2000

Annual Report on Occupational Noise-Induced Hearing Loss in Michigan

2000 Annual Report on Occupational Noise Induced Hearing Loss in Michigan

A Joint Report
of the
Michigan State University
Department of Medicine
117 West Fee Hall
East Lansing, Michigan 48824-1315
(517) 353-1846
Kenneth D. Rosenman, MD
Professor of Medicine
Mary Jo Reilly, MS
Epidemiologist

and

The Michigan Department
of Consumer and Industry Services
Occupational Health Division
P.O. Box 30649
Lansing, Michigan 48909-8149
(517) 322-1608
Bill Deliefde, MPH
Regional Supervisor, MDCIS/MSU Liaison
Douglas J. Kalinowski, MS, CIH,
Deputy Director
Bureau of Safety and Regulation

June 8, 2001

Summary:

This is the seventh annual report on occupational noise-induced hearing loss (NIHL) in Michigan. Over 2,200 new people were reported in the year 2000 to the Michigan Department of Consumer and Industry Services (MDCIS) with hearing loss known or suspected to be caused by noise at work. There were 200 more reports this past year from audiologists and otolaryngologists in private practice compared to 1999.

Occupational noise-induced hearing loss is affecting mainly men, with an initial onset when they are 35-64 years of age. Exposures to noise are occurring primarily in manufacturing facilities.

Thirty-nine of the 91 (42.9%) companies identified by and inspected as part of the surveillance system had no hearing conservation program or a deficient program despite the presence of noise levels above the legal limit (Table 11). Ten of these 91 inspections were conducted in the year 2000 as part of the occupational NIHL surveillance program.

There were 854 workplace inspections which were conducted by the Occupational Health Division of the Michigan Department of Consumer and Industry Services in the year 2000 that were not initiated because of the noise-induced hearing loss surveillance system; 82 of those 854 companies inspected in the year 2000 were in violation of some portion of the noise standard. Forty-six of these 82 companies were cited for having the complete absence of a hearing conservation program. It is important to recognize, however, that the majority of the 854 inspections were in response to a specific complaint or referral. Consequently, the scope of these inspections was primarily limited to the complaint or referral item unless other serious issues were observed during the course of each inspection.

The data in this report indicates that a large number of both small and large companies do not have hearing conservation programs despite a need for them. Follow-up of reports from non-company audiologists and otolaryngologists shows that almost half of the companies where patients with work related noise-induced hearing loss have worked did not have a hearing conservation program at the time the employee worked at the company.

Patients exposed to noise in construction were almost never provided hearing testing (94%), although 43% of them were given hearing protection such as plugs or muffs. Workers exposed to noise in construction in more recent decades were more likely to be given hearing protection than workers exposed to noise before the 1980's. Ten percent of construction workers with noise-induced hearing loss who had no other types of job exposures to noise were exposed to construction-related noise for five or fewer years.

Noise-induced hearing loss is an insidious condition which may take years to develop to a stage where it affects an individual's ability to communicate at home and in the work place. Prevention of noise-induced hearing loss is one of the strategic goals of MDCIS. A new initiative to increase

inspections in 26 industry categories likely to have noise exposure has been developed. This past year we developed a fact sheet to be distributed by audiologists and otolaryngologists to their patients who have work-related noise induced hearing loss (Appendix I). In calendar year 2001 we will be distributing this fact sheet at hearing clinics in Michigan on a pilot basis. Through surveillance of work-related hearing loss in Michigan along with work place interventions, the state is working to reduce the burden of hearing loss among its workers.

Background:

Facilities covered by the general industry noise standard are required to institute hearing conservation programs to prevent noise-induced hearing loss if the 8 hour time weighted average noise levels are at or above 85 dBA. However, the construction industry as well as transportation, oil and gas well drilling and servicing, agriculture and mining are exempted from this standard. Project SENSOR (Sentinel Event Notification System for Occupational Risks), the Michigan Department of Consumer and Industry Services' surveillance program for occupational noise-induced hearing loss (NIHL), identifies facilities that lack hearing conservation programs despite excessive noise exposures.

Nationally, one million workers are estimated to have work-related hearing loss, primarily from manufacturing-related exposures to noise (Weeks et al, 1991). Based on data from the National Health Interview Survey, one would expect approximately 86,000 individuals in Michigan to have noise-induced hearing loss related to work place exposures (Ries, 1994).

In 1992, the Michigan Department of Consumer and Industry Services (MDCIS) with financial assistance from the National Institute for Occupational Safety and Health (NIOSH) initiated a special emphasis program for NIHL. Funding assistance from NIOSH ended in September 2000. The surveillance program is based on Michigan's Occupational Disease Reporting Law, Part 56 of P.A. of 1978, which specifies that any health professional who knows or suspects a patient has a work-related illness must report it to the MDCIS within ten days (Figure 1). The goal of the special emphasis program is to prevent additional work-related hearing loss by inspecting facilities where index patients with NIHL have worked. The sources used to identify persons with occupational NIHL are: (1) reports from audiologists and otolaryngologists, (2) reports from hospitals, (3) reports from companies, and (4) reports from the Bureau of Workers' Compensation. Both private practice audiologists and otolaryngologists and those working for industry send reports to the Michigan Department of Consumer and Industry Services. Reports from hospitals are requested once each year. Hospital discharge summaries for individuals with a primary or secondary diagnosis of hearing loss (International Classification of Diseases (ICD)-9th Revision codes 388.10-.12, 389.10-.18, and 389.9) are obtained and the work-relatedness of the condition is determined from the medical record.

An individual is considered to have occupational NIHL if a health professional determines the

individual: (1) has audiometric findings consistent with noise-induced hearing loss and (2) has a history of exposure to sufficient noise at work to cause hearing loss. If asked for guidance, the following minimum hearing loss is suggested:

(a) a standard threshold shift (STS) of 10 dB or more in either ear at an average of 2000, 3000 and 4000 Hz, (this is related to the MIOSHA enforcement standard) or;

(b) a fixed loss (suggested definitions: a 25 dB or greater loss in either ear at an average of: 500, 1000 and 2000 Hz, or 1000, 2,000 and 3000 Hz, or 3000, 4000, and 6000 Hz; or a 15-25 dB or greater loss in either ear at an average of 3000 and 4000 Hz) (this recommendation was developed by the state advisory committee for occupational noise-induced hearing loss surveillance).

Patients reported by a company medical department with a standard threshold shift (STS) are already enrolled in their company's hearing conservation program (HCP). Those reported with a fixed loss by a private practice audiology clinic or by an otolaryngologist not part of a company's HCP are followed up to determine if the company where they are or were exposed to noise has a HCP. All patients with a fixed loss who are reported by private-practice audiologists and otolaryngologists are administered a brief questionnaire about the history of their exposures to noise. The questionnaire asks about the three most recent companies where the patient was exposed to noise; non-work exposures are not detailed, since the health professional who originally reported the individual already made a professional judgement that noise exposures at work contributed at least in part to the patient's hearing loss.

After the patient has been interviewed, a referral for an industrial hygiene investigation is forwarded to the appropriate MIOSHA district if: the individual reports they were exposed to noise and were not provided regular audiometric testing and hearing protection by their employer within the last five years; the facility is in MIOSHA jurisdiction; and the facility has not recently been inspected where noise issues were addressed. Follow-up is typically not performed at companies for which the law does not require the provision of a comprehensive hearing conservation program such as in construction and agriculture. An industrial hygienist conducts monitoring for noise and reviews the completeness and quality of the company's hearing conservation program, if one exists. After the investigation is completed, a report of the results and any recommendations are sent to the company and union (or designated labor representative if the company does not have a union), as well as to the reporting audiologist or otolaryngologist. If the company is cited for violations of any regulations, they must post the citations at or near the location of the violations for a minimum of three days or until the items have been corrected, whichever is later.

Results:

The results in the seventh annual report are presented in the following order: a description of all of the occupational disease reports submitted to the MDCIS for NIHL in the year 2000; results of interviews of patients with fixed loss identified through Project SENSOR and reported by non company audiologists and otolaryngologists from 1992-2000; and, a summary of the MIOSHA inspections not conducted as part of project SENSOR from 1/1/2000-12/31/2000 where violations of the noise standard were found.

2000 Occupational Disease Reports for NIHL

Figure 2 shows the number of reports of hearing loss since 1985. Approximately 10% of all occupational disease reports submitted to the Michigan Department of Consumer and Industry Services are for hearing loss. Because of increased awareness of the reporting law by employers and health care providers there has been an increase in the overall number of reports received since 1989, and an increase in the number of non-company reports received, especially since 1994. In the year 2000, there were 2,254 reports of work-related hearing loss submitted to the Michigan Department of Consumer and Industry Services. Of the 2,254 reports submitted in the year 2000, 1,214 were submitted by company medical departments. The other 1,040 reports were submitted by private-practice audiologists and otolaryngologists. Table 1 shows the number of patients with a fixed hearing loss reported by the private-practice health professionals.

Patient Demographics

Ninety-one percent (2,043/2,252) of the reports where gender was listed are for men. Although requested, information on race was missing for 1,246/2,254 (55%) of the reports. Of the individuals for whom race was known, 80.3% were white, 13.4% were African American and 6.4% were of other descent. These percentages were similar for reports from companies as well as from private practice hearing health professionals. The mean age of individuals reported is 52 years, ranging from 17 to 93 years. Patients reported by companies were generally younger than patients reported by non-company audiologists and otolaryngologists (average age 48-58 years, respectively). Approximately 83% of the individuals reported by company medical departments were between 30 and 59 years of age compared to 54% of non-company health professionals in the same age range (Figure 3). Some of the reports by non-company audiologists and otolaryngologists were of retired individuals. All reports from companies were of current workers.

