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Social capital as disease prevention

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Abstract

Increasing demand for healthcare in developed countries raises concerns about the sustainability of spending on healthcare. Building on epidemiological, medical, economic, sociological and psychological research, I argue that a well-being and social capital crisis largely explains rising healthcare demand. There is compelling evidence that increasing dissatisfaction has caused an increase in morbidity and mortality rates in the US. A main policy recommendation is to tackle declining connections and the spread of social isolation in order to increase well-being and health. I review literature suggesting three domains where policies for social capital can be implemented: urban planning, schooling and regulation of advertising. Moreover, a crisis of trust between physicians and patients underlies the increasing phenomenon of defensive medicine that weighs substantially on healthcare spending. Policies aimed at tackling defensive medicine are discussed.

JEL codes: I10; I31; Z13

Keywords: health, morbidity, mortality, social capital, happiness, subjective well-being, objective well-being

1. Introduction: Healthcare spending out of control

Healthcare is the largest economic sector in industrialized countries. It has grown faster than the rest of the economy across many decades, and now accounts for a major portion of GDP. From the early 1970s the ratio of healthcare expenditure to GDP roughly doubled in France, Germany, UK and Italy (Huber 1999). In the US healthcare spending was 5% of GDP in 1960 (7.2% in 1970) and is about 19% today. It is projected to reach 34% of GDP by 2040, a third of the economy (CAE Health Report 2009).

This upward trend, which has not been affected by the many reforms to healthcare systems in western countries, poses disquieting questions about the sustainability of widespread access to healthcare. In the US rising costs were a major reason for the increase in the number of uninsured before Obama's Affordable Care. Soaring healthcare burden is making universal healthcare in Europe increasingly difficult to maintain. It is hard to provide "the same standard for all" when the standard becomes more and more costly.

Why is spending on healthcare spiraling out of control? Pundits identified several factors affecting the rise of healthcare costs. Among these we can include the higher rate of inflation for health-related goods and services as compared to other goods and services, which is largely connected to routine use of expensive high-tech devices (Callahan 2008); the practice of defensive medicine to avoid lawsuits on the part of physicians; soaring demand for healthcare, boosted by the ageing population (Hosseini 2015).

Building on epidemiological, medical, economic, sociological and psychological research, I argue that a crisis of well-being and several forms of social capital have largely contributed to rising healthcare spending, and I draw conclusions about policies aimed at containing such costs. I will use the term happiness interchangeably with well-being.

The recent creation of a ministry of loneliness in the UK is motivated by astounding estimates on the extent of loneliness in British society. Nine million Brits suffer from social isolation – almost one in six – and at least 200,000 elderly report no conversation with friends or relatives for at least a month (Kentish 2017). The establishment of policies aimed at tackling loneliness must be framed in the growing awareness that poor social capital is a major risk factor for health, an idea that is strongly backed by evidence. Indeed, for decades epidemiologists have focused on psycho-social risk factors, such as poverty of social connections, unhappiness and economic inequality. I argue that, especially in the US, declining social capital and happiness boosted healthcare demand in the

past few decades and that reversing such trend is critical to regain control of spending on healthcare. Evidence suggests that policies aimed at this purpose are available in three domains: urban planning, schooling and advertising regulation.

The paper is organized as follows. I first review evidence showing that morbidity and mortality are lower for happier individuals (section 2). The biological mechanism linking happiness to health is examined in section 3. Section 4 shows that less socially connected individuals have higher morbidity and mortality risk than those with more social capital. In section 5, I turn to the trends of happiness and social capital in western countries, finding clear evidence of their decline, especially in the US. Section 6 deals with evidence suggesting that happiness mediates the impact of social capital on health. Section 7 is devoted to the negative impact of the decline in happiness among Americans on their morbidity and mortality. Section 8 reviews evidence concerning the critical role of forms of social capital, such as trust, empathy and communication between physicians and patients, in therapeutic effectiveness. In section 9, I argue that the upsurge in defensive medicine is a consequence of the crisis of these forms of social capital. Cuban healthcare, presented in section 10, is a successful example of an entire healthcare system based on trustful relationships between physicians and patients. Sections 11-12 are devoted to policy implications. Section 13 concludes.

2. Happiness and health

In the nineteenth century, epidemiology focused on infectious diseases, which were then the leading cause of death. The evidence produced by epidemiologists backed the great reforms of the Sanitary Movement that promoted improvement in the health and hygiene of the urban slums. Such neighborhoods began to lose their Dickensian aspects and there was a substantial increase in life expectancy, which was very short at the time (Wilkinson and Pickett 2009).

In the twentieth century, when cardiovascular disease and cancer replaced infections as the leading cause of poor health and death, epidemiologists encouraged lifestyles that would eliminate the risk factors such as smoking, alcohol, dietary fats, physical inactivity, etc.

The third phase of epidemiology occurred in the second half of the 1900s, when the focus shifted to other *psychosocial* risk factors. Scholars documented that happiness has a direct impact on health and longevity, and that pessimism, feelings of not being in control of our lives, stress, and hostile or aggressive feelings towards others are major risk factors for poor health.

For example, the risk of cardiovascular disease was found to be double among individuals suffering from depression or mental illness, and 1.5 times greater among those who are generally unhappy (Keyes 2004). The effects of psychosocial well-being on health are estimated to be greater than those associated with not smoking or with physical exercise (Levy et al. 2002).

In the 1930s, a group of young nuns was asked to write short autobiographies. The emotions expressed in these autobiographies were analyzed 65 years later. Researchers found that the mortality of the nuns was accurately predicted by the amount of positive emotions expressed in the autobiographies. Ninety percent of the top 25% of the ranking (those expressing more positive emotions) was still alive at the age of 85 years, while only 34% of the bottom 25% was still alive. The risk of confounding factors is very low in this kind of study. The nuns had a very similar lifestyle and ate similar food throughout their lives (Danner et al. 2001).

Studies in many countries based on different methods and population samples come to the same conclusions. Ill-being is a major risk factor, while happiness protects health. Research has monitored samples of hundreds, thousands, sometimes tens of thousands of persons over many years, sometimes decades. Studies use different measures of happiness, including depression and anxiety scores, optimism, positive and negative affects, stress, ability to enjoy life, ability to smile, hostile feelings and cynicism, reported happiness and life satisfaction.

