CPWR

THE CENTER FOR CONSTRUCTION
RESEARCH AND TRAINING

Construction Noise & Hearing Loss: Links to Mortality and Dementia

November 13, 2025

Moderator: **Chris Trahan Cain, CIH**, Executive Director, CPWR

Panelists:

Rick Rinehart, ScD, Deputy Director, CPWR and Principal Investigator, BTMed

John Dement, PhD, CIH, Professor Emeritus, Division of Occupational and Environmental Medicine, Duke University Medical Center & Industrial Hygienist and Epidemiologist, BTMed

Marianne Cloeren, MD, MPH, Associate Professor, UMD School of Medicine & Medical Director, BTMed

Jessica Bunting, MPH, Research to Practice (r2p) Director, CPWR

Housekeeping

- Today's webinar will be recorded and automatically shared via follow-up email.
- The recording and slides will also be posted on cpwr.com/webinars.
- Attendees are automatically muted! Please submit panelist questions via the Q&A box.
- Spanish audio is available via simultaneous interpretation

Simultaneous Interpretation
Interpretación simultánea

WINDOWS - MAC (Navegador web/*Browser*)

1. En los controles del seminario web, haga clic en **Interpretación** 
2. Haga clic en el idioma que desee escuchar.
3. (Opcional) Para escuchar solo el idioma interpretado, haga clic en **Silenciar audio original**.

Nota: Hay que unirse al audio del seminario web a través de audio o VoIP de la computadora. No podrá escuchar la interpretación de idiomas si utiliza las funciones de audio de teléfono llamada directa o recibir llamada.

1. *In your webinar controls, click **Interpretation*** 
2. *Click the language that you would like to hear.*
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ANDROID - iOS (Aplicación móvil/*Mobile App*)

1. En los controles del seminario web, toque los puntos suspensivos •••
2. Toque **Interpretación de idiomas.**
3. Toque el idioma que desee escuchar.
4. (Opcional) Toque el botón de alternancia **Silenciar audio original**.
5. Haga clic en **Finalizado**.

Nota: No podrá escuchar la interpretación de idiomas si utiliza las funciones de audio de teléfono llamada directa o recibir llamada.

1. *In your webinar controls, tap the ellipses* •••
2. *Tap **Language Interpretation**.*
3. *Tap the language you want to hear.*
4. *(Optional) Tap the toggle to **Mute Original Audio**.*
5. *Click **Done**.*

Note: *You cannot listen to language interpretation if you use the dial-in or call me phone audio features.*

What is BTMed?

The **Building Trades National Medical Screening Program** (BTMed) provides **FREE** medical exams for former DOE construction trades workers. Participants are eligible to receive an exam every three years.

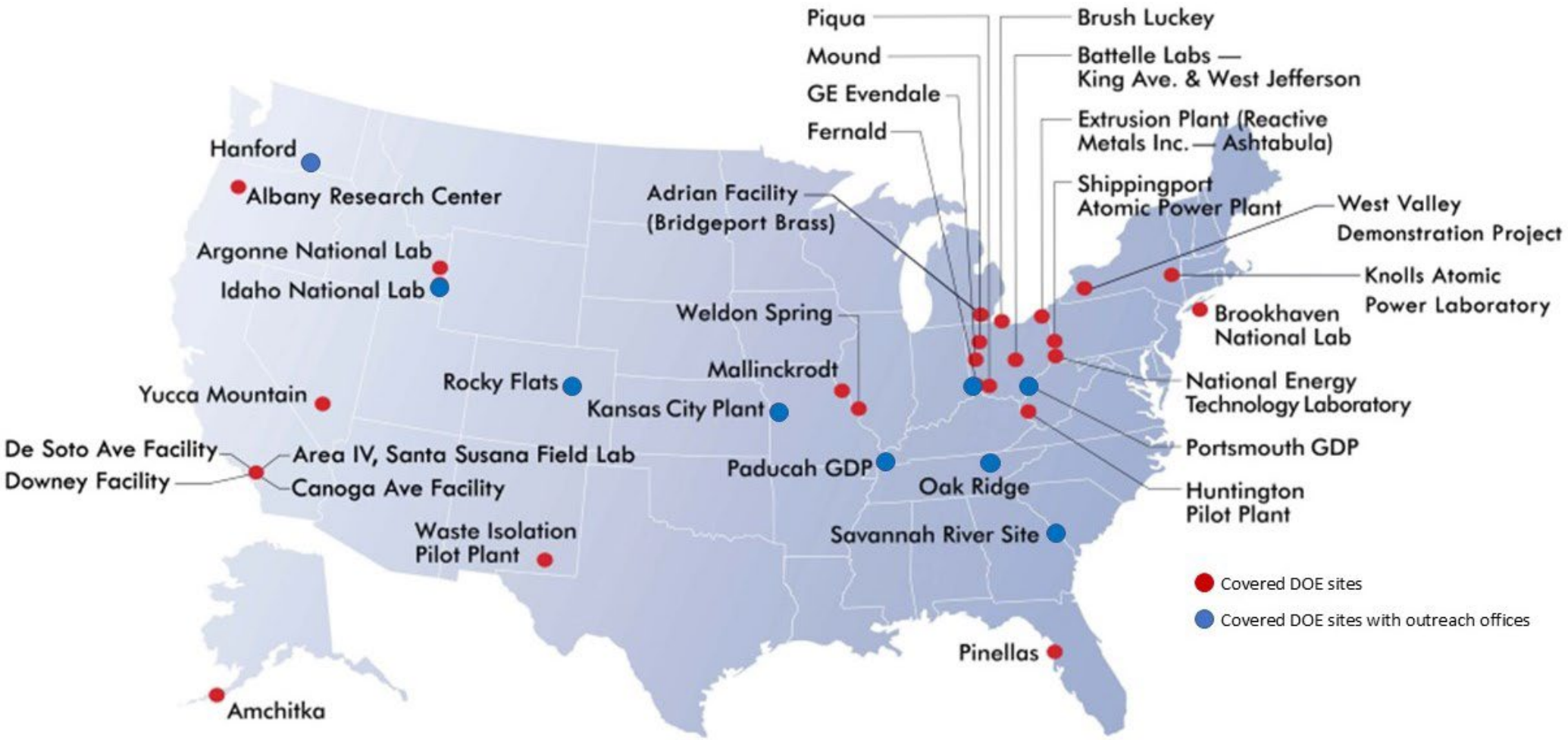
BTMed has completed 50,000 exams!

Workers Included in BTMed

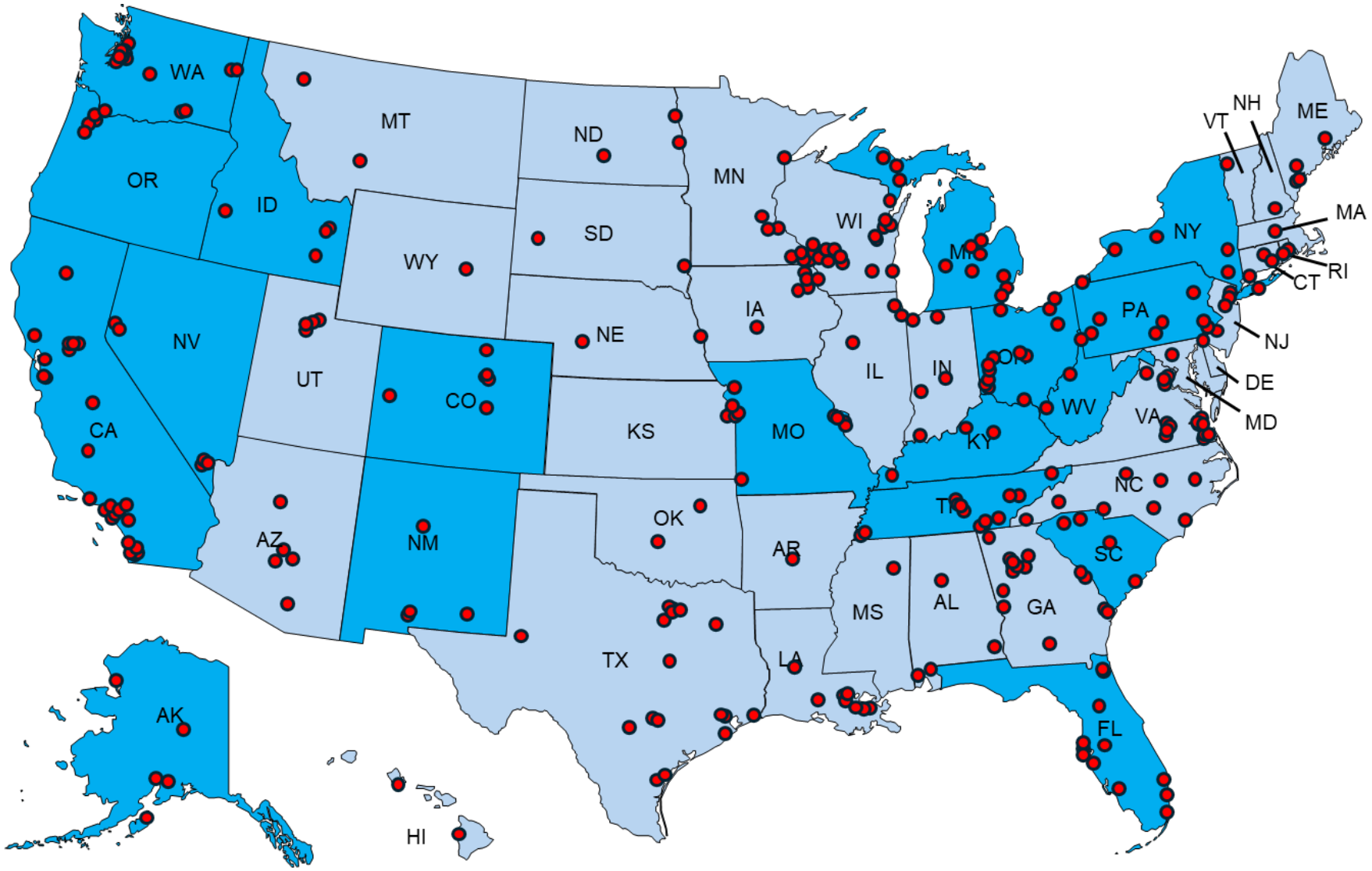
- "Former" construction workers on DOE sites
- Most employers are subcontractors
- New construction, maintenance, renovation, repair, hazmat, D&D

BTMed Over the Years

Year	# of covered sites
1996	2
1997	3
1999	4
2004	7
2005	15
2006	22
2011	23
2015	27
NOW	35

