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Centre d'expertise et de référence

santé recherche innovation centre d'expertise et de référence promotion de santé santé environnementale

# Outbreaks in different settings

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## Declaration of Conflict of Interest

✓ I do **not** have an affiliation (financial or otherwise) with a pharmaceutical, medical device or communications organization.

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## Objectives

- Highlighting the importance of a structured outbreak service to support Health care facilities and community
- Key steps that could have been taken to prevent an outbreak spreading to community
- The important take home messages for Infection Control Professionals

## Outline

- What is Field epidemiology?
- Role of INSPQ in outbreak investigations
- Examples of support
  - Review of a healthcare-associated outbreak
- Take home messages


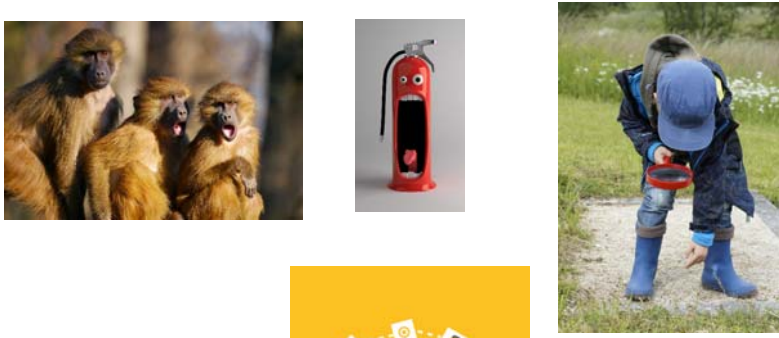
# What is Field Epidemiology (FEP)?

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Background text: santé, recherche, innovation, centre d'expertise et de référence, promotion de santé, santé environnementale, prévention des maladies chroniques, santé au travail, développement des personnes et des communautés, microbiologie, sécurité et prévention des traumatismes, recherche.

## Characterized by...



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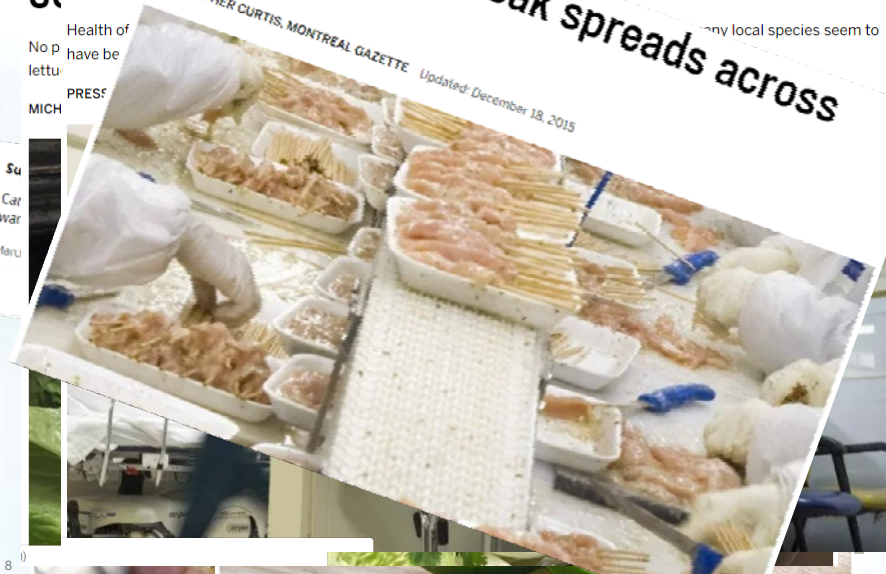
# The field epidemiologist



