

The Triple Axel: Influenza, TB and MERS-CoV

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December 10, 2015



1. Influenza

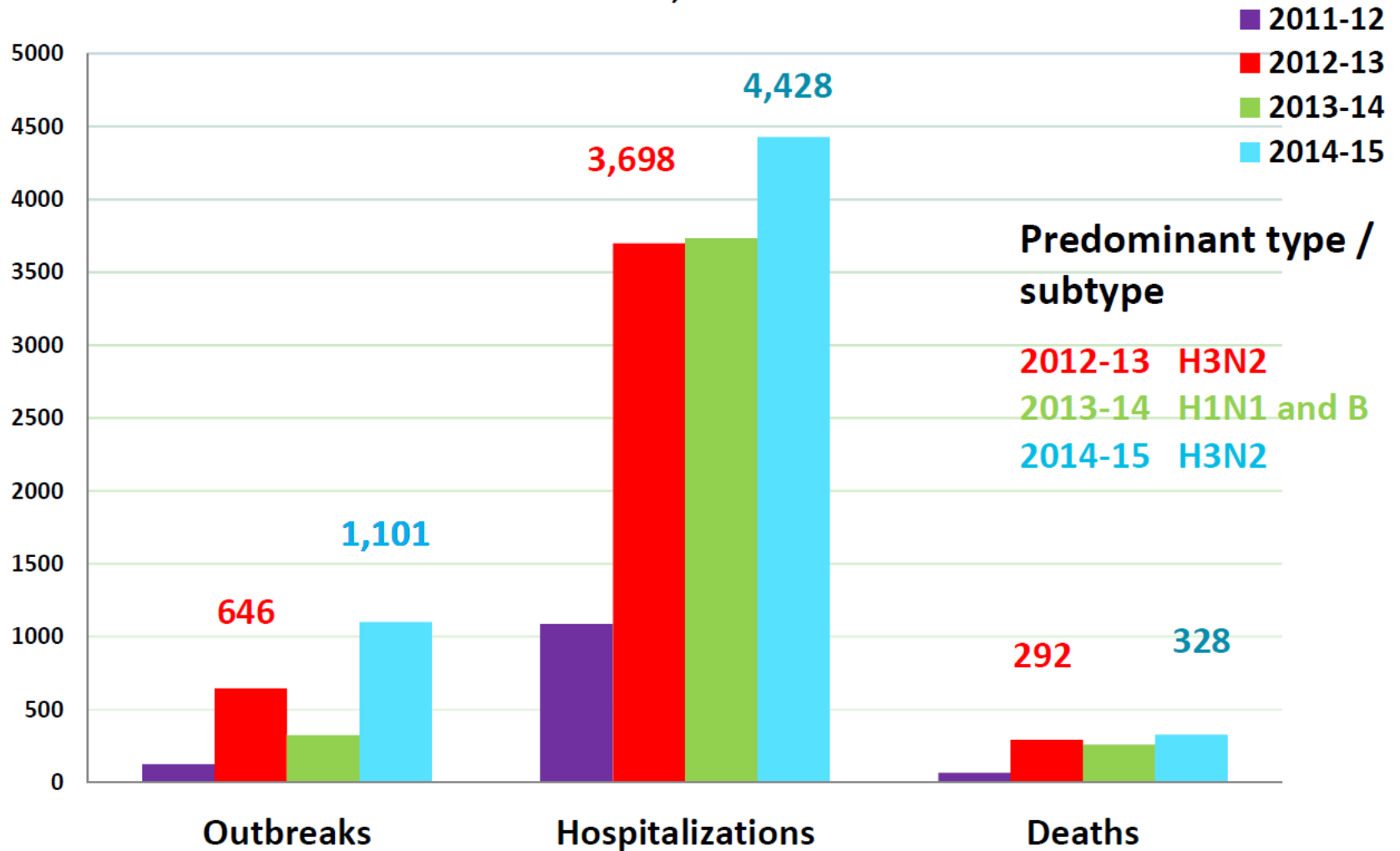


Influenza

- 10-20% of the population is infected each year (up to 30% of children)
- Infection rates are highest in children 5-9, but serious illness and death highest in those <2, >65 and those with chronic medical conditions