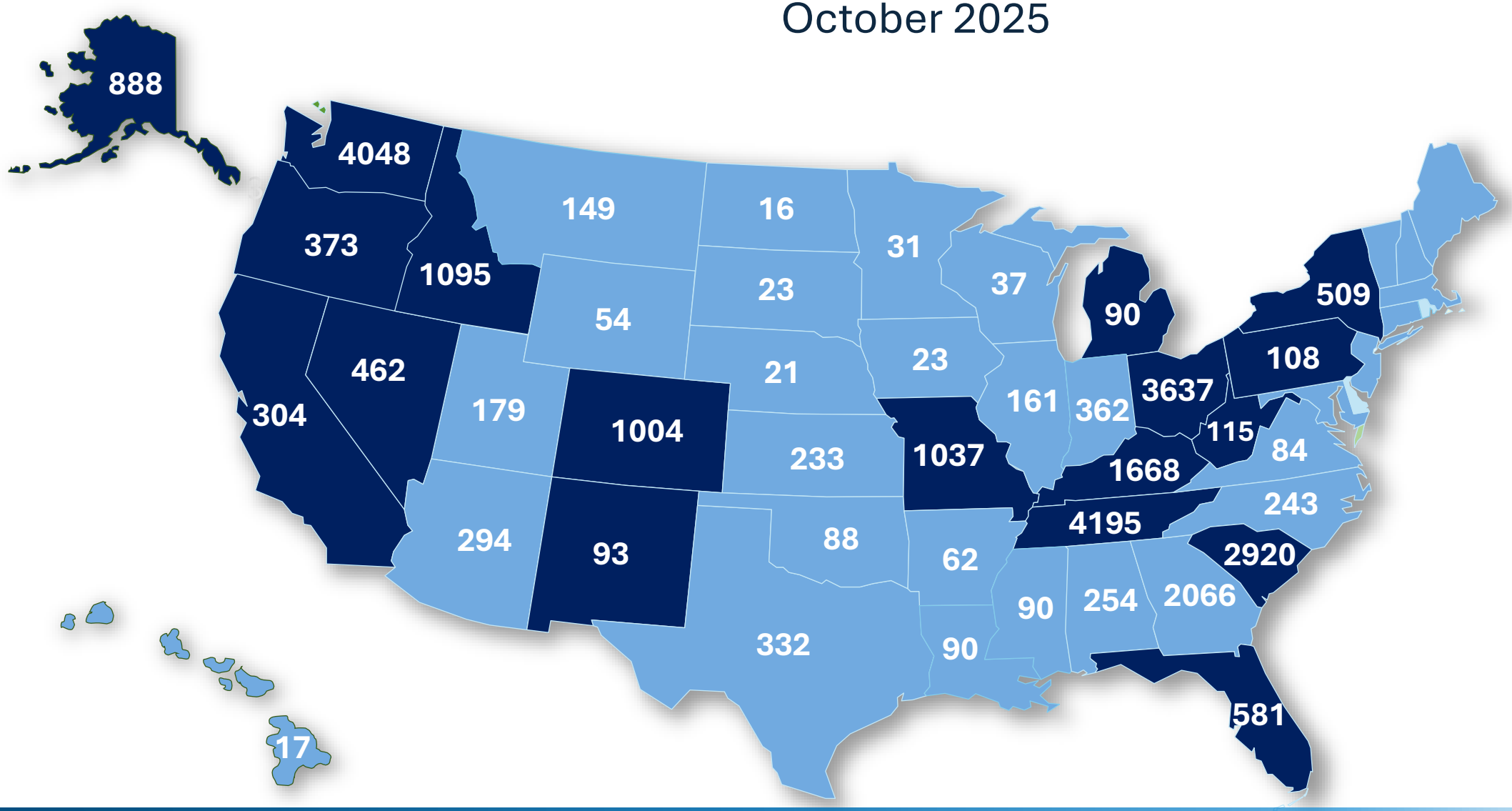


BTMed Medical Provider Network



BTMed Workers Screened by State

October 2025



Maine	11
New Hampshire	8
Vermont	5
Massachusetts	18
Rhode Island	3
Connecticut	16
New Jersey	28
Delaware	9
Maryland	19
Washington DC	1
International	15

Cohort Distribution by Occupation

All Construction Trades Combined	**84.5%**
Carpenter	6.2%
Electrician	15.7%
Ironworker	4.9%
Laborers	13.5%
Painter	2.8%
Pipe Trades	15.6%
Operating Engineer	5.9%
Millwright/Mechanic	2.3%
Sheet Metal Worker	4.50
Teamster	3.8%
All other construction trades	9.3%
All Non-Construction Workers	**15.5%**
Administrative, Scientific, Security	7.00%
All Other Non-Construction Workers	8.50%
Cohort Overall	100%

Building Trades National Medical Screening Program

Published Medical Findings

Below is a list of all the published medical findings. Click on each link to view/download the document. To request a copy of the full manuscript for one of the published findings, please contact BTMed by emailing btmed@btmed.org.

Click here for a list of all BTMed published medical findings.

Is Work-Related Hearing Loss Associated With Dementia?

Hearing Loss Is Associated With Increased Mortality in a

Colorectal (CRC) Screening in Occupational Health

Occupational lung cancer screening: A Collegium

Hearing Loss and All-Cause Mortality among Construction Trade Workers

Results from the Building Trades National Medical Screening Program

John Dement, PhD, CIH

Professor Emeritus, Division of Occupational and Environmental Medicine,
Duke University Medical Center
& Industrial Hygienist and Epidemiologist, BTMed

Building Trades National
Medical Screening Program

Presentation Objectives

- To present data on hearing loss prevalence among BTMed construction trade workers.
- To briefly review the literature concerning the association between hearing loss and mortality.
- To present results investigating the association between speech-frequency hearing loss and all-cause mortality among BTMed participants.

Hearing Loss Prevalence Analyses

- Based on data for 21,340 BTMed participant through September 2021

- Hearing impairment was defined as having an average hearing threshold level of ≥ 20 dB HL across 500, 1,000, 2,000, and 4,000 Hz in the better ear.[1]

[1]Global Burden of Disease Study 2013 C. Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990-2013: A systematic analysis for the Global Burden of Disease Study 2013. Lancet. 2015;386(9995):743-800

Hearing Impairment by Trade Group

Trade Group or Job Category	Hearing Impairment		
	Number of Workers with Data	Prevalence Percent	Risk Ratios (95% CI)[1]
Administrative/Scientific/Security	1304	41.2	1.00 (Ref)
All Construction Trades	18207	56.7	1.37 (1.29-1.45)
Asbestos Worker/Insulator	546	46.5	1.22 (1.11-1.34)
Boilermaker	380	65.9	1.54 (1.41-1.68)
Carpenter	1342	65.3	1.58 (1.47-1.68)
Cement Mason/Brick Mason/Plasterer	348	60.3	1.36 (1.24-1.50)
Electrician	3407	51.6	1.21 (1.14-1.29)
Ironworker	1026	64.7	1.51 (1.41-1.62)
Laborer	2989	48.2	1.33 (1.24-1.42)
Machinist	162	51.9	1.12 (0.97-1.29)
Millwright/Mechanic	463	63.3	1.44 (1.32-1.56)
Operating Engineer	1249	59.4	1.47 (1.37-1.58)
Other Construction-Related NEC	369	66.9	1.46 (1.33-1.59)
Painter	606	53.3	1.40 (1.28-1.53)
Plumber, Steamfitter, Pipefitter	3328	59.9	1.38 (1.30-1.47)
Roofer	208	49.0	1.24 (1.08-1.43)
Sheet Metal Worker	976	64.1	1.47 (1.37-1.58)
Teamster	808	57.7	1.34 (1.24-1.44)

Lower noise exposed comparison group

[1]Age, sex, and smoking adjusted regression model.

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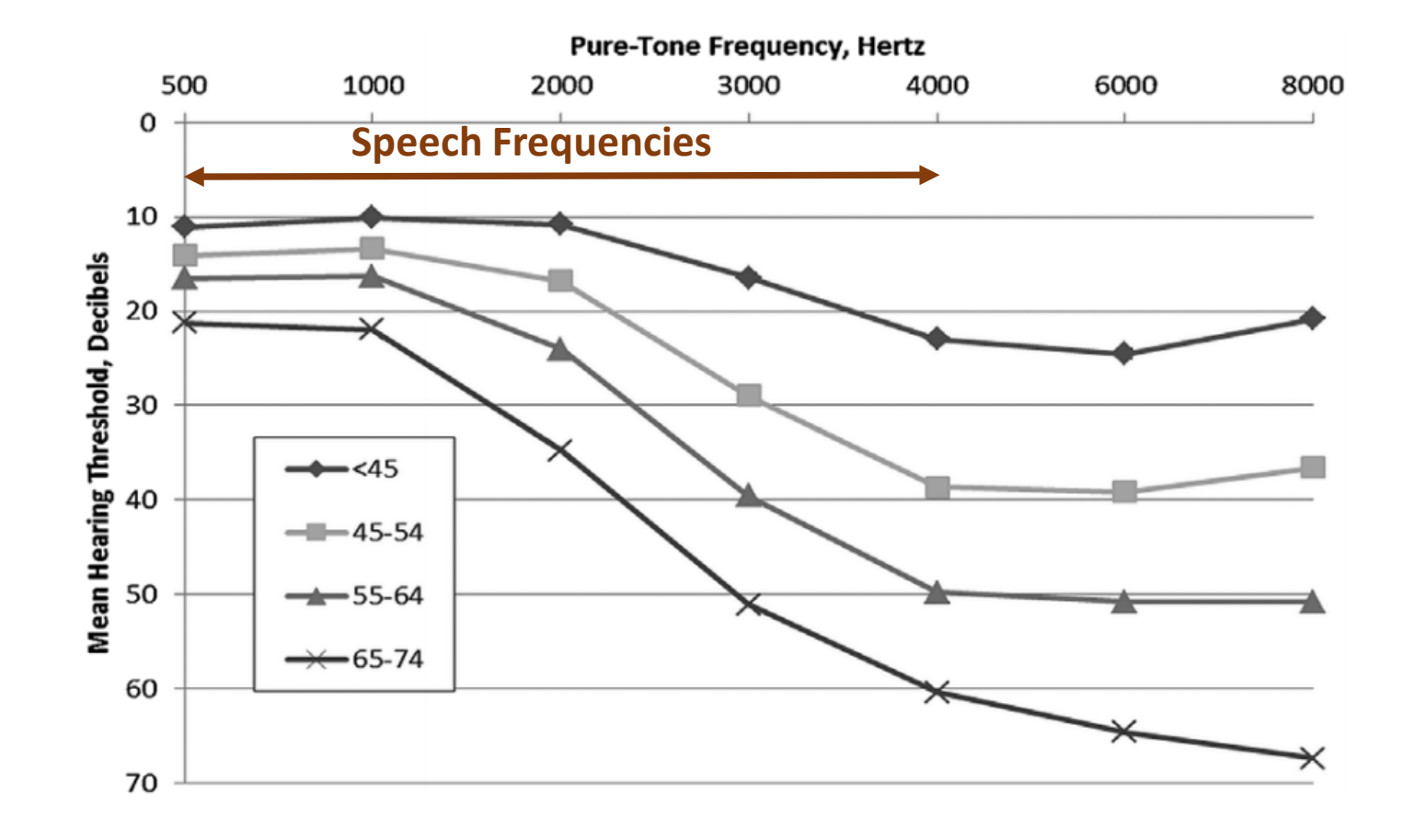
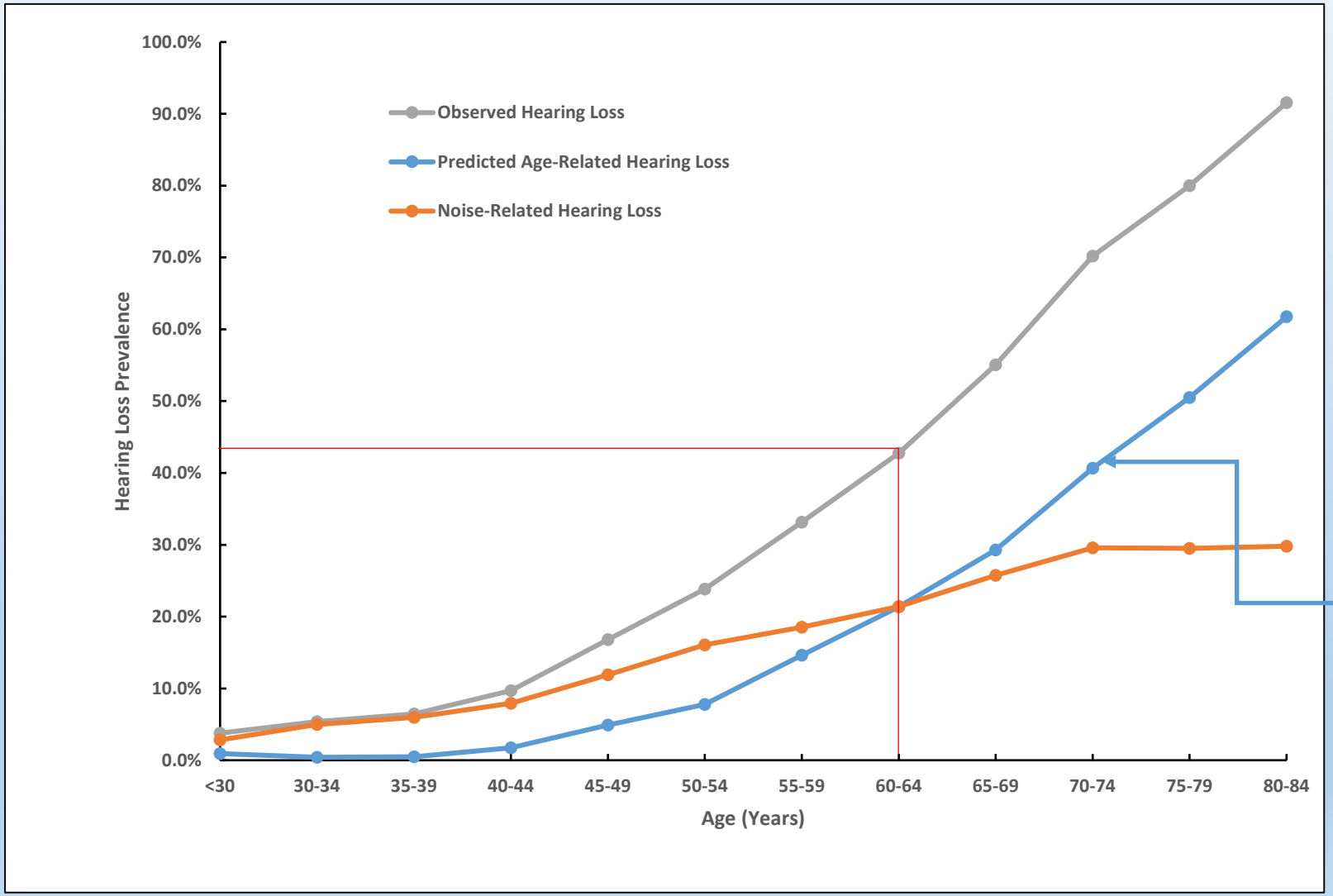
BTMed Mean Hearing Threshold by Age Category



