Health Status and Healthcare Cost Drivers for Minnesota Refugees

By

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Health Status and Healthcare Cost Drivers for Refugees

In Fiscal Year 2015, the Minnesota Department of Human Services spent $81 million in state funds to support refugees, including: $72.3 million on Medical Assistance; $805,000 on MinnesotaCare.\(^1\) But, insurance costs only tell part of the fiscal impact of refugees on health care costs. The types of medical conditions present in refugee populations, which differ from the general population, uniquely impact on the cost of health care. When refugee health status differs significantly from native born residents, the need to treat illness that is rare in the native population adds costs to our state’s overall health care bill.

The Minnesota Department of Health has highlighted six health conditions prevalent among primary and secondary refugees living in the state. The three most prevalent health conditions and one cultural procedure (female genital cutting or mutilation) that has the potential for long term healthcare costs, will be examined in this paper.

Tuberculosis (TB) is the primary disease among refugees which is present in a significantly greater quantity than among native born Minnesotans. Parasitic infection and Hepatitis B infection are the next two most frequent health conditions in the adult population of resettled refugees.

### Health Status of New Refugees, Minnesota, 2016

<table>
<thead>
<tr>
<th>Health Condition</th>
<th>No. infected among screened (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB infection*</td>
<td>649/3,032 (21%)</td>
</tr>
<tr>
<td>Hepatitis B infection**</td>
<td>135/2,768 (5%)</td>
</tr>
<tr>
<td>Parasitic infection***</td>
<td>468/2,463 (19%)</td>
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<tr>
<td>Syphilis infection</td>
<td>20/1,572 (1%)</td>
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<tr>
<td>HIV infection</td>
<td>13/2,982 (&lt;1%)</td>
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<tr>
<td>Elevated Blood Lead****</td>
<td>105/1,337 (8%)</td>
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Total number of health screenings: \(N_{\text{Minnesota}}=3,110\) (99% of the 3,125 eligible refugees) * Persons with LTBI (QFT+ or \(\geq 10\) mm induration w/ normal CXR) or suspect/active TB disease ** Positive for Hepatitis B surface antigen (HBsAg)*** Positive for at least one intestinal parasite infection ****Children <17 years old (\(N_{\text{Minnesota}}=1,382\) screened); Lead Level \(\geq 5\) ug/dL
With 81% of TB cases in Minnesota coming from the non U.S. born population and with 21% of Primary Refugees and 30% of Secondary refugees tested testing positive for TB in 2016, clearly the resettled refugees TB status increases medical costs in Minnesota.
Tuberculosis Disease: Minnesota, 2011–2015

Hennepin: 289
Ramsey: 164
Suburban metro: 108
Greater MN: 186
Total: 747

Percent foreign born
By county, 2012-2016

When you examine the
following maps of Minnesota you will see the correlation of refugees residence and TB cases.

Non U.S.-Born Tuberculosis Cases by Country of Birth, Minnesota, 2011-2015

African/African-American Tuberculosis Cases by Place of Birth, Minnesota, 2011-2015
The red, purple and blue counties have the highest numbers of TB cases and on the shaded map, the darker shading the greater the percent of refugees in the population.


- Refugee: 48%
- Immigrant: 29%
- Other*: 19%
- Unknown: 4%

* "Other" includes visitors, tourists, students, those arriving on employment visas

N = 612

For example Hennepin had 239 TB cases and over 13% of it’s population are refugees. Neighboring Carver county has 2-5 TB cases and 5% of it’s population are refugees. Moving one more county to the west McLeod county had no TB cases and only 3% of it’s population are refugees. More refugees more TB. Less refugees less TB.

What is the race and ethnicity of those who have TB?

African or African American and Asian or Pacific Islander have the highest rates of TB. Somalians make up the largest percentage of TB cases among Africans (47%) and all non U.S. Born TB cases (28%). Refugees make up the largest percentage (48%) of non U.S. born TB.

How long after arrival in Minnesota do non US-Born TB cases appear?

