

K8.1 An overview of the literature on the subsequent impacts of childhood shocks

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Health is best thought of as an element of human capital that is tightly connected to the other two elements: cognitive (thinking) abilities and non-cognitive characteristics (personality, values, etc.). The three elements develop in interaction with and complementing one another. For example, a better state of health measured in the preceding period, *ceteris paribus*, is linked to higher cognitive abilities in the following period (Heckman, 2007). At the same time, human capital is connected to the environment that surrounds the individual, and defines the individual's academic and economic performance and decisions; and vice versa. The earlier in life any positive or negative environmental impacts or interventions occur, the greater impact they will have on human capital. The economic literature examining these interactions and correlations has grown rather large in the past twenty years (Currie, 2009, Almond *et al*, 2018, Currie–Almond, 2011).

According to the fetal programming hypothesis, environmental impacts start influencing the development of human capital at conception, and the fetal period has a fundamental impact on the future human capital (Almond–Currie, 2011). The tobacco consumption and stress levels of the mother, nutrient intake, and any adverse environmental factors (water and air pollution) have long-term effects on the postnatal development of the child. An insufficient nutrient intake suffered during this period may cause obesity, cardiovascular issues or diabetes in adulthood (*Ibid*). Increased maternal stress may have a detrimental effect on the child's cognitive abilities and academic achievements (Aizer *et al*, 2016). External detrimental factors suffered during the fetal period – as has become clear after the examination of those who were in their fetal period during the Spanish flu or the Chernobyl disaster – may cause significant disadvantages to individuals in terms of educational attainment and the labour market (Almond, 2006, Almond *et al*, 2009).

As the impacts of the fetal period influence the health characteristics measured at birth (such as

birth weight) to a great extent, many studies use these as condensed indicators of the fetal state of health. The state of health at birth, measured by the birth weight, fundamentally impacts the state of health, educational attainment and economic situation of the individual in adulthood. A low birth weight lowers academic achievements and the probability of employment, and increases the body mass index and the likelihood of coronary heart disease in adulthood (Behrman–Rosenzweig, 2004, Heckman, 2007).

Further detrimental environmental factors suffered as a young child also impact the entire lifespan of the individual. The development of cognitive abilities is mostly completed by the age of 10 (McLeod–Kaiser, 2004), and the cognitive, emotional and health characteristics established by the age of 10 provide more than half of the reasons for differences in weight gain and health issues that can be observed in adulthood (Conti–Heckman, 2010). The family environment is a central childhood influence. It includes parenting style, bedtime stories, talking to the child, emotional richness or the lack of emotions, and the physical environment. Among the influences of the family environment, emotional safety is a pivotal one that plays a key role in the development of the child's brain (Shonkoff, 2010). The mental health or drug use of the mother have a major influence on the mental development of the child and on the probability of future behavioural issues (Frank–Meara, 2009). Beyond these, the other factors most commonly investigated by the literature are the impacts of pollution, infections and nutrition. Air pollution suffered in early childhood, for example, has a substantial detrimental effect on the results of school tests and on labour market income (Isen *et al*, 2017, Lavy *et al*, 2014).

The extremely rich web of correlations that surrounds an individual's human capital becomes evident even through the few examples presented here. This summary highlights how public policy decisions that influence vastly different fields are

connected to one another through human capital. For example, through the literature presented here, an insight can be gained into how an envi-

ronmental scheme that results in cleaner air may influence economic growth substantially through a strengthened human capital stock.

References

- AIZER, A.–STROUD, L.–BUKA, S. (2016): [Maternal Stress and Child Outcomes: Evidence from Siblings](#). *Journal of Human Resources*, Vol. 51, No. 3, pp. 523–555.
- ALMOND, D. (2006): [Is the 1918 Influenza Pandemic Over? Long-Term Effects of In Utero Influenza Exposure in the Post-1940 U.S. Population](#). *Journal of Political Economy*, Vol. 114, No. 4, pp. 672–712.
- ALMOND, D.–CURRIE, J. (2011): [Killing Me Softly: The Fetal Origins Hypothesis](#). *The Journal of Economic Perspectives*, Vol. 25, No. 3, pp. 153–172.
- ALMOND, D.–CURRIE, J.–DUQUÉ, V. (2018): [Childhood Circumstances and Adult Outcomes: Act II](#). *Journal of Economic Literature*, Vol. 56, No. 4, pp. 1360–1446.
- ALMOND, D.–EDLUND, L.–PALME, M. (2009): [Chernobyl's Subclinical Legacy: Prenatal Exposure to Radioactive Fallout and School Outcomes in Sweden](#). *The Quarterly Journal of Economics*, Vol. 124, No. 4, pp. 1729–1772.
- BEHRMAN, J. R.–ROSENZWEIG, M. R. (2004): [Returns to Birthweight](#). *The Review of Economics and Statistics*, Vol. 86, No. 2, pp. 586–601.
- CONTI, G.–HECKMAN, J. J. (2010): [Understanding the Early Origins of the Education-Health Gradient: A Framework That Can Also Be Applied to Analyze Gene-Environment Interactions](#). *Perspectives on Psychological Science*, Vol. 5, No. 5, pp. 585–605.
- CURRIE, J. (2009): [Healthy, Wealthy, and Wise: Socioeconomic Status, Poor Health in Childhood, and Human Capital Development](#). *Journal of Economic Literature*, Vol. 47, No. 1, pp. 87–122.
- CURRIE, J.–ALMOND, D. (2011): [Human Capital Development before Age Five – Chapter 15](#). In: *Card, D.–Ashenfelter, O.* (eds.): *Handbook of Labor Economics*, Vol. 4, pp. 1315–1486.
- FRANK, R. G.–MEARA, E. (2009): [The Effect of Maternal Depression and Substance Abuse on Child Human Capital Development](#). Working Paper, 15314, National Bureau of Economic Research.
- HECKMAN, J. J. (2007): [The technology and neuroscience of capacity formation](#). Manuscript.
- ISEN, A.–ROSSIN-SLATER, M.–WALKER, W. R. (2017): [Every Breath You Take – Every Dollar You'll Make: The Long-Term Consequences of the Clean Air Act of 1970](#). *Journal of Political Economy*, Vol. 125, No. 3, pp. 848–902.
- LAVY, V.–EBENSTEIN, A.–ROTH, S. (2014): [The Impact of Short Term Exposure to Ambient Air Pollution on Cognitive Performance and Human Capital Formation](#). NBER Working Papers, No. 20648.
- MCLEOD, J. D.–KAISER, K. (2004): [Childhood Emotional and Behavioral Problems and Educational Attainment](#). *American Sociological Review*, Vol. 69, No. 5, pp. 636–658.
- SHONKOFF, J. P. (2010): [Building a New Biodevelopmental Framework to Guide the Future of Early Childhood Policy](#). *Child Development*, Vol. 81, No. 1, pp. 357–367.