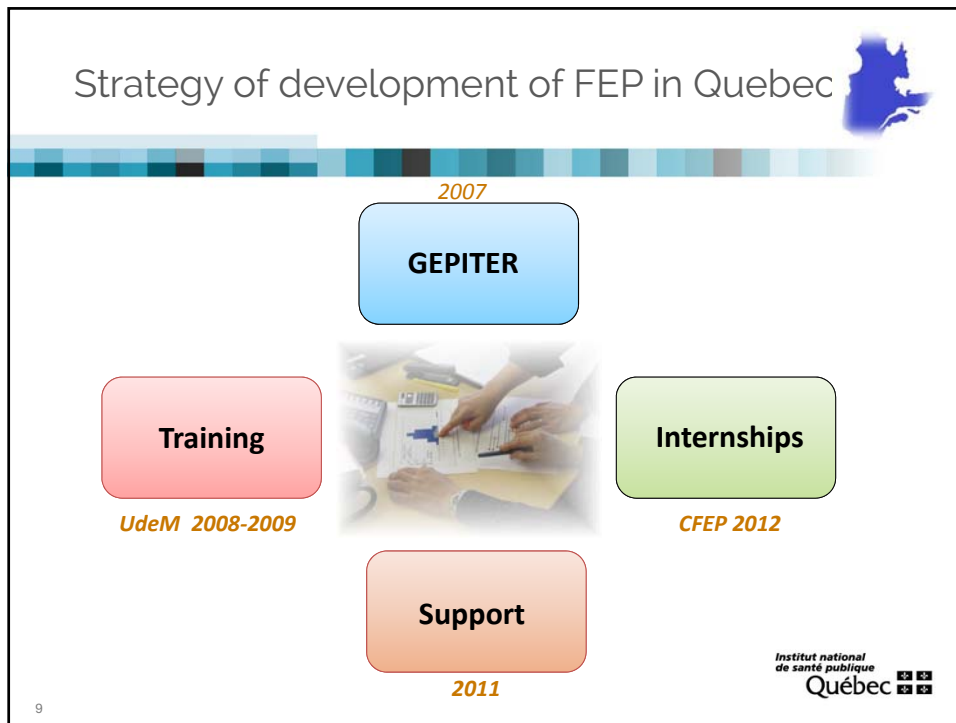
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Lakeshore General Hospital hit by four  
A Quebec Salmonella outbreak of toxoplasmosis linked  
Canada  
to u'  
CHRISTOPHER CURTIS, MONTREAL GAZETTE Updated: December 18, 2015  
any local species seem to



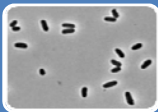
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## Support team in action



**Outbreak of *Pseudomonas* infections in a neonatal unit in 2011**



**Outbreak of *Corynebacterium striatum* in a Heath facility in 2011**



**Measles outbreak in a unvaccinated community in 2015**

Collaboration with CEFEP

## More support examples




**Investigation of a bartonellosis cluster in 2016**



**Tuberculosis outbreak in Nunavik in 2015**

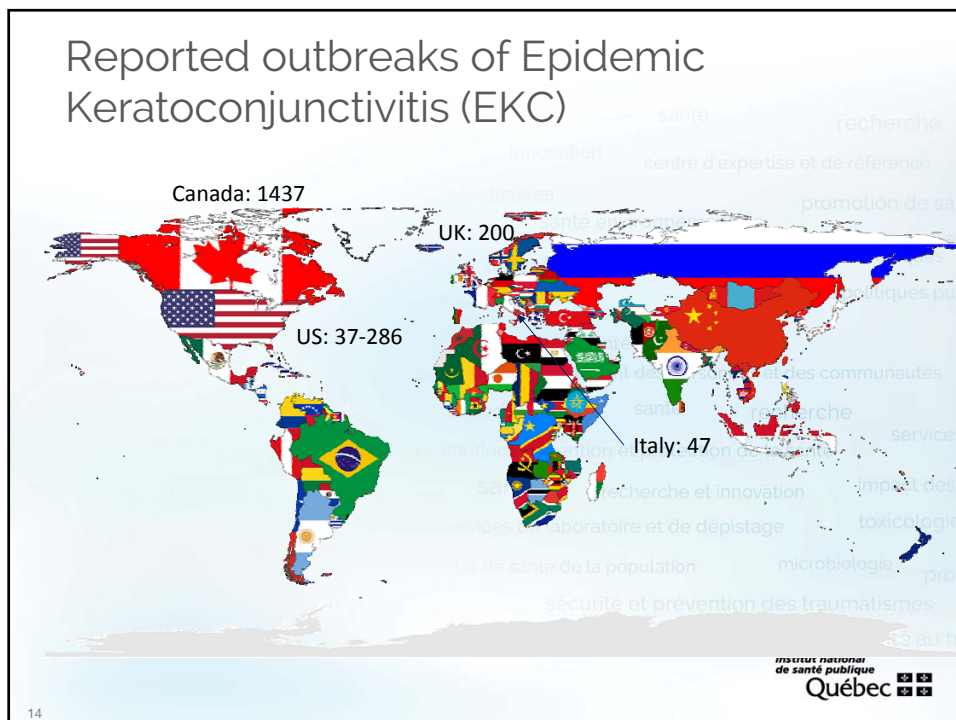
- Mobilisation in collaboration with CEFEP

