Poor Education Predicts Poor Health—A Challenge Unmet by American Medicine

Richard B. Johnston, Jr., MD, University of Colorado School of Medicine and National Jewish Health

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In his first address to Congress, George Washington urged their promotion of "Science and Literature" as the surest basis of public happiness and as essential for democracy. He might be concerned to know that the most recent data, from 2015, show that U.S. 15-year-olds are ranked 24th among 71 educational systems in reading, 25th in science, and 40th in math [1]; that only 22% of 12th-graders are rated proficient or better in science [2]; and that among 23 participating countries, U.S. adults ranked 14th in literacy, 18th in numeracy, and last in "problem-solving in a technical-rich environment" [3].

Yes, the United States is a heterogeneous society in all aspects, and the scores in these surveys are averages. Many Americans do exceptionally well; but the averages make it clear that too many individual children are ill-prepared to succeed in adult life, and too many adults lack the basic skills to ensure a life of meaningful employment, health, and well-being.

You have undoubtedly heard that health outcome measures for the American population are also depressingly low. The United States spends more on health care than any other country; yet in 2016 it had the highest infant mortality and lowest life expectancy among 11 high-income countries [4]. All-cause mortality in midlife (ages 25-64 years) white non-Hispanic Americans, American Natives, and Alaskan Natives actually increased from 1999 through 2016 [5]. Mortality fell in other racial-ethnic groups until 2009-2011 when rates in these groups also began to rise [5]. Maybe most alarming is that children born in the United States have a 57% greater chance of dying before adulthood than do children born in 19 other wealthy countries [6].

Are the relatively poor educational performances and embarrassing health outcomes related? The cumulative data indicate that they are, as summarized in recent reviews [7,8,9,10]. A large number of well-conceived studies, including controlled trials, describes an association that is strong, consistent, and related in dose-response fashion--the more education, the better the health [7,8,9,10,11]. As educational attainment drops stepwise from college degree to less than a high school diploma, morbidity and functional limitations increase in both men and women. Among American women and men aged 45-64, those with at least a college degree experienced no change in disability and a mild increase in functional limitations as they aged from 2000 to 2015 [7]. As educational attainment dropped stepwise to less than a high school diploma, functional problems increased step by step to a high of 80% in those with less than a high school education [7]. Better educated adults live longer and healthier lives than their less educated peers. More schooling is clearly linked with better health. What is the basis for this relationship?

Education improves knowledge, reasoning skills, social skills, and a belief in the validity of science, all of which prepare an individual to understand the value of a healthy lifestyle and how to achieve it. The American Academy of Arts & Sciences reports that the percentage of those who value scientific research varies directly and stepwise with level of education: 52% without a high school diploma to a high of 94% with a graduate/professional degree [12]. Not surprisingly then, data indicate that less-educated adults are more likely to be obese and to smoke, eat an unhealthy diet, abuse drugs, and seldom exercise [13,14,15,16].

It is generally agreed that if the United States is to improve the health of its people, it must effectively address the social determinants of health. Education is the most fundamental of those determinants except for poverty, and education offers a path out of poverty. Should the mediocre educational systems of America be of concern, therefore, to the American medical establishment? We already have programs to reduce obesity and smoking, for example. Yet the Centers for Disease Control and Prevention (CDC) reports that the prevalence of obesity and smoking in U.S. adults varies

inversely with educational attainment and in step-wise fashion [15,16]—for example, smoking varies from 5% in those with a graduate degree to 41% in those without a high-school diploma [16]. Inadequate education is a fundamental problem.

To date, American medicine has largely ignored the implications of the education-health relationship. We already have much to do. Half of all physicians in the United States report at least one symptom of burnout. Isn't promoting education someone else's problem? On the other hand, what can we do for our children that could have a greater impact on their health, happiness, economic success, and general well-being than to provide them access to high-quality education? What can we do for inadequately educated adults that would have a greater health impact than to help them achieve the literacy and training that they need to gain economic independence? Is there a better way, in fact, to strengthen the future of America?

