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GAVIN PUBLISHERS

Journal of Community Medicine & Public Health

Allkhenfr H, et al. J Community Med Public Health 5: 211.
DOI: 10.29011/2577-2228.100211

Research Article

Determining Physical and Mental Health Conditions Present in Refugees Age 0-59 Years Arriving in Utah

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Citation: Allkhenfr H, Dearden SE, Frost CJ, Gren LH, Benson LS (2021) Determining Physical and Mental Health Conditions Present in Refugees Age 0-59 Years Arriving in Utah. J Community Med Public Health 5: 211. DOI: 10.29011/2577-2228.100211

Received Date: April 05, 2021; **Accepted Date:** April 15, 2021; **Published Date:** April 20, 2021

Abstract

Purpose: The aim of this study was to report the prevalence of physical and mental health conditions identified for newly arrived refugees in Utah.

Methods: The Utah Refugee Health Screener is a standardized form used to screen all refugees resettled in Utah. Prevalence was calculated for mental and physical health conditions. Comparisons were made by age, sex, and geographic region.

Results: Between 2012 and 2017, 6,842 refugees (ages 0-59 years) were resettled in Utah and included in this analysis. The prevalence of mental health findings was higher for adults than children (36.9% vs 18.0%). Among adults, women had higher prevalence of mental health findings than men (Prevalence Ratio (PR) of 1.3-1.9), while refugees from the Middle East had consistently higher prevalence than those from other regions. Similarly, the prevalence of physical health findings was generally higher for adults than children (66.2% vs 41.5%). Differences between men and women were most notable for the categories of pulmonology (PR=3.6 for men vs women), endocrinology (PR=2.0 for women vs men), and neurology (PR=2.0 for women vs men).

Conclusions: Adult refugees have higher prevalence of both mental and physical health findings on screening exam. Screening identifies conditions that are largely treatable. However, these conditions typically don't resolve without treatment and if left untreated, result in increased morbidity and mortality. The initial domestic screening is an opportunity to connect refugees with appropriate treatment to address health concerns, thus facilitating their ability to successfully engage in other resettlement activities, such as work and school.

Keywords: Epidemiology; LTBI; Mental health; RHS15; Refugees; Refugee health screening; Refugee domestic examination; Utah refugee health

Introduction

As of 2019, over 70 million people are living as internationally displaced persons, with approximately 26 million of these individuals designated as refugees worldwide [1,2]. Between 2012 and 2017, 644,083 refugees were resettled around the world [3]. Of these 396,400 were resettled in the US, 3 and 7,017 of those were resettled in Utah [4,5].

The US Federal Refugee Resettlement Program requires every refugee to participate in a medical screening (which includes physical and mental health data collection) that is comprehensive, culturally sensitive, and linguistically appropriate within 30 days of arrival in the US.5 Primary care providers and public health officials can utilize the information from these screenings to (a) follow-up on conditions of public health concern and (b) manage acute and chronic conditions refugees have upon arrival. The overseas refugee screening exam primarily focuses on identifying conditions of public health concern that would disqualify refugees from entering the US. The domestic health screening is a more

comprehensive exam that is conducted by primary care providers experienced in refugee healthcare service delivery. The findings on the latter exam guide development of a management plan to address acute and chronic health conditions.

Refugee health screening is necessary to ensure the health of both immigrant and host populations. Many refugees arrive in resettlement countries with pre-existing conditions and may develop new health issues [6-8]. Addressing physical and mental health needs early after resettlement is important to prevent the progression to increasingly serious health conditions [9]. To better understand the distribution of health conditions at arrival by age, sex, and regions where refugees arrive from, we analyzed the domestic health screening exam data for refugees resettled in Utah between the years 2012 and 2017.

