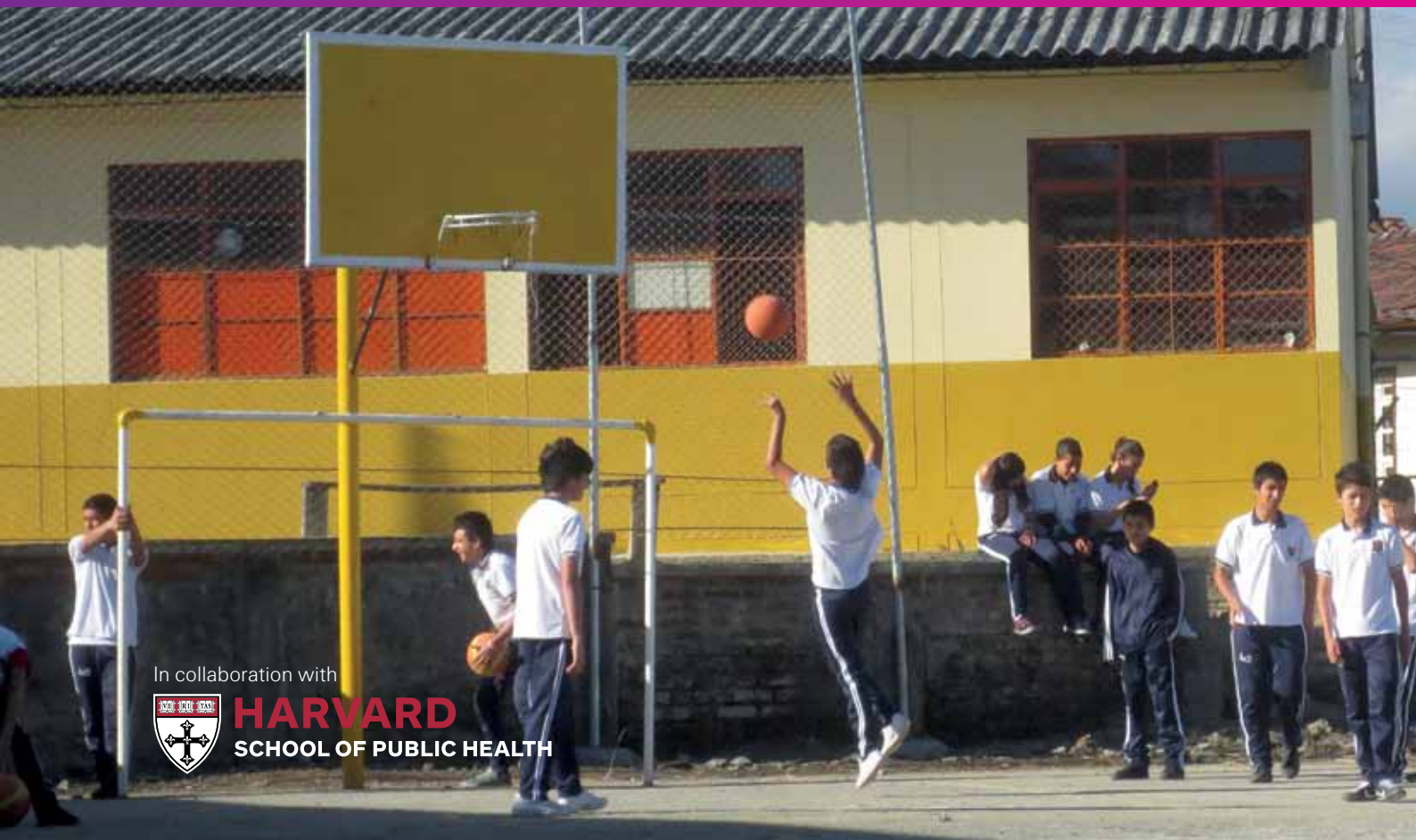




Swiss Re
Centre for Global Dialogue

**Impact of cardiovascular
risk factors on healthy
lifespan and mortality in
Brazil and Mexico**

Conference report



In collaboration with



HARVARD
SCHOOL OF PUBLIC HEALTH

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Introduction

Cardiovascular disease and stroke have become the number one causes of death in the strategically important markets of Brazil and Mexico. But what do we know behind these headline figures? What efforts are being made to improve cardiovascular mortality outcomes and how can public health contribute? What factors are inhibiting the development of healthier hearts? How will these questions affect overall mortality in these two countries?

A two-day conference entitled “Impact of cardiovascular risk factors on healthy lifespan and mortality in Brazil and Mexico”, held on 15-16 October 2013 at the Norton’s Woods Conference Center at the American Academy of Arts and Sciences in Cambridge, Massachusetts, tried to answer these and other questions. The event, sponsored by Swiss Re, one of the world’s largest re/insurers, in collaboration with the Harvard School of Public Health, gathered leading public health experts, academics, insurers and leading experts in fields spanning epidemiology, the aging process, and cutting edge advances in the prevention, detection and treatment of disease.

The conference complemented a joint research collaboration currently being undertaken by Swiss Re and the Harvard School of Public Health. In January 2013, we created SEARCH – Systematic Explanatory Analyses of Risk factors affecting Cardiovascular Health – to better understand the relationship between risk factors and health outcomes. Swiss Re seeks more accurate projections of global morbidity and mortality while HSPH seeks to better understand the most important determinants of health and to improve health status globally.

Joseph Brain
Drinker Professor of
Environmental Physiology
Harvard School of Public Health

Daniel Ryan
Head Life & Health
Research & Development
Swiss Re

Session 1: Goals of the meeting



Welcome and introduction

Julio Frenk, Dean of the Faculty, Harvard School of Public Health

In his welcoming address, Julio Frenk recognised this year's landmark anniversaries for both the Harvard School of Public Health (100 years) and Swiss Re (150 years). He then gave an overview of the transformation in global public health over the past century, setting the stage for the symposium's focus: the rise of cardiovascular risk factors in two rising economies, Mexico and Brazil.

Throughout most of history, said Frenk, illness was a succession of acute episodes, caused mostly by microorganisms, from which a person either recovered or died. Today, most illnesses are chronic conditions that accompany us throughout long periods of life. This "amazing transformation," as Frenk described it, largely took place over the past 100 years – a period during which life expectancy more than doubled.

This past century also saw the emergence of formal, organised, complex health systems, namely, the creation of specialised institutions and armies of professionals who devote themselves solely to preserving health and treating people who lose their health, said Frenk.

"The essence of public health is to understand the relationship between risk factors and health outcomes and then to address the most significant of those risk factors, with the expectation that it will lead to improved health and prevent premature death," said Frenk.

According to Frenk, four major threats to global health challenge the recent advances in public health:

- 1) Pandemics. These include the growing obesity pandemic and associated pandemics of heart disease, diabetes, and cancers, as well as older pandemics such as AIDS, malaria, and tuberculosis, which remain problems in many parts of the world.
- 2) Unhealthy or harmful physical and social environments. These include conditions and behaviours that lead to unhealthy lifestyles.
- 3) Humanitarian crises. The roughly six million children worldwide who die before they reach their fifth birthday – mostly from preventable causes – exemplify this threat. Disasters, both human-caused and natural, also fall under this threat.
- 4) Failing health systems. Despite the fact that health care institutions represent the largest sector of economy in the world, they consistently fail to meet people's expectations.

To devise solutions to these four threats, HSPH invests in people, infrastructure, big data, and ideas. The ethos of its policy is guided not by ideological preconceptions, short-term economic interests, or political pressures but by scientifically derived evidence, Frenk asserted.

The ultimate goal is to address risk factors and to prevent problems before they happen, or to predict their occurrence and be prepared. The business of reinsurance companies is exactly the same: to understand and manage risks. The HSPH – Swiss Re collaboration is especially valuable because of this synergy.

In addition to investing in postdoctoral fellowship support, Swiss Re is bringing in senior scholars who have worked in the countries of interest for a long time, said Frenk, who anticipates that both institutions will learn from each other, ensuring that both continue to thrive as they celebrate many birthdays into the future.



