

# Healthcare: The Case for the Urgent Need and Widespread Use of Preventive Medicine in the U.S.

Y Meunier

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## Abstract

The cost of health care is ballooning in the U.S. with no end in sight to the trend despite the fact that we know how to limit and decrease it through preventive medicine. To reverse this non-sensible and soon-to-be unsustainable situation, this paper reiterates why preventive medicine is the best solution to control expenditure and improve mortality and morbidity across the board. It analyses different medical conditions and corporate interventions to make the case de novo at a crucial time and outlines some major obstacles to change. The author calls for prompt and drastic action in the form of a prevention Marshal-like national plan with information mass campaigns.

## BACKGROUND

The cost of curative medicine is constantly increasing in the U.S. with no foreseeable improvement. It has already reached staggering levels. The main causes of mortality are attributable to diseases, which are in various proportions preventable by life-style modifications. In 2005, 58.4% of the major killers were in this category as follows<sup>[12]</sup>:

#1: Heart diseases (26.6%), #2: Cancer (22.8%), #3: Stroke (5.9%) and #6: Diabetes (3.1%). For type 2 diabetes alone<sup>[3]</sup> the 2002 costs were sizable:

- Direct medical expenditure: \$91.9 billion, divided as follows:

- \* \$23.2 billion for diabetes care
- \* \$24.6 billion for related chronic conditions
- \* \$44.1 billion for excess prevalence of general medical conditions

- Indirect expenditures: \$39.8 billion, including the following:

- \* Lost workdays
- \* Restricted activity days
- \* Permanent disability
- \* Mortality

According to economists, the trend is for a worsening of this picture. Health care spending was \$2.1 trillion in 2006 or 16% of the GDP<sup>[4]</sup>, which is a 6.7% increase over the 2004 spending. It is projected to reach 19.5% of GDP by 2017<sup>[56]</sup>.

## OBJECTIVE

The objective of this paper is to re-affirm with hard data that preventive medicine is the best way to avoid a health care crisis in the U.S. Not only preventive medicine makes sense to reduce mortality and morbidity but also it provides a good return on investment for federal and state institutions as well as corporations and the individual<sup>[78]</sup>.

## METHODOLOGY

The author made a review of the recent literature in order to determine the financial impact of preventive measures at the medical condition and corporate level.

## RESULTS

### SAVINGS PER MEDICAL CONDITION

#### ABDOMINAL AORTIC ANEURYSM

##### SAVINGS

\* \$14,000 to \$20,000 per Quality Adjusted Life Year (QALY). QALY is a way of measuring disease burden, including both the quality and quantity of life lived, as means of quantifying the benefit of a medical intervention. The QALY model requires utility, independence, risk neutrality and behavior. It is based on the number of years of life that would be added by the intervention. Although

sometimes debated, particularly versus HYE (Healthy-Years Equivalent)<sup>[9]</sup>, it is one of the best tools available to measure the impact of an initiative<sup>[10111213]</sup>.

\* Average cost of the necessary preventive procedure: \$45-60 per person.

### **INTERVENTION**

\* One time screening by ultrasound for men 65-75 who have ever smoked.

### **ALCOHOL MISUSE**

#### **SAVINGS**

\$4.30 for \$1.00 invested, according to the trial for early alcohol treatment project<sup>[1415]</sup>.

### **INTERVENTION**

Screening of all adults and providing counseling intervention in primary care settings.

### **ASPIRIN THERAPY**

#### **SAVINGS**

\* \$11,000 per QALY gained<sup>[[[16.17]]]</sup>.

\* Cost for 81mg/day (1 tab of baby aspirin): less than 50 cents per week.

### **INTERVENTION**

\* Discussing AAS prevention with adults at increased risk for coronary heart disease.

### **CERVICAL CANCER**

#### **SAVINGS**

\$11,830 per QALY saved (in year 2000 dollars)<sup>[181920]</sup>.

### **INTERVENTION**

Screening every women sexually active with a cervix, as follows:

a- PAP test (yearly), or

b- Liquid based PAP test (every 2 years), or

c- a or b + HPV DNA test (every 3 years)

After 70, if at least 3 tests were normal in the last 10 years or post hysterectomy: Stop screening (except if the latter was performed for cancer or pre-cancer).

