



*Zaatari refugees camp, Jordan*

# The Epidemiology of Curable Sexually Transmitted Infections among Forcibly Displaced Populations

Ghina Mumtaz, PhD  
American University of Beirut

December 6, 2023

Infectious Disease Epidemiology and Applied Studies (I.D.E.A.S.) Seminar  
Keck School of Medicine at USC



I declare no conflict of interest

# Outline

1. Overview of forced displacement in the world today
2. Factors of vulnerability to poor sexual health outcomes in humanitarian settings
3. Prevalence of curable STIs among forcibly displaced populations: systematic review and meta-analysis
4. Prevalence of curable STIs among Syrian refugees in Lebanon: Findings of ongoing studies



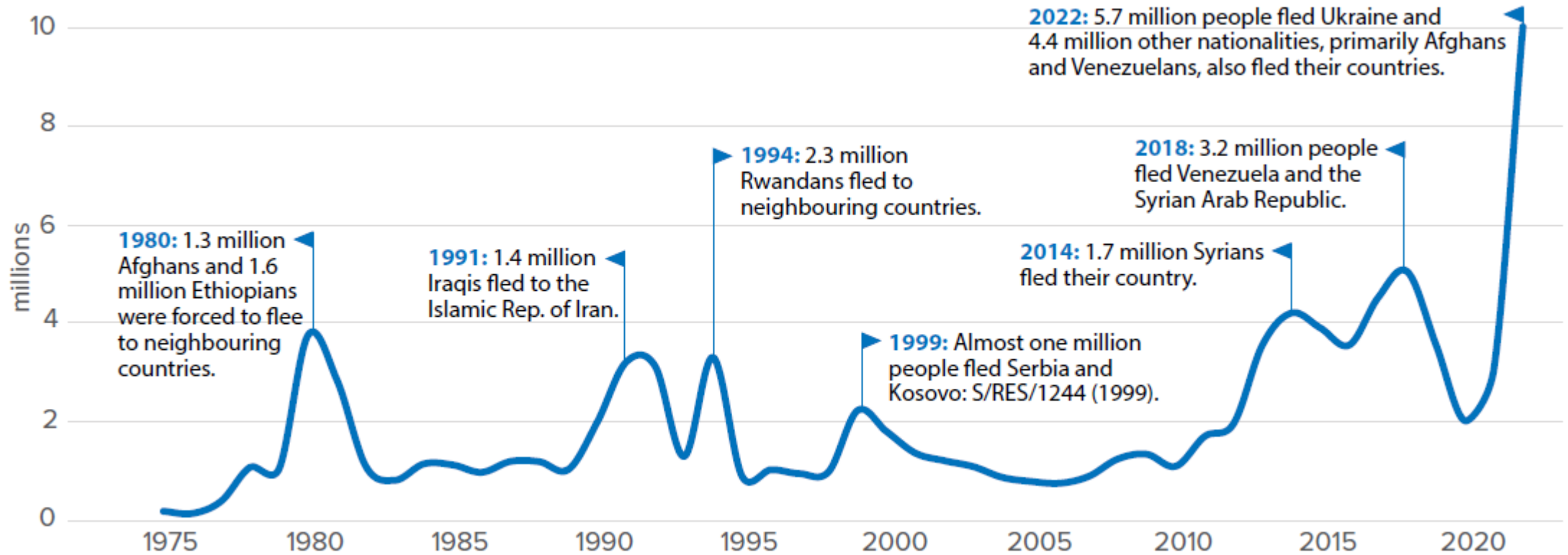


*Dadaab refugees camp, Kenya*

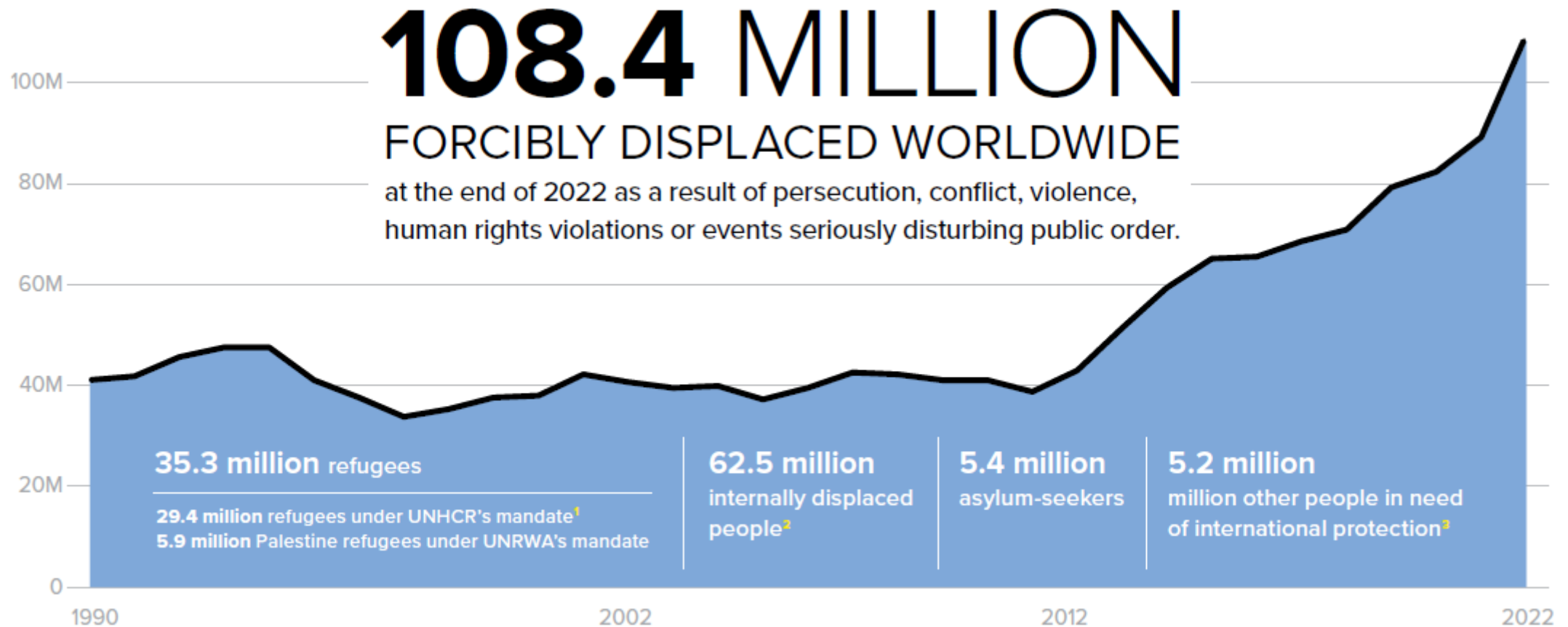
# 1. Overview of forced displacement in the world today