The Swiss Re Perspective

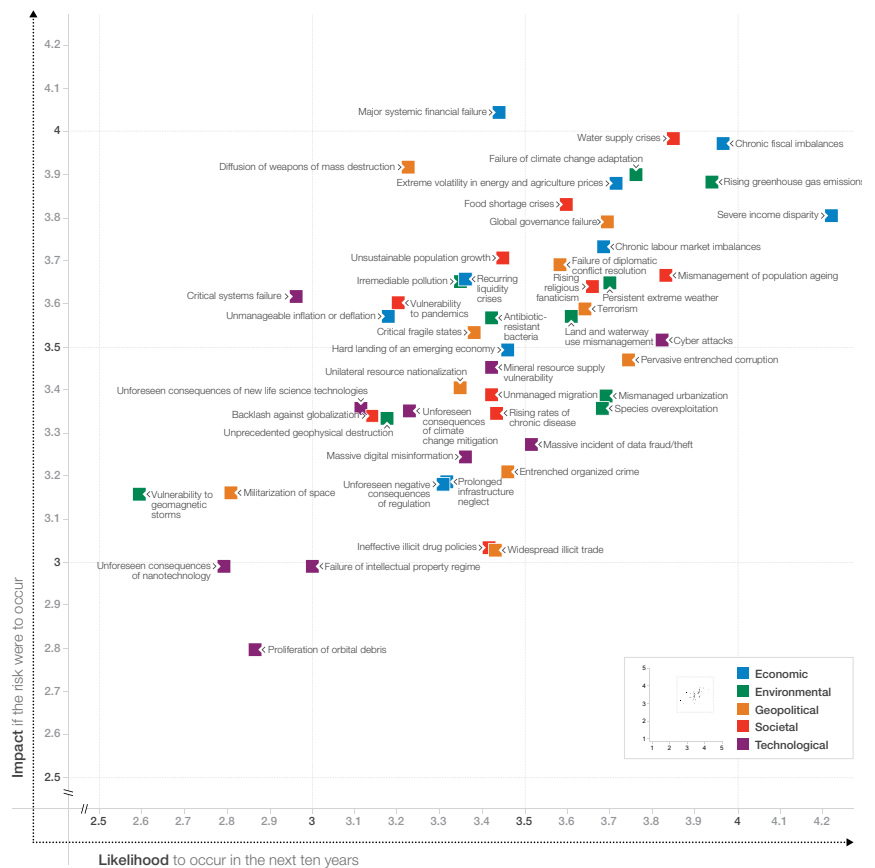
Eric Smith, CEO, Swiss Re Americas

Founded in 1863, Swiss Re formed during a time of profound industrial advancement. The resulting economic growth increased demand for insurance, as insurers recognised that sharing large risks with other parties could reduce earnings volatility and help their capital work more efficiently. But, as Eric Smith explained, it was natural disasters – namely, devastating fires and earthquakes – that fuelled the emergence and growth of reinsurers such as Swiss Re.

The company’s presence grew in Europe, Russia, Latin America, and Japan and opened its first United States office in 1910. In the intervening decades, Swiss Re expanded its range of interests to include the study of risks such as influenza pandemics, smoking, and obesity. Today, Swiss Re has a well-diversified portfolio of risks, from life insurance to property to various liability covers.

Swiss Re is a strategic partner at the World Economic Forum, which publishes the Global Risk Report. It provides insight into key risks facing the insurance industry, including chronic diseases.

Figure 1:
Global Risks Landscape 2013 according
to the World Economic Forum



Source: World Economic Forum, Global Risks Report 2013

Session 1: Goals of the meeting

Reductions in smoking prevalence and better control of blood pressure and lipid management have the potential for significant increases in life expectancy. In fact, the recent advances in old age life expectancy in recent decades surprised government and insurance companies, including Swiss Re, said Smith.

“But the past is not necessarily a good predictor of the future, and we need to consider how risks in the years ahead may differ in both impact and type,” said Smith. In developed and emerging countries, he noted, there is great uncertainty as to the magnitude of further improvements, as more targeted use of new and existing treatments is offset by the impact of increasing obesity.

“Information is clearly our lifeblood. Swiss Re has had a long tradition of research, and we actively work with universities and other research organisations to develop and understand new sources of information,” said Smith.

One major source is the Global Burden of Disease (GBoD) study, the largest-ever systematic effort to describe the worldwide distribution of a wide array of major diseases, injuries, and health risk factors. It provides age- and country-specific analyses of the burden associated with 291 major causes of death and disability and the relative importance of 67 risk factors. The project is slated to move to annual publication, which will allow an assessment of the impact of health policy initiatives.

Looking forward, Swiss Re has planned major events around the world, bringing together clients, academics, businesses, and the wider Swiss Re family. The Swiss Re – HSPH collaboration offers the opportunity to hold more intense dialogue around risk factors in key countries around the world that hold the answer to not only longer lives, but longer healthier lives, said Smith.



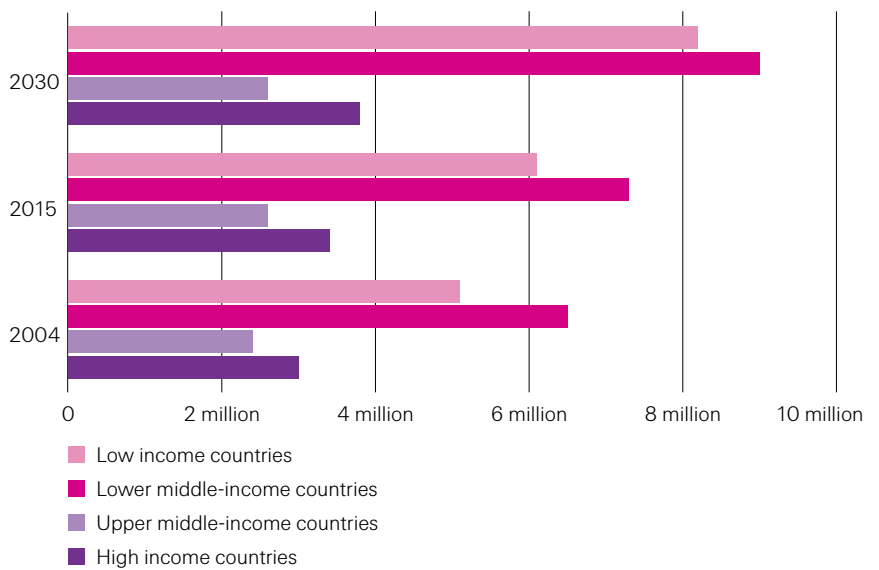
Our focus: Cardiovascular disease

Michelle Williams, Stephen B. Kay Family Professor of Public Health, Harvard School of Public Health

Michelle Williams began with an overview of the programme in cardiovascular epidemiology at HPSH. Outcomes of interest to this group include coronary heart disease, acute coronary syndrome, heart failure, sudden cardiac death, atrial fibrillation, peripheral artery disease, and thromboembolic disease.

Cardiovascular disease is one of the major noncommunicable diseases (NCDs) along with diabetes, cancer, chronic respiratory disease, and mental health. Worldwide, NCDs account for 60% of all deaths. Contrary to common perception, said Williams, the burden of NCDs is even worse in low and middle-income countries, accounting for 80% of deaths.

Figure 2:
Estimated deaths from cardiovascular disease (2004). More people die from heart disease and stroke in the LMICs than in HICs



Source: Global Burden of Disease 2004 Update, World Health Organization

The prevalence of many risk factors for NCDs has dramatically increased in developing countries, largely due to changes in societal and environmental factors. For example, Mexico experienced a rapid epidemiological transition from 1950 to 2010. Deaths from infectious and parasitic diseases declined dramatically, while deaths from NCDs rose rapidly during that 60-year period.

The determinants for this rapid change include demographic shifts, marked by increases in the aging population, as well the transition toward increasing urbanisation and industrialisation, said Williams. Other changes include those related to education, culture, poverty and its effect on access to health care, as well as changes in the built environment.

Session 1: Goals of the meeting

Risk factors driving the rise of NCDs include tobacco use, high blood pressure, overweight and obesity, physical inactivity, diets low in fruits and vegetables, alcohol use, and air pollution. In Mexico, increases in the prevalence of overweight and obesity have been especially dramatic, Williams said. By 2006, the prevalence of overweight and obesity had reached nearly 70%.

Williams, whose expertise is in reproductive and perinatal epidemiology, noted that pregnant women who are overweight or obese have higher rates of complications such as gestational diabetes and pre-eclampsia. "That means women are entering pregnancy with a higher risk of delivering low birth weight babies (preeclamptic mothers) or macrosomic babies (mothers with gestational diabetes)" said Williams. Low birthweight, for example, can lead to a higher risk of adiposity rebound across the life course, she said, which increases the risk of hypertension, atherosclerotic disease, type 2 diabetes, and respiratory conditions in adulthood.

Increasing global consumption of tobacco is another major concern. Since 2005, the rate of tobacco-related deaths has risen far more in developing countries than in developed countries.

These health consequences undermine economic development and global efforts to reduce poverty, according to the World Health Organization. The two primary mechanisms are loss of productivity due to premature death and prolonged disability due to chronic disease, Williams said.

NCDs cost developing countries between 0.2% to 6.77% of their gross domestic product – an economic burden greater than that caused by malaria in the 1960s and AIDS in the 1990s, according to the Institute of Medicine. As such, there is a global imperative to implement cardiovascular disease prevention and control strategies, said Williams.



Longevity research – a collaborative approach

Christoph Nabholz, Head Business Development,
Swiss Re Centre for Global Dialogue

In his overview of Swiss Re's focus on longevity research, Christoph Nabholz described the company's Life&Health R&D team. Their goal, he explained, is to build proprietary knowledge on future morbidity and mortality that enables the company to outperform its peers.

