

# Lifecycles and Education: The Coronavirus Crisis Across Generations

Contagious diseases strike individuals, make them suffer and sometimes kill them. Epidemics strike societies that produce less when lockdowns and social distancing hamper market interactions and may break out in riots or wars. Just like some individuals and some of their organs are more susceptible to harm from viruses, so are there parts of societies that pandemics damage more. Complex webs of urban interactions are more productive than lonely countryside activities but are more easily infiltrated and broken down by germs: cities produce some 80 percent of the world's GDP and account for more than 90 percent of Covid-19 virus infection cases (United Nations 2020). And just as in individuals, immune system reactions can also take forms in societies that, like populist politics and industrial subsidies, need not effectively fight the epidemic and have long-term negative consequences.

In a society struck by an epidemic, life is worse for most if not all individuals. How much worse depends on where they live and on how they make a living. To fight contagion, it is easier and more important to do without restaurant meals than with food altogether, so waiters and other low-paid urban service workers fare much worse than farmers. And it also depends on their age in 2020, because the pandemic hampers life differently for individuals in terms of education, in work and in retirement.

What follows discusses first the impact of the Covid-19 disease on individuals of different ages in 2020, then the implications for their lifetime income and welfare regarding the need to prevent contagion by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that causes that disease, focusing in particular on education and human capital. We will conclude by discussing how policy might soften and redistribute the short- and medium-term implications of the corona crisis and of the structural transformation triggered by contagion containment measures.

## 3.1 LIFE AND DEATH

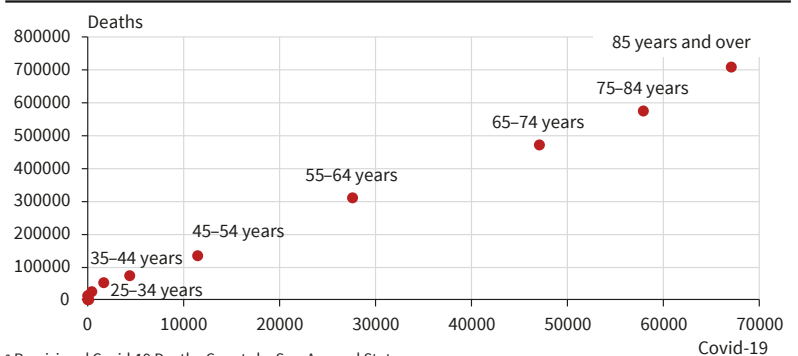
For the elderly, the virus is often deadly, and care is more difficult to obtain in shut-down care facilities. From the medical point of view, however, it is hard to tell whether the predicament of youth is better than that of their parents and grandparents. The elderly face a significantly larger risk of SARS-CoV-2 disease and death when infected with Covid-19. But the risk of death is much higher for the elderly regardless of Covid-19 mortality, which does not increase with age much faster than mortality from all causes (Spiegel-

halter 2020), and death deprives youth of many more years of remaining life. In the United States, for example, the percentage of all deaths that are related to Covid-19 rises from about 2 percent for people ages 18–29 to about 9 percent for the 35–44-year-old group, and thereafter remains roughly constant at 9–10 percent until the oldest ages (see Figure 3.1 and the top of Figure 3.2).<sup>1</sup>

For age groups where the percentage of Covid-19 in all deaths is similar, statistics such as “95 percent of people who die of the virus are over 60” only tell us that to avoid death from any disease it is better to be young, not whether the young are more or less likely to die when they catch SARS-CoV-2. Even though the Covid-19 additional death risk is several times smaller for people below 35 than for the elderly, young people have several times more years of life at stake. The product of the average life expectancy and Covid-19 death percentages by age groups displayed in the figures is maximum at 2.39 for 35–44-year-olds, and about 1.6 for both the 25–34 and 65–74 age groups. At age 25, life expectancy in the United States is 57 years and the additional risk of Covid-19 death is 2.2 percent. At age 70, life expectancy is 16 years and death risk is about 10.1 percent higher in times of Covid-19 in the United States. As life expectancy is 28 percent smaller and the death risk increases 4.5 times, the expected loss of life due to SARS-CoV-2 among 70-year-olds is only 29 percent greater than among 25-year-olds in terms of life duration. Because death

<sup>1</sup> Covid-19 death data by age are available for many countries and are broadly similar in Europe and elsewhere (O'Driscoll et al. 2020). United States data are readily downloadable and arguably more interesting than those of any other single country. EU aggregate statistics of this type do not appear to have been compiled by the European Centre for Disease Prevention and Control (which has a narrower remit than its US counterpart) or other agencies.

