

# Combating Measles in Central Nebraska: A Public Health Case Study

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## Objectives

1. Review vaccine epidemiology and the rate of vaccination required for herd immunity
2. Identify risk for measles outbreaks in Nebraska and specific populations at high risk
3. Identify perceptions within the Somali community regarding MMR vaccination and ways to increase vaccination rates.



No disclosures



## The case

A 12 month old Somali female is brought in by her mother for her 12 month well child check.

- Parents have no concerns
- Meeting growth and development milestones
- Physical exam appropriate for age
- Up to date on vaccinations. Needs 12 month vaccines.



...We don't want the vaccine that will make her not talk...



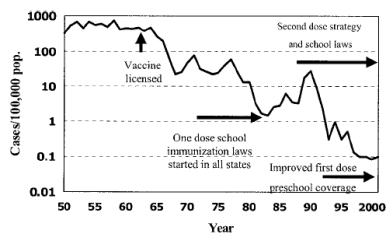
## Measles Basics

- Highly contagious RNA virus
- URI prodrome with maculopapular rash spreads head to toe develops 2-4 days later
- Spread by respiratory droplets- 90%secondary attack rate
- Usually mild to moderate but complications can be severe
  - 18% require hospitalization
  - 1-6% pneumonia
  - 0.1% encephalitis
  - 0.1% to 0.3% death

<https://www.cdc.gov/vaccines/pubs/surv-manual/chpt07-measles.html>  
[www.cdc.gov/measles/about/complications.html](https://www.cdc.gov/measles/about/complications.html)



## How did we get here



**Figure 2.** Reported measles incidence, United States, 1950–2001. Data are shown on a logarithmic scale to highlight relative changes.

Evolution of Measles Elimination Strategies in the United States

| Measles cases per year |       |
|------------------------|-------|
| Year                   | Cases |
| 2010                   | 63    |
| 2011                   | 220   |
| 2012                   | 55    |
| 2013                   | 187   |
| 2014                   | 667   |
| 2015                   | 188   |
| 2016                   | 86    |
| 2017*                  | 118   |
| 2018**                 | 9     |

Number of measles cases by year since 2010

\*Cases as of December 30, 2017. Case count is preliminary and subject to change.

\*\*Cases as of January 27, 2018. Case count is preliminary and subject to change. Data are updated monthly.

Source: Morbidity and Mortality Weekly Report (MMWR), Notifiable Diseases and Mortality Tables

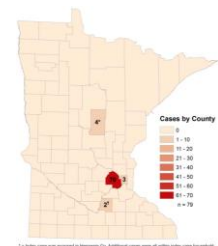
## Measles outbreaks

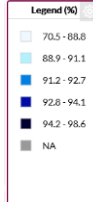


[minnesota.cbslocal.com](http://minnesota.cbslocal.com)

## Minnesota 2017 measles outbreak

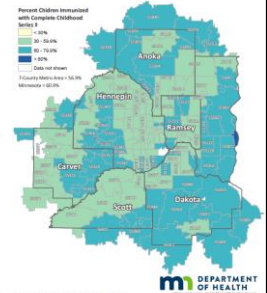
- 79 cases
  - Outbreak from April to August
  - >8000 exposed
  - 22 (31%) required admission
  - No deaths
  - 71 unvaccinated
  - 81% Somali
  - Minnesota cost \$900,000
  - Hennepin County cost \$400,000



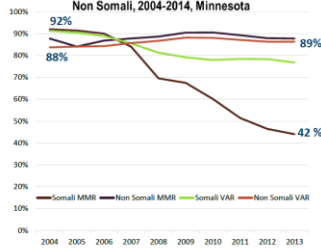


Percent Children Living with Grandparents Series 1

- 30-59.9%
- 60-79.9%
- 80-89.9%
- 90-99.9%



Comparison of MMR and Varicella Rates at 2 Years Old in Minnesota-born Children of Somali Descent versus Non Somali, 2004-2014, Minnesota



\*Two-sided  $p < 0.05$  for comparison with non-

# Childhood Vaccine Beliefs Reported by Somali and Non-Somali Parents

Jody E. Wigg, MD, and Diana J. Shellen, MD, PhD

Table 2. Vaccines for Children Refused by Parents in a Written Survey

| Vaccine     | Total (n = 96) | Somali (n = 27) | Non-Somali (n = 69) | P Value |
|-------------|----------------|-----------------|---------------------|---------|
| MMR         | 10.4 (10)      | 22.2 (8)        | 5.8 (4)             | .03     |
| Hepatitis B | 4.2 (4)        | 0 (0)           | 5.8 (4)             | .57     |
| Varicella   | 1.0 (1)        | 0 (0)           | 1.4 (1)             | 1.00    |
| DTaP        | 1.0 (1)        | 0 (0)           | 1.4 (1)             | 1.00    |
| Rotavirus   | 1.0 (1)        | 0 (0)           | 1.4 (1)             | 1.00    |
| Influenza   | 6.3 (6)        | 3.7 (1)         | 7.2 (5)             | 1.00    |
| Other       | 1.0 (1)        | 0 (0)           | 1.4 (1)             | 1.00    |

Data are % (n).  
DTaP, diphtheria-tetanus-acellular pertussis; MMR, measles-mumps-rubella.

- 76.9% Somali individuals were aware of a theory that vaccines caused autism
  - 63.9% attributed autism to MMR
- 100% of Somali parents who refused MMR personally knew a child who received MMR and subsequently was diagnosed with autism
  - 40% of non-Somali parents

# Health beliefs about preschool immunisations: an exploration of the views of Somali women resident in the UK

Naomi Tomlinson MBEChB BMedSc (International Health)

Final year medical student, University of Birmingham, Birmingham, UK.

