

Change, Psychosocial Stress and Health in an Era of Globalization

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Abstract. In the last decades, globalization has produced an acceleration of social, economic and political changes worldwide. These changes had a number of positive effects including enhancing political freedom, living standards and health conditions. However, many of them have also produced adverse health consequences, especially when they have been implemented in a sudden, rapid and unexpected way. This is especially true among those populations whose ability to adjust to the new circumstances generated by rapid change was limited. The aim of the present research project was to examine the health consequences of rapid social, economic and political change following globalization as well as to investigate the role of psychosocial factors in explaining these relationships. A theoretical framework proposing major psychosocial pathways connecting rapid change with health-related outcomes has been developed. A series of case studies from countries affected by rapid change supported the hypothesized relationships included in the framework. Countries of interest were the former Soviet Union nations, China, Japan, Micronesia Islands, New Zealand, Australia, Canada, and the United States. The limited ability of certain populations to adjust to rapid changes induced by globalization as well as the pace of change of social, economic and political reforms are discussed.

1. Introduction

In the last three decades, there has been an acceleration of social, economic and political change worldwide. Globalization produced a series of rapid changes in different sectors of society contributing to enhance political freedom, living standards and health conditions. However, many of these changes have also caused adverse consequences, especially when they have been implemented in a sudden, rapid and unexpected way. Sharp increases of income inequality across countries and within countries influenced the social organization of societies as well as social relations and community participation. Changes in the labor market influenced unemployment, job security and the type of labor affecting the lives of millions of families and workers. Urban and environmental changes had important effects on the quality of life of communities, with particular reference to those of low socioeconomic status. Changes in the social and health sectors have influenced social security and access to healthcare among vulnerable populations.

Overall, such rapid changes have caused social and economic uncertainty among individuals, families and institutions [1]. However, growing instability disproportionately affected populations whose ability to adjust to the new circumstances was limited. The resulting psychosocial stress and disruption of social relations had a very negative impact health and health behaviors. Psychosocial factors mediate the relation between rapid change and health-related outcomes in at least two major ways. First, rapid change at the

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macro level such as economic downturn and income inequality affect health through individual perceptions of place in the social hierarchy producing negative emotions that are translated “*inside*” the body into poorer health via psycho-neuro-endocrine-immunologic mechanisms and self-destructive behaviors such as alcohol abuse and suicide. Second, perceptions of relative position and negative emotions are also translated “*outside*” the individual into antisocial behaviors such as homicides and traffic accidents, reduced civic participation, and less social capital and social cohesion within the community [2].

The aim of the present research project is to examine the health consequences of rapid social, economic and political changes following globalization as well as to investigate the role of psychosocial factors in explaining these relationships. The project aims at improving our understanding of the determinants of mortality changes worldwide by examining the effect of social and economic uncertainty, psychological stress, social relations, and health-related behaviors. First, a definition of stress and a theoretical framework explaining major psychosocial pathways connecting rapid change and health will be presented. It will follow a discussion of major concepts of the framework. Then, a series of case studies supporting the hypothesized relationships will be used to examine stress-related health outcomes among those countries and those populations particularly affected by rapid social, economic and political change. Countries will include the former Soviet Union, China, Japan, Micronesia Islands, New Zealand, Australia, Canada, and the United States. Finally, implications for research, public health and public policy will be discussed.

2. Stressors, Stress and Stress Response

There is disagreement about the meaning of “stress”. The numerous definitions provided emphasize different aspects of stress: stressful events, individual appraisals of situations provoking stress, and stress responses. These differing definitions emerge from three distinct approaches to understand stress: environmental, psychological, and biological. The basic assumption of the environmental approach is that stress is an effect of objective stressful situations. Stressful life events (*stressors*) can be therefore directly associated with physical and psychological illnesses as well as with poor health behaviors. The psychological stress tradition places emphasis on the organism’s perception and evaluation of the potential harm posed by objective environmental experiences. Psychological models of stress argue that events influence only those persons who appraise them as stressful (*perceived stress*). Perceived stress may be associated with negative physical and emotional states as well as with changes in health practices. The biological perspective focuses on the activation of physiological systems that are particularly responsive to physical and psychological demands. Prolonged or repeated activation of these systems is thought to place persons at risk for the development of a range of both physical and psychiatric disorders. Such physiological states may also be responsible for behavioral responses to stress (*stress response*). Two interrelated systems that are viewed as primary indicators of a stress response are the sympathetic-adrenal medullary system (SAM) and the hypothalamic-pituitary adrenocortical axis (HPA) [3].

The environmental, psychological and biological approaches have each focused on a specific part of the model, often ignoring other parts. In response to such limitations, a framework unifying these approaches has been proposed by Cohen, Kessler and Gordon [3] that defines stress as a process in which “*environmental demands tax or exceed the adaptive capacity of an organism, resulting in psychological and biological changes that may place persons at risk of disease*”. The main premise of the model is that each tradition focuses on a different stage of the process through which environmental demands are translated into psychological and biological changes that place people at risk for disease and health-damaging behaviors. The components of the process are environmental demands, stressors, or events; subjective evaluations of the stressfulness of a situation or perceptions of stress; affective, behavioral, or biological responses to stressors or appraisals as stress response. This heuristic model certainly represents a relevant breakthrough in the study of stress process and it helped to broaden the perspectives of each single approach. Despite such advantages, Cohen’s and other models contributing to our understanding of the stress process suffer from a major limitation regarding the elaboration of the environmental part of the model. While most of these models include stressful events such as socioeconomic stressors (e.g. unemployment, job loss and financial constraints) none of them include factors that may influence such stressors at the macro level. Stress process models emphasizing the role of socioeconomic stressors have been mainly interested in stressors or life events that directly affect people’s lives, and the way individuals respond to them. Such stressors have been studied as immediate risk factors for disease and health-damaging behaviors by reducing people’s ability to maintain control over their lives. An interesting elaboration of the stress process model emphasizing factors influencing immediate stressors of people’s life has been proposed by Schultz and colleagues [4]. These authors presented a stress process model based on results of a community assessment exercise in which a random sample of 700 women living on an underprivileged area of Detroit was asked about stressors in their community. The model included immediate stressors of people’s life such as poor quality of housing, lack of transportation, concern about physical safety and not having enough money to pay bills. It also emphasized the role of stress-mediating mechanisms at different levels (social, individual, physical and genetic). Yet, even this model failed to address the macro social and economic factors influencing socioeconomic stressors and stress. None of these models have attempted to integrate macro social, economic and political factors into a coherent framework linking such factors with stress and behavioral, psychological and biological responses to stress. As a result, possible broader causes of stress are seldom, if ever, mentioned. Unfortunately, such decontextualisation of the stress process limits our understanding of the causal model involved in the stress-health linkage. It may also result in misleading interpretations regarding the relationships of variables included in the stress process because of lack of attention to the context within such relationships exist.

3. Theoretical framework of Rapid Change, Psychosocial Stress and Health

The present framework attempts to study the relations between rapid change (stressor), individual perceptions of rapid change (perceived stress) and health-related outcomes (stress response) as well as to fill an important gap in the conceptualization of the stress

process. Rephrasing a statement often used in the literature on socioeconomic status and health, it is crucial to know “how macro socioeconomic stressors get under the skin” and cause physical, behavioral and psychological reactions. Similarly to previous models, the present framework takes into account a series of stress-buffering factors (individual, physical and genetic). However, it includes broader factors such as social capital and political participation that may influence both social and economic uncertainty (e.g. poverty) and macroeconomic changes (e.g. a rise in income inequality). The framework entails multiple underlying mechanisms linking rapid change, social and economic uncertainty, stress, health behaviors and health. It is based on previous stress process models, general susceptibility theory and social causation theory. General susceptibility theory maintains that members of lower social classes experience worse health by virtue of their social position. Rather than focusing on a specific disease, the emphasis is on a general pattern of vulnerability to different health-related outcomes [5]. Social causation theory identifies social position as a determinant of health and focuses upon factors not readily accessed within other theories, such as psychosocial factors [6-10]. The framework hypothesizes that macro level stressors (such as rapid changes) are associated with higher levels of psychosocial stress that, in turn, influence health behaviors and health. Stress is mainly associated with feelings of loss of control and powerlessness that are detrimental to health behaviors and health. The framework emphasizes socioeconomic stress in contrast with psychological and individual-based theories that see stress primarily associated with the incapability of the individual to have control over his/her life and the environment [11], or with a lack of resources and coping skills to face the stressful events [12]. The framework assumes that, despite the importance of the individual actively interacting with the environment, objective stressors such as unemployment, job insecurity and financial problems have a major and potentially greater negative impact on health and health behaviors.

The framework, represented in figure 1, can be explained as follows: *rapid changes* (e.g. rapid flexibilization of labor market²) may create or influence *social and economic uncertainty* (e.g. job insecurity). They may also simultaneously provoke multiple sources of uncertainty for the individual (e.g. job insecurity and loss of health insurance). When confronted by socioeconomic demands, people appraise (*primary appraisal*) whether such stressors pose a potential threat (e.g. “If I lose my job I can not support my family!” and/or “what will happen to me if I get a disease now that I do not have health insurance?”), and assess whether sufficient adaptive capacities are available to cope with such stressor/s (*secondary appraisal*). If individuals find these changes taxing or threatening, and at the same time view their coping skills and resources (*stress-buffering*

² Labour market flexibilization can be explained from macro, meso and micro perspectives. From a macro perspective is a policy measure to tackle high unemployment and free the economy from rigidities. From a meso perspective flexibility refers to the extent to which companies are able to continually adapt the input of people and resources to the constantly changing demands from the environment and from the different labour processes. From the perspective of individual employee (micro perspective) can be defined as the ability of employees to attune the employment situation as flexibility and adequately as possible to the changing circumstances of personal life. Flexibilization consists in higher temporary and part-time labour contracts, a relaxation of hiring-and-firing regulations, flexible working hours, changes in the regulation of leaves (including sick and maternity leaves), holidays, benefits, pension and wages (and health insurance in the US).

mechanisms) as inadequate (e.g. “I do not know where to look for a job if I lose this one” and/or “I can not afford to pay for my health insurance”), they perceive or feel themselves as under stress (*stress*). Stress is mainly associated with feelings of not having control over important things in life, powerlessness and lost purpose in life. Such feelings can first undermine people’s willingness to adopt certain *health behaviors* (e.g. non smoking, drinking moderately, eating healthy food). They may also affect *health status* (e.g. increased blood pressure, reduced organ impairment through neural (e.g. excitability), and neuro-endocrine (e.g. suppression of immunitary functions) responses. The appraisal of stress may also result in negative emotional states that put a person under risk of psychological health problems (e.g. suicide, depression or anxiety disorders).

[Insert Figure 1]

Social, economic and political changes can also influence stress and health outcomes, not only through social and economic uncertainty, but also through modifications of stress-buffering mechanisms at the societal and individual level. *Rapid changes* (e.g. rise in income inequality) may, for example, reduce social cohesion and reduce the amount of social support available to individuals (*stress buffering mechanisms*). Such changes may indirectly increase *stress* because of the stress-buffering effect of these factors. Stress buffering mechanisms such as social cohesion and social support can also act as protective factors against *health-damaging behaviors* (e.g. alcohol abuse) through social norms or moral guidance. They may also have a direct effect on *health status* (e.g. depression, anxiety disorders, and suicide) especially through protection against social isolation and social exclusion.

3.1 Rapid change

Rapid changes can be conceptualized as stressors related to the macro social and economic environment. In general, stressors are discrete and observable environmental and social events that may produce either acute or chronic stress on individuals [13]. A major characteristic of life events or stressors is controllability. According to the classification of stressors included in the Social Readjustment Classification [14] economic, occupational, environmental and social stressors are among the least controllable stressful life events. Economic stressors include poverty, financial constraints, and assuming mortgages. Occupational stressors include unemployment, job insecurity, changes of labor conditions and working hours, intensity and nature of work. Environmental stressors refer to poor housing, residential crowding, living in unhealthy neighborhoods (e.g. because of crime, pollution, noise). Social stressors may include change in residence (induced by reallocation of workers), changes in family life such as divorce, spouses beginning work outside home, and reduced access to social security. A further stressor (applicable to those countries without universal access to healthcare such as the US) may be lack of access to health insurance.