This variety of well-being measures has produced unambiguous results. Individuals' well-being measured in the initial period of observation strongly correlates with future health and longevity. For example, initial well-being predicts the development of cardiovascular disease in healthy persons and progression of cardiovascular disease in those who already have it (Hemingway and Marmot 1999), incidence of cancer among initially healthy persons and survival of cancer patients (Williams and Schneiderman 2002), speed of recovery after coronary by-pass surgery and speed of return to normal activities after discharge from hospital (Scheier et al. 1989), probability of survival after stem-cell transplant (Loberiza et al. 2002), hypertension (Raikkonen et al. 1999), female fertility (Buck et al. 2010), mortality among the chronically ill (Guyen and Saloumidis 2009), HIV seropositivity (Moskowitz 2003), diabetes (Moskowitz et al. 2008), immune competence, cardiovascular reactivity (Lyubomirsky et al. 2005) and wound healing speed (Kiecolt-Glaser et al. 2005).

Stressful and relaxing events have important physiological consequences. Rozanski et al. (1999) showed that persons with hypertension have significant variations in blood parameters in samples

drawn before and after experiencing an earthquake. The latter induced an increase in blood pressure and viscosity lasting 4-6 months. Davidson et al. (2003) documented that individuals who practiced meditation produced more antibodies in response to influenza vaccine than controls. Patients awaiting gall bladder removal who practiced relaxation had a lower incidence of wound infection after the operation than a control group (Holden-Lund 1988). Even stress in early life or prenatally has significant effects on physical, emotional and cognitive development, as well as on health throughout life (Wilkinson and Pickett 2009).

Moreover, reported health worsens when happiness declines. This does not necessarily imply worse objective health, but people with a poor perception of their health require medical appointments and diagnostic tests (Argyle 2001). Doctors generally agree that anxious people, hypochondriacs and lonely elderly persons, who often seek the doctor out of a need for someone to talk to, weigh on healthcare costs.

3. Why does well-being influence health?

The human body is extraordinary at reacting to what we call acute stress. When we are involved in a stressful event, our body activates what is called the fight or flight reaction. Hormones secreted by the adrenal glands mobilize energy supplies: the immune system is activated, the blood vessels constrict, heart and lung activity increases, clotting factors are released into the bloodstream in prevision of injury, the brain becomes more reactive and pain perception is dulled.

This reaction is protective if the emergency ends quickly but harmful if it becomes chronic. In the latter case the brain loses memory and cognitive functions, the risk of depression and insomnia increases, the immune system deteriorates, chronic constriction of blood vessels increases the risk of hypertension and cardiovascular disease, and digestive and sexual functions may be upset. In short, the biology of stress indicates that the problem is not stress but chronic stress (Wilkinson and Pickett 2009).

Research on isolated individuals – who tend to be very unhappy – has provided emerging evidence of the role of hormonal and neuro-endocrine effects on gene transcription and cell immunity, linking unhappiness and morbidity (Hawkey and Cacioppo 2010). Other research suggests that social isolation is strongly associated with unhealthy behaviors (Hawkey et al. 2003).

4. The social cure

Apart from happiness, epidemiologists have also focused for decades on two other psychosocial risk factors: poor social capital and economic inequality. Citizens of highly unequal countries experience poorer health and shorter lives than citizens of more equal countries (Wilkinson and Pickett 2009). Similarly, poverty of social capital increases mortality and morbidity.

The concept of social capital refers to the quality and the quantity of an individual's connections to other individuals and the community (Putnam 2000). Since the seventies, a flood of research has documented that having friends, identity and loving relationships, participating in groups and associations, and enjoying social support protect health (Berkman and Syme 1979, House et al. 1988, Seeman et al. 1987, Berkman and Glass 2000, Stanfeld 2006). For example, socially isolated heart attack patients have nearly twice the probability of patients with a rich social life of having another heart attack within 5 years. Being isolated from others has a much higher impact than well-established risk factors, such as coronary artery disease or physical inactivity, on the probability of having another heart attack (Jetten et al. 2012).

Poverty of social connections is also predictive of mortality from ischemic heart disease; those who are socially isolated have a risk of death over 5 to 9 years that is 2-3 times higher than that of well-connected persons (Kaplan 1988). Isolated individuals with coronary artery disease are more than twice as likely to have a lethal event than socially integrated individuals (Brummett et al. 2001).

These effects not only concern those with serious health problems. Social isolation even makes people more vulnerable to the common cold. Isolated individuals have twice the probability of catching a cold than more sociable individuals, although the latter are presumably much more exposed to infection (Cohen et al. 1998). Other studies have shown that wounds heal faster in persons with good marital relationships. In addition, Putnam (2000) showed that persons joining a voluntary group for the first time reduce their probability of death in the coming year by 50%.

Comparing American states, average participation in voluntary associations predicts average mortality rates, infant mortality, and death from coronary heart disease and cancer (Kawachi et al. 1997). Likewise, a health index in American states is strongly correlated with various indicators of sociability (Putnam 2000).

It was recently documented that poor social relationships affect the immune system, stimulating production of inflammatory substances that favor the onset of many diseases. A sample of 122 persons made a note of their positive and negative social interactions for 8 days: for example, time spent with friends or help from partner or relatives on the positive side and a disagreement with a friend or family member on the negative side. In the four days after this period, saliva samples were obtained from the participants to analyze concentrations of two pro-inflammatory hormones. Persons who had experienced negative interactions had higher levels than those who had experienced positive interactions with others. This result suggests that secretion of inflammatory substances in response to unpleasant interactions occurs on an almost daily basis. Every negative relationship seems to take away a piece of health (Chiang et al. 2012).

After kids and teens, older adults are the population group at highest risk of social isolation. Eighty percent of young people under 18 years of age and 40% of individuals over 65 years report feeling lonely at least sometimes. Levels of loneliness gradually diminish throughout mid-life, and then increase in old age (Berguno et al. 2004, Pinquart and Sorensen 2001, Weeks 1994). Reduced inter-generational living and family size, greater geographical mobility and the decline in community ties all contribute to make loneliness an increasing part of the experience of growing old.

This is a major threat for health. While in young age loneliness mainly creates mental health problems, in the old age it largely translates into deterioration of physical health as well. Lonely or isolated older adults are at greater risk for all-cause mortality (Valtorta et al. 2012). A meta-analysis of 148 longitudinal studies, observing more than 300,000 individuals for an average of 7.5 years, found that individuals who have poor social connections have double the mortality risk of individuals with strong social ties (Holt-Lunstad et al. 2010). This effect is greater than that of other well-established risk factors for mortality, such as physical inactivity and obesity, and comparable with cigarette smoking.

Similarly, older individuals who are lonely are at greater risk of increased morbidity related to the major causes of disease burden in the elderly. Social isolation has been associated with increased risk of development and progression of cardiovascular disease (Hawkley and Cacioppo 2010, Knox and Uvnas-Moberg 1998) and dementia (Fratiglioni 2000). Another study followed more than 16,000 seniors for a period of six years and found that memory among the least integrated declined at twice the rate it did among the most integrated (Ertel et al. 2008). In a sample of 800 older adults, lonely individuals were more than twice as likely to develop Alzheimer's disease than those who were not lonely, over four years of follow-up (Wilson et al. 2007).

