

# THE SA'UDI ARABIAN POPULATION AND AUDIOLOGY IN THE U.S.

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Note: If 'n.d.' is included in a citation, it is likely a website. All links are included under 'Websites', located under the 'Resources' section.

## General Information

- Saudi Arabia is the largest country on the Arabian Peninsula and shares the Persian Gulf and the Red Sea with Jordan, Yemen, and Iraq.



(Arabic German Consulting, n.d.)

- The capital is Riyadh, located nearly in the center of the country.
- The population are generally termed Saudis.
- The desert in the interior of the country is the most prominent environment. Those living in the interior are less likely to have the cosmopolitan outlook that their coastal counterparts may have.
- The country is officially termed the Kingdom of Saudi Arabia, and is ruled by a family monarchy.
- In 1990, only 7% of the workforce was made up of women.
- Nomadic life was very prevalent up until 1950, and still exists today.
- Natural resources consist mainly of petroleum, natural gas, iron ore, gold, and copper.
- Literacy for men is over 90% and for women is over 70%. For children under the age of 15, literacy is 89.2% for the boys and 93.2% for the girls (Royal Embassy of Saudi Arabia, n.d., *Special and adult education*, ¶ 4.).
- Life expectancy for the population is 75.67 years, with the median age being 21.4 years.
- Elections were allowed to be held in 2005; the monarchy is beginning to allow partial political representation.

Above taken from Metz (1992).

- There are institutional schools for the deaf, blind, physically and mentally disabled in Saudi Arabia. This indicates it is possible to have clients who have received services in Saudi Arabia before coming to the United States (Royal Embassy of Saudi Arabia, n.d., *Special and adult education*, ¶ 1).

## Demographic Information

- It is difficult to discover information about the number of Saudi Arabians in the United States as Arabic peoples are not classified under their own race on the United States Census Report of 2000 (United States Census Bureau, 2001).
- In 2005, admissions into the United States from Saudi Arabia increased by 17.9%.
- Though Saudi Arabian immigration to the United States increased, in 2005 the amount was still 68.7% below the value for the fiscal year of 2001.

Above taken from The Migration Policy Institute (2006).

- After September 11, 2001, many Arabs in America experienced discrimination and challenges with their identity as Americans. Witteborn (2007) conducted several interviews with first and second-generation Arabs living in the United States to qualitatively explore self-identity. Some dropped the term “Arab” after 9/11, while others referred to themselves as “Arab-American”. This is a useful study in examining how Arabs in the U.S. view themselves and provides the clinician with a better basis of understanding for the discrimination some clients may suffer. Trust may be more difficult to earn.
- Panagopoulos (2006) also conducted a study concerning 9/11, but examined the sentiments of Americans toward the Arab population. Resentment was high after the attack, but has decreased since. Understanding of Islam among Americans is not high, but anxiety is. This is a useful awareness article for the clinician before meeting with Arabian clients.
- Many Arabs that live in the U.S. have intermarried with ethnicities other than their own. Kulczycki & Lobo (2002) found that over 80% of U.S.-born Arabs had spouses that were not Arabic. Thus, the clinician may encounter ethnically diverse families with integrated beliefs and customs.
- Michigan is one of the locations in the U.S. with the largest Arabic population. El Reda, Grigorescu, Posner, & Davis-Harrier (2007) evaluated this population according to maternal demographic profiles and risk factors of preterm birth weight (<37 weeks gestation), comparing the Arabic population to the local Caucasian population. Interestingly, the risk factors are higher for foreign-born Arab women in Michigan to give birth to preterm babies, but the prevalence is lower in comparison to their U.S.-born Caucasian counterparts.

## Religion, World Views, and Cultural Implications

- Women and men are segregated.
- Islam is the official religion of Saudi Arabia and is practiced as law. No other religion is allowed to be practiced in the country.
- The Quran is the holy book of Islam.
- There are Five Pillars of Islam:
  - Faith (shahada): there is no god but Allah and Mohammed is his messenger.
  - Prayer (salah): prayer should be done according to certain rituals five times a day and directed toward Makkah (Mecca), where the holy stone is.
  - Almsgiving (zakat): a percentage of earnings should be given for the good of the community and members in need.
  - Fasting (sawm): for the ninth month of the Islamic calendar, Ramadan, all Muslims abstain from food, drink, and sexual activity from sunrise to sunset.
  - Pilgrimage to Makkah (hajj): at least once in their life, a Muslim should make a journey to Makkah.

Above taken from Arab Net (2002, *Religion*).

- Men wear traditional dress, called a thobe. Men also have a traditional headdress consisting of three pieces: the tagia, a small, white cap that sits on the ghutra, which is a large square of cloth. Some wear a cord (iqal), which also holds the ghutra in place.
- Women wear a long, black cloak (abayah), with a scarf covering the hair and a full-length veil covering the face. Underneath, women may wear fashionable clothing of their choosing.
- Foreigners are expected to dress modestly in Saudi Arabia, with men wearing long pants and shirts, and women wearing skirts that come below the knee, and shirts with modest necklines and elbow-length sleeves.

Above taken from Arab Net (2002, *Clothing*).