3.1.1 Economic changes

Among the economic changes provoked by globalization in the last two decades, a rapid increase of *income inequality* is probably the most important one [15]. According to the

United Nations Human Development Reported published in 1996, the 358 richest persons on earth control assets equivalent to the annual income of 45 percent of the world population [16]. In the United States, the top 1 percent of income earners receive twelve percent of the entire country's pretax income and holds 37 percent of wealth [17]. Such increasing disparities are quite serious because research shows that higher income inequalities are associated with lower life expectancy and higher mortality. Inequality seems to influence population health through different mechanisms and psychosocial stress is one of the most important. The psychosocial effects of income inequality include a decrease of social capital, reduced participation to political and civic life, higher psychological stress and social exclusion [2].

According to Wilkinson, it is not only the inferior material conditions that affect health, but also the social meanings attached to those conditions, and how people feel about their circumstances and about themselves. He based such conclusions on evidence regarding the socioeconomic gradient that does not distinguish merely between the poor and the rest of the society, but affects every rung of the social ladder. Research shows that people who own houses and have two cars are healthier than those who rent houses and have one car [18]. Administrative civil servants are healthier than executives [19], and people in the highest income group are healthier than those only slightly less well-off [20]. This is particularly true in the developed countries, where the stress of relative deprivation, rather than material deprivation, seems having a greater impact on health [2]. Figure 2 shows that there is a strong negative correlation between income inequality and life expectancy at birth ($r=-0.864$; $p<.001$) among the top 21 wealthy nations.

[Insert Figure 2]

Some results from animal studies support these conclusions. Sapolsky [21] has been observing the social relationships among free-ranging olive baboons in Kenya, taking physiological measurements in a way that would probably be unacceptably intrusive for most human subjects. He found that a dominance hierarchy is readily identifiable among male baboons, and there are, on average, significant differences between dominant and subordinate males in the functioning of the endocrine systems. In dominant males, the physiological responses to stress (the fight and flight syndrome) are turned off more rapidly after the stressful events has passed. In subordinate animals, there seems to be a break in the feedback loop, and the stress response continues. Prolonged stress, or rather the responses it engenders, is known to have deleterious effects on a number of biological systems and to give rise to a number of illnesses.

Evans and colleagues interpreted these results in their book *Why some people are healthy and others not?* [22] noting that people in the lower social hierarchies face higher sense of uncertainty regarding a variety of situations including their occupational status, economic security, and residential mobility. They generally have much less control over important things of their life compared to people of higher social positions. In extreme cases, they may result in feelings of "learned helplessness", a response to their unsatisfactory social environment that is unpredictable and uncontrollable and that,

therefore, imposes much greater strain, which may have physical, behavioral and psychological consequences.

3.1.2 Labour market changes

Globalization has been linked to *rapid labor market changes* with particular reference to an increase of short-term employment, changes of labor types, reallocation of workers or career changes and changes of regulations regarding workers' security and rights [23]. According to some authors, such changes are due to increasing imbalances of power between the "business class" and the "working class". There is evidence that they can be very stressful for many working people, especially those in lower occupational positions and when they happen in a sudden and unexpected way.

Short-term unemployment is a serious risk factors for health and health behaviors not only because it is associated with decreased access to basic items, housing, healthcare and education [24], but also for its psychosocial effects. According to Sen [25] unemployment generates psychological harm because of loss of self-confidence, disruption of social role, anxiety about the future, sense of exclusion, and disruption of family and social relations. Unemployment is also associated with social isolation and social exclusion. The health effects associated with unemployment include suicide, psychiatric morbidities [26], high blood pressure, and the onset of an array of different diseases [27]. The loss of emotional balance caused by unemployment seems also a major risk factor for the adoption of health-damaging behaviors, particularly smoking and alcohol consumption [28]. Figure 3 shows the results of a recent study conducted in Veneto demonstrating that unemployed people were much more likely to be psychologically distressed than all other occupational classes.

[Insert Figure 3]

Another major stressor influenced by rapid change and globalization is job insecurity [29]. Job insecurity is a powerful chronic stressor because it increases life and economic uncertainty especially among low skilled workers. For young people, it is a major obstacle for having a stable life, a marriage, vacations and choices. Job insecurity makes also people more likely to change residence, disrupt family life and the pattern of social relationships that buffer them against stressful life situations. A group of social scientists investigated the health effects of job loss and insecure re-employment among white collars civil servants after the privatization of public services in England. According to their findings, insecure re-employment was associated with increases in minor psychiatric morbidities, and having four or more consultations with a general health practitioner in the last year even, independent of financial strains and health behaviors [26]. A recent study examined changes in the health status of civil servants whose employment security was threatened. According to the authors carrying out the study, threats to employment security have adverse consequences for health status that are unexplained by health selection or health-related behaviors [30]. Another study of the effect of job losses resulting from a factory closure found that health began to deteriorate when redundancies were first announced, before people became actually unemployed [31]. Job uncertainty has also been associated with a variety of adverse mental and physical health outcomes.

Ferrie, Shipley, Stansfeld and Marmot found that loss of job security has adverse effects on self reported health and minor psychiatric morbidity, which are not completely reversed by removal of the threat and which tend to increase with chronic exposure to the stressor [32]. With regard to health behaviours, some studies found a weak to negligible association between job insecurity and health-damaging behaviours [33]. Others reported higher unhealthy behaviours among people [34] employed in insecure jobs.

Another potential stressor influenced by increasing imbalances of power between the “business class” and the “working class” is the work environment. Occupational studies conducted in Sweden, the United States, Germany and England found that most important health-related aspects of the work environment are the amount of control people have over their work, the pressure of work, and the social support they get from colleagues [35-38]. Such conditions are more likely to characterize low status jobs often consisting of repetitive tasks of short duration. There is also substantial evidence that individuals working in stressful occupations, defined as having high demands and low control over tasks, are more likely to adopt unhealthy behaviors and poor health lifestyles [39]. A recent study conducted in Japan among 6,759 rural workers found that high psychological demands at work were associated with heavy smoking, and exaggerated prevalence of alcohol drinking. Low job control and job strain were also associated with lower consumption of vegetables [40].

Changes in the labor market may have a negative impact on stress-buffering mechanisms at both the societal (e.g. social capital) and individual level (e.g. marital status and social support) as well. For example, labor market changes have been associated with increasing residential mobility of workers. Residential mobility reduces social cohesion and sense of community that are powerful stress-buffering mechanisms [41]. Recently, there have been significant changes in the labor market with an increasing participation of women. In the US, the female civilian labor force reached 57% by the end of 1999 [42] while working mothers increased from 52% in 1975 to almost 72% in 1999 [43]. Families in which only the husband was employed comprised 19.3% of all-married couple families in 1999, and the proportion of married-couple families in which both husband and wife were employed was 53% [42]. The rise of female-labor participation may have dramatically affected family life and relationships. A study in the US showed that growing participation of women in the labor market over the last hundred years was associated with substantial increases of divorce and separation [44]. The effects of having both parents working full-time may also have an important impact on children’s health, with particular emphasis on emotional functioning.

3.1.3 Urban and environmental changes

Income inequality and neo-liberal market policies have been associated with an increase of *urban and environmental changes*. In particular, income inequality has been associated with an increase of “urban decline”, [45] and segregation of lower social classes in urban areas [46] while the most privileged groups move to suburbs. In the US, for example, the most affluent Americans have been steadily abandoning metropolitan areas to retreat to suburbs where they have been able to access better services and conditions. The abandonment of urban areas among the richest groups however was associated with

increasing disinvestment on urban services and ultimately with an increasing deterioration of urban life [41]. Lower socio-economic status is likely to be correlated with stressors such as higher population density, inadequate housing, noise, crime, pollution, discrimination, poor access to resources, and with hazards [47]. Residents of low-income communities have also less access to high quality housing, shops, banks, healthcare services and transportation. They also have higher crime rates and lower presence of recreational facilities and parks [48].

Globalization has been linked with a weakening of environmental regulations due to increased imbalances between business and civic society. Policies regulating air and water pollutants, noise, crowding, and presence of toxic agents have a powerful effect on quality of life across communities. These factors disproportionately affect poor communities (e.g. toxic dumping in poor neighborhoods). People living in low income neighborhoods are exposed to several physical hazards such as air and water pollutants, hazardous wastes, pesticides and industrial chemicals [49] and to greater crowding and exposure to noise [50]. The physical environment influences psychological and physical well-being. Research has identified geographic, community and environmental conditions as predictors of social disorganization, chronic illness and health behaviors [24]. Unhealthy environments can get “under the skin” by exposing people to chronic stress due to the amount of hassles and time needed to address basic tasks of living. In particular, lower socio-economic groups find themselves living in harsher environments that are highly stressful and allow few effective solutions or coping. Poor neighborhoods are subject to greater social and economic stress because of crime, traffic noise, lack of facilities, environmental pollutants and low social cohesion [51]. Boardman and colleagues [52] using the 1995 Detroit Area Study found higher levels of psychological distress among residents of disadvantaged neighborhoods. Low socioeconomic neighborhoods have also higher rates of cancer, hypertension, heart disease and upper-respiratory diseases including asthma, bronchitis and emphysema [53]. Environments impact not only physical health, but also mental health, with particular reference to depression and anxiety [54]. Finally, unhealthy environments are related to health-compromising behaviors as already discussed in the previous chapter. A recent study found that men in poor neighborhoods were more likely to smoke than those in less disadvantaged places [55].

Housing availability and housing quality are also major stressors. In particular, homelessness is a very stressful condition associated with a range of different physical and psychological impairments. Housing quality is also an important predictor of health status. Residential crowding has been often associated with increased psychological distress, and poorer health status. Studies on overcrowding, defined as 1.5 persons or more per room, found it to be associated with all causes mortality [56] stroke and cancer [57]. Residential density in the home has also been associated with increased likelihood of infections and with higher death rates from heart disease and respiratory disorders [57]. However, no association has been found between residential density and poor health behaviors.

3.1.4 Changes in the health and social sectors

Globalization can also be associated with *disinvestment in social and health services* as well as with policies diminishing access to social security to citizens. Various types of welfare policies exist in different nations. There is evidence that countries adhering to free-market neoliberal policies have promoted a decline of welfare state measures including the privatization of public services, healthcare and education [58]. According to Davey-Smith and colleagues, “cross nationally, higher levels of both social expenditure and taxation as a proportion of GNP are associated with longer life expectancy” [59]. According to Coburn, poorer life expectancy among countries powerfully adopting neoliberalism is due to the combination of income inequality and changes in social welfare measures [58]. These authors and others, disagreeing with the relative deprivation hypothesis, maintain that income inequality is not mainly associated with health status through social cohesion and psychosocial factors, but it is related through a decline of welfare state measures characterizing societies whose income distribution is skewed towards the richest groups. Lack of social services has a crucial impact on health, especially for the most vulnerable and disadvantaged groups in society. Reduction or elimination of benefits and pensions, the reduction of social expenditures and removal of social safety schemes affects people’s economic status, especially those who are most in need. Such disinvestment in social services is believed to be a major reason for higher level of poverty among countries adopting market solution to manage them.

Residential mobility has been identified as another social stressor. Durkheim was the first researcher postulating that the breakdown in family, community and work ties that occur when workers migrate to different areas (e.g. industrial areas) are detrimental to well-being [60]. Immigrants are usually more vulnerable to social exclusion, discrimination, poverty and unemployment compared to other citizens. They are also more likely to die prematurely and be affected by a variety of diseases. Residential change is known as a stressful event, and has been identified as a risk factor in the aetiology of coronary heart disease (Kasal and Cobb, 1980; Syme et al., 1964). A recent study comparing death rates among immigrants and citizens born in Sweden found that death rates for liver cirrhosis and malignant neoplasms of the trachea, bronchus and lung were about 40-100% higher among immigrants from other Northern countries than among the Swedish born populations [61]. Residential mobility is not only deleterious for individual health, but it also contributes to the erosion of sense of community and social cohesion [41]. An increasingly flexible working population changing jobs and job locations more frequently than in the past is likely to result in more disorganized communities with lower social capital and participation to social and voluntary activities.

