

New Strategies for Recognizing and Preventing Occupational Diseases: The Canadian Forum on Occupational Health and Safety

Canadian Centre for Occupational Safety and Health

"Workplace Health Challenges for the 21st Century"

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Introduction

Louis Pasteur once said, "Science knows no country because it is light that illuminates the world."

Like science, emerging infectious diseases know no country either. There are no security barriers to prevent their migration across international borders or around the world's time zones--their movement is as free as that of our globally interconnected delivery system of goods, services, email messages, and workers in a globally-integrated economy. And, because each of our scientific, social and economic activities is becoming more and more interconnected, the need for us to cooperate and collaborate has never been greater.

In some sub-Saharan countries of Africa—the continent with 70% of the world's total of 42 million AIDS sufferers—up to 38% of the entire adult working population is infected with HIV. In these countries, employers have had to purchase, and make available, anti-viral medications to their HIV-infected workers to maintain minimum workforce capability. In some African countries, effectuating even a minimum level of sustainable *workforce-dependent* economic activity has become a struggle.

The social and economic effects of emerging diseases reached a milestone with the 2003 outbreak of some 8,000 cases of Severe Acute Respiratory Syndrome, or SARS. In a global sense, this relatively small outbreak nevertheless cost the interconnected global economy nearly \$60 billion dollars in disrupted social and economic activities.

The human immunodeficiency virus, the SARS-coronavirus and newly emerging avian influenza virus are biologic agents that are challenging political systems, national and international health care systems, industrial sectors and occupational health professionals. But, newly emerging pandemic agents are not the only hazardous agents which present new challenges to us in the 21st century. Human beings as agents of international terrorism--using radiation, infectious agents, or chemicals--either for purposes of mass disruption or mass destruction, pose challenges as critical to us in the occupational safety and health community as they do to an increasingly globally-integrated economy.

On behalf of the United States National Institute for Occupational Safety and Health, I am pleased to be asked to participate in the first National Forum by the Canadian Centre for Occupational Safety and Health on ways to improve the recognition and prevention of occupational diseases.

I am also pleased to speak to you today as a representative of the nearly 2000 scientist researchers, field investigators and support personnel who work at NIOSH in eight States.

NIOSH has many internationally recognized experts in the field of occupational disease--experts in respiratory diseases like chronic beryllium disease and beryllium sensitization; experts in occupational cancer; experts in infectious diseases that can be transmitted in an occupational setting; experts in workplace stress and related cardiovascular disease; and experts in work-related musculoskeletal disorders.

However, I am not an expert in any of these diseases. I recognize that the organizers were not completely aware of this fact when they invited me. Nevertheless, I am by nature an optimistic person so I am going to continue.

My presentation will be brief. I just want to pose a single question to you.

Is our occupational risk recognition, risk characterization, risk control and risk communication paradigms--be they regulatory or consultative--configured as they were in the last century, or even in the century before the last century--are they the ones we need for a rapidly changing 21st century world?

This question becomes all the more urgent because we in the occupational health community are simultaneously struggling with challenges relating to the workforce itself, challenges relating to technological advances, and to the challenges of global economic integration.

Workforce Challenges

Several workforce demographic and social trends will occur in the 21st century that have importance for workplace health.

First, the average age of workers is increasing in most developed countries of Western Europe and North America. This is occurring for three major reasons. Life expectancy is increasing. In fact, advances in medicine in the coming decades may further lengthen human life spans in the developed world. Second, fertility rates are declining, generally. And third, the US is experiencing a unique event—the progression through life of an unusually large post-World War II “baby boomer” generation.

Let me say at the outset that even though NIOSH as a matter of policy is strongly opposed to aging, we nevertheless thought it best to explore what reasons might exist besides their increasing numbers to focus on the workplace health and safety needs of older workers.

In order to answer this question, the National Institute for Occupational Safety and Health, the National Institute on Aging, the Archstone Foundation, and the Environmental Protection Agency asked the National Research Council to organize a study on the health and safety needs of older workers. The Report—entitled the Health and Safety Needs of Older Workers—was released in 2004, and is available on the National Academies Press website at <http://www.nas.edu/nrc/>.

Why should attention be paid to the health and safety needs of older workers?

Understanding the capabilities, limitations, and needs of older workers can help address issues of productivity and labor supply. Slowdowns in the labor supply are projected in the next two decades from 4% growth in the 1970s to 0.4% growth in the decade 2010 to 2020. Therefore, to maximize the benefits to the economy and investment capital, a societal interest in retaining older workers in the workforce drives our interest in older workers. So, from this perspective, we need to learn which older workers can be expected to work productively, what kinds of tasks they are best suited for, and how their productivity might be increased through cost-effective accommodations and support programs in the workplace and in the community.

Older workers differ from younger workers in physical, psychological and social ways. Some of these differences are normative changes of aging and others are age-dependent risks of developing abnormal conditions or pathologies. Work performance may be diminished relative to younger workers—especially in strenuous industries like mining, construction and agriculture—where musculoskeletal stamina is important. But, other cases, age-related changes such as increased experience may enhance work performance.

Age-related changes in skeletal muscle mass, bone density, vision, hearing, lung function, skin thickness, metabolic rate and immune function are characteristics of older workers that interact with work-related exposures—with exposures accelerating the normative age-related system changes. As you know, functional aging is often represented as a negative slope of function versus time. It is the precise degree of the negativity of the slope that distinguishes in age-related functional changes that distinguishes healthy aging from abnormal aging.

Do we know much about the effects of work on older workers?

Unfortunately, assessing the causes and extent of work-related injuries and illnesses for older workers versus younger workers is hampered by limitations in existing data collection systems. As an example, little is known about the age distribution of work-related musculoskeletal disorders despite the fact that these are the most commonly reported work-related disorder. An important point when we consider just this one area, is that the increased prevalence of some degree of musculoskeletal impairment among older workers, as opposed to younger workers, and the growth of our older workforce, is expected to increase the number of workers who bring musculoskeletal impairments to the job, and who will be at increased risk of exacerbating their existing impairments.

All in all, recognizing occupational effects of work on older workers is going to be a challenge. We need to incorporate this challenge into every study of occupational disease in the 21st century.

The **second** workforce challenge is the increasing proportion of new entrants to developed countries workforces that are non-native immigrants. In the US, the flow of immigrants is both responsible for increasing the racial and ethnic diversity of the American workforce, but more than that is responsible for challenging our ability to create a transcultural workplace safety paradigm in the United States. Transcultural workplace safety emphasizes risk recognition, risk control and risk communication strategies that are responsive to the multi-cultural composition of a developed country's workforce.

For instance, immigration is fast transforming the American workforce. Over a third of all unskilled jobs are now held by immigrants and about half of the foreign-born population in the United States is from Mexico and Latin America.

The Latino population represented 9% of the American population in 1990, by 2000 the Latino representation was 12.5%, and by 2050, Latinos will represent one out of every four persons in the United States.

Latino men and women are more likely to be employed than non-Latino workers in riskier blue-collar and service occupations. Furthermore, data show that racial and ethnic minorities suffer disproportionately more from both fatal and non-fatal work-related injuries and illnesses.

In the 21st century, we will need to fashion a risk communication paradigm that builds on workers' cultural values instead of ignoring them; a risk communication paradigm that is effective without assuming a "standard" educational attainment on the part of the worker; and a risk communication paradigm that incorporates hands-on demonstrations of safety principles instead of relying on a worker's oral or written language literacy.

Third, workforce participation by women is increasing. Coupled with decreasing labor participation rates for males (at least during the 1990s), the increasing female participation has brought the American workforce into near gender balance. A more gender balanced workforce across all industries requires us to better integrate protection against gender-specific reproductive hazards and musculoskeletal hazards into our risk management paradigm.

Fourth, the lines between occupational health and non-occupational health issues will continue to blur. Ill health and injury, whether caused by work or resulting from off-work activities, reduces income, quality of life, and opportunity. Nevertheless, there has been a longstanding disconnect between those interested in control of hazards arising from work, and those interested in reduction of risks arising from outside the workplace.

In the 21st century, we will need to integrate our workplace safety community with other injury prevention and health promotion professional communities. We can ill afford to continue the separation of workplace safety from health promotion. There is a growing body of evidence and opinion that the separation of focus on at-work and off-work hazards and risks is artificial and is not serving workers or their employers optimally. A new emphasis on a business's "people asset" suggests that productivity is related to a more holistic view of health than our current occupational vs. non-occupational paradigm. Through a *STEPS to a Healthier Workforce* Initiative, NIOSH is engaging the broad community of those interested in protecting and improving the health of people who work into a new effort to integrate approaches to health protection and health promotion—to focus on a common goal of improved worker safety by drawing on a diversity of independent and interacting strategies.

Technological Advances

Information Technology

Advances in information technologies will make the 21st century economy in developed countries one based more on information--as opposed to one based on production, as it was in the last century. We have seen remarkable advances in informational technology at the end of the 20th century. What has been the effect of these advances in information technologies on work itself?

The 20th century conventional model of employment was that of a full-time job of indefinite duration at a facility owned or rented by the employer. I think that continued exclusive use of that model by the occupational health community is anachronistic. The advances in information technologies have weakened, and will continue to weaken, the bonds between work and the workplace.

For instance, in the 20th century, we thought self-employment was non-standard. Now, 25% of the American workforce can be considered to be working in a nonstandard way. Employment in the 21st century will be characterized by temporary or contract work, contingent workforces, decentralized decision-making, vertical disintegration and specialization, expansion in the range and variety of work schedules and hours worked per shift, and the continued trend toward outsourcing functions peripheral to the core business.

Based on what we can see ahead in the 21st century, one can envision continued disintegration of traditional work sectors into a business model consisting of an array of individuals, IT-enabled perhaps through wireless connections, self-employed, "e-lancers" working from multiple locations, including their homes, and other transient places around the globe, concurrently on multiple projects for multiple different payers.

And these formerly "non-standard" arrangements of employment and the breakdown of the traditional employer-employee relationships may indeed have profound effects on workforce safety and health. We already are finding out that how work is organized may affect cardiovascular, musculoskeletal and psychosocial health. Injury rates may depend on stressors arising from work hours, scheduling and organization.

Nanotechnology

Perhaps the most demanding challenge that awaits us in the 21st century is the knowledge and application of nanotechnology. Nanotechnology involves the engineering and manipulation of materials, structures and devices on a nanometer scale--less than 100,000th the width of a human hair. At this ten to the minus 7 to minus 9 meter scale, many materials have unique and unusual properties--some even of a quantum mechanics nature.

Nanotechnology is already used in a number of products from dental-bonding agents to magnetic storage media and more applications will emerge in the next several decades, such as drug delivery systems, medical imaging applications, stronger, lighter and more durable materials, new defense technologies and miniature sensors. Another possibility is the use of nanotubes as reinforcement for composite materials. Presumably from the nature of the bonding, it is predicted that nanotube-based materials could be 50 to 100 times stronger than steel at one-sixth of the weight, if current technical barriers can be overcome.

New technologies introduce new occupational safety hazards, and nanotechnology is no exception. Materials and devices under development are so far from our current understanding that we can not easily apply our existing paradigms to protecting workers. Perhaps for the first time, we need to characterize the quantum properties of exposure. Since nanotechnology products are increasing in use--societal implications--including ones related to occupational health, have become a significant issue.

Very little is known currently about how dangerous nanomaterials are, or how we should protect workers in nanotech-related industries. But, research over the past few years has shown that nanometer-diameter particles are more toxic than larger particles on a mass basis. This may be because the surface area of a molecule is the place where chemical reactivity occurs and carbon nanotubes, for instance, are all surface area.

This fact, plus the combination of particle size, unique structures, and unique physical and chemical properties, suggests that a great deal of care needs to be taken to ensure adequate worker protection when manufacturing and using nanomaterials.

In the U.S., the National Nanotechnology Initiative places a strong emphasis on societal implications of nanotechnology. Consideration of the workplace health impact of nanotechnology is one of the 10 key aims of the U.S. National Nanotechnology Program, which was established by an act of Congress in December of 2003, called the 21st Century Nanotechnology Research and Development Act.

NIOSH is uniquely positioned to investigate the health effects of nanoparticles based on its current work in welding, diesel, and beryllium ultrafine particles. For instance, NIOSH research has shown a close correlation between beryllium sensitization and the number concentration of nanometer-diameter beryllium particles.

From this start, NIOSH has been building an active nanotechnology program over the past few years. As well as interacting with industry and other research groups, NIOSH is participating in the Nanoscale Science, Engineering and

Technology subcommittee of the National Science and Technology Council, or NSET, and is a member of the National Nanotechnology Initiative. NSET and NNI are responsible for directing federal nanotechnology research within the U.S.

Many industries and research organizations have an immediate need for guidance on how to handle nanomaterials. While we still don't know how harmful or benign these materials may be, it is important to provide basic information to manufacturers and users on how to minimize health risks based on what we do know. Basic industrial hygiene questions need to be answered. For instance, since nanoparticles have so little mass, can gravimetric methods be useful in exposure assessment or should some other dose metric be used?

NIOSH is therefore taking the lead through the interagency working group on nanotechnology and health to provide basic information on precautions that can be taken to reduce exposures through the appropriate use of control measures, personal protective equipment and good working practices.

In addition, an expert group gathered for the first-ever *International Symposium on Occupational Health Implications of Nanomaterials*, sponsored by NIOSH and the Health and Safety Executive (HSE), the United Kingdom's counterpart to the Occupational Safety and Health Administration in the U.S. (HSE's Health & Safety Laboratory, NIOSH's research counterpart in the U.K., is located in Buxton). NIOSH and HSE convened the research summit to examine occupational health issues related to the production and use of nanomaterials: What is currently known about potential exposures to nanoparticles in such processes? What more do scientists and policy makers need to know, in order to understand the potential occupational health impacts of this 21st Century technology?

Never before had leading researchers from the U.S., Europe, and Asia met strategically to share their latest findings related to the occupational health aspects of nanotechnology, and to lay out the areas of study needed to fill critical gaps.

From three days of scientific presentations and workshop deliberations, several consistent themes emerged:

- In themselves, studies to date do not provide all the information needed for determining, with confidence, whether nanomaterials have occupational health effects. However, they provide a good springboard for designing new research that will move scientific understanding significantly forward.
- To fill existing gaps, collaborative research is needed across different scientific disciplines. For example, studies are needed to better define the properties and behavior of nanoparticles; develop a "metric" for measuring

exposure to nanoparticles in ways that correlate with potential health factors; assess the adequacy of personal protective equipment; and better assess the relevance of data from laboratory animal studies for predicting potential human effects.

- While further research is planned and conducted, makers and users of nanomaterials can take precautionary steps to control exposures, using the traditional risk assessment/risk management approach and instituting controls as appropriate.
- Tools to measure, assess, and control exposures need to be standardized internationally, to avoid confusion and to promote scientific collaboration.
- Scientists and policy makers should maintain open communication with the public as research, development, and application of nanotechnology advances.

Lastly, it is important to engage discussion of the societal implications of nanotechnology not only among experts but also among workers and the general public. If we lose the public's trust about nanotechnology at its embryonic developmental stage, as it was lost with genetically-modified crops, then we are in an uphill battle to recover it.

The first international nanotechnology conference will be followed by another in 2005. In partnership with the University of Minnesota, NIOSH will sponsor a *Second International Symposium on Nanotechnology and Occupational Health* on October 4 through 6, 2005, in Minneapolis, Minnesota. Go to www.cce.umn.edu/nanotechnology to find out more information about the Conference.

Also, a lot more information about the challenges of nanotechnology is available on the NIOSH nanotechnology topic page at www.cdc.gov/niosh/topics/nanotech/. Presentations and proceedings from the 2004 symposium will be posted on the web page as soon as they become available.

Global Economic Integration

The third challenge in the 21st century that I wanted to mention to you today concerns global economic integration and the challenges that globalization pose for workplace health.

The need for global cooperation to create a sustainable approach to occupational health protection is greater than it has ever been because globalization is a more prevalent than it has ever been.

I understand **globalization** to be an increase in the frequency and duration of linkages between countries leading to similarities in the activities of *individuals*, the practices of *businesses*, and the policies of *governments*. **Sustainable globalization** is when those linkages lead to the betterment of the human condition for all the world's peoples.

And, whether measured by knowledge transfer, by the flow of goods and services, by direct or indirect investments, the economies of the both the developing and developed world are becoming more integrated, and, therefore, more susceptible to sudden social, political, security or economic dislocations.

Three issues are worth mentioning today: first, the unifying thread of costs analysis that all businesses--regardless of location on the globe--share in common; second, the interplay of labor standards and globalization; and third, the need for linkages that create a common, and sustainable, system for risk management that is not dependent on a legally constrained governmental quantitative risk assessment model.

First, as more and more businesses become global businesses and as more and more workers from developed countries emigrate to other countries to work, the countries in which those businesses and their workers will find themselves have risk management paradigms that differ from ours. More than regulatory paradigms, the global language of safety is largely the language of the market.

