

# PROGRAM

## National Conference on Ergonomics, Safety, and Health in Construction

*Setting the Agenda and Creating a Coalition*

July 18-22, 1993

Omni Shoreham Hotel, Washington, D.C.

*Sponsored by:*

The Center to Protect Workers' Rights  
*and*

National Institute for Occupational Safety and Health  
U.S. Occupational Safety and Health Administration  
U.S. Department of Energy

*with*

American Industrial Hygiene Association  
American Public Health Association  
National Constructors Association  
National Erectors Association  
National Safety Council

Society for Occupational and Environmental Health  
ANSI A-10 Committee on Safety in Construction & Demolition

*with the help of:*

Bau-Berufsgenossenschaft (Germany)

Bygghälsan (Sweden)

Construction Safety Association of Ontario (Canada)

Stichting Arbouw (the Netherlands)



*We are pleased to acknowledge financial support for this conference from the following organizations:*

*National Institute for Occupational Safety and Health*

*U.S. Occupational Safety and Health Administration*

*U.S. Department of Energy*

*Building and Construction Trades Department, AFL-CIO*

*Union Labor Life Insurance Company*





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## WELCOME!

This conference is a watershed for construction safety and health. It brings together unions, employers, government, public health advocates, construction owners, and insurance experts. Never before has such a broad range of interests assembled to address this subject.

This diverse gathering is as it should be. Safety and health should not be a source of dispute for the interests in the construction industry. We have a moral obligation that should be our primary motivation. If this fails, there is a legal framework — the Occupational Safety and Health Act — to fall back on. There is also an economic reason: Safety and health pays in reduced injuries and in lower construction costs.

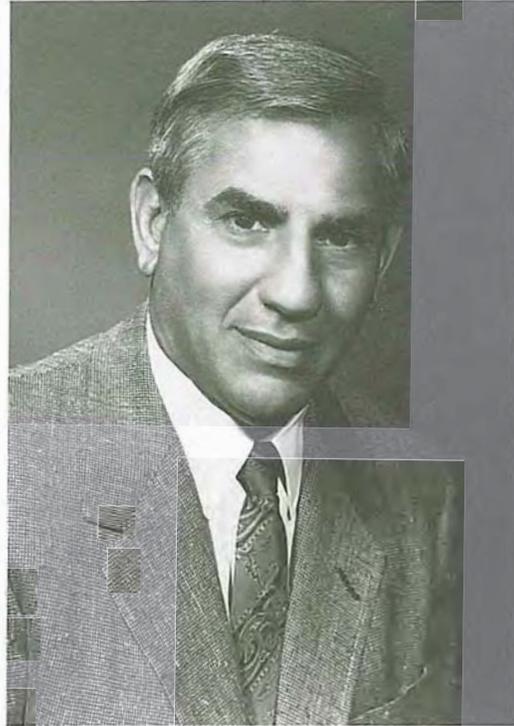
There is an epidemic in the United States, and it has to be stopped. It has been around for so long that no one seems to take notice. This epidemic is in the form of deaths, injuries, diseases, and disabilities among construction workers.

This week, some 40 construction workers will die on the job, some 4,000 will suffer serious injuries, and countless others will be exposed to hazards that will harm their health. We should remember this terrible toll as we meet.

The charge to this conference is clear. Our task is to define ways to control this epidemic, and this should be accomplished through consensus.

In the United States, we are in the unenviable position where we can learn from others who have advanced while we have stood still. We are grateful to the leaders of construction safety and health organizations in Germany, the Netherlands, Sweden, and Ontario, Canada. They have helped us define the needs and opportunities for change. They have brought their expertise to this conference.

This is a working conference. We want your involvement and input in shaping the national agenda to end the epidemic. That's what the workshops are for. We also hope you will stay with us as we follow up on your recommendations. Developing an agenda is one thing; implementing it is more difficult. For this we need a coalition, and we hope we are beginning here to build the coalition.



Robert A. Georgine  
Conference Chairman

**J. Donald Millar, M.D., D.T.P.H. (Lond.)**  
**Director**  
**National Institute for Occupational Safety and Health, CDC**  
**July 13, 1981 - July 31, 1993**



Dr. Millar has contributed greatly toward assuring safe and healthful working conditions for all America's workers. His accomplishments include promoting scientific excellence in NIOSH research, marshalling the program's resources to address the most significant, preventable workplace hazards, and supporting the reintroduction of worker safety and health activities into many state and local public health programs.

***THANK YOU DR. MILLAR!***

## Schedule

### Sunday, July 18

Noon-8:00 p.m.	<b>Registration Begins</b> West Lobby
3:00-6:00 p.m.	<b>Exhibits First Open</b> Ambassador Ballroom
6:00-8:00 p.m.	<b>Opening Reception</b> Veranda and Terrace (Blue Room is backup)

## Monday, July 19

- 9:00 a.m.      **Plenary Session I: Opening Session**  
Regency Ballroom  
Robert A. Georgine, Chair
- Knut Ringen, Dr.P.H.  
Director  
Center to Protect Workers' Rights      *Call to Order*
- Robert A. Georgine  
President  
Building and Construction Trades Dept.      *Welcome: Why We Are Here*
- J.Donald Millar, M.D., D.T.P.H. (Lond),  
Director  
National Institute for Occupational  
Safety and Health      *Safety & Health: A New Beginning (video)*
- Riley Bechtel  
President and Chief Executive Officer  
Bechtel Group      *Welcome from NIOSH*
- Riley Bechtel  
President and Chief Executive Officer  
Bechtel Group      *Industry's Commitment to Safety and Health*
- 10:15      **Break and Exhibits**  
Ambassador Ballroom
- 10:45 a.m.      **Plenary Session II: Where the U.S. Stands**  
Regency Ballroom  
Robert A. Georgine, Chair
- Vice President Albert Gore, Jr. (*tentative*)      *The Clinton Agenda*
- Anders Englund, M.D. (Panel Moderator)  
Director, Dept. of Health & Social Affairs  
National Board of Occupational Safety & Health  
Sweden
- Dr. jur Joachim Berger  
Managing Director  
Bau-Berufsgenossenschaft  
Frankfurt, Germany
- Leen Akkers  
General Manager  
Stichting Arbouw  
The Netherlands
- Matt Elliot  
Immediate Past President  
Construction Safety Assn. of Ontario      *Organization of Safety & Health*