The Harvard Study of Adult Development is the longest study of adult life ever conducted. Several generations of researchers tracked the lives of 724 males for 75 years. The conclusion from this study is that good relationships keep people happier and healthier. During their lives, some of the participants climbed the social ladder and others sank, but this was not what predicted their future health and happiness. It was their connection to family, friends and community. Those who were more connected were happier, physically healthier, and lived longer than those who were less well connected. On the other hand, loneliness killed. People who were more isolated were less happy, their health declined earlier in midlife, their brain function declined sooner and they lived shorter lives than people who were not lonely.¹

5. Trends of happiness and social capital

In the light of the literature reviewed so far, the trends of happiness and social capital in the West are alarming. Especially in the US, happiness and social capital declined in recent decades, consistent with the view that their erosion have played a role in boosting healthcare demand.

The decline of American social capital was popularized by Putnam (2000) and confirmed in the ensuing debate (Paxton 1999, Robinson and Jackson 2001, Costa and Kahn 2003, Bartolini et al. 2013). Loneliness has become a mass problem in the US. In 2004 a quarter of Americans reported that they had no one with whom they could discuss important matters. This share was 10% in 1985. If family members are not counted, this share amounted to more than half of Americans in 2004 (36% in 1985). The number of persons the average American shares confidences with dropped by one third (from nearly 3 persons in 1985 to about 2 in 2004) (McPhearson et al. 2014). One out of three Americans are lonely, up from one out of five in 1980 (Knowledge Networks 2010). For as many as 15–30% of the general population, loneliness has become a chronic state (Heinrich and Gullone 2006, Theeke 2009). According to data from the Census Bureau, “unrelated individuals” (those who do not live in a family group) increased from 6% in 1960 to 16% in 2000 (Shaw Crouse 2001).

As for trust, from the early 1970s to the 2010s the share of the working age population responding that most people can be trusted fell from 50% to nearly 30% (Gould and Hijzen 2016). Solidarity, honesty and associational activity have sharply declined since the 1970s (Putnam 2000, Bartolini et

¹ <http://www.adultdevelopmentstudy.org/>

al. 2013). Families have become increasingly unstable. Americans marry less, divorce more, live together less and separate more frequently than in the 1970s (Bartolini et al. 2013).

Although they are not as depressive as American trends of social capital, European ones do not offer occasion for optimism. Sarracino (2012) analyzes the trends of trust and associational activity in Europe between 1980 and 2005. He finds that associational activity stagnated or grew slightly in most western European countries. However, trust in others has shrunk in Spain and the Netherlands since the 2000s, in Italy, Ireland and Belgium since the 1990s, and in France since the 1980s.

Turning now to happiness trends, subjective measures of happiness and life satisfaction have mostly stagnated in Europe in the last few decades (Sarracino 2012). As far as the US is concerned, reported happiness has been significantly declining since the 1970s (Blanchflower and Oswald, 2004, Bartolini et al. 2013, Sachs 2017).

Objective data on well-being – concerning the spread of psychiatric drugs, mental illness, suicides and addictions – depicts an even more disquieting picture of America than subjective data. The use of psychiatric drugs rose so much that it turned the US into a “sedated society”. Prescriptions for antidepressants, stimulants, antipsychotics, mood stabilizers and anxiolytics soared, bringing the share of the psychiatrically medicated adult population to 20%. Great Britain, where this share is 15%, is not doing much better (Davies 2017).

This flood of psychiatric drugs in the US is a result of the upsurge of mental illnesses. The probability of suffering from depression has grown rapidly across generations. A study by Robins et al. (1984) on American and Canadian citizens documented that individuals born around 1910, who were therefore 75 years old at the time of the study, had a 1.3% probability of experiencing a major depressive episode during their lives. For those born after 1960, this probability shot up to 5.3%, although one would expect a lower probability because they were 25 years old or under. All generations had a higher probability of experiencing depression than previous generations. Twenge et al. (2010) assessed the evolution of mental illness using a survey, administered to high school and college students since the 1930s, that included many questions regarding symptoms of depressions and anxiety. They found that depression and anxiety rose significantly in the period 1938-2007 in the US.

Another survey shows that between 1982 and 2013 symptoms of depression and anxiety rose significantly in a nationally representative sample of U.S. 12th graders (Twenge 2013). Evidence suggests that mental illnesses began to soar in the 1980s. Using measures of anxiety dating back to

and unchanged since the 1950s, Twenge (2000) showed that normal American kids and teens in the 1980s scored as high in the anxiety scale as children in psychiatric care in the 1950s. In the 1990s the situation had become critical. Psychiatric interviews conducted on a national sample of American adults showed that almost 50% experienced at least one mental disorder in the course of their lives and about 30% experienced one in the last year (Kessler et al., 1994). A staggering 18.2% experienced mental disorders in the last month (Kessler and Frank, 1997). The situation did not seem much better in other countries. Jenkins et al. (1997) show that 16% of a national sample of young British adults suffered a neurotic disorder in the past week. In Ireland, 2.4% of the population experienced clinical depression in the last month, and 12.2% in the last 12 months (McConnell et al., 2002). A vast international study on depression conducted on a sample of 40,000 individuals in the US, Puerto Rico, Germany, Italy, France, Lebanon, New Zealand and Taiwan shows that the risk of depression grew enormously in the twentieth century (Cross National Collaborative Group 1992). The method used in these studies, i.e. the diagnostic interview, seems to solve the main problem involved in assessing the evolution of depression over time, namely changes in its diagnostic criteria and perception. In fact, researchers did not ask: "Have you ever been depressed?" but questions such as whether respondents have trouble falling asleep, whether they feel well-rested when they wake up, whether they have trouble thinking, whether they have experienced dizzy spells, headaches, shortness of breath, a racing heart, or whether they have ever cried every day for two weeks or tried to kill themselves.

As for addictions, American society has been struck by an epidemic, in particular abuse of opioids. Of the 20.5 million Americans aged 12 or older who had a substance use disorder in 2015, the substance was prescription opioids in 2 million cases and heroin in 591,000 cases (ASAM 2016, Center for Behavioral Health Statistics and Quality 2016). Deaths from overdose tripled since the start of the millennium, reaching 60,000 in 2016. This is the largest massacre of Americans since WW2. Roughly 58,000 US soldiers died in the entire Vietnam War, nearly 55,000 Americans died in the car crash peak in 1972, more than 43,000 died in the AIDS peak in 1995, and about 40,000 were shot in 1993, the peak year for firearms deaths (Lopez and Frostenson 2017).

