

Hepatitis C screening and prevalence among primary refugees resettling in the U.S., 2010 – 2015

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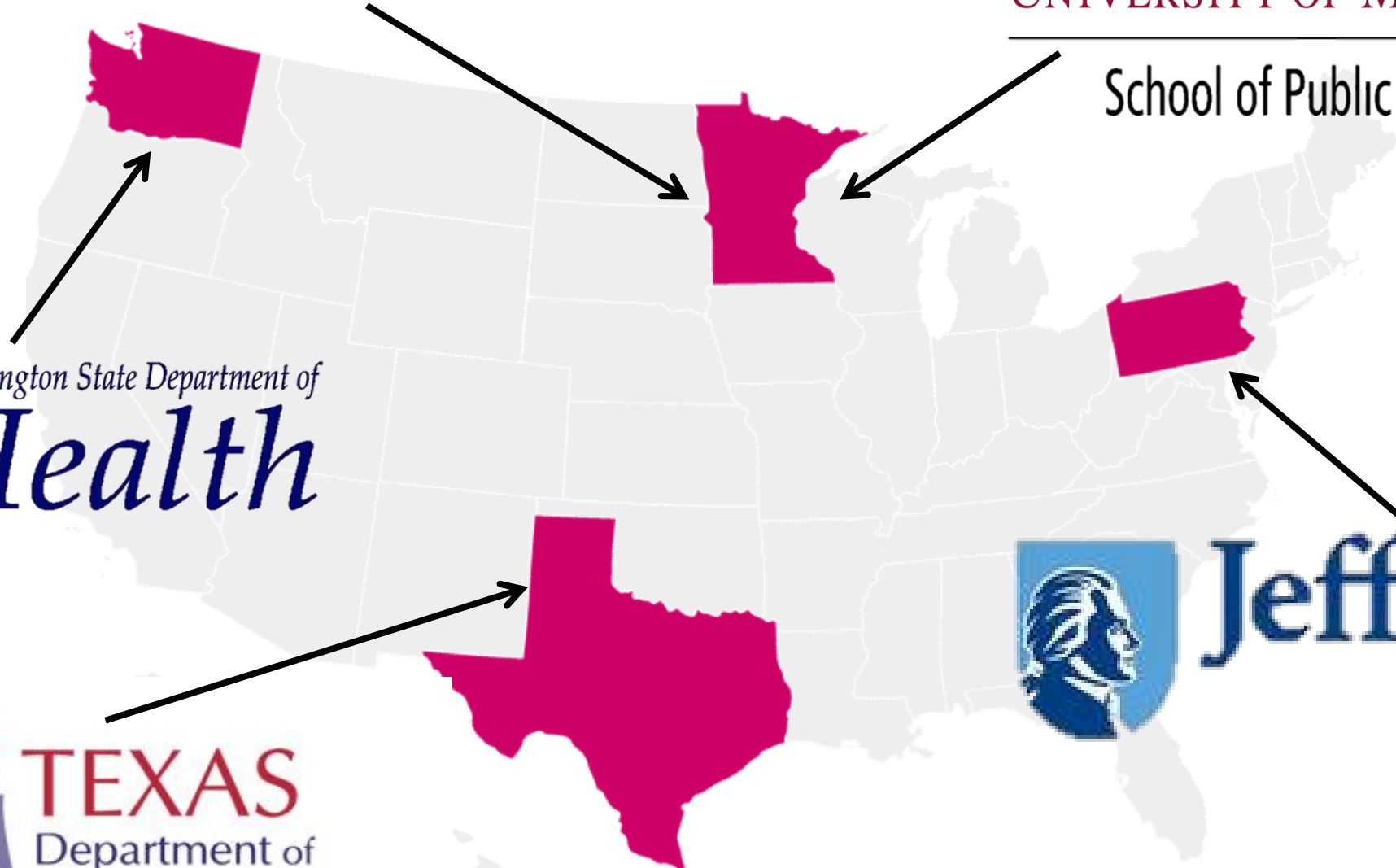