If there was diethylstilboestrol (DES) exposure before birth or the patient is HIV+ or immunodepressed: Continue

screening.

### **CHILD DEVELOPMENT DISABILITIES**

#### **SAVINGS**

\* Children with attention deficit hyperactivity disorder ADHD have 2.6 times as many medical claims and average \$1,000/year in medical costs.

\* Family members of children with ADHD have per capita annual and indirect costs 2 times the family of children without ADHD<sup>[21]</sup>.

### **INTERVENTION**

Family physician screening.

### **COLORECTAL CANCER**

#### **SAVINGS**

Average cost-effectiveness ratios: \$10,000 to \$30,000 per life-year saved (in year 2000 dollars), compared to no screening<sup>[2223]</sup>.

### **INTERVENTION**

Screening men and women over 50. One procedure can be chosen from the following recommended six options:

Fecal occult blood test or fecal immunochemical test (yearly)

Flexible sigmoidoscopy (every 5 years)

Fecal occult blood test or fecal immunochemical test (yearly) + sigmoidoscopy (every 5 years)

Double contrast barium enema (every 5 years)

Computed tomographic colonography (every 5 years)

Colonoscopy (every 10 years)

### **DIABETES (TYPE 2)**

#### **SAVINGS**

In year 1997, the cost per QALY for targeted screening at age 55 was \$34,375 compared to no screening<sup>[2425]</sup>.

### **INTERVENTION**

Screening adults with high blood pressure or hyperlipidemia.

### **HEALTHY DIET**

#### **SAVINGS**

Benefit to cost ratios:

\* \$10.64 / \$1.00 for a food and nutrition education program in Virginia<sup>[26]</sup>.

\* \$10.75 / \$1.00 in Iowa<sup>[27]</sup>.

## **INTERVENTION**

Behavioral dietary counseling for adult patients with hyperlipidemia and other risk factors for cardio-vascular disease and diet-related chronic disease.

## **HYPERTENSION**

### **SAVINGS**

Reducing blood pressure from less than 140/90mm/Hg to less than 130/85mm/Hg in high-risk individuals would increase life expectancy by 16.5 to 17.4 years and decrease lifetime medical costs by \$1,450<sup>[28,29,30]</sup>.

## **INTERVENTION**

Screening adults over 18 for high blood pressure.

## **IMMUNIZATION**

### **SAVINGS**

Children / Adolescents

\* The routine childhood vaccination program saves nearly \$10 billion in direct medical costs and \$43 billion in social costs for every birth cohort<sup>[31]</sup>.

\* For varicella, hospitalization costs declined from \$85 million to \$22.1 million in 2002, which was the year of introduction of the vaccine<sup>[32]</sup>.

Adults

Age 65 to 79: Medicare managed care plan for influenza immunization saves \$80 per year, per vaccinated individual.

## **INTERVENTION**

Children / Adolescents

See the CDC immunization tables<sup>[33]</sup>.

Adults

One flu shot every year. For other vaccinations, see the CDC immunization tables<sup>[34]</sup>.

## **MOTOR VEHICLE ACCIDENTS**

### **SAVINGS**

a- Children

From \$24 to \$69 per child. These costs are comparable with

those of counseling for other prevention messages<sup>[35,36,37]</sup>.

b- Adults

Nets cost savings: \$330 per patient intervention<sup>[38]</sup>.

## **INTERVENTIONS**

a- Child safety seat counseling sessions (11x1.5mn).

b- Counseling trauma patients on the dangers of alcohol.

## **SEXUALLY TRANSMITTED DISEASES**

### **SAVINGS**

\$177 saved per patient (in year 2002 dollars)<sup>[39]</sup>.

## **INTERVENTION**

Gonorrhea in urban emergency settings: Screening women over 15 and under 29 using urine-based NAAT (Nucleic Acid Amplification Tests).

## **BREAST FEEDING**

### **SAVINGS**

1993-1994 data from the special supplementation nutrition program for women, infants and children (WIC) in Colorado studying formula feeding vs. breast-feeding:

The latter saved \$478 in WIC costs and Medicaid expenditures during the first 6 months of the infants' life<sup>[40]</sup>.

## **INTERVENTION**

Pre-natal and post-partum care.