Globalization has been accompanied by an increase of privatization of healthcare in many developed and developing nations. As a result, an increasing number of people in have difficulties in getting the healthcare they need. Privatization of medical care is widespread in most developed countries. Among the most developed countries, only the US does not have a universal healthcare system. Ironically, the US also has the most expensive healthcare system in the world. In 1999 the United States spent 53 percent more on health care than any other OECD country spent [62]. Despite such huge costs, in 1999 one out of every six Americans, 32 million adults under the age of 65 and more than

10 million children, remained uninsured [63]. Lack of health insurance, however, is not equally distributed across different social classes, but it is more likely to affect the poorest populations. Accessibility to healthcare, especially for the sick and the elderly of lower social classes, is an important stressor determined by policies at the macro level. Lack of health insurance has been associated with increased mortality and morbidities as well as with reduced utilization of healthcare and preventative-related services [64].

3.2 Stress

Although stress is largely related to objective stressors in the environment, perceived stress is mediated by people's appraisal of the situations. When confronting socioeconomic stressors, people evaluate whether these demands pose a potential threat (primary appraisal) and whether sufficient adaptive capacities are available to cope with them (secondary appraisal). If they find the socioeconomic demands taxing or threatening, and at the same time view their coping resources as inadequate, they perceive themselves as under stress. The negative appraisal of stress may result in negative emotional states such as anxiety, loss of self-esteem and powerlessness. It may also affect deeper feelings of the individuals including life purpose [3, 65].

3.2.1 Primary appraisal

Appraisal refers to the individual's evaluation of the meaning of encounters with the environment. Although not regarded as strictly separate processes, a distinction is often made between primary appraisal and secondary appraisal. Primary appraisal refers to the evaluation of the environmental situation with regard to the person's well-being. The environment can be appraised as either irrelevant, benign-positive or stressful. Within the latter category, there are at least three types of stress appraisal: a) harm/loss; b) threat; and c) challenge. Harm/loss pertains to the situations in which some damage or loss to the individual has occurred; threat involves anticipated or possible future damage or losses; challenge refers to situations that present the possibility for grow or gain [11].

3.2.2 Secondary appraisal

Secondary appraisal pertains to the capability of the individual for dealing with the situation. When a stimulus is appraised as requiring a coping response, individuals evaluate their resources in order to determine whether they can cope with the situation. Coping strategies refer to the specific efforts, both behavioral and psychological, that people employ to master, tolerate, reduce or minimize stressful events. Two general coping strategies have been distinguished: actions designed to directly alter the threatening conditions (e.g. flight or fight) or thoughts or actions whose goals are to relieve the emotional stress response (e.g. use of tranquilizers, cognitive restructuring, and denial of danger). An additional distinction is between active and avoidant coping strategies. Active coping strategies are either behavioral or psychological responses designed to change the nature of stressor itself or how to think about it, whereas avoidant coping strategies lead people into activities (such as alcohol use) or mental state (such as withdrawal) that keep them from directly addressing stressful events [3].

3.2.3 Sense of personal control and powerlessness

Despite the absence of consensus regarding the operationalization of sense of personal control, this concept and others related to it have been consistently seen as predictors of health outcomes. Control is believed to reflect individuals' beliefs regarding the extent to which they are able to control or influence their outcome. Personal control parallels other constructs such as mastery, empowerment, self-efficacy, locus of control, learned helplessness, and powerlessness [7]. The latter concept is particularly important in studying social causation of health inequalities. Powerlessness, as defined by Seeman, is the expectancy or belief that an individual cannot determine the occurrence of outcomes [66]. Sense of personal control varies from country to country and it is negatively associated with macroeconomic stressors such as income inequality. Figure 4 shows the Gini coefficients (indicators of income inequality) and personal control scores of selected Eastern European countries.

[Insert Figure 4]

3.2.4 Life purpose

The individual's ability to adapt to stressful circumstances and the characteristics of people who maintain their health in spite of stressful transitions has been studied by several researchers. A host of researchers studied survivors of the Hungarian revolution, migration and the farm crisis. Additional researchers studied survivors of Nazi concentration camps, the Vietnam war, cancer, and depression. Researchers found that one of the most important distinguishing characteristics of survivors was a more positive perception or meaning of their life and an overall sense of coherence that life makes sense. In other words, people are more likely to cope and succeed in dealing with stressors if they possess a positive motivational state, a determination to meet personal goals and a "will" to survive under adverse social, economic and political conditions [67].

Purpose in life refers to the belief that life provides suitable challenges and rewards that continues to be worth living [67, 68]. People have their own explanations for why life is worthwhile. Examples include being powerful and successful or famous, working to support a family, being a good mother and wife, making a difference for the society, or believing in god. Stressors can make people question the meaning of their life through uncertainty and loss of control. Sense of purpose can also be lost when people lose their social roles (social integration) and lose social bonds (social control). Stressors whether social, economic or political, makes it more difficult to predict the future. This uncertainty means that it is difficult for anyone to set out where they expect to be in five or ten years' time. This raises particular difficulties for individuals and families. This affects people's ability to plan their life and their vision of the future. Major life events related to socio-economic factors giving life meaning to people are being at school, being integrated among peers, getting a job, marriage, having a car, having a house. Loss of purpose in life can even increase the risk of suicide, or affect a person's motivation to take care for themselves or adopt healthy behaviors [69].

3.2.5 Allostatic load

Often, the word “stress” has been used to refer to biological regulation of the body in response to external and internal environments. Major “stress mediators” are hormones such as cortisol and catecholamines. As seen, this is an over-simplification since these biological reactions to stress include social, psychological, behavioural and environmental responses. Moreover, a broader view of stress refers not just to dramatic stressful events, but rather the many events of daily life that elevate activities of the physiological systems. Chronic stress has a cumulative effect on the body as observed by Selye in his articulation of the General Adaptation Syndrome. Selye maintained that individuals respond to stressful events with non-specific reactions that, over time, produce wear and tear on the physiological system [13]. This mechanism is also named “allostatic load”. The term derives from “allostasis” that means “maintain stability (or homeostasis) through change”. Allostatic load refers to repeated cycles of allostasis as well as the inefficient turning-on or shutting-off of these responses [70]. The inefficient turning on and shutting off of the neuroendocrine responses have physiological, neural and immunitary consequences. A major physiological consequence is the effect of allostatic load on cardiovascular system. Allostatic load results in repeated surges of blood pressure in the face of stress accelerating atherosclerosis and synergizing with metabolic hormones to produce Type II diabetes [71, 72]. In the brain, dysfunctions of adrenal steroids and catecholamines activities due to allostatic load may results in neural excitability, retention of memories of emotionally charged events and other types of cognitive dysfunctions [73]. Such effects can be eventually linked with psychological impairments such as depression and anxiety disorders. For the immunitary system, chronic overactivity of adrenal steroids and catecholamines have immunosuppressive effects if these mediators are secreted chronically or not shut off properly [74]. Stress or allostatic load rather than causing specific health effects, is responsible for determining a general vulnerability to diseases. Acute and chronic psychosocial stress is increasingly recognized as a cause of deaths due to heart problem and hypertension, alcohol psychosis, neurosis, homicide, suicide, accidental deaths, ulcers and cirrhosis of the liver. The direct effects of stress also include vulnerability to infectious illness, the extent and intensity of inflammatory and healing processes, and reactivation of latent viruses such as herpes simplex or Epstein-Barr. Finally, stress has been linked to other major diseases such as cancer and HIV [47].

3.3 Stress-buffering mechanisms

As discussed, not all stressful experiences provoke negative emotional and physical reactions, and there are many individual differences in coping with such events. Social relations are important stress-buffering factors both at the social and individual level. A society may better tolerate macroeconomic stressors such as economic downturns when social capital is high and communities are cohesive. Similarly, people may not view potentially threatening events as stressful if they believe that their social network will aid them in coping. Although there are physical and genetic differences among individuals making them more or less vulnerable to negative responses to stress, social relations are

very powerful factors protecting people against chronic stress, adverse health outcomes, and health-damaging behaviours.

3.3.1 Social level stress buffering

One of the most important stress-buffering factors at the macro level is social capital. Social capital refers to those features of social organizations such as networks of associations, high levels of interpersonal trust, and norms of mutual aid and reciprocity which act as resources for individuals and facilitate collective action [75-77]. Social capital is strongly related to mortality and income inequality [78, 79]. Recent trends of inequality and other factors have not only affected poverty and disadvantaged populations, but also the entire social organization of societies. Increasing inequality has forced many Americans to spend longer hours at work and send more family members into the workforce, just to keep from slipping back down the economic ladder. According to Shor [80], the 80% of the American labour force, that are production and non supervisory employees, must now work an extra 245 hours, or six extra weeks per year, just in order to keep up with their 1973 standard of living. Spending more time at work translates into higher psychological distress and social isolation. It also results in lower social capital because of reduced time to devote socializing, and participating in social, political and community activities including volunteerism. Figure 5 represents the relation between income inequality and volunteerism rate, an indicator of social capital, among Italian regions.

[Insert Figure 5]

According to Richard Frank, an economist, widening economic disparities have also affected community life by changing consumption practices. As inequalities widen, and the top earners begin to set new standards in the pattern of conspicuous consumption (e.g. bigger houses, bigger cars), the rest of society is forced to engage in “defensive spending” to maintain relative status [81]. Earning the extra income to be able to keep up with the rising levels of conspicuous consumption seem having come at the expense of what can really make a difference to people’s quality of life such as time to be spend with families and friends, leisure time and volunteering in the community.

Communities with higher social capital are also characterised by higher political participation and stronger civic society. Political scientists have maintained that the degree of political participation by the citizenry depends on the extent to which members are embedded in the institutions of civic society such as voluntary groups, churches, and labor unions. According to Verba and colleagues, ordinary and routine activity on the job, at church, or in an organization, that has nothing to do with politics or public issues, can develop organizational and communication skills that are relevant for politics and thus can facilitate political activity [82]. Lack of citizen’s participation in voluntary associations is associated with lower civic skills that are indispensable for taking part in politics. Lack of civic engagement and political participation of marginalized groups make decision-makers less responsive in their policies toward taking care of the needs of disadvantaged groups. Conversely, higher levels of participation/social capital have the

potential to influence social policies for the poor [83] and buffering them from macro and micro socioeconomic stressors.

3.3.2 Individual level stress buffering

Differences in attitudes, beliefs, skills, personality characteristics and social support systems render some persons relatively immune to stress-induced responses (e.g. neuroendocrine, psychological, behavioral) and others relatively susceptible. As already mentioned, stress acts through the effects of stress appraisal. The importance of individual appraisal of stressful events became clear when scientists showed that the same stressful event could lead to different physiological, behavioral and physical responses and that there are many differences in coping and reacting to experienced stress [84]. Coping skills intervene in modifying individual's appraisal of a stressor. There is substantial evidence to affirm that the major coping resource available to individuals are social relationships including social support and social integration. Social support refers to the type of help that people receive from others, and it is generally classified into two major categories: emotional and instrumental. Emotional support refers to the things that people do that make a person feel loved and cared for and that bolster a sense of self-worth (e.g. talking over a problem, providing encouragement/positive feedback). By contrast, instrumental support refers to the various types of tangible help that people may provide (e.g. help with housekeeping, provision of transportation or money) [85]. Social support can prevent responses to stressful events by preventing a particular situation from being appraised as highly stressful [86]. The belief that others will provide necessary resources may redefine the potential for harm posed by a stressful situation. Support beliefs may reduce or eliminate the affective reaction to a stressful event, dampen physiological responses to the event, or prevent maladaptive behavioural responses [87]. Also, the actual receipt of support could also play a role in the stress-buffering model. Support may alleviate the impact of stress appraisal by providing a solution to the problem, by reducing the perceived importance of the problem, or by providing a distraction from the problem. It might also tranquillise the neuroendocrine system so that people are less reactive to perceived stress or facilitate healthful behaviours such as exercise, personal hygiene, and proper nutrition [88, 89].