Nearly half (49%) of the TB cases appear within 5 years of arrival while nearly 2/3 of the cases appear within 9 years of arrival. (see next page)
How often do TB cases effect school settings?

From 2011-2015 slightly more than 1 in 5 TB cases (168 of 747) occurred among students attending a school or a daycare settings. On average, over 33 TB cases occur among students attending a school or a daycare each year. Another way to say that is in a 9 month school year, about 4 cases of TB occur among students attending a school or daycare every month.

Non U.S.-Born Tuberculosis Cases by Interval Between Arrival in U.S. and Diagnosis of Tuberculosis, Minnesota, 2011-2015

Are Non U.S. born TB patients more likely to experience TB which is resistant to traditional treatments?

Tuberculosis Cases by Drug Susceptibility Patterns and Place of Birth, MN 2011-2015
Drug resistant TB is much more prevalent in non US-Born residents of the US. Over 35% of the Minnesota Cases of TB reported from 2011-2015 among non US-Born residents were resistant too at least one drug with one third (12%/35%) being resistant to two or more drugs. Treating TB among non US-Born Minnesotans is typically more expensive than treating TB among US-born Minnesotans.

Using data from the CDC on the typical cost of treating each level of drug resistant TB (See Appendix A) and the number of cases of each level of drug resistant TB among non US-born Minnesotans, it is possible to estimate expenditures (calculation immediately follows) for treating drug resistant TB in the five years from 2011-2015.

\[
\text{(}$513,000 \times 4 \text{ MDR cases=}$2,052,000$) + (160,000 \times 57= $9,120,000) + (18,000 \times 107=$1,926,000)$ = $13,098,000 or $2,619,600 a year.
\]

Parasitic Infections

Second only to TB, 19% of refugees tested positive for at least one Parasitic Infection. Many U.S.-bound refugees come from countries where intestinal parasites are endemic. These infections are rare in the United States. Under diagnosis or misdiagnosis can lead to potentially serious consequences. The abstract for “Economic Analysis of the Impact of Overseas and Domestic Treatment and Screening Options for Intestinal Helminth Infection among US-Bound Refugees from Asia” appears as Appendix B.

An economic decision tree was developed to estimate the cost and health impacts of four interventions on an annual cohort of 27,700 U.S.-bound Asian refugees: 1) "No Program," 2) U.S. "Domestic Screening and Treatment," 3) "Overseas Albendazole and Ivermectin" presumptive treatment, and 4) "Overseas Albendazole and Domestic Screening for Strongyloides". Health outcome measures (four parasites) included outpatient cases, hospitalizations, deaths, life years, and quality-adjusted life years (QALYs).

According to the model outcomes, the most effective treatment option is "Overseas Albendazole and Ivermectin," which reduces outpatient cases, deaths and hospitalization by around 80% at an estimated net cost of $458,718 per death averted, or $2,219/$24,036 per QALY/life year gained relative to "No Program." With this finding,
It is surprising that 19% of new refugees present with at least one Parasitic Infection. By waiting for the refugee to arrive in the US and then screening and treating, the costs are substantially ($3,832,572 v. $458,718) higher than presumptively treating for parasites. To minimize the cost of screening and treating all refugees should be screened and treated overseas for Parasitic Infection to minimize the health-care costs born by taxpayers when refugees are resettled from areas of the world where Parasitic Infections are endemic.

**Hepatitis B**

Hepatitis B (HEP B) is a multiple dimensional condition that can be prevented by vaccination and intervention immediately following exposure. HEP B can present as an acute infection and can result in severe liver damage leading to liver failure. As with most infections prevention is less expensive than treatment. The HEP B, vaccine typical costs $500 to complete the regime of three shots and resultant administration fees. With 5% (137) of the Minnesota refugees testing positive for HEP B a prudent immunization regimen would have immediate family members receive the vaccine. Assuming each individual case is surrounded by about five family members. The total cost of the immunization program is estimated to be $342,500.

Lifetime health care costs for a patient with chronic hepatitis B has been estimated at $65,000. With 137 cases of HEP B in the population of 2016 Minnesota Refugees, the estimated life time cost for health care for this group is $8,905,000. For cases requiring transplantation, the one year individual case cost is $280,000.

