International Medical Expenditures

Organization for Economic Cooperation and Development (OECD), 1996
Gerald F. Anderson, Health Affairs, November/December, 1997
Uwe E. Reinhardt, JAMA, September 8, 2004 (Vol 292, No. 10) 1227-1230.
“HEALTH CARE TAB READY TO EXPLODE: COST OF $3.6 TRILLION PROJECTED BY 2014”
USA Today - Front Page, February 24, 2005

Medical Costs to Soar
Overall Medical Costs are Expected
to Reach $3.6 Trillion in 2014

In 2014, costs of $11,045 / Person vs $6,423 in 2005.

References: Centers for Medicare and Medicaid Services, February 13, 2005
Health Affairs, February 2005

“...The picture’s pretty bleak, gentlemen. ... The world’s climates are changing, the mammals are taking over, and we all have a brain about the size of a walnut.”
Medical Costs and Corporate Profits

HCFA: By 2030 AD ("Baby Boomers" in 70s and 80s) medical costs at over $16 Trillion or more than 33% GDP.

Schroeder SA, "We can do better - Improving the health of the American people", NEJM, 357; 12: 2007, p 1221-1228

After Tax Profits and Medical Benefit Costs
ALL USA CORPORATIONS 1996 - 2000

The National Data Book, 2005 and IRS Data Reports
Corporate Medical Care Crisis

- More than 82% of employers have “little confidence” that they can manage their medical expenditures and future liabilities
- Major union negotiation issues of salary/COL increases versus medical benefits
- For majority of employers, as medical costs increase, earnings decrease accordingly


Comparison of Medical Cost Increases and Earnings

Costs Posing Greatest Pressures on Corporations
Business Roundtable’s CEO Economic Outlook Survey (2005)

February 26, 2005
“American Healthcare Is the Best in the World if . . . ”

1. You have full, comprehensive, in-depth health insurance coverage with low deductibles and copayments, and no exclusions for preexisting conditions.
2. You live in a major metropolitan area.
3. You have a long-term relationship with a physician who serves your primary care needs, seeks specialist attention when needed, and finds the right specialist.
4. You speak and understand good English and so does your doctor, and you are neither sight nor hearing impaired.
5. You are well educated.
6. You have money and transportation capability.
7. You are white.
8. You are naturally skeptical and questioning.
9. You personally access the internet to help you take charge of your life; and until recently -
10. You are male.

Dr. George D. Lundberg, Editor In Chief, WebMD
August 13, 2004
CAM and Integrative Medicine

"CAM refers to a broad range of healing philosophies (schools of thought), approaches and therapies that mainstream, Western (conventional) medicine does not commonly use, accept, study, understand, or make available. A few of the many (over 650) CAM practices include the use of acupuncture, herbs, homeopathy, therapeutic massage, and traditional oriental medicine to promote well being or treat health conditions. People use CAM treatments and therapies in a variety of ways. Therapies may be used alone, as an alternative to conventional therapies, or in addition to conventional, mainstream therapies, in what is referred to as holistic, which generally means they consider the whole person, including physical, mental, emotional, and spiritual aspects."


---

Evidence Based Medicine
Conventional Medicine
Cochrane Collaboration

<table>
<thead>
<tr>
<th>Conclusions</th>
<th>Number of reviews</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence of positive effect (Treatment more beneficial than control)</td>
<td>33</td>
<td>20.8%</td>
</tr>
<tr>
<td>Possibly positive effect (Unsolved issues such as poor trial quality, small number of patients, long term side effects preclude making a definitive statement)</td>
<td>28</td>
<td>17.6%</td>
</tr>
<tr>
<td>No evidence of effect (Insufficient to draw conclusions)</td>
<td>39</td>
<td>24.5%</td>
</tr>
<tr>
<td>Evidence of no effect (Treatment no more beneficial than placebo or no treatment)</td>
<td>33</td>
<td>20.8%</td>
</tr>
<tr>
<td>Treatments appear equal (Treatment no more beneficial than other/standard medical care)</td>
<td>15</td>
<td>9.4%</td>
</tr>
<tr>
<td>Evidence of negative effect (Treatment more harmful than beneficial)</td>
<td>11</td>
<td>6.9%</td>
</tr>
<tr>
<td>Evidence of no effect (Treatment no more beneficial than placebo or no treatment)</td>
<td>33</td>
<td>20.8%</td>
</tr>
</tbody>
</table>