# A World in Turmoil

Number of newly displaced 1975-2022



# Massive population movements



# 35.3 Million refugees

- **51%** of refugees are **women** who require comprehensive sexual and reproductive health information and services
- **67%** are in a **protracted** situation (in a LMIC host country for at least five consecutive years )





# Where do they come from?

**52%**

ORIGINATED FROM  
JUST THREE  
COUNTRIES

52 per cent of all refugees and other people in need of international protection came from just three countries:

**Syrian Arab Republic**  
6.5 million

(20%)

**Ukraine**  
5.7 million

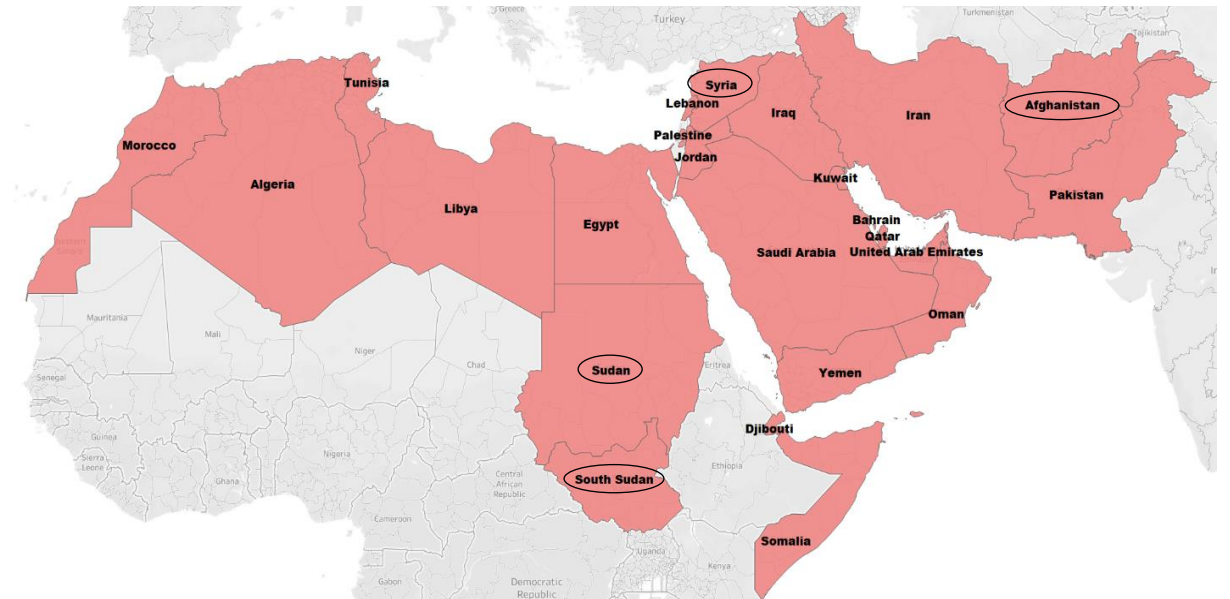
Fastest outflow

**Afghanistan**  
5.7 million

**46%**

ORIGINATED FROM THE MIDDLE EAST  
AND NORTH AFRICA

46% of all refugees came from countries in MENA: Syria, Afghanistan, South Sudan, Sudan, and Somalia



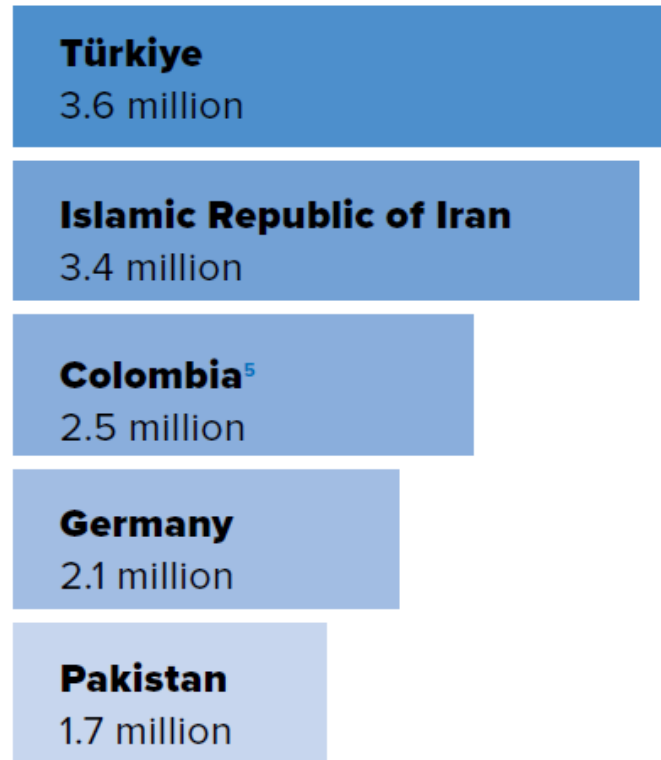


# Where are they hosted?

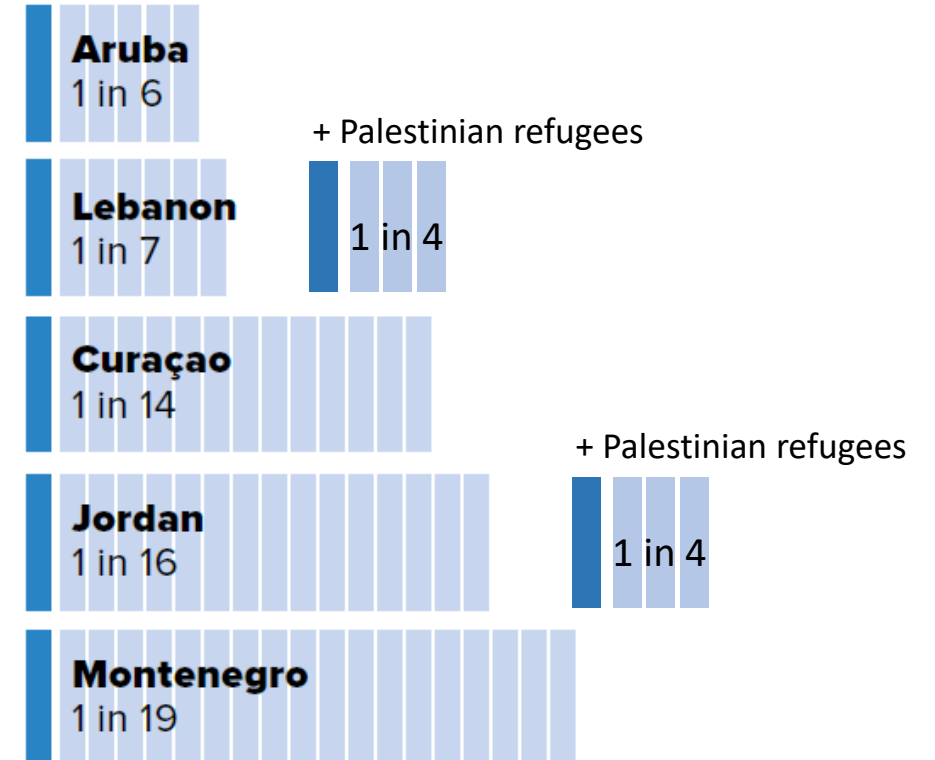
**76%**  
HOSTED IN LOW-  
AND MIDDLE-INCOME  
COUNTRIES

Low- and middle-income countries hosted 76 per cent of the world's refugees and other people in need of international protection.<sup>4</sup> The Least Developed Countries provided asylum to 20 per cent of the total.

Turkey hosts the largest number of refugees



Lebanon & Jordan have the highest per-capita number of refugees





*African refugee women in Egypt*

Source: Euro-Med Human Rights Monitor

## **2. Factors of vulnerability to poor sexual health outcomes in humanitarian settings**

# Vulnerability factors

- Health service disruption + low prioritization of sexual health services
- Increase in social determinants affecting sexual health: poverty, food insecurity, social instability, discrimination and marginalization, trauma...
- Transactional sex, as a survival strategy
- Sexual and gender-based violence: intimate partner violence, rape as a weapon of war, abduction of women and children...
- Sometimes higher HIV/STIs prevalence rates among the military
- Psychosocial context leading to increase in sexual and injecting risk behavior and risk networks
- Key populations disproportionately affected

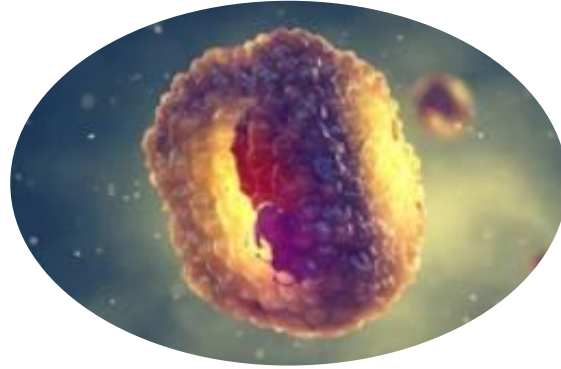
# Impact on sexually transmitted infections?

