

Environmental Health Work with Cruise Ships

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Today's Presentation

- Introduction to cruise ships & environmental health work
- Ship standards & international port health
- Food safety, housekeeping, potable water & pools/spas
- Communicable disease control – norovirus
- Examples of incidents and work



Modern Cruise Ships - Unique Environment “Floating Cities”

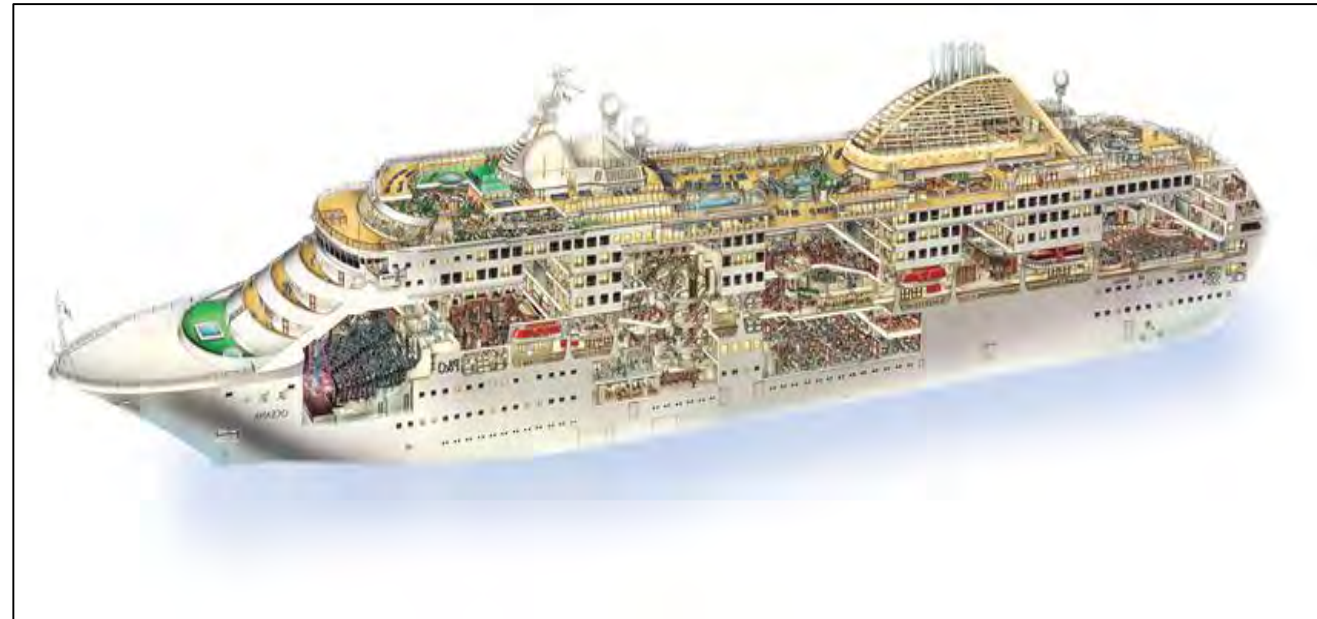
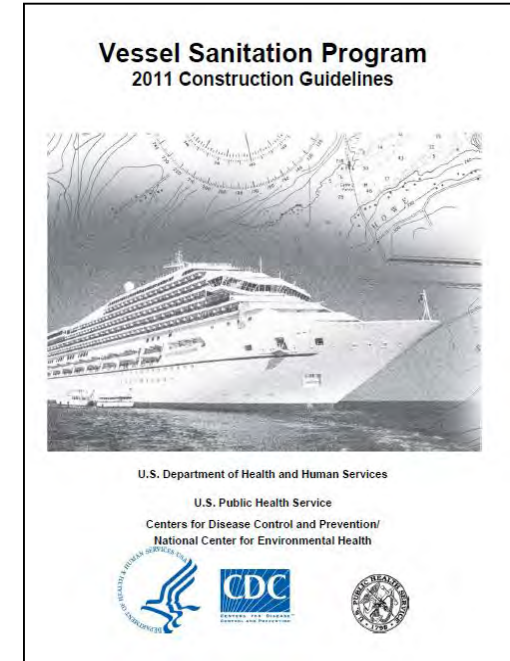
Regal Princess carries 3560 passengers & 1300 crew