With 137 new cases of HEP B arriving in Minnesota in 2016 as a result of resettlement of refugees, significant immediate and long term health care costs are incurred. The cost of preventing and treating refugee related HEP B must be considered a cost of the resettlement program. (See Appendix C for more details)

**Female Genital Mutilation (FGM)**

FGM is included in this paper because it has a health care cost and is endemic among the most recent refugees being resettled in Minnesota. The following statement from a World Health Organization document succinctly describes FGM and the lack of reliable data to determine it’s burden on women’s health:

> Female genital mutilation (FGM) is a harmful practice without any known benefit. [1, 2] The true burden of FGM is difficult to determine owing to the lack of reliable data on girls younger than 15 years; women and girls in the Middle East, Africa, Asia, and Latin America; and on immigrant populations continuing the practice in Europe, North America, and Australia.[3]

Some key facts regarding:
FGM has no health benefits for girls and women. More than 200 million girls and women alive today have been cut in 30 countries in Africa, the Middle East and Asia where FGM is concentrated.

Some Long-term health risks:

- Chronic genital infections
- Chronic reproductive tract infections
- Urinary tract infections
- Painful urination
- Menstrual problems
- Keloids
- Human immunodeficiency virus (HIV)
- Female sexual health
- Obstetric complications
- Perinatal risks

Health risks result in health care costs even if they can not be calculated and need to be considered a cost of refugee resettlement. (See Appendix D for details)

Summary and Conclusions

Each of the health conditions examined by this paper are serious and expensive to treat. At least two conditions (TB and HEP B) have the potential to breakout of the refugee population and impact other groups of people. Last year’s outbreak of measles within Minnesota’s refugee population should serve as a warning that refugee resettlement has costs beyond simply placing them in a location. TB, which had become rare, has become a renewed public health problem primarily due to the arrival of non US Born residents. The prevalence of drug resistant TB presents new threats and increasing costs to treat TB.

The cost of treatment for parasitic infections can be reduced by diagnosis and treatment prior to allowing the refugee to resettle. Chronic HEP B in a potential refugee means life time cost of treatment of $65,000; and, if liver damage is so severe, transplantation costing $280,000. FGM’s cost for treatment can not currently be calculated; but, the shear number of long term health risks does not offer comfort for those interested in health care cost containment.

Why do we choose to allow people to resettle in the US that have medical conditions that threaten public health and impose ongoing costs of treatment on their new place of residence without having those costs both acknowledged and covered? When the receiving communities do not receive funds to off set these known costs state and local taxpayers bear that cost.
The National Governors Association periodically issues complaints about the obligations placed upon states without consultation by the program. The Senate report from the 1992 Reauthorization of the Refugee Resettlement Act acknowledged that the decision to stop reimbursing states for the state cost of Medicaid and cash welfare was causing pain at the state level:

Some smaller states indicate that they may eliminate their refugee programs entirely with such a cut [reimbursement to states]. And a consequence of such funding cuts is pressure to reduce the number of refugees admitted for resettlement at a time when commitments continue to Vietnamese political prisoners, Amerasian children, Soviet Jews, and others. The prospect of these cuts has jeopardized the current refugee program.

If anything the cost shifting has grown and local and state taxpayers are bearing the cost of a program they have little to no control over. Some people might call that taxation without representation. Until the full cost of refugee resettlement is covered the program should be suspended.

End notes

1 “Fiscal Impact of the Federal Refugee Resettlement Program Topic Selection Background Paper” Minnesota Office of Legislative Auditor April 2017


5 National Governors Association website. e complaints come and go, perhaps depending on NGA leadership. From NGA website 2009

THE COSTLY BURDEN OF DRUG-RESISTANT TB IN THE U.S.

Multidrug-resistant (MDR) tuberculosis is a major health threat globally. Nearly half a million MDR TB\(^1\) cases are estimated to occur worldwide annually, including cases that are extensively drug-resistant (XDR).\(^2\)

While MDR and XDR TB are relatively rare in the U.S., their treatment comes at a terrible price – it is very expensive, takes a long time to treat, disrupts lives, and has potentially life-threatening side effects.

