
# The state of TB in Nunavik

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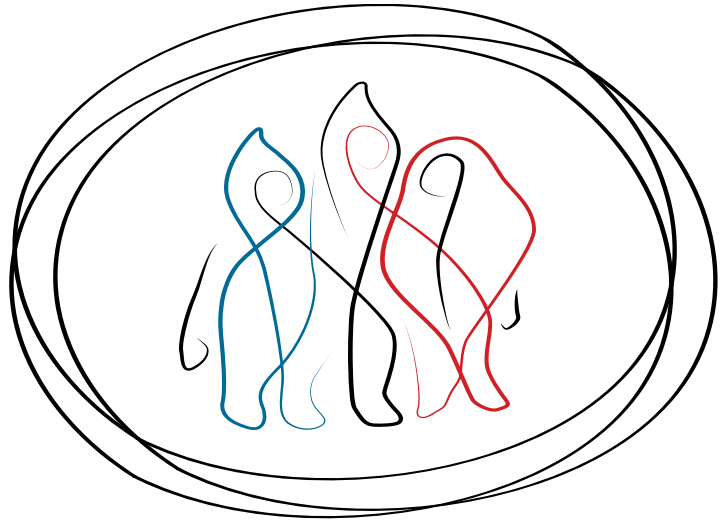
RÉGIE RÉGIONALE DE LA SANTÉ ET DES SERVICES SOCIAUX DU NUNAVIK
NUNAVIK REGIONAL BOARD OF HEALTH AND SOCIAL SERVICES

# TB in Nunavik: an overview

- What is TB?
- What is the history of TB in the region?
- What are the recent numbers?
- Why are the numbers so high again?



# What is TB?

# What is tuberculosis (TB)?

- A contagious disease caused by tiny germs (bacteria), called *Mycobacterium tuberculosis*

- Usually attack the lungs but they can also cause problems in other parts of the body, including the lymph nodes, bones and kidneys

*Mycobacterium tuberculosis*

Linette McElroy (ITK). Tuberculosis. Photo credit: http://www.bioquell.com/en-us/resources-and-support/microbiology/mycobacterium-tuberculosis/

# What is the difference between sleeping TB and active TB?

- Sleeping TB (TB infection)
  - The germs are asleep in the body, not causing damage
  - Cannot be spread to others
  - BUT: the germs can wake up and cause TB disease later in life
  - Treatment is highly suggested
- Active TB (TB disease)
  - The germs are awake, multiplying and causing damage to the body
  - TB disease of the lungs is contagious
  - Serious disease, sometimes deadly
  - Treatment is mandatory

# Does everyone with TB infection get active TB?

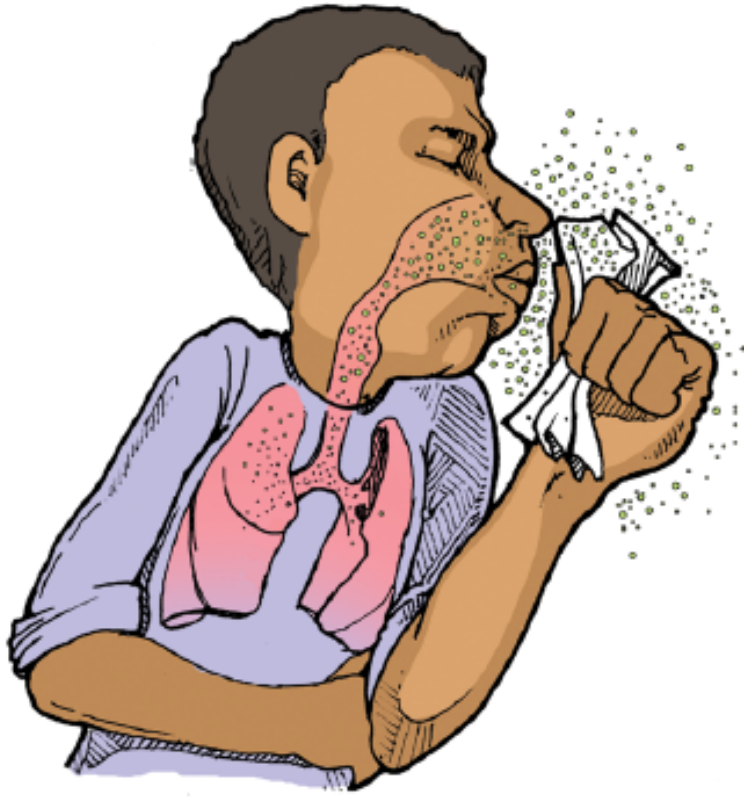
**NO**

- Only about 1 in 10 **healthy adults** with TB infection eventually develop active TB
  - Higher proportions documented in Nunavik in outbreak contexts

- The risk can be much higher for young children, Elders and people with impaired immunity

# How does TB spread?

- TB spreads through the air
- People with **active TB** release TB bacteria into the air by coughing, sneezing, laughing, shouting, and singing
- People become infected by breathing air that has TB bacteria in it for many hours in enclosed spaces



*Mycobacterium tuberculosis* spreads with coughing

Linette McElroy (ITK). Tuberculosis.

# How does TB spread?

- Crowded housing, poor indoor air quality (e.g., lack of ventilation, mould, cigarette smoke), inhaling drugs and sharing inhalation devices can increase transmission and lead to TB outbreaks.


Transmission of *Mycobacterium tuberculosis* through shared air

Linette McElroy (ITK). Tuberculosis.