Symphony of the Seas carries 5580 passengers & 2200 crew



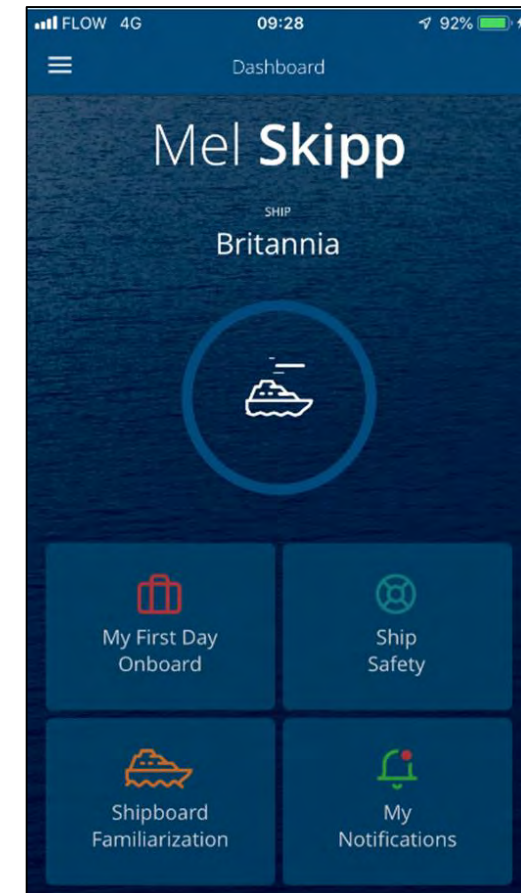
Wide Scope of Environmental Health

- Overall Ship Design & Construction
- Case/ Outbreak Prevention & Response Procedures (OPRP)
- Food Operations
- Potable Water
- Recreational Water Facilities – pools, spa pools, water parks etc.
- Housekeeping
- Child Areas - kids clubs etc.
- Garbage & Waste – sewage etc.
- Medical – infection control
- Crew Welfare



Typical Work on Cruise Ships

- Overall public health strategy and policy
- Consultation on design & construction
- Routine audits & training work
- Inspecting suppliers, ports, tours & resort hotels
- Assist shore departments & ships – guidance, advice and information
- Developing & implementing training – videos etc.
- Dealing with complaints & questions
- IPM (pest control)



Standardized Ship Procedures

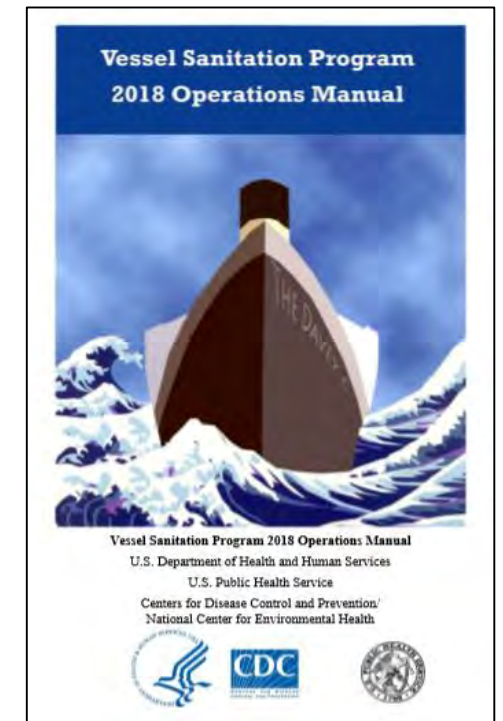
- Outbreak Prevention and Management
- Food Safety
- Potable Water
- Recreational Water Facilities
- Medical
- Reporting

The screenshot displays the GLOBAL HESS dashboard. On the left is a sidebar menu with options: Dashboard, My Tasks, My Primary Documents, My Primary Document Updates, My Documents for Approval, My Procedure Suggestions, My HESS Self-Reported Non-Conformity, My HESS Action Items, eform Reports, HESS Regulations (selected), HESS Procedures, Corporate Policies and Publications, Checklists/Forms/Attachments, Updates By Month, Amendment Summary, CSMART, HESS Audits, Investigations and Inspections, HESS Self-Reported Non-Conformity, and Suggestions. The main content area is titled 'HESS Procedures'. It features a 'SECTION' dropdown set to 'PHS - Public Health and Sanitation Procedures' and a 'SERIES' dropdown set to 'Select value'. Below these is a search bar and a status 'Showing 1 to 43 of 43 entries'. A table lists 10 procedures, each with a plus icon, a magnifying glass icon, an item number, and a title.