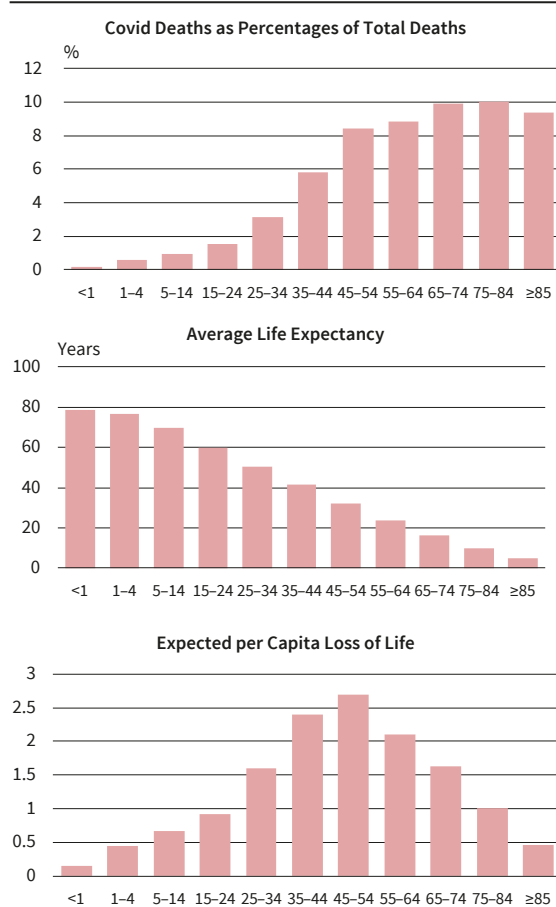
Figure 3.1  
Deaths in United States According to Age Group<sup>a</sup>  
February–October 2020



<sup>a</sup> Provisional Covid-19 Deaths Counts by Sex, Age and State. Source: Centers for Disease Control and Prevention.

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Figure 3.2  
Additional Covid Deaths, Life Expectancy, and Expected per Capita Loss of Life by Age Group in the United States



Source: Authors' calculations based on US Social Security Area, life expectancy data from Actuarial Life Table, Social Security Administration, interpolated and aggregated by age group using 2017 estimated population sizes from National Vital Statistics Report, Centers for Disease Control and Prevention. © CESifo

deprives the latter of the best years of their life, the quantity and quality of life lost appears quite comparable across age groups in the United States. Life expectancies and death risks by age do vary across countries, as well as across genders and socio-economic groups within countries with different population structures.<sup>2</sup> But these types of computations make it far from obvious that the loss-of-life consequences of SARS-CoV-2 differ much by age.

Trading off the cost of exposure versus the many economic and social benefits of being alive is difficult.<sup>3</sup> This may explain why youth avoid contagion

<sup>2</sup> Among individuals who catch Covid-19 at each age, those who die certainly have worse preexisting health conditions or more limited access to medical facilities, and hence, shorter life expectancy regardless of Covid-19. The calculation can disregard this because it is not obvious whether health conditions matter more or less for Covid-19 and other deaths at different ages.

<sup>3</sup> Difficult, but not impossible, using the “statistical death” methods introduced by Schelling (1968). Rosen (1988) shows that the value of eliminating a risk to a life, which depends on willingness-to-pay for one additional year and residual life expectancy, declines rapidly with the working age at which it is assessed. The riskiness of infection depends on how death rates vary by age among infected people. Even though many infections go undetected, estimates from seroprevalence surveys confirm that age-specific relative death risks of Covid-19 infection to death risk from all causes are roughly proportional (O’Driscoll et al. 2020).

less carefully than older people and makes it hard to discuss the interaction of economics and death in many historical situations besides the current pandemic. The nineteenth-century industrial revolution increased income tremendously, but life expectancy declined as factories and urbanization made it easier for diseases to infect people. In twentieth-century Russia, not only wars but also Stalinist industrialization exerted a massive effect on death rates (Rosefielde 1983), and so did the eventual demise of the Soviet Union. Chen et al. (1996) report a 45 percent increase in total death rates in Russia between 1989 (10.7 per thousand population) and 1994 (15.5 per thousand population), which is more than the excess deaths observed during Covid-19 epidemic episodes. Increasing health inequality and social segmentation is having similarly significant implications in the twenty-first-century United States. Case and Deaton (2020) estimate that 157,000 deaths, about half as many as those related to Covid-19 in 2020, were caused by suicide, drugs, and alcohol abuse in 2017 among poor uneducated victims of a globalization that, unlike Covid-19, was not considered a national tragedy.

