Noise exposition in the daily life

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Nowadays, the man lives exposed in a world of sounds (pleasant - disagreeable, nonannoying - annoying) throughout the time, during the 24 hours a day. The man is exposed to the noise in his daily life, since he awakes, moves, works, entertains itself, rests, and to sleep. We have made a survey of levels of exhibition to the noise, having distinguished they are leisure, work or rest, in a amog young population of 20-35 years without hearing problems, and of both sexes. The results show us and agree with other authors, that the exhibition levels are highest in the activities chosen, like for example the leisure. In addition, the levels of exhibition, to the noise are related with the diverses activities of the population.

1 Objectives, methodology and procedures

Objectives are to measure, during a period of time sufficiently prolonged, the sonorous levels at which it is exposed each one of the encuestados ones, as well as to analyze the contribution of each one of sonorous atmospheres to the total dose of perceived noise. This way it is possible to determine to what extent influences this last these atmospheres, among them the urban noise.

In order to carry out the measures noise dosimetters were used noise Pro DLX-1 QUEST, equipped with a measurement rank sufficiently to quantify the exhibition to the noise in all the atmospheres to which foreseeably they would be exposed the integral subjects of the sample. These devices are made up of a small microphone connected by means of a flexible cable to a measurer, which has an internal memory in which the values of the denominated Equivalent Continuous Level Sonorous weighed A (LAeq) in paid attention periods are stored that, in all the cases, were of 10 seconds.

So that the measurement was representative of the exhibition to the noise of the encuestado one, it was tried to locate the microphone in the possible point next to his ear, in the neck of the shirt. Each encuestado took with himself the device of permanent form - exclusively during the period of dream - throughout one week, moving with him to anyone from the places to which it did habitually, including labor activities and of leisure. The dwell time in each one of sonorous atmospheres as well as the nature of these last ones, were written down by the subject in a notebook; every 24 hours

2 Treatment of data

Was come to the unloading in computer of the memory of the dosemeter the data registered by the dosemeters and the information provided by the members of the group with respect to different sonorous atmospheres, treats to a computer science process with the purpose of obtaining, for each one of them, the total time of permanence in the atmosphere at issue, the standardized continuous level equivalent to a day of 24 hours, and the percentage of sonorous exhibition of the atmosphere at issue, this last one calculated with respect to total the sonorous exhibition of all atmospheres.

At sight of the results and to interpretatives effects, a sonorous atmosphere classification in six categories, that are made up, of 34 sonorous atmospheres settled down as well:

OCCUPATIONAL, LABOR: Referring data to the noise received in the job

LEISURE: Referring data to the leisure activities and I rest

HOME: Data corresponding to the period of stay in house

CAR: Data relative to the displacements in private transport

PEATONAL: Data corresponding to the displacements on foot

BICYCLE: Data relative to the displacements in bicycle.

9 PERSONS ANSWERED 24 hours				
Monday	Tuesday	Wednesday	Thursday	Friday
73,53	67,01	77,06	69,78	80,61

3 Results

Once finished the period of measurement we have worked the collected data to obtain the pertinent conclusions. These data will serve us to calculate the sonorous level equivalent Leq(dBA) and the Leq24h through an obtained bibliography formula. The collected data are the following ones.
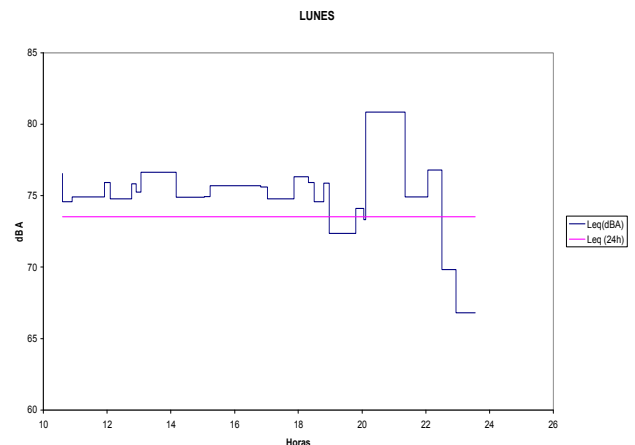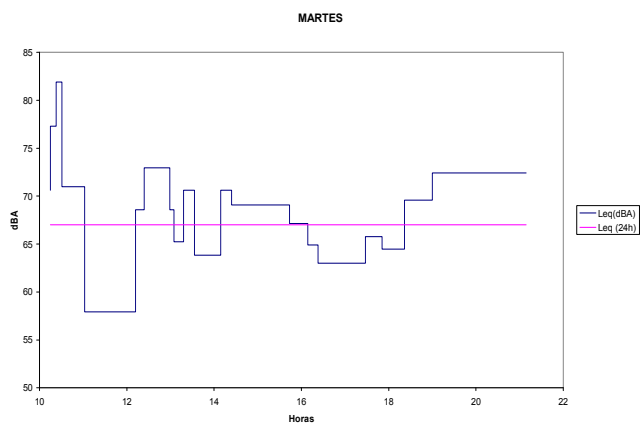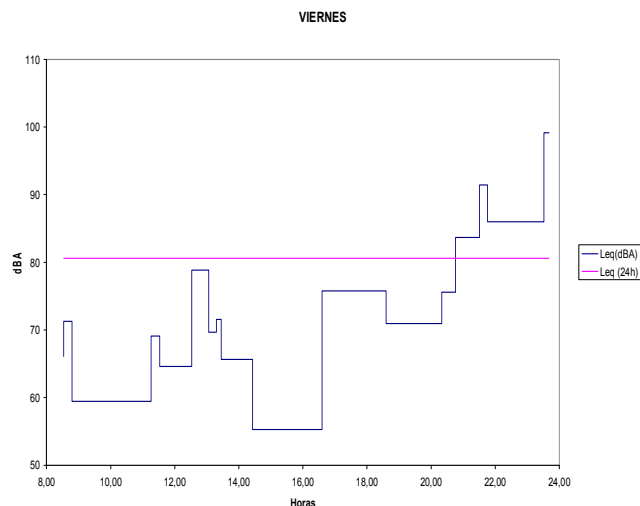

Fig. 1 Monday
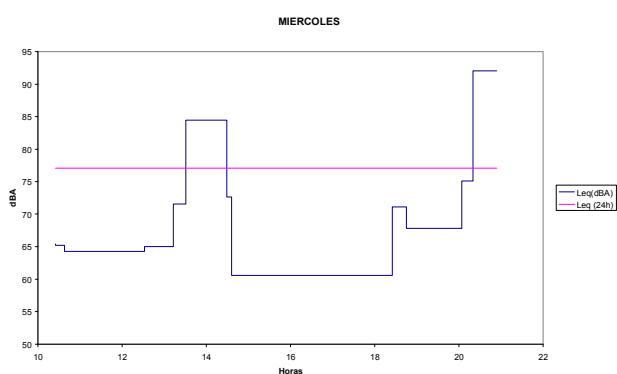
Fig. 2 Tuesday

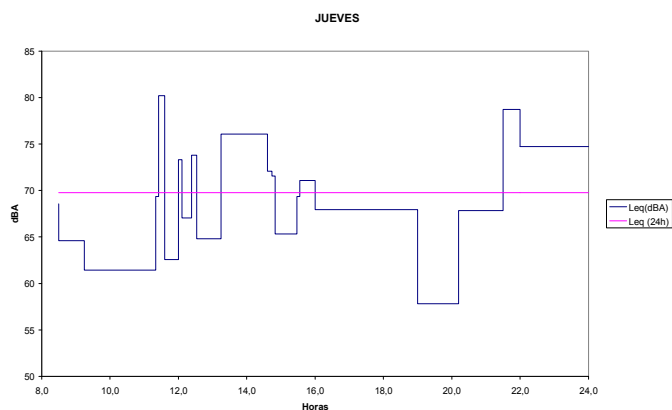
Fig. 3 Wednesday

**Fig. 4 Thursday**

Fig. 5 Friday

We observed that for almost every day, the Leq24h represents what dBA would be an average of the Leq() to which has been exposed throughout a day, nevertheless observing the graphs we see that there are two days in which this is not fulfilled; in the case in that the Leq24h is below the values of Leq of that day it is because of 24h of the day there are very few hours with a high sonorous level. In the first case we are 12h with activities with a high sonorous level and 12h in which they have not taken measurement because they are the hours of dream. In the case in that the Leq24h leaves over the obtained values of Leq(dBA) it is because we have had many hours with activities in which elnivel sonorous is not elevated. It we can yet conclude that the fact to be exposed during a short period of time to an elevated acoustic loading, affects more to the Leq24h than the fact to be during a long period of time exposed at levels of high noise.

3.1 Values of Leq_{max} and Leq_{24h}

The values obtained for the equivalent continuous sonorous level that corresponds to 24 h of the day (Leq24h (dBA)); also we will analyze Leqmax (dBA) that is the maximum sonorous equivalent level that is reached throughout a day in a certain activity.