Obviously, improving public education in the United States will require commitment of more federal, state, local, and non-governmental dollars. The need for improvements in "infrastructure," usually understood as roads and bridges, is said to be urgent. But is there really any more elemental component of a nation's infrastructure than its schools? Nevertheless, when budget dollars get tight, legislators too commonly look to the education line to make up the shortfall. Yes, public education costs money; but an old maxim says it succinctly: "If you think education is expensive, try ignorance."

What, then, can be done by the medical profession—practitioners and their professional organizations-- to improve our country's systems of public education? First, we need a position statement and overall plan. Recent workshops held by the National Academies of Science, Engineering, and Medicine have begun to explore education-health relationships [9,17], with analysis and insights that could guide development of such a plan. Second, the professional organizations, academic specialty groups, and non-profit partners representing our clinical disciplines need to advocate energetically for an array of important health-related issues. Health disparities are a consistent target while public education is not, though educational disparities surely promote health disparities.

Third, these organizations and academic centers can confront the problem directly. For example, the American Academy of Pediatrics has declared that promoting pre-kindergarten literacy is, "an essential component of primary care pediatric practice" [18]. With physician leadership, New York's United Hospital Fund led the creation of The First 1000 Days of Life initiative that was incorporated into the state's annual budget. Participating physicians' offices and daycare centers promote early reading and family health literacy. Reach Out and Read, created by two academic pediatricians and an early-childhood educator, distributes books in pediatricians' offices and encourages parents to read to their children. It has improved receptive and expressive language in disadvantaged children [19]. The New York University Langone School of Medicine has led the non-profit City Health Dashboard in developing three metrics available to U.S. cities to guide improvement in health-related educational outcomes: third-grade reading proficiency, on-time high school graduation, and chronic absenteeism.

Fourth, while health-related professional organizations urge governmental and private-sector support for education, healthcare providers can contact legislators, vote for and endorse pro-education candidates, and stand by teachers as they push for better classroom and salary support.

Fifth, the American Medical Association's Principles of Medical Ethics states, "A physician shall recognize a responsibility to participate in activities contributing to the improvement of the community and the betterment of public health." Based on the respect that they carry, individual healthcare providers—physicians, nurses, social workers, and others—can encourage educational achievement with every encounter, particularly prevention visits. Pediatricians can routinely promote education, ask about possible barriers to learning, and work with school health services to address health-related absenteeism. Those who take care of disadvantaged adults can inquire about job status and barriers to economic independence, encourage adult education when appropriate, and recommend programs such as ProLiteracy that help adults gain skills in literacy, math, and computer science [20]. Education is fundamental to all aspects of a good life, however defined. Physicians have the opportunity to guide our patients toward that ultimate goal. We should accept the opportunity as integral to the responsible practice of medicine.

Getting an education can prevent disease. Inadequate education is a fundamental driver of deficiencies in other social determinants of health. It is a realistic target for improvement that offers an individual a path out of poverty and ill health; and coincidentally, it

offers the nation a stronger workforce, a more stable economy, and more intelligent participants in its democracy.