Social integration is the extent to which an individual participates in a broad range of relationships. In a well-known 9-year follow-up study of residents of Alameda County, California, Berkman and Syme examined the association between social integration and mortality. Those who were more socially integrated at the outset of the study lived longer than their counterparts who had fewer types of social ties [90]. Increased longevity among socially integrated persons has been replicated in a number of subsequent studies [91, 92]. According to House, the health risk associated with lower levels of social integration are comparable in magnitude to the risks associated with cigarette smoking, high blood pressure, and obesity and are still significant after controlling for these and other traditional risk factors [93].

Social support and social integration can also have direct effects to health status and health behaviors. Social resources have a beneficial effect irrespective of whether persons are under stress [69]. Those who participate in a social network are subject to social

controls and peer pressures that influence normative health behaviors. Integration in a social network is also presumed to provide a source of positive effects such as self-worth because of demonstrated ability to meet normative role expectations. These positive psychological states are presumed to be beneficial because they reduce psychological despair, result in greater motivation to care for oneself, or result in suppressed neuro-endocrine response and enhanced immune function. Having a wide range of network ties also provides multiple sources of information and thereby increases the probability of having access to an appropriate information source. Information could influence health-relevant behaviors or help one to avoid or minimize stressful or other high-risk situations. A network may also operate to prevent disease by providing tangible and economic services that result in better health and better healthcare for network members [69].

It is also possible that isolation causes disease rather than social integration and social protecting or enhancing health. This approach assumes that isolation increases negative affect and a sense of alienation and decreases feelings of control and self-esteem. Isolation can therefore be seen as a symptom of psychosocial stress resulting in psychological states that could increase neuro-endocrine response, suppress immune function, and interfere with performance health behaviors.

As seen, research suggests that social stressors may be more prevalent in lower socio-economic environments (residential crowding, fear of crime, financial strain) that are associated with lower perceived support [94-97] and may contribute to reductions in levels of social support because they foster a distrust of others [98]. However, findings in the literature are consistent in describing that certain stress-buffering mechanisms can significantly alleviate the impact of socioeconomic stressors irrespective of the socioeconomic status.

The important role of the church and spirituality in health, for example, has been consistently reported in the literature [99]. Spirituality has been identified as an important factor in reducing the impact of stressors on health status including hypertension and cardiovascular diseases. Religion and spirituality are also stress-buffering mechanisms reducing “self-destructive” behaviors (e.g. suicide, alcohol abuse) because they fulfill the functions of giving a meaning and purpose to life, and binding people together in groups. Protective factors such as participation to community activities, and religious attendance therefore play key roles in modifying the negative relationships between exposure to stressors such as unemployment and financial strain and health outcomes [100].

3.3.3 Physical and Genetic

Susceptibility to stress and the ability to manage change are also influenced by individual factors such as age, gender and ethnicity. There are also considerable individual differences in appraising stressful life events, coping with challenges, and responding to stressors. Such differences are based on interacting genetic, developmental, experiential and cognitive factors. Individuals differ in their physiological and behavioural reactions to events throughout life. This makes stress a particularly difficult concept to measure. Objective stress may in fact differ substantially from subjective or perceived stress.

Because of these problems, some researchers prefer to use perceived stress scales in conjunction with objective scales to overcome such an obstacle.

3.4 Behavioral response to stress

As seen, unemployment, inequalities, social stratification, distress migration and decline of the share of the population living in stable and complete families may create stressful situations conducive to poor health behaviors. When considering the “allostatic load”, or “chronic “stress”, certain behavioral responses such as smoking or alcohol consumption may have a perceived adaptive benefits in the short run as “stress relievers”, although in the long run will produce damaging effects [70]. Under the influence of economic problems, stressful social and physical environments, low job satisfaction, unemployment, or the threat of unemployment, and lack of influence and control over one’s life, the individual is more likely to adopt an unhealthy lifestyle (overeating, use of alcohol, tobacco, and other drugs, exercise less). These behaviors are functional because they may give short-term relief in a stressful situation [101]. As Davey-Smith reports, in his contribution in understanding socioeconomic differentials in mortality risk in the US, in constrained economic circumstances, smoking can be one of the few activities undertaken for personal pleasure and one that provides some respite from the strain of coping with the consequences of material deprivation [102].

Social isolation interacts with socioeconomic stressors in worsening health status and determining poor health behaviors. This happens because a large number of positive social relationships may buffer individuals against the adverse effects of socioeconomic-related stress [85]. For the disadvantaged social groups, social exclusion and discrimination add stress to the socioeconomic stress they already suffer. For example, Wilson found that the breakdown of family structure in the black community and the social dislocation of the ghetto neighborhood as well as the isolation from the mainstream society, make the disadvantaged social groups particularly likely to be bereft of a caring network and social support [103]. Although the direct causation is unclear, social isolation can also interact with socioeconomic stressors typical of lower social status groups in influencing health behaviors. High susceptibility to poor health behaviors among specific adult population groups has been analyzed in terms of exclusion from or inadequate participation in a society's structure of opportunities. Acquisition of core social roles, such as the work role, the family and marital role, and civic roles, are essential prerequisites for successful personal self-regulation in adult life, strengthening a sense of self-esteem, self-efficacy, and belonging (self-integration). It is argued that exclusion from, or loss of core social roles impairs personal self-regulation and triggers a state of “social reward deficiency“. This state, in turn, elicits prolonged stressful experience, and it may reinforce a person's craving for stress-relieving, potentially addictive health-damaging behavior [104]. In extreme cases, it may lead to suicide.

In sum, the framework envisions a cascade of effects starting from rapid change (conceptualize as macro socioeconomic stressors) to micro socioeconomic stressors and stress buffering mechanisms that, in turn, affect individual stress and health outcomes. Although psychologists proved that a certain amount of stress is necessary to enjoy life

and it is even beneficial, stressors such as poverty, long-term unemployment, unhealthy neighborhoods, poor housing, lack of social security and lack of healthcare are neither necessary nor beneficial. More importantly, such stressors do not exist in a social vacuum, but they are the consequences of larger social, economic and environmental factors. This is the first stress process framework that integrates in a systematic way the multiple interconnections between micro and macro socioeconomic stressors.

4. Case studies supporting the theoretical framework

In this project, a series of case studies from countries most affected by rapid change induced by globalization, support some of the proposed hypothesized relationships of the theoretical framework. Selected countries include the former Soviet Union countries, China, Japan, Micronesia Islands, Australia, New Zealand, Canada, and the United States.

4.1 Former Soviet Bloc Countries

In the past twenty years, former soviet bloc countries have been undergoing a transition from socialist planned economies to market economies. The political and economic changes in the former Soviet Bloc were both unprecedented and unexpected, and they were carried out in an accelerated fashion. Such rapid economic, social and political changes have been accompanied by sharp increases of income inequality, privatization of production, and skyrocketing unemployment rates [105]. The sudden imposition of market reforms has led to commodity shortages, spiraling inflation, and burgeoning government deficits. High prices for basic items such as food and medicines, as well as increasing difficulties in maintaining an adequate social welfare system, have caused large numbers of economically vulnerable citizens to fall through the social safety net [106]. Life expectancy for Russian men decreased from 63.8 to 57.7 years while for women life expectancy decreased from 74.4 to 71.2 years. The most striking feature of the mortality crisis in many Eastern European countries is that it has no affected those groups considered especially vulnerable, such as children and the elderly, but instead those of working age, particularly middle-aged single men. The major causes of declining life expectancy in Russia were cardiovascular diseases, alcohol-related diseases, suicide, accidents and homicide [107, 108].

[Insert Figure 6]

The regions with the largest falls in life expectancy at birth were predominantly urban, with high rates of labor turn-over, large increases of crime rates and increased income inequality [105]. Rapid transition has been associated with behavioral changes, most notably alcohol consumption. Alcohol has significantly contributed to the decline of life expectancy in Russia not only because of alcohol-related deaths, but also because of conditions associated with alcohol consumption such as accidents and cardiovascular diseases. Alcohol consumption was also the most frequently proposed determinant of the changes of suicide rates [109].

Although alcohol consumption significantly contributed to the mortality crisis in Eastern Europe, in general, there has been a lack of understanding of the process linking macro factors such as income inequality and proximal determinants of health such as alcohol drinking and suicide in the decline of life expectancy. Suicide rates and alcohol consumption did not sharply increase in a social vacuum. Such rates increased right after the rapid economic changes in 1989 with the transformation of former Soviet bloc countries from communist social economies to free market economies. Rapid economic changes, intended to enhance prosperity, living standards and health conditions were generally accompanied by growing instability and a mounting sense of uncertainty among individuals, families and institutions. While in some countries the reorientation of the economy occurred in a gradual fashion, in many former Eastern bloc countries changes occurred in a sudden, rapid and unexpected way [1].

There is evidence that psychosocial risk factors have played a major role in this mortality crisis. A study comparing risk factors for cardiovascular mortality among Swedish and Lithuanian men found that the latter were 4 times more likely to die of CHD than their Swedish counterparts. However, difference in traditional coronary risk factors and lifestyle variables (i.e. plasma cholesterol and blood pressure levels, obesity, tobacco use) between Eastern and Western Europe have not offered convincing explanation for the mortality gap. Differences in psychosocial coronary risk factors were striking: Lithuanian men reported more signs of psychosocial stress and social isolation, less effective coping and self-esteem and more vital exhaustion and depression than Swedish men [110].

Different aspects of the stress process such as perceived threat, ineffective coping, lack of control and different characteristics of social capital such as social networks, social norms and social exclusion seem implicated in the explanation of the relation between economic transition and fall in life expectancy due to alcohol consumption, suicide rates, accidents and cardiovascular diseases. These factors were determined by macro factors such as impoverishment and unemployment that are, in turn, related with broader macro factors such as economic recession and increase in income inequality. Figure 7 shows the relation between changes in income inequality and changes in suicide rates in selected former Soviet Union countries between 1989 and 1997.

[Insert Figure 7]

4.2 China

Since the late 1970s and 1980s China, has undertaken a transition from a centrally planned economy toward a market-based economy. Although economic liberalization has improved living standards and granted individuals increased choice in consumption, education, health and employment, this transformation has not come without health and social problems. At the present time China, a country whose per capita disposable income increased by 6.1% (after inflation) between 1980 and 1993 [111], is facing an unprecedented mortality crisis due to suicide and depression. According to the Chinese Minister of Health, suicide is the fifth most important cause of death in the country, accounting for 287 000 deaths per year. However, the rural suicide rate is three-fold the

urban rate and there are more suicide deaths among women than men. These mortality patterns are strikingly different from those reported in any other parts of the world [112].

A recent case control psychological autopsy study revealed at least 8 significant predictors of suicide in China: depression, previous suicide attempt, acute stress at the time of death, low quality of life, high chronic stress, severe interpersonal conflict in the 2 days before death, a blood relative with previous suicidal behavior, and friend or associated with previous suicidal behavior. The same study highlighted that the ready availability of pesticides and rat poison in rural homes in China makes self-poisoning an option for people who are experiencing acute or chronic stress [113]. Another study on suicide among Chinese women suggests that such high rates in rural areas are associated with low social status, forced marriage, domestic abuse, birth control policy, harassment by the husband's family, frustration over rural life, availability of pesticides, and greatly limited access to medical resuscitation facilities [114]. Yet, despite the importance of these risk factors, studies analyzing the sharp increase of suicide rates in the last decades failed to account for the psychosocial effects of macro social and economic change occurred in the last decades. Why rapid social and economic changes have disproportionately affected women and people living in rural areas in China?

According to the Beijing Suicide Prevention Center, suicide and depression go hand to hand to fast development and increased sense of life uncertainty. A plausible hypothesis for the suicide mortality crisis in China may be searched in how economic reforms may have influenced the psychological health of a population, and of Chinese women living in rural areas in particular. While the introduction of market forces in China has opened up an array of opportunities, these benefits depend ultimately upon the capacity of individuals to respond and adapt to the changing requirements of market society. Although China's economic performance has been remarkable since the initiation of the reform process, the Gini coefficients (an indicator of income inequality) increased from 0.15 in 1983 to 0.20 in 1992 for the urban, and from 0.26 to 0.37 for the rural population (Figure 8) [115]. Epidemiological surveys conducted in the same timeframe suggested that measurable changes were occurring in psychosocial distress indicating a worsening mental health picture in China [116]. Some authors have attributed the rising rate of mental health and social problems to fundamental disruptions in social life after economic reforms [117].

[Insert Figure 8]

Although the risk factors of high suicide rates in China are still unknown, and more research is certainly needed to shed light on this complex phenomenon, psychosocial problems caused by rapid economic reforms seem a plausible explanation for this mortality crisis. This demonstrates that a decrease of social cohesion and increases of psychological distress can have deadly effects even in a country where both economic development and life expectancy are improving at very high rates.

4.3 Japan

In 90s, Japan was been hit by a severe economic recession. In order to revitalize the economy, a number of measures were introduced to lift restrictions on competition and create a more flexible system rewarding productive workers and managers. There was a shift from a robust economy mostly regulated by the state to a deregulated market economy. This change seems also associated with a shift from cohesive society to a society of social fragmentation and economic uncertainty. Among the most disturbing effects of such changes, the increase of unemployment rate seems one of the most important. Unemployment, unknown for decades, rose steadily from close to zero in the late 1980s to 5.4 percent in 2002 [1]. The Japanese National Police Agency reported that 33048 people committed suicide in the 1999, an increase of 185 record level set the previous year. Among those who left a note, many reported financial crisis and unemployment as major reasons for committing suicide. Almost a half of those who committed suicide were without work [118].

Financial problems and unemployment seem the most plausible reasons for the sharp increase of suicide rates in Japan. The trauma of unemployment was particularly severe in a society that until recently had been used to full employment. According to the National Network on Karoshi, many emergency calls from families that lost their breadwinners because of suicide pointed out corporate restructuring or pressure being brought on workers for early retirement as major causes of death. Men accounted for more than two-thirds of suicide. In terms of age, the greatest proportion of suicide (34%) in 1999 was that for people aged over 60. This was followed by 25% among those in their 50s and 16% among those in their 40s [118].

Loss of employment was particularly stigmatizing and shameful and may have had serious consequences in terms of meaninglessness or loss of sense of purpose. Post-war Japanese society is sometimes called a “company-society” since many companies adopted a lifelong employment system and the seniority system of wages and promotion to form the models of company as “community” and company as “families”. Many employees and their families lived their lives belonging to and depending on their company [119]. This tragic increase in deaths was probably due to the stress caused by the inability to adjust to historically unknown events such as unemployment and bankruptcy. The resulting sense of shame, loss of social role, dejection and stigma felt by those who lost their job may have played a crucial role in the increase of suicide.

Although the Japanese have traditionally regarded suicide as an honorable means of atoning for failure or showing remorse, the impetus behind the latest increase of suicide rates is undoubtedly economic. Psychosocial factors such as loss of role in society, however, seems to be a major factor distinguishing unemployed who committed suicide versus those who did not commit suicide. First, young populations were less likely to commit suicide not only because their higher ability to cope with unemployment, but also because they may have been less attached to corporations and their “sense of purpose” may have been less affected compared to older men. Although the primary determinants of suicide is certainly economic, a major factor intervening between unemployment and

suicide is how men perceive stressful events, and whether or not such events cause a loss of social role and sense of purpose.

4.4 Micronesian Islands

The Micronesia islands in recent decades have experienced a series of rapid social and economic changes. In particular, the economy moved from a subsistence economy based on family gardening and fishing, to a cash economy based on waged labors and imported foods and products. Such changes have been associated with an extraordinarily high incidence of youth suicide in Micronesia. Presently, it is one of the highest in the world. Among the age group at highest risk there were young men between 15 and 24 years old [120].

[Insert Figure 9]

Although many factors seem responsible for such increases of death, the stress induced by rapid change seems the most plausible explanation. In the mid-1960s, social change accelerated in Micronesia as the American colonial administration greatly increased budgets for the islands and extended hundreds of US federal programs to include Micronesia. These changes touched every aspect of Micronesian societies. American-style schools were built on every island. American cultural influences arrived as well as with movies and television and thousands of Peace Corps Volunteers. More importantly, many economic changes occurred. A rapid increase in paid employment came about with the creation of thousands of new jobs for schoolteachers, office workers and laborers. There was a dramatic change from family-based subsistence to individual wage labor [120].

Changes were accompanied by a sort of “cultural invasion”, and many people were unable to adapt to the new situation. Not only suicide increased, but also alcohol drinking. Suicide rates showed an interesting geographic variation. Social change in Micronesia was most advanced in the districts centers and port towns on the main islands. In the rural, outer islands, the traditional ways of life have changed much less. Suicide cases in the outer islands appeared very rarely. This shows that in those communities where rapid change did not occur, suicide rates did not increase [120].

Social changes in Micronesia Islands have been more stressful for men compared to women. This may be related to the degree rapid change affected social roles of males and females. Women’s roles traditionally in Micronesia centered around taking care of the house, taking care of the children, and preparing food. These remained important aspects of family life despite the social and economic change. Men’s roles, on the other hand, were severely affected. Traditionally, they involved fishing, the heavy labor of gardening, and provision of food for the family through subsistence labor. After rapid change, the role of food provider in the subsistence economy has been replaced by the role of wage earner in the cash economy.

Social change did not only affect “sense of purpose” and social roles, especially among males, but also has weakened social relations among those groups which owned the

garden land and maintained the community's men houses. The traditional social supports for men, especially young men, which were the community houses and the extended families, have largely disappeared, and young men have lost much of their former independence and role in their communities [120].

4.5 Australia

In Australia, the number of suicides has dramatically increased in the last 25 years especially among young males. The highest overall and highest male suicide rates occurred right after economic depression. The number of suicide appeared to have increased during the three months before and six months after the stock market crash of late 1987. The incidence of suicide increased by 15 percent during those months [121]. A major cause of suicide appeared to be not only unemployment, but also downward occupational mobility. Under downward occupational mobility the "self-image" is impaired and individuals are led to perceive their downward mobility as a sign of rejection and negative evaluation of their self-worth. This increases their sense of alienation and anomie and reduce their levels of social integration in society which consequently increases their vulnerability to suicidal behavior [122].

However, social and economic changes have disproportionately affected certain populations such as people of lower occupational status and indigenous groups. Suicide rates have been high among unskilled and semi-skilled blue-collar occupations that are characterized by low job autonomy, greater external supervision, poorer promotional possibilities, lower wage levels, and greater sensitivity to market forces. Also, suicide rates among aboriginal populations are significantly higher compared to other ethnicities. This seems related to the devaluation of their culture in an era of "Westernization" which may have affected their self-identity and social life. This devaluation has accentuated a sense of anomie, hopelessness, despair and depression, all of which have contributed to a sharp increase of self-destructive behavior such as suicide and alcoholism [122].

4.6 New Zealand

Over the last two decades, health outcomes have been improving in New Zealand. Yet, despite such improvements, serious public health problems remain, especially among vulnerable populations such as Maori. The gap in life expectancy between indigenous and non-indigenous populations in New Zealand is 8 years [123]. In the last years, the introduction of an extreme version of the market model (in which individual reward and performance are closely linked, trade unions play a negligible role, the welfare sector is much more market oriented and state subsidies are no longer universal) seem having played a major role in the increase of mortality among adult and elderly male Maoris of 30-79 years of age. A factor responsible for such increase of suicide, the leading cause of death for young people under the age of 25 years in New Zealand. According to the Minister of Health of New Zealand, the total Maori suicide rate (per 100 000) increased to 17.5 in 1997, compared to non-Maori (13.1), and the Maori youth suicide rate (33.9) far exceeded the equivalent non-Maori rate (24.3) (Figure 10).

[Figure 10]

According to some researchers, rapid economic reforms may have exacerbated the already difficult situation of Maori youth. Rapid changes in the last years however may have further contributed to decrease the already poor self-esteem of Maori, in constant struggle to develop and maintain a positive sense of identity in an environment where messages received about being Maori are negative [124].

4.7 Canada

In Canada, abrupt social and cultural changes have been related to increasing death rates of aboriginal people due to suicide and substance abuse. According to the report submitted by the Royal Commission on Aboriginal Peoples, the suicide rate among Aboriginals of all age groups is now three times higher than that of non-Aboriginal people. The rate of suicide with regards to Native youth is five to six times higher than non-Native youth [125].

There are different factors that seem responsible for the high incidence of suicide rates among Aboriginal populations in Canada including psychological factors and cultural factors. There is evidence, however, that during times of economic and political change suicide has dramatically increased. According to some authors, the roots of the poor economic conditions and psychosocial stress that contributed to the high suicide rates among Aboriginal people are the result of Canada's Indian policy. The policy Two Acres and Cow: Peasant Farming for the Indians of the Northwest, 1889-97, is an example of rapid political change affecting the lives of Aboriginal people. This policy was introduced at dismantling the old tribal system, while implanting a new concept of hard work, private property and self-sustaining farming existence. However, the forced transition from the traditional subsistence based economy and band or tribal lifestyle, to the current wage and welfare economy is probably one of the major causes of social disruptions and loss of self-identity of Aboriginal people [126].

Some authors have used the term "cultural stress" to describe the increase of suicide rates among Aboriginal people in Canada. A strong discrepancy/incongruence between the values, norms and beliefs that were taught to them within their original cultures and those promoted by rapid social and economic change have resulted in distress, loss of confidence and identity. Studies conducted on Aboriginal suicide in British Columbia revealed significant geographic patterns: communities with a low rate of suicide have retained some traditions and have remained in relative isolation from the acculturation process to the larger North American society [127].

4.8 United States

In the United States, rapid changes in the last decades have affected the lives of both American Indians and Alaskan natives. American Indians, facing rapid socio-cultural changes, were particularly affected by cardiovascular diseases and related risk factors such as diabetes. As recently as 40 years ago, the rates of cardiovascular disease in American Indians were exceedingly low, due to a history of few cardiovascular risk factors such as diabetes, hypertension and hypercholesterolemia. However, over the past

several decades, the incidence and prevalence of these risk factors have risen significantly. The development of diabetics epidemic and other cardiovascular disease risk factors have resulted in a marked increase in the incidence and prevalence of cardiovascular disease in American Indian [128].

Among Alaska natives, the stress induced by rapid social and economic change seemed to be a major factor responsible for the sharp increase of suicide rates among youth. Not so long ago subsistence-oriented lifestyle was not only common in Alaska, but, to a larger measure, also preferred by both whites and Natives. The Alaskan life styles were sustained by values and tradition based upon hard work, self-sufficiency and interdependence. The Alaska Native Claim Settlement Act (ANCST) in 1971 created a new set of social conditions with a dramatic disruption of traditional lifestyle patterns. An economy system that was primarily self-contained and independent where rural communities depended upon hunting, fishing, whaling and other types of subsistence activities, was rapidly transformed into a cash economy with dependence on a larger social group such as the state and the nation. According to ISER, the high rates of Alaska native suicide (37 per 100,000) attests to the failure and frustration of natives to define more meaningful lives [129]. Stress born out of rapid change and marginalization from the social patterns that have bonded Natives into cohesive units have lead to alienation, estrangement and self-destruction [130].

5. Conclusions

What can be learnt from the recent experiences in the regions under study regarding the health and psychosocial effects of rapid change in the context of increasing globalization? Results of this project have important implications in terms of research, public health, and public policy. First, this project contributes to existing research by shedding more light on the role of psychosocial factors in explaining the relationship between rapid change and mortality caused by suicide, alcohol consumption, cardiovascular disease, and accidents. Although case studies have shown different patterns of mortality across countries, rapid change seems to produce similar adverse effects in different settings and among different populations. In particular, this research shows that globalization may negatively affect the physical and psychological health of those populations whose social role and sense of purpose is particularly sensitive to rapid change. It also highlights the negative effect of globalization on stress-buffering mechanisms at the societal level (e.g. social cohesion) and individual level (e.g. social integration and social support).