Arguably, widespread distress underlies such a mass vulnerability to addiction. The profile of the American citizen most affected by the epidemic provides much information about the causes of such distress. Young or middle aged, poorly educated, non-Hispanic white males who live in the Rust Belt (previously known as the industrial heartland of America), were more frequent victims of this epidemic (Lopez and Frostenson 2017). This is the profile of the losers of globalization.

Deindustrialization eroded the community and social connections, beyond the jobs and the self-esteem of white males. The decline in marriages and fertility, and the rise in the share of children born to unmarried mothers or living in single-parent households, were particularly acute in the Rust Belt (Autor et al. 2017).

As far as suicides are concerned, in the period 1999-2014, the age-adjusted suicide rate in the United States increased by 24%. Suicide rates increased for males and females and for all ages from 10 to 74 years. A total of 42,773 people died from suicide in 2014, compared with 29,199 in 1999. The rise was particularly steep for women. The suicide rate tripled among girls 10 to 14 years of age (Curtin et al. 2016).

6. Social capital and happiness

Social capital is a major source of happiness. Studies on happiness, both economic (Helliwell 2006, Bruni and Stanca 2008) and psychological, come to the same conclusion: “individual differences in happiness appear to be solidly anchored in the invisible threads of connection to others” (Cacioppo et al. 2008).

Neuroscientists have provided much evidence on humans’ deep need to be connected to others. They found that helping another person triggers activity in parts of the brain involved with pleasure and reward (the caudate nucleus and anterior cingulate cortex). This suggests that helping others is as gratifying as fulfilling a personal desire (Rilling et al. 2002). Conversely, the pain of social exclusion involves the same areas of the brain as physical pain (Eisenberger and Lieberman 2004).

Human brain is equipped to understand others’ emotions. A subset of the brain cells that fire when one is experiencing something, also fires when one is watching someone experiencing the same thing. These cells are called mirror neurons (Rizzolatti and Craighero 2004). Mirror neurons cause our brain to act as if we were experiencing whatever the person we are watching is experiencing. Since their discovery, these neurons have been hailed as a cornerstone of human empathy.

In the light of this literature, the conclusion is that the effect of social capital on health is likely to be mediated by happiness. Social capital seems to promote health largely because it promotes happiness.

7. Troubled lives, troubled health

Evidence that unhappiness is undermining American health has been recently brought by Case and Deaton (2015). In one group of the American population, middle-aged white non-Hispanics, distress was so sharp as to lead to increased morbidity and mortality since 1998 (figure 1).

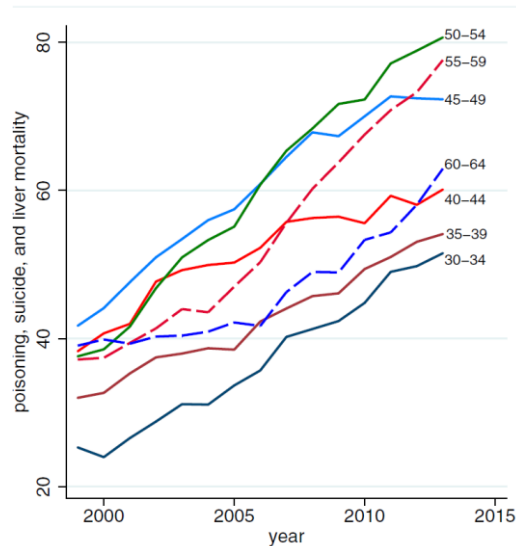


Figure 1. Mortality by drug and alcohol poisoning, suicide, chronic liver disease and cirrhosis among white non-Hispanics by 5-year age group.

The list of causes for the increase in mortality in fig. 2 speaks volumes about the underlying epidemic of dissatisfaction. Concurrent declines in self-reported health, mental health and ability to work, increased reports of pain and deteriorating measures of liver function all point to increasing distress, particularly concentrated in midlife.

This data aroused much attention because it shows an inversion of the worldwide increasing trend in longevity. What strikes in Case and Deaton's findings is the extent to which mass dissatisfaction and frustration can turn into health deterioration. And of course, into health spending.

Health deterioration may not be an exclusively American phenomenon. *Healthy life years* (also called disability-free life expectancy) decreased in many European countries. An example is shown in figure 2, which refers to the female population between 2010 and 2015. Males exhibit a slightly less disquieting trend.

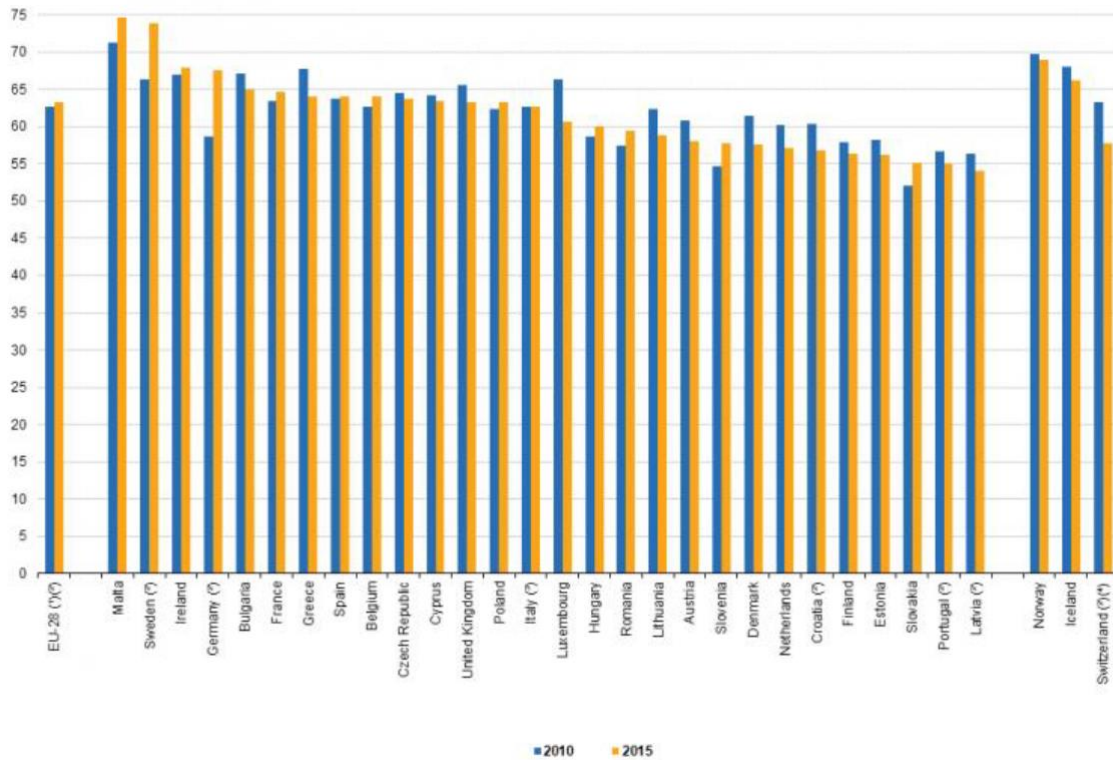


Figure 2: Healthy life years at birth, females, 2010 and 2015. Source: Eurostat http://ec.europa.eu/eurostat/statistics-explained/index.php/Healthy_life_years_statistics

Importantly, in the period considered in figure 2 longevity continued to increase in all European countries. Life expectancy increased more than healthy life expectancy even in those countries where healthy years increased. So, everywhere in Europe longevity and health diverged, with an increasing portion of life spent with a disability.

