Diet & Breast Cancer in the Middle East:
A First Look

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Outline

- **BC in Middle East: prevalence & mortality**

- **Risk Factors for BC**
  - **Convincing evidence:**
    - **Alcohol consumption**
    - **Lactation**
    - **Obesity**
  - **Limited Evidence:**
    - **Fats**
    - **Sugars**
    - **Dietary patterns**
    - **Vitamin D**
    - **Folate**

- **Diet & BC in ME**

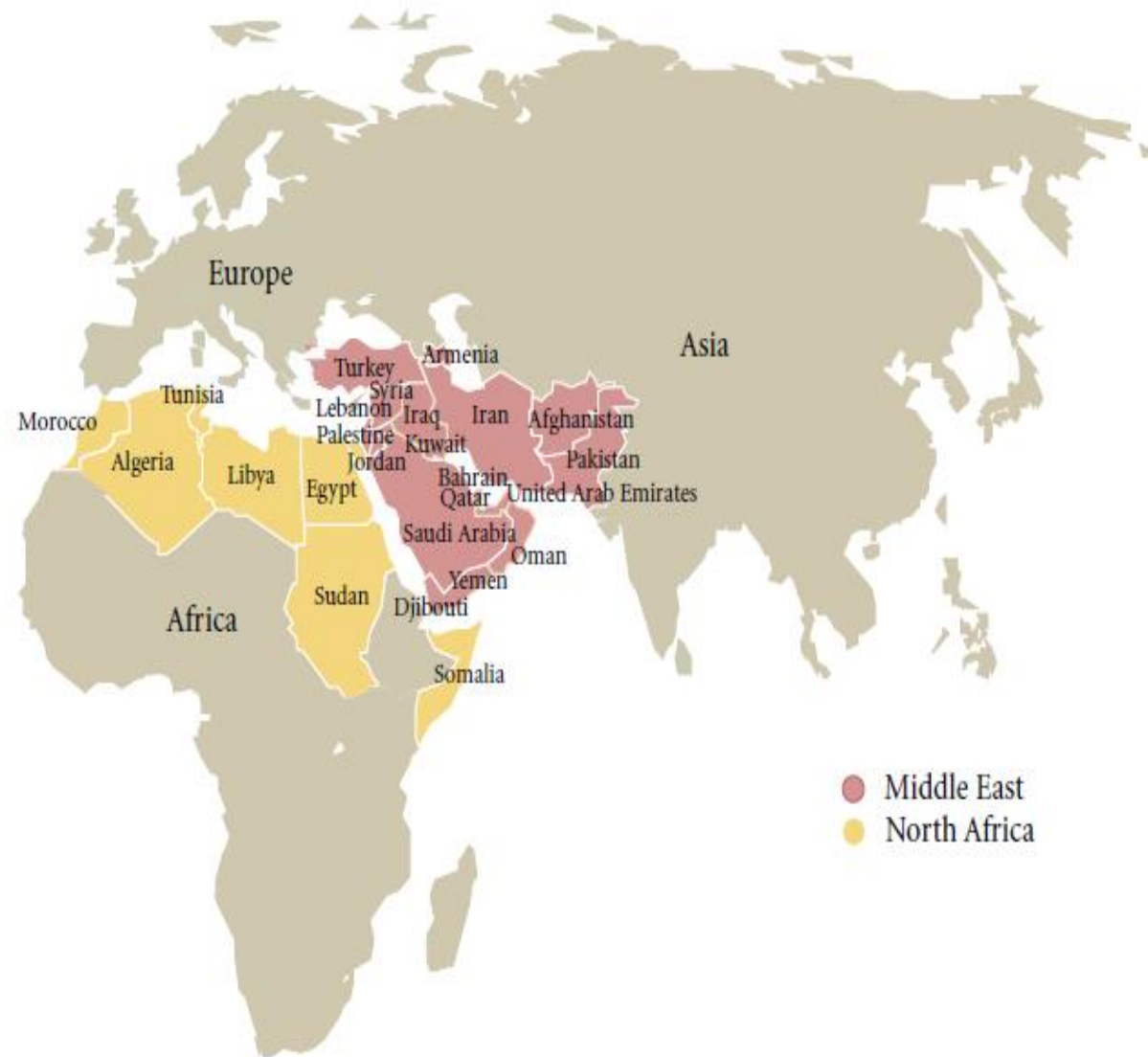- **Evidence for association between Diet & BC in ME**

FIGURE 1: Map of the Middle East and North Africa (MENA) region. The MENA region includes countries such as Algeria, Armenia, and Turkey, that are not members of the WHO Eastern Mediterranean Region (EMR) that is referred to in the literature.