# What are the symptoms of active TB?

loss of appetite

fatigue

**FEVER**

Night sweats

**WEIGHT LOSS**

**COUGH**

**> 2 weeks**

**COUGHING UP BLOOD**

# How is active TB diagnosed?

- Chest x-rays can help diagnose TB disease
- Tests on sputum or other body fluids are needed to confirm the diagnosis
- It is important to diagnose people with TB disease quickly:
  - The longer TB disease goes untreated, the more damage it can do
  - Delays in diagnosis and treatment can also lead to more people becoming infected with TB bacteria

# Can active TB be cured?

**YES**: it **can** and **must** be treated

- Routine treatment for active TB takes 6 to 9 months. Isolation at the hospital is required for adults at the beginning of the treatment.
- Longer treatment may be needed with severe illness, drug reactions, drug-resistance, or missed doses
- Treatment is available in every community once contagious phase is over
- Treatment is *mandatory* (MATO)

# Can active TB be prevented?

**YES!**

# 1- By detecting and treating sleeping TB

- The tuberculin skin test (TST) can detect TB infection

- But:
  - Cannot tell whether a person has sleeping TB or active TB
  - Not fool proof

Tuberculin skin testing

Linette McElroy (ITK). Tuberculosis. Photo credit: Canadian Tuberculosis Standards, 7th Edition

# 1- By detecting and treating sleeping TB

- Medications can safely prevent people who are infected with TB bacteria from developing TB disease
  - Isoniazid (INH) 9 months
  - Rifampin (RIF) 4 months
  - A new regimen (3HP – INH & rifapentine) can reduce treatment to 3 months (once a week, for 12 weeks) – not available yet in Nunavik; to be evaluated
- Treatment is available in every community

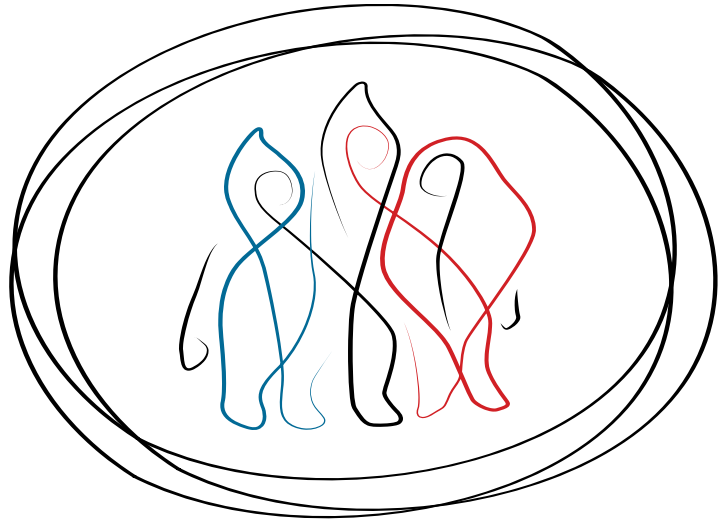
# 2- Other ways of preventing TB

- The **best way** is to protect people from becoming infected with TB bacteria
  - Diagnosing people with active TB quickly and making sure they complete proper treatment
  - Raising awareness about the symptoms of active TB and the importance of early diagnosis and treatment
  - Working on the conditions of life and risk factors that favor the spread and development of disease (ex: overcrowding, poor nutrition, smoking, etc.)

Inuit-specific tuberculosis strategy. Inuit Tapiriit Kanatami. March 2013

# 2- Other ways of preventing TB

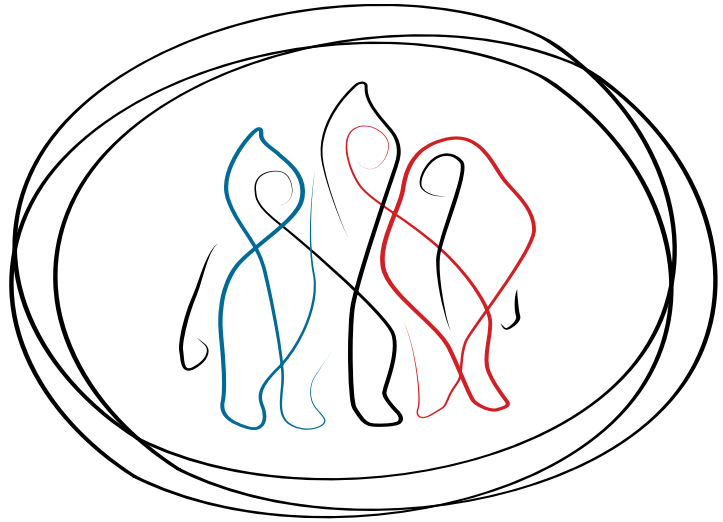
- BCG vaccine
  - Used in some communities in Nunavik (6/14)
  - Does not prevent people from getting infected, but helps to protect babies and young children from developing more severe forms of TB disease such as TB meningitis