Materials and Methods

Participants and Procedures

The Utah Department of Health (UDOH) provided data from the initial domestic screening for refugees age 0-59 years, resettled in Utah from 2012-17. Three clinics conducted screening and reported the results to UDOH using the Utah Refugee Health Screening Form (U-RHSF). The U-RHSF includes demographic information; findings from history, physical exam, and laboratory results (based on the CDC guidelines for domestic screening 10); and the Refugee Health Screener-15 (RHS-15) for mental health. The physical exam is completed for refugees of all ages, and the RHS-15 is completed for those age 14 years and older. We used a cut-off of >12 on the RHS-15 section I (assessing anxiety, depression, and posttraumatic stress disorder) and >5 on RHS-15 section II (assessing general stress) to identify a positive screen, as recommended [11]. For reporting to UDOH, specific findings were grouped by the corresponding body system. For example, the endocrine system contains findings for diabetes and thyroid disorders. The prevalence of positive findings on the U-RHSF included any diagnosis written by the provider; signs or symptoms related to a diagnosis; provider's referral for further diagnosis or treatment; or lab results outside the normal range, based on age- and sex-specific reference ranges for normal values. This study was approved by the University of Utah and UDOH Institutional Review Boards.

Demographic Information

Since most of the countries of origin have a large number of ethnicities, the UDOH created a categorical variable (Nativity and Culture) to report nationalities and preserve data on ethnicities. For analysis, we grouped refugees by geographic region (Africa, Middle East, Non-Middle East Asia), based on the Nativity and Culture variable. Statistical Analysis Descriptive statistics for prevalence of positive findings were calculated and reported by body system. We assessed differences in prevalence by age, gender, and geographic region using tests of means or medians for continuous variables, and chi-square test for dichotomous variables. Analyses were completed using SAS University Edition (SAS Institute, Inc.).

Results

Demographics of refugees resettled between 2012 and 2017 in Utah, are in Table 1. The majority of refugees were from Iraq (19.8%), Somalia (18.7%), the Democratic Republic of the Congo (11.0%), Bhutan (7.9%), and Afghanistan (5.7%). No significant difference in age was noted for women and men, with a mean of 21.6 years (SD: 14.6) (Table 2).

Characteristic	Combined	Female	Male
Nativity/culture of origin[1], n (%)	n=6842	n=3214 (47.0)	n=3628 (53.0)
Iraq	1333 (19.5)	615 (19.1)	718 (19.8)
Somalia	1322 (19.3)	645 (20.1)	677 (18.7)
Democratic Republic of the Congo	838 (12.2)	438 (13.6)	400 (11.0)
Bhutan	556 (8.1)	271 (8.4)	285 (7.9)
Afghanistan	372 (5.4)	166 (5.2)	206 (5.7)
Karen	336 (4.9)	170 (5.3)	166 (4.6)
Sudan	316 (4.6)	102 (3.2)	214 (5.9)
Burma	213 (3.1)	102 (3.2)	111 (3.1)
Eritrea	169 (2.5)	74 (2.3)	95 (2.6)
Chin	152 (2.2)	61 (1.9)	91 (2.5)
Iran	130 (1.9)	65 (2.0)	65 (1.8)
Rohingya	122 (1.8)	43 (1.3)	79 (2.2)

Syria	122 (1.8)	53 (1.6)	69 (1.9)
Burundi	110 (1.6)	57 (1.8)	53 (1.5)
Other[2]	566 (8.3)	279 (8.7)	287 (7.9)
Age at arrival, in years Mean (Standard deviation)	21.6 (14.6)	21.5 (14.6)	21.7 (14.5)

[1]Utah Department of Health created a categorical variable (Nativity and Culture) to report nationalities and preserve data on ethnicities.