A Major Human Cost
Of those treated for drug-resistant TB:

- 9% Die During Treatment
- 27% Stop Working
- 73% Hospitalized
- 37% Require Home Isolation

Severe Treatment Side Effects

- Depression/Psychosis: 19%
- Hearing Impairment: 13%
- Hepatitis: 13%
- Kidney Impairment: 11%
- Loss of Mobility: 8%
- Vision Impairment: 7%
- Seizures: 1%

Preventing and Controlling MDR and XDR TB in the U.S. Requires:

- Better Treatment Options
- Rapid Diagnosis
- Expert Treatment of Every TB Case
- Improving Global TB Diagnosis and Treatment

Footnotes

1 Multidrug-resistant TB is resistant to at least two of the best and most important anti-TB drugs (isoniazid and rifampin).
2 Extensively drug-resistant TB is resistant to isoniazid and rifampin among first-line drugs, resistant to any fluoroquinolone and at least one second-line injectable drug.


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http://www.cdc.gov/nchhstp/newsroom
9,272 TB CASES REPORTED IN THE U.S. IN 2016

A Typical TB Case Requires:

+ 180 days of medications
+ X-Rays
+ Lab Tests
+ Follow-up & testing of contacts

Total cost to U.S for TB cases in 2016: $451 million

Our current strategies are not enough to achieve TB elimination in this century.

TB CAN HAPPEN ANYWHERE & TO ANYONE!
To eliminate TB, we must reach the hardest hit populations.

TB case rates are:

- 30x Higher for Asians than whites.
- 8x Higher for African Americans than whites.
- 8x Higher for Hispanics/Latinos than whites.

2 out of every 3 TB cases occur among non-U.S.-born persons.

DRUG-RESISTANT TB IS COMPLEX & COSTLY.
Drug-resistance threatens our ability to treat & control TB.

<table>
<thead>
<tr>
<th>TOTAL 2016 CASES</th>
<th>DIRECT TREATMENT COSTS PER CASE</th>
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<tbody>
<tr>
<td>1 Extensively Drug-Resistant TB</td>
<td>$513,000</td>
</tr>
<tr>
<td>96 Multidrug-Resistant TB</td>
<td>$160,000</td>
</tr>
<tr>
<td>9,175 Tuberculosis (Nonmultidrug-Resistant)</td>
<td>$18,000</td>
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ELIMINATING TB REQUIRES A COMPREHENSIVE APPROACH.
CDC is committed to fighting TB whenever & wherever it occurs through:

- Vigilant Surveillance
- Better Diagnostics & Treatments
- Testing & Treatment of High-Risk Populations
- Education of Health Care Providers

To learn more about TB, visit: www.cdc.gov/tb

November, 2017
Appendix B


Abstract

Background: Many U.S.-bound refugees travel from countries where intestinal parasites (hookworm, Trichuris trichuria, Ascaris lumbricoides, and Strongyloides stercoralis) are endemic. These infections are rare in the United States and may be underdiagnosed or misdiagnosed, leading to potentially serious consequences. This evaluation examined the costs and benefits of combinations of overseas presumptive treatment of parasitic diseases vs. domestic screening/treating vs. no program. Methods: An economic decision tree model terminating in Markov processes was developed to estimate the cost and health impacts of four interventions on an annual cohort of 27,700 U.S.-bound Asian refugees: 1) "No Program," 2) U.S. "Domestic Screening and Treatment," 3) "Overseas Albendazole and Ivermectin" presumptive treatment, and 4) "Overseas Albendazole and Domestic Screening for Strongyloides". Markov transition state models were used to estimate long-term effects of parasitic infections. Health outcome measures (four parasites) included outpatient cases, hospitalizations, deaths, life years, and quality-adjusted life years (QALYs). Results: The "No Program" option is the least expensive ($165,923 per cohort) and least effective option (145 outpatient cases, 4.0 hospitalizations, and 0.67 deaths discounted over a 60-year period for a one-year cohort). The "Overseas Albendazole and Ivermectin" option ($418,824) is less expensive than "Domestic Screening and Treatment" ($3,832,572) or "Overseas Albendazole and Domestic Screening for Strongyloides" ($2,182,483). According to the model outcomes, the most effective treatment option is "Overseas Albendazole and Ivermectin," which reduces outpatient cases, deaths and hospitalization by around 80% at an estimated net cost of $458,718 per death averted, or $2,219/$24,036 per QALY/life year gained relative to "No Program". Discussion: Overseas presumptive treatment for U.S.-bound refugees is a cost-effective intervention that is less expensive and at least as effective as domestic screening and treatment programs. The addition of ivermectin to albendazole reduces the prevalence of chronic strongyloidiasis and the probability of rare, but potentially fatal, disseminated strongyloidiasis.
For patients not covered by insurance, the total cost of a Hepatitis B vaccination sometimes includes a consultation fee, and usually includes shot administration fees and the cost of the three required doses of the vaccine for a total of about $120 to $370 or more.

