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INAD Brazil 2024:



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International Noise Awareness Day — INAD Brazil 2024

In 2024, workers and prevention are the campaign's focus

Abstract: This paper presents Brazil's 2024 INAD campaign, whose slogan is "Noise at work? Prevention is the solution!". After contextualizing the International Noise Awareness Day and its development in Brazil, the text discusses the focus on occupational health and the campaign's main awareness goals. It examines the national regulatory framework, the direct and indirect effects of noise exposure, additional accident risks, and the synergistic impact of ototoxic agents. The paper outlines preventive guidelines grounded in engineering controls, exposure management, and safety culture, and highlights the role of educational materials and outreach activities. Emphasis is placed on the articulation between acoustic engineering, occupational health, and education as the basis for consolidating a culture of prevention and reducing the impact of noise in workplaces across different productive sectors. The article also points to opportunities for technical and social engagement of the acoustics community.

Dia Internacional da Conscientização sobre o Ruído — INAD Brasil 2024

Resumo: Este artigo apresenta a campanha brasileira do INAD 2024, cujo lema é "Ruído no trabalho? Prevenção é a solução!". Após contextualizar o Dia Internacional da Conscientização sobre o Ruído e sua trajetória no Brasil, discute-se o foco em saúde ocupacional e os principais objetivos de sensibilização. São abordados o enquadramento normativo, os efeitos diretos e indiretos da exposição ao ruído, os riscos adicionais de acidentes e a sinergia com agentes ototóxicos. Descrevem-se diretrizes preventivas baseadas em medidas de engenharia, gestão da exposição e fortalecimento da cultura de segurança sonora, bem como o papel de materiais didáticos e ações continuadas ao longo do ano. O texto enfatiza a articulação entre engenharia acústica, saúde do trabalhador e educação para consolidar uma cultura de prevenção e reduzir o impacto do ruído no ambiente de trabalho em diferentes setores produtivos.

1. Introduction

Each year, the International Noise Awareness Day campaign in Brazil (INAD Brazil) proposes a theme and a slogan designed to highlight how noise shapes our daily lives, bringing into view both its harms and the preventive measures associated with a specific aspect of exposure. See the national campaign logo in Figure 1.

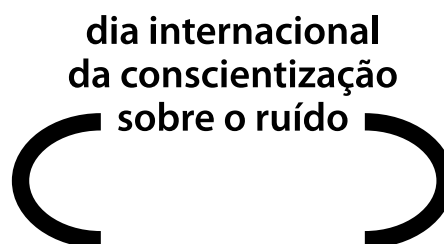


Figure 1: INAD Brazil logo (<http://www.inadbrasil.com>).

In 2024, the International Noise Awareness Day (INAD) turns its focus to *noise at work and its effects on health*, adopting the central slogan

“Noise at work? Prevention is the solution!”.

More than a catchphrase, this message distills the need to safeguard workers’ hearing health while also underscoring the strategic role of acoustical engineering, occupational health, and sound-environment management in reducing noise exposure in workplace settings.

2. Focus and objectives of INAD Brazil 2024

The Brazilian campaign seeks to go beyond the simple dissemination of exposure limits, advancing instead a cultural shift in the way occupational noise is understood and addressed. In this spirit, INAD Brazil 2024 aims to:

- contribute to raising awareness of the health effects of noise on those who work, both in auditory terms and across systemic dimensions;
- underscore the relevance of preventing sound exposure as a means of ensuring well-being, productivity, and safety at work;
- explain how the physical and organizational characteristics of the work environment influence noise propagation, level, and spatial distribution; and
- present sound-environment management guidelines that support technical, regulatory, and managerial decisions oriented toward risk mitigation.

By bringing together professionals from engineering, health, and safety, INAD Brazil promotes an integrated approach, in which measurement, analysis, design, and education move in concert toward healthier workplaces.

3. International and national context

For decades, noise has been recognized as a relevant risk factor for occupational health. Internationally, agencies such as the Environmental Protection Agency (EPA) [1], the French National Research and Safety Institute (INRS) [2], the Occupational Safety and Health Administration (OSHA, USA) [3], and the European Agency for Safety and Health at Work (EU-OSHA) [4] have developed recommendations, campaigns, and action plans aimed at reducing occupational noise exposure and promoting safer sound environments.

