or may not be used to purchase PrEP, the same strategies for negotiating reduced pricing by purchasing in bulk as was done for ART may also be used to purchase PrEP in bulk. An example of this is in Brazil, a middle-income country. Recent published findings indicated that there were high rates of adherence to PrEP among men who have sex with men and transgender women taking part in a PrEP demonstration program in that country.[4] Subsequently, on May 24, 2017, the Brazilian government announced a plan to provide PrEP for free to approximately 7000 high-risk individuals across the country.[5]

Although middle-income countries, such as Brazil, may be willing and able to make this commitment, it is less likely that low-income countries will be able to do so. Because of this, PEPFAR should continue to consider and recommend the use of PrEP for various groups, such as pregnant women, men who have sex with men, high-risk heterosexuals, and other high-risk populations. With a patchwork approach to PrEP similar to that used with ART, access to PrEP can be greatly expanded and can make a significant difference in reducing the global burden of HIV.

MODELS TO SUPPORT ACCESS

With more widespread use of PrEP and ART, questions arise regarding the meaning of "safer sex." in this issue of *AJPH*, Calabrese et al. look at how provider biases may affect their ability to effectively counsel patients using PrEP about the risks involved in stopping the use of condoms (p. 1572). With respect to supporting providers who prescribe PrEP, Greene recommends provider education and other means for supporting expanded prescriptions of PrEP (p. 1580). Provider education as a means of expanding access to PrEP can also have multiple benefits: it increases access to and utilization of routine HIV and other sexually transmitted infections testing and a range of primary and preventative health care services—screenings and services that may otherwise be missed or ignored.

In addition, Samandari et al., from the Centers for Disease Control and Prevention, advocate increasing the use of PrEP as part of a comprehensive HIV prevention strategy (p. 1577). Even as a game changer, PrEP should be considered only one tool in an arsenal of comprehensive HIV prevention and education programming. An important consideration, especially as we grapple with minimizing disparities in access and use of PrEP, is recognizing that the prevention paradigms of the early HIV/AIDS era will need to be modified to meet the needs and challenges of a new generation of individuals currently at risk for HIV.

PrEP has become an important part of the more recent HIV prevention programs, especially those that focus increasingly on biomedical prevention technologies; therefore, it necessitates an increase in the role of clinical providers in treating HIV and preventing new infections. Thus, the most likely path to expanding this model and achieving access to PrEP worldwide is to use the institutional pathways and funding mechanisms that have supported global efforts to expand access to HIV treatment. AJPH

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Years of Life Lost, Age Discrimination, and the Myth of Productivity

See also Taksler and Rothberg, p. 1653.

For decades, public health has tried to identify factors that contribute to health disparities. But actual measures of population health have not been examined for their potential to reinforce or increase substantial health inequities. The years of life lost (YLL) formulation has the apparent purpose of measuring population health, as one metric among several including age-adjusted and age-specific mortality and life expectancy. In itself, YLL does not overtly entail a specific purpose for its utilization compared with these other measures. Its primary differentiating characteristic is a focus on deemphasizing the mortality of older populations compared with younger ones. However, YLL simultaneously conceals and instantiates multilayered biases related to age discrimination and the implicit emphasis on economic productivity as a measure of "contribution to society."

Years of life lost implies a more specialized utilitarian function in comparison with other measures of population health status—namely, its application to the allocation of (scarce) health

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This editorial was accepted July 7, 2017.
doi: 10.2105/AJPH.2017.304020

resources. In measuring population health, YLL minimizes that of older populations, thereby objectifying numerically (1) the acceptability (or normativeness) of age-group discrimination and (2) the "worthiness" of the person to receive societal benefits on the basis of alleged productivity. For these reasons, it is inadequate for the allocation of societal resources to health care and illness prevention.