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Jefferson

Chronic Hepatitis C Infection

- Major contributor to hepatocellular carcinoma & cirrhosis
- Screening Test: Presence of Hepatitis C antibody (Anti-HCV)
- Diagnostic Test: Presence of Hepatitis C viral RNA
→ Dx Chronic Hepatitis C Infection
- In recent years treatments available to cure infection
 - Expensive but cost-effective at all stages of disease for most genotypes (Chhatwal et al 2015 & Treharne et al 2015)
- Screening at-risk groups more important than ever

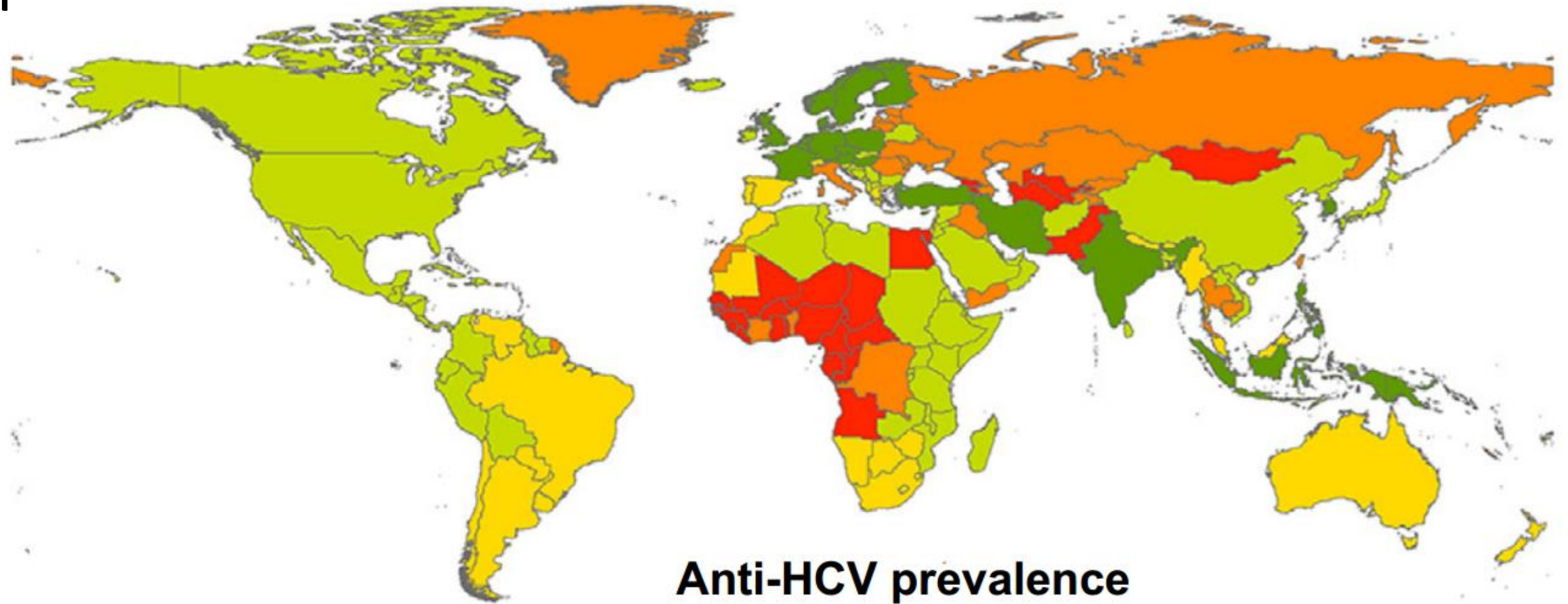


Existing Research on Hepatitis C in Refugees

- Greenaway et al. (2015): systematic review – refugee anti-HCV prevalence
 - Highest in Sub-Saharan Africa (4.4%), Asia (3.8%) & Eastern Europe (2.2%)
- Mixon-Hayden et al (2014): chronic infection in US-bound refugees
 - 7.23% in Hmong refugees from Thailand, 0.51% in those from Laos
 - 0.85% in refugees from Somalia
 - 0.66% in refugees from Bhutan
 - 0.37% in refugees from Myanmar
 - 0.00% in refugees from Iraq
- Shire et. al (2012): Somali patients tested at Mayo for anti-HCV
 - 9.1% of Somali patients had antibodies



Gower et. al, 2014 - Review of Global Prevalence



Anti-HCV prevalence



Current CDC Guidelines for Hepatitis C Screening

- “Same as the guidelines for the general U.S. population”
 - Baby Boomers
 - IDUs
 - HIV+
 - Transfusion recipients
 - Children of HCV+ mothers
 - Individuals with abnormal liver function
- Are these the at-risk groups in refugee populations?