## **FOLIC ACID SUPPLEMENTATION**

### **SAVINGS**

\$5,000 per QALY<sup>[41]</sup>.

## **INTERVENTION**

Pre-natal and post-partum care.

## **TOBACCO CESSATION IN PREGNANT WOMEN**

### **SAVINGS**

\$6.00 are saved for each dollar spent on smoking cessation programs in pregnant women<sup>[42,43]</sup>.

## **INTERVENTION**

Smoking cessation program.

## **PRE-NATAL AND PREGNANCY CARE**

### **SAVINGS**

A universal screening would save \$3.69 million and prevent

64.6 cases of pediatric HIV infection for every 100,000 pregnant women screened<sup>[44]</sup>.

### **INTERVENTION**

HIV testing in pregnant women.

### **SMOKING CESSATION**

#### **SAVINGS**

Smokers who stopped smoking reduce potential medical costs associated with cardio-vascular disease by about \$47 during the first year and \$853 during the following 7 years<sup>[45,46]</sup>.

### **INTERVENTION**

Screening all adults for tobacco use and providing cessation intervention.

### **SAVINGS FROM CORPORATE PREVENTIVE MEDICINE INTERVENTIONS**

#### **REVIEW OF 72 ARTICLES<sup>[47]</sup>**

After reviewing 72 articles on the topic, Aldana found that for each dollar invested in 3 to 5 years, the return on investment (ROI) was about:

\* \$4.00 saved in health costs

\* \$5.00 saved by reducing absenteeism

10-year study of employees in a health care setting<sup>[48]</sup>

- ROI (for each dollar invested)

\* \$6.52 saved in health costs and sick leaves

- Intervention

Health risk assessment (HRA), newsletter, self-care book, self-directed change materials, workshops, financial incentives

1-year study of employees and retirees at Blue Shield of California<sup>[49]</sup>

- ROI (for each dollar invested)

\* \$6.00 saved in health costs

- Intervention

HRA, newsletter, self-care book, self-directed change materials, nurse line, serial feedback

2-year study of retirees and spouses of Bank of America in

California<sup>[50]</sup>

- ROI (for each dollar invested)

\* \$5.96 saved in health costs

- Intervention

HRA, self-directed change materials, serial feedback

3-year study of employees at Procter and Gamble in Cincinnati<sup>[51]</sup>

- ROI (for each dollar invested)

\* \$6.75 saved in health costs

- Intervention

HRA, newsletter, self-care book, telephone coaching, workshops, nurse line

2.5 year study of employees and retirees of Chevron in San Francisco<sup>[52]</sup>

- ROI (for each dollar invested)

\* \$6.42 saved in health costs

- Intervention

HRA, newsletter, telephone coaching, workshops

3-year study of employees at Citibank<sup>[53]</sup>

- ROI (for each dollar invested)

\* \$4.64 saved in health costs

- Intervention

HRA, newsletter, self-care book, telephone coaching, workshops, nurse line, serial feedback

5-year study of employees at Daimler Chrysler at 14 sites in Michigan<sup>[54]</sup>

- ROI (for each dollar invested)

\* \$212.00 saved annually in medical costs

Intervention

HRA, self-care book, self-directed change, workshops, financial incentive

## **DISCUSSION**

The first mention of preventive medicine goes back to the Greek civilization. Hippocrates the great physician of the 5<sup>th</sup> century B.C. classified causes of disease and identified behavior-related and therefore actionable factors such as irregular food intake, exercise and habits. Much more recently, in 1978 the Alma –Ata declaration<sup>[55]</sup> emphasized the importance of prevention to improve global health. Nevertheless, in 2008 the concept of prophylaxis has not penetrated the U.S. society in significant ways because of various obstacles. The data presented above clearly show that preventive medicine is the best way not only to improve mortality and morbidity in the U.S, but also to decrease health care costs. Hopefully, they will lay to rest the false debate about the cost-effectiveness of preventive medicine. Similarly to global warming this useless controversy is delaying the tough choices that must be made. Authors like David Brown spread counterproductive ideas in the mass media<sup>[56]</sup>. Unfortunately, he echoes a vast number of papers in the health economics literature based on macro-economic analyses contending that health care costs will continue to rise despite preventive medicine initiatives because they are driven by technology. Their arguments are flawed at least on two counts:

Morally, it is questionable to let people suffer when their ailments can be avoided

Financially, most of the time they do not take into account the indirect costs of illness which far exceed direct cost<sup>[55]</sup>.

