



Summary: Hearing Screening

Albania

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1. Glossary of Terms: Hearing Screening

Abnormal test result	A test result where a normal “pass” response could not be detected under good conditions. The result on screening equipment may indicate “no response,” “fail,” or “refer.”
Attendance rate	<p>The proportion of all those <u>invited for screening</u> that are <u>tested and receive a result</u>,</p> <ul style="list-style-type: none"> • <u>Invited for screening</u> includes all those that are offered the screening test. • <u>Tested and receive a result</u> could be a “pass” or “fail”. <p>Attendance rate provides information on the willingness of families to participate in screening.</p>
Attendance rate in first year of life	<p>See definition of Attendance rate.</p> <p>The calculation cut-off is after <u>one year of life</u>.</p>
Compliance with referral (percentage)	<p>The percentage of those who are <u>referred from screening</u> to a diagnostic assessment that actually <u>attend</u> the first diagnostic assessment.</p> <p>Percentage of compliance provides information on the willingness of families to attend the diagnostic assessment after referral from screening.</p>
Coverage	<p>The proportion of those <u>eligible for screening</u> that are <u>tested and receive a result</u> within a <u>specific time</u>.</p> <ul style="list-style-type: none"> • <u>Eligible for screening</u> includes those within the population that are covered under the screening or health care program. • <u>Tested and receive a result</u> could be a “pass” or “refer to diagnostic assessment”. • <u>Specific time</u> can be defined, such as 1 month after birth, 3 months after birth, etc. <p>Coverage provides information on the overall effectiveness and timeliness of a complete screening programme.</p> <p>Factors such as being offered screening, willingness to participate, missed screening, ability to complete the screen, and ability to document the screening results will influence the coverage.</p>
Coverage in first year of life	<p>See definition of Coverage.</p> <p>The <u>specific time</u> is pre-defined as within the first year of life.</p> <p>In other words, the coverage is the proportion of those eligible for screening that complete the screening sequence to a final result within the first year of life.</p>
False negatives	The percentage of <u>infants/children with a hearing loss</u> (defined by the target condition) that <u>receive a result of “pass”</u> during screening.



	Example: If 100 infants with hearing loss are screened, and 1 infant passes the screening, the percentage of false negatives is 1%.
False positives	<p>The percentage of <u>infants/children with normal hearing</u> that <u>receive a result of “fail”</u> from the final screening test.</p> <p>Example: If 100 infants with normal hearing are screened, and 3 infants fail the screening and are referred for diagnostic assessment, the percentage of false positives is 3%.</p>
Guidelines	Recommendations or instructions provided by an authoritative body on the practice of screening in the country or region.
Hearing screening professional	A person qualified to perform hearing screening, according to the practice in your country or region.
Inconclusive test result	A test result where a normal “pass” response could not be detected due to poor test conditions.
Invited for screening	Offered screening.
Outcome of hearing screening	An indication of the effectiveness or performance of screening, such as a measurement of coverage rate, referral rate, number of infants detected, etc.
Permanent hearing loss	<p>A hearing impairment that is <i>not</i> due to a temporary or transient condition such as middle ear fluid.</p> <p>Permanent hearing loss can be either sensorineural or permanent conductive.</p>
Positive predictive value	<p>The percentage of infants/children referred from screening who have a confirmed <u>hearing loss</u>, as described by your protocol or guideline and indicated in the Target Condition (see definition).</p> <p>For example, if 100 babies are referred from screening for diagnostic assessment and 90 have normal hearing while 10 have a confirmed hearing loss, the positive predictive value would be 10%.</p>
Preschool or (pre)school children	All children between 3-6 years of age.
Preschool or (pre)school screening	<p>Screening that takes place during the time children are between 3-6 years of age.</p> <p>This refers to <i>any</i> hearing screening during this age. The location of the screening is irrelevant to the definition.</p>