Industry

Table 2 and Figure 4 show the number of employees working at the companies where the patients were exposed to noise. Most of the reports were for large companies employing 500 or more individuals, although the non-company health professionals reported more patients from smaller

companies. Table 3 is a distribution of industry type of the patients reported. Most of the reports were for patients working in manufacturing facilities. This corresponds to companies which are more likely to have hearing conservation programs. However, the non-company health professionals reported more individuals from other types of industries, including construction (16.8%), transportation and communication services (10.9%), services (8.8%), government (5.2%), agriculture (0.8%), and trade (0.4%) than the company or contract medical departments. Companies report patients with NIHL as part of their hearing conservation program (HCP). In contrast, the patients reported by non-company hearing health professionals would not necessarily be working at a company with a HCP.

Patients with a Fixed Loss, Reported by Non-Company Audiologists and Otolaryngologists from 1992-2000

A total of 3,516 of 3,742 (94%) patients reported by non-company audiologists and otolaryngologists between 1992 and 2000 have been interviewed. The interviews ask about the three most recent jobs where a person was exposed to noise.

Patient Demographics

Ninety-four percent of the interviewed patients reported from 1992-2000 were men. Of the interviewed patients reported from 1992-2000, 86.6% were white, 11.2% were African American, 1.4% were Hispanic, 0.1% were Asian and 0.6% were other. Race was unknown for 173 individuals. Figure 5 shows the distribution of decade of birth for the patients reported. Over 88% of the patients reported were born between 1920 and 1959, and includes retirees with hearing loss unlike the reports from companies which only include actively working individuals.

Industry

Table 4 shows all the industries where the patients with fixed hearing loss were ever exposed to noise, by the first and second halves of the time period during which surveillance has been conducted (1992-1995 and 1996-2000). Overall, 60% of the 4,597 companies where the 3,516 patients ever worked were in the manufacturing industry. The 4,597 companies are not unique companies; more than one patient may have worked at the same company. Therefore, the company would have been counted more than one time. A greater percentage of individuals reported from 1996-2000 worked in construction (13.4%) and metal fabrication (14.2%) compared to the reporting period 1992-1995, with construction accounting for 8.2% and metal fabrication accounting for 5.5% of the individuals from this first half of the reporting period.

Table 5 shows the most recent industries in which the interviewed patients were exposed to noise by reporting period (1992-1995 and 1996-2000), and whether the company provided regular hearing tests for their employees. The percentages of companies where the patient reported they did receive regular hearing testing ranged from 0% to 100% within industry types. Overall within

each time period, 44% of the most recent companies where the patients were exposed to noise regularly tested their employees' hearing. The number of companies in Table 5 are not unique companies; more than one patient may have worked at the same company. Therefore, the company would have been counted more than once.

Table 6 shows the number of employees working in companies where the interviewed patients were exposed to noise, by reporting period (1992-1995 and 1996-2000). Workers were exposed to noise in both small and large companies, with typically less than 50% of workers reporting having received regular hearing tests, especially in the smaller companies. The number of companies reported in Table 6 are not necessarily unique companies; more than one patient may have worked at the same company. Therefore, the company would have been counted more than once.

The interviewed patients worked in noise for a variety of durations, ranging from less than 5 years to greater than 35 years (Figure 6). For individuals reported from 1996-2000, interviewed workers had longer noise exposure (30 or more years) than those reported from 1992-1995.

Figure 7 shows the decade of the patients' first exposure to noise by reporting period. Some patients had very early exposures to noise; however, a greater percentage of patients reported from 1996-2000 had their first exposure to noise in the 1970's and later than the patients reported from 1992-1995.

Table 7 shows the decade when the interviewed patients with fixed hearing loss were most recently exposed to noise by industry. The percentage of individuals at companies with hearing tests increased over time within the industry types that have been required by OSHA (since 1972) to provide such hearing tests. Construction and agriculture industries had the lowest percentages of workers with regular hearing tests; these industries are not required by MIOSHA or OSHA to provide regular hearing tests.

Table 8 shows the decade in which cases most recently worked, and whether they were provided with hearing protection (plugs or muffs) by industry type. Over time, the percentage of workers who were provided hearing protection increased in all industries. The percentage of manufacturing workers given hearing protection improved the most of any industry type, with only 8% of workers given hearing protection in the 1940's and 92% of workers given hearing protection in the 1990s. Workers in agriculture had the lowest percentage provided with hearing protection.

Table 9 shows the decade when the interviewed patients with fixed hearing loss were most recently exposed to noise by company size. Larger companies had higher percentages of workers with regular hearing tests and had the greatest improvement over time than smaller companies.

Table 10 provides a distribution of hearing testing status for interviewed patients reported by non-company health professionals. Twenty-seven percent of the most recent companies where the

patients reported by non-company audiologists or otolaryngologists were exposed to noise had both baseline and regular hearing testing; 49% had neither.

Inspections

In response to the reports of hearing loss identified through the Project SENSOR Surveillance program, inspections were conducted at 91 companies where the person reported they had never received audiometric testing within the last five years. Of the 91 companies, 51 (56.0%) were required to have a hearing conservation program (HCP) because they had noise levels at or above 85 dBA. Of those 51 companies, 39 (76.5%) had either no HCP or a deficient HCP. Forty-one of the 51 companies requiring a HCP were in manufacturing; five were in services; three were in government; one was in the trade industry; and one was in agriculture. Forty of the 91 companies were not required to have a HCP because noise levels were below 85dBA. Table 11 lists the characteristics of the 91 companies inspected as part of the surveillance efforts.

In addition, three other companies were identified where the person reported they had never received audiometric testing; however, these three companies had been inspected for noise prior to the start of the State's follow-up efforts, between 1987 and 1992. Two of the three had noise levels above 85dBA and no HCP. The other company also had noise levels above 85dBA and a deficient HCP. All three of these companies were in manufacturing.

In the year 2000, there were also industrial hygiene inspections assessing noise exposures that were conducted independently of those referred for inspections based on the patient interviews as part of Project SENSOR. In Michigan, limited scope complaint or referral MIOSHA inspections normally will include review of compliance with the noise standard if the company under investigation clearly has excessive noise levels and employees are observed not wearing hearing protection. During the 854 inspections conducted in the year 2000, 82 facilities received a citation for a violation of the noise standard. These facilities were generally small. However, 4 (4.9%) of the facilities had more than 250 employees (Table 12). In contrast 21% of the 39 companies from Table 11 that were inspected in response to hearing loss and received a citation for a violation of the noise standard had more than 250 employees. Forty-six (56.1%) of the companies were cited for a complete lack of a hearing conservation program despite exposures to excessive levels of noise. The other companies were cited for violations of sections of the noise standard (Table 13). The manufacture of fabricated metal products, transportation equipment and lumber were the most common types of companies cited (Table 14).

Noise in Construction

Of the 3,516 interviewed patients with a fixed loss reported to the State of Michigan from 1992-2000, 497 (14.1%) had at least part of their exposure to noise in construction jobs. The following discussion and associated tables presents the details of those construction-related noise exposures. The hearing loss patients exposed to noise in construction were mostly white males, born in the

1930's-1950's. Table 15 presents the demographic characteristics of these 497 patients.

At the most recent construction job where these 497 individuals were exposed to noise, approximately 94% had no regular hearing testing performed at their job (Table 16); however, approximately 43% of these individuals were given hearing protection (plugs or muffs). Table 17 presents the decade of most recent noise in construction exposures for these individuals, as well as the status of regular hearing testing and access to hearing protection. The majority of noise exposures in construction for these individuals were recent; 23% of the 401 individuals with known decade of exposure occurred in the 1980's, 48% of the most recent noise exposures in construction occurred in the 1990's, and almost 13% of the most recent noise exposures occurred in the years 2000-2001. The percentages of individuals given regular hearing tests over time did not improve. However, the percentage of individuals given hearing protection over time did improve in the most recent decades. Some of these individuals had a relatively short duration of exposure to noise (Table 18), for example with almost 10% of these individuals working for 5 or fewer years.

During the 1996-2000 reporting period, 13.4% of all reports of fixed hearing were from having noise exposures in construction compared to the 1992-1995 reporting period where 8.2% of all reports were from noise exposures in construction (Table 4).

Discussion:

This is the seventh annual report of occupational noise-induced hearing loss in Michigan. There were 2,254 reports of hearing loss submitted to the Michigan Department of Consumer and Industry Services in the year 2000. The reports submitted probably represent a substantial underestimate of the total number of individuals with work-related hearing loss. There are approximately 450 audiologists and 150 otolaryngologists in the state. Reports were received in the year 2000 from only 7 of the 80 estimated group practices in the state, and 43 practitioners not known to be associated with a group practice. This is up from 1999 when we received reports from 7 of the 80 estimated groups practices and 26 solo practitioners.

The potential number of individuals who should be reported is very likely to be much larger than the number of reports received. In Michigan, we estimate there are currently at minimum 145,000 manufacturing production workers, 20,700 construction workers, 500 miners, 27,200 blue collar workers in wholesale and retail trade, and 12,100 workers in noisy service industry environments exposed to daily noise levels of 85 dBA or greater (NIOSH, 1998 and Bureau of Labor Statistics, 1996). Table 19 provides estimates of blue collar workers in Michigan who are exposed to excessive levels of noise, by industry type. Based on data from the National Health Interview Survey, we would expect approximately 86,000 workers in Michigan to have occupational noise-induced hearing loss (Ries, 1994).

The reports submitted are mainly of men in their 30's to 60's, who work in large manufacturing companies. Follow-up of reports from non-company audiologists and otolaryngologists shows that 44% of noisy companies where the patients worked had a hearing conservation program when the individual worked there. Over time the numbers of companies that provide regular audiometric testing has increased, especially among manufacturing companies with more than 100 employees. This is not true for smaller manufacturing companies, construction companies and the farming industry (Tables 7-9).

