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A Psychosocial Comparison of 35- and 55-Year-Old Men and Women in Sweden and Estonia: The Swestonia Cardiovascular Risk Factor Study

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During the past decade, the incidence of coronary heart disease (CHD) has declined in the United States and in Western Europe, but has increased in Eastern Europe and in many non-European countries. This study is a baseline comparison of psychosocial factors in a random sample of 35-year-old and 55-year-old men and women from Tartu, Estonia and Sollentuna, Sweden, who will be followed longitudinally to investigate CHD risk. One hundred men and women from each country in each age group were invited by letter to participate in a study of risk factors for CHD. Complete data were available for 279 Estonians and 272 Swedes. All participants were given the same physical examination and answered the same self-report questionnaires concerning demographics, lifestyle, and psychosocial factors. In general, Swedish men and women in both age groups rated their quality of life higher than Estonians. Self-reported health and depressive symptoms, both of which have predicted CHD risk, were also worse in Estonians than in Swedes. The psychosocial differences found here, together with the lack of major differences in traditional risk factors, reflect the results found in other East–West comparisons. Implications for CHD risk are discussed.

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During the past two or three decades, Eastern and Western Europe have come to be characterized by divergent mortality trends. Life expectancy has continued to rise in Western Europe since the second World War, but in Eastern Europe it has stagnated, and actually decreased since the mid 1960s (Watson, 1995). This has led to what has been termed the "East–West public health divide" (Vågerö & Illsley, 1992). Coronary heart disease (CHD) is the main cause of death in West European countries, representing about 40% of all cause mortality before the age of 74 (Marmot, 1992). During the past decade, the incidence of CHD has declined in the United States and in Western Europe (Sans, Kesteloot, & Kromhout, 1997; Uemura & Piza, 1988) but increased in Eastern Europe and in many non-European countries (Feachem, 1994). An overview of mortality in 50 European countries shows Sweden as having the second highest male life expectancy and Estonia the seventh lowest (Bobak & Marmot, 1996). In Sweden, age-adjusted mortality rates from cardiovascular disease have declined steadily since the beginning of the 1980s, whereas in Estonia, they actually increased for several years following the fall of the communist regime in the early 1990s, subsequently returning to the level of the 1980s in 1995 (World Health Organization, 2000). The mortality rate in Estonian women has remained fairly constant and is now at approximately the same level as that of Swedish men. The mean life expectancy for Estonian men is now 64 years, compared to 76 years for Swedish men. The reason for this discrepancy is not known, however, the recent decade's fluctuations in Estonia indicate that the causes are unlikely to be genetic. There is a consensus that total serum cholesterol, blood pressure, smoking, and low physical activity are major modifiable risk factors for CHD and these risk factors have served as the basis for different prevention programs all over the world (Manson et al., 1992; Pajak, Tuomilehto, & Ruokokoski, 1988). However, the fact that the disparities increased after the collapse of the communist regimes in 1989 (Bobak & Marmot, 1996), when the economic situation deteriorated, has stimulated many researchers to begin investigating psychosocial factors as contributors. This line of reasoning has been strengthened by results from the 26 country Multinational Monitoring of Trends and Determinants in Cardiovascular Diseases (MONICA Study), that has revealed large intercountry differences in risk factor distribution. The MONICA comparison between Eastern and Western European countries showed that a combination of classical risk factors could explain only part of the observed CHD mortality differences between countries (Ginter, 1995). The large remaining component of unexplained differences in CHD occurrence between regions and socioeconomic groups has continued to stimulate a search for additional risk factors. Accumulating data from longitudinal and cross-sectional epidemiological studies, post myocardial infarction studies, and experimental animal studies have established a strong link between certain

