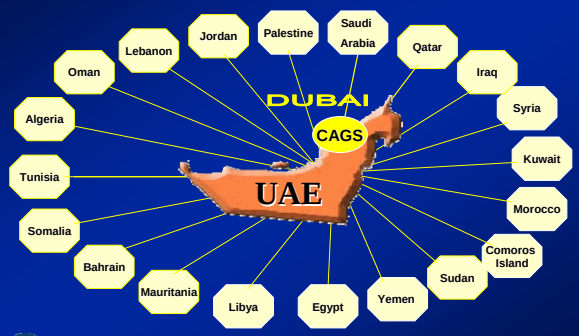
CTGA: The Database for Genetic Disorders in Arabs

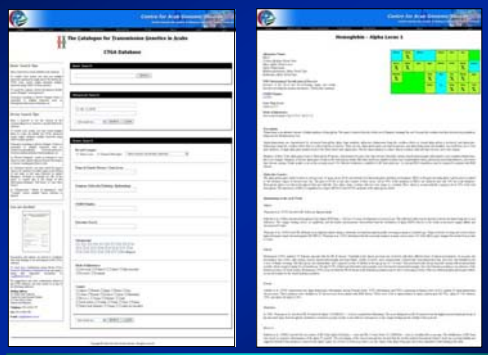
Ghazi Omar Tadmouri

Centre for Arab Genomic Studies
Dubai, United Arab Emirates

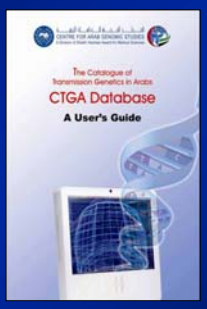
Centre for Arab Genomic Studies



The CTGA Database: Search & Results

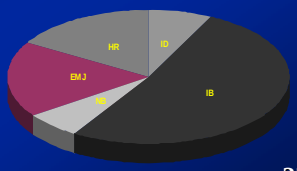


The CTGA Database: A User's Guide



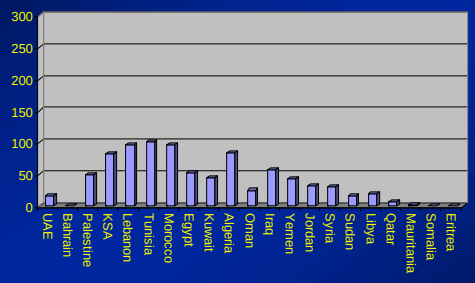
Data Collection Model: UAE

- International Databases
- International Bibliographies
- National Bibliographies
- Emirates Medical Journal
- Hospital Records

