months old, as identified by El Tantawi et al.), would the findings change? Was universal health care not significantly associated with any dependent variable because the oral and medical health sectors are still too siloed? What additional exo- and macro-level factors might be important contributors to ECC data availability or to ECC prevalence?

Future research might adjust these associations for more confounding variables for which data exist. Dietary intake, for example, is essential to tooth condition. Among children younger than 36 months, breastfeeding prevalence would be appropriate to explore,[4] whereas sugar or corn consumption might be a good option to assess among children 36 to 71 months of age. Other macro-level factors worth considering are a mother's educational level, the under-5 mortality rate,[5] healthy life expectancy at birth,[6] and the sociodemographic index developed through the Global Burden of Disease Study.[6]

A balance has to be struck between bias introduced with each additional predictor and inclusion of predictors for which theory offers a credible argument. In such cases, even if these additional control variables are not statistically significant in a final model, this can be an important signal to policymakers and future researchers that such predictors have been taken into account. There are ever more creative ways to explore this balancing act. For example, the sociodemographic index is a summary indicator that combines per capita income, years of schooling, and the total fertility rate. Thus, this index could save degrees of freedom in the analysis (thus preserving statistical power), help avoid overfitting of a model, and potentially solve the earlier-mentioned complexity issue related to measures of wealth.

Given that dental caries can lead to systemic infections and even death,[7] we must continue to insist that our country surveillance systems improve measurement of ECC and that our health (including oral health) systems improve both their reach and their effectiveness. AJPH

Cynthia A. Tschampl, PhD

REFERENCES

1. GBD 2016 Disease and Injury Incidence and Prevalence Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet*. 2017;390(10100):1211–1259.

2. Oesterle S, Kuklinski MR, Hawkins JD, Skinner ML, Guttmannova K, Rhew IC. Long-term effects of the Communities That Care Trial on substance use, antisocial behavior, and violence through age 21 years. *Am J Public Health*. 2018;108(5):659–665.

3. World Health Organization. Universal health coverage. Available at: http://www.who.int/mediacentre/factsheets/fs395/en. Accessed May 26, 2018.

4. United Nations Children's Fund. Infant and young child feeding: current status and progress. Available at: https://data.unicef.org/topic/nutrition/infant-and-young-child-feeding. Accessed May 26, 2018.

5. GBD 2016 Mortality Collaborators. Global, regional, and national under-5 mortality, adult mortality, age-specific mortality, and life expectancy, 1970–2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet*. 2017;390(10100):1084–1150.

6. GBD 2016 DALYs and HALE Collaborators. Global, regional, and national disability-adjusted life-years (DALYs) for 333 diseases and injuries and healthy life expectancy (HALE) for 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet*. 2017;390(10100):1260–1344.

7. Otto M. *Teeth: The Story of Beauty, Inequality, and the Struggle for Oral Health in America*. New York, NY: New Press; 2016.

Nonsuicidal Self-Injury: A Neglected Public Health Problem Among Adolescents

See also Monto et al., p. 1042.

In this issue of *AJPH*, Monto et al. (p. 1042) take an important step in providing prevalence estimates and health risk behavior correlates of nonsuicidal self-injury (NSSI) among a large nonclinical sample of high school students in 11 states using 2015 Youth Risk Behavior Surveillance System (YRBSS) data. They found that 17.6% of adolescents had engaged in at least one form of NSSI within the past year, including just over one in 10 male adolescents and nearly one in four female adolescents. This work adds to the current body of epidemiological research on NSSI and demonstrates a substantial population-level burden of NSSI among youths. It also builds on research from the 2007 Minnesota Student Survey, a population-based survey of Minnesota high school students that found an NSSI prevalence of 7.3% among youths who had never experienced suicidality.[1] The 2016 Minnesota Student Survey employed an NSSI question similar to that of the YRBSS and showed rates (15%–16%) comparable to those observed by Monto et al.

DISENTANGLING NSSI AND SUICIDALITY

Monto et al. found strong associations between NSSI and past-year suicide attempts, consistent with previous research demonstrating that adolescents who engage in NSSI are at an increased risk of subsequently

ABOUT THE AUTHORS

Nicholas J. Westers is with the Department of Psychiatry, Children's Medical Center Dallas and the University of Texas Southwestern Medical Center, Dallas. Alison J. Culyba is with the Division of Adolescent and Young Adult Medicine, Children's Hospital of Pittsburgh of UPMC, Department of Pediatrics, School of Medicine, University of Pittsburgh, and the Department of Behavioral and Community Health Sciences, Graduate School of Public Health, University of Pittsburgh, Pittsburgh, PA.

Correspondence should be sent to Nicholas J. Westers, PsyD, Children's Medical Center Dallas, 6300 Harry Hines Blvd, Ste 1200, Dallas, TX 75235 (e-mail: nicholas.westers@childrens.com). Reprints can be ordered at http://www.ajph.org by clicking the "Reprints" link.