psychosocial factors and the pathogenesis of CHD (Rozanski, Blumenthal, & Kaplan, 1999). Examples of such factors include the balance between psychological demands and control at work (Karasek & Theorell, 1990), lack of social support (Knox & Uvnäs-Moberg, 1998), depression and depressive symptoms (Anda et al., 1993; Barefoot et al., 1996; Barefoot & Schroll, 1996), hopelessness (Anda et al., 1993), and poor perceived health (Kristenson, 1998). In contrast, psychosocial factors such as social support (Berkman, Leo-Summers, & Horwitz, 1992; Kawachi et al., 1996) have been identified as protective. Although knowledge concerning the mediating mechanisms is incomplete, elucidation of the basic pathophysiology underlying the relation between psychosocial factors and CHD is expanding rapidly (Rozanski et al., 1999). Overwhelming data now indicate that emotions associated with psychosocial stressors and buffers influence not only health behaviors, but also neuroendocrine processes that can predispose to CHD risk (Knox & Uvnäs-Moberg, 1998).

Researchers have hypothesized that the stress resulting from the changing political situation in Eastern Europe during recent decades may play a causal role in the CHD mortality differences (Kristenson, 1998). The dissolution of the Soviet Union led to great expectations for economic improvements that in many cases have not been realized. Transition to a free-market economy has been difficult and in many cases involved a deterioration in life style, poorer health behaviors (e.g., increased smoking and alcohol consumption), and increased stress from problems such as unemployment.

The aim of the Swestonia study is to characterize and longitudinally follow a representative sample of 35- and 55-year-old men and women in Sweden and Estonia to investigate psychosocial factors that may be involved in cardiovascular risk. A comparison of traditional risk factors in the Estonian and Swedish study groups has been described elsewhere (Knox et al., 2001), so this article will focus on a baseline cross-cultural comparison of psychosocial factors in Sweden and Estonia.

METHOD

Participants

The data described here are the cross-sectional results from the first examination of psychosocial factors in an ongoing prospective study of Swedes and Estonians. It compares a random sample of 35- and 55-year-old men and women from Tartu in Estonia and Sollentuna in Sweden, two municipalities of about the equal size (60,000 inhabitants) that were examined during the same period from fall through spring of 1994 to 1995. The purpose of the two age cohorts was to investigate whether the changing economic and political conditions in Estonia have had differ-

ing effects on people of different ages. One hundred men and women from each town and each age group were randomly chosen from their national population registries and invited by letter to participate in a study of CHD risk factors. If the participants had not responded to the invitation within 10 days, a second letter was sent. Finally, if there was no answer, they were contacted by telephone. Exclusion criteria were the presence of serious acute or chronic diseases, which could prevent participation or invalidate the results of the investigation. The resulting 35- year-old sample consisted of 78 Estonian men, 63 Estonian women, 66 Swedish men, and 74 Swedish women. The 55-year-old sample consisted of 67 Estonian men, 71 Estonian women, 71 Swedish men and 61 Swedish women. Most of the missing data were due to the fact that people in the registries had moved. Statistical tests showed no significant difference in educational level between groups in the two countries.

Procedure

The study was run in both countries simultaneously. Each participant underwent a health check comprising a physical examination that included a fasting blood draw, measurements of weight, height, waist:hip ratio and blood pressure (sitting after 10-min rest). Before seeing the doctor, the participants were asked to fill in a self-report questionnaire concerning demographics, health behaviors, self-rated health, quality of life, and other psychosocial factors. Blood samples, including analyses of serum lipids and glucose, were analyzed at the Department of Clinical Chemistry, Karolinska Hospital, Sweden.

Psychosocial Measures

Quality of Life was assessed using the Gothenburg Quality of Life Instrument (GQLI; Tibblin, Svärdsudd, Welin, Erikson, & Larsson, 1993). Items covered several quality of life areas, including social well-being: home, family, housing, work situation, financial situation, leisure; mental well-being: patience, mood, self-esteem, energy, sleep; physical well-being: perceived health, hearing, vision, memory, fitness, appetite; and feelings of being appreciated (both within and outside of the home). Items were rated on a seven-point Lickert scale ranging from 1 (*very bad*) to 7 (*excellent, could not be better*).

Depressive mood was assessed with nine yes or no questions, and the number of yes answers was summed so that higher scores indicate more depressive symptoms (Pearlin, Menaghan, Lieberman & Mullan, 1981). Items included lack of enthusiasm for doing anything, crying easily, feeling downhearted or blue, feeling lonely, having poor appetite and trouble sleeping, and feeling hopeless about the future.

Mastery, as expressed primarily by whether or not the respondent felt that he or she had control over what happened in his or her life (Pearlin et al., 1981), was measured by seven items, each item answered on a four-point scale from 1 (*not at all*) to 4 (*a lot*). Higher values indicate higher mastery or a more internal locus of control. The items included ability to change important things in one's life, feeling helpless in dealing with problems, having control over what happens to oneself both now and in the future, and whether or not the person felt she or he could do anything she or he set his or her mind to do.

Self-esteem (Pearlin et al., 1981) was measured on a four-point Likert scale from 1 (*not at all*) to 4 (*a lot*). There were 10 items such as: "I feel that I am a person of worth", "I feel that I have a number of good qualities", "I feel that I am a failure", or "I do not have much to be proud of".

Type A behavior was measured using a 10-item scale developed for use in primary health care in Sweden (Karlberg, Krakau, Sjödén, & Undén, 1997). Higher values indicated less Type A behavior.

Statistical Methods

Mean differences in psychosocial factors and self-rated health between countries, genders, and age groups were analyzed with Student's *t* test.

RESULTS

Table 1 (men) and Table 2 (women), shows the differences between countries with respect to psychosocial factors and self-rated health.

Quality of Life

In Sweden both men and women rated their general satisfaction in most quality of life areas as significantly higher than Estonian men and women. This was true for the 35-year-olds as well as the 55-year-olds. Estonians in both age groups rated their housing, economy, leisure, and feelings of being valued significantly lower than Swedes of the same age and sex. The 55-year-old Estonian men (but not women) also rated self-esteem, endurance, and energy lower than their Swedish counterparts. The 35-year-old Estonian women (but not men) rated memory, mood, energy, and self-esteem significantly lower than 35-year-old Swedish women. Both Estonian women and men in the 35-year-old age group also reported significantly lower mastery than their Swedish counterparts.

TABLE 1
Mean and Standard Deviation for Study Group Characteristics for Men in Sweden and Estonia, Differences Between Countries Tested by *t Test*

	35-Year-Olds					*55-Year-Olds*				
	Estonia		*Sweden*			*Estonia*		*Sweden*		
Quality of life	*M*	*SD*	*M*	*SD*	*Sign Level*	*M*	*SD*	*M*	*SD*	*Sign Level*
Family	5.0	1.6	5.2	1.4	ns	5.1	1.4	5.9	1.0	***
Housing	5.1	1.4	5.6	1.4	*	5.1	1.4	6.3	1.0	***
Work	4.5	1.5	4.7	1.5	ns	4.3	1.9	4.7	1.5	ns
Economy	4.1	1.4	4.8	1.5	**	3.8	1.5	5.4	1.3	***
Self-rated health	4.5	1.3	5.7	0.9	***	3.7	1.5	5.8	0.9	***
Leisure	4.2	1.6	4.9	1.2	**	4.2	1.5	5.6	1.1	***
Hearing	6.2	1.0	6.2	1.1	ns	5.0	1.5	5.4	1.4	ns
Vision	5.7	1.5	5.9	1.3	ns	3.7	1.6	5.1	0.9	***
Memory	5.0	1.3	5.4	1.1	ns	4.3	1.4	5.2	1.1	***
Fitness	4.7	1.3	4.2	1.3	*	4.1	1.2	4.4	1.1	ns
Appetite	5.7	1.2	6.4	0.8	***	5.4	1.2	6.2	1.0	***
Mood	4.9	1.2	5.1	1.2	ns	4.7	1.3	5.7	1.0	***
Energy	5.0	1.1	5.1	1.1	ns	4.6	1.2	5.3	1.0	***
Endurance	4.9	1.4	4.9	1.2	ns	4.7	1.2	5.3	0.9	**
Self-esteem	5.1	1.2	5.3	1.3	ns	4.9	1.3	5.8	0.9	***
Sleeping	5.2	1.6	5.4	1.4	ns	4.5	1.6	5.7	1.3	***
Appreciation outside home	4.9	1.1	5.5	1.0	**	4.6	1.3	5.7	0.9	***
Appreciation at home	5.4	1.2	5.9	1.0	**	4.9	1.3	6.1	0.8	***
Depression	3.6	2.2	1.8	2.1	***	3.2	2.3	1.3	1.8	***
Type A	2.1	0.3	2.2	0.3	*	2.1	0.4	2.3	0.4	*
Mastery	3.1	0.4	3.3	0.4	**	3.0	0.4	3.3	0.4	*