		Select value	Select value
		ITEM NUMBER	TITLE
+	🔍	PHS-1001	Public Health Inspections and Variances
+	🔍	PHS-1101	Acute Gastroenteritis (AGE) Response Levels and Management
+	🔍	PHS-1102	Personal Crew Hygiene and Illness Reporting Requirements
+	🔍	PHS-1103	Acute Gastroenteritis (AGE) Notification and Reporting
+	🔍	PHS-1104	Acute Gastroenteritis (AGE) Communication and Information
+	🔍	PHS-1105	Case Management of Communicable Illness
+	🔍	PHS-1106	Acute Gastroenteritis (AGE): Management Of Cleaning, Sanitizing and Hand Sanitizing
+	🔍	PHS-1107	Outbreak Prevention in Housekeeping and Laundry and Environmental Cleaning and Sanitizing
+	🔍	PHS-1108	Outbreak Prevention in Food and Beverage Areas
+	🔍	PHS-1109	Outbreak Prevention in the Medical Center
+	🔍	PHS-1110	Outbreak Prevention in Technical and Environmental Operations

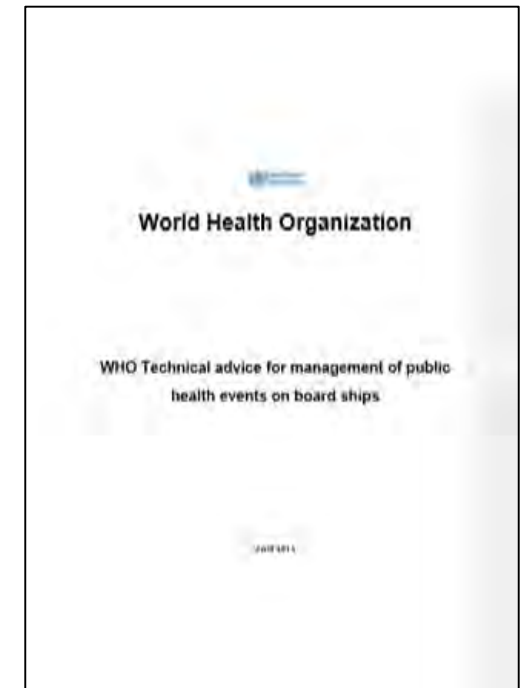
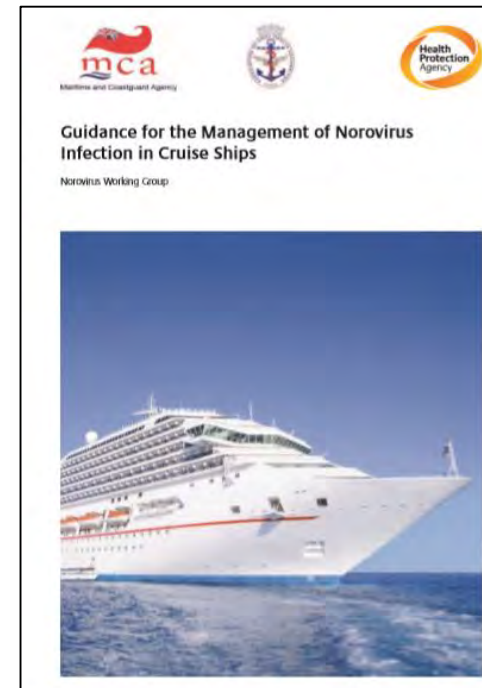
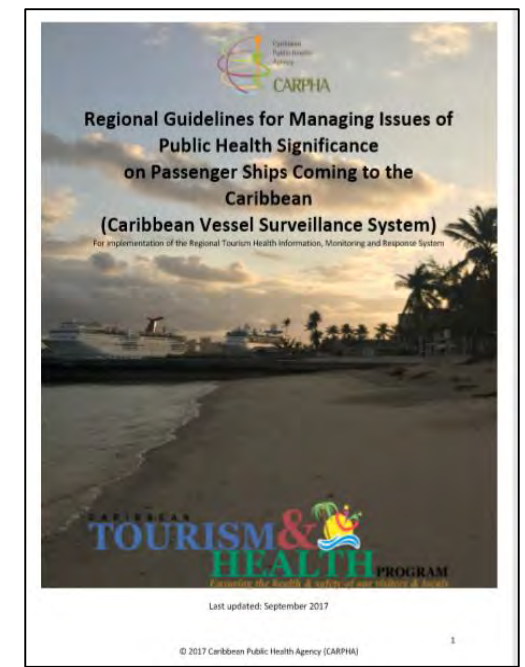
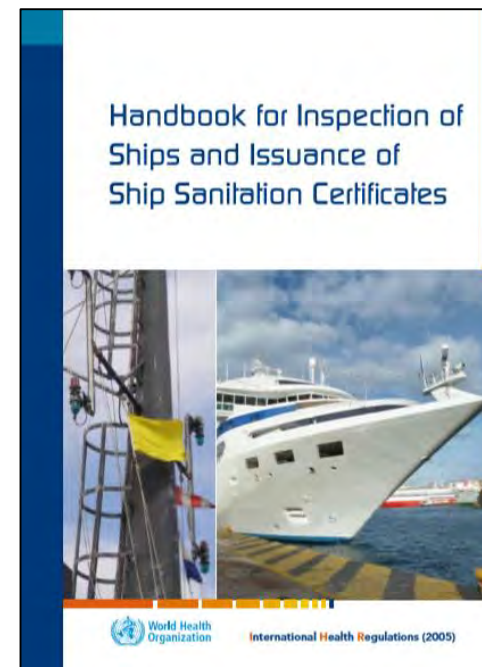
International Port Health