Reference: Reviewing the Reviews: The Evidence Base of Contemporary Medicine is Weak, Jeanette Ezzo, Dan Moerman, Victoria Hadhazy, Brian Berman, Complementary Medicine Field, University of Maryland, Cochrane Collaboration, Baltimore, Maryland, 1999
Evidence Based Medicine
Cardiovascular Interventions

- American College of Chest Physicians (1986) rated evidence from A (large RCT with positive results) to C (nonrandomized, no controls, and/or case series)
- Only 24 percent of the therapies rated A with 45 percent rated C
- Repeated in 1998, increased to 44 percent rated A

Source: Dr. James Dalen, editor of Archives of Internal Medicine "Conventional" and "Unconventional" Medicine: Can They Be Integrated?
Archives of Internal Medicine, Vol 158, November 9, 1998.

"Your bad cholesterol is holding your good cholesterol for ransom. They want a cheeseburger and a shake every day or else the good cholesterol gets whacked."
Stanford University School of Medicine
Graduation Speech
June 19, 1997

“Here are some things I think we need to do, as a profession and as a nation, to improve our approach to health.

Eliminate the divide between alternative and conventional. Let’s adopt another mindset; there are methods that work and methods that don’t . . .

Let’s eschew simple labels. For example, “herbal” and “botanical” do not mean “unconventional”; think of all the mainstream medicines - digitalis, quinine, vineristine, taxol, and many others - that come from plants.”

Dr. Harold Varmus, Nobel Laureate
Director, National Institutes of Health

• Brief overview of each of the major CAM therapies.
• Triage (French: "triager") into: What Works? What Does Not Work? and, What Is in the Works?
• Integrate into conventional medicine (Integrative Medicine)

CAM Interventions

• MindBody Medicine
• Dietary Supplements, Phytonutrients, and Hormones
• Traditional Chinese Medicine
• Acupuncture
• Western Herbal Medicine

• Naturopathy
• Homeopathy
• Chiropractic
• Ayurvedic
• Spiritual Healing
• CAM Insurance / MCOs

Concluding statement of meeting held in Great Hall of the People, Beijing:

“Western Medicine showed definite promise as adjunctive treatment to Traditional Chinese Medicine.”

Professor Tan Shien-Xu
Chairman, Integrative Medical Institute
Beijing Friendship Hospital

Sin-Hua, Chinese News Agency
April 1998
Cost Benefit Analysis (CBA) and Integrative Medicine

- Cost Benefit Analysis (CBA) encompasses an array of medical economic evaluations including cost benefit/effect/offset, Net Present Value (NPV), Return on Investment (ROI), and predictive econometric modeling
- Different methodologies and perspectives result in noncomparable and often non-generalizable outcomes
- Lack of standardization in operationalizing and monetizing costs and/or benefits independently of the CBA methodology
- CBA issues of IM evaluations are comparable to those in Patient Centered Medical Home (PCMH), chronic care management (CCM), multifactorial behavioral/medical interventions, Integrated Population Health (IPH), and with clinical and cost outcomes research in worksite/corporate environments
- Systematic review of “Medical Economics of IM” focused on the 2 most robust databases of CBA of the potential CAM components of IM and the worksite/corporate clinical and cost effectiveness research

Integrative Medicine and CBA of CAM Components

- Few if any studies meet the IM definitions criteria and/or are self identified as IM
- International research literature review yielded 59 CBA studies (39 “Full” and 20 “Partial” evaluations). Evaluated by BMJ 35 item checklist and 4 criteria of randomization, prospective economic data, comparison to usual care, and blinding
- Eight (8) modalities and/or conditions identified with CBA of CAM interventions ranging from acupuncture for migraine to numerous citations of guided imagery, relaxation therapy, and meditation outcomes
- Clinical and cost outcomes prototypes most extensive in worksite/corporate research (N=153) with 62 of 63 CBA analyses indicating cost benefit, cost/effect, or ROI
“In God we trust, all others must present data.”

