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## EFFECT OF SEMMELWEIS 11.

### Perinatális mortalitás, veleszületett defektusok, vérrokonházasság, születésszabályozás az arab világban

### Demography of the Arab World: Perinatal Mortality, Birth Defects, Consanguinity and Birth Control

Dr. László Király MD FETCS<sup>1</sup>  
[laszlokir@gmail.com](mailto:laszlokir@gmail.com)

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#### Abstract

With achievements in decreasing infant mortality rate, improving healthcare and somewhat declining fertility rate, population growth remains at the highest in the Arab World. Extended family, where women carry subordinate status, expansion of religious attitudes into secular life have been proposed for the peculiarities in demography. Consanguinity is traditionally prevalent; some countries with significant immigrant subpopulation feature segregated reproductive groups. Religious considerations reduce open-access to family planning, birth control and cancel the possibility of termination of unwanted, defected pregnancies. These phenomena translate into a higher prevalence of birth defects, especially of congenital heart disease that present with higher complexity.

Failure to integrate the youth bulge into their labour market led to serious consequences of radicalization, violence and migration in the Arab world. Majority of the countries experienced political instability ranging from riots to complete disintegration of the political state. Root-causes of recent upsurge in migration are complex, however, they apparently contain demographic elements.

**Key words:** demography, family planning services, fertility, population dynamics, Middle East

**Kulcsszavak:** demográfia, születésszabályozás, termékenység, népességváltozás, Közel-Kelet

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#### Introduction

Family is the foundation of Muslim society. A Muslim family however represents an extended, multigeneration community that is essential in maintaining social order, peace and

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<sup>1</sup> Head, Consultant, Pediatric and Congenital Cardiac Surgery, Sheikh Khalifa Medical City managed by Cleveland Clinic, Institute of Cardiac Sciences. POB 51900, Abu Dhabi, United Arab Emirates. Adjunct Staff, Cleveland Clinic Foundation, Cleveland, Ohio, USA. Mobile: +971 50 581 6482, e-mail: [laszlokir@gmail.com](mailto:laszlokir@gmail.com)  
[www.kaleidoscopehistory.hu](http://www.kaleidoscopehistory.hu)

Dr. Király László Head, Consultant

growth. Any member of the extended family has a demarcated role to fulfil when interacting with others that creates a web of predominantly hierarchical relations. This is dissimilar from the Western pattern where relationships tend to be egalitarian. Furthermore, among Arabs and Muslims, loyalty seems the strongest at family/tribe level. Identification weakens as community size increases to nation state, only to reinforce again at the level of religious community (Ummah). Thus, political loyalty among Arabs and Muslims spans the exact opposite course of that in the modern West [Huntington, 1988]. (**Fig. 1**)

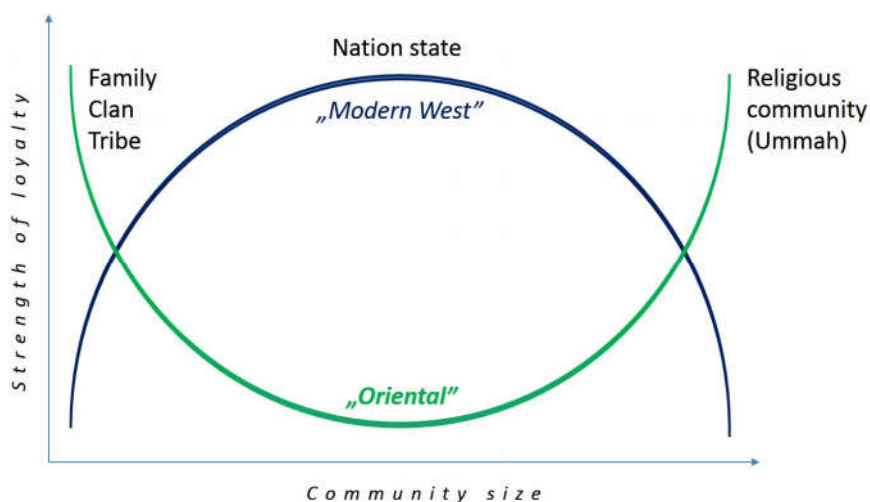


Fig. 1: Strength of political loyalty plotted against community size in Oriental and modern western societies

Demographic phenomena, trends in the Arab world, therefore, may be discussed in the context of family and religion as well as of politics. We acknowledge success in decreasing mortality rate, expanding lifespan in these countries, however, will not focus on discussing the demographic aspects of the achievements. Instead, we provide a case study on recent demographic trends in the United Arab Emirates and demonstrate higher prevalence of congenital heart disease (CHD).