- Vessel Sanitation Program - Construction Guidelines & Operations Manual
- UK port health
- EU SHIPSAN – manual and inspections
- Public Health Agency Canada, ANVISA, NSW Health etc.



International Guidelines etc.

- CARPHA surveillance guidelines
- WHO Inspections & SSCs
- Catering Industry Guide Ships
- HPA Guidance for Management of Norovirus on Cruise Ships
- EU Potable Water Directive



Food Safety Management

- Procedures & Systems – HACCP based
- Safe Food Sources & Transport
- Menu Design – fresh cooked & food risk
- Checks & Inspections – shore excursion, ships and suppliers
- Temperature Control
- Cleaning & Disinfection
- Buffet Service – design, temperature & time



Housekeeping Measures

- Design of Laundries, Cabins, Pantries etc. – flow, cleanability
- Surveillance & Reporting – use of toilet paper, signs of illness
- Cleaning & Disinfection – order, methods, contact time
- Dedicated Team (Hit Squad) – for affected guests
- Checks - on methods housekeeping trolleys/equipment
- Testing of Disinfectant Solutions
- Laundry – temperature, separation etc.
- Records – trends & diligence



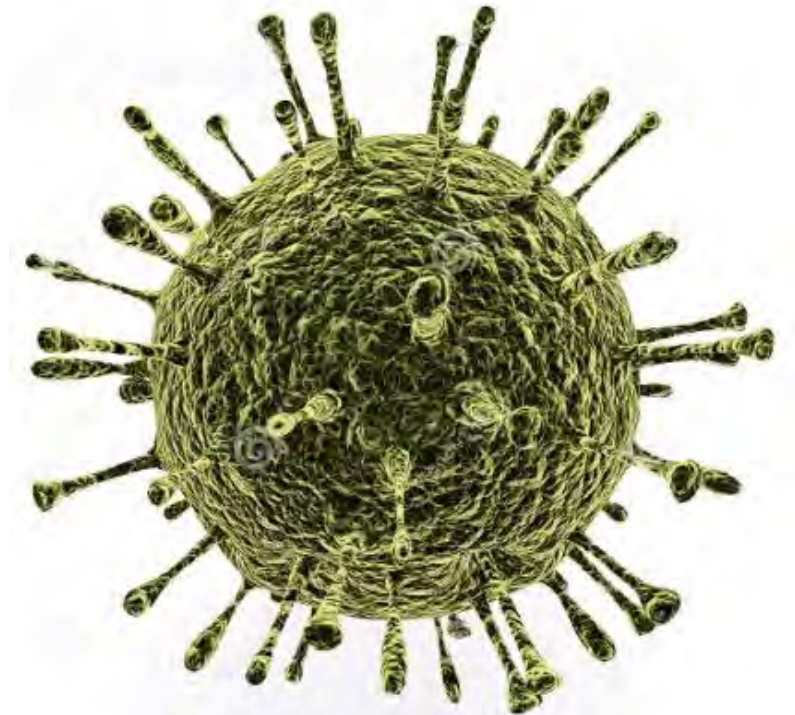
Potable Water & Pool/Spa Prevention Measures

- Water Safety Plans
- Water Sources – test & certificates etc.
- Effective Chlorination & pH etc. – monitor, test & record
- Checks on Pool Operations – turnover, filters, water clarity, UV systems
- Pool Health Procedures – cleaning, checks, faecal accidents, signage etc.



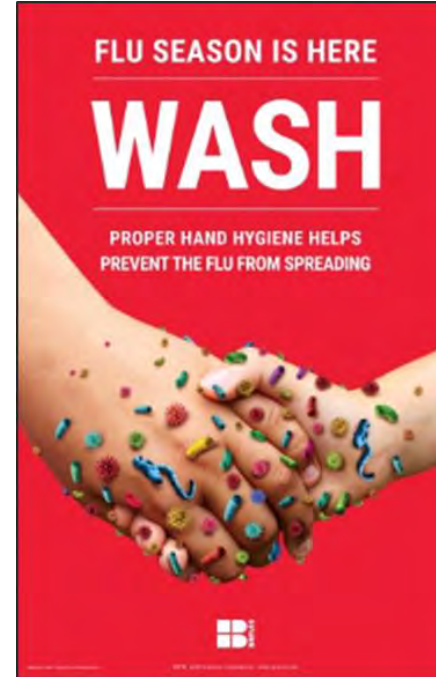
Communicable Disease Management

- Prevent introduction & spread
- Rapid identification of cases
- Containment
- Eradication



