

Audiological Considerations for South Pacific Islanders and Filipinos

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South Pacific Islanders: General

- The South Pacific Islands consist of over 10,000 islands and has a total population of less than five million people total (Athanasou & Torrance, 2002).
- The South Pacific Islands are divided into three geographical and cultural groups.
 - Polynesian
 - Hawaii, Samoa, Tahiti, Tonga, New Zealand
 - Micronesian
 - Mariana, Guam, Marshall, Caroline Gilbert, Palau, and Ellice islands
 - Melanesian
 - Solomon, New Caledonia, New Hebrides, Fiji

Contemporary Life

South Pacific Islanders in the United States

- South Pacific Islanders compose 0.3% of the U.S. Population
- South Pacific Islanders are more likely to report belonging to more than one ethnic group.
- Most numerous South Pacific Islanders within the U.S.
 - Native Hawaiian 140,600
 - Samoan 91,000
 - Tongan 27,700
 - Chamorro (Guam) 58,200
 - Fijian 9,700
- Most South Pacific Islanders live in Hawaii and California (U.S. Census, 2004).

Characteristics of Family

- Utilize various hierarchical structures.
 - In Micronesia, the hierarchical system is matriarchal (Cheng, 1987).
 - Most other groups use a patriarchal system (Mokuau & Tauili'ili, 2004).
- Family authoritarian
 - Gender may be important in determining authority, males have more authority within the family (Mokuau & Tauili'ili, 2004).
- Regardless of the authority and hierarchy used within the family, group consensus is highly valued.
 - Value of extended family

Children

- Children are highly valued and the center of family life (Cheng, 1987).
- Other family members are responsible for taking care of the children (Rosenberry-McKibbin, 1995).
- Infants and small children are not expected to demonstrate independence and may reach self-help milestones later (Posadas, 1999).

Language

- 1200 languages are spoken throughout the South Pacific Islands (Mokuau & Tauili'ili, 2004).
- The majority of languages are mutually unintelligible.
- Chamorro language (Cheng, 1987)
 - Spoken in Guam
 - Chamorro is the language of the largest ethnic group in Guam.
 - Alphabet includes:
 - /i, e, ae, u, a/
 - /p, t, k, b, d, g, ch, y, f, s, h, m, n, z, ng, l, r, w/
- Native Hawaiian language (Mokuau & Tauili'ili, 2004)
 - Not spoken by the majority of native Hawaiians.
 - Alphabet includes:
 - /a, e, i, o, u/
 - /h, k, l, m, n, p, w/
 - polysyllabic language
 - stress is placed on the second to last syllable
 - pronunciation of vowels and diphthongs may influence the meaning of the word
- Samoan language (Mokuau & Tauili'ili, 2004)
 - Similar to native Hawaiian language.
 - most Samoans speak English as well as the native Samoan language
 - Alphabet includes:
 - /a, e, i, o, u/
 - /f, g, h, m, n, p, s, t, v, h, k,r/
 - vowels may be pronounced differently in order to change word meaning.

Education

- Education is an important value within the South Pacific Islander culture.
- Most cultures did not have a written language and oral education is still important.
- Books may not be available in schools and homes in many of these islands due to their remote locations.
- South Pacific Islanders graduate at rates from 66.5-85%, depending on the island group (Native Hawaiian Research Center, 2004a; 2004b; 2004c).
 - When compared to the overall high school graduation rate, only native Hawaiians graduate at a higher rate than the general population (Native Hawaiian Research Center, 2004d).
- South Pacific Islanders graduate from college at rates lower than the general population.
 - Native Hawaiians graduate at rates of 12.6% (Native Hawaiian Research Center, 2004a; 2004b; 2004c; 2004d).
- Reasons for the reduced graduation rates:
 - The educational system in the U.S. values individualism.

- Many South Pacific Islanders utilize an oral approach to education.
- Traditional religions and beliefs are usually combined with Christian religions (Rosenberry-McKibbin, 1995).
- Higher education may be seen as an unnecessary drain on the family's resources.

Healthcare

- Many South Pacific Islanders may use healers or herbs to treat illnesses or conditions.
- Many rely on family's advice and traditional treatments may be used out of respect for their families' beliefs (Abel, Park, Tipene-Leach, Finau & Lennan, 2001).
- Many do not seek prenatal care which may lead to low birth weight and premature infants
 - Low birth weight
 - Native Hawaiians: 6.7%
 - South Pacific Islanders: 5.0%
 - General Population: 4.2%
 - Prematurity
 - Native Hawaiian: 9.0%
 - South Pacific Islander: 6.3%
 - General Population: 5.9% (Prince, Song, Quadri & Baker, 2003)
 - These rates are not statistically significant, but may indicate an increased risk for these conditions.

Religion

- Indigenous religions value the cooperation between the environment, people, and spiritual realm (Mokuau & Tauili'ili, 2004).
- Most practiced religions are Christian, typically Catholic or Protestant (Mokuau & Tauili'ili, 2004).

Cultural values and adherence

- Collective culture
 - The good of the group is greater than the good of the individual.
 - Everyone works together for the good of the group.
 - Place more emphasis on sharing and cooperation.
- May not adhere to time schedules (Mokuau & Tauili'ili, 2004).

Belief about disabilities

- Varies depending on the family and the culture.
- Native Hawaiian
 - Disabilities have uncontrollable spiritual causes.
- Chamorro
 - Individuals with disabilities are a gift and are meant to be protected by others (Cheng & Hammer, 1992).
- Samoans
 - Disabilities are caused by God's displeasure with the family.
 - Disabilities are a source of family guilt (Mokuau & Tauili'ili, 2004).

Audiological considerations

- 13.04% of Polynesians involved in the California Department of Developmental Services have hearing loss, compared with 7.99% of the total population (State of California, 2005).
- Risk factors for hearing loss.
- Lack of prenatal care in the first trimester.
 - 68% of Chamorro
 - 76% of Native Hawaiians
 - 48% of Samoans
 - 83% of the overall population (Hawaii State Department of Health, 1996; Curtis & Martin, 2000).
- May lead to higher rates of prematurity and low birth weight.
- South Pacific Islanders have infant mortality rates twice as high as the general population (Kagawa-Singer & Kassim-Lakha, 2003).

Otitis media

- Native Hawaiian children are more likely to experience significant negative middle ear pressure (Pugh, Burke, & Brown, 2004).
- Prevalence rate of 4-6% (World Health Organization, 2000).

Assessment-UNHS

- UNHS does not exist throughout all of the South Pacific Islands.
- UNHS in Guam: 1.3% of children in Guam were screened in 2001 (Centers for Disease Control and Prevention, 2003).
- UNHS in Hawaii: Hearing loss occurs in 4.3 of every 1000 children born in

Hawaii (Prince, Miyashiro, Weirather, & Heu, 2003).

Treatment

- . • Determine what the family wants from treatment and therapy.
 - . • Should be conducted in the family's native language.
- Provide flexible scheduling options.

Filipinos

General Information:

- . • The Philippines consists of 7,107 islands located between Taiwan and Indonesia.
- . • Located geographically in Asia.
- . • Influenced by many different groups, including Spain and the United States (Harper & Fullerton, 1994).
- . • 3rd largest immigrant population in the United States (U.S. Census, 2004)

Contemporary Life

- 1,850,000 Filipinos are currently in the United States, composing 0.85% of the total population.
- Most Filipinos live in Hawaii and California (U.S. Census, 2004).

Family

- Belong to a collective cultural group.
- May live in larger families than Caucasians (Santos & Chan, 2004)
- Families may include several generations, including blood and non-blood relatives (Santos & Chan, 2004)
- Authority is determined by age, regardless of gender (Posadas, 1999).
- Other important characteristics of authority include wealth, education, and prestige (Santos & Chan, 2004).
- Family obligation

- Children are taught the needs of family obligation from a

young age and are indebted to their families.

Children

- Children are required to be obedient and respectful.
- Children become responsible financially for their families.
- Families in the U.S. often send money to relatives in the Philippines (Santos & Chan, 2004).
- Children are not expected to be independent and may reach self-help milestones later than Caucasian children (Carlson & Harwood, 1999/2000).

Language

- 100 languages spoken in the Philippines
 - 3 most common languages: Tagalog, Ilocano, Cebuano
 - Tagalog is spoken by 60% of the population (Cheng, 1987).
- All languages are mutually unintelligible, but have similar characteristics (Gochenour, 1990)
 - Most sentences begin with verb-initial
 - Next to last syllable is stressed (Li, 1983)
- Filipino government created national language
 - Pilipino
 - Combination of Tagalog, English, Spanish
 - About half of the population understands Pilipino (Harper & Fullerton, 1994)
- English is the unifying language in the Philippines.
 - 3rd largest English speaking population in the world (BYU, 1986).
 - 75% of Filipinos in the U.S. speak English 'very well' (U.S. Census, 1993).

Education

- Immigrants are more highly educated than U.S. born Filipinos (Santos & Chan, 2004)
- 12% of Filipinos obtain college degrees (Office of Hawaiian Affairs, 2004)
- Education is seen as a status symbol and a way to provide stability for the family (Posadas, 1999).

Health care

- Illness may have many causes.
- Filipinos may be susceptible to the “evil eye” which does not respond to treatments (Montepio, 1986/1987).
- May use traditional folk medicine and healers.
 - Healers are expected to provide instant improvement
 - May be used in combination with Western medicine (Santos & Chan, 2004)
- Rates of Prematurity
 - Filipino: 9.0%
 - General Population: 5.9%
- Rates of Low Birth Weight
 - Filipino: 6.5%
 - General Population: 4.2% (Prince, Song, Quadri & Baker, 2003).

Religion

- Only Asian country that is predominantly Christian.
 - Most are Roman Catholic (Winters, 1988).
 - Other religions include: Protestantism, Islam, Buddhism, Taoism, traditional religions, evangelical and charismatic forms of Christianity, and indigenous Christian cults
 - Christian beliefs are usually combined with indigenous beliefs (Santos & Chan, 2004).

Cultural Values and Adherence

- Respect for elders is enforced.
- Children do not interrupt adults.
- Children do not respond unless addressed.
- Eye contact with elders is inappropriate
- Generally, Filipinos are less confrontational and do not want to offend the other person (Cheng, 1987).
- Adherence
 - Filipinos in the U.S. may be less likely to adhere to traditional cultural values when compared to other Asian groups (Kim, Yang, Atkinson, Wolfe, & Hong, 2003).

Belief about disabilities

- Disabilities may be due to God's will or as punishment for the family's wrongdoings (Santos & Chan, 2004).
- The whole family may be described as having bad blood (Rita, 1996).
- Dishonor for the whole family
- The disabled member may be removed from the family (Cheng, 1987).

Audiological Considerations

- Little information exists describing this population specifically.
- 9.52% of Filipino clients involved in California's Department of Developmental Services have hearing loss (State of California, 2005).
- Risk Factors for hearing loss
 - Higher rates of prematurity and low birth weight.
 - Genetic risk factors
 - May have a specific Connexin 26 mutation, V37I (Bason et al., 2003).

Assessment-UNHS

- Philippine hearing screening program had a bilateral refer rate of 29% (Chiong, Llanes, Tirona-Remulla, Calaquian, & Reyes-Quintos, 2003)
 - 33% for high risk infants
 - 11% for low risk infants (Quintos, Isleta, Chiong, & Abes, 2003).
 - Possibly due to otoacoustic emissions testing or high rates of poor health of the infants.

Treatment

- Focus on the family.
 - An extended family member may initially seek out intervention services (Santos & Chan, 2004).
- Take note of developmental milestones
- Acknowledge the family's use of other health care, such as healers.

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Abel, S., Park, J., Tipene-Leach, D., Finau, S., & Lennan, M. (2001). Infant care practices in New Zealand: A cross-cultural qualitative study. *Social Science & Medicine*. 53, 1135-1148.

