UCLA Institute of the Environment and Sustainability

Southern California Environmental Report Card - Winter/Spring 2011

GRADE A to D-

Health and the Built Environment

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Over the course of the 20th century, the lifespan of the average American increased by 30 years. Only five years of that increase, however, were attributable to advancements in medical care. The rest were due to public health efforts–mainly immunizations and improvements in the healthfulness of our environment. Yet, most people, including health professionals, do not really understand environmental health, or they have far too narrow a view of it. Some envision an inspector issuing A's, B's or C's to restaurants, checking microbe levels in water supplies, or analyzing pollutant concentrations after a hazardous chemical spill. These are important functions, but the environment is much greater than simply the hazards we test for—it is the entire medium in which we exist. And just as health is more than the absence of disease, environmental health is more than simply the absence of toxins.

THE BUILT ENVIRONMENT

The design and location of homes, schools, workplaces, stores, streets, and open spaces—our built environment—has a tremendous impact on physical, mental, and social health. The built environment is the product of our imagination and our work, and it is where we spend nearly all of our time, yet it is also the source of many chronic diseases and natural resource challenges we face. This article focuses on the environmental health of the people of Southern California, particularly as it relates

to the built environment. The size, complexity, and diversity of the region make Southern California one of the most dynamic places in which to study the built environment and health. In recent years, the region has made many advances, but as is the case with most report cards for Southern California, we find numerous areas that still need improvement.

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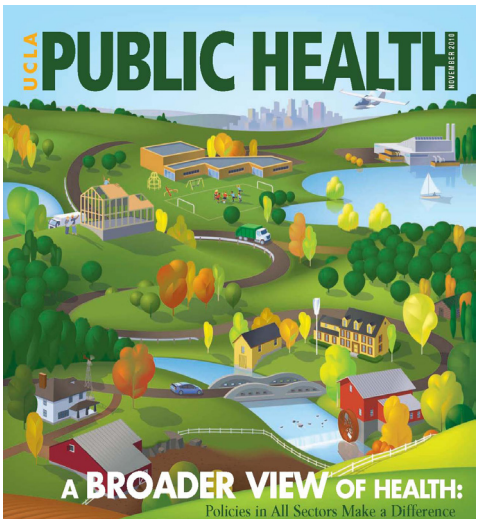

On the first day of my course at UCLA each quarter I ask my students to think about the characteristics of an ideal place to live—one that meets their environmental, health, social, and economic needs. I ask them to describe how such a place would look and feel. From an environmental standpoint, they invariably answer, "It would have lots of trees, and streams and lakes with clean water; the air would be clean; and food would be grown organically and locally if possible." I then ask them to describe an economically and socially vibrant place where they would want to live. They answer, "It would be filled with bright, creative, interesting people; it would have fine restaurants and numerous cultural and sports amenities." It would also have "meaningful and safe jobs, where we don't have to spend a lot of money on commuting or overpriced housing."

Then I ask, "How would you describe the look and feel of a healthy place?" The students identify many of the environmental factors that impact health: "It would have safe, clean, quiet, and attractive places to live, work, and play. It would have ample natural light and safe air quality, attractive parks and walking trails, farmers markets and community gardens." What the students correctly identify is that the features that promote healthy communities are the same ones that promote a robust environment and economy.

SOUTHERN CALIFORNIA

For the first half of the 20th century, Southern California looked and felt like that ideal healthy place described by my students. There was plentiful locally grown and healthy food, lively culture and an exquisite environment, all of which drew the best and brightest from across the United States and the world. In 1945, Los Angeles County was the leading agricultural county in the

nation; Orange County produced huge quantities of citrus; Ventura County had magnificent tree and row crops; and the Pacific Ocean was abundant with healthy and uncontaminated fish. Southern California even had an effective transit system until about 1950, and it was relatively easy to move around the region without being grid-locked on a freeway.

The development of the Southern California region brought progress and prosperity. By improving quality of life through environmental health interventions, we were able to extend the quantity of people's lives. Increased prosperity allowed many people to be better protected from the elements, to live and work without crowding and toxic exposures, to have central heating and air conditioning, to easily commute to the places they needed to go, to breathe clean air and to drink clean water, and to have safe and adequate food. In the latter half of the 20th century, however, the development of Southern California began to change, with unforeseen health consequences.

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THE AUTOMOBILE VS. PUBLIC TRANSIT

In recent decades, much of Southern California was built to meet the needs of the automobile. A consortium of automobile and fuel interests bought up transit systems like the Red Car and dismantled them, further directing the population into automobiles. At the same time, the Federal-Aid Highway Act and state resources provided immense funding for freeways. Much of Southern California's housing was built as one and two-story detached homes, requiring extended infrastructure such as sewers, water lines, and, of course, roads. Southern California's agriculture contracted to negligible levels as roads, parking lots, commercial centers, and housing tracts paved over the landscape. As a consequence, it is now estimated that 30 to 35% of the City of Los Angeles is paved over.