BC in ME vs. West: lower incidence rates & similar mortality rates

Estimated Age-Standardized BC Incidence and Mortality Rates per 100,000 by World region. Source: GLOBOCAN
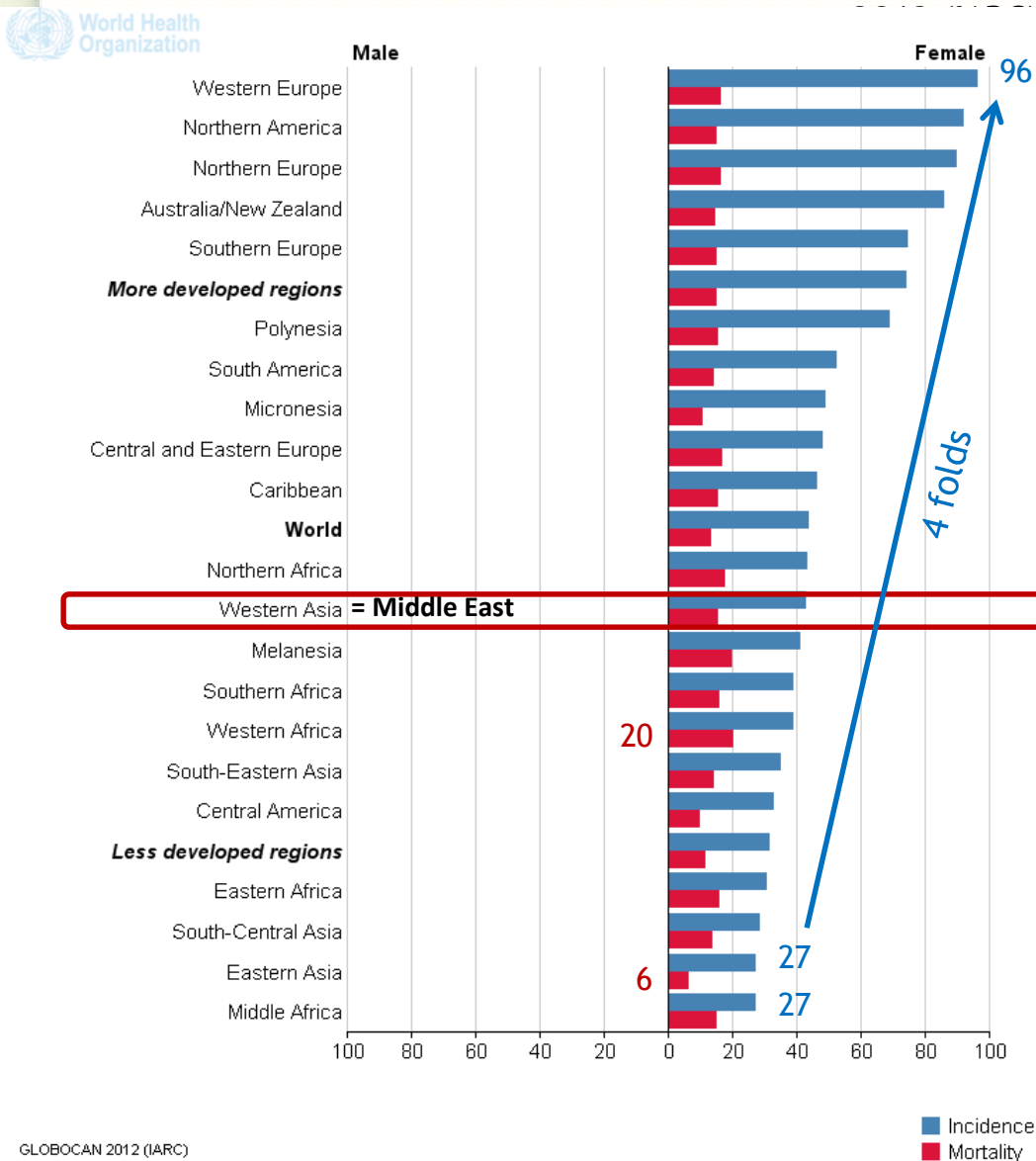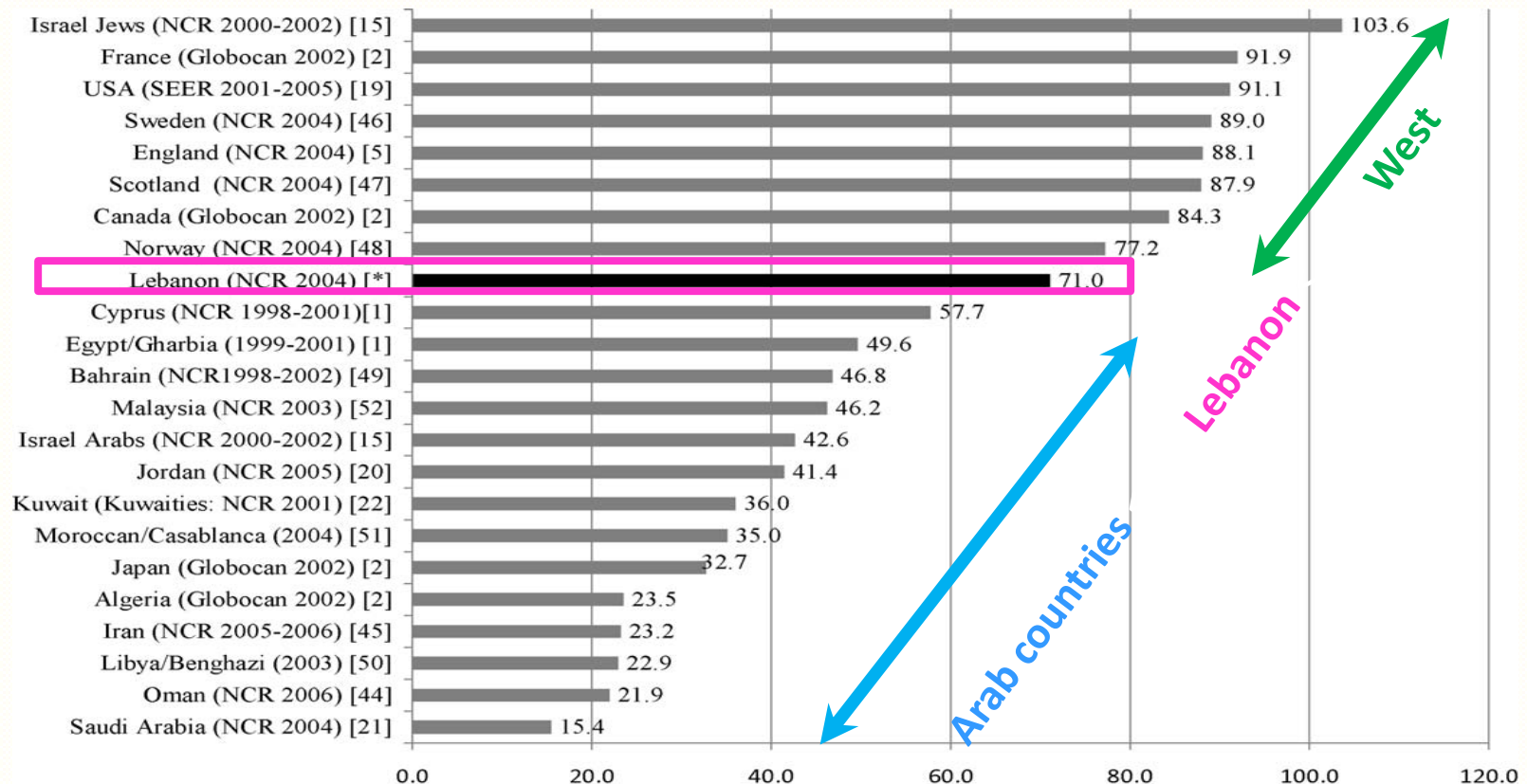