[2]Countries/ethnicities with fewer than 100 total arrivals during the study period, in order of magnitude were: Ethiopia (63), Somali Bantu (48), Central African Republic (46), Sri Lanka (39), Congo (39), Pakistan (39), Karenni (33), South Sudan (28), Rwanda (21), Kachin (15), Columbia (14), Ivory Coast (14), North Korea (13), Kunuma (13), Mon (12), Ukraine (10), Nepal (9), Venezuela (8), Russia (8), Philippines (8), Shan (8), Peru (7), Mexico (7), Togo (7), Arkanese (7), Palestine (7), El Salvador (6), China (5), Cameroon (5), Guinea (4), Nigeria (3), Uganda (3), Guatemala (2), Chad (2), Hazara (1), Cambodia (1), Zimbabwe (1), Chili (1), Morocco (1), The Gambia (1), Honduras (1), Jordan (1), Haiti (1), and 4 individuals with unknown origin.

Table 1: Demographic characteristics of refugees, age 0-59 years, arriving in Utah between 2012 and 2017.

Condition	Number with condition (%)		Prevalence ratio increased for		
	Children, 0-17 years	Adults, 18-59 years	Children	Adults	p-value
Mental Health					
Any mental health finding	117 (18.0)	1372 (36.9)		2.05	<0.001
RHS-I positive	67 (10.3)	991 (26.7)		2.59	<0.001
RHS-II positive	61 (9.4)	744 (20.0)		2.14	<0.001
Torture/violence history	44 (6.8)	399 (10.7)		1.59	0.002
Depression diagnosis	17 (2.6)	306 (8.2)		3.15	<0.001
Anxiety diagnosis	14 (2.2)	301 (8.1)		3.77	<0.001
Physical Health					
Any physical health finding	1297 (41.5)	2462 (66.2)		1.59	<0.001
LTBI	330 (10.6)	1077 (29.0)		2.74	<0.001
Nutrition	433 (13.9)	322 (8.7)	1.6		<0.001
Dermatology	295 (9.4)	357 (9.6)		1.02	0.822
Ophthalmology	158 (5.1)	460 (12.4)		2.44	<0.001
Gastroenterology	122 (3.9)	465 (12.5)		3.2	<0.001
Cardiology	76 (2.4)	487 (13.1)		5.39	<0.001
Dental	232 (7.4)	303 (8.2)		1.1	0.269
Musculoskeletal	37 (1.2)	486 (13.1)		11.08	<0.001
Neurology	80 (2.6)	380 (10.2)		3.99	<0.001
Hematology	228 (7.3)	216 (5.8)	1.26		0.013
ENT	192 (6.2)	177 (4.8)	1.29		0.011
Pulmonology	50 (1.6)	200 (5.4)		3.36	<0.001
Hepatitis B	37 (1.2)	155 (4.2)		3.53	<0.001
Endocrinology	10 (0.3)	165 (4.4)		13.88	<0.001
Urology	39 (1.3)	91 (2.5)		1.96	<0.001
Gynecology	23 (1.55)	71 (4.11)		2.65	<0.001
HIV	3 (0.2)	28 (0.8)		4	0.031

Abbreviations: ENT: Ear, Nose & Throat; HIV: Human Immunodeficiency Virus; LTBI: Latent Tuberculosis Infection; RHS-I: Refugee Health Screener-Section 1 is a 14-item assessment of symptoms associated with post-traumatic stress disorder, anxiety, depression, and coping skills; RHS-II: Refugee Health Screener-Section 2 is a single item assessment of general distress.

Table 2: Mental and physical health findings by age group and prevalence ratio comparing age groups, presented in decreasing order of overall prevalence.

Denominators are provided here to indicate where there are missing observations in the calculation of percent with the condition: Children - n=651 (all mental health conditions, since only those age 14 and older received this exam); n=3124 (any physical health condition); n=1486 (gynecology); n=3120 (gastroenterology, urology); n=3122 (dental, ENT); n=3123 (hematology, ophthalmology); n=3124 (nutrition); n=3125 (dermatology, endocrinology, LTBI, neurology, pulmonology); n=3128 (cardiology); n=3136 (hepatitis B, musculoskeletal); n=1478 (HIV) Adults – n=3714 (urology); n=3716 (anxiety, endocrinology); n=3717 (gastroenterology, hepatitis B, pulmonology); n=1728 (gynecology); n=3718 (any physical health condition, cardiology, dental, depression, ENT, hematology, LTBI, musculoskeletal, neurology, nutrition, RHS-II); n=3719 (dermatology, ophthalmology, RHS-I, torture/violence); n=3718 (HIV).