## 1. Demographic trends

The Arab world comprises of some twenty countries from Western Sahara to Iraq and Lebanon to Somalia that divides into three rather different regions: Maghreb, Mashriq, and the Gulf. (**Fig. 2**)



Fig. 2: The Arab world

Total population of the Arab countries doubled in the last thirty years: from 173 millions (1980), 220 millions (1991), to 359 millions (2010); and it is expected to exceed 428 millions in 2020 [Zohry, 2010]. (Fig. 3)

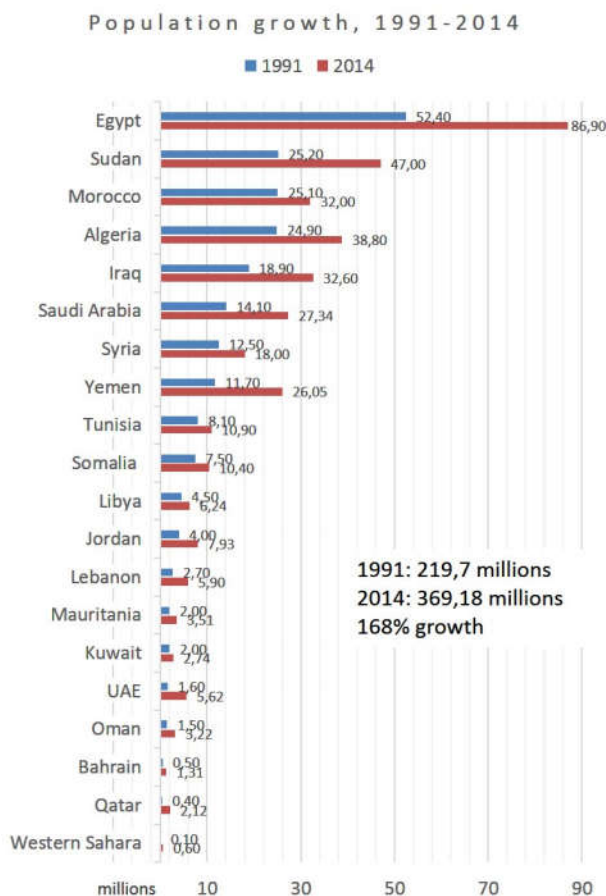


Fig. 3: Population growth in the Arab world between 1991 [Obermeyer, 1992] and 2014 [CIA Factbook, 2015]

Expanding civilization, improvement in community healthcare, prospects for personal/family progress have generally been associated with declining fertility rate. Despite **population growth** has somewhat slowed down in the last fifteen years, it is generally acknowledged that the population growth of Maghreb and Mashriq countries remains higher than anywhere on the globe excepting for Subsaharan Africa [Zohry, 2010]. High birth rate has been accompanied to very high infant mortality rate. These unusual features of Arab demography have been attributed to the low status of women in the region and to Islam [Obermeyer, 1992].

The **status of women** remains a controversial issue, where veiling, domestic oppression, mutilation/female circumcision, sexual abuse and slavery, honour killing etc. are often mentioned by Western scholars, whereas Muslim apologists denote high prestige, power and autonomy of Muslim women both in the days of the *Prophet Muhammad* and ever since [Serour, 2013]. Although the Qur'an, and Hadith renders equal legal, economic status to women and mandate independence for decisions about their own education, employment and health care [Qur'an, 2010; Al-Tabrizi, 1340], it adds to ambiguity that these sources of Islamic law also charge different family members with different level of responsibilities. Men are responsible for providing for others that legitimates male authority and promotes segregation of the sexes [Hassan, 1995]. Husband's mother enjoys ultimate authority over all women in the extended family, clan and tribe [Heard-Bey, 2004]. Thus, extended family seeks to reassert collective control over women's bodies and fertility by deploying Islamic doctrine that honors frequent childbearing [Varley, 2012]. Social and peer pressure is promoted by an early age at marriage, extended reproductive period with continuous childbearing throughout, low contraceptive use, low education level of women [Forsythe, 1991]. Women's status is aptly illustrated by the title of relevant statistics: 'Poor, powerless, pregnant' [Population Crisis Committee, 1988].

Due to complex socioeconomical factors, both **infant mortality rate** and **fertility rate** has been steadily declining all over the Arab countries for the last 50 years. (**Fig. 4**) Infant mortality (including perinatal mortality) falls, life expectancy increases, and the population grows faster as a result of health infrastructure improvement, inclusion of rural/remote areas into healthcare, increasing rate of immunization, improved birth medical care (80% of deliveries are attended by medical personnel), etc. [Shaikh et al, 2013].

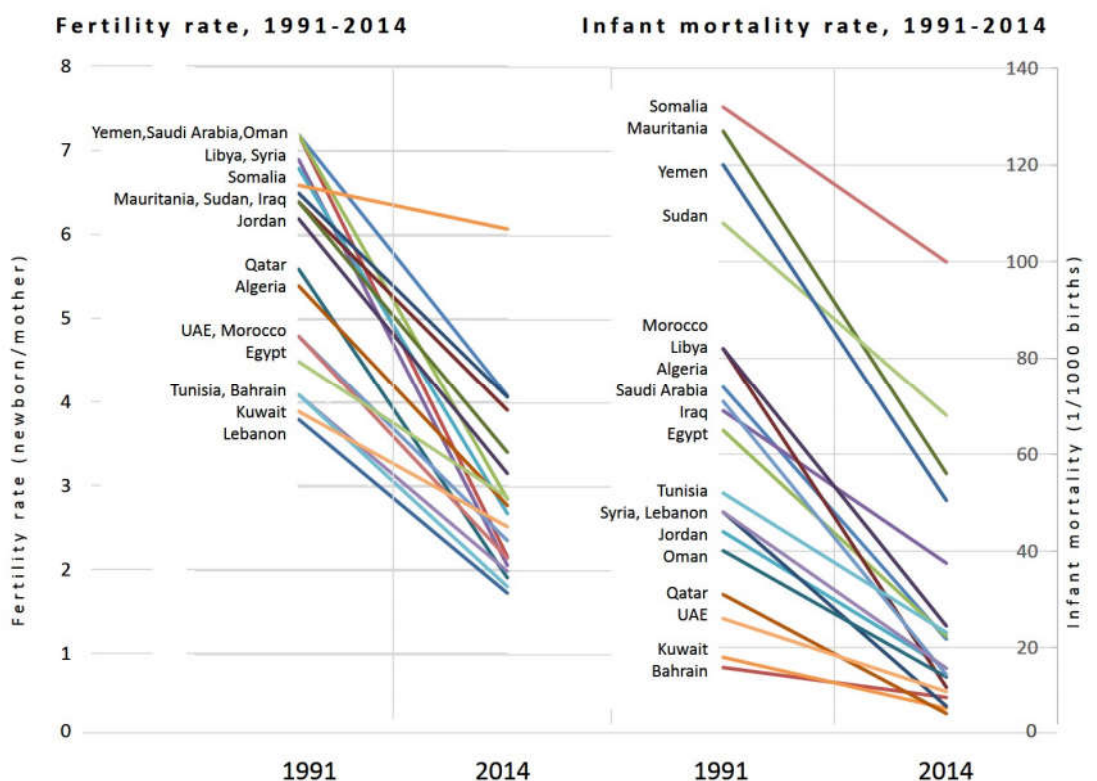


Fig. 4: Fertility rate v infant mortality rate in the Arab countries, 1991-2014

Decreasing fertility rate is complex to explain. *Obermeyer* demonstrated that economic growth, urbanization, better access to education and healthcare may not be the primary driving force in deciding for or against pregnancy in an Arab community [Obermeyer, 1992]. Social and reproductive success could be competitors, however, a mother's status is often characterized in an extended Muslim family by the number of her children [Vining, 1986]. Others argued that by open access to a range of contraceptive methods, and to correct information on family planning, fertility rate would fall [Campbell et al, 2013]. Fertility rate appears to be a rather sensitive indicator of society's feeling of security: after 50 years of continuous decline Egypt's fertility rate rose again – reportedly - in association with the social unrest of 2013 [The Economist, 2015].

