

Global Climate Change and its Implications for Life Insurance and Health Organizations

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Executive Summary

Efforts to enlist the support of the insurance industry on the issue of climate change have centered mostly on the property/casualty industry. This report considers the potential health impacts of climate change, the threats they pose for the life and health insurance industry, and the opportunities for partnership with life and health carriers to promote energy efficiency and renewable energy. Since managed care has resulted in significant reorganization among health insurers and integration of insurers with health care providers, we also consider partnership opportunities with health care providers.

Climate Change Health Risks. The Intergovernmental Panel on Climate Change (IPCC) and several researchers have identified numerous risks associated with rising global temperatures. Reliable predictions of the scope, timing and location of these risks may not be available at this time, but climate changes could have considerable impacts on insurers' mortality and morbidity experience and health care providers' rates of utilization. Section I of this report discusses these risks in depth:

- improved conditions for the spread of vector-borne diseases like malaria, dengue, Lyme disease, encephalitis, and hantavirus or water-borne illnesses like cholera, cryptosporidiosis and toxoplasmosis
- enhanced mortality risks due to natural disasters, including flash floods (IPCC, 1998); flooding and intensified precipitation also can contaminate waters and soils with pathogens, hazardous chemicals and agricultural waste;
- increased probability of episodes of heat-related mortality and respiratory disease, and increased vulnerability of populations to power outage under scenarios of increased heat; and
- constraints on food production and public water supplies.

Partnership with Life Insurance Industry. In light of these threats of climate-related losses, several preventive strategies may provide opportunities to improve short and long term financial results. Section II reviews the competitive market conditions within the life insurance industry and among the broader market for financial services. This section also identifies recent experience of higher premium growth and profitability of overseas life insurance markets. Section III discusses the rapid growth and size of the market for socially screened investments and the expanding market for renewable energy. We highlight opportunities for life insurers to capture a portion of this market with funds specializing in companies committed to the development or use of energy efficiency and renewable energy. We also consider the vulnerability of emerging overseas markets to climate change due to budget constraints on public health and infrastructure (Section I) and the ensuing opportunities for investment in renewables and energy efficiency, especially in China (Section III).

Partnership with Health Care Organizations. Section IV reviews the growing incentives within the health care industry for preventive medicine and collaboration with public health interests. These incentives have arisen partly due to the rise of managed care and integration among insurers and health care providers; increased public scrutiny of managed care organizations; the extension of managed care to Medicare and Medicaid populations; and the efficacy of community health initiatives. Community health initiatives based on collaboration between health care organizations and public health interests have focused primarily on *personal* health issues smoking, drug use, teen violence and teen pregnancy. While climate change is an eminently

environmental health issue, these collaborative efforts have drawn considerable sponsorship from government agencies and foundations sensible to the public health threats of climate change. With support from the agencies and foundations, future collaborative efforts could be sponsored to address preventive measures for issues like smog, indoor air quality, respiratory ailments, and climate change itself. Such efforts could work in partnership with the organizations like the WHO, the NIH, the CDC, the American Public Health Association, and the EPA through its ENERGY STAR efforts with doctors' associations. Collaboration on climate change or related environmental health issues may be of interest to the American Association of Health Plans and the American Hospital Association which have participated in ongoing public-private collaborative efforts.

Introduction

The prospect of global climate change presents challenges to all sectors of society. Property insurance and reinsurance companies primarily in Europe and Japan were among the first companies to recognize their exposure to losses due to climate change. This effort has evolved into an international initiative with the support of over 70 insurance companies worldwide and the United Nations Environmental Programme (UNEP). To date, an insurance industry initiative sponsored by the DOE and EPA through the Center for Building Sciences has worked to inform U.S. property/casualty insurers about the benefits of energy efficiency and the UNEP effort. Other recent efforts include seminars sponsored by the National Renewable Energies Laboratory and the National Association of Independent Insurers on Solar Energy and the Insurance Industry. This report identifies and discusses global climate change risks for the life/health insurance community and the potential opportunities for partnership with the life/health insurance community to address the causes and impacts of global climate change. The report will consider the prospects for constructive engagement with the life insurance industry separately from the health industry. Since managed care has resulted in significant reorganization among health insurers and integration of insurers with health care providers, this report also considers partnership opportunities with health care providers.

- Section I. Projected impacts of global climate change on business opportunities, including IPCC related assessment and reactions from business sponsored think tanks
- Section II. Overview of major trends affecting the life insurance companies
- Section III. Opportunities for partnership with life insurance companies
- Section IV. Overview of major trends affecting the health care insurance industry
- Section V. Opportunities for partnership with health care insurance industry
- Section VI. Loss Prevention Benefits of Energy Efficiency)
- Section VII. Conclusions

Section I focuses on the enhanced risk of illness related to vector and water borne diseases, flooding, heat related stress, the interactions of increased heat and air pollution, particulate matter, food and water supply limitations, and the impact of IMF debt obligations on countries' public health efforts. Some discussion is directed at the arguments of climate change skeptics especially in regards to vector-borne diseases and heat-related stress.

Sections II and III aim to identify trends that have relevance for initiating partnerships with the life insurance industry. For life insurance, these issues include increased competition and consolidation within the financial services industry, expense control, and opportunities for expansion abroad. Opportunities for partnership take into account the rapid and sizable growth in socially screened investment funds offered by several competitors in the financial services industry. Life insurers could capture a portion of this market with promotions of investments for policyholders in energy efficiency and renewables. Another opportunity recognizes the high rates of premium growth in foreign markets yet greater potential public health risks in these emerging insurance markets due to IMF restructuring obligations. In perhaps the most sought after market for expansion, China, environmental health risks including air and climate-related concerns recently have received high-profile international attention, and thereby might create opportunities for direct or policy holder investments in energy efficiency technologies. This report does not address the incorporation of energy efficient technology into insurance company real estate holdings given EPA research to date on this issue.

For health insurance, sections IV and V cover similar themes of consolidation and increased competition, the dominance of managed care delivery, the backlash against managed care, regulatory concerns for non-profit managed care organizations, and the trend towards partnership with public health interests. Opportunities are growing for collaboration among public health groups, managed care organizations and health care providers due to 1) ever increasing coverage

of Medicaid and Medicare groups under managed care and 2) the consolidation of health carriers and providers under financial contracts that favor reduced utilization of health care services. Increased interest in public health concerns could create opportunities for partnership with managed care organizations and health care providers to take action on climate change, IAQ and energy efficiency. The potential for partnership may benefit from existing climate change priorities among public health agencies and some physicians groups.

This report can only be considered an initial assessment of the opportunities for partnership with life insurance and health care organizations.

Section I: Impacts of Climate Change on the Insurance Industry

Global climate change may have adverse implications for economic growth, water resources, agriculture, forestry, heat-related stress and infectious diseases. Impacts on morbidity and mortality are expected to vary by region. Health-related impacts in developed countries with adequate public health systems and emergency resources may be more favorably situated to respond to crises. In the following section, we review not only projected health risks related to climate change, but also opinion critical of the prognosis for enhanced risk.

Malaria and Dengue. Several studies have considered the effects of climate change on vector-borne diseases (VBDs) (Epstein et al, 1998; Martens et al, 1997; Martens, 1998; Moore, 1996; Patz et al, 1996; Patz et al, 1998; CDC, 1996). The general consensus with regard to VBDs is that climate change could expand the range and epidemic potential of malaria, dengue, encephalitis and schistosomiasis. As of 1995, 2.5 million people worldwide died of malaria while 1 million died of HIV. Malaria and dengue transmission increase as temperatures warm up to about 40 C. Warmer, moister conditions not only facilitate the spread of mosquitoes, but also shorten the incubation period of malaria parasites and dengue virus, thereby enhancing their potential for spreading disease. The incubation period of dengue, in fact, shortens non-linearly with increasing temperature (Patz et al, 1998). Though recent outbreaks of malaria in the U.S. have affected small numbers of people, they have coincided with unusually warm and moist conditions (Zucker, 1996). Some studies indicate that much of the U.S. in its current climate favors the transmission of malaria and dengue. Future warming would improve the conditions for greater transmission, especially in areas bordering regions with exposure to such disease (Epstein et al, 1998). Epstein et al (1998) cite examples of this phenomena in relation to the penetration of vector borne disease into heretofore disease-free high altitude regions. Rising temperatures in highlands of Asia, Latin America and Central Africa have coincided with the expanded range of malaria and dengue.

Skeptics View of Malaria and Dengue Threat: Most of the aforementioned studies comment that the U.S. has adequate capacity to respond to outbreaks of infectious disease. Several critics (Moore, 1996; Reiter, 1998) of the IPCC scientists (Epstein, Haines, and Martens) argue that concerns of infectious disease and climate change are overblown. Moore (1996) contends that public health efforts and simple technologies like window screens have helped keep Singapore and Hong Kong relatively free of malaria and dengue, in spite of proximity to disease ridden bordering regions. Similar examples exist along the U.S.-Mexico border. Reports of a 1995 dengue outbreak along the U.S.-Mexico border reveal over 2,000 cases of the disease on the Mexico side and just 7 cases in all of Texas (New Hope, 1997). Moore, however, does suggest that environmental policies to preserve wetlands may assist the spread of VBDs in the United States. Reiter (1998) argues that malaria and dengue outbreaks before the 1950's were not uncommon in the U.S. nor at high altitudes in Central Africa, the Himalayas or the Andes. Reiter attributes most of the expanded range of VBD to "large-scale resettlement of people (often associated with major ecological change), rampant urbanization without adequate infrastructure, high mobility through air travel, resistance to malarial drugs, insecticide resistance, and the deterioration of vector-control operations and other public health practices."

Response to Skeptics on Malaria and Dengue Threat: Where Reiter's criticism falls short is that climate change could aggravate the conditions which he attributes to the spread of VBDs. By extending the range and virulence of VBD's, global warming could put additional strains on public health efforts to contain their spread. While most all authors have cited the U.S.' capacity to contain VBD, it should be noted that efforts to develop a vaccine for malaria have not made significant progress (Kwiatowski & Marsh, 1997; Lancet, 1996) and that drug resistance has made treatment increasingly more expensive. While the increasing cost of treatment may restrict treatment only in poorer regions, the prophylactic currently recommended in the U.S., Mefloquine, has several bothersome side-effects including increased nervous tension and nightmares. Efforts to contain the spread of mosquitoes are increasingly challenged by:

- 1) increasing insect resistance,
- 2) direct human health concerns about food & groundwater contamination,
- 3) toxicity to birds, reptiles, and fish (that consume mosquito larvae); and friendly insects (e.g. lacewings and ladybugs); this diversity of predators serving to biologically control the proliferation of biting insects (Pimental et al, 1997)

Perhaps the greatest risk associated with malarial outbreak in the U.S. is that its symptoms might be confused with other diseases. The general population also is not familiar with the heightened risks it poses to children and pregnant women. Women may face complications from sulphha-based malarial drugs during the latter stages of pregnancy.