Monday Noon	<p><b>Lunch</b> Blue Room</p> <p>Secretary Robert B. Reich (tentative):</p>	<i>The Department of Labor and Safety and Health in Construction</i>
1:30 p.m.	<p><b>Plenary Session III: The Magnitude of the Problem</b> Regency Ballroom Irvin Etter, Chair</p> <p>Irvin Etter Executive Vice President &amp; Chief Operating Officer National Safety Council</p> <p>John Moran, P.Eng. Director of Occupational Safety and Health Laborers' Health &amp; Safety Fund of North America</p> <p>Eva Holmström, Dr.Med.Sci. Bygghälsan Sweden</p> <p>John Gentleman President Union Labor Life Insurance Co.</p>	<p><i>Overview</i></p> <p><i>Deaths and Traumatic Injuries</i></p> <p><i>Work-Related Musculoskeletal Disorders</i></p> <p><i>The Workers' Compensation Crisis</i></p>
3:00 p.m.	<p><b>Break and Exhibits</b> Ambassador Ballroom</p>	
3:30 p.m.	<p><b>Plenary Session IV: Enforcement Strategies</b> Jim Lapping, Chair (and Panel Moderator) Regency Ballroom</p> <p>James L. Weeks, Sc.D. Research Scientist George Washington University</p> <p>James P. Huckaby Director, Workers' Health &amp; Safety Division Texas Workers' Compensation Commission</p> <p>David Ziegler Acting Assistant Secretary for Occupational Safety and Health U.S. Department of Labor</p> <p>James Conery B.E.C.E. Safety Administrator Boeing Corp.</p> <p>Wayne Rice Vice President and Manager of Safety Services Bechtel Construction Co.</p>	<p><i>Mining as a Model for Enforcement</i></p> <p><i>Prevention, Texas Style</i></p> <p><i>The View from OSHA</i></p> <p><i>An Owner's Viewpoint</i></p> <p><i>A Contractor's Viewpoint</i></p>

## Tuesday, July 20

9:00 a.m.	<b>Plenary Session V: Health Hazards</b> Regency Ballroom Robert A. Georgine, Chair	
	James Melius, M.D., Dr.P.H. Director, Division of Occupational Health and Environmental Epidemiology New York State Department of Health	<i>Diseases in Construction</i>
	Reinhold Rühl, Dr.rer.nat., Dipl.chem. Specialist in Hazardous Materials Department of Occupational Safety and Health Bau-Berufsgenossenschaft	<i>The GISBAU System</i>
	Senator Tom Harkin	<i>The Americans with Disabilities Act and the National Construction Safety and Health Initiative</i>
10:15	<b>Break and Exhibits</b> Ambassador Ballroom	
10:45	<b>Six Workshops on Safety and Health Hazards</b>	
	William Burke, OSHA Ron Stanevich, NIOSH Mark Monson, Construction Safety Council Robert Dexter, Stone & Webster	<i>Shoring and Trenching</i> Diplomat Room
	Steve Cooper, Iron Workers Graciella Perez-Balke, OSHA Gwendolyn Cattledge, NIOSH Robert Krul, Roofers	<i>Slips, Trips, and Falls</i> Regency Ballroom
	Robert Herrick, NIOSH David May, OSHA Mike Andrews, Painters Laura Welch, George Washington University	<i>Solvents and Other Chemicals</i> Capitol Room
	John Moran, Laborers Paul Seligman, NIOSH Ellen Roznowski, OSHA Pam Susie, Center to Protect Workers' Rights	<i>Lead and Other Metals</i> Empire Room
	Dennis Groce, NIOSH L. Christine Oliver, Mass. General Hospital Bill Kojola, Laborers	<i>Dusts</i> Calvert Room

**(Workshops—continued)**

David Rall, Collegium Ramazzini  
John Dement, Duke University Medical School  
Marian F. Meiselman, Carpenters  
Jack Keane, Asbestos Workers

*Chrysotile Asbestos*  
Embassy Room

Noon

**Lunch**  
Blue Room

Thomas P. Grumbly, Assistant Secretary for Environmental Restoration and Waste Management, U.S. Department of Energy: *DOE's New Vision*

1:30 p.m.

**Plenary Session VI: Ergonomics**  
Regency Ballroom  
Richard Lemen, Ph.D., Chair (and Panel Moderator)

Richard Lemen, Ph.D.  
Deputy Director  
NIOSH

*Why Ergonomics is Important*

Barbara Silverstein, Ph.D., M.P.H.  
Research Director, SHARP Program  
Washington State Department  
of Labor & Industries

*What Has Been Done in the U.S. and  
How It Pays Off*

Gerda Linke-Kaiser, Dr. med.  
Chief, Industrial Medicine Service for the  
Construction Industry & Building Trades  
Bau-Berufsgenossenschaft  
Frankfurt, Germany

*Ergonomic Innovations in Germany: Tile  
Setters, Lifting, and Crane Operators*

Tony Cederqvist  
Physiotherapist and Researcher  
Bygghälsan  
Sweden

*Ergonomic Innovations in Sweden:  
Hands, Wrists, and Shoulders*

Nadine Marks, B.S.C.  
Project Coordinator, Research and Development  
Construction Safety Assn. of Ontario

*Ergonomic Innovations in Canada*

3:00

**Break and Exhibits**  
Ambassador Ballroom

3:30

**Four Workshops on Adopting Ergonomics in the Workplace**

Lynn MacDonald, Sheet Metal Workers  
LaMont Byrd, Teamsters  
John Franks, NIOSH  
Scott Schneider, Center to Protect Workers' Rights

*Noise and Vibration*  
Palladian Room

**(Workshops-continued)**

Roger Nelson, Thomas Jefferson University  
Gerda Linke-Kaiser, Bau-Berufsgenossenschaft  
Tom Waters, NIOSH  
Ira Janowitz, Univ. of California Ergonomics Lab. *Lifting*  
Diplomat Room

Stanley Hubbard, Electrical Workers  
Harriet Applegate, Greater Cincinnati Occupational  
Health Center  
Roger Stephens, OSHA  
Vern Putz-Anderson, NIOSH *Repetitive-Motion Injuries*  
Regency Ballroom

William Rhoten, Plumbers  
Mark Catlin, Harborview Medical Center  
Steve Shapiro, Environmental Protection Agency  
Jean-Louis Belard, NIOSH *Heat Stress and Cold*  
Empire Room