*Islam* approves of sexual gratification in the marriage that forms the sole basis for sexual relations and parenthood [Al-Qaradawi, 2010]. Marriage is not a sacrament but a contract with pronatalist approach. Thus patterns of marriage, e.g. polygyny and divorce are allowed to promote fertility. Islamic jurisprudence generally discourages *contraception*, extolling the virtues of large families. The first source of Islamic law, the Qur'an, does not mention contraception; it is permissible according to the Hadith [Atighetchi, 1994]. Eminent medieval Islamic scholar *Al Ghazali* (1058-1111) provided five arguments for birth control [Musallam, 1983]. These include (1) prevention of disease transmission from parent to offspring, (2) concern about the mother's disposition or (3) health for too recent or too frequent

pregnancies, respectively. The husband's impecunious situation (4), and (5) concerns for the mother's beauty may also warrant birth control. The use of contraceptives in Muslim countries varies widely, and ranges from less than 5% (in Mauritania, North Yemen, Somalia, and Sudan) to more than 50% (in Turkey, Lebanon, and Tunisia) [Oberneger, 1994]. Thus, Muslim opinion with respect to contraception is divided by country, Islamic law school (e.g. Hanafi, Maliki etc.), and on a personal level by education and wealth. The use of contraception appears significantly widespread among the educated and economically healthy multiparous women even in conservative (wahabi) Saudi Arabia [Al-siba and Khwaja, 1986].

The Qur'an describes formation of the embryo almost scientifically: '*Then We made the sperm-drop into a clinging clot, and We made the clot into a lump [of flesh], and We made [from] the lump, bones, and We covered the bones with flesh; then We developed him into another creation. So blessed is Allah, the best of creators*' [Qur'an, 23:14]. 'Development into another creation' is interpreted that a soul emanates from God and takes up residence in the embryo's 'bones and flesh'. This process takes place at around 120 days into gestation, according to Hadith [Al-Tabrizi, 1340]. Pulsation of the heart commences that signifies life and the embryo is considered a living creature from then onwards [Boobes, 1996]. As 'our bodies belong to Allah', **abortion** is regarded a direct interference against God's plan: a murder, euthanasia, suicide, mortal sin [Hamdy, 2012]. Thus, abortion is generally prohibited with few special exceptions, e.g. when the life of the pregnant woman is threatened and - in some Muslim-majority countries - when 120 days have not lapsed. Majority (18 of 47) of Muslim countries, however, would not allow termination of pregnancy saved for directly life-threatening situations [Shapiro, 2014]. Prenatal screening is, therefore, of little consequences: even a serious malformation of the foetus (like anencephaly) may not permit termination of pregnancy [Bruwer et al, 2014].

## 2. Consanguinity

It is estimated that currently couples related as second cousins or closer (i.e. consanguineous) and their offspring constitute around 10% of the global population [Bittles et al, 2010]. During human evolution and in special situations consanguinity may have reached 50% [Harpending et al, 1998]. Consanguinity is driven by geographical, ethnic, economic, social and religious differences; all of them being considered of fundamental importance by Muslim communities [Dhami and Sheikh, 2000]. Other aspects that promote consanguineous marriage are: low maternal education, low age at marriage, poverty. Larger family size and higher infant mortality rate have been associated with consanguinity as independent outcome variables. An excess of 3.5% mortality is now attributed to the effect of inbreeding [Hamamy et al, 2011]. Interestingly, modern migration trends have a boosting effect on consanguinity: e.g. some 75% of first generation Pakistani Muslim immigrants in Britain are in a consanguineous relationship, and approximately 50% are married to first cousins. This represents an increase from the generation of their parents, of whom only 30% are married to first cousins [Darr and Modell, 1988].

Although, negative effects of consanguinity have been given much attention both in the scientific literature and Western public opinion, confers many advantages, which, at least in part, explain its continued appeal. **(Fig. 5)**



