

Keynote Presentations

THE SEX OF MENA BIOMEDICAL RESEARCHERS IN 2009 & 2019

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evaluametrics Evaluation of research through publication metrics



ONOMASTICS = STUDY OF NAMES

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Heritage/ethnicity and sex/gender

APPLICATIONS TO SCIENCE POLICY

- Focus on research and authorship of papers in the Web of Science
- Since 2009, authors tagged with addresses and (mostly) have given names
- Studies on sex and the promotion of women – author position/seniority?
- Studies on workforce composition and the treatment of ethnic groups
- Migration of scientists to other countries – where they come from, where they go, and who benefits

THE 20 MENA COUNTRIES - I

- Located in the Middle East & North Africa
- All are majority Muslim



- Also included Turkiye for historical reasons

THE 20 MENA COUNTRIES - 2

Country	ISO	Country	ISO	Country	ISO	Country	ISO
Afghanistan	AF	Iraq	IQ	Morocco	MA	Syria	SY
Algeria	DZ	Jordan	JO	Oman	OM	Tunisia	TN
Bahrain	BH	Kuwait	KW	Palestine	PS	Turkiye	TR
Egypt	EG	Lebanon	LB	Qatar	QA	UAE	AE
Iran	IR	Libya	LY	Saudi Arabia	SA	Yemen	YE

- **Are they permitting or encouraging women to do biomedical research?**
- **Do women get to be senior and so in last author position on papers?**
- **Do they do better in some fields than in others?**

CREATION OF DATABASES - I

- **Biomedical research filter based on address terms**
- **Abbvie, Bethesda, Canc, Diabet*, Emergency, Family, Glaxo*, Hosp, Immun, Janssen, Karolinska, Liver...**
- **Articles + reviews identified in WoS and downloaded for PY=2009 and 2019**
- **In 2009, authors tagged with addresses and many had given names not initials**
- **2019 was BC or before COVID**

CREATION OF DATABASES - 2

- **Data retained for analysis: index, authors, title, addresses, subject**

4902/ Elbawab, Hatem; Alreshaid, Farouk; Hashem, Tariq; Alnasser, Asayil; Husain, Raja; Aljehani, Yasser/ Intercostal hemangioma: Case report of a rare chest wall tumor in childhood/ [Elbawab, Hatem; Alreshaid, Farouk; Alnasser, Asayil; Husain, Raja; Aljehani, Yasser] Imam Abdulrahman Bin Faisal Univ, King Fahad Hosp Univ, Div Gen Thorac Surg, Dept Surg, Coll Med, Dammam, Saudi Arabia; [Hashem, Tariq] Imam Abdulrahman Bin Faisal Univ, King Fahad Hosp Univ, Dept Pathol, Coll Med, Dammam, Saudi Arabia/ Surgery

- **Note that last author (Aljehani) is not last in address file**

INFORMATION SOURCES

- **Family names or surnames can reveal country or region with Origins software**
- **Other sources of information include forebears.io and other websites**
- **Given names or forenames may show sex or gender, but many are androgynous or change with country**
- **Several websites e.g., Gender.API and Baby name guesser**
- **Our rule: 75% certainty, 4+ examples**

DATA PROCESSING - I

- **Macro written by PR lists each name with index, country, position and sex**
- **Some names are not in thesaurus (which has ~ 90,000 given names) so are listed for check**
- **Some names change sex in different countries (e.g., Hilal: M in EG, F in TR; Rony: F in EG, M in Arab world); they are in a sub-thesaurus with country column headings**
- **Papers in 3 fields identified with title words (CARDI, CHILD, ONCOL) as well as journals**

DATA PROCESSING – 2

- Title words for fields selected that were most commonly occurring in specialist journals:

CARDI		CHILD		ONCOL	
alirocumab	antiplatelet	adolescent	juvenile	abiraterone	avelumab
amplatzer	aorta	birth	neonat	adenoma	bleomycin
aneurysm	aortic	boy	newborn	afatinib	bortezomib
angina	arrhythmia	child	paediatric	AML	brachytherapy
angiography	arterial	colic	pediatric	anaplastic	BRCA
angioplasty	arteries	Down	preschool	anticancer	Burkitt
angiotensin	arteriosus	girl	students	antitumor	cancer
anticoagulant	artery	infant	young	atezolizumab	carcinoma

DATA PROCESSING – 3

- **Macro can also sex names of researchers only with initials if surnames match and given names and initials are harmonious**
- **But only if all names are of one sex, so Hassan, A can't be sexed if other given names are Ahmed (M) and Aya F)**
- **Researchers are coded with subfield codes and pivot tables then constructed to list countries and sex of individuals, for each subfield**

DATA PROCESSING – 3

Name	Country	Papers	First?	Last?	Other?	Sole?	frac	sex	Index
Elkholy, Amgad	Egypt	1			1		0.07	M	394
Elotla, Sally Fawzy	Egypt	3			3		0.43	F	360
Elshabrawy, Abdelhamid	Egypt	1			1		0.03	M	107
Elshabrawy, Arafa M.	Egypt	1			1		0.09	M	129
Elyan, D. S.	Egypt	1	1				0.20	M	577
Elyan, Diaa	Egypt	1	1				0.14	M	601
Elyan, Diaa S.	Egypt	1	1				0.11	M	660

Frac = total fractional contribution; index is paper number, used to characterise subject. Note sexing of Elyan, D.S. (Diaa is M in EG but mainly F in India)

RESULTS FOR MENA IN CARDI (2019)

CARDI	F	M	U	Total	F %
Others	3852	8484	2422	14758	31.2
AE	77	279	161	517	21.6
AF	1	10		11	9.1
BH	19	35	15	69	35.2
DZ	43	64	57	164	40.2
EG	808	1761	659	3228	31.5
IQ	21	124	42	187	14.5
IR	1635	2467	566	4668	39.9
JO	82	204	63	349	28.7
KW	30	85	22	137	26.1
LB	148	224	69	441	39.8
Total	9481	19803	5937	35221	32.4

Note high F % in Algeria (DZ), Lebanon (LB) and Iran (IR), but very low values in Afghanistan (AF) and Iraq (IQ). “0” is others

RESULTS FOR MENA IN CHILD (2019)

CHILD	F	M	U	Total	F %
Others	3562	4061	1805	9428	46.7
AE	139	162	71	372	46.2
AF	5	27	6	38	15.6
BH	35	49	10	94	41.7
DZ	35	33	52	120	51.5
EG	905	1113	586	2604	44.8
IQ	41	162	72	275	20.2
IR	2063	2108	583	4754	49.5
JO	167	271	110	548	38.1
KW	63	82	28	173	43.4
LB	169	137	56	362	55.2
Total	11105	12936	5566	29607	46.2

Note much higher F % overall, and in all countries as it is a “female” occupation. Above 50% in two countries.

FIRST & LAST AUTHORS IN 2009

BIOMED	FIRST AUTHOR			LAST AUTHOR		
	F	M	F %	F	M	F %
AE	29	69	29.6	12	59	16.9
AF	1	2	33.3		3	0.0
BH	5	20	20.0	1	19	5.0
DZ	51	56	47.7	20	33	37.7
EG	293	778	27.4	241	551	30.4
IQ	7	35	16.7	7	29	19.4
IR	856	2446	25.9	626	2139	22.6
JO	48	196	19.7	41	133	23.6
KW	47	142	24.9	31	127	19.6
LB	80	139	36.5	36	154	18.9
MENA	4357	10002	30.3	3152	9529	24.9

Last author is usually the most senior. In most countries (but not all) more F in first than in last position. MENA excludes others

CHANGES BETWEEN 2009 AND 2019

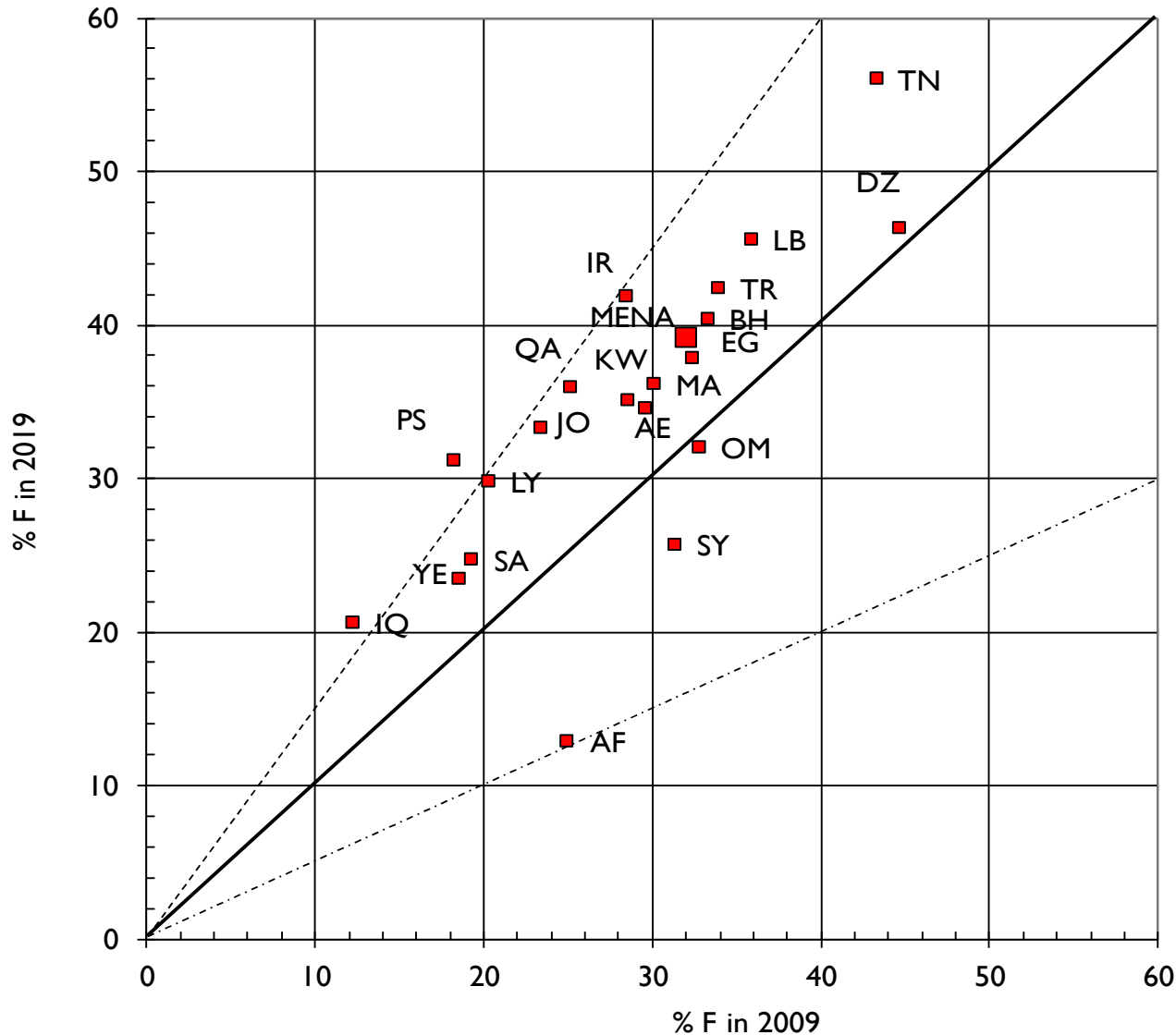
- An increase in F % in all four fields

Year	BIOMED	CARDI	CHILD	ONCOL
2009	32.1	32.0	31.1	33.1
2019	39.1	33.2	45.9	41.1
Change	7.0	1.2	14.8	8.0

But it's much more for child (paediatric cancer) than for cardiology which is still seen as a very male profession

Increase in biomed overall varies a lot by country:

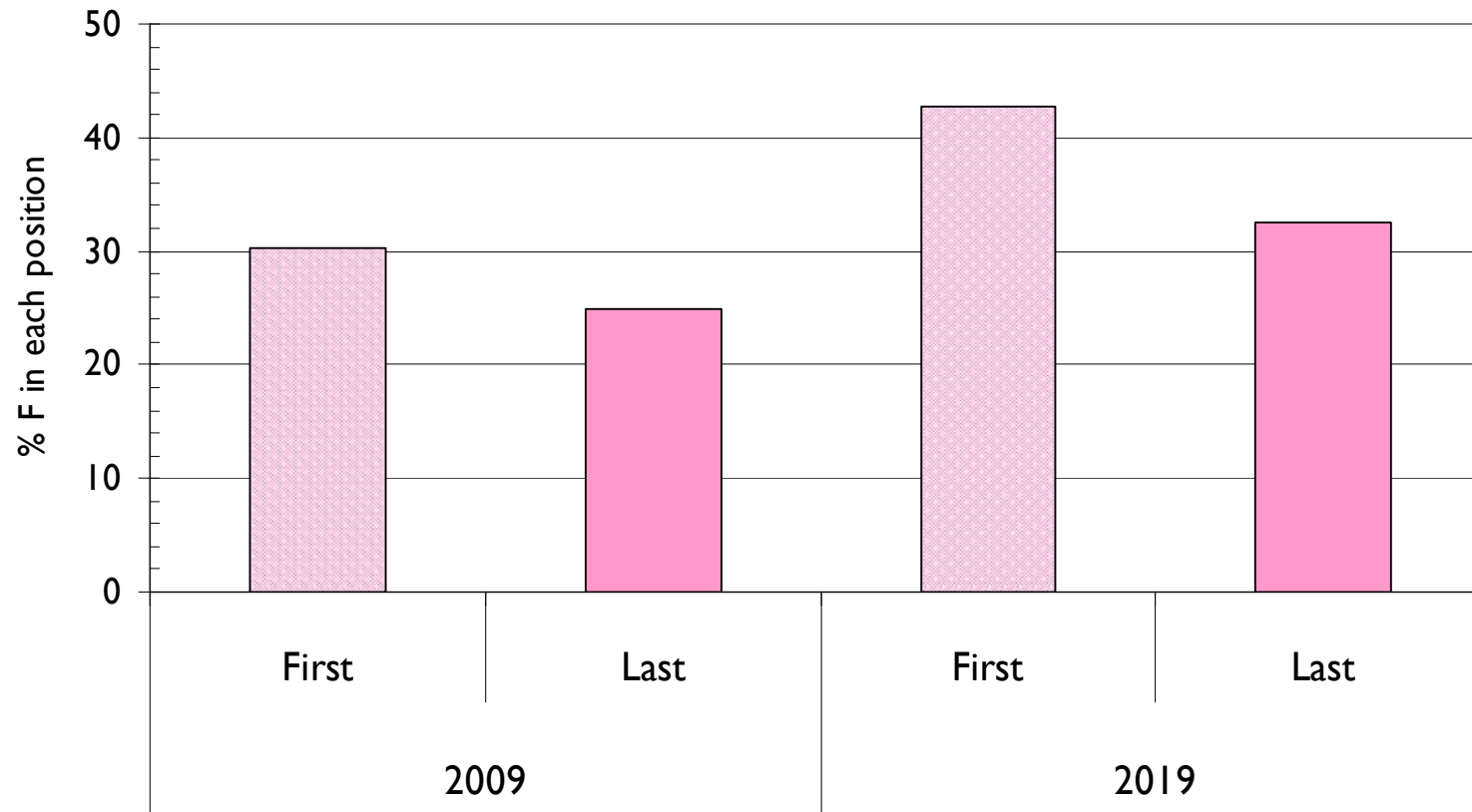
CHANGES BETWEEN 2009 AND 2019



Most countries show an increase in F %, especially Palestine and Iraq, but Afghanistan and Syria show a decrease

Diagonal line represents equivalence; dashed line = plus 50%; chain-dotted line = minus 50%

CHANGES IN FEMALE POSITION



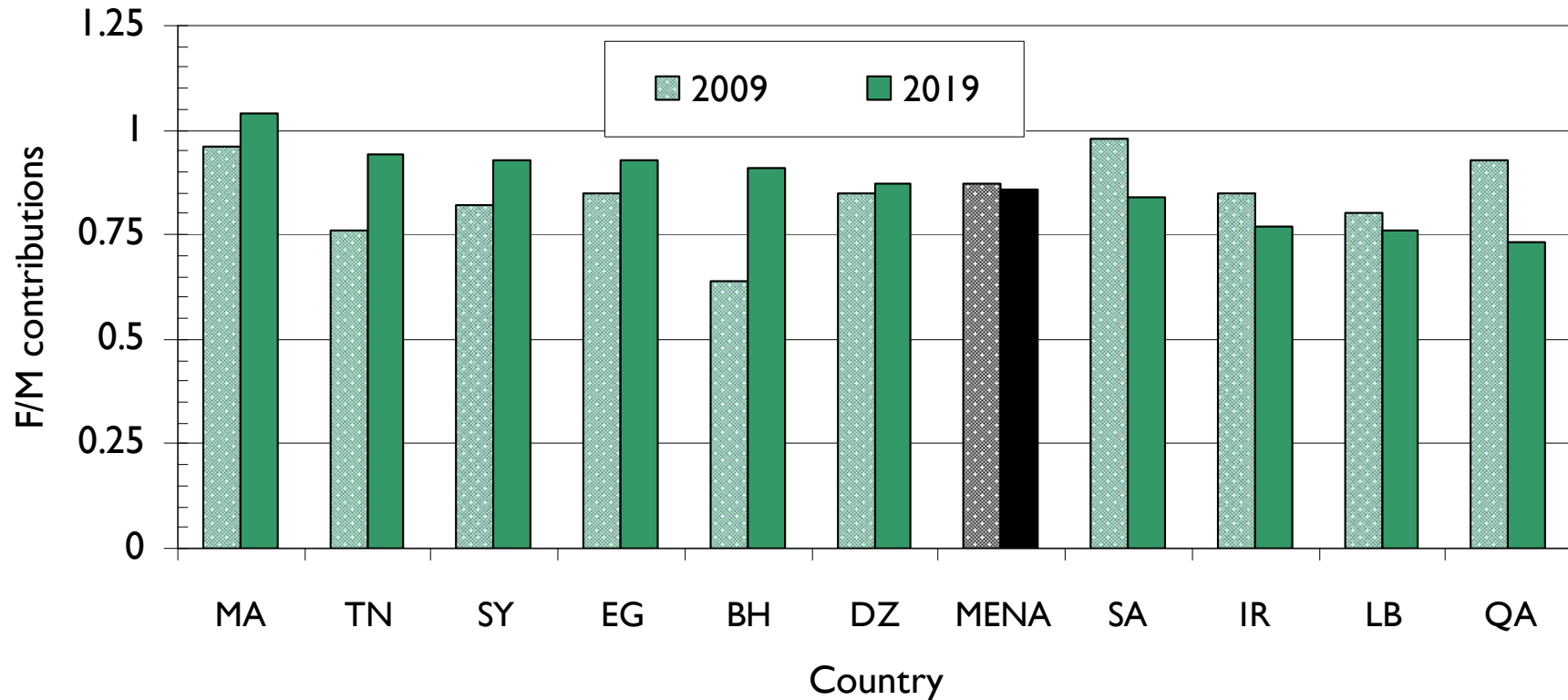
Bigger increase in first position represents younger researchers

CONTRIBUTIONS OF F AND M - I



Males contribute more on average, but difference is decreasing

CONTRIBUTIONS OF F AND M - 2



Ratio of F to M papers/researcher is improving for some countries, especially North African ones, but declining for others

CONCLUSIONS - I

- Onomastics is **NOT** an exact science but can be very useful for science policy
- It can reveal the **ethnic/heritage composition** of researchers in a country, and where they go
- It can also show progress in **female** research career advancement
- **And in their output** as researchers
- **We can also compare scientific fields**
- **And which countries** do most to advance female researchers, both junior and senior

CONCLUSIONS - 2

- **In the MENA countries, there are big variations in how well women fare as researchers**
- **In most countries, women are advancing both overall and as last (senior) authors**
- **We need to study why some countries do better at encouraging women in research**
- **In Europe, childcare provision is a major factor: is this also true in MENA countries?**
- **Cardiology seems to discourage women: why?**