❖ lack of early detection programs & adequate diagnosis

❖ Lack of access to treatment facilities

GLOBOCAN 2012 (IARC)

Faculty of Agricultural and Food Sciences

BC incidence rates: Lebanon vs. West

Age-standardized incidence rate (/100,000) for BC in Lebanese females compared to other countries

Country	Rate
Israel Jews (NCR 2000-2002) [15]	103.6
France (Globocan 2002) [2]	91.9
USA (SEER 2001-2005) [19]	91.1
Sweden (NCR 2004) [46]	89.0
England (NCR 2004) [5]	88.1
Scotland (NCR 2004) [47]	87.9
Canada (Globocan 2002) [2]	84.3
Norway (NCR 2004) [48]	77.2
Lebanon (NCR 2004) [*]	71.0
Cyprus (NCR 1998-2001)[1]	57.7
Egypt/Gharbia (1999-2001) [1]	49.6
Bahrain (NCR1998-2002) [49]	46.8
Malaysia (NCR 2003) [52]	46.2
Israel Arabs (NCR 2000-2002) [15]	42.6
Jordan (NCR 2005) [20]	41.4
Kuwait (Kuwaities: NCR 2001) [22]	36.0
Moroccan/Casablanca (2004) [51]	35.0
Japan (Globocan 2002) [2]	32.7
Algeria (Globocan 2002) [2]	23.5
Iran (NCR 2005-2006) [45]	23.2
Libya/Benghazi (2003) [50]	22.9
Oman (NCR 2006) [44]	21.9
Saudi Arabia (NCR 2004) [21]	15.4

Reference numbers are between square brackets [ ]
[*] Source: Lebanese Ministry of Public Health - Epidemiological Surveillance Program - National Cancer Registry. May 2009

Lebanon: *wide adoption of screening programs & better awareness of BC and its early signs → early diagnosis*

N.A. Lakkis et al. cancer Epidemiology 34(2010) 221-225

ME countries	USA & Europe
Average age at diagnosis of BC was **48** among 7455 patients from 11 countries including **Lebanon**	median age of BC is ~**63**
65.5% of patients were <50 yrs old in 8 countries	only **25-30%** of patients <50 yrs
	50% of patients >63 yrs

Average age at diagnosis of BC in ME countries is a decade earlier than western countries

H. Najjar, A. Easson , International Journal of Surgery 8 (2010) 448-452
Rodriguez-Cuevas S et al. Cancer 2001;91:863e8.
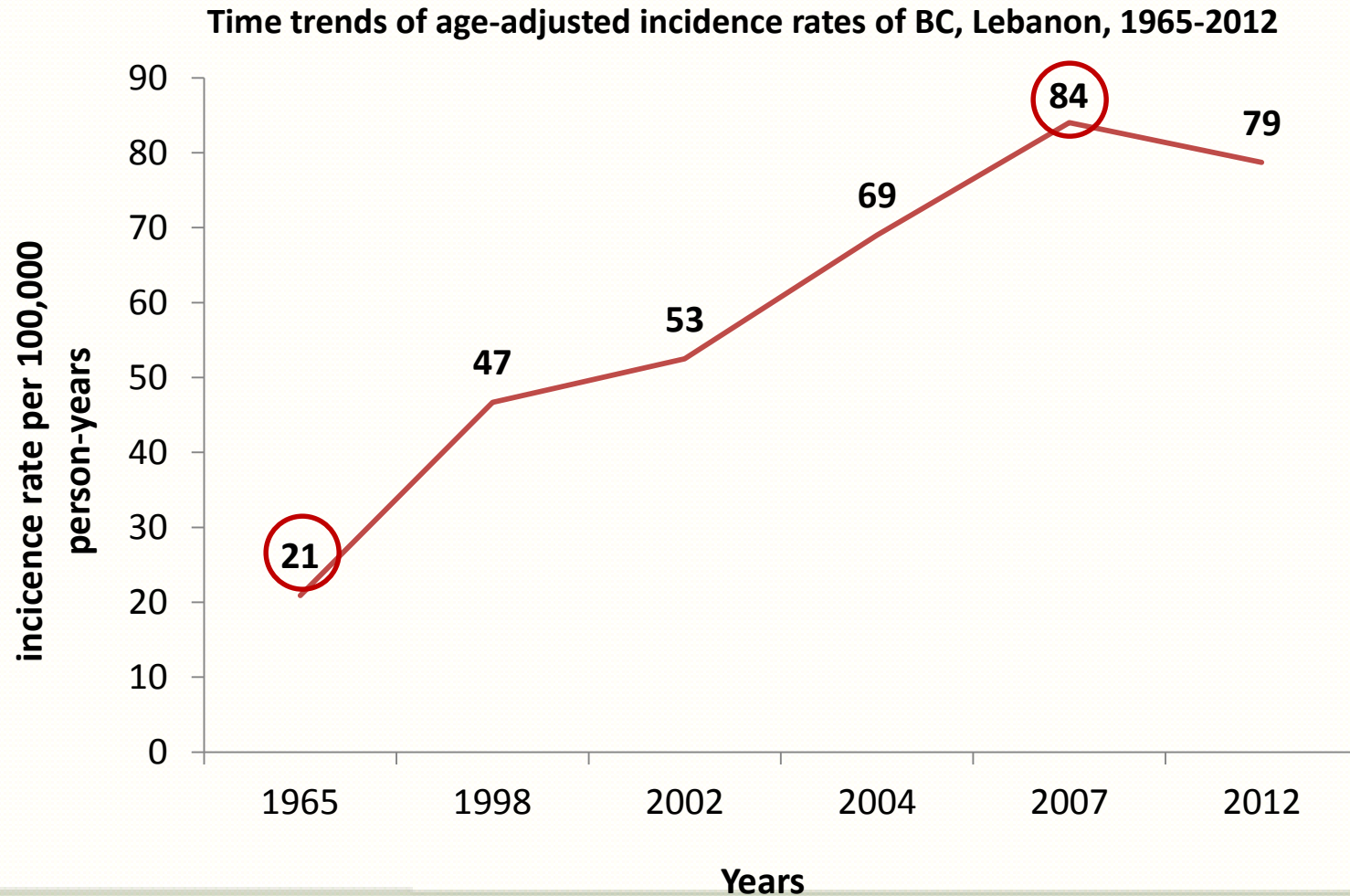
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Why higher BC rates in Lebanon