- Documented increase in structural determinants of STIs in humanitarian settings
- Evidence on the impact of conflict on HIV infection is sparse and conflicting (2 systematic reviews)
- Some studies in SSA paradoxically found a relatively lower HIV prevalence in conflict settings, attributed in part to a decline in mobility and urbanization during periods of war
- Such conditions may not be applicable to all settings where displaced populations typically settle in urban settings within neighbouring countries
- Impact on other STIs, namely curable ones, largely unknown





Gonorrhea



Chlamydia



Trichomonas



Syphilis

### **3. Prevalence of curable STIs among forcibly displaced people: systematic review and meta-analysis**

# Objective

Characterize the epidemiology of curable sexually transmitted infections (STIs) - including *chlamydia trachomatis*, *Neisseria gonorrhoeae*, syphilis, and *trichomonas vaginalis* - among forcibly displaced people (FDP) globally, and to estimate their mean prevalence in this population group.

# Methods

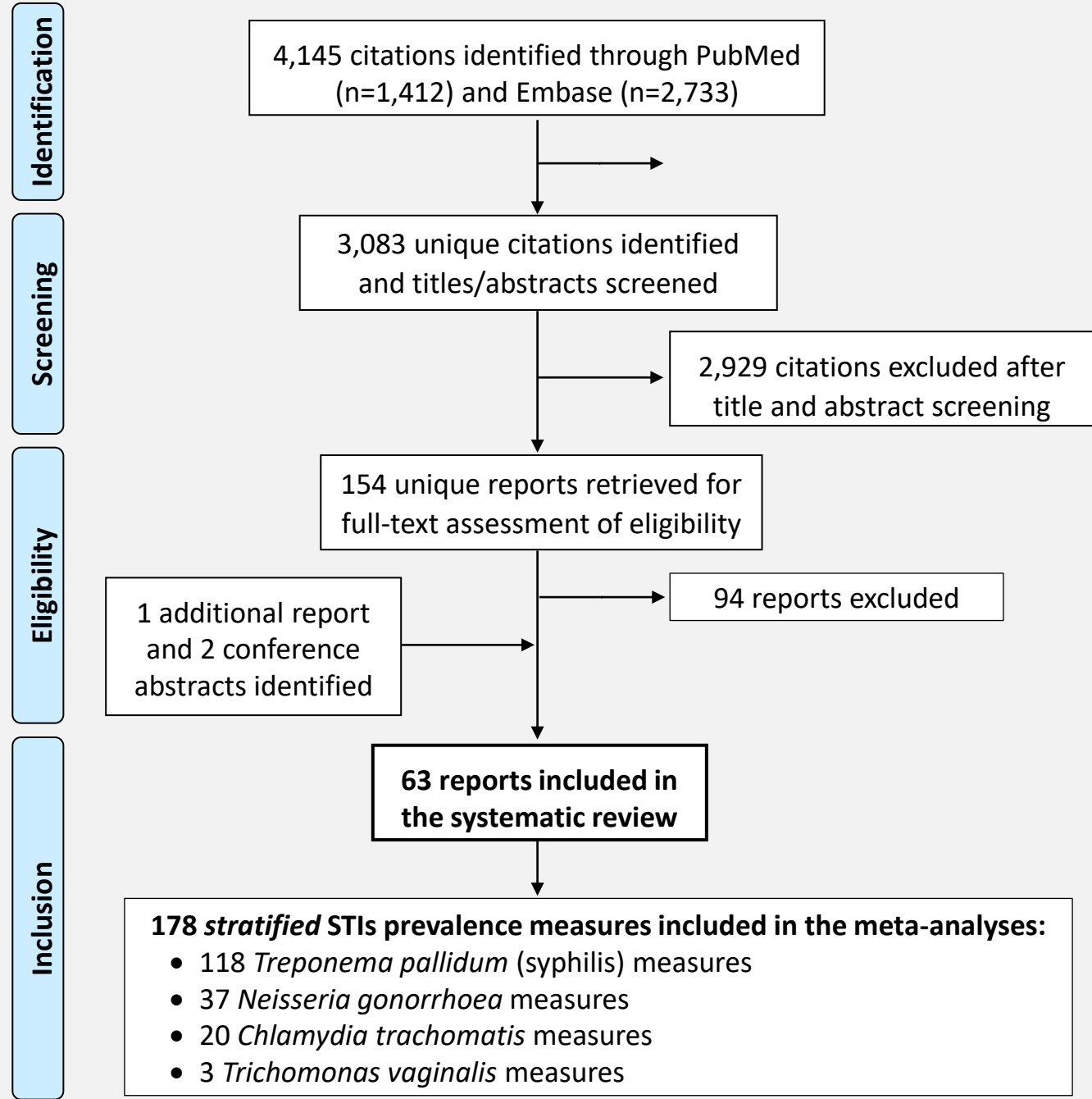
- Systematic review following Cochrane Collaboration and PRSIMA guidelines
- Data sources: PubMed, Embase, International conferences. No date or language restrictions

- Eligibility criteria:

Outcome (prevalence)	Population	Crisis
Chlamydia	Refugees	Political conflict
Gonorrhoea	Asylum seekers	Armed conflict/wars
Trichomonas	Internally Displaced (IDPs)	Natural disasters
Syphilis		Famine

- Excluded: Migrants, displaced populations due to development projects
- Random-effects meta-analyses + meta-regressions

# PRISMA Flow Chart





# Data availability

**178** STIs prevalence measures on a total of **954,974** forcibly displaced people

## Outcome

---

- Syphilis: 118 (66%)
- *Neisseria gonorrhoea*: 37 (21%)
- *Chlamydia trachomatis*: 20 (11%)
- *Trichomonas vaginalis*: 3 (2%)

## Study year

---

- <2000: 39 (22%)
- 2000-2009: 37 (32%)
- ≥ 2010: 82 (46%)

## Country of origin

---

- Asia: 50 (28%)
- Africa: 49 (28%)
- Middle East: 24 (14%)
- Eastern Europe: 9 (5%)
- South America: 2 (1%)
- Mix: 21 (12%)
- Unspecified: 23 (13%)

**Only 5 prevalence measures among Syrian refugees**

# Pooled STIs prevalence in forcibly displaced people

	Studies	Samples		Reported prevalence		Pooled mean prevalence		
	N	Tested	Positive	Median (%)	Range (%)	Estimate (%)	95% CI	I <sup>2</sup> (%)
<b>Syphilis</b>								
<i>Active, syphilitic infection</i> <sup>*</sup>	49	688,250	3,322	0.9	0.0-30.8	<b>1.1</b>	0.8-1.3	98.3
<i>Active infection</i> <sup>†</sup>	20	47,400	498	1.6	0.0-27.3	1.6	1.0-2.3	91.8
<i>Lifetime infection</i> <sup>‡</sup>	19	24,946	631	2.2	0.0-12.3	2.2	0.8-4.0	96.9
<i>Unclear infection time</i> <sup>§</sup>	30	117,776	708	0.8	0.0-7.5	0.9	0.5-1.5	96.6
<b>Neisseria gonorrhoeae</b>								
<i>Active infection</i> <sup>**</sup>	31	55,089	223	0.1	0.0-13.0	<b>0.1</b>	0.0-0.3	84.2
<i>Unclear infection time</i> <sup>§</sup>	6	2,582	17	0.2	0.0-8.8	0.7	0.0-0.3	88.5
<b>Chlamydia trachomatis</b>								
<i>Active infection</i> <sup>**</sup>	14	8,390	134	1.0	0.0-28.6	<b>1.5</b>	0.5-2.9	93.6
<i>Unclear infection time</i> <sup>§</sup>	6	10,309	186	2.3	0.0-9.8	2.1	0.6-4.2	90.3
<b>Trichomonas vaginalis</b>								
<i>Active infection</i> <sup>**</sup>	2	189	63	33.5	31.0-36.0	--	--	--
<i>Unclear infection time</i> <sup>§</sup>	1	43	0	0.0	--	--	--	--

\* Determined by a non-treponemal test combined with a treponemal test

† Determined by only a non-treponemal test

‡ Determined by only a treponemal test

§ Test unspecified

\*\* Determined by culture, nucleic acid amplification test (NAAT), gram stain (for Neisseria gonorrhoea), or wet mount (for trichomonas vaginalis)

## Multivariable meta-regression analysis for Syphilis

- Refugees from Africa had 2.4 higher odds of syphilis than refugees from Asia
- Strong variation in syphilis prevalence by host country/region: highest is Australia, North America, and Africa
- Declining odds of syphilis infection at 5% per year
- Studies with a larger sample size had lower odds of syphilis

Factors	Studies	Samples	Multivariable analysis	
	N	Tested	OR (95% CI)	p-value
<b>Refugee region of origin</b>				0.002
Asia	35	188,757	ref	
Africa	38	97,739	2.41 (1.22-4.78)	
Middle East	16	139,784	0.48 (0.20-1.15)	
Eastern Europe	4	14,447	0.36 (0.09-1.42)	
South America	1	8,073	0.66 (0.06-7.55)	
Mix	12	297,655	1.55 (0.63-3.81)	
Not specified	12	131,917	2.54 (1.03-6.27)	
<b>Host country region</b>				0.014
Asia	9	5,215	ref	
Australia	14	7,328	4.51 (1.39-14.69)	
North America	49	733,124	3.80 (1.37-10.55)	
Africa	9	5,273	5.12 (1.31-19.93)	
Europe	35	117,798	1.97 (0.65-6.00)	
Middle East	2	9,634	1.16 (0.11-12.19)	
<b>Year of data collection</b>	118	878,372	0.95 (0.93-0.97)	<0.001
<b>Sample size</b>				<0.001
<500 participants	54	8062	ref	
≥ 500 participants	64	870,310	0.36 (0.21-0.60)	
<b>Method of STI ascertainment</b>				0.288
Self-report	2	230	ref	
Laboratory testing in study	76	651,101	0.85 (0.10-7.42)	
Extracted from medical records	40	227,041	0.60 (0.06-5.17)	

Adjusted R<sup>2</sup> = 53.1%

# Summary of findings – Data availability

- Despite the identified studies, there is a **persistent knowledge gap** for these infections in this population
- Overall, relatively small number of studies on STIs among forcibly displaced people
- Most on syphilis (2/3<sup>rd</sup>)
- Increase in the number of publications in the last decade
- Yet, **very little data on Syrian refugees**: largest FDP + protracted situation (over 10 years)