- Generosity and hospitality are important to Saudi Arabians. One of the ways in which they practice this is giving coffee, which is an important cultural tradition. It is often served with dates and sweets.
- Burning incense (oud) is a common practice to welcome guests into the home.

Above taken from Royal Saudi Embassy (n.d., *Culture*).

- The family and the tribe are extremely important and the base of the social structure. Familial responsibility is serious, and both the immediate and extended family is close. This is beneficial as the individual is supported by a network and always has assistance. As a clinician, working with the family will be extremely important in encouraging use of amplification and rehabilitation exercises. Because the family is of such great importance, it may not be uncommon to have several family members present at an appointment. This is a good opportunity to include the family member's support system in a return to hearing.

Above taken from Kwintessential Cross Cultural Solutions (n.d.).

## **Appropriate Professional Methods**

- Upon meeting others, Saudi Arabian men will shake hands. Close friends might greet with a handshake and a kiss on the cheek.
- Women might hug and kiss close friends when meeting them.
- Men and women do not usually greet each other in public if they are from outside of the same family. This is important if working with a male Saudi as a female clinician.
- Saudis will take the time to converse about general things upon greeting each other (similar to small talk). This is also common in U.S. society, so take the time to find out about the client and share information about yourself to begin building a relationship.

Above taken from Kwintessential Cross Cultural Solutions (n.d.).

- Holidays include Ramadan, the holy month of fasting, and Eid Al-Fitr, the feast of the end of the fast of Ramadan, and Eid Al-Adha, the culmination of the hajj, or pilgrimage to Makkah. Schools and businesses close during this time. This may not be a good time to schedule appointments for the family. If they seem reticent about an appointment time, inquire about celebrations and other customs which you may work around.
- There is a break in the afternoon during which businesses close; clients may or may not be likely to come for appointments during this time. Coming for

appointments at this time of the day may depend upon their acclimation to U.S. society and whether they are keeping that particular tradition.

Above taken from Royal Embassy of Saudi Arabia (n.d., *Saudi Arabia: Facts & Figures*).

- Many companies close on Thursdays in Saudi Arabia. If the family still observes this tradition, Fridays may be optimal days for appointments.
- Gifts are not opened when they are received, so if a client does give you a gift, such as coffee, wait until after the appointment to open it.
- Saudis do not have a notion of personal space and may interact quite closely with you.
- Saudis will work with those they feel they know well and have spent time with in building a good relationship.
- Clients from Saudi Arabia tend to judge on personal appearance, so dressing in a modest way, as described above, when meeting with a Saudi client will make a favorable impression and facilitate a positive working relationship.
- If only meeting with a male family member, do not ask about his wife, as that is considered inappropriate.
- In business, Saudis tend to make decisions slowly. This process may also translate to decisions of amplification and rehabilitation. Patience is important, but this can be a difficult process due to critical periods of auditory development for children. Having a good relationship with the family will help in this situation.
- Saudis do not like to give bad news, and may provide vague acceptances such as saying “perhaps”. Having them repeat what you have said or what they plan to do will provide the clinician with a clearer picture of their intentions. Similarly, giving bad news to the family, such as a hearing loss, will be a difficult cultural situation.

Above taken from Kwintessential Cross Cultural Solutions (n.d.).

## **The Arabic Language and Helpful Vocabulary**

- English is widely spoken in Saudi Arabia, used in businesses and taught as a second language in the schools. Urdu, the official language of Pakistan, as well as Farsi and Turkish are spoken among the non-Saudi peoples (Kwintessential Cross Cultural Solutions, n.d.).

- Arabic is the language of the Quran, the holy book of Islam (The Arab World: Your Guide to Everything Arab, n.d.).
- Salman H. Al-Ani (1970) wrote a book entitled *Arabic phonology. An accoustical and physiological investigation*, which provides important information as to the acoustics of the Arabic language. This may provide insight for both audiologists and speech pathologists, who are servicing clients speaking Arabic.
- Several books are listed below under Resources, which provide information on the phonology and morphology of Arabic; helpful to both audiologists and speech pathologists.
- Arabic sign language does exist, albeit with different dialects. Abdel-Fattah (2005) describes differences in Arabic sign language. The abstract of this study is given below under Resources.

- Some animal sounds in Arabic (Algeria) include:

Bee: bezzzz	Cat: miaou miaou
Baby chickens: twit twit	Cow: moooooo
Dog: haw haw	Donkey: hiihan hiihan
Duck: couak couak	Goat: maa maa
Sheep: baa baa	

(Lonympics, n.d., *Animal sounds in foreign languages*)

- Several questions useful for the clinican:

**Where is/ are** --- feyn?

**What?** --- 'eyh?

**What's that?** --- 'eyh da?

**When?** --- imta?

**Why?** --- leyh?

**Why not?** --- leyh la?

**How?** --- keyf?

**Who?** --- meen?

**How many?** --- kam?

- Numbers:

- |            |              |
|------------|--------------|
| 1. wahid   | 20. ishron   |
| 2. itnan   | 30. talatona |
| 3. talatha | 40. arba'ona |
| 4. arba'a  | 50. khamsoon |
| 5. khamsa  | 60. sittoon  |
| 6. sitta   | 70. sab'oon  |
| 7. saba'a  | 80. tamanoon |
| 8. tamanya | 90. tis'oon  |
| 9. tisa    | 100. mi'a    |
| 10. ashra  |              |

• Colors:

- |                      |                    |
|----------------------|--------------------|
| red---ahmar          | black---aswad      |
| grey---ramady        | white---abyad      |
| blue---azrak         | orange---bortokaly |
| magenta/pink---warda | green---ahdar      |
| yellow---asfar       | brown---bony       |

Above taken from *The Arab World: Your Guide to Everything Arab* (n.d., *Questions, Numbers and Colors*).