While U.S. public health efforts may be adequate to contain a major outbreak of malaria or dengue, if warming climates, immigration patterns and drug/insecticide resistance complicate containment efforts, the implications for the life insurance and managed care organizations could be considerable. If people in the U.S. start worrying about malaria, it's possible that many more people will visit their doctor's offices and emergency rooms if they get symptoms vaguely related to those for dengue or malaria, etc. The risk of malaria, especially to populations that have not developed immune responses, could easily motivate many Americans to see the doctor if they have flu-like symptoms, dizziness, etc. People suffering from flu, smog or ozone, if they have been bitten by a mosquito, will have reason to be concerned about malaria. The potential for extra visits will make it harder to contain costs, unless some vaccine is developed, which could be expensive as well, and even then, states may require insurers to cover these costs. If a vaccine for malaria is developed, this scenario might not materialize, but little progress has been made to date in this venture. One recently proposed larvicide, a mosquito specific hormone that shuts off digestion, might deter resistance because it is a chemical produced by the larvae itself (Environmental Health Perspectives, April 1998). Studies have yet to confirm the impacts of this larvicide on other insects, fish, birds, animals or water supply.

Hantavirus Pulmonary Syndrome. Warm, wet weather in the Southwest this past winter and in 1993 have coincided with El Niño conditions which have afforded plant growth and water resources to rats and mice carrying varieties of hantavirus. The virtual explosion in rodents in the Four Corners region has sparked a public health warnings about the disease which kills 50% of its victims (ABCnews.com, 7/8/98). The disease takes on several forms, and generally transmits via inhalation of rodent excretia in the form of dust. (Schmaljohn & Hjelle, 1998). The Sin Nombre variety carried by deer mice has been found throughout the U.S. (Schmaljohn & Hjelle, 1998). In 1993, 80 people were afflicted with hantavirus (ABCnews.com, 7/8/98). While a positive correlation between global warming and increased El Niño events has yet to be confirmed, climate change models predict warmer, wetter winters for much of the U.S., which could improve the chances for greater hantavirus infestation and mortality.

Flooding and Water-Borne Illnesses. Between 1979 and 1995, extreme weather events in the U.S. claimed over 1,700 lives. Flooding is generally the leading cause of mortality by drowning.

While stream-flow studies (USGS: Lins & Slack, 1997) show no statistically significant increases in the *frequency* of flooding over the past century, future studies need to test for changes in the *severity* of floods. Though momentous, floods along the Mississippi (1993), Grand Forks N.D. (1997), the Ohio River (1997), and the Willamette Valley (1996) and ice storms in the Southeast (1993) and Northeast (1998) are probably too few in number to represent significant deviations from natural variability. According to NOAA, however, trends in precipitation in the U.S. show a 10% increase in precipitation over the past century, with over 50% of this increase due to extreme precipitation events of 2 in. or greater. Some areas show increases as high as 20%. (Karl & Knight, 1998). Based on increases of heavy precipitation, one might infer that areas prone to flooding might experience greater floods, but future predictions of flooding and extreme weather require greater resolution than currently afforded by existing global circulation models. Floods also may depend on pre-existing conditions other than precipitation, including temperatures, snow pack, soil saturation, land use, and vegetation cover.

U.S. public health resources are generally considered among the best in the world. Public health depends in large part on water quality. Water treatment facilities in the U.S. already have witnessed significant challenges from outbreaks of *pfisteria*, *cryptosporidia*, and other water borne pathogens. Flooding can overwhelm filtration facilities and heavy rain can load water supplies with pathogen-laced manure or toxic chemicals (*IPCC, 1998*). The IPCC reports that "extreme precipitation contributed to an outbreak of toxoplasmosis in British Columbia in 1995 when excessive runoff contaminated a reservoir with oocysts from domestic and wild cats" (British Columbia CDC, 1995). A major *cryptosporidia* outbreak in Milwaukee in 1993, which affected over 400,000 lives, coincided with unusually heavy rains and spring runoff (MacKenzie et al, 1994). Of those surveyed with *cryptosporidia*, the median length of the illness was 9 days, with considerable diarrheal impacts. *Cryptosporidia* presents challenges for other municipalities as well. New York City faces costs of nearly \$6 billion to filter *cryptosporidia* and other pathogens from its water supply. Given the considerable costs of filtration, other municipalities could be vulnerable to *cryptosporidia* and other diseases in the event of increased heavy rainfall. Excessively dry conditions can present hazards to water quality as well if less water is available to dilute polluted discharges and runoff. Warmer conditions assist diseases like cholera:

Zooplankton, which feed on algae, can serve as reservoirs for *Vibrio cholerae* and other enteric pathogens, particularly gram-negative rods. Quiescent forms of *V. cholerae* have been found to persist within algae; these quiescent forms can revert to a culturable (and likely infectious) state when nutrients, pH, and temperature permit (Huq et al., 1990). *V. cholerae* occur in the Gulf of Mexico and along the east coast of North America. With warmer sea surface temperatures, coastal algal blooms therefore could facilitate cholera proliferation and transmission (IPCC, 1998)

U.S. public health resources are considerable, but municipal controls on water quality have already experienced significant challenges during the 1990's. Changes in temperature and precipitation patterns could pose considerable challenges to water quality and thus public health. We are not currently aware of any challenge to the IPCC assessment of health conditions due to threats to water quality.

Heat-Related Stress. Increased global warming is projected to bring increased frequency of extreme heat episodes that could escalate heat-related mortality and morbidity. Hansen et al (1998) argues that the likelihood of an unusually warm season has increased from 30% between 1950 and 1980 to 50%-60% in the 1990s. Kalkstein & Greene (1997) have analyzed the mortality impacts of seven major categories of air masses in the 44 largest metropolitan areas in the U.S., and have projected the increase in frequency of these events based on 3 widely-used global circulation models (GCM) for the years 2020 and 2050. The models generally assumes 2 to 6

times increases in the incidence of offending, deadly air masses by these dates, with higher impacts on mortality in more northerly regions, less adapted to extreme heat.

Potential impacts of higher summertime temperatures include more frequent urban heat waves with resultant loss of life or hospitalization, power outages, and business interruptions. NOAA found that a three degree increase in the average summer temperatures would lead to a five-fold increase in the likelihood of extreme heat episodes. Medical researchers reviewed a dozen past U.S. heat waves, identifying over 5,300 deaths above the norm. Higher urban air temperatures also accelerate the formation of smog, with its attendant health risks (, 1997).

Data on hospital admissions due to heat-related stress are not widely available. The Kalkstein & Greene study assumes that as climate changes, people in more northern climates will adapt as people have in more southern climates. For instance, if New York City's summer becomes more like St. Louis, then the percentage of houses with air conditioning will increase to be comparable to current conditions in St. Louis. The study also adjusts for the fact that increased mortality due to heat spells generally results in slightly reduced aggregate mortality rates for the following week or two, the net effect being an overall increase in mortality over average levels.

Skeptics View of Heat-Related Stress Threat and Response to Skeptics. Kalkstein & Greene (1997) also respond to allegations that general warming would diminish the winter mortality rate and thereby wash out any increases in mortality due to heat spells (Moore, 1996). They cite that in cooler regions, winter mortality rates are less dependent on a significant temperature threshold as are summer conditions. Winter-related illnesses are more related to respiratory illness generally induced by confined, poorly ventilated interiors than temperature, suggesting that a small rise in winter temperatures will not reduce winter mortality in anyway comparable to increases in summer mortality.

Moore's critique of these and other studies asserts that crude mortality rates are lower in warmer climates, and thus as the climate warms in more northerly regions, mortality rates should decline. Instead of analyzing isolated heat spells that contribute the most to heat related mortality, he assumes that if these isolated heat events are significant, they should reduce the differences between winter and summer mortality rates, as if summer and winter mortality rates are correlated. He analyzes monthly average temperatures for 3 relatively hot years, 1987-1989, but uses Washington D.C. as a proxy for the nation, a city which might be considered well-adapted to extreme heat, and which might not register a spike in mortality due to increased heating. Unlike Kalkstein & Greene (1997), his analysis does not look closely at any particular extreme heat event but essentially assumes that seasonal mortality is a function of temperature; since mortality is higher in the winter and lower in the summer, warmer temperatures must mean less mortality. He gives no consideration to data that might undermine his logic like the deadly 1995 Chicago heat wave nor to the causes of winter related mortality, which have less to do with actual contact with cold temperatures as with confined, poorly ventilated interiors. Mixing the analysis of summer events with winter events caches the impacts of extreme summer events. Moore presents another similar regression of 89 major counties in the U.S. which essentially shows lower mortality rates in warmer climates, but doesn't account for increased incidents of extreme events in more northerly regions. He assumes an approximate reduction in mortality of 40,000 per year due to global warming. Like other studies that take a more optimistic view of global warming (Helms et al, 1996; The Institute for Biospheric Research, 1992), Moore's study fails to consider the impacts of increased extreme weather events on the economy or public health¹.

¹ Moore's research is sponsored by the Hoover Institution which has credibility among business circles. Moore has recently released a book, [Climate of Fear: Why We Shouldn't Worry About Global Warming](#) which advances his 1996 public health studies. He also contributes to the *World Climate Report* which takes an optimistic view of climate change and receives sponsorship from coal-related interests.

Implications of Heat-Related Stress for Insurers: While Kalkstein & Greene (1997) project sizable increases in the rate of heat-induced mortality, it remains a question whether the projected increase in numbers of deaths for the 44 major metropolitan areas will be of consequence to life insurers and health care organizations. In addition to increases in summer related mortality, the study projects reductions in winter-related mortality:

Table 1: Estimated Total Excess Weather-Related Mortality Assuming Full Acclimatization

<u>Global Circulation Model</u>	Average Summer Season		
	<u>Present</u>	<u>2020</u>	<u>2050</u>
Geophysical Fluids Dynamics Laboratory 89	1,840	1,981	3,190
UK Meteorological Office	1,840	4,128	4,748
Max Planck Institute for Meteorology	1,840	2,799	3,863

<u>Global Circulation Model</u>	Average Winter Season		
	<u>Present</u>	<u>2020</u>	<u>2050</u>
Geophysical Fluids Dynamics Laboratory 89	1,067	1,104	989
UK Meteorological Office	1,067	984	894
Max Planck Institute for Meteorology	1,067	1,098	1,059

<u>Global Circulation Model</u>	Average Annual Total		
	<u>Present</u>	<u>2020</u>	<u>2050</u>
Geophysical Fluids Dynamics Laboratory 89	2,907	3,085	4,179
UK Meteorological Office	2,907	5,112	5,642
Max Planck Institute for Meteorology	2,907	3,897	4,922

Two issues might complicate these figures: interactive effects of heat with air pollution and adequacy of power generation for increased demands for air conditioning. Kalkstein & Greene (1997) and Kalkstein (1993) focus primarily on the effects of increased mortality due to heat spells. They indicate that while heat beyond a certain threshold has a traceable impact on mortality statistics, their study did not consider the impacts of pollution on mortality and morbidity.

Extreme Heat and Air Pollution. The IPCC's recently released, *The Regional Assessment of Climate Change: An Assessment of Vulnerability* (1998) identifies threats to human health in terms of urban air quality. The report documents that ground-level ozone is positively correlated with temperature and with increases in respiratory-related hospital admissions, suggesting that respiratory ailments may increase with enhanced frequency of extreme heat events². In addition to implicating the affects of increased temperature on ozone and smog-induced respiratory disease, the *Regional Assessment* implies that increased extreme heat and humidity events could exacerbate the incidence of asthma³. Information from the National Center for Health Statistics (NCHS, 1996) supports the correlation between increased heat and the incidence of respiratory illness in citing greater numbers of asthma cases in the South than more northern regions.

