Dear Readers,

The beginning of each new year provides us with the opportunity to think over the priorities and plan the most important activities for the next 12 months.

As Tom Gaulton, Charlotte Hague and other authors mentioned, the early detection and reporting of incidents is an important aid to risk assessment and coordinated risk management. In this issue you can find an article related to surveillance of chemical events on ships or at port and also meet the information about some events detected by event-based surveillance (EBS) which occurred on a ship or a port in 2015.

Mr. Martin Walter continues his series of articles with the information about solid waste (garbage) from vessels. Please, pay Your attention to the MARPOL requirements and overview of the discharge of the revised MARPOL annex V which entered into force on the 1st of January, 2013.

As it was highlighted during the 13th International Symposium on Maritime Health in Bergen, Norway, shipping cannot be regarded as healthy, if seafarers are not. Seafarers cannot be healthy, if shipping is not. The two links together. In this Newsletter we would like to present You the main occupational risks on board ships and some information about seafarers medical examinations and it’s results in some countries. Noting that occupational and with work related diseases are avoidable, their research should be one of the health care priorities.

Also I would like to suggest You to read the scientific articles which abstracts are presented in recent publications section. And don’t miss the opportunity to attend in the forthcoming live webinars on health threats related to maritime transport.

As this is my last Editorial, I would like to wish to all the authors and readers interesting articles, useful information for professional activities and further professional advancement.

The New Year started for the SHIPSAN ACT Joint Action with an important meeting: the Joint Action leadership participated in a two-day meeting held by ECDC on 18th–19th January 2016 with representatives from SHIPSAN ACT Joint Action, ELDSNet members, the ECDC ELDSNet team and the cruise industry. The objectives of the meeting were to discuss the timely ELDSNet notifications regarding cruise ships and the role each participant has to play to facilitate this. The EU SHIPSAN ACT leadership had the opportunity to present what SHIPSAN can offer regarding timely ELDSNet notifications related to cruise ships.

Moreover, a table top exercise will be organised by the SHIPSAN ACT partnership under the scope of work package 7: SHIPSAN ACT Information System, aiming to clarify and describe the communication routes of public health events on ships in the European context.

Finally, the partnership continues to implement national training courses on ship inspections for port health officers with the support of SHIPSAN and WHO. A revised e-learning course on ship inspections based on the revised European Manual for port health officers is currently at the last stages of development and will be delivered by the end of February 2016.
Thematic Sections

Chemical and radiological issues on ships: Surveillance of chemical events on ships or at port
Tom Gaulton, Charlotte Hague, Rob Orford, Eirian Thomas, Raquel Duarte-Davidson

For the past 12 months, the Centre for Radiation, Chemical and Environmental Hazards (CRCE), Public Health England, has been undertaking daily event-based surveillance (EBS) of chemical events (e.g. spillages, releases and exposures) occurring around the world. EBS is carried out by scanning web-based early warning systems, which collect news stories related to a certain keyword or subject (chemical, poisoning, fatality etc.) and social media sites such as twitter (e.g. by searching the keyword ‘chemical’).

The information gained is rapidly and easily accessible and provides a high level of detail, sourcing both official media reports and first-hand accounts from members of the public, making this an effective strategy for detecting chemical incidents very soon after they have occurred.

Of particular interest are unusual events with a high number of casualties, especially those which have the potential to affect more than one country (serious cross-border threats to health), such as a fire and explosions at the port of Tianjin, China in August 2015. This was reported widely in the media and on social network sites. Below are some examples of international incidents identified by PHE through EBS that occurred on ships or at ports in 2015 (Table 1).

The focus of EBS is early and timely detection of chemical events and alerting of the relevant stakeholders (the European Commission, WHO, local and international poison centres) on the potential public health impact of the event. An active EBS surveillance strategy has enabled the EU Commission and European Union Member States (MSs) to have a greater situational awareness of emerging chemical threats. The early detection and reporting of incidents is an important aid to risk assessment and coordinated risk management.

While chemical exposures/releases on ships are thought to be under-reported, the ones that are detected through EBS are logged in a database to establish the frequency and severity of incidents and the types of chemicals involved in exposures/releases, including those on ships or at ports. While the actual number of maritime incidents may be much higher, events occurring out at sea would have a lower public health impact than most events on land and would not be logged.

### Key points:
- EBS undertaken by PHE to detect chemical incidents of public health concern.
- Benefits of EBS: rapid, remote, low-cost.
- Aims to notify stakeholders and support the EU decision 1082/2013 and IHR 2005.
- Also able to detect maritime chemical incidents.

In addition, the search terms used for EBS include general keywords such as chemical, poison and toxic and are not specifically searching for maritime incidents. The recorded incidents in Table 1 show that the method is valid and there may be potential to carry out EBS dedicated to maritime incidents in future.

<table>
<thead>
<tr>
<th>Date</th>
<th>Country of Incident</th>
<th>Chemical Hazard</th>
<th>Description</th>
<th>Casualties</th>
</tr>
</thead>
<tbody>
<tr>
<td>27/05/2015</td>
<td>Germany</td>
<td>Unknown fertiliser (Industrial/Agricultural)</td>
<td>A damaged cargo ship carrying fertiliser is stranded off the coast of Heligoland, emitting foul-smelling smoke. Authorities say the cargo ship is at risk of exploding. Later the fires were extinguished and the ship declared safe.</td>
<td>36 people hospitalised, including 22 crew members</td>
</tr>
<tr>
<td>14/07/2015</td>
<td>Malaysia</td>
<td>Unknown gas (believed to be phosgene)</td>
<td>Five Vietnamese crew have reported to have been exposed to toxic gas on board the bulk carrier Hiram in Pengerang waters, off Malