

# The Wider Benefits of Learning

Part 2: Learning and Health

# 2





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## Part 2: Learning and Health

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## Foreword

For centuries, scholars searched for a miraculous substance that would make people happy, healthy, wealthy and able to enjoy life. A panacea that would help them deal successfully with life's difficulties, better understand themselves and the world, and ultimately gain wisdom they could transmit to future generations.

Today, science has found this magic formula. The trouble is that virtually no one knows that it exists, where and how to find it and what miraculous effects it has when properly used. At the same time, renowned researchers are proving its effectiveness in increasing numbers of international studies. It works on everyone, everywhere, from infancy to old age, in all of life's circumstances and spheres. It has an unending number of side effects – all of them positive and good for people. As for how much of it to apply, the only mistake we can make is not to use enough. That's because the more of this magic formula people use and the more often they use it, the better they feel, scientists have unanimously determined. And when people feel better, statisticians have recently proven in comparisons of countries throughout Europe, so do the regions and countries where they live with others.

In fact, everyone knows this miracle substance and many are already using it. However, in most cases it cannot sufficiently produce its effects. Most people totally misunderstand it because too often, it has been prescribed incorrectly and in the wrong

dose. The miracle substance that science has discovered is nothing other than learning. But not just learning in schools and educational institutions, much too often discussed only as it relates to finding employment or enhancing corporate and national competitiveness. The real magic formula is learning in all of life's phases and aspects – lifelong and “life-wide.”

It may seem inappropriate to speak of a miracle and science in the same breath. But the human brain and its ability to learn are among the greatest miracles in our known universe. And the miracle of learning and cognition within our brain a) is only barely understood by even the best and most advanced scientists, and b) these scientists themselves admit that the more they investigate, the more they discover ever greater miracles about the brain's complexity, capacity and plasticity. (More insight into these interconnections can be found in the Bertelsmann Stiftung publication entitled “Warum Lernen Glücklich Macht” [Why Learning Makes You Happy]. In short, science still considers the fact that human beings learn and how they learn to be a kind of miracle.

Researchers throughout the world have begun to investigate the positive effects of lifelong learning on individuals and society. And the more interconnections and relationships between learning and life processes they study, the more multifaceted, surprising and unambiguous their results have been. They already agree on one conclusion: If we want to unleash the

miraculous effects of learning, we first have to understand learning in its diverse forms, possibilities and effects in a completely different way.

Educational research, generating much public interest, has shown how successful schooling, vocational training and university attendance affect income and job opportunities, and how closely education and skills development are related to a society's economic prosperity. On the other hand, the public has heard virtually nothing about the happiness that is derived from learning or the pleasure of curiosity and discovery, or from personal development and the ability to continually change oneself. Too little attention is paid to the connections between learning and gains in resilience, physical and mental health, participation in social life and social solidarity, all of which have also been scientifically investigated.

To survey the current status of research on the diverse effects of lifelong learning, the Centre for the Wider Benefits of Learning at the Institute of Education of the University of London, at the request of Bertelsmann Stiftung, has prepared a comprehensive review of the literature on the social and personal benefits of learning. The scope of the published findings has persuaded the editor to present this survey thematically, in sections.

This second of five parts focuses on the close reciprocal effects between learning and health.

# The study on wider benefits of learning

## Learning and well-being - a look at complex relationships

Although the term “learning” has already become central to the discussion of economic and social policy in Europe, most of these countries lack both clarity and understanding of the specific learning relationships involved. Learning is considered the key to success for individuals, organizations, regions and nations, leading to greater economic affluence for knowledge societies. But the complex phenomenon of learning is often reduced to formal education and its consequences for employability.

Similarly, scientific research into the interconnections in education has been essentially devoted to studying formal learning in school and other educational institutions. For years, data has been systematically collected on the performance of secondary and post-secondary students. The number of scientific studies and research papers in this area has risen dramatically. There have also been studies on the value of vocational training, continuing vocational training and – to a lesser extent – adult learning for the job market. But with the dominant focus on the economic consequences of formal learning processes, the holistic and social effects of learning have received comparatively little attention.

In fact, growing numbers of international scientists have begun to investigate the positive main and side effects of lifelong and life-wide learning beyond the economic impact on individuals and society: What are the effects of learning, for example, on the development of identity, self-consciousness, motivation and

resilience? On our ability to continually adjust to changing living conditions? How does learning affect our health, life expectancy and birth rate? Or, to take just one example, our ability to come to grips with an increasingly complicated healthcare system? What forms of learning result in greater well-being, greater life satisfaction and happiness? And what are the effects of learning processes on social cohesion and vitality – in neighborhoods and associations, municipalities, regions and whole societies? To what extent does learning influence personal willingness to integrate, be tolerant, show solidarity and become politically and socially engaged? And what factors can best improve the framework conditions and circumstances for every form of learning at every age?

Without exception, results of the studies by international scientists indicate that the key to future well-being, happiness, social cohesion and – as just one important positive consequence out of many – personal and national economic development in Europe lies exactly in the widely ignored effects of lifelong and life-wide learning processes. Until now, the conclusions of these studies and research have never been assembled, correlated and made available to a broader public. The following survey of the status of international research is intended to close that gap.

## The study on wider benefits of learning

### Intention of the study on wider benefits of learning

Within the framework of the European Lifelong Learning Indicators (ELLI) project, the Centre for the Wider Benefits of Learning at the University of London's Institute of Education was asked to assemble all internationally available scientific studies on the effects of the various forms of lifelong and life-wide learning on individual and social development, evaluate them and summarize them in a comprehensive report. In fact, this survey of the state of research on the social and personal benefits of learning reflects the findings of more than 200 international studies and research projects on the effects of learning in all phases and areas of life. We decided to split up this voluminous collection of material into five complementary categories and publish them in the form of five individual studies. Each individual study examines a central connection between the various forms and stages of lifelong learning and an aspect relevant to personality or social development.

The individual studies are not intended to provide comprehensive and final answers on the effects of lifelong learning in the particular category. Instead, they show the current science as a work in progress - and it is hoped that they will stimulate further research efforts.

### Overview of the five parts of the study

#### **Part 1: Learning and identity**

The first study covers the scientific discussion of the reciprocal relationship between lifelong learning processes and the development of human identity. Numerous studies show that the forms and quality of formal, non-formal and informal learning in various phases of our lives impact our self-confidence, self-esteem, resilience and the development of social skills, and look at how they do it. And in addition, they examine how – through the concepts of self that are affected by learning processes – these forms of learning then impact future learning behavior and internal attitudes toward learning later in life.