This is so even as the global community struggles to harmonize disparate national safety systems through various efforts such as the United Nations Globally Harmonized System for the Labeling and Classification of Chemicals, the European Union's REACH program, and the British Health and Safety Executive's Control Banding initiative.

The necessity for building a business case for workplace safety efforts will only grow in importance as economies become globally integrated and market incentives remain the main driver for development. The issue for us is that other countries may lack our legal foundation for workplace standards development and standards enforcement. In the absence of a globally unifying legal framework, the pressure on safety professionals to actually demonstrate not only the effectiveness, but also the attendant cost savings of safety and health interventions, will only grow. A cost-benefit analysis for occupational health protection interventions at the establishment level will become the overriding decision metric in a globalized economy. Our paradigm of rule-centered safety and health may not fit a global workplace.

Second, the often acrimonious debate that occurs between advocates of globalization and those opposed to it over the role of labor standards needs to be transformed to a discussion of how globalization and labor standards can complement each other. Workplace safety is among those labor standards that have to be fitted to global realities. That will require us to look very closely at our risk characterization and risk control paradigms.

This is our third globalization question--how globally exportable is our occupational exposure limits setting process or our quantitative risk control paradigm?

Setting limits for safe exposure to chemical agents in the workplace and in the environment is a complex process involving science, law and policy--especially for chemicals with suspected or known carcinogenic effects. Development and use of occupational exposure limits is a question which should transcend national interests and international borders--and so does the question about how effective they can be in protecting worker health in the 21st century.

The concept of occupational exposure limits dates back to 1886 when Germany became the first country to introduce them to aid in the assessment and management of risks posed by the new industrial workplace. In the intervening 118 years, the processes for developing, setting and using occupational exposure limits have become widespread throughout the developed world. However, the process of developing and setting mandatory or voluntary limits is increasingly being criticized in the United States as bureaucratically complex and excessively time-consuming. Indeed, examining the occupational exposure limit--whether a permissible exposure limit (PEL) or a recommended exposure limit (REL)--it would be mighty hard to assert that the U.S. process of setting occupational exposure limits is efficient either in terms of resource demands or expeditious in terms of time from initiation to completion. As a result, the scientific status of most governmental exposure limits in the U.S. is "dated" to say the least.

Worker advocates point to the lack of health protection that scientifically out-of-date mandatory exposure limits represent. And, since quantitative-dependent risk management is still a part of any occupational safety and health professional's job, these professionals are increasingly utilizing occupational exposure limits derived from non-US governmental sources as a standard of professional practice, or developing their own limits or considering alternatives to quantitative risk assessment-dependent risk management or developing non-quantitative risk management models

It seems then that the statutory promise contained the standard-setting provisions of the American Occupational Safety and Health Act has been dimmed in the three and one-half decades since it was enacted in 1970. Indeed, soon after the Act was promulgated, it became clear that for regulatory purposes,

qualitative methods were insufficient to support regulation when the U.S. Supreme Court struck down OSHA's benzene standard in 1980 for an insufficiently science-based rationale for risk assessment and risk reduction. This spurred a decade of development in the 1980s of the controversial principles of quantitative risk assessment and enshrined it as the cornerstone of risk management.

When examining the current substance-by-substance quantitative risk assessment approach now thirty-five years later, given the current number of possibly toxic chemicals in commercial use which lack an exposure limit, it is not hard to conclude that the current exposure limit-setting process--whether governmental or non-governmental--is less than fully effective in protecting workers from exposure to toxic chemicals in the workplace. And the situation does not look like it will get much better anytime soon.

Compared with the number of chemicals in commercial use, relatively few substances have any kind of occupational exposure limit, let alone regulatory ones. For instance, the UN Organisation of Economic Co-operation and Development (OECD) List of high production volume chemicals—chemicals produced at levels greater than 1,000 tons per year in at least one of the 30 member countries—contains 5,235 chemicals. Only a small percentage of these chemicals have exposure limits established for them.

One has to ask then: Is the quantitative risk assessment-dependent path that we have been on during the last three decades, the right path to protecting workers in the 21st century's globally-integrated economy?

Among proposals to "fix" the problem with exposure limits development in the United States are those that merely tinker with the development process; those that suggest generic approaches to exposure limit-setting; and others that propose making legislative changes to the Occupational Safety and Health Act to simplify the exposure limit adoption process. But, perhaps those with the greatest promise are those that look to more globally sustainable approaches.