Led by Daniel Ryan, the 10-person interdisciplinary team includes medical doctors, epidemiologists, biochemists, actuaries, geneticists, and pharmacists, all with a broad range of expertise. "We're concentrating on four high growth markets in which underlying health conditions are changing rapidly. As re/insurers we need to understand the underlying trends behind these changes," said Nabholz. The company's collaboration with HSPH, known as the Systematic Explanatory Analysis of Risk factors affecting Cardiovascular Health (SEARCH), in Brazil, China, India, and Mexico, was designed to address that need.

The core group for SEARCH includes 11 faculty mentors and 11 fellows from HSPH, and 12 Swiss Re collaborators, all of whom have in-depth knowledge of these countries and their markets, said Nabholz. The central aim is to better understand the relationship between risk factors and health outcomes in high-growth economies.

Swiss Re has also established international biomedical expert networks in collaboration with swissnex. Swissnex is an initiative of the Swiss government that promotes public-private ventures with science and technology counselors in Swiss embassies worldwide. The company also collaborates with the Swiss Biotech Association, which represents nearly 240 companies, including Merck, Serono, Novartis, and Roche.

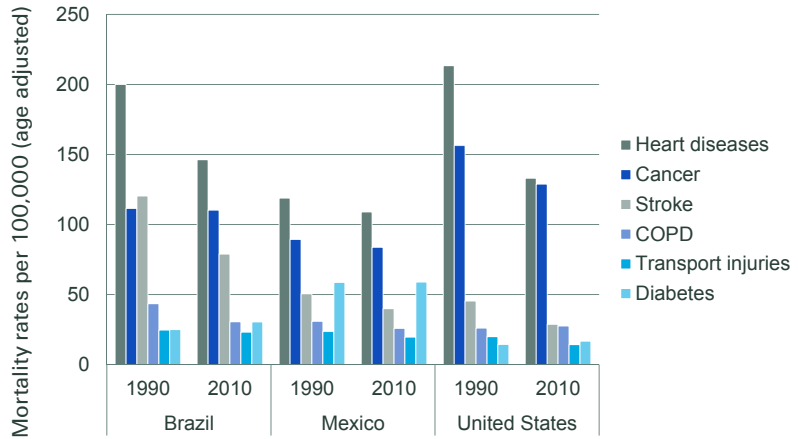
Nabholz also highlighted Swiss Re's openness to public print and e-publishing, which include conference reports, its Risk Dialogue Magazine, and a print and iBook version of "Understanding the drivers of longevity." The company also created Risk Connect, a web platform for information sharing between staff and external stakeholders, and the online Swiss Re Centre for Global Dialogue medical expert library.

Next, Nabholz touched on the topic of personalised medicine, which aims to prevent and treat disease more effectively by using better diagnostics and therapies targeted to specific forms of a disease. Cancer, which shares key risk factors with heart disease such as smoking and obesity, has led the way in the use of personalised medicine.

Session 1: Goals of the meeting

He then focused on disease trends in the United States, Mexico, and Brazil, noting two trends of interest. In 2010, stroke mortality was higher in the Brazil than in the United States, and in Mexico, diabetes was the third leading cause of death.

Figure 3:
Cardiovascular disease mortality has decreased over the last two decades



Source: Global Burden of Disease 2010

Stroke management and diabetes prevention is key, said Nabholz. Given the rapid changes in Mexico and Brazil, he questioned, how can we make good future predictions, and how will public health prevention efforts affect these trends? “That is what I would like to learn from your research,” said Nabholz.



Our strategy: Projections in rapidly changing countries

Joseph D. Brain, Cecil K. and Philip Drinker Professor of Environmental Physiology, Harvard School of Public Health

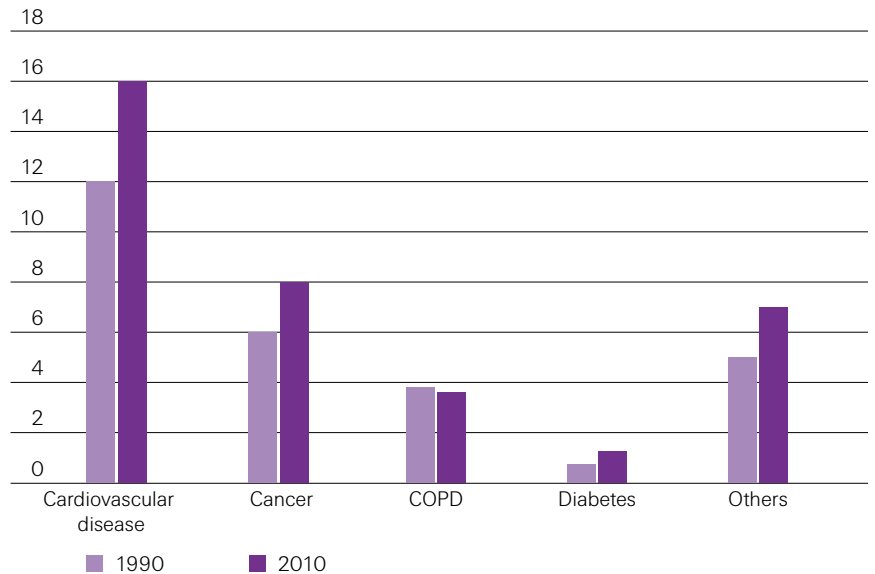
The SEARCH project seeks to more accurately predict how people will age and how long they will live, said Joe Brain. The strategy behind SEARCH involves collecting high-quality data (including novel data sources), integrating that data into useful models, and obtaining new cohort inventories.

Enormous reductions in infant mortality have changed the global demographic profile. In the past, preventing infectious disease to save children’s lives was a moral imperative. Now, data shows that this practice “is not only right thing to do, it’s also good for economic development,” said Brain.

But as infectious disease rates in neonates and children have declined, rates of NCDs have risen. These illnesses are a cause, not just a consequence of poverty, because NCDs decrease productivity and are costly to treat, said Brain.

Worldwide, rates of cardiovascular disease, cancer, diabetes and other NCDs rose between 1990 and 2010, as shown in an October 3, 2013 paper in the New England Journal of Medicine, authored by SEARCH team members David J. Hunter and K. Srinath Reddy.

Figure 4:
Global deaths due to noncommunicable diseases in 1990 and 2010



Source: Hunter and Reddy 2013

Data from the GBoD project, which includes all countries and all causes of death, shows that ischemic heart disease is the leading cause of death worldwide. That justifies our focus on cardiovascular disease, said Brain. The four countries that SEARCH focuses on were chosen in part because they represent evolving markets for Swiss Re and because HSPH postdoctoral fellows and faculty are actively conducting research in those countries. Most importantly, they are rapidly growing economies undergoing profound changes in risk factors for cardiovascular disease, stroke and diabetes.

Session 1: Goals of the meeting

Quoting John Dryden, Brain said, “Every man who lives is born to die.” But we are living longer and longer. “What are the consequences?” asks Brain.

Deaths of infants and children under age 5 are the primary driver for life expectancy at birth, which ranges widely from developing to developed countries. But once you survive that vulnerable period, life expectancy isn’t that different, said Brain. At age 65, for example, life expectancy is roughly similar in Switzerland, the United States, Brazil, and Mexico. These four countries differ by approximately three years for men for four years for women.

According to Brain, your longevity depends on the air you breathe, the food you eat, the water you drink, the house you live in, your occupation, your individual choices, your genetic risk, and the health system you use.

SEARCH will address risk factors that impact longevity, especially tobacco use, unhealthy diet, physical inactivity, the harmful use of alcohol, hypertension, indoor and outdoor air pollution, as well as poverty, stress, and prejudice. “Although we can’t change genetics, we can change risk factors and health outcomes,” said Brain, pointing to the declines in lung cancer deaths following the sharp drop in cigarette smoking in the 1970s in the United States.

Session 2: Our geographical focus



Overview of health in Mexico: Past, present, and future

Martin Lajous, Research Professor, National Institute of Public Health, Cuernavaca, Mexico; Research Fellow in Epidemiology, Harvard School of Public Health

Mexico is undergoing major demographic and epidemiological transitions, said Martin Lajous. Life expectancy is increasing dramatically, while fecundity is going down. By 2050, 30% of the population will be 60 years of age or older. Mortality due to chronic disease and injuries rose from 40% to 85% from 1970 to 2012.

The speed of Mexico's nutrition transition from traditional diet to more industrialised products has been striking, said Lajous. For instance, tortilla consumption is declining, but intake of sugar-sweetened beverages tripled between 1999 and 2006. Physical inactivity has also increased dramatically.

These changes have had an enormous impact. According to four different surveys, the BMIs of Mexican women have been increasing steadily and right now, 73% of Mexican women are overweight or obese.