*$p < .05$. **$p < .01$. ***$p < .001$.

Depressive Symptoms

There were also large differences between countries with respect to depressive symptoms, with Estonians in both age groups reporting twice as many as Swedes. Estonian 55-year-old men also reported a lower locus of control than same-aged Swedish men, but Estonian and Swedish women did not differ in this respect.

Type A Behavior

Estonians, with the exception of 35-year-old Estonian men, reported slightly more Type A behavior.

Self-Rated Health

With respect to the proportion of people in each country rating their health as "poor," there were pronounced differences. Estonians rated their health significantly lower then Swedes ($p < .001$), independent of age and sex. In the younger age group, 20% of Estonian men and 24% of Estonian women rated their health as low. The corresponding values for Swedes were 2% and 0% respectively. In the 55-year-olds, 39% of Estonian men and 45% of Estonian women rated their health as poor, whereas the values for Swedes were 4% and 8%, respectively.

TABLE 2
Mean and Standard Deviation for Study Group Characteristics for Women in Sweden and Estonia, Differences Between Countries Tested by *t* Test

	35-Year-Olds					*55-Year-Olds*				
	Estonia		*Sweden*			*Estonia*		*Sweden*		
Quality of Life	*M*	*SD*	*M*	*SD*	*Sign Level*	*M*	*SD*	*M*	*SD*	*Sign Level*
Family	4.8	1.5	5.3	1.3	ns	4.6	1.5	5.5	1.4	***
Housing	4.5	1.7	5.8	1.2	***	4.8	1.4	6.1	1.1	***
Work	4.4	1.7	4.7	1.5	ns	4.6	1.6	4.5	1.5	ns
Economy	3.7	1.4	4.6	1.5	**	4.0	1.6	5.1	1.5	***
Self-rated health	4.4	1.4	5.7	1.0	***	3.6	1.6	5.6	1.4	***
Leisure	4.3	1.7	5.2	1.2	**	4.3	1.4	5.0	1.4	**
Hearing	6.0	1.3	6.4	1.0	*	5.0	1.8	5.5	1.4	ns
Vision	5.5	1.7	5.6	1.4	ns	3.5	1.6	4.6	1.2	***
Memory	4.9	1.5	5.5	1.2	0	3.9	1.6	4.9	1.1	***
Fitness	4.2	1.5	4.5	1.5	ns	3.9	1.7	4.3	1.3	ns
Appetite	5.2	1.5	6.2	1.1	***	4.9	1.6	6.0	1.2	***
Mood	4.5	1.5	5.3	1.1	***	4.5	1.4	5.4	0.9	***
Energy	4.4	1.3	5.1	1.2	**	4.2	1.6	5.1	1.1	***
Endurance	4.7	1.2	4.8	1.1	ns	4.5	1.5	4.8	1.2	ns
Self-esteem	4.8	1.4	5.5	1.1	**	4.6	1.3	5.0	0.9	ns
Sleeping	5.3	1.7	5.6	1.5	ns	4.3	1.8	5.2	1.7	**
Appreciation outside home	4.8	1.3	5.5	1.0	***	4.6	1.4	5.5	0.9	***
Appreciation at home	5.4	1.6	5.9	1.4	ns	4.9	1.7	5.9	1.0	***
Depression	4.9	2.2	2.1	2.4	***	4.4	2.4	2.5	2.2	***
Type A	2.1	0.4	2.1	0.4	ns	2.0	0.5	2.2	0.3	**
Mastery	3.0	0.5	3.3	0.4	**	3.0	0.4	3.0	0.4	ns