Compared with <u>region</u>:

1. Adoption of screening programs, more complete registration, better awareness

2. High mean age at marriage

3. Decline in fertility rate

4. Younger menarche & later menopause

5. Use of HRT among Lebanese females

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Lebanon: age-adjusted incidence rate of BC has increased by ~4 fold between 1965 & 2007

Time trends of age-adjusted incidence rates of BC, Lebanon, 1965-2012

Abou Daoud, 1966
Shamseddine et al 2004
National Cancer Registry, 2003
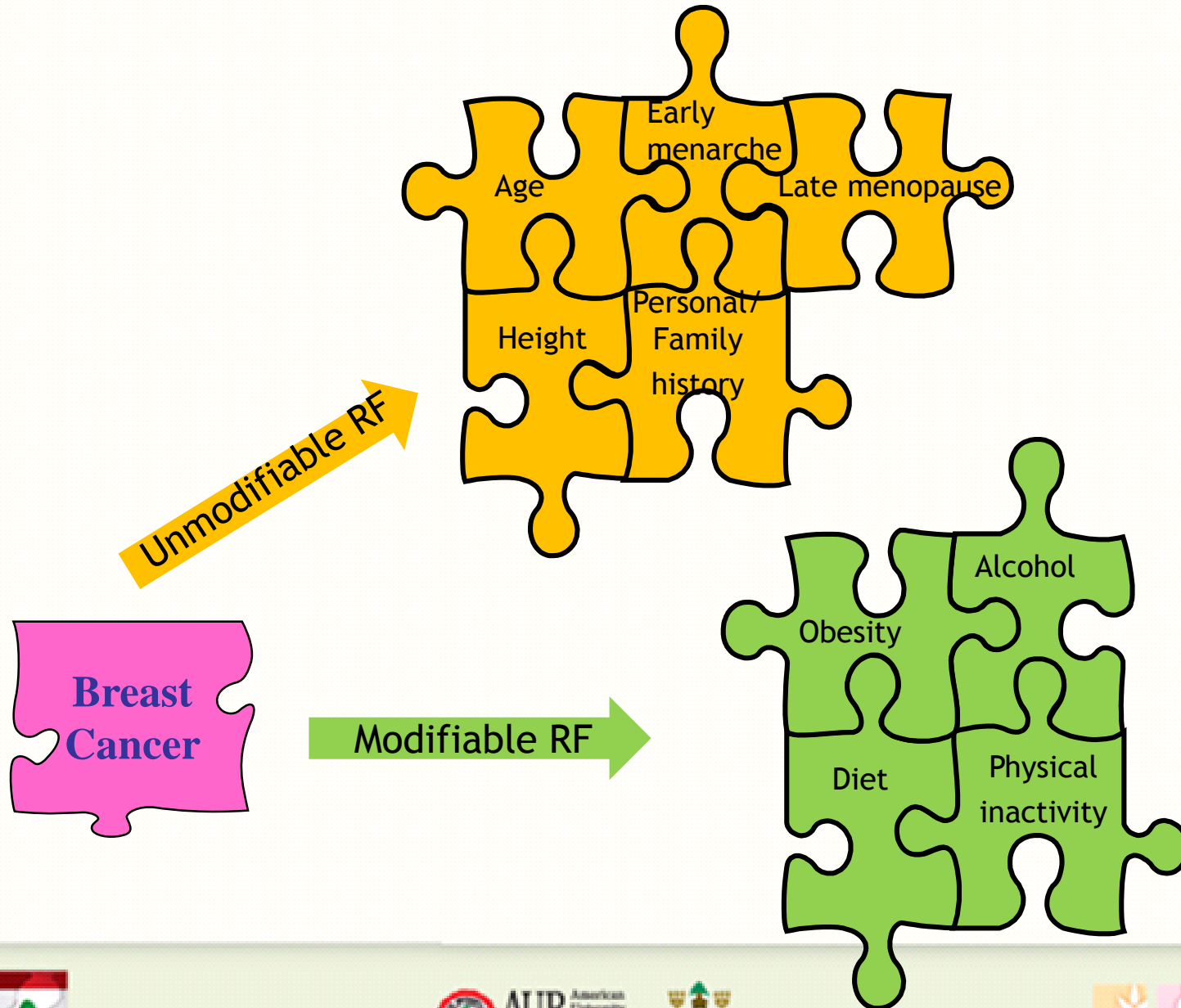Tfayli et al 2010
Globocan 2012