	Leq24(dBA)	Leqmax(dBA)
Mean Value	72,7	85,1
Standard Deviation	5,4	6,3
Minim	58,8	73,6
Maxim	80,6	99,2

The histogram with these values to see while intervals of values are most of the data for the Leq24h (dBA) and Leqmax (dBA).
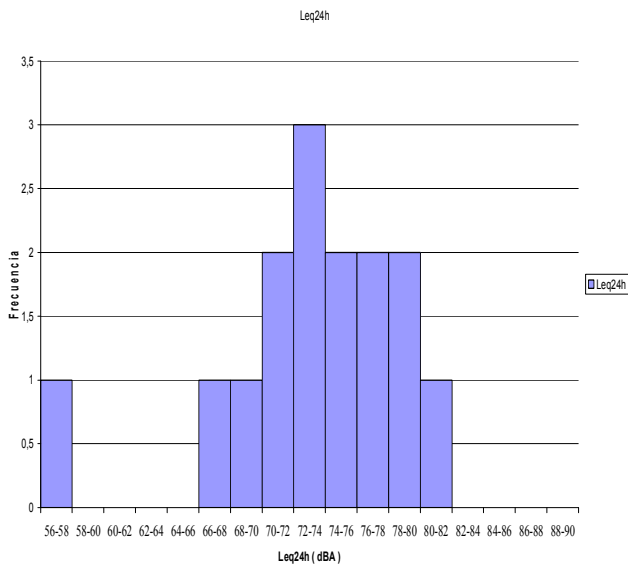
For the Leq24h level we can observe that most of the values is in the 66-82 rank dBA and the average value is in 72.69 dBA that agrees with the interval that more values it has; considering that stops a correct auditory protection the Leq24h must be below 70 dBA we can conclude that we are a little over this value this is because the study this fact with young people that they frequent places with a high sonorous level (bars, cafeterias, pub, meetings with friends...)

3.2 Values of Leq according to activities

All the made measures have been classified in four great groups: 1-Actividades of home 2-University 3-Desplacements 4-Leisure

These values is represented in the following table

Activity	Mean Value	Standard Deviation	Min.	Max.
Home activities	71.3	6.6	55.3	88.6
University	70.6	5.7	56.8	82.7
Displacements	73.4	4.5	65.2	91.4
Leisure	76.7	6.6	63.8	92.0

1.- Home activities

Activity	Mean Value	Standard Deviation	Min.	Max.
A mixture of activities	73.3	6.8	55.3	88.6
Personal cleanliness	68.9	5.8	55.7	77.3
Music	74.6	4.8	70.4	80.0
T. V.	72.5	4.1	66.8	80.3
Launch, Dinner, etc	71.6	7.3	60.5	84.5
Study	67.6	9.2	56.5	77.6

2.- University

Activity	Mean Value	Standard Deviation	Min.	Max.
Class	69.1	5.8	56.8	77.9
Corridor + Break	73.1	3.6	65.8	78.4
Bibliotheca	69.7	9.6	60.6	82.7
Computers	73.5	7.3	65.0	81.9
A mixture of activities	70.6	5.4	62.6	76.8

3. Displacements

Activity	Mean Value	Standard Deviation	Min.	Max.
Bicycle	74.2	5,4	65.2	91.4
Car	74.2	4.7	67.1	81.4
Walking	71.8	2.4	67.9	75.5

4.- Leisure

Activity	Mean Value	Standard Deviation	Min.	Max.
Pub-Bar	**81.8**	**4.6**	**68.8**	**79.6**
Walking	**73.6**	**5.5**	**72,4**	**92.0**
Sport	**82.3**	**4.3**	**75.3**	**86.0**
A mixture of activities	**75.6**	**5.0**	**65.1**	**83.0**
Shopping	**68.5**	**3.6**	**65.3**	**74.1**

Activities with greater acoustic levels was those than they have been chosen voluntarily

5   Conclusion

The mean levels and standard deviations of the Leq24h and Leqmax are:

Leq24(dBA) Leqmax(dBA) Average Value 72.69 85.10 Standard deviation 5.44 6,30

80% of the data of the Leq24h surpass 70dBA, this takes us to the conclusion that the young people we are exposed at a level of environmental noise quite superior to the recommended level

The 35,7% of the data of the Leqmax surpass 85dBA that is average value of the Leqmax.

The people who have made the measurements have been rigorous in the taking of measurements since they are the same ones that have made the study; this it difference of the measurements taken in jobs since in this case it interested the obtained values to us and in no case of manipulating them, as it is the case of some workers who can manipulate data to demonstrate that they work with acoustic levels detrimental for the health.

Activities with greater acoustic levels was those than they have been chosen voluntarily

References

[1] Acoustics and noise control. B. J. Smith, R. J. Peters, S. Owen. 1995

[2] B.O.E. 2 November 1989, Real Decree 1316/89 of 27 of October Protection of the workers as opposed to risks derived from the exhibition to the noise during the work