An acoustic intervention of a live music club for a safe and good music environment

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Background

20% (18-80 y) has a hearing loss  SBU 164:2003

15 % has tinnitus (50.000 a severe form)   
HRF, Sweden, 2006

15 % are oversensitive to sound
"The Acoustic project"

- "The birth"
- Problem areas
- The venue chosen
- The intervention - What did we do?
- Results
- Spreading of knowledge
- Summary
National Board of Health & Wellcare

The Ministry of Health & Social Affairs

The Health & Safety Office, Göteborg

The Event Organisers Association

The Board of Culture, Göteborg

The National Concert Organizer, Sweden

The Swedish Work Environment Authority

National Institute for Working Life

Musicians, technicians …
2003:
100 dB LAeq?

No way!
That’s just impossible!
<table>
<thead>
<tr>
<th>Role</th>
<th>Count</th>
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<tbody>
<tr>
<td>Researcher</td>
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<tr>
<td>Absorbent representative firm</td>
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<td>Acousticians</td>
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<td>Sound technique expertise</td>
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<td>Health and Environmental Safety Office, Göteborg</td>
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<tr>
<td>Swedish Musicians Union</td>
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<td>Artists and Musicians against tinnitus</td>
<td>2</td>
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<tr>
<td>The Event Organisers Association</td>
<td>1</td>
</tr>
<tr>
<td>Representatives from the music club chosen</td>
<td>3</td>
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The main aim

To create a healthy work- and music environment

without reducing the musicians’ free artistic expression or the audiences’ musical experience
Specific problem areas at smaller music clubs

Distance stage-audience = direct sound
Distance stage-audience = amplified sound
Walls, ceiling, floor
Risk awareness & knowledge
Work organisation
Sound technique
Money
The venue chosen, before the intervention
Typical factors that influences the sound in a small music club

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Typical factors that influences the sound in a small music club
Typical factors that influences the sound in a small music club
Metods

- A computerised simulation technique (CATT)

- Sound level measurements

- Questionnaire
  (before and after the intervention employees, musicians and audience)
Result: A new stage, technique and acoustics
Dose meter measurements done before the intervention
Dose meter measurements

Before

After
Reduced sound levels from acoustic drums on stage

97 dBA before
94 dBA after new absorbents = -3 dB
90 dBA with a 80 cm screen = -7 dB

89 dBA with a 100 cm screen = -8 dB
87 dBA with a 120 cm screen = -10 dB
Result, hering disorders (HD) and the use of hearing protections

40 % of the audience reported HD
57% did ”often or always” use ear plugs

56 % of the musicians reported HD
78% did ”often or always” use ear plugs
Results, positive reactions concerning sound level

**After:**
- 96% of 25 listeners
- 100% of 12 musicians

**Before:**
- 45% of 11 listeners
- 16% of 6 musicians
Result

A well educated and motivated sound technician
Spreading of knowledge

An educational day
Press conferences
Interviews /articles
Study visits
Awards x 2
Useful report
Education (sound technicians and safety officers)
Scientific article
Open doors throughout the project

Forum for discussion:
Open meetings for interested people
Chattpages on the Internet

An open diary with information, articles, protocols from meetings and results at:
www.ammot.se
Summary of results

- New acoustic absorbents on walls and in ceiling
- A more stable stage floor with less resonance
- The bar was moved = a larger and a safer work environment
- Speakers were mounted in a audience-safe position
- Lower sound levels on stage, from stage and from PA during concerts and disco
- The direct sound reflected from the stage was reduced by half
- An educated sound technician
- The sound variation was reduced from 14 to 3 dBA
- Employees, musicians and audience were positive.

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Summary

The employees meant that their work environment was radically improved.

The sound levels were rated lower than before, but the sound quality was rated much higher by both musicians and audience.
Thank You for your attention!