**Treatment to prevent hepatitis B infection after exposure**

If you know you've been exposed to the hepatitis B virus and aren't sure if you've been vaccinated, call your doctor immediately. An injection of immunoglobulin (an antibody) given within 12 hours of exposure to the virus may help protect you from getting sick with hepatitis B. Because this treatment only provides short-term protection, you also should get the hepatitis B vaccine at the same time, if you never received it.

**Treatment for acute hepatitis B infection**

If your doctor determines your hepatitis B infection is acute — meaning it is short-lived and will go away on its own — you may not need treatment. Instead, your doctor might recommend rest, proper nutrition and plenty of fluids while your body fights the infection. In severe cases, antiviral drugs or a hospital stay is needed to prevent complications.

**Treatment for chronic hepatitis B infection**

Most people diagnosed with chronic hepatitis B infection need treatment for the rest of their lives. Treatment helps reduce the risk of liver disease and prevents you from passing the infection to others. Treatment for chronic hepatitis B may include:

- **Antiviral medications.** Several antiviral medications — including entecavir (Baraclude), tenofovir (Viread), lamivudine (Epivir), adefovir (Hepsera) and telbivudine (Tyzeka) — can help fight the virus and slow its ability to damage your liver. These drugs are taken by mouth. Talk to your doctor about which medication might be right for you.

- **Interferon injections.** Interferon alfa-2b (Intron A) is a man-made version of a substance produced by the body to fight infection. It's used mainly for young people with hepatitis B who wish to avoid long-term treatment or women who might want to get pregnant within a few years, after completing a finite course of therapy. Interferon should not be used during pregnancy. Side effects may include nausea, vomiting, difficulty breathing and depression.

- **Liver transplant.** If your liver has been severely damaged, a liver transplant may be an option. During a liver transplant, the surgeon removes your damaged liver and replaces it with a healthy liver. Most transplanted livers come from deceased donors, though a small number come from living donors who donate a portion of their livers.
Associated Health Costs - United States

Lifetime health care costs for a patient with chronic hepatitis B has been estimated at $65,000 in the absence of liver transplantation. For the 150,000 HBV carriers with significant liver damage, the lifetime health care costs in the U.S. have been estimated to be $9 billion. Assuming an estimated survival of 25 years, the annual health care costs for the affected U.S. population with chronic hepatitis B is $360 million. Based on the same economic analysis, treatment of chronic hepatitis B with interferon is projected to increase life expectancy by about three years and reduce the aggregate health care costs.

With the cost per liver transplantation in the range of $280,000 for one year, liver transplantation for hepatitis.
Female genital mutilation (From WHO)
Fact sheet
Updated February 2017

Key facts
Female genital mutilation (FGM) includes procedures that intentionally alter or cause injury to the female genital organs for non-medical reasons. The procedure has no health benefits for girls and women. Procedures can cause severe bleeding and problems urinating, and later cysts, infections, as well as complications in childbirth and increased risk of newborn deaths. More than 200 million girls and women alive today have been cut in 30 countries in Africa, the Middle East and Asia where FGM is concentrated. FGM is mostly carried out on young girls between infancy and age 15. FGM is a violation of the human rights of girls and women.

