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Applying the Concepts of “Community Spread” and “Flatten the Curve” to Chronic Conditions and Their Prevention

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Background
As this is being written, the Coronavirus (COVID-19) pandemic is spreading around the planet. To date, 210 countries have been affected. Billions of people are in lockdown as health services struggle to cope. Across America, cases and fatalities have been reported in all states. Particularly hard hit have been major cities such as New York, New Orleans, Seattle, Chicago and Detroit with more certainly to come. Words such as isolation and self-quarantine are ubiquitous. Previously unknown or rarely referenced terms such as social isolation, social distancing, shelter in place, personal protection equipment (PPE) and ventilators also are now part of everyday lexicon and jargon. Millions of Americans, like myself, are hunkered down and doing their best to minimize their own risk and risk to others; an option unavailable to millions more in essential services, ranging from health care workers and first responders to transportation, food processing and grocery store employees.

Unlike toilet paper and sanitary wipes, one commodity not in demand by most at this time is time itself. The crisis has provided plenty of time to read and reflect. Articles once relegated to a corner pile on the desk are now getting their just attention. One of particular interest is Today’s Health Problems and Health Education. In this 1954 article, an icon in Health Education, Mayhew Derryberry, who in 1941 was appointed the first chief of the newly formed Division of Health Education in the U.S. Public Health Service, contrasted the challenges for health education of chronic compared to communicable diseases. In contrast, using the Derryberry article as a departure point, the purpose of this Commentary is to expand our thinking on addressing chronic conditions using current strategies to contain the communicable COVID-19. This Commentary advances the notion that strategies to address communicable diseases also have relevance and applicability for Health Educators and the American Journal of Health Education, with its mission to prevent or delay the onset of major chronic diseases and illnesses and inform the discussion on the role of lifestyle behaviors in chronic disease management.

The focus of the Derryberry article is straightforward. It is well documented that today’s health problems of greatest significance are chronic diseases such as heart disease, cancer, stroke, diabetes, obesity and mental illness. Unfortunately, tools for dealing with the health conditions of today are not as available for most contagious diseases that can rely on preventive measures such as vaccination, immunization, safe water and milk supplies, sanitary sewage disposal and insect vector control. Furthermore, in situations where a person contracts a communicable disease, there are often antibiotics, other effective agents or treatments available.

Derryberry recognized the difficulty of this approach. For many reasons, the task of health education, which is normally difficult enough, is made much more difficult by the lack of specific procedures for preventing today’s ills, as well as by the absence of completely effective curative measures. Because control procedures are vague, the actions that health educators try to teach individuals to take to prevent or to cure disease are less well defined than were the actions necessary to control the contagious diseases.

Further supporting his contention is that, unlike contagious diseases, the onset of chronic conditions is much more insidious and gradual.

Therefore, the motivation to act with reference to the slowly developing problems of chronic disease is not nearly so great as was the motivation to act in preventing the contagious diseases .... Because control procedures are vague, the actions that health educators try to teach individuals to take to prevent or to cure disease
are less well-defined and less obvious to the public eye than actions necessary to control the contagious diseases.\(^{(p1225)}\)

An additional obstacle is that, unlike contagious diseases where a single action such as being vaccinated or immunized may protect the person for a long period, prevention of chronic diseases and disability often require significant and difficult changes to one’s daily lifestyle such as diet, physical activity and tobacco use. Finally, chronic and contagious diseases differ in the amount of individual understanding necessary to prevent and cure the diseases or to avoid accidents. Installing a safe water supply and sanitary sewage or immunizing a population requires far less understanding and action than for the prevention of chronic diseases.

Now for a different take. No doubt, differences between methods for prevention of acute and chronic diseases exist, but crossover in some methods exists as evidenced in the recent responses to the COVID-19 pandemic. Each day, the public hears the health experts espouse practical and useful concepts to minimize “community spread” and maximize efforts to “flatten the curve.” Let us look at each and their relevance not just for contagious diseases but some chronic diseases.

### Community spread

For communicable diseases, community spread refers to the transmission of microorganisms from one individual to another by means of (1) airborne coughing, sneezing, breathing, droplet infection, small particles that stay in the air for a short period of time, (2) direct physical contact, touching an infected individual, (3) indirect physical contact, typically by touching a contaminated surface, (4) fecal-oral transmission, usually from unwashed hands, or (5) contaminated food or water sources due to the lack of sanitation and hygiene.

The idea of community spread of a condition from one person to another also has applicability for chronic diseases. Chronic diseases are broadly defined as conditions that last one year or more and require ongoing medical attention and/or limit activities of daily living or both.\(^{(4)}\) Chronic diseases and illnesses such as cardiovascular disease, cancer, diabetes, cirrhosis, Alzheimer’s/dementia, etc. are recognized as major public health challenges. They are the leading causes of death and disability in the US. They are also leading drivers of the nation’s 3.5 USD trillion in annual healthcare costs in 2017.\(^{(4)}\) In 2014, 60 percent of Americans had at least one chronic condition, and 42 percent had multiple chronic conditions.\(^{(5)}\) Ninety percent of the nation’s annual health expenditures are for people with chronic and mental health conditions.

Reducing the prevalence and incidence of chronic conditions require reducing the risk factors by not only encouraging individual responsibility but, very importantly, by collective participation, obligation and shared responsibility by community members, health professionals, organizations, businesses and government at all levels. Support and involvement by these entities is indispensable in any effort aimed at health promotion and disease prevention with respect to chronic diseases. In their seminal work, *Actual Causes of Death*, by McGinnis and Foege in 1993\(^{(6)}\) and later updated by Mokdad, Marks et al.,\(^{(7)}\) they attributed the actual causes of the foremost chronic deaths, such as heart disease, cancer, and stroke, to behaviors of tobacco use, poor diet, or physical inactivity.