8. From curing the illness to caring for the ill

Relationships are also crucial for healing people and not just for keeping them healthy. The patient-doctor relationship is critical in medicine because medical personnel interacts with patients when they are most vulnerable. Relational quality always plays a fundamental role in patient well-being and therapeutic effectiveness, but it has special importance in the case of severe or even incurable diseases, where the physician has to deal with frightened, depressed and anxious patients, who are therefore highly sensitive to the relational atmosphere that surrounds them.

Usually doctors have little or no training in relational skills. Rather, they learn to deal with diseases instead of patients. Yet, research shows that the psychological aspects of their relationship with

patients are fundamental for therapeutic effectiveness. For example, Williams et al. (2000) found that when medical staff is empathetic and involves patients in decision making, patients have better physical and psychological health, fewer visits to the doctor, more health-oriented behavior, better adherence to prescriptions and greater satisfaction with therapy. Stewart (1995) reviewed the literature on the effects on health of good communication between patients and doctors. Most articles found positive effects, such as better emotional health (less anxiety and stress), faster recovery, better physiological condition (blood pressure, blood sugar) and better pain control. Another study (Stewart et al., 2000) showed that a model centered on patient needs and expectations improves therapeutic effectiveness and reduces the number of diagnostic tests and medical appointments. When the empathy of health personnel improves, so does patient satisfaction and adherence to treatment (Kim, Kaplowitz, and Johnston, 2004).

The question of adherence to treatment is important because it is estimated that 25-50% of patients do not stick to the prescribed therapy (Di Matteo 2004; Vermeire et al. 2001). This implies protracted illness, extra medical appointments and more hospital readmissions. A review of 127 studies found a significant relationship between style of communication of doctors and adherence to therapy (Zolnierek and Di Matteo 2009). Patients of doctors with an impersonal and non-empathetic style of communication stuck to the treatments prescribed 19% less than those with doctors having better communication ability. Relational training positively influences the communicative style of doctors. Adherence improves by 16% if doctors have had relational training. The quality of the doctor-patient relationship is not an optional extra, at least according to patients. They think that a doctor's capacity to communicate is often unsatisfactory and that it is one of the most important qualities that doctors should have (McBride et al. 1994).

Poor awareness of the importance of relationships and personal care in medicine is reflected by decades of policy advocating increased nursing workload. However, the cost of nursing personnel is relatively small compared to the benefits it brings. A study analysed more than 400,000 patients, 50 years of age and over, who underwent common surgical operations in 300 hospitals in nine European countries (Alkenet et al. 2014). It found that for every extra patient in the care of a nurse, the probability that a patient die within 30 days of admission increased by 7%. Mortality was not only affected by nursing workload, but also nurse training. If the percentage of graduate nurses in a ward increased by 10%, the probability of a patient dying within 30 days of admission fell by 7%. In hospitals where 60% of nurses were graduates and each nurse was responsible for an average of six patients, mortality was 30% less than when only 30% of nurses were graduates and each cared for

an average of eight patients. These results are in line with those obtained in earlier studies (Rafferty et al., 2007; Diya et al. 2012).

These studies suggest that investing in nurses, namely in their training and in reducing their workload, gives excellent results, and costs a tiny fraction of the underutilized high-tech equipment found in many western hospitals.

9. Defensive medicine

Despite its critical nature, the doctor-patient relationship is one of the most dysfunctional aspect of healthcare organization. The crisis of this relationship is reflected by the cost of malpractice insurance coverage, which has been increasing for decades. The frequency of legal action against doctors for malpractice increased by 10% annually in the period 1970-1989 in the U.S. (U.S. General Accounting Office, 1986; Danzon, 1991). In Italy, legal action for malpractice increased almost fourfold in the period 1994-2012 (Ania 2014).

Basically, patient suspicion of doctors has advanced enormously. The public is bombarded with frequent news of healthcare scandals, in which the cynicism, incompetence and negligence of doctors is portrayed in grotesque terms, demolishing the foundations of the paternalistic relationship that traditionally characterized the doctor-patient relationship.

Trust in medicine is shrinking. In 1966, nearly three quarters (73%) of Americans said they had great confidence in the leaders of the medical profession. In 2012, only 34% expressed this view. Today, only 23% of Americans report a great deal or quite a lot of confidence in the system (Blendon et al. 2014).

Doctors react to patients mistrust by minimizing the risk of legal action by patients. They prescribe unnecessary screenings and treatments so as not to be accused of failing to do and try everything possible. This is defensive medicine. The cost is borne by national health systems, insurance companies and patients, who undergo screenings that may be invasive and that expose them to the risk of overdiagnosis. By means of defensive medicine, doctors transfer the cost of minimizing the risk of legal action to other subjects.

Rampant defensive medicine is one of the costly effects of weakening trust in medicine. Declining cooperation in doctor-patient relations is the flip side of the flawed therapeutic relationship, that of curing the illness instead of the patient. Building empathy and trust between doctors and patients

is a condition for the sustainability and effectiveness of healthcare expenditure. Another consequence of shrinking confidence in medicine is the current proliferation of (sometimes highly dubious) alternative medicine and treatments. In several European countries, current widespread opposition to certain vaccines – accused of serious side-effects, allegedly hushed by mainstream health communications – is yet another consequence.

The impact of defensive medicine on U.S. healthcare expenditure is estimated at around 10% (Mello et al. 2010). In Italy, defensive medicine is estimated to account for 10.5% of national health system spending and 11.8% of total healthcare spending (public and private) (Piperno, 2010).

Countries such as Sweden and New Zealand have taken interesting measures to clip the wings of defensive medicine. In these countries, the national health system is financially responsible for medical malpractice instead of doctors themselves. Doctors can, of course, be subject to disciplinary action. Reducing or eliminating the financial responsibility of medical practitioners towards patients seems to sharply reduce incentives for defensive medicine (Weiler, 1993; Towse and Danzon, 1999).

