

Regulation for control
of sound exposure in
entertainment venues

Case study from Switzerland

Make Listening Safe

WHO

This document summarizes the Swiss regulations for control of sound exposure in entertainment venues. The case study will be used for the development of a WHO standard for control of sound exposure in entertainment venues. The document has been prepared by WHO with the help of Mr Raphael Elmiger, Federal Office of Public Health, Switzerland.

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Contents

Introduction	5
History	5
Summary of regulations	6
Sound limits	7
Sound measurement	7
Notifications	8
Hearing protection.....	8
Quiet zones / respite areas.....	8
Implementation and control	8
Impact.....	9
Strengths.....	10
Weaknesses	10
Future directions	11
References	12

Introduction

Hearing loss affects millions of people around the world. One of the key contributors to hearing loss is recreational noise. More and more young people are at high risk of hearing loss due to exposure to noise in recreational settings, such as bars, discotheques, clubs or sports events. Such hearing loss is of concern as it is irreversible, while being preventable through safe listening. WHO has initiated a process of developing a standard for control of sound exposure in recreational settings. As a first step, a systematic review was carried out to explore existing country legislations, regulations, and policies to protect patrons' hearing in entertainment venues. The review identified Switzerland as one of the countries with the most comprehensive and well-implemented regulations. To provide insight into the regulation in Switzerland, this document will present in a nutshell its components, strengths and weaknesses. The information presented in this case study will be used as a basis for the development of the WHO standard for control of sound exposure in recreational settings.

History

The drafting of the Sound Levels and Laser Ordinance regulating sound levels at recreational events in Switzerland was initiated by the Federal Office of Public Health. It was driven by the concerns of health experts in the country about the hearing of predominantly young people, as there were increasing reports of persons with permanent hearing issues after attending loud rock concerts. Techno music was also on the rise and some events were known to have very high sound levels in the 1990s. The Federal Office worked closely with event organizers to develop a well applicable ordinance that could serve both sides - people attending recreational events and event organizers. The proposal went through political process without much resistance and the first version of the Ordinance came into force on 1 April 1996. Afterwards, several revisions of the Ordinance have been made.

In 2007, new obligations have been laid down for the event organizers, including:

- Introduction of different categories of events with different requirements:
 - above an hourly sound level $L_{Aeq,1h}$ of 93 dB(A)
 - above an hourly sound level $L_{Aeq,1h}$ of 96 dB(A)
 - above an hourly sound level $L_{Aeq,1h}$ of 96 dB(A) and lasting longer than 3 h

- Obligation to inform the audience about the health risk of high sound levels at all events with an hourly sound level above 93 dB(A)
- If an event lasts longer than 3 hours, a respite area must be available with an hourly sound level below 85 dB(A)

The 2011 revision included only minor changes, including clearer wording and new versions of standards referenced (for example for hearing protectors). The Ordinance is currently being integrated into the Ordinance to the Federal Act on Protection Against Hazards Arising from Non-Ionising Radiation and Sound. The provisions of the previous Ordinance remain largely the same. The new version will include events without amplified sounds, such as carnivals. More information is provided below.

Summary of regulations

- The Sound Levels and Laser Ordinance applies to all recreational venues in which the audience is exposed to electroacoustically generated or amplified sounds (e.g. clubs, concert halls, bars, restaurants, festivals, discotheques, fitness classes).
- It was Implemented in 1996 and the enforcement authorities responsible for its implementation and monitoring are the Swiss cantons.
- The rules postulated by the Ordinance apply to all venues and events regardless of their size or duration of the event (e.g. a concert of couple of hours or a bar that plays music the whole evening). However, events above a certain sound level that are lasting longer than 3 h must provide a respite area with an hourly sound level below 85 dB(A).
- According to the Ordinance, the maximum average hourly sound level is 100 dB(A) for all types of recreational events.
- There is also a limit for the momentary sound level. The maximum sound level L_{AFmax} (frequency weighting A, time weighting Fast F, time constant $t_{ein} = 125$ milliseconds) of 125 dB(A) must not be exceeded at any time during the event.
- Organizers of events with an hourly sound level above 93 dB(A) are obliged to notify the authorities before the event takes place.
- Organizers must ensure the provision of free earplugs, prominently display posters to provide information to the audience on the potential damage of their hearing.
- Organizers are obliged to measure the sound through a sound level meter.