Second, this project is also of practical importance in terms health promotion because it informs public health professionals about the need to prioritize psychosocial interventions among especially vulnerable populations. Such vulnerability is determined by the degree of sensitivity to rapid change. This project showed that vulnerable populations include working age men in the former Soviet Union countries, women living in rural China, unemployed people from Japan, youth of Micronesia Islands, and indigenous populations in Australia, New Zealand, Canada and United States. Despite significant differences, a common characteristic of these populations is not only a loss of social role and sense of purpose in life, but also the inability to cope with rapid change. Psychosocial

interventions that may limit the negative effects of rapid change may include counseling sessions to prevent suicide and substance abuse combined training programs designed to teach effective coping skills.

Third, findings have important implications in terms of public policy. While globalization may bring a variety of benefits to the income and the health of the poor, the risk of adverse health and psychosocial consequences must be confronted appropriately. While autarky is not the solution to these adverse health effects [131], the pace of change seems a crucial factor in making these policies more healthy. There may be little disagreement about the need to move to a more globalized economy driven by market forces. However, the critical question pertains to the sequencing and speed of the transition. Our research indirectly indicates that “gradualism” needs to be preferred over “shock therapy”. These approaches have shown to produce very different results, especially in Russia and China. While the sudden, unexpected and simultaneous application of market principles to the Russian economy have produced an unprecedented mortality crisis, the step-by-step approach of China was successful in limiting the adverse health effects of rapid change. This study provides substantial evidence that drastic changes such as rapid liberalization, flexibilization of the labor market, privatization may cause severe disruption of social life especially among those populations whose ability to cope with such changes is limited. When societies are not given adequate time to adapt to such changes, many vulnerable populations can be severely affected. It is crucial to systematically evaluate the impact of social and economic reforms on major socioeconomic determinants of health such as income inequality, social cohesion, psychological stress, social isolation and health behaviors. At the national level, successful examples of countries that have combined economic growth, fair income distribution across social groups, and health status, must be followed. At the global level, effective policies that lead to a gradual integration of countries into the world economy, and social buffering mechanisms preventing mortality crises and protecting the most vulnerable populations from social and economic uncertainty are needed. This is crucial to make globalization fulfilling its promises and avoid that the social and health costs of rapid changes may offset the economic benefits they were supposed to produce.

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Figure 1: Theoretical Framework of Rapid Change, Psychosocial Stress and Health

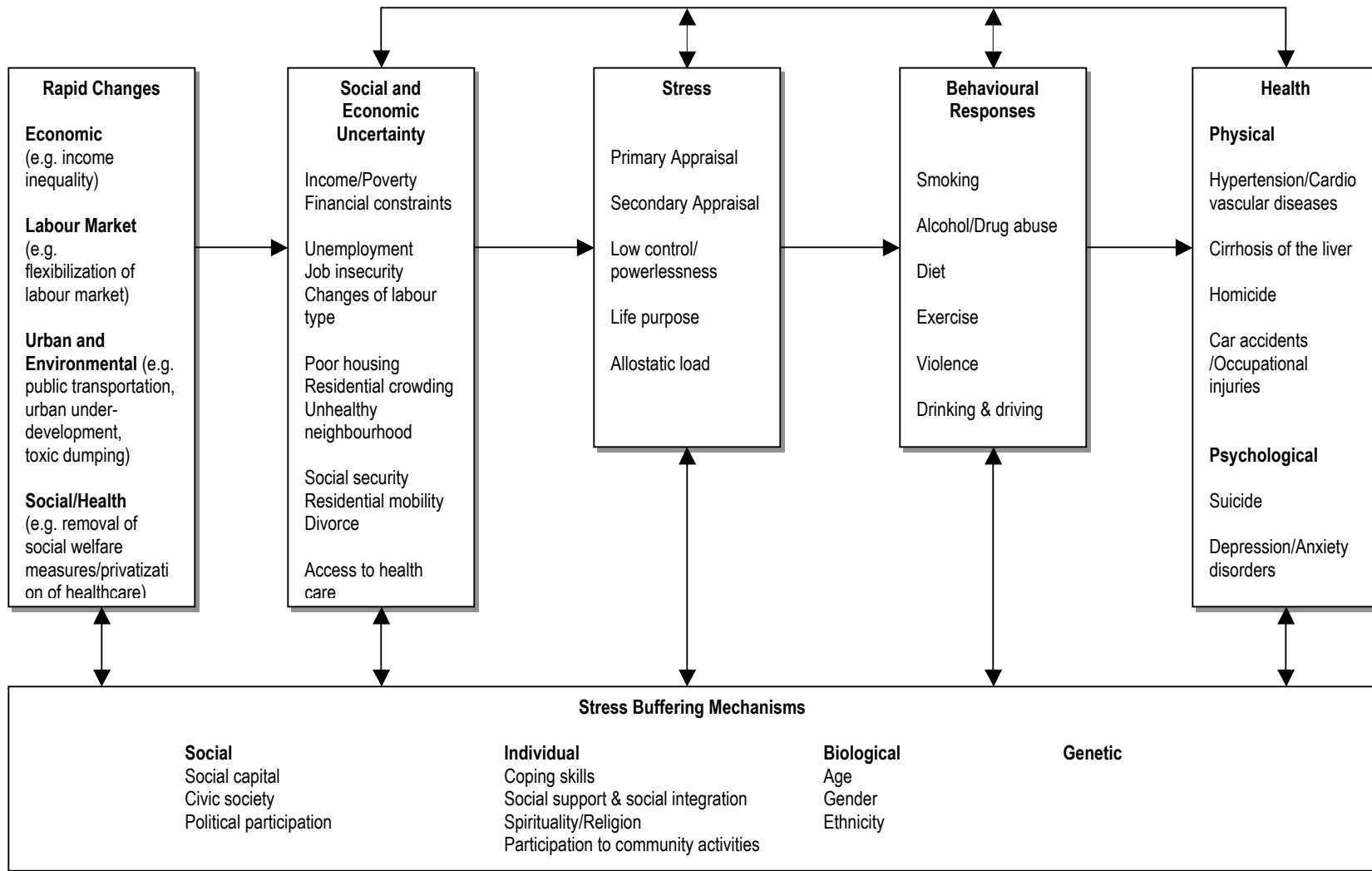
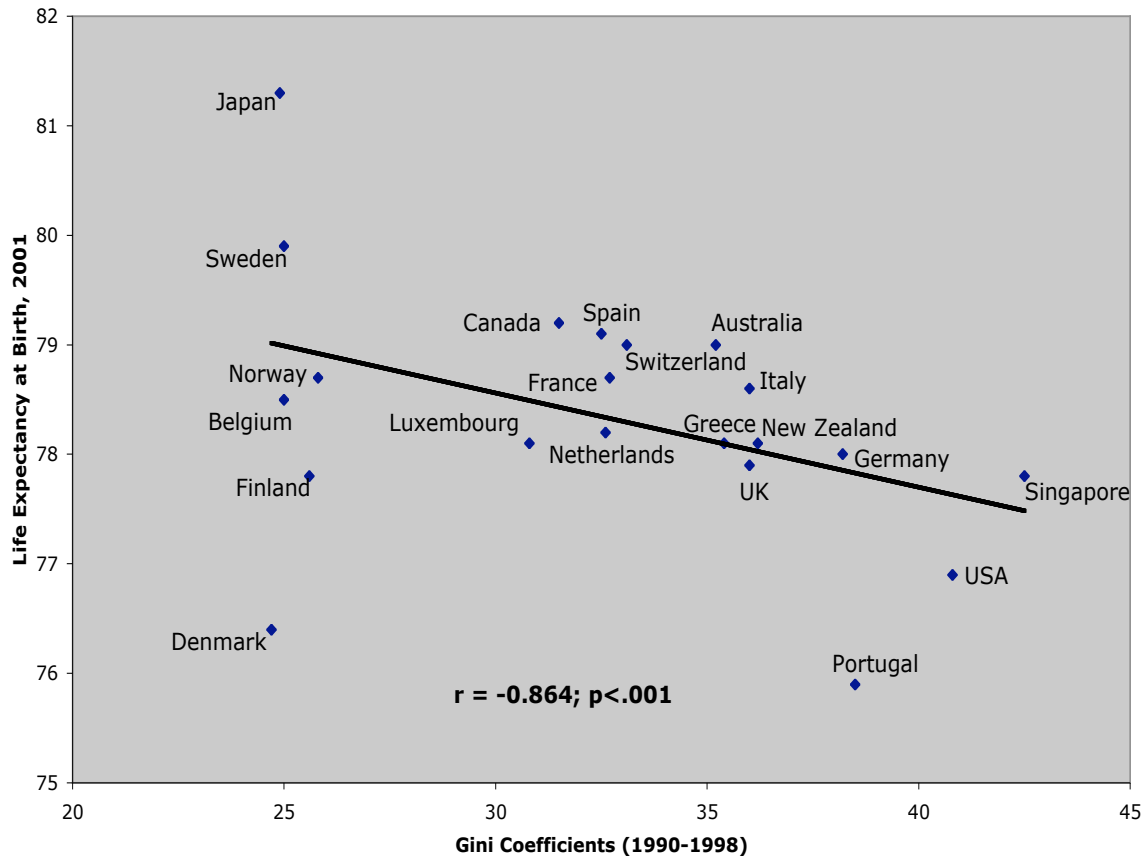


Figure 2: Income inequality and life expectancy at birth among industrialized countries (n = 21).



Source: De Vogli R, Mistry R, Gnesotto R and Cornia GA. Income Inequality is Negatively Correlated With Life Expectancy at Birth: Evidence from Italy and 21 Wealthy Nations. *Journal of Epidemiology and Community Health* (on press).

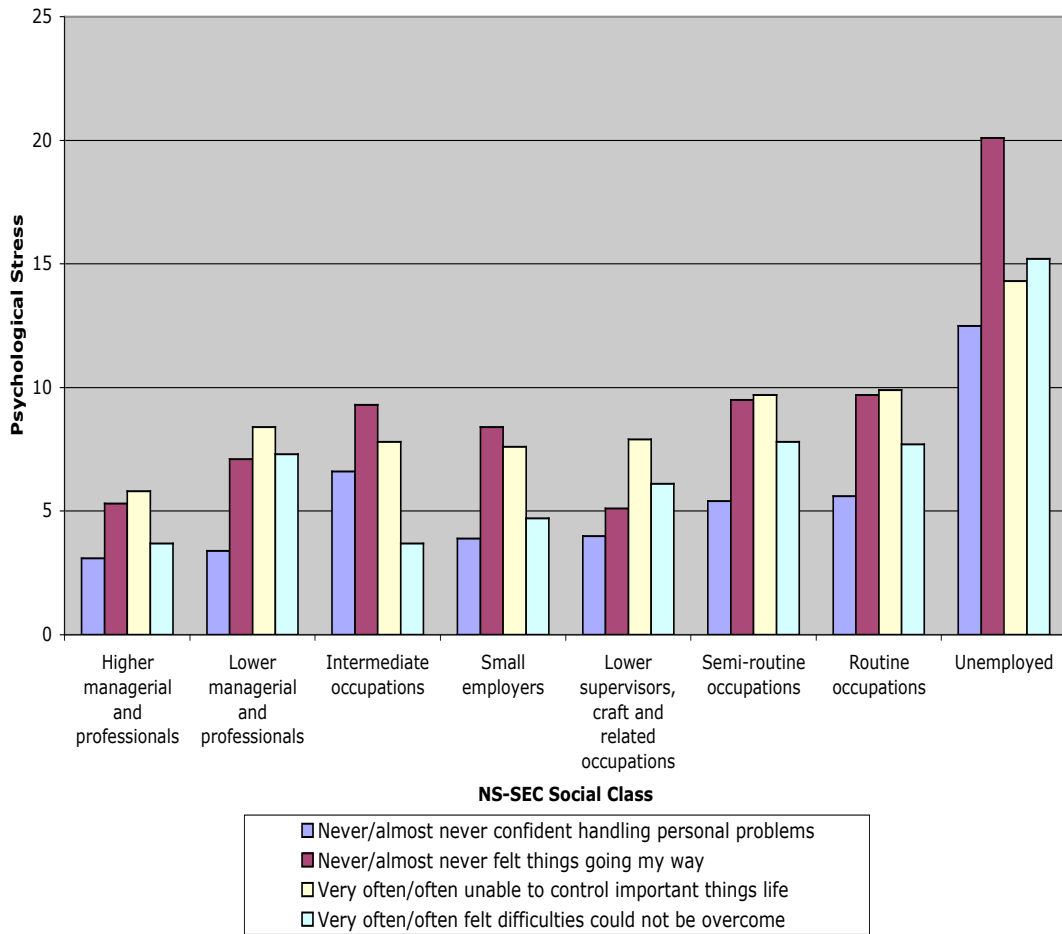
Note: Data are from the Human Development Indicators 2003. The correlation presented above is weighted by population size and adjusted for per capita Gross Domestic Product (GDP).

r (crude) = -0.415; $p < .065$.

r (adjusted for per capita GDP) = -0.433; $p < .065$.