## A large-scale outbreak of viral keratoconjunctivitis related to healthcare-associated transmission



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## Region of Côte-Nord

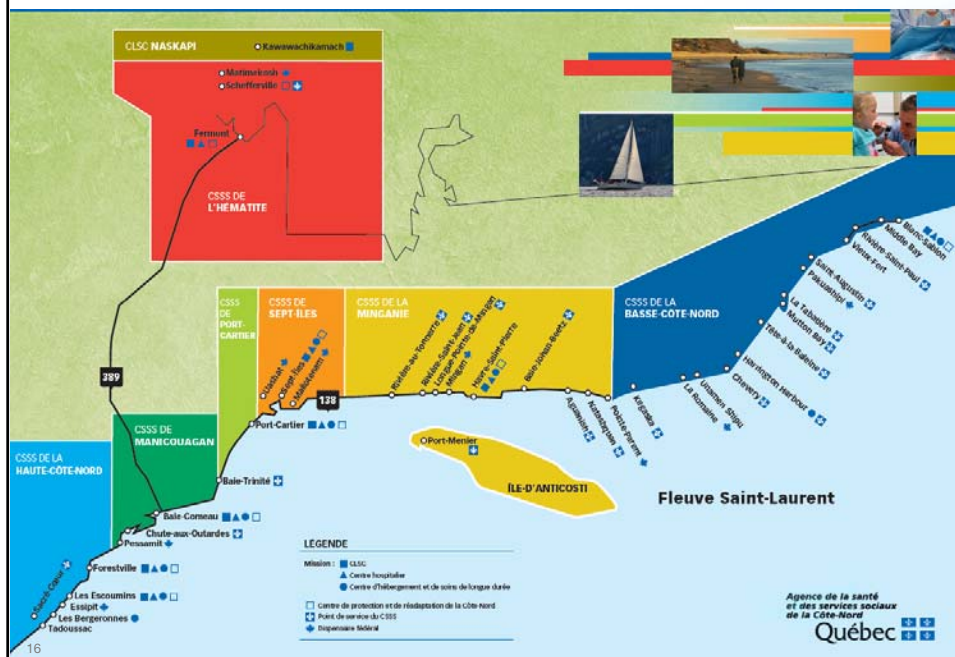


- Population of 94 766
- Majority: Francophone
- Basse-Côte-Nord: 60% Anglophone
- Indigenous population: 14%

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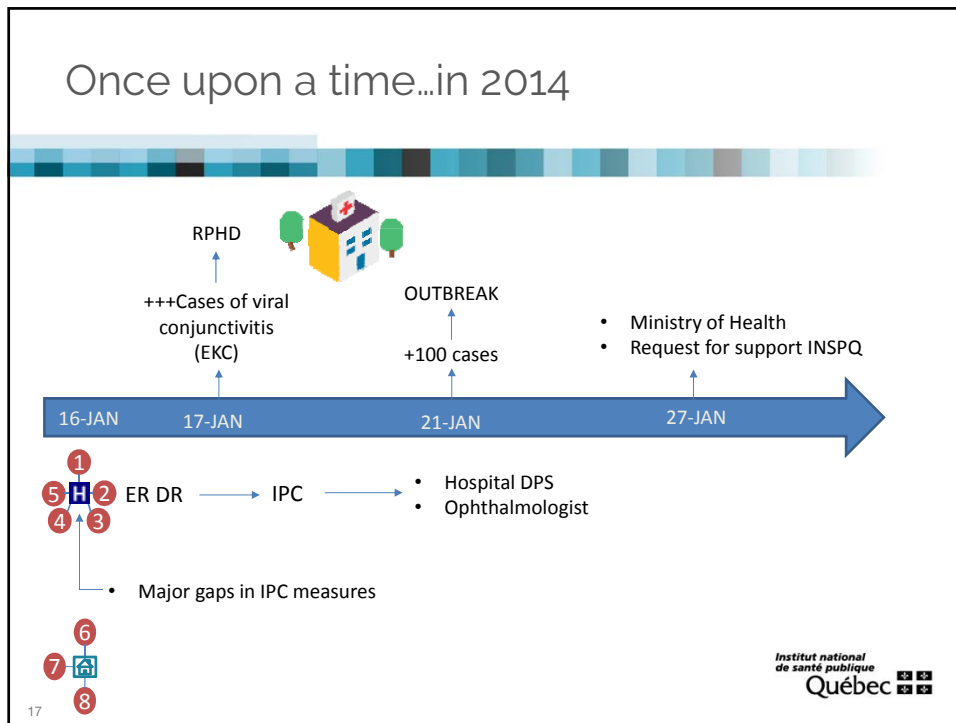
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## Health Services