Study Objectives

- Estimate prevalence of Hepatitis C antibodies & infection in refugees arriving to four participating sites
- Identify high-risk groups
 - “High-prevalence” threshold for anti-HCV set at $>1.6\%$ or >16 per 1000 (Global estimate by Gower et al 2014)
- Use findings to inform more targeted screening guidelines



Study Design

- Cross-sectional study
- Study population: **primary refugees** who
 - Arrived between Jan 2010 and Jun 2015
 - To MN, TX, WA, or Philadelphia
- Data sources:
 - State RHA databases
 - State Hepatitis C reporting databases
 - Medical records



Demographics & Data Summary

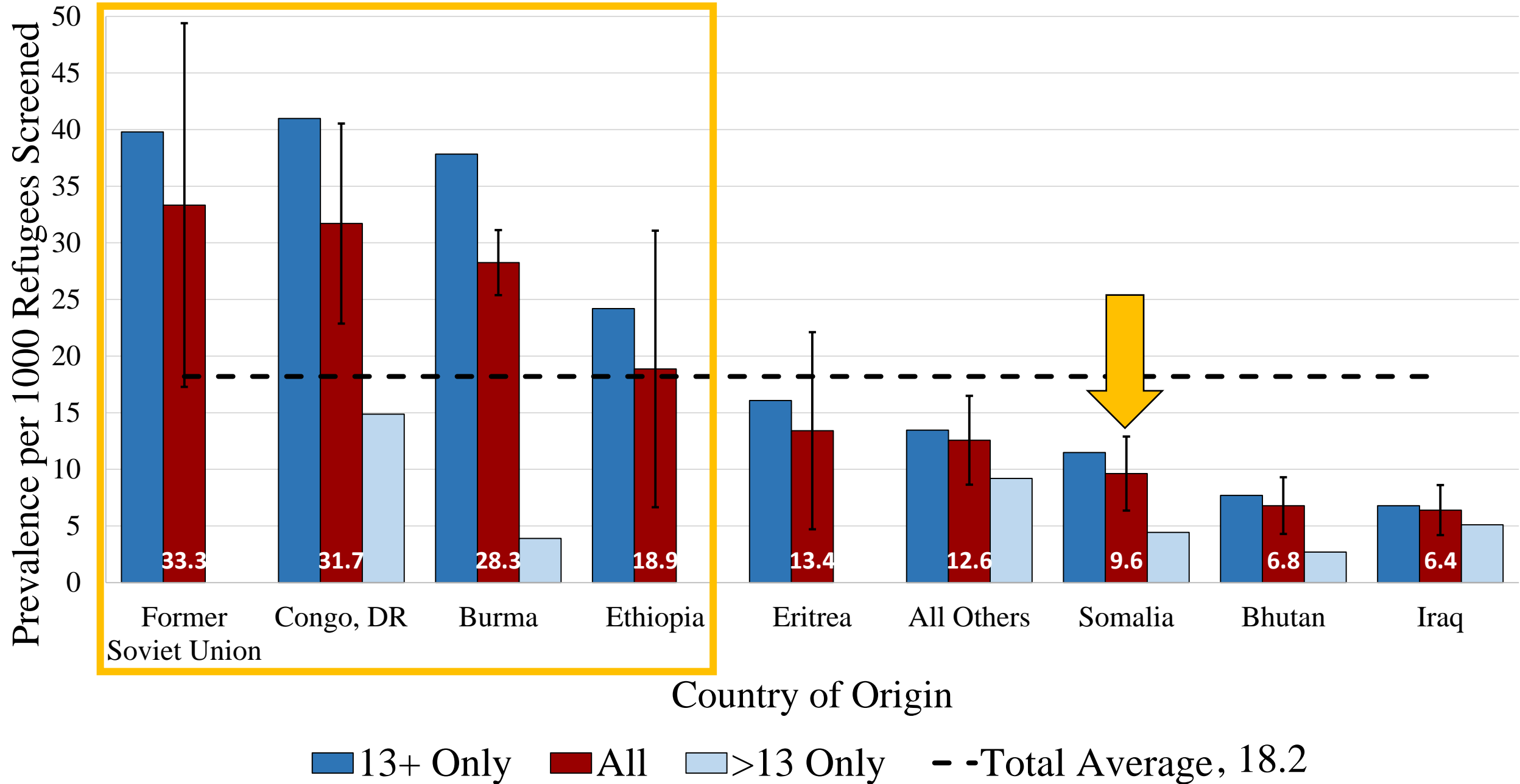
Population	Number	Percent Male	Average Age	Top 6 Countries of Origin	
All who received a Refugee Health Assessment (RHA)	56,751	53.3	24.8	1. Burma 2. Iraq 3. Somalia	4. Bhutan 5. Congo, DR 6. Iran
→ All who were screened for Hepatitis C	31,538	53.6	25.3	1. Burma 2. Iraq 3. Bhutan	4. Somalia 5. Congo, DR 6. Iran
→ → All who had antibodies to Hepatitis C (positive anti-HCV)	574	62.7	36.2	1. Burma 2. Congo, DR 3. Somalia	4. Iraq 5. Bhutan 6. FSU
→ → → All who were diagnosed with chronic HCV infection	84	63.1	46.3	1. Burma 2. FSU 3. Congo, DR	4. Iraq 5. Somalia