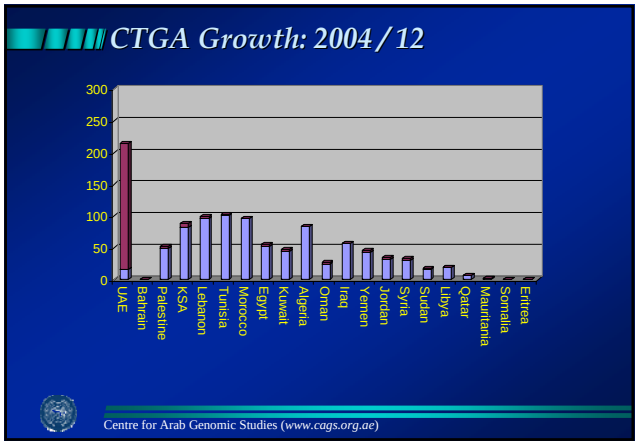


228

CTGA Growth: 2004 / 09



UAE


CTGA Growth: 2004 / 12
300
250
200
150
100
50
0
UAE
Bahrain
Palestine
KSA
Lebanon
Tunisia
Morocco
Egypt
Kuwait
Algeria
Oman
Iraq
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Mauritania
Somalia
Eritrea
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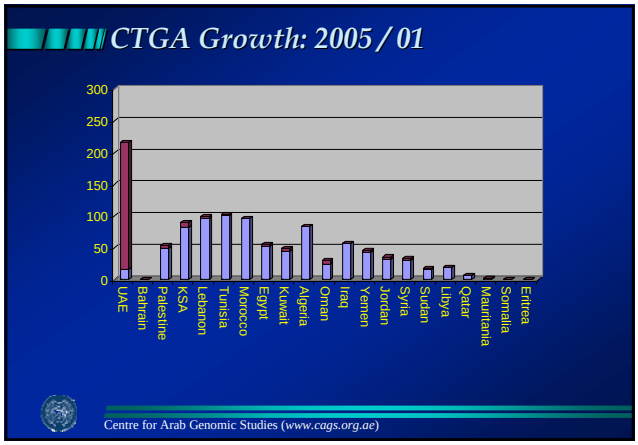
CTGA Growth: 2005 / 01
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Eritrea
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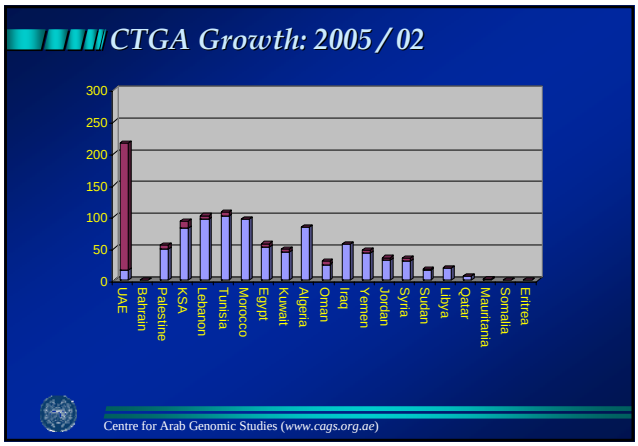
CTGA Growth: 2005 / 02
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Eritrea
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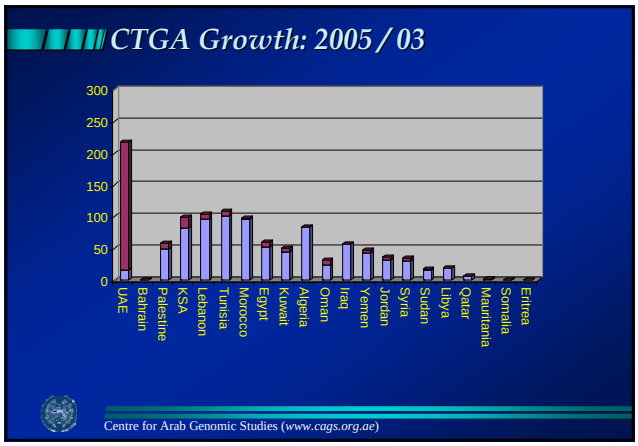
CTGA Growth: 2005 / 03
300
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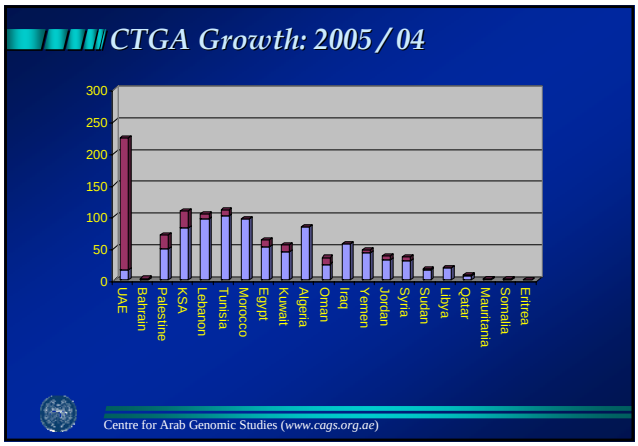
CTGA Growth: 2005 / 04