This paper describes and compares the infant care practices and beliefs of Maori, Tongan, Samoan, Cook Islands, Niuean and Pakeha (European) caregivers residing in Auckland, New Zealand. Focusing on four areas--sources of support and advice; infant feeding; infant sleeping arrangements; and traditional practices and beliefs--it explores inter-ethnic similarities and differences and intra-ethnic tensions. The international literature indicates that there can be significant cultural variation in infant care practices and in the meanings attributed to them. There is, however, little New Zealand literature on this topic, despite its importance for effective health service and health message delivery. Participants were primary caregivers of infants under 12 months. An average of six focus groups were conducted within each ethnic group, resulting in a total of 37 groups comprising 150 participants. We found similarities across all ethnic groups in the perceived importance of breastfeeding and the difficulties experienced in establishing and maintaining this practice. The spectrum of behaviours ranged widely with differences most pronounced between Pacific caregivers, especially those Island-raised, and Pakeha caregivers, especially those in nuclear families. Amongst the former, norms included: the family as central in providing support and advice; infant bedsharing; abdominal rubbing during pregnancy; baby massage; and the importance of adhering to traditional protocols to ensure infant well-being. Amongst the latter, norms included: strong reliance on professional advice; looser family support networks; the infant sleeping in a cot; and adherence to Western biomedical understandings of health and illness. Maori caregivers bridged the spectrum created by these groups and exhibited a diverse range of practices. Intra-cultural differences were present in all groups indicating the dynamic nature of cultural practices. They were most evident between Pacific-raised and New Zealand-raised Pacific caregivers, with the latter attempting to marry traditional with Western beliefs and practices.

Athanasou, J. A., & Torrance, J. (2002). Career development in the Pacific Islands: Key issues influencing educational and vocational achievement. *International Journal for Educational and Vocational Guidance*. 2, 7-20.

The Pacific Islands provide an example of cultural heterogeneity compounded with economic, historical and geographic backgrounds that limit the scope for educational and vocational achievements as well as the study of career development. Although education is a regional priority, an emphasis on formal systems of assistance for career development is not evident; it is embedded within personal self-direction, family traditions or the educational system. A tentative model is proposed for (a) the analysis of educational and

vocational achievements; and (b) for career development research in the region.

Bason, L., Dudley, T., Lewis, K., Shah, U., Potsic, W., Ferraris, A., et al. (2002). Homozygosity for the V37I Connexin 26 mutation in three unrelated children with sensorineural hearing loss. *Clinical Genetics*. 61, 459-464.

Mutations in the Connexin 26 (Cx26) gene have been found to account for approximately 20% of all childhood deafness. This number approaches 50% in documented recessive cases of hearing loss. Two mutations, 35delG and 167delT, account for the majority of reported mutations in this gene, but to date, more than 60 mutations have been described. No other single gene has yet been identified that contributes this significantly to the aetiology of hearing loss. Several mutations in this gene have been found to predominate in specific ethnic populations (167delT in Ashkenazi Jews and 235delC in Japanese individuals). While the majority of mutations found in Cx26 result in frame shifts and premature terminations, a number of missense mutations have also been identified. The V37I missense mutation has been reported as both a polymorphism and as a potentially disease-causing missense mutation. The present authors have identified three unrelated individuals with sensorineural hearing loss who are homozygous for this mutation. One individual is of Philippine ancestry, another is from a Chinese and Cambodian background, while the third is of Chinese ancestry, raising the possibility that this mutation may be more frequent among populations in eastern Asia.

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Objective -To determine pass and refer rates, and identify risk factors relating to refer responses, in neonates screened using distortion-product otoacoustic emissions (DPOAEs). *Material and Methods* -A total of 435 neonates admitted to the neonatal intensive care unit (NICU) of the Philippine General Hospital between May and October 2000 were screened using DPOAEs within 48 h of admission. *Results* -The male:female ratio in the sample was 1.05. In total, 56% of neonates were born preterm, the mean birthweight was 2428.39±710.39 g and 8.9% weighed <1500 g. In total, 47.9% were delivered by Caesarian section and 44.9% were delivered vaginally. Almost 14% of neonates had 1-min Apgar scores of <6, and 4% had 5-min Apgar scores of <7. Approximately 95% of neonates had a poor perinatal history. Using pediatric aging it was noted that 46% of these neonates were born preterm, and 30.4% were small for gestational age. At least one neonatal disease was found in 42% of neonates, whilst 95.7% had to be given medication. The bilateral refer rate was 29.1%. Two-by-two analysis of risk factors for hearing loss and DPOAE measurements showed that only male sex seemed to have a significant association with a refer response. Neonates weighing <1500 g at birth showed a marginally significant association with a refer response ($p=0.07$). All other neonates showed no crude association with DPOAE measurements. *Conclusion* - These preliminary data show that a high proportion of NICU patients may have poor outer hair cell function, and thus poor hearing. In order to develop an effective neonatal hearing screening program, further studies of prevalence and risk factors should be pursued in the same setting.