W. Edwards Deming
Founder
Demings Institute
Washington, DC

Actionable Recommendations

- Incorporate CBAs into all “Effectiveness” trials throughout the continuum of prevention, primary care, and Integrative Medicine (“Effectiveness” RCTs)
- Match appropriate CBA methodology, perspective, and outcomes to the specific research hypotheses and implementation environment
- Engage worksite/corporate collaborators in “health” oriented CBAs
- Extend CBA by monetizing such variables as pharmacy offset, STD, LTD, patient/provider satisfaction, changes in HRAs, absenteeism, “presenteeism”, performance, and productivity
- Combine conventional and CAM (ICD 9, CPT, “ABC”) coding for Dx and payment of IM services
- Metrics: Develop an international, internet server available, standardized foundation database of recommended clinical and cost outcome metrics
CORPORATE HEALTH IMPROVEMENT PROGRAM (CHIP)

- Develop and Evaluate Innovative Health and Medical Programs in Corporate Worksites
- “Town Gown” Projects with “Evidence Based” RCTs
- Managed Care with Clinical and Cost Outcomes
- Utilization Review and Medical Outcomes
- Health Promotion, Disease Management, and Integrative Medicine
Corporate Health Improvement Program (CHIP™)
Corporate Members

- American Specialty Health
- Canyon Ranch Resorts
- Corning
- Dow
- Ford Motor Company
- IBM
- Mercer
- NASA
- Nestle
- Pepsi
- Pfizer
- Prudential
- Thomson Reuters
- Walgreens

Corporate Health Improvement Program (CHIP™)
Collaborating Organizations

Republic of Singapore
Partnership for Prevention
Integrated Benefits Institute (IBI)
National Business Group on Health (NBGH)
University of Texas School of Medicine, Houston
Corporate Health Improvement Program (CHIP™)

Current Research Projects

- **Ford Motor Company** – “An Integrative Medicine Intervention for Back Pain” – Two (2) Year RCT

- **NASA** – “National Assessment of Stress Adaptation” (NASA2) – Two (2) Year Individual and Worksite Assessment and Intervention

- **Prudential** – “Supporting Total Recovery in Valued Employees” (STRIVE) – Two (2) Year “Total Health Management” Intervention with Disabilities

- **University of Arizona School of Medicine and Marino Center** – “Studies in Patient-Based Informatics for Comparative Effectiveness Research” (SPICER) – Three (3) Year Tracking of Patients with 10 most common conditions in an IM Primary Care Clinic
“When choosing between two evils, I always like to take the one I’ve never tried before!”

Mae West (1936)

Acupuncture

What Works: Pain, Substance abuse, Nausea, Stroke rehabilitation, COPD, Depression, Fibromyalgia, Tendonitis, Carpal tunnel syndrome, Low back pain, Asthma, and may be more effective than many conventional treatments for these disorders

National Institutes of Health Consensus Panel, 1997

What is in the Works:
- Post operative pain and analgesic mechanism (University of Maryland)
- Surgical anesthesia with children (Stanford University School of Medicine)
- Acupuncture, self hypnosis, and osteopathy with children with spastic cerebral palsy (University of Arizona)
- Basic MRI research with bioelectromagnetic pathways (Stanford University School of Medicine)
Corporate Health Improvement Program (CHIP™) Current Research Projects

- **American Specialty (ASH) and Medstat** - Developing Return on Investment (ROI), Prevention and Integrated Medicine Predictive Equations for Health Plans and Corporations