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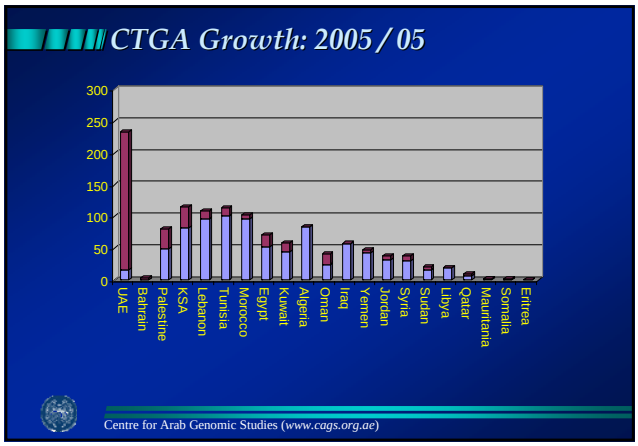
CTGA Growth: 2005 / 05
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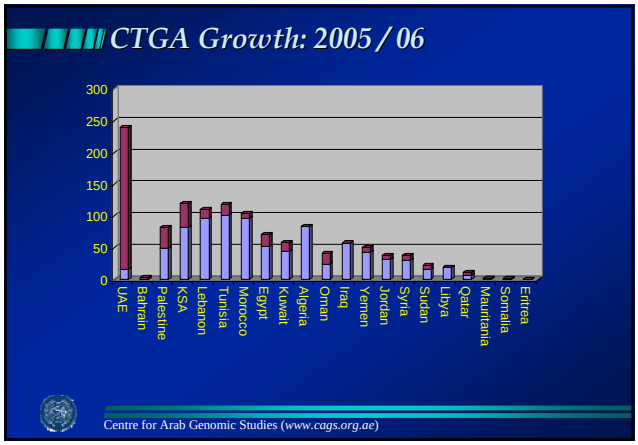
CTGA Growth: 2005 / 06
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UAE
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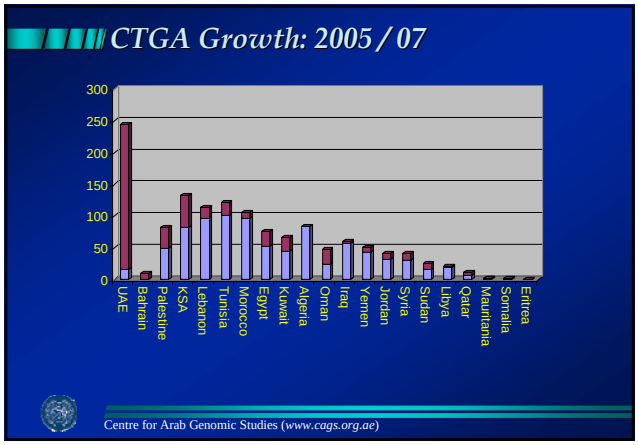
CTGA Growth: 2005 / 07
300
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Eritrea
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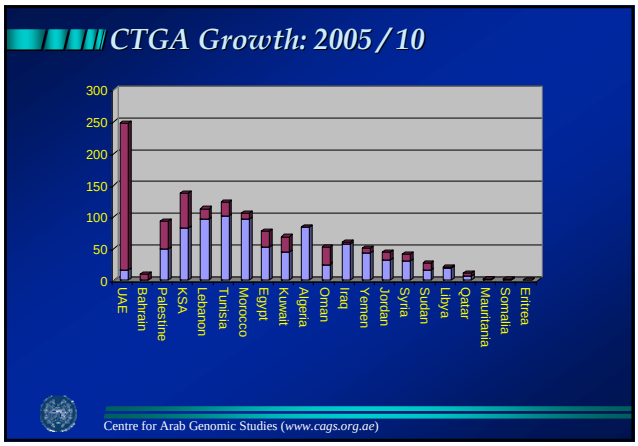
CTGA Growth: 2005 / 10
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Eritrea
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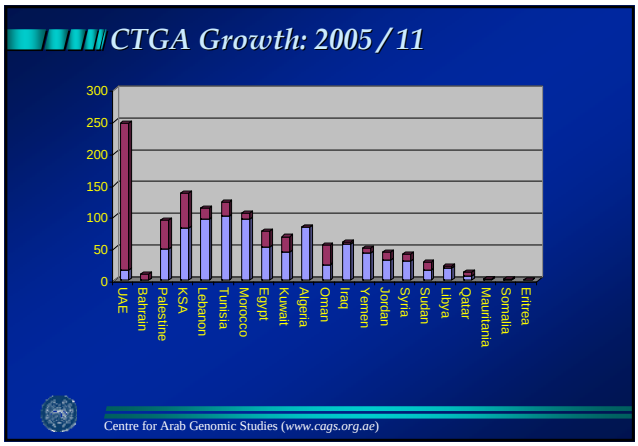
CTGA Growth: 2005 / 11
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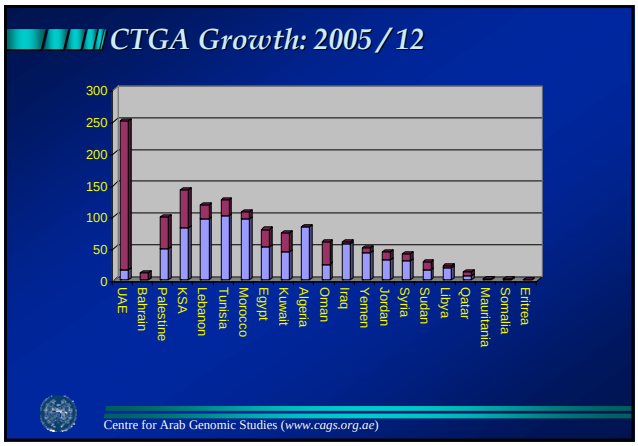
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Eritrea
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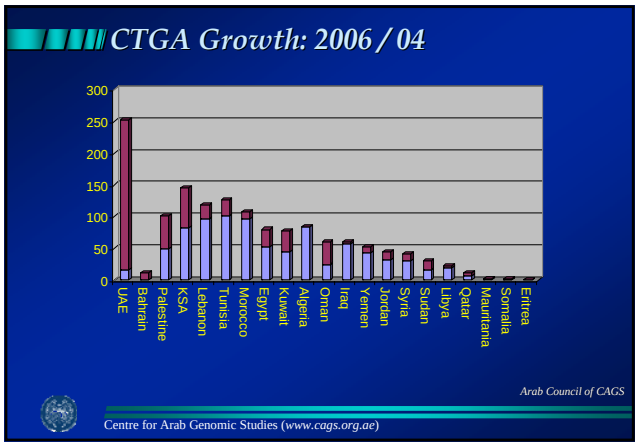
CTGA Growth: 2006 / 04
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Arab Council of CAGS
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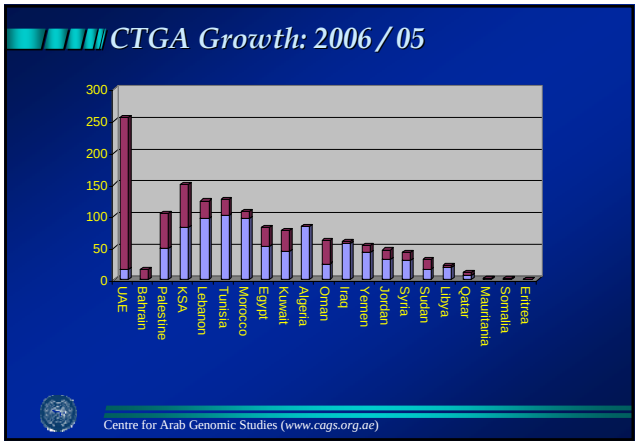
CTGA Growth: 2006 / 05
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Eritrea
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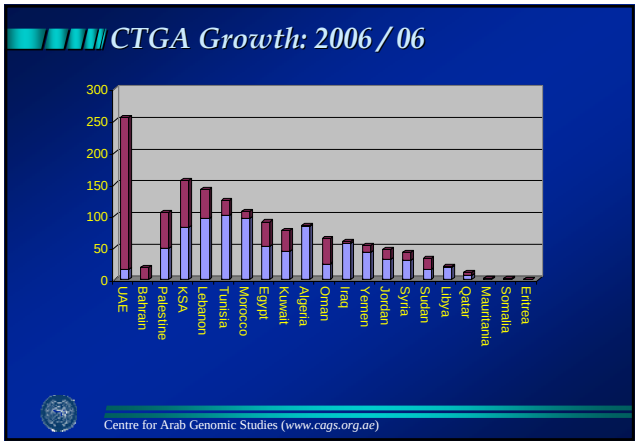
CTGA Growth: 2006 / 06
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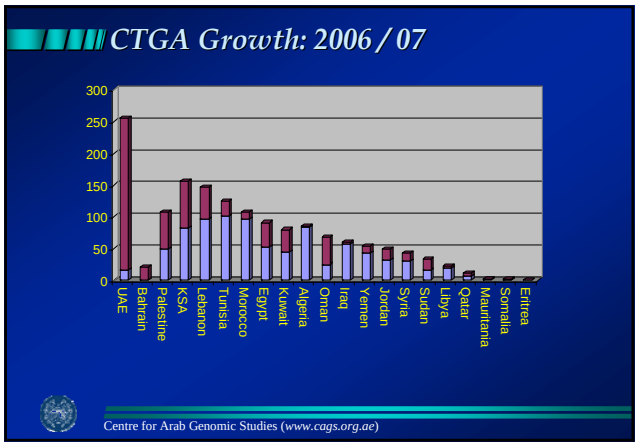
CTGA Growth: 2006 / 07
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Eritrea
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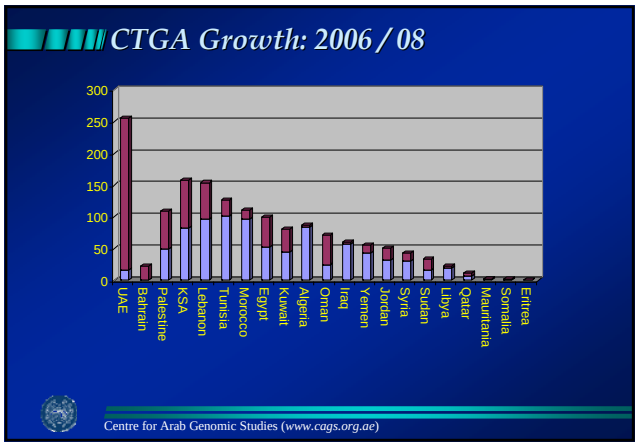
CTGA Growth: 2006 / 08
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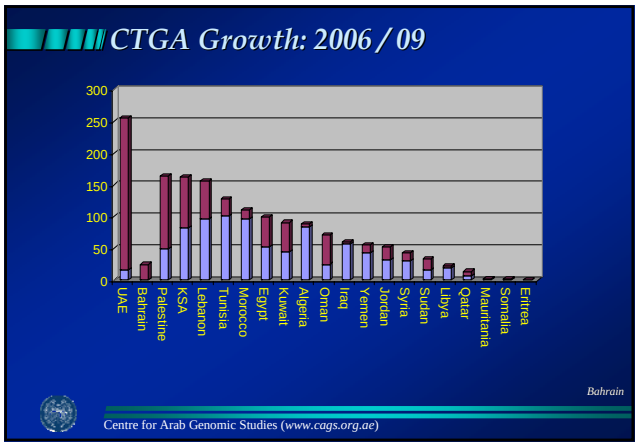
Somalia
Eritrea
Centre for Arab Genomic Studies (www.cags.org.ae)


CTGA Growth: 2006 / 09
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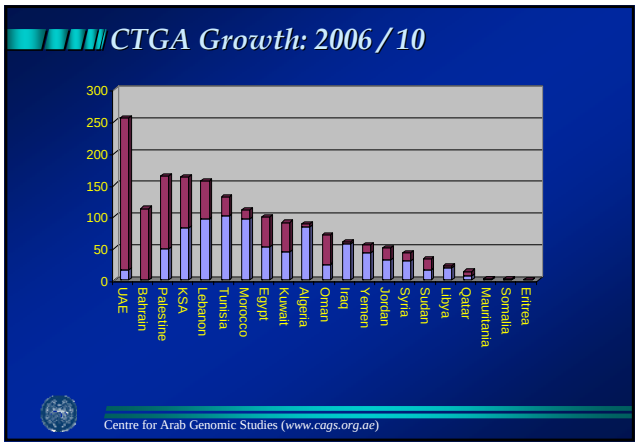
Eritrea
Bahrain
Centre for Arab Genomic Studies (www.cags.org.ae)


CTGA Growth: 2006 / 10
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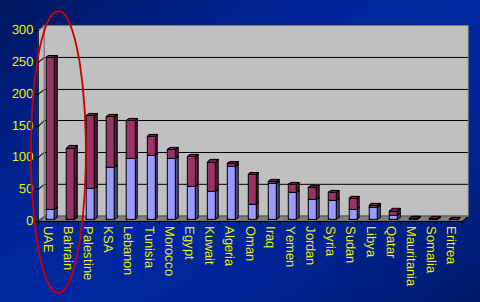
Mauritania
Somalia
Eritrea
Centre for Arab Genomic Studies (www.cags.org.ae)

CTGA Growth: 2006 / 10



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Genetic Disorders in the UAE

228

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Epidemiology of GDs in the UAE