Saba Redwood EDD MA RGNRSCN

Research Fellow in Medical Sociology, University of Birmingham, Birmingham, UK.

It's really good ... cause there's a lot of diseases and um a lot of illness going on especially when they're really young ... and I think that will protect them for their health.

(Interview B7)

It is important for the kids to get it [immunisations] ... kids haven't got that power to like ... to prevent diseases and everything so it's good for them to get the injection ... because their immune system is low and everything.

(Interview B9)

I think it's good. Because um ... I think it's ... a bit more safety for your child ... especially when it comes to your children you want to protect them the most ... I feel when, when I see that those things are available for children, vaccinations, I think it's very good because it gives them a bit more protection anyway.

(Interview B10)

# Health beliefs about preschool immunisations: an exploration of the views of Somali women resident in the UK

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## Box 3 Fears about the MMR vaccine

I saw some people ... they have phobia about the injection ... they said maybe in the future if you give your child that injection ... maybe err he's getting some illness ... and maybe in the future he never talk properly.

(Interview A2)

She's got ideas in her head like that the child might not be able to talk when he grows up or he might be bit late for his talk ... his behaviour might really go wrong.

(Interview B2)

Some children you can see ... it is changing [gesture towards mouth] ... speaking, walking. But Alhamdulillah I saw my children nothing.

(Interview B4)

My problem the MMR ... I see the difficult to have MMR because they can't talk, they can't walk, they can't ... they have the, the problem.

(Interview B6)

# Washington State

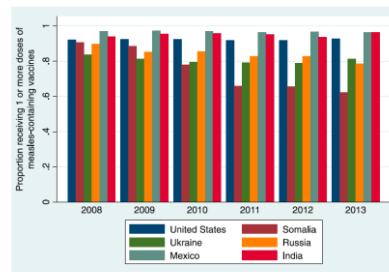


FIGURE 1  
Receipt of measles-containing vaccines by parental country of birth and birth year

# What about Nebraska?

University of Nebraska Medical Center

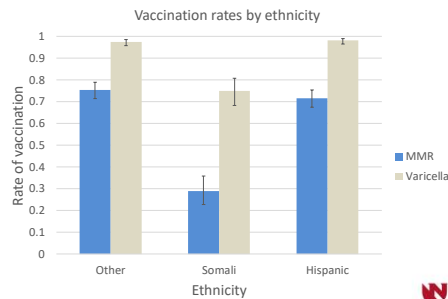
# How are we doing locally

Table 1. Demographic characteristics of Lexington Regional Health Center patients between 15 and 72 months.

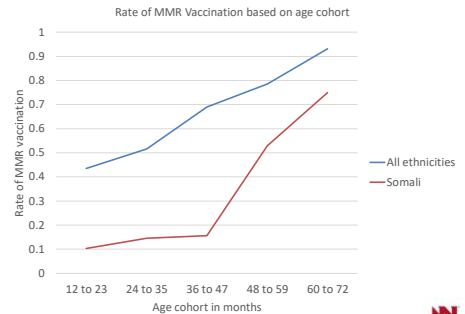
|                 |           |
|-----------------|-----------|
| Total patients  | 1182      |
| Gender          |           |
| Female          | 540 (46%) |
| Male            | 642 (54%) |
| Ethnicity       |           |
| Hispanic        | 483 (41%) |
| Somali          | 180 (15%) |
| Other           | 519 (44%) |
| Age (months)    |           |
| 15 to 23        | 209 (18%) |
| 24 to 35        | 287 (24%) |
| 36 to 47        | 242 (20%) |
| 48 to 59 months | 210 (18%) |
| 60 to 72 months | 234 (20%) |



## MMR vaccination



## Vaccination based on age



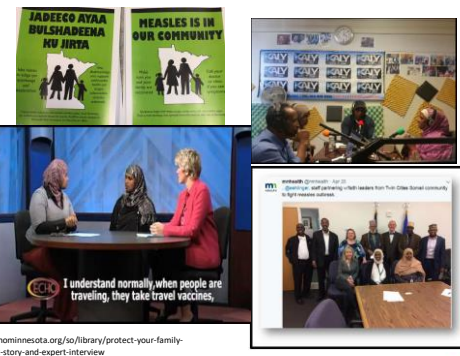
## What's next

- Partnerships
- Community leader interviews
- Focus groups
- Intervention

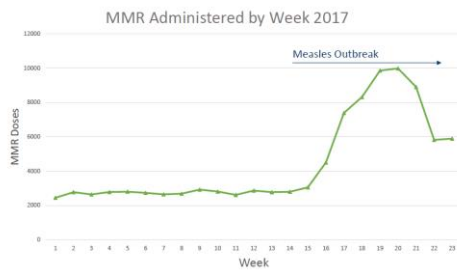
WADAN KALE NA BODANEYSAA? U TAXADAN QOYSKAADA.  
**KA FAKIR JADEECADA.**  
Jadeecada qoyska badan maada ay ka baxay jirto. Wadani, qoyska, hawl iyo fikir.



## Minnesota Resources



## Fear drives vaccination



## Conclusions

- We have made great improvements nationally in the elimination of measles, but there are still pockets of unvaccinated individuals that put us at risk for outbreaks.
- Within the Somali population there is MMR-specific vaccine hesitancy due to fears of autism.
- Our communities are at risk for measles when we fail to reach herd immunity levels. Family medicine providers are key to preventing outbreaks.

## Thank you

- Lexington Regional Health Center
- UNMC-Family Medicine Department
- Brady Beecham, MD MPH
- Aravind Menon, MBBS, MPH
- Somali interpreters-Mulki & Sahra



## Questions



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