Key Communicable Diseases

- Viral Gastroenteritis - Norovirus
- Bacterial and parasitic pathogens
 - Salmonella, E.coli, Cryptosporidium etc.
 - Ciguatera toxin!!!
- Influenza-Like Illness
- Legionella
- Measles

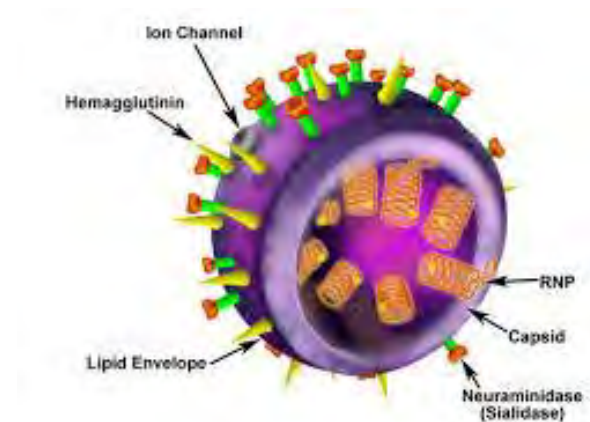


Recent Challenges for Cruise Industry

- H1N1 influenza pandemic
- Ebola in East Africa
- Plague in Madagascar
- Zika virus
- Measles outbreaks – US and worldwide

Tourists back in Texas from cruise ship carrying woman monitored for Ebola

- Carnival Magic passenger: 'Y'all blew it out of proportion'
- Monitored passenger disembarks, drives home with husband
- Texas hospital mounts '#PresbyProud' PR fightback
- Interview: British nurse who survived Ebola



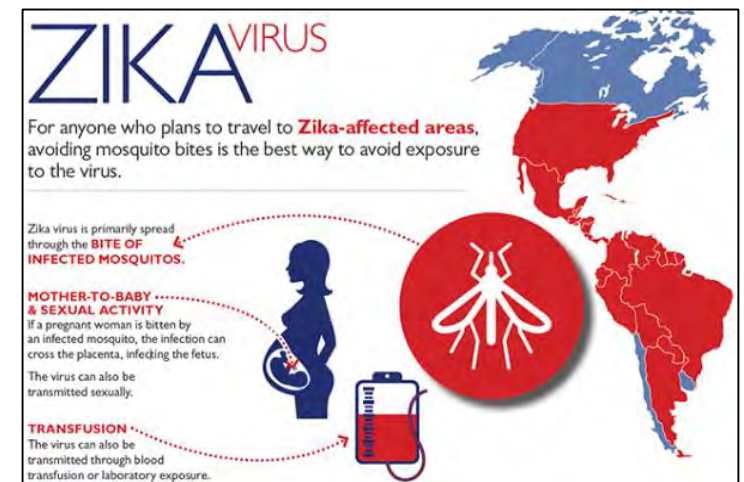
ZIKA VIRUS

For anyone who plans to travel to **Zika-affected areas**, avoiding mosquito bites is the best way to avoid exposure to the virus.

Zika virus is primarily spread through the **BITE OF INFECTED MOSQUITOS**.