10. Cuban relational healthcare

There is a saying in Cuba: “We live like the poor, and die like the rich”. It sums up experience of the Cuban revolution, which was a substantial economic failure, but achieved at least one extraordinary result. Cuba is the only poor country that has the healthcare outcomes of a rich country. According to World Bank data, per capita healthcare expenditure in Cuba is about 5% of the U.S. figure, with similar results in terms, for example, of longevity and infant mortality. Secretary General of the United Nations, Ban Ki-moon, observed that “Cuba can be proud of its health care system, a model for many countries”. He defined the Cuban ELAM (Escuela Latino Americana de Medicina) “the world’s most advanced medical school.” The World Health Organization (WHO) was impressed by the country’s medical achievements. Cuba was chosen to chair the 67th World Health Assembly in May 2014 in recognition of the excellence of its healthcare system.

How did the Cubans manage to obtain a benefit-cost ratio that is absurdly high by western standards? The approach to medicine is radically different in Cuba, starting with medical training. The curriculum combines population-based public health principles, prevention and clinical medicine. Students work with Cuban communities even in their basic science years and public health is an important subject in their clinical training. The focus is bio-psycho-social, centered on individuals, families and community (Frank and Reed 2005). Education emphasizes the intrinsic

motivation of doctors. The Cuban approach to medical training is a “paradigm shift in what it means to be a doctor”: it reverses “the trend that has patients becoming clients and customers, while healers become income-driven service providers” (Frank and Reed 2005, p. 4).

Cuban healthcare is based on close relations between doctors and patients; doctors are strongly rooted in the community. This “relational medicine” has produced an original model based on spatially decentralized healthcare, the success of which rests on prevention and early treatment.

Family doctors work in clinics and care for everyone in the neighborhood. At least once a year, the doctor knocks on each person’s door for a check-up (at home or elsewhere, if they prefer). The check-up involves many questions about jobs and social and emotional life, information that is aided by being right there in the person’s home. Doctors classify patients into risk categories and establish how often they need to be seen. Western systems, where people bounce between specialists and hospitals, are fragmented by comparison. The Cuban system fosters a holistic approach centered on trust between patients and a primary-care physician². Most residential blocks still have a doctor’s office; the doctor lives upstairs and is on call.

Today Cuba sends more doctors to help in developing countries than all G8 countries combined. There are currently more than 70,000 Cuban doctors and more than 20% are in mission in 66 countries³. Cuba’s medical missions have become the country’s most profitable resource as well as a diplomatic tool. In 2014, overseas healthcare services were estimated to bring in \$8.2 billion, putting them ahead of tourism⁴.

This success is built on prevention and trust in patient-doctor relationships. Although many aspects of this model cannot be replicated in rich countries, the Cuban example suggests a quite different approach from the costly pursuit of high technology by healthcare systems.

11. Policy: Preventive happiness

Healthcare systems need to reverse the trend to decreasing relationship quality between medical personnel and patients. Increased spending on nurses, relational training of physicians and shifting

2 <https://www.theatlantic.com/health/archiv1e/2016/11/cuba-health/508859/>

3 http://www.thestar.com/news/world/2012/06/02/cubatraind_doctors_making_difference_around_the_world.htm

4 https://elpais.com/elpais/2017/02/10/inenglish/1486729823_171276.html

liability for medical malpractice from doctors to national health systems are policies for tackling these issues.

However, these policies do not affect the demand for healthcare. Limiting demand is critical for regaining control of healthcare spending. So far, demand limitation has largely relied on medical information about healthy lifestyles, such as not smoking, doing physical exercise and eating correctly. However, evidence suggests that happiness has greater importance. In 2003, the United States spent around \$100 billion to treat its citizens' mental illnesses (Wilkinson and Pickett 2009). Although huge, the figures of psychiatric treatment only capture a small portion of health expenditure generated by unhappiness. Unhappiness is expensive because healthcare systems are the end stations of distress. Unhappiness tends to turn into poor health, creating pressure on healthcare systems.

This suggests that much prevention of disease should take place outside the healthcare system, focusing on the promotion of well-being. There is nothing new about this kind of prevention. The principle improvements in health have often taken place outside healthcare systems. In Europe the great leap forward in longevity occurred in the second half of the nineteenth century, much before antibiotics, with improvements in hygiene, living conditions and nutrition.

Since social capital is so critical for happiness, in the next section I review various public policies for social capital.

12. Policies for social capital

12.1. Urban policy

Cities, since they first existed 5000 years ago, had social capital at the center of their organization. Crucial for creating relations was the common space, symbolized by the city square, where citizens of all ranks could meet. Cities were built for people; all streets were pedestrian. Then, the advent of automobiles transformed human environments into places dangerous for humans. Cars have invaded common urban spaces, harming their function to build social ties. Where cars are less dominant people live better, are happier, and more socially connected.

These ideas are at the center of New Urbanism, an urban design movement that emphasizes pedestrian-oriented, mixed-use, high-density neighborhoods as a means for building relationships among residents. According to New Urbanists, in fact, residents are more likely to walk about in

such neighborhoods, thus having more chances for casual interactions (encounters, conversations, exchange of favors). This enhances the neighborhoods' social fabric, the engagement of residents in neighborhood-related activities, and the sense of community.

Studies comparing traditional neighborhoods and conventional low-density car-oriented suburbs find greater social interaction and sense of community in traditional neighborhoods (e.g. Kim and Kaplan 2004, Lund 2002). According to Putnam (2000), American urban sprawl has played a major role in the decline of social capital in the US. Other studies focus directly on the degree of walkability, which is calculated using objective and/or perceived measures (Frank et al. 2010). Such studies document that more walkable neighborhoods have enhanced social interaction and greater sense of community (Leyden 2003, Lund 2003, du Toit et al. 2007, Wood et al. 2008, 2010, Rogers et al. 2010, 2013). Even dog walking works as a catalyst in strengthening the community's social fabric (Wood and Christian 2011). Walkability has a positive impact not only on social capital but on the neighborhood's real estate price, foreclosure, and crime rates as well (Gilderbloom et al. 2015). Walkable neighborhoods translate into more "eyes on the street," which lead to less crime. These results have been replicated in cities throughout Northern America, Europe, Asia, and Oceania.

Urban quality of life has progressively become the focus of political debate in many cities, giving rise to remarkable political novelties in local elections. In the past two decades, mayors of important cities, such as Bogotá, Paris and Mexico City, have won office after electoral campaigns emphasizing the need for radical reform of the quality of public spaces and transport (Montgomery 2013). For decades, many large northern European cities have increasingly based their urban planning on the principles of New Urbanism, limiting cars, giving priority to public transport, cycling, parks and pedestrian areas.