Prevalence	The number or percentage of individuals with a specific disease or condition. Prevalence can either be expressed as a percentage, proportion, or as the value per 1000 individuals within the same demographic.
Programme	An organized system for screening, which could be based nationally, regionally or locally.
Protocol	Documented procedure or sequence for screening, which could include which tests are performed, when tests are performed, procedures for passing and referring, and so forth.
Quality assurance	A method for checking and ensuring that screening is functioning adequately and meeting set goals and benchmarks.
Referral criteria	<p>A pre-determined cut-off boundary for when an infant/child should be re-tested or seen for a diagnostic assessment.</p> <p>For example, referral criteria may be “no response” at 35 dB nHL.</p>
Risk babies / Babies at-risk	<p>All infants that are considered to be at-risk or have risk-factors for hearing loss according to the screening programme.</p> <p>Two common risk factors are admission to the neonatal-intensive care unit (NICU) or born prematurely. However, other risk factors for hearing loss may also be indicated in the screening programme.</p>
Sensitivity	<p>The percentage of infants/children with hearing loss that are identified via the screening program.</p> <p>For example, if 100 babies with hearing loss are tested, and 98 of these babies are referred for diagnostic assessment while 2 pass the screening, the sensitivity is 98%.</p>
Specificity	<p>The percentage of infants/children with normal hearing that pass the screening.</p> <p>For example, if 100 babies with normal hearing are tested, and 10 of these babies are referred for diagnostic assessment and 90 pass the screening, the specificity is 90%.</p>
Target condition	<p>The hearing loss condition you are aiming to detect via your screening programme. This includes:</p> <ul style="list-style-type: none"> • The <u>laterality of the condition</u>, whether the program aims to detect both unilateral and bilateral hearing loss or just bilateral hearing loss. • The <u>severity of the condition</u>, whether the program aims to detect hearing loss ≥ 30 dB HL, ≥ 35 dB HL, ≥ 40 dB HL or ≥ 45 dB HL
Well, healthy babies	<p>Infants who are <i>not</i> admitted into the NICU or born prematurely.</p> <p>Well, healthy babies may or may not have additional risk factors for hearing loss, according to the procedures indicated in the specific screening programme.</p>



2. Abbreviations

ABR – auditory brainstem response

aABR – automatic auditory brainstem response

ANSD – auditory neuropathy spectrum disorder

ASSR – auditory steady-state response

CI – cochlear implant

CMV – cytomegalovirus

dB HL – decibel hearing level

dB nHL – decibel normalized hearing level

dB SNR – decibel signal-to-noise ratio

DPOAE – distortion product otoacoustic emissions

HA – hearing aid

NICU – neonatal intensive care unit

OAE – otoacoustic emissions

TEOAE – transient-evoked otoacoustic emissions



3. Background

In Albania, universal childhood hearing screening is not currently implemented. Childhood hearing screening programmes have been project-based to date. The following report contains information with regards to the current and previous status of hearing screening in the entire country of Albania.

3.1. General

Albania has a total area of 28 748 km² and a population of 2 876 591 as of 2017 (Albanian Institute of Statistics (INSTAT), 2018). In Albania, each birth is registered through the Ministry of Health Civil Registration Office. The number of births in Albania was 31 733 from in 2016 (Albanian Institute of Statistics (INSTAT), 2018).

The World Bank income classification categorizes Albania as an upper-middle income country (The World Bank, 2018). The gross domestic product (GDP) is €3443 per capita as of 2014 (Albanian Institute of Statistics (INSTAT), 2018).

From the World Health Organization (WHO) Global Health Expenditure Database, health expenditure in Albania in 2015 was 266 USD or €229 per capita (World Health Organization, 2018).

Data acquired from the 2016 United Nations Demographic Yearbook indicate an infant mortality rate of 7.9 per 1000 for the country of Albania in 2013 (United Nations Statistics Division, 2016) and 8.7 per 1000 live births in 2014 according to the Albanian Institute of Statistics (2018).

3.2. Neonatal hearing screening

In Albania, neonatal hearing screening is only available as part of the maternity package within the few private hospitals. It is not available universally. An attempt at implementation occurred first in 2004; however, it was never implemented across the entire country. Currently, a neonatal hearing screening implementation project is underway through EUSCREEN.

The screening that has been performed on well babies has been funded by parents (private hospitals) and charity (project-based); screening for at-risk infants has been funded by parents and the state. Screening is not embedded into the general Preventive Child Health Care screening system nor is it obligatory for parents.

3.3. Preschool hearing screening

There is no preschool hearing screening in Albania.

4. Guidelines & Quality Control

There are no guidelines or protocols for hearing screening in Albania. Screening protocols have been developed for each independent project implemented in Albania.

Quality assurance on hearing screening is not performed and there have been no annual reports on hearing screening in Albania. Studies have been performed on hearing screening in Albania and data are collected after each project is completed (Beqiri & Nika, 2015; Hatzopoulos, Qirjazi, & Martini, 2007; Qirjazi, 2005; Sallavaci, 2016).



5. Process: Screening, Diagnosis, Intervention

5.1. Neonatal hearing screening

The average length of stay in the maternity ward after delivery is estimated to be 3 days. According to the National Health Report (2014), over 99% of births in Albania take place in the hospital. It is estimated that only 0.1% of births take place at home.

There is no neonatal hearing screening protocol that indicates the targeted maximum age of screening or target condition for screening. There is no general invitation for neonatal hearing screening for well or at-risk infants.