### 3.2 ECONOMIC COSTS OF REMOTE LEARNING AND SCHOOL CLOSURES

While loss of life is sadly difficult to evaluate, it is easier and useful to assess the economic damage inflicted by the corona pandemic crisis to individuals who survive the disease, or do not even catch it. For workers and firms, income losses are obvious. For young people, the quality and quantity of education decrease under social distancing and during lockdowns. This has obviously negative implications for their income when they are working, because workers with more and better education earn higher wages.

Returns on investments in education, measuring their cost as foregone earnings while studying, are typically around 9 percent per year of education in developed countries. As Figure 3.3 shows, there is some variation across countries, which is not easily interpretable as the estimates turn out to be similar across disparate countries (Psacharopoulos and Patrinos 2018).

Better educated workers are also more likely to be employed. It is easy to see why. Less-skilled individuals are less productive, hence, earn lower wages when employed and it is harder for them to find employment at any given wage. Skills may be innate or be learned, not only at work and in the family, but also in formal education, and it would be odd to find that more education resulted in fewer and worse skills.

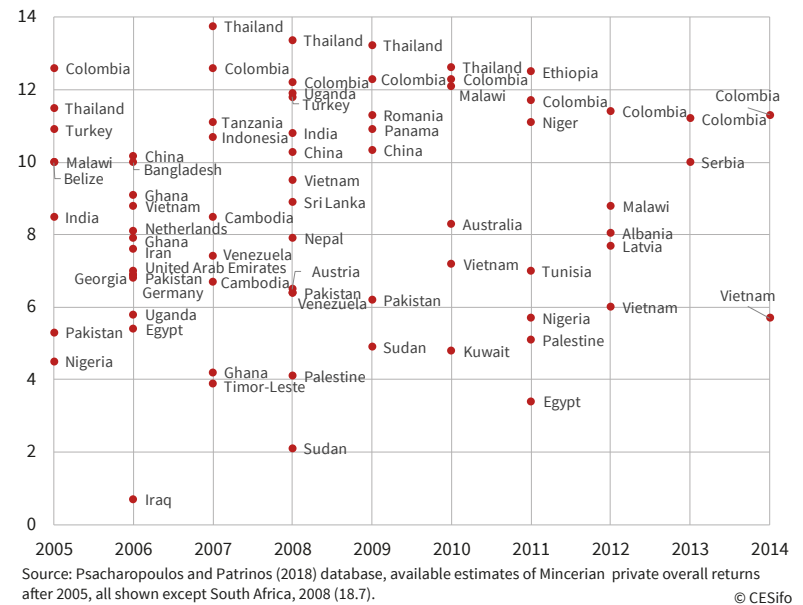
The contribution of education to skills and wages need not be well measured by the statistics displayed in Figure 3.3 for two reasons. The first is that just sitting in a classroom does not produce as much

future income as paying attention to teachers who teach competently: not just the duration, but also the quality of education matters, and it is difficult to measure. The second is that the quality of students also matters: smarter students spend more time in better schools, and their income while working will be higher not only because of schooling but also because (whether because of their own innate ability or of their family background) they are smarter. At the national level, the quantity and quality of schooling contribute to increasing cognitive skills, which Hanushek and Wößmann (2008) find to be associated with income growth, just as they should be in theory. As for individuals, so for countries correlation need not be causation. Productivity and growth are also strongly correlated with changes of indicators of governance quality, corruption, and other country characteristics determined in turn by politics and policies as well as by historical shocks to social capital.

Accounting for these factors in empirical work is possible but difficult, so estimates of the productivity contribution of time spent at school vary widely (Belzil 2007). It is also difficult to assess the extent to which online learning can substitute classroom work. However, experts agree that the kind of learning losses experienced during the spring 2020 lockdowns will reduce by about 3 percent all future labor incomes, as each month of missed education typically reduces all future monthly incomes by about 1 percent (Hanushek and Wößmann 2020; Psacharopoulos et al. 2020). On an undiscounted yearly basis, 40 years of 3 percent losses amount to 1.2 annual incomes. Even though the real interest rate hovers around zero for the foreseeable future, discounting this loss is appropriate because labor income is risky, and at the very least accounts for the possibility that an individual may die or become unable to work. Hence, the expected discounted income loss from missed education plausibly amounts to about one year of lifetime income. Also, at the aggregate level, the discounted future productivity and GDP consequences of missing an entire school year have the same order of magnitude as current per capita GDP (Hanushek and Wößmann 2020).