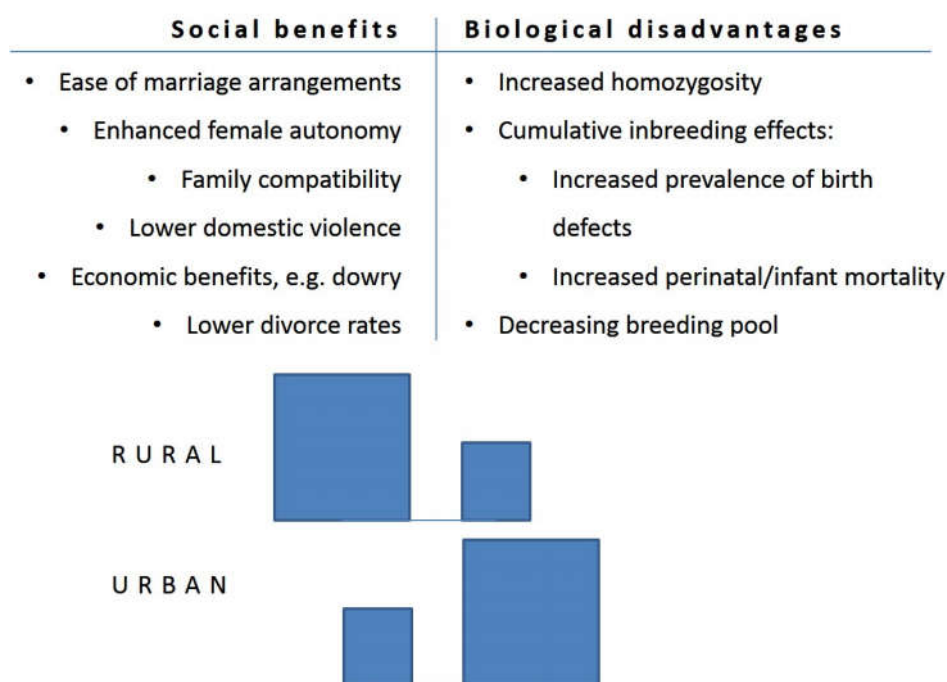


Fig. 5: Social benefits and biological disadvantages of consanguineous marriage and their comparative effect in rural and urban conditions

### 3. Birth defects

Consanguinity and intracommunity marriage (endogamy) have been associated with an increased frequency of familial disorders by an autosomal recessive pattern of inheritance. Muslim communities show an intrinsic prevalence for consanguineous unions. Nevertheless, in the higher prevalence of congenital anomalies observed among Muslims - that translates into increased perinatal and infant mortality -, there may be other than genetic factors to play a role. These factors include environmental, epigenetic, e.g. social deprivation, cultural and communication difficulties. [Bunday et al, 1990]. Much attention has been given to congenital cardiac disease (CHD) since these anomalies are the second most frequent birth defects. Furthermore, their complexity, acuity mostly warrants immediate medical/surgical attention in the neonatal period. A systematic review of the literature supports that consanguinity (principally at first cousin level and closer) increases the prevalence of CHD [Shieh et al, 2012]. *Becker et al* analyzed individual subgroups with CHD in Saudi Arabia. First-cousin consanguinity was significantly associated with ventricular septal defect, atrial septal defect, atrioventricular septal defect, pulmonary stenosis, and pulmonary atresia. The interesting observation is that – excepting for an atrioventricular septal defect – these anomalies rarely conjoin to genetic syndromes [Becker et al, 2001]. Other studies also confirmed the association of collectively higher CHD prevalence with the size of the reproductive population [Gev et al, 1986], potential sociodemographic patterns [Chebab et al, 2007]. The correlation for individual lesions, however, have been inconsistent and weak [Yunis et al, 2006]. Studies, nevertheless, agree that there is an increased prevalence and complexity of CHD in Arab/Muslim communities. At this point in time, further investigation for a more precise risk estimate and a better understanding of the underlying disease factors is needed. In

order to further elaborate on this subject, we present a case-study of peculiar demographic trends in the United Arab Emirates.

#### 4. Case-study: Sociodemographic trends in the United Arab Emirates (UAE)

Discovery of world's six largest oil reserve in the UAE prompted equally large-scale investments in oil-industry and establishment of the entire social infrastructure in the late 1960s, and seventies. Transportation network, utility distribution system, mass housing, education and healthcare systems have been newly created alongside with the foundation of government structures (code of civil law, ministries, local municipalities, etc). All this requested massive influx of foreign workforce. UN population statistics estimates the population in the area of the present-day UAE (Trucial States) at 70 000 in the pre-oil era [United Nations, 2011]. That number represents the total number of indigenous population, so-called Emiratis, at the period, when significant immigration is not yet considered. CIA World FactBook puts the current population number to 5 628 805 (2014 July estimate) [CIA Factbook, 2014]. Thus, the entire country's population increased by 80 times, in which the share of Emiratis (15% = 844 320) represents 12 times growth. In other words, 85% of the UAE's inhabitants are *resident* immigrants, so-called non-nationals (4 784 484; 2014). (**Table 1**) At the same time, UAE National Bureau Of Statistics gives 8 264 070 as total number of inhabitants of the country, extrapolated from a census of 2010 [National Bureau Of Statistics, 2010]. The difference (between 5.6 and 8.2 millions) can be resolved by the fact that more than 2.5 million people are temporary workers. This exclusively male workforce employed mostly for physical labour, construction work is recruited from the Indian subcontinent. Employees leave behind their families to work sometimes in conditions of modern-day slavery. This temporary workforce (they turn over in shifts of 6-12 months) is not locally involved in any of the usual social activities, e.g. reproduction, healthcare or education, etc.