Influenza Outbreaks, Hospitalizations and Deaths

Ontario, 2011-2015

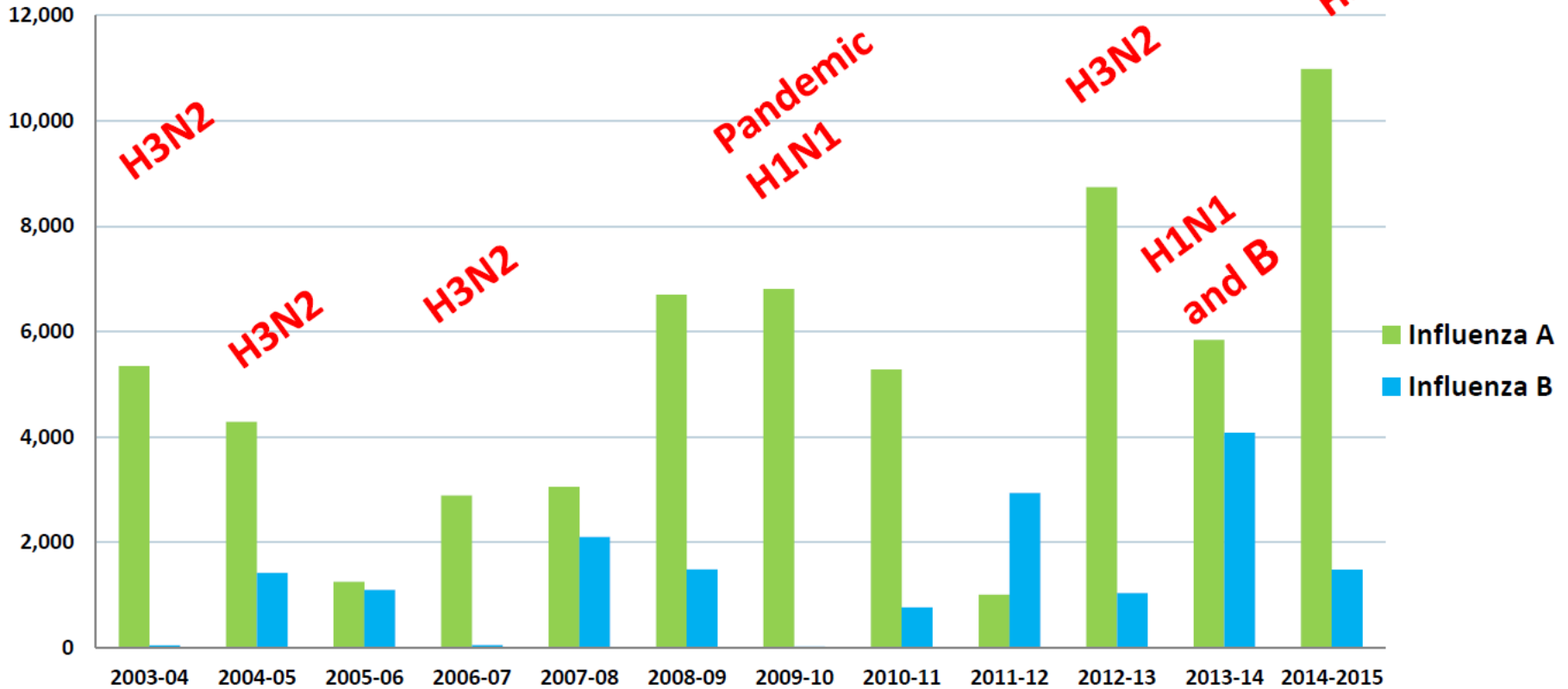


Influenza

- Influenza viruses infect birds, mammals, humans
- Common human flu viruses include 2 types of flu A (H1N1 and H3N2) and 2 types of flu B (Victoria and Yamagata lineages)
- Circulating types change from year to year
- Large changes in the virus can cause a pandemic because most people are not immune

Total Influenza A and B by Year

Ontario, 2003-04 to 2014-15

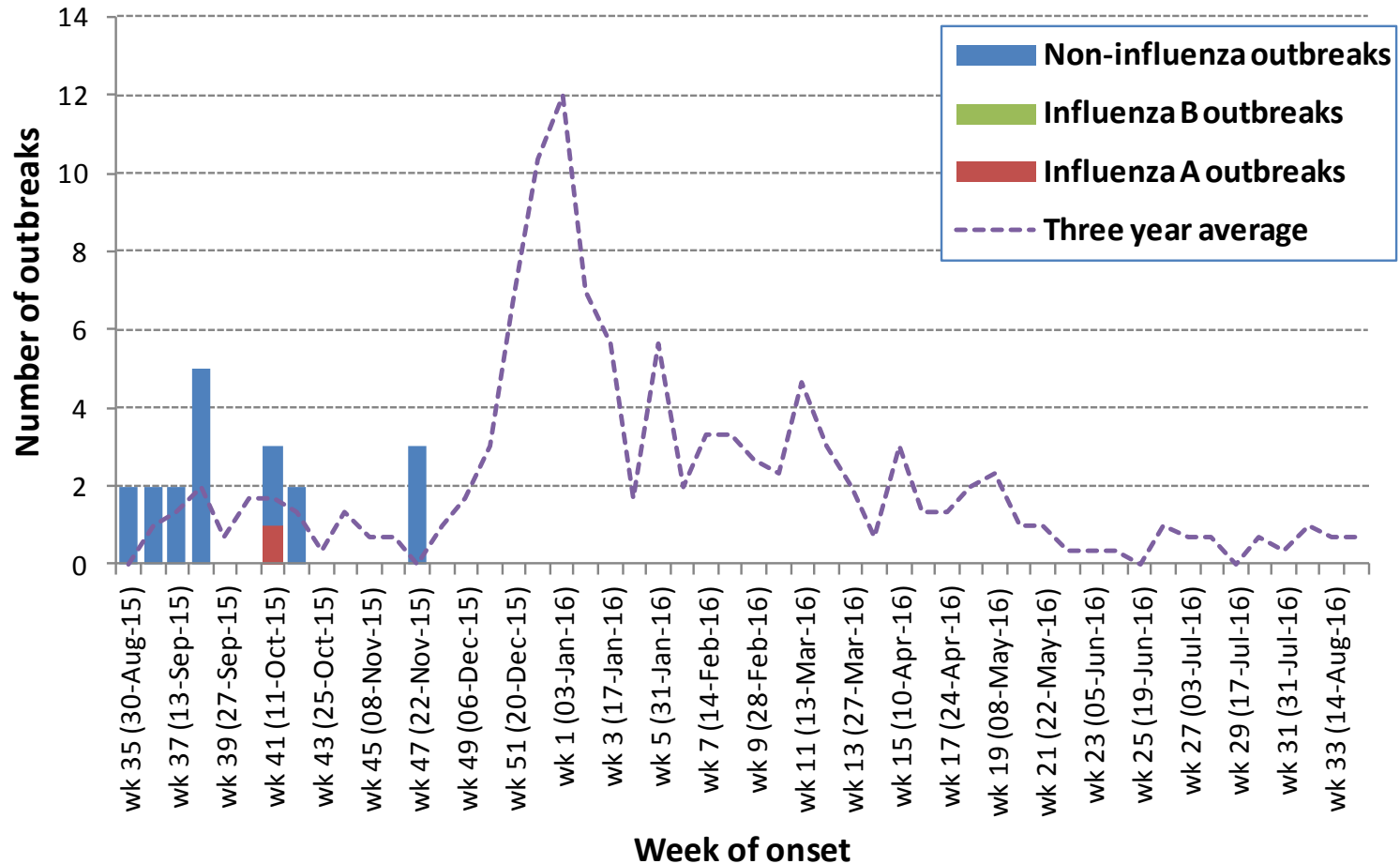


Flu Season 2015-16



- Ottawa had first outbreak in a LTC Oct 19 (influenza A), early but not a predictor
- In Canada, flu activity significantly lower than previous seasons
- So far, H3N2 has been the most common subtype

Ottawa Respiratory Outbreaks, LTC, Acute Care, and RH Current Season and Three Year Mean



Data source: iPHIS, MOHLTC, extracted by Ottawa Public Health on December 3, 2015

Possibilities for Ontario 2015-16 influenza season

Could be any of several possibilities:

- Mild season
- H3N2 matched or mismatched season
- pH1N1 season
- B season with Yamagata, Victoria or both
- Any combination of the above

Impossible to know for certain

Nosocomial Influenza*

- Hospital-acquired influenza has a case fatality estimated at 7-16%
- As many as 26% of unvaccinated HCW are infected with flu annually; transmission to patients shown in many settings
- Majority of HCW continue to work when acutely ill with ARI, including flu

* AMMI Canada Position Paper 2012 – Mandatory Immunization of Healthcare Workers

The Key to Preventing Nosocomial Flu

Health care workers:

- **Seasonal flu immunization**
- Stay home when ill
- Select appropriate PPE when caring for known or suspected flu cases
- Surveillance, outbreak management

Patients:

- Early recognition, separation, and droplet precautions for suspected or confirmed cases
- Appropriate use of antiviral medications

Everybody:

- Compulsive hand hygiene
- Compulsive respiratory etiquette

Influenza Vaccine



- World Health Organization makes a scientific prediction of the strains of flu that will circulate during the upcoming influenza season.
- ‘Match’ between vaccine and circulating strains varies from year to year
- Unfortunately, last year’s formula was not a good match however, getting the flu shot, together with hand washing, covering your coughs and sneezes, and staying home when sick, remain the best protection against the flu.