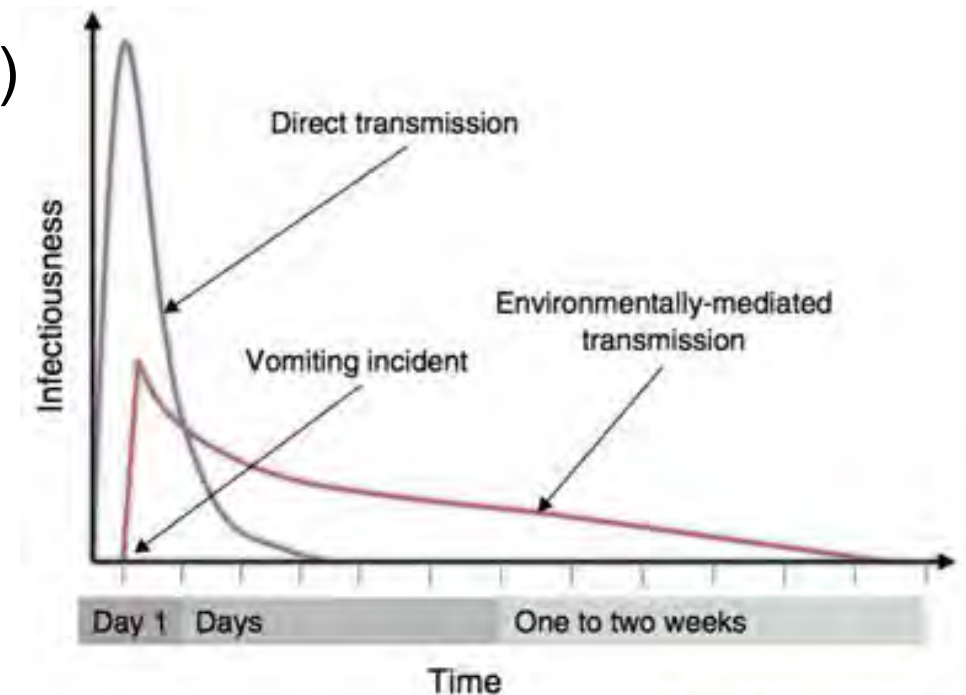
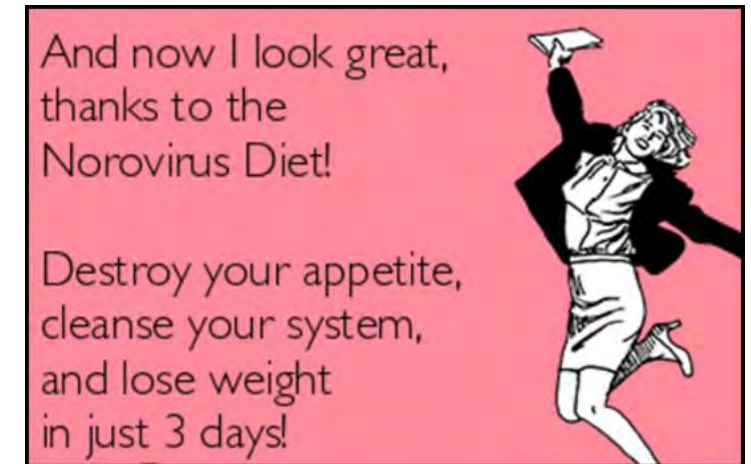
MOTHER-TO-BABY & SEXUAL ACTIVITY
If a pregnant woman is bitten by an infected mosquito, the infection can cross the placenta, infecting the fetus.
The virus can also be transmitted sexually.

TRANSFUSION
The virus can also be transmitted through blood transfusion or laboratory exposure.

