Case studies from the Netherlands

Daisy Ooms
Medical Doctor in Communicable Disease Control; MPH
Public Health Authority Kennemerland, the Netherlands
Three case studies from Amsterdam Airport Schiphol

1. Measles transmission on board of an airplane

2. Suspicion of MERS-Coronavirus

3. Suspicion of Lassa virus
Ports of Entry under Dutch PH law

A Port

*WHO designated Point of Entry*

- Amsterdam Airport Schiphol

B Ports

- Eindhoven Airport
- Rotterdam The Hague Airport
- Maastricht Aachen Airport
- Groningen Airport
Amsterdam Airport Schiphol
Amsterdam Airport Schiphol

Main Airport of the Netherlands
- 512,000 air movements* 2018
- 71 million passengers* (89% of Dutch total)
- 21 million intercontinental passengers* (98% of Dutch total)

Europe’s 3\textsuperscript{rd} busiest Airport

World’s 11\textsuperscript{th} busiest Airport
Cooperation partners

**Public Health Authority**
- Specialized PH professionals (doctors and nurses)
- Not located on the airport (30 minute distance)

**Airport Medical Services (at the airport)**
- Medical centre for first aid and ambulance
- Report suspected cases to Public Health
- Cooperates in handling incidents

**Airport stakeholders**
- Facilitates everything what is needed: logistics, transport, security clearance, (quarantine) location, etc.
Training and Exercise
Temporary passenger holding areas on Schiphol

- Holding area Busstation G-terminal, max. 286 pax
- Plane on holding
- Quarantine location max. 8 hours
- Quarantine location Long-term residence (not yet realized)
Case Study 1
Case Study 1: Measles

On December 26\textsuperscript{th} 2018, A Ukrainian family took a flight from Zanzibar → Amsterdam → Kiev

The index case:

- 8 year old child, unvaccinated, with high fever and exanthema (rash)
- Suspicion of Measles by a medical doctor
- Child taken off board during the stopover in Amsterdam
- Hospitalized (in isolation) and diagnosed with measles on December 28\textsuperscript{th}.
Measles

- Viral disease
- Airborne transmission by droplets
- Highly contagious, capable of causing epidemics

- Incubation period: ca. 14 days
- Symptoms: fever, rash, cough, running nose, eye infection
- Sometimes severe complications (encephalitis)

- Vaccine preventable disease
Measles worldwide

[World map showing measles rates globally, with different shades indicating varying rates of measles incidence.]

Data source: IVB Database
Measles in Europe

Due to suboptimal vaccine coverage, large measles outbreaks in several countries in the European region currently occur.

Ukraine:
Lowest vaccine coverage of the European Region (31% in 2016)
Timeline of infection

- December 19\textsuperscript{th}: first day of illness
- December 24\textsuperscript{th}: start rash
- Country of infection: Ukraine
- December 20\textsuperscript{th} till 28\textsuperscript{th}: contagious period
Transmission in Airplanes

An Aircraft is a semi-closed environment

- 10 air exchanges / hour
- Each exchange 50% of the air is recirculated, but filtered
- Per air exchange: 63% of pathogens is removed
- Air supply is mainly transverse (circular) ➔ Limited rows at risk?

Contact tracing according to RAGIDA

Patient travelled on airplane. Time frame: between four days before and four days after onset of rash.

YES

Flight during the last two days?

YES

Contact tracing of all passengers* with priority of children <2 years of age

• Vaccinate all susceptible > 6 months**
• HNIG if available for persons not eligible for vaccination**

NO

Flight three to five days ago?

YES

HNIG available?

NO

Flight six to 12 days ago?

YES

Contact tracing of all passengers* with priority of children <1 years of age

HNIG for vulnerable persons**: 
• unvaccinated children <1 year
• pregnant women
• persons with immuno-compromising conditions

NO

Information of passengers and crew about the event if feasible and management for cases and their susceptible contacts as nationally recommended

NO

No contact tracing

No contact tracing

No contact tracing
Contact tracing according to RAGIDA

Patient travelled on airplane. Time frame: between four days before and four days after onset of rash.

YES

Flight during the last two days?

NO

Flight three to five days ago?

NO

Flight six to 12 days ago?

NO

No contact tracing

YES

HNIG available?