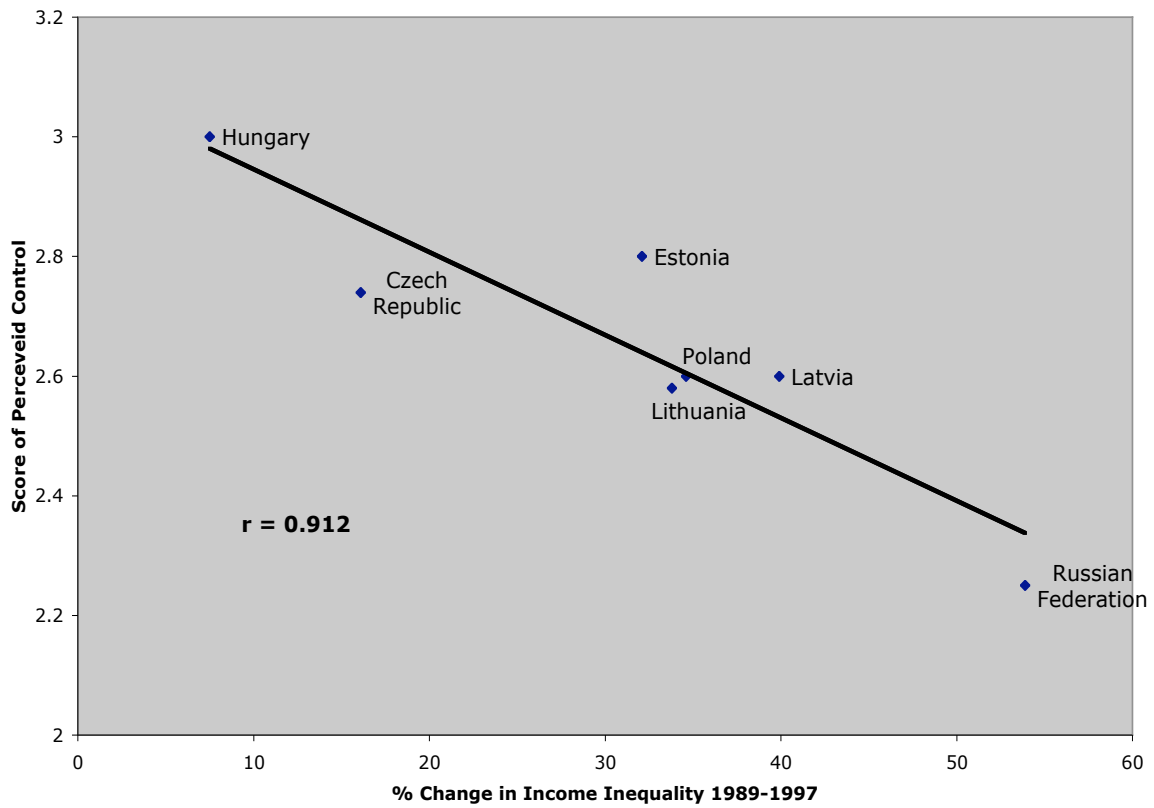
r (weighted by population size) = -0.907; $p < .001$

Figure 3: Psychological Stress Items by Social Class in a sample of 4002 living in the Veneto region (Italy).



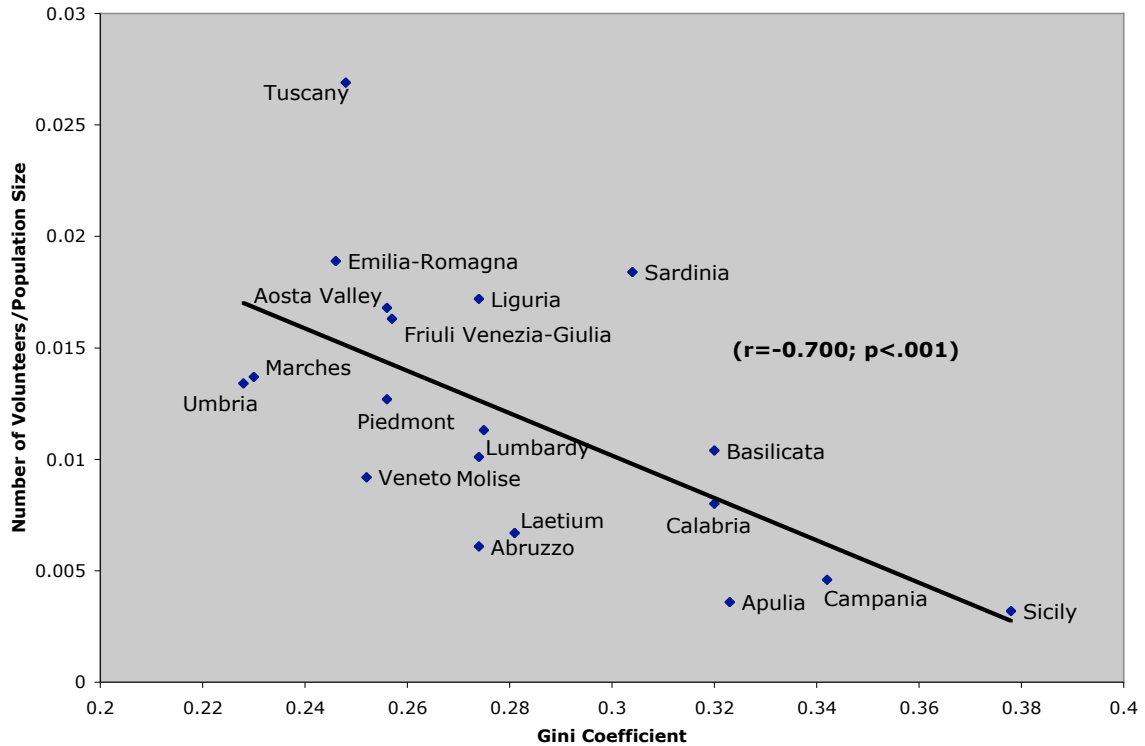
Source: De Vogli (2003) Socioeconomic Determinants of Healthy Lifestyles: Does Psychosocial Stress Matter?. University of California, Los Angeles, School of Public Health, PhD Dissertation.

Figure 4: Change in Income Inequality 1989-1994 and Perceived Control in selected former Soviet Bloc countries.



Source: Authors' elaboration. Income Inequality were taken from WIDER database, perceived control scores from Marmot M and Bobak M (2000) Psychosocial and Biological Mechanisms behind the Recent Mortality Crisis in Central and Eastern Europe in Cornia and Paniccia' (2002) Mortality Crisis in Transitional Economies. London Oxford Press.

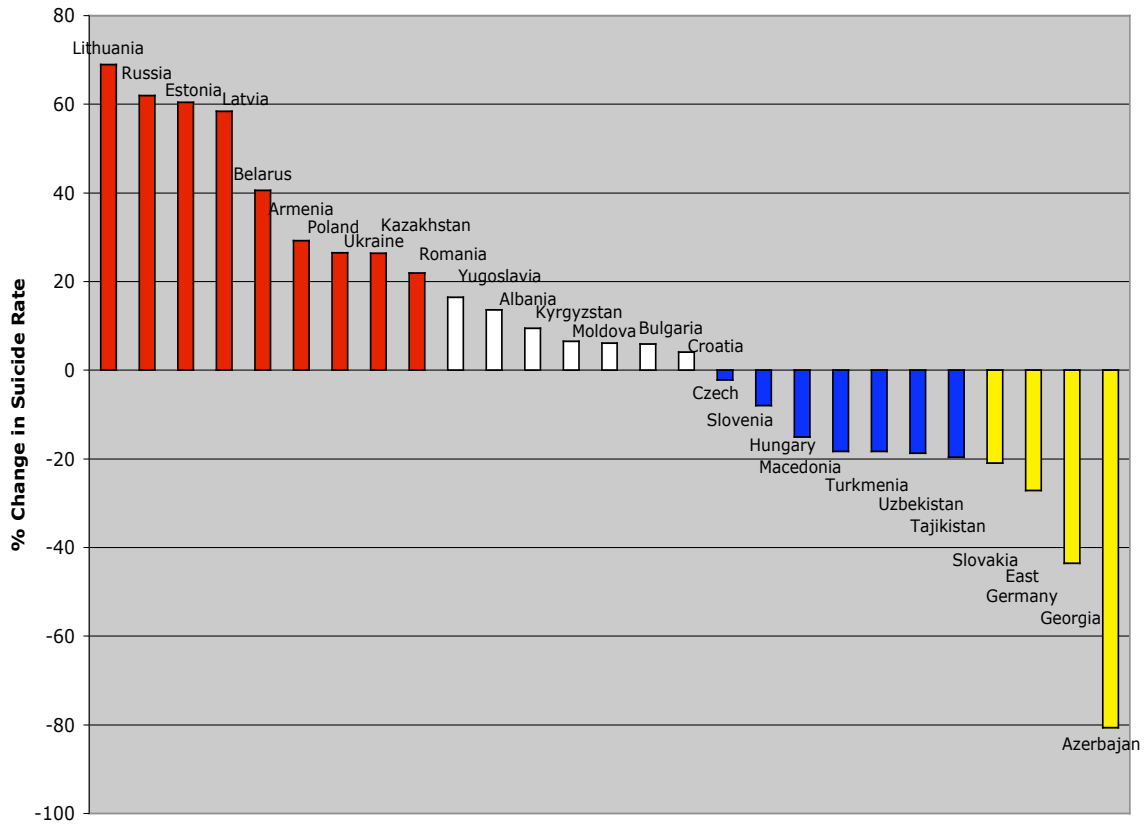
Figure 5: Income Inequality and Social Capital across Italian Regions (N=19).



Source: Author's elaboration of data on gini coefficient 1995-2000 from SIHIW - Bank of Italy and number of volunteers by population size 1999 from the Social Indicators database of the National Institute of Statistics for all 20 Italian regions.