Approximately 14% of the patients that have been identified and interviewed were exposed to noise in construction. Yet construction workers are minimally covered for noise exposures by MIOSHA and OSHA laws. Interviews of these individuals reveals that almost none were given regular hearing testing, even in the more recent decades of exposures. However, nearly half of these workers were provided hearing protection with the percentage of workers given ear plugs or muffs much greater in the 1980's and 1990's than before the 1980's. The lack of coverage for this group of workers potentially exposed to excessive levels of noise in their jobs highlights an industry that is not adequately covered by noise exposure laws and is not voluntarily providing audiometric testing to its workers. The worker using a jackhammer which can produce noise levels of 90-130 decibels is not required to be enrolled in a hearing conservation program that includes annual audiometric testing. The federal OSHA program has indicated its intention to initiate rule- making this year to address these deficiencies.

The report of an individual with work-related hearing loss is a sentinel health event that is critical to effective occupational disease surveillance. Reports from non-company health professionals provide the base upon which meaningful information on exposures to noise at work can be gained, with the goal of intervening to prevent others from developing work-related hearing loss. There were 5,332 individuals at the worksites we inspected that had noise exposures of 85 dBA or greater, and lacked or had a deficient HCP who would directly benefit from these inspections. The results of initial follow-up inspections indicate the program has a high rate of success in identifying companies which although legally required to have a hearing conservation program are not in compliance with the law (Table 11).

The Michigan Department of Consumer and Industry Services has been focusing on hearing loss for six years now. In 1993, letters were sent to otolaryngologists, audiologists, speech and hearing clinics, occupational health nurses and mobile van units to educate these groups of health professionals about the reporting law and the importance of reporting known or suspected work-related hearing loss. In 1995, a reminder letter was sent to the state's audiologists and otolaryngologists. Other outreach efforts include presenting miniseminars at the Michigan Speech-Language-Hearing Association's annual conferences, exhibiting an educational booth about work-related hearing loss at various conferences and providing information on the status of the surveillance efforts through various association newsletters. In 1998, a quarterly newsletter on occupational NIHL that is mailed to the state's approximately 460 audiologists, otolaryngologists, mobile vans and clinics was initiated. In 1998, an internet web site that contains the annual reports and newsletters was developed; it can be accessed at: www.chm.msu.edu/oem.

In January, 2000, a letter was sent to 719 Michigan hearing health professionals to provide them with a reminder about their obligation to report known or suspected occupational noise-induced hearing loss. In January 2001 a secure server was created to allow for electronic occupational disease report submission via the web site previously mentioned.

In June, 2000, the Michigan Department of Consumer and Industry Services, Bureau of Safety and Regulation Occupational Health Division initiated an Occupational Noise Exposure Local Emphasis Program (LEP) to comply with one of MIOSHA's Strategic Planning Goals: to reduce NIHL/STS by 15%. Twenty-six categories of manufacturing industries are the focus of this initiative; these are industries known to have large numbers of noise exposed workers. Inspections are conducted as planned program inspections (i.e. selected because they fell within the targeted industry categories) or as rollover inspections (i.e. the inspection was initiated for a reason other than noise but the facility falls within the LEP's targeted industry categories). At each inspection, the MIOSHA enforcement industrial hygienist provides the employer with informational handouts that are appropriate to the operations carried out at that facility. Just like any other MIOSHA enforcement inspection, the company is required to correct any violations of the Michigan noise standard.

The number of reports of hearing loss submitted by non company hearing health professionals increased until 1995, decreased in 1996, increased in 1997, decreased in 1998 and increased in 1999 and the year 2000. Ongoing, and renewed outreach efforts are needed. One example this year was the creation of a fact sheet for practitioners to hand out to their patients with work-related noise-induced hearing loss (Appendix I). The State will continue to encourage practitioners to report their patients who have work-related noise-induced hearing loss.

References:

Bureau of Labor Statistics, Michigan Employment Security Commission. Current Employment Statistics. 1996 Annual Report of Michigan Production/NonSupervisory Workers.

National Institute for Occupational Safety and Health. Criteria for a Recommended Standard, Occupational Noise Exposure Revised Criteria 1998. June, 1998, DHHS (NIOSH) Publication No. 98-126.

Ries PW. Prevalence and Characteristics of Persons with Hearing Trouble: United States 1990-1991. Vital Health Statistics (10). 1994; No. 188. DHHS Publication PHS 94-1516.

Weeks JL, Levy BS and GR Wagner, eds. Preventing Occupational Disease and Injury. American Public Health Association, 1991.

Michigan Department of Consumer and Industry Services

Division of Occupational Health

Known or Suspected Occupational Disease Report

FIGURE 1

(Information will be held confidential as prescribed in Act.)

EMPLOYEE AFFECTED

Name (Last, First, Middle)	Age	Sex M F	Race: ◯ White ◯ Black ◯ Hispanic ◯ Other
Street	City	State	Zip
Home Phone Number	Social Security Number		

CURRENT EMPLOYER

Current Employer Name	Worksite County		
Worksite Address	City	State	Zip
Business Phone	If Known, Indicate Business Type (products manufactured or work done)		
Number of Employees ◯ <25 ◯ 25-100 ◯ 100-500 ◯ >500			
Employee's Work Unit/Department	Dates of Employment From: _____ To: _____ Mo Day Year Mo Day Year		
Employee's Job Title or Description of Work			

ILLNESS INFORMATION

Nature of Illness or Health Condition (Examples: Headache, Nausea, Difficulty Breathing, Cough, etc.)		Date of Diagnosis _____ Mo Day Year
Suspected Causative Agents (Chemicals, Physical Agents, Conditions)	Did Employee Die? Yes ◯ No ◯	If Yes, Date of Death _____ Mo Day Year
If Physician, Indicate Clinical Impression for Suspected Occupational Disease, or Diagnosis of Confirmed Occupational Disease		

ADDITIONAL COMMENTS

_____

_____

REPORT SUBMITTED BY

If Report Submitted by Non-Physician, Did Employee See a Physician? *If yes, record information below.* Yes ◯ No ◯ Don't Know ◯

Physician's Name	Phone		
Office Address	City	State	Zip
Name of Person Submitting Report	Physician ◯ Non-Physician ◯		
Address	City	State	Zip
Signature	Phone		Date

The Michigan Department of Consumer and Industry Services is an equal opportunity, affirmative action employer, service provider and buyer.

Return completed form to:

Michigan Department of Consumer and Industry Services
Division of Occupational Health
Bureau of Safety and Regulation
7150 Harris Drive, P.O. Box 30649
Lansing, MI 48909-8149

OH - 51 (9/96)

Authority: P.A. 368 of 1978
Completion: Required
Penalty: Misdemeanor

Figure 2. All Company and Non-Company Patients with Noise-Induced Hearing Loss Reported to the Michigan Department of Consumer and Industry Services: 1985-2000