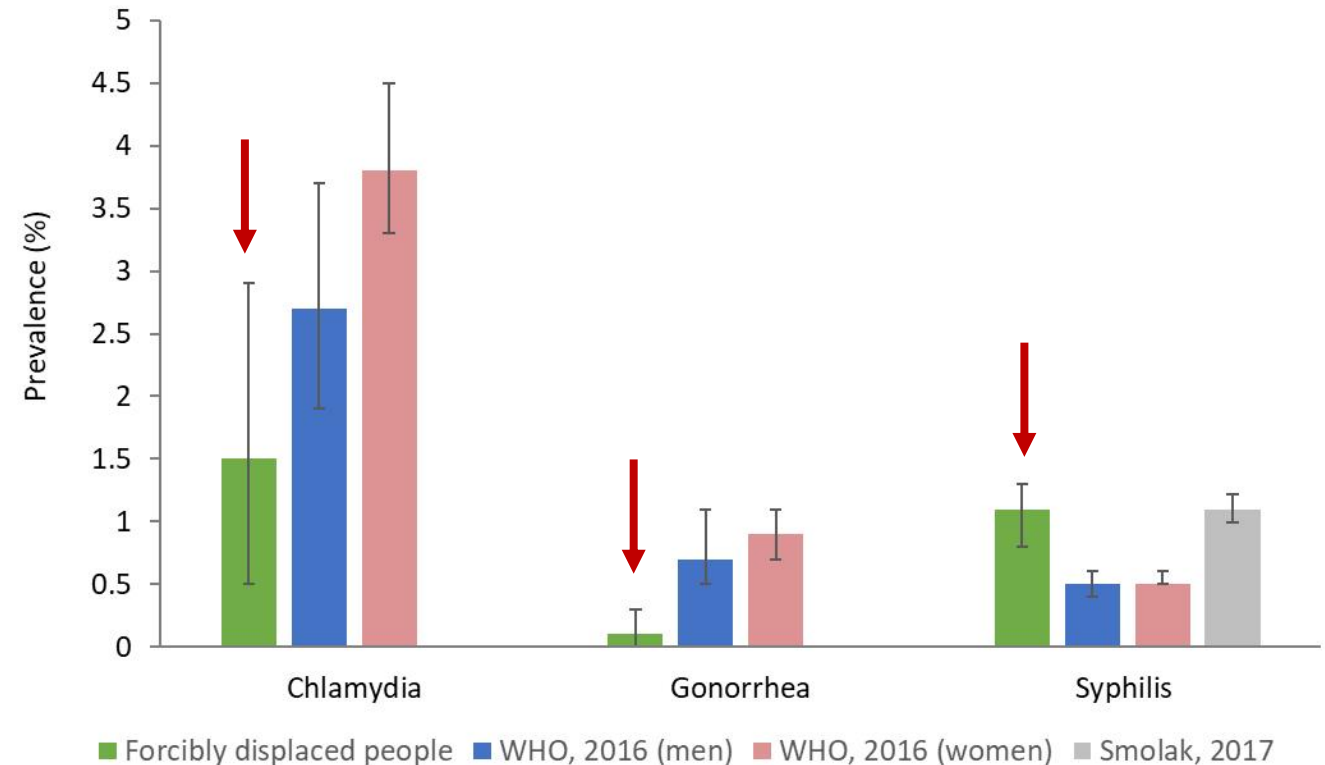


Source: Deutsche Welle



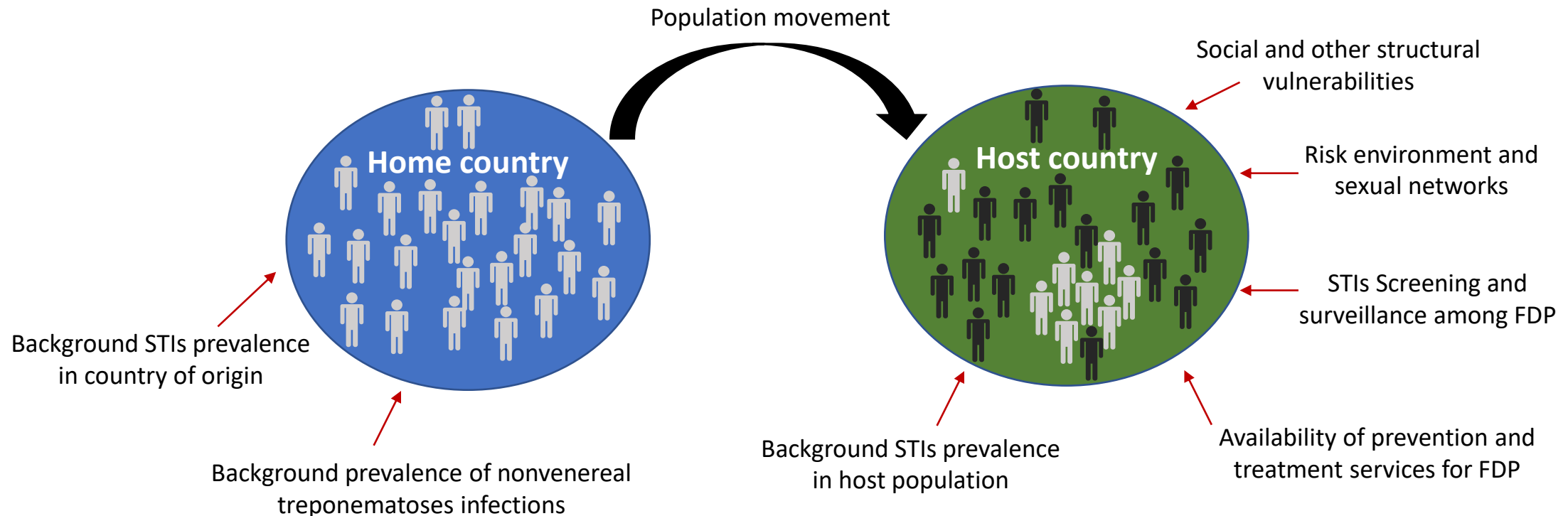
# Summary of findings – Epidemiological patterns