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### INSPQ Mobilisation

- SEPT: Field epidemiology support team
- CERDM: Center of expertise in reprocessing of medical equipment

The slide features two images. The top image shows three individuals in full-body yellow protective suits and masks, standing in a field. The bottom image shows a surgical microscope in a clinical setting. The text to the right of each image describes the corresponding team: SEPT (Field epidemiology support team) and CERDM (Center of expertise in reprocessing of medical equipment). The logo for 'Institut national de santé publique Québec' is in the bottom right corner.

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## IPC measures: 1<sup>st</sup> to 24 February 2014

- Enhanced IPC measures
- Posters
  - Hospital
  - Daycare and schools
- Ad hoc committee and crisis unit
- New reprocessing procedures for ophthalmology medical devices
- Ophthalmology service closed
- Visits and group activities suspended

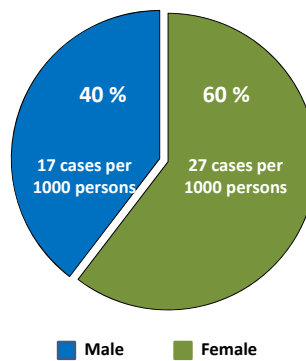
## Investigation



- **Design:** Observational, descriptive study
- **Study period :** December 1st, 2013 to March 1st, 2014
- **Data:** Patient medical records
- **Laboratory tests :** Sample from cases
- **Case definitions:** Probable cases (clinical presentation), severe cases, Healthcare-associated and community-associated

Distribution of cases by age and sex:  
 Outbreak of EKC, December 2013 to May 2014. N=939.

Age groups (years)	n (%)	Incidence rate*
0-5	98 (11)	42
6-16	114 (12)	26
17-24	73 (8)	19
25-44	275 (29)	29
45-64	245 (26)	17
65 and more	130 (14)	17
<b>TOTAL</b>	<b>935 (100)</b>	<b>22</b>



\* Per 1 000 persons (population estimated for HCN-M for 2014)

Medical service consulted and motive

Service consulted*	n	%
Ophthalmology	81	64
Emergency	17	13
General/family medicine	13	10
Gynecology	7	6
Other	9	7
<b>TOTAL</b>	<b>127</b>	<b>100,0</b>

\* Regional hospital 3 weeks prior to episode.

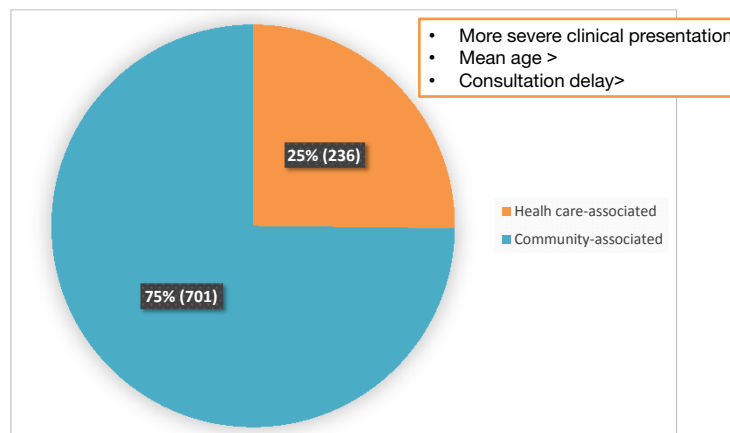
64% (81 cases) for eye problems

### Previous contact with EKC cases

Place of contact*	n	%
Household	268	61
Regional Hospital	79	18
Other medical center	46	10
Daycare/school	23	5
Other workplace	11	3
Not specified	15	3
<b>TOTAL</b>	<b>442</b>	<b>100</b>

\* 3 weeks prior to episode.