• Consonant placement:

		Bilabial	Labiodental	interdental	Dental (incl. alveolar)		Post-alveolar	Palatal	Velar	Uvular	Pharyngeal	Glottal
					plain	emphatic						
Plosive	voiceless				ت t	ط tʔ			ك k	ق q		ء ʔ
	voiced	ب b			د d	ض dʔ	ج dʒ¹					
Fricative	voiceless		ف f	ث θ	س s	ص sʔ	ش ʃ		خ x		ح ħ	ه h
	voiced			ذ ð	ز z	ظ ðʔ			غ ɣ		ع ʕ	
Nasal		م m			ن n							
Lateral					ل l²							

Trill				ر							
Approximant	و						ي				
t											

- There are three vowels in Arabic: long and short /a/, /i/, and /u/.
- There are two diphthongs: /aj/ and /aw/.

Above taken from Wikipedia: The Free Encyclopedia (n.d., *Sounds*).

## Auditory Skill Development

- The Jeddah Institute for Speech and Hearing offers annual child development workshops in Arabic (Jeddah Institute for Speech and Hearing, 2004). The website is provided under Resources.
- Normative data on speech-language development for Saudi Arabians is lacking (Saudi Speech Pathology and Audiology Association, 2007). The website is provided under Resources.
- Most, Levin, & Sarsour (2007) conducted a study with 23 Arabic-speaking children ages 8-12 with severe-profound sensorineural hearing loss. They evaluated the effect of Modern Standard Arabic orthography on speech production quality (syllable stress and vowels) for these children. It was found that fully vowelized words (orthography including letters and diacritics representing all consonants and vowels) ensured high percentages of correct vowel production: 99% for reading fully vowelized words, 74% for reading partially vowelized words (letters so short that short vowels are omitted), and 59% on aural imitation of vowelized words. Fully vowelized words also affected correct consonant production. Finally, fully vowelized words influenced correct stress placement, with 54% for reading fully vowelized words, 21% for partially vowelized words, and 33% for aural imitation. Thus, similar to English, vowels are important for Arabic-speaking children with hearing loss, and demonstrate a relationship with other aspects (consonants, stress) of the language as well.
- Saleh, Shoeib, Hegazi, & Alib (2007) evaluated 30 Egyptian children between the ages of 12 and 30 months growing up with a Cairene dialect of Arabic. Phonemic inventories and phonologic analysis was conducted through observation of video tapes. Glottal replacement was the most naturally occurring phonological process, and there was an early frequent production of laryngeal phonemes. Stops, nasals, and glides were occurred frequently and mostly in the form of bilabial and alveolar sounds. Correct phoneme production was mainly shown by the final position of the word. This study provides information as to the expected sounds that are similar to English that a clinician might expect from a young Arabic-speaking child. It is assumed that the children in this study were all

normal-hearing and developing normally. As English includes the same phonological categories as those listed above, this developmental language data provides information as to what sounds Arabic-speaking children are learning and able to produce. See the abstract below for information in obtaining the full article.

## Hearing Loss

- 30-50% of those in Southern Asia, the Pacific Islands, Central Asia, Asia Minor, and Native North Americans and the Inuit of Asian ancestry have dry cerumen (Yoshiura et al., 2006).
- The prevalence of hearing loss in Riyadh, Saudi Arabia has been reported to be 7.7% for children in 1994. 5.07% was due to chronic secretory and suppurative otitis media and 2.6% was due to sensorineural hearing loss (Bafaqeeh, Zakzouk, Muhaimeid, & Essa, 1994).
- Parental education, low income, and maternal employment may put children at a higher risk for hearing loss ((Bafaqeeh, Zakzouk, Muhaimeid, & Essa, 1994).
- Consanguinity is a common practice in Saudi Arabia, increasing the risk for genetic hearing loss (Bafaqeeh, Zakzouk, Muhaimeid, & Essa, 1994).
- In 1993, 66.07% of children and infants in Riyadh had hearing loss due to a hereditary cause (Zakzouk, El-Sayed, & Bafaqeeh, 1993).
- Because foreign-born Arab women are at a higher risk for giving birth to preterm babies (El Reda, Grigorescu, Posner, & Davis-Harrier, 2007), children may also be at a higher risk for hearing loss (Joint Committee on Infant Hearing, n.d.).
- About half of Saudi Arabian families tend to be consanguineous (el-Hazmi et al., 1995). Zakzouk (2002) found high rates of sensorineural hearing loss with high rates of consanguinity, due to genetic interactions.