# What is the history of TB in the region?

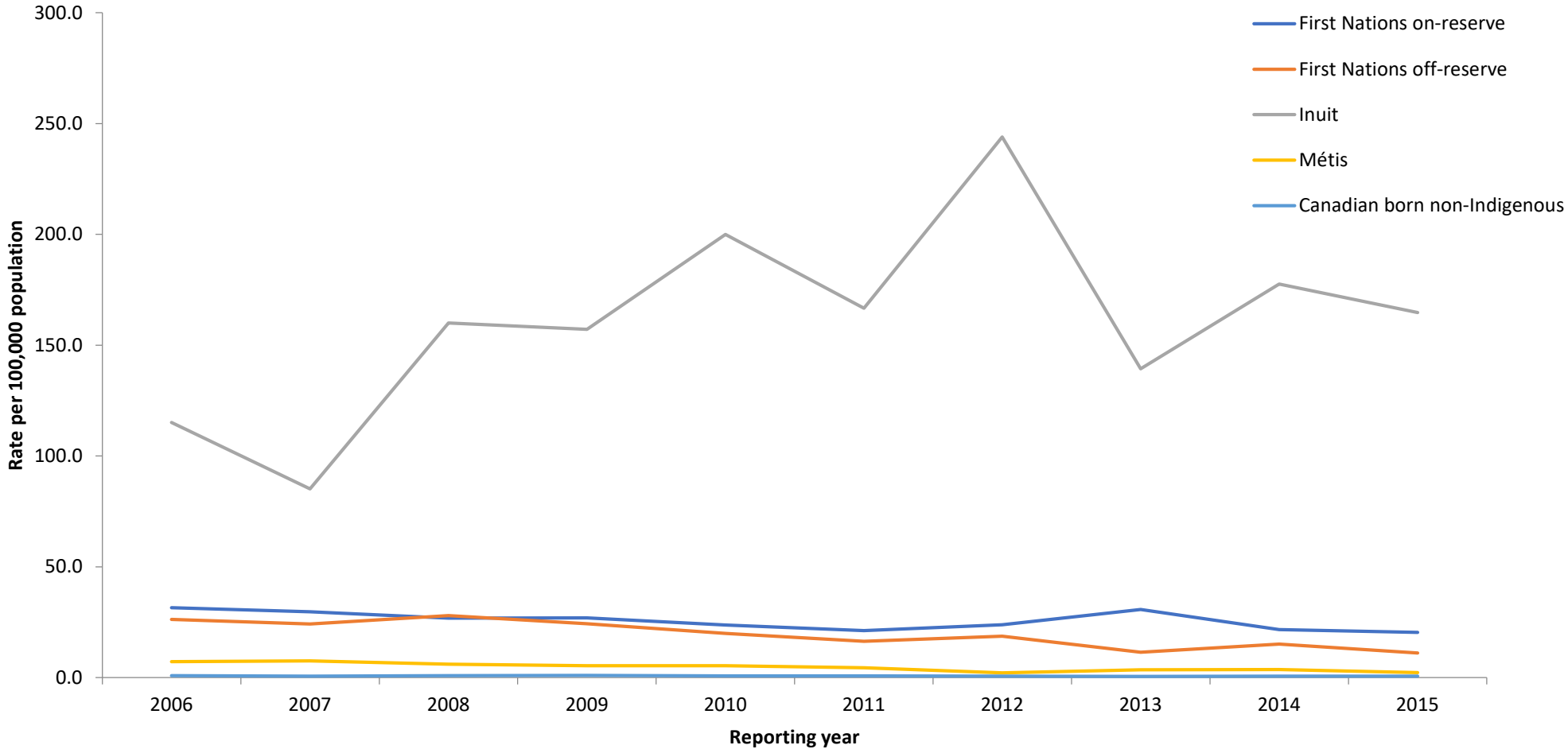
# A short and dramatic history

- Recent introduction of  the TB germ in the region
- Rampant epidemics in the Inuit communities
- Federal plan for addressing TB in Inuit:
  - Summertime medical services with ship-board clinics
  - Evacuation of those found to have active TB
  - Dramatic declines in TB, however evacuation programs that resulted in severe social trauma
- In Nunavik steady decline to 2003, but resurgence in the last 10 years with frank local outbreaks since 2011.

