



## The NOISE database and other electronic and web-based tools for researchers and educators

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### ABSTRACT

NAL and the HEARing CRC are increasingly seeking ways i) to translate our hearing loss prevention research findings and ii) promote noise awareness and hearing health via electronic and online methods. The aim is to translate our research work into tools that are broadly accessible to both researchers and the general public regardless of location. This presentation will discuss some recently developed online initiatives with a focus on the NOISE database project. The NOISE database allows researchers to access and contribute to its collection of 895 noise level measurements obtained at a wide range of different leisure activities in Australia and across the globe. Also included will be an introduction to our 'Know Your Noise' website aimed at young adults. The site allows anyone to learn more about the consequence of their noise exposure through the Noise Risk Calculator and other elements of the site.

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### 1. INTRODUCTION

Over the past several years researchers at NAL and The HEARing CRC have been building a body of research into leisure noise exposure, its relative contribution to a person's overall noise exposure and the risks it poses to hearing, either alone, or in conjunction with other noise sources. Using a variety of methods (including personal dosimetry, surveys and questionnaires), we have achieved an understanding of how leisure participation patterns change over a lifetime, methods for calculating risk associated with leisure and noise exposures, and gathered a large set of noise measurements at a wide range of leisure events;.

Although our research has been published in peer-reviewed journals and presented at relevant conferences and meetings, it is not possible to present the full extent of our work through these traditional academic outlets. We also recognize the need for our findings to be more widely disseminated in order to maximize their usefulness. Using alternative outlets for presenting our data means we can reach new audiences, and in doing so, raise awareness of noise effects and the importance of hearing health in the scientific and non-scientific community.

The most ubiquitous method available to us today is the internet, and thus we have developed two research-driven internet-based tools in order to translate our findings to any number of recipients situated anywhere in the world. The first of these is the NOISE (Non-occupational Incidents, Situations and Events) Database, which is aimed mainly at researchers and policy makers. The second offering is 'Know Your Noise' (KYN) an interactive website aimed at young adults seeking information about their noise exposure, and hearing health.

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## 2. THE NOISE DATABASE

Available at: [noisedb.nal.gov.au](http://noisedb.nal.gov.au), the NOISE database brings together almost 900 leisure event measurements, allowing users to search for information about noise exposure across common noisy activities. The measurements have been organized into seven main categories: Attendance at sports venues, Active recreation and sport, Arts and cultural activities, Attendance at entertainment venues, Travel, Domestic activities, and Other. Each category also contains a number of subcategories, making it easier for users to further pinpoint measurements they are interested in. Measurements come from a wide range of venues, including inner-city nightclubs, large concert venues and sporting stadia, international race tracks, the New York subway, and local school discos.

There are two main features of the website (see Figure 1). Firstly, there is a search function in which users can interrogate the database to obtain a subset of noise measurements. The 'simple' search allows any user to access a list of noise measurements within their specified leisure category and subcategory of interest. The average noise level (in  $L_{Aeq}$ ) and exposure (in  $Pa^2h$ ) are calculated and displayed along with a full list of measurements onscreen. Users can also conduct an 'advanced' search, which yields a more detailed output, available in a downloadable spreadsheet. Users can specify the type of data that most interests them, with the flexibility to restrict the output to data collected by NAL- or other organisations, and to receive data only from within Australia or measurements collected internationally. Users can also choose to view measurements based on the type of equipment used to collect the data.

Register | Sign In

HOME SEARCH ABOUT ADD YOUR DATA CONTACT US

**THE NOISE DATABASE**

**Start a search**  
EXPLORE THE NOISE DATABASE

**Make some noise**  
ADD YOUR DATA

### The NOISE database

The NOISE (Non-Occupational Incidents, Situations, and Events) database brings together a wide range of leisure noise measurements for researchers and others to explore.

The database is managed by the National Acoustic Laboratories, a division of Australian Hearing, and it aims to identify which leisure activities pose a risk to hearing health, and help estimate individuals' noise exposures.

Read more on how the measurements are collected and how noise exposure is calculated. If you have similar data of your own, we invite you to add your data to the NOISE database.

To explore the NOISE database:

- Use our Simple Search to explore by noise category, or
- Register for our Advanced Search to help narrow your results.

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**THE NOISE DATABASE**

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THE HEARING CRC

National Acoustic Laboratories  
A Division of Australian Hearing

Figure 1 – Screen shot of the NOISE database home page

The second main feature of the NOISE database is an upload function, in which users can contribute their own data. Contributors are given advice on collecting noise measurements, and invited to format their data using detailed instructions provided online. Once ready, the data can be uploaded to the NOISE database via the website. All data received at NAL then goes through a verification process. If approved, the data is added to the NOISE database and made available as part of the database in all future searches.