## Diagnostic Testing

- Assessment measures and clinical research are needed for this population.
- Outcomes of clinical treatment across ages and related to case load size, service paradigms, and service providers in Saudi Arabia are lacking.
- The Saudi Speech Pathology and Audiology Association is a group aiming to conduct a greater amount of normative research, clinical treatment, educational services, and assessment measures in Saudi Arabia. This information could then be applied to clients in the U.S.

Above taken from Saudi Speech Pathology and Audiology Association (2007).

- The Jeddah Institute for Speech and Hearing conducts research and development on diagnostic tools and assessments in Arabic (Jeddah Institute for Speech and Hearing, 2004).
- Robertson (2006) developed a monosyllabic word recognition list in Arabic for her Master's thesis. The abstract of her thesis is included below under Resources, and may be useful for clinicians during speech testing.
- The Listening Progress Profile (LiP) is a closed-set test that screens for various auditory skills by exposure to different environmental sounds and recognition of the patient's name. Children can complete it and it has been used to test Arabic children (Nasser, Al-Sari, & Al-Malki, 2005).
- The Arabic Minimal Auditory Capabilities Test is another speech perception test for Arabic speakers. It includes question/statement identification, accent identification, vowel identification, initial consonant identification, spondee discrimination, sentence identification, and high context sentences recognition (Nasser, Al-Sari, & Al-Malki, 2005).

## **Cochlear Implants and Hearing Aids**

- As mentioned above in the section Arabic Language, the book by Al-Ani (1970) on the acoustics and physiologic aspects of Arabic may provide important programming information for both the hearing aid and cochlear implant audiologist. For children that are clients, it may be beneficial to include programs for both English and Arabic language environments, as the child is likely to be around both languages and the frequency information is bound to be different. Taking the time to unravel the vowel and consonant characteristics will provide best care for the client. With an adult client, the clinician may inquire as to if they would like different programs for English and Arabic or if they would only prefer it for one language. Information on this book is provided below under Resources. It is available on amazon.com.
- For clients who are still wearing traditional dress, feedback and rustling of clothing against the microphones may be problematic (for the men wearing headdresses and the women wearing veils). For children, this should not be a problem. Body-worn aids may be useful in addressing this challenge, as well as cochlear implants with the processor connected by a cord rather than at ear level. If they clients are made aware of this difficulty with the microphone, the clinician may be able to reach a compromise between clothing and amplification (Arab Net, 2002, *Clothing*).

- There is an International Outcome Inventory for Hearing Aids measure that has been developed in Arabic and is useful for gauging amplification benefit (Mustafa, 2005).
- Arabic adults with cochlear implants having suspected auditory neuropathy and non-auditory neuropathy hearing loss have been shown to perform comparably on Arabic speech perception tests, demonstrating the effectiveness of cochlear implantation not only for the Arabic population, but also for those with possible auditory neuropathy (Soliman, Kamal, & Ashour, 2003).
- Nasser, Al-Sari, & Al-Malki (2005) found Arabic children that are congenitally deaf and implanted under the age of 5 years to have significant closed-set speech perception skills. Post-lingually deafened users with the shortest period of deafness enjoyed the greatest benefit in speech perception tests.

## Rehabilitation

- As mentioned previously (see Auditory Skill Development) in a study conducted by Most, Levin, & Sarsour (2007), words that are fully vowelized are easier for Arabic-speaking children with severe-profound hearing loss to work with. Thus, it would be important in therapy to address the vowels first, and make associations between Arabic vowels and English vowels. Working with the vowels may seem simple due to the low-frequency content and relative intensity as compared to other speech sounds, but it is the job of the audiologist (cochlear implant and/or hearing aid), to ensure that the frequencies and formants involved in the therapy sessions are audible to the child (this includes Arabic!).
- Saleh, Shoeib, Hegazi, & Ali (2007) performed a study with Egyptian children growing up in the presence of Arabic with a Cairene dialect (results explained above in Auditory Skill Development). Most importantly noted is that glottal replacement was the most naturally occurring phonological process, and there was an early frequent production of laryngeal phonemes. Stops, nasals, and glides were occurred frequently and mostly in the form of bilabial and alveolar sounds. Correct phoneme production was mainly shown by the final position of the word.
- There is no educational strategy to address speech-language and hearing services in Saudi Arabia (Saudi Speech Pathology and Audiology Association, 2007).

## Counseling

- The International Outcome Inventory for Hearing Aids has been developed in Arabic and may be used as an assessment as to how hearing aids are benefiting the client. Mustafa (2005) gave this assessment to 106 patients in a clinic in Saudi Arabia. The mean scores were quite low (2.3 to 2.7) and illiteracy was a challenge encountered in completing the assessment. The author suggested a new

hearing aid assessment developed for those in the region who are illiterate, as that rate is quite high. Thus, it may be important for the clinician to realize that the clients may not be quite literate, even in Arabic assessments, and to work with the interpreter to accommodate the client.

- 700 children with hearing loss in schools for the deaf and in integrated classes in public school in Riyadh were given questionnaires to ascertain attitudes toward hearing aids. 63% reported use from the hearing aids and 76.57% of the parents reported positive attitudes toward the use of the hearing aids. However, only 60% of the parents reported increased vocalizations and improvements from rehabilitation therapy (Al-Abduljawad, 2002). Attitudes may be beneficial in views toward use, but faith in rehabilitation may require encouragement for the parents.