6:00-8:00

**Reception and Exhibits**  
Ambassador Ballroom

## Wednesday, July 21

9:00 a.m.	<b>Plenary Session VII: Prevention</b> Regency Ballroom Philip J. Landrigan, M.D., Chair	
	Philip J. Landrigan, M.D. Chief, Department of Community Medicine Mt. Sinai School of Medicine	<i>The American Public Health Association and Construction Safety and Health</i>
	Steven I. Schlossberg Director, Washington Branch International Labor Organization	<i>The ILO Perspective</i>
	Philip R. Lee, M.D. Assistant Secretary for Health Dept. of Health and Human Services	<i>The Clinton Administration's Interest in Prevention</i>
	Margaret Seminario, M.S.I.H. Director, Occupational Safety and Health AFL-CIO (Moderator)	<i>Strategies for Prevention</i>
	Bill McCook, C.R.S.P. Training and Development Coordinator Program Delivery Group Construction Safety Assn. of Ontario	<i>Planning Site Safety and Health</i>
	Ake Lindblad Technical Director Bygghälsan Sweden	<i>Introducing New Technology</i>
	Paul Forder Vice-Chair, Labour Workplace Health and Safety Agency of Ontario	<i>Training</i>
10:15	<b>Break and Exhibits</b> Ambassador Ballroom	
10:45	<b>Plenary Session VIII: Success Stories</b> Regency Ballroom Thomas R. O'Neill, Chair	
	Manfred Heimann, Dipl.-Ing., Germany Pekka Roto, M.D., M.I.H., Finland J.C. den Nijs, the Netherlands	<i>Ending Sandblaster Silicosis Preventing Cement Dermatitis Reducing Lifting Injuries (Bags of Cement)</i>
	Göran Engholm, M.S.C., Sweden Eva Holmström, Dr.Med.Sci., Sweden	<i>Saving Workers' Hearing Reducing Rebar Tying Injuries</i>
Noon	<b>Lunch</b> Blue Room Senator Edward M. Kennedy: <i>OSHA Reform</i>	

1:30 p.m.

**Five Workshops on Implementing Safety and Health on the Worksite**

Richard Niemeier, NIOSH  
Stephen Mallinger, OSHA  
Ake Lindblad, Sweden  
Dan Paine, Sinco  
Matthew J. Burkart, ANSI A-10 Cttee.

*How to Introduce New Technology*  
Capitol Room

Ben Evans, ICF Kaiser Engineers  
Patrick Finn, DOE  
Diane Morrell, Ebasco Services  
John Moran, Laborers

*Managing Site Safety and Health*  
Diplomat Room

Clarence Atchison, Fletcher Industrial  
Mike Andrews, Painters  
Richard Dwyer, Carpenters  
Jerry Purswell, University of Oklahoma

*The Role of Worker Training and Certification*  
Calvert Room

Sandra Tillett, Occupational Health Foundation  
Orlando Pannocchia, OSHA  
William Smith, Operating Engineers  
John Graham, Construction Safety Assn.  
of Ontario

*Hazard Communication Programs*  
Regency Ballroom

Ed Gorman, Carpenters  
Heinz Aulmann, HVBG  
Robert Nolan, U.S.A. Casualty Co.

*The Role of Workers' Compensation in Prevention*  
Empire Room

3:00 **Break and Exhibits** (last access to exhibits)  
Ambassador Ballroom

3:30 **Plenary Session VIII: Conference Report**  
Regency Ballroom  
Robert A. Georgine, Co-Chair  
Robert McCormick, Co-Chair

John Dunlop, Ph.D.  
Lamont University Professor Emeritus  
Harvard University

*Personal Observations and Conference Findings*

4:30 **Main conference ends**

**Thursday, July 22**

**Special Session on Workers' Compensation  
Empire Room**

9:00 a.m

**Plenary Session: Defining the Problem**

Joseph F. Maloney, Co-Chair  
Noel Borck, Co-Chair

Arthur Oleinick, M.D., J.D., M.P.H.  
Associate Professor  
School of Public Health  
University of Michigan

*The Magnitude of the Problem: What the  
Data Show*

John H. Lewis  
Attorney  
Coconut Grove, Florida

*The State of Workers' Compensation in  
the United States*

Kevin Ryan, F.C.A.S., M.A.A.A.  
Director, National Property & Casualty  
Insurance Services  
Cooper & Lybrand  
Wayne, Pa.

*Assigned Risk Pools*

10:15

**Break**

10:45

Anders Englund, M.D. (Panel Moderator)  
Director, Dept. of Health & Social Affairs  
National Board of Occupational Safety & Health  
Sweden

Matt Elliot  
Immediate Past President  
Construction Safety Assn. of Ontario

*Handling Cross-Craft and Multi-Employer  
Issues*

Joachim Berger, Dr.jur.  
Managing Director  
Bau-Berufsgenossenschaft  
Frankfurt, Germany

and

Heinz Aulmann, Dr.jur.  
Head, Department of Accident Insurance Law and  
International Affairs

HVVG  
St. Augustin, Germany

*Funding by Sector*

J.F.A. Letteboer  
Deputy Director  
Stichting Arbouw  
The Netherlands

*Integrating the System*



**Thursday, July 22**  
**Special Session on Needs for Research**

9:00 a.m.	<p><b>Plenary Session: Defining the Problems</b> Ambassador Ballroom Richard Lemen, Ph.D., Chair</p> <p>Richard Lemen, Ph.D. Deputy Director NIOSH</p> <p>John Finklea, M.D., Dr.P.H. Medical Officer Center to Protect Workers' Rights Centers for Disease Control &amp; Prevention</p> <p>Göran Engholm, M.S.C. Bygghälsan</p> <p>Timothy Ore, Ph.D. Manager, policy and economic analysis TCF Development Authority Melbourne, Australia</p> <p>Arthur Oleinick, M.D., J.D., M.P.H. Associate Professor Dept. of Environmental and Industrial Medicine University of Michigan</p> <p>G. Stewart Young, M.H.S. Central Artery/Tunnel Safety Consultant Arthur D. Little Inc.</p>	<p><i>The Need for More and Better Research</i></p> <p><i>Conference Research Issues and Linking Research Intervention and Evaluations</i></p> <p><i>Overview of Epidemiology</i></p> <p><i>Trends and Costs of Injuries and Disease in the New South Wales Construction Industry</i></p> <p><i>Using Workers' Compensation Data in Research</i></p> <p><i>Monitoring a Construction Project</i></p>
10:15	<p><b>Break</b></p>	

(Special session on needs for research-continued)

10:45

**Three Workshops**

*Safety and acute trauma*

Thomas Bender, M.D., M.P.H., NIOSH, Chair  
Richard Niemeier, Ph.D., NIOSH, Rapporteur  
Ambassador Ballroom

*Health hazards*

Philip Bierbaum, M.E., NIOSH, Chair  
Nancy Bollinger, M.S., Rapporteur  
Executive Room

*Ergonomics (musculoskeletal exposures), noise, and worksite culture*

Lawrence Fine, M.D., Dr.P.H., NIOSH, Chair  
Derek Dunn, Ph.D., NIOSH, Rapporteur  
Diplomat Room

Noon

**Lunch** (with workers' compensation session participants)

Regency Ballroom

Jay Himmelstein, M.D., Assistant Chancellor for Health Policy, University of  
Massachusetts Medical Center, Worcester

*Workers' comp, health care reform, and ADA: Problems of Integration and Research  
Needs*

1:30 p.m.