The target conditions indicated for previous neonatal screening protocols are hearing losses of > 35 dB HL for well babies and > 40 dB HL for at-risk babies. These target conditions were decided during the hearing screening project from 2004 to 2008 and were based on a literature review.

5.2. Neonatal diagnostic assessment

There is no protocol that indicates details of the diagnostic assessment. A diagnostic audiological evaluation should be completed by 3-6 months according to the protocol the project from 2004 to 2008 and is based on the JCIH position statement (Joint Committee on Infant Hearing, 2007).

5.3. Preschool hearing screening

In a study conducted on hearing loss prevalence among preschool-aged children in Albania, the target condition was a bilateral hearing loss of > 20 dB HL (Sallavaci, 2016).

5.4. Intervention approach

In Albania, treatment options available include grommets, hearing aids, and cochlear implants. Children are fitted with hearing aids from 2-5 years of age, and children are fitted with cochlear implants when they are available in Albania.

Cochlear implants have been fitted in Albania when money is available (i.e. when some money was donated to the government for this purpose). When available, these funds are used to fit both adults and children, including both failed CI users and new candidates. Until now 11 children have been fitted over 9 years. In 2018 the government allocated funds for approximately 9 CIs; however, these CIs are yet to be fitted.

The hearing aid fitting criteria for children in Albania is a bilateral moderate to severe hearing loss.

6. Protocols

In Albania, the ongoing implementation is part of the EUSCREEN Horizon 2020 EU project. During a previous project, a protocol was established to perform neonatal hearing screening in parts of Albania from 2004-2005 (Qirjazi, 2005; Hatzopoulos, Qirjazi, & Martini, 2007). The following information reflects the former screening protocols and results from this former project. It does not reflect the current hearing screening situation in Albania.

Note: sections 6, 7 and 8 reflect the former screening protocol in place from 2004-2005 and does not reflect the current hearing screening situation in Albania.

Hearing screening protocols are described for neonatal hearing screening (well-baby and at-risk) as well as for preschool hearing screening when applicable.

- The Test performed is the screening technique used
- The Age of the child is indicated in hours, days, months or years
- Referral criteria may be the lack of an OAE response at specified frequencies, a response-waveform repeatability constant, the absence of an aABR response at a specified intensity, or an absent behavioural response at a specified intensity. Referral criteria may be defined within a protocol or limited based on the device used.
- The Device is the screening device used.
- Unilateral Referrals indicates whether children are referred if only one ear fails screening.
- The Location is where the screening takes place.

6.1. Neonatal hearing screening (well)

The neonatal hearing screening protocol implemented in 2004-2005 in Albania is described below. The protocol was a 2-step OAE protocol. The first OAE was performed in the maternity hospital within the first 3 days after delivery and an OAE rescreen occurred in the ENT clinic within 1 month after the initial OAE. If the second OAE did not pass, infants were referred for a diagnostic ABR.

Table 1: Former screening process for well babies in Albania (Qirjazi, 2005; Hatzopoulos, Qirjazi, & Martini, 2007).

Test	Age	Referral criteria	Device	Unilateral Referrals?	Location
OAE1	<24-72 hours	2/5 freq at 6 dB SNR & 70% reproducibility	EchoLab-Plus	Yes	Maternity hospital
OAE2	1 month			Yes	ENT clinic

6.2. Neonatal hearing screening (at-risk)

The neonatal hearing screening protocol implemented in 2004-2005 for NICU or at-risk infants in Albania was the same as the protocol for well babies (Table 1). For NICU babies the repetitions of the tests while the baby was still in the maternity hospitals were allowed.

6.3. Preschool hearing screening

Not applicable. Currently, there is no preschool hearing screening in Albania. In previous projects and research studies, preschool hearing screening used pure-tone audiometry (Sallavaci, 2016); however, the protocol varied depending on the study. No universal programme was ever established.



7. Professionals

Note: sections 6, 7 and 8 reflect the former screening protocol in place from 2004-2005 and does not reflect the current hearing screening situation in Albania.

7.1. Neonatal hearing screening (well)

Midwives performed hearing screening during the 2004-2005 implementation of hearing screening (Qirjazi, 2005; Hatzopoulos, Qirjazi, & Martini, 2007). No theoretical training was offered during the project. The use of devices, the test results, delivery of information to parents, etc. was only practically taught by the project coordinator.

7.2. Neonatal hearing screening (at-risk)

Midwives also performed hearing screening for at-risk infants during the 2004-2005 implementation of hearing screening.

7.3. Preschool hearing screening

Not applicable. Currently, there is no preschool hearing screening in Albania. In previous research studies and projects, technicians would have performed screening.