As for tobacco, smoking prevalence has gone down amongst male adults but rates in adolescents remain a challenge. However, surveys show that the majority of Mexicans agree with the elimination of smoking areas in public places – something unheard of 10 years ago, said Lajous.

Deaths from cardiovascular disease and diabetes rose between 1979 and 2007, although deaths attributed to diabetes may be overestimated, and death certificates need to be standardised, noted Lajous. These changes have greatly increased costs and had a major impact on the health care system.

Until quite recently, Mexico's health care system was fragmented, with only two forms of insurance: one for private workers and one for state workers. But out-of-pocket expenses were high, and 58% of people were uninsured.

In 2003, a third form of insurance, Seguro Popular, became available and 48.5 million Mexicans have joined over the past decade. Current challenges include quality of care and heterogeneity across states. Future plans include the integration of all three forms of insurance to create universal coverage, with a goal making coverage more effective and strengthening primary care and prevention, said Lajous.

Prevention efforts should focus on primary risk factors such as physical activity, diet, and smoking. Tobacco taxes are already in place, and a tax on sugar-sweetened beverages is under discussion. In addition, in 2006, the National Institute of Public Health established a cohort study of 115 000 women to track their health and different risk factors, which will help establish prediction models about disease incidence and mortality. Other public health efforts underway include an agreement with bread manufacturers about reducing salt in their products.

In conclusion, said Lajous, chronic disease is a health priority in Mexico. Health care reform and more public health research is urgently needed to address the problem.



Overview of health in Brazil: Past, present, and future

Marcia Castro, Associate Professor of Demography, Department of Global Health and Population, Harvard School of Public Health

Marcia Castro began her talk with a historical perspective on Brazil's massive public health campaigns, which began in 1920. In the early 20th century, expeditions to the Amazon and Northeast regions of Brazil reported the rampant infectious diseases and very poor health conditions in those regions, leading one physician to describe rural Brazil "an enormous hospital." This had a major impact amongst physicians, academics, and intellectuals, spurring movements that led to the creation of National Department of Public Health in 1920 and the Ministry of Education and Public Health Affairs in 1930.

When the military regime took over the country in 1960, the national income increased dramatically but inequality also skyrocketed. Since that time, urban populations increased from 45% to 85%, fertility rates fell from more than 6 children per woman to less than 2, and infant mortality fell from 120 to 22 per 1,000. Life expectancy rose from less than 50 years in the 1940s to more than 70 years today.

Between 1930 and 2007, infectious disease rates dropped from 50% to 5%, thanks to the 1973 National Immunisation Programme, which eliminated polio and reduced rates of malaria and Chagas disease.

Today, 70% of deaths in Brazil are due to NCDs. Age-standardized mortality declined by 20% for cardiovascular disease and chronic respiratory diseases, in part due to tobacco control measures. In 1989, 35% of the population smoked; today, only 14% do, said Castro. The prevalence of diabetes and hypertension is rising in parallel with that of excess weight. Half of adult men and women are overweight and about 12% are obese.

Castro then showed the average rankings of disease burden in Brazil, comparing 1990 to 2010. For both sexes, the ranking for communicable diseases dropped while noncommunicable diseases rose over the 10 years. Amongst males, interpersonal violence topped the list at both time periods but was not amongst the top 25 for women.

To conclude, she showed rankings for the same time periods for both Brazil and Mexico and highlighted three trends of interest. First, diarrheal disease ranked in the top three for both countries in 1990 but did not appear in the top 25 in either country in 2010. Second, diabetes ranked number one in Mexico by 2010 (up from seven in 1990) but number eight in Brazil in 2010. Third, stroke moved from six to four in Brazil, but for Mexico, stroke wasn't among the top 10 in either 1990 or 2010.

"I can't talk much about the future, but I think we need to look at the obesity epidemic and all the implications it can have for the burden of NCDs," said Castro.



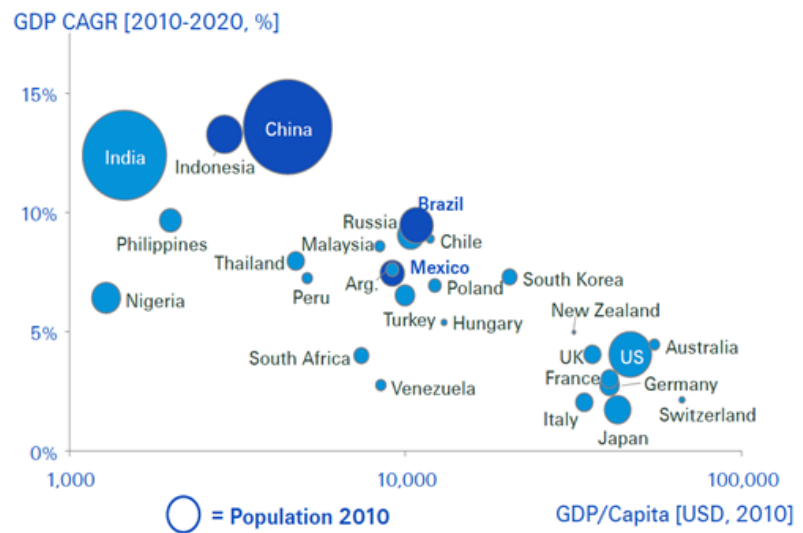
A Latin American insurance perspective

Eduardo Lara, Head of Health Insurance Latin America, Swiss Re

As the two most populated countries in Latin America, Brazil and Mexico also present the greatest needs and opportunities for health insurance. The key question, said Eduardo Lara, is how to fill the protection gap in life and health insurance in these two high-growth markets. The collaboration between Swiss Re and HSPH will benefit society both by enhancing underwriting and improving how we treat health conditions in Brazil and Mexico, said Lara.

Lara presented an overview of each country's economic and health insurance status, as well as a breakdown of health care spending. Despite having low growth, Mexico's gross domestic product (GDP) per capita is still higher than that of Brazil and its peers in Latin America. However, Lara noted, Mexico has very uneven income distribution.

Figure 5:
Insurance opportunities & challenges.
Emerging markets are increasingly relevant
for health insurance business



Source: Swiss Re

Mexico spends 6.2% of its GDP on health expenditures, with 49% coming from public expenditure and 51% from private expenditure. But of that 51%, only about 6% is actually covered by private insurers; the rest is paid out-of-pocket.

For Brazil, which spends 8.9% of its GDP on health care, it's a different picture. The country has similar percentages of public versus private health expenditure (46% and 54%, respectively). But for Brazilians with private health expenditure, out-of-pocket expenses account for 58%, with private health insurance covering 40%.

Session 2: Our geographical focus

In Brazil, the government has very strict rules for private health insurance, with mandatory comprehensive coverage. There are no financial limits and underwriting is restricted. Mexico, on the other hand, has lots of flexibility, with no restrictions. Private insurers can provide major medical, minor medical, comprehensive, or other types. But 95% of revenues comes from major medical products, said Lara.

Broad social and economic trends occurring in developing countries will affect the lives of older people. Demographic and family changes mean there will be more older people who do not have families to care for them. With declining support from families, society will need better information and tools to ensure the well-being of the world's growing number of senior citizens.

For insurers, the central challenge is to identify and properly assess a person's risk, based on the scarce information provided by the insurance application. To accept more people at an affordable rate, said Lara, insurers use different tools and techniques. For example, statistical evidence helps insurers predict future costs of current and past conditions, which fall into four main categories:

- 1) Acute (such as appendicitis), for which costs go up at diagnosis but then return to a normal level
- 2) Chronic (such as a slipped disk), for which costs rise and continue at a high level
- 3) Progressive (such as a knee injury), for which costs stay high
- 4) Relapsing (such as alcoholism), for which costs rise and then drop slightly

In conclusion, now is an important time to take advantage of out-of-the box thinking and using new models and technologies translating data into knowledge to help close the protection gap, said Lara.

Workshop Summaries



Determinants of cardiovascular health in Mexico

Moderator: Subu Subramanian, Professor, Population Health and Geography, Harvard School of Public Health

Research fellow Hiram Beltrán-Sánchez began by describing the two national representative data sources for Mexico: the Mexican Health and Aging Study (MHAS) and the Mexican Family Life Survey (MxFLS).

The MHAS is a longitudinal sample of approximately 15 000 adults aged 50 and older. They were surveyed on multiple dimensions of health, including blood samples, and economic, social, and psychosocial measures in 2001, 2003, and 2012. The MxFLS includes about 35 000 people aged 20 or older who were surveyed 2002, 2005, and 2010 with similar questions.

Beltrán-Sánchez focused on the MHAS because cardiovascular disease primarily affects older people. Preliminary evidence shows higher reports of chronic disease in women compared to men from 2001 to 2012, as well as an increase in diabetes but a reduction in hypertension and arthritis.