**Workshops continue**

3:30

**Break**

(in workshop rooms)

4:00

**Plenary Session: Reports by Three Workshops**

Ambassador Room  
Chair, James Merchant, M.D., Dr.P.H.

Richard Niemeier, Ph.D.

*Safety and acute trauma*

Nancy Bollinger, M.S.

*Health hazards*

Derek Dunn, Ph.D.

*Ergonomics, noise, and worksite culture*

4:30

**Session ends**

**Special Session on Research Needs  
Safety and Acute Trauma Workshop  
Ambassador Ballroom**

Chair: Thomas Bender, M.D., M.P.H., NIOSH  
Rapporteur: Richard Niemeier, Ph.D., NIOSH

**Injury Surveillance (75 minutes)<sup>1</sup>**

Presenters

Timothy J. Pizatella  
NIOSH

*Surveillance of Fatalities*

William Eisenberg  
Bureau of Labor Statistics

*Morbidity and Mortality Surveillance in  
Construction in the U.S.*

Discussant

Earl Pollack, Sc.D.  
George Washington University

Presenters

D.L. McVittie, D.Eng.  
Construction Safety Assn. of Ontario

*Construction Injury Surveillance in Ontario*

Paul Becker, M.S., C.I.H.  
West Virginia Construction Safety & Health Program

*Construction Injury Surveillance at the State Level*

Robert Brewer, M.D.  
National Center for Injury Prevention & Control

*Hospital-Based Injury Surveillance*

Discussant

Diane Wagener, Ph.D.  
National Center for Health Statistics

Discussion from the floor (25 minutes)

**Epidemiology of Workplace Injuries (50 minutes)**

Presenters

Harlan Amandus, Ph.D.  
NIOSH

*Injury Risk Factors and Data Collection Methods*

Terence Chorba, M.D., M.P.H., M.P.A.  
National Center for Injury Prevention & Control

*Record Linkage*

Discussants

Craig Zwerling, M.D., Ph.D., M.P.H.  
University of Iowa

Carol Conroy, M.P.H., Ph.D.  
Univ. of California Health Dept.

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<sup>1</sup>Presenters have 10 minutes each and discussants 5 minutes each.

(Safety and acute trauma workshop—continued)

Discussion from the floor (20 minutes)

**Intervention/Control Research** (55 minutes)

Presenters

Aaron Schopper, Ph.D.  
NIOSH

*Engineering Interventions*

Jorma Saari, Ph.D.  
Finnish Institute of Occupational Health

*Behavioral Interventions*

Janet Johnston, Ph.D.  
NIOSH

*Training*

Discussants

Pat Cattafesta  
OSHA

Ralph Frankowski, Ph.D.  
University of Texas

Discussion from the floor (15 minutes)

## Special Session on Research Needs Health Hazards Workshop

Chair: Philip Bierbaum, M.E.  
Rapporteur: Nancy Bollinger, M.S.

### Opening Remarks

Nancy Bollinger, M.S.  
NIOSH

### Leading Work-Related Diseases in Construction (35 minutes)

Presenter (10 minutes)  
Philip Bierbaum, M.E.  
NIOSH

*What We Know Now*

Discussants (5 minutes)  
James Nethercott, M.D.  
Johns Hopkins University

*Dermatology*

Paul Schulte, Ph.D.  
NIOSH

*Cancer*

L. Christine Oliver, M.D.  
Massachusetts General Hospital

*Lung Diseases*

Laura Welch, M.D.  
George Washington University

*Reproductive Disorders*

Edward L. Baker, M.D., M.P.H.  
Centers for Disease Control and Prevention

*Neurotoxic Disorders*

Discussion from the floor (time permitting)

### Industrial Hygiene and Exposure Assessment: Research Needs (35 minutes)

Presenters (10 minutes each)  
Robert Herrick, Sc.D., C.I.H.  
NIOSH

*Sampling and Analysis*

Sidney Soderholm, Ph.D.  
NIOSH

*Aerosols*

Discussants (5 minutes each)  
Mark Goldberg, Ph.D.  
Mt. Sinai School of Medicine

John Dement, Ph.D.  
Duke University Medical School

Dennis W. Groce, C.I.H.  
NIOSH

Discussion from the floor (time permitting)

**(Health hazards workshop—continued)**

**Lunch**

**Health Effects: Research Needs (50 minutes)**

Presenters (10 minutes each)

William Halperin, M.D.  
NIOSH

*Morbidity Surveillance*

Cynthia Robinson, Ph.D.  
NIOSH

*Mortality-Based Epidemiology*

Paul Seligman, M.D., M.P.H.  
NIOSH

*Clinic-Based Approaches*

Discussants (5 minutes each)

Elizabeth Grossman, Sc.M.  
OSHA

Discussion from the floor (15 minutes)

**Break (5 minutes)**

**Controlling Exposures: Research Needs (40 minutes)**

Presenters (10 minutes each)

James Jones, C.I.H.  
NIOSH

*Engineering Controls*

James Spahr, M.P.H.  
NIOSH

*Personal Protective Equipment*

Cor van Duizenbooden, M.D.  
Stichting Arbouw

*Controlling Solvent Exposures among Painters*

Discussant (5 minutes)

Robert Spear, Ph.D.  
University of California

Discussion from the floor (5 minutes)

**OSHA's View: Research Needs for Construction Safety and Health (20 minutes)**

Presenter (10 minutes)

TBN  
OSHA

**(Health hazards workshop—continued)**

Discussants (5 minutes each)

Pam Susie, M.S.P.H.

Center to Protect Workers' Rights

*Worker Viewpoint*

Aronne Goldkette

Broad, Vogt & Conant Inc.

*Employer Viewpoint*

**Summary Comments** (5 minutes)

Nancy Bollinger, M.S.

**Special Session on Research Needs  
Workshop on Ergonomics (Musculoskeletal Exposures), Noise, and Worksite Culture  
Diplomat Room**

Chair: Lawrence J. Fine, M.D., Dr.P.H.  
Rapporteur: Derek Dunn, Ph.D.