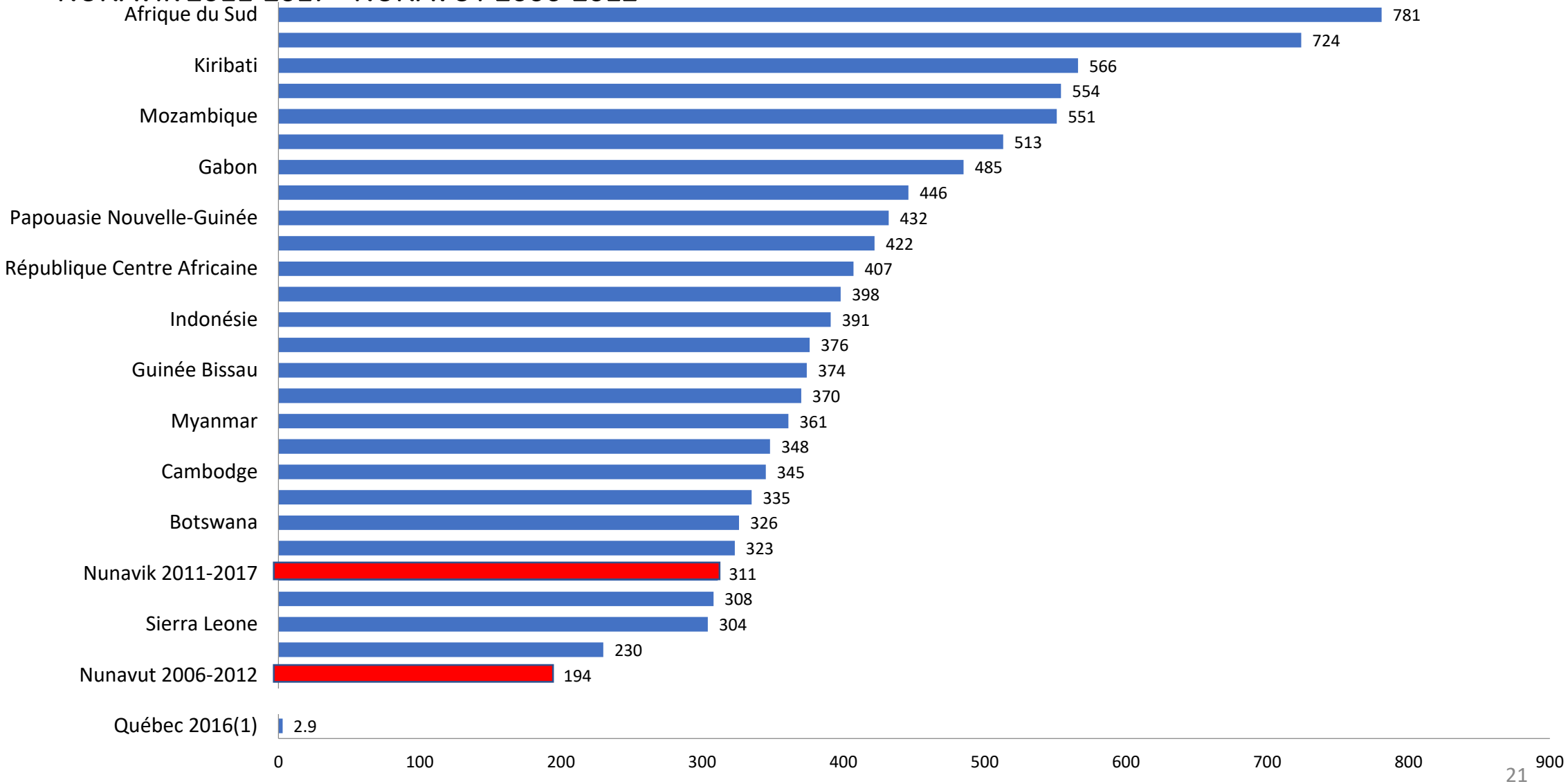


# What are the numbers?

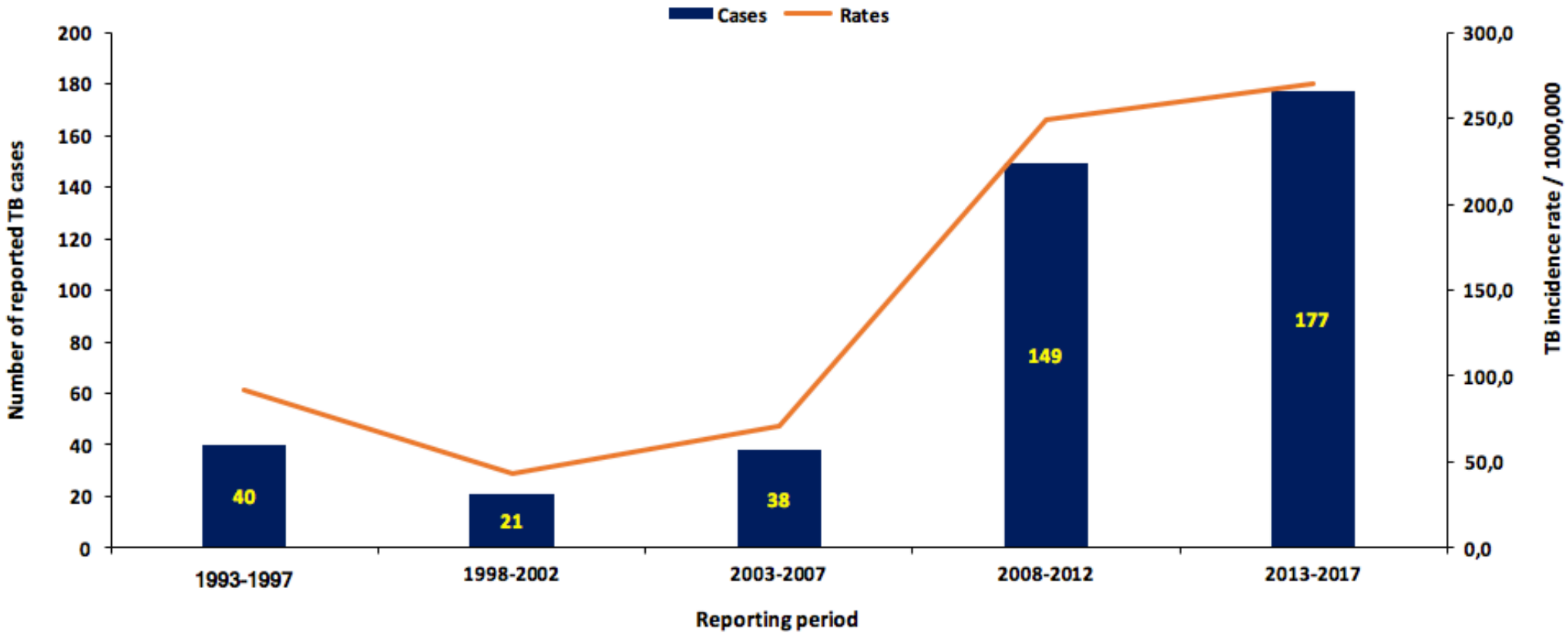
# Incidence rate of TB disease by Indigenous group compared with Canadian-born non-Indigenous, 2006 – 2015



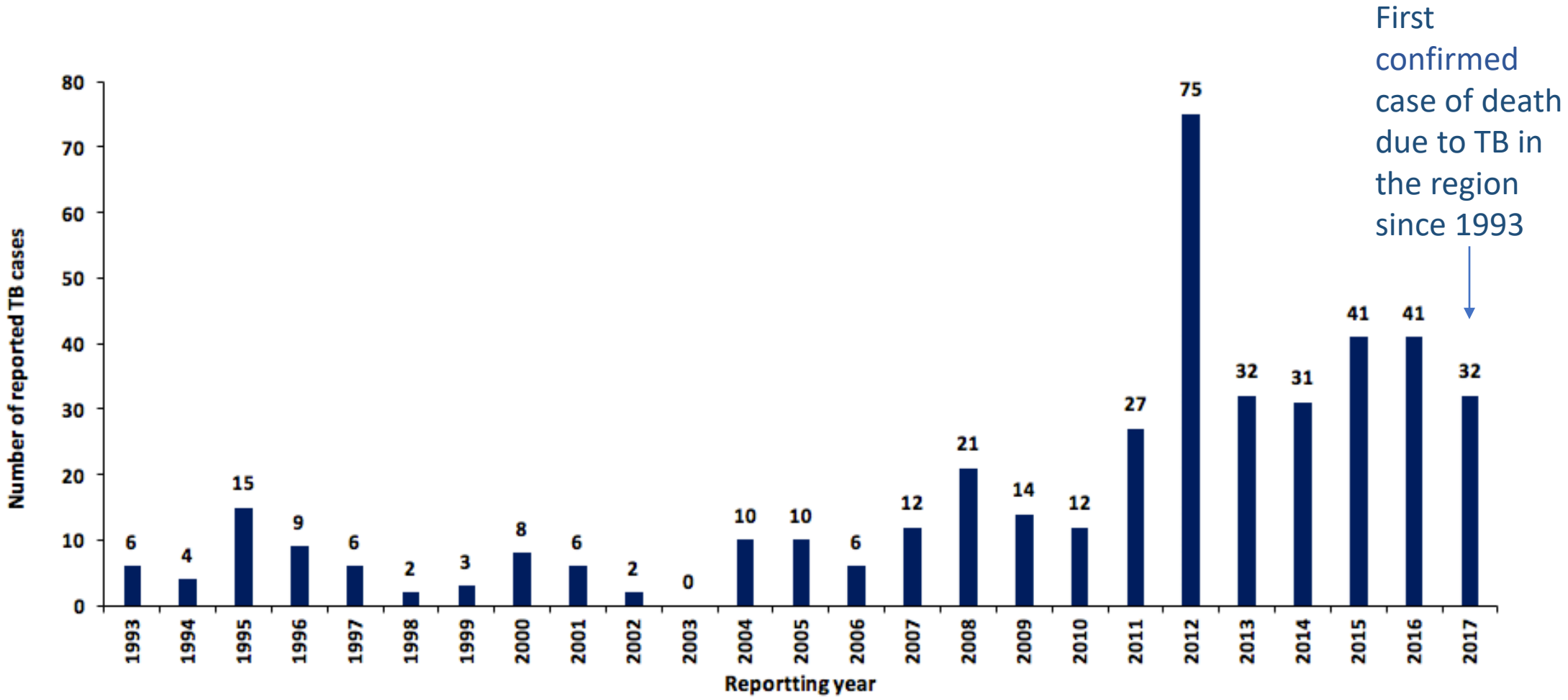
# Incidence rate ("n" / 100,000 p.a) WHO - 2016
# NUNAVIK 2011-2017 - NUNAVUT 2006-2012