Several promising approaches are on the global horizon. I will mention only two.

First, a globally harmonized system for the classification and labeling of chemicals, or GHS, is developing under the auspices of the United Nations. The GHS has the potential to bring together risk assessment and risk management in a globally consistent strategy for chemicals, and may provide a context for the use of a newer exposure control tools without the need for technically-intensive risk assessment. In the United States, NIOSH, the Occupational Safety and Health Administration are joining the Environmental Protection Agency in examining the utility of the globally harmonized system.

Second, a newer risk management approach--used first by the pharmaceutical industry--is attracting attention--control banding. Control banding has the potential to provide linkages between risk assessment and risk control for businesses in both the developed and in the developing world. This is so because barriers to workplace hazard management in developing nations include lack of expertise, technology, finances and time, and the same barriers exist in small businesses in developed countries. In fact, even when a current occupational exposure limit does exist for a particular toxic agent, small to medium-sized employers whether they are in developed or developing nations have less resources and expertise to implement an exposure assessment and control plan that is fully responsive to the control measures necessitated by a quantitative exposure limit.

A model program that provides clear solutions to chemical control problems in workplaces can be found in an innovative new product of the British Health and Safety Executive (HSE). This approach, which eliminates the need to measure exposures and yet meets the regulatory requirements of the UK, has immense potential value for employers in developed and developing nations who could devote scarce resources to controlling exposures rather than to measuring exposures.

The control banding approach has recently gained momentum through adoption by the International Program on Chemical Safety (IPCS) and the formation of an international workgroup to advance the approach in developing nations. Several WHO Collaborating Centers in developing and industrializing nations are beginning the translation and piloting of the ILO Chemical Toolkit, with assistance from the International Occupational Hygiene Association and the UK's HSE.

In chemical control banding, a chemical is assigned to a "band" for control measures, based on its hazard classification. Based on a control banding approach, controls for chemicals that have never had an occupational exposure limit can be developed and implemented without the need for setting a laborious quantitative occupational exposure limit.

Interest in the United States--in collaboration with several global partners--is growing for the control banding approach. The National Institute for Occupational Safety and Health hosted the Second International Conference on Control Banding in March of 2004 and plans the Third International Conference next week in Washington. We are actively studying how the control banding approach can be validated. We hope to have our own Control Banding Topic Page on our website soon.

Clearly, there are many more approaches that can be considered. For instance, there are ones based on a precautionary approach where the traditional risk assessment paradigm is reversed from where the government is required to show adverse risks from use of a particular chemical before regulating exposure

to it to one in which the manufacturer is required to show the absence or the acceptability of risks associated with the chemical before the chemical is allowed to be marketed as the REACH Program in the EU seems to move towards.

The important point is not that any of these--or other--alternatives is more valid than the other. Rather, the point is that it is time to begin a serious discussion of how to control risks in a 21st century globally integrated economy recognizing the methods developed in the last century may have outlived their utility.

Conclusion

In conclusion, there is no doubt that there are many challenges for us as the future of occupational safety and health unfolds in the 21st century. To chart our course, though, it is crucial that we break down the barriers that separate our individual professional efforts. We need to develop partnerships and collaborations to promote the transfer of research findings into practical, cost-effective, evidence-based interventions for each of the many workplace safety challenges we face.

NIOSH is proud to work in collaboration with the Canadian Centre for Occupational Health and Safety to achieve a safer, healthier 21st century. As common partners in the WHO Global Network of Collaborating Centers in Occupational Health--a network of partners, located in about 40 countries around the globe, working together in 15 priority areas on more than 300 projects--we hope to bring reality to the concept of sustainable globalization.

Our partnership needs to realize that paradigm shifts in our thinking may be necessary in order to make further progress to our goal of workplace illness elimination. And these goals need to be more than achieving zero adverse work-related outcomes, but rather a holism where work is self-defining in the most enhancing way possible, where a worker can enjoy any retirement years with intact health, and where non-work-related health behaviors are valued and promoted in the workplace.

As the World Trade Center taught us in 2001, and as the epidemic of SARS taught us in 2003, our world is interconnected and our future is also.

Thank you for inviting me to participate in the first National Forum on Occupational Diseases.

I wish each of you a safe, a healthful and a secure workplace.