Every month of a child’s missed schooling implies future income losses that are (roughly, and on average) equivalent in present value to about one month of their family’s per capita income. This is a large loss, perhaps surprisingly large until one realizes that production of education uses not only teachers and classrooms, but also the time and effort of students. Because the cost and value of educational investments includes teacher wages and use of school facilities, which are in GDP, and the opportunity costs of students, which are not, accounting for education would increase the measured production and investment of an economy. This unmeasured production is invisible both when it takes place and when it does not, so lockdowns decrease

**Figure 3.3**  
**Additional Earnings Associated with an Additional Year of Education**  
As a percentage of earnings foregone by not working at the initial education level



tion, however, is not obviously biased by patterns along the per capita income dimension, probably the strongest determinant of schooling and work. In poorer countries, fewer young people are in school, but there are more of them and their income will increase more strongly than in richer countries, where more of the older ones are in higher education.

### 3.3 CURRENT AND FUTURE INCOME AND WELFARE LOSSES ACROSS GENERATIONS

The economic effects of Covid-19 are negative for all generations and most individuals, and obviously not to the same extent across and within generations but they need not be particularly bad for the youngest population cohorts in 2020. If they are still in education, they are hit hard, because not learning much during lockdowns has dramatic future income implications. Current income implications are equally dramatic, however, for adult owners of firms who cannot operate their production facilities and for adult workers who are partly or completely shut out of employment, such as waiters, trial lawyers, and (perhaps surprisingly) many medical doctors and nurses.<sup>5</sup>

Within generations of those of working age in 2020, the timing of the pandemic can be very consequential for people who lose a particularly large portion of their lifetime income if 2020 happens to be particularly important in their career. Athletes who were at their best this year may well be just a little bit too old for a gold medal in the postponed Olympics, for example. And just as during and after the Great Recession of 2008–09 (Rothstein 2020), so too will those entering the labor force during and after the 2020 pandemic fare worse than older and younger generations. Entering the job market during a crisis not only initially implies longer unemployment and lower initial wages, but also permanently worsens career prospects, not least by making it difficult to explore with job switches in the first few years of employment.

While the consequences of the current crisis are unavoidably bad, the economic welfare implications of lockdowns and social distancing are arguably smaller than it appears from current and expected future income loss calculations. Like furloughed workers, homebound students do not much enjoy their locked-down leisure time. Being at home is not a complete waste of time, however, and behavioral adjustments offset some welfare losses. Young individuals who miss schooling during the pandemics may later study or work harder, retire later, or stay in school

longer rather than just consume their lower income, and workers whose job was not just temporarily shut down but disappeared permanently may later go back to school and learn new skills. These choices, if unconstrained, tend to have similar implications at the margin for individuals who optimally choose to do a bit of each. To the extent that schooling choices later in life are optimal from the individual point of view, discounted future income gains from additional schooling should indeed be similar (as they are in the data reviewed above discussing lockdown education losses) to current opportunity costs in terms of earned income.

### 3.4 WHAT NEEDS TO (BUT MAY NOT) BE DONE

For societies facing the coronavirus crisis, it is pointless to wish the virus had not occurred, instead it is possible and useful to try and deal efficiently with the shock and to apportion or share its fallout appropriately. We argued above that loss of life and of economic welfare are both heavy and broadly similar for the generations affected by Covid-19, and that individual reactions to some extent can buffer shocks. But this does not imply that their distribution is the best possible because, as usual, interacting individual choices may fail to achieve society's efficiency and equity objectives.

An hour of videoconferencing is less productive and more tiring than an hour of in-person interactions, especially when sharing and discussing creative ideas. For this reason, it is useful to people to be together when working and earning income, and also when learning and accumulating human capital. People also very much enjoy being together during their leisure hours. There are no payments among friends who drink or play soccer together, but in a pandemic, togetherness allows a free exchange of viruses as well as good vibes. Leisure, like working and learning, becomes less productive, and so does the service that helps people get together. Jobs disappear for restaurant and cafeteria cooks and waiters, for cinema operators and office cleaners, and many other relatively low-wage service workers. Because it is more fun to go out when others go out, and no fun if nobody else does, individual decisions generate network externalities and support both high and low togetherness equilibria. The high one is preferable if the only externality is through fun. If instead external contagion effects dominate fun effects, the low togetherness equilibrium is better but, just because no market payments are envisioned, interacting individual choices need not choose it.