² [R]ecent studies (U.S. EPA, 1996) provide evidence of a positive correlation between ground-level ozone and respiratory-related hospital admissions in several cities in the United States. Such hospital admissions in the province of Ontario strongly relate to ambient levels of sulfur dioxide and ozone and to temperature (Canadian Public Health Association, 1992). Research has shown that ground-level ozone formation is affected by weather and climate. Many studies... (Wolff and Lioy, 1978; Atwater, 1984; Kuntasal and Chang, 1987; Wackter and Bayly, 1988; Wakim, 1989)... suggest a nonlinear relationship between temperature and ozone concentrations at ground level: Below temperatures of 22-26°C (70-80°F), there is no relationship between ozone concentrations and temperature; above 32°C (90°F), there is a strong positive relationship (IPCC, 1998).

³ There is a limited number of studies, however, that shed some light on possible impacts of climate change on air quality and associated health implications. Emberlin (1994), for example, has suggested that global warming may affect the seasonality of certain allergic respiratory disorders by altering the production of plant aero-allergens. Asthma and hay fever can be triggered by aero-allergens that cause high seasonal morbidity. The severity of allergies may be intensified by projected changes in heat and humidity, thereby contributing to breathing difficulties (Environment Canada et al., 1995; Maarouf, 1995). (IPCC, 1998)

Health care organizations should be familiar with the growing importance of asthma and respiratory ailments. The NCHS (1996) report indicates that hospital admissions for respiratory illness have risen considerably in the past 16 years:

Table 2: (NCHS, 1996): Monitoring Health Care in America: Spotlight on Lung Disease

<u>Numbers of Hospital Discharges of Inpatients</u>	<u>1994</u>	<u>1978</u>	<u>Change</u>
- with a first-listed diagnosis of asthma	451,000	201,000	224%
- for chronic bronchitis	500,000*	259,000	193%
- for emphysema	250,000	64,000	391%

* 1993

Another NCHS study, (Burt et al, 1996), documents not only a 50% rise in asthma-related doctor visits in the past decade, but also the prevalence of asthma as the 6th most frequent diagnosis in office or outpatient visits. The study also reports that asthma cases often involve repeat doctor visits: “Only hypertension, diabetes, and otitis media have more repeat visits than asthma”. The cost implications of trends like these has motivated one managed care organization, Lovelace Health Systems of Albuquerque, NM to foster special facilities for the treatment of asthma (Terry, 1997). It is worth noting that Lovelace, a subsidiary of Cigna Insurance, has instituted special treatment facilities for only 3 other conditions: diabetes, birth, and depression. Lovelace’s “crowning achievement” is a 34% reduction in hospital admissions for childhood asthma. The implementation of this clinic at a cost \$250,000-\$500,000 demonstrates the capacity of managed care organizations to invest in prevention and proper care of respiratory illness. The rising costs associated with respiratory illness, to date, has not stirred a general mobilization of health insurers or providers to address the underlying environmental causes of asthma. It remains to be seen whether health care organizations will act upon the benefits of promoting environmental health initiatives that might reduce health care utilization. Greater awareness of the prospects for increased incidence and intensification of an already widespread and costly ailment as a result of global warming, however, may facilitate action.

Extreme Heat and Power Generation. One material issue that has eluded the studies of the correlation of climate change and health issues is the impact of increased heat on power-generation. The key adaptation cited for improving resistance to killer heat waves in the Kalkstein & Greene (1997) has been air conditioning. The heat wave that killed over 500 Chicago residents also coincided with power outages. Will power resources be adequate to deal with increased peak demands? Kalkstein & Greene (1997) assume that northern regions will adapt to warmer conditions as people have in more southerly regions with widespread air conditioning. Their projections would be substantially worse without these adaptations. From the perspective that morbidity and mortality will depend in part on adequate power supply in the future, it may be in the interests of life and health insurers to promote the existence of adequate power resources, whether this is the result of increased capacity or efficiency. Since investments in energy efficiency are generally cheaper per kilowatt saved than increased capacity, society in general but life and health insurers as well would benefit from the promotion of energy efficiency, especially if this reduces the risks of increased warming. Renewable energy sources, like solar, may also offer benefits of improving emergency response in the wake of disasters. A conference sponsored by the DOE and the National Association of Independent Insurers considered the utility of solar energy in assisting claims handlers following a disaster as compared to reliance on gas powered generators (Katz, 1998). Similar investments in solar energy resources and energy efficiency could reduce central power supply burdens during peak summer heat. These investments could improve responses to projected increases in summer heat waves, especially for hospitals, nursing facilities, schools, businesses and residences.

Particulate Matter. A study conducted by the EPA and the World Resources Institute projects considerable reductions in mortality due to particulate matter from compliance with European Union pre-Kyoto Treaty proposals for fossil-fuel abatements (Working Group on Public Health and Fossil-Fuel Combustion, 1997). The EU proposed 15% reductions in greenhouse gas emissions below 1990 levels by the year 2010 for developed countries, and 10% reductions in projected 2010 greenhouse gas emissions for developing countries. The reductions in mortality due to particulate matter under the EU proposal are calculated in relation to a business-as-usual scenario, where emissions continue at their projected levels.

Table 3: Annual Reductions in Mortality (000's) due to Particulate Matter from Compliance with EU Proposal for Greenhouse Gas Reductions - (90% confidence intervals in parenthesis)

<u>Year</u>	<u>Developed Countries*</u>	<u>Developing Countries*</u>	<u>All Countries</u>
2005	56 (31-83)	137 (75-204)	193 (106-287)
2010	89 (49-131)	286 (157-425)	375 (206-557)
2015	106 (58-156)	508 (278-750)	614 (337-906)
2020	138 (76-203)	563 (309-831)	701 (385-1034)
Total Cumulative Avoided Mortality 2000-2020	1,670 (900-2500)	6,340 (3500-9400)	8,010 (4400-11900)

Developed countries correspond to Annex 1 of the Framework Convention on Climate Change, whereas Developing countries are all non-Annex 1 countries.

This study relies on over 40 studies documenting the mortality impacts of short-term and long-term exposure to particulate matter. The study admits that it depends heavily on the methodology proposed by Pope et al. (1995) and Woodruff et al (1997) to project mortality savings and several other assumptions about the heights of smoke stacks, PM releases due to fossil-fuel burning, and sources of PM exposure (interior vs exterior). While projected mortality savings may serve to illustrate orders of magnitude rather than precise estimates, the study does indicate significant benefits for life and health insurers from reductions in fossil fuel burning.

Food and Water Supply. This study has generally considered the effects of increased global warming on disease and heat-related stress. Climate change could also have serious impacts on agriculture and water resources, perhaps to a greater degree in less developed countries. The IPCC's *Regional Assessments of Climate Change* identifies limitations on agricultural projections:

The productivity of food and fiber resources of North America is moderately to highly sensitive to climate change. Most studies, however, have not fully considered the effects of potential changes in climate variability; water availability; stresses from pests, diseases, and fire; or interactions with other, existing stresses.

Much uncertainty surrounds the health implications of limited food and water in the U.S., though analysis of existing trends in resource use might reveal significant stresses in water supply in the Great Plains due to groundwater degradation and depletion. Hail, heavy rain, flood, and windstorms also can cause agricultural losses, though projections of these events on a local scale are mostly in a developmental phase. Recent crop losses due to the 1997-1998 El Niño event raise questions of how farmers may adapt in the future.

Table 4: Estimated Crop Losses for the 1997-1998 El Niño event (August, 1998):

<u>State</u>	<u>Crop Losses (\$Millions)</u>	
Florida	\$175	Other states not listed, but seriously affected by El Niño conditions include Arkansas, South Dakota and New Mexico
Georgia	\$500	
Louisiana	\$420	
Oklahoma	\$2,000	

NOAA estimates that the ultimate economic impacts of the 1997-1998 El Niño to be 2-3 times the agricultural losses. Recent global circulation model studies suggest that additional greenhouse gas accumulation could produce either a more El Niño-like climate or an amplification of El Niño events (Meehl & Washington, 1996; Knutson et al., 1995, 1997). While El Niño and La Niña events have proven costly for farmers, climate skeptics cite numerous field and laboratory studies that enhanced levels of CO₂ will lessen crop demands for water, improve crop heat resistance and promote yields (Balling WCR, 1998; New Hope, 1998). Other research, however, has found that the benefits of enhanced CO₂ diminish with prolonged exposure (Wolfe & Erickson, 1993) and that absorption of enhanced CO₂ will require higher nitrogen loads (Cao & Woodward, 1998).

Other parts of the world are experiencing increasing shortages of water. Aside from massive floods in 1998 attributed to deforestation, China has been diverting much of its irrigation water to urban uses and has been losing much farm land to urban expansion. In response to constraints on water, the U.S. and Chinese authorities plan to hold a workshop on water-resource management later in 1998 (Greenwire, 6/29/98). Constraints on food and water resources could complicate China's economic ambitions that may have consequences for life insurers attempting to expand market share there. The Worldwatch Institute has followed China's economic conversion and increased reliance on imported food resources, and sees it paralleling the trends of Taiwan, South Korea, and Japan, all of which significantly increased food imports as they grew in economic stature (Brown, 1995). China may have the resources to import much of its food, but may frustrate many emerging insurance-market countries' efforts to feed their populations. This situation could only worsen if climate change impedes the capacity of farmers to produce more. These trends could boost the prices of grain worldwide, potentially increasing poverty and political unrest in emerging insurance markets. Agricultural projections under climate change vary considerably and face limitations from the inability of global circulation models to predict on a daily basis with fine spatial resolution the character of major synoptic events like storm tracks, monsoons, and El Niño/Southern Oscillation events.

Implications for life insurance expansion abroad. Many of the countries cited for rapid levels of premium growth, particularly in Asia and Latin America, are also strapped with sizable foreign debt and IMF restructuring obligations (Thailand, South Korea, Indonesia, Malaysia, Philippines, Mexico, Brazil). These restructuring deals require countries to prioritize debt repayment which invariably means significant cutbacks in all forms of domestic spending, including health and welfare (Brecher & Costello, 1995; Bello et al, 1994, 27). World Health Organization data show substantial declines in national health spending over the 1980s for Brazil and Mexico that approximately coincide with major structural adjustment programs (WHO, 1998). This pattern of reduced health care spending in light of structural adjustment may be expected with the countries experiencing the recent financial crisis in Asia. Decreases in public health spending along with deforestation and habitat changes have been cited as causes for resurgence of infectious diseases in the Americas (CDC: Emerging Infectious Diseases, 1996). Life insurance companies considering expansion abroad, especially in the areas with high rates of premium growth like Latin America and South East Asia, should consider the capacity of their host countries to respond to public health risks. Public health budgets in many of these countries will most likely be challenged by increasing debt obligations, which in the case of Latin America has led to resurgence of diseases like malaria, dengue, and cholera. The prospects of global warming suggest even greater stresses on already beleaguered health departments. While the sectors of society with the greatest capability of purchasing insurance are perhaps least at risk of health, food and welfare problems, the increased risks of epidemic might have spill-over effects on political stability and financial circumstances for insurance sales.

