



Sustainability, Energy, and Health

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This is a guest post by Hank Weiss of the University of Pittsburgh. Hank is an affiliate of Dan Bednarz, and was instrumental in setting up [Health After Oil](#), where this article was previously published.

“You cannot have well humans on a sick planet” – Thomas Berry

The U.S. presently spends an estimated 16 percent of its gross domestic product (GDP) on health care, compared with 8 to 10 percent in most other major industrialized nations. The Centers for Medicare and Medicaid Services (CMS) projects that growth in health spending should continue to outpace GDP over the next 10 years [[The Commonwealth Fund, January 2007](#)]. But can this really happen in an era of energy and resource limitations? What are the ramifications to health care and sustainability if it cannot?

From an energy perspective, health care buildings account for 11 percent of all commercial energy consumption, using a total of 561 trillion Btu's of combined site electricity, natural gas, fuel oil, and steam or hot water.[[EIA](#)] Health care facilities are the fourth highest consumer of total energy of all building types and have an energy intensity (Btu/square foot) that is the second highest among all commercial building types.[[EIA](#)] Many medical products, few of which are designed to be recycled, are petroleum based; including gloves, syringes, IV and dialysis tubing, tablets, gels, ointments, antihistamines, and many antibiotics and antibacterial medications. None of these energy estimates accounts for the huge energy and material costs for the manufacture and transportation of goods, services, personnel and patients that enable these energy intensive facilities to perform their myriad and complex functions.

In the United Kingdom it has been estimated that as much as 5% of all transport need is generated by the National Health Service.[1] In 2001 the U.S. National Household Transportation survey reported that on average, each U.S. household makes about one trip a week for medical or dental visits and that each trip is about 10 miles in length [personal communication, Center for Transportation Analysis, Oak Ridge National Laboratory]. While this represents only 1.2% of all [vehicle miles traveled](#) it does not include the miles traveled by medical staff to work nor doctor related travel by public vehicles, nor travel by the staff, support services and vendors that keep modern medical systems functioning.

With healthcare costs already growing exponentially from the demand for more and more complex services and drugs, compounded by; 1) inflationary increases due to the sectors heavy use of energy and transportation, 2) a rapidly aging population needing greatly increased services, 3) a falling proportion of workers to support the retired population, 4) 45.7 million uninsured and

increasing poverty [[Income Poverty and Health Insurance in the US: 2007](#)], 5) increases in lifestyle caused diseases, 6) decreasing public health expenditures as a proportion of federal health dollars (see figure 1), 7) a growing reverse “brain drain” to oil wealthy countries, then throw in energy and economic declines - we face an almost unimaginable crisis in health care funding and delivery that will make today’s debate over who pays for the uninsured quite moot. It is very difficult to foresee how the current U.S. health care system can survive the confluence of all these pressures for increasing services at increasing costs at a time of decreasing resources. We must soon decide, even more so than is done today (either implicitly or explicitly), who will get what kinds of services and who will not.

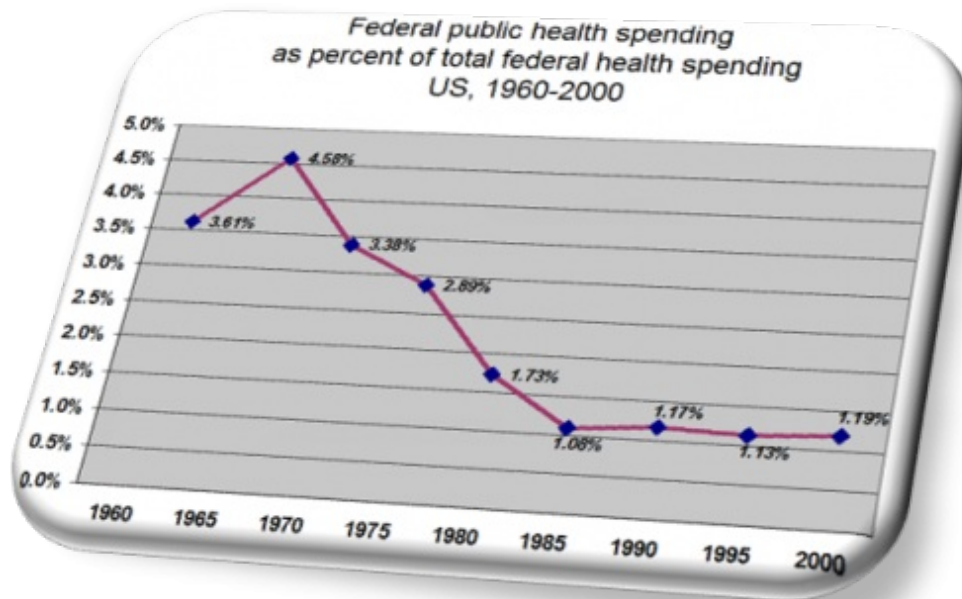


Figure 1. Source: [University of Illinois](#).