Education, which is never left completely to market payments and family budgets, always confronts society with problems that during a pandemic are more dramatic and no easier to solve. Education differs from market work and income in two respects. The first is that schooling not only improves individ-

<sup>5</sup> In the United States, the third quarter 2020 consumer expenditure on goods was only 2 percent lower than in the third quarter of 2019. Most of the – 14 percent decline of Services was accounted for by transportation services (– 39 percent), Recreation services (– 51 percent), and food services and accommodations (– 39 percent), but health care (– 20 percent) also declined very significantly. Data source: Bureau of Economic Analysis (2020).

ual production skills, but also equips them with crucial social skills and society with social capital. For every member of society, it is important that all others know how to behave in social and market interactions: well-educated societies are more productive too because of such external effects which are strongest at elementary level, making it efficient for primary schooling to be mandatory and free, and making it particularly damaging for it to be missed during lockdowns. The second is that while the income resulting from production of market goods and services may be consumed rather than invested in physical or knowledge capital, learning activities are automatically invested in human capital (i.e., future discounted labor income), an investment is particularly appropriate at times when much debt is being accumulated.

### 3.4.1 Learning, Why Now?

Students and their families may not respond appropriately to lockdowns and social distancing, both because they disregard the external effects of primary education and because rewards to study, while similar in size to those of work, are timed very differently. The reward of work arrives in monthly paychecks and can be consumed immediately; the reward of learning arrives in the distant future and can be consumed sooner only by borrowing. When social distancing makes education more difficult, students should but might not exert more study effort. If exams are random or disappear altogether, and adulthood is lived out in unpredictably difficult circumstances, young people may well refrain from studying as hard as they should for their own good. Delayed gratification is always less desirable than immediate gratification, but more so during times of crisis when the future is heavily discounted, to an extent that depends on individual psychological attitudes which in turn depend on life histories and circumstances. Parental background is important, and all the more so when encouragement and adaptability are needed to face a once-in-a-century crisis. The children who prefer to eat a marshmallow immediately than wait 15 minutes and eat two are often those who come from family and social situations that lead them to mistrust promises and grab opportunities as they arise and become divorced high-school dropouts or develop drug habits, while their more patient classmates live less disappointing adult lives.<sup>6</sup>

### 3.4.2 Funding Education

It is harder for children from poorer families to afford the financial cost of their education in the pandemic, and it always is. The 8-9 percent estimates of private rates of return on education are in fact suspiciously higher, on a risk-adjusted basis, than those of finan-

cial assets. They may not only be biased by the role of individual ability in determining both education and wages, but also indicate that education of poor children cannot be financed at market rates by poor families, who cannot borrow at reasonable rates. Scholarships and subsidized borrowing are a possible remedy, but public policies cannot always address the asymmetric information issues that hamper private financial markets: unfortunately, not only wealth but also ability to exploit educational opportunities are low for students from financially and culturally disadvantaged families.

### 3.4.3 What to Learn

Another eternal issue is highly relevant in the post-pandemic future and has been discussed by this report in recent years (EEAG 2013, section 3.4; EEAG 2016). Should post-primary education provide young people with generally useful human capital, as it typically does in English-speaking countries, or should it sort them into vocational tracks providing specific skills, as it tends to do in German-speaking countries?

There are pros and cons to both systems. Keeping all students together in “comprehensive” secondary schools fosters social cohesion and can equip all workers with advanced general skills required by complex and fluid labor markets. Of course, family background is a key determinant of achievement even in very comprehensive educational systems: forcing students to test their academic skills need not benefit those hailing from culturally poor families, who may try and fail academic exams only to seek employment without any certified skills. Tracked schooling ensures more immediate employability of individuals assigned to vocational tracks but tends to perpetuate and deepen socio-economic inequality (see Ozer and Perc 2020, for a recent review of issues and evidence). A broad-based education provides skills that are useful in a large variety of situations, and there is evidence that it is more useful in adult life than vocational education (Brunello and Rocco 2017). In labor markets faced with structural change, highly specific vocational training easily finds you the first job but leaves you more vulnerable than “learn-to-learn” general education.

The advantages and disadvantages of educational approaches depend on circumstances. Vocational education has been popular among policymakers since the Great Recession, when it was partly accounted for by a focus on youth employability. And advantages and disadvantages affect different people differently, so there is intense and legitimate disagreement on these issues. The elite strata of society generally favors vocational education for the masses and academic education for themselves, preferably in exclusive institutions that foster personal ties among future leaders.

<sup>6</sup> Mischel (2015) provides an interesting and accessible review of this evidence.