Section II: Life Insurance Industry: Major Trends

Consolidation and Competition. The U.S. life insurance community faces several challenges from enhanced competition due to financial deregulation, technological innovation, and changing demographics. Competition has coincided with growing attempts among mutual insurance companies to switch to stock ownership by forming mutual holding companies to enable greater access to capital from financial markets. Another sign of competition and excess capital is increased consolidation not only in the life insurance industry but in financial services in general. The \$9 billion acquisition of Salomon Brothers by Travelers Group followed by its prospective \$70 billion merger with Citibank foreshadows the potential forms of consolidation in the financial services industry that future deregulation may enable. Efforts to remove Depression-era regulations requiring separate operations for insurance, banking and securities firms got a boost with the 1996 *Barnett* Supreme Court ruling that banks could sell insurance in small towns. Congress has since been considering financial deregulation with H.R. 10 that would end major divisions in the financial services field.

Emulation of Other Financial Services. Best's Review suggests that as the walls between financial services sectors come down, life insurance companies will have to fashion products more for the consumer rather than for purposes of promoting their products to agents and brokers (Mayewski, et al, 1997). Since most agents and all brokers are paid commissions, life insurance companies traditionally have had to compete on their terms of compensation. The authors anticipate the adoption of greater financial transparency for consumers as deregulation progresses. This might include the disclosure of sales loads, which is common practice for all other financial services, but not insurance. Some insurers are preparing for the effects that commission disclosures could have on sales. Life insurance products in England suffered a significant drop in sales after insurers were required to disclose brokers' commissions. Insurers also might invest in consumer-friendly technologies like 24-hour information access via phone or Internet, currently in place with other financial institutions, or offer expanded investment choices for deferred annuity, variable and universal life products. Internet access may encourage ease of comparison among policies, thereby further enhancing pressures to provide value.

Other trends in the life insurance field include a decline in growth of traditional guarantee products in favor of more annuity and investment related products. The aging of the baby-boom generation, along with current favorable stock market returns, has driven the push for annuity and investment products. Governments worldwide also have contributed to the demand for individual retirement savings through expanded privatization of social security schemes (Mayewski et al, 1997). Declining interest rates have brought capital gains to many fixed income investments, but lower reinvestment rates have taken some of the luster out of universal life policies. Like stock markets, the industry tends to fluctuate through times of expansion when consumers shop for competitive returns and times of financial duress when customers shop for insurers committed to quality and stability. As stock market returns in the mid-to-late 1990s have been very positive, competition for returns has intensified with insurers giving consideration to riskier investments and cost control. This may change if recent market declines signify the end of the long standing bull market.

Expense control. The cost of distribution systems via brokerages, agencies and direct marketing has been a topic of endless discussion among insurers. The current front loading of commissions has been attributed to recent "market conduct" problems of misleading illustrations and questionable sales practices. Prudential may face fines of upwards of \$1.9 billion for agency and sales misconduct. With existing competition from other financial institutions for annuities and potentially more competition in other areas of underwriting, the possibilities of Internet sales and bank distribution may spell some relief to the costs of existing distribution systems, and may transform the role of existing agency networks. Updating computers systems for the year 2000 conversion for some companies remains an issue. The industry could be vulnerable to consumer uncertainty and, at worst, a rush of cash-outs if year 2000 problems lead to financial instability.

Expansion Abroad. The Asian and Latin American markets traditionally have limited direct foreign investment in financial institutions (Bishop, 1998; Hu, 1998a). With the passage of the General Agreement on Trade in Services (GATS) in December of 1997, insurance companies will soon have greater access to these key markets and those in Eastern Europe (Banham, 1998a). The GATS creates a dispute-resolution mechanism for financial institutions seeking access to WTO member countries. The signing of this agreement caps a multiyear effort by the International Insurance Council and the U.S. Trade Representative to liberalize trade in financial services . This agreement comes on the heels of country by country efforts to open overseas markets to U.S. financial institutions.

In their publication, Sigma No. 4/1998, Swiss Re documents higher rates of premium growth in 1996 in Latin America and in some South and East Asian countries than in the U.S. and Japan. Some sample rates of life insurance premium growth:

Table 5: Life Insurance Co. Real Premium Growth and World Market Share (1995-1996) – Source: Swiss Re

	Real Premium Growth (1995-1996)	Share of World Market (1995-1996)		Real Premium Growth (1995-1996)	Share of World Market (1995-1996)
			Asia		
United States	5.2%	23.94%	South Korea	3.3%	3.95%
Europe	8.9%	30.18%	Taiwan	13.2%	0.92%
Japan	-7.3%	34.00%	India	5.4%	0.38%
			PR China	56.7%	0.33%
			Hong Kong	10.4%	0.30%
Latin America			Singapore	18.1%	0.25%
Brazil	8.1%	0.24%	Thailand	9.9%	0.18%
Chile	18.5%	0.12%	Malaysia	11.2%	0.17%
Mexico	-1.9%	0.12%	Indonesia	23.1%	0.10%
Argentina	8.1%	0.12%	Philippines	8.5%	0.05%
Columbia	10.5%	0.03%			

Latin American markets are small in relation to North America, Europe and Japan, but some South and East Asian markets for life insurance are relatively large due to relatively insubstantial social security networks. Latin American life insurance markets are expected to continue growing with ongoing social security system privatization (Bishop, 1998; Banham 1998b). The commerce department in January, 1998 released statistics comparing U.S. insurance companies in their domestic and overseas operations (Jennings, 1998). The report indicated that premium growth, asset growth, and profitability were significantly higher for overseas operations as compared to U.S. operations. One key statistic was that while foreign operations provide approximately 10.7% of parents' sales, they accounted for 15.6% of their profits.

*Table 6: Comparison of Domestic vs Foreign Operations of U.S. Based Insurance Companies **

	<u>Life Insurance</u>	<u>Non-Life</u>	<u>Total</u>
Foreign Sales 1995 (billions)	\$19.6	\$34.9	\$54.5
Foreign Sales 1989 (billions)	\$11.1	\$20.4	\$31.5
Foreign Sales Growth Rate (annualized)	9.9%	9.4%	9.5%
Domestic Sales 1995 (billions)	-	-	\$402.1
Domestic Sales 1989 (billions)	-	-	\$343.7 est
Domestic Sales Growth	-	-	4.0%

* Sales includes premium income plus investment and other income. Foreign sales includes revenues from affiliates, subsidiaries, branch offices and joint ventures.

Experts attribute the relatively slower growth in the U.S. to high levels of market saturation and competition.

The opening of markets to foreign investment with protections from discriminatory trade practices should offer much encouragement to insurers considering overseas expansion. Some exceptions were made among the GATS signatories, and perhaps the most sought after market, China, is not a WTO member as of yet and is limiting access to foreign investors at this time (Bangsberg, 1998). Another consideration that may delay some investors is the general economic turmoil in South East Asia. Similarly the Mexican Peso crisis provides another example of currency-related risks for investing overseas. Reports from Best's Review indicate in South Korea that economic turmoil may increase the potential for lapses and transfers of long term savings vehicles to banks which can pay higher short term rates of return (Hu, 1998b). Some allege that companies currently invested in these countries may have suffered, yet, the U.S. insurer with the largest overseas investment, AIG, reports not to be seriously affected by the crisis in terms of its balance sheet since many policies are denominated in local currencies (Bowers, 1998a). They also have noted favorable increases in short term interest rates. Declining currencies and economic restructuring may provide significant opportunities to companies seeking to buy-out ailing foreign companies. Met Life recently bought out Korea's number three insurance company and took full ownership of its existing joint venture (D'Allegro, 1998).

Interviews with top insurance executives indicate that several see a trend toward expansion abroad. In an interview of executives published in January 1998, several expressed regret for not expanding abroad sooner (Best's Review P/C, January 1998). Several predicted that while the GATS represents a first step in opening foreign markets to direct investment, many see standardization of the regulatory process for banks and insurers as a potential next step. A Life Office Management Association survey of insurance executives from around the world (conducted in Summer, 1996) indicated that companies in the Pacific Rim anticipate significant growth in demand for life insurance products (Forbes, 1998). This 1996 survey, of course, precedes the turmoil that has since ensued, but more recent surveys (1998) of insurance executives from Indonesia, Thailand, Malaysia, the Philippines and Singapore reveals confidence in a recovery for their industries over the next 2-3 years. Several executives point to the experience of Mexico's insurance industry, which they claim took steps to strengthen itself in the wake of the (1994) currency devaluation (Best's Review L/H, 4/98).

Section III: Life Insurance Industry: Opportunities for Partnership

Section II discusses how U.S. life insurers face considerable challenges in remaining competitive in the market for financial services, as existing companies consolidate and as banks and mutual fund companies increasingly encroach on their traditional markets. In addition to growing competition, several high profile companies recently have suffered blows to their reputation due to product misrepresentations. In response to competitive pressures and credibility concerns, several observers have suggested that life insurers not only improve the transparency of sales loads and product features, but also emulate the services offered by other financial organizations. In the following section, we will discuss how insurers could address some of these concerns through their investment choices for life insurance and annuity products. In particular, by offering investment choices with priorities in renewable energy, energy efficiency or climate change mitigation, insurers could capture a growing market of socially-minded investors. Offering these and other socially screened funds would lend support to socially-minded companies, which along with other efforts might help redress credibility problems.

As pertains to growth opportunities abroad, U.S. life insurers stand to benefit from market liberalization and increasing international trade. Financial turmoil in Asia may temporarily slow premium growth, but may signal opportunities for mergers and acquisitions. In the section below, we discuss the health and safety risks posed by climate change in overseas markets especially in areas with strains on public health infrastructure due to IMF debt obligations. We also briefly discuss investment opportunities in energy efficiency and renewable energy in China, one the key

targets for overseas expansion. Before discussing the potential impacts of climate change on overseas expansion, we will recap some of the possible public health and safety threats related to climate change that could adversely affect life insurance experience.

Adverse Experience Risks due to Climate Change. A common marketing strategy of life insurance companies is to appeal to an individual's sense of responsibility to their families. In addition, life insurers aggressively compete for the best investment returns for their life and annuity products. Investments in energy efficient technologies, renewable energy and climate change mitigation have similar advantages in terms of loss prevention and financial return. As discussed in Section II, decreases in carbon emissions offer more immediate benefits of reduced respiratory ailments, whereas energy efficient technologies like fluorescent lamps greatly reduce the risk of fire as compared to the popular halogen torchierre design (see Section VI for more examples). From a larger perspective, the benefits of reduced carbon emissions also could help diminish the potential health and safety risks associated with climate change. These risks include:

- Improved conditions for the spread of vector borne diseases like malaria, dengue, Lyme disease, encephalitis, and hantavirus or water borne illnesses like cholera, cryptosporidiosis and toxoplasmosis (*See Section I*)
- Enhanced mortality risks due to natural disasters, especially flash floods (IPCC, 1998). Flooding and intensified precipitation also can contaminate waters and soils with pathogens, hazardous chemicals and agricultural waste.
- Increased probability of episodes of heat-related mortality and respiratory disease, and the increased vulnerability of populations to power outage under scenarios of increased heat (*See Section I*).