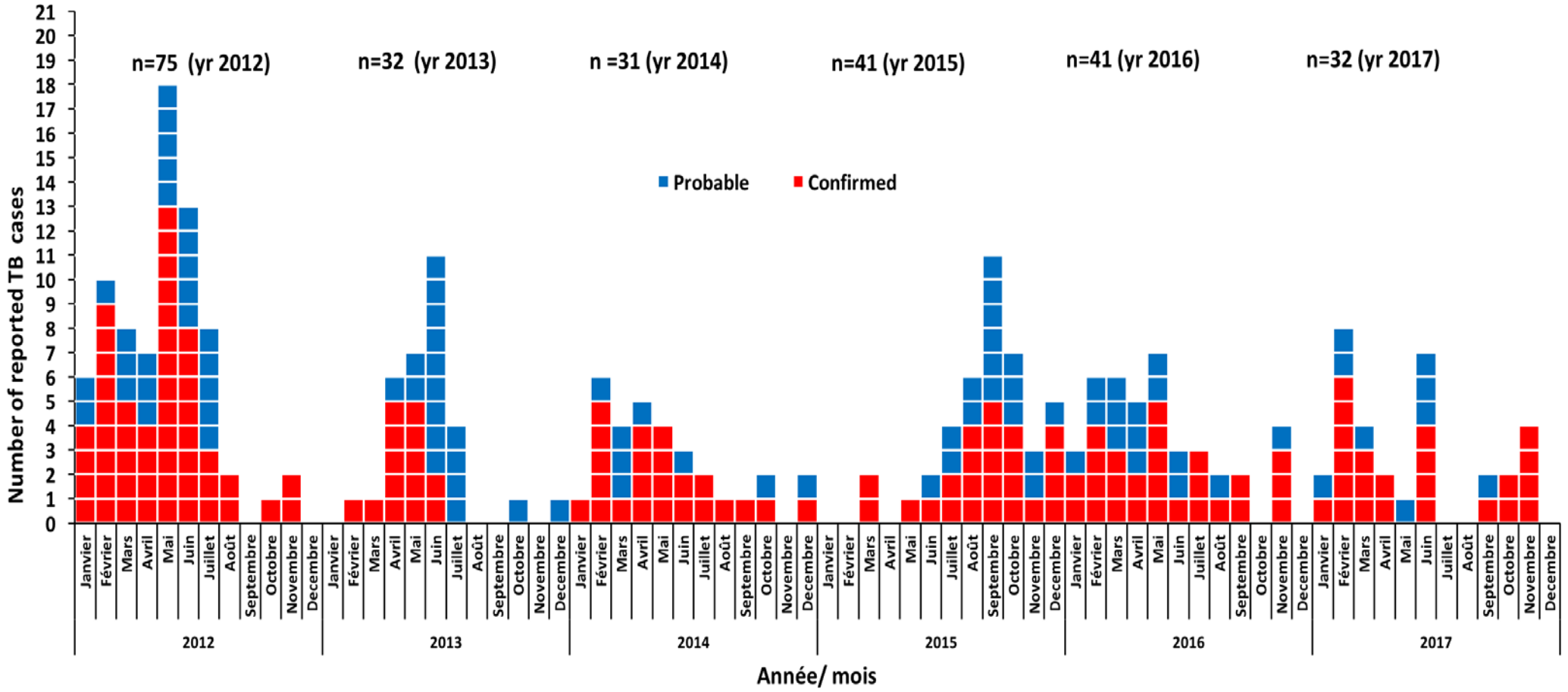
# Number of reported active TB cases and incidence rates per 100,000, Nunavik, period 1993-1997 to 2013-2017



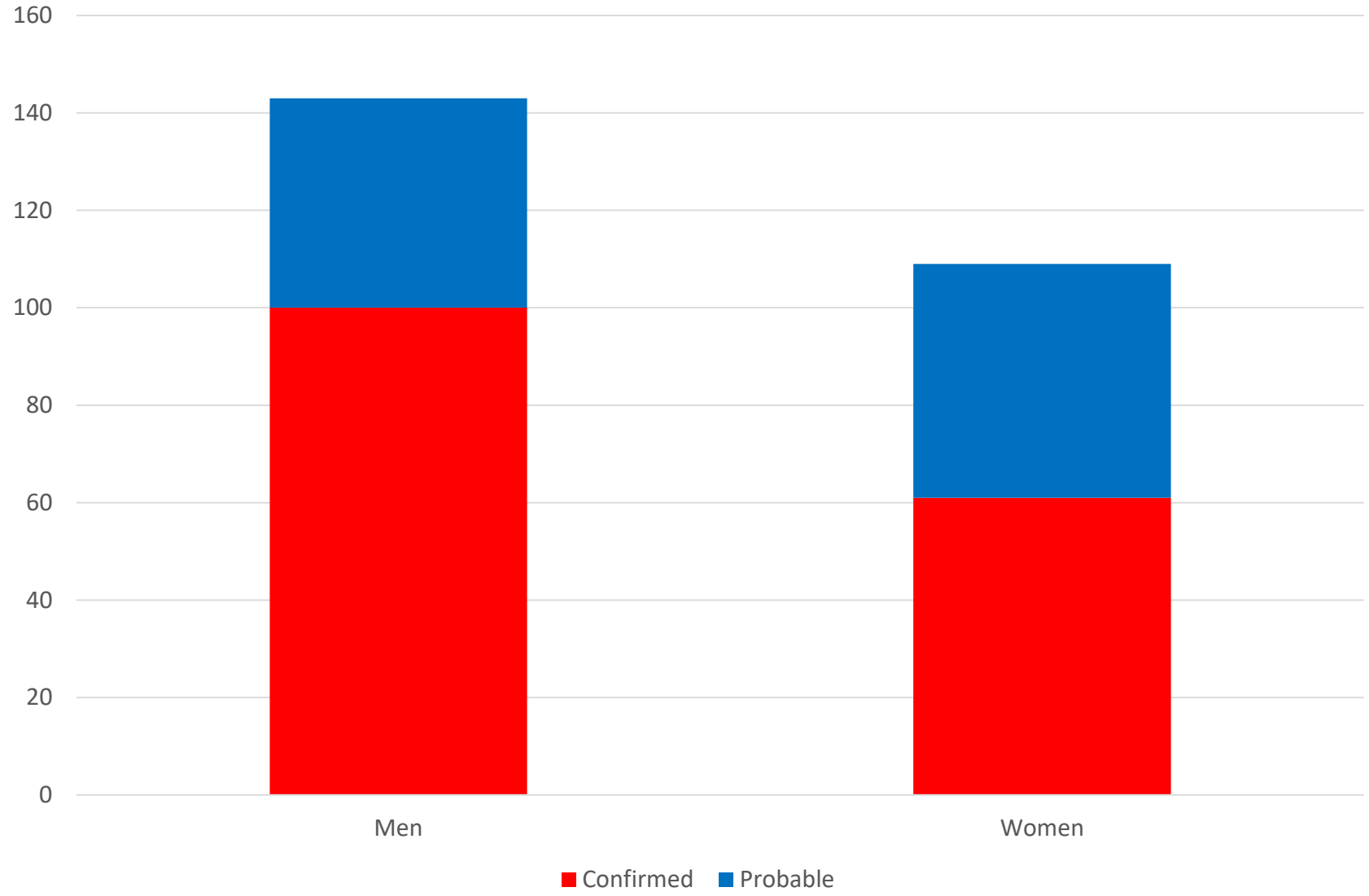
# Number of reported active TB cases, Nunavik, 1993-2017