### 3.5 HOW POLICY CAN HELP EDUCATION DURING AND AFTER THE CORONAVIRUS CRISIS

During lockdowns, welfare is lower because work, study and leisure all decline. As discussed in Chapter 2, policy should make unavoidable and permanent welfare losses as small as possible in the aggregate, and even out individual welfare losses.

#### 3.5.1 Short-term Emergency Policy

Because the life-loss risk is similar for younger and older people, there is no reason to enforce different rules across age groups. But different activities are differently hampered by distancing. The externalities generated by leisure together make it advisable to restrict in-person interactions and force individuals to spend leisure time alone or in a small family. This makes leisure less enjoyable, as is appropriate to support efficient time-allocation of unavoidable welfare losses when work and study are also conducted on small screens, and less productive. Both working and learning should instead be allowed and encouraged and be supported by suitable regulation and communication infrastructures to reduce in-person interactions and slow down the spread of contagion.

Special attention to schooling is warranted because investment in human capital fosters growth and eases the burden of accumulated debt, and because it usually brings many people together in indoor spaces likely to spread contagion. Different restrictions are warranted in different situations. Old-age retirement facilities deserve particular attention not because their residents are elderly but because they, like prison inmates or sailors on warships, live together in large groups, where contagion spreads easily. Customers of schools are younger, but in order to prevent virus transmission and contagion at home who they also need to be distanced from each other, protected and disinfected when together.

Keeping schools open is highly desirable, however, particularly at the primary level: not only because teaching young children remotely can be impossible, and even when children can use computers, remote learning contributes little to their socialization, but also because keeping schools open for young children who cannot be left home alone makes it possible for their parents to work. To ensure social and economic resilience during pandemic emergencies, primary schools should be kept open throughout the workday. This requires appropriate fiscal and health security policy measures. New temporary workers should be hired to help teachers and other permanent workers manage entry and exit, breaks and meal-times, and school personnel should have the same priority for testing and vaccination as medical personnel in order to ensure that they are able (and willing) to continue working and reassure parents who fear contagion. To prevent further feminization of teaching

professions, notably in primary schools, temporary support to school staff could target male recruits. This would let children witness an increased masculine presence in care professions, and give men experience in jobs they may not have considered before.

Financial difficulties need not hamper education in rich countries where monetary and fiscal policies tend to ease funding of all investments but might in poor countries and in poor segments of rich-country societies. Family income and learning inequalities are even more strongly related than usual during lockdowns, when high-skill individuals work from home, as business owners run companies on Teams and psychologists consult on WhatsApp, while low-skill workers such as supermarket cleaners or delivery staff had to choose between their health and their income. Although income losses have occurred at all levels of education, they have been particularly important for those at the bottom of the skill distribution. And children of low-wage service workers can be shut out not only of school buildings but also of online instruction because of inadequate Internet access and lack of expertise (UNICEF 2020).

Policy should ensure equitable access to digital equipment and physical study spaces, both of which hamper the home-learning opportunities of underprivileged students. The corona crisis has made evident that many students do not have access to adequate learning environments outside the school. This affects their capacity to learn even in normal times. The resulting education inequalities exacerbate those already present across central, suburban and peripheral geographical school locations in many countries. Schools or other educational institutions (libraries) should reconsider their potential for offering learning spaces outside standard hours. Governments should grant children from low-income families access to schools and computer rooms and provide both equipment and training to ensure that disadvantaged students can benefit from remote learning activities.

#### 3.5.2 Toward a New and Different Normal

Previous issues and trends will be amplified and hastened by the crisis and post-crisis trajectory. Any crisis shortens and narrows the horizon of political interactions and tends to make previous populist and authoritarian political tendencies more extreme. In the aftermath of the coronavirus crisis, polarization of political attitudes will likely be reinforced by employment and wage polarization trends, driven in past decades by technological and trade developments, which can only be strengthened by lower consumption of leisure and office services and widespread adoption of remote electronic work, which implies relative income losses for unskilled workers substituted by machines that boost the productivity of skilled workers. To ensure an efficient transition to permanently more computerized industrial produc-

tion and commerce and learning, policy should in the future not just support consumption, but help markets face and implement the necessary structural adjustment.

### 3.5.2.1 Basic Education

The most convincing evidence that education increases productivity is that generated by variation of compulsory schooling mandates (see Hampf 2019, and references therein). Education, especially at the elementary level, fosters networking and builds social capital. The implications of compulsory non-schooling or remote learning during lockdowns are plausibly symmetric. Prolonged social distancing may have severe negative psychological impact on many people who crave such interaction, and on society as a whole. This is a particularly important issue for people in their formative years. Just as cumulative changes in the new economic normal are hard to predict, so are these other less tangible costs to society. Once people get used to not interacting in person or work or educate themselves remotely, the way we live changes permanently, and differently for different people.