### Type of cases of EKC by probable source of exposure. December 2013 to May 2014. N=937.

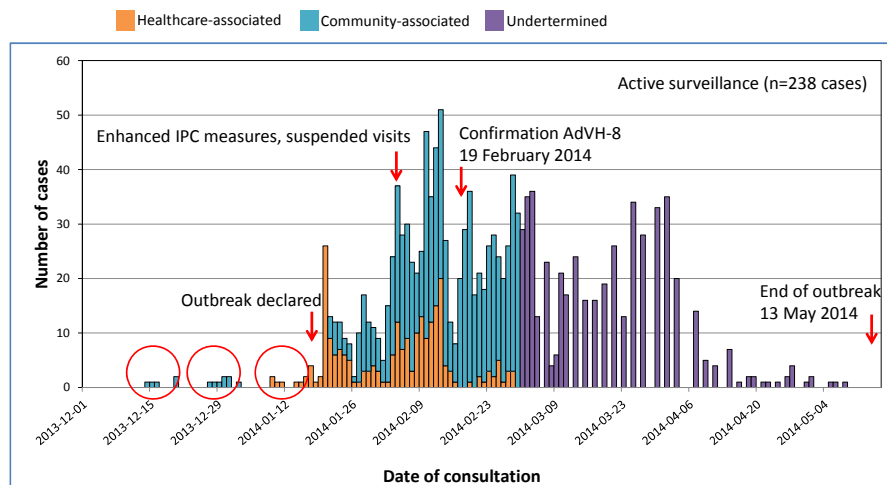


Type of patient that met case definition for :  
**Healthcare-associated** EKC, December 2013 to May 2014.

Type of patient	N (%)
Healthcare professional	115 (48)
Hospitalized patient	17 (8)
Patient with prior consultation*	104 (44)
Total	236 (100)

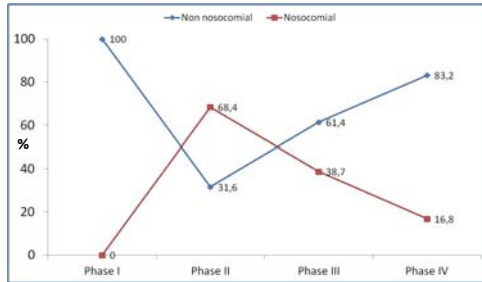
\* At the Regional hospital 3 weeks prior to episode.

Epidemic curve of EKC cases, December 2013 to May 2014. N=939.



## Outbreak progression: relative risk based on place of acquisition

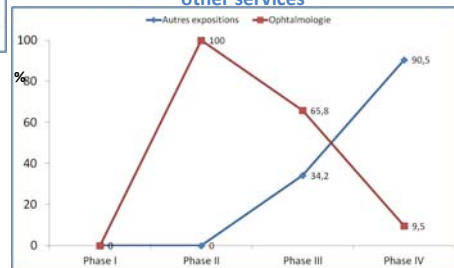
### Community-associated vs healthcare-associated



**Phases of the outbreak**  
 Phase I : 8 to 28 December 2013  
 Phase II : 29 December 2013 to 18 January 2014  
 Phase III : 19 January to 8 February 2014  
 Phase IV : 9 February to 1st March 2014

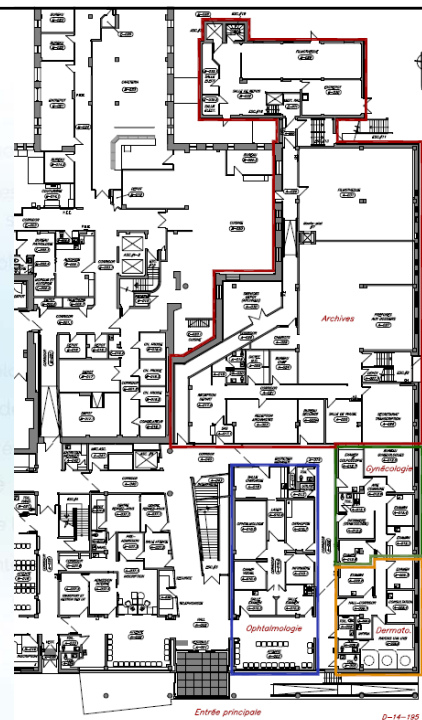
**Relative risk and prevalence observed in exposed**  
 $p < 0,05$  for all  $X^2$  and Fisher Exact tests  
**Trend in prevalence observed in exposed**  
 $p < 0,05$  for Fisher Exact test 2 x 3 (extension Freeman-Halton)