Differences in disease prevalence by gender, are reported in Table 3. With the exception of ear, nose and throat (ENT) and urology, there were no significant differences in conditions by gender among children (data not shown). Positive findings in the ENT category were more common in boys than girls (7.0% vs 5.2%, prevalence ratio (PR) =1.36, p=0.033), while findings in the urology category were more common in girls than boys (1.7% vs 0.9%, PR=1.98, p=0.038).

Condition	Number with condition (%)		Prevalence ratio increased for		
	Adult Men	Adult Women	Men	Women	p-value
Mental Health					
Any mental health finding	632 (31.8)	740 (42.8)		1.35	<0.001
RHS-I positive	432 (22.7)	559 (32.4)		1.42	<0.001
RHS-II positive	326 (16.4)	418 (24.2)		1.48	<0.001
Torture/violence history	213 (10.7)	186 (10.8)		1.01	0.953
Depression diagnosis	116 (5.8)	190 (11.0)		1.89	<0.001
Anxiety diagnosis	139 (7.0)	162 (9.4)		1.34	0.007
Physical Health					
Any physical health finding	1317 (66.2)	1145 (66.3)		1	0.959
LTBI	643 (31.3)	434 (25.1)	1.25		<0.001
Nutrition	137 (6.9)	185 (10.7)		1.56	<0.001
Dermatology	205 (10.3)	152 (8.8)	1.17		0.12
Ophthalmology	221 (11.1)	239 (13.8)		1.24	0.012
Gastroenterology	216 (10.9)	249 (14.4)		1.33	0.001
Cardiology	275 (13.8)	212 (12.3)	1.13		0.162
Dental	145 (7.3)	158 (9.1)		1.25	0.039
Musculoskeletal	255 (12.8)	231 (13.4)		1.04	0.617
Neurology	141 (7.1)	239 (13.8)		1.95	<0.001
Hematology	95 (4.8)	121 (7.0)		1.47	0.004
ENT	99 (5.0)	78 (4.5)	1.1		0.51
Pulmonology	161 (8.1)	39 (2.3)	3.58		<0.001
Hepatitis B	90 (4.5)	65 (3.8)	1.2		0.256
Endocrinology	60 (3.0)	105 (6.1)		2.01	<0.001
Urology	46 (2.3)	45 (2.6)		1.13	0.565
Gynecology	n/a	71 (4.1)		--	--
HIV	12 (0.6)	16 (0.9)		1.55	-0.453

Abbreviations: ENT: Ear, Nose & Throat; HIV: Human Immunodeficiency Virus; LTBI: Latent Tuberculosis Infection; RHS-I: Refugee Health Screener-Section 1 is a 14-item assessment of symptoms associated with post-traumatic stress disorder, anxiety, depression, and coping skills; RHS-II: Refugee Health Screener-Section 2 is a single item assessment of general distress.

Table 3: Mental and physical health findings by gender for adults (age 18-59 years) and prevalence ratio comparing gender, presented in order of prevalence used in Table 2.

Denominators are provided here to indicate where there are missing observations in the calculation of percent with the condition: Adults-n=3714 (urology); n=3716 (anxiety, endocrinology); n=3717 (gastroenterology, hepatitis B, pulmonology); n=1728 (gynecology) n=3718 (cardiology, dental, depression, ENT, hematology, LTBI, musculoskeletal, neurology, nutrition, RHS-II); n=3719 (dermatology, ophthalmology, RHS-I, torture/violence); n=3733 (HIV).

Adult women had higher prevalence of mental health findings than adult men (excepting exposure to torture/violence). Women had 42-48% higher prevalence of a positive screen on the RHS-15 screening exam, and higher prevalence of anxiety and depression compared to men (34% vs 89%).