Source: Dement J, Welch LS, Ringen K, Cranford K, Quinn P. Hearing loss among older construction workers: Updated analyses. *Am J Ind Med. 2018;61(4):326-335.*

Hearing Loss among BTMed Participants by Age

Data through September 2021



Hearing Loss Definition: Speech-frequency pure-tone average hearing levels (HL) were calculated for each ear using measurements at 0·5 kHz, 1 kHz, 2 kHz, and 4 kHz. Hearing earing loss was defined as a pure-tone average HL > 20 dB in the better hearing ear.

Predicted age-related hearing loss.
Source: Flamme GA, et al. Population-based age adjustment tables for use in occupational hearing conservation programs. Int J Audiol. 2020;59(sup1):S20-S30.

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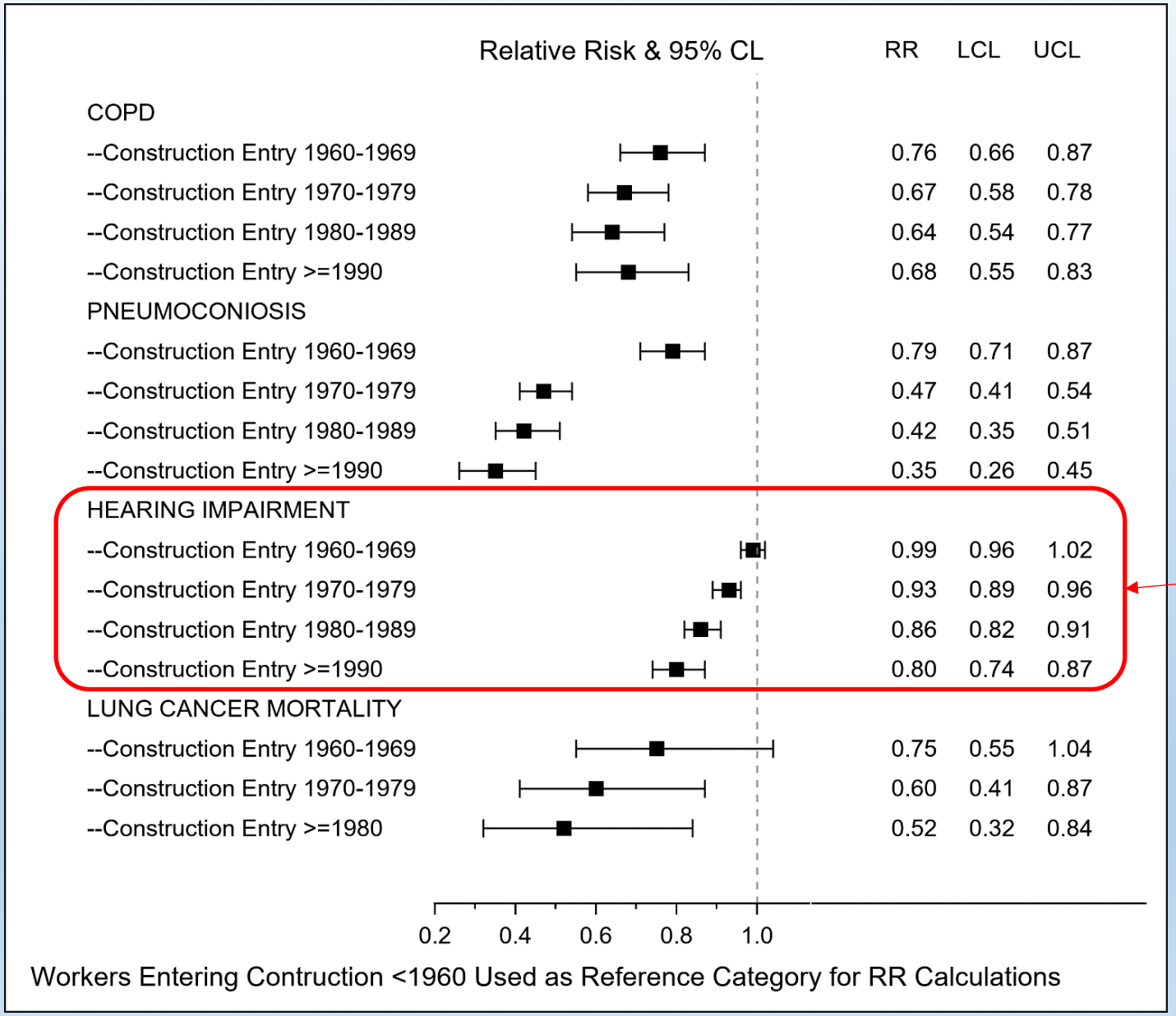
Disease Risk by Time Period of Construction Trade Entry



Source: Ringen K, Dement J, Welch L, Quinn P. How much have adverse occupational health outcomes among construction workers improved over time? Evidence from 25 years of medical screening. *Am J Ind Med. 2023;66(1):18-29.*

Regression model adjusted for age, sex, smoking (status and pack-years), and years of construction trade work. Trend by trade entry time period significant ($p<0.0001$)

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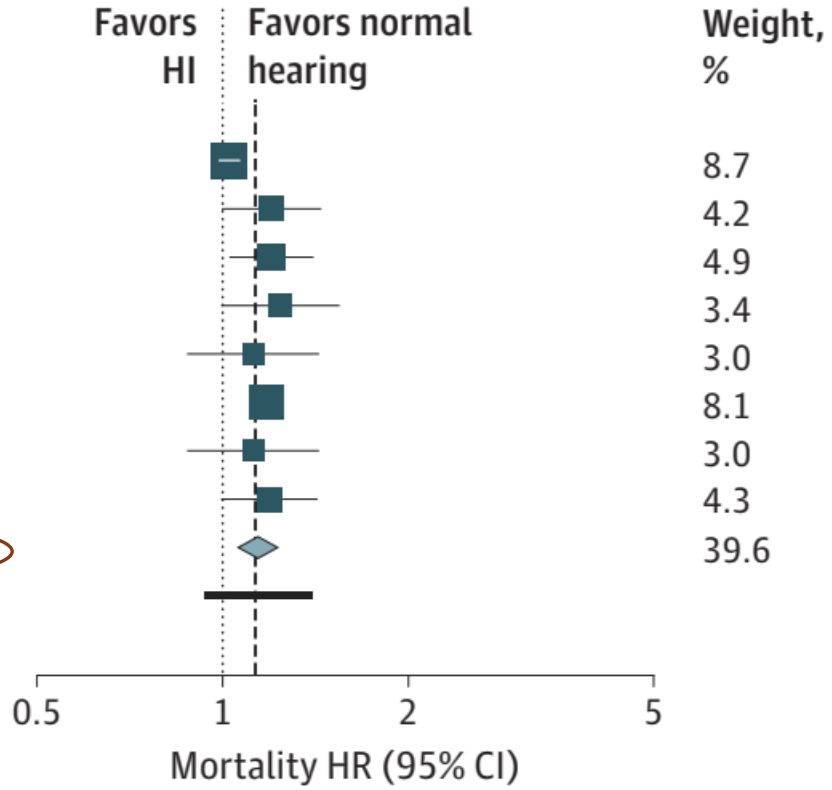
Impacts of Hearing Loss

- Communication Difficulties
- Social Isolation
- Stress and Fatigue
- Falls and Work-Related Injuries
- Cognitive Decline and Dementia
- Premature Mortality
  - All-Causes
  - Cardiovascular Diseases
- Economic Impacts: Absenteeism, Under Employment, Unemployment, Increased Medical Expenditures

Meta-analysis of Hearing Loss in the Speech Frequency Range and All-Cause Mortality

A All-cause mortality

Study	TE	seTE	Mortality HR (95% CI)	Weight, %
Audiometry				
Engdahl et al,[35] 2019	0.03	0.0205	1.03 (0.99-1.07)	8.7
Fisher et al,[20] 2014	0.18	0.0948	1.20 (1.00-1.44)	4.2
Genther et al,[8] 2015	0.18	0.0801	1.20 (1.03-1.40)	4.9
Gopinath et al,[39] 2013	0.22	0.1127	1.24 (0.99-1.55)	3.4
Karpa et al,[16] 2010	0.11	0.1256	1.12 (0.88-1.43)	3.0
Lee et al,[9] 2020	0.16	0.0308	1.17 (1.11-1.25)	8.1
Reuben et al,[17] 1999	0.11	0.1256	1.12 (0.88-1.43)	3.0
Schubert et al,[19] 2017	0.17	0.0920	1.19 (0.99-1.43)	4.3
Random effects model			1.14 (1.06-1.23)	39.6
Prediction interval			(0.93-1.39)	
Heterogeneity: $I^2 = 64\%$, $\tau^2 = 0.0053$, $P < .001$				