With regard to the link between BMI and chronic disease, the data show that the probability of being diabetic is about 21% higher for overweight compared to normal weight and 40% higher for obese compared to normal weight, said Beltrán-Sánchez, who plans to assess the link between excess weight and mortality in the longitudinal data. His fellowship work will also estimate the risk of death associated with diabetes and related comorbidities and compute life expectancy and years of life lost due to major diseases.

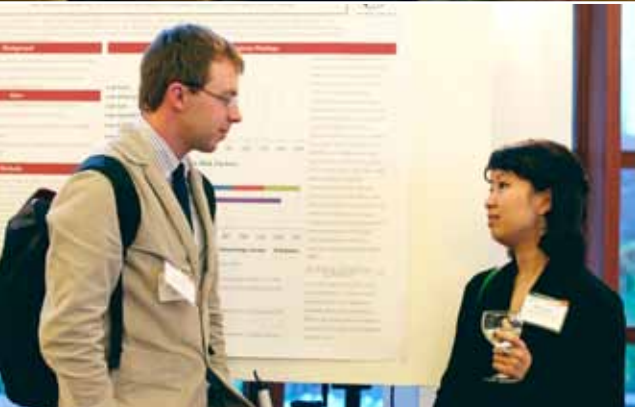
Next, Martin Lajous described the focus of his fellowship, which relies on national survey data to evaluate cardiovascular health, define Mexico's national goals, and monitor progress.

To set Mexico's 2020 goals, he is using the American Heart Association's seven health and behaviour metrics: current smoking state, BMI, physical activity, healthy diet score, total cholesterol, blood pressure, and fasting plasma glucose. Data from these metrics are used to define poor, intermediate, and ideal levels of cardiovascular health, explained Lajous.

So far, data on smoking, BMI, and blood pressure from 2006 and 2012 is available. The physical activity and diet data don't fit the AHA metric and will therefore need adjustment, and the 2012 data for cholesterol and glucose is still pending.

Both smoking rates and BMI increased over the six years, while blood pressure rates showed some improvements. Greater access to health care and subsequent treatment of high blood pressure may explain this trend, said Lajous.

Lajous also reported on the effects of Mexico's indoor smoking ban, which began in April 2008. Hospital discharge data showed declines in rates of heart attack and stroke between 2008 and 2012, and preliminary estimates of cost savings over the four years was estimated at USD 17.8 million for Mexico City. If the other states had enacted the ban, the estimated savings would have been USD 109.2 million.







The use of public United States data sources for insurance mortality research

Moderator: Kenneth Krause, Medical Director, Underwriting Medical R&D, Swiss Re

The insurance industry is always looking for data, said Kenneth Krause. Although companies like Swiss Re have clients all over the world that provide lots of data, it's not always in a format that contains the necessary information. Instead, Krause explained, "We look for public health studies that look at markers of disease that might guide our policies or give us ideas for what to look at in terms of our underwriting and risk assessment."

Using several studies as examples, Krause described how Swiss Re might draw from research results, which may help guide mortality pricing in the insurance industry. Although the data are from United States studies, similar issues are likely to apply in Brazil and Mexico, he said.

The Cardiovascular Health Study includes 5,888 participants age 65 and older who have been followed biannually since 1988. The study data, which includes hundreds of measures including function, behaviour, medical history, and medical tests, offers an opportunity to study the predictive value of standard risk factors as well as potential new markers, alone or in new combinations.

Examples of the desired data elements include echocardiogram findings, smoking and drinking habits, and prescription drug use. An exploratory analysis by Krause, published in the *Journal of Insurance Medicine* in 2007, showed that a simple sum of prescription drug classes used could be a useful predictor of mortality in people ages 65 and older.

The National Health Interview Survey Second Longitudinal Study of Aging includes nearly 9,500 people ages 70 and up who were interviewed about their health, living and personal circumstances, functional status, and activity levels between 1994 and 1996. Baseline data from this cohort was then matched with data from the National Centre for Health Statistics (NCHS) Research Data Center, which provides secure access to NCHS data, maintaining the confidentiality of the respondents and records.

During the follow-up period from 1994 to 2002, 42% of the cohort died; their median age was 82 to 83 years. A multivariate mortality model showed factors you would expect to contribute to mortality, such as smoking, number of medications, and past hospitalisations, according to Krause. Factors you might not expect to contribute to mortality included regular exercise, arthritis, and driving frequency. Finally, factors you would expect to contribute but don't include heart disease, doctor visits, and admission to a skilled nursing facility.

Insurance companies are paying close attention to demographic shifts that show where the elderly population is growing, said Krause. Making life insurance accessible and affordable for this growing market is important, he added.



Determinants of cardiovascular health in Brazil

Moderator: Nancy Long Sieber, Adjunct Lecturer, Department of Environmental Health, Harvard School of Public Health

The four research fellows gave brief presentations on their projects, each of which focuses on key risk factors for cardiovascular mortality in Brazil: diet and metabolic risk factors, physical activity, overweight, obesity, and waist circumference, and air pollution.

Marcia Otto described how the Brazilian diet has shifted from one that features homemade foods such as rice, beans, and fish to a dietary pattern that includes more sugar-sweetened beverages and more highly processed foods high in salt, sugar, and other refined carbohydrates. Rates of obesity rose sharply between 1975 and 2009 in Brazil, where cardiovascular disease and diabetes together account for almost 40% of the total mortality in Brazil. Her project aims to 1) quantify the number of deaths attributable to diet and cardiometabolic risk factors; 2) evaluate trends in these risk factors to project future incidence of mortality due to cardiovascular disease and diabetes; and 3) review national policies and populations strategies designed to improve dietary behaviour amongst Brazilians.

Grégore Mielke's project explores physical activity trends in Brazil, using data from three surveys: 1) the Pelotas health survey; 2) the VIGITEL telephone survey; and 3) the Pelotas birth cohort study. The Pelotas health survey is a representative sample of about 3,000 adults ages 20 and older living in Pelotas, a city in southern Brazil. All-domain physical activity data was collected in 2002, 2007, and 2012. The VIGITEL survey targets adults 18 and older living in the capital cities throughout Brazil and included questions about physical activity during work, leisure time, and for transportation purposes. The Pelotas birth cohort study includes all people born in Pelotas in 1982, 1993, and 2004 and follows them throughout life. Preliminary evidence shows increases in inactivity between 2002 and 2007. Future research will examine how socioeconomic factors affect activity levels, including trends within different subgroups over time.

Claudia Suemoto summarised her early research on how BMI and waist circumference affect diabetes and mortality amongst elderly people in Brazil. The cohort includes about 1,500 community-dwelling people living in São Paulo, who were followed for a median of 6.7 years. Their average age was 71 and their average BMI was 26.9. While being underweight was associated with a higher risk of death, neither overweight, obesity, nor a high waist circumference (higher than 88 cm for women, 102 cm for men) was linked to higher mortality compared to people of normal weight. Survival bias – meaning that obese people died at younger ages and were therefore not included in the study – may explain this finding, said Suemoto. Future plans include analysing specific causes of mortality rather than all-cause mortality.

Jennifer Nguyen presented findings from a systematic literature review on air pollution and cardiovascular risk in Brazil. She identified 19 studies, all of which looked at particulate and gaseous air pollutants; no studies of household air pollution or environmental tobacco smoke were available. Most of the studies were done in the state of São Paulo, where most air pollution monitors are located. One particulate air pollutant, PM10, had strong associations with higher rates of cardiovascular mortality, hospital admissions, and stroke. Sulfur dioxide, a gaseous pollutant, has strong links to increased hospital admissions, said Nguyen.



Cardiovascular risk factors: Implications for the insurance industry in Mexico

Moderator: Monica Wilson, Medical Manager, Swiss Re

In Mexico, key drivers of rising rates of cardiovascular disease include the aging population and globalisation and urbanisation within the country, said Monica Wilson, who also discussed global trends in cardiovascular mortality and the issues involved in underwriting life insurance in Mexico.

Compared with six other Latin American countries, Mexico has the highest rates of both diabetes and metabolic syndrome, both of which are closely linked with a higher risk of cardiovascular disease. Nearly 11% of Mexicans have diabetes – a rate higher than the United States and 31 other countries.

Worldwide, deaths from cardiovascular disease are going down, but the benefits are mainly noticeable in developed countries. In Mexico, age-adjusted death rates from cardiovascular disease are rising due to an increase in the prevalence of risk factors and decreased access to preventive medicine and treatment. Mexico spends just 6.2% of its gross domestic product on health care, placing it near the very bottom among the 34 countries in the Organisation for Economic Cooperation and Development.

In comparing the United States and Mexico insurance markets, Wilson noted that in the United States, large sums are insured, with fewer requirements. Tele-underwriting and preferred rates are available, as are policies for older people. In contrast, Mexico insures smaller sums and rarely insures people over age 70. However, policies in Mexico may include a critical illness rider that covers certain “dread diseases,” such as a heart attack, stroke, or cancer.