## Resources

### Abstracts

- Abdel-Fattah, M.A. (2005). Arabic sign language: A perspective. *The Journal of Deaf Studies and Deaf Education*, 10(2), 212-221.

Sign language in the Arab World has been recently recognized and documented. Many efforts have been made to establish the sign language used in individual countries, including Jordan, Egypt, Libya, and the Gulf States, by trying to standardize the language and spread it among members of the Deaf community and those concerned. Such efforts produced many sign languages, almost as many as Arabic-speaking countries, yet with the same sign alphabets. This article gives a tentative account of some sign languages in Arabic through reference to their possible evolution, which is believed to be affected by the diglossic situation in Arabic, and by comparing some aspects of certain sign languages (Jordanian, Palestinian, Egyptian, Kuwaiti, and Libyan) for which issues such as primes, configuration, and movement in addition to other linguistic features are discussed. A contrastive account that depicts the principal differences among Arabic sign languages in general and the spoken language is given.

- Al-Abduljawad, K.A. (2002). Impact of using hearing aid and its benefits: Survey of institutes for the deaf children. *Saudi Journal of Disability and Rehabilitation*, 8(3), 169-173.

Hearing impaired children from Al-Amal boys and girls institutes for the deaf and girls integrated classes in the public school in Riyadh city, were approached to study the benefits of using hearing aids. A questionnaire was

designed in Arabic and sent to parents of 900 hearing impaired students. The questionnaire contained in addition to name, age, time of discovering hearing loss - the use of hearing aid, benefits of amplification, the impact on verbal communication, repair and satisfaction by students and parents. 400 of 450 (88.9%) responses were obtained from the girls' institutes while 300 responses (66.7%) were obtained from the boys' institutes. 85.43% of the students were using hearing aids which were either provided by institutes or bought by the parents. 63.14% were benefitted from using the hearing aids. 50% girls and 51.3% boys received amplification before entering the institutes, and 76.57% of the parents reported positive attitude towards using the aids. 59.85% (N=700) of the parents reported improvement / increased verbal vocalization of their children, after speech therapy as part of their rehabilitation program. There are several issues related to hearing aids such as the type, cost, maintenance, cleaning and changing of batteries.

- Bafaqeeh, S.A., Zakzouk S.M., Muhaimeid H.A., & Essa A.R. (1994). Relevant demographic factors and hearing impairment in Saudi children: epidemiological study. *Journal of Laryngology & Otology*, 108(4), 294-298.

A representative sample of 6421 Saudi children were clinically examined and screened for hearing loss. Hearing impairment was detected in 494 children (7.7 per cent). In 326 of the children it was due to chronic secretory and suppurative otitis media (5.07 per cent) and in 168 of them sensorineural hearing loss (2.6 per cent). The study revealed that parental education, low income, and employment of the mother showed a slightly higher at risk rate of hearing impairment. Children from related parents were also at a higher risk of hearing impairment and they demonstrated a marked adverse effect on the incidence of hereditary sensorineural hearing impairment. Comparison with other surveys of school children in developed and developing countries has been carried out.

- el-Hazmi, M.A., al-Swailem, A.R., Warsy, A.S., al-Swailem, A.M., Sulaimani, R., & al-Meshari, A.A. (1995). Consanguinity among the Saudi Arabian population. *Journal of Medical Genetics*, 32, 623-626.

This study was conducted on 3212 Saudi families to investigate the prevalence of consanguineous marriages. The families were interviewed and the information on the relationship between the husband and wife was obtained. The overall rate of consanguinity shows that 57.7% of the families screened were consanguineous. The most frequent were first cousin marriages (28.4%) followed by distant relative marriages (15.2%) and second cousin marriages (14.6%). The families were grouped according to the province of their origin

and the consanguinity rates were calculated accordingly. There were slight differences in the consanguinity rates in the five provinces, which ranged from 52.1% to 67.7%. In each province first cousin marriages were the most frequently encountered pattern, ranging from 17.9% to 40.9%. The inbreeding coefficient (F) was calculated for each province and ranged from 0.020 to 0.030. Within each province, there were several significant differences among the populations in the different areas. The highest rate of consanguinity was 80.6% in Samtah and the lowest rate was around 34% in Abha in the South Western province. These results place Saudi Arabia among the countries of the world with a high rate of consanguinity. The possible consequences of increased consanguinity are presented and discussed.

- El Reda, D.K., Girgorescu, V., Posner, S.F., & Davis-Harrier, A. (2007). Lower rates of preterm birth in women of Arab ancestry: an epidemiologic paradox—Michigan, 1993-2002. *Maternal Child Health Journal*, 11(6), 622-627.