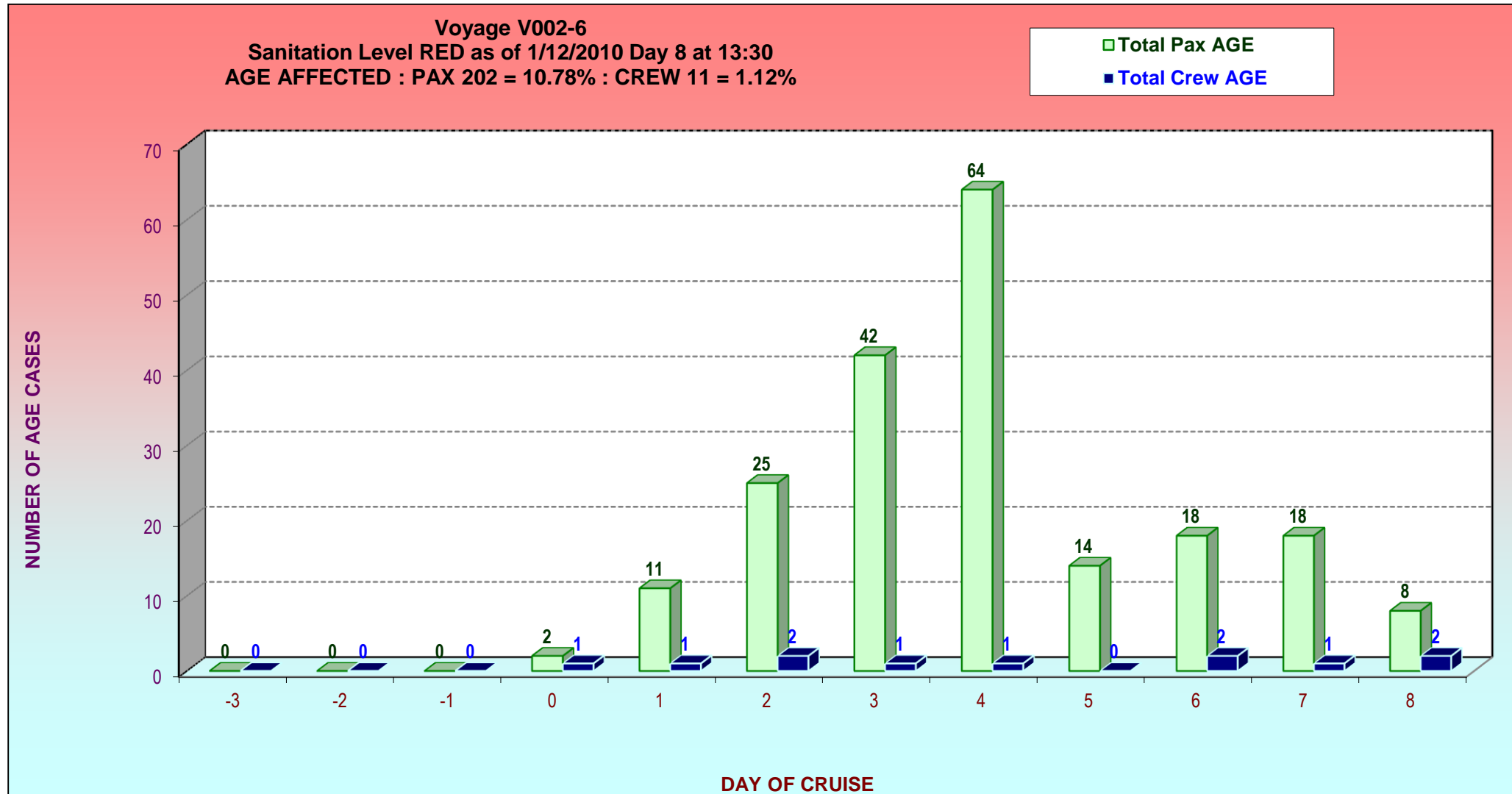


Norovirus – Key Challenge

- Number 1 cause of viral gastroenteritis
- Estimated 699 million cases a year
- Affects 1 in 15 people in US annually
- Infection from small numbers (18 viral particles)
- Symptoms of vomiting & diarrhoea
- Survives on surfaces for long periods
- Easily spread in aerosol and by contact
- Hard to destroy



Example Of Cruise AGE Surveillance



Overall AGE Management Issues

- Design – flows, hand touch surfaces, hand wash
- Medical & public health - resources & checks
- Manage public health in food operations, potable water, pools & spas, housekeeping, kids club etc.
- Standard prevention & response measures
- Training, advice and communications