- **Dow** - “An Integrative Medicine Intervention for CHD Prevention” (3 Year RCT)

- **Republic of Singapore** - “Healthiest Workforce in the World” (5 Year R&D)

- **Extensive Application of “Telemedicine” RCTs**
MindBody Medicine

**Modalities:** Stress Managements, Mindfulness and other forms of meditation, Hypnosis, Clinical Biofeedback, Autogenic Training, Massage, Jacobsons Progressive Relaxation, Tai Chi, Yoga, Qi Gong

**What Works:** MindBody Medicine has the most extensive body of scientific evidence for a positive impact on the largest number of conditions for the greatest number of patients

**What is in the Works:**
- Qi Gong for post bypass surgery healing (*University of Michigan*)
- Relaxation, imagery, and chamomile with children with abdominal pain (*University of Arizona*)
- Relaxation, imagery, and AIDS (*George Washington University*)
- Reiki for pain (*University of Michigan*)
A Review and Analysis of the Clinical and Cost-Effective Outcome Studies of Comprehensive Health Promotion and Disease Management Programs in the Workplace

Kenneth R. Pelletier

AJHP
March/April 1991: Volume 5, Number 4: 311-315
September/October 1993: Volume 8, Number 1: 50-6
May/June 1996: Volume 10, Number 5: 380-388
July/August 1999: Volume 13, Number 6: 333-345
November/December 2001: Volume 10, Number 2: 107-116

JOEM
October 2005: Volume 47, Number 10: 1051-1058
July 2009: Volume 51, Number 7: 1051-1058
Clinical and Cost Outcomes
Return on Investment

SUMMARY

Time Period: 1980 – Present
Number of Studies: 169 Quasi-Experimental
Comparison Groups: 121 Experimental
RCTS: 51 (All since 1992)
Longitudinal: 6 Months to 12 Years

All studies demonstrated clinical benefits
Cost effect, cost benefit, and/or ROI: 74 of 75

Worksite Disease Management
First Study

Gimbel’s Department Store, New York City in 1974

Objective: Improve blood pressure by screening asymptomatic, uncomplicated hypertension at the worksite.

Intervention:
• Diagnostic and therapeutic services at work site
• Integration of delivery system with the administration of a labor union
• Adherence to rigid protocol
• Continuous patient surveillance by nurses and paraprofessionals

Results: Of 180 employees, 84% were screened and 65% of 186 with confirmed hypertension elected the treatment program

Of the 94 patients followed for one year:
• 97% remained under therapy, with no untoward effect
• 81% of patients had satisfactory blood-pressure reduction

Deriving ROI

• Return on Investment (ROI) is a financial measure.
  - Can be estimated prospectively or retrospectively
• Evaluating ROI should not be at the expense of other outcomes.
  - Need to evaluate entire program
  - ROI is just one measure of program effectiveness
• What is ROI?
  - How much you (expect to) save, compared to how much you (expect to) spend
  - ROI and savings are not the same:
    - Savings reflect differences in $ with vs. without the intervention
    - ROI = Savings per dollar invested
    - Expressed as a ratio (e.g. 2:1) or in dollars (Net Present Value)
  - ROI can be low but savings can be high
  - NPV = Savings minus program costs (Preferred metric)
ROI CAVEATS

- ROI is just one focus for an evaluation - an important outcome but consider the multiple variables leading to financial impact

- Majority of health promotion and disease management programs require 3-5 years to demonstrate economic impact

- Use scientifically sound methods
  - Doing it the fast and easy way is likely to yield an answer of little value
  - ROI estimation is not spreadsheet work

- Work with medical researchers, economists, funders, patients, doctors, and other vested parties to check assumptions and test their impact

- Not easy but getting accurate ROIs will improves program decisions
**ROI “BEST IN CLASS” (1999)**

**ROI Studies of Intervention Programs at:**
- Canada and North American Life
- Chevron Corporation
- City of Mesa, Arizona
- General Mills
- General Motors
- Johnson & Johnson
- Pacific Bell
- Procter and Gamble
- Tenneco