DISEASE	RATE	DISEASE	RATE
Atrioventricular Septal Defect	28.8	Asplenia with Cardiovascular Anomalies	4.1
Down Syndrome	21.4	Pyloric Stenosis, Infantile Hypertrophic 1	4.1
Cryptorchidism, Unilateral or Bilateral	16.5	Synpolydactyly 3	4.1
Clubfoot	14.4	Urogenital Adysplasia, Hereditary	4.1
Hypospadias	12.3	Anencephaly	3.7
Tetralogy of Fallot	12.3	Nijmegen Breakage Syndrome	3.7
Acetabular Dysplasia	8.2	Hydrocephalus	2.5
Neural Tube Defect, Folate-Sensitive	8.2	Diaphragmatic Hernia 1	2.5
Transposition of the Great Arteries, Dextro-Looped	8.2	Osteogenesis Imperfecta, Type I	2.5
Polycystic Kidney Disease, Autosomal Recessive	7	Hypoplastic Left Heart Syndrome	2.1
Orofacial Cleft 1	6.8	Patent Ductus Arteriosus	2.1
Neural Tube Defects	6.2	Pena-Shokeir Syndrome, Type I	2.1
Pierre Robin Syndrome	6.2	Thrombocytopenia--Absent Radius Syndrome	2.1
Polydactyly	6.2	Poland Syndrome	2
Right Pulmonary Artery, Anomalous Origin of, Familial	6.2	Situs Inversus Viscerum	2
Multicystic Renal Dysplasia, Bilateral	6.2	Achondroplasia	1.7

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Epidemiology of GDs in the UAE

DISEASE	RATE	DISEASE	RATE
Meckel Syndrome, Type 1	1.6	Epidermolysis Bullosa, Generalized Atrophic Benign	0.8
Omphalocele	1.6	Fabry Disease	0.8
Fibrochondrogenesis	1.6	Glaucoma 3, Primary Infantile, A	0.8
Hirschsprung Disease	1.4	Pulmonary Hypoplasia	0.8
Chondrodysplasia Punctata, Autosomal Dominant	1.3	Rhizomelic Chondrodysplasia Punctata, Type 1	0.8
Duodenal Atresia	1.2	Thanatophoric Dysplasia	0.6
Pulmonary Hypertension, Primary	1.2	Short-Rib-Polydactyly III	0.5
Spinal Muscular Atrophy, Type I	1.2	Stickler Syndrome, Type I	0.5
Arthrogryposis, Distal, Type 1	1.2	Stuve-Wiedemann Syndrome	0.5
Frontonasal Dysplasia	1.2	Ellis-van Creveld Syndrome	0.5
Cerebrocrostomandibular Syndrome	1.2	Abdominal Muscles, Absence of, with Urinary Tract Abnormality and Cryptorchidism	0.4
Osteogenesis Imperfecta Congenita	0.9	Absence Defect of Limbs, Scalp, and Skull	0.4
Atrial Septal Defect 1	0.8	Saethre-Chotzen Syndrome	0.4
Hypochondroplasia	0.8	Segmentation Syndrome 1	0.4
Coarctation of Aorta	0.8	Asphyxiating Thoracic Dystrophy	0.4
Dandy-Walker Syndrome	0.8		

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Epidemiology of GDs in the UAE

DISEASE	RATE	DISEASE	RATE
Autonomic Control, Congenital Failure of	0.4	Joubert Syndrome 1	0.4
Conotruncal Heart Malformations	0.4	Campomelic Dysplasia	0.3
Ectodermal Dysplasia, Anhidrotic	0.4	Asphyxiating Thoracic Dystrophy	0.3
Facial Ectodermal Dysplasia	0.4	Chondrodysplasia Punctata 2, X-Linked Dominant	0.3
Fanconi Anemia	0.4	Osteogenesis Imperfecta, Progressively Deforming, with Normal Sclerae	0.3
Gaucher Disease, Type II	0.4	Osteopetrosis, Autosomal Recessive	0.3
Hutchinson-Gilford Progeria Syndrome	0.4	Schneckenbecken Dysplasia	0.3
Hydrocephalus due to Congenital Stenosis of Aqueduct of Sylvius	0.4		
Ichthyosis, Lamellar, 1	0.4		
Krabbe Disease	0.4		
Oculopalatoskeletal Syndrome	0.4		
Pancreas, Annular	0.4		
Protein S, Alpha	0.4		
Robinow Syndrome, Autosomal Recessive	0.4		
Suppressor of Tumorigenicity 8	0.4		
Tracheoesophageal Fistula with or without Esophageal Atresia	0.4		

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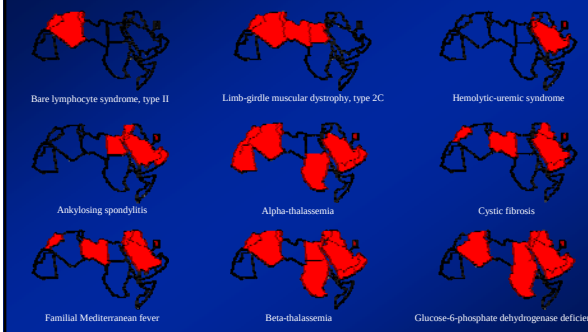
Geography of GDs in the Arab World