Consistent with their findings to improve health and prevent or delay the onset of the major chronic diseases and illnesses, we also should consider the concept of community spread by efforts aimed at community support, policies and legislation. Smoking is an excellent example of what can be done to affect positive change through “community spread.” At the time of the first *Smoking and Health: Report of the Advisory Committee to the Surgeon General of the Public Health Service*\(^{(8)}\) in 1964 showing the link between smoking and lung cancer, laryngeal cancer and chronic bronchitis, more than one-half of men and nearly one-third of women were regular smokers. Tobacco industry advertising strongly supported smoking and the behavior as not only fashionable and socially acceptable but also health promoting.\(^{(9)}\) In 1930, the American Tobacco company, maker of Lucky Strikes published an ad claiming “20,679 Physicians say ‘LUCKIES are less irritating’ to the throat.”\(^{(10)}\) This result was helped by the company’s ad agency sending cartons of Lucky Strike cigarettes to physicians and a letter asking if they thought Lucky Strikes were “less irritating to sensitive and tender throats than other cigarettes.” At that time a majority of physicians smoked. Similarly in 1946, Reynolds tobacco, in conjunction with an ad campaign with the slogan, “More doctors smoke Camels than any other cigarette,” gave doctors a free carton of Camel cigarettes and then asked what brand they smoked.\(^{(10)}\)

How times have changed. While tobacco use is the leading cause of preventable disease, disability, and death, significant progress has been made. The prevalence of cigarette smoking among U.S. adults (13.7%) is now far less than one-half of what it was in 1964.\(^{(11)}\) Although vaping remains an emerging and increasing problem, the high school cigarette-smoking rate has fallen by nearly 80 percent since 2000, when 28 percent smoked. In 2019 the CDC found that 5.8% of high school students stated they smoked cigarettes in the past 30 days – a decrease from 15.8% in 2011.\(^{(12)}\)
During the decades that followed, and yes, it took decades, the decline in cigarette smoking was the result of the combination of annual Surgeon General’s reports on the impact of tobacco use on specific populations, specific smoking-related diseases, and the impact on secondhand smoke. This was coupled with public education, local, state and federal laws and policies addressing tobacco product marketing and advertising, labeling and packaging, and youth access. Simultaneously, grassroots movements aimed at protecting nonsmokers emerged and resulted in “smoke free” initiatives limiting exposure to secondhand smoke in restaurants/bars, workplaces, public buildings and parks. Smoking once considered acceptable and stylish fell out of favor. These efforts facilitated a steady movement away from smoking as an acceptable social norm. By 2011 a Gallup poll reported that for the first time, a majority of Americans supported a ban on smoking in all public places. Since then this trend has accelerated across the nation.

Smoking is not the only example of efforts to promote “community spread.” Faced with an increasing obesity epidemic, efforts to promote community support for physical activity have included promoting physical education and extracurricular activities in schools, enhanced community parks and recreation facilities, including programs for youth to Silver Sneakers for people age 65 and over, and enhancing infrastructure for walking, jogging, and bicycling. With millions hunkered down by COVID-19, how about promoting exercise sessions via Smart TVs, iPads, and Zoom? Just as schools and libraries support reading programs, how about those same entities doing the same for physical activity and related health behaviors? How about registering people for a school, business, organization or local government sponsoring a 1, 5, 10, 25, 50 million or more step challenge for employees and community members? Or, think bigger and emulate the recently successful American Public Health Association Billion Steps Challenge.

In terms of nutrition, increased efforts could be directed at not only promoting healthy individual behaviors but also community-wide support of organizations, businesses, schools and government at cutting the intake of sugars and fats, increasing consumption of fruits and vegetables. How about promoting and supporting community efforts to increase the availability and affordability of healthier food and beverage choices in both public and private service venues and to reduce “food deserts” in areas where access to affordable, healthy food options is limited or nonexistent because grocery stores are too far away?

**Flatten the curve**

From a communicable disease perspective, as exemplified by the COVID-19 pandemic, “flatten the curve” refers to a statistical chart used to visualize when and at what speed new cases are reported and could be flattened, rather than being allowed to rise exponentially. It too has relevance to chronic diseases.

No doubt, different chronic diseases pose different challenges and dictate different responses. Nevertheless, the overall prescription described above of information, education, policy and legislation would seem to be an effective approach to promoting “community spread” by “flattening the curve” in terms of the prevalence of existing cases or incidence of new cases in a community, state, or nation during a given period. Using this approach as with the example of tobacco use, the rise to the apex can be slowed, the apex flattened to a plateau at a lower number and, from there, the rate of decrease accelerated and maintained.

**Summary and conclusions**

Yes, no doubt, like communicable disease, we are confronted and challenged with a host of chronic health problems often requiring individual behavioral and community-wide actions that present a different set of challenges than contagious diseases. While there are differences, there are also lessons from societal responses to contagious diseases that are applicable to reducing chronic conditions. Unlike contagious diseases, chronic disease are not amenable to measures such as vaccination or immunization. They require different strategies. Yet, as indicated in this Commentary, just as strategies exist to reduce communicable diseases, strategies also exist not only to avoid “community spread” of chronic diseases but also promote “community spread” in a positive way and “flatten the curve.” While the current COVID-19 crisis will be resolved eventually, the challenge of chronic diseases will persist and require continued and enhanced effort to address “community spread.”

**Disclosure statement**

No potential conflict of interest was reported by the author.

**References**