In the United States, obtaining medical evidence needed to assess life insurance coverage is reliable and easy to obtain. In Mexico, those who can afford private health insurance receive care from multiple doctors. For those covered under the public health care system, obtaining physician statements and lab results is difficult, so insurers basically rely on age and amount requirements, said Wilson.

But high rates of disease in Mexico pose a challenge for insurers. People living in urban areas, who are more likely to be able to afford insurance, have higher rates of diabetes (15.5%) than those in rural areas (10.4%). And 43% do not have their illness under control. Similarly, about 43% of the population has high blood pressure, and 44% did not have their blood pressure under control. “These people would be declined for critical illness and life insurance coverage,” said Wilson.

Session 3: Important risk factors for cardiovascular diseases in Brazil and Mexico



Smoking

Gregory N. Connolly, Professor of the Practice of Public Health, Harvard School of Public Health

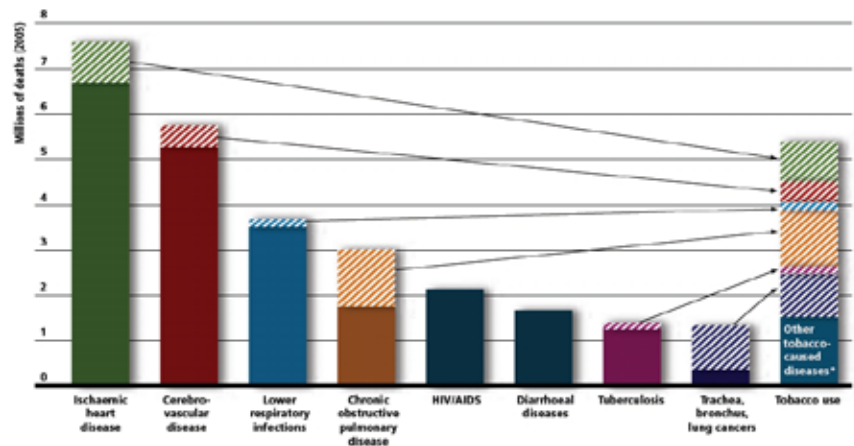
Tobacco addiction is an international public health catastrophe that is being exported from rich nations to poor ones. Worldwide, 1.3 billion people smoke. In the 20th century, smoking caused an estimated 100 million deaths. The projection for the 21st century? One billion deaths, most of which will occur in developing countries, according to Greg Connolly. His presentation explained how tobacco fits into the context of chronic disease and described the interventions to reduce tobacco use on a population level.

Smoking deaths in developing nations occur in middle age, which has a devastating effect on both economic development and poverty rates. In China, for example, smoking rates in males are very high, and experts predict massive loss of life amongst middle-age Chinese males. This could be devastating to the world economy, given the major role that Chinese males play in the world's economic health. In the Philippines, a smoker spends 18% of the family's total income, which takes money away from education, health care, or other needs of the family, said Connolly. In addition, the four major tobacco companies are now targeting women in developing countries.

Tobacco use is a risk factor for six of the eight leading causes of death in the world, including ischemic heart disease, cardiovascular disease, lower respiratory infections, chronic obstructive pulmonary disease, tuberculosis, and cancers of the trachea, bronchus, and lung. As such, the easiest way to address chronic disease and extend longevity is to address tobacco use, said Connolly.

Figure 6:

Tobacco use is a risk factor for six of the eight leading causes of death in the world



Source: MPOWER - WHO Report on the Global Tobacco Epidemic 2008

Smoking is a social behaviour, and by removing social incentives to smoke through pricing, clean indoor air laws, and mass media campaigns, smoking rates will plummet. In Massachusetts, said Connolly, "We raised prices, banned indoor smoking, did a media campaign, and sued tobacco companies. We got USD 8.2 billion over 25 years and smoking rates plummeted. There's no reason why Brazil couldn't do the same thing," said Connolly.

Session 3: Important risk factors for cardiovascular diseases in Brazil and Mexico

Smoking rates in Massachusetts have dropped from 40% in 1980 to just 14% today. The health benefits reaped from anti-smoking interventions include approximately 19 000 fewer male lung cancer deaths from 1997 onward, and about 425 fewer deaths from coronary heart disease in 2003 relative to 1993, said Connolly.

To improve global health in a similar manner, said Connolly, we need increased stewardship over tobacco companies. These companies enjoy a 20% profit margin (versus 2% for other products), and high-income nations like the United States are benefiting from these profits.

With regard to the Swiss Re – HSPH collaboration, the goal is to better understand social acceptability of smoking, to identify the social forces at play (industry marketing versus public health policies), and to create a database of these factors. Swiss Re fellow Hillel Albert also plans to analyse the supply and demand influences on social determinants and to model and project tobacco use.



Diet and metabolism

Carlos O. Mendivil, Associate Professor, Universidad de los Andes, Bogota, Colombia; Research Associate, Department of Nutrition, Harvard School of Public Health

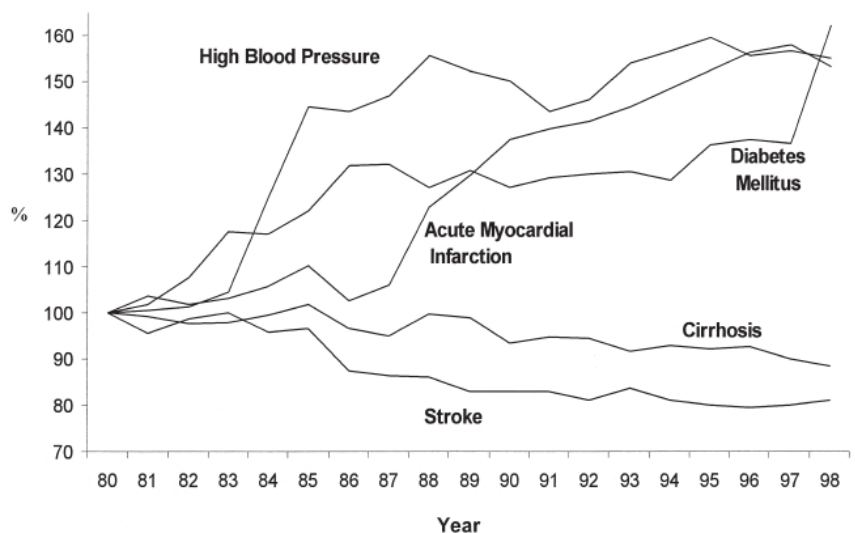
In his presentation, Carlos Mendivil described the two phases of the nutrition transition in Brazil and Mexico. During the first phase, the “receding famine” stage, people transition from being undernourished to having access to plenty of food, albeit predominantly starchy food. Although high in fibre, the diet has little variety, low levels of essential fats, and is sometimes low in protein. Populations in this phase are characterised by high rates of chronic under-nutrition and stunting.

The second phase, the “degenerative diseases” stage, is the transition to a diet with increased levels of saturated and trans fats, dietary sugars, and processed foods, along with reduced levels of physical activity. During this stages, rates of chronic health problems (such as obesity, diabetes, cardiovascular disease, and bone density problems) increase.

In Mexico, changes in food purchases reflect this second phase: Between 1988 and 1994, people bought about 30% less fruits and vegetables, 27% less milk and milk derivatives, and 19% less meat. But they purchased 6% more refined carbohydrates and 37% more soda. In fact, said Mendivil, some Mexicans drink 2 to 3 litres of soda a day, in some cases because they don’t trust the safety of their drinking water.

During that time period, the percentage of overweight people rose from 24% to 35%, while obesity rates went from 9% to 24%. These trends are correlated with economic status, with high income levels linked to lower rates of overweight and obesity. Rates of chronic diseases linked to excess weight, including high blood pressure, heart disease, and diabetes also rose during this time frame.

Figure 7:
Age-adjusted mortality rates for NCCDs in Mexico. The second phase of the nutrition transition in Mexico



Source: National Institute of Public Health, Mexico

Session 3: Important risk factors for cardiovascular diseases in Brazil and Mexico

In Brazil, a nationwide phone survey suggested that obesity rates also rose dramatically between 2006 and 2009. In 2013, a study of the health and economic burden of obesity in Brazil considered five chronic diseases (diabetes, heart disease, stroke, hypertension, and knee osteoarthritis) and eight cancers associated with excess weight. Without any intervention, rates of these illnesses would double or triple by 2050, creating a huge economic burden. Reducing BMI by just 1% could save an estimated 40% of that cost, according to the study, Mendivil explained.

In terms of causes of overweight and obesity, cost of food is a major factor for Brazilians. If you compare the cost per calorie of different foods, processed foods cost about half as much per 1 000 calories than fruits, vegetables, and legumes. "It's a lot more expensive to eat healthy foods," said Mendivil, adding that energy dense foods are also more widely advertised and more accessible.