The car-oriented urban evolution after WW2 especially damaged the relational opportunities of individuals with reduced mobility, such as the elderly and children, whose connections largely depend on the existence of a social fabric within walking distance. Contemporary cities are largely responsible for transforming children and old people, who experienced dense social connections until a few generations ago, into the population groups most at risk of solitude (Pinquart and Sorensen 2001).

In a single generation since the 1970s, the 'radius of activity' of children – the area around their home where they are allowed to roam unsupervised – has declined by almost 90% (Gaster 1991). Between 1969 and 2001 in the US, the share of students walking to school decreased from 40.7%

to 12.9% (McDonald 2007). This is not an exclusively American phenomenon; the mobility and independence of children has plummeted everywhere in the industrial world. In Britain, in 1971, 80% of 7-8-year-olds were allowed to walk to school, often alone or with their friends. Two decades later, fewer than 10% walked to school, and almost all of them were accompanied by their parents (Hillman et al. 1990). Today, two out of three 10-year-olds have never been to a store or a park by themselves (Moss 2012). Roughly one out of two adults thinks that 14 is the earliest age at which a child should be allowed out unsupervised. Just one generation ago, ten-year-olds had more freedom than a teenager does today (Children's Society 2007).

This radical transformation of children's lives has a number of harmful effects, ranging from a lack of contact with nature to an obesity epidemic due to an increasingly sedentary life-style. Youth obesity has tripled in prevalence (LaFontaine 2008) as a result of the collapse in children's overall levels of physical activity (Salmon and Timperio 2007). Above all, however, the transformation of kids' lives results in relational deprivation since it limits contacts among children. When kids used to play on the street, they formed their own groups, and involvement in group interpersonal dynamics taught them social skills that would accompany them throughout their lives.

While tackling loneliness in old age is a priority for reducing healthcare demand over the medium-term, prevention over the very long-term requires tackling loneliness among the young. Failure to acquire social skills during childhood set lives on a path where loneliness and conflict are more likely to be frequent experiences.

Urban planning should be considered a key ingredient of medium and long-term disease prevention. The decisions made every time a new neighborhood is built have consequences for social connections – and therefore health – that may persist across generations. Pedestrian areas, traffic restrictions and mass public urban transportation are crucial for relieving the pressure of cars on cities. Importantly, it is nearly impossible to offer low cost, high frequency public transport in low-density suburbs. The large average distance and low population density around bus stops imply that buses travel almost empty.

12.2. Educational policy

Educational practices are critical to the development of social skills. Teaching methods differ tremendously not only from country to country, but also between schools and even within schools. Algan et al. (2011) exploit this variability to explore the effects of progressive education. They examine data from hundreds of thousands of fourth to ninth graders from dozens of countries, and

rank the methods by which they are taught according to their degree of verticality/horizontality. When teaching practices are vertical, teachers primarily lecture and ask students questions, while students mostly take notes or read textbooks. The classroom is teacher-centered because the central relationship in the classroom is that between the teacher and the student. By contrast, horizontal - or participatory - teaching practices focus on students working in groups on common projects. And in this system, it is students who ask teachers for answers to questions. The classroom is student-centered because the central relationship in the classroom is that between the students.

Controlling for a wide range of student, teacher and school characteristics, Algan et al. find that horizontal teaching is related positively and significantly to several dimensions of students' social capital, including beliefs in cooperation with other students and with teachers, membership in associations, trust in institutions, and participation in civil society. This holds true at the student level, across schools and within countries. These findings are consistent with the idea that the beliefs and skills underlying social capital are acquired through the practice of cooperation. Predictably, schooling practices that are more cooperative form individuals that are more cooperative.

Actually, the plethora of Western educational systems abounds with experiments aimed at radically extending participatory practices (Sliwka 2008). Some of these experiments are strictly local, while others, such as the Montessori or Waldorf-Steiner schools, have a long and successful history that led to the creation of global networks.

Despite differences in many important respects, all alternative educational models share certain features: learning is organized as an active process based on the needs and interests of individual students; they focus on experience, reflection, cooperation, participation and enjoyment; there is little or no room for tests.

Montessori education is a century-old schooling method that continues to gain popularity. More than 5000 schools in the United States use the Montessori program. Montessori education is characterized by multi-age classrooms, a special set of educational materials, student-chosen work in long time blocks, collaboration, the absence of grades and tests, and individual and small group instruction in both academic and social skills (Montessori 1964). The effectiveness of some of these elements is supported by research on human learning (Lillard 2005).

Lillard and Else-Quest (2006) evaluated the impact of Montessori education and found that it fosters social and academic skills more than traditional education. This study overcomes the main problem when comparing the results of the Montessori method with other teaching methods: distinguishing

between the impact of different schooling methods and the impact of different parents. Parents who enroll their children in Montessori schools can be expected to be different from other parents. This is crucial because parents have a dominant influence on children outcomes (NICHD 2004). Lillard and Else-Quest control for this potential source of bias because in their case study students were randomly assigned to the Montessori or to traditional teaching method through a lottery. They document that by the end of kindergarten, the Montessori children performed better on standardized reading and math tests, interacted more positively in the playground, and showed higher social cognition and control, and greater concern for fairness and justice. At the end of elementary school, Montessori children wrote more creatively, used more complex sentence structures, selected more positive responses to social dilemmas and felt more connected with their community at school.

Studies on Waldorf-Steiner schools provide similar results. They show a positive relationship between Steiner schools and learning, achievement and the development of academic, creative and social capabilities (Woods et al. 2005). However, this evidence may be affected by the self-selection bias of parents, which the study of Lillard and Else-Quest instead allows to overcome.

Specific schooling programs, called social and emotional learning programs, can be employed to enhance emotional intelligence. Emotional intelligence is critical to social capital because it provides the cooperative skills on which social capital is based. A study by Durlak et al. (2011) involving about 270,000 students from kindergarten through high school, explored the effects of social and emotional learning programs across multiple outcomes. This meta-analysis of 213 school-based social and emotional learning programs concludes that they have a positive impact on social and emotional skills, attitudes toward self and others, positive social behavior, behavioral problems, emotional distress, and academic performance (+11%).

Many northern European countries have increasingly integrated principles of alternative schooling into mainstream education. These countries score high in the international ranking of participatory schooling. They also rank high in academic achievement, suggesting that there is no conflict between the acquisition of social and cognitive skills.