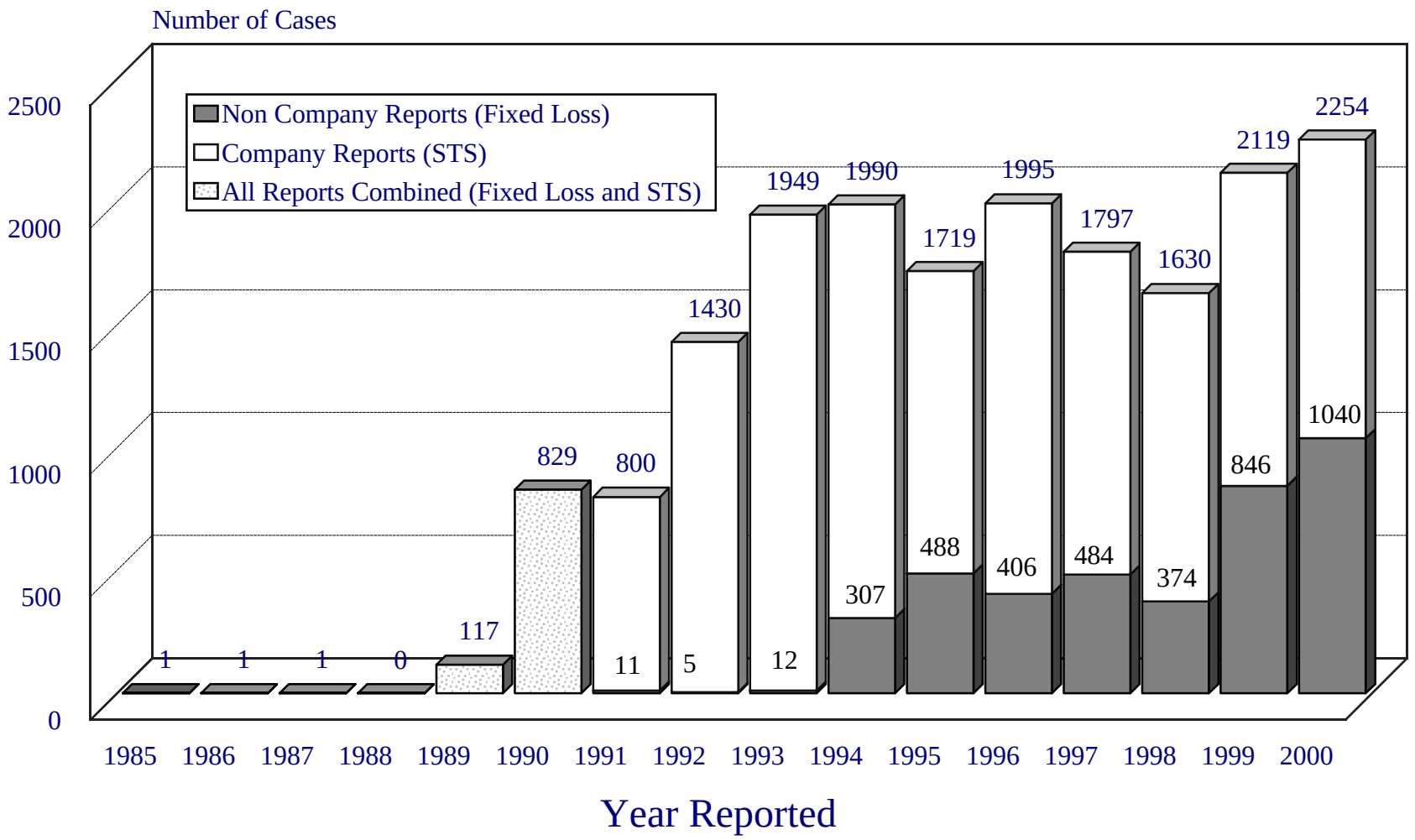
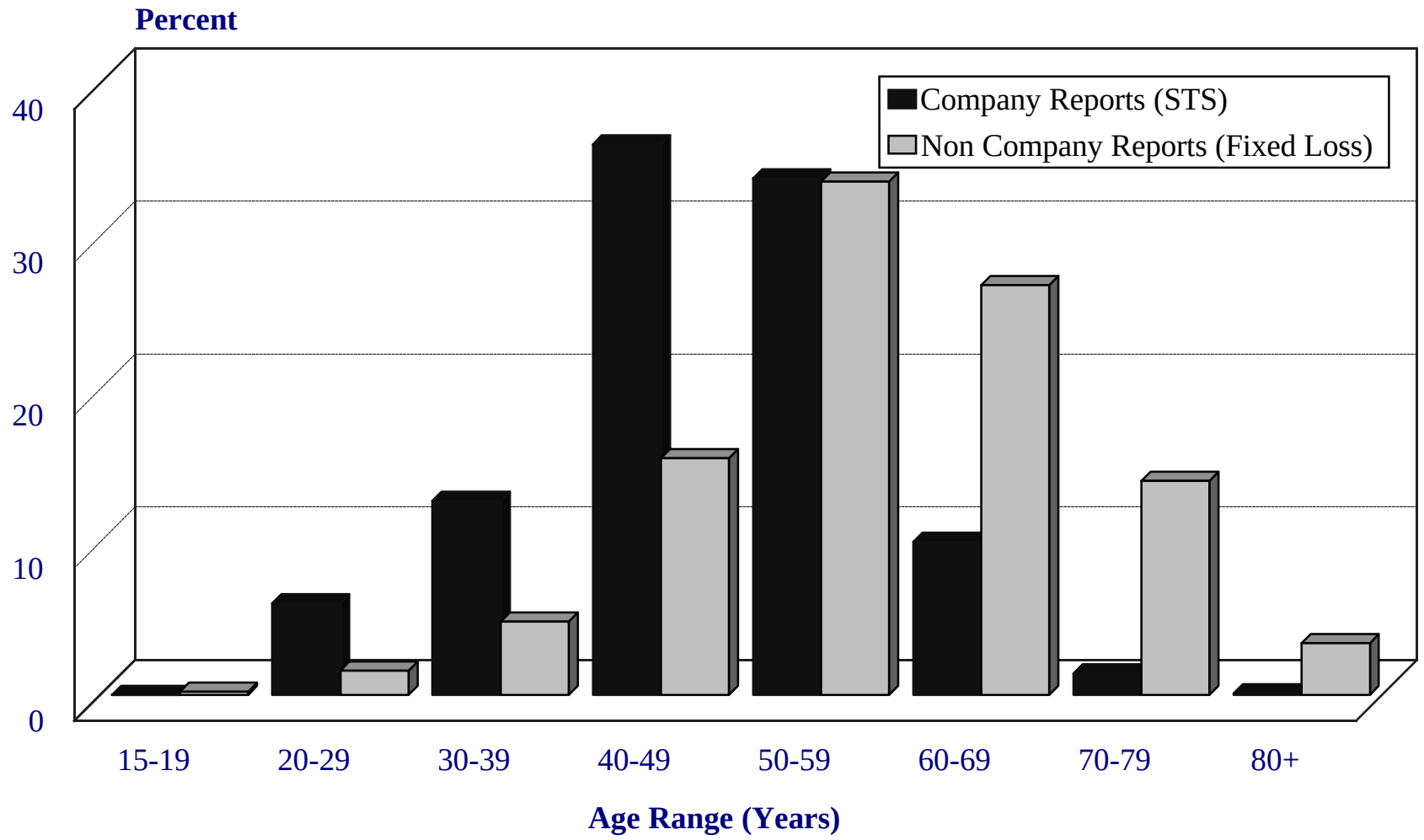
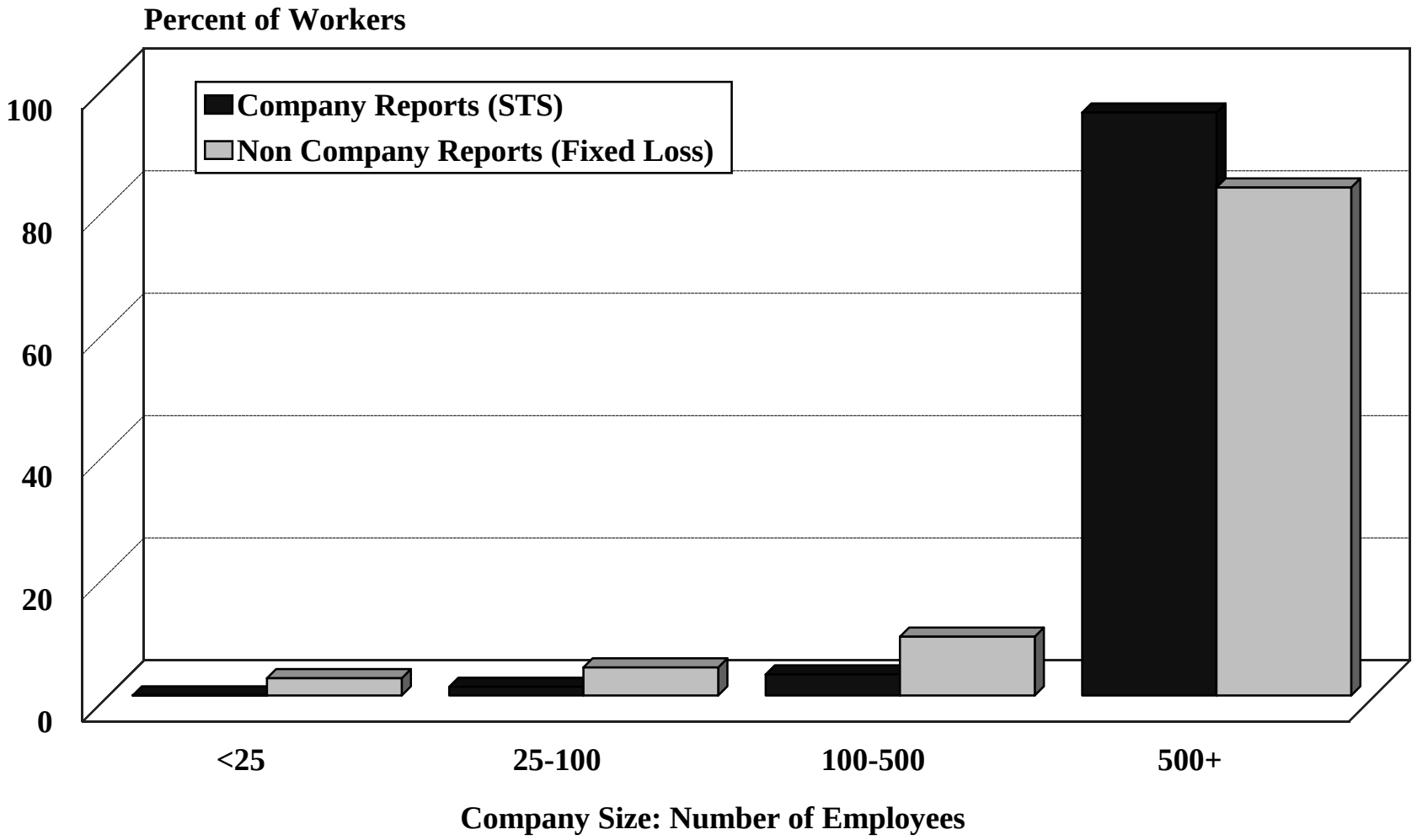


Figure 3. All Company and Non-Company Patients with Noise-Induced Hearing Loss Reported in 2000: Age Range* by Reporting Source