In Brazil, noise management encompasses both the workplace and the surrounding urban and environmental context, supported by specific legislation and standards. In the occupational domain, two references stand out: **NR 15** [5], which addresses the characterization of unhealthy conditions and establishes tolerance criteria for exposure, and **NHO 01 (Fundacentro)** [6], which systematizes the technical procedure for the *assessment of occupational exposure to noise*, guiding the execution of measurements and the preparation of reports. In parallel, technical standards such as **ABNT NBR 10152** [7] establish measurement procedures and reference values for noise levels in indoor building environments, including workstations. By aligning INAD with this normative framework, the campaign reinforces that legal compliance is a starting point, but it does not exhaust the discussion of acoustic comfort, health, and evidence-based preventive practices.

4. Direct and indirect effects of occupational noise

Continuous or intermittent exposure to elevated sound pressure levels can trigger a wide range of effects. Traditionally, attention has centered on **direct auditory effects**, especially noise-induced hearing loss, whether temporary or permanent, which may evolve from a transient threshold shift to irreversible impairment. However, the **indirect effects** of noise, often underestimated, also play a central role in illness and in work performance.

Among the indirect effects frequently associated with occupational noise exposure are headaches, dizziness, fatigue, tinnitus, difficulty concentrating, muscular tension, irritability, increased blood pressure, accelerated heart rate, sleep disturbances, chronic stress and, in some cases, impacts on sexual and emotional well-being. These effects are generally gradual and may influence productivity, quality of life, and worker safety, even when no clinically established hearing loss is present.

5. Additional risks and workplace accidents

Noisy environments are also associated with a greater **risk of accidents**. Excessive noise can mask warning signals, hinder verbal communication, demand greater cognitive effort for speech comprehension, and reduce the ability to maintain focus and attention during critical tasks. In addition, the combination of poor sleep, stress, and fatigue linked to noise tends to compromise reaction time and decision-making under risk. The result is an environment in which potential threats go unnoticed more often, increasing the likelihood of incidents and workplace accidents.

6. Combined effects: noise and ototoxic substances

INAD Brazil 2024 further emphasizes the **synergistic** impact between noise and certain **ototoxic substances** in occupational environments. Specific chemical agents, such as some heavy metals, organic solvents, asphyxiants, and certain pharmaceuticals, may intensify auditory damage when combined with noise exposure. In such scenarios, an analysis based exclusively on sound level tends to underestimate the true risk. From the standpoint of occupational hygiene, it becomes essential to adopt a multidimensional view, in which acoustic monitoring, chemical-exposure assessment, and clinical follow-up speak to one another, guiding more comprehensive preventive strategies.

7. Prevention as the solution: from the source to a culture of safety

The slogan “*Noise at work? Prevention is the solution!*” points to the **principle of prevention** as the organizing axis of control actions. In keeping with the classical hierarchy of measures in occupational safety and health, interventions at the source and along the transmission path are prioritized before exclusive reliance on personal protective equipment. Several technical guidelines merit emphasis:

- **Engineering measures:** implementation of acoustic barriers, enclosure of noisy machines, adoption of absorbing materials and acoustic-conditioning solutions in critical areas, as well as layout designs that distance sensitive workstations from the main noise sources;
- **Lower-emission equipment:** inclusion of noise-emission requirements in the specification and procurement of machines and tools, favoring quieter technologies;
- **Preventive maintenance:** inspection and maintenance routines that avoid mechanical wear, misalignments, and other failures capable of significantly increasing noise emission;
- **Training and awareness:** capacity-building on risks associated with noise, proper use of hearing protectors, and encouragement to report situations of excessive exposure, integrating the topic into the activities of the Internal Commission for Accident Prevention (CIPA), the Internal Week for Accident Prevention at Work (SIPAT), and internal programs; and

- **Continuous monitoring:** campaigns to measure noise levels, personal dosimetry, critical analysis of results in light of NR 15 and the comfort parameters of ABNT NBR 10152, in addition to hearing conservation programs with periodic follow-up.

By bringing these pillars together, prevention ceases to be merely a set of procedures and becomes part of a **culture of sound safety**, in which technical decisions, investment in technology, and organizational behavior converge to protect health.

8. Noise levels, annoyance, and acoustic comfort

Even levels classified as “moderate” may produce annoyance, irritability, and possible cardiovascular repercussions over time. Thus, although NR 15 is centered on tolerance limits aimed primarily at preventing hearing loss, it is equally crucial to consider **annoyance levels** appropriate to each type of activity, as indicated by the ranges recommended in NBR 10152. For the technical community working in acoustics and vibrations, this means integrating, within a single project, occupational safety criteria and acoustic comfort criteria, avoiding the false dichotomy between “meeting the standard” and “providing well-being.”

9. INAD 2024: one minute of silence, a year of action

In 2024, INAD is observed on **April 24**. Between **14h15 and 14h16**, a **minute of silence** is traditionally proposed as a symbolic gesture to reveal how present noise is in our everyday lives and how its momentary absence can be illuminating. Although the campaign has a reference day, INAD Brazil encourages **actions to extend throughout the entire year**, with activities in schools, universities, companies, health services, and public spaces. For researchers, faculty, students, designers, and safety technicians, it is an opportunity to transform technical knowledge into concrete actions through monitoring projects, outreach events, the production of didactic materials, and case studies in real workplace environments.

10. Materials released in 2024

The official graphic and audio materials of the INAD Brazil 2024 campaign were organized on the [INAD 2024 Materials](#) page of the campaign’s official website [8]. On that page, all visual and audio artifacts supporting the dissemination of the slogan “*Noise at work? Prevention is the solution!*” are gathered for use across different institutional contexts and communication platforms.

The set of graphic materials made available in 2024 includes (see examples in Figure 2 or at the end of this insert):

- the main INAD 2024 poster in A3 format;
- a banner in A0 format;
- a levels poster (A3), emphasizing noise levels;
- a poster from the *Keep Calm* series;
- a postcard in the 10 cm × 15 cm format;
- an Instagram artwork package, intended for feed posts and *stories*;
- a set of graphic elements (icons, illustrations, logos, and modular components); and
- a presentation template in PPTX format.

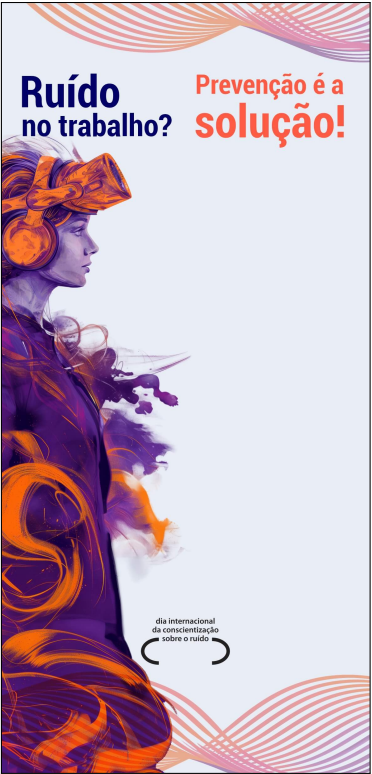
Complementing the visual materials, the page also provides the [INAD 2024 Spot](#), produced in six tracks: three narrated versions and three corresponding instrumental tracks, conceived for use on



(a) Main poster.



(b) Poster with sound levels.



(c) Instagram story artwork



(d) Keep Calm poster.

Figure 2: Materials from the INAD Brazil 2024 campaign.

radio, institutional media, and social networks, with normalized *loudness* levels aimed at message intelligibility and consistent playback [8].

From the standpoint of open access and reproducibility, all these files are also maintained in the public repository [inad2024](#) on GitHub [9]. That repository contains editable versions of the materials organized into thematic folders to facilitate reuse and local adaptation.

In the online environment, the official [@inad.brasil](#) Instagram profile [10] serves as one of the campaign's primary vectors of dissemination, concentrating *cards*, carousels, short videos, calls for the minute of silence, and direct *links* to the website and the GitHub repository. The interplay between the materials page, the open repository, and Instagram thus forms an integrated communication strategy that broadens reach and facilitates adoption by universities, schools, health services, companies, and other INAD Brazil partners.