Which Refugees Were Screened for Hepatitis C?

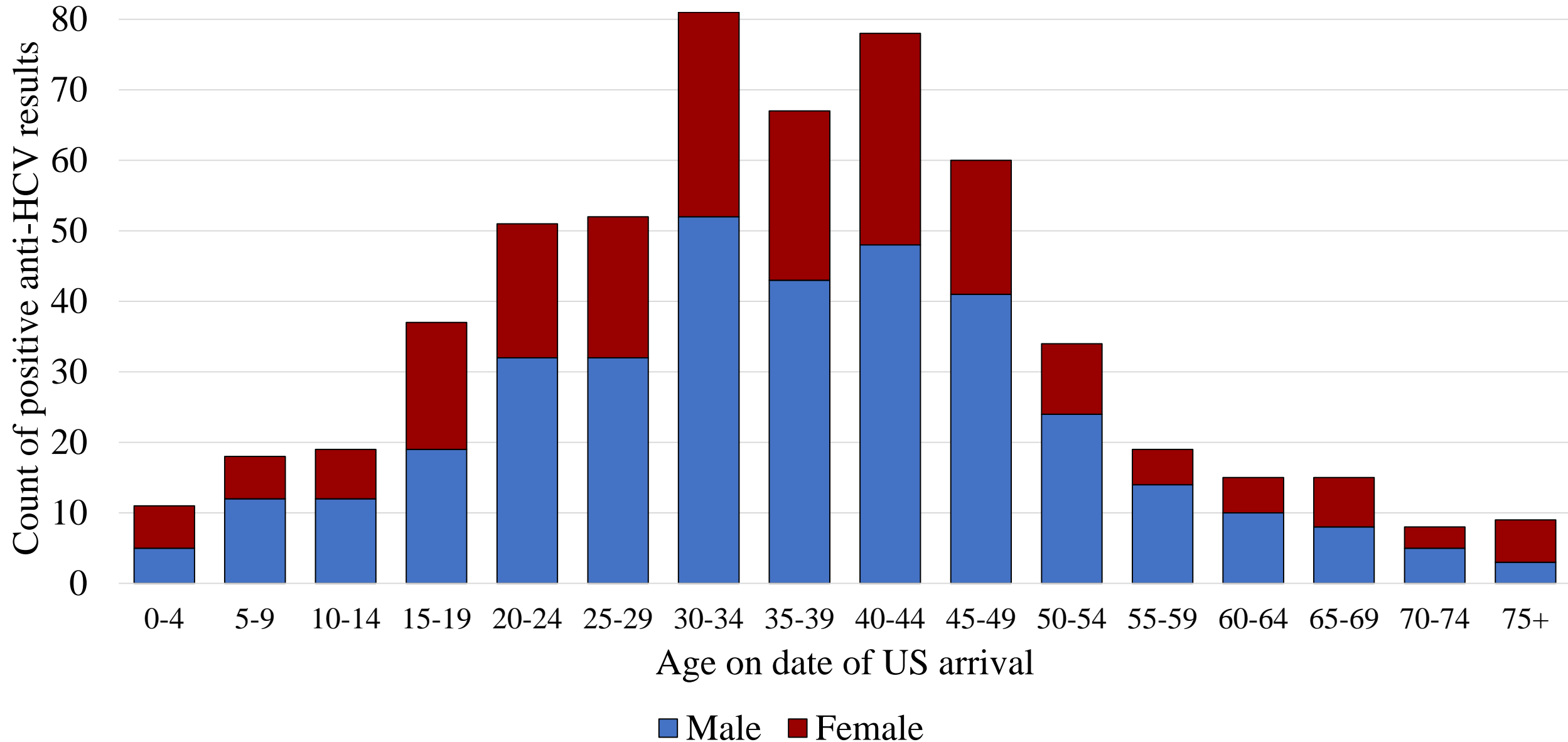
Factor	• Numerator Group • Referent Group	Screening Ratio	95% CI*
Country of Origin	<ul style="list-style-type: none"> • High prevalence countries (4) • All other countries 	1.35	1.33 – 1.37*
Age	<ul style="list-style-type: none"> • 13 or older • Less than 13 years old 	1.16	1.14 – 1.83*
Sex	<ul style="list-style-type: none"> • Male • Female 	1.01	0.999 – 1.03