Source: Tan BKJ, Ng FYC, Song H, et al. Associations of hearing loss and dual sensory loss with mortality: A systematic review, meta-analysis, and meta-regression of 26 observational studies with 1 213 756 participants. *JAMA Otolaryngol Head Neck Surg. 2022;148(3):220-234.*

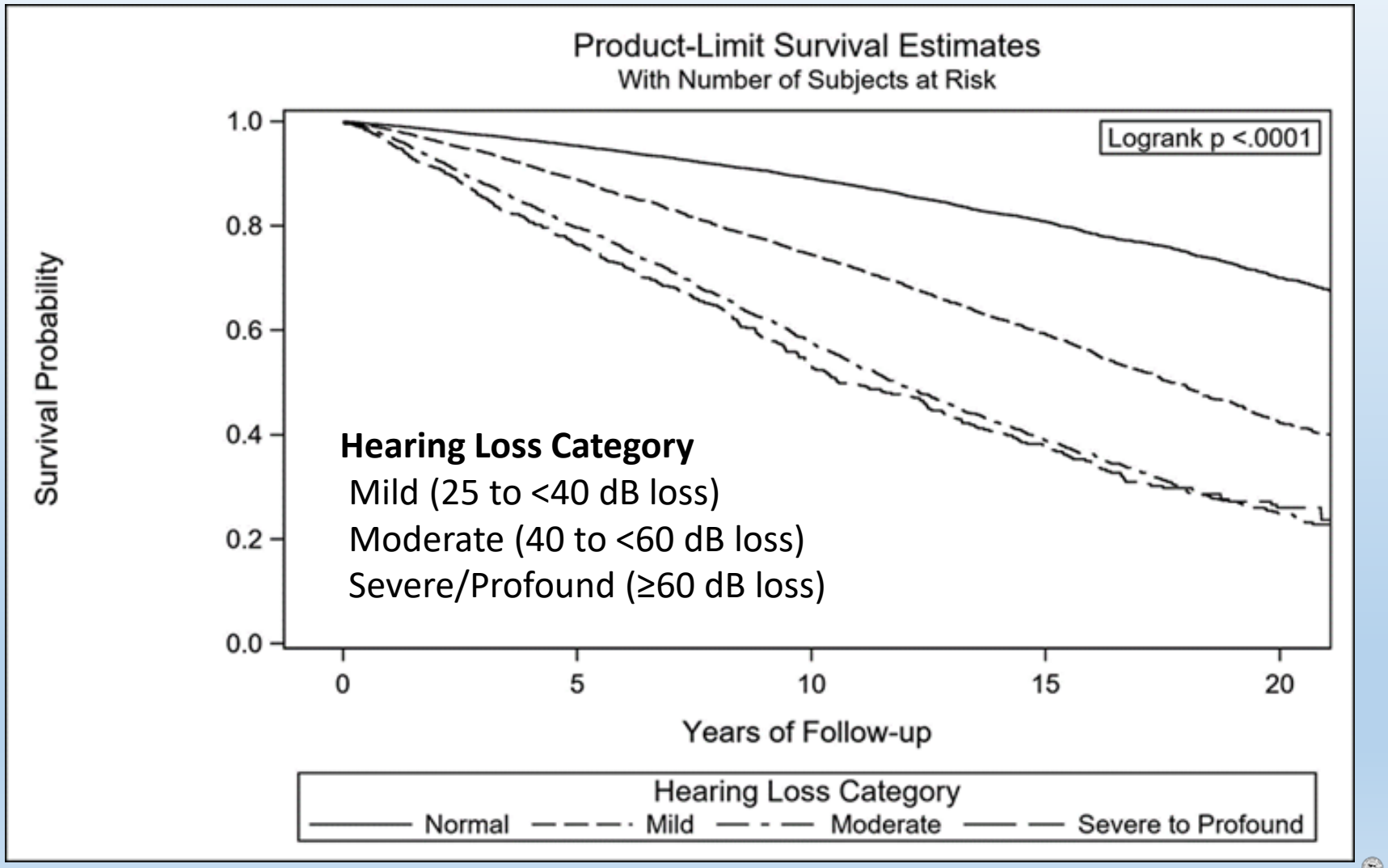
Hearing Loss and Mortality among BTMed Participants

Source: Dement J, Ringen K, Cloeren M, et al. Hearing loss is associated with increased mortality in a cohort of older construction trades workers. Am J Ind Med. 2025;68(3):273-285. https://doi.org/10.1002/ajim.23693.

BTMed Hearing Loss and Mortality Study

- Objectives
  - Evaluate the impact of speech-frequency hearing loss while controlling for other risk factors and potential confounder.
  - Evaluate the impact of hearing aid use among those with hearing loss by audiometry.
- Study Population
  - 19,379 workers with audiometry and 5,398 deaths through December 31, 2021 (NDI follow-up).
  - Hearing impairment was defined as having an average hearing threshold level of ≥ 25 dB HL across 500, 1,000, 2,000, and 4,000 Hz in the better ear.
  - 8,018 (41.4%) percent had speech-frequency hearing loss at cohort entry.
    - 2,228 (15.3%) of those with hearing loss reported using hearing aids.
- Kaplan-Meier survival plots and Cox proportional hazards multivariate regression.
  - Cox models controlled for age, gender, race/ethnicity, smoking, BMI, hypertension, diabetes, cardiovascular disease, heavy alcohol use, dementia, construction-trade work, CXR parenchymal profusion ≥ 1/0, and COPD by spirometry.

Kaplan-Meier All-Cause Mortality Survival Estimates by Severity of Hearing Loss



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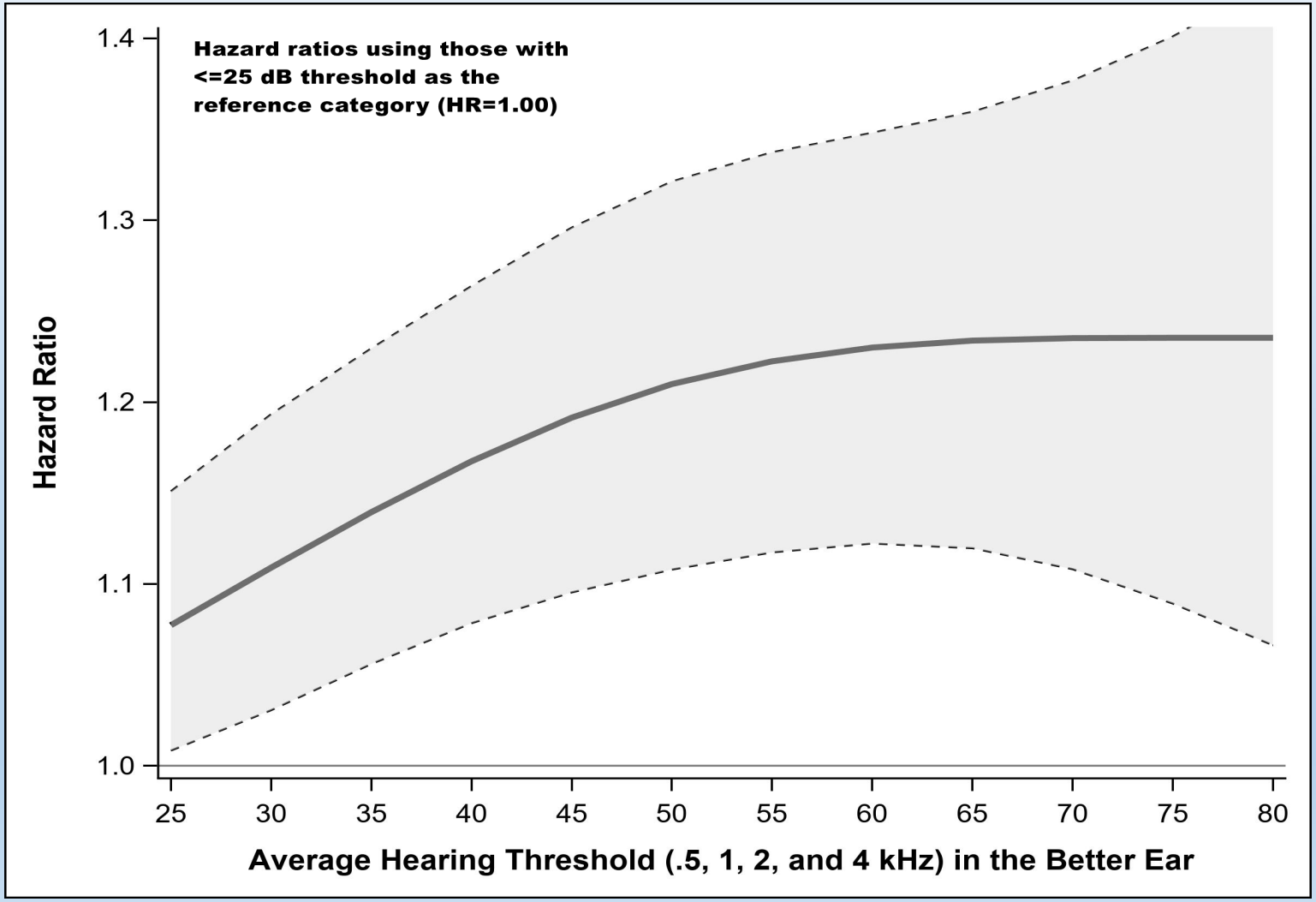
Cox Proportional Hazards Regression Models for All-Cause Mortality and Hearing Loss

	Model 1	Model 2	Model 3
	HR (95% CI)	HR (95% CI)	HR (95% CI)
Hearing Loss Category			
None	1.00 (ref)	1.00 (ref)	1.00 (ref)
Any Hearing Loss (> 25 dB loss)	1.30 (1.22-1.38)	1.13 (1.06-1.20)	1.10 (1.03-1.17)
Mild (25 to <40 dB loss)	1.20 (1.12-1.29)	1.07 (1.00-1.15)	1.05 (0.98-1.12)
Moderate (40 to <60 dB loss)	1.46 (1.35-1.58)	1.23 (1.13-1.33)	1.19 (1.10-1.29)
Severe/Profound (≥60 dB loss)	1.41 (1.25-1.58)	1.21 (1.07-1.36)	1.15 (1.02-1.30)
Factors Adjusted for in Model	Age, decade of birth	All Model 1 plus: gender, race/ethnicity, smoking, BMI, hypertension, diabetes, cardiovascular disease, heavy alcohol use, dementia	All Model 2 plus: construction-trade work, CXR parenchymal profusion ≥ 1/0, and COPD by spirometry

Spline Effect for All-Cause Mortality Hazard Ratio by Average Hearing Threshold



Fully adjusted regression model, Model 3 covariates

Cox Proportional Hazards Regression Models for Effects of Hearing Aid Use on All-Cause Mortality

	Model 1	Model 2	Model 3
	HR (95% CI)	HR (95% CI)	HR (95% CI)
Hearing Aid Use Category			
None	1.00 (ref)	1.00 (ref)	1.00 (ref)
Hearing Aid User	0.73 (0.66-0.81)	0.72 (0.65-0.80)	0.70 (0.63-0.77)
Factors Adjusted for in Model	Age, decade of birth	All Model 1 plus: gender, race/ethnicity, smoking, BMI, hypertension, diabetes, cardiovascular disease, heavy alcohol use, dementia	All Model 2 plus: construction-trade work, CXR parenchymal profusion ≥ 1/0, and COPD by spirometry

Note: Models based on data for 8,018 individuals with hearing loss at cohort entry

Population Attributable Risk (PAR) for Mortality

- The study cohort was at high risk of hearing loss, with 41.4% having hearing loss by the study definition at cohort entry.