For physical health, there were no significant differences between adult men and women in most areas. Men had a higher prevalence of findings in the pulmonology category (PR=3.58, $p<0.001$) predominantly representing COPD and asthma, and for LTBI (PR=1.25, $p<0.001$). Women had a higher prevalence of findings in the other categories where differences were noted (Table 3); the greatest differences seen were for endocrinology (PR=2.01, $p<0.001$) predominantly representing diabetes, and neurology (PR=1.95, $p<0.001$) predominantly representing headaches.

Differences in prevalence of mental health findings by region from which refugees originated, are found in Figure 1. Refugees from the Middle East had significantly higher prevalence, relative to those coming from Africa or Non-Middle East Asia, for anxiety, depression, and both screening scores (RHS-I, RHS-II). The prevalence of reported torture and/or violence was similar for refugees coming from Africa and the Middle East, and were significantly higher relative to refugees from Non-Middle East Asia.

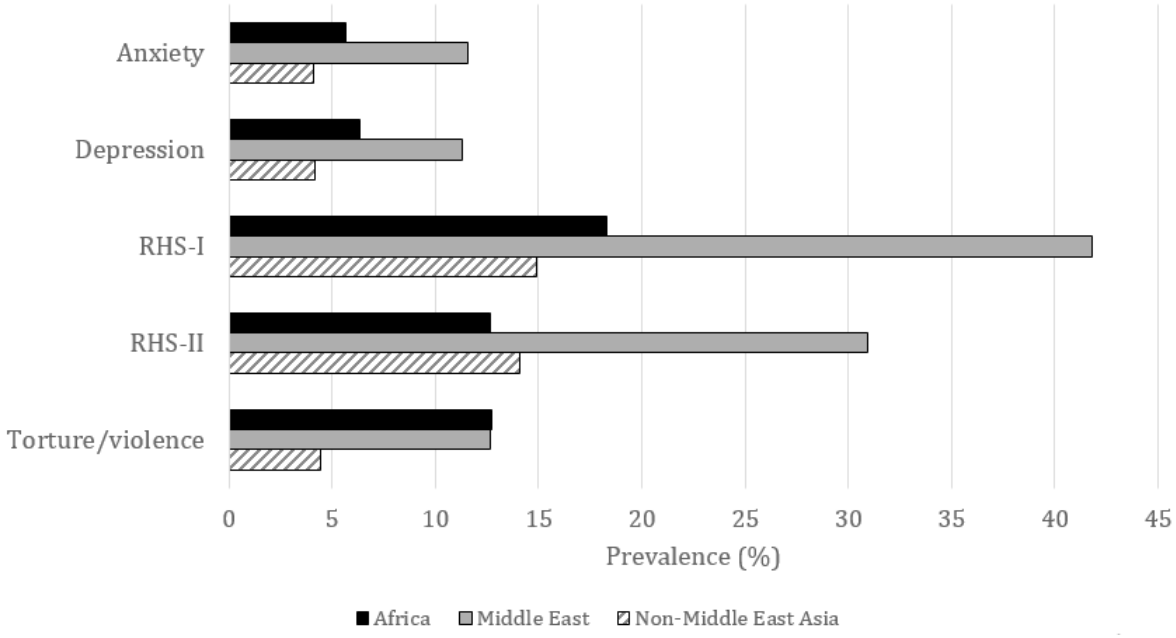

Figure 1: Prevalence of mental health conditions by geographic region.

Differences in physical health findings by region from which refugees originated was also evaluated. The most common condition was latent tuberculosis infection (LTBI), with prevalence of 24.2% for Africa, 11.7% for Middle East, and 26.7% for Non-Middle East Asia (Middle East statistically lower than the other regions). Other infectious diseases noted were HIV (Africa: 1.3%; Middle East: no cases; Non-Middle East Asia: 0.4%; Africa statistically higher than Non-Middle East Asia) and hepatitis B (Africa: 4.0%, Middle East: 0.8%, Non-Middle East Asia: 3.4%; Middle East statistically lower than the other regions). The remaining physical health findings were grouped by organ system (Figure 2).