The challenge is how do we construct a much lower energy health system without major negative impacts on health status? The “Peak Health” crisis will likely bring government deeper into paying and managing this large sector of the economy as many private health care providers fail to adopt or go broke trying. It may even be the driving force that eventually leads to a true universal health system; a model many other industrial democracies have used for a long time. But it is not yet clear what that future U.S. health system will look like in different phases of the transition; though there are many examples of less energy intensive medical care systems to choose from (see below).

While some observers have suggested alternative health care modalities may come to the fore or that a much greater focus on prevention and community level primary care will be necessary[2], in all likelihood what will emerge will be something different from anything we see today. Parts may be familiar though; borrowing and melding what can work from many traditions while building upon elements of modern medicine that can make the transition. It is hoped that whatever form(s) of health care do emerge are built upon a perspective of evidence-based preventive measures and treatment so that we don’t move to something novel or trendy just because we hope it will work. But clearly, believing that all of the best available disease care can be affordably provided to every person is a pipe dream policy doomed to failure in an era of resource and energy limitations and one that we can already begin to see in the failures of growing costs, large numbers of uninsured, and pockets of increased health disparities between rich and poor.

The fundamental positive relationship between energy use and health status is not well appreciated; overshadowed usually by a focus on the direct and positive wealth and health relationships (Wealth = Health) discussed recently by Hanlon and McCarteny and many others.[3] But from an energy perspective, we know that Energy = Wealth; therefore to a great extent, Energy = Health. This is demonstrated by plotting per capita energy use against the key public health indicators of longevity and infant mortality.

Striking associations are evident for each (see figures 2 and 3 below). Yet there are nation specific exceptions along these continuums that may offer insights as to how positive public health indicators can be maintained at very favorable levels with considerably less energy input. This opens up the vital need to define how this is done and which of these may be imported to the U.S. in part or in whole to reduce health energy and resource expenditures while maintaining high public health indicators.

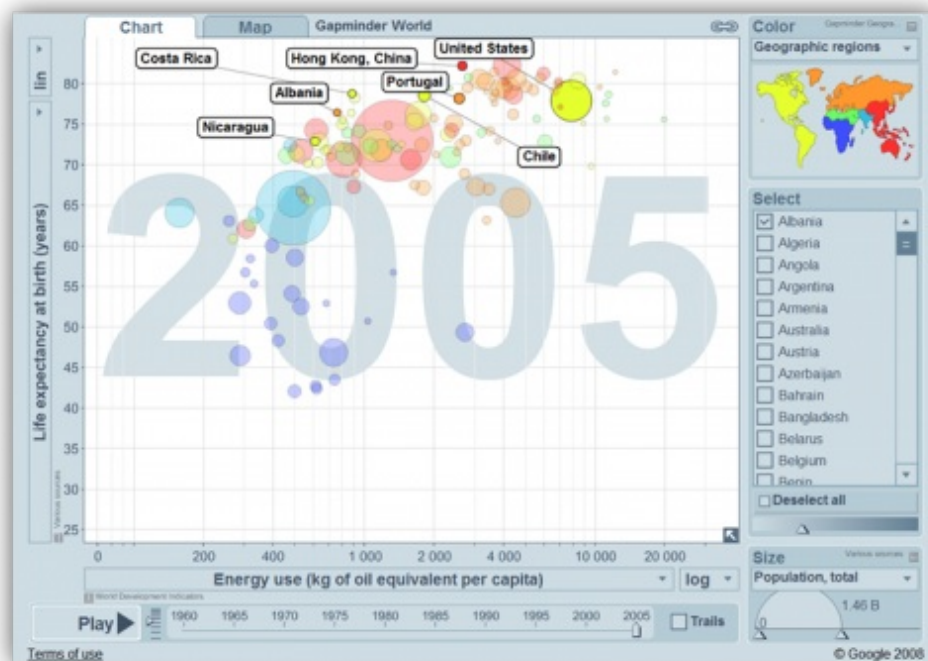


Figure 2. Selected countries with life expectancy at or above US levels with much lower national energy use (source, [Gapminder](http://www.gapminder.org)).