- Using the fully adjusted model the estimated PAR for mortality related to hearing loss was:

4.9% (95% CI = 2.3%–11.9%)

Conclusions and Implications

- We observed a 10 -13% increase in mortality risk among workers with hearing loss by audiometry after control for major confounders.
  - Effects were non-linear with a plateau at about a 60 dB hearing loss with a hazard-ratio of about 1.2.
- We observed a significant reduction in mortality risk of about 30% among those with hearing loss but using hearing aids.
- Policy Implications:
  - A need to recognize that occupational noise exposures have more severe outcomes than previously thought, and that efforts to prevent such exposures should be given greater priority.
  - Workers' compensation should recognize the heath impacts of hearing loss and allow compensation for prescription hearing aids.
- Audiometry is important for older workers with appropriate education on the importance of hearing aids where significant hearing loss is detected.

Work-Related Hearing Loss and Dementia

Results from the Building Trades National Medical Screening Program

Marianne Cloeren, MD, MPH

Associate Professor, University of Maryland School of Medicine

& Medical Director, BTMed

Building Trades National Medical Screening Program

Presentation Objectives

- Briefly review the current research on dementia in relation to hearing loss
- Describe the association between prevalence and incidence of dementia and hearing loss in BTMed participants
- Consider the preventive implications

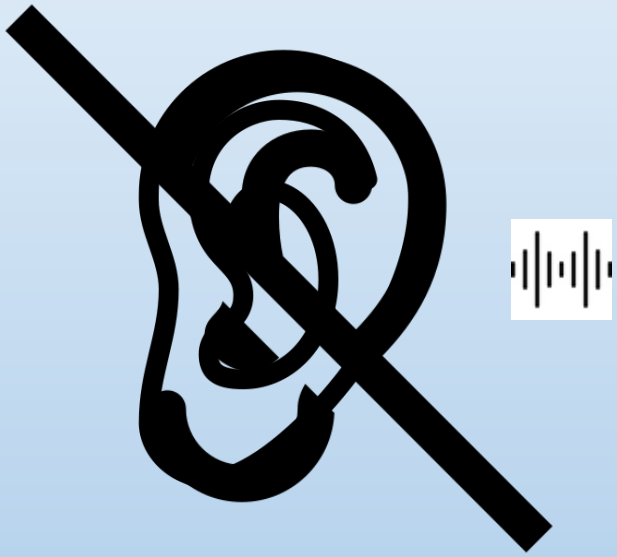
Source: Cloeren M, Dement J, Quackenbush J, Quinn P, Ringen K. Is Work-Related Hearing Loss Associated With Dementia? Evidence From a High-Risk Population. Am J Ind Med. 2025 Nov;68(11):1013-1027. doi: 10.1002/ajim.70026. Epub 2025 Oct 3. PMID: 41039914; PMCID: PMC12512089.

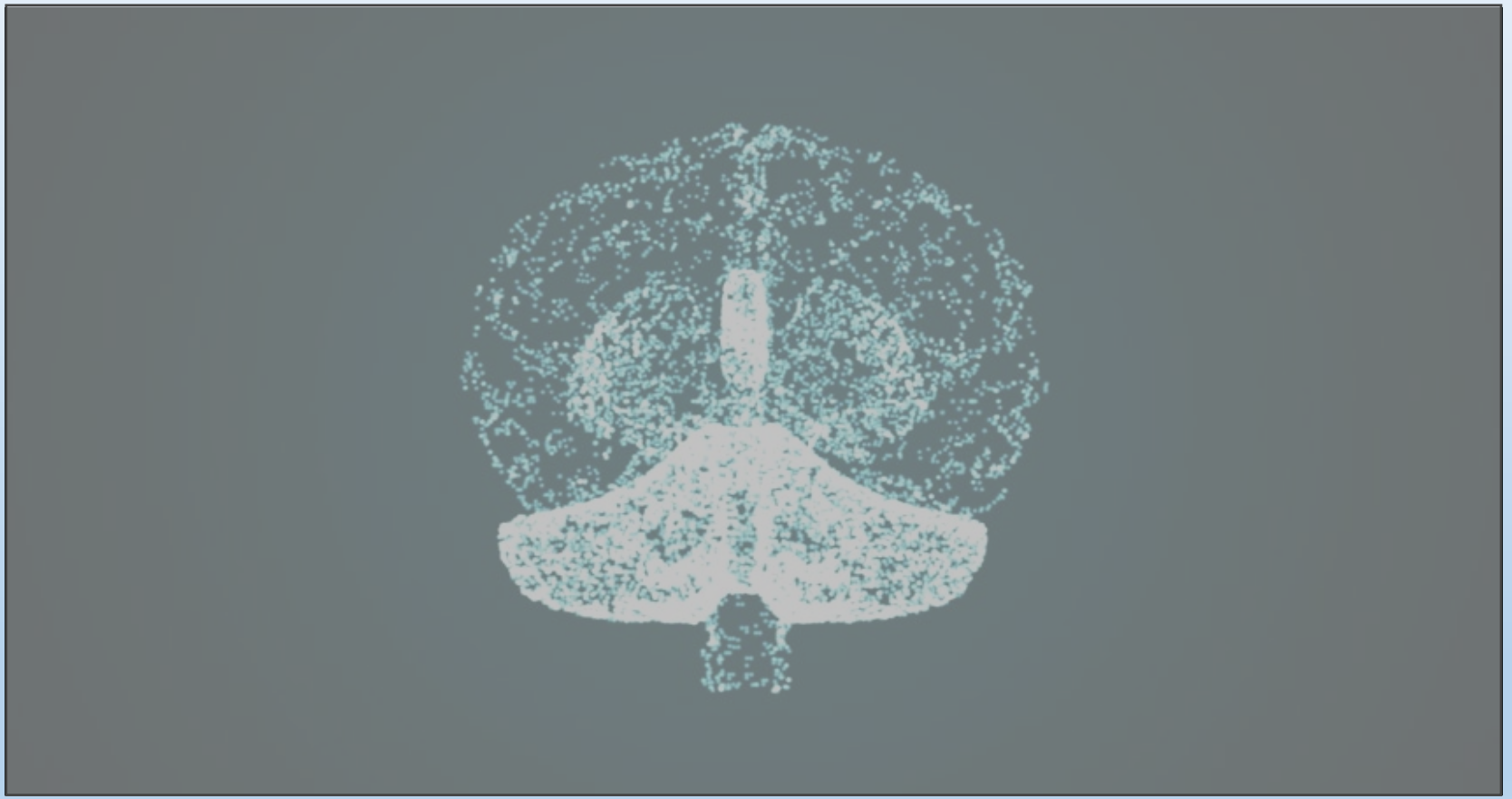
Research Evidence for Connection

- Hearing loss affects 22.2% of the US population[1]
- Link between age-related hearing loss and dementia[2]
- Estimated 24% of hearing loss is attributable to occupational noise[1,3]
- Most research on dementia has involved age-related hearing loss

1. Haile LM et al. (2024). Hearing Loss Prevalence, Years Lived With Disability, and Hearing Aid Use in the United States From 1990 to 2019: Findings from the Global Burden of Disease Study. *Ear and hearing*, *45*(1), 257–267. https://doi.org/10.1097/AUD.0000000000001420
2. Lee M et al. (2022). Variation in Population Attributable Fraction of Dementia Associated With Potentially Modifiable Risk Factors by Race and Ethnicity in the US. *JAMA network open*, *5*(7), e2219672. https://doi.org/10.1001/jamanetworkopen.2022.19672
3. Tak, S., & Calvert, G. M. (2008). Hearing difficulty attributable to employment by industry and occupation: an analysis of the National Health Interview Survey--United States, 1997 to 2003. *Journal of occupational and environmental medicine*, *50*(1), 46–56. https://doi.org/10.1097/JOM.0b013e3181579316

Brain Health Depends on Neural Inputs





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Methods

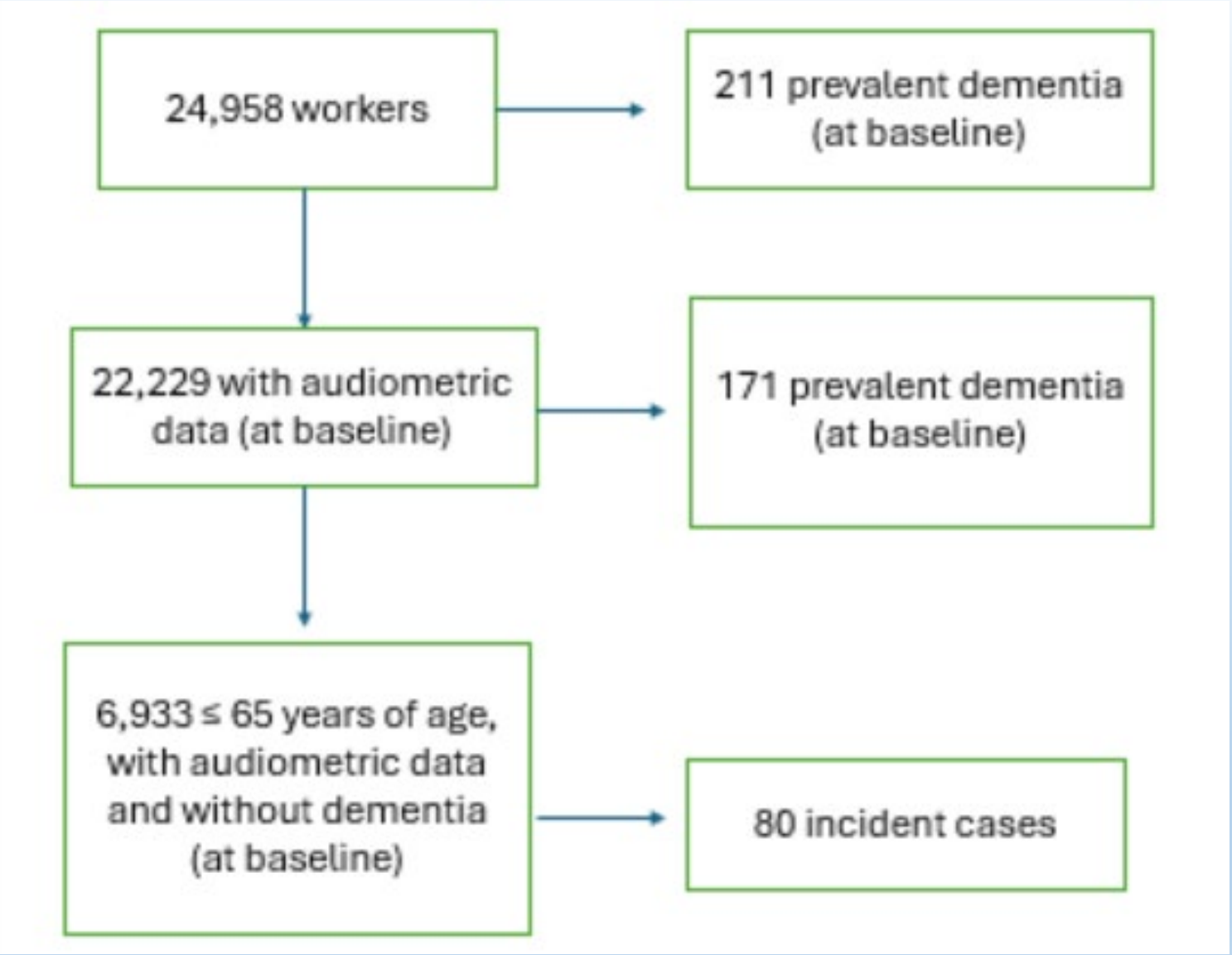
- Data from all BTMed participants 1996 to 2024 with baseline audiometry
- Hearing loss was defined as a speech-frequency pure-tone average ≥20 decibels (dB) in the better ear and categorized as
  - Mild (20–34 dB)
  - Moderate (35–49 dB)
  - Moderately severe (50–64 dB)
  - Severe to complete (≥65 dB).
- Dementia was defined with criteria based on medical history, physical exam and medications.