**Table 1: Population subgroups and their religious orientation in the UAE** [CIA Factbook, 2014]

Population groups	%	Religious orientation
Emiratis	15%	Sunni Muslims (100%)
Middle Eastern Arabs	14%	Sunni Muslims (90%), Shia Muslims (10%)
Iranians	10%	Shia Muslims (100%)
Indians	35%	Muslims (55%), Christians (25%), Hindus (15%)
Pakistanis	17%	Sunni Muslims (78%), Shia Muslims (22%)
Westerners	4%	Christians (~90%)
Far-East Asians	5%	Muslims (Indonesians), Christians (Filipinos), other (e.g. Buddhists)

UAE's population growth remains high: 2.91%/year without immigration. Rapidly expanding local society creates a demand for developing services and collaborates in establishing infrastructure. Parallel to international trends of developing civilization, decreasing birth rate is observed among both Emiratis and resident non-nationals (from 50(1950) to 15.54(2014) births/1000 population/year) [UN, 2010; CIA Factbook, 2014]. (**Fig. 6**) UAE's figure is

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significantly higher than the average of the European Union (10.7 births/1000 population/year), however it rests in the range of other Arab countries (17.45 births/1000 population/year) [CIA Factbook, 2014].

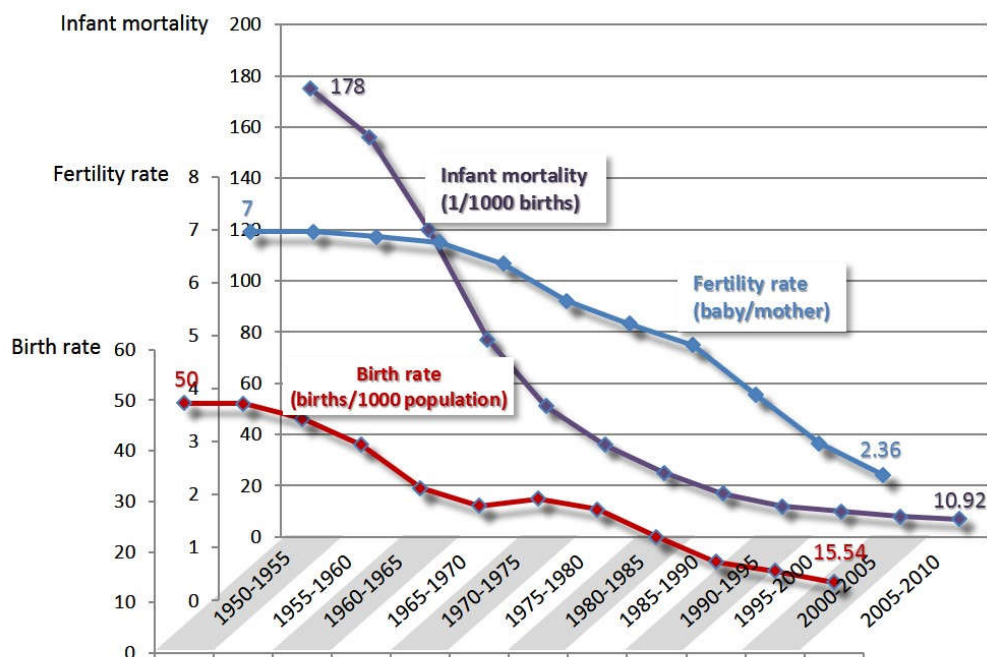


Fig. 6: Trends of infant mortality, fertility rate and birth rate in the United Arab Emirates, 1950-2010. *Note: the United Arab Emirates was established in 1971, so preceding data relate to the population living in the area of the country.*

Rate of infant mortality is generally considered a measure of a country's healthcare infrastructure [Preston, 2001]. Thus, the fall of infant mortality from 180/1000 births (1950) to 10.92/1000 births (2010) over sixty years signifies the foundation and development of local healthcare. It may be of interest to note that the first hospital in Abu Dhabi (capital city of the UAE) was only founded in the late sixties, whereas healthcare facilities had already been functional in Dubai and Sharjah since the mid-40s [Beshyah, 2013]. Fertility rate (number of babies born to a mother) also decreased from 7 (1950) to 2.36 (2010). This complex change follows the trends universally observed – as already mentioned - in other Arab countries.