**Results:**
- Sample sizes ranged from 500 - 50,000 employees
- ROI estimates in 9 studies ranged from 1.40 - 4.90: 1 in savings per dollar expended
- Median ROI was 3:1

Ref: Goetzel, Judy, and Ozminkowski: AWHP's Worksite Health, Summer 1999, pp. 12-21

---

**ROI Research Review (2001)**

**Objective:** Peer reviewed journals (English) identified 196 studies and pared down to 72 studies meeting inclusion/exclusion criteria for review

**Scoring Criteria:**
- A (experimental design)
- B (quasi-experimental - well controlled)
- C (pre-experimental, well-designed, cohort, case-controlled)
- D (trend, correlational, regression designs)
- E (expert opinion, descriptive studies, case studies)

**Intervention Program Impact on Medical Care Costs:**
- 32 evaluation studies examined - Grades: A (4), B (11), other (17)
- Average duration of intervention: 3.25 years
- Positive impact: 28 studies
- No impact: 4 studies (None with randomized designs)
- Average ROI: 3.48 to 1.00 (7 studies)
- ROI evidenced over 3.25 years

Presenteeism Measures

1) Stanford Presenteeism Scale or “SPS”  
   (Koopman and Pelletier, 2002)

2) Work Productivity Short Inventory  
   (Ozminkowski et al., 2003)

3) Work Limitation Questionnaire  
   (Lerner, et al., 2001)

4) Health and Labor Questionnaire  
   (van Rijen, et al., 1996)

5) Endicott Work Productivity Scale  
   (Endicott and Nee, 1997)

6) Work Productivity and Impairment Questionnaire  
   (Reilly, et al., 1993)
Return on Investment (ROI) for Selected Disease Management Programs (2005)

Method:
- Reviewed 44 studies of specific conditions which provided enough information to assess the ROI outcome
- Diabetes, asthma, CHF, depression, and multiple risk factor studies such as multifactorial CHD interventions
- All had randomized, quasi-experimental, or controlled pre-post designs

Results:
- Studies vary in terms of quality
- ROI varies by condition
- CHF and asthma programs demonstrated best ROI
- Programs that address multiple risks also demonstrate ROI
- Results may help forecast ROI for Disease Management Interventions

Ref: Goetzel, Ozminkowski, Villager, Duffy: Return on Investment (ROI) from Selected Disease Management Programs, Health Care Financing Review, Summer 2005, 26:4, 1-19

Health Management ROI Programs

Literature Review Results

- ROI for components of care management range in degree of return and timing of return for comprehensive worksite HP/DM programs (N=25)
- Program impact varies based on:
  - Communication approach
  - Incentives/Engagement strategy
  - Population/Organizational demographics
  - Funding arrangement (fully or self-insured)
- Savings and ROI estimates are based on programs in place 2-3 years

<table>
<thead>
<tr>
<th>Average Percent Cost Avoidance of Total Claims Cost</th>
<th>Comprehensive WHP</th>
<th>Disease Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>2% - 4%</td>
<td>2% - 4.5%</td>
<td></td>
</tr>
<tr>
<td>Average ROI - Healthcare only</td>
<td>1.5:1 - 3.0:1</td>
<td>1.2:1 - 1.8:1</td>
</tr>
<tr>
<td>Average ROI - Healthcare and Productivity</td>
<td>3.0:1 - 5.0:1</td>
<td>2.5:1 - 3.5:1</td>
</tr>
</tbody>
</table>

"There are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things that we do not know. But there are also unknown unknowns - the ones we don’t know we don’t know."