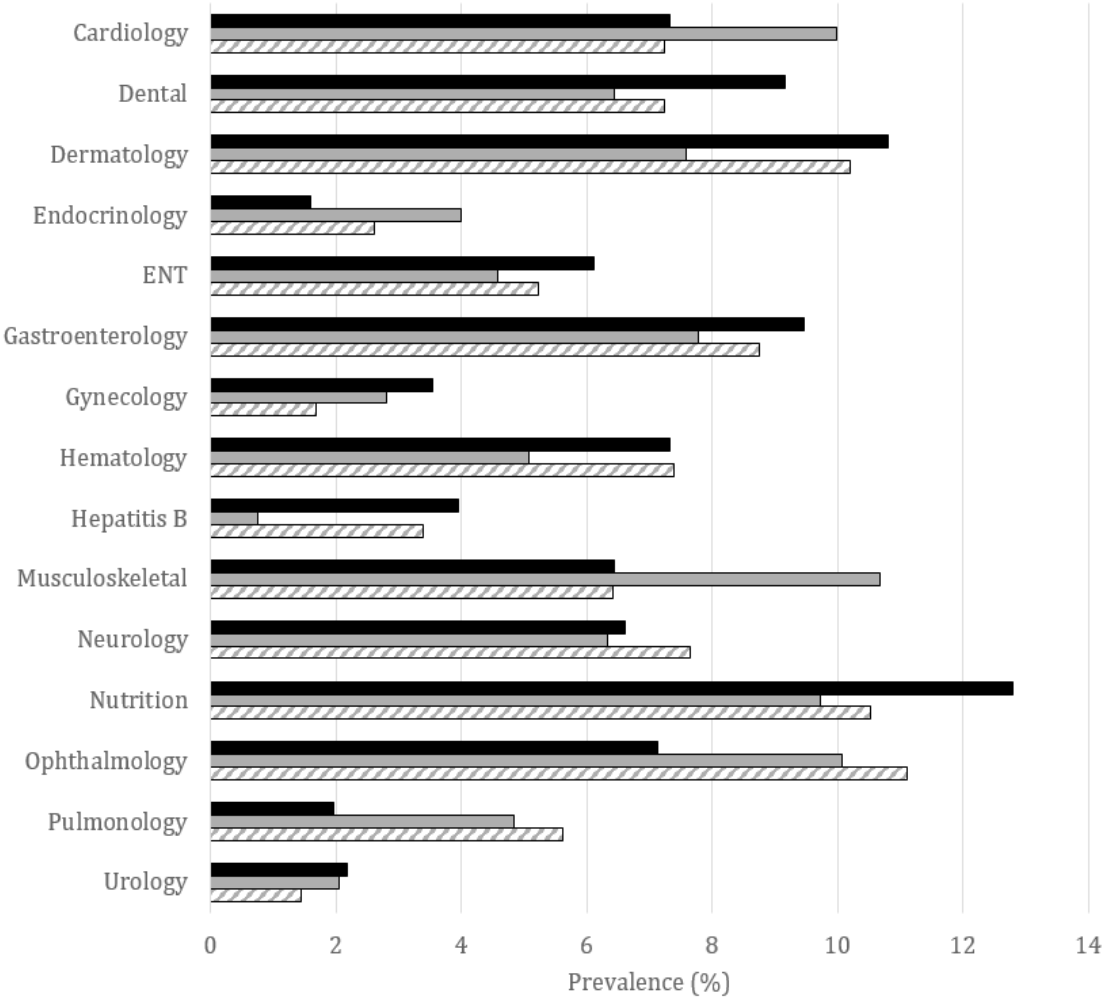

Figure 2: Prevalence of physical health conditions by geographic region.

