

UNIVERSITÀ DEGLI STUDI DI MILANO  
FACOLTÀ DI MEDICINA E CHIRURGIA

**RISK FACTORS AND HEALTH STATUS AMONG OPERATORS AT A LARGE CALL CENTER IN ITALY**

**P. Carrer, A. D'Alcamo, E. Omeri, P. Urso, S. Fossati**  
Department of Occupational and Environmental Health,  
University of Milan, Italy

**M. Coggiola**, Occupational Health Unit,  
Hospital "CTO Maria Adelaide", Torino, Italy

**M. Musti**, Department of Internal Medicine and Public Health -  
Occupational Health Unit, University of Bari, Italy

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**CALL CENTER**

**INTRODUCTION**

Call centers are a rapidly growing industry in many countries.

Workers are exposed to a variety of health hazards, e.g.:

- video display unit working
- indoor air quality
- stress
- others, as noise and vocal strain

**CALL CENTER**

**OBJECTIVES**

To investigate health risk factors and the health status of operators at a large call center by an integrated approach including building assessment, environmental measurements, questionnaire survey and health surveillance data analysis.

**HEALTH RISK ASSESSMENT AND HEALTH SURVEILLANCE IN A LARGE CALL CENTER IN ITALY**

**METHODS**

Bank Call Center

- n. 222 operators: female 49%, male 51%
- age  $32 \pm 7$  years
- 9 large rooms

- Health Risk Assessment
- Health Surveillance

**HEALTH RISK ASSESSMENT AND HEALTH SURVEILLANCE IN A LARGE CALL CENTER IN ITALY**

**1. HEALTH RISK ASSESSMENT**

Buildings characteristics, systems, equipments and use

- Check-list (from "HOPE project")

Work process and for workspace's ergonomics

- Check-list

Environmental surveys

- **IAQ:** PM<sub>10</sub>, TVOCs, Benzene, Toluene, Xylenes, Formaldehyde, CO<sub>2</sub>
- Microbiological agents, Allergens
- **Microclimate:** T, air velocity, relative humidity, PMV-PPD
- **Noise:** environmental noise and on earphones

**HEALTH RISK ASSESSMENT AND HEALTH SURVEILLANCE IN A LARGE CALL CENTER IN ITALY**

**2. HEALTH SURVEILLANCE**

Health Surveillance

- results from the periodical health surveillance have been collected and evaluated

Questionnaire "Environment and Health"

- self-administered questionnaire on subjective perception of environmental working conditions and subjective symptoms (adapted from Anderson K. et al, 1993)

Questionnaire "Voice Handicap Index (VHI)"

- self-administered questionnaire on subjective perception of vocal performance (Rantala e Viikman, 1999)

**RESULTS: 1. HEALTH RISK ASSESSMENT**

Buildings characteristics

- Check-list "HOPE":
  - sources of TVOCs
  - management ventilation system

Work process and for workspace's ergonomics

- No significant evidences

Environmental surveys

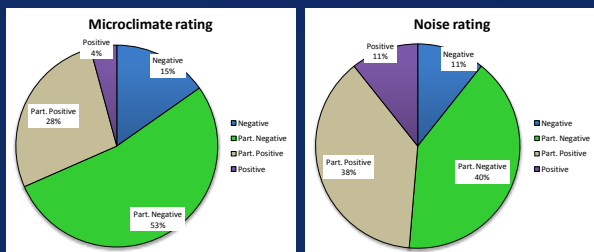
- **TVOCs:** mean 210 µg/m<sup>3</sup> (194 –389 µg/m<sup>3</sup>)
- **Microclimate:** in 5/9 rooms PMV not in comfort range (-.05 ÷ +.05.) — PPD > 10%
- **Noise:** , Environmental noise: 55-64 dB(A)  
 . On earphones: also > 80 dB(A)

**RESULTS: 2. HEALTH SURVEILLANCE**

**Health Surveillance**

- ➔ Three subjects with dysphonia and one case of vocal cords nodules

**"Environment and Health" Questionnaire**

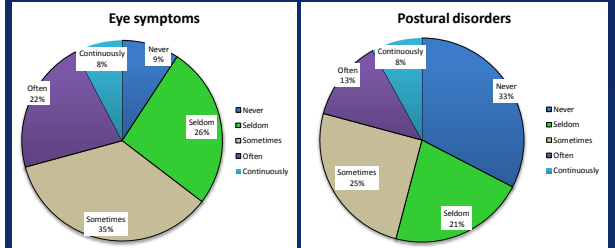


Microclimate evaluated "negative" or "partially negative" by 68% of the workers

Environmental Noise evaluated "negative" or "partially negative" by 51% of the workers

**"Environment and Health" Questionnaire**

The most reported symptoms were eye symptoms (30%) and musculoskeletal complaints (21%)



**Voice Handicap Index - VHI Questionnaire**

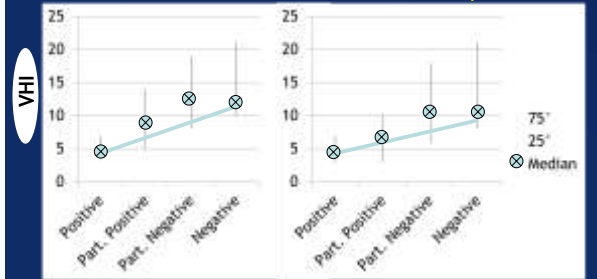
Valuation tool of VOICE QUALITY: - 3 Scales: . Physical (P)  
 (Rantala e Viikman, 1999) . Functional (F)  
 . Emotive (E)

Total score (T score) from 0 to 120

Altered vocal function: T score > 30

- ➔ VHI value resulted over the limit of 30 in the 6% of the subjects

**VHI in relation with "Environment and Health" questionnaire**



## Conclusions

In Call Centers workers can be exposed to different health risk factors. In this study the main issues were represented by IAQ, noise on environment and on earphones, and high vocal strain.

An integrated and multidisciplinary approach has been recommended, including in particular:

- Risk Management: TVOCs indoor sources, Ventilation system, noise; periodical risk assessment
- Training of workers: prevention of postural risks and use of voice
- Health surveillance protocol: IAQ perception and symptoms questionnaire, VHI, audiometry

## Thanks for the attention

**Paolo Carrer**

Department of Environmental and Occupational Health  
University of Milan, Italy

**correspondence:**  
**paolo.carrer@unimi.it**