Indoor and outdoor air pollution

Douglas Dockery, Professor of Environmental Epidemiology,
Harvard School of Public Health

We expect respiratory effects from air pollution, but strong evidence shows that air pollution also has significant cardiovascular effects, said Doug Dockery. If you improve air pollution, you can improve health, he added, citing evidence from a New England Journal of Medicine paper that tracked more than 8,400 adults in six United States cities. Participants enrolled in 1974 and were followed for 14 to 16 years.

Two of the cities had high levels of air pollution, two had moderate levels, and two had low levels. "We found a 30% higher mortality rate in the high-pollution cities compared with the low-pollution cities," said Dockery, who led the study. But a follow-up study of the same cohort during 1990 to 1998, after air pollution levels had declined, showed a clear decline in mortality rates, with life expectancy increasing even in the "clean" cities.

Similar trends were seen in a later study, in which Dockery and colleagues looked at the relationship between fine particulate air pollution levels and life expectancy in 51 metropolitan areas in the United States between 1980 and 2000. After controlling for confounding factors such as socioeconomic levels and proxy indicators of cigarette smoking (chronic obstructive pulmonary disease and lung cancer mortality), they found a significant association between high rates of air pollution and lower life expectancy. After the Environmental Protection Agency revised the National Ambient Air Quality Standard in 1990, air quality improved, as did life expectancy.

In 2010, the American Heart Association released a scientific statement that deemed particulate air pollution "a modifiable risk factor that contributes to cardiovascular morbidity and mortality." Air pollution impacts a wide range of clinical end points, including atherosclerosis, high blood pressure, and arrhythmias, with evidence from many studies throughout the world. Globally, many regions – especially in Africa, India, and China – have much worse air quality than here in the United States, Dockery noted.

In developing countries, indoor air pollution from cooking fires poses a significant risk, not just for childhood respiratory diseases but also for heart disease. A 2012 Lancet study ranked household air pollution from solid fuels as third among the 20 leading contributors to the global burden of disease. Ambient particulate matter pollution ranked ninth.

Air quality is particularly bad in China and India, but less so in Mexico and Brazil, said Dockery. Air pollution levels vary in Brazil, however: Levels in São Paulo are about 28 $\mu\text{g}/\text{m}^3$ compared to about 14 $\mu\text{g}/\text{m}^3$ in Curitiba. If pollution levels in São Paulo dropped to those seen in Curitiba, life expectancy would rise by an average of 3.5 years, he added.



Time trends in physical activity levels in Brazil

I-Min Lee, Professor, Department of Medicine at Harvard Medical School and Professor, Department of Epidemiology at Harvard School of Public Health

More than 60 years of epidemiological data – supported by basic science, animal studies, and randomised controlled trials – clearly shows that physically active individuals have better health than individuals who are not active, said I-Min Lee. Physical activity leads to lower rates of many chronic diseases, including coronary heart disease, high blood pressure, stroke, and type 2 diabetes.

In fact, lack of physical activity is responsible for perhaps 6% to 10% of all noncommunicable diseases throughout the world, which means the impact of being inactive is comparable to that of smoking or obesity, said Lee. For example, while Dr. Connolly's data showed six million deaths attributed to smoking in 2010, an estimated 5.3 million deaths were attributed to lack of physical activity in 2008. As Dr. Dockery noted, smokers live an average of 6.8 years less than nonsmokers, but research also shows that inactive people live 4 to 8 years less than active people.

In 2012, Pedro Hallal, Lee, and colleagues published a study in *Lancet* showing that about a third of the world's population does not get sufficient physical activity to meet guidelines. For most low and middle-income countries, data usually come from a snapshot estimate. But thanks to the Swiss Re collaboration, the researchers will be able to look at changes in physical activity levels in Brazil over time.

The first project reported on trends in physical activity in adults living in Pelotas, a city of about 340 000 in southern Brazil. About 3 000 adults took surveys in 2002, 2007, and 2012 that included six questions about moderate and vigorous physical activity levels, including walking and biking for transportation. Overall, the percentage of inactive people went from 41% in 2002 to 52% in 2007, and 54% in 2012. Initially, poorer people were less likely to be inactive, but by 2007, inactivity levels were similar across socioeconomic groups. Women, the elderly, and people with less education were more likely to be inactive.

The second project used data from an annual, nationwide telephone survey (VIGITEL) begun in 2006 that targets a random sample of more than 54 000 adults in each of Brazil's state capitals. The survey includes questions about standard disease risk factors and questions about leisure, occupational, household, and commuting physical activity.

Between 2009 and 2012, there were modest increases in leisure time physical activity, but slight declines in active commuting. As in the Pelotas survey, higher activity levels were seen amongst men, younger people, and those with more education.

Session 4: The road ahead



Health systems: Addressing overtreatment and undertreatment in achieving global goals of universal access

Shannon Brownlee, Senior Vice President, The Lowy Institute

The problems in how we deliver and overuse health care – particularly for cardiovascular disease – has profound implications for our ability to address health promotion and disease prevention, said Shannon Brownlee.

She began her presentation by showing a Dartmouth Atlas map of the 306 hospital referral regions in the United States, each of which includes at least one referral hospital that is authorised to do open heart surgery or neurosurgery. The map, which shows the annual age, sex, race, and price-adjusted Medicaid reimbursements per beneficiary in the different regions, reveals a 2.5-fold variation between the highest- and lowest-spending regions. Certain areas in the United States spend as much as USD 15 580 per beneficiary, while others spend as little as USD 6 260.

A study looking at the health implications of these spending discrepancies concluded that while Medicare enrollees in higher-spending regions receive more care than those in lower-spending regions, they do not have better health outcomes or satisfaction with care.

These and other findings suggest that 10% to 30% of the health care delivered in the United States is unnecessary, said Brownlee. Data from the Dartmouth Atlas also shows that rates of percutaneous coronary interventions or PCI (also known as angioplasty, which often includes use of a stent) differ by up to 10-fold around the country. But the highest procedure rates do not correspond with the highest rates of cardiovascular disease (as measured by rates of acute myocardial infarction). Similar regional variation is evident with coronary artery bypass grafting (CABG).

Studies looking at individual hospitals show that rates of inappropriate use of PCI ranges from 10% to 60%. Recently, the United States Department of Justice has investigated several “outlier” hospitals where rates of cardiovascular interventions are very high, and some cardiologists have paid fines and even been jailed, said Brownlee.

As for rates of overuse of cardiac procedures in the rest of the world, we don’t have a clear picture, especially in Mexico and Brazil, due to a lack of data. PCI and CABG rates are far lower in Mexico than in the United States, but there are no published studies on the variation of cardiac procedures utilisation in Mexico or Brazil. However, 139 studies in 23 countries (mostly Europe) looking at variation in treatment for cardiovascular disease all found unwarranted variation.

Anecdotal evidence suggests that low- and middle-income countries (LMICs) may be on the path toward adopting a “more is better” medical culture, taking their cues from the United States and the nations in the Organisation for Cooperative Development. In addition, multinational corporations are actively marketing drugs and devices in LMICs, said Brownlee.

Socially responsible development of delivery systems in LMICs means that it’s important to pre-empt the excesses that are so entrenched in the United States and Europe, said Brownlee.



Synergies with the WHO and with ministers of health

Thomas Zeltner, Special Envoy for Financing, World Health Organization

The World Health Organization (WHO) needs to foster synergies between the business sector, academia, and ministers of health, according to Thomas Zeltner, who offered a brief history of WHO’s actions over the past few decades and its plans for the future.

In 1990, the top five causes of global disability-adjusted life years (DALY) were lower respiratory infections, diarrhea, preterm birth complications, ischemic heart disease, and stroke. At the time, WHO responded by concentrating on emerging and re-emerging infectious diseases: HIV/AIDS, SARS, and influenza. By 2010, ischemic heart disease topped the list of DALYs, followed by lower respiratory infections, stroke, diarrhea, and HIV/AIDS.

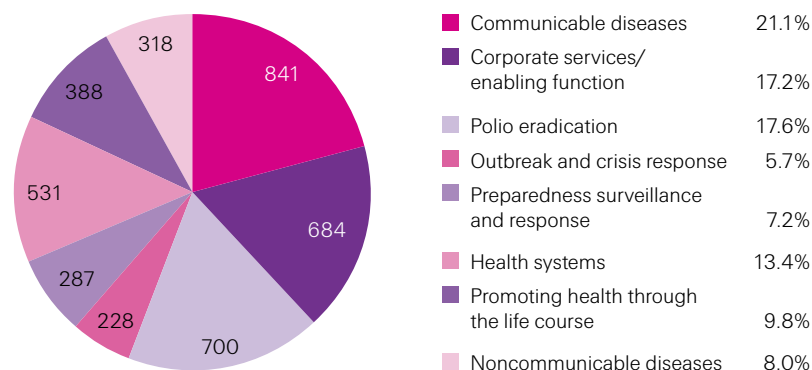
These changes bring up a number of questions, said Zeltner. For example, did WHO’s efforts help to prevent HIV from being higher on the list? And did ischemic heart disease and stroke rise to the first and third positions as a result of natural history, or because WHO didn’t respond to the emerging threat of those noncommunicable diseases? But the trickiest question, said Zeltner, is “What do we want in the number one and two positions in 2030?”