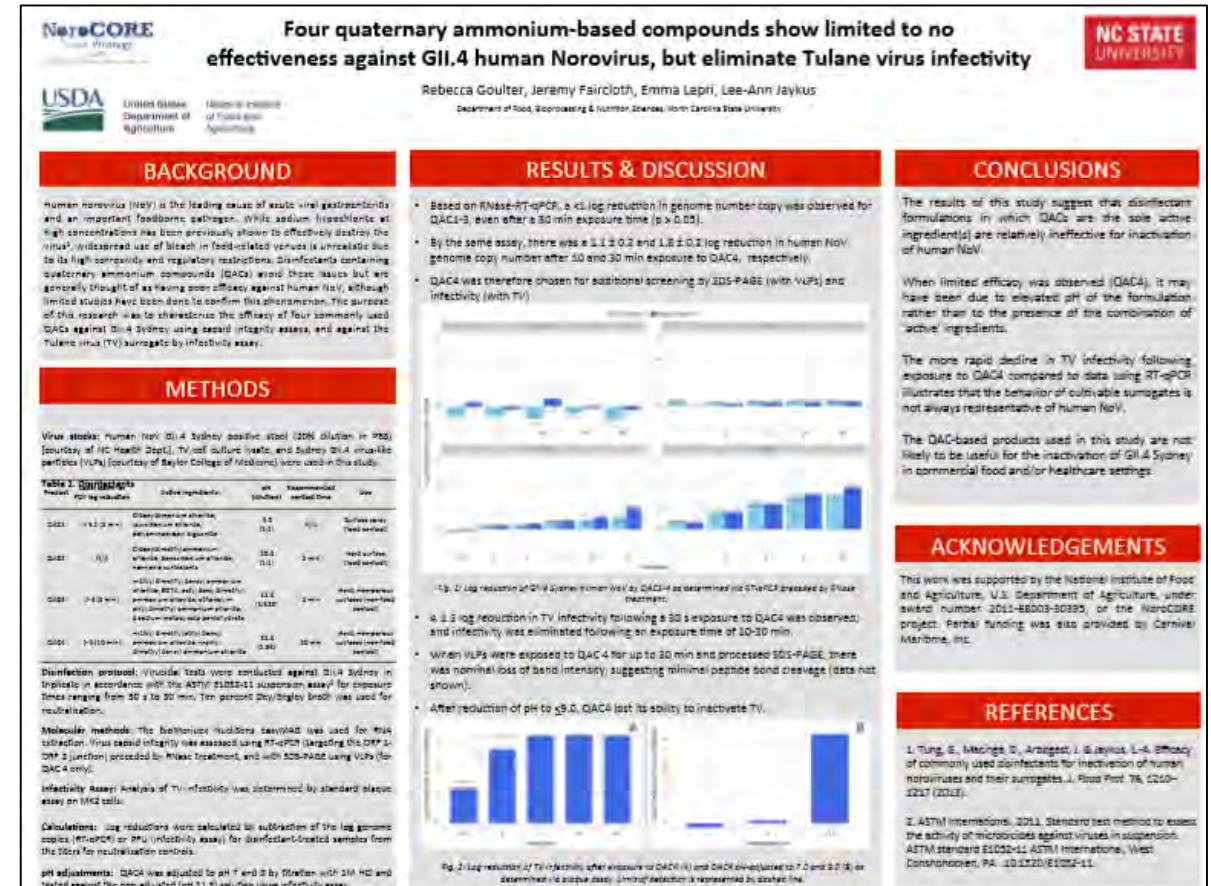
AGE Management Procedures

- Outbreak Prevention & Response Plans
- Consistent
- Easy to use
- Based on best practice standards, science & practicality

BASELINE LEVEL	BACKGROUND NUMBERS OF AGE Standard Operating Procedures
ELEVATED LEVEL	ELEVATED NUMBERS OF AGE <ul style="list-style-type: none">• Sudden increase among either passenger or crew• Typical thresholds: 6 cases in 24 hours or 12 cases in 48 hours• Suspicious vomiting incidents consistent with norovirus.
MAXIMUM LEVEL	OUTBREAK CONDITIONS <ul style="list-style-type: none">• Significant and sudden increase in cases• Typical threshold: > 9 cases in a 24 hours period or more than 15 cases in 48 hours• If cumulative proportion of illness reaches 2%• Outbreak precautions initiated

Research Role - Norovirus

- Disinfectants & Hand Sanitizers
- Worked with NoroCORE and North Carolina State University
- Using human NoV, Tulane virus, VLPs etc.
- Conclusions – no magic bullet!!!



Example of Emergency Work – Princess Cay

- Fire at Shore Facility – Destroyed Reverse Osmosis plant and power to the island
- No potable water to toilets, hand washing and food outlets
- No power for fridges, ventilation etc.
- Joint action to get resource open and ensure safe public health standards



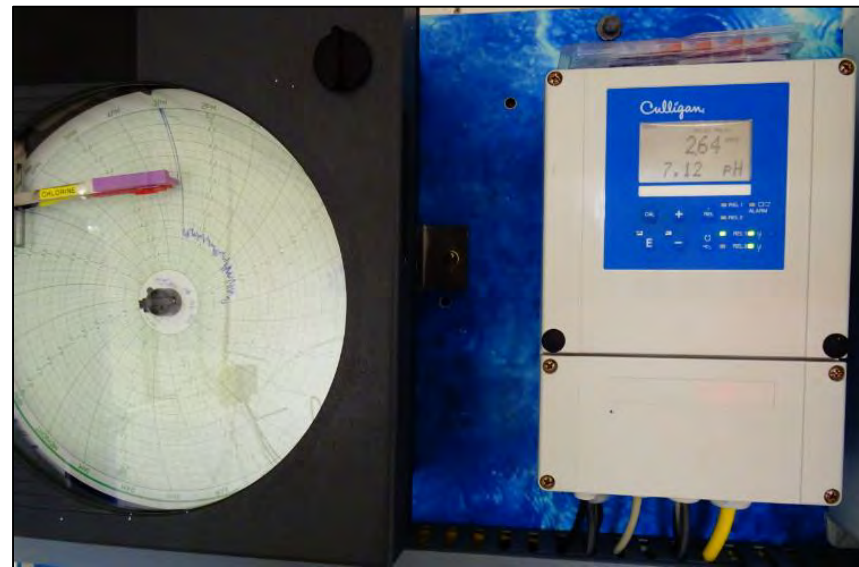
Example of Emergency Work – Grand Turk

- Spike in cases of Norovirus on multiple ships visiting Grand Turk
- Investigation of port facilities
- Reverse osmosis water plant – municipal
- Port improvements – onsite water system, irrigation system and sampling



Port Development Work

- We own 5 ports in Mexico and the Caribbean
- Onsite public health personnel
- Potable water production and distribution
- RWFs – pools, spas wave rider etc.
- Food outlets and bars
- Air conditioning & Legionella controls
- Development of procedures, inspections and training



Thanks for listening & any questions?