Statistical Methods

- Cross-sectional and longitudinal analyses of the association of dementia with hearing loss using logistic regression and interval-censored Cox models.
- Kaplan-Meier functions to measure dementia-free survival in those with and without hearing loss on baseline audiometry.

Dementia in Participants Included in Analysis

Most participants identified as male (92.5%) and white (82.4%). Hearing loss was present in 54.6% of the cohort.



Cloeren M, Dement J, Quackenbush J, Quinn P, Ringen K. Is Work-Related Hearing Loss Associated With Dementia? Evidence From a High-Risk Population. Am J Ind Med. 2025 Nov;68(11):1013-1027. doi: 10.1002/ajim.70026. Epub 2025 Oct 3. PMID: 41039914; PMCID: PMC12512089.

Results

Cross-sectional analysis

- Logistic regression analysis found a significant association between audiometric hearing loss and prevalent dementia (OR=1.88, CI=1.15-3.07).
- Risk of dementia increased by 11% for each 10 db of hearing loss (OR=1.11, 95% CI=1.01-1.22).
- Survival function analysis showed a significantly poorer dementia-free survival in those with hearing loss ($p<0.0001$).

Results: Dementia Prevalence

Variable and Strata	Dementia Cases	Adjusted Odds Ratio[1] (95% CI)
Hearing Loss Severity Category		
None (<20 dB)	23	1.00 (Ref)
Mild (20-34 dB)	57	1.78 (1.06-2.97)
Moderate (35-49 dB)	57	2.13 (1.23-3.69)
Moderately Severe (50-64 dB)	22	1.63 (0.84-3.17)
Severe to Complete (≥65 dB)	12	2.18 (1.00-4.74)
Any Hearing Loss (threshold ≥20 dB)		
No	23	**1.00 (Ref)**
Yes	148	**1.88 (1.15-3.07)**
Dementia Increased Risk Per 10 dB Increase in Hearing Level	148	**1.11 (1.01-1.22)**

Table 1. Logistic Regression Results for Dementia Prevalence and Hearing Loss Determined by Audiometry at Initial Examination

Results: Dementia-Free Survival

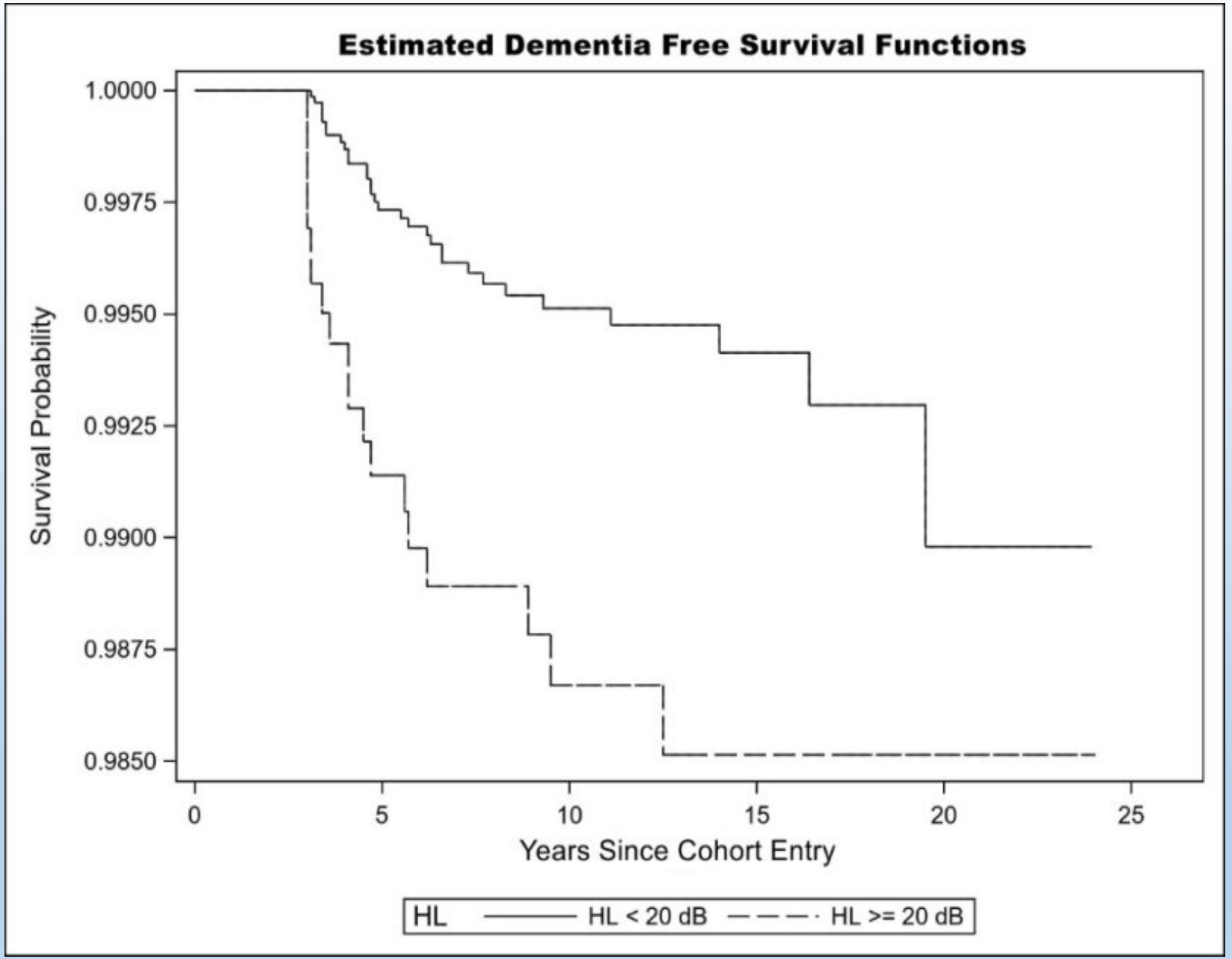


Figure 1. Estimated Survival Functions for Incident Dementia by Hearing Level (HL)

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Results

Longitudinal analysis

- Hazard ratio results were not significant but found a hazard ratio of 1.60 (CI=0.99-2.59) and increasing risk of incident dementia with greater hearing loss severity (p-trend= 0.0928).

Conclusions

- Occupational hearing loss was associated with higher prevalence of dementia and shorter dementia-free survival.
- The pattern across analyses suggests that hearing loss may contribute to cognitive decline among noise-exposed workers.

Implications

We do – it’s called hearing conservation

Levels of Prevention

Primary — Prevent hearing loss

- Reduce noise
- Use effective hearing protection

Reductions of 20-30%

Secondary — Identify early hearing loss before symptoms

- Hearing tests to find temporary threshold shifts
- Correct the conditions causing the NIHL

Reductions of 15-30%

Tertiary — Treat the hearing loss to prevent dementia

- Testing to diagnose hearing loss
- Access to effective, affordable hearing aids

Reductions of ~20%

CPWR THE CENTER FOR CONSTRUCTION RESEARCH AND TRAINING

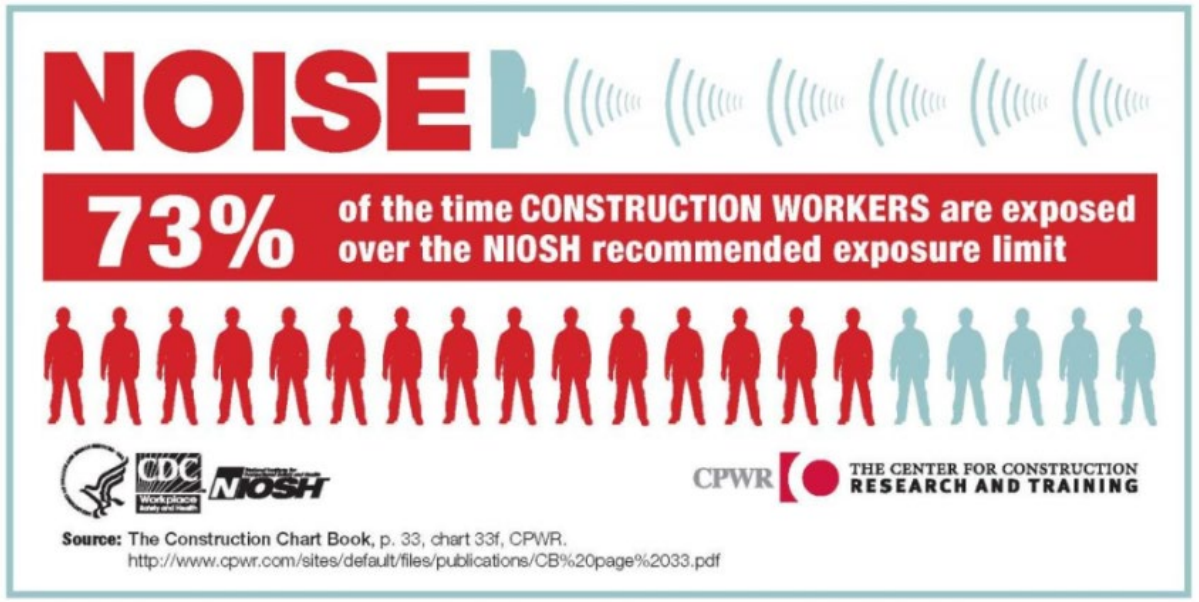
An Evaluation of CPWR's Noise & Hearing Loss Prevention Training Program

Jessica Bunting, MPH
Director, Research to Practice (r2p)
jbunting@cpwr.com

What is the Construction Noise & Hearing Loss Prevention Training Program?