This editorial was accepted May 15, 2018.

doi: 10.2105/AJPH.2018.304550

attempting suicide. In fact, several studies suggest that specifically among adolescents who are depressed, a history of NSSI may be a stronger risk factor for attempting suicide than is a past suicide attempt.[2]

NSSI poses a particular challenge for youth-serving clinicians and mental health systems. Youths are often evaluated in emergency departments for NSSI, and many are admitted unnecessarily to psychiatric inpatient programs. Because the behavior is, by definition, not suicidal in intent, many youths may be best served with community-based mental health treatment. However, in research and clinical assessment, it is often challenging to determine which youths engaging in NSSI require inpatient hospitalization. Future work is urgently needed to differentiate youths at the highest risk for suicide, appropriately triage services, and guide best practices.

FRONTIERS IN NSSI RESEARCH

Monto et al. fill an important gap in NSSI research by exploring health risk behaviors rarely examined among adolescents who self-injure (e.g., using drugs, fighting, cyberbullying, forced sexual intercourse). Importantly, although the prevalence of NSSI varied by sex, the pattern of associated risk factors was generally consistent among both male and female students. The association of NSSI with health risk behaviors highlights the importance of assessing the broader context in which NSSI occurs. Although these associations bring to light cooccurrence patterns, they cannot be used to assess causation or to evaluate the possibility of reverse causation.

Another important step in advancing NSSI research is to move beyond examining NSSI as either present or absent and study frequency and patterns of NSSI behavior. Many youths search for new strategies to cope with emotional distress, and some try NSSI once or twice to determine whether it is helpful to them and stop when it is not. As in the study by Monto et al., these adolescents are often grouped with those who have integrated NSSI into their regular coping repertoire. Although small studies often lack the power to examine NSSI frequency, YRBSS offers the opportunity to conduct this more detailed analysis. Monto et al. noted that 5.5% of the sample had engaged in NSSI six or more times in the previous 12 months, providing a valuable data source for more detailed study of risk profiles.

USING THEORY TO INFORM RESEARCH AND PRACTICE

Disentangling NSSI and suicidality speaks to a broader discussion about how best to identify youths engaged in risk behaviors who will actually attempt suicide. The interpersonal psychological theory of suicide[3] posits that individuals attempt suicide when they have both a *desire* to die (i.e., suicidal ideation) and the *capability* to act on that desire. According to the interpersonal psychological theory of suicide, individuals who ideate about suicide attempt suicide only if they have acquired the capability to tolerate the anticipated physical pain and have a decreased fear of death. Individuals who engage in NSSI may become habituated to various forms of pain (e.g., tearing, burning, bruising) so that death by suicide is not as frightening over time.

However, it is not simply whether individuals engage in NSSI that increases the risk for a suicide attempt but how many times they self-injure, how long they have been self-injuring, how many different methods of NSSI they have used, and why they engage in NSSI (e.g., to release tension, to avoid suicide, to self-punish). It is essential that we balance studies of population-level prevalence and correlates of NSSI with theoretically grounded examinations of how these risk behaviors actually unfold across the adolescent life course. In doing so, we can bring together multidisciplinary perspectives from youths, clinicians, researchers, and public health officials to move the field forward.

A PUBLIC HEALTH FRAMEWORK FOR INTERVENTIONS

The health impact pyramid outlined by Frieden[4] provides a useful framework from which to conceptualize the public health impact of NSSI and identify intervention opportunities beyond traditional individual-based approaches. This model posits that the greatest population effect with the least amount of individual effort can be achieved by targeting socioeconomic and sociostructural factors. In the case of NSSI, this should include sustained efforts to address mental health parity and improve access to mental health care for all youths.

Changing social and environmental contexts to promote healthy behavior has been successfully used to address suicide. Suicide research has demonstrated the effectiveness of structural interventions, such as fencing around bridges and the tops of high buildings.[5] Additionally, changes in media reporting practices have successfully reduced the suicide copycat phenomenon. More responsible reporting of NSSI in the media, including discussing negative consequences and focusing on help-seeking behavior and available resources, may provide novel avenues for harm reduction.

School-based prevention programs, such as the Signs of Self-Injury Program,[6] may offer opportunities for long-lasting protective interventions. Such programs can foster empathy for those engaging in NSSI and improve help-seeking attitudes and intentions among youths. They may prove a particularly efficient approach considering the NSSI burden documented by Monto et al.

Family- and individual-level clinical interventions may also play an important role in addressing NSSI. There are no empirically supported treatments specifically for adolescent NSSI, but most treatments that help with NSSI do so by addressing the context in which it occurs (e.g., depression).[7] Research has shown that supportive and positive family relationships are one of the greatest protective factors against many health risk behaviors, including NSSI.[1]

Few medical providers feel prepared to address NSSI at the individual level through counseling or education, and few resources exist to help them. However, one model has been developed as a tool to assist health

professionals with screening adolescents for NSSI and providing brief, targeted advice and counsel.[7] Because of the high prevalence of NSSI among both male and female adolescents, youth-serving professionals should incorporate routine screening for NSSI and link to appropriate mental health services as part of best practices in assessing psychosocial risk and protective factors that affect health.