**OBJECTIVE:** Preterm birth (PTB), <37 weeks gestation, occurs in 12.1% of live births annually and is associated with significant morbidity and mortality in the United States. Racial/ethnic subgroups are disproportionately affected by PTB. Michigan is home to one of the largest Arab-American communities in the country; however, little is known about PTB in this population. This study examined the maternal demographic profile and risk factors of preterm birth (PTB) among foreign-born and US-born women of Arab ancestry relative to US-born Whites in Michigan. **METHODS:** Using Michigan Vital Statistics data, we examined correlates of PTB for primiparous U.S.-born white (n = 205,749), U.S.-born Arab (n=1,697), and foreign-born Arab (n=5,997) women who had had a live-born singleton infant during 1993-2002. We examined variables commonly reported to be associated with PTB, including mother's age and education; insurance type; marital status of parents; receipt of prenatal care; mother's chronic hypertension, diabetes, and tobacco use; and infant sex. **RESULTS:** Foreign-born Arabs are less educated and more likely to be on Medicaid, and they receive less prenatal care than US-born Whites. Prevalence of PTB was 8.5, 8.0, and 7.5% for US-born Whites, US-born Arabs, and foreign-born Arabs, respectively. Pregnancy-related hypertension was the only predictor of PTB that these three groups had in common: Adjusted Odds Ratio (AOR)=2.1 (95% Confidence Interval (CI)=1.99, 2.21), AOR=2.6 (95% CI=1.24, 5.51), and AOR=2.6 (95% CI=1.55, 4.31) for US-born whites, US-born Arabs, and foreign-born Arabs, respectively. **CONCLUSIONS:** Foreign-born Arab women in Michigan have a higher-risk maternal demographic profile than that of their US-born white counterparts; however, their prevalence of PTB is lower, which is consistent with the epidemiologic paradox reported among foreign-born Hispanic women.

- Kulczykcki, A. & Lobo, A.P. (2002). Patterns, determinants, and implications of intermarriage among Arab Americans. *Journal of Marriage and Family*, 64(1), 202-210.

This study examines Arab American intermarriage using 1990 U.S. Census data. The results indicate high rates of intermarriage consistent with an assimilation perspective. Over 80% of U.S.-born Arabs had non-Arab spouses, implying a diminishing ethnic identification. Logistic regressions show that for both sexes, those with part Arab ancestry, the U.S. born, those with strong English-language ability, and the highly educated were significantly more likely to out-marry, as were Arabs of Lebanese ancestry. The cultural and structural assimilation of Arab Americans is facilitating intermarriage, with indicators of acculturation being the strongest predictors, especially for women. The article further discusses ethnic options for children of intermarried couples.

- Most, T., Levin, I., & Sarsour, M. (2007). The effect of Modern Standard Arabic orthography on speech production by Arab children with hearing loss. *Journal of Deaf Studies and Deaf Education*, 12(3), 350-361.

This article examined the effect of Modern Standard Arabic orthography on speech production quality (syllable stress and vowels) by 23 Arabic-speaking children with severe or profound hearing loss aged 8–12 years. Children produced 15 one-syllable minimal pairs of words that differed in vowel length (short vs. long) and 20 two-syllable minimal pairs differing in stress pattern. Each word was produced in three tasks: reading partially or fully vowelized words and imitation of aural stimuli. Results showed that fully vowelized words ensured vowel production: high-quality productions appeared on 99%, 74%, and 59% of productions on reading fully vowelized words, partially vowelized words, and on imitation, respectively. Moreover, correct vowel production affected correct consonant production. Correct production of stress was best on reading fully vowelized words, appearing on 54%, 21%, and 33% of productions for fully vowelized words, partially vowelized words, or imitation, respectively. Findings suggest the need to present fully vowelized written texts when teaching speech production to children with hearing loss. Such presentations enable more accurate productions that result in more intelligible speech.

- Mustafa, M.W.M. (2005) Norms for the Arabic International Outcome Inventory for Hearing Aids. *The Internet Journal of Otorhinolaryngology*, 4(1). Retrieved March 16, 2008, from <http://www.ispub.com/ostia/index.php?xmlFilePath=journals/ijorl/vol4>

Arabic is one of the youngest members of the Semitic Language Family. Arabic critically differs from most modern European languages, not only English, in being "diglossic". The International Outcome Inventory for Hearing Aids (IOI-HA) was developed as a product of an international workshop on Self Report Outcome Measures in Audiological Rehabilitation. The Arabic version of the IOI-HA emerged at the end of 2003. This work is designed to study the norms for the Arabic IOI-HA version. Out of 215 of our patients, who were asked to come to the Audiology Unit, only 106 came and completed the IOI-HA. Most of them had sensorineural hearing loss and were illiterate (does not understand formal Arabic). Measures to help illiterate people were taken. The results reflected a generalized impression that our patients were not happy with their hearing aids. The mean scores of each of the items of the IOI-HA ranged from 2.3 to 2.7. An immense need to develop a modified version of the IOI-HA in the informal form of Arabic was clearly noticed. The hearing aid delivery strategy of the Egyptian Health Insurance Authority has also to be revised.

- Nasser, A., N.H., Al-Sari, N., & Al-Malki, K.H. (2005). Speech perception in pre-lingual and post-lingual cochlear implantees. *Saudi Journal of Oto-Rhino-Laryngology Head and Neck Surgery*, 7(1), 26-32.