Summary BC in ME

- **Incidence: 1/3rd of total cancer**
  - **Most frequent cancer among women in ME**
  - **Lower than developed countries**
  - **Predicted to increase more than developed countries**
  - **Highest rates in Lebanon, Bahrain & Kuwait**
  - **Lebanon highest rate among ME countries and among age groups 40-49 yrs worldwide**
  - **Lowest rates in KSA & Oman**

Summary Mortality ME

- **Mortality: 1/4th of total cancer**
  - Similar to developed countries
  - Predicted to increase more than developed countries
  - Highest rates in Bahrain & Kuwait
  - Lowest rates in KSA & UAE
- **Diagnosis: a decade earlier than West**

- **Among top 4 most common cancers, with 12 countries out of 21 having BC first**

Risk Factors for BC

Breast Cancer

Unmodifiable RF → Age, Early menarche, Late menopause, Height, Personal/Family history

Modifiable RF → Obesity, Alcohol, Diet, Physical inactivity

Diet & BC in ME

- **Nutrition Transition**
- **↓ alcohol consumption (mostly underreported)**
- **Suboptimal breastfeeding practices**
- **↑ obesity prevalence**
- **↑ fat and sugar intake**
- **Healthy, Western & Traditional dietary patterns**
- **↓ vitamin D, calcium and folate intake**

Nutrition Transition in ME

- Diet is becoming increasingly energy-dense, sweeter, and high in processed foods
  - Traditional Diet → Western Diet

- Increasing adoption of **western lifestyle** in LMIC countries = **important determinant in ↑ of BC incidence** in theses countries
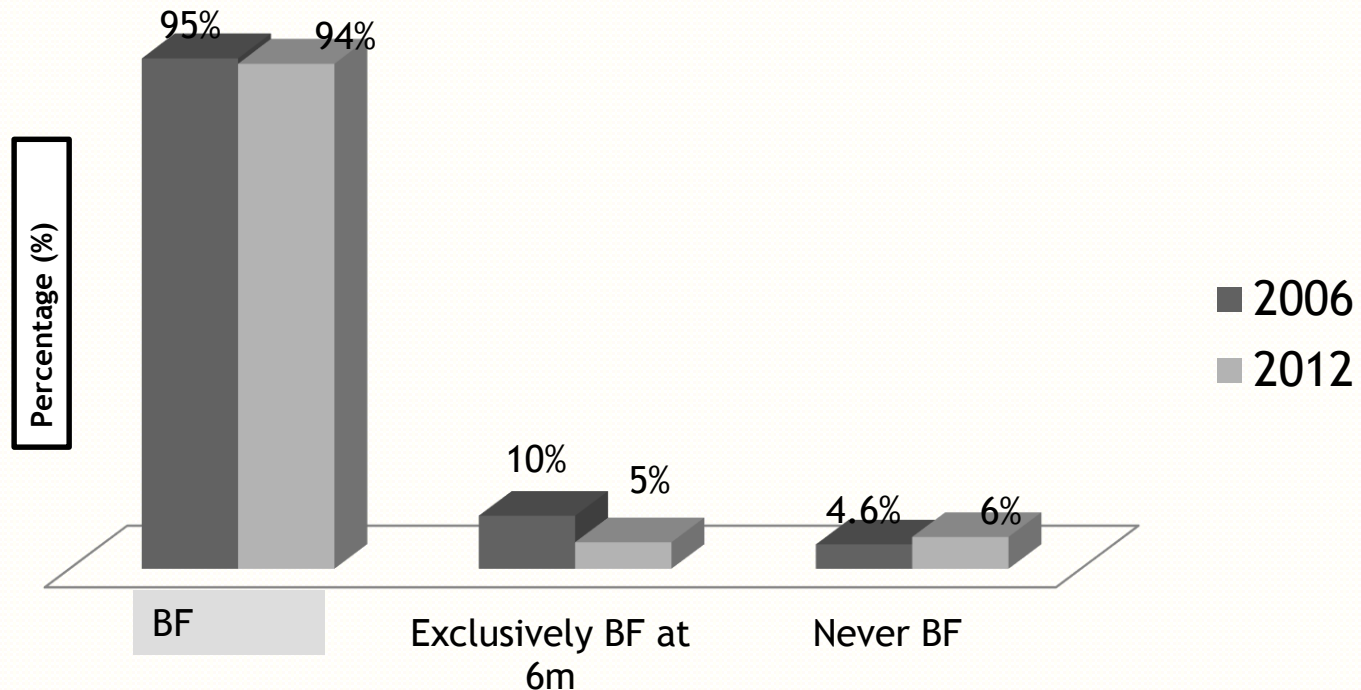
Diet in the Middle East

- ↑ in protein, fat and sugar *(Iraq, Lebanon, Jordan, Kuwait, KSA)*
- ↓ in cereals, fruits & vegetables → ↓ fiber *(Bahrain, Syria, Lebanon)*
- ↑ in processed foods

Sibai et at 2010

Lactation protects against BC

Pooled analysis from 47 epidemiological studies (>50 000 controls and ~97 000 BC cases):

→ statistically significant ↓ risk of BC by 4.3% for every 12 months of breastfeeding

WCRF/AICR. Food, Nutrition, Physical Activity, and the Prevention of Cancer: a Global Perspective, Second Expert Report, 2007

Exclusive BF Practice 2006/2012 - compared

Percentage (%)

95% 94% (BF)
10% 5% (Exclusively BF at 6m)
4.6% 6% (Never BF)

■ 2006
■ 2012

- At 6 months of age, the % of infants who are exclusively BF declined by half in the last 6 years
  - Never BF remains very low