Presenters

**Work-Related Musculoskeletal Disorders**

11:00 am	Lawrence J. Fine, M.D., Dr.P.H. NIOSH	<i>Welcome and NIOSH Perspective on Work-Related Musculoskeletal Disorders</i>
11:05	Eva Holmström, Dr.Med.Sci. Bygghälsan	<i>Low-Back Disorders</i>
11:20	Barbara Silverstein, Ph.D., M.P.H. Washington Dept. of Labor & Industries	<i>Upper Extremity Disorders</i>
11:30	Thomas Cook, Ph.D., P.T. University of Iowa	<i>Control Strategies</i>
11:40	Martin Helander, Ph.D. University of Buffalo	<i>Control Strategies</i>
11:50	Amit Bhattacharya, Ph.D. University of Cincinnati Medical Center	<i>Directions for Future Research</i>

Noon **Lunch**

**Noise**

1:30 pm	Lawrence J. Fine, M.D., Dr.P.H. NIOSH	<i>Introduction</i>
1:35	Derek Dunn, Ph.D. NIOSH	<i>Adverse Health Effects</i>
1:50	Dennis Driscoll, M.S., P.E., INCE Bd.Cert.M.S. Associates in Acoustics	<i>Adverse Health Effects</i>

**Worksite Culture**

2:00	Susan J. Schurman, Ph.D. Rutgers University	<i>Effective Prevention: Changing Behavior and Organizations</i>
2:10	Jeffrey V. Johnson, Ph.D. Johns Hopkins University School of Public Health	<i>Effective Prevention: Changing Behavior and Organizations</i>

(Workshop on ergonomics, noise, and worksite culture—continued)

Discussants

- 2:25 Scott Schneider, M.S., C.I.H.  
Center to Protect Workers' Rights
- 2:40 Roger Stephens, Ph.D.  
OSHA
- 2:50 Stephen Burastero, M.D., M.P.H.  
Lawrence Livermore National Laboratory

Audience Comment

3:00-3:30

## **Continuing Medical Education Credits, Continuing Education Units, and Certification Maintenance Points**

The U.S. Centers for Disease Control and Prevention is offering 20 CME and 2 CEU credits to individuals who qualify. To obtain credit, complete an evaluation form following each session and leave the form in a designated box when exiting the session.

The American Board of Industrial Hygiene will award 3.0 CMPs to certified industrial hygienists attending July 19-21 — 0.5 CMP for each half day — and 1.0 CMP for attending the special session on research needs Thursday, July 22. The ABIH approval number is 7593. Ask at the registration desk for a copy of the letter indicating ABIH approval.

## Speakers

### Abbreviations and Translations

<b>AFL-CIO</b>	— American Federation of Labor & Congress of Industrial Organizations
<b>CDC</b>	— U.S. Centers for Disease Control and Prevention
<b>BCTD</b>	— Building and Construction Trades Department, AFL-CIO
<b>NIOSH</b>	— National Institute for Occupational Safety and Health, CDC
<b>OSHA</b>	— U.S. Occupational Safety and Health Administration, Department of Labor
<b>BBG</b>	— Bau Berufsgenossenschaft, The Building Industry's Foundation, Germany
<b>Bygghälsan</b>	— The Swedish Construction Industry's Organization for Working Environment
<b>Stichting Arbouw</b>	— Dutch National Foundation for Health, Safety, and the Prevention of Absenteeism in the Construction Industry

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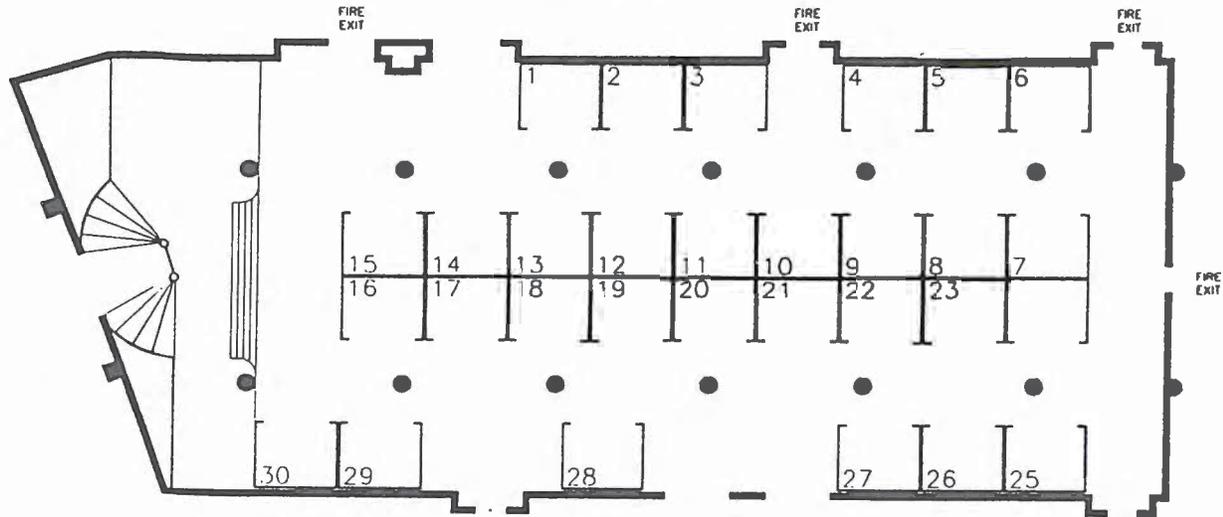
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*Craig Zwerling*, M.D., Ph.D., M.P.H., associate director, University of Iowa Injury Prevention Research Center, Iowa City

# Exhibit Locations

## Ambassador Ballroom



## Exhibitors

Bilsom	Booth 1
American Industrial Hygiene Association	Booth 2
National Safety Council	Booth 3
Department of Energy	Booth 4-6
Ingersoll-Rand Company	Booth 7-8
National Constructors Association	Booth 9
National Erectors Association	Booth 10
NIOSH Cooperative Agreements: Model State-Wide Construction Safety and Health Programs, West Virginia University, State University of New York at Buffalo, Chicagoland Construction	Booth 11
Scandinavian Ergonomic Equipment and Tools	Booth 12-18
International Labor Office	Booth 19
Sandvik Saws & Tools Co.	Booth 20
Union Labor Life Insurance Company	Booth 21
Occupational Safety and Health Administration	Booth 22
Slip Industries	Booth 23
Construction Industry Ergonomics Database, University of Iowa	Booth 25
The SINCO Group	Booth 26
Professional Safety Consultants/University of Maryland Critical Path Management/Safety and Health	Booth 27
National Institute for Occupational Safety, and Health, CDC/Center to Protect Workers' Rights	Booth 28
Sullair Corporation	Booth 29
Construction Safety Association of Ontario	Booth 30