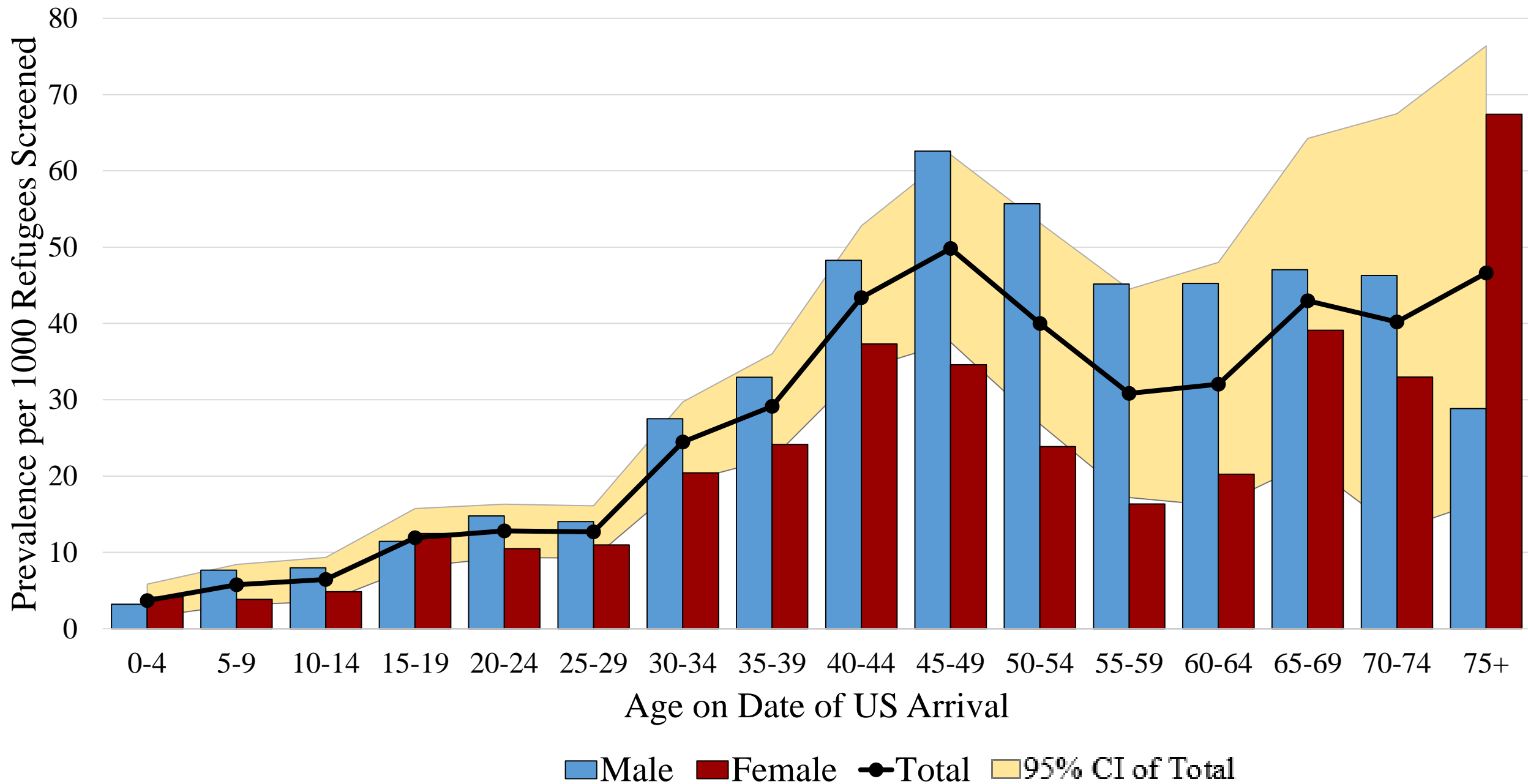
Hepatitis C Antibody Prevalence by Country of Origin and Age