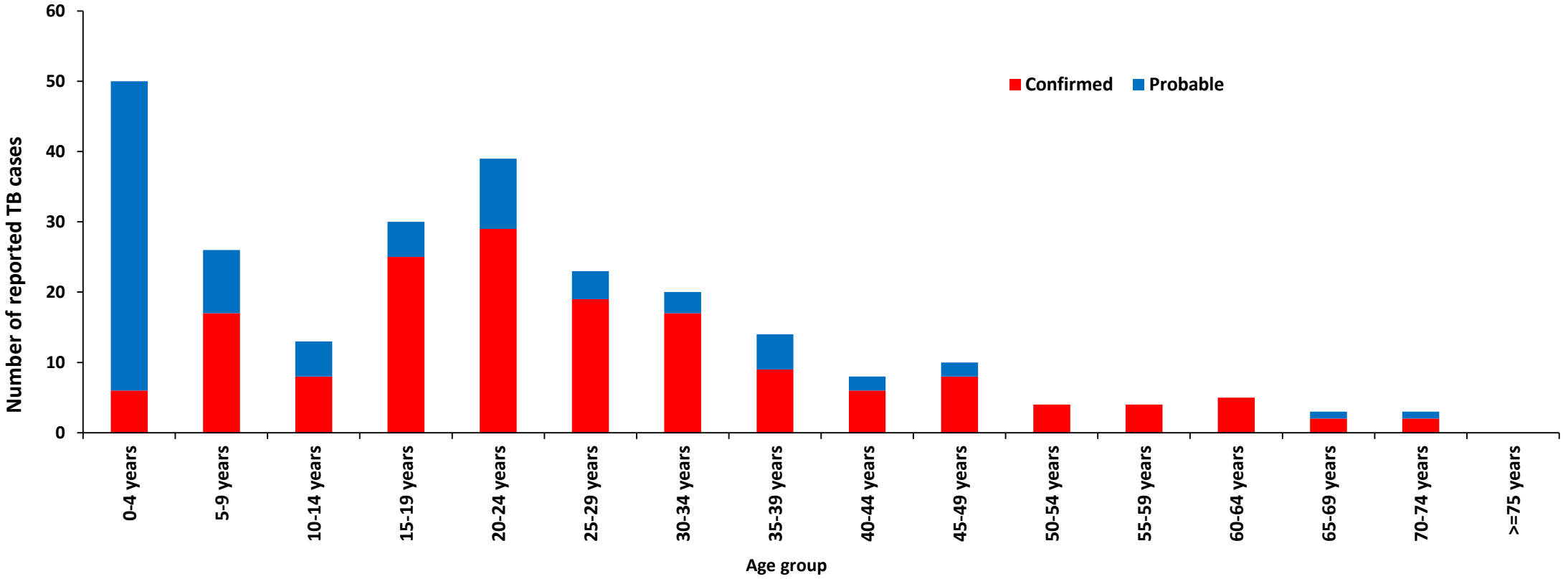
# Number of reported active TB cases by year, month and status, Nunavik, 2012-2017