11. An invitation to the acoustics and vibrations community

This insert in the journal *Acústica e Vibrações* is an invitation for the technical and scientific community in the field to assume an even greater leading role in the occupational-noise agenda. To amplify the slogan “**Noise at work? Prevention is the solution!**” is to foster dialogue in public and private institutions, disseminate qualified information on risks and control strategies, support local and regional INAD initiatives, and incorporate the theme into teaching, research, and outreach practices. We therefore close with the following message:

... may this be not only a moment of reflection, but a consistent step toward a culture of prevention that values silence when necessary, protects hearing, and promotes quality of life at work and beyond.

12. Acknowledgments

We thank all individuals, collectives, and organizations who, throughout 2024, acted as vectors of the INAD Brazil campaign, transforming technical knowledge into concrete awareness-building actions. Every share, class, lecture, published material, measurement performed, and conversation sparked in schools, universities, companies, and health services helped expand the campaign's reach and reinforced the construction of a culture of prevention.

In particular, we record our gratitude to the sponsors who made possible and strengthened the production, organization, and dissemination of the campaign materials, with a special, by-name acknowledgment to each partner:

- **LAEPI**: for its institutional partnership and confidence in the purpose of INAD Brazil, supporting the mobilization of the technical community and the dissemination of preventive content.
- **HBK (Hottinger Brüel & Kjær)**: for its support of initiatives that value acoustic metrology and sound-environment management as central instruments of occupational health.
- **Acoem**: for encouraging the integration of engineering, health, and environmental noise management, promoting an applied, interdisciplinary, and results-oriented perspective.
- **DEWESoft**: for its support and proximity to the acoustics and vibrations community, reinforcing good practices in acquisition, analysis, and monitoring as the basis for preventive decisions.

In addition, we thank the **national supporters**, whose work broadened the campaign's reach across the country and strengthened ties with key professionals and institutions. We gratefully acknowledge the support of the **Brazilian Academy of Audiology (ABA)**, the **Federal Council of Speech-Language Pathology and Audiology (CFFa)**, the **Brazilian Society of Speech-Language Pathology and Audiology (SBFa)**, **Dangerous Decibels Brazil**, the **Ministry of Health** and **Oswaldo Cruz Foundation (Fiocruz)**, the **Research Group in Acoustics and Vibrations (GPAV)**, **Federal University of Santa Maria (UFSM)**, and, in a special way, the **Brazilian Acoustical Society (Sobrac)**.

Finally, we extend this acknowledgment to the technical and scientific community in acoustics, vibrations, speech-language pathology and audiology, safety engineering, and occupational health, as well as to the students and professionals who embraced the campaign in their routines and institutions. May the efforts brought together in 2024 become continuity: a year of action, education, and prevention, sustained by evidence, good practices, and collective responsibility.

References

1. United States Environmental Protection Agency. *U.S. EPA — United States Environmental Protection Agency*. 2024. Accessed: 28 Nov. 2024. URL: <https://www.epa.gov>.
2. Institut national de recherche et de sécurité (INRS). *INRS — Occupational health and safety (Santé et sécurité au travail)*. 2024. Accessed: 28 Nov. 2024. URL: <https://www.inrs.fr>.
3. Occupational Safety and Health Administration. *OSHA — Occupational Safety and Health Administration*. 2024. Accessed: 28 Nov. 2024. URL: <https://www.osha.gov>.
4. European Agency for Safety and Health at Work (EU-OSHA). *EU-OSHA — European Agency for Safety and Health at Work*. 2024. Accessed: 28 Nov. 2024. URL: <https://osha.europa.eu/en>.
5. Brazil. Ministry of Labour. *Regulatory Standard NR 15 — Unhealthy activities and operations (original: Atividades e operações insalubres)*. 1978. Ordinance (Portaria) MTb No. 3.214, of 08 June 1978. Consolidated text. Accessed: 28 Nov. 2024. URL: <https://www.gov.br/trabalho-e-emprego/pt-br/acao-a-informacao/participacao-social/conselhos-e-orgaos-colegiados/comissao-tripartite-partitaria-permanente/arquivos/normas-regulamentadoras/nr-15.pdf>.
6. FUNDACENTRO – Fundação Jorge Duprat Figueiredo de Segurança e Medicina do Trabalho. *NHO 01 — Occupational Hygiene Standard: Technical Procedure: Assessment of Occupational Noise Exposure (original: Avaliação da Exposição Ocupacional ao Ruído)*. [S.l.], 2001. Accessed: 28 Nov. 2024. URL: <https://www.gov.br/fundacentro/pt-br/centrais-de-conteudo/biblioteca/nhos>.
7. Brazilian Association of Technical Standards. *ABNT NBR 10152:2017 — Acoustics: sound pressure levels in indoor environments of buildings (corrected version: 2020)*. Rio de Janeiro, RJ, Brazil: [s.n.], 2017. 2nd ed. Accessed: 28 Nov. 2024.
8. INAD Brasil. *INAD 2024 Materials — INAD Brazil: International Noise Awareness Day*. 2024. Accessed: 28 Nov. 2024. URL: <https://www.inadbrasil.com/materiais-inad-2024/>.
9. INAD Brasil. *inad2024: Repository of materials for the INAD Brazil 2024 campaign*. 2024. Public repository on GitHub. Accessed: 28 Nov. 2024. URL: <https://github.com/inadbrasil/inad2024>.
10. INAD Brasil. *INAD Brazil (@inad.brasil) on Instagram*. 2024. Official campaign profile on Instagram. Accessed: 28 Nov. 2024. URL: <https://www.instagram.com/inad.brasil/>.



Ruído no trabalho?

Prevenção é a solução!

International Noise
Awareness Day

 /inad.brasil

www.inadbrasil.com

Realização
dia internacional
da conscientização
sobre o ruído



No dia 24 de abril de 2024 será celebrado o Dia Internacional da Conscientização sobre o Ruído. Serão 60 segundos de silêncio, entre 14h15 e 14h16, para destacar o impacto do ruído excessivo em nossas vidas.

24 de abril de 2024

Patrocínio e Apoio



Apoio Nacional



Colaboradores Nacionais



Apoio e Organização Regional

24 de abril de 2024

dia internacional da conscientização sobre o ruído

Níveis de pressão sonora a 1 m de distância



Decolagem
de avião
140 dB_A

Limiar da dor
130 dB_A

Boates e indústrias
120 dB_A

Buzina de carro
100 dB_A

Trânsito
80 dB_A

Voz humana forte
70 dB_A

Voz humana normal
60 dB_A

Escritório
50 dB_A

Biblioteca silenciosa
40 dB_A

Geladeira moderna
30 dB_A

Brisa floresta
10 dB_A

Limiar da audição
aprox. 0 dB_A



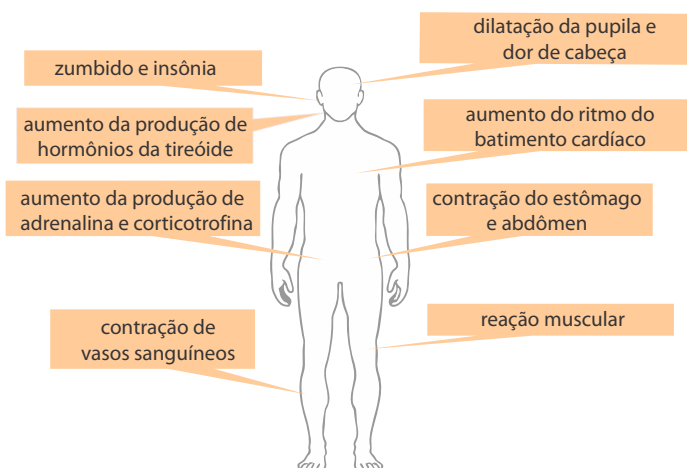
Ruído no trabalho?

Prevenção é a solução!

Se liga!

O som em excesso a que você se expõe não afeta somente sua audição, mas também seu corpo inteiro!

Alguns efeitos do ruído no ser humano:



Os efeitos podem não ser imediatos, mas são cumulativos!

Dependem:

- do nível de pressão sonora,
- do tempo de exposição e
- da predisposição pessoal.

Acompanhe em www.inadbrasil.com e [/inad.brasil](https://www.instagram.com/inad.brasil)

dia internacional
da conscientização
sobre o ruído

Patrocínio e Apoio



Apoio Nacional



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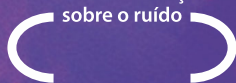
Apoio e Organização Regional





KEEP
CALM
AND
enjoy
life

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