A group of 6 pre-lingual cochlear implantees were assessed for closed-set speech perception at different intervals following cochlear implantation. The mean age of this group was 4.8 years. The auditory response to speech was assessed using the Listening Progress Profile (LiP). The other group composed of 7 post-lingual cochlear implantees was assessed for closed-set and open-set speech perception at different intervals following cochlear implantation. The mean age of this group was 29.8 years. The minimal auditory capabilities test (MAC Test) was administered for monitoring progress in this group of patients. The aim of this study is to assess speech perception results in both pre-lingual and post-lingual deafened cochlear implantees.

- Panagopoulos, C. (2006). The polls-trends: Arab and Muslim Americans and Islam in the aftermath of 9/11. *Public Opinion Quarterly*, 70(4), 608-624.

The terrorist attacks against the United States on September 11, 2001, fueled widespread concern and speculation about mounting Islamophobic sentiment among Americans in response to the events. To monitor developments in opinions about Muslims and Arabs (both living in the United States and abroad) and attitudes toward the Islamic faith, survey organizations began to assess more regularly Americans' attitudes on these topics. I analyze

developments in public sentiment about Arab and Muslim Americans and Islam in the age of the war on terror using available public opinion data. The data analyses in this study suggest that Americans possess lingering resentment and reservations about Arab and Muslim Americans. The evidence also reveals low levels of awareness about basic elements of Islam but growing anxiety about Islam's (especially Islamic fundamentalism's) compatibility with Western values of tolerance, acceptance, and civility. Some of the sharpest movement in opinion dynamics we observe is in the immediate aftermath of the 9/11 attacks, but opinion levels stabilize shortly thereafter. Monitoring these developments as the war on terror continues is crucial.

- Robertson, M.C. (2006). *Psychometrically equivalent Arabic monosyllabic word recognition materials*. Unpublished master's thesis. Brigham Young University, Utah.

The purpose of this study was to develop, digitally record, evaluate, and psychometrically equate a set of Arabic monosyllabic word lists to use in the measurement of the word recognition score. Familiar Arabic monosyllabic words were digitally recorded by a native male talker from Jordan who was judged to have a standard Arabic dialect. Twenty native Arabic participants with normal hearing were used as subjects to determine the percentage of correct word recognition for each word at 10 intensity levels ranging from -5 to 40 dB HL in 5 dB increments. The monosyllabic word data were analyzed using logistic regression. The words producing the steepest psychometric function were included in the final word lists. Four lists of 50 words each were created and eight half-lists (25 words each) were created from the four lists. A Chi-square analysis was performed, revealing no statistical differences among the lists and half-lists. The mean monosyllabic psychometric function slopes at 50% for lists and half-lists were 4.8%/dB.

- Saleh, M., Shoeiba, R., Hegazia, M., & Alib, P. (2007). Early phonological development in Arabic Egyptian children: 12-30 Months. *Folia Phoniatrica et Logopaedica*, 59(5), 234-240.

Phonological development is a dynamic process that operates on three levels: universal development, specific language development, and specific child development. An intricate relationship between the three factors delineates the course of acquisition of each child's phonemic inventory. This study is designed to investigate the phonemic inventory and the phonological processes used by Arabic Egyptian children in order to evaluate cross-linguistic similarities and differences. Thirty Egyptian children with Cairene dialect, in the age period between 12 and 30 months, were included and divided into three groups, each covering a 6-month interval. A 1-hour tape recording for each child was done, followed by analysis of the phonemic inventory and phonological processes.

Phonemic inventories showed universal similarities, with frequent occurrence of stops, nasals, and glides mostly in the form of bilabial and alveolar sounds. This is besides a specific tendency for early frequent production of laryngeal phonemes. Glottal replacement was found to be a common and naturally occurring phonological process, leading to frequent occurrence of glottal stop /ʔ/ in the inventories of Egyptian children. The final position of the word showed the highest degree of correct phoneme production.

- Soliman, S., Kamal, N., & Ashour, S. (2003). Auditory neuropathy and cochlear implantation. *International Congress Series, 1240*, 423-428.

This work was undertaken to study the prevalence of auditory neuropathy among deaf subjects “as diagnosed by objective tests for peripheral neuropathy” together with their performance using the cochlear implant (CI) device. Thirty-five adult CI subjects versus twenty subjects with sensorineural hearing loss of both genders and of variable etiology of hearing loss were included. Electrophysiological testing of peripheral nerves in the form of nerve conduction studies (NCS) and electromyography (EMG) were performed on all subjects of both groups. For the CI subjects, the post-operative performance was estimated using Arabic speech perception tests. Results showed a good percentage of CI subjects had mild polyneuropathy of the demyelinating type. Those subjects were categorized as possible auditory neuropathy (AN). Post-operative Arabic speech tests of both the possible AN and normal NCS groups were comparable. This work addressed issues related to the possible site of lesion in AN and the role of electrical stimulation in these cases. In conclusion, cochlear implantation is harder in mild cases of neuropathy particularly in children.

- Witteborn, S. (2007). The situated expression of Arab collective identities in the United States. *Journal of Communication, 57*(3), 556-575.

