

# NOISE IMPACT ON WORKERS AND POPULATION HEALTH

S. Curcuruto<sup>1</sup>, C. Fabozzi<sup>2</sup>, P. Nataletti<sup>3</sup>

<sup>1</sup>Regional Agency for the Environment Protection of Umbria (ARPA Umbria)

<sup>2</sup>Regional Agency for the Environment Protection of Lazio (ARPA Lazio)

<sup>3</sup>Italian National Institute for Occupational Prevention and Safety (ISPESL)

**Introduction** Referring to the professional exposition to noise, there aren't reliable official statistic data in Italy. At present this is due to the lack of the decrees consequent the rules about the specific matter established with the 277/91 decree. Particularly when the noise levels on workplace exceed the limits, this decree establishes the duty for the employers to create the "individual level noise exposition Register". A copy of this Register must be sent to National and Local Competent Bodies.

About the environmental noise, Italian regulation started in 1995 (before the new European Directive 2002/49/CE of European Parliament and Council of 25th June 2002) and it principally regards the limits and territorial management referred to the noise pollution. Although the Italian regulation is quite complete, we still haven't enough data referred to the percentage of population exposed to different levels of acoustic pollution.

The following information shows the studies carried out in Italy on the population exposure levels to the noise and the data of the working field. The synthetic information enable to get a general esteem of the impact of this kind of environmental pollution and, consequently, the general state of health of the citizens, considering that in our country we don't have enough structured studies about the evaluations of the sanitary impact of the acoustic pollution.

**Data on workers and population exposition** From 1991 until today the ISPESL has received approximately 6000 notifications, transmitted by many companies located on the national territory, containing information about the noise values of personal exposure of the employees, as required by 277/91 decree. As a result, more than 41.000 workers are exposed every day to a personal noise level (LEP,d) higher than 90 dB(A); more than 12.000 workers are exposed to a LEP,d inferior to 90 dB(A). Totally more than 53.000 workers are exposed to noise levels higher than 80 dB(A).

The above data sent to ISPESL are clearly underestimated, if it is referred to the number of more than three million companies counted in Italy. On the basis of these elements, in a conservative way we can assume that the real workers population that is exposed to noise level higher than 90 dB(A) of LEP,d include, at least, 100.000 units. INAIL data on the professional hypoacusis in the industry, services and agriculture during the period 1989-1999, totally show beyond 38.000 events, with a decreasing course in the time, approximately 1000 events in 1999 against 7000 of 1989. Nevertheless it always remains the first professional disease in Italy, contributing with more of 50% to the total of the reimbursed professional diseases. During the last two years (2000 and 2001), approximately 9.000 new reports of professional hypoacusis have been denounced. Totally, in Italy approximately 134.000 workers have permanent incapacity caused by hypoacusis and deafness due to noise, equivalent to 56% of the total of the unearned income distributed by INAIL. The medium degree of gravity of these hypoacusis is of 24.2% and the medium age of the unearned income holders is approximately 64 years.

At the moment, regarding the so-called "extra-hearings effects" of noise, reliable data on workers exposure and on the relative effects on health in a wider meaning of psycho-physical well-being do not exist. However, it is sure that the noise is one of the greatest causes of



discomfort and stress on the job, with the consequences to create reduced efficiency, loss of concentration, aggressiveness in the interpersonal relationships in the work place.

Moreover, about the exposition of the population, in these last 7 years, from the framework law on the environmental acoustic pollution, various surveying have been carried out in Italy, even if none with an complete approach, but generally for the study of particular problems; from these surveying some interesting indications have been carried out.

A study on the noise produced by harbour infrastructures results enough meaningful because by the campaign of measure carried out it was possible to have a real picture of the acoustic climate in the urban neighbouring areas. The 7 studied infrastructures, with various level of importance and various characteristics of marine traffic, have permitted to find levels of noise between 64 and 70 dB(A) in day period and 57 and 69 dB(A) in night period.

Another surveying interested the dancing premises that are object of specific standardization, as well as the levels of noise permitted inside. The maximum levels found inside the surveyed places (more than 20 on the national territory, various for dimension and typology) was always higher than 106 dB(A) with values that reached also 120 dB(A). The survey was lead in 1997 and permitted to know the real entity of the noise levels within specific typology of premises and to estimate the exposure of the frequent visitors.

Other studies referred to wider fields, carried out during the years 1996-1999, permitted to esteem the population exposed above 55 dB(A) in the night period and 65 dB(A) in day one. The studies were carried out on 10 cities, but only on 4 cities all the population was considered. For these last 4 cities the study results show:

- a percentage of population exposed to 55 dB(A) during the night period always higher than 27%, with one pick of 100%,
- a percentage of population exposed to 65 dB(A) during the day period always higher than 34%, with picks beyond 80%.

The noise, essentially referred to the road traffic, was measured during the monitoring campaigns finalized to the predisposition of the acoustic zoning.

Finally, important information on the acoustic conditions of our cities, and therefore on the recurrent exposure conditions of the population, come out from the show "European Day: in city without my car ", that takes place in Italy and in other European countries every year, on the 22nd of September. In Italy such show has always involved numerous communes distributed on the whole national territory. During these campaigns of noise measurements the values that have been measured in the cities are comprised between 64 and 72 dB(A).

**Considerations** In Italy the incidence of the professional hypoacusis constitutes a meaningful social and sanitary problem. In fact, deafness determines physical and psychological effects on the working and social life of sick persons. The Directive 86/188/CEE, that for the first time established specific rules in Europe, was issued 15 years ago, and Italy is the last country to regulate this matter respect to other Countries that, in this meantime, supplied to reduce the exposure risk to this agent.

Moreover, the data reported in the above paragraph about environmental noise pollution point out that our society is essentially noisy and the acoustic exposition conditions of the population are rarely under the 65 dB(A) during the day and 55 dB(A) in the night period. This scenario presents positive and negative elements. A positive element surely is the engagement of the legislator in the definition of complex rules that have given impulse to the actions against the acoustic pollution. On the other side, during the same time an equal engagement of the local authorities and of the managers of transport infrastructures has lacked. For example, data on the acoustic zoning, duty of the communal administrations, point out that the percentage of zoning territory referred to single region is always inferior to 30%, while to national level it comes down to a value around to 5%.