Influenza vaccine effectiveness

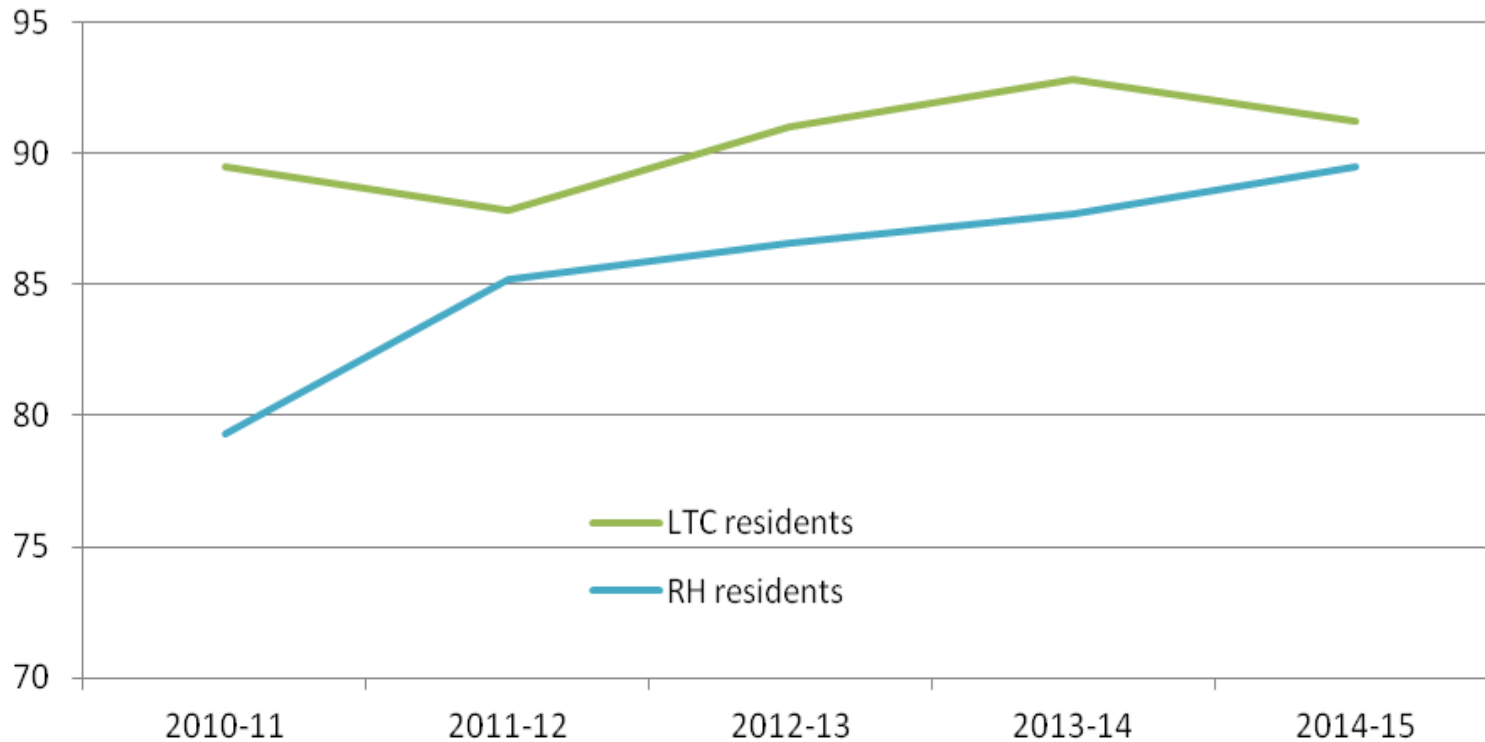
Canada, 2007-08 to 2014-15 seasons

Season	Influenza A/H1N1	Influenza A/H3N2	Influenza B	Overall
2007-08	69%	57%	55%	60%
2008-09	68%	55%	56%	56%
2009-10*	93%	-	-	93%
2010-11	59%	39%	25%	37%
2011-12	80%	51%	51%	59%
2012-13	59%	41%	68%	50%
2013-14	71%	-	73% (Yamagata)	68%
2014-15**	-	-8%	-	-

What's the Evidence Linking HCW Immunization and Patient Outcomes?