Curtis, S.C. & Martin, J.A. (2001). Births: Preliminary data for 1999. *National Vital Statistics Report*. 49(13).

OBJECTIVES: This report presents preliminary data for 1999 on births in the United States. U.S. data on births are shown by age, race, and Hispanic origin of mother. Data on marital status, prenatal care, cesarean delivery, and low birthweight are also presented. **METHODS:** Data in this report are based on more than a 97-percent sample of births for 1999. The records are weighted to independent control counts of births received in State vital statistics offices in 1999. Comparisons are made with 1998 final data. **RESULTS:** The crude birth rate in 1999 was 14.5 per 1,000 population, a slight decline from 1998 (14.6), returning to the level observed in 1997. However, the fertility rate, which is limited to women aged 15-44 years, was 65.8 in 1999, a slight increase over the rate for 1998 (65.6). The birth rate for teenagers continued to decline for 1998-99, dropping 3 percent to 49.6 births per 1,000 females aged 15-19 years. The 1999 rate for teenagers is 20 percent lower than the recent high point in 1991. The rate for young teenagers 15-17 years fell 6 percent, and the rate for teenagers 18-19 years declined 2 percent. Since 1991, rates have fallen 26 percent for teenagers 15-17 years, and 15 percent for teenagers 18-19 years. Birth rates for women aged 20-24 years declined slightly between 1998 and 1999 whereas the rate for women aged 25-29 years rose 2 percent.

Birth rates for women in their thirties and forties continued their long increase. Rates for women in their thirties increased 2 to 3 percent and were the highest in three decades. The birth rate for women aged 40-44 years was the highest level reported since 1970. The birth rate for unmarried women in 1999 was 43.9 per 1,000, 1 percent lower than in 1998 and 6 percent lower than the peak level reported for 1994 (46.9). However, the number of births to unmarried women was up about 1 percent due to the continued increase in the number of unmarried women of childbearing age. The rate of prenatal care utilization continued to improve. The total cesarean rate increased 4 percent between 1998 and 1999 and continued a 3-year rise. The low birthweight rate remained unchanged at 7.6 percent.

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Using data on 570 Chinese, Filipino, Korean, and Japanese American college students from three previous studies and two unpublished, the authors subjected 22 items constituting six value dimensions of the Asian Values Scale to the following structural equation modeling procedures: confirmatory factor analysis, factorial invariance analysis, and structured means analysis. The results of confirmatory factor analysis provided support for a hierarchal factor model when this model was compared with two competing models. The results of factorial invariance analysis indicated that the meanings of the factors within the hierarchal model were conceived similarly among the four Asian American ethnic groups. On the basis of these results, a structured means analysis was conducted, revealing similarities and differences between the ethnic groups' adherence to

six cultural value dimensions. Implications regarding psychological services for these Asian Americans are discussed, and suggestions for future research are offered.

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Prince, C.B., Miyashiro, L., Weirather, Y., & Heu, P. (2003). Epidemiology of early hearing loss detection in Hawaii. *Pediatrics*. 111(5), 1202-1206.

Objective. Universal Newborn Hearing Screening began in 2 Honolulu hospitals in 1992, and by 1999, all 14 civilian birthing facilities in Hawaii were providing screening. Examination of 1998 Hawaii data indicated that approximately 13% of infants who did not pass initial hearing screening in the hospital did not return for the indicated follow-up. The purpose of this study was to determine the epidemiologic profile of infants who were born in 1999 and did not return for follow-up.

Methods. A population-based, cohort study of the hearing screening completion rates among the 13 civilian birthing facilities in Hawaii that provided data to the Department of Health was conducted. Analysis included a bivariate analysis of the demographic characteristics of infants who completed the screening/follow-up process compared with those who did not and logistic regression modeling to ascertain the demographic profile of infants at high risk for being lost to follow-up.