Statistically significant differences by geography were as follows:

Relative to the other Regions, Refugees from Africa had Higher Prevalence for Dental and Nutrition Findings

Relative to the other regions, refugees from the Middle East had higher prevalence for cardiology and musculoskeletal findings; Relative to the other regions, refugees from Africa had lower prevalence for endocrinology (predominantly diabetes), ophthalmology and pulmonology (predominantly COPD and asthma) findings; Relative to the other regions, refugees from the Middle East had lower prevalence for dermatology and hematology findings; Relative to the other regions, refugees from Non-Middle East Asia had lower prevalence for gynecology findings; Refugees from Africa had statistically higher prevalence of gastroenterology and ENT findings relative to refugees from the Middle East.

Discussion

Understanding the variation in prevalence of health problems experienced by refugees is critical to healthcare professionals and community workers. The Utah Refugee Health Screener captured the physical and mental health conditions for refugee's age 0-59 years in this study. The condition identified are treatable, and swift resolution of these conditions will aid refugees in achieving other goals of resettlement, such as successful participation in work and school. Almost one third of these refugees had at least one finding on the RHS-15. The RHS-15 has good sensitivity (range .81 to .95) and specificity (range .86 to .89) for Iraqis, Nepali and Burmese,

and is assumed to perform well for other groups [11]. Although adult women scored significantly higher than men on the RHS-15, both had similar rates of reporting torture and violence. Refugees from the Middle East, mainly Iraqis, were more likely to screen positive. This is likely related to the nature of trauma, which has included air bombardments, rocket attacks, witnessing a shooting, interrogation and harassment by militias [12].Others have reported that refugees can be hesitant to talk about mental health, which may result in under-reporting [13].Thus, primary care providers should consider repeat screening after establishing rapport with refugee patients.

Among adults, the prevalence of hypertension was >12%. Hypertension is categorized as: previously undiagnosed, diagnosed but untreated, or treated but not at goal. This screening is a single measurement, and those without a prior diagnosis of hypertension, but with elevated blood pressure at screening, should be further evaluated. Hypertension is a global silent epidemic [14]. Prompt and effective treatment of hypertension reduces the risk of stroke, heart failure, renal disease, poor vision and dementia [15-18]. These preventable conditions represent expensive and increased care needs that can be avoided if hypertension is identified early and treated effectively [19-21]. Diabetes was found in a number of refugees. The prompt diagnosis and effective treatment of diabetes reduces the risk of additional comorbid conditions such as cardiovascular disease, renal disease, neuropathies and retinopathy.

The prevalence of dental problems among refugees was 7.8%, however, we believe that this number underestimates the magnitude of the problem in refugees. Refugee screening didn't include a dental screening for most of the adults. The dental issues were identified through history taking and examination by primary care providers.

The prevalence of LTBI was similar between male and female youth (10.9% and 10.2%), however, adult males had higher prevalence of LTBI than adult females (31.3% and 25.1%, respectively, $p<0.001$). Sex disparities in LTBI have been reported globally, which can be explained by differences in gender roles in countries of origin [22]. The prevalence of pulmonology conditions was higher in adult males than females, and consisted mainly of COPD and asthma. This higher prevalence is likely explained by the higher rates of smoking among men [23]. The prevalence of pulmonology conditions among Middle East and Non-Middle East Asia refugees (4.8% and 5.6% respectively) were higher than African refugees (2.0%), which follows the relative rates of smoking [23].

Literature Search and Data Sources

Our search strategy was focused on identifying the most recent data. A comprehensive literature review was completed using the key words "refugee health, refugee health screening findings, domestic refugee health screening, LTBI among refugees, presumptive parasites treatment for refugees, blood lead levels in refugees, immigrant's health, mental health screening for refugees and immigrants". The data sources include Cochrane, PubMed, CDC guidelines for refugee health screening, states and federal published refugee statistics, and national refugee health programs websites.

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