12.3. Policy for advertising targeting children

Policies for social capital include regulation of advertising aimed at children. Marketing pressure on children and teenagers has soared in the last few decades. Kids and teens have become the primary target of advertising. In the United States, total spending on advertising targeting children reached

15 billion dollars in 2004, 150 times the amount spent in 1983 (Schor 2004). Marketing budgets have recently shifted to the internet, where digital advertising offers unprecedented opportunities to capture children's attention through entertainment, which is mainly funded by commercial interests (Buckleitner 2008). The mounting advertising burden is bad news because since the 1970s, studies have invariably documented a relationship between exposure to advertising and the media, and childhood materialism (Goldberg and Gorn 1978, Pollay 1986, Greenberg and Brand 1993, Buijzen and Valkenburg 2003, Schor 2004, Nairn et al. 2007).

In fact, rampant marketing to youngsters has been paralleled by soaring materialism. Seventy-five percent of American children want to get rich, a higher percentage than in any other part of the world (except India). Approximately two-thirds of parents report that their kids define their self-esteem in terms of the things they own and wear, much more than the parents themselves ever did. More than one-third of children between 9 and 14 "really like kids that have very special games or clothes," more than half believe that when you grow up, the more money you have, the happier you are, and almost 2/3 say that "the only kind of job I want when I grow up is one that gets me a lot of money" (Schor 2004, p. 23).

Materialism plays a negative role in shaping children's happiness and social capital, as documented by abundant psychological literature. The negative impact of materialism on well-being holds across a wide range of measures of child well-being, such as parent assessment (e.g. Goldberg et al. 2003), life satisfaction (Ahuvia and Wong 2002) and life dissatisfaction scales (Buijzen and Valkenburg 2003), self-esteem (Nairn et al. 2007, Chaplin and John 2007) and measures from standardized scales for anxiety, depression and psychosomatic symptoms (Schor 2004).

Children's materialism is also highly correlated with family conflict, less generosity and higher probability of anti-social behaviour (Buijzen and Valkenburg 2003, Nairn et al. 2007, Cohen and Cohen 1996, Kasser and Ryan 1993, Kasser 2005). More materialistic kids have a lower opinion of their parents, argue with them more frequently, and have lower self-esteem and more depressive tendencies. Children's probability of thinking "my parents are not cool" or "my parents don't understand what kids these days need" is highly correlated with level of materialism (Schor 2004, Nairn et al. 2007).

A particular aspect of these family conflicts concerns "pester power": children nag their parents to buy advertised products (Buijzen and Valkenburg 2003, Nairn 2014, Flouri 2004). Children who are more exposed to ads are more likely to pester their parents. In turn, children who pester their

parents more often experience greater dissatisfaction and disappointment when parents refuse to buy what they ask for (Buijzen and Valeknburg 2003). Pester power is an increasingly frequent source of family quarrels. One third of UK children says that if they want to buy something and their parents do not, they will continue to ask until their parents give in. More than half say they do this sometimes. Only 15% say they never do it (Bailey 2011). These effects are likely to be amplified in the future, given the nature and weight of digital advertising.

Summarizing, marketing pressure targeting kids and teens is boosting their materialism, which is not a good deal for their happiness and social capital. More materialistic values acquired during childhood and adolescence can lead individuals to lasting increase in morbidity risk, because young age is crucial for the formation of life values (Kasser 2002). The influence of adult materialism on morbidity, due, for example, to cardio-vascular disease or psychosomatic disorders, is likely to be mediated by well-being and social connections (Keyes 2004).

Various western countries have regulated advertising as a consequence of increasing awareness of the harm associated with mounting commercial pressure on children and teenagers. Sweden has banned television advertising to children under 12 years of age since 1990. Norway and Greece ban advertisements aimed at small children. Greece also bans advertising of children's toys between 7am and 10pm. New Zealand prohibits advertising of junk food. Austria and Flanders (Belgium) do not allow ads targeting children before, during or after children's TV programs. Several countries - such as Australia, Canada, and the UK - have powerful advertising regulation authorities, who are at the forefront in regulating children's media (Lisosky 2001, Caron and Hwang 2014).

13. Conclusion

The main goal of this survey is to explore innovative policies for disease prevention. Prevention is critical to regain control of spending on healthcare. Soaring demand for healthcare plays a major role in driving healthcare expenditure out of control. Following a decades-long upward trend of healthcare spending to GDP, the sector now amounts to around 10% of the economy in European countries and almost 20% in the US, where it is projected to reach a third of the economy in two decades. There is little doubt that these figures are unsustainable and threaten widespread access to healthcare.

I focused on declining happiness and relationships as a major cause of increased demand for healthcare. Epidemiologists have documented that happiness and social capital are major predictors

of health and longevity. This suggests that the spread of distress, loneliness and conflictual relationships in many western countries, documented by economic and sociological literature, has contributed to the rise in morbidity rates. Evidence of a causal link between widespread dissatisfaction and increased morbidity and mortality is especially compelling for the US.

In this context, the healthcare system appears to be the end station of distress. Tackling ill-being is essential to control of healthcare spending, because it is critical for limiting morbidity. Research in fields ranging from economics to social psychology and neuroscience suggests that social capital is a major source of happiness. Socially isolated individuals tend to be very unhappy. Consistently, their risk of morbidity and mortality is much higher than that of socially connected individuals.

Quantitative evidence and successful implementations suggest that public policies for social capital are possible in three domains: urban planning, schooling and regulation of advertising. Importantly, these policies are relatively inexpensive to implement. Urban studies show that urban planning plays a major role in the formation of social capital of the urban population, particularly of the population groups most at risk of solitude: the elderly, children and teenagers. High residential density, pedestrian areas, parks, car restrictions, public transport and cycling can relieve the pressure of cars on common urban space, which is essential to enhance social capital. Such practices in urban planning are well-established in many northern European cities and are being taken up across the world.

Elderly persons are at high risk of loneliness and at the same time, are a major burden on healthcare systems. Tackling loneliness in old age should be considered a priority for reducing healthcare demand in the medium term. However, social capital of youngsters is critical for disease prevention in the very long term. Social skills and values that affect individuals' relationships throughout their lives are largely acquired in youth. Failure to acquire social skills during childhood sets lives on a path where loneliness and conflict are more likely to be frequent. A similar effect can be expected from early acquisition of materialistic values. Loneliness, materialism and poverty of social skills in youth are warning signals for long-term morbidity and mortality.

Literature on schooling shows that participatory teaching practices enhance the social skills and beliefs that underlie cooperation and social capital. Similarly, there are various examples of strong regulation of advertising, aimed at restricting commercial pressure targeting children.

A crisis of another form of social capital, trust between doctors and patients, underlies the rise in defensive medicine, namely the practice of prescribing unnecessary screenings and treatments to

avoid lawsuits by patients. Defensive medicine weighs substantially on healthcare spending. It is estimated at about 1% of GDP in Italy and 2% in the US. Policies for tackling defensive medicine include training physicians to improve the quality of their relationship with patients and shifting liability for medical malpractice from doctors to national health systems.

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