A comprehensive strategy to address adolescent NSSI must combine research, the refinement of clinical best practices, and the development of multitiered prevention and intervention programs, including public health programs to address NSSI among youths in the general community. This integrated approach can help us identify effective individual and contextual strategies to reduce the burden of NSSI and safeguard youths. AJPH

Nicholas J. Westers, PsyD
Alison J. Culyba, MD, PhD, MPH

CONTRIBUTORS
Both authors contributed equally to this editorial.

ACKNOWLEDGMENTS
This editorial was supported by the National Institutes of Health via the National Center for Advancing Translational Sciences (grant KL2TR001856).

Note. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

REFERENCES

1. Taliaferro LA, Muehlenkamp JJ, Borowsky IW, McMorris BJ, Kugler KC. Factors distinguishing youth who report self-injurious behavior: a population-based sample. *Acad Pediatr*. 2012;12(3):205–213.

2. Asarnow JR, Porta G, Spirito A, et al. Suicide attempts and nonsuicidal self-injury in the treatment of resistant depression in adolescents: findings from the TORDIA study. *J Am Acad Child Adolesc Psychiatry*. 2011;50(8):772–781.

3. Joiner TE. *Why People Die by Suicide*. Cambridge, MA: Harvard University Press; 2005.

4. Frieden TR. A framework for public health action: the health impact pyramid. *Am J Public Health*. 2010;100(4):590–595.

5. Lester D. Preventing suicide by restricting access to methods for suicide. *Arch Suicide Res*. 1998;4:7–24.

6. Muehlenkamp JJ, Walsh BW, McDade M. Preventing non-suicidal self-injury in adolescents: the signs of self-injury program. *J Youth Adolesc*. 2010;39(3):306–314.

7. Westers NJ, Muehlenkamp JJ, Lau M. SOARS model: risk assessment of non-suicidal self-injury. *Contemp Pediatr*. 2016;33(7):25–31.

Short-Term Adverse Effects of Austerity Policies on Mortality Rates: What Could Their Real Magnitude Be?

See also Cabrera de León et al., p. 1091.

Assessing the effects of policies on health matters. A lot. It matters in ways as ancient as humanity, and it matters in particularly challenging ways in this age of post-truths, alternative facts, fake news, plain lies, and other expressions of the reluctance to look at reality. Valid scientific studies are crucial in assessing the effects of policies. The article by Cabrera de León et al. (p. 1091) illustrates the importance of looking at the effects of politically and financially driven responses to the economic crisis. Also, their empirical analysis shows the need to assess how economic, fiscal, occupational, welfare, environmental, and sanitary policies have affected the conditions in which citizens work (or not) and live, or die; the performance of health systems; and indicators of population health.[1]

The sharp increase in mortality in Spain from 2010 to 2011 reported by the authors is difficult to attribute to austerity policies because it largely precedes them. With the exception of 2012, public expenditures in Spain increased each year from 2007 to 2015. Social expenditures dropped only 0.1 gross domestic product points from 2010 to 2011.[2] The main austerity measures—especially those deriving from a Royal Decree Law, in force since July 2012—were implemented in 2012 and thereafter.[3]

A CHANGE IN THE STANDARD POPULATION

The putative mortality increase did follow the onset of the economic recession in 2007 and 2008. Crucially, the reliability of the age-adjusted overall mortality rates (AAMRs) used by Cabrera de León et al., particularly for 2011, is problematic: the population used to standardize rates changed in 2011.[4] Before 2011, the standard population used for AAMRs was the Spanish population of July 1, 1999; since 2011, the European standard population provided by Eurostat has been employed.[3] Cabrera de León et al. acknowledge in an appendix that the AAMR data they used are not comparable from 2010 to 2011 because of the change in the reference population; yet, they base their most important calculations on these unreliable data. Hence, their results should be considered with great caution.

Poverty and impoverishment—and the related lack or loss of social protection and welfare benefits—may be key in explaining the links between the economic recession, austerity measures, and increasing mortality in Spain and many other countries. The long-term high unemployment rate became even more dramatic in Spain after the onset of the crisis, increasing from 9.2% in 2005 to 22.1% in 2015,[5] with the young population (48% of which was unemployed in 2015) particularly affected.[4] The recession had a stronger impact

ABOUT THE AUTHORS
Cristina Hernández-Quevedo is with the European Observatory on Health Systems and Policies, London School of Economics and Political Science, London, England. Beatriz G. Lopez-Valcarcel is with the Department of Quantitative Methods for Economics & Management, University of Las Palmas de Gran Canaria, Canary Islands, Spain. Miquel Porta is with the Hospital del Mar Institute of Medical Research (IMIM), Universitat Autònoma de Barcelona, CIBER de Epidemiología y Salud Pública, Barcelona, Spain, and the Gillings School of Global Public Health, University of North Carolina, Chapel Hill.

Correspondence should be sent to Miquel Porta, MD, PhD, MPH, Hospital del Mar Institute of Medical Research, Universitat Autònoma de Barcelona, Carrer del Dr. Aiguader 88, E-08003 Barcelona, Catalonia, Spain (e-mail: mporta@imim.es). Reprints can be ordered at http://www.ajph.org by clicking the "Reprints" link.

This editorial was accepted April 24, 2018.
doi: 10.2105/AJPH.2018.304507