### Healthcare-associated to ophthalmology and other services



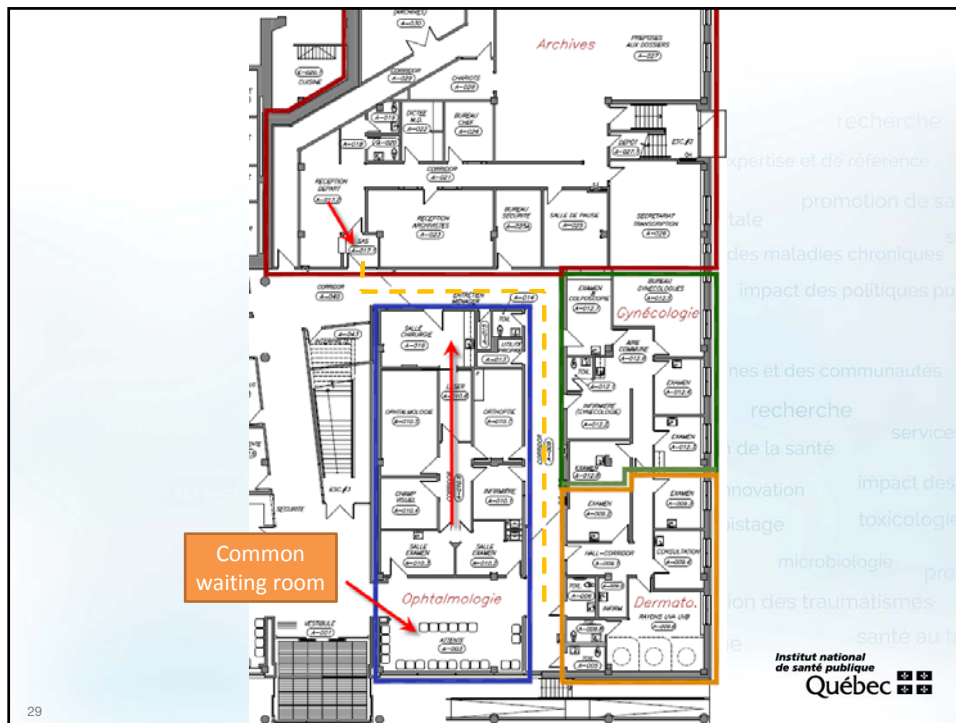
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## Organisation of Hospital 1<sup>st</sup> floor



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## So what happened?

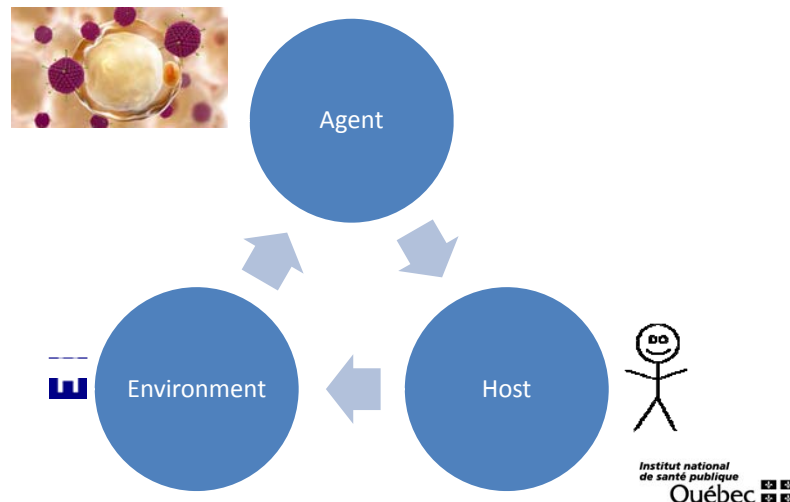
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## Observations (before and during the outbreak)