Whereas property/casualty observers have argued that they can adjust their rates on annual renewal policies if climate conditions worsen (Mooney, 1998), most individual life insurance policies are long term in nature with maximum levels set on mortality charges. Life insurers with managed care operations might be additionally vulnerable to increased health care utilization with the outbreak of infectious disease. In the past, public health measures eradicated most vector borne diseases from the U.S with the use of DDT for mosquito abatement and sulfa drugs for treatment. Changing climate conditions, drug and pesticide resistance, and environmental concerns about pesticide use could impede responses to future outbreaks. Vaccines for malaria and dengue have not emerged, and North Americans generally have less resistance than people commonly exposed to these diseases. These and other diseases may not reach many individuals with resources to spare on life insurance, but the potential for epidemic remains a possibility. With regard to heat related ailments, investments in decentralized power systems like wind and solar might serve as backups under situations of increased heat or storm damage, while other mitigating steps might include improved insulation, higher reflectance roof coverings, energy efficient windows, and increased tree cover.

Emerging Insurance Markets Risks and Opportunities. Climate change could pose greater public health risks, especially in emerging insurance markets, where debt burdens stand to hinder public health responses or where food and water adequacy could be challenged by a change in climate. Such conditions could weaken economies and diminish demand for life insurance products.

Multinational Monitor indicates that most World Bank investments in power generation slated for India and other Asian countries are in traditional coal fired plants (Wysham et al, 1997). The greenhouse gas impacts of these investments are considerable, not to mention the local effects on

air quality from the standpoint of acid deposition, particulate matter, and ozone. Perhaps more significant is the widespread practice of wood and coal burning for domestic use. During President Clinton's visit to China, news reports circulated that "20% of all deaths in China's big cities are due to respiratory ailments linked to air pollution" (Lin, 1998).

Seeing as most countries have standards requiring insurers to invest in domestic entities, however, life insurance companies could help mitigate the impacts of global warming in their host countries by investing in or encouraging renewable sources of energy and energy efficient technologies. Investments in cleaner energy technology for China may get a boost seeing as Presidents Clinton and Jiang Zemin agreed

to intensify their cooperation on developing cleaner energy sources and monitoring greenhouse gas emissions (Laura Myers, AP/San Francisco Chronicle/Examiner online, 6/28). The joint efforts would focus on reducing emissions from coal-fired power plants (John Broder, New York Times, 6/27), helping China lessen its dependence on inefficient coal technologies (John Harris, Washington Post, 6/27), and helping China establish a national air-quality monitoring network (Warren Strobel, Washington Times, 6/27). The leaders also said they intend to work together to fight environment-related health problems (John Broder, New York Times, 6/28) and hold a water-resources management workshop in the US later this year (Reuters/Inside China Today, 6/29) (*Greenwire*, 6/29/98).

Other promotions following Clinton's visit include an effort sponsored by the Dept. of Energy to showcase energy efficiency approaches and technologies for commercial buildings (*Greenwire*, 7/10/98). The high profile of these efforts lends salience to the growth opportunities for investments in energy efficiency in countries like China.

Domestic Policyholder Investment Options. In addition to domestic and overseas investments in renewable energy generation and energy efficiency, life insurers might stand to capture a potentially lucrative market of environmentally conscious consumers. Life insurers offer several forms of tax-deferred investment vehicles including mutual fund options for their variable annuity and cash-value life insurance products. Mutual fund options might include offerings from well-recognized firms like Fidelity, Vanguard, Dreyfus, or T. Rowe Price, or internally managed funds. Life insurers have been a major player in the market for guaranteed investment contracts which offer secure, fixed income options with competitive returns, typically for 401(k) and 403(b) employer retirement plans. In view of Best's Review encouragement (Mayewski et al, 1997) that life insurers match the capacities of their chief competitors, especially banks and mutual fund companies offering variable deferred annuity products, life insurers may stand to benefit from an emerging trend in mutual fund investment. In recent years, socially conscious investment funds have enjoyed significant growth:

- 1) nearly 9% of all assets under professional management is part of a socially invested portfolio,
- 2) between January 1, 1995 and January 1, 1997, total assets in funds applying social or environmental screens grew 227%, as compared to 84% for all institutional tax-exempt assets under management,
- 3) the number of mutual funds employing social and/or environmental screens has increased from 55 to 144 between 1995 and 1997 (See Appendix I)⁴,

The growth in demand for these investment options may provide an avenue for promoting investments in renewables and energy efficiency. A common hurdle to promoting these

⁴ The surge in responsibly invested mutual funds is attributed, in large part, to the move against investments profiting from the sale of tobacco products led by such groups as the American Medical Association (AMA) and the Coalition for Tobacco-Free Kids (See Appendix I).

investments is the contention that investment screens limit flexibility and can inhibit market returns. Whereas most mutual funds have lower returns than the S&P 500, several socially screened investment funds have surpassed the S&P 500 depending on the time of measurement. As of May 31, 1998, the Domini Social Index of 400 firms has outperformed the S&P 500 from the standpoint of 1-year, 3-year and 5-year averaged returns and The Domini Social Equity Fund has received a 5-star rating from Morningstar for these 3 periods. The Citizens Trust Index Portfolio has recently received a 5-star rating for the period ending March 31, 1998. The Parnassus Fund has produced extremely favorable returns, which vary somewhat depending on the point of measurement due to its contrarian approach. Parnassus has offerings through Standard Insurance and Minnesota Mutual, but these insurance companies do not broadly advertise Parnassus. Several other social investment funds have already gained market share among group retirement and IRA savings plans. One fund, The Calvert Group, has had considerable success in marketing its fund to major life insurers, and has formed an alliance with Acacia Life Insurance Company.

Figure 7: Calvert Group Market Offerings among Insurance Companies

	<u>Individual</u>	<u>401(k)/403(b)</u>	<u>Sect 457</u>
Acacia Mutual	x		
Aegon	x		
Aetna	x		x
American United Life		x	
Lincoln Life		x	
Metropolitan Life		x	
Mutual of America (American Life)	x	x	
New York Life	x	x	
Protective Life	x		
The Hartford			x

Some insurance companies market their own social or environmental funds. Security Benefit Life of Topeka, KS offers its own *Social Awareness Fund* option for its deferred annuities and variable life products. Another insurer, UNI Storebrand of Norway in partnership with Scudder Investor Services, offers the *Environmental Value Fund*, which invests exclusively in companies with the best environmental records for their respective industries.

The common misperception that being green means lower returns has been disputed in a study of 243 firms. Using criteria developed by the Franklin Research and Development Corporation, Russo & Fouts (1997) found a positive correlation between environmental and economic performance. Several investment advisors have caught on and have devised environmental performance criteria for choosing stocks, and have shown better than average returns (Greenwire, 7/20/98). Of these groups, Innovest Group International has clients including five Fortune-100 companies and one among the world's 10 largest insurers. Vantage Global Advisors compared the returns of its unscreened portfolio of 1,300 companies with that of a screened subset of this portfolio. The subset portfolio was screened for military, nuclear power, alcohol, tobacco, gambling, and environmental criteria from Kinder, Lydenberg and Domini, and produced nearly identical returns for the January 1987-December 1994 period (unscreened 277% vs screened 274%), with nearly identical variability (Guerard, 1996).

Life insurers could benefit from considering the demographics of environmentally conscious consumers. Market research has indicated that consumers with environmental priorities tend to be educated women, age 30 to 44 with incomes greater than \$30,000, and tend to be "influential in their community... [and] rally support for local environmental clubs and social causes" (Ottman, 1998). In light of this orientation to promoting their causes, a foothold among this group of consumers could be a self-activating marketing strategy.

Investment opportunities in renewables and energy efficiency are showing promise as more and more industries recognize the challenges presented by climate change. Though many in the oil industry are resisting policies to contain climate change, several oil companies are teaming up with auto manufacturers to develop fuel cell engines and pumping stations to fuel them, including companies that have resisted the Kyoto Protocol, like Mobil and Ford. Other oil companies like British Petroleum, Enron, Amoco and Shell Oil have embraced the Kyoto challenge and are investing large sums in solar and wind power. Sales for wind power grew 25% in 1997 and 40% for solar, and markets for renewables are nowhere near saturation. While the U.S. is the largest producer of solar panels, the developing world is the largest consumer, especially in places where electrical power infrastructure is lacking. The demand for renewable power in the U.S. will become more apparent as utility deregulation progresses and as the price of renewable energy approaches existing sources. Industrial involvement in climate change and energy efficiency extends into many other sectors. A group of 17 major multinationals have joined the Pew Charitable Trust's Business Environmental Leadership Council⁵ which aims to foster activism among businesses concerning climate change. While a complete analysis of the marketability of funds directed specifically at energy efficiency and renewables is beyond the scope of this study, global warming has salience, a vocal commitment from the Executive branch, and much unexplored investment opportunities to sell.

Potential Barriers to Partnership with Life Insurance Companies. The health risks associated with climate change may be perceived as too minimal to concern life insurers. Most longer term policies have provisions for increased mortality charges if experience proves worse than anticipated. Mortality expense charges, however, do have upper limits, and the group most likely to be affected by climate-related mortality might be older groups with limited capacity to sustain rate increases.

Life insurer investment policies might pose potential barriers to partnership. Reserving standards mandate that a significant portion of life insurance general assets be invested in fixed income securities, with much priority given to high quality investments. These standards might limit life insurers' exposure to equity investments or bond issues from start-up firms specializing in renewables and energy efficiency. In light of these constraints, it should be emphasized that several major corporations are investing heavily in solar, wind and energy efficiency, so that relatively high quality investments in this area are available. Among the interested parties are companies from the oil and utility sector, whose relatively high dividends complement most insurers' portfolio management strategies. Insurers with a penchant for energy stocks should consider that Innovest Group International has found greater returns for oil companies with better than average environmental standards.

While investment restrictions generally do not apply to variable products offering a choice of investment funds, another potential barrier to partnership may stem from a stigma or unfamiliarity with social investment strategies. As mentioned, a common perception is that social screens diminish investment returns. The social investment market has seen considerable growth, especially after recent revelations from the tobacco industry, but insurers focus primarily on measures of risk and reward. Most insurers provide their own investment fund offerings, but we are aware of only one, Security Benefit Life, that has offered its own social investment fund. Several major insurers offer Calvert Group social investment funds, but this offering is generally one among many. In addition to concerns about returns on investment, insurers may be wary of

⁵ Several major industries, some with direct interests in fossil-fuel production or use, like Boeing, Lockheed-Martin, BP, Enron, Sunoco, BP, Enron, United Technologies, Maytag, Whirlpool, Toyota, American Electric Power, Intercontinental Energy Corporation, 3M, International Paper, Baxter International, Holnam Inc., and Air Products and Chemicals Inc. have issued a joint statement with the coordination of the Pew Charitable Trusts to address means of mitigating the causes of climate change. www.pewclimate.org/council.html

affiliating with any environmental concerns like climate change. Public opinion generally weighs in favor of taking action, but a large market for life insurers includes companies and associations opposed to such activism. If affiliating with environmental concerns like climate change seems like an unnecessary risk, it should be emphasized that investments in renewables and energy efficient technologies have considerable growth and loss-prevention potential.

While climate change could present substantial obstacles to public health and economic growth in overseas markets, it could be argued that any company expanding overseas is taking on a multitude of other risks. In the wake of the Asian and Latin American currency and economic crises, the risks of climate change may seem too distant and abstract to present any pause for consideration. Nonetheless, reports about significant air pollution and flooding due to deforestation along the upper Yangtze river, in a year of somewhat normal rainfall, should serve as an alert to companies pursuing the Chinese insurance markets. International and domestic support for alternative energy resources, furthermore, may provide investment opportunities for insurers expanding abroad.