Their economic argument is very damaging because business deciders read these papers much more than medical ones and it provides the core of the rationale that maintains the status quo in disease prevention but inertia is quickly fading as an option. This literature addresses the following:

(1) The supply side and affirms that technological progress is the main driver for the observed health care cost continuous upward trend. It is obvious that a MRI procedure is much more expensive than an X-ray but it provides more information. Therefore, it becomes more and more requested and performed. However, the need for both can be nullified if the patient stays in good health. Moreover, a broad debate needs to take place on the quality of care desired in the US and ways of better reimbursing prevention and strengthening the preventive supply side with incentives, in a general context. One option could be to move preventive care out of the medical realm into other societal spheres, keeping some medical oversight and guidance to be determined.

(2) The demand side and questions the ability of prevention to raise welfare and maximize health. While it may be true that economical mathematics may show that total eradication of a plague in a society may not be the best goal to maximize health investments, the history of pandemics has proven otherwise in terms of global benefits.

Other authors<sup>[5758]</sup> warn that not all preventive medicine interventions will save money and recommend that careful analysis of the costs and benefits of specific interventions, rather than broad generalizations should be the rule. This analysis could identify not only cost-saving preventive measures but also delivering substantial health benefits relative to their net costs. Additionally, they suggest that it will be necessary to identify the preventive measures that are not yet fully deployed and those that could serve a large population and bring about significant overall improvements in health at an acceptable cost. Conversely, other services might be proven overused. These are common sense and general recommendations and most of these studies have already been carried out as this paper suggests. They clearly show that most preventive health interventions are cost-effective. By and large the obstacles to preventive medicine do not reside in the scientific community but rather in the mostly self-serving and ideological economic and political arenas.

Currently, the investment in the area of preventive medicine is minimal compared to the enormous needs. This includes federal, state, university, corporate, physician, and individual levels. Major obstacles toward prevention stand strong such as: The insurance, pharmaceutical industry, medical groups, food, agricultural and tobacco lobbies, to name a few. Analyses of deleterious cost spending by these entities are much needed, although data are often not available to the public and/or researchers. Despite hurdles on information gathering we know that, for example, from January 2005 through June 2006 alone, the pharmaceutical industry spent approximately \$182 million on federal lobbying. This industry has 1,274 registered lobbyists in Washington DC<sup>[59]</sup>.

It will take strong political will from the executive and legislative branches to turn the situation around. Moreover, it is unlikely to happen in the short-term as their decisions would likely antagonize traditional political bases on both sides of the aisle if only by demanding or advocating for change and moving away from long lasting comfort zones. Sacrifices would be required without any previous national wide-scale experiment to refer to or with unwelcome models

of preventive medicine and the way it is organized and implemented in countries like France, Canada and Great Britain<sup>[60]</sup>. Valuable lessons could be learned from their healthcare systems, in particular regarding immunization coverage and peri and pre-natal care. With the progressive increase in health insurance premiums, Americans are becoming more and more dissatisfied with the cost-effectiveness of their healthcare system<sup>[61]</sup>. This shift is not occurring in most single payer countries<sup>[62]</sup>. It seems that the solution starts with the fast and furious education of the masses. A huge paradigm shift is necessary, for example:

\* While it is generally accepted that a vehicle in perfect working condition should get regular servicing to stay in good shape the same notion does not apply to human beings. Even for immunization, the following is interesting:

How many parents would have their children immunized if it were not mandatory to attend school?

How many adults keep their tetanus vaccination up to date every 10 years?

The acceptance of immunization was largely enabled by lethal epidemics. In these large events, scores of people were dying simultaneously. In 2008, the vast majority of people have long forgotten the following facts:

Poliomyelitis epidemics occurred in the US in 1894 (Vermont), in 1916 (widely spread), and between 1945 and 1949 (widely spread). In 1952, there were 58,000 cases and 35,000 in 1953. The baby boomer generation is the last one that grew up with the disease in its human environment and faced the dire consequences it carries. The subsequent generations are progressively forgetting the impact of the disease on a national and frequently personal level.

