Protecting Travellers on Airplanes, Cruise Ships, Passenger Ferries and Rail; A Risk based Approach to Public Health Protection on Conveyances

Presented to the Canadian Public Health Association Conference, Edmonton, June 2012
Health Canada’s Role in Protecting Public Health on Conveyances

Mandate to protect the travelling public through the reduction of potential risks from water, food or sanitary conditions on passenger conveyances including:

- National and International Aircraft
- Passenger trains
- Passenger Ferries and Cruise Ships
- Interprovincial and International motor coaches (buses)
- Airports and port terminals and related services
- Flight Kitchens

Department of Health Act states that Minister's powers, duties and functions include:

4(e) the protection of public health on railways, ships, aircraft and all other methods of transportation, and their ancillary services

- Potable Water Regulations for Common Carriers prescribe standards for safe drinking water on conveyances
Three Pillar Approach to Public Health on Conveyances

**Active Prevention**
- Outreach and training of conveyance operators
- Awareness campaigns for Canadians

**Targeted Oversight**
- Routine public health audits and inspections

**Investigations**
- Public health investigations of complaints or investigation of disease outbreaks,
- Conducted in collaboration with provincial-territorial, national or international public health authorities
2010 - Health Canada conducted a qualitative risk assessment incorporating
• number of passengers,
• complexity of operations,
• historical compliance/outbreaks

• Recognized need for a quantitative tool

Challenges:
• No public health models that met program requirements.
• Risk assessment tool should provide a comparable risk assessment (risk rating) both within a conveyance sector (e.g. cruise ship) as well as across all conveyance sectors (e.g. trains, ferries, airlines)

2011 - Health Canada introduced a risk-based approach to public health on conveyances

Purpose:
• Target resources to areas of highest potential risk
• Expand the type and number of tools available to support conveyance sectors to manage risks

Outputs
• Quantitative measure of the risk associated with certain conveyance and facility activities (general, food, potable water, sanitation).
• Use quantitative measure to identify which tools and how many resources will be targeted to each industry
Risk Definition and Principles

Hazard x Exposure = Risk

**Hazard** - the inherent properties of a substance, object or activity with a potential for adverse or harmful effects to occur.

**Exposure** - a quantitative measurement of the extent to which a given hazard is present.

**Risk** - the likelihood (probability) of identified hazards causing harm in exposed populations.

Risk Assessment on Conveyances
Measurement of the risk associated with certain conveyance and facility activities (general, food, potable water, sanitation).

Risk Management
A process that includes identifying, selecting and implementing activities for mitigating risk.
Information Collection on Exposures and Potential Hazards

Risk Assessment Tool

General
- Passenger Capacity
- Duration of Travel
- Itinerary
- Annual Operating Period

Food
- Type of Food Service
- Type of Food Preparation
- Facility and Equipment
- Total Capacity of Food Facilities
- Food Safety Management Plan
- Staff Knowledge and Training
- Historical Level of Compliance

Potable Water
- Type of Water Source
- Type of Water Treatment
- Number of Water Transfers
- Number of High Hazard Cross Connections
- Total Capacity of Potable Water Storage Tanks
- Potable Water Management Plan
- Staff Knowledge and Training
- Historical Level of Compliance

Sanitation
- Total Capacity of Public Facilities
- Total Capacity of Private Facilities
- Sanitation Management Plan
- Staff Knowledge and Training
- Historical Level of Compliance
- Historical Water Quality

Travelling Public Program/Le Programme du public voyageur
## Risk Assessment Tool Framework
### EXAMPLE

<table>
<thead>
<tr>
<th>Risk Weight</th>
<th>Risk Determinant</th>
<th>Risk Descriptors</th>
<th>Risk Value</th>
<th>Risk Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Duration of Travel</strong></td>
<td>Not applicable: no passengers.</td>
<td>0</td>
<td>x1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 1 day.</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 – 7 days.</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 7 days or Insufficient information to evaluate.</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

**Guidance:** Duration of travel is defined as the length of time passengers stay on a conveyance from embarkation to disembarkation.

**Program Activity Link:** Conveyances and facilities that score 30 points for this risk determinant should be approached and offered assistance with the development of a GI surveillance system and GI outbreak management plan.

**EHO Comments:**

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**Travelling Public Program/Le Programme du public voyageur**
## Risk Area Score and Risk Rating

### Cumulative Risk Score (X₁)

<table>
<thead>
<tr>
<th>Risk Area</th>
<th>Total Risk Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>0 – 120 points</td>
</tr>
<tr>
<td>Food</td>
<td>0 – 510 points</td>
</tr>
<tr>
<td>Potable Water</td>
<td>0 – 630 points</td>
</tr>
<tr>
<td>Sanitation</td>
<td>0 – 330 points</td>
</tr>
<tr>
<td><strong>Cumulative Risk Score (X₁)</strong></td>
<td><strong>0 – 1590 points</strong></td>
</tr>
</tbody>
</table>

### Calculation of Cumulative Risk Score for Sector

\[
[ \text{Median}(X₁, X₂, X₃, \ldots, Xₙ) ] \times [1 + Y]
\]

\[
Y = \frac{\text{Annual number of passengers carried for sector}}{\text{Annual number of passengers carried for all sectors}}
\]

<table>
<thead>
<tr>
<th>Cumulative Risk Score (X₁)</th>
<th>Risk Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 530 points</td>
<td>Low</td>
</tr>
<tr>
<td>531 – 1060 points</td>
<td>Medium</td>
</tr>
<tr>
<td>1061 – 1590 points</td>
<td>High</td>
</tr>
</tbody>
</table>
Activities to Support Risk-Based Approach

Activities

Risk Surveillance
- GI Surveillance
- Complaint Surveillance
- Sampling Programs

Risk Mitigation
- Active Prevention
- Targeted Oversight
- Investigations
  - Disease Outbreaks
  - Unsatisfactory Sampling Results
  - Complaints

Management Plans
- Outreach Activities
- Audits

Outreach Activities

Inspections

Disease Outbreaks

Unsatisfactory Sampling Results

Complaints

Inspections

Audits

Disease Outbreaks

Unsatisfactory Sampling Results

Complaints
Risk Management by Conveyance (Example)

Hypothetical example

Risk tool has identified that a specific passenger ferry had low risk scores in food and sanitation but a high risk score in potable water.

Risk management activities may include:

- supporting the development of a potable water management plan
- targeted inspections of onboard water system at a higher frequency than for food and sanitation areas
- Investigation of adverse water samples results
Applications of the Risk Assessment Tool - Across Sectors (i.e. aircraft, rail....)

Risk tool provides:

1. Cumulative quantitative measure of risk for each conveyance and facility sector
2. Allows for the comparison of risk across conveyance and facility sectors

This information informs:

• Prioritization and allocation of resources sector by sector on an annual basis
• Selection of risk management strategies and tools
Risk Management Across Sectors - Example

Hypothetical example:

The airline sector was found to be highest potential risk due in part to the number of passengers carried per year.

Risk management activities may include:
• Training for airline crew (flight attendants (food safety) or groomers (onboard sanitation)
• Targeted audits of companies with highest passenger loads
• Follow up of complaints from public

Training and Awareness Campaign
Inspections of long haul aircraft
Complaint Investigation
Health Canada will conduct an annual risk assessment to set activity targets for coming years

- Targets established through this system will be evaluated throughout the year as part of performance management

Risk tool and outputs will be evaluated regularly to ensure they are supporting the program objective of reducing risks to the Canadian travelling public are met.
Health Canada Contacts Information

For further information, please contact:

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