Transition from the Trucial States (1853-1968) to the United Arab Emirates (since 1971) reveals special characteristics of the sociodemographics. (Fig. 7) Settled population was scarce and centered in coastal villages, whereas the Bedouin moved freely across the desert [Thesiger, 1959]. Traditions and customs were rooted in Islam that also directed everyday life. Neither external cultural factors, nor foreign population (immigrants) stimulated an effect on local trends (Fig. 7A). The oil-era prompted significant immigration and Emirati population has quickly become a minority. Industry, commerce and trade introduced effects

of globalization. Immigrants brought their own culture and traditions, however Islam remained a common denominator (**Fig. 7B**). Negative effects of globalization resulted in a quick spread of civilizational diseases; e.g. type 2 diabetes mellitus affects 1 in four Emiratis, which is the highest prevalence on the globe [United Health Group, 2011]. (**Fig. 7C**) As most immigrants have been Muslims themselves, it was natural that fundamentals of Islam grew in importance over the last decades. That parallels a general trend of desecularization observed elsewhere in the Middle East [Huntington, 1988]. Lastly, Emirati citizenship conveys benefits of free access to education and healthcare, heavy subsidies on utilities, even monthly cash allowance (!), etc. All these amenities could be lost if an Emirati married outside the tribal (=nationality) system; so, extracommunity marriage is discouraged. There are cross-cultural and cross-community links established at professional level, however, they hardly exist in personal interaction. As a result, reproductive groups are much segregated in the UAE: Emiratis have family with Emiratis, people from India with Indians, Middle Easterners with fellow Arabs from the Middle East, etc. Small, secluded reproductive groups boost the occurrence of unfavorable traits [Campbell et al, 2007]. This phenomenon duly echoes the segregation mentioned about Pakistani expats living in Britain (see at Consanguinity and below).

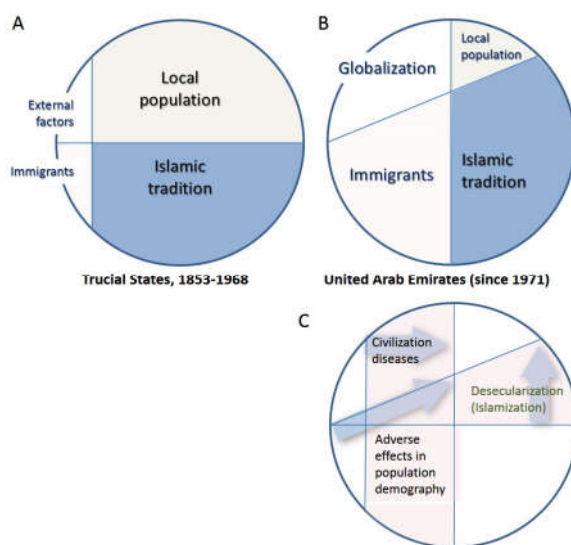


Fig. 7: Comparative effect of external factors and the Islamic tradition on the local population and immigrants (A) in the Trucial States, (B) United Arab Emirates, (C) along with the trends introduced by transition.

Congenital heart disease (CHD) offers unique insight as nearly all patients get diagnosed and receive treatment early in life. CHD has higher prevalence in segregated communities, e.g. it is 6.25‰ (1/160 births) among the British Pakistanis, whereas surrounding population in the Midlands has 4‰ (1/245 births) (paired t-test,  $p < 0.001$ ) [Townsend et al, 2013]. Increased prevalence of CHD in the UAE is a joint result of several factors: segregated and small reproductive groups, consanguinity and lack of prenatal screening. (**Fig. 8**) These factors not only increase CHD prevalence but also boost its complexity [Király, 2015].