*$p < .05$. **$p < .01$. ***$p < .001$.

Life Quality Profile

To facilitate between-country comparisons, a "life quality profile" was calculated showing the Estonians' ratings expressed as a percentage of Swedish ratings. These profiles can be seen in Figure 1 (35-year-olds) and Figure 2 (55- year-olds). The results indicate a less favorable profile for 55-year-old than for 35-year-old Estonians. The differences were especially noticeable in ratings of economy and leisure. Younger Estonian women were less satisfied than men in most of the quality of life areas, whereas differences between men and women in the older age group were less noticeable. The exception to this was in areas representing mental well-being in 55-year-olds, where Estonian men had a less favorable profile than women.

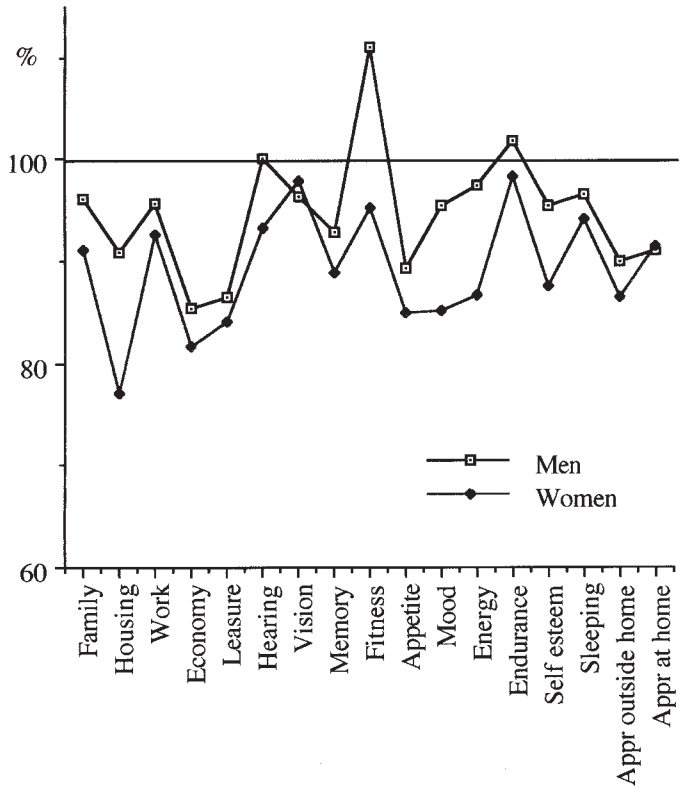

FIGURE 1 Relative ratings of life quality dimensions for the 35-year-olds. Estonians' ratings expressed as percentage of Swedish ratings.