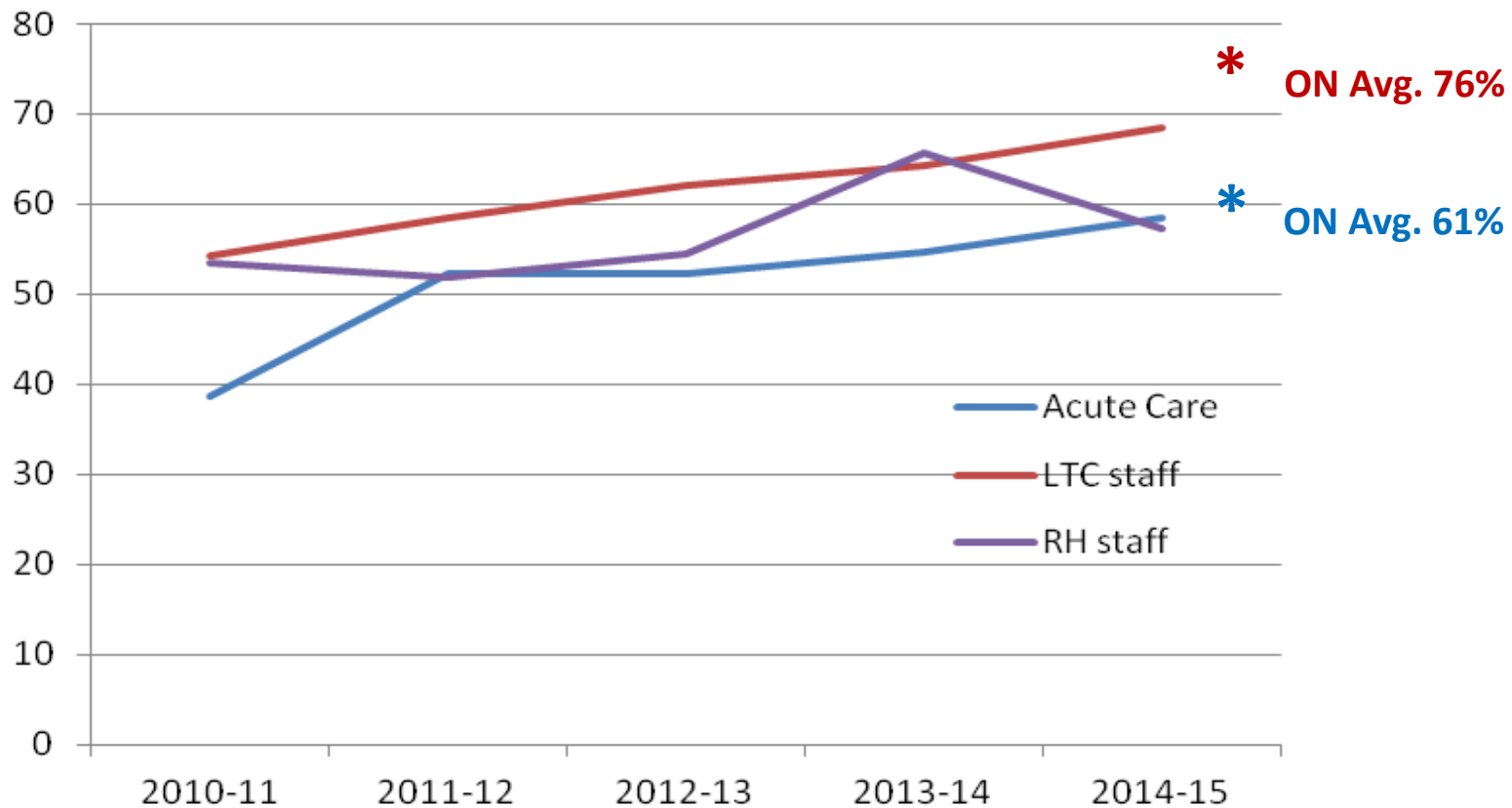
- Descriptive studies show correlation between HCW immunization and reported outbreaks
- 4 RCTs of **LTC** HCW immunization:
 - ↓ cases of, and GP consultations for ILI
 - ↓ deaths from all causesbut not – ↓ pneumonia, deaths from pneumonia

Resident Influenza Immunization Rate Ottawa, 2010-2011 to 2014-2015



Data source: Selfreport by facility as of mid-December of reporting year.
Data from retirement homes are incomplete.

Staff Influenza Immunization Rate Ottawa, 2010-11 to 2014-15



Data source: Self report by facility as of mid-December of reporting year.
Data from retirement homes are incomplete.

Why don't people get flu vaccine?

- Mistrust of information provided
- Fear of the vaccine's side effects
- Fear/dislike of needles
- Perceived low risk/benefit ratio
- Poor knowledge of vaccine
- Poor knowledge of effects of influenza
- Vaccine mismatch with circulating strain
- Decisional conflict (undecided)
- Not recommended by health care provider

Influenza Outbreak Prevention & Control

- Recommend LTCHs and RHs develop pre-outbreak plans that support activities such as:
 - Active surveillance of staff and residents
 - Promotion of immunization of residents & staff
 - Cohorting of staff during an outbreak
 - Measures that will expedite the administration of antiviral medication for staff and residents.

Outbreak Management

- Early recognition and reporting to OPH
- OPH will facilitate lab testing
- Control measures important regardless of pathogen
- Offer vaccine to unimmunized residents and caregivers; prophylaxis and treatment do not take the place of immunization

OPH Outbreak Management Support

- Case by case assessment of outbreak & facility capacity
- Provision of resources (e.g. Outbreak Resource Kit)
- Attendance at debriefs post-outbreak
- Provision of educational sessions for staff
- Ensure initiation of Tamiflu chemoprophylaxis and/or treatment
- Facilitate resident repatriation from hospital to LTCH/RH