Developed in 2018 based on surveys with thousands of union trainers and workers to determine gaps in training and resources needed, which found that:

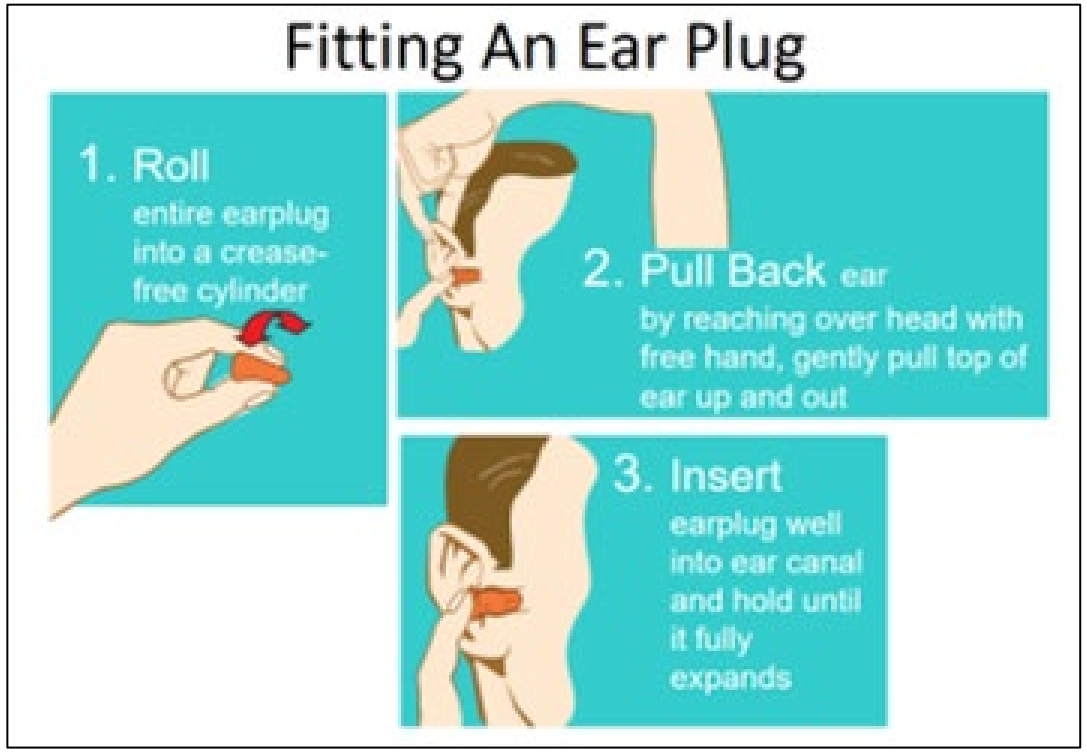
- Workers benefit from noise training
- Workers are not always retaining what they learn
- Workers need ongoing & repetitive training and hearing loss
- Trainers need more noise training resources



https://www.cpwr.com/research/research-to-practice-r2p/r2p-library/other-resources-for-stakeholders/preventing-hearing-loss/

Resulting 3-Part Program

- **1 Hour Module**
  Provides instructors with materials to fulfill 1 hour of the 2 hours training requirement for Health Hazards in the OSHA 30. See additional training resources available on RF Radiation and Silica exposure to help fulfill the remaining hour.
  - Instructor Manual
  - Presentation
- **30 Minute Module**
  Designed to fulfill the OSHA 10-hour training program requirement for a ½ hour training module on a health hazard. Alternatively, it can be used for a portion of the OSHA 30-hour health hazard training requirement.
  - Instructor Manual
  - Presentation



Resulting 3-Part Program

- **In-Class & Hands-On Refresher Exercises**
  A series of short (5-10 minutes) exercises designed to reinforce and apply lessons learned about noise hazards and hearing loss prevention.
  - Instructor Manual
  - Presentations for Noise Training Exercises for use in OSHA 10- & 30-Hour Modules
    - Exercise A-1: The Impact of Hearing Loss
    - Exercise A-2: Are you talking to me?
    - Exercise A-3: What does hearing loss sound like?
    - Exercise A-4: How to Properly Use Ear Plugs
    - Exercise A-5: How loud is too loud?
    - Exercise A-6: Self-assessment of Hearing
  - Presentations for Noise Training Exercises for use in In-class for Skills Training Programs
    - Exercise B-1 – Cumulative Presentation: Noise and Hearing Loss – The risk and prevention
    - Exercise B-2 (A) – Stand Alone Slide: Noise – What are the risks?
    - Exercise B-2 (B) – Stand Alone Slide: The Cost of Hearing Loss
    - Exercise B-2 (C) – Stand Alone Slide: Noise – How Loud is Too Loud?
    - Exercise B-2 (D) – Stand Alone Slide: Preventing Hearing Loss?
  - Noise Training Exercises For Use In The Hands-On Portion Of Skills Training Programs
    - Exercise C-1: Identifying Noise Levels of Equipment (Group Activity)
    - Exercise C-2: Measuring Noise Levels Throughout the Day (Individual Activity)
    - Exercise C-3: Choosing the Right Hearing Protection

After completing the 1-hour module training, trainees will be able to:

Explain why noise and hearing loss is an important issue for construction workers

Recognize the signs and effects of hearing loss and tinnitus

Identify hazardous noise, types of noise, and common noise sources

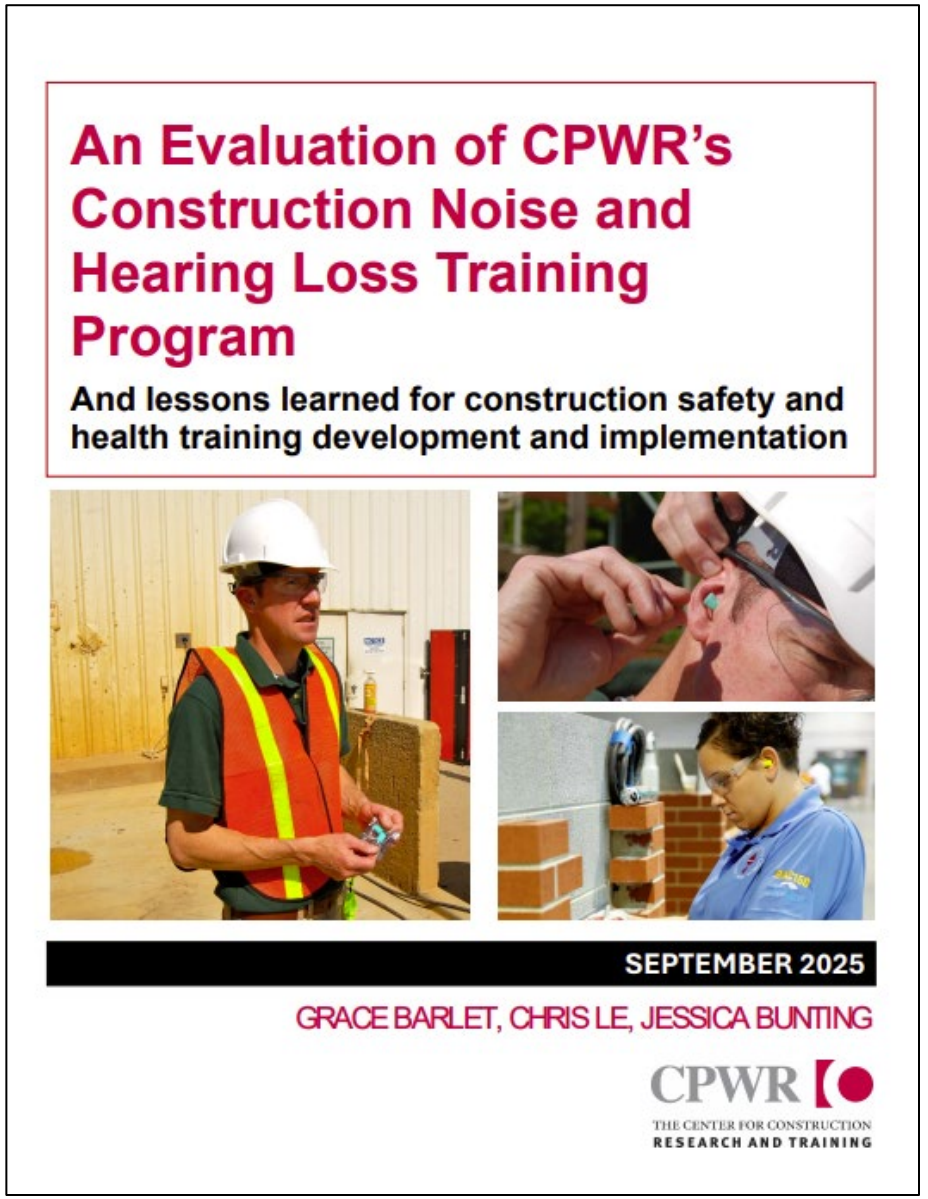
Know how to measure noise using common indicators and free mobile apps

Describe several ways to control noise exposure

Understand the different types of hearing protection devices used in construction and how to use them correctly

Evaluating the Program

- Assessed the program's usability and effectiveness
- Recruited union trainers and workers through "TRU-Net" (CPWR's network of researchers and trainers)
- Trainer evaluation = one survey with 23 multiple-choice and open-ended questions
- Trainee evaluation = in-class implementation of program with 3 surveys (following the Kirkpatrick model)