#### **Part 2: Learning and health**

The second study collects the relevant studies on the effects of learning on physical and mental health. Numerous studies have made clear the direct relationship between the duration and frequency of learning processes in various phases of life and mental and physical well-being, health behavior, life expectancy and numerous other physical and mental health aspects. Likewise, studies show how learning behavior affects our ability to find our way through an increasingly complex medical system.

## The study on wider benefits of learning

### **Part 3: Learning, life satisfaction and happiness**

The third study summarizes findings about the consequences of learning for the well-being, quality of life, happiness and optimism of people. It examines research on the effects of both learning in school as well as adult learning on a positive attitude toward life. Besides showing a positive correlation between learning and happiness, this part of the study makes it clear that the scope of research efforts lags far behind the importance of this crucial field of knowledge.

### **Part 4: Learning and community vitality**

The fourth study looks at a broad spectrum of research results on the effects of formal, non-formal and informal learning processes on social cohesiveness and community vitality. Given the diverse and complex interconnections it examines, this individual study is divided into four sub-chapters. The first looks at the effects of lifelong learning on social inequality, income differences, social mobility – and the influence of learning sequences on social cooperation in a society. The second discusses the effects of learning on active citizenship, the possibilities of social participation and the integration of immigrants. Also considered is how participation in learning processes can be combined with aspects of interpersonal behavior such as trust, tolerance and inter-cultural sensitivity. The third sub-chapter deals with the concept of “social capital” and describes how learning contributes to developing individual and community social capital. The final section deals conceptually and statistically with the connections between learning and criminality and thus how specific learning processes and educational interventions affect criminal behavior.

### **Part 5: Learning spill-overs and interplays**

The fifth and last study describes the numerous positive “side effects” of learning, which cannot be directly ascribed to the categories already listed but are of substantial importance for human well-being and the positive development of societies. Unlike the previous four categories of the accompanying study, which look at the more or less direct effects of learning processes on individual and social development aspects, this section looks at some more complex reciprocal effects of learning and living processes. Thus it illustrates how positive learning experiences impact people’s future learning behavior, followed by the complex relationships between learning and occupational prospects. In addition, it explores the multifaceted impacts of learning on family situations. These include, for example, the influence of the educational and learning level of parents on the development of their children or the effects of learning processes in which parents and children participate together. The influence of the learning behavior of adults on their children’s academic success and birth weight, family structure and size, marriage and divorce and parental behavior in early and later development phases of their children is also described. Finally, the study discusses the influence of the learning behavior of adults on their immediate neighborhood and accordingly how learning affects processes of sustainable development and the search for social justice.

This thematic structure of the survey of research results offers a better overview of the diverse aspects of the positive impacts of learning on people and societies. However, interdependencies between the various areas should not be ignored because in the final analysis, the individual and social effects of learning are never one-dimensional or limited to specific spheres of life.

## The study on wider benefits of learning

Instead, every learning experience influences the whole person – and accordingly the society in which that person lives.

This survey of research results on the positive impacts of learning on people and society is another important component of the ELLI project as a whole, to continue to complete the picture of lifelong learning and its positive effects on people and societies. As a mirror of the status quo of research, it is intended to provoke new and different ways of thinking about the meaning and design of formal, non-formal and informal learning processes for both individuals and society.

# Focus: Learning and health

## Introduction and overview

When the relationship between learning and health is discussed, the focus is usually on acquiring healthy habits. Children and adolescents, for example, should learn to eat the right foods, engage in exercise and avoid alcohol, cigarettes and drugs. Adults should learn to stay fit, do sports, lose weight, avoid severe stress and apply preventive measures. Seniors ought to learn strategies and behaviors that will preserve their physical and mental health and agility. But almost no one mentions that the very act of learning keeps us healthy in every phase and aspect of life.

Researchers have begun to examine this frequently overlooked connection. Studies show that learning is one of the most important factors in determining health. Regardless of income, origin, social background or other factors, participation in learning has a decisive influence on human health. Numerous studies show that people who learn more, earlier, longer and throughout life will live longer and stay healthy longer.

Meanwhile, many European countries are having a hard time dealing with exploding health costs in their ever more complex health systems that are increasingly difficult for people to use effectively. The problems of modern life with overwhelming consequences for health include poor nutrition, obesity, lack of exercise, along with their effects on the heart, circulation and the probability of diabetes. Not to mention stress, constant rushing and overwork that trigger depression or burnout in increasing numbers of people.

But only a handful of politicians have realized that the solution to these health problems lies in improving learning conditions and opportunities in all life phases and areas. There can be no doubt that a closer look at the connection between learning behavior –

from the perspective of how people succeed in nourishing their body, mind and soul – and state of health and health behavior can pay off, as shown by the results of the ELLI-Index:

In those European countries where people learn more naturally, have a positive attitude towards learning and repeatedly take advantage of new opportunities to learn, they are and remain physically and mentally healthier from infancy to old age. Their life expectancy is higher, infant mortality is lower, and they know much better how to avoid risks to their health or, when sick, how to navigate their healthcare system. What scientific findings are available to explain these interconnections?

This second part of the study on “The Wider Benefits of Learning” examines, from a scientific perspective, the complex direct and indirect effects of learning on human health. Because the interconnections and reciprocal effects in this field are so multifaceted and complicated, the results are presented in the following sub-sections:

## Learning, health and life expectancy

Scientists have shown that our learning behavior in early childhood and at school affects our health until we are very old and that how long children and adolescents learn and how engaged they are in learning will have a significant influence on whether they are healthy and stay that way in later life. International studies show that the number of years of education, level of qualification and even school attendance without graduating all improve health status throughout life. For example, the combination of frequent absences from school and poor achievement increases the risk of illness and poor health status in adults by a factor of 4.5.

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Further research also shows that the number of years of learning is significantly related to life expectancy. Longitudinal studies in the US show that just one additional year of education increases life expectancy by an average of 1.7 years. A Dutch study shows that men with the lowest education levels have on average a life expectancy that is 5 years less than men with university degrees.

### Learning and health behavior

Scientific studies of the effects of learning processes on health behavior are of particular interest. While there are efforts by European governments to raise tobacco taxes or prohibit smoking in public spaces, in order to reduce tobacco consumption and limit its harmful effects, scientists have discovered that people who learn more and for a longer time are much less likely to even start smoking. Longitudinal studies show that a person aged 30 who has finished school at the lowest possible level is 75% more likely to smoke than a person of the same age with more schooling. Moreover, scientists report that school attendance and engagement have the biggest influence on whether adolescents are likely to smoke. Other studies have shown that adult smokers significantly increase their chances of stopping smoking if they take part in adult learning courses and programs.

In fact, the drastically growing problem of overweight children, adolescents and adults can be proven to be closely related to how well and how long people learn. On average, half of the citizens of OECD member countries are overweight. The situation in Germany is representative: recent surveys indicate that 60 percent of men and 45 percent of women weigh more than they should, and nearly every sixth German is obese. Before 1980, the

share of morbidly obese people in most countries was well below ten percent, OECD experts note in recent publications.

Obesity has become a worldwide epidemic in affluent societies, and results show that it is one that can be prevented and treated wherever people learn more and longer. Thus, a study in Sweden (according to the ELLI-EU Index, it is the country most successful at learning) shows that by prolonging school attendance by one year, the likelihood of a Body Mass Index (BMI) in the healthy range rises by 14.5 %. Another longitudinal study, conducted in Denmark, another leader in learning, shows that just half a year more school attendance has a causal and significant influence of 35.5% on reducing BMI, particularly in men.

The same applies to activity or sports. The longer people go to school, the more active they tend to be on average each week, investigators in the USA and Sweden have noted. Participation in job-related, academic, leisure-oriented or other forms of adult education is especially effective in promoting physical activity. This was found in a study relating increases in physical activity levels in adults aged 33 to 42 to their learning behavior. Whereas 38% of people who could be described as generally learning-oriented increased their activity level during this time even without taking part in further education courses of any kind, the effect of participation in from 3 to 10 courses is 7% higher, i.e., the likelihood of being active and involved in sports rises by close to a factor of 5.

### Learning and mental health

But learning behavior also has a decisive effect on mental health, especially with respect to the increasingly common illness of depression. Nearly 21 million Europeans suffer from it. One

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in every four EU citizens experiences depression for at least a short time in their life – and the trend is rising. According to the results of a study by experts for the European Brain Council (2009), by 2020 depression will be the leading form of illness. In the meantime, learning proves to be one of the best ways of fighting and mitigating depression. As with other health effects, studies indicate that a higher level of education has the biggest influence on increasing satisfaction with life and reducing the risk of depression – and learning in later phases of life plays an important role as well. Thus studies show that people with a college degree are between 35% (women) and 55% (men) less likely to suffer from depression than people with less education. But even for the risk group that is most frequently affected, women without degrees, it turns out that earning an educational qualification when they are older than 16 also reduces the likelihood of depression in their later life by up to 10 percentage points.

The effects of lifelong learning on mental health become even more significant when viewed with respect to demographic change. More and more people are living longer – and it turns out that education and lifelong learning behavior have a vital influence on health in old age. This means that in addition to the significant effects of general education, there are many indications that non-formal and informal learning delay the aging process and its negative effects on health. Numerous studies show that learning in its complex forms and possibilities protects holistic competence as well as social and cultural productivity in older people and lessens the cognitive and geriatric problems and deficits due to aging. Lifelong learning processes provide a support function that preserves and increases physical and mental health (Weishaupt 2010).

Above all, even with respect to the reduced cognitive abilities of the elderly and senility, studies show that the risk of dementia and declining mental capacity can be reduced by regular participation in cognitively stimulating further education, learning and daily activities. Those who learn a foreign language, take cooking classes, go dancing or play cards when they are old are less likely to experience dementia. In addition, from more education, people develop what scientists call a “cognitive reserve” that significantly delays the onset of symptoms of dementia.

### Learning and health literacy

The last section looks at the influence of health education on the ability to deal with the healthcare system. This is reflected in the use of prevention, knowledge of health risks and treatment opportunities, disease management and doctor visits. Scientific studies show that even limited health literacy has a strong impact on what people know about their health, how they deal with chronic illness, how often they suffer from physical and mental illness and how frequently they see a doctor or go to the hospital. Moreover, it turns out that those with less health literacy usually see a doctor when their illness is much more advanced– which usually worsens the prospects of recovery and extends treatment time. The uptake of preventive examinations is a good example of the extent to which learning, in this case adult education, can prevent serious diseases: According to the results of a longitudinal study in England, among 100,000 women who take part in adult education courses, as many as 347 cancers were prevented by education-induced greater participation in cancer screening and stopping smoking.

## Research results in detail

### 1. Learning , health and life expectancy

#### 1.1 Education and general health

There is particularly robust evidence linking years and level of education with health benefits for individuals: education appears to have an effect on health independent of income, race, social background and other factors (OECD 2001). Many studies find a strong positive correlation between schooling and multiple measures of health outcomes, healthy habits, and healthy activities, with this correlation remaining large after conditioning on income (Grossman 2005). Wagstaff (1986), for example, concludes that schooling improves health while simultaneously reducing the number of physician visits.

It is possible that the health benefits of education are connected with choosing to undertake jobs with relatively lower occupational hazards, or to live in less polluted areas. Better educated individuals are also thought to be more skilled at identifying health-related information, using this to modify their behavior in a way that promotes health (Kenkel, 1991). However, Kenkel also demonstrates, using US data, that most variation in health outcomes cannot be explained by differences in health knowledge. The health benefits seem to occur particularly for intermediate levels of education, indicating that participation in secondary education is significant for health.

Failure to flourish at secondary school (measured not just in terms of examinations passed but also in functioning well intellectually, psychologically and socially at school, including attainment, attendance, social adjustment and attitudes) has been associated

with poorer physical and mental health, health behaviors and wellbeing outcomes at age 33 (Hammond and Feinstein, 2006). This study used 1958 British birth cohort data and controlled for social, psychological and economic factors up to age seven. Both attainment at school and engagement with school were markers of adult health and wellbeing: outcomes were relatively poor for those who did not achieve well despite their good engagement, but worse still for those who neither engaged nor achieved.

Flourishing at secondary school was associated with a broader range of positive outcomes (wellbeing, lifestyle, mental and physical health) than participation in adult learning, which was associated with positive changes in wellbeing but not mental and physical health. The positive outcomes in adult health and wellbeing associated with flourishing at secondary school were also much greater in magnitude than those associated with participation in adult learning. As noted in part one of the wider benefits study, 'Learning and Identity', a separate study of socially disadvantaged members of the same cohort found that academic attainment at age 16 predicted health at age 33 (Schoon et al. 2004).

As adults, individuals with a degree or higher were 70–80 percent more likely to report 'excellent' health than similar individuals with school-leaving qualifications or below. Those with qualifications at level 4 (post-secondary school) or above, but below degree level, were 40 percent more likely to report excellent health than those with school-leaving qualifications or below (Feinstein 2002).

In Sweden, Spasojevic (2003) used the 1950 school reform, which extended the required years of schooling from seven or eight to nine, to estimate the effects of education on an index

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of bad health combining around 50 health symptoms and self-reported health. For the cohort of men born between 1945 and 1955—who were most affected by this reform—the additional year of schooling reduced the risk of poor health by 18.5 percent after controlling for a set of family background characteristics.

The causal effect of education on self-reported health has also been investigated by Arendt (2005) and Adams (2002). In Arendt's research, education was estimated using the Danish school reforms that took place in 1958 and 1975, providing universal schooling to all children up to age 14 and then to 16. His results showed that the odds ratios of having excellent health were 1.50 and 2.10 for men and 1.55 and 2.25 for women with 13 and 18 years of education respectively, compared with those with only seven years of education.

This result was also obtained by Adams (2002). Using a sample of individuals born in the US between 1931 and 1941, and the compulsory education laws in effect from 1915 to 1939, he found that for males, additional years of compulsory education had an effect of 4.4 percentage points on the probability of having good health and of 3.2 percentage points on the probability of having excellent health. For women, the effect of education on good health was 4.8, on very good health 6.3, and on excellent health 4.2 percentage points.

Berger and Leigh (1989) investigated the causal effect of education on the physical functioning of individuals aged 20–40 in the US, focusing on years of schooling completed. Their results showed a significant effect of additional years of schooling on individuals' physical functioning. In particular, those with more years of completed schooling were estimated to have lower blood pressures than those with fewer years of schooling.

In terms of literacy skills, although health outcomes were not directly measured in the International Adult Literacy Survey (IALS), analysis of IALS data has shown that high levels of literacy are associated with better health outcomes, for example, higher life expectancy and healthier habits and lifestyles (OECD and Statistics Canada 2000). Similarly, Roberts and Fawcett (1998) found that people with lower literacy levels were more likely to be at higher health risk, with an increased effect on senior citizens.

Bynner et al. (2001) measured both the economic and non-economic impacts of improving adult literacy and numeracy skills. Using statistical modeling techniques, the authors found that individuals who increased their literacy and numeracy levels suffered less from poor physical and mental health, and that these effects persisted after controlling for earlier family circumstances and educational achievement. Parsons and Bynner (2008) also found that adults with low (entry level) literacy and numeracy skills had generally poor health prospects.

### 1.2 Mobility and function in everyday life

For white male Americans aged 47–56 in 1991, Arkes (2004) found significant effects of years of education on reducing the likelihood of having a condition that limited ability to work, but insignificant effects on mobility limitations. He found that an additional year of schooling reduced the probability of having a work-limiting condition by 2.6 percentage points, relative to the baseline that 12.5 percent of the sample had such a condition. This was more important for individuals affected by state unemployment rates during their teenage years, that is, individuals at the margin of dropping out from high school. Thus, completing high school or some form of further education was found to reduce the likelihood of having a work-limiting condition.

### 1.3 Mortality rates

Number of years of schooling was found to be a significant predictor of mortality after controlling for income, marital status and health (Rosen and Taubman 1982). Deaton and Paxson (2001) also showed that years of schooling was negatively correlated with mortality, for those both under and over the age of 60, using the US 1976–1996 Current Population Survey and the National Longitudinal Mortality Study. For those over 60, years of schooling was negatively associated with the probability of dying within the next year. Income was not protective when entered along with education in a multivariate regression.

Although some evidence has challenged the importance of schooling as a determinant of mortality (Duleep 1986; Menchik 1993), recent studies continue to suggest that education is a strong determinant. Muller (2002), for example, found that education was more important than income inequality in predicting mortality rates in the US: the income inequality effect disappeared when an indicator for schooling was incorporated into the regression models. A higher percentage of the population not having a high school diploma was associated with an increase of 2.1 deaths per 1000 of population.

Bopp and Minder (2003) explored the relationship between education and mortality in German-speaking Switzerland over the years 1990–1997. Their results showed sizeable mortality gradients by education for all age groups and both sexes. For example, the mortality odds ratio decreased by 7.2 percent per additional year of education for men, and by 6 percent for women. Meanwhile, Gardener and Oswald (2004), using a sample of adults aged 40 and above in 1991 from the British Household Panel Survey, showed that mortality rates were lower for more educated men and women. A male educated to degree

level was predicted to have a 5 percent lower mortality risk than a man with no formal qualifications. For women, a degree was associated with an approximately 3 percentage point lower probability of mortality.

Glied and Lleras-Muney (2003) found that individuals with higher levels of education appeared to benefit from the development of new health care technologies more rapidly than those with lower levels of education. The authors tested the hypothesis that educational effects on mortality were larger in periods when greater advances in technological health care took place, by linking education gradients in mortality to a measure of medical innovation: the number of active drug ingredients recently approved by the US Food and Drug Administration to treat a disease.

Results showed that the interaction term between education (measured as years of compulsory schooling) and number of drug ingredients approved had a negative impact on mortality. Sensitivity analyses showed that the effect of education was not driven by geographical variation or by personal income. Educational effects on mortality rates were instrumented using compulsory schooling laws that were in place in the individuals' state of birth when they were 14 years old, with the sample restricted to white cohorts born between 1901 and 1925.

At the national level, Or et al. (2005) estimated different indicators of mortality for OECD countries. The selected indicators were life expectancy at birth and at 65, infant mortality, and premature mortality by heart disease. Their results suggested that for countries with higher levels of education, there is an associated average increase of 0.082 and 0.072 percentage points in life expectancy (for women and men respectively) at birth, and 0.40

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and 0.28 percentage points at 65. This evidence is conditioned on national income, average level of education, the efficiency of health professionals and availability of medical technologies, but does not address concerns about causality.

## 2. Learning and health behavior

### 2.1 Drug use

In terms of health-related outcomes, participation in more years of education is associated with a range of benefits, with some of the evidence showing causal effects. These include a lower incidence of smoking, as well as lower rates of substance abuse, taking more exercise and being less likely to be obese. Participation in adult learning may also mitigate potential negative effects of earlier educational experiences.

#### Smoking

Higher education is particularly important with regard to smoking: those with level 2 (school-leaving) qualifications or below are 75 percent more likely to be smokers at age 30 than similar individuals educated to degree level or more (Feinstein 2002). However, schooling still makes a difference: an additional year of schooling was estimated to reduce average daily cigarette consumption by 1.6 for men and 1.1 for women (Wolfe and Haveman 2001). Hammond and Feinstein (2006) found that school engagement reduced smoking even for those who did not obtain qualifications, improving the odds of not smoking at age 33 by 0.96. However, low attainment mattered more than engagement, increasing the odds of smoking by 2.74 compared with normal engagement and attainment. The combination of low attainment and disengagement had by far the worst effect, increasing the odds of smoking by 4.69.