*US Secretary of Defense Donald Rumsfeld
Pentagon News Briefing re: North Korea
17 October 2002*

### Summary of Characteristics of Worksite Wellness Programs & ROI (2010)

<table>
<thead>
<tr>
<th>Method of Delivery</th>
<th>Percent of Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health risk assessment</td>
<td>81%</td>
</tr>
<tr>
<td>Self-help education materials</td>
<td>42%</td>
</tr>
<tr>
<td>Individual counseling</td>
<td>39%</td>
</tr>
<tr>
<td>Classes, seminars, group activities</td>
<td>36%</td>
</tr>
<tr>
<td>Added incentives for participation</td>
<td>31%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Focus of Intervention</th>
<th>Percent of Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight loss and fitness</td>
<td>66%</td>
</tr>
<tr>
<td>Smoking cessation</td>
<td>50%</td>
</tr>
<tr>
<td>Multiple risk factors</td>
<td>75%</td>
</tr>
</tbody>
</table>

Σ: Amid soaring health spending, there is growing interest in workplace disease prevention and wellness programs to improve health and lower costs. In a critical meta-analysis of the literature on costs and savings associated with programs, we found that medical costs fall by about $3.27 for every dollar amount spent on wellness programs and that absenteeism costs fall by about $2.73 for every dollar spent.

“Bottom Line” on the “Bottom Line”

- All worksite interventions (N=169) indicate positive clinical/health outcomes
- All demonstrated related benefits (monetize) in STD, LTD, absenteeism, retention, productivity, performance, and/or presenteeism
- Cost effectiveness, cost benefit, and/or ROI is positive in 74 of the 75 studies analyzed for financial outcomes
- Out of the 75 studies reporting financial outcomes, 33 reported ROI and all were positive
- Vast majority of all cost effectiveness studies and literature reviews demonstrate positive ROI
- In the more rigorous studies/interventions the ROI tends to be lower
- Most conservative ROI estimate is 1:1 (Break Even) to 2:1
- Evidence based ROI range: Approximately 3.5-4.90 : 1
- ROI outcomes most evident at approximately 3.25 years

“I think we agree, the past is over.”

_george w. bush, president of the united states_  
_dallas morning news, may 10, 2000_
CAM and Integrative Medicine
Future Directions

- Genomics, Cloning, and Phenotyping Rx
- NIH-NCCAM Research and Private Foundation R&D
- Corporate Clinical and Cost Effectiveness
- National Integrative Medicine Clinics Network and Database
- Federation of State Medical Boards (FSMB)
- National and International CAM/Integrative Medicine
- Spas - Domestic and International
Corporate Health Improvement Program (CHIP)
Website Resources

- University of Arizona School of Medicine - Center of Excellence in Integrative Medicine (CIM):
  integrativemedicine.arizona.edu
- Corporate Health Improvement Program (CHIP) - "Public" Website:
  integrativemedicine.arizona.edu/chip.html
- Dr Kenneth R. Pelletier Website, Articles, Audiovisuals, and Contact Information:
  drpelletier.com
Complementary and Alternative Medicine 1990 and 1997

<table>
<thead>
<tr>
<th></th>
<th>1990</th>
<th>1997</th>
<th>% Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Practitioner Visits</td>
<td>427M</td>
<td>629M</td>
<td>47%</td>
</tr>
<tr>
<td>Total Primary Care Visits</td>
<td>338M</td>
<td>386M</td>
<td></td>
</tr>
<tr>
<td>Total Expenditure</td>
<td>$13.7B</td>
<td>$21.2B</td>
<td>45%</td>
</tr>
<tr>
<td>Out of Pocket</td>
<td>$10.3B</td>
<td>$12.2B</td>
<td></td>
</tr>
</tbody>
</table>

For existing Illness (42%) versus for prevention (58%)


Complementary and Alternative Medicine 1997

- Grand Total of $27B for:
  - Professional Services
  - Herbals
  - Vitamins
  - Diet Products
  - Books and Classes
- Highest use by people 25 - 49, more women (48.9%) than men (37.8%), more college educated, and higher incomes (>$50,000/yr.)
- Less among African Americans (33.1%) than other racial groups (44.5%). Higher in west (50.1%) than elsewhere in USA (42.1%).