Our intention is for the NOISE database to become a primary source of leisure noise measurements that are reliable, up-to-date, and accurate. In particular it aims to provide reliable average measures for a wide range of leisure activities so they can be used to estimate individuals' noise exposures in the absence of actual noise measurements (obtained using dosimeters and sound levels meters). The NOISE database is also intended to support acousticians, researchers, policy makers and hearing health advocates to identify the leisure activities that pose a real risk to hearing health. No matter the user, or the purpose, it is hoped that the database will continue to make a positive contribution in efforts to reduce harmful noise exposure in high-noise leisure environments.

### 3. KNOW YOUR NOISE (KYN)

KYN is a recently launched interactive website at [knowyournoise.nal.gov.au](http://knowyournoise.nal.gov.au). (see Figure 2). In contrast to the NOISE database, this website is aimed less at researchers, and more at members of the general public, with a particular focus on young adults. It was conceived as a way of reaching out to young people who might be thinking about their noise exposure, either voluntarily or with guidance from a clinician or a teacher.. It has a fresh, open feel, which invites participation, and also offers users reliable and relevant information and advice that is easy to understand, and presented in a non-patronising way.



Figure 2 – Screen shot of the Know Your Noise home page (during development phase)

There are two main interactive aspects to KYN: a noise risk calculator and a speech-in-noise hearing test. The noise risk calculator is the result of several years of experience in designing and administering surveys for estimating lifestyle noise exposure. It asks the user to provide information about a wide range of known high-noise leisure and work activities, including regularity and duration of involvement. Using the information entered, and NAL's average noise levels for each leisure activity (from the NOISE database), the website calculates the average yearly exposure for the user, and uses this to generate one of five corresponding risk ratings, ranging from low to very high. Anyone who is receiving more than the acceptable noise dose (based on the occupational guidelines of 1.01 Pa<sup>2</sup>h per 8-hour working day) is given a rating of 'high' and those receiving twice the acceptable noise

dose are rated as ‘very high’ risk.

The user receives their risk rating alongside a graph indicating how they compare to average risk levels of other people in their age group. These averages are calculated from extensive data previously collected by NAL and The HEARing CRC in the citizen science project, Sound Check Australia (1), which will be updated as more data is collected. In addition to the risk rating, users are shown a pie chart, which lists their top-8 noisiest activities and shows the relative contribution of each activity to their overall exposure.

Another key component of the KYN website, is the ‘experiment with your data’ section where users can ‘play’ with their answers to the leisure and work questions to see how changes in behavior would affect their overall risk rating. For example, a user who obtains most of their noise exposure from a weekly nightclub visit of 5 hours duration could experiment with their data to see how a reduction of 5 hours to 3 hours exposure would reduce their overall risk rating. This is an important feature of KYN because it provides the user with a self-directed lesson in how participation contributes to risk, based entirely on their own personal lifestyle and behavior patterns and preferences.

The second main feature of KYN is the speech in noise hearing test. Like the noise risk calculator, this builds on the work of Sound Check Australia, which featured an online speech in noise test, in turn, based on Australian Hearing’s Telscreen telephone screening test (developed by NAL).

Users complete the adaptive test by listening through their computer speakers or headphones to a series of 3-digit sequences presented in noise until the individual’s SNR threshold is reached. Results are displayed on a graph showing their score in relation to the median score for people in their own age group (using data obtained from the Sound Check Australia project), together with an explanatory statement, such as “Your score is in the median zone and this indicates that you can hear in background noise as well as most people your age.”

A third and final feature of KYN is a repository of hearing health information, allowing users to browse and learn more about noise and hearing health. There is a wealth of online resources produced by educational, charitable and other groups. We have chosen a select group of attractive, relevant, and reliable resources from Australian (including resources developed by HEARnet, the HEARing CRC’s online Hearing Education and Research network) and international groups to feature as links on the KYN website.. Over time, these resources can be expanded to include new noise apps, links to events, and other hearing loss prevention initiatives that will be of interest to the target age range.

#### **4. CONCLUSIONS**

NAL, through its charter, is committed to a continuing program of hearing loss prevention. The development of the NOISE database and the KYN interactive website, in particular, addresses a previously difficult to reach audience where individuals can learn about and understand their noise exposure by exploring data relevant to them and their peers. In doing so, it provides a much-needed set of resources for raising community awareness of issues related to noise exposure and hearing health. One of the biggest obstacles to any health promotion activity is lack of public support and interest. Putting hearing loss prevention in the spotlight through these attractive and accessible formats allows us as researchers to engage more people and in a more useful way than has been possible to date.

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