2. Tuberculosis



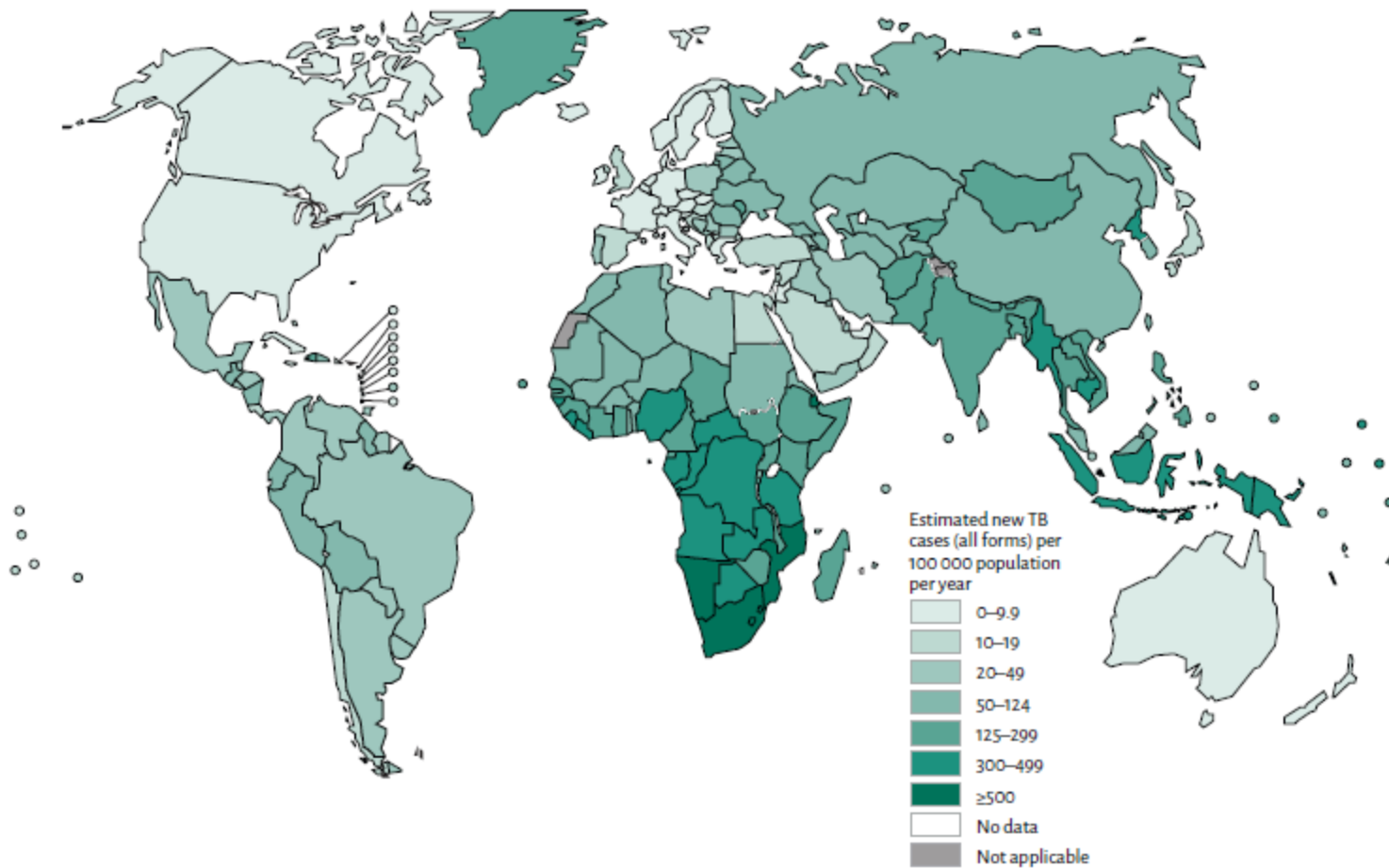
Global TB Situation

- 1/3 of the world population is infected
- New case every 3 seconds--9.6 million in 2014
- In high-incidence areas, each contagious case can infect 10-15 people per year
- Death every 22 seconds--1.5 million in 2014

TB rates by country

■ **FIGURE 2.6**

Estimated TB incidence rates, 2014



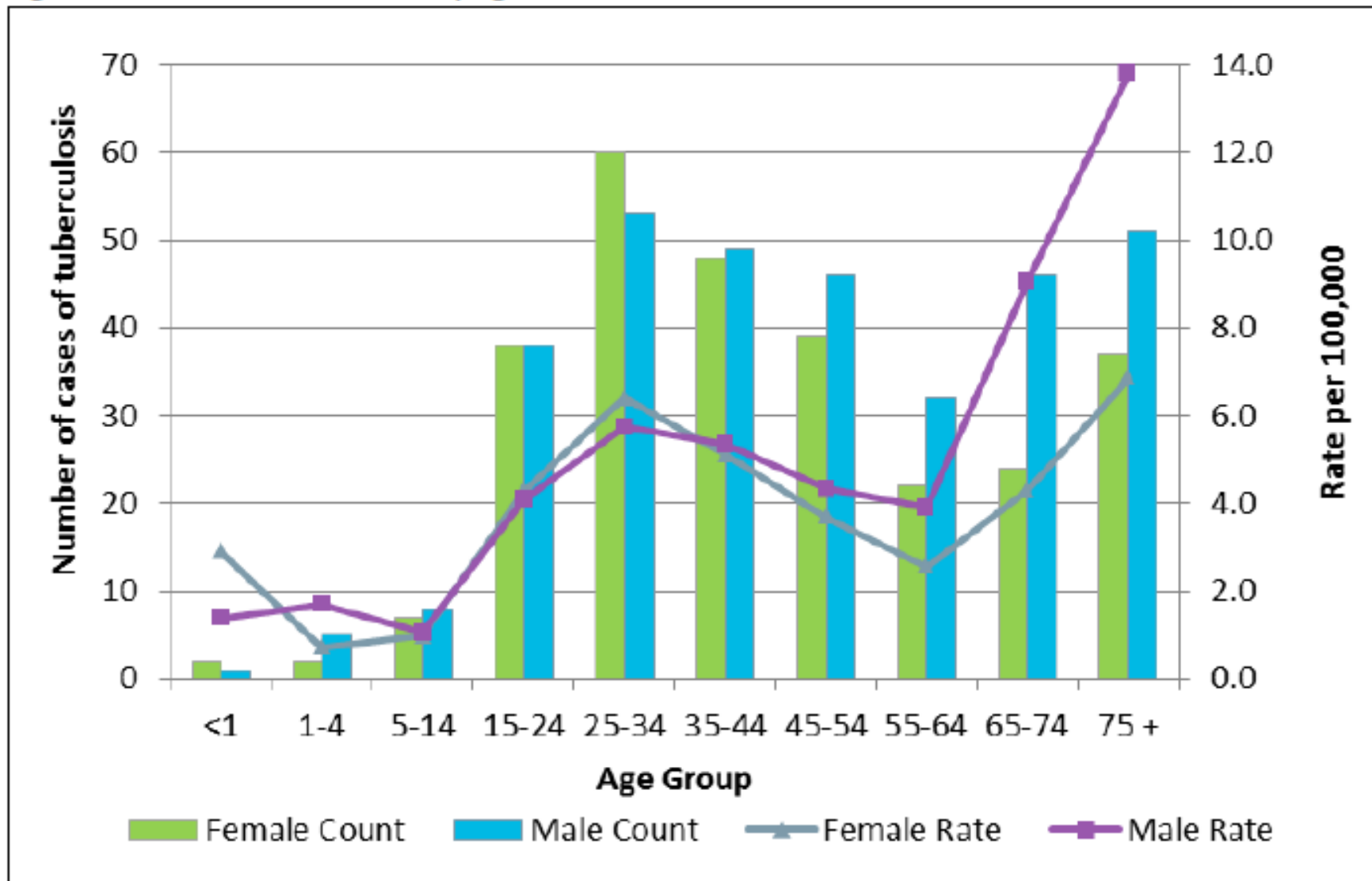
The TB situation in Canada

- Forgotten by most
- But not gone: A new TB case in Canada every 5 hours
- A death every 2 weeks