One important issue is that of recovering the education missed by younger people during the pandemic. Kenya adopted the radical solution of just erasing a full school year and accepting a permanent loss of 2020 in all young people's lives.<sup>7</sup> For mandatory education, repeating a year may be better than low-quality education during lockdowns followed by difficult learning by ill-prepared students in the following years of the educational program. If it were possible to stop aging by decree, skipping 2020 would just delay work and retirement as well as education. But aging goes on relentlessly: lives will not last longer, and brains gradually lose ability to learn. It would be better to make up lost time by extending mandatory school time, with shorter vacations and/or longer school days and weeks, depending on each country's current organization.

A crisis is bad luck, but luckily comes with opportunities to change. At all education levels, adopting new ways of teaching and learning can help make up lost ground. In times of anxiety and possible despair students need motivation, and time spent at schooling is wasted if students are not interested in what they learn. One solution is problem-based learning where students need to recognize a problem in real life and work out a solution in competing groups, presenting their findings and being gently challenged by the teacher. This requires much more thinking on the part of both students and teachers but can be done remotely as well as in person. Remote learning is not new but is now being taken up much more broadly than before. It is not motivational if done in

traditional fashion, because it is even harder to pay attention to a screen than to a live teacher if both recite a boring list of notions, but it offers innovative instruments for interactive delivery of new types of basic broad-based competencies. After the crisis, schools should experiment with new techniques, including those implemented during the emergency, and online facilities can let schoolteachers improve their curricular and communication skills.

### 3.5.2.2 What to Learn in High School

In the new normal, better online education facilities can lower the cost and increase the accessibility of high-quality education. Learning would improve if classroom work supplemented a well-prepared online course, to be combined with periods of in-class interaction that can be shorter in middle and high schools than at the elementary level, and as they were before the coronavirus crisis.

Not only how, but also what to learn requires adjustment. To face the challenging times ahead, education should teach young people to think, adapt, learn new skills, solve new problems. This is relevant beyond primary education. Mechanically learning how to operate or fix a machine makes young people employable when that specific machine is used in available jobs, but flexibility is more important when the future is particularly hard to predict. A new normal will come, but it is doubtful whether it will demand diesel mechanics, or designers of electric planes, or capable warehouse operators for online shopping websites, or (in a worst-case scenario of social and economic collapse) competent stonemasons in support of primitive agriculture.

Practical vocational training remains important, but in times of accelerating, unpredictable structural change and moribund firms, it should be enhanced by cognitive skills, training in problem-solving, and logical preparation for learning. All young people should be motivated to learn general skills, applicable beyond a certain firm or sector, and equipped to learn new skills and face future challenges. It does help to have practical experience in a working environment, and well-structured vocational training programs already exist in Germany and some other countries. To prepare for a future where flexibility and ability to learn can only be of increasing importance, however, practical training should not be too narrow.

### 3.5.2.3 Beyond School

Education takes place also later in life, and lifelong education is particularly important for workers with vocational schooling. The relevant issues are again familiar but more challenging in times of structural change. During a lockdown, leisure service workers must be idle, but office and factory workers can still produce using socially distanced technology. In the

<sup>7</sup> See the New York Times (2020).

aftermath of the pandemic, office and factory jobs will disappear more quickly than along previous technological trends, however, workers will need to retrain, either within the firm or between jobs. If leisure-support and other jobs disappear permanently, suitable retraining should be a condition of wage support or unemployment benefits.

Adapting human capital to labor demand is essential to make the labor market more fluid. Non-conventional learning can be useful in delivering this type of lifelong education. Training programs and targeted policies can help but need to focus on sectors where firms are seeking to hire (such as some health and IT service providers; not flight attendants and pop-concert technicians). Access to retraining should be flexible, allowing individuals and employers to respond to country- and sector-specific market signals about which new skills should be learned. To integrate new labor market entrants, the standard and much-discussed policy interventions meant to encourage job creation for the young are arguably more appropriate after the pandemic, when uncertainty may lead firms to prefer poaching experienced workers from each other rather than training inexperienced workers. Governments should ensure that the price of labor reflects the costs faced by firms, as well as external effects not accounted for by hiring decisions. To this end, it can be advisable to reduce net labor costs for firms that hire labor-market entrants, in the form of reduced social security contributions, minimum wage exemptions or, in countries where contributions are low and minimum wages not binding, wage subsidies. Facilitating marginal employment is also desirable, as such experiences can be a first step into the labor market with positive medium-term effects for individuals.<sup>8</sup> However, all such measures are fiscally wasteful if subsidies and exceptions go to jobs that would have been created anyway or prevent creation of jobs for non-subsidized workers or sectors.