Diphtheria epidemics happened between 1735 and 1740 in the New England colonies. The mortality rate in children under 10 was as high as 80%. In the 1920s, there were 100,000 to 200,000 cases a year with 13,000 to 15,000 deaths.

A pandemic of German measles epidemics took place between 1962 and 1965. In 1964-1965 the US had 12.5 million cases, which led to 11,000 miscarriages or therapeutic abortions and 20,000 cases of congenital rubella. Of these, 2,100 died as neonates, 12,000 were deaf, 3,580 blind and 1,800 mentally retarded.

Nowadays, hypertension, obesity and myocardial infarction

(MI), to cite a few national and critical public health issues, affect many more people and differ because:

Deaths trickle in and do not happen concomitantly in mass

They are not communicable diseases. Therefore, their threat is less acute. It must be noted however that obesity, for example, may spread like an infectious disease, the agent being food and drinks and the vector the feeding culture transmitted from one individual to another by families, friends, the media and culture of the susceptible individual.

They evolve on a chronic mode and are endemic. Even if MI is an acute event, it results from the slow build up of the plaque.

When someone dies from MI, it is perceived more as an individual and internal tragedy (heart problem). When someone dies from diphtheria, it is seen more as an external and collective scourge (the spreading of a deadly bacterium). Hence, it becomes easier for society to mobilize against this common enemy.

Now that the threat of a "classic" infectious disease has vanished, people focus on the side effects of vaccines. The mass media, mainly for economic purposes, sometimes foments a negative image of this preventive intervention, reporting, for example, that the measles shot induces autism or that the hepatitis B vaccine causes multiple sclerosis. Doctors know the impact of such best-selling stories with increasing numbers of patients refusing to be vaccinated or turning to alternative medicine, which is highly inefficient in this regard. These facts on immunization illustrate how a highly efficient preventive medicine measure can become taken for granted and undervalued by a population.

\* While certain preventive measures like stem cell or gene therapy are welcome and anxiously awaited, behavioral modifications are not so popular to prevent or delay the onset of a disease. Multiple economic, psychological and societal factors can explain the difference: Stress, instant gratification, availability of unhealthy agents almost everywhere, aggressive marketing, wrong role models, majority as the norm, etc

One must be aware of three facts: (1) the free market is inefficient at the national preventive medicine level because firms in the related trade would be depending on too many parameters to emerge (social, psychological, medical, economical, financial, political, national, international) and require massive investment in a pioneer field. Some

companies are successful but have very limited impact offering, for example, exercise centers and wellness programs. However, no multifaceted proactive health corporation is currently represented at NYSE Euronext, (2) the same free market may be dangerous as seen on the internet with deviant medical practices promoted in the name of well-being. As a result, the new preventive medicine educational movement should be kept under some supervision of medical authorities, and (3) in order to obtain wide-spread societal behavioral change there should be short term benefits if they are adopted and/or negative consequences if they are denied. These could be determined and created at all levels.

Ultimately, the question remains: How can this massive transition be accomplished?

A task force encompassing all the partners and representing a cross-section of the American society could be nominated at the federal level to indicate the best action plan and strategies to move forward with an aggressive and ambitious agenda. It could take the form of a domestic Marshall-like plan aimed at saving the U.S. health care services by adapting them better to the current and future needs and based on preventive medicine. This would also be the opportunity for the States to become a leader in a new form of healthcare and spearhead innovative and economical solutions for challenges ahead.

Additional answers to this question and action are required promptly as the current dynamics are leading us to an unsustainable picture in human and treasure cost in the near future.

## **CONCLUSION**

Preventive Medicine is vastly underutilized in the U.S. at a time when health costs are getting exorbitant and seemingly uncontrollable. However, it represents a very powerful, cost-effective and morally correct tool that can be used to avoid the looming health care crisis and improve the longevity and quality of life. In order to succeed radical action is needed at many levels without any delay.

## **CORRESPONDENCE TO**

Yann A. Meunier, MD Health Promotion Manager Stanford Health Improvement Program Stanford School of Medicine Hoover Pavilion, N151 211 Quarry Road Stanford, CA 94305-5705 or: ymeunier@stanford.edu

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**Author Information**

**Yann A. Meunier, MD**

Health Prevention Manager, Stanford Health Improvement Program, Stanford School of Medicine