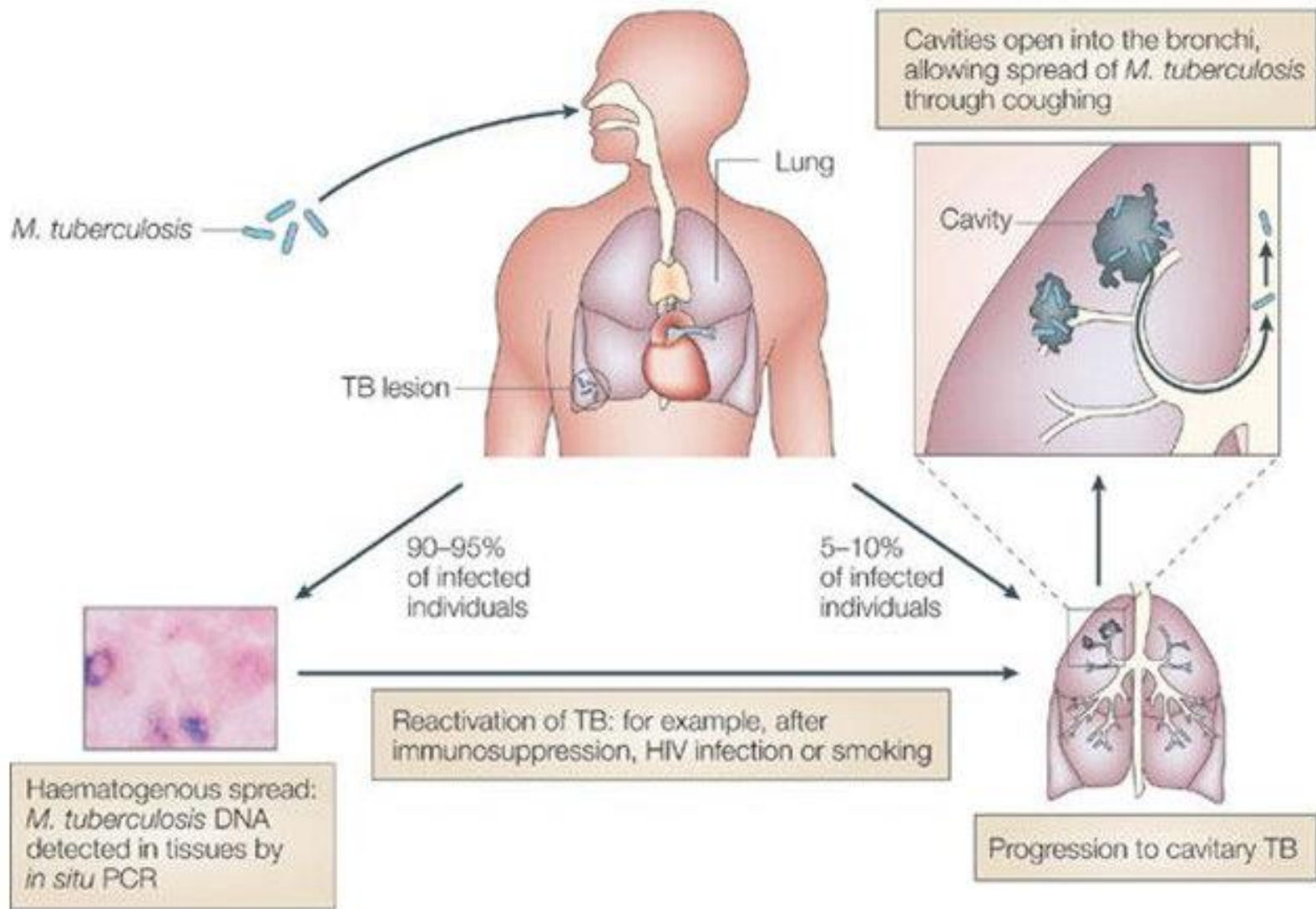
TB in Ontario

- Highest rates in GTA, Ottawa
- >80% of cases born outside Canada
- Top 5 countries of origin: India, the Philippines, China, Vietnam and Pakistan
- Although Canadian indigenous peoples are at higher risk, in Ontario they make up only 2% of cases
- ~70% of cases are respiratory

Figure 3. Incidence of active TB by age and sex: Ontario, 2012



Source: Tuberculosis – Ontario Provincial Report 2012 (July 2015)



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A person with latent TB infection (LTBI)

- Usually has a positive TB skin test
- Has a **normal chest xray**
- Has TB bacteria in his/her body that are **inactive**
- **Does not feel sick**
- **Cannot spread TB** bacteria to others
- **May** get treatment to prevent TB disease

A person with active TB disease

- Usually has a positive TB skin test
- May have an **abnormal chest x-ray** and/or a **positive sputum test** for TB
- Has TB bacteria in his/her body that are **active**
- Usually **feels sick**
- **May spread TB** bacteria to others if TB is in lungs or throat
- **Needs treatment** for active TB disease

Challenges with TSTs in institutionalized elderly

- TSTs are no longer recommended for initial screening or contact follow-up for residents >65 because:
 - Interpretation is often complicated by immune suppression and remote exposure
 - For many elderly, risks of LTBI treatment outweigh potential benefits

Screening Recommendations for Admission to Long Term Care

■ 65+ :

- Chest x-ray (PA and lateral – NOT portable)
- Documented TB symptom screen

■ <65 :

- Documented 2-step TST, if previous TST was negative or unknown
- Documented TB symptom screen
- Assess for LTBI treatment if TST +ve

Signs and Symptoms of Active TB

- Cough of **at least 2 weeks duration**,
- Signs and symptoms diagnosed as community acquired pneumonia **not responsive to two courses of antibiotics**
- Coughing up blood
- Fever
- Night sweats unrelated to menopause
- Reduced appetite
- Unexplained weight loss
- Fatigue
- Chest pain
- Enlarged lymph nodes (e.g. in neck)
- **Additional symptoms in the elderly: failure to thrive, worsening cognitive function**

A TB story

- Elderly individual, foreign born
- Multiple health care visits over 9 months, presumed diagnosis lung cancer; lung biopsy done, not sent for TB culture
- Admitted to LTCH; abnormal CXR; repeat CXR – TB scars, no active disease

TB Story -2

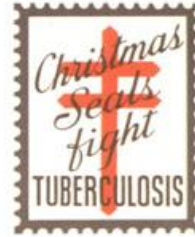
- 6 months after LTCH admission, CT showed new nodules
- Deterioration of health, decreased mobility
- 2 months later, admitted to hospital, TB suspected; sputum smear positive; started on treatment
- Died 1 month later – cause of death disseminated TB

Contact follow-up

- 86 LTCH residents
- Chart review and symptom check to rule out secondary cases of active TB
 - 27 high risk: CXR and medical assessment – 23 had abnormal CXR (no evidence of TB)
 - 59 low risk: baseline CXR – 20 abnormal (no evidence of TB)
- Ongoing monthly surveillance by LTCH for two years for TB symptoms