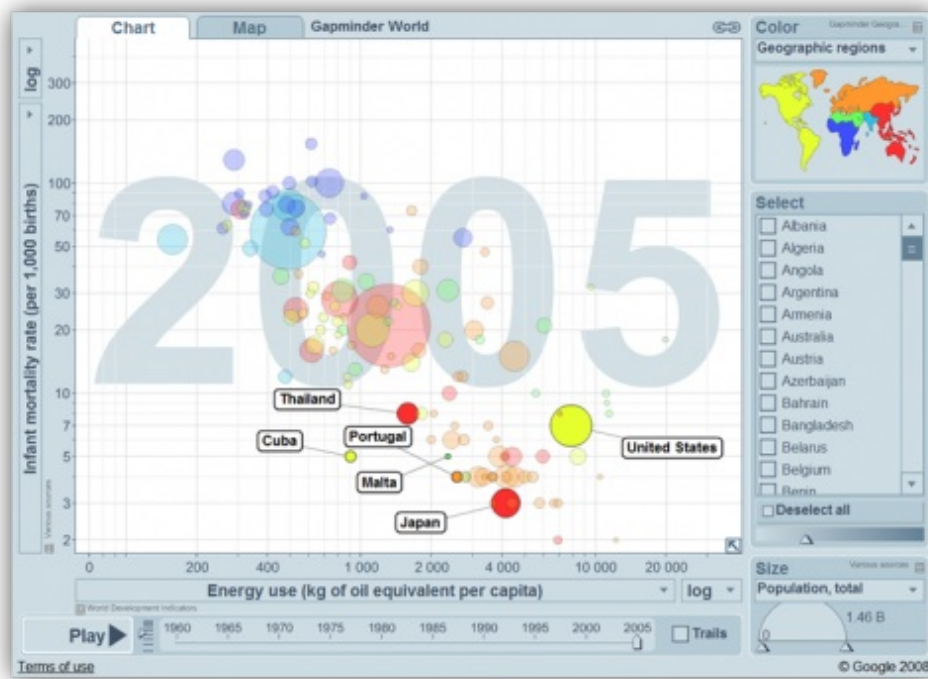


Figure 3. Selected countries with infant mortality rates at or below US levels with much lower national energy use (source, [Gapminder](http://www.gapminder.org)).

The relationship between sustainability and health can also be explored through the interaction of the built environment and land use on health. Looking at the picture this way suggests areas of potential gains in preventing injuries and many “lifestyle” diseases (see Fig 4 below). But there remain potential risks to health from sustainability lifestyles that are not often considered. Transitioning to sustainable living requires changes in lifestyles with attendant increased and decreased health risks.

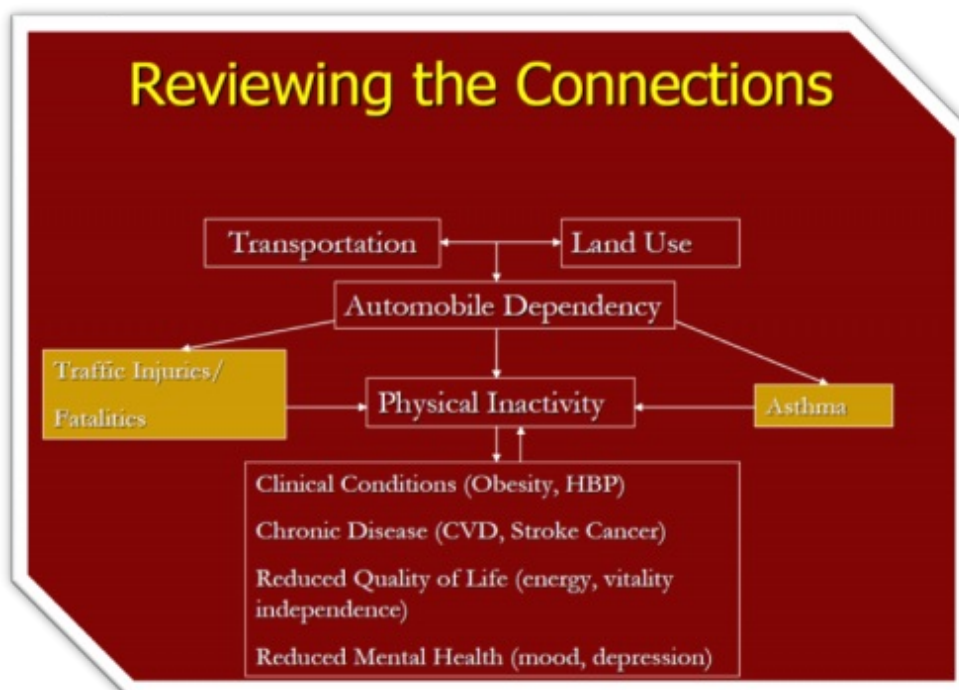


Figure 4. Original source: [Active Living by Design](http://www.active-living-by-design.org), University of North Carolina.

Planning for and managing these risks will be a critical aspect of moving to sustainable economies and environments. Examples of increased or potential risks already of concern with increased energy costs include pedestrian and bicycle injury, scooter and motorcycle injuries, as well as things like gardening injuries (as people grow their own), wood chopping related injuries (as people in NE switch from fuel oil), and fires (due to gas hoarding, emergency use of space heaters and wood stoves). Also there are concerns (documented in some similar economically distressed settings) over increased violence and suicides due to job losses and increasingly difficult economic circumstances, especially for those already living on the economic edge. Mental and behavioral health issues will be important concerns in the transition to sustainable communities.

All too often, sustainability plans and efforts do not include health expertise or health planning input, components and considerations, yet health status is consistently among peoples most important concerns. If we cannot ensure and document adequate health status and care in the emerging efforts at sustainable environments, communities and lifestyles, we will lose a fundamentally important incentive for individuals and governments to adopt them.

[1] Material Health: A mass balance and ecological footprint analysis of the NHS in England and Wales, Best Foot Forward Ltd, 2004.

[2] Jeffery, Stuart. How peak oil will affect health care. Published Jun 16, 2008, The International Journal of Cuban Studies.

[3] Hanlon, P. and G. McCartney, Peak oil: Will it be public health's greatest challenge? Public Health, 2008. 122(7): p. 647-52.



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