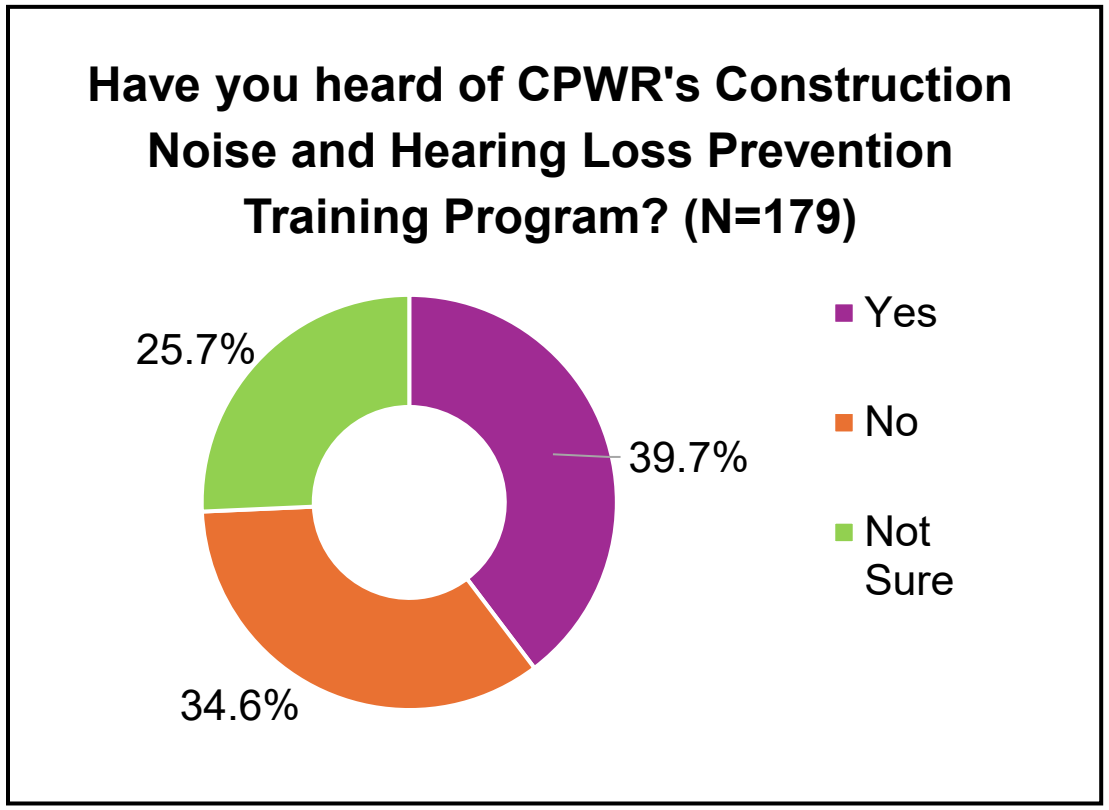


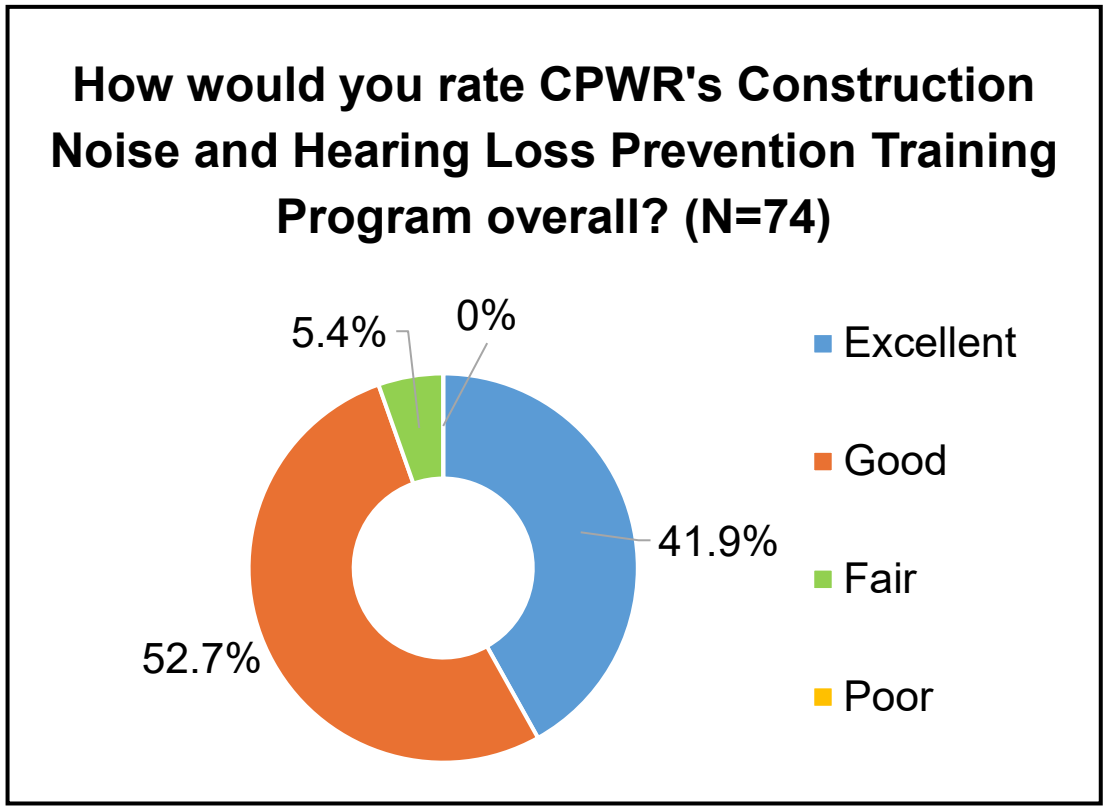
https://www.cpwr.com/wp-content/uploads/RR-CPWR_Noise_Training_Program_Evaluation.pdf

Trainer Assessment

- Asked trainers about their **experiences with and thoughts on how to improve** CPWR's Noise Training
- A total of **183 trainers** completed the survey, representing:
  - the International Association of Sheet Metal, Air, Rail and Transportation Workers,
  - the International Union of Bricklayers and Allied Craftworkers,
  - the United Union of Roofers, Waterproofers and Allied Workers,
  - the International Association of Heat and Frost Insulators and Allied Workers,
  - and the International Union of Painters and Allied Trades

Trainer Assessment





Of the seventy-four trainers who gave CPWR's Noise Training program an overall rating, **94.6% rated it good or excellent**.

Trainer Assessment

- The ***30 Minute Elective Module* was the most widely used** (30.1%) by trainers, followed by the *1 Hour Elective Module* (28.9%), and the *In-Class and/or Hands-On Refresher Exercises* (25.3%).
- Trainers relied most often on **OSHA** (93.3%), **CPWR** (83.9%), and **their union's training curriculum** (83.9%) for information and materials to support training sessions.
- **Many trainers already used other training programs or materials**. Over half the trainers (51.4%) said they used a combination of materials from CPWR's Noise Training and other sources, while 40.8% relied solely on materials from other sources.

Trainer Assessment

- When asked for recommendations to improve the program, **several trainers stated no changes were needed**.
- Others suggested the program should be more widely promoted to increase awareness.
- Additional feedback included addressing broken links in program materials and emphasizing the importance of hearing loss prevention to younger generations.

Trainee Assessment

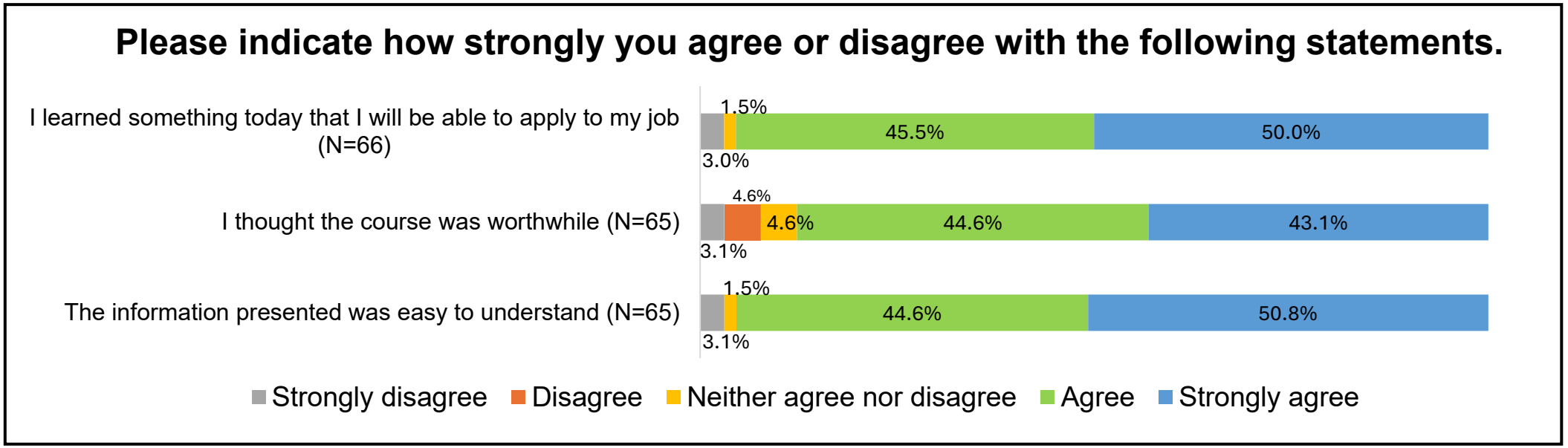
- All trainers used the 1-hour module for the assessment.
- Trainees were asked the same 22 questions over three surveys to assess their understanding of noise and hearing loss:
  - Before receiving the Noise Training
  - Immediately after the training, and
  - A few weeks post-training
- Each trainee received a **score based on the number of questions they answered correctly**, and an overall average was calculated for each survey.
- 71 trainees completed the baseline survey
- 67 trainees completed the immediate follow-up survey
- 47 trainees completed the later survey

Trainee Assessment

- Nearly all of the 67 trainees (98.5%) who completed the first follow-up survey **said the training program content was good or excellent**.
- For the baseline survey, the average score was **59.6%**.
- For the second survey, the average score was **75.5%**, a 26.7% increase.
- For the third survey, the average score was **66.6%**.
  Although the average score declined with time following the second survey, it remained 12.2% higher than baseline, indicating trainees retained knowledge from the program.

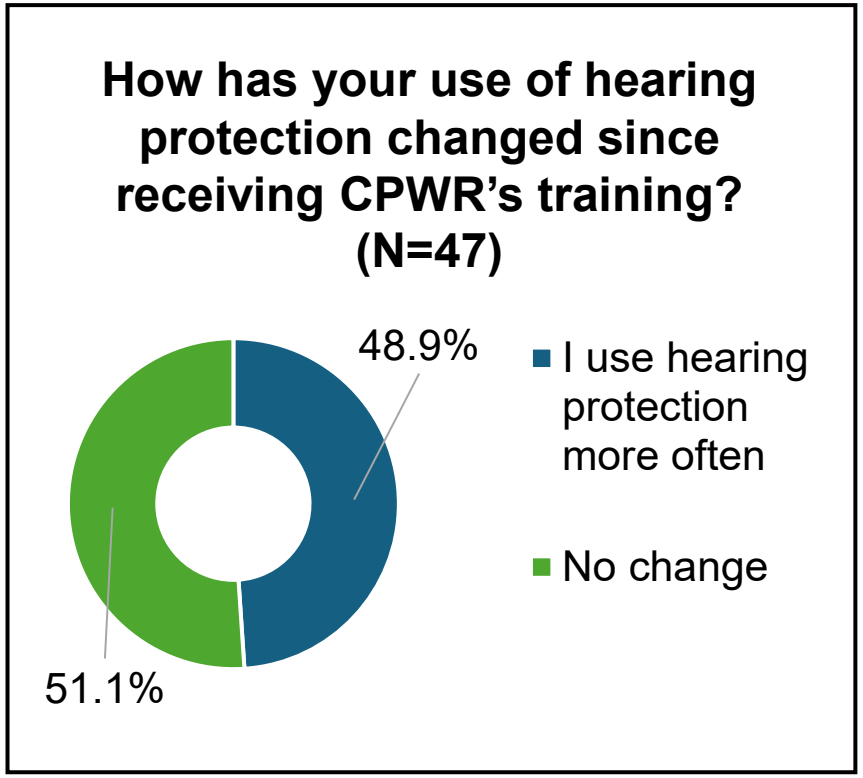
Trainee Assessment

Almost all (95.5%) trainees agreed or strongly agreed they had learned something from CPWR's Noise Training they could apply to their job. When trainees were asked to list what they learned that they could apply to their job, almost three-fourths (74.2%) said it taught them how to properly use earplugs and other personal protective equipment.



Trainee Assessment

- **Nearly half of trainees (48.9%) said they used hearing protection more often** after receiving CPWR's Noise Training.
- A majority of trainees (81.8%) found the **videos to be the most helpful** part of the training, followed by the lectures/presentations (69.7%), demonstrations (60.6%), hands-on activities (59.1%), handouts (45.5%), and group discussions (43.9%).



Trainee Assessment

- In the third survey, 43 apprentices responded to a question about what topics they needed more information about.
- Over a third said they needed more information about the **signs and effects of hearing loss and tinnitus** (37.2%), **how to select and use hearing protection** (37.2%), and **what their employer is required to do to protect employees from hazardous noise** (34.9%).
- They also wanted more information on **how to determine if a noise level is hazardous** (32.6%) and **why noise and hearing loss is an important issue for construction workers** (27.9%).

Next Steps

- Review the program for broken links & other immediate fixes needed
- Evaluate whether additional improvements are needed
- Continue promoting the program to help prevent hearing loss in construction!
- Use findings to support future development of short but comprehensive safety and health training programs

CPWR THE CENTER FOR CONSTRUCTION RESEARCH AND TRAINING

Thank You!

Questions?