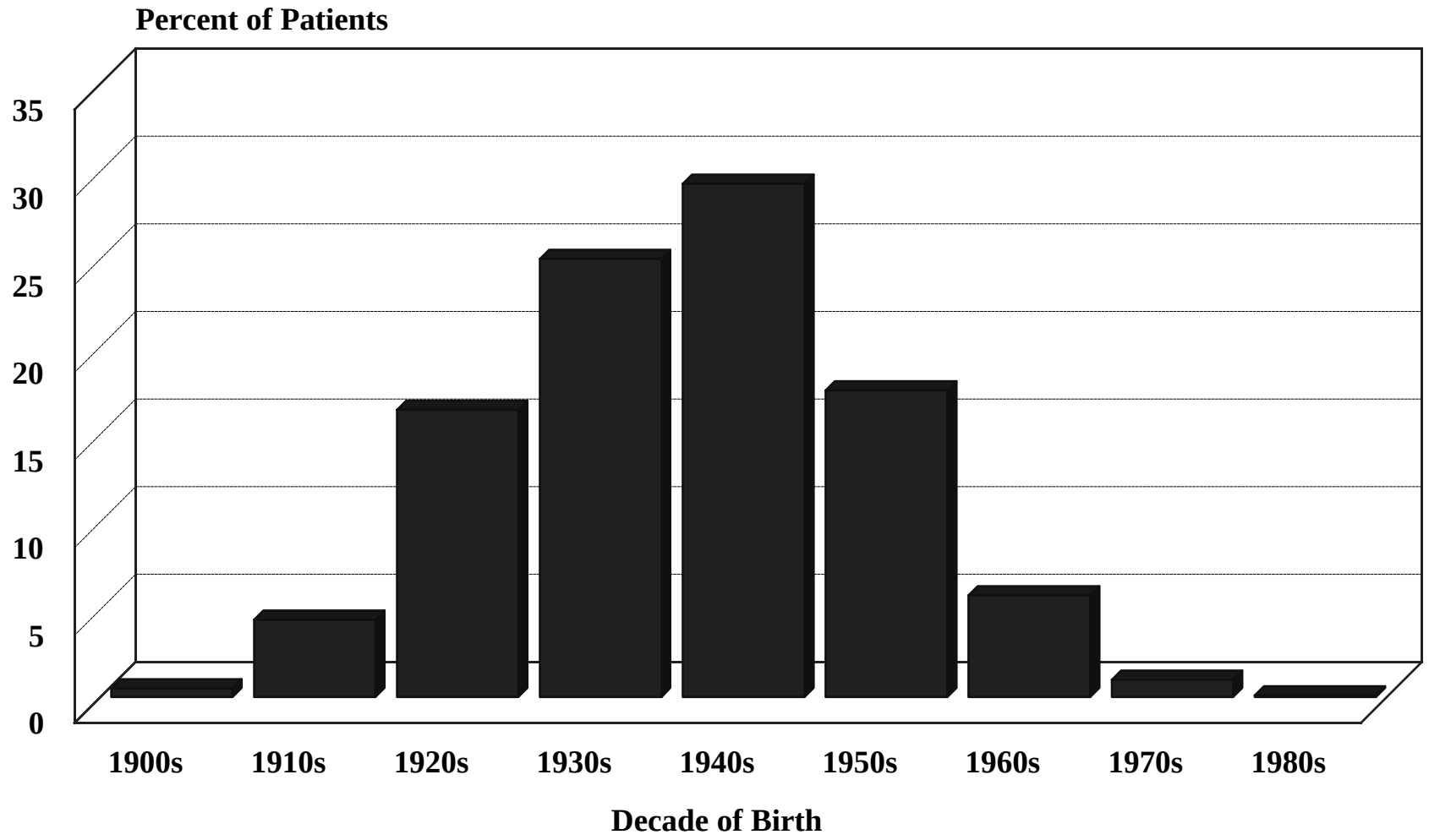
*** Age was unknown for 11 individuals reported by company medical departments and 40 individuals reported by non company hearing health professionals.**

Figure 4. All Company and Non-Company Patients with Noise-Induced Hearing Loss Reported in 2000: Number of Employees* at the Company Where Exposure to Noise Occurred



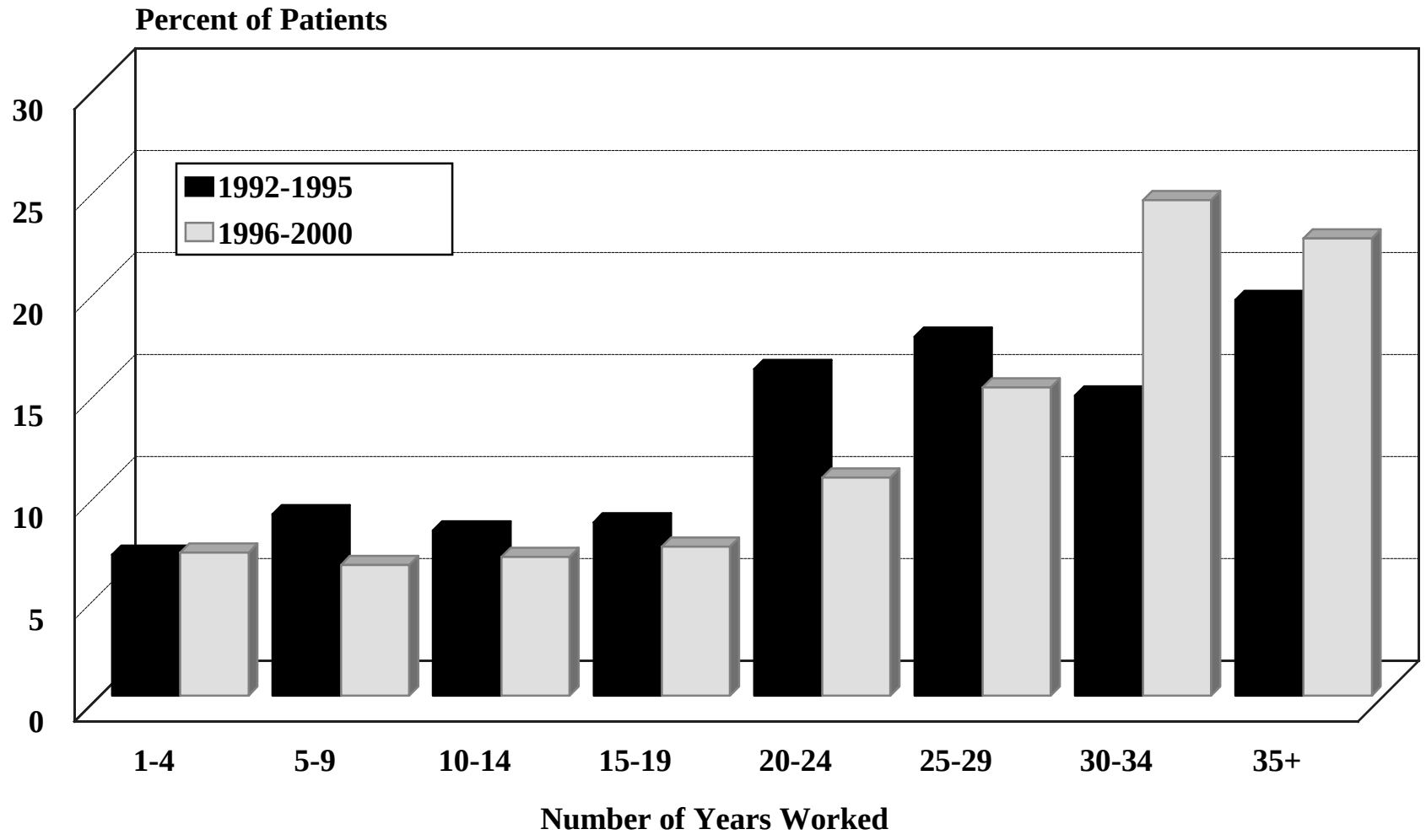
* Number of employees was unknown for 822 individuals reported by non company hearing health professionals.

Figure 5. Patients with a Fixed Hearing Loss: Distribution of Decade of Birth,* Michigan 1992-2000



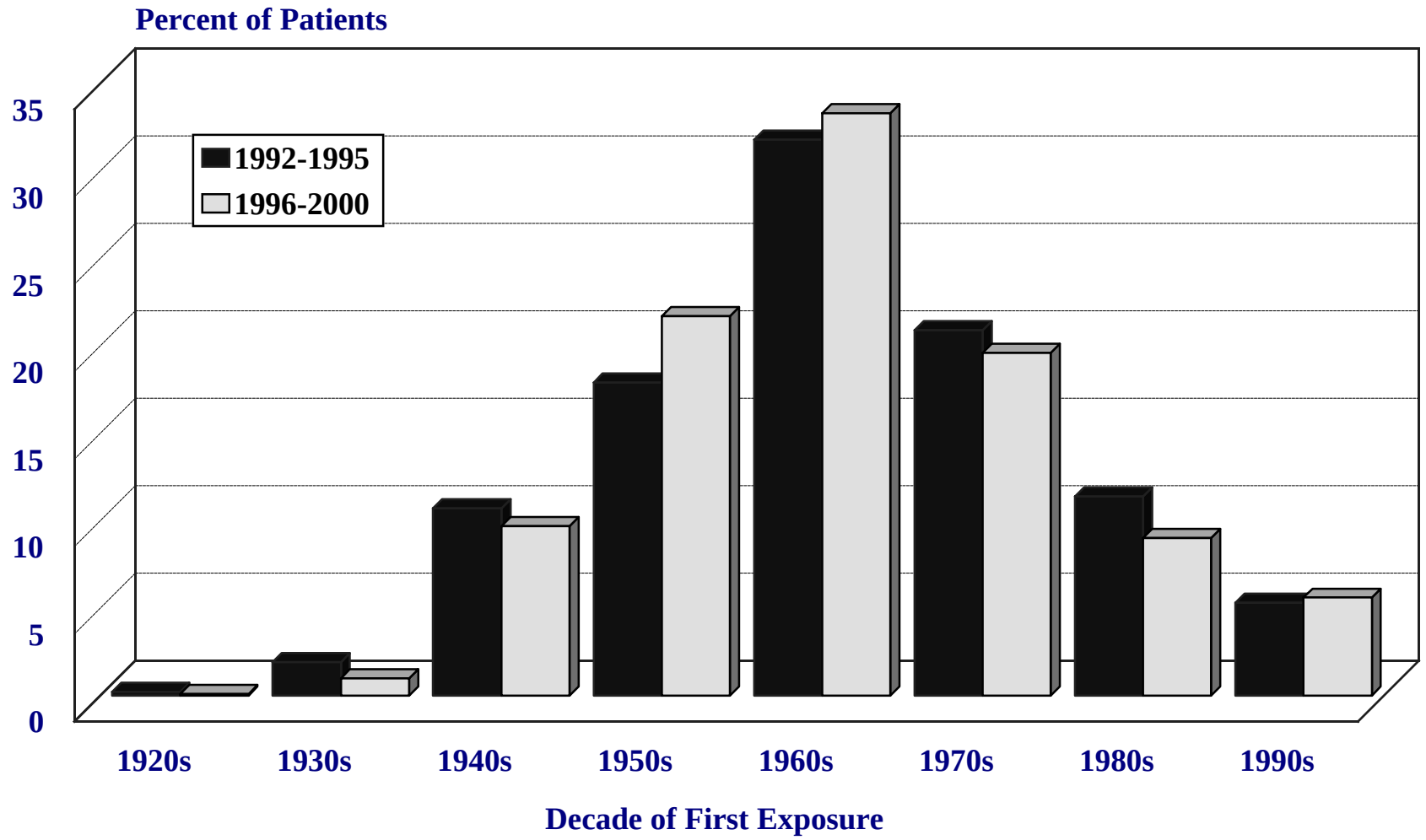
* Decade of birth was unknown for 26 patients.