Over many years, increasingly long car travel times to work, shop, or conduct the basic business of life became the norm for most Southern Californians. For many people, the most challenging and stressful part of the day is their commute on the congested freeways that span the Southern California region. Car crashes became the leading cause of death for Los Angelinos age 25 to 44. Current traffic fatality rates mean that drivers have a one in a million chance of dying for every 80 miles they drive. Pedestrians and bicyclists are marginalized, and drivers have increased risks

of obesity, depression, high blood pressure, and diabetes.

People who use public transit are two to four times more likely to achieve daily physical activity recommendations as compared to drivers. Research has shown that each hour spent in a car per day is associated with a 6% increase in the risk of obesity, while any additional kilometer walked per day is associated with a 5% decrease in risk. In many communities, long commutes have contributed to declines in civic engagement. The time people spend in traffic could otherwise be spent engaging in activities such as exercising, socializing, cooking, and volunteering, thus promoting social capital, and providing a range of health benefits.

There are positive signs for future sustainable development in the region, including pockets of "smart growth," along with recent votes to increase funding for local and regional transit systems, and commitments to create enhanced bicycle infrastructure.

Although more than 30% of the population does not drive (either because of age, income, or disability) as noted above the region was developed for automobiles rather than pedestrians. As population and travel times increase, it is becoming clear that sole reliance on cars is untenable. Investments in subway and light rail have begun to turn this around. And there are positive signs for future sustainable development in the region, including pockets of "smart growth", along with recent votes to increase funding for local and regional transit systems, and commitments to create enhanced bicycle infrastructure in cities such as Long Beach and Los Angeles. Local planning commissions and a number of the region's planning leaders are becoming more amenable to transit-oriented developments. The advantage of transit-oriented developments is they encourage and support density. They also provide the ridership for transit systems which can often move passengers one hundred times more safely per mile than do cars, with a far lower carbon footprint, and substantially less stress.

AIR POLLUTION

Inexpensive gasoline and increasing numbers of cars led to dangerous air pollution levels by the 1960s in Southern California. Average blood lead levels in children during that time were over 20 mcg per deciliter—a level now considered lead poisoning. Lower income areas have been disproportionately impacted by the development patterns of recent decades; they have fewer parks and open spaces, and are more often intersected by major roadways and industrial zones. In the 1960s, a full term baby born in the most air polluted parts of eastern Los Angeles weighed on average seven ounces

less than those born closer to the coast. By the end of that decade, it became clear Southern California air quality had to be improved, and the state received authority from Congress to set more stringent air standards than the other 49 states.

The advent of the catalytic converter, in particular, was critical to air quality improvement, as it reduced emissions of ozone precursors and had the enormous additional benefit of requiring unleaded gasoline. Removal of lead from gasoline was accompanied by dramatic reductions in lead in air, leading to reductions of lead levels to the point where today the average blood lead of a child in Southern California is under 2 mcg per deciliter. These and other technical fixes have resulted in marked improvements in air quality, although progress has been somewhat blunted recently by a dramatic and continuous increase in vehicle miles traveled.

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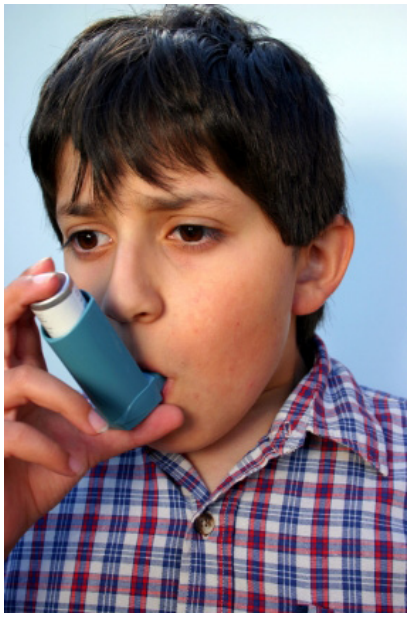
CHRONIC DISEASE



The diseases public health confronts today are primarily chronic diseases, including obesity, diabetes, asthma, cardiovascular diseases, and cancer. Each of these is caused by, or aggravated by, environmental exposures. The epidemics of obesity and diabetes can largely be traced to substantial increases in the sugar and fat content of the American diet. This is aggravated by reductions in physical activity and substantial decreases in fitness. The average Southern California adult has gained about 25 pounds over the last 30 years, and obesity has tripled in California teens and quadrupled in pre-teens. Three quarters of California children cannot pass the standard fitness test at school.