Section IV: Health Insurance/Managed Care Industry : Major Trends

Dominance of Managed Care. Managed care has become the dominant paradigm for health care delivery mostly in response to uncontrolled health care cost inflation for employers throughout the 1980s and early 1990s. A simple projection of health care costs from the standpoint of the early 1990s might have predicted that, unabated, health care expenditures would climb from 14% of GNP to 20% by the first decade of the 21st century, as the trend rate far exceeded GNP. Since its introduction in the early 1990s, employers sponsoring health plans and insurers have promoted managed care to contain cost increases. Managed care organizations act as insurers and health service providers. Some insurance companies have formed or acquired managed care operations, while some managed care organizations have initiated or purchased other lines of insurance (Nowacki et al, 1997). Life insurers currently own the largest number of HMOs. In response to consolidation among health care purchasers, health care providers like doctors and hospitals have formed groups to strength their negotiating position with purchasers. Others have formed their own managed care plans (Bailit, 1997). Statistics as of 1995 provide an overview of the constellation of HMO ownership arrangements:

*Table 8: HMO Ownership as of January 1, 1995
(American Managed Care and Review Association Foundation, in HIAA 1995)*

Insurance companies	154	Corpoation	26
National managed care chains	124	Physician/hospital joint ventures	19
Blue Cross/Blue Shield	88	Physician/medical group	18
Independently owned	67	Cooperatives	10
Hospital or hospital alliance	43	Other	79

Insurance companies offering traditional fee-for-service indemnity arrangements have faced heavy price competition from managed care, and several companies like USLIFE, Credit Life, Horace Mann Life Insurance, Mass Mutual and John Hancock have either discontinued their indemnity lines or sold them to managed care companies (Nowacki et al, 1997). Meanwhile stiff competition within the managed care arena has led to price cutting, relaxed underwriting, greater physician network choices, consolidation even among non-profit Blue Cross Blue Shield plans, and higher underwriting losses (Nowacki et al, 1997). The shift to the managed care paradigm has not spared several operators from underwriting losses in 1995, 1996, and 1997. Many attribute these losses to inadequate premiums, rapid increases in drug costs, and pressures to offer greater choices of physicians for plan members. Many health plans hiked premiums significantly for 1998, and have returned to profitability. New risk-based capital requirements may force some managed care operators to increase rates further (Novak, 1998).

Managed care in the form of Health Maintenance Organizations have fundamentally altered the traditional fee-for-service arrangement, which gave doctors and health systems little incentive to limit requests for an ever-increasing number of treatments and laboratory tests. HMOs contract with groups of providers, with compensation either based on salaries, fees per enrolled member (“capitation”), or discounted fee-for-service schedules. Under capitation, insurers pay doctors’ groups an overall fee based on enrollment, and doctor’s decide how to distribute fees among themselves. This arrangement discourages excess utilization because providers gain no compensation for extra tests and procedures. Providers may receive bonuses subject to their utilization record. Variations on the HMO include Preferred Provider Organizations (PPO) which allow larger networks of providers and hybrid HMO-PPO arrangements called Point of Service (POS) plans (HIAA, 1996). Patients seeking treatment outside of a negotiated group pay extra. In response to increasing public and regulatory demands for POS options, health insurers have moved to incorporate risk/profit sharing with care providers. Doctor and hospital groups have merged and consolidated to increase bargaining power with insurers, and lobbied Congress successfully in 1997 to allow for Provider Service Organizations (PSOs), through which providers may assume the role of a risk-bearing insurer for Medicare recipients (Ginsburg, 1998). The increasing overlap of insurers with providers has fostered the integration of delivery systems merging managed care companies with physician groups and hospitals.

Backlash to Managed Care. The managed care concept by 1995 had succeeded in enrolling 73% of employees with health coverage (Bailit, 1997). However, the growth of managed care plans has coincided with increased complaints about plan restrictions, consequent declines in quality of health care, unionization drives among doctors in New Jersey, and efforts to revoke the license of the one of the largest HMOs in Texas, Kaiser Permanente (Bowers, 1998b). HMO executives have received much press for lucrative compensation arrangements perceived as at the expense of plan member choices (Families USA, 4/1/98). State legislators have proposed nearly 800 managed care bills. Bills passed in 1995 aimed at ensuring broad disclosure requirements, utilization review fairness, fairness for physicians, point-of-service options and choices of health plans (The HMO Page, 8/10/95). Much to the chagrin of HIAA, pending Congressional Republican proposals would mandate external appeals and point-of-service requirements for HMO plans and promote statewide healthcare purchasing cooperatives (Gradison, 1998). Managed care organizations have responded to pressure from public opinion, legislators and regulators managed care paradigm with various public relations and organizational initiatives.⁶ Other threats to the health insurance carriers include the advent of employer coalitions functioning as managed care operations without a health insurance intermediary. These arrangements have developed out of concern in some regions that consolidation among managed care organizations has limited plan options, accountability among doctors, and price competitiveness for plan sponsors (Hann, 1997).

Non-profit HMO Backlash. While health insurers resist efforts to regulate managed care, non-profit managed care organizations increasingly face questions about the public benefits they provide to maintain their tax-exempt status (Proenca, 1998; Schlesinger et al, 1998). Anspaugh (1997) explains that as non-profit care health care providers have felt pressure to lower costs in the form of lower reimbursements, they have sought mergers and alliances among themselves and with for-profit organizations. Citizen and regulatory groups have responded with threats to their tax-exempt status on the grounds that these alliances undermine their charitable missions of emergency room care and various forms of community health outreach. Similar pressures have

⁶ Since 1995, the HIAA has partnered with the Agency for Health Care Policy and Research to promote consumer awareness of managed care plans and criteria for choosing among plans (AHCPR, 1995). The American Association of Health Plans has been working to “head off legislation by promoting programs such as the ‘patients first’ initiative, which voluntarily set standards for members of the association to safeguard the needs of consumers” (Barbara Bowers, 1998b).

been brought to bear on non-profit health plans, culminating with the implementation of community benefit standards for managed care plans (Schlesinger et al, 1998). In Massachusetts and Minnesota, these standards call on non-profit HMOs to develop a strategy to aid in community health and report on their progress. Another concern for non-profit managed care organizations, like Blue Cross Blue Shield plans, is that as they adopt more popular and flexible PPO and POS plans that transfer more risk to the plan than to the service providers, their tax-exempt status becomes vulnerable to IRS investigation (Vecchioni, 1997)⁷. Plans considering an escape from the regulatory yoke of tax-exempt status, however, have found privatization prohibitively expensive. The IRS required California Blue Cross to donate \$3 billion to a health care foundation when it transferred to private ownership as Wellpoint Health Networks, Inc. Similarly, Missouri Blue Cross became RightCHOICE Managed Care, but had donate \$500 million of its stock to a private health care foundation. In light of these costs and needs to remain competitive, the number of Blue Cross plans have consolidated from 100 to 55 over the past few years (Nowacki, 1997).

Incentives for Prevention. While under considerable scrutiny, the managed care paradigm and its widespread consolidation (12 national HMO firms represent 70% of enrollment [Schlesinger et al, 1998]) provide several economic incentives to partner with public health interests and promote preventive strategies. The managed care compensation structure of salary or capitation means that managed care organizations and health care providers benefit from less utilization. Incentives for healthy lifestyles are clearly in their interest. Chief among these preventive efforts have been incentives to exercise, wear seat belts, quit smoking, and prevent alcohol and drug abuse, HIV transmission, and teenage pregnancy (AAHP, 1998; HIAA, 1996). Several have observed that managed care and provider organizations, as they consolidate under capitated arrangements, stand to benefit from public health initiatives (Schlesinger et al, 1998; Proenca, 1998; Chapel et al, 1997; Reiser, 1997; Halverson et al, 1997, Levinson, 1997). These benefits will become more apparent as Medicaid and Medicare recipients transfer to managed care delivery. Forty percent of Medicaid recipients were enrolled in managed care as of 1996 (Bailit, 1997). Medicare migration to managed care has been more gradual, but recent AARP endorsement of certain managed care contracts for the elderly may encourage greater enrollment (Nowacki, 1997).

Public-Private Health Care Collaboration. In light of industry consolidation and reductions in public health care budgets, several public health interests have sponsored partnerships with managed care providers, doctors and hospitals to further public health interests. One such partnership initiative, the Community Care Network has conducted a study on 25 such efforts⁸ around the country and the most common public-private collaborative activities undertaken to date are preventive in nature: 72% of the groups collaborate on health education efforts, 62% work together on immunization, 52% on injury prevention, and 52% on prenatal care for the uninsured (Bazzoli, 1997). Petersen (1998) sees health promotion as a common thread among these partnerships. Halverson et al (1997) reviewed 63 such partnerships and discovered much interest in preventive outreach, education, and health planning and policy development. Several studies indicate interest in partnerships facilitating data collection on potential markets, costs and effectiveness of treatment, immunization records, disease, health needs and customer satisfaction (Halverson et al, 1997; Bazzoli, 1997; Petersen, 1998; Nelson et al, 1998). Halverson et al (1997) found that until recently, non-profit managed care organizations have sought the bulk of these partnerships; however, with the advent of managed care for Medicaid and Medicare, more for-

⁷ IRS tax-exempt criteria (501c(4)) favors plans that compensate health care providers based on capitation, salary, or heavily discounted fee schedules as in Medicaid and Medicare to PPO or POS plans that offer coverage to out-of-network providers thereby forcing the plan to assume greater insurance risk. Other criteria include maintaining broad community representation on the board of directors, affordable rates, and access to underinsured groups like small employee groups, Medicaid and Medicare.

⁸ sponsored by the American Hospital Association, the Health Research and Educational Trust, the Voluntary Hospital Association, the Catholic Health Association, the W.K. Kellogg Foundation and the Duke Endowment

profit organizations are taking an interest. Their analysis suggests greater interest in public-private collaboration among managed care organization in places with high levels of managed care penetration and consolidation. Bazzoli (1997) found that physician's organizations also can play a positive or negative role in promoting partnerships.

Potential Barriers to Public-Private Collaboration. While many observers acknowledge the economic incentives to health care purchasers and providers from public health initiatives, several caution that competition and consolidation may narrow the scope of partnership efforts. Chapel et al (1997) comment that public outreach efforts among health care provider organizations are vulnerable to budget cuts in highly competitive environments, if they fail to frame their missions in terms of business goals, like prospecting for new markets, or cannot document the impacts of preventive efforts. They note that the tools for measuring the returns on preventive efforts are just being developed. Petersen (1998) suggests that managed care organizations partnering with public health agencies may need to focus efforts on target populations, but should emphasize the preventive aspects of partnerships. Schlesinger et al (1998) contend that while employers may pursue prevention efforts within their firms, cost containment concerns may override community-wide efforts, especially if sponsors have disperse populations. Surveys also indicate that individual enrollees are not demanding community based health initiatives. They may favor public health in general terms, but when asked to evaluate concrete measures of plan performance, "even the most relevant forms of health promotion are often confusing to consumers and seem to have little influence on their choice of a health plan" (Schlesinger et al, 1998 citing: Hibbard J. et al 1996; Tumlinson et al, 1997). In response, Schlesinger et al (1998) and Chapel et al (1997) argue for government advancement of community health standards. Both studies identify the potential leverage to be gained from public employee and Medicaid/Medicare managed care contracts with incentives for community health. Thus, while the economic incentives for public health initiatives are gaining steam, government involvement may be needed to facilitate greater public-private partnership.