- Overall STIs prevalence rates among FDP were **lower or comparable** to the general population
- Yet, still a **substantial burden** in this vulnerable population



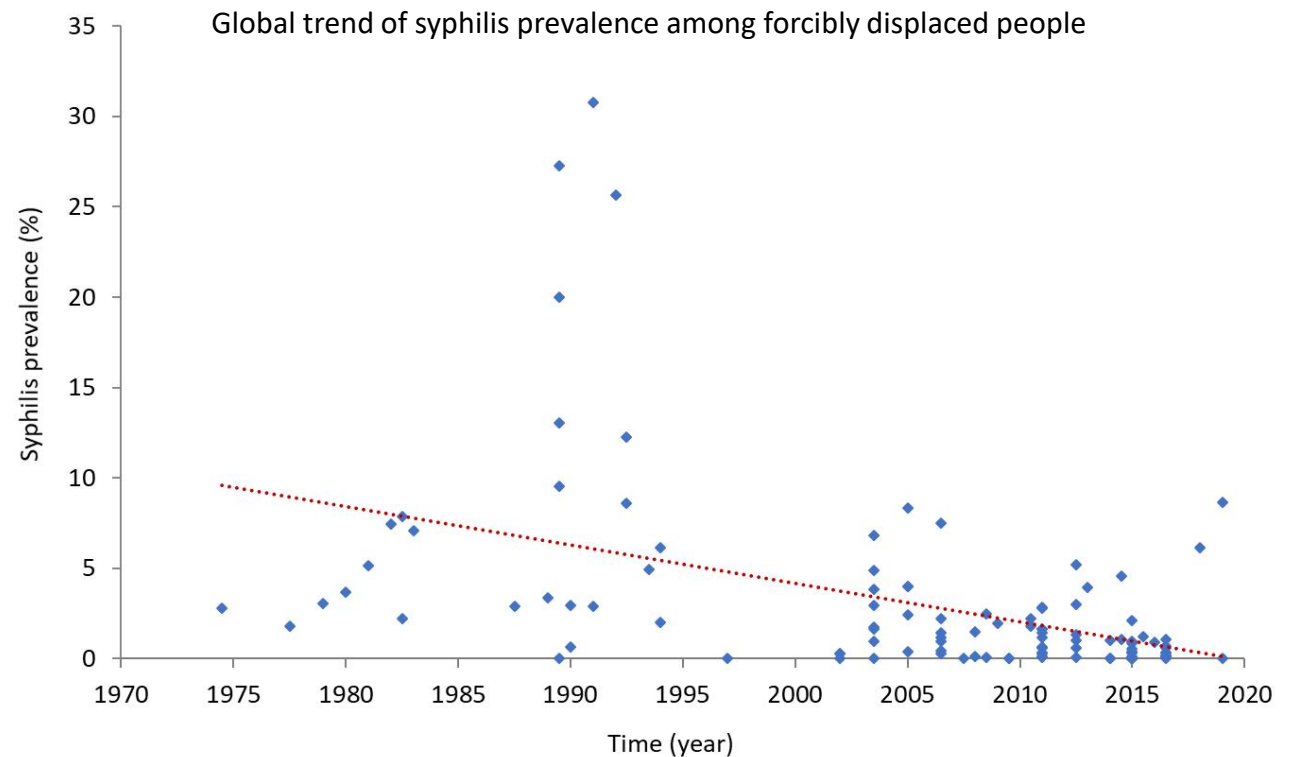
# Summary of findings – Epidemiological patterns

- Strong **variability** in **syphilis** prevalence with **home and host country**



# Summary of findings – Epidemiological patterns

- Temporal **trend** of **decreasing syphilis** prevalence (5% per year)
- In line with global trends in the general population  
(Smolak, 2017)
- May reflect true decline in incidence and/or shorter duration of active infection



# Recommendations

- Further studies are needed to better understand the **recent burden** of STIs and the **sexual health needs** of forcibly displaced populations in **different** global settings, to inform screening and treatment policy and programming
- Need to expand STI **surveillance**
- Specifically: increase the evidence base among **Syrian refugees** who make up a third of the FDP globally
- **Qualitative** studies needed to better understand the context and structural factors in order to inform and improve SRH programs





## **4. Prevalence of curable STIs among Syrian refugees in Lebanon: Findings of ongoing studies**

# Study objectives

- Estimate the prevalence of chlamydia, gonorrhoea, and trichomoniasis among pregnant Syrian refugee women in Lebanon