References

1. U.S. Department of Education, National Center for Education Statistics: Program for International Student Assessment (PISA), 2015:203-13. https://nces.ed.gov/surveys/pisa/pisa2015. Accessed March 2, 2019.
2. U.S. Department of Education, National Center for Education Statistics: Science Assessment: Overall Achievement Levels. https://www.nationsreportcard.gov/science_2015/#acl/chart_loc_1?grade=12. Accessed March 2, 2019
3. Organization for Economic Cooperation and Development (OECD), Program for the International Assessment of Adult Competencies (PIAAC), 2016. Adult skills in an international context. https://nces.ed.gov/fastfacts/display.asp?id=683. Accessed March 2, 2019
4. Papanicolas I., L.R.Woskie, and A.K. Jha. 2018. Health care spending in the United States and other high-income countries. *JAMA*;319:1024-1039.
5. Woolf S.H., D.A. Chapman, J.M. Buchanich, K.J. Bobby, E.B. Zimmerman, and S.M. Blackburn. 2018. Changes in midlife death rates across racial and ethnic groups in the United States: systematic analysis of vital statistics *BMJ*;362:k3096 doi: 10.1136/bmj.k3096.
6. Thrakar A.P., A.D. Forrest, M.G. Maltenfort, and C.B. Forrest. 2018. Child mortality in the US and 19 OECD comparator nations: a 50-year time-trend analysis. *Health Affairs (Millwood)*;37(1):140-149.
7. Zajacova, A., and E. M. Lawrence. 2018. The relationship between education and health: reducing disparities through a contextual approach. *Annual Review of Public Health*;39:273-289.
8. Hahn R.A., and B.T. Truman. 2015. Is the welfare state effective? Education promotes health and promotes health equity. *International Journal of Health Services*;45:657-678.
9. Zimmerman E. S., and S.H. Woolf. 2014. Understanding the relationship between education and health. *NAM Perspectives.* Discussion Paper, Institute of Medicine, Washington, DC. https://nam.edu/wp-content/uploads/2015/06/BPH-UnderstandingTheRelationship1.pdf. Accessed March 10, 2019
10. Cohen A.K., and S.L. Syme. 2013. Education: A missed opportunity for public health intervention. *American Journal of Public Health*;103(6):997-1001.
11. Campbell, F., G. Conti, J. J. Heckman, S. H. Moon, R. Pinto, E. Pungello, and Y. Pan. 2014. Early childhood investments substantially boost adult health. *Science*;343:1478–1485.
12. American Academy of Arts and Sciences. Perceptions of Science in America-Report Feb 2018. https://www.amacad.org/topic/science-technology. Accessed March 2, 2019
13. Cutler, D.M., and A. Lleras-Muney. 2010. Understanding differences in health behaviors by education. *Journal of Health Economics*;29(1):1-28.
14. Lawrence E.M. 2017. Why do college graduates behave more healthfully than those who are less educated? *Journal of Health and Social Behavior*;58(2):291-306.
15. Ogden C.L., T.H. Fakhouri, M.D. Carroll, C.M. Hales, C.D. Fryar, X. Li, D.S. Freedman. 2017. Prevalence of obesity among adults, by household income and education—United States 2011-2014. *MMWR Morbidity and Mortality Weekly Report*;66(50):1369-1373.
16. Jamal A., E. Phillips, A.S. Gentzke, D.M. Homa, S.D. Babb, B.A. King, and L.J. Neff. 2018. Cigarette smoking in adults—United States, 2016. *MMWR Mobility and Mortality Weekly Report*;67(2):53-59.
17. National Academies of Sciences, Engineering, and Medicine. 2019. *School Success: An opportunity for Population Health Action: Proceedings of a workshop—in brief.* Washington, DC: The National Academies Press. https://doi.org/10.17226/25370. Accessed March 4, 2019.
18. American Academy of Pediatrics Policy Statement. 2014. Literacy promotion: an essential component of primary care pediatrics. *Pediatrics*;134:404-409.
19. Mendelsohn A.L., L.N. Mogilner, B.P. Dreyer, J.A. Forman, S.C. Weinstein, M. Broderick, K.J. Cheng, T. Magloire, T. Moore, and C. Napier. 2001. The impact of a clinic-based literacy intervention on language development in inner-city preschool children. *Pediatrics* 107(1):130-134.
20. ProLiteracy. Web Site. https://www.proliteracy.org/What-We-Do/Programs-Projects. Accessed March 10, 2019.

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Author Information

Richard B. Johnston, Jr. is Emeritus Professor, Department of Pediatrics at the University of Colorado School of Medicine and National Jewish Health, Denver, Colorado. Dr. Johnston is a member of the National Academy of Medicine.

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Correspondence

Questions or comments should be directed to Richard B. Johnston, Jr. at Richard.Johnston@ucdenver.edu.

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