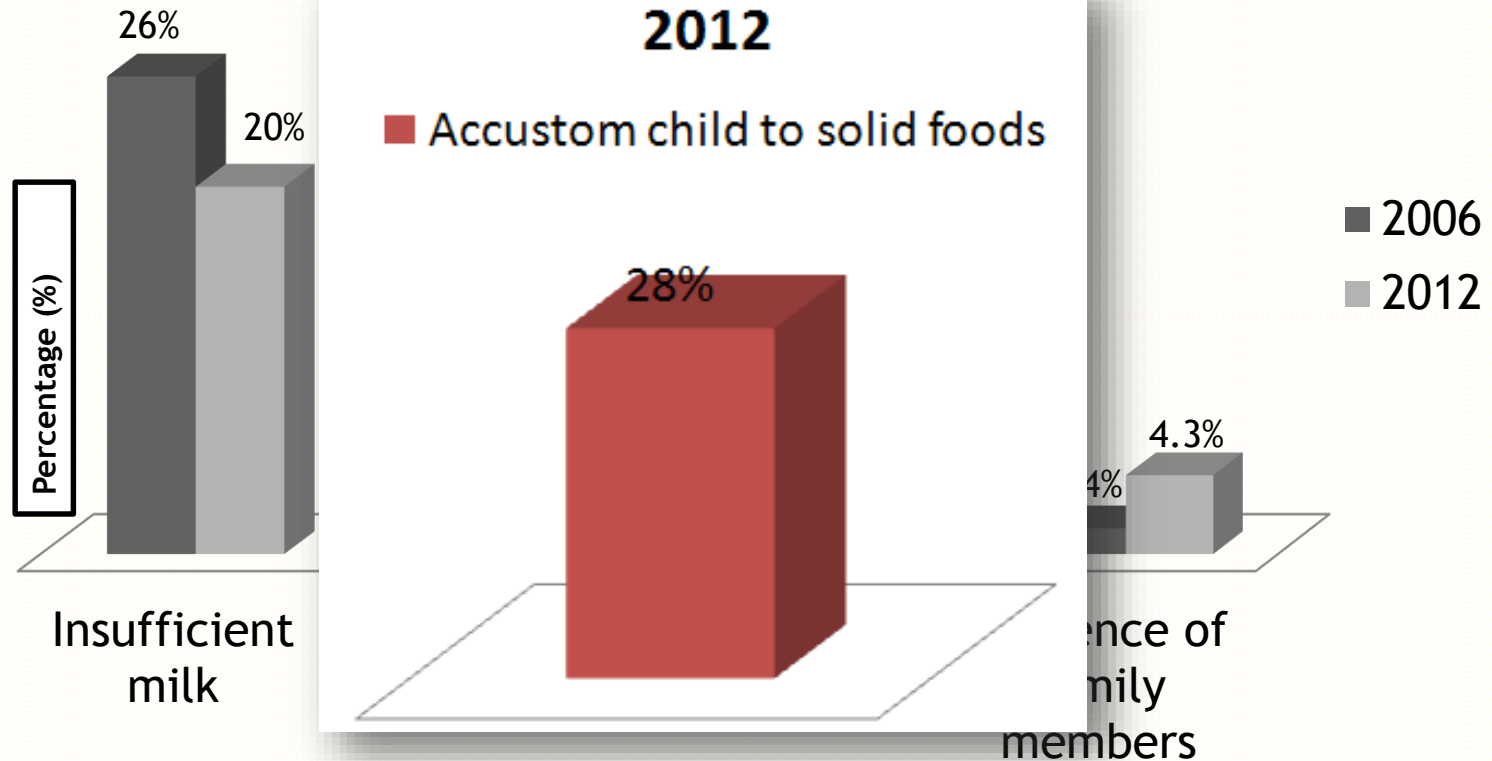Batal et al, 2006; Nasreddine et al, 2012 (unpublished data)

Complementary feeding Practice 2006/2012 - compared
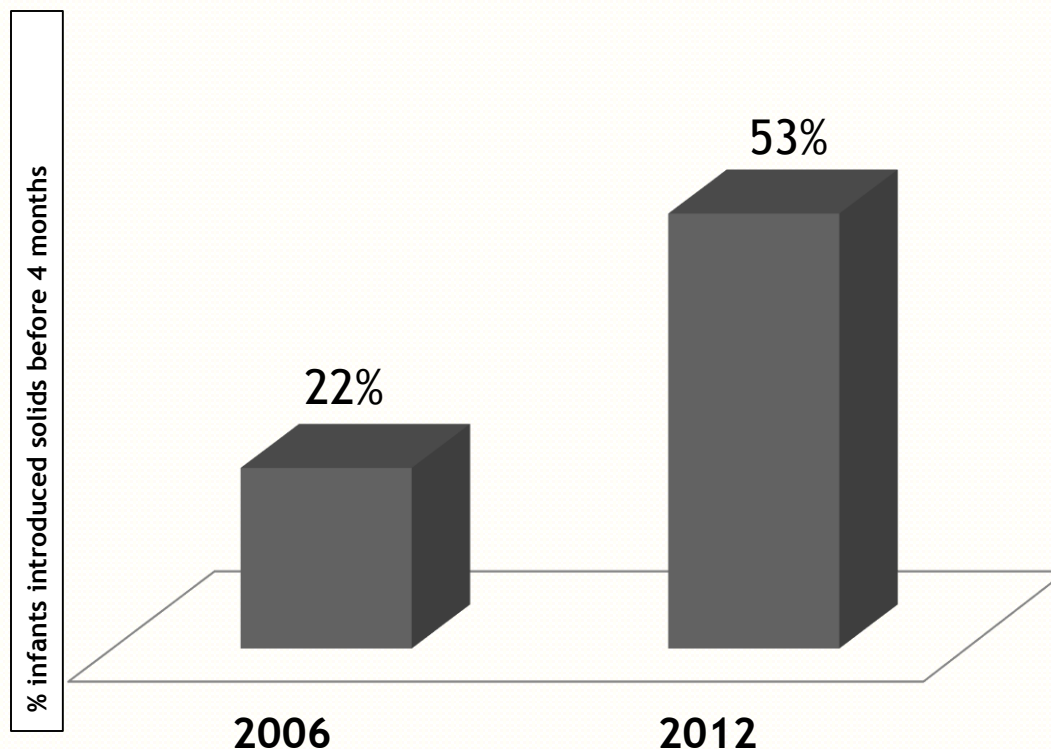
% of infants receiving early introduction of solid foods (<4 months) more than doubled in the last 6 years