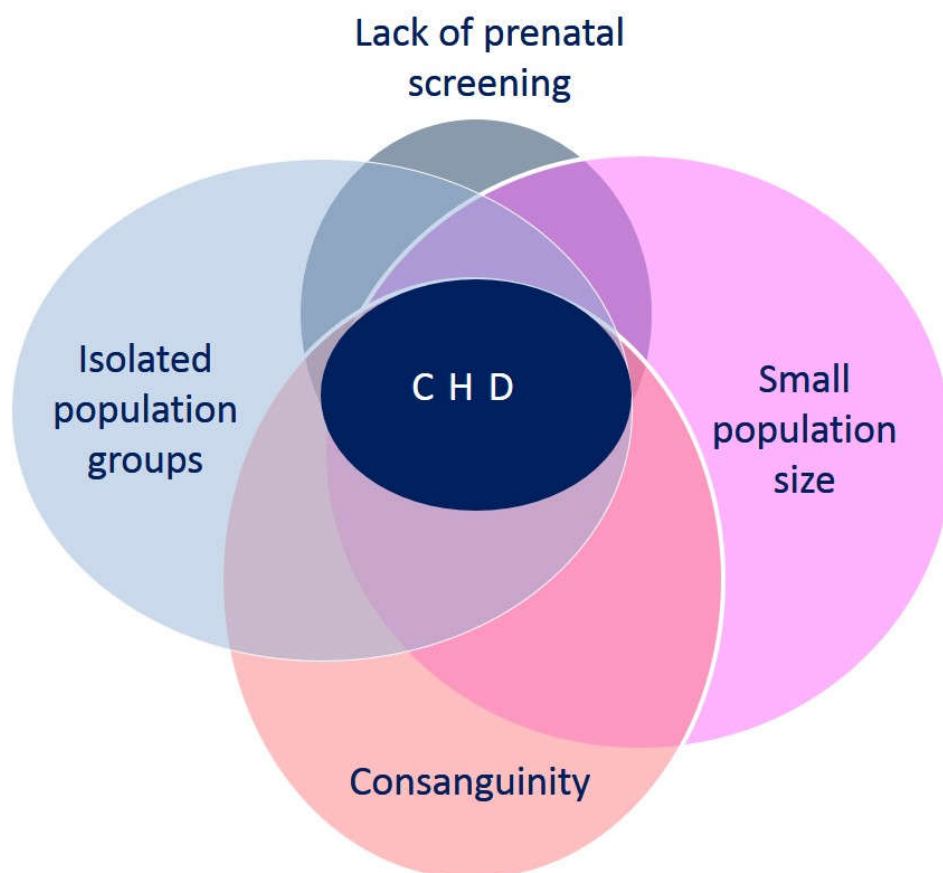


Fig. 8: Increased prevalence of congenital heart disease (CHD) is a joint result of several factors: segregated and small reproductive groups, consanguinity and lack of prenatal screening.

## 5. Discussion

*Levitt and Dubner* suggest an interesting comparison between the fall of Romanian dictator *Nicolae Ceaucescu* and the fall of US homicide rate since the 80s [*Levitt and Dubner, 2008*]. Comrade Ceaucescu made abortion illegal; and it was the millions of unwanted young people who started the protesting against his regime that ultimately led to his demise. In contrast, most US states legalized abortion from the 80s that - they argue - possibly resulted in improved birth control and family planning. Unwanted children without a supportive family background, without prospects other than for crime would not have been born. Thus, since criminals were not around, crime rate fell.

All this may well be an oversimplification, however, demographic factors, i.e. overpopulation - 'youth bulge' - has, indeed, been identified as a driving force of migration, radicalization and prompting the so-called 'Arab Spring' [*Zohry, 2010*]. Nearly all of the overpopulated Maghreb and Mashriq countries experienced political destabilization: uprising against the regime (Tunisia and Egypt), smouldering civil war (Algeria, Lebanon), to complete disintegration of the state (Lybia, Syria, Iraq and Yemen). A common denominator in all these civil movements is the involvement of a young generation who lost the prospects for a

successful professional and personal future and wealth. The ruling political regimes in these countries missed the opportunity to integrate the majority of the new generation in the labour market, allow them prospects, development, etc.

The Gulf countries have been in a much different situation. Their population numbers and growth have been unable to fulfil the requirements of developing oil-based economy. Rooted in British colonial rule, when governmental infrastructure was administered by civil servants imported from India by the British, immigrant working force was mainly imported from Indian subcontinent. Indian, Pakistani and South East Asian working force has traditionally been much cheaper and easier to control than fellow Arabs from the Middle East. The Gulf countries – most of them strict autocracies – only yield themselves to Pan-Arab movement in words; they are lenient to finance migration camps abroad rather than liberalizing their own immigration policy.

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