TUBERCULOSIS

FIND
IT

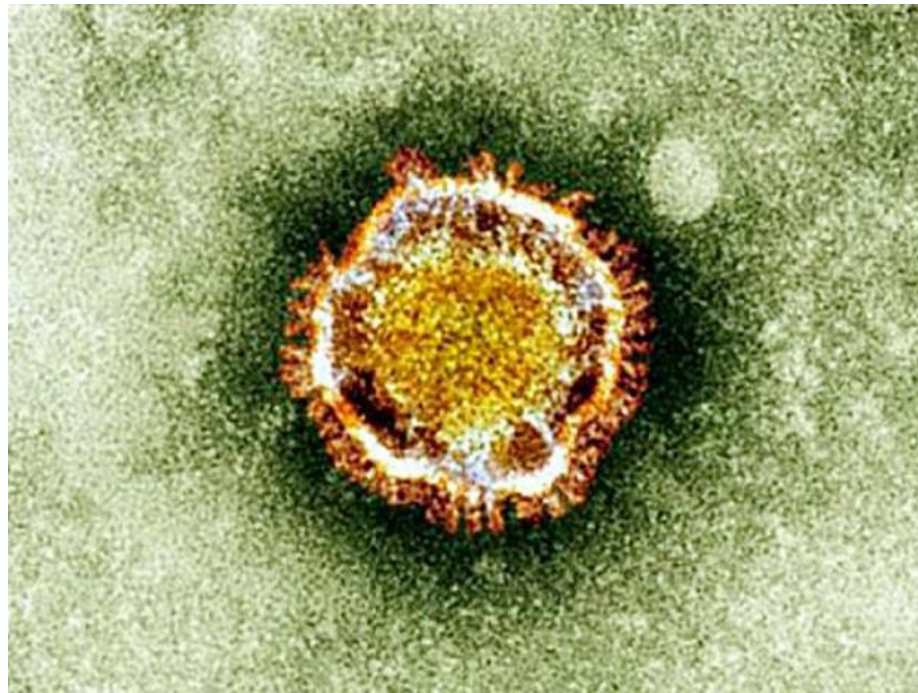


TREAT
IT

CONQUER
IT



3. Middle East Respiratory Syndrome Coronavirus (MERS-CoV)

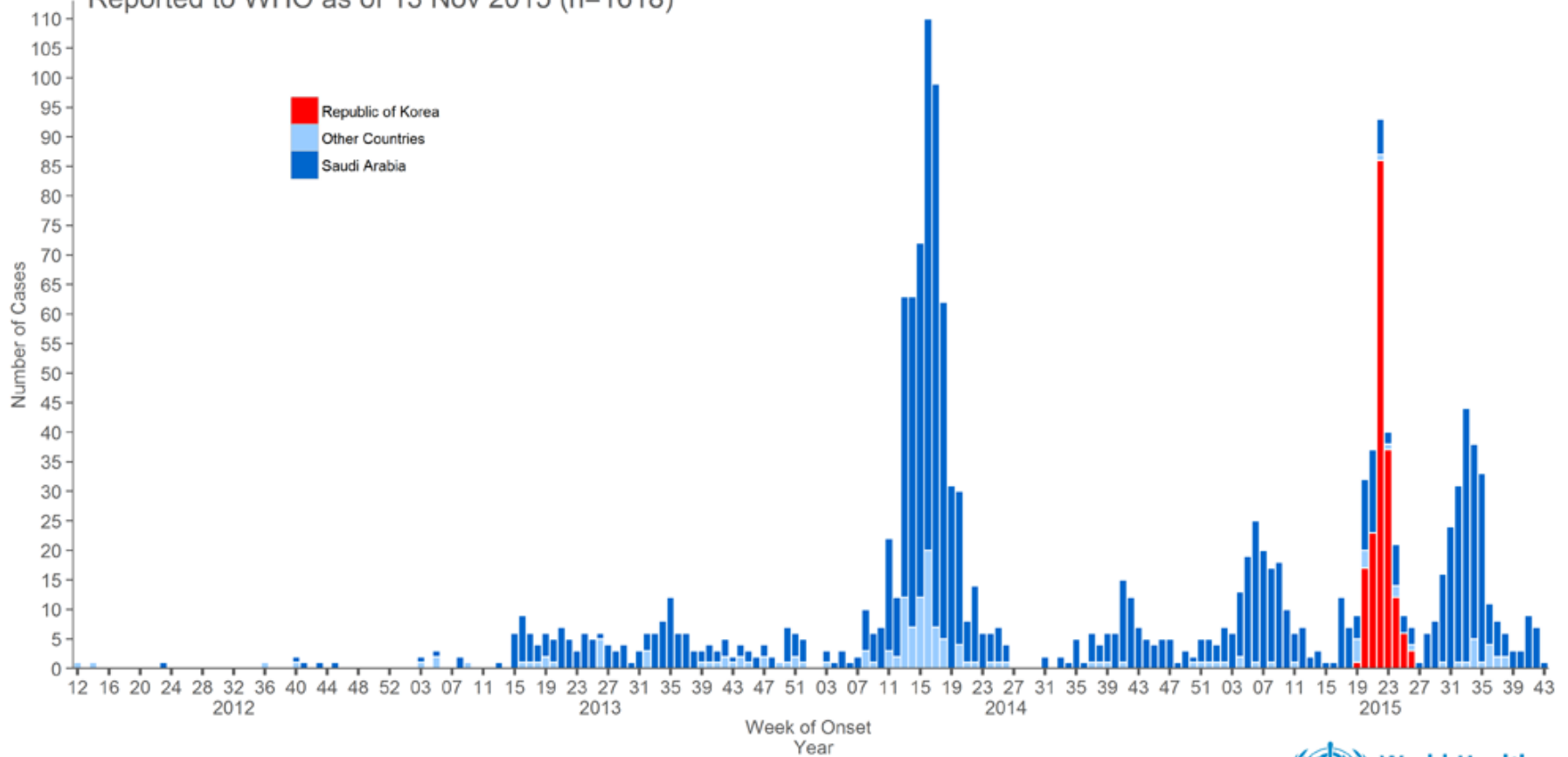


MERS-CoV

- Viral respiratory infection
- Incubation 9-14 days, early presentation of upper respiratory tract infection
- Typical symptoms include fever, cough and shortness of breath
- Pneumonia common, but not always present.
- Gastrointestinal symptoms, including diarrhoea, have also been reported.
- No specific treatment but symptomatic supportive care

Confirmed global cases of MERS-CoV

Reported to WHO as of 13 Nov 2015 (n=1618)



Other countries: Algeria, Austria, China, Egypt, France, Germany, Greece, Iran, Italy, Jordan, Kuwait, Lebanon, Malaysia, Netherlands, Oman, Philippines, Qatar, Thailand, Tunisia, Turkey, United Arab Emirates, United Kingdom, United States of America, Yemen