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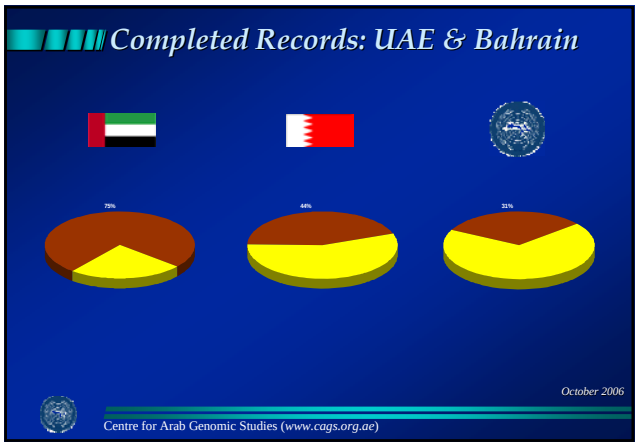
Completed Records: UAE & Bahrain
75%
46%
31%
October 2006
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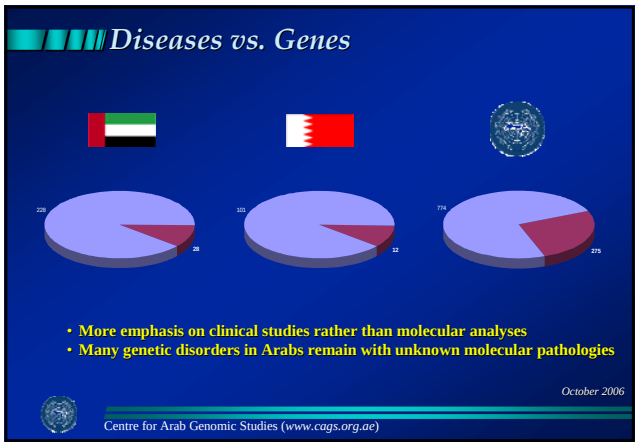
Diseases vs. Genes
226
28
101
12
774
275
• More emphasis on clinical studies rather than molecular analyses
• Many genetic disorders in Arabs remain with unknown molecular pathologies
October 2006
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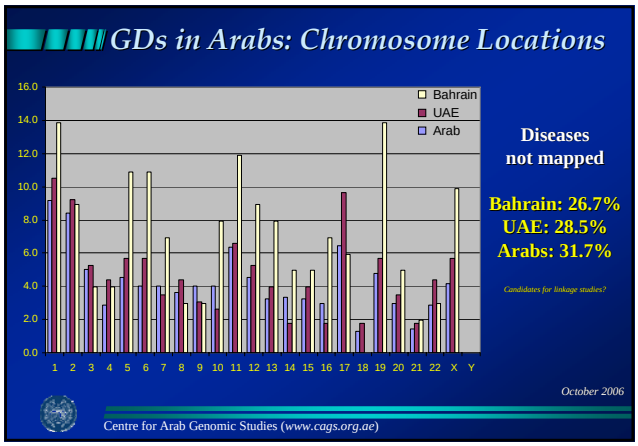
GDs in Arabs: Chromosome Locations
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Bahrain
UAE
Arab
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 X Y
Diseases not mapped
Bahrain: 26.7%
UAE: 28.5%
Arabs: 31.7%
Candidates for linkage studies?
October 2006
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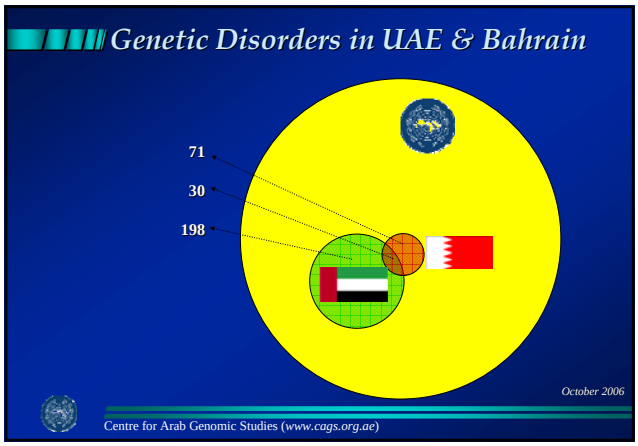
Genetic Disorders in UAE & Bahrain
71
30
198
October 2006
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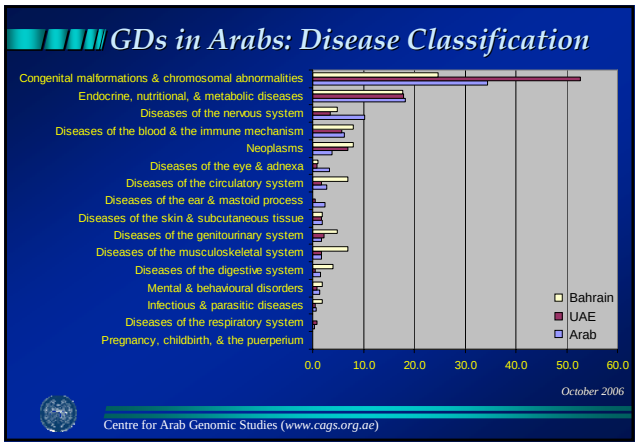
GDs in Arabs: Disease Classification
Congenital malformations & chromosomal abnormalities
Endocrine, nutritional, & metabolic diseases
Diseases of the nervous system
Diseases of the blood & the immune mechanism
Neoplasms
Diseases of the eye & adnexa
Diseases of the circulatory system
Diseases of the ear & mastoid process
Diseases of the skin & subcutaneous tissue
Diseases of the genitourinary system
Diseases of the musculoskeletal system
Diseases of the digestive system
Mental & behavioural disorders