Asthma, which is the most prevalent chronic disease in children and has multiple causes, is made worse by poor air quality. Studies show higher traffic densities are associated with higher on-road and near-roadway air pollution which in turn leads to greater morbidity, including asthma, and increased mortality. The built environment can also influence mental health, particularly anxiety and depression. At present, anti-depressants are the leading class of prescription drugs taken by American adults. Numerous studies have shown

neighborhood factors such as noise pollution, overcrowding, limited access to green space, crime, and violence have negative mental health impacts. Conversely, regeneration of housing and neighborhoods can confer positive mental health benefits, although it is important to note gentrification may have negative health impacts in low-income communities.

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NATURAL RESOURCES

The proper management of our natural resources is key to promoting the health and vitality of the Southern California region. As fossil fuels become more costly, we will likely see an even greater proliferation of hybrid and electric vehicles that emit less pollution. As the cost of solar panels comes down, their use, too, will increase. While the quality of our drinking water is generally good, future generations will be astonished by our profligate use of drinking water for irrigation and toilet flushing. Many parts of Southern California, particularly Los Angeles, have substantial amounts of unused or underutilized land. These vacant lots, many of which are owned by the city, often end up being the repository of household debris and community nuisances. Action programs seeking to turn vacant lots into pocket parks, community gardens, and other community amenities are being put in place under funding from foundations such as the California Endowment and under national initiatives, including the Centers for Disease Control and Prevention's RENEW program.

GOODS MOVEMENT

Another important regional consideration related to the built environment and health is goods movement. At present, the ports of Los Angeles and Long Beach handle 70% of the U.S. Pacific coast cargo. Thousands of trucks burning diesel fuel pass through southwest Los Angeles each day from the port, raising cancer and asthma risks, and causing injuries and traffic problems. In recent years, however, major improvements have been made through

the ports' Clean Trucks Program. Beginning in 2012, any truck not meeting the 2007 Federal Clean Truck Emissions Standards will be denied entry to the ports. Community groups and non-profits have organized to involve local residents in advocating for a cleaner environment surrounding the ports. There remains much to be done to increase the health and sustainability of operations at the port, but the recent progress is commendable.

Our current environmental health challenges require transdisciplinary solutions that solve multiple problems simultaneously.

CONCLUSION

The Southern California region is facing a "perfect storm" of economic, environmental, social, and health challenges. The reductionist solutions of the 20th century will not work to solve these problems. Poorly designed built environments can amplify threats, for example the way unreinforced buildings make earthquakes more dangerous, or they can mitigate them, for example the way tree planting and green spaces can reduce heat island effects. Just as jurisdictions must work on common goals, so too must academic programs. Our current environmental health challenges require transdisciplinary solutions that solve multiple problems simultaneously.

In a forest, there is no waste; everything is recycled and all resources contribute to the sustainability and vitality of the ecosystem. In order to protect and promote the health of our population and future generations, we must look to nature's example. In the 21st century, Southern California will continue to grow in size, diversity, and complexity. Now, more than ever, it is imperative we create healthy and sustainable built environments to ensure the health and prosperity of our ecosystems, our people, and our region.

GRADES

Air Quality: Improved from D to B- (Could become an A with less paving, lighter color roofs, more solar, more efficient buildings and appliances, and much less driving)

Ports of Long Beach and Los Angeles: Improved from D to C+

Chronic Diseases Associated with Built Environment: Declining from C to D

Local Organic Food Production and Farmers Markets: Improving from F to D

Walkability: D

Bikeability: D-

Drinking Water: Quality A, Conservation D

SUGGESTED READING

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AUTHOR BIO

Richard J. Jackson is Professor and Chair of the UCLA School of Public Health's Environmental Health Sciences department. He is also a faculty member with UCLA's Institute of the Environment and Sustainability and Urban Planning department. Dr. Jackson earned an M.D. from the University of California, San Francisco and M.P.H. from the University of California, Berkeley. Professor Jackson has studied the impact of the environment on health, particularly relating to children. He has also chaired the American Academy of Pediatrics Committee on Environmental Health. Dr. Jackson has done extensive work on pesticides in California, and has also focused on epidemiology, infectious diseases and toxicology. Over the past decade much of his work has focused on how the 'built environment' including how architecture and urban planning, affect health. He recently served on the Board of Directors of the American Institute of Architects and has written and spoken extensively in the above areas. Currently, Dr. Jackson has been working on policy analyses of environmental impacts on health ranging from toxicology, chemical body burdens, terrorism, sustainability, climate change, urban design and architecture. In addition, he is developing policy analyses in related areas, such as how farm, education, housing, and transportation policies affect health.

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