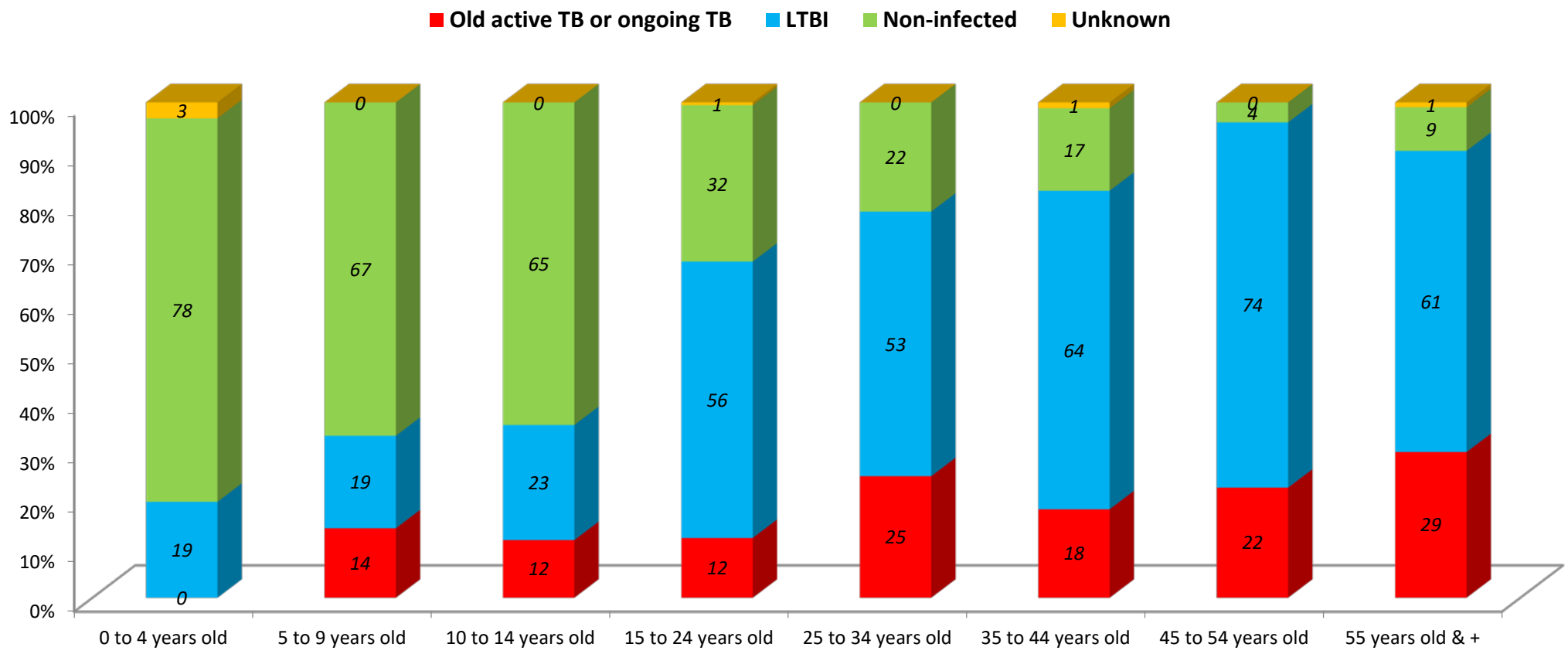
# Number of reported active TB cases by sex and status, Nunavik, period 2012-2017

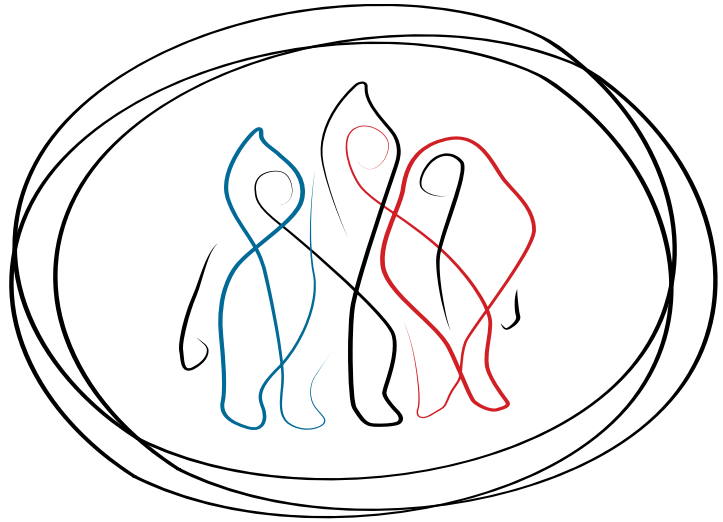


# Number of reported TB active cases by age groups and status, Nunavik,  period 2012-2017



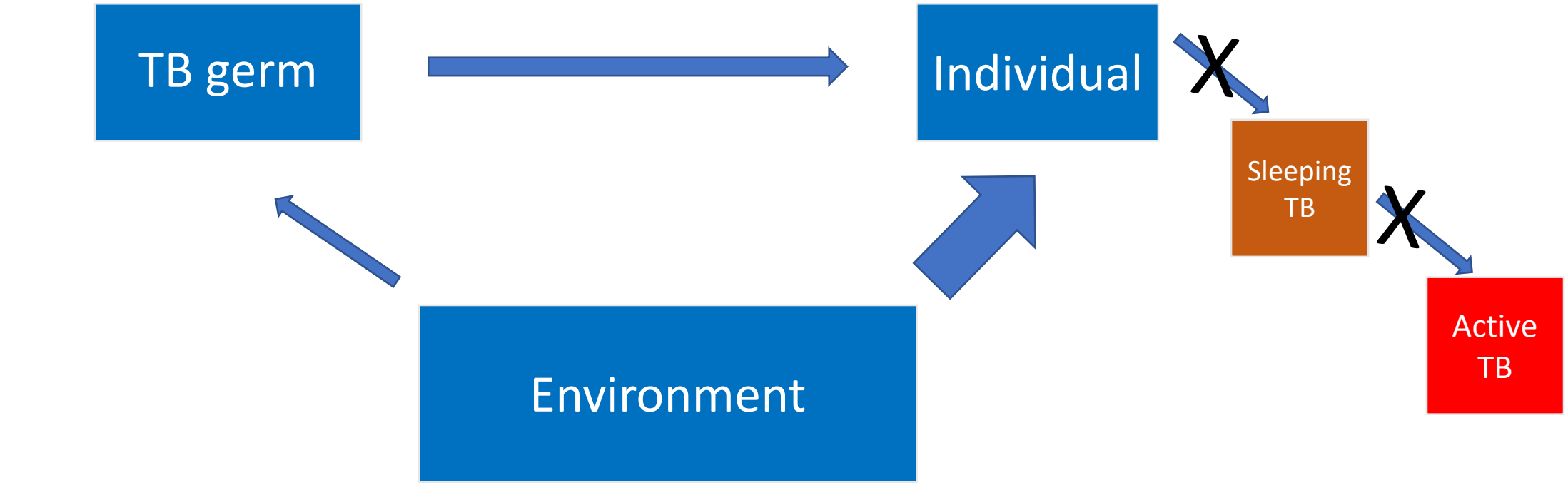
# Community E. Distribution (%) of TB status by Age Group On February 29, 2017.





# Why are the numbers so high again?

# Major components of a system favorable to elimination/transmission of TB




Socio-physical

Socio-economic

Socio-sanitary

Socio-political

# What do we know about the « Nunavik » TB germ

- The same old one coming from a same ancestry and toward which there was success in the past
- With village specific « cousins »
- No signs of increased virulence (strenght)
- No transmission of a germ resistant to standard first line antibiotics (until now)

Lee, R. S., Radomski, N., Proulx, J. F., Levade, I., Shapiro, B. J., McIntosh, F., ... & Behr, M. A. (2015). Population genomics of Mycobacterium tuberculosis in the Inuit. *Proceedings of the National Academy of Sciences*, *112*(44), 13609-13614.