Regardless of potential limitations, the idea of managed care partnership with community health efforts has reached into other realms of health care practice. Among several recommendations to employers sponsoring health care, McNeill (1998) endorses the promotion of health not only within the workforce, but also from the standpoint of the community:

Involve the community. Employers pay large premiums to health plans and thus tend to feel that the plans should take the responsibility for ensuring cost-effective care of their workers. This focus on plan responsibility was necessary to ensure a good transition to managed care by shaping the plans to attend to employer demands. Now the circle of responsibility has to be widened to the community. A community approach acknowledges that factors beyond the influence of a health plan affect health and that community-wide efforts, to enhance prevention programs, for instance, or combine resources for certain patient groups, will boost outcomes. Employers can be important facilitators for community health initiatives, using their leverage to bring stakeholders together and drive change.

McNeill's comments reflect a recurring theme that the current returns on health care investments are lacking and that addressing community health issues might produce greater results. Health care purchasers and providers under capitated arrangements stand to benefit from community health efforts, especially as the population ages and becomes more vulnerable to chronic disease conditions. The high costs of treating chronic disease and the implications of increasing case loads due to an aging population have mobilized several plans and providers to consider disease management (Terry, 1997; MacStravic, 1998). MacStravic (1998) recommends that health care providers considering chronic disease management should develop partnerships with community organizations, and public and environmental health agencies, to reduce "environmental risks, [and improve] lifestyles, earlier detection... and education". Though prevention efforts sponsored by

health care purchasers and providers have focused primarily on lifestyle issues, the consolidation of much of the population under the managed care paradigm offers incentives for considering environmental risks as well.

Section V: Health Insurance/Managed Care Industry : Opportunities for Partnership

As discussed in Section IV, competition in the managed care industry is intense and the public's reception of HMOs is suffering. In spite of past support, Congressional Republicans have been moving to require broad disclosure terms, point-of-service options, external appeals mechanisms for disputed claims, utilization review guidelines, and statewide health care purchasing cooperatives. Democrats have pushed for the right of policyholders to sue for inappropriate restrictions on care, but this provision seems unlikely to pass. Non profit HMO's also face pressures to fulfill their community service mandates, with threats to their tax exempt status. Clearly much pressure is on managed care providers to respond to public demands for quality of care, choice of physician, and reasonable cost. The managed care industry could help address some of these demands through community health initiatives with the potential of reducing costs and promoting higher standards of health.

Many public-private initiatives have emphasized preventive measures with an emphasis on the *individual* like health education, immunization, and screening for disease. Climate change and other environmental issues with implications for public health require *collective* action from all sectors of society. Community-based efforts could produce significant local health benefits if aimed at reducing smog, poor IAQ, resulting respiratory ailments, and over-dependence on the electrical grid during peak demand, especially for hospitals. Stakeholders to these efforts might appreciate the money pouring into renewable energy and energy efficient technologies, and the support of several large corporations for taking action on climate change. While climate related risks might seem distant or elusive, Medicaid and Medicare managed care providers should bear in mind that these populations might be the most vulnerable to public health threats from climate change. Insurance or provider groups experiencing consolidation also might want to consider that widespread market share might mean greater exposure to climate-related risks in areas with fewer competitors. Broader exposure to climate-related risks may encourage health carriers and providers to work with public health officials in promoting climate change adaptations. Further considerations include the rising costs of respiratory ailments like asthma as compared to the benefits of reducing ozone and particulate matter. While recent chronic disease management programs have helped contain the costs of treating asthma, reductions in fossil fuel emission would advance these efforts more effectively. Ultimately, efforts to reduce smog forming and greenhouse gas emissions could have broad appeal if conceived in terms of thinking globally and acting locally by helping reduce the more long-term health impacts of climate change.

The timing of an initiative to the major health insurance organizations is debatable seeing as the industry is currently in the midst a battle over Republican sponsored regulations to limit plan restrictions on managed care. In addition, Democrats have demanded that lawsuits be allowed against managed care organizations when treatment is denied improperly. Expenditures as of July, 1998 on public relations and advertising to oppose this legislation are as high as \$2 million for the American Association of Health Plans (AAHP) and \$1.5 million for the Health Benefits Coalition representing employers and insurance companies (Pear, 1998). Seeing as the AAHP promises to spend more, federal regulation is clearly their overriding concern. Approaching health insurance organizations regarding this topic at this time, however, could be strategic from the standpoint that it might offer a means to establish public credibility. The AAHP has shown interest in collaboration with community health issues by:

1. sponsoring awards to member plans making notable community health efforts (AAHP, 1998),
2. promoting greater efficiencies in immunization programs (Petersen, 1998),

3. partnering with the Agency for Health Care Policy and Research to reduce tobacco use and to support the “Building Bridges” conferences promoting research collaboration among HMOs and government, academic and foundation entities (Nelson et al, 1998),
4. working with the Center for Disease Control and the HMO Group (representing some of oldest and largest HMOs) to develop research capabilities within managed care, evaluate programs, and provide new initiatives for health improvement (Nelson et al, 1998).

The AAHP’s prevention and community health interests have primarily aimed at individual lifestyle issues, but this is not inconsistent with a homeowner taking steps to improve IAQ and insulation. Furthermore, commentators have observed that public-private efforts might have the greatest chances of acceptance when the benefits accrue mostly to plan members (Petersen, 1998; Schlesinger et al 1998; Chapel et al, 1997). For employers that own their workplaces, these objectives would coincide with building improvements like IAQ and energy efficiency improvements. The issue of IAQ has credibility at least among health care providers seeing as the Joint Commission for the Accreditation of Healthcare Organizations has recently published guidelines on the topic. Inasmuch as employers have phased out smoking from workplaces, IAQ and energy efficient HVAC could be presented as an important next step to improving workplace health and safety.

As for approaching individual managed care organizations, those with a history of involvement in public health issues and research might be the most welcome to gestures on climate change, energy efficiency and renewables. Managed care organizations that have had a long history in health care research include Kaiser Permanente plans, the Henry Ford Health System, and the Group Health Cooperative of Puget Sound (Nelson et al, 1998). Several other organizations have delved into public research more recently (see Nelson et al, 1998). The CDC has maintained an Office of Managed Care which might be a good reference for other managed care organizations that have taken part in previous public-private collaborations, as would organizations sponsored by the Community Care Network (see page 9) and those recognized by the AAHP for their community health initiatives.

While health insurance organizations may welcome partnerships, other stakeholders in the public-private health care discussion might be even more supportive. Engaging health care provider organizations could bolster the salience of climate-related health issues within the current public-private collaborations for community health. An obvious place to start would be to join forces with the signatories of the 12/1/97 New York Times letter: “*Medical Warning: Global Warming*”. Other organizations include, the *National Association of Physicians for the Environment* which has funding from the EPA and directly promotes energy efficiency and the ENERGY STAR program, and *Physicians for Social Responsibility* which has a large policy directive on climate change as well. The *American Public Health Association* supports a policy statement on climate change (APHA, 1997). With regard to private-public collaboration on community health, much of the funding for these initiatives already comes from federal agencies like the Agency for Healthcare Policy Research (Dept. of Health and Human Services), CDC and the NIH⁹, which have research priorities regarding climate change, air pollution or respiratory

⁹ The Medicine/Public Health Initiative with sponsorship from the Agency for Healthcare Policy Research, the CDC, the Josiah Macy, Jr. and W.K. Kellogg foundations has brought together the leadership and membership of the American Medical Association and the American Public Health Association to collaborate various on the following principles: “engage the community, change the educational process; create joint research efforts, devise a shared view of health and illness; work together in health care provision; jointly develop health care assessment measures, and create local and national networks to translate initiative ideas into action” (Reiser, 1996). While the APHA has a policy statement urging action on climate change (APHA, 1997) whereas the AMA has none but has taken on the tobacco industry with a divestment campaign.

The CDC and NIH provided grants of \$800,000 to six managed care organizations (60 applied) to address “various aspects of research, delivery and data collection related to sexually transmitted diseases within MCOs. The grants represent the first of several rounds of awards to be made available to MCOs that are conducting public health work”

disease. Discussion with these agencies might include characterizing portions of studies and grants in such a way as to anticipate the effects of health-related issues under changing climate conditions, or to project health improvements due to improved IAQ and other energy efficiency technologies.

Organizations of health care providers or with health interests on a national and local scale could also become valuable partners in promoting greater acceptance of energy efficient technologies. If managed care organizations dealing with communities and with providers hear the message about climate change and energy efficiency from their community partners, they may show more interest in the topics. Together, these organizations might forward a network collaboration strategy. The following organizations were chosen for their emphasis on issues of health and climate change. While almost all of the major environmental organizations are very much involved with promoting action on climate change, the following groups have a very defined focus on health issues:

- 1) Children's Health Environmental Network (www.chechnet.org) provides information on impacts of air pollution on children's health (www.chechnet.org/chech/index.html).
- 2) Children's Environmental Health Network (www.cehn.org) supports various initiatives on federal level and takes stand on climate change (www.cehn.org/climate.html).
- 3) Environmental Working Group (www.ewg.org) reports on several environmental health issues, including air quality, and keep close track of groups trying to delay or misconstrue environmental regulations. They launched a very effective campaign on pesticides.
- 4) Environmental Defense Fund (www.edf.org) has major initiative on climate change and energy efficiency and has much experience developing partnerships with business.
- 5) W. Alton Jones Foundation (www.wajones.org) helped sponsor the New York Times letter and supports work on several other environmental health issues.
- 6) The Pew Charitable Trust (www.pewclimate.org/home.html) has teamed with big business on climate change (*See footnote page 5*), is investigating it from a health perspective and is focusing on public health concerns (www.pewtrusts.com/programs/hhs/hhswp.cfm).
- 7) Robert Wood Johnson Foundation (www.rwj.org) and W.K. Kellogg Foundation (www.wkkf.org) have supported community health issues. No statements were available concerning climate change.

Potential Barriers to Partnership with Health Insurers. Potential barriers to partnership with health insurers and providers on the topic of climate change or energy efficiency probably have much in common with problems facing public-private collaboration efforts. These barriers might include budget limitations stemming from increased competition, health plan sponsor (employers) concerns that efforts be focused on target populations, inadequate means to measure the returns on preventive efforts, and little demand from individual consumers. Public health issues like air quality and climate change may not captivate much interest among health insurers given more immediate concerns about profitability, market share, cost containment, complaints against managed care procedures, threats of additional regulation and rapid organizational changes due to consolidation and integration with providers. As with life insurers, taking a stand on the issue of climate change may appear to some insurers as an unnecessary liability with clients. Furthermore, if climate-related health risks become widespread, the industry could respond with regional premium increases, so long as a large share of the public and plan sponsors can foot the bill. If

(Petersen, 1998).