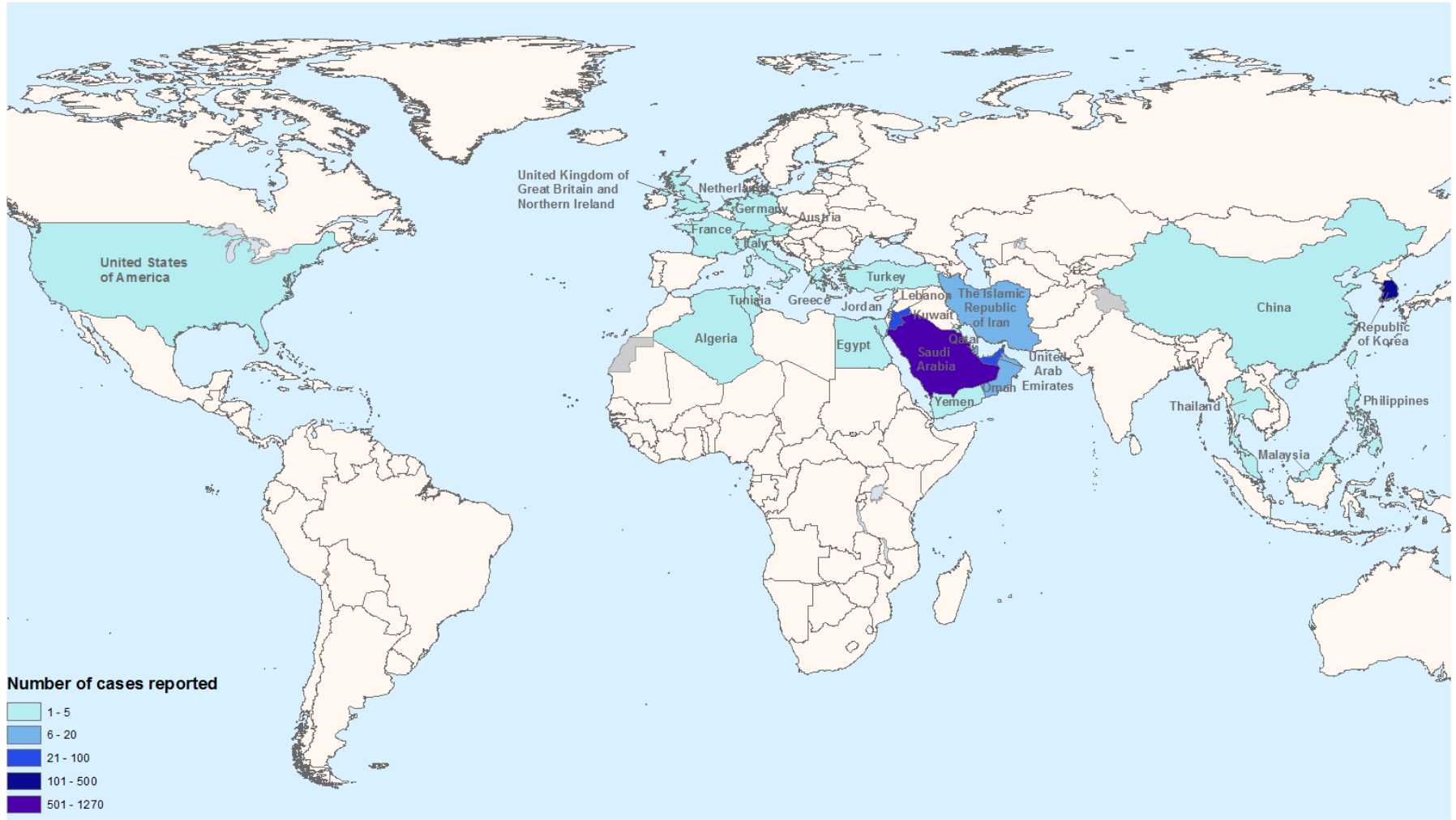
Please note that the underlying data is subject to change as the investigations around cases are ongoing. Onset date estimated if not available.



http://www.who.int/csr/disease/coronavirus_infections/maps-epicurves/en/

CONFIRMED CASES OF MIDDLE EAST RESPIRATORY SYNDROME - CORONAVIRUS 2012 - 2015

MAP DATE: 13 November 2015



Map Scale (A3): 1:72,651,466
1 cm = 727 km

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

MERS-CoV

Source of infection (Saudi Arabia)

Health care acquired:

- health care worker 12 %
- patients 33 %

Household contact 14 %

Primary 38 %

Unclassified 3 %



Reservoir

Found in camels, mechanism of transmission to and between humans not yet understood

Who should be investigated for MERS-CoV?

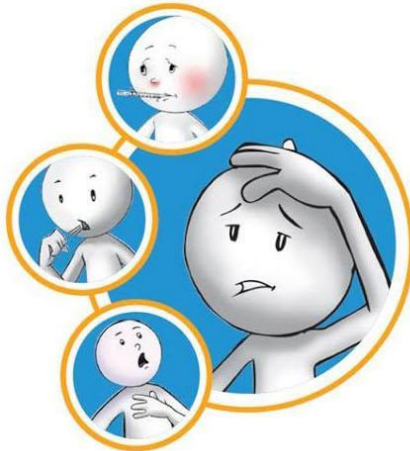
- Acute respiratory illness (fever, cough, breathing difficulty)

AND one of:

- Travel to affected area in last 14 days
- Contact in last 14 days with someone who had travelled to affected area
- Close contact of confirmed case

MERS-CoV

Middle East respiratory syndrome coronavirus



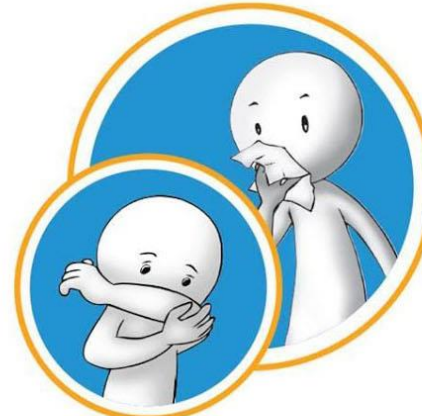
Consult a health worker if you have fever (38 °C or higher), cough or difficulty breathing. Inform them of your recent travel history



Avoid close contact with people if you are sick



Wash your hands regularly with soap and water and maintain good personal hygiene



Cover your mouth and nose with a tissue or your sleeve when coughing or sneezing

MERS Co-V in the Health Care Environment

- Ontario recommendations:
 - Routine practices (point of care risk assessment, respiratory hygiene, hand hygiene)
 - Contact, droplet and airborne precautions

MERS-CoV: Key Messages

- Ask about travel history (and history of contact with person who has travelled) in all people with acute respiratory illness
- Do risk assessment and use appropriate IPAC practices consistently in all circumstances
- Report suspect cases to OPH

In Summary

■ Influenza:

- common, huge health impact
- Early recognition and reporting of outbreaks can reduce impact
- Immunization is still cornerstone of prevention

■ TB:

- keep it on your radar!
- if missed it can have serious consequences for the individual, facility and contacts

■ MERS-CoV:

- rare and unlikely, but always important to consider travel history

In Summary

For all three:

IPAC practices are essential for prevention and control

..... In order to increase the likelihood of a perfect landing!

Acknowledgements

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