8. Results: Neonatal Hearing Screening

Note: sections 6, 7 and 8 reflect the former screening protocol in place from 2004-2005 and does not reflect the current hearing screening situation in Albania.

8.1. Coverage and attendance rates

During the previous implementation project of neonatal hearing screening in Albania, coverage was roughly estimated to be about 12%. The attendance rate for the initial OAE screen is unknown.

Data from Qirjazi (2005) and Hatzopoulos et al. (2007) indicate a high percentage of families that were referred from the initial OAE test did not follow-up for rescreening. The attendance rate for OAE2 was 60% for well infants and 50% for NICU infants (Hatzopoulos, Qirjazi, & Martini, 2007).

8.2. Referral rates

Data on pass and referral rates were acquired from Qirjazi (2005) and Hatzopoulos et al. (2007)

Table 2: Referral rates for each step of the neonatal hearing screening protocol (well babies) in the Albania from 2004-2005 (Qirjazi, 2005; Hatzopoulos, Qirjazi, & Martini, 2007).

Test	Referral Rate
OAE1	12.5%
OAE2	82.6% (though not representative, due to the high percentage of “case leakage”

Referral rates assume 100% attendance. Rates reflect the number of infants that refer from each step out of the number of infants screened at each step.

After the second OAE, 7.6% of well infants and 10.3% of NICU infants screened were referred for a clinical ABR (Qirjazi, 2005; Hatzopoulos, Qirjazi, & Martini, 2007). This figure, calculated from the total number of infants referred from step 2 out of all infants screened in the step 1, does not account infants lost between the two steps of the screening process. As indicated the high percentage of case leakage (or loss-to-follow-up) must be accounted for.

8.3. Diagnostic assessment attendance

The compliance rate from the second OAE phase to clinical ABR is unknown. However, a high percentage of infants not returning for follow-up is noted.

8.4. Prevalence / Diagnosis

In total 0.86% of well infants and 1.1% of NICU infants were referred on to additional follow-up after the clinical ABR confirmed a hearing loss. However, as indicated a high percentage of infants were lost between screening steps (Qirjazi, 2005; Hatzopoulos, Qirjazi, & Martini, 2007).

Out of the NICU infants that received a diagnostic ABR, 16% were found to have a hearing loss requiring additional follow-up (Qirjazi, 2005; Hatzopoulos, Qirjazi, & Martini, 2007).

Data are unavailable regarding the prevalence of hearing loss among neonates in Albania.

For preschool-aged children (6-7-year old), 4.4% have a hearing loss > 30 dB HL (Sallavaci, Toci, Sallavaci, & Stroni, 2014).

8.5. Treatment success



In Albania, infants may not be treated for hearing impairment due to payment problems. Data are unavailable regarding how many children are fitted with hearing aids per year in Albania, and it is estimated that 0 children are fitted with cochlear implants per year.

8.6. Screening evaluation

Data are unavailable regarding the outcome measures for neonatal hearing screening.



9. Results: Preschool Hearing Screening

9.1. Coverage and attendance rates

Not applicable.

9.2. Referral rates

Not applicable.

9.3. Diagnostic assessment attendance

Not applicable

9.4. Prevalence / Diagnosis

Not applicable.

9.5. Treatment success

Not applicable.

9.6. Screening evaluation

Not applicable.



10. Costs: Neonatal Hearing Screening

There has not been a cost effectiveness analysis completed in Albania. Screening is not free of charge for parents (in private hospitals), and no reward or penalty is offered for those attending or refusing hearing screening.

10.1. Screening costs

Data are unavailable regarding the costs for hearing screening

10.2. Equipment costs

Data are unavailable regarding the costs for hearing screening equipment, maintenance, or disposables.

10.3. Staff costs

Data are unavailable regarding the salary costs for nurses and midwives in Albania. Education for nursing in Albania costs €460 per year for 4 years (part-time), including the costs of books.

10.4. Diagnostic costs

The cost for a diagnostic assessment is not provided.

10.5. Amplification costs

The cost of hearing aids is unavailable; however, speech therapy, batteries and ear molds are estimated to cost €70 per year.

10.6. Social costs

In Albania, there is one specialized residential school for the education of children who are deaf or blind, with 102 attending students. This school accommodates children up to the age of 16. The costs associated with attending this school are unknown, as are the costs for attending mainstream school. However, 3.27% of GDP is allocated to financing education in Albania. Parents are responsible for the costs associated with books and materials (~€50 per year).



11. Costs: Preschool Hearing Screening

11.1. Screening costs

Not applicable.

11.2. Equipment costs

Not applicable.

11.3. Staff costs

Not applicable.

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