Short-term health risks of FGM
Severe pain: cutting the nerve ends and sensitive genital tissue causes extreme pain. Proper anaesthesia is rarely used and, when used, is not always effective. The healing period is also painful. Type III FGM is a more extensive procedure of longer duration, hence the intensity and duration of pain may be more severe. The healing period is also prolonged and intensified accordingly.
Excessive bleeding: (haemorrhage) can result if the clitoral artery or other blood vessel is cut during the procedure.
Shock: can be caused by pain, infection and/or haemorrhage.
Genital tissue swelling: due to inflammatory response or local infection.
Infections: may spread after the use of contaminated instruments (e.g. use of same instruments in multiple genital mutilation operations), and during the healing period.
Human immunodeficiency virus (HIV): the direct association between FGM and HIV remains unconfirmed, although the cutting of genital tissues with the same surgical instrument without sterilization could increase the risk for transmission of HIV between girls who undergo female genital mutilation together.
Urination problems: these may include urinary retention and pain passing urine. This may be due to tissue swelling, pain or injury to the urethra.
Impaired wound healing: can lead to pain, infections and abnormal scarring
Death: can be caused by infections, including tetanus and haemorrhage that can lead to shock.
Psychological consequences: the pain, shock and the use of physical force by those performing the procedure are mentioned as reasons why many women describe FGM as a traumatic event.
Long-term health risks

Pain: due to tissue damage and scarring that may result in trapped or unprotected nerve endings.

Infections:

- **Chronic genital infections**: with consequent chronic pain, and vaginal discharge and itching. Cysts, abscesses and genital ulcers may also appear.
- **Chronic reproductive tract infections**: May cause chronic back and pelvic pain.
- **Urinary tract infections**: If not treated, such infections can ascend to the kidneys, potentially resulting in renal failure, septicaemia and death. An increased risk for repeated urinary tract infections is well documented in both girls and adult women.

**Painful urination**: due to obstruction of the urethra and recurrent urinary tract infections.

**Menstrual problems**: result from the obstruction of the vaginal opening. This may lead to painful menstruation (dysmenorrhea), irregular menses and difficulty in passing menstrual blood, particularly among women with Type III FGM.

**Keloids**: there have been reports of excessive scar tissue formation at the site of the cutting.

**Human immunodeficiency virus (HIV)**: given that the transmission of HIV is facilitated through trauma of the vaginal epithelium which allows the direct introduction of the virus, it is reasonable to presume that the risk of HIV transmission may be increased due to increased risk for bleeding during intercourse, as a result of FGM.

**Female sexual health**: removal of, or damage to highly sensitive genital tissue, especially the clitoris, may affect sexual sensitivity and lead to sexual problems, such as decreased sexual desire and pleasure, pain during sex, difficulty during penetration, decreased lubrication during intercourse, reduced frequency or absence of orgasm (anorgasmia). Scar formation, pain and traumatic memories associated with the procedure can also lead to such problems.

**Obstetric complications**: FGM is associated with an increased risk of Caesarean section, post-partum haemorrhage, recourse to episiotomy, difficult labour, obstetric tears/lacerations, instrumental delivery, prolonged labour, and extended maternal hospital stay. The risks increase with the severity of FGM.

**Obstetric fistula**: a direct association between FGM and obstetric fistula has not been established. However, given the causal relationship between prolonged and obstructed labour and fistula, and the fact that FGM is also associated with prolonged and obstructed labour it is reasonable to presume that both conditions could be linked in women living with FGM.

**Perinatal risks**: obstetric complications can result in a higher incidence of infant resuscitation at delivery and intrapartum stillbirth and neonatal death.

**Psychological consequences**: some studies have shown an increased likelihood of post-traumatic stress disorder (PTSD), anxiety disorders and depression. The cultural significance of FGM might not protect against psychological complications.