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	Monday, July 20	8 - 9 am, 10:15 - 10:45 am, 3 - 3:30 pm
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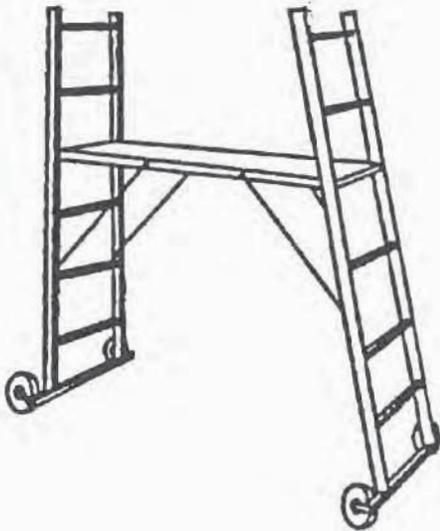
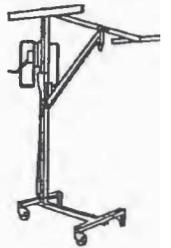
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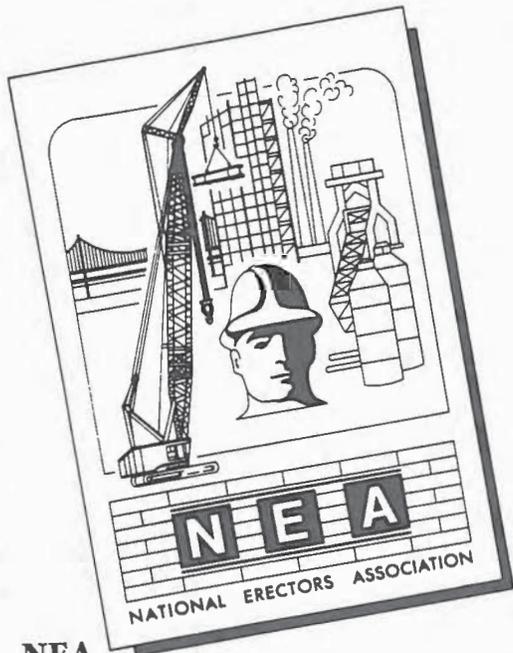
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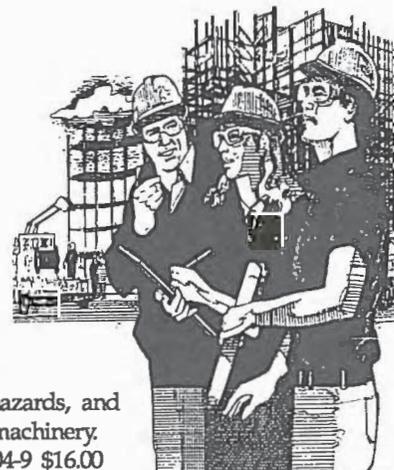
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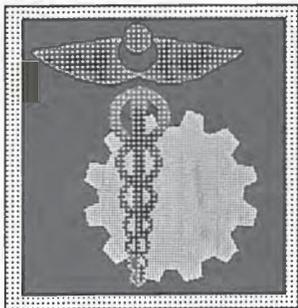
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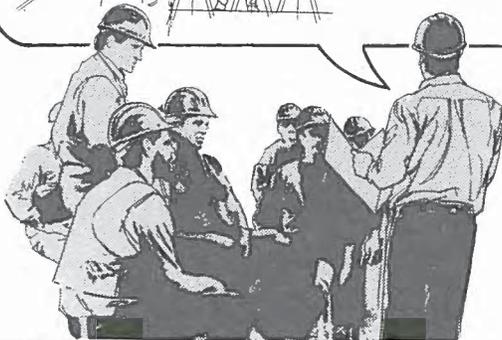
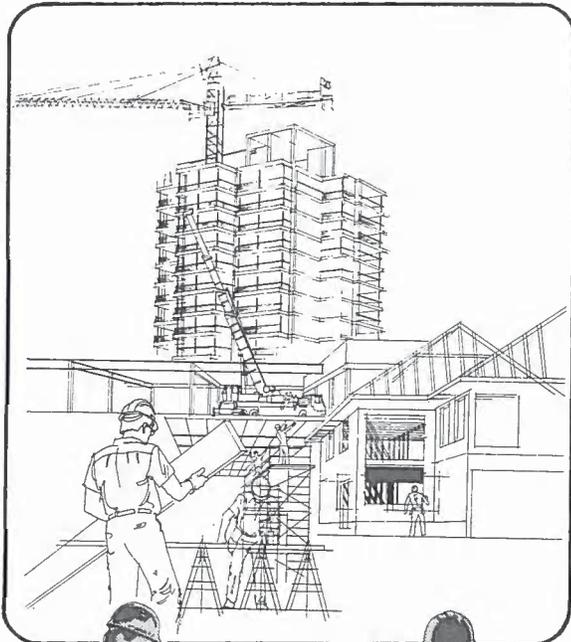
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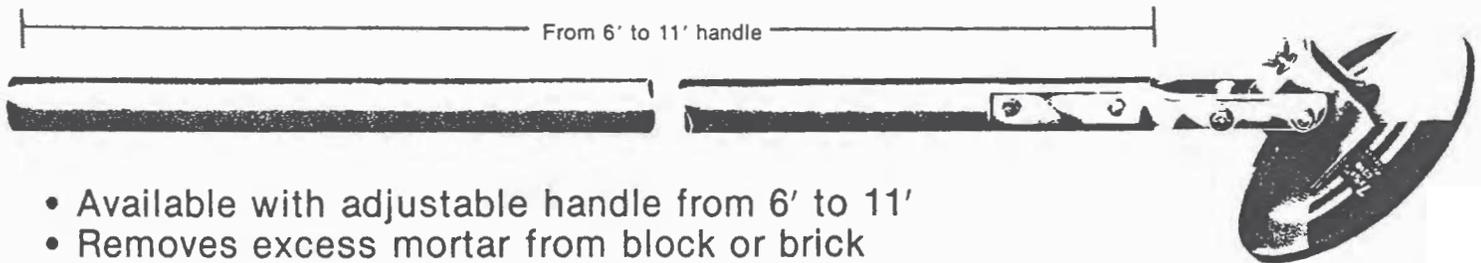


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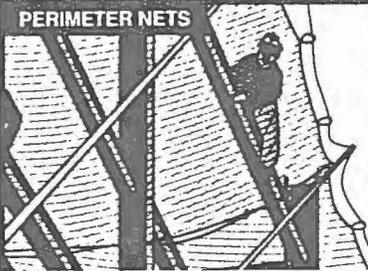


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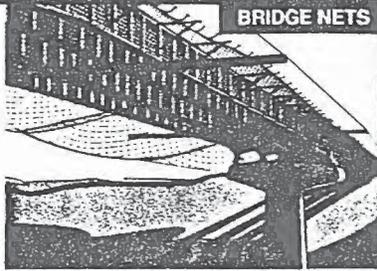