Results. Of 12 456 infants, hearing screening data could be linked to the birth certificate file, and a final disposition regarding completion of the screening/follow-up process was determined for 10 328 (83%). Less than 2% ($n = 176$) of the linked infants failed to complete the screening/follow-up procedures. Low birth weight and white infants and infants born to women who had not completed high school were approximately twice as likely not to complete the screening as were their normal birth weight or nonwhite counterparts.

Conclusions. Failure to complete the hearing screening follow-up may be related to cultural differences that have been previously reported in other maternal and child health studies of the diverse populations in Hawaii. The results of this study will allow the Hawaii Newborn Hearing Screening Program to target its efforts and limited resources toward infants who are at higher risk of not completing the screening and who may need special attention to encourage their mothers to complete the screening process, and to move quickly with rescreening infants whose initial tests are positive so that infants are not lost to follow-up.

Prince, C.B., Song, L., Quadri, N., & Baker, K.K. (2003). The epidemiology of low birth weight and preterm delivery in Hawai'i, 2000-2001. *Californian Journal of Health Promotion. 1*, 83-90.

To create a better understanding of Hawai'i birthing population so that culturally appropriate strategies to prevent infant mortality could be developed, we undertook an analysis of population-based perinatal data collected in Hawai'i for the years 2000 and 2001. The data were collected by the Pregnancy Risk Assessment Monitoring System (PRAMS). In this system, a stratified random sample of women who delivered a live born infant are mailed a self-administered questionnaire two to six months after they deliver, with telephone follow-up for those who do not respond. A bivariate analysis of maternal characteristics of singleton infants and the prevalence of low birth weight (<2,500 grams) and preterm delivery (<37 weeks gestational age) at the time of PRAMS survey were conducted using chi-square test statistic. To assess the independent effects of the sociodemographic and behavioral variables on the outcome, we constructed logistic regression models adjusting for age, education, race/ethnicity, marital status, household income, area of residence, 1st trimester entry into prenatal care, 3rd trimester smoking or drinking alcohol, illegal drug use, and being the victim of physical abuse during pregnancy. We estimated model coefficients by using unconditional maximum likelihood methods and we estimated relative risks by calculating adjusted odds ratios (aORs). A total of 6251 women were sampled and 5009 responded, for a response rate of 80%. Most women (98.6%) had some prenatal care, although nearly 20% entered care in the second or third trimester. Women who were less than 20 years of age (aOR 1.7; 95% confidence interval [CI] 1.1-2.0) or had only a high school education (aOR 1.5; 95% CI 1.1-2.0) were more likely to have delivered a low birth weight infant than were older more educated women. After adjustment, only married women (aOR 1.5; 95% CI 1.1-2.0). In conclusion, we found that risk factors for low birth weight and preterm delivery among singleton infants

in Hawai'i were not different from risk factors reported for mainland populations, namely maternal age, education, and marital status. Hawai'i PRAMS has been a valuable source of data about the women giving birth in Hawai'i. Further analysis of these perinatal data should provide useful information for clinicians, policymakers, and public health advocates.

Pugh, K.C., Burke, H.W.K., & Brown, H.M. (2004). Tympanometry measures in native and non-native Hawaiian children. *International Journal of Pediatric Otorhinolaryngology*. 68, 753-758.

BACKGROUND: Ethnicity has been readily accepted as a variable affecting the incidence of otitis media, with certain indigenous groups having an increased risk of middle ear dysfunction. Tympanometry provides objective information on middle ear status, and findings obtained from this procedure have often served as a criterion for medical referral. **OBJECTIVE:** To extend previous research and to facilitate use of normative tympanometry measures obtained from children with native Hawaiian ancestry. **METHODS:** Data were collected from 718 ears of 359 children in academic levels ranging from preschool to third grade. Subjects were matched across groups (182 native Hawaiian; 177 non-native Hawaiian) for academic level and gender. Variables included physical ear-canal volume (Vec), tympanometric peak compliance (peak Y, also known as static admittance), tympanometric width (TW), and tympanometric peak pressure (TPP). **RESULTS:** Significantly higher TW ($F_{1,714}=8.82$, $P=0.008$) and TPP ($F_{1,714}=9.98$, $P=0.002$) values occurred in ears of native Hawaiian children. Statistical interaction between gender and age was not significant. **CONCLUSION:** Differences in tympanometric findings between groups suggest differences in middle ear function, and these findings continue to underscore the importance of including tympanometry within a hearing screening protocol for early identification of possible hearing impairment.