#### 3.5.2.4 Universities

Formal higher education, imparted to young adults who choose not to enter the labor market after finishing high school, is optional and should generally be left up to the individual. The coronavirus crisis, however, implies that these choices are made in a very different environment. Existing educational models are heavily challenged by distancing rules. It is hard for elite institutions to justify expensive tuition, justified by pleasant campus facilities and valuable personal interactions among young people who will in the future be political and industry leaders, when

<sup>8</sup> For example, allowing marginal employment for those receiving unemployment benefit in Germany has not surprisingly been found to result in an increased job-finding probability for long-term unemployed individuals and to lead to more stable post-unemployment jobs (Caliendo et al. 2016).

students can only interact online with teachers and are less likely to move internationally.

The future will likely see more remotely supplied education and more concentrated enrollment in fewer institutions, but much remains to be seen. It is hard at this time to formulate policy implications for a higher education environment characterized by a new mix of qualities, stronger economies of scale, and a smaller role for networking and social connections. Public policy will plausibly continue to fulfil its two main roles, that of assessing and certifying the quality of higher education, and that of financing its provision (and fundamental research, a complementary public good). The first may be more difficult as exams become less reliable, and personnel and facilities become less important and more difficult to assess. The second may not be as relevant, as remote learning is less expensive and opportunity costs are low: there is little else for youth to do in 2020, so enrollment has increased in many public universities in Continental Europe as well as in the United Kingdom, also as a result of reduced enrollment in the United States and revised entrance exam scores in light of less reliable assessments.

#### 3.5.2.5 Funding Education Policies

During the emergency, public debt subsidizes consumption and investment, but it will soon be time for fiscal policy to steer a suitable path to a new normal. If students have shorter summer vacations or work more hours to make up the shortfall in human capital resulting from the crisis, so should teachers, who need to be paid accordingly because they are working harder. Because this increases the future income of currently young generations, it is appropriate to pay for this and other education-boosting measures with public debt to be repaid by the revenue of income taxes when current students enter the workforce.

Other funding sources, such as retirement cuts, would redistribute welfare across generations. As discussed in Chapter 2, a suitable source of funding for educational investments might be found if taxes are used to address global warming and not subsidies. Just as hiring teachers as a solution to school problems appears an attractive concept, so is throwing money at global warming politically appealing. But while the green orientation and the name itself of the *Next Generation EU* recovery plan is advertised as a gift to currently young generations, subsidies might mostly keep aircraft engineers well fed while toying with electric plane models, and if so, the currently young will one day be ignorant, jobless and heavily indebted (albeit in a balmy green environment).

It will also be important to address the issue, discussed in detail by García-Peñalosa and Wassmer (2016), that public education funding may ben-



efit other countries when skilled workers migrate. In theory, the problem could be addressed by requiring skilled migrants or the receiving country to refund education costs, like East Germany used to do. In practice, the free-movement-of-persons principle allows skilled labor to move within the EU, which in this and other ways combines integrated markets and national policies in a way that can trigger damaging race-to-the-bottom tensions as well as beneficial competition (Sinn 2003). The coronavirus crisis has dramatically reduced international mobility for students and graduates. But it has also introduced policy instruments that can support mobility and prevent concerns about such funding spillovers: if the common debt issued in the Next Generation EU framework is used to fund education and is repaid in proportion to future income, it automatically implies transfers from countries that offer high incomes and that attract migrants to countries where low incomes induces outmigration. This gives stronger incentives for each country to fund domestic higher education, whether or not such financing is mandated by spending rules.

Financing educational investment with public debt is appropriate if that investment does pay for itself. Public debt, however, may appear to be a costless solution even when it is actually expensive and not a solution. Money is necessary, but insufficient for solving problems that may just “eat” the money and continue to exist. Improving schools requires resources in the pandemic as much as ever but spending more on teachers or facilities or longer education may not suffice to generate the growth needed to repay the additional debt. Low-quality education can be expensive yet fail to produce much of the growth in skills needed to sustain economic growth. As outlined above, teaching methods and techniques, curricular content, inclusiveness, and resilience of educational systems need to be revised to preserve and improve their quality in the challenging times ahead.

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