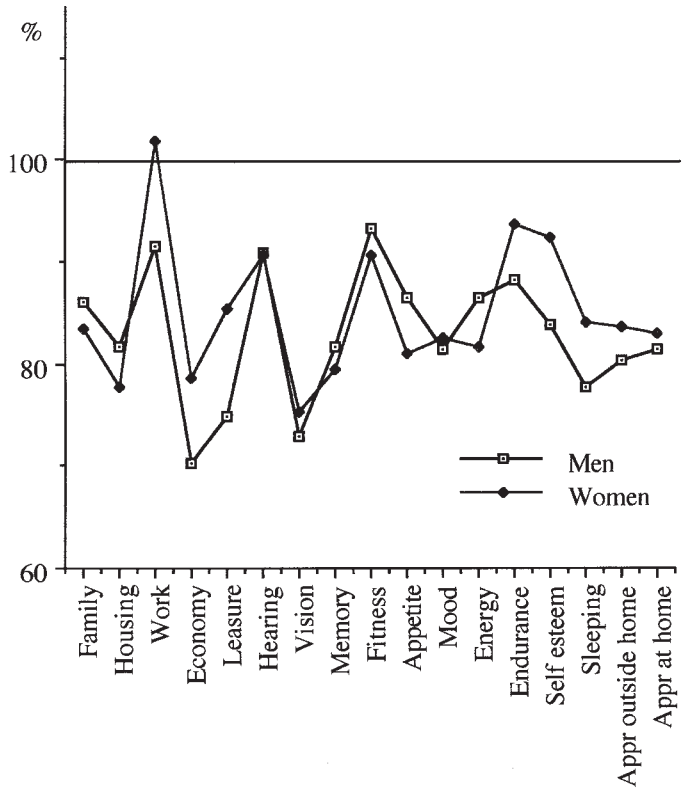

FIGURE 2 Relative ratings of life quality dimensions for the 55-year-olds. Estonians' ratings expressed as percentage of Swedish ratings.

DISCUSSION

The Swestonia cardiovascular risk factor study, initiated in 1996, is a population-based comparison of CHD risk factors in 35- and 55-year-old Swedish and Estonian men and women. The objective of this article is to provide a baseline comparison of psychosocial factors and self-rated health that may be of importance for future CHD risk in this cohort.

The results showed that Swedish men and women in both age groups rated their general satisfaction in most quality of life areas as significantly higher than men and women in Estonia. Areas showing the largest between-country differences in both genders were self-rated health and depressive symptoms, with Estonians having the worst profile. Similar results were found in the LiVicordia study, a comparison of psychosocial and CHD risk factors in Swedish and Lithuanian cohorts

(Kristenson et al., 1998). Data from the World Values Survey, 1990, revealed a striking east–west divide in self-rated health among people in the age group 35 to 64 years, that was of greater size than the gender gap in self-rated health (World Values Study group, 1994), as well as a strong correlation between self-rated health and mortality (Carlson, 1998). In this study, Estonians also reported lower self-esteem and a lower sense of mastery, or control over their lives than Swedes, reflecting results from LiVicordia (Kristenson et al., 1998).

Significantly, the cultural discrepancies in quality of life and other psychosocial factors reported here, could not be explained by differences in educational level, which did not differ significantly between the two countries. Comparisons between Estonians and Swedes with respect to traditional risk factors have been described elsewhere (Knox et al., 2001). Those results showed only small differences in serum lipids and blood pressure, sometimes to the Estonians' advantage. More Estonians smoked, but in the older age group, Swedes had smoked longer. Thus, traditional risk factors do not seem to offer an adequate explanation for the discrepancy in CHD mortality between the countries. Also, these results reflect conclusions from the LiVicordia study, where traditional risk factors do not seem to suffice as an explanation of the different mortality rates between Lithuanians and Swedes. That study has postulated psychosocial strain and oxidative stress as possible alternative explanations (Kristenson, 1998).

Although multiple *t* tests increase the possibility of random significances (mass significance problems), the emphasis of this study is on the overall profile. The trend toward lower quality of life in Estonia in both age groups is consistent even if a few of the associations turn out not to be significant.