Frequency of positive anti-HCV results by age and sex



Hepatitis C Antibody Prevalence by Age and Sex



Results: Demographic Factors of Anti-HCV Prevalence

Factor	<ul style="list-style-type: none"> • Numerator Group • Referent Group 	Prevalence Ratio	95% CI*
Country of Origin	<ul style="list-style-type: none"> • High prevalence countries (4) • All other countries 	3.23	2.68 – 3.90*
Age	<ul style="list-style-type: none"> • 13 or older • Less than 13 years old 	3.97	3.08 – 5.11*
Sex	<ul style="list-style-type: none"> • Male • Female 	1.45	1.23 – 1.72*



Results: Comparing Refugees & US Population

- Refugees are 39% more likely to have Hepatitis C antibodies than the general US population PR=1.39 (1.23–1.58)
- US population prevalence: 13 per 1000 individuals (NHANES – Ditah et. al 2014)
- Refugee population prevalence: 18.2 per 1000 individuals



Summary of Results

- Prevalence increases consistently with age
 - No chronic HCV cases younger than 15
- Prevalence slightly higher in males
- Refugees 39% more likely to have HCV antibodies than the general US population
- Screening is targeted to at-risk groups
→ but still missing many with the disease

Country or Group	Prevalence Per 1000 Refugees
Former Soviet Union	33.3
DR Congo	31.7
Burma	28.3
Ethiopia	18.9
Eritrea	13.4
All Others	12.6
Somalia	9.6
Bhutan	6.8
Iraq	6.4
TOTAL	18.2

Limitations

- Country of Origin linked to resettlement state
 - May have missed significant populations resettling to other states
- Not generalizable to asylees
- Differences in the way Hepatitis C diagnoses are reported by state limits ability to estimate prevalence of chronic disease
- Risk-based screening at some sites may inflate prevalence estimates
- Almost no exposure data was available
 - I.e.: Hx surgery, tattoo, infected needle sharing partner



Next Steps

- Tease out exposures / risk factors in high prevalence groups
- Collect data on likelihood of treatment in chronically infected refugees

Potential guidelines?

- Screen all refugees 13 years and older for Hepatitis C antibodies
- Screen all refugees regardless of age from high prevalence countries
 - Former Soviet Union, DR Congo, Burma, & Ethiopia



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