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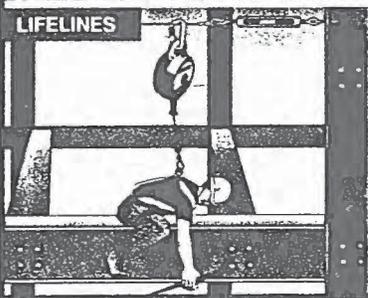
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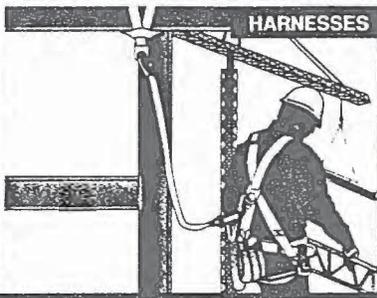
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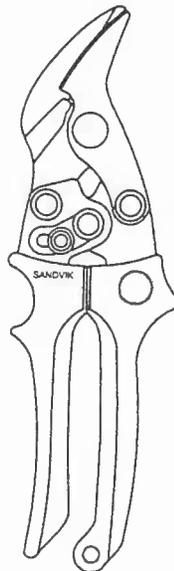
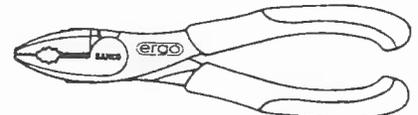
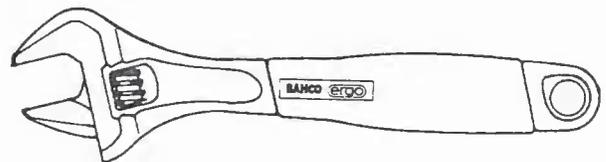
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**A Case Study  
in the  
Use of Workers' Compensation Data  
to Explore  
Incidence and Outcome**

**CONSTRUCTION SAFETY IN MICHIGAN, 1986/87. Oleinick A, Gluck JV, Guire KE, Hawthorne VM, Schork MA, University of Michigan, United States.\***

**Objectives:** To calculate the rate of compensable missed worktime injuries in workers in the construction industry in Michigan, 1986 and 1987; to measure the amount of disability in the form of missed worktime produced by these injuries; and, to identify factors which affect the risk of injury or the duration of the resulting disability.

**Methods:** In cooperation with the Michigan Bureau of Workers' Disability Compensation, we identified the group of Michigan workers who have been paid compensation for an occupational injury or illness that occurred in 1986 or 1987. In Michigan, workers receive compensation if they miss work for more than 7 days following a work-related injury or illness, have specified anatomic or functional losses, or are killed on the job. We estimate that the workers' compensation system covers more than 90% of workers in the Michigan workforce. Occupational illnesses are probably not counted well by the compensation system.

Each compensation payment was converted to a missed worktime estimate by a series of computer programs designed for the project. For each worker injured in 1986, all missed worktime estimates during observation were added together to produce a single cumulative missed worktime estimate. Missed worktime estimates were obtained for more than 98% of the 73,122 1986 cases with some indication of payment in the compensation system. Compensable missed worktime is estimated to account for more than 90% of all missed worktime due to occupational injuries. The cumulative missed worktime estimates in this report include missed worktime beyond the follow-up date of 3/1/90 because all data for an individual were used, including data from "lump sum" claim settlements, or redemptions. The missed worktime equivalent in weeks is defined as the settlement amount divided by that worker's weekly compensation rate.

To obtain injury, industry and occupation characteristics, we matched the compensation records with records in the 1986 and 1987 Michigan Supplementary Data System (SDS) file, a collaborative effort of the Michigan Bureau of Safety and Regulation and the federal Bureau of Labor Statistics. For 1986, 56,206 of the 61,491 SDS cases were matched to the 72,057 cases with missed worktime information (78%). Analysis of a sample of 2,092 unmatched cases indicated that the matched cases are representative of all workers with compensable injuries.

The resulting database contains 11 independent, or predictor, variables and 4 dependent, or outcome, variables. The independent variables are date of injury, gender, age, nature of injury, anatomic area injured, source of injury, type of accident, occupation (census-coded), industry (SIC-coded), establishment employment size and injury cohort (1986 and 1987). The dependent variables, available or potentially available, are 4 variants of missed worktime.

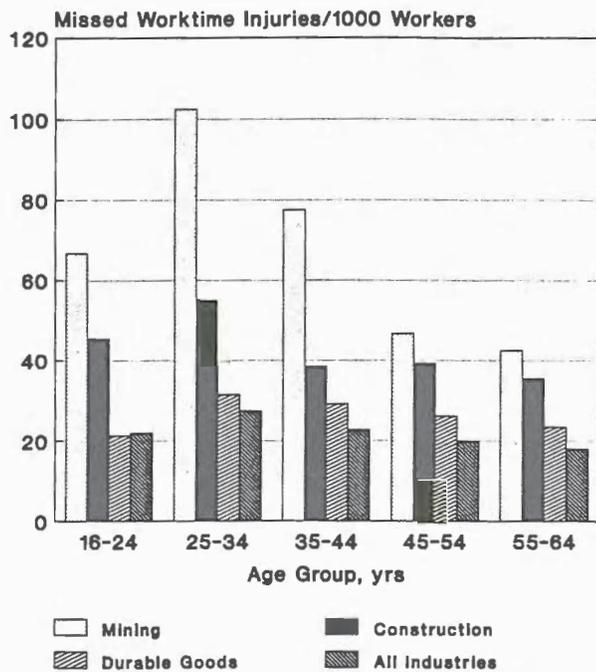
Estimates of the workforce by age were obtained from the 1986 Current Population Survey, a federal survey.

**Results:** Overall, among male workers, workers in the construction industry (SIC 15-17) constituted 6.0% of the Michigan workforce, had 11.7% of the compensable missed worktime injuries and were responsible for 16.4% of all the missed worktime identified through follow-up, including missed worktime estimated from "lump sum," or redemption, agreements. The odds ratio for compensable injury risk, construction v. all other industries, is 2.1.

Figure 1 shows rates for compensable missed worktime injuries per 1000 workers in selected standard industry groups and for all industries combined. Age- and gender-specific denominator data were obtained by interpolation from estimates of the employed workforce. In 1986, there were only 91 compensable injuries among women construction workers in all 3 SIC construction categories (1.9% of the total). The pattern by age is the same in all industry groups, with the peak risk of injury in the 25-34 year age group and a gradual decline thereafter. The construction industry rates are second highest of those shown, with 4-5% of workers in this industry experiencing a compensable missed worktime injury each year. A comparison of the total employed workforces with the total number of full-time equivalent (FTEs) workers in each of these industry groups suggests that, if estimates of age-specific FTEs were available for 1986, that the age curve for construction injuries would more closely approximate the curve for mining injuries in the first three age groups and would exceed all other industry groups in the two oldest ages.