Infectious & parasitic diseases
Diseases of the respiratory system
Pregnancy, childbirth, & the puerperium
Bahrain
UAE
Arab
0.0 10.0 20.0 30.0 40.0 50.0 60.0
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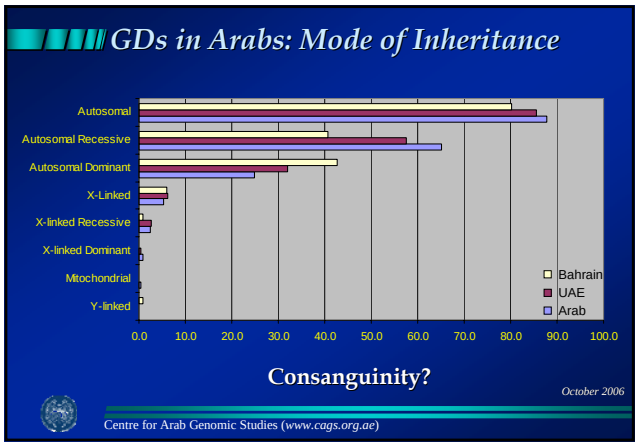
GDs in Arabs: Mode of Inheritance
Autosomal
Autosomal Recessive
Autosomal Dominant
X-Linked
X-linked Recessive
X-linked Dominant
Mitochondrial
Y-linked
Bahrain
UAE
Arab
0.0 10.0 20.0 30.0 40.0 50.0 60.0 70.0 80.0 90.0 100.0
Consanguinity?
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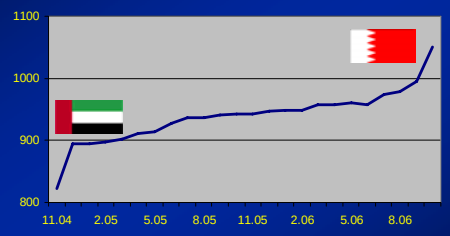
CTGA Growth



October 2006

Genetic Disorders in Arab Populations

Nucleic Acids Res. & Nature Genetics

Editorials in *Nature* (**441**, 1027, 2006) and *The Lancet* (**367**, 959, 2006) earlier this year have reviewed the prospects for international funding of regional research and for the restructuring of medical education and practice in response to the three United Nations Arab Human Development Reports, respectively. For recommendations to become reality, practical examples are needed that can be sustained, copied and amplified by the efforts of others. From this journal's perspective, an excellent example of such a seed is provided by the Centre for Arab Genomic Studies (CAGS; http://www.cags.org.ae/index.html) established in Dubai by the Sheikh Hamdan Bin Rashid Al Maktoum Award for Medical Sciences.

Centre for Arab Genomic Studies

Sheikh Hamdan Bin Rashid Al Maktoum Award for Medical Sciences

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