United Nations Population Fund

# Setting - LEBANON

- Highest per-capita rate of refugees in the world
- Hosts:
  - An estimated 1.5 M Syrian refugees (841,700 registered with UNHCR)
  - Over 480,000 Palestinian refugees registered with UNRWA
- Since late 2019 – Concomitant crises
  - Political uprising
  - Unprecedented economic crisis – 98% devaluation of the Lebanese Lira
  - Beirut blast (Aug 2020)
  - COVID-19 pandemic





# Setting - LEBANON

- While STIs are a neglected area of research globally, their epidemiology remains even more poorly understood in MENA
- Little data on the prevalence of STIs in Lebanon, including among refugee women
- Antenatal screening of STIs is not routinely conducted in Lebanon
- Studies have documented a high burden of underage marriage, sexual assault, rape, and intimate partner violence among Syrian refugee women in Lebanon
- Over 90% of pregnant Syrian refugee women in Lebanon receive medical care



Source: Reuters

# Data collection sites

- Urban: 3 public ANC clinics in some of the most vulnerable high refugee-density neighborhoods in **Beirut** suburbs
- Rural: 2 public ANC clinics + 1 mobile clinic in the **Bekaa** which hosts the highest number of Syrian refugees in Lebanon – many in informal tented settlements



*Informal tented settlements, Bekaa*



*Burj el Barajneh camp, Beirut*



# Methods

- Cross-sectional study
  - Beirut: Feb-Sept 2022
  - Bekaa: Jun-Jul 2023
- Eligible participants: adult, pregnant Syrian refugee women at  $\leq 34$  weeks of gestation seeking antenatal care at participating centers
- Sociodemographic and sexual behavior data collected through an interviewer-administered survey
- STI testing through Xpert NG/CT and TV analysis of urine specimens



Amel Association

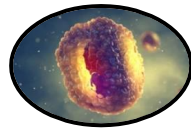
Source: *The New Humanitarian*



# Results – Prevalence of STIs

- Beirut: 318 participants
- Bekaa: 113 participants

431 participants



Chlamydia n= 2

**0.5% (0.1-1.7%)**



Trichomonas n= 1

**0.2% (0.04-1.4%)**



Gonorrhea n= 0

**0.0%**

# Results – Sociodemographic characteristics

	Overall, n (%)	Beirut, n (%)	Bekaa, n (%)
<b>Residence*</b>			
Camp	93 (21.6)	34 (10.7)	59 (52.2)
Community	338 (78.4)	284 (89.3)	54 (47.8)
<b>Currently married</b>	429 (99.5)	316 (99.4)	113 (100.0)
<b>Education*</b>			
None	54 (12.5)	27 (8.5)	27 (23.9)
Intermediate school or lower	303 (70.3)	231 (72.6)	72 (63.7)
Secondary school or higher	74 (17.2)	60 (18.9)	14 (12.4)
<b>Currently employed</b>	27 (6.3)	13 (4.1)	14 (12.4)
	<b>mean [range]</b>	<b>mean [range]</b>	<b>mean [range]</b>
<b>Age (years)</b>	25.6 [18-44]	25.6 [18-44]	25.6 [18-42]
<b>Age at first marriage (years)</b>	18.3 [10-33]	18.3 [10-31]	18.5 [12-33]
<b>Crowding index (people/room)*</b>	3.2 [1-15]	3.1 [1-10]	3.6 [1-15]
<b>Time in Lebanon (years)*</b>	6.7 [0-31]	6.3 [0-31]	7.8 [0-20]

\* P < 0.05

## Results – Sexual behavior and STI history

	Overall, n (%)	Beirut, n (%)	Bekaa, n (%)
Ever condom use	97 (22.6)	78 (24.5)	19 (17.0)
Self-reported STI history	184 (42.9)	135 (42.7)	49 (43.4)
Received treatment	161 (87.5)	118 (87.4)	43 (87.8)
	mean [range]	mean [range]	mean [range]
Number of lifetime sexual partners	1.1 [1-5]	1.1 [1-5]	1.1 [1-2]
Number of sexual encounters in past week	2.0 [0-25]	2.0 [0-25]	1.5 [0-6]

# Another ongoing study – Fahme et al

- **Design:** Mixed-methods longitudinal cohort study
- **Population:** Sexually active, reproductive-age Syrian refugee women who reside in an urban refugee camp in Beirut, Lebanon
- **Recruitment:** Community-based; door-to-door by community health workers
- **Preliminary results to date:**
  - N = 250 participants
  - 96% currently married
  - 50% with severe food insecurity
  - 68.4% with depression
  - Eight out of ten women report SGBV
  - **Only one case of T. vaginalis identified**





# Summary of findings

- The **prevalence of chlamydia, gonorrhea, and trichomonas** among Syrian refugee women retained in care seems **low**.
- **Consistent** with the literature on the **general population** in this region.
- Further studies are needed to examine the prevalence, risk factors, and sequelae of STIs among a **larger, nationally representative sample** of the female Syrian refugee population in Lebanon.

# Acknowledgments

**Sasha Fahme, MD**

Weill Cornell Medicine-New York  
American University of Beirut



**Laith Abu-Raddad, PhD**

Weill Cornell Medicine-Qatar



**Jeffrey Klausner, MD**

University of Southern California



**AMERICAN  
UNIVERSITY OF BEIRUT**

**FACULTY OF HEALTH SCIENCES**



Thank you