The AHCPR is conducting research on asthma and respiratory ailments with the help of three large HMOs in Boston, Chicago and Seattle, "to evaluate the effectiveness of different methods of diagnosing, treating, managing and, where applicable, preventing widespread health problems. AHCPR is providing \$1.28 million for the first year and has earmarked \$4.80 million to complete the study. The National Heart, Lung, and Blood Institute, which developed the guideline to be used in the study is contributing \$800,000." <http://www.ahcpr.gov/news/press/respdis.htm>

needed rate hikes exceed the budgets of families and employers, however, health risks could become uninsurable or the public could demand greater federal involvement in health coverage. Here again, an emphasis on the potential gains from adaptive measures may attract more interest.

Doctors and hospitals may have increasingly stronger financial interests in preventive health measures, but climate change may still rank as a distant, elusive threat. These groups, however, may not have the same concerns as insurers about losing business if they take a stand on climate change. Health care providers taking such a stand can support their positions with the endorsements from major public health organizations like the World Health Organization, the American Public Health Association, the National Institutes for Health, and almost all of the world's environmental protection agencies. The potential for partnership with doctors and hospitals might depend somewhat on endorsement from the American Medical Association, the American Hospital Association and the associations for the major specialties like the American Council on Pediatrics. The AMA has generally focused attention on personal rather than environmental health concerns. Their divestment campaign against tobacco companies may reveal an increasing willingness to look beyond personal issues.

While plan sponsors (employers) have shown some interest in community health issues, climate change is global in scope and may not inspire the same sense of local immediacy. Several employers also may sympathize with groups like the Global Climate Coalition, and may be opposed to any support of partnership with the EPA or DOE on this topic. However, inasmuch as employers have taken on community health issues with some degree of concern for their operations, they may also see benefits in energy efficient technologies offering property loss prevention and health improvement for their own facilities. Even GCC members like the American Petroleum Institute have made strong recommendations for investment in energy efficiency.

Community health partnerships often focus on prevention but climate change may still rank as a distant, elusive threat. Emphasis on alleviating more immediate concerns like smog, asthma, emphysema, and other respiratory ailments may captivate more interest among these groups than dealing with climate change. The need for surrogate focuses, however, may become less important if climate extremes, like the 1997-1998 El Niño, become more common place. Since many of these collaborations have received significant grant sponsorship, it may help to encourage these sponsoring government agencies and foundations to condition future grants on consideration of smog, IAQ, respiratory ailments, and potential health impacts of climate change. An important priority would be to focus on the environmental causes of respiratory ailments, seeing as some insurers and providers have developed specialized facilities and procedures for dealing with asthma. Obviously, managing the treatment of chronic disease is a first priority, but much could be done to address the underlying environmental causes.

Section VII Conclusions

Climate change poses several risks to the life insurance and health care industries, but also many opportunities to improve competitiveness and reduce costs. It might be argued that public health infrastructure in the U.S. is sufficient to stave off significant mortality losses due to climate changes. Climate alterations, however, could affect growth opportunities for life insurers in overseas markets with debt-related constraints on public health and infrastructure. In several ways, U.S. life insurance companies stand to benefit from larger efforts to limit climate change. Whether through investment initiatives or partnerships to limit climate change, U.S. life insurance companies can:

1. help limit adverse experience,
2. improve or maintain competitiveness within the market for financial services,
3. improve industry credibility and social standing, and

4. preserve and enhance growth opportunities abroad.

Industries favoring energy efficiency and renewable energy offer significant investment opportunities, some of which are major global corporations. Such investments could enhance general asset allocations and may prove to be popular offerings for variable annuity and life insurance products. Similar opportunities may also be possible in overseas operations, and could facilitate immediate reductions in IAQ problems, smog and its attendant effects on respiratory health. These efforts might compliment property/casualty initiatives to reduce property losses via energy efficiency technologies.

Health care organizations have experienced significant organizational changes in the past decade with the growth of managed care arrangements and the integration of health care providers with health insurers. Compensation structures favoring efficient utilization of services and the growth of managed care for Medicaid and Medicare recipients have given considerable incentive to preventive health measures, including collaborative efforts with public health officials. The health risks related to climate change could undermine these and other efforts to improve community health and reduce health care utilization. Nonetheless, community health initiatives bring together providers, public health officials, insurers, and community groups and thus provide several constituencies to approach with regard to the health effects of climate change, smog, or IAQ. Climate change already has considerable salience for public and environmental health organizations nationally and globally. A mandate for action on climate change, energy efficiency and renewable energy could expand upon

1. collaborative efforts currently underway to promote community health,
2. initiatives aimed at improving IAQ within health care organizations through the Joint Commission for the Accreditation of Healthcare Organizations,
3. EPA efforts to promote energy efficiency among physicians practices

With the help of organizations committed to funding community health initiatives and other public health organizations committed to addressing climate change, future health initiatives could reach beyond the current focus of personal issues, and consider underlying causes including environmental concerns like air pollution and climate change.

**Social Investment Forum
1997 REPORT ON RESPONSIBLE INVESTING TRENDS IN THE UNITED STATES
November 5, 1997**

“Between January 1, 1995 and January 1, 1997, total assets under management in screened portfolios for socially aware investors rose 227 percent from \$162 billion to \$529 billion. Over the same period, institutional tax-exempt assets under management in the U.S. grew by 84 percent (including both market appreciation and cash inflows), according to Pensions & Investments.

“The number of responsibly invested mutual funds has nearly tripled in the past two years. In 1995, the Social Investment Forum identified 55 mutual funds as employing social and/or environmental criteria as a part of their formal, publicly stated investment policy. Today, that number has risen to 144, a gain of 162 percent. The surge in responsibly invested mutual funds is attributed, in large part, to the move against investments profiting from the sale of tobacco products led by such groups as the American Medical Association (AMA) and the Coalition for Tobacco-Free Kids. Other factors include: growing demand from socially concerned investors and improved data collection for purposes of the 1997 study.

“Tobacco is now the common denominator for virtually all socially aware investors. Over 97 percent of managers running screened portfolios and 84 percent of all socially screened assets avoid investing in tobacco companies. Other screens include: gambling, 72 percent; weapons, 69 percent; alcohol, 68 percent; birth control/abortion, 50 percent; environment, 37 percent; labor 25 percent; human rights, 23 percent; and animal welfare, 7 percent.

“Nearly 90 percent of responsibly invested funds are managed with three or more screens. In numbers almost identical to those contained in the 1995 study, the Social Investment Forum found that about a third of the managers listed in the 1997 Nelson’s Directory of Investment Managers identify themselves as running portfolios with social screens. Similarly, 88 percent of these managers employ three or more screens, about the same as the 90 percent found to be using multiple screens in the 1995 study.

“Three quarter of a trillion dollars is controlled by investors who play an active role in shareholder advocacy. Institutional investors leveraged assets valued at \$736 billion in the form of shareholder resolutions, voted their proxies on the basis of formal policies embodying socially responsible goals, and/or actively worked with publicly traded companies to encourage more responsible behavior.

“Nearly one out of every 10 dollars under management in the U.S. today is part of a responsibly invested portfolio. A total of 710 major investing institutions (including pension funds, mutual fund families, community development funds, and foundations) were found to be involved in socially responsible investing in one way or another with assets totaling \$1.185 trillion. This broad figure accounts for roughly 9 percent of the \$13.7 trillion in investment assets under professional management in the U.S., according to the 1997 Nelson’s Directory of Investment Managers.

www.socialinvest.org/InvSRIrends.HTM

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Information from July 1998 Best's Review L/H

Current Rank	Company	State	Current Premiums	% Increase	Prior Rank
1	Metropolitan Life Ins Co	NY	20,568,907,108	-0.2	1
2	Prudential Ins Co of America	NJ	18,957,681,699	-5.8	2
3	Connecticut General Life Ins	CT	13,125,201,454	7.4	3
4	Principal Mutual Life	IA	12,710,851,098	4.6	4
5	Nationwide Life Insurance Co	OH	10,159,051,422	17.5	6
6	New York Life Ins Co	NY	8,495,489,126	-15.6	5
7	Equitable Life Assur Society	NY	7,861,644,810	45.9	13
8	Hartford Life Insurance Co	CT	7,540,291,595	43.3	14
9	John Hancock Mutual Life	MA	7,317,564,708	-8.6	8
10	Northwestern Mutual Life Ins	WI	7,294,047,132	9.4	9
11	Massachusetts Mutual Life Ins	MA	6,605,609,587	8.3	10
12	Aetna Life Ins and Ann Co	CT	6,463,368,288	49.8	19
13	Lincoln National Life Ins Co	IN	6,336,403,358	-21.8	7
14	Jackson National Life Ins Co	MI	5,867,991,274	31.7	18
15	American Family Life Columbus	GA	5,865,381,572	-0.4	12
16	Teachers Ins & Annuity Assoc	NY	5,364,437,063	25.2	20
17	Aetna Life Ins Co	CT	5,205,646,467	-12.2	11
18	Guardian Life Ins Co of Amer	NY	4,999,715,411	-2.5	15
19	Allstate Life Ins Co	IL	4,739,303,866	-3.8	16
20	Pacific Life Ins Co	CA	4,580,953,038	20.2	23
21	Continental Assurance Company	IL	4,194,957,539	-11.5	17
22	American Life Ins Co - DE	DE	4,126,158,388	13.2	24
23	HealthCare Service Corp	IL	3,952,931,048	10.5	25
24	IDS Life Ins Co	MN	3,845,314,272	-4.3	21
25	Great-West Life & Ann Ins	CO	3,614,534,839	19.1	28
26	American Skandia Life Assur	CT	3,419,827,630	34.6	32
27	Variable Annuity Life	TX	3,386,039,309	16.9	30
28	SunLife Assur Company of CN	CN	3,270,072,000	-3.3	26

29	Kemper Investors Life Ins Co	IL	3,111,640,994	619.2	165
30	Travelers Insurance Company	CT	3,110,020,851	17.9	31
31	General American Life	MO	2,839,052,501	-6.1	29
32	BHG Life Ins Co	NE	2,647,276,929	-31.4	22
33	Allmerica Financial Life & Ann	DE	2,597,694,557	78.7	61
34	Employers Reassur Corp	KS	2,584,908,376	120.7	76
35	Transamerica Life Ins & Ann	NC	2,553,038,156	14.9	35
36	Allianz Life Ins Co of NA	MN	2,509,991,015	13.3	36
37	Anchor National Life	AZ	2,508,264,314	18.7	40
38	SunLife Assur Co of CN (U.S.)	DE	2,425,997,492	17.9	41
39	State Farm Life Insurance Co	IL	2,422,821,798	2.9	33
40	Manufacturers Life Ins Co USA	MI	2,373,767,271	65.1	62
41	Pruco Life Ins Co	AZ	2,356,678,532	149.0	91
42	ITT Hartford Life & Annuity	CT	2,277,890,359	6.1	39
43	UNUM Life Ins Co of Amer	ME	2,196,989,928	-6.1	34
44	Integrity Life Ins Co	OH	2,192,558,834	197.5	109
45	Minnesota Mutual Life Ins Co	MN	2,170,820,491	28.8	47
46	Transamerica Occidental Life	CA	2,110,906,988	17.6	46
47	SunAmerica Life Ins Co	AZ	2,051,345,481	50.8	65
48	United HealthCare Ins Co	CT	2,039,387,771	9.5	45
49	Western National Life Ins Co	TX	2,024,864,130	26.5	50
50	Blue Cross & Blue Shield of TX	TX	1,998,096,950	6.4	44