Quintos, M.R.T.R., Isleta, P.F.D., Chiong, C.C., & Abes, G.T. (2003). Newborn hearing screening using the evoked acoustic emission: The Philippine general hospital experience. *Southeast Asian J Trop Med Public Health*. 34 (supplement 3), 231233.

Objective -To determine pass and refer rates, and identify risk factors relating to refer responses, in neonates screened using distortion-product otoacoustic emissions (DPOAEs). *Material and Methods* -A total of 435 neonates admitted to the neonatal intensive care unit (NICU) of the Philippine General Hospital between May and October 2000 were screened using DPOAEs within 48 h of admission. *Results* -The male:female ratio in the sample was 1.05. In total, 56% of neonates were born preterm, the mean birthweight was 2428.39 ± 710.39 g and 8.9% weighed <1500 g. In total, 47.9% were delivered by Caesarian section and 44.9% were delivered vaginally. Almost 14% of neonates had 1-min Apgar scores of <6, and 4% had 5-min Apgar scores of <7. Approximately 95% of neonates had a poor perinatal history. Using pediatric aging it was

noted that 46% of these neonates were born preterm, and 30.4% were small for gestational age. At least one neonatal disease was found in 42% of neonates, whilst 95.7% had to be given medication. The bilateral refer rate was 29.1%. Two-by-two analysis of risk factors for hearing loss and DPOAE measurements showed that only male sex seemed to have a significant association with a refer response. Neonates weighing <1500 g at birth showed a marginally significant association with a refer response ($p=0.07$). All other neonates showed no crude association with DPOAE measurements. *Conclusion* - These preliminary data show that a high proportion of NICU patients may have poor outer hair cell function, and thus poor hearing. In order to develop an effective neonatal hearing screening program, further studies of prevalence and risk factors should be pursued in the same setting.

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Spivak, L., Dalzell, L., Berg, A., Bradley, M., Cacace, A., Campbell, D., et al. (2000). New York state universal newborn hearing screening demonstration project: Inpatient outcome measures. *Ear and Hearing*, 21, 92-103.

Objective: To evaluate the feasibility of universal newborn hearing screening by examining inpatient outcome measures from 8 hospitals located in geographically diverse areas of New York State over a 3-yr period.

Design: Funding was provided by the New York State Department of Health to implement predischarge hearing screening programs in the neonatal intensive care units (NICUs) and well-baby nurseries (WBNs) of eight hospitals. Various screening protocols including transient evoked otoacoustic emissions alone or in combination with conventional auditory brain stem response or screening auditory brain stem response were implemented by each site. Measured outcomes included rate of misses, refusals, and fails. Results were analyzed as a function of year of operation, nursery type, and

geographic location.

Results: Six out of eight hospitals successfully implemented universal hearing screening during the first year, and the remaining 2 hospitals implemented programs during the second year of the project. Over a period of 3 yr, 69,761 newborns were screened at the eight hospitals representing 96.9% of all live births. The overall fail rate (4.04%) combined with the miss rate (2.61%) resulted in 6.63% of infants referred for outpatient follow-up. Mean data indicated that inpatient outcome measures improved with year of operation, with most individual hospitals also showing improvements. Both fail and miss rates were higher in the NICU than in the WBN and for hospitals located in New York City than in other regions of the state.

Conclusions: Inpatient outcome measures of a universal newborn hearing screening project, which involved multiple centers across geographically diverse regions of New York State, were acceptable in terms of successfully screening a high percentage of live births and attaining low refer rates for outpatient screening. This study adds to the growing body of literature supporting the feasibility of screening all newborns before hospital discharge.

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<http://www.nativehawaiianhealth.net> Pacific Islander Cultural Association

<http://www.pica-org.org> US Census Bureau <http://www.factfinder.census.gov> Native

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