This qualitative inquiry explores how self-identified Arabs living in the United States express their collective identities in talk. Twenty-one participant observations, 50 interviews, and 4 group discussions were conducted with first- and second-generation Arabs of Druze, Muslim, and Christian faiths. Identity labels were identified as a means of communication for expressing collective identities. The participants in this study identified themselves as a heterogeneous group with intersecting and evolving collective identities that were affirmed and refuted in social interactions. Self-identification as “Arab,” “Arab American,” “Muslim,” or “Iraqi” depended on such situational factors as audience, physical setting, and September 11. Although some respondents dropped the label “Arab” after September 11 to avoid discrimination, others started to self-identify as “Arab American.” The findings add to the literature on culture, identity, and communication by illustrating the

importance of identity terms for personal and communal relationships, problematizing the definition of large identity groups a priori as ethnic, national, or cultural, describing the social and communicative consequences of self- and other-ascribed identities, and highlighting the impact of September 11 on Arab identity expressions in the United States.

- Yoshiura, K., Kinoshita, A., Ishida, T., Ninokata, A., Ishikawa, T., Kaname, T., Bannai, M., Tokunaga, K., Sonoda, S., Komaki, R., Ihara, M., Saenko, V.A., Alipov, G.K., Sekine, I., Komatsu, K., Takahashi, H., Nakashima, M., Sosonkina, N., Mapendano, C.K., Ghadami, M., Nomura, M., Liang, D-S., Miwa, N., Kim, D-K., Garidkhuu, A., Natsume, N., Ohta, T., Tomita, H., Kaneko, A., Kikuchi, M., Russomando, G., Hirayama, K., Ishibashi, M., Takahashi, A., Saitou, N., Murray, J.C., Saito, S., Nakamura, Y., & Niikawa, N. (2006). A SNP in the ABCC11 gene is the determinant of human earwax type. *Nature Genetics*, 38, 324-330.

AC003034AC007728 Human earwax consists of wet and dry types. Dry earwax is frequent in East Asians, whereas wet earwax is common in other populations. Here we show that a SNP, 538G A (rs17822931), in the ABCC11 gene is responsible for determination of earwax type. The AA genotype corresponds to dry earwax, and GA and GG to wet type. A 27-bp deletion in ABCC11 exon 29 was also found in a few individuals of Asian ancestry. A functional assay demonstrated that cells with allele A show a lower excretory activity for cGMP than those with allele G. The allele A frequency shows a north-south and east-west downward geographical gradient; worldwide, it is highest in Chinese and Koreans, and a common dry-type haplotype is retained among various ethnic populations. These suggest that the allele A arose in northeast Asia and thereafter spread through the world. The 538G A SNP is the first example of DNA polymorphism determining a visible genetic trait.

- Zakzouk, S., El-Sayed, Y., & Bafaqeeh, S.A. (1993). Consanguinity and hereditary hearing impairment among Saudi population. *Annals of Saudi Medicine*, 13(5), 447-450.

Hereditary sensorineural hearing loss is a preventable disease. A random sample survey of 6,421 Saudi infants and children was conducted to study the prevalence of consanguineous marriage and its effect on the prevalence of hereditary sensorineural hearing loss. First cousin consanguineous marriage was found among the parents of 21.1% of the children studied and second cousin consanguinity was present in 23%. The overall prevalence of hereditary sensorineural hearing loss was 1.7%. A higher prevalence of 2.8% of this type of deafness of more distant consanguinity and 1.4% among non-consanguineous families' children. The study showed that consanguinity is

widely practiced among the population surveyed and demonstrated a marked adverse effect on the incidence of hereditary sensorineural hearing impairment.

- Zakzouk, S. (2002). Consanguinity and hearing impairment in developing countries: a custom to be discouraged. *Journal of Laryngology and Otology*, 116(10), 811-816.

Consanguineous marriage is a tradition which is commonly practised among Asian, African, and Latin American communities whether they are living in their own countries or settled in Europe or the USA. These communities, in addition to their custom of interrelated marriage, have large families and are a rapidly growing population. The siblings of consanguineous marriages have a significantly higher incidence of autosomal recessive diseases including hearing impairment. Two epidemiological surveys were carried out 10 years apart. There were 6,421 subjects from Riyadh City and 9,540 from all other parts of the Kingdom of Saudi Arabia. A random sample was examined otologically and a questionnaire was filled in that included age, sex, family relation, number of siblings, etc. ENT examination and audiological assessment were performed. Consanguinity was found among 22 per cent as first cousins and 23 per cent as second cousins in the first survey. In the second survey 19 per cent were first cousins and 28 per cent second cousins. The rate of consanguinity was 45 per cent in the first survey and 47 per cent in the second. The prevalence of hereditary sensorineural hearing loss (SNHL) was 66.07 per cent and 36.6 per cent in the first and second survey respectively. The incidence of hereditary hearing impairment is very high in developing countries compared to developed countries. Prevention is essential to reduce the incidence of genetic hearing loss. Consanguinity should be discouraged through health education of the public about the adverse effect of interrelated marriage. Genetic counselling, premarital and antenatal screening are to be applied whenever possible, at least for those at risk of developing genetic diseases including hearing impairment.

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- Unitron has been conducting conferences in the Middle East focusing on Arabic Audiology, and thus may have further resources. See [www.unitronhearing.com](http://www.unitronhearing.com).