Figure 6. All Interviewed Patients with a Fixed Hearing Loss: Total Duration of Years Worked* in Noise, Michigan 1992-1995 and 1996-2000



* Duration was unknown for 151 patients identified between 1992 and 1995 and for 441 patients identified between 1996 and 2000.

Figure 7. All Interviewed Patients with a Fixed Hearing Loss: Distribution of Decade of First Exposure* to Noise, Michigan 1992-1995 and 1996-2000



* Decade was unknown for 183 patients identified between 1992 and 1995 and for 529 patients identified between 1996 and 2000.

Table 1. Number of Non-Company Based Health Professionals Reporting Patients with a Fixed Noise Induced Hearing Loss in Michigan, in Calendar Year 2000

Number of Patients Reported	Health Professionals Number	Percent	Total Number of Patients Reported
1	27	(54.0)	27
2-10	19	(38.0)	68
11-50	2	(4.0)	50
51+	2	(4.0)	895
Total	50*	(100.0)	1040

*Includes 7 group practices.

Table 2. All Company and Non-Company Patients with Noise-Induced Hearing Loss Reported in Calendar Year 2000: Number of Employees at the Company Where Exposure to Noise Occurred

	Total		STS**		Fixed Loss***	
Number of Employees	Number	Percent	Number	Percent	Number	Percent
<25	6	(0.4)	0	--	6	(2.8)
25-100	27	(1.9)	17	(1.4)	10	(4.6)
100-500	62	(4.3)	41	(3.4)	21	(9.6)
500+	1337	(93.4)	1156	(95.2)	181	(83.0)
Total*	1432	(100.0)	1214	(100.0)	218	(100.0)

*Number of employees was unknown for 822 companies reported by private practice health professionals.
**STS=Standard Threshold Shift, reported by company.
***Fixed=reported by audiologist/otolaryngologist in private practice.

Table 3. Calendar Year 2000 Occupational Disease Reports of Noise-Induced Hearing Loss: Industry of Patients Reported

Standard Industrial Classification (SIC)*	Number of Patients	Percent	STS**** Number of Patients	Percent	Fixed Loss***** Number of Patients	Percent
Agriculture/Forestry (01-08)	7	(0.3)	0	----	7	(0.8)
Construction (15-17)	156	(7.3)	0	----	156	(16.8)
Manufacturing (20-39)						
Food (20)	11	(0.5)	7	(0.6)	4	(0.4)
Apparel (23)	1	(<0.1)	0	----	1	(0.1)
Lumber (24)	3	(0.1)	1	(0.1)	2	(0.2)
Furniture (25)	15	(0.7)	13	(1.1)	2	(0.2)
Paper (26)	6	(0.3)	0	----	6	(0.6)
Printing (27)	4	(0.2)	0	----	4	(0.4)
Chemicals (28)	16	(0.7)	7	(0.6)	9	(1.0)
Rubber (30)	44	(2.1)	39	(3.2)	5	(0.5)
Stone/Clay/Glass (32)	9	(0.4)	8	(0.7)	1	(0.1)
Primary Metals (33)	204	(9.5)	40	(3.3)	164	(17.7)
Metal Fabrication (34)	200	(9.3)	145	(11.9)	55	(5.9)
Machinery (35)	20	(0.9)	10	(0.8)	10	(1.1)
Electronics (36)	69	(3.2)	68	(5.6)	1	(0.1)
Transportation (37)	1114	(52.0)	869	(71.6)	245	(26.4)
Instruments (38)	1	(<0.1)	0	----	1	(0.1)
Miscellaneous Mfg Industries (39)	24	(1.1)	5	(0.4)	19	(2.0)
Transport./Comm. Svcs. (40-49)	102	(4.8)	1	(0.1)	101	(10.9)
Retail Trade (52-59)	4	(0.2)	0	----	4	(0.4)
Finance, Insurance & Real Estate (60-67)	2	(0.1)	0	----	2	(0.2)
Services (70-89)						
Business (73)	2	(0.1)	0	----	2	(0.2)
Automotive Repair (75)	3	(0.1)	0	----	3	(0.3)
Repair (76)	3	(0.1)	0	----	3	(0.3)
Recreation (79)	1	(<0.1)	0	----	1	(0.1)
Health (80)	26	(1.2)	0	----	26	(2.8)
Education (82)	38	(1.8)	1	(0.1)	37	(4.0)
Engr./Mgt. (87)	1	(<0.1)	0	----	1	(0.1)
Private Households (88)	8	(0.4)	0	----	8	(0.9)
Miscellaneous Services (89)	1	(<0.1)	0	----	1	(0.1)
Public Admin. (91-97)			0			
Government (91)	15	(0.7)	0	----	15	(1.6)
Police (92)	11	(0.5)	0	----	11	(1.2)
Admin. Economic Programs (96)	1	(<0.1)	0	----	1	(0.1)
Military (97)	21	(1.0)	0	----	21	(2.3)
Total	2143	(99.6)**	1214	(100.1)**	929***	(99.9)**

*Standard industrial Classification (1987 Manual).

**Percentage does not add to 100 due to rounding.

***SIC was unknown for 111 patients reported by private practice health professionals.

****STS=Standard Threshold Shift, reported by company.

*****Fixed=reported by audiologist/otolaryngologist in private practice.

Table 4. Patients with a Fixed Hearing Loss: Type of Industry at Any Company Exposed to Noise: Michigan 1992-1995 and 1996-2000

Standard Industrial Classification (SIC)*	1992-1995 #	1992-1995 %	1996-2000 #	1996-2000 %
Agricultural Production & Services (01-07)	35	(3.4)	74	(2.1)
Forestry (08)	0	–	5	(0.1)
Mining (10-14)	5	(0.5)	17	(0.5)
Construction (15-17)	83	(8.2)	480	(13.4)
Manufacturing (20-39)				
Food (20)	19	(1.9)	31	(0.9)
Apparel (23)	4	(0.4)	4	(0.1)
Wood (24)	13	(1.3)	16	(0.4)
Furniture (25)	1	(0.1)	17	(0.5)
Paper (26)	13	(1.3)	48	(1.3)
Printing (27)	4	(0.4)	35	(1.0)
Chemicals (28)	14	(1.4)	32	(0.9)
Petroleum Refining (29)	2	(0.2)	1	(<0.1)
Rubber (30)	20	(2.0)	34	(0.9)
Leather (31)	1	(0.1)	3	(0.1)
Stone/Clay/Glass (32)	17	(1.7)	22	(0.6)
Primary Metals (33)	55	(5.4)	508	(14.2)
Metal Fabrication (34)	73	(7.2)	169	(4.7)
Machinery (35)	55	(5.4)	143	(4.0)
Electronics (36)	7	(0.7)	21	(0.6)
Transportation (37)	285	(28.1)	989	(27.6)
Measuring Instruments (38)	4	(0.4)	4	(0.1)
Miscellaneous Manufacturing (39)	15	(1.5)	86	(2.4)
Transportation/Communication Services (40-49)	75	(7.4)	254	(7.1)
Trade (50-59)	15	(1.5)	74	(2.1)
Finance, Insurance & Real Estate (60-67)	4	(0.4)	6	(0.2)
Services (70-89)				
Hotels (70)	2	(0.2)	1	(<0.1)
Personal Services (72)	1	(0.1)	1	(<0.1)
Telemarketing (73)	4	(0.4)	6	(0.2)
Automotive Repair (75)	29	(2.9)	47	(1.3)
Repair (76)	4	(0.4)	14	(0.4)
Amusement/Recreation (79)	6	(0.6)	16	(0.4)
Health (80)	9	(0.9)	37	(1.0)
Education (82)	27	(2.7)	153	(4.3)
Social Services (83)	0	--	2	(0.1)
Parks (84)	1	(0.1)	0	--
Engineering/Management (87)	2	(0.2)	7	(0.2)
Geology (89)	1	(0.1)	1	(<0.1)
Public Admin. (91-97)	110	(10.8)	224	(6.3)
Total	1015**	(100.3)***	3582	(100.0)

*Standard industrial Classification (1987 Manual).

**SIC was unknown for 29 companies from patients identified between 1992-1995, and for 26 companies from patients identified between 1996-2000.