Hartley and Horne's (2005) review found that two out of three studies showed a significant relationship between low literacy and smoking in adolescent males and females and among adults waiting for child related services in private and public clinics. In terms of stopping smoking, Sander (1995) found that schooling had a large positive effect on the odds that men and women would quit smoking. For example, the odds that men with 16 years of education would quit smoking were approximately 0.10 percentage points greater than the odds that men with 12 years of schooling would quit.

De Walque (2010) focused on the impact of education on both initiation and cessation of smoking in the US, using retrospective data from the National Health Interviews Surveys (1940 to 2000). He found that one year of college education decreased smoking prevalence by 3.8 percentage points and increased the probability of smoking cessation by 5.0 percentage points. Arendt (2005) estimated the effects of education on the probability of never smoking finding that an additional year of compulsory schooling significantly increased the probability of never smoking for men (1.43) and women (0.80).

Currie and Moretti (2002) estimated the effect of maternal education on the probability of smoking during pregnancy, for young women at the margins of college enrolment. Being able to enroll in college and stay for a minimum of two years reduced the probability of smoking during pregnancy by 5.8 percentage points. This is a large effect given that on average only 7.8 percent of the women in the sample smoked during pregnancy.

Some positive effects of participation in adult learning have also been discovered. In the UK, Feinstein et al. (2003) found that participation in adult learning, including for leisure courses,

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had small but significant positive effects on changes in smoking between the ages of 33 and 42, controlling for the individual's development up to age 33. Positive effects were found for those taking few courses, but pernicious effects for those taking high numbers of courses. Effect sizes were not large in absolute terms, but given the relative stability of the outcomes during this phase of adult life (age 33 to 42), the shifts were substantial: for example, for smokers the effect on giving up smoking of taking one or two courses was an increase in the probability of giving up from 24.4 percent to 27.7 percent.

### Alcohol consumption

Several studies have found a correlation between levels of alcohol consumption and level of education. In the US, Tien et al. (1998) came to the conclusion that years of schooling were negatively related with extreme alcohol use, controlling for gender and age. In Finland, in adolescence and young adulthood, poor school achievement and dropping out of school were shown to be related to higher levels of binge drinking (Laukkanen et al. 2001). In the Netherlands, Droomers et al. (1999) found that excessive alcohol consumption (more than six glasses on three days or more weekly) was more common among lower educational groups.

Hartley and Horne's (2005) review found that the odds of having misused alcohol were significantly higher among boys, although not girls, with lower literacy levels.

Educational differences in starting excessive alcohol consumption among an adult, initially alcohol-consuming, Dutch population were investigated by Droomers et al. (2005). Results showed that individuals with lower levels of qualifications were almost three times more likely to start excessive alcohol consumption during the six and half year follow-up period than the group

who completed higher vocational schooling or university. Data were based on the Netherlands GLOBE Study, which collected extensive information on educational background, alcohol consumption, psychosocial and material stressors, and lack of social resources.

Inconclusive results have been found regarding the effects of participating in adult learning. Feinstein et al. (2003) found that while taking vocational and leisure courses (such as sports or arts and crafts) reduced alcohol consumption, taking specifically work-related courses increased it. Hammond and Feinstein (2006) did not find any effects of participation in adult learning on drinking.

### Illicit drugs

Meanwhile, reduced drug use has been identified by youth workers and young people as an outcome of youth work (Merton 2004). There is also some evidence (Maggs et al. 2008) to suggest that having higher levels of education is associated with increased use of some illicit drugs, and sometimes with increased alcohol use.

## 2.2 Nutrition and fitness

### Nutrition

It is reasonable to hypothesize that in countries with low social inequalities, such as Finland, differences in food habits by educational background may be diminished. Nonetheless, Roos et al. (1998) found that the food behavior of men and women with a higher educational level (13 or more years of education) was more closely in line with Finnish dietary guidelines than that of those with a basic education only (less than nine years). Data came from the FINMONICA Risk Factor Survey.

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However, other findings suggest that levels of education are not associated with changes in the quality of the diet from childhood to adulthood. Mikkila et al. (2004) investigated childhood and adulthood determinants of nutrient intake, and found that individuals' level of education, measured as years of schooling, had no significant influence on the quality of adult diet, once quality of childhood diet was controlled for. Data source was the longitudinal Young Finns Study in Finland.

In Norway, Jacobsen and Nilsen (2000) investigated the relationship between education and the intake of fat and various nutrients. Data on individuals aged 25 to 69 showed that for women, intake of fats and cholesterol was negatively related to years of schooling. Both men and women's schooling was associated with increasing fiber intake, and number of years of schooling was also associated with intake of fruits and vegetables.

In the US, where social inequalities are greater, Variyam et al. (2002) explored the distribution of macronutrient intake, measured as intake of total fat, saturated fat, cholesterol and fiber, among adults. They showed that an additional year of education reduced men's saturated fat intake by 0.52 grams at the 90th percentile, where intake exceeded the recommended daily allowance, as opposed to a reduction of 0.18 at the conditional mean. With regard to cholesterol intake, the reduction was larger at the upper quintiles, while for fiber, the effect of education was more uniform. For women, only the results for fiber intake were significant, with the largest effect at the 50th percentile, although the increase at the conditional mean was greater. This study used data from the US Department of Agriculture's 1994–1996 Continuing Survey of Food Intakes by Individuals.

### Obesity

Years and level of education has been found to have a negative impact on Body Mass Index (BMI) and the probability of being obese. Causal effects of schooling were investigated by Spasojevic (2003) for Sweden and by Arendt (2005) for Denmark.

Spasojevic (2003) found that attending school for one additional year increased the probability of having BMI in the healthy range by 0.145 percentage points. She used the 1950 Swedish comprehensive school reform, which required some individuals to have one more year of compulsory schooling; the results applied only to men born between 1945 and 1955. Arendt (2005) used the Danish school reforms of 1958 and 1975 to estimate educational effects. Men affected by this reform had almost half a year longer education, while women had a third of a year more than those not affected by the reform. His results showed that the additional schooling had a causal, and significant, impact on reducing BMI by 0.355 especially for men.

The differences between school and college education were investigated by Chou et al. (2004), who explored the factors associated with an increase in obese adults in the US since the late 1970s. They found that having high school education reduced BMI by 0.50, while attending college but not graduating reduced BMI by 0.57, compared with having less than a high school education. However, the larger effect was for college graduates: this was associated with a BMI of reduction -1.50. The study used data from the Behavioral Risk Factor Surveillance System for the years 1984 to 1999.

Graduates from higher education in the UK were also slightly less likely to be obese: average BMI was 3 percent lower than for a similar individual with a school-leaving qualification or lower

(Feinstein 2002). For men who progressed from no qualifications to level 1 (the most basic school-leaving qualification), a drop in the probability of obesity was estimated of between 5 (1958 cohort) and 7 (1970 cohort) points; for women in the 1958 cohort the figure was 5 points.

For participation in adult learning, Hammond and Feinstein (2006) found no effects on obesity.

### Exercise

There are large inequalities in terms of the amount of exercise taken by adults with different levels of educational attainment (Wadsworth 1997). For example, using the 1985 US Health Interview Survey, Kenkel (1991) showed that an additional year of schooling increased an individual's amount of exercise taken per two weeks by 34 minutes, after controlling for health knowledge and other individual characteristics. Ross (2001), meanwhile, found that an additional year of schooling increased weekly exercise by 5 percent (from a mean level of 2.9 days per week), based on data from the US Community, Crime and Health survey. He also found that an additional year of schooling also increased the number of days walked per week by 6 percent, from an average of 3.2 days per week (this result was only significant at the 10 percent level). The proportion of individuals with a college degree in the neighborhood was positively associated with walking, possibly because individuals felt more secure to walk in the streets in such areas.

In Sweden, Frisk et al. (1997) found that level of education and general awareness of the importance of a healthy lifestyle positively influenced the likelihood that women would be physically active on a regular basis.

The effect of adult learning was investigated by Feinstein et al. (2003), who investigated the effects of work-related, vocational, academic, leisure oriented and other types of adult learning courses on whether or not people increased their level of exercise between the ages of 33 and 42. Their results showed that participation in adult learning had positive effects on exercise, controlling for the individual's background and development up to age 33. In particular, 38 percent of adults with the characteristics of learners would increase their level of exercise between ages 33 and 42 without taking any courses, but the estimated effect of taking three to 10 courses was 7 percentage points, representing an increase in the chance of exercising by a factor of almost a fifth.

### 2.3 Cancer screening

The effects of adult learning on the uptake of cervical cancer screening by women were investigated by Sabates and Feinstein (2006) using the British Household Panel Survey. Women with level 2 (school-leaving) qualifications had a 5.7 percentage point higher probability of having more than two cervical smear tests in 11 years than those with lower qualifications; effects of higher level qualifications were similar.

Adult learning was statistically associated with an increase in the uptake of screening. Adult learning leading to qualifications led to increases of between 4.3 and 4.4 percentage points, whereas for general training the increment was between 1.5 and 1.7 percentage points.

The authors concluded that education might enhance the demand for preventative health services by raising awareness of the importance of regular health check-ups and hence the willingness to undertake them. Education might also improve the

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way in which individuals communicate with health practitioners and understand information regarding tests.

### 3. Learning, age and mental health

#### 3.1 Adult cognitive ability and ageing

The Seattle Longitudinal Study is designed to explore psychological development during adulthood, and has continued in seven-year intervals since 1956. The variables identified as reducing the risk of cognitive decline in old age include: (1) favorable environment mediated by high socioeconomic status, (2) involvement in a complex and intellectually stimulating environment, (3) flexible personality style at midlife, and (4) high cognitive status of spouse.

These factors indicate that adult learning could play a valuable role: indeed, there is evidence for cognitive benefits connected with learning throughout life, with adult learning being associated with cognitive ability in adulthood. Hatch et al. (2007) found that adult education with and without qualifications resulted in an increase in verbal ability score of 1 to 1.4, over and above the impact of highest qualifications by age 26 and of childhood ability,

#### 3.2 Literacy proficiency and ageing

There is a relationship between low literacy skills and ageing. However, there are many contributing factors: parental education, country of birth, occupational status, socio-economic status, social and cultural participation, reading habits, participation in adult education and some physical and mental disabilities (Sticht 1989).

Analysis of the International Adult Literacy Survey (IALS) illustrates this general pattern: one study showed that those aged over 50 scored significantly lower on all of the three measured literacy scales (prose, document and quantitative) than adults under 50 (Van der Kamp and Boudard 2003). Within this general trend however, the literacy proficiency of older adults varied significantly, especially in regard to their level of education, gender and labor market participation. An earlier study found that, for Dutch adults, older men and women did not differ on the prose scale but women had significantly lower scores on the document and quantitative scales (Van der Kamp and Scheeren 1996, in Van der Kamp and Boudard 2003). Again, factors such as educational attainment, being poor, being unemployed or not in the labor force and having a first language other than English were factors associated with low levels of literacy and numeracy.

Roberts and Fawcett (1998) used Canadian data from the IALS to examine variations in literacy skills and practices and in patterns of information acquisition among seniors (e.g. their use of books, television, newspapers etc.) by selected socio-economic variables. They found that it was not only the frequency of various activities such as reading books, newspapers and viewing television, but also the variety of literacy sources that was important for maintaining literacy proficiency. High-literacy seniors were more likely than low-literacy seniors to be exposed to a wider variety of literacy sources and to view these on a more frequent, daily basis. Low-literacy seniors also required more assistance with literacy tasks (as measured by IALS), and they tended to over-estimate their literacy skills.

Van der Kamp and Boudard (2003) undertook a qualitative study to explore some questions about benefits and costs of poor literacy. They found that over 60 percent of their sample of older

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adults with poor literacy did not experience difficulties related to literacy; however, more than 50 percent were keen to avoid situations in which literacy was needed.

Adults with poor literacy coped by avoidance, by relying on relatives and acquaintances; seeking information in other ways, and looking for alternatives, such as going to a bank counter rather than using a cash machine. They sought to learn new skills if they were of interest or relevant to their daily life. Though many coped well, some were vulnerable, especially those at risk of losing their job or being socially excluded because of their low level of literacy skills. This was especially the case for older women; the study also found that older people tended to see literacy in gender related ways, ascribing different literacy tasks to men and to women.

### 3.3 Mental health

#### Onset of dementia

Everyday activities in old age are associated with clinically meaningful outcomes, and frequency of participation in cognitively stimulating activities has been reported to be associated with both reduced risk of dementia and magnitude of cognitive decline (Allaire and Willis 2006; Menec 2003).

People with a higher level of educational achievement tend to experience onset of dementia later than those with lower educational achievements (Sorensen 2008). However, once diagnosed, dementia seems to progress much faster in people with higher educational achievement. This is thought to be because although people in this group actually develop dementia in the same way as others, their larger 'cognitive reserve' allows them initially to mask the symptoms of their developing dementia. There is some evidence to indicate that older people

who take part in adult learning, including leisure activities such as dancing and card playing, are less likely to develop dementia, but exercise, diet and previous level of education could also be playing a part here, and causality has not been addressed.