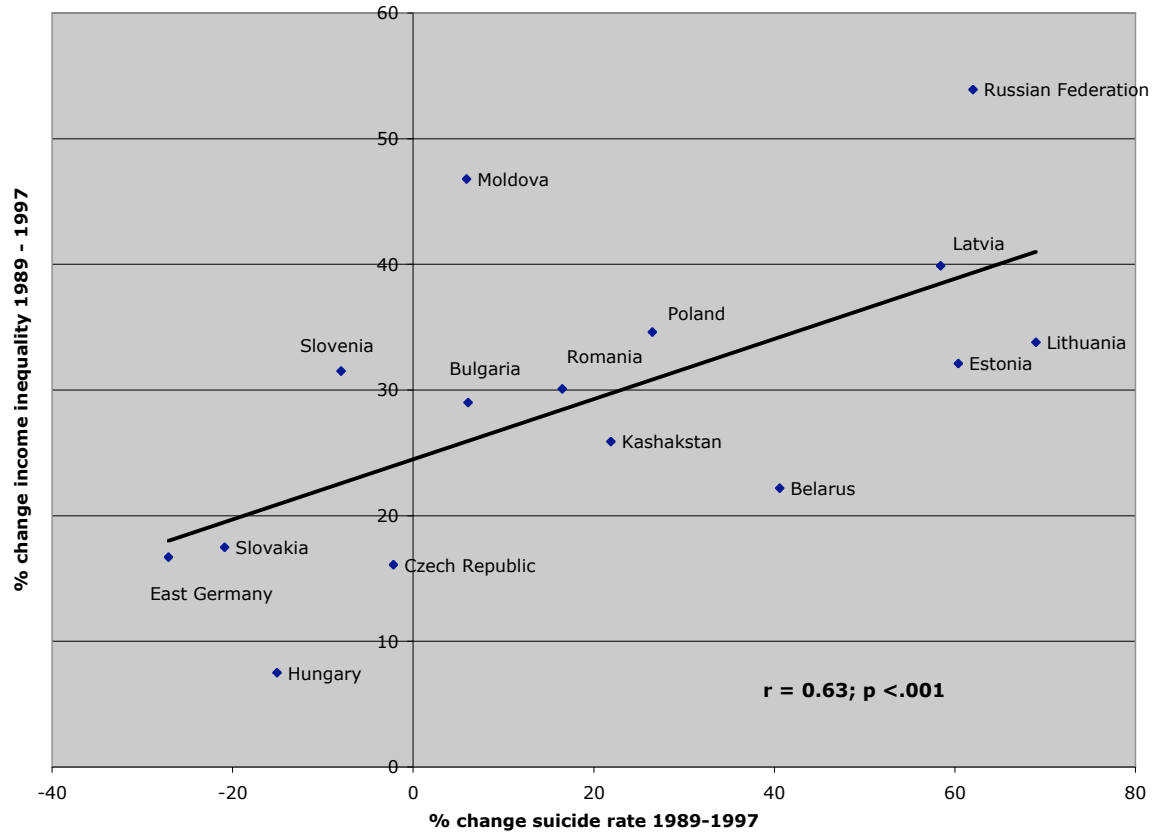
Note: Outlier region Trentino Alto-Adige, with the highest volunteerism rate (0.068) and very small income inequality (Gini coefficient = 0.257) has been removed from the analysis.

Figure 6: Percent change in suicide rates in selected former Soviet Bloc countries between 1989 and 1994.



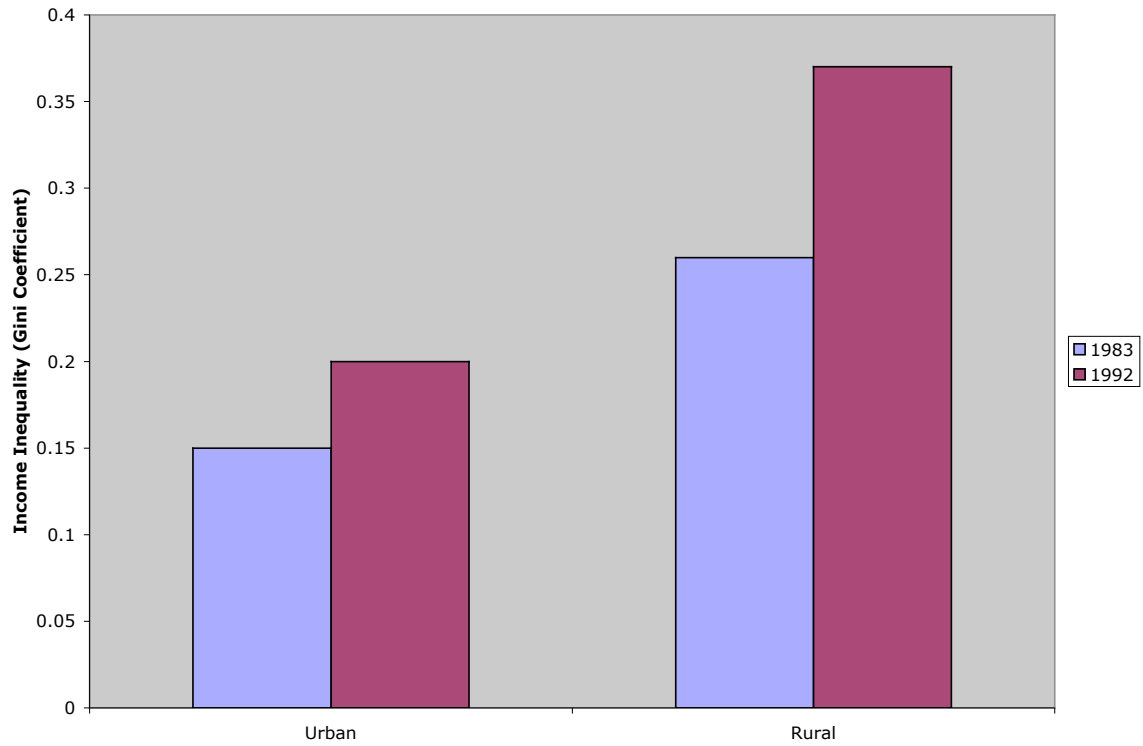
Source: Authors' elaboration of Table 1 from Makinen (2000) Eastern European transition and suicide mortality
 Albania 1989-93
 Armenia 1994: estimate based on standardized rate
 Belarus 1994: estimate based on standardized rate
 Croatia 1985-89
 East Germany 1990-94: "New Lander and East Berlin"
 Georgia 1994: estimate base on standardize rate
 Macedonia 1991-94: estimate based on standardized rate
 Tajikistan 1994: estimate based on standardized rate

Figure 7: Change in Income Inequality and change in suicide rates in selected former Soviet bloc countries (1989-1997).



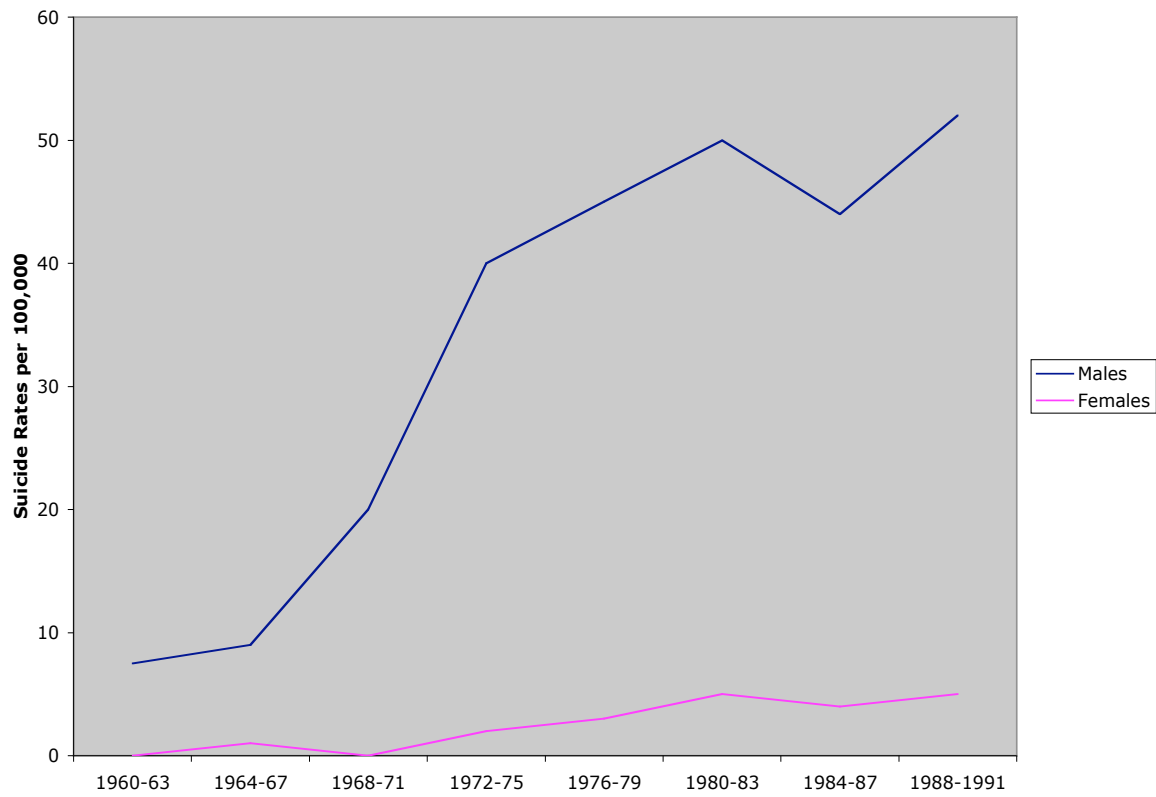
Source: Author's elaboration of data from UNU/WIDER Database on Income Inequality and Suicide rates from WHO database Health for all 1989-1997.

Figure 8: Change in Income Inequality in China (1983-1992).



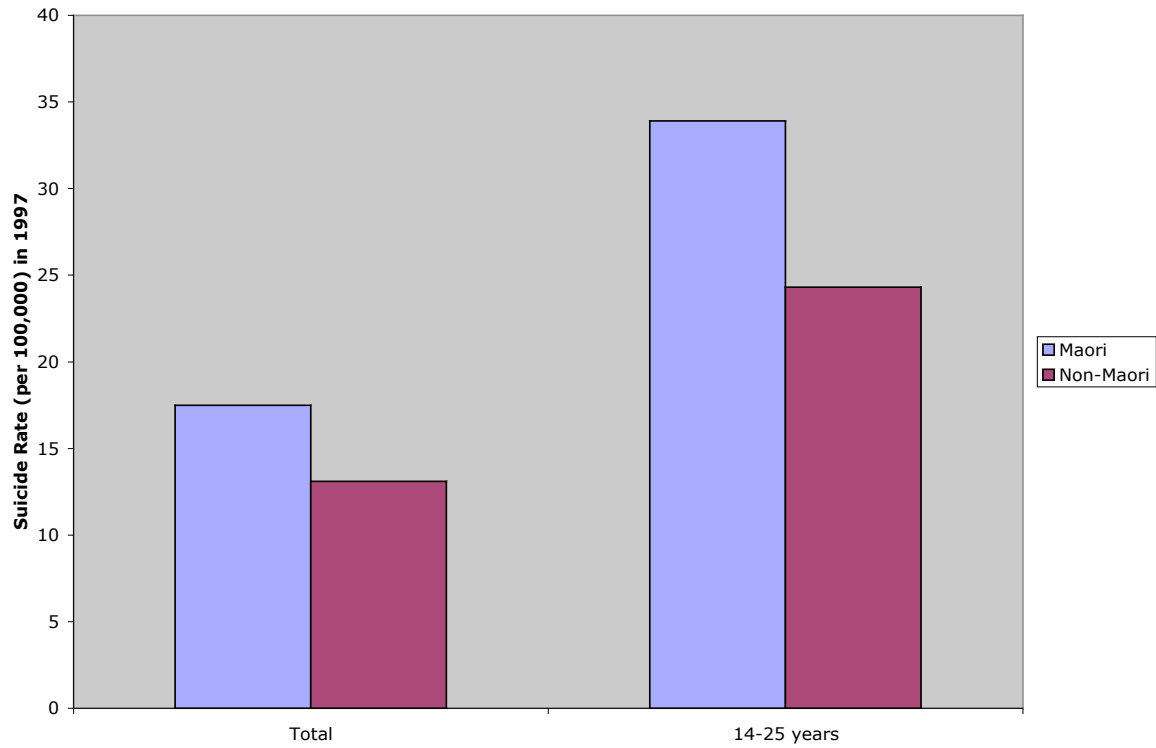
Source: Author's elaboration of data from Hsiao W (2002) *Economic reform and health: lessons from China*. *N Engl J Med* 335:430-2.

Figure 9: Micronesian Suicide Rates 1960-1991 among Males (N=572) and Females (N=49)



Source: Reproduced by permission of Rubenstein (2002) Youth Suicide and Social Change in Micronesia. Occasional Paper No.36, Kagoshima University Research Center for the Pacific Islands.

Figure 10: Suicide Rates among Maori and Non-Maori Populations in New Zealand (1997).



Source: Author's elaboration of data from the Minister of Health of New Zealand (1999)