***Percent does not add to 100 due to rounding.

Table 5. All Interviewed Patients with a Fixed Hearing Loss: Type of Industry and Performance of Regular Hearing Testing at Most Recent Company Exposed to Noise: Michigan 1992-1995 and 1996-2000

	1992-1995		1996-2000	
Standard Industrial Classification (SIC)*	# Companies	% Have Hearing Testing	# Companies	% Have Hearing Testing
Agricultural Production & Services (01-07)	24	(14)	50	(7)
Mining (14)	2	(**)	9	(50)
Construction (15-17)	46	(3)	361	(9)
Forestry (08)	---		1	(**)
Manufacturing (20-39)				
Food (20)	15	(50)	17	(69)
Apparel (23)	2	(0)	2	(100)
Wood (24)	7	(29)	14	(8)
Furniture (25)	---		10	(33)
Paper (26)	10	(37)	36	(79)
Printing (27)	3	(0)	17	(36)
Chemicals (28)	10	(89)	24	(58)
Petroleum Refining (29)	1	(**)	---	
Rubber (30)	16	(45)	18	(64)
Leather (31)	1	(**)	1	(0)
Stone/Clay/Glass (32)	15	(14)	13	(45)
Primary Metals (33)	37	(45)	437	(54)
Metal Fabrication (34)	52	(59)	109	(63)
Machinery (35)	40	(48)	76	(31)
Electronics (36)	5	(50)	7	(33)
Transportation (37)	230	(58)	787	(61)
Measuring Instruments (38)	3	(50)	3	(33)
Miscellaneous Manufacturing (39)	8	(33)	49	(23)
Transport./Comm. Services (40-49)	58	(57)	200	(56)
Trade (50-59)	13	(14)	51	(10)
Finance, Insurance & Real Estate (60-67)	3	(0)	5	(0)
Services (70-89)				
Hotels (70)	1	(0)	1	(0)
Personal Services (72)	---		1	(0)
Telemarketing (73)	2	(100)	4	(0)
Automotive Repair (75)	14	(22)	23	(0)
Repair (76)	3	(0)	7	(0)
Amusement/Recreation (79)	6	(20)	9	(12)
Health (80)	9	(43)	34	(31)
Education (82)	25	(11)	138	(50)
Social Services (83)	---		2	(0)
Parks (84)	1	(100)	---	
Engr./Mgt. (87)	1	(0)	4	(33)
Geology (89)	1	(100)	1	(0)
Public Admin. (91-97)	78	(31)	198	(31)
Total	742**	(44)	2719	(44)

*Standard Industrial Classification (1987 Manual).

**There were 29 companies for patients from 1992-1995 with an unknown SIC, and 26 companies for patients from 1996-2000 with an unknown SIC.

Table 6. All Interviewed Patients with a Fixed Hearing Loss: Number of Employees in Most Recent Company Exposed to Noise by Status of Hearing Testing, Michigan 1992-1995 and 1996-2000

	1992-1995		1996-2000	
Company Size: Number of Employees	# Companies	% Have Hearing Testing	# Companies	% Have Hearing Testing
<25	94	(30)	252	(15)
25-100	83	(22)	196	(27)
100-500	120	(52)	277	(46)
500+	303	(54)	1203	(59)
Total	600	(45)	1928	(46)

*There were 171 companies from patients identified 1992-1995 and 817 companies from patients identified 1996-2000 with an unknown number of employees.

Table 7. All Interviewed Patients with a Fixed Hearing Loss: Decade Last Worked and Status of Regular Hearing Testing at Most Recent Company Exposed to Noise, by Industry Type*, Michigan 1992-2000

Decade Last Exposed to Noise and Hearing Testing Status

	1940's		1950's		1960's		1970's		1980's		1990's		2000	
Industry Type (SIC)**	No. of Pts.	% Have RHT***	No. of Pts.	% Have RHT	No. of Pts.	% Have RHT	No. of Pts.	% Have RHT	No. of Pts.	% Have RHT	No. of Pts.	% Have RHT	No. of Pts.	% Have RHT
Agriculture/Forestry (01-08)	1	0	1	0	2	0	3	0	6	17	33	6	4	0
Mining (13-14)	0	--	0	--	0	--	0	--	3	50	5	60	0	--
Construction (15-17)	0	--	2	0	6	0	14	11	73	10	180	5	50	14
Manufacturing (20-39)	13	8	24	5	47	0	133	16	374	44	1008	66	147	79
Transportation (40-49)	0	--	0	--	2	50	10	38	38	30	144	62	35	56
Trade (50-59)	0	B	1	0	1	100	3	0	3	0	42	8	2	50
Finance (60-67)	0	--	0	--	0	--	1	0	0	--	3	0	0	--
Services (70-89)	0	--	1	0	2	0	3	0	26	13	184	32	26	50
Public Administration (91-97)	5	****	6	0	7	0	12	0	17	38	95	35	14	36

*For 704 Patients, either industry type or decade last exposed to noise was unknown.

**Standard Industrial Classification (1987 Manual).

***Regular Hearing Test.

****There is no percentage in this column because the status of regular hearing testing was unknown.

Table 8. All Interviewed Patient's with a Fixed Hearing Loss: Decade Last Worked and Status of Hearing Protection Availability at Most Recent Company Exposed to Noise, by Industry Type*, Michigan 1992-2000

Decade Last Exposed to Noise and Percent with No Hearing Protection

	1940's		1950's		1960's		1970's		1980's		1990's		2000	
Industry Type (SIC)**	No. of Pts.	% Have HPD***	No. of Pts.	% Have HPD	No. of Pts.	% Have HPD	No. of Pts.	% Have HPD	No. of Pts.	% Have HPD	No. of Pts.	% Have HPD	No. of Pts.	% Have HPD
Agriculture/Forestry (01-08)	1	****	1	****	2	0	3	33	6	0	33	37	4	50
Mining (14)	0	B	0	B-	0	-B	0	B	3	100	5	100	0	--
Construction (15-17)	0	--	2	50	6	33	14	30	73	33	180	67	50	65
Manufacturing (20-39)	13	8	24	10	47	11	133	45	374	67	1008	86	147	92
Transportation (40-49)	0	--	0	--	2	0	10	13	38	16	144	59	35	82
Trade (50-59)	0	--	1	0	1	0	3	0	3	0	42	57	2	50
Finance (60-67)	0	--	0	--	0	--	1	0	0	--	3	0	0	--
Services (70-89)	0	--	1	0	2	50	3	0	26	14	184	69	26	65
Public Administration (91-97)	5	****	6	50	7	0	12	40	17	82	95	69	14	93

*For 704 Patients, either industry type or decade last exposed to noise was unknown.
**Standard Industrial Classification (1987 Manual).
***Hearing Protection Device (ear plugs or muffs).
****There is no percentage in this column because the availability of hearing protection was unknown.

Table 9. All Interviewed Patients with a Fixed Hearing Loss: Decade Last Worked and Status of Regular Hearing Testing at Most Recent Company Exposed to Noise, by Industry Size*, Michigan 1992-2000

	Company Size (Number of Employees)							
	<25		25-100		100-500		500+	
	No. of Pts.	% with HCP**	No. of Pts.	% with HCP	No. of Pts.	% with HCP	No. of Pts.	% with HCP
1940's	1	0	1	0	0	--	8	13
1950's	5	0	3	0	5	20	14	0
1960's	7	0	5	25	9	13	31	0
1970's	17	6	19	11	18	11	82	22
1980's	38	18	38	19	54	27	279	47
1990's	227	18	182	27	255	55	812	67
2000	30	29	12	55	39	70	82	72

*For 1243 patients, either company size or decade last exposed to noise was unknown.
**Hearing Conservation Program.

Table 10. All Interviewed Patients with a Fixed Hearing Loss: Status of Hearing Testing for the Most Recent Company Exposed to Noise, Michigan 1992-2000

Regular Hearing Tests Conducted	Baseline Hearing Test Conducted			
	Yes	No	Unknown	Total
Yes	507	284	174	965 (27%)
No	163	915	137	1215 (35%)
Unknown	28	29	1279	1336 (38%)
Total	698 (20%)	1228 (35%)	1590 (45%)	3516

Table 11. Ninety-One Companies Inspected Where Patient Reported They Had Not Received Audiometric Testing: Michigan 1992-2000

Industry (SIC)*	Total Number of Inspections #	%	Hearing Conservation Program (HCP) Required #	(%)	Citation Issued Re: HCP		Total Number of Employees Exposed to Noise
Agricultural Services (07)	1	(1.1)	1	(100.0)	--		
Construction (15-17)	1	(1.1)	* *		Deficient No HCP	- 1	- 562
Manufacturing (20-39)	67	(73.6)	41	(61.2)	Deficient No HCP	21 (51.2) 11 (26.8)	2600 1416
Transportation (40-49)	2	(2.2)	0	(B)			
Trade (50-59)	7	(7.7)	1	(14.3)	Deficient No HCP	- 1 (100.0)	B 14
Services (70-89)	9	(9.9)	5	(55.6)	Deficient No HCP	- 3 (60.0)	B 40
Government (91-97)	4	(4.4)	3	(75.0)	Deficient No HCP	2 (66.7) -	700 (# employees unknown for 1 compa -

*Standard Industrial Classification (1987 Manual).
**Construction has separate regulations that require a less comprehensive program.

Table 12. Size of Companies Cited for Violations of the Noise Standard in Michigan: MIOSHA Inspections Conducted 1/1/2000 to 12/31/2000

Number of Employees	Companies	
	Number	Percent
≤ 50	55	(67.1)
51 - 250	23	(28.0)
251 +	4	(4.9)
Total	82	(100.0)

Table 13. Violations of the Noise Standard in Michigan: MIOSHA Inspections Conducted 1/1/2000 to 12/31/2000

Standard Violated	Number of Citations	Percent*	Percent**
No hearing conservation program	46	(56.1)	(44.2)
Noise monitoring	15	(18.3)	(14.4)
Exceeded noise level	13	(15.9)	(12.5)
Training	13	(15.9)	(12.5)
Access to medical records	9	(11.0)	(8.7)
Any audiometric testing, evaluation or follow-up	6	(7.3)	(5.8)
Provide hearing protection	2	(2.4)	(1.9)

*A company may be cited for more than one type of violation, therefore these percentages are based on a total of 82 companies cited.
**Percentage based on a total of 104 violations.