AGE DISCRIMINATION AND PRODUCTIVITY ARGUMENTS

Taksler and Rothberg, in the current issue of the *AJPH,* acknowledge the implicit, if not explicit, emphasis on age discrimination in the YLL (p. 1653). One of their supporting claims is that this discrimination is justified on the grounds that younger populations (e.g., those aged 15–65 years) are economically more productive, as they are more likely to be in the labor force or, generally, make more "societal contributions." Furthermore, with respect to productivity, the decline in manufacturing employment because of deindustrialization and globalization as well as the Great Recession has produced unusually high rates of unemployment, long-term unemployment, and the inability of the formerly employed to find work at the skill levels and wages they formerly enjoyed. This means that, from a productivity standpoint, the unemployed and underemployed contribute less and are therefore less worthy of societal health benefits. This places such vulnerable persons in the double jeopardy of economic loss—heightened mental and physical illness[1] and a threat to health benefits.

In addition, the apparently straightforward measure of YLL is a gradient, not simply a metric that categorically distinguishes old from young. In this metric, a 50-year-old person is less worthy than a 35-year-old person, a 35-year-old person less worthy than a 25-year-old person, and so on. This brings us to a point of absurd moral calculation resulting from precise mathematical use of the YLL. By contrast, the marketplace regards older workers as *more* valuable and increases their income as they age and become more experienced. They achieve higher management positions on the basis of that experience on the understanding that tacit knowledge and productivity increase through "learning by doing."[2] It would therefore be worthwhile to correct for the age asymmetry in the YLL by adjusting for the more extensive experience of the older population. Furthermore, the YLL assumption overlooks the fact that people in retirement have already worked through a full career and have made their "economic contribution" as evidenced by their retirement. It would seem odd that society should now penalize them for already having made that contribution—compared with the younger population, which has not as yet done so.

PRODUCTIVITY AND THE HEALTH GRADIENT

But, more generally, if economic productivity is to be the major criterion of "societal contribution," then profound biases related to productivity are introduced. For example, labor economists are agreed that highly educated persons are considerably more "productive" (based on skills and other human capital), which is evidenced by their higher occupational rank, wages, and salaries. Does society really intend to discriminate against the lower-skilled and lower-educated population by virtue of their allegedly inferior economic productivity in terms of diminished allocation of health care resources? More trenchantly, minority ethnic groups currently and traditionally have substantially lower education levels than the White population. The use of economic productivity as a criterion for obtaining "scarce" health resources therefore compounds discrimination by social class, ethnicity, and gender. It eliminates any moral basis for distributing scarce health resources to persons with disabilities that may interfere with economic performance.

The phenomenon of consistently higher morbidity and mortality rates of lower socioeconomic groups for nearly all diagnoses (i.e., the "health gradient" or "social gradient") has been recognized as one of the central findings of epidemiology. In fact, the relative lack of health insurance by private or government sources is heavily dominated by lower socioeconomic groups. Thus, the YLL argument for resource allocation based on economic productivity places an additional burden of minimization of health care resources allocated to those most in need.

SOCIETAL AGING AND NEED FOR HEALTH RESOURCES

The issue of "need" rises to an even higher level when one compares older versus younger populations. This is the case because older populations virtually always show higher morbidity and mortality rates. The older population, clearly most in need of medical and preventive care, then suffers "double jeopardy" both in terms of their poorer state of health and minimization of allocation of health resources. This is a negation of the most fundamental ethical principle of health services delivery, namely that the medically needy receive the highest allocation of health care resources. Moreover, the motivation of public health professionals has been to protect the health of the entire population and, in particular, to maximize its life span. In YLL and related measures of premature death, we have a metric that denies the motivation to expand life beyond the "standard" working life.[3,4]

The use of YLL as an age-discriminatory measure for allocation of health resources compounds the fact that over the past few decades, in the United States and United Kingdom, age discrimination in older populations' receipt of health services has been rampant—even regarding cardiovascular illnesses and cancer.[5] Indeed, such discrimination is contrary to law in the United States. There is evidence that age discrimination in health care leads to higher mortality in older populations.[6] Furthermore, age discrimination has been extensive in employment and reemployment in the United States, again despite its being contrary to established federal law.