NO

Contact tracing of all passengers* with priority of children <2 years of age

YES

Vaccinate all susceptible > 6 months**

HNIG if available for persons not eligible for vaccination**

NO

Contact tracing of all passengers* with priority of children <1 years of age

YES

HNIG for vulnerable persons* *:

• unvaccinated children <1 year
• pregnant women
• persons with immunocompromising conditions

NO

Information of passengers and crew about the event if feasible and management for cases and their susceptible contacts as nationally recommended
Contact tracing:
- Prioritize on children < 2 years and passengers seated in the same row
- Then proceed, as long as the timeframe permits, in either direction from the index
Public Health measures - according to RAGIDA

Contact tracing:
- Prioritize on children < 2 years and passengers seated in the same row
- Then proceed, as long as the timeframe permits, in either direction from the index

Preventive measures (post-exposition) for unvaccinated persons:
- Active immunization (vaccination) possible < 72 hours
- Passive immunization, possible < 7 days
  only risk groups: children, pregnant women, immune compromised
Public Health measures - the reality in this case

Retrieving passengers list:
- Resistance due to privacy legislation
- Airline wants to consult legal advisor
- Expected delay due to Christmas holidays: undesirable because of limited timeframe for preventive measures
Public Health measures
- the reality in this case

Pragmatic solution:
An information letter to all passengers
Composed by Public Health Authority, distributed by Airline

Advice: to check the following things:
• Immunization status: not vaccinated or infected before?
• Belong to risk group?

➔ If yes to both: contact your medical doctor at short notice. You might need immunization.
Three secondary cases

Secondary case 1: Netherlands
- Woman, born in 1975
- Seated behind the index case
- Developed symptoms on January 6th
- Directly admitted in isolation at the hospital’s emergency department
- No further transmission

Secondary case 2: Netherlands
- Not seated near the index case, but gave medical assistance
- Received one vaccination in the past
- Mild symptoms

Secondary case 3: Belgium
Case 1 – Lessons learned

Measles in Europe are a serious Public Health threat and aviation contributes to the spread

Retrieving passengers list can be difficult and time consuming, due to privacy legislation

The pragmatic approach was fast and useful because appropriate preventive measures (isolation) were taken around a secondary case.

Passengers at risk are not limited to the rows directly around the index case.
Case Study 2
Case Study 2

Notification from a taxiing aircraft

• A flight from Rome to Amsterdam, already landed and taxiing to the gate.
• Group of 20 elderly travelers (> 65 years)
• 18 out of the 20 travelers are ill: severe coughing, malaise, fever, running nose
• Traveled around the world in 31 days to visit the seven ‘wonders of the world’

And this was all the information we had...
The seven wonders of the world

Taj Mahal, India

Maya Temples, Mexico

Petra, Jordan

Colosseum, Rome
The seven wonders of the world:

- Maya Temples, Mexico
- Petra, Jordan
- Taj Mahal, India
- Colosseum, Rome
- Chinese Wall, China
- Great Pyramid of Giza, Egypt
- Christ the Redeemer, Brazil
MERS-Coronavirus

- New type of Coronavirus (2012)
- Outbreaks in the Middle East and South Korea
- Severe respiratory Infection, ARDS, high case fatality rate (34%)
- Transmission by Dromedary camels
MERS-Coronavirus

New type of Coronavirus (2012)

Outbreaks in the Middle East and South Korea

Severe respiratory infection, ARDS, high case fatality rate (34%)

Transmission by Dromedary camels

Transmission route
Dromedary $\rightarrow$ human

But also: human $\rightarrow$ human

Source: WHO
What did we do?

We decided to go to the airport in order to make a good risk assessment of the MERS-CoronaVirus.

Advice for now:
1. The passengers can deboard, after they complete a Passenger Locator Form
2. The travelling group has to stay in a separated place, and wait for the Public Health Authority
Risk Assessment at the Airport

- First complaints started on day 5, in Peru
- The last person became ill before arriving in Jordan
- Intermittent presence of symptoms during the trip
- Group didn’t visit animal markets in China, India or Jordan
- No contact with Dromedary Camels or animal waste
- No hospital visit or contact with sick people

**Conclusion:** Respiratory infection of unknown cause
- Does not meet the case definition for MERS-CoV.
- People can go home
Afterwards

- An information letter to all airplane passengers

- Diagnostic test (MLPA): nasal/throat swab tested for a wide of respiratory infections

- Diagnostic material of 10 people.
  - 1 test failed, 4 people tested negative
  - 2 persons: Influenza A
  - 1 person: RSV type B
  - 1 person: Rhinovirus
  - 1 person: Rhinovirus and Adenovirus
Lessons learned

- How to act in an unclear situation, with very little information (unlike the clear cases in exercises)

- Discrepancy between Public Health and Airport partners in risk perception.
  *(Public Health not very worried about the risk, but the airport partners scaled up high)*

- Straightforward handling a case at the airport is not possible. Upscaling is necessary to be facilitated.
Case Study 3