- Event duration less than 3 hours: the organizers are only obliged to measure the sound levels and make sure sound levels do not exceed the hourly level of 100 dB LAeq.
- Event duration more than 3 hours: the organizers are obliged to measure the sound levels, making sure sound levels do not exceed the hourly level of 100 dB LAeq, as well as record the measurement and keep the recording for 30 days in case the authorities request it later.
- In case of events longer than 3 hours, respite areas must be provided for the audience where the level of sounds must be LAeq, 1h ≤ 85 dB(A).
- The Ordinance also stipulates requirements for events with children and young people under 16. In these events, the sound level limit is LAeq, 1h < 93 dB(A), but event organizers do not have to take any of the above-mentioned actions.

Sound limits

The rationale behind choosing a limit of 100 dB LAeq is based on a pragmatic rather than evidence-based decision of the Federal Office. The Federal Office used the existing legislation for sound limits in workers (85 dB(A) for 40 hours per week) and applied it to a short event that will last 3 hours, coming to an estimated 100 dB(A) hourly average limit for recreational events.

Sound measurement

- All venues should record sound levels (LAeq,5min measurements must be recorded at least every 5 minutes during the event) and make sure the sound does not exceed the hourly average of 100 dB(A).
- When the event is longer than 3 hours, organizers should also keep the recording for 30 days in case authorities request it.
- The measurement should be done at the loudest place for the audience (normally in front of the loudspeakers).
- If this is not possible (e.g. if there are many people at this place), a test measurement can be done in advance (for example with pink noise), determining the difference

between the loudest point and the mixing desk, which is then added to the measured sound at the mixing desk during the concert.

Notifications

Event organizers must inform the audience about the health risks of loud sounds through posters. The Federal Office provides the posters to the organizers for free. Event organizers must make sure that the posters are put up at the event. On the other hand, the written notification to the enforcement authorities (Swiss cantons) must include information on the maximum hourly level, duration of the event, measurement procedures, and site plan (for longer events only).

Hearing protection

Hearing protection is provided at all events in Switzerland free of charge. There are no formal requirements for the type or quality of the earplugs provided. Normally, the earplugs can be accessed at the entrance of the venue or close to the bars.

Quiet zones / respite areas

A quiet zone or respite area must be available for the audience in events that last more than three hours. Notice to this need to be prominently displayed at the entrance of the venue. The respite areas should have an hourly sound level not exceeding 85dB LAeq, must take at least 10% of the total area provided for the audience, and be clearly marked and accessible to the audience. A smoking room may be included in the respite area provided that another part of the respite area is smoke-free.

Implementation and control

- The Federal Office of Public Health in Switzerland is the organ responsible for the creation and revisions of the Ordinance, as well as for provision of information and advice to the cantons, event organizers and the audience.
- The responsible regulatory authorities for applying the Ordinance are the Swiss cantons.
- Each canton has an indicated office that monitors the compliance of the Ordinance by checking sound measurements, provision of hearing protection and other requirements included in the regulation.

- The cantonal office is also the one applying enforcement procedures in case of non-compliance. Sometimes the cantonal offices can delegate the monitoring of an event to the local police. A venue can be fined if the sound exceeds 100 dB(A).
- The first act can be a warning, and then the second-time event organizers can be given a fine.
- A venue can also be fined if it does not provide free earplugs or the needed warning messages on the potential damage to people's hearing.

Impact

There are no systematic studies assessing the levels of compliance or the levels of hearing loss before and after the implementation of the Ordinance. There is, however, a survey that has been carried out to assess the percentage of people who use earplugs, and their perception of hearing protection.

For the study, 430 visitors from five concerts of different styles (pop, rock, heavy metal, classical) were interviewed. The survey took place directly at the concert halls. Results show that 39% of the interviewees wear hearing protection, which is a significantly higher proportion than in comparable foreign studies. Among those who do not wear hearing protection mentioned the following reasons:

- 50%: loss of music quality,
- 23%: ergonomically uncomfortable earplugs,
- 9%: social aspects such as difficulties maintaining conversation with friends, and
- 3% that it is not cool.

The results of the study show that the following factors have a strong influence on whether someone wears hearing protection or not:

- The social norm: Those who have friends who wear hearing protection protect themselves.
- A positive cost-benefit balance: Those who see clear advantages of the preventive action accept possible "disadvantages" (e.g. possible loss of sound quality) in favor of their health.
- An awareness of the real danger: Those who perceive the situation as risky for themselves wear hearing protection.

Strengths

- The sound regulations in Switzerland are among the most detailed and comprehensive that exist nowadays. The Ordinance includes different sound levels for different age groups, and a range of measures such as provision of earplugs, quiet zones and warnings.
- Because of the collaborative effort between the Federal Office and industry bodies, two decades after the implementation of the Ordinance event organizers in Switzerland are now fully aware of the regulations.
- The Ordinance is well accepted by all the stakeholders (regulatory authorities, music industry, event organizers)
- The Ordinance is constantly improved through series of revisions.
- The political structure of Switzerland allows each cantonal office to monitor closely the compliance of the Ordinance, unlike other countries where a national office might find difficulties to provide the required guidance and coverage at a country level.
- Cantonal offices collaborate well with the local police which ensures widespread monitoring.

Weaknesses

- There are no formal requirements on the nature of the sound level meter (e.g. 1st or 2nd class). Thus, event organizers are the ones responsible for the measurement of the sound and occasionally do it through iPhones or simple tools bought online. This poses problems, because often the measurements differ from the objective measurements of the Swiss cantons or the police, who must follow certain requirements (sound level meters need to be at least class 2 devices and verified by the Swiss Federal Institute of Metrology).
- Swiss authorities intended to include in the new revision of the Ordinance regulations on the quality of the sound level meter but met the opposition of the music industry. To obtain a mutually agreeable decision, the Federal Office decided not to include a revision of the sound measurement policy in the regulations, but the industry committed to create best practice recommendations for event organizers on the type of

measurement devices that should be used. These recommendations will be published soon.

- The implementation of the Ordinance is not equal in different parts of the country. Some cantons are well prepared to monitor the compliance of the regulations, but others lack resources and manpower to cover all music venues and events.
- There are no systematic studies carried out to assess the impact of the Ordinance. From the little evidence that is available, we know that the levels of use of hearing protection is higher than in other countries, but still does not reach even 50% of the audience. Many people are aware of the damaging impact of loud sounds on their hearing but still prefer not to use hearing protection.

Future directions

The Federal Office is currently working on a further revision of the ordinance. The Federal Council is expected to implement this new ordinance in mid-2019. The new ordinance will lead to several changes:

- The title of the Ordinance will be changed to “Ordinance of the Federal Act on protection against hazards arriving from non-ionizing radiation and sound”
- The new ordinance will be based on a new law that will ensure a more solid legal foundation.
- The Ordinance will include regulations for events without amplified sounds, the most prominent example of which are the carnivals where big groups of people often play live music and the sound can be very loud.
- In the case of non-amplified sound events, organizers will not be obliged to measure the sound, they will only have to provide hearing protection and information in the form of posters informing the audience of the potential damage that loud sounds can cause to their hearing.

References

- Information about the Ordinance in English can be found here:
<https://www.admin.ch/opc/en/classified-compilation/20022391/index.html>
- Information about the Ordinance in German can be found here:
<https://www.admin.ch/opc/de/classified-compilation/20022391/index.html>
- Information about the Ordinance in French can be found here:
<https://www.admin.ch/opc/fr/classified-compilation/20022391/index.html>
- Enforcement guidelines created by the Federal Office of the Swiss Government to help the Swiss cantons and event organizers implement the Ordinance can be found here:
- In German: <https://www.bag.admin.ch/dam/bag/de/dokumente/str/schall/slv-vollzugshilfe.pdf.download.pdf/slv-vollzugshilfe.pdf>
- In French: <https://www.bag.admin.ch/dam/bag/fr/dokumente/str/schall/slv-vollzugshilfe-f.pdf.download.pdf/slv-vollzugshilfe-f.pdf>