Zeltner argued that by concentrating on infectious disease, WHO lost ground in the global health arena. Another factor was the emergence of the Global Fund and the GAVI alliance. Compared to WHO, which includes 194 member states, these smaller organisations are able to make decisions more easily and quickly. In addition, the amount of money in global health has exploded, from USD 6 billion in 1991 to USD 28 billion today. Because of this expansion, WHO now plays a much smaller role in global health.

WHO’s efforts to control tobacco include the Framework Convention on Tobacco Control, which has been signed by 177 countries. A United Nations general assembly meeting on prevention and control of NCDs in 2011 focused on four diseases: cardiovascular disease, diabetes, cancers, and chronic respiratory disease. The overarching global target is a 25% reduction in premature mortality from NCDs by 2025, which includes nine targets focused mainly on controlling risk factors, such as lowering the use of tobacco, alcohol, and salt, and preventing increases in obesity.

In 2014, WHO’s budget for NCDs will rise from 8% to 20.5%, but that percentage is still low compared to the budget allocation for infectious diseases and emergencies, noted Zeltner.

Figure 8:
Approved WHO programme
budget 2014–2015 (in USD million)



Source: World Health Organization

Zeltner closed with a quote from global health expert Barry R. Bloom, of HSPH: “The World Health Organization needs major reform to regain its leadership as a convener and provider of scientific and technical knowledge.”



The future of disease-based models of longevity

Daniel Ryan, Head Life & Health R&D, Swiss Re

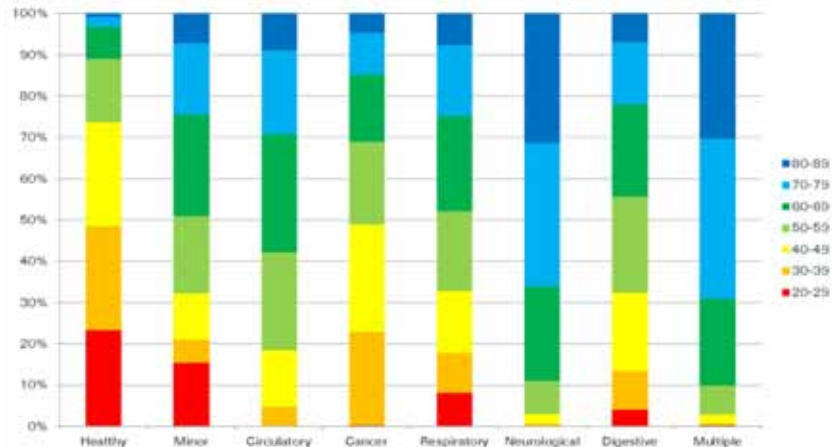
In 2009, a Lancet article featuring a graph of life expectancies from 1850 to 2000 suggested that most babies born in the year 2000 in the United States, several European countries, and Japan will celebrate their 100th birthdays. But when considering life expectancy trends, asked Daniel Ryan, are past successes a good guide to the future? In his presentation, he discussed novel sources of data that enable a deeper level of analysis to predict longevity trends.

For example, if you look at mortality trends in men from 1970 to 2010 in the United States, mortality rates fell for most causes of death, especially for cardiovascular disease. Overall mortality from cancer hasn't changed much, but we know that this isn't the complete picture as cancer survival rates are improving. Are we just detecting cancer earlier and people are still dying at the same age? Or are improvements in diagnosis and treatment extending life? Ryan questioned.

The main problem is that we typically have very limited information on individuals: when and how they died, said Ryan. In certain countries, researchers can use medical records databases to achieve a better understanding of how diseases develop and patterns of health over a lifetime, said Ryan.

In the UK, for example, data warehouses, such as the Clinical Practice Research Database (CPRD), capture diagnosis and treatment information on 5 million patients from visits to their general practitioner. These data warehouses play a key role in monitoring and promoting clinical standards and guiding healthcare expenditure. Data from these records can also enable researchers to explore the drivers of mortality, said Ryan.

Figure 9:
UK men aged 20-89 now.
Distribution of health and disease



Source: Clinical Practice Research Database (CPRD) from Department of Health, United Kingdom (UK)

There are also unstructured databases with similar information on health status. On the PatientsLikeMe website, people with different diseases share information about their symptoms and treatments. People with similar experiences then gain insight as to how their functional status may change over time. Currently, more than 220 000 people with some 2 000 different conditions have joined. "Their attitude is that sharing their health information helps other sufferers and increases the likelihood of insights that will help their own future health," said Ryan.

Session 4: The road ahead

Actuaries and demographers are keenly interested in better models of future population numbers and life expectancy. A more complete understanding may be possible from such data if we consider disease-centred mortality models. Such models bring together data and expert opinion in three central elements: 1) current rates of disease diagnosis, 2) co-morbidity and survival for different diseases, 3) forward-looking scenarios on the impact of changes in risk behavior, diagnosis and treatments.

As examples, Ryan shared expert opinions on the potential impact on future longevity of stem cell therapy, genetic testing, vaccines, monoclonal antibodies, monitoring technology, and nanomedicine.

Panel discussion and concluding remarks

Frank Hu, Professor of Nutrition and Epidemiology,
Harvard School of Public Health

Stephen Kramer, Head of Epidemiological Research, Life & Health R&D, Swiss Re
Carlos Mendivil, Associate Professor, Universidad de los Andes, Bogota, Colombia

Frank Hu began the discussion by noting that one value – 80% – came up frequently over the two-day conference. Several NCDs are responsible for 80% of deaths; 80% of NCD deaths occur in low-and middle-income countries; and several risk factors – tobacco, diet, and physical activity – are responsible for 80% of NCDs.

The bad news? NCDs contribute greatly to morbidity and mortality. The good news? Many of those deaths could have been prevented or avoided by lifestyle interventions, which speaks to the importance of the conference, said Hu.

In terms of addressing obesity and its risks, calorie content is the number one issue, said Carlos Mendivil, noting that Latin American countries need to avoid the super-sizing that happens in United States. He also stressed the need to promote whole grains and banish trans fats from the Latin American diet. To tackle the soda problem, said Mendivil, “We need help from public policy professionals, because taxation isn’t going to be enough.”

Addressing Thomas Zeltner, Vikas Saini brought up the imbalance among different health care policies worldwide, particularly in terms of investments and resources. From a public policy point of view, how do we navigate a transition from some of the intensive, ineffective medical care policies to more a public health infrastructure?

The problem, said Zeltner, is that most leaders are not trained in dealing with complex systems. “If you have a problem in Massachusetts that you can’t solve, you move it to Washington, and if you can’t solve it in Washington, you move it to Geneva and the WHO. We believe that moving up helps, but it does not.” A lot is about power and money, he added. “It’s hard for economies and even governments to get out of this conflict and to say we could actually have better health for less money.”

Mendivil then asked Zeltner what he would chose as the top five causes of death worldwide. In Germany, the word for being sick also means suffering, Zeltner replied, noting that he would prefer causes of mortality where suffering is low. “With chronic diseases, we need to acknowledge that it’s not just one person who suffers, it’s also the parents and the children,” he added

Hu added that in terms of longevity, the goal is to die at a later age but also to enjoy more healthy years. The “healthy aging phenotype” consists of the following criteria: living to age 75 without a major chronic disease or physical disability and with good cognitive function and no depression. Only about 10% of adults meet those criteria, he said. Most cardiovascular disease risk factors also predict the healthy aging phenotype, he said.

In his concluding remarks, Joe Brain reiterated the importance of cardiovascular disease as a paradigm for solving problems related to a range of health problems. He praised all the speakers, especially the fellows and mentors, who have been “extraordinarily productive” since the program launched some six months ago.

“In a crowded field where there’s a lot going on, we have found a path that can help solve some of the profound problems that face society, while paying attention to the ethical, moral, and spiritual core that undergirds some of these decisions,” said Brain.

Organisers



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Title:

Impact of cardiovascular risk factors on healthy lifespan and mortality in Brazil and Mexico
Conference Report

Publisher:

Swiss Re Centre for Global Dialogue

Author:

Julie Corliss

Photography:

Isabel Roeder, Henry Sieber

Graphic design and production:

Swiss Re Corporate Real Estate & Logistics/Media Production, Zürich

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global_dialogue@swissre.com
www.swissre.com/cgd

Swiss Re Centre for Global Dialogue
Gheistrasse 37
8803 Rüschlikon
Switzerland

Telephone +41 43 285 8100
Fax +41 43 285 8101
global_dialogue@swissre.com
www.swissre.com/cgd