\*Supported, in part, by the University of Michigan Multipurpose Arthritis Center, through an NIAMS grant.

**Figure 1**  
**Injury Rate by Industry**  
**Michigan Male Workers Injured in 1986**



\* Based on employed full-time & part-time workforce. If age-specific FTE data were available, construction rates would be similar to or exceed those for mining.

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Table 1 gives the percentage distribution of the most frequent compensable injuries by occupational group and work location. The construction trades and laborer/helper occupations account for 80% of injuries in the construction industry. Roughly 70% of injuries in construction occupations occur in the construction industry. Back sprains/strains/dislocations, including herniated intervertebral disks, are the most frequent injury in all occupational groups listed, accounting for almost a fifth of all injuries. The rate for this injury among all construction industry workers, 7.58 per 1,000 employed workers, is second only to the transportation industry. Knee sprains/strains, including ligament tears, are the second most common injury, while finger cuts/lacerations/punctures, abdominal herniae and ankle sprains/strains (also includes ligament tears) follow in descending order of frequency. The distributions of injury type differ slightly by worksite, with relatively fewer back and knee injuries in the "other industry" group. The numbers of injuries in the categories listed, representing a 2-year experience of a major industrialized state, are sufficient to support various types of causal modeling aimed at identifying risk factors for these injuries.

**Table 1**  
**Missed Worktime Injuries in Construction Occupations by Industry**  
**Michigan: 1986 & 1987 Cases Summed**

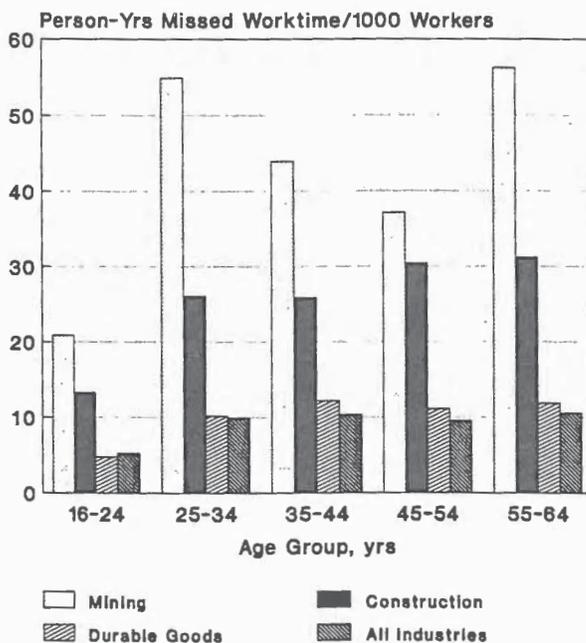
Categories With >100 Cases in Both Years

Body Part	Injury	Work Location			All	N
		Within Construction Industry		Construction Occupations in Other Industries		
		Construction Trades	Laborers Helpers			
		(column pct)				
Finger	Cut	5.3%	3.8%	2.7%	4.2%	461
Finger	Fracture	2.0%	3.6%	1.4%	2.2%	236
Wrist	Fracture	1.9%	2.0%	0.8%	1.6%	176
Hand	Cut	2.4%	1.7%	0.9%	1.8%	198
Hand	Fracture	1.0%	2.1%	0.7%	1.1%	122
Shoulder	Sprain/Disloc	2.5%	2.9%	1.3%	2.2%	245
Back	Sprain/Disloc	19.0%	19.1%	13.9%	17.5%	1908
Abdomen	Hernia	4.7%	3.3%	3.0%	3.9%	425
Knee	Sprain	7.6%	5.6%	3.6%	6.0%	652
Ankle	Sprain	3.3%	3.6%	2.5%	3.1%	340
Ankle	Fracture	2.3%	2.2%	1.1%	1.9%	208
Foot	Fracture	2.9%	3.1%	1.7%	2.6%	278
Toe	Fracture	1.3%	2.1%	1.1%	1.4%	153
sub-total		56.4%	55.0%	34.8%	49.6%	5402
Other Injuries		43.6%	45.0%	65.2%	50.4%	5487
		100.0%	100.0%	100.0%	100.0%	
All Cases	N (col sum)	5388	2231	3270		10889

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Through follow-up to 3/1/90, the 4,667 male construction workers injured in 1986 had accumulated 2,596 person-years of missed worktime, including the missed worktime attributed to "lump sum" settlements, with a median missed worktime of 6.2 weeks and an average of 28.9 weeks. These missed worktime figures are minimum estimates, because they do not reflect the 14.7% underestimate of missed worktime by our algorithms or the 53.3% underestimate represented by insurance company reserves set aside for future payments to the entire 1986 injury cohort for the period roughly beyond our follow-up date. The much longer average missed worktime is due to the 15% of workers with the longest missed worktimes. For comparison, the median and average for all injuries were 4.8 and 20.7 weeks, respectively.

**Figure 2**  
**Missed Worktime by Industry Through**  
**3/1/90 for Michigan Male Workers\***  
**Injured in 1986**



\* Based on employed full-time & part-time workforce. If age-specific FTE data were available, construction rates would be similar to or exceed those for mining.

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### Conclusions:

1. Construction industry workers are more than twice as likely to have a compensable work injury as workers in other industries.
2. Back and knee sprains/strains/dislocations, including herniated intervertebral disks and torn ligaments, are the most frequent injuries.
3. Injured construction industry workers have longer disabilities, as measured by missed worktimes, than workers in other industries. It is not known whether the cause is more serious injuries initially or whether the nature of the work performed in the construction industry requires that workers be more fully recovered before returning to work.
4. Workers' compensation data, carefully interpreted, can serve as a valuable source of information on occupational injury and disability in the construction industry.

Figure 2 gives the missed worktime rates per 1,000 employed workers by age for selected and all industries. The Figure shows that construction industry workers have the 2nd highest missed worktimes, in the overall range of 20-25 person-years per 1000 employed workers, and the missed worktime experience is worst for oldest workers. This places them second only to the mining industry. As noted, with respect to Figure 1, if adjustments for full-time equivalent workers by age and industry were available, then the construction industry rates would more nearly approximate those in the mining industry. It is unclear whether the high missed worktime rates are due to more serious injuries in construction industry workers or to greater difficulty in returning to work while there is residual disability, to a combination of these, or to other factors.

## Notes

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## Notes

**This document was made possible by grant numbers U60/CCU306169 and U02/CCU308771 from the National Institute for Occupational Safety and Health. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of NIOSH.**