Batal et al, 2006; Nasreddine et al, 2012 (unpublished data)

BF Cessation 2006/2012 - compared

2012

■ Accustom child to solid foods

28%

26%

20%

4.3%

Percentage (%)

Insufficient milk

...ence of ...mily members

■ 2006
■ 2012

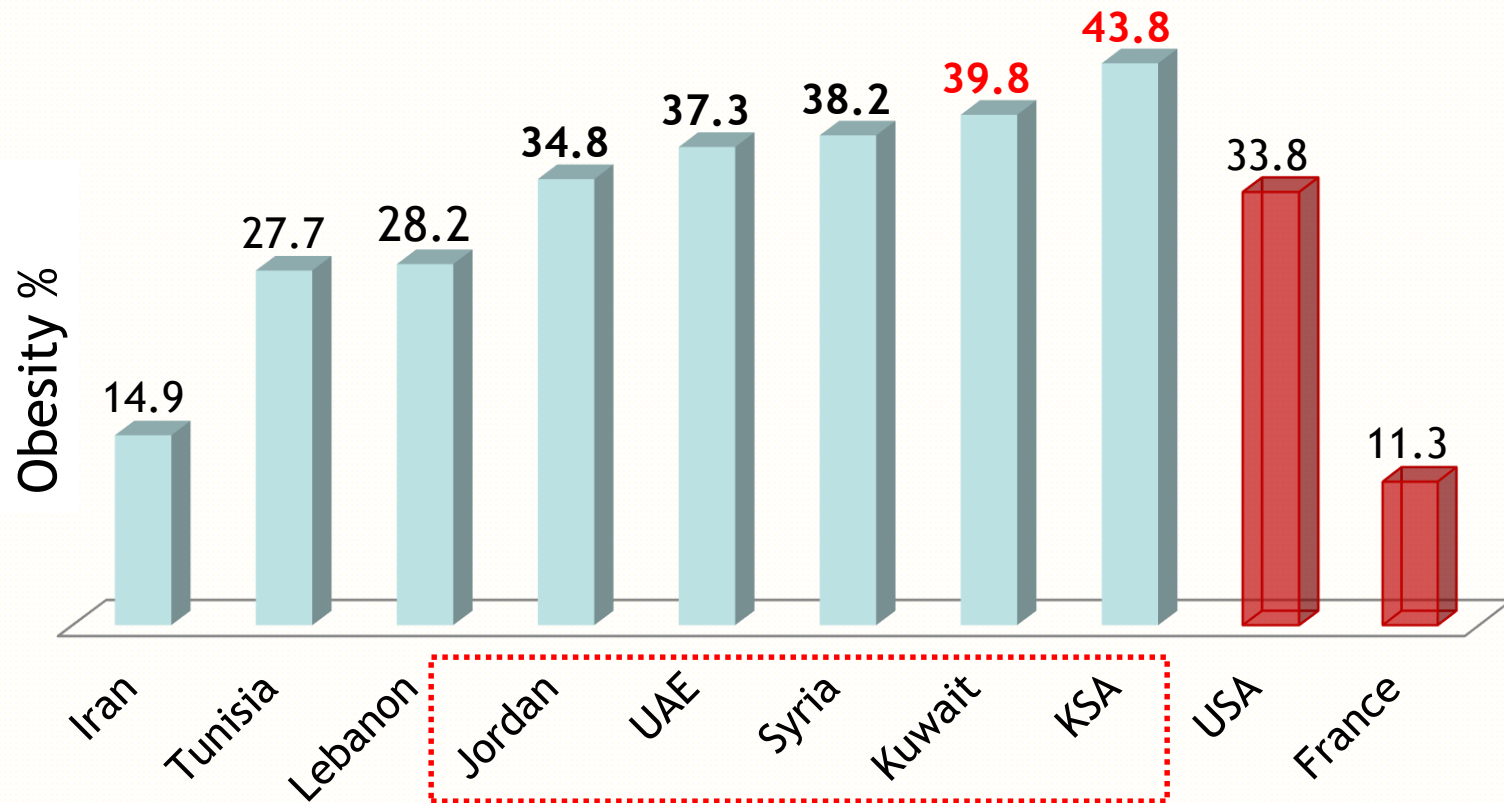# Probable increase in risk of postmenop BC with increased adult weight gain

Meta-analyses:

- cohort studies: 3% ↑ risk per 5kg gained

- case-control studies: 5% ↑ risk per 5kg gain

Figure 6.1.26 Weight gain and postmenopausal breast cancer; cohort and case-control studies

Relative risk (95% CI)

Cohort

	Relative risk, per 5 kg gained
Brestom 2001	1.11 (0.99–1.24)
Folsom 1990	1.11 (1.03–1.20)
Huang 1997	1.05 (1.02–1.08)
Barnes-Josiah 1995	1.03 (1.02–1.03)
Summary estimate	1.03 (1.02–1.04)

Case control

Jemstrom 1999	1.28 (1.05–1.55)
Chie 1998	1.09 (0.84–1.40)
Trentham-Dietz	1.07 (1.05–1.09)
Friedenreich 2002	1.06 (1.01–1.11)
Franceschi 1996	1.04 (1.00–1.07)
Trentham-Dietz 2000	0.97 (0.93–1.01)
Summary estimate	1.05 (1.04–1.07)

Relative risk, per 5 kg gained

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Obesity (BMI≥30) among adults (≥20 years) in MENA