Table 14. Type of Industry Cited for Violations of the Noise Standard in Michigan: MIOSHA Inspections Conducted 1/1/2000 to 12/31/2000

Industry (SIC Code)*	Companies Number	Companies Percent
Manufacture of:		
Fabricated Metal Products (34)	35	(42.7)
Transportation Equipment (37)	14	(17.1)
Lumber (24)	10	(12.2)
Industrial and Commercial Machinery (35)	7	(8.5)
Primary Metal (33)	4	(4.9)
Rubber/Plastics (30)	4	(4.9)
Stone, Clay, Glass (32)	1	(1.2)
Furniture (25)	1	(1.2)
Paper and Allied Products (26)	1	(1.2)
Printing (27)	1	(1.2)
Transportation:		
Motor Freight (42)	1	(1.2)
Services:		
Auto Repair (75)	1	(1.2)
Miscellaneous Repair (76)	1	(1.2)
Engineering (87)	1	(1.2)
Total	82	(99.9)**

Table 15. Demographic Characteristics of 497 Patients with Noise-Induced Hearing Loss, with Noise Exposure in Construction: Michigan 1992-2000

Gender

	Number	Percent
Male	495	(99.6)
Female	2	(0.4)
Total	497	(100)

Race

	Number	Percent
White	438	(90.5)
African American	36	(7.4)
Hispanic	6	(1.2)
Other	4	(0.8)
Total	484	(99.9)

Race was unknown for 13 individuals.

Decade of Birth

Decade	Number	Percent
1910-1919	21	(4.2)
1920-1929	83	(16.8)
1930-1939	121	(24.4)
1940-1949	129	(26.1)
1950-1959	100	(20.2)
1960-1969	36	(7.3)
1970-1979	5	(1.0)
Total	495	(100)

Decade was unknown for 2 individuals.

Table 16. Status of Regular Hearing Testing and Use of Hearing Protection at Most Recent Construction Job Where 497 Patients with Noise-Induced Hearing Loss were Exposed to Noise: Michigan 1992-2000

	Regular Hearing Tests*			Given Hearing Protection**	
	Number	Percent		Number	Percent
Yes	19	(6.5)	Yes	120	(43.3)
No	272	(93.5)	No	157	(56.7)
Total	291	(100)	Total	277	(100)

*Status of testing was unknown for 206 individuals.

**Status of hearing protection was unknown for 220 individuals.

Table 17. Most Recent Decade Where 497 Patients With Noise-Induced Hearing Loss Were Exposed to Noise in the Construction Industry: Status of Regular Hearing Tests and Use of Hearing Protection, Michigan 1992-2000

			Regular Hearing Tests					Given Hearing Protection				
	Total Patients		No		Yes		Unk.	No		Yes		Unk.
Decade*	Number	Percent	Number	Percent	Number	Percent	Number	Number	Percent	Number	Percent	Number
1930-1949	2	(0.5)	1	(100)	0	--	1	2	(100)	0	B	0
1950-1959	8	(2.0)	7	(100)	--	--	1	6	(86)	1	(14)	1
1960-1969	24	(6.0)	18	(100)	--	--	6	16	(94)	1	(6)	7
1970-1979	33	(8.2)	24	(92)	2	(8)	7	19	(79)	5	(21)	9
1980-1989	91	(22.7)	51	(91)	5	(9)	35	35	(70)	15	(30)	41
1990-1999	193	(48.1)	130	(96)	6	(4)	57	44	(37)	76	(63)	73
2000-2001	50	(12.5)	18	(86)	3	(14)	29	9	(35)	17	(65)	24
Total	401	(100.0)	249	(94)	16	(6)	136	131	(53)	115	(47)	155

*Decade was unknown for 96 individuals.

Table 18. Duration of Years Worked for 353 Patients with Noise-Induced Hearing Loss Who Were Only Exposed to Noise in Construction Jobs: Michigan 1992-2000

Duration*	Number	Percent
1-5	28	(9.5)
6-10	16	(5.4)
11-15	10	(3.4)
16-20	29	(9.9)
21-25	21	(7.1)
26-30	50	(17.0)
31-35	61	(20.7)
36-40	44	(15.0)
41-45	24	(8.2)
46-50	11	(3.7)
Total	294	(99.9)**

*Duration was unknown for 59 individuals.

**Percent does not add to 100 due to rounding.

APPENDIX I

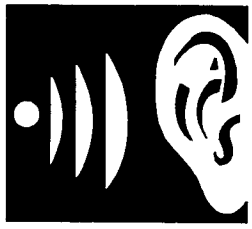
WORK-RELATED HEARING LOSS FACT SHEET

YOU HAVE BEEN GIVEN THIS FACT SHEET BECAUSE YOUR HEALTH PRACTITIONER SUSPECTS THAT NOISE AT WORK HAS SIGNIFICANTLY CONTRIBUTED TO A LOSS OF YOUR HEARING.

Q. How Does Noise Cause Hearing Loss?

A. Your ear receives sound waves and sends them through a delicately balanced system to the brain. Part of this remarkable system is a chamber in the inner ear filled with fluid and lined with thousands of tiny hair cells. The hair cells signal the auditory nerve to send electrical impulses to the brain. The brain interprets these impulses as sound. When you are exposed to loud or prolonged noise, the hair cells are damaged and the transmission of sound is permanently altered. (American Speech-Language Hearing Association)

Exposure can be from:

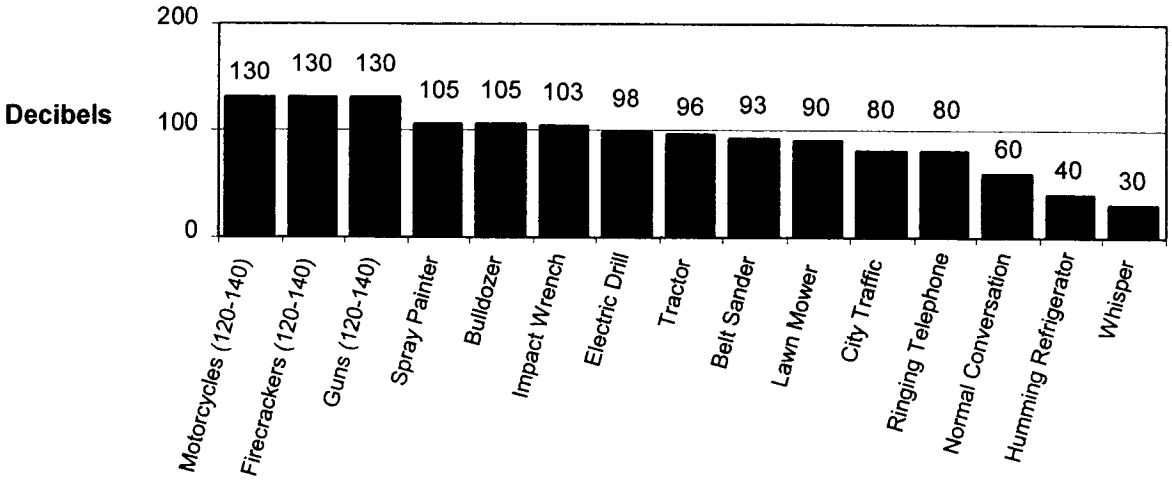


- A one-time exposure to extremely loud noise.
- Repeated or long exposure to loud noise.
- Extended exposure to moderate noise.

Q. What Sounds Cause Hearing Loss?

A. The loudness of sound is measured in units called decibels. Hearing loss occurs with exposures of 85 decibels or greater.

Source of Noise



(www.NIDCD.nih.gov/health/wise/index.htm)

Employers are required to provide a hearing conservation program if average sound levels are 85 decibels or greater during a typical work day. A hearing conservation program consists of measuring noise levels, training people about noise and hearing protection, providing hearing protection and hearing testing, and trying to make engineering changes to reduce noise.

What Should I Do About My Hearing Loss?

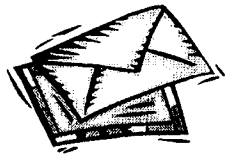
▶ If you continue to be exposed to excessive noise at work or at home, you should protect your ears with either ear plugs or ear muffs. If your employer does not provide hearing protection devices, they can be purchased at drug, hardware or sporting good stores. There are also sites on the internet that can help you locate and purchase hearing protectors (i.e. www.cdalloz.com/hear.htm or www.howardleight.com). It is important to note the amount of rated protection on the hearing protector package does not indicate how much protection you can expect to get at home or in your workplace. For most people, the main consideration is finding a hearing protector that is comfortable to wear and convenient to use. It may take some trial and error to find a protector that meets your needs. There are over 200 styles available. So, find a protector you like and wear it every time you are in hazardous noise.

▶ Monitor your hearing with an annual hearing test.

▶ Ask your health care provider if a hearing aid or other treatment would help your hearing.

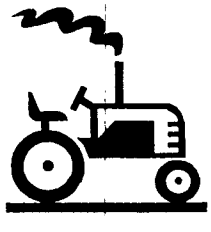
▶ Please contact Michigan State University either by:

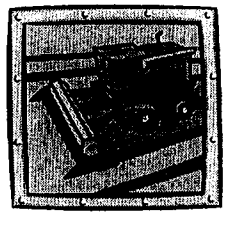
Telephone: 1-800-446-7805
Email: ODREPORT@ht.msu.edu
Mail: Kenneth D. Rosenman, M.D.
Michigan State University
117 West Fee Hall
East Lansing, MI 48824-1315



Michigan State University, under contract to the State OSHA program, is keeping track of how many people in Michigan are getting hearing loss from noise at work. This information will be shared with the State OSHA program as part of their strategic plan to reduce excessive noise levels and prevent hearing loss among Michigan workers.

To help Michigan State University with this important health project, please complete the information on the next page. Tear off page at the fold, then tri-fold at dotted lines and tape closed. Postage-paid mailing on reverse.





Your Name: _____

Your Address: _____

Your Telephone Number: _____

Company Where You Were Exposed to Noise:

Name: _____ City: _____

What Years: _____ to _____

Did your employer provide you hearing protection? YES / NO (circle one)

Did your employer provide you hearing testing? YES / NO (circle one)

What health care provider told you that noise at work contributed to your hearing loss?

Name: _____ City: _____

11-3993

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 941 EAST LANSING, MI

POSTAGE WILL BE PAID BY ADDRESSEE

KENNETH D ROSENMAN MD
DEPARTMENT OF MEDICINE
MICHIGAN STATE UNIVERSITY
117 WEST FEE HALL
EAST LANSING MI 48824-9902