One problem with comparing quality of life between different countries is that there could be cultural reporting bias. Although it was not possible to test reporting bias in this study, other multinational studies have indicated good association between self-report of quality of life and more "objective" measures. In a study of happiness, the connection between global questions about happiness (with quality of life) measured in different countries and several indicators of social welfare were investigated (Veenhoven, 1993). The results showed a clear positive association between the "subjective" measures of happiness and the more objective indicators of social welfare. The authors' conclusion was that questions on global happiness or life quality were valid measures for comparing differences between countries. They also suggested that such subjective measures could be used as an indication of the individual's perception of how well a society fulfils the individual's needs. Measures of self-rated health have also been used as cross-cultural indicators of health status, and results from several studies show that it is a strong, independent predictor of future morbidity and mortality, despite differences in wording and study design (Bjorner et al., 1996).

The purpose of measuring psychosocial factors in this study was to investigate the extent to which they contribute to differences in subsequent cardiovascular dis-

ease morbidity and mortality between Sweden and Estonia. Those results will have to wait until further longitudinal measures are made. However, other studies suggest that the strong differences in psychosocial profiles between Sweden and Estonia may indicate a partial explanation for between country differences in risk. Research in recent decades has demonstrated the importance of social, environmental, and behavioral characteristics for the development of CHD (Rozanski et al., 1999). Self-rated health has been demonstrated to predict longitudinal mortality (Kaplan, et al., 1996) and myocardial infarction in a comparison of Dutch and Lithuanians (Appels, Bosma, Grabauskas, Gostautas, & Sturmans, 1996). In Swestonia, one of the strongest differences between countries in men and women of both age groups, was self-rated health. Several other studies have also used CHD morbidity or mortality or both as endpoints and found an association between self-rated health at baseline and future incidence of, or death from CHD (Idler & Kasl, 1991; Pijls, Feskens, & Kromhout, 1993; Wannamethee & Shaper, 1991). A number of possible explanations for the independent association with self-rated health have been discussed. Poor self-rated health might reflect subclinical disease or may be associated with personality characteristics such as anger, hostility, or depression that have shown associations with CHD via neuroendocrine pathways. Self-rated health may also be related to "vital exhaustion," sleep problems, or other similar states, that have been shown to predict mortality.

Recent epidemiological studies evaluating the relation between depression and CHD, have consistently demonstrated a significant prospective association between the occurrence of major depressive episodes and the incidence of cardiac events (Rozanski et al., 1999). Further, the presence of depressive symptoms in the absence of diagnosed major depression, is also associated with an increased risk for cardiac events (Anda, Williamson, Jones, Macera, & Eaker, 1993). A number of studies also support a gradient between the magnitude of depression and future cardiac events (Anda et al., 1993; Everson et al., 1996). These data suggest that the risk for CHD associated with depression exists along a continuum, based on magnitude. One important aspect of depression is the absence of hope. Recently, prospective epidemiological studies have reported an association between symptoms of hopelessness, a component of depression, and the development of CHD (Anda et al., 1993; Everson et al., 1996). It has been demonstrated that men experiencing hopelessness develop significantly more carotid artery atherosclerosis over time than those who don't (Everson, Kaplan, Goldberg, Salonen, & Salonen, 1997).

The large differences between Estonia and Sweden in terms of self-rated health, depression and quality of life, indicate that people in Estonia are much less content with their life situations than Swedes. These differences were more pronounced in the 55-year-old cohort than in the 35-year-old cohort. It has been proposed that disease in adult life is related to accumulation of advantage and disadvantage throughout the life span. Although this is an attractive proposition with evidence to support it, it does not explain the fluctuating age adjusted rates of CHD in Estonian

men that occurred in the early 1990s, after the dissolution of the Soviet Union. During that same period in Sweden, CHD rates continually declined. These data suggest that there were additional factors over and above cumulative effects, that affected the rise in CHD in central and Eastern Europe (Marmot, 1998).

According to accumulating literature, psychosocial stressors interact synergistically with conventional CHD risk factors to heighten the risk for cardiac events (Rozanski et al., 1999). Hopefully, the longitudinal nature of the Swestonia Study will eventually elucidate specific aspects of the psychosocial environment that contribute to the development of CHD.

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