# What de we know about the individual factors associated with sleeping TB and active TB

- Age
- Underlying health conditions
  - Immunity problems (HIV, severe kidney disease, organ transplant/medications, some cancers, diabetes, …)
  - Sleeping TB → Active TB
  - Nutritional status
  - BCG
  - Chronic lung diseases
- Underlying individual/social practices/contexts
  - Use of tobacco-Inhaled drugs
  - Density of social networks and of indoor crowdedness
- Knowledge of disease and access to health care

# What do we know about the socio-physical environment and TB

TB is transmitted in enclosed space environments

- lenghty periods of time inside
- overcrowded spaces
- poorly ventilated spaces

In Nunavik:

1 in 2 Nunavimmiut live in crowded housing (2016)

1 in 4 Nunavimmiut live in a dwelling in need of major repairs (2016)

# What do we know about the socio-economic environment and TB

“Persons with low socio-economic status tend to have:

- more frequent contact with persons with active tuberculosis
- more food insecurity,
- higher levels of smoking,
- lower levels of awareness and less power to act on existing knowledge concerning healthy behaviors
- and poor access to health care services*” (NRBHSS Regional plan of action on TB, 2014)

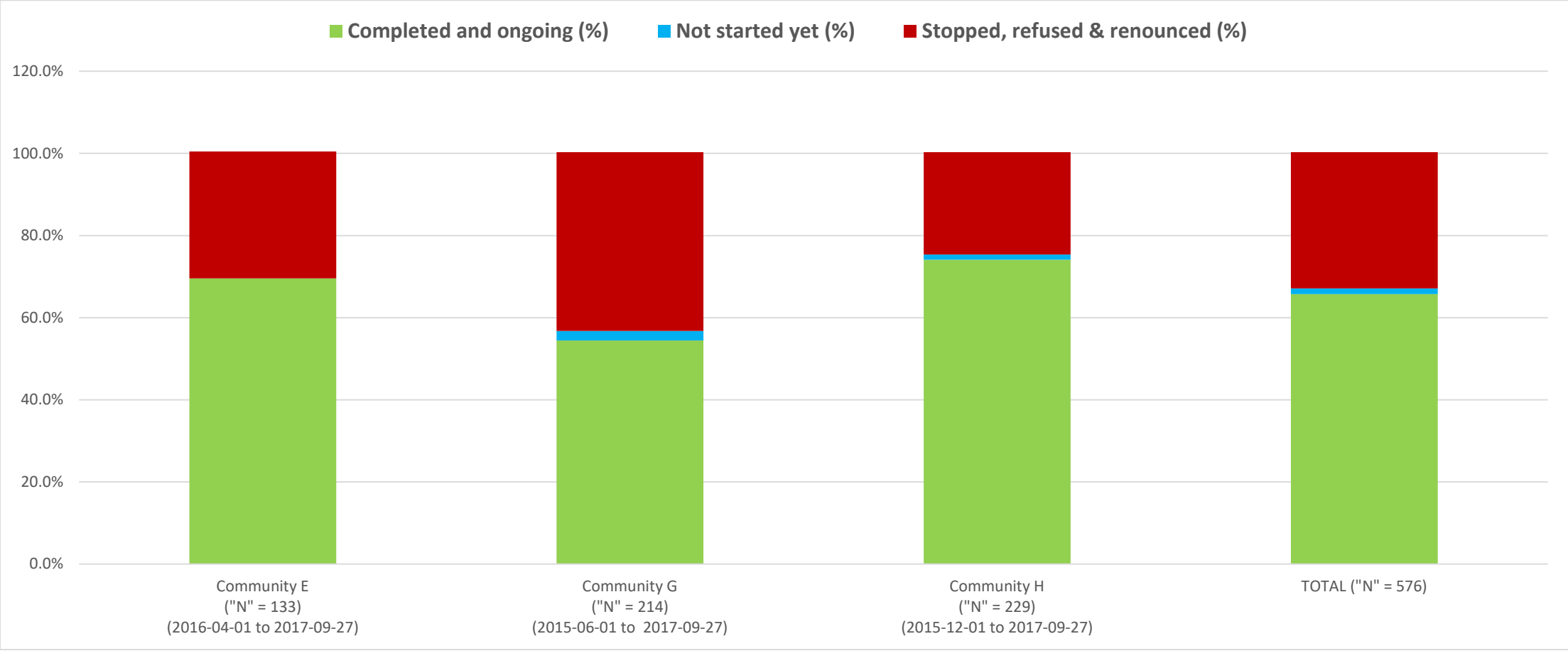
In Nunavik:

Poverty: 1 in 5 household (2013)
Food insecurity: 1 in 2 household (2012)
Smoking: 2 in 3 adults (2012)
18-44 years of age. Secondary level diplomation (2012)
Men: 26,5%
Women: 32,3%

# What do we know about the socio-sanitary (demographic/cultural and health) environment and TB

- Age structure of the population
  - Youths (15-34 y.o.) infected in social settings (gathering houses) in recent oubreaks
- Pool of sleeping TB treated/untreated. Variable from community to community
- HIV
- Diabetes
- Inhaled drug use
  - Marijuana use in sharing contexts linked to recent outbreaks
- Awareness, self care and relation to health care
  - Highly infectious cases discovered late or poorly collaborating to the investigation in recent outbreaks
  - Adhesion to LTBI treatment variable (55%-74%)

# Candidates to LTBI prophylaxis (« n » = 576)
# Communities E , F and G. June 2015 to Sept 27, 2017
# Preliminary estimate of adherence/compliance



# What do we know about the socio-political environment and TB

Organisational/leadership awareness and action:

- Economic development
- Housing
- Food security
- Knowledge development within family, school and community

In the health field…

# In summary

- Drastic change in profile with major localized outbreaks
  - In the absence of increase in virulence (strenght) of TB germ
  - With known community-level and individual risk factors for TB

- Resurgence likely due to environmental modifications (physical, social, etc.) affecting directly or indirectly the acquisition of the infection and/or the passage from sleeping TB to active TB

- Better understanding of these factors is still needed