- Major gaps in IPC measures (mainly in ophthalmology)
  - Risk of contamination of the environment and cross-transmission by personnel
- Delayed declaration (under-estimation of risk)
- Health care personnel working while contagious
- Amplification sources

## Hypotheses: Outbreak Progression





# Take home messages

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## Health care services

- Promote standard and enhanced IPC measures
  - Exclude all infected personnel
  - Identify and isolate suspected cases
  - Increase social distance between patients
- Conduct audits
- Adequate reprocessing of medical equipment
- Make friends with Public Health professionals
- Maintain IPC and outbreak investigation training

## Additional measures for ophthalmology service



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## Recommandations: Alert system for cluster surveillance

### Level 1: 1 cluster of $\geq 5$ cases over 1 week

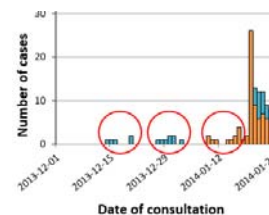
- Notify IPC team
- Site visit: Review basic hygiene and disinfection measures
- Ongoing surveillance

### Level 2: 2<sup>nd</sup> cluster over 3 weeks

- Implement/enhance immediate IPC measures
- Confirm diagnosis
- Notify RPHD
- Investigate cases

### Level 3: 3<sup>rd</sup> cluster or additional healthcare-associated cases

- Assemble team
- Initiate outbreak investigation



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## The dream team

CISSS de la Côte-Nord : Infectious disease service

- Dr François Desbiens
- Dr Hélène Chouinard
- Dr Manon Gingras
- Dr Claudette Viens
- Suzie Bernier
- Julie Lafrenière
- Service and archive personnel and IPC nurses (Nathalie Landry and Isabelle Tremblay)

INSPQ

- Dr Julio C. Soto
- Mihaela Gheorghe
- Mélissa Trudeau
- Myriam Troesch

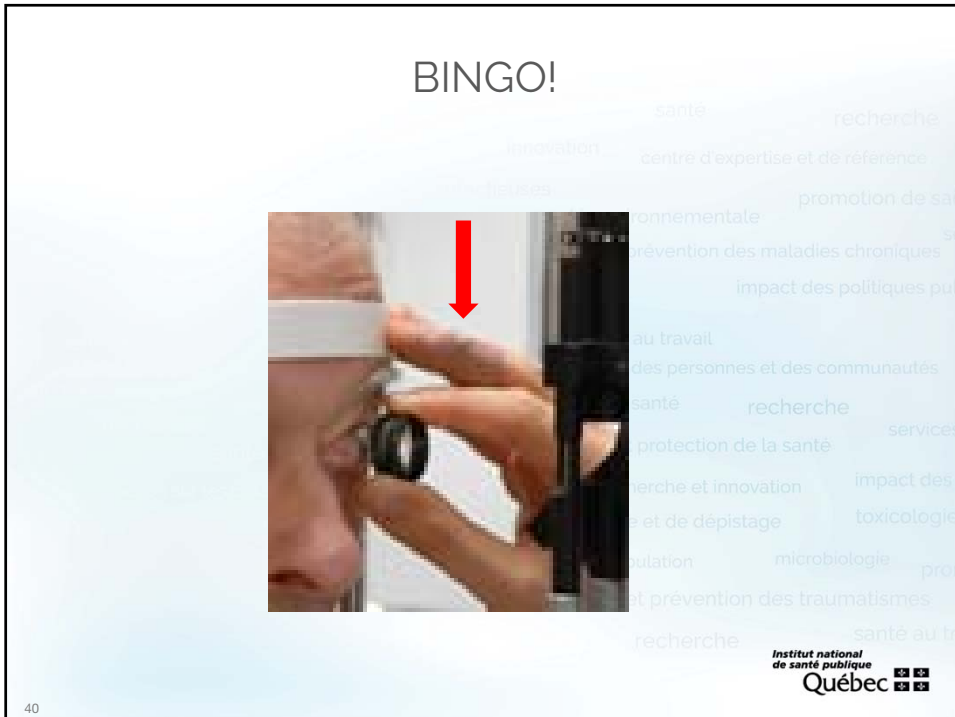


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## What's wrong with this picture?

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Questions?

Attention de ne pas marcher sur les ~~oeufs~~  
Yeux



Adapted from Journal of Manic, 18 February 2014. © Métyvié

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