DELINEATING IMPORTANCE OF SPECIFIC ILLNESSES

One must be especially cautious in making inferences about the comparative "importance" of different causes of death based on YLL where major chronic diseases are involved in industrialized countries. For example, Taksler and Rothberg claim that, on the basis of YLL, cancer has now become a more prominent cause of death than heart disease in the United States. However, heart disease should logically be viewed in

conjunction with stroke, which is physiologically associated with heart disease in that they are both cardiovascular diseases. As the totality of cardiovascular diseases (whose underlying components are hypertension and arteriosclerosis) continues to be numerically more important than cancer, it is not clear what focusing on the fractional distinction between the two chronic diseases accomplishes from any policy standpoint.

In addition, it is not evident that the causes of death dominating the younger populations provide greater potential for preventive actions compared with chronic diseases in the older populations. Indeed, preventive efforts regarding tobacco control, alcohol, weight management, and environmental pollution have been beneficial in curtailing mortality—and expanding life expectancy—for chronic diseases in the older population. By contrast, the causes of death more common in younger industrialized country populations, heavily beset by mental and behavioral disorders (anxiety, depression, alcohol and opioid abuse) have proven more intractable to preventive measures.[7]

EQUALITY IN HEALTH RESOURCE ALLOCATION

In the current US political climate, with impending legislation proposing major reductions in health insurance, the use of YLL legitimates further devaluation of older and less healthy populations. But the overriding ethical principle of public health must specify that all persons are of equal worth and are to be treated equally over the life span, taking into account their need for health and preventive services on the basis of illness severity and potential mortality. AJPH

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ACKNOWLEDGMENTS

I thank *AJPH* Editor-in-Chief Alfredo Morabia, MD, PhD, for inviting me to write this editorial.

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On Being Transnational and Transgender: Human Rights and Public Health Considerations

See also Cheney et al., p. 1646.

There has been a notable increase in attention to the lives and health needs of transgender people.[1,2] The growing burden of HIV among transgender communities during the 1990s brought visibility to this population, spurring two decades of research on individual-level health behaviors, mental health, substance use, and sex work as drivers of transgender women's HIV risk.[3] The Institute of Medicine called for a broader research agenda on transgender-specific health needs in 2011—the same year that the National Transgender Discrimination Survey highlighted systematic antitransgender bias and structural violence as enduring challenges for transgender people.[4] The human rights of transgender people have more recently been garnering attention as a legitimate public health issue, demonstrated by the study by Cheney et al. (p. 1646), in this issue of *AJPH*, on transgender women from Mexico seeking asylum in the United States. This work demonstrates how the arc of research on transgender health has evolved from initially focusing on individual-level behaviors to considering transnational and legal issues that affect health outcomes.

The study analyzed asylum declarations filed through a legal service organization in California by transgender women immigrating from Mexico. Although Mexico has instituted national policies that acknowledge the rights of sexual minority populations, such as the legalization of same-sex marriage, there remains resistance to progress among religious institutions and local communities that acknowledge only heterosexual lifestyles and that discriminate against nontraditional forms of gender identity and expression. According to their document analysis, systemic community violence was a key impetus for transgender women's immigration from Mexico.

Forms of violence included childhood insults by family members, intimidation in school settings, and more extreme acts of physical victimization, sexual assault, and murder of transgender adults. Transgender women reported a lack of support from police and the legal system in Mexico; some officers were perpetrators of transgender violence. The authors noted limitations of their research, including a nonrepresentative sample of transgender women from Mexico who had access and comfort using legal services in the United States, which might not be the case for many transgender immigrants.

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This editorial was accepted July 17, 2017.

doi: 10.2105/AJPH.2017.304030