groups?

In the author’s view as a physician it is necessary to make an appeal to those who initiate and organize physical activities for aging groups:

- No “self-made sports” without competent care
- Prevention of accidents
- Regard of the multi-morbidity of aging people.

Therefore, benefits of physical activity should be balanced with the risks of sport accidents and chronic damages of the skeletal system, including lethal sport accidents – and with sport-related acute myocardial ischemia. Nevertheless, preventive programs for physical activities *in special groups* with special indications seem to be efficient, but only if combined with professional care to avoid damages by bad execution.

Physical activity as a preventive aspect should regard the involved health risks as well. To prevent these risks a preventive aspect should be also considered. Frequent chronic damages of the skeletal system will reduce the quality of life or even the ability to work, whereas motor mobility up to an old age may increase the quality of life for those who like to practice sports. The following questions remain: Is sport then a bitter medicine or a bad remedy? Can physical (and mental) flexibility be enforced by daily sportive activities? To what extent does this flexibility lie in our hands, and to what extent is it beyond our control?

In conclusion it can be stated that preventive medicine for older people should be seen as a complex system with many interacting variables, including *risk factors* and *risk behaviour*.

Therefore, physical activity for older people cannot be justified with simple, mono-causal arguments.

## REFERENCES

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