Obesity Prevalence (%) highest in KSA and Kuwait

Increased Fat Intake in the Region

- Contribution of **total fat intake** is ranging between **22% to 45%** among most MENA countries (> DRI = 25-35%)

- The ⬆ **trend in the incidence of NCDs** shown among MENA countries is **in parallel with** ⬆ **SFA intake**

Sibai et al, 2010

Western Pattern associated with high odds of obesity

Only the western pattern associated with high BMI and WC

	BMI (kg/m²)		Waist circumference (cm)	
	β	95% CI	β	95% CI
Western pattern	**0.49**	**0.21,0.76**	**1.08**	**0.39,1.76**
Lebanese Traditional pattern	0.14	-0.12,0.40	0.40	-0.25,1.05
Prudent pattern	0.23	-0.02,0.48	0.59	-0.03,1.21
Fish and Alcohol	0.24	-0.02,0.50	0.39	-0.27,1.04

Naja F et al, 2011

# Summary BC epidemiology in ME:

- 1/3rd of total cancer cases; incidence highest in Lebanon, Bahrain & Kuwait

  and lowest in KSA & Oman

- 1/4th of total cancer deaths; mortality highest in Bahrain & Kuwait and lowest in KSA & UAE

- Predicted to increase more than developed countries

- Diagnosis: a decade earlier than West

- Among top 4 most common cancers

- **Evidence for the association between Diet & BC in ME:**

  - **Lebanon:** western pattern associated with ↑ BMI and WC

Future Research in ME

- **Need for large cohort studies and multidisciplinary approach – consortium**

- **Need for research relating food habits and dietary patterns to BC risk**

- **Implementation of research on determinants of behaviors**

- **Better understanding of early determinants of cancer**

- **Improvement of dietary assessment through biomarkers of exposure and metabolomics**

- **Formulation of adequate database for BC registry**

Lebanon & Qatar: partner countries of IBCN
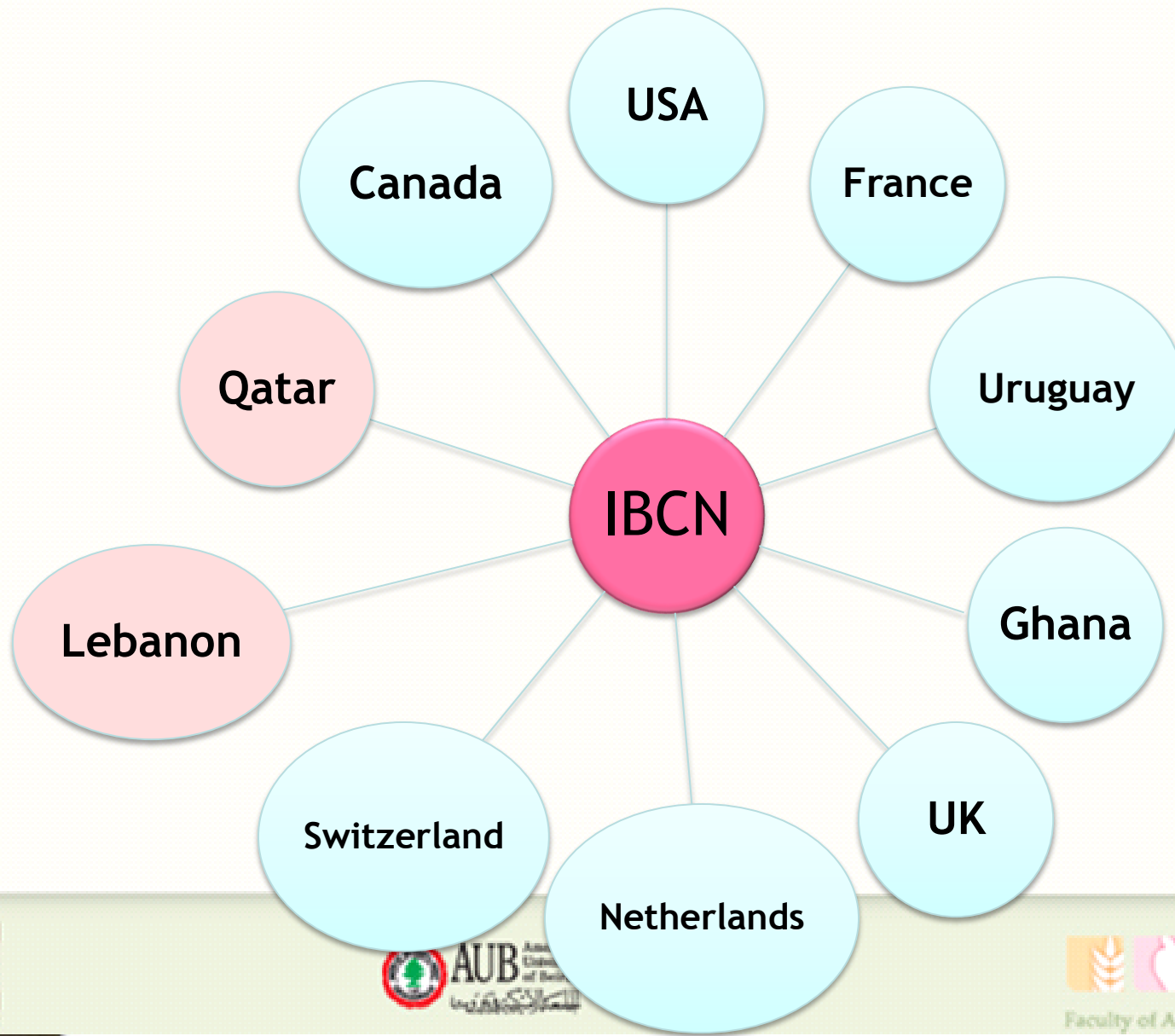
FAFS co-founders of IBCN

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Thank You