#### Depressions

As with other health effects of learning, secondary education appears to be the most significant level of education for improving aspects of mental health, namely, increasing life satisfaction and lowering the risk of depression—although later learning again plays a role.

Graduates in the UK, for example, have been found to be between 35 percent (women) and 55 percent (men) less likely to suffer from depression than similar individuals qualified to school-leaving level or below (Feinstein 2002). Those with level 4 (post-secondary school but sub-degree) qualifications were 40 percent less likely. Bynner and Parsons (2001) found significant effects of higher education in the UK for men only. Men with higher education were less than half as likely to suffer from depression as men with qualifications below level 3 (upper secondary school level).

Feinstein (2002) also estimated the effect that an increase in qualifications might have on depression. Controlling for prior ability, health and family background, for a woman to progress from having no qualifications to having an academic level 1 qualification (the most basic school-leaving qualification) after the age of 16 was estimated to have an effect of reduced probability of depression of between six and 10 percentage points. For men the effect was smaller, but for younger men was also thought to be six points. Feinstein concludes that the sizable differences in health observed for those with different levels of

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education are partially due to the effects of education and are not due solely to differences that precede or explain education.

Chevalier and Feinstein (2006) also found that the level of the highest qualification an individual had achieved by the age of 42 was related to depression in adulthood, with the potential significantly to reduce the risk of depression. However, the effect was non-linear, and was larger at low to mid-levels of educational qualifications. The authors estimated that individuals with at least school-leaving academic qualifications (approximately level 2) reduced their risk of adult depression by six percentage points (Sabates et al. 2007).

The role of education as a protective factor against depression in the context of age of entry to parenthood was investigated with US data by Mirowsky and Ross (2002). Years of schooling were found to be associated with a decrease in the symptoms of depression. When other socio-economic variables and physical health were introduced as controls, the estimated coefficient was reduced from 6 percent to 2.3 percent. Data came from the 1995 Survey of Aging, Status and the Sense of Control.

A review by Feinstein et al. (2004) found some evidence that parents' level of education was related to their mental health and wellbeing, because of economic factors, access to health services, their health-related practices and their ability to cope with stress. These effects could in turn be explained in part by the effect of education on efficacy, cognitive skills and wellbeing. However, the authors conclude that the benefit of education in terms of mental health and wellbeing was more in terms of managing mental health conditions and sustaining wellbeing than as a key driving force. Parental mental health and wellbeing

was in turn an important influence on children's outcomes, particularly through its influence on parent-child interaction.

Feinstein et al. (2003) found that participation in leisure courses was positively associated with becoming depressed. This may be because some adults take up such courses at a difficult time in their lives, without the course necessarily having an impact on their depression. Conversely, a study of older adults' participation in learning carried out by Jenkins (forthcoming 2010) found that the likelihood of depressive symptoms was significantly reduced for those who visited the gym or participated in exercise classes, in addition to the finding that those with qualifications were less likely to report depression than the base category of adults with no qualifications.

Many studies of students in community-based education who have a history of mental health difficulties report that participation in learning has positive effects upon mental health (e.g. Wertheimer 1997; McGivney 1997).

### Potential negative effects of learning

Qualitative research on participation in adult learning in the UK (Schuller et al. 2002) found that learning appeared to benefit participants' mental health and related identity capital (structure in life, self-esteem, efficacy, positive identity and feeling part of the social world). However, learners also experienced negative effects on health in terms of stress and alienation from their environment. Feinstein et al. (2003) also found no overall evidence that participating in adult learning protected against the onset or progression of depression. In some cases it was even thought to trigger or reinforce it.

## 4. Learning and health literacy

### 4.1 About the concept of health literacy

A body of evidence exists around health literacy—that is, the ability to obtain, process, and understand basic health information and services needed to make appropriate health decisions. Poor health literacy skills are strongly associated with negative outcomes, which to some extent mirror those experienced by individuals with lower levels of education.

Those with poor health literacy skills are less knowledgeable about health (Gazmararian et al. 2003; Williams et al. 1998), receive less preventive care (Scott et al. 2002), have worse chronic illness control (Schillinger et al. 2002), poorer physical and mental health function (Wolf et al. 2005), and have higher emergency department and hospital utilization (Baker et al. 2002, 2004). Baker et al. (1998) found that inadequate literacy was associated with an almost doubled probability of hospitalization.

Low health literacy is associated with worse disease control in patients with diabetes, but lower literacy patients are still willing to take action in the management of their disease (Powell et al. 2007). Individuals with low health literacy are more likely to wait until the later stages of their illness to seek medical attention (Prasauskas and Spoo 2006).

Several studies point to links between literacy skills (i.e. in the general sense rather than in the sense of health literacy only) and various health outcomes. In Hartley and Horne's (2005) review:

- knowledge of smoking, contraception, human immunodeficiency virus (HIV), hypertension, diabetes, asthma and post-operative care.
- the probability of having a prevention tests and immunization
- breastfeeding.
- adherence to medical regimes or clinical trial protocols.
- diabetes outcomes.
- rates of depression in various populations (those in a cardiovascular dietary education program, mothers, HIV-infected patients, and those with rheumatoid arthritis).
- no association between literacy and the functional status of patients with rheumatoid arthritis, presence of migraine headaches amongst children, or presentation with late-stage prostate cancer.
- health status in adjusted analyses of adult patients, and one found a similar association in unadjusted analyses of elderly patients.

Numeracy skills have been found to be the strongest predictor of comprehension about differences between hospitals (for example, which hospital is cheaper, complies with more regulations, has more beds, etc.), followed by health literacy skills (Hibbard et al, 2007).

The importance of adequate literacy is underlined by a Cochrane review of research on the impact of 'decision aids' (O'Conner et al. 2004). Decision aids are interventions designed to help people make specific deliberated choices among options (including the status quo) by providing information about the options and outcomes (e.g. benefits and harms) relevant to a person's health status. They have been developed as adjuncts to counseling offered by practitioners when patients are faced with a decision, e.g. about treatment or screening.

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The study found that: decision aids reduced rates of major elective surgery by 23 percent without affecting health outcomes or patient satisfaction; with decision aids, patient choices were more likely to be based on realistic perceptions of the chances of benefits and harms, and personal values; and decision aids helped the undecided to make a decision. Crucially, most decision aids to date assume adequate to high levels of literacy and their positive effects are much less likely to be available to people with poor literacy.

Health literacy also has broader social benefits in addition to individual benefits. Nutbeam's (1999) framework includes functional health literacy, interactive health literacy and critical health literacy. Functional health literacy is broadly the ability to read and comprehend medical information and instructions. Interactive health literacy refers to the development of personal skills that improve capacity to act independently and improve motivation and self confidence to act on advice received; critical health literacy involves personal and community empowerment to act on the social and economic determinants of health. Higher levels of individual health literacy contribute to community action for health, and to social capital (Nutbeam 2000).

Higher levels of education in general are also associated with differences in the ways in which individuals access health services, which has wider implications for the healthcare system; these differences are discussed below (see also the section 'Cancer screening', above).

## 4.2 Use of health services

### Access to primary healthcare

Evidence on access to healthcare tends to focus on quite specific cohorts, and the picture is complex. For example, in Denmark, Bruce et al. (2004) found that people with higher education were less likely to use primary care for mental health problems. In Switzerland, Schellhorn et al. (2000) showed that elderly people with a degree made 18 percent fewer visits to a primary physician than elderly people with lower levels of education.

On the other hand, Dunlop et al. (2000) in Canada and found that, conditional on health status, men and women with higher education were actually more likely to take advantage of access to General Practitioner services, leading to long-run health benefits. In the US, Deb and Trivedi (2002) found that number of years of schooling was positively related to the number of contacts with a physician, and also to the number of outpatient visits with a physician or other health professional.

In the UK, Windmeijer and Santos Silva (1997) found that individuals with higher vocational degrees and teaching and nursing degrees, conditional on health status, were less likely to visit the GP than individuals with qualifications below school-leaving level. However, individuals with a university degree or higher were more likely to visit the GP than individuals with lower qualifications.

### Access to specialist care

Results for Switzerland, Denmark and Canada showed an increase in uptake of specialist care by those with more education. In Switzerland, for example, higher education led to a sharp increase in specialist utilization by 45 percent (Schellhorn et al. 2000). Thus, while it might be expected that referral to a

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specialist should be made on the grounds of health need, the finding of disparities in access to specialists suggested that individuals with lower levels of education might be less able to indicate their preferences or need for care—while individuals with higher levels of education are able to access the service more effectively, and perhaps better claim specialist care.

### Access to hospitals

Findings from Germany (Geil et al. 1997) have suggested that neither secondary education (at least), nor a degree from a university or college, nor vocational training are significant predictors of hospitalization for either males or females. The authors investigated the factors determining demand for hospitalization using the 1984 to 1989, 1992 and 1994 sweeps of the German Socio-economic Panel.

In contrast, and by the use of more robust statistical techniques, Arendt (2005) estimated a causal effect of education on hospitalizations. He also investigated the effects of education on the number of days in hospital given that hospitalization had occurred. Results showed that educational attainment beyond primary schooling significantly reduced hospitalization by 1.9 percentage points for women and by 1.5 percentage points for men (which correspond to relative effects of 39.7 percent and 32.2 percent respectively). Once hospitalized, there were no significant differences in the number of days in hospital for men with and without education. However, women with more education had 5 percent more days in hospital once hospitalized.

The estimated effect can be given a useful interpretation as the investigated individuals were mainly low income people in rural areas, particularly girls. Therefore, the study provides evidence that education had an effect on reducing hospitalization mainly

for those with low levels of education. One possible interpretation for the higher number of days in hospital for more educated women once hospitalization occurred is that it reflected a higher demand for healthcare and more efficient use of follow up services once hospitalized.

### Access to social care

An additional year of schooling has been associated with a decrease of between 0.52 to 0.67 percentage points in the probability of requiring personal care for adults in the US. Arkes (2004) used intra-state differences in unemployment rates during individuals' teenage years to estimate educational effects on white male Americans aged 47 to 56 in 1991. The effect he found is large considering that only 3.2 percent of white males in this group in 1990 required personal care.

### Access to emergency medical services

Dismuke and Kunz (2004) investigated potentially unnecessary emergency department (ED) use in the US: that is, use of emergency services for conditions that could be treated by a GP. They found that graduating from high school decreased potentially unnecessary ED use among the insured, and education beyond high school also appeared to decrease unnecessary ED use, with the impact being greater for the insured. However, for those without insurance, graduating from high school was associated with an increase in unnecessary ED use. Thus the relationship between education and ED use appeared to be mediated by insurance status.

### Uptake of welfare benefits

Higher levels of education have been associated with a lower probability of receiving social transfer benefits (Wolfe and Haveman 2001). Higher education of mothers has been found

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to reduce the probability that their daughters will, if eligible for welfare benefits, elect to receive them. Studies of applicants for disability income transfers also find that having more education decreases the probability of receiving these benefits (OECD 2001). More educated workers also tend to have lower unemployment rates, as well as receiving higher wages and thus paying more to society in tax (OECD 2001).

# Information about the project “European Lifelong Learning Indicators” (ELLI)

It is important to remember that this study is just one part of the larger European Lifelong Learning Indicators (ELLI) project. The ELLI project was launched by the Bertelsmann Stiftung in January 2008 in an effort to make the concept of lifelong learning more understandable and transparent. It is meant as a resource for political decision makers – from the European to the community level – as well as educational institutions, private industry, academics and journalists. In addition, it assists individuals in Europe who want to know more about learning in their own community, country and the rest of Europe, i.e., what learning entails and the impact it has. The ELLI project is breaking new ground by expanding its focus to include not only the formal educational system, but also learning that takes place outside of traditional educational institutions. This holistic approach is an essential component of the project, and is reflected in all of its instruments and activities.

For an overview of all activities please visit our webpage

[www.elli.org](http://www.elli.org)

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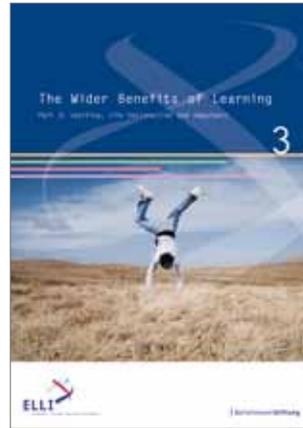
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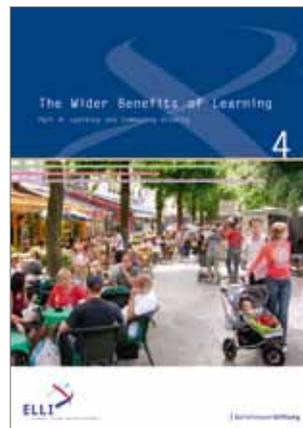
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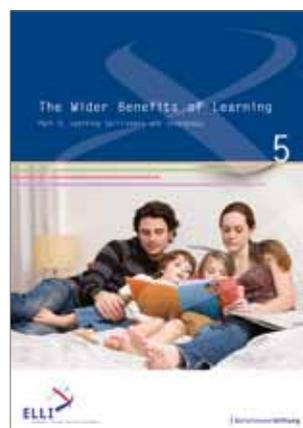
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