Bilateral permanent hearing loss is the most prevalent congenital sensorineural defect. The benefits of early detection and intervention on language development in children with hearing impairment have been proven by several studies. Universal newborn hearing screening programs (UNHSP) have been recommended by various international bodies and are accepted worldwide.

There are two physiologic techniques usually used for neonatal hearing screening: Transient Evoked Otoacoustic Emissions (TEOAE), and Auditory Brainstem Responses (ABR). Our experience aimed at making a general survey of:

1. Italian hospital maternity wards employing UNHSP, in relation to healthy babies only;
2. Total annual births and percent screened in 2003 in Italy and in regional districts;
3. Instrumentation;
4. Screening protocols;
5. Characteristics of the maternity wards adopting UNHSP, in terms of geographical location, annual births, etc.

All maternity wards active until 2003 in Italy were included.

Data were collected by means of a screening survey questionnaire (SSQ) administered either orally or in writing to the birth hospital primary physician, or the program director.

**Statistical evaluation**

The distribution of the hospitals screened, in terms of geographic area and adoption of the protocol was analyzed using the SPSS statistical software package (SPSS, Inc, Chicago, IL).


In 2003, 145 maternity wards (23.5%) in Italy adopted universal hearing screening programs, for a total of 156,048 newborns screened in 2003 (29.3% of all newborns in Italy?). Geographical coverage: North-West 62.2%, North-East 36.6%, Center 17.3%, South 12%, Islands 5.6%. The international protocols established for newborn hearing screening programs are TEOAE, ABR, or a combination of the two methodologies. The two-stage screening approach (TEOAE/ABR) is the most frequently used protocol (75 hospitals, 51.7%), the TEOAE approach alone (test-retest) is quite common (68 hospitals, 46.8%), and the ABR only (1 stage) is rather uncommon (2 hospitals, 1.3%).

Characteristics of the maternity wards: 105 birth centers adopted UNHSP, of which 72.4% with a mean annual birth rate ≥ 1,000, 40 (27.5%) with a mean annual birth rate < 1,000. Overall, 102 (70.3%) of these maternity wards were part of hospitals located in a city with ≥ 50,000 inhabitants, and 43 (29.6%) were part of hospital located in a rural area ≤ 50,000 inhabitants.

Our results suggest a quick diffusion of newborn hearing screening programs in Italy. So far the issue is limited to some district areas only. The number of children screened could increase with more public information support.

The adoption of UNHSP by hospitals with a high birth rate (≥ 1,000 annual births), located in an urban area is an important starting point. As a matter of fact, the data collected is important for further epidemiological studies on the extent of the infant hearing loss problems in our country and will supply information for health planners, policy program planning and resource allocation.

**Acknowledgments**

We wish to thank Andrea Boner for major contributions to the manuscript, and Marco Cioppa who helped with the statistical analysis.
Tab. I.

<table>
<thead>
<tr>
<th>NHSP details</th>
<th>n</th>
<th>Total</th>
<th>%</th>
<th>North West</th>
<th>%</th>
<th>East North</th>
<th>%</th>
<th>Centre</th>
<th>%</th>
<th>South</th>
<th>%</th>
<th>Islands</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>Maternity wards adopting NHSP</td>
<td>145</td>
<td>618</td>
<td>23.5</td>
<td>75</td>
<td>61.9</td>
<td>30</td>
<td>35.2</td>
<td>16</td>
<td>14.4</td>
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<td>9.2</td>
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<td>Total births screened in 2003</td>
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<td>532,221</td>
<td>29.3</td>
<td>85,291</td>
<td>62.2</td>
<td>33,315</td>
<td>36.6</td>
<td>16,927</td>
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Screening protocols

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<th>%</th>
<th>East North</th>
<th>%</th>
<th>Centre</th>
<th>%</th>
<th>South</th>
<th>%</th>
<th>Islands</th>
<th>%</th>
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<tbody>
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<td>TEOAE only (2 stage)</td>
<td>68</td>
<td>46.8</td>
<td>39</td>
<td>57.3</td>
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<td>14.7</td>
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<td>19.1</td>
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<td>TEOAE/ABR</td>
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Hospitals details

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<thead>
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<th>Hospitals details</th>
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<td>Urban Hospitals NHSP (=&gt; 50,000)</td>
<td>102</td>
<td>70.3</td>
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<td>Rural Hospitals NHSP &lt;= 50,000 inhabitants</td>
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<tr>
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<tr>
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<td>40</td>
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</tbody>
</table>

Tab. II. Geographical distribution of Italian maternity wards employing UNHSP.
References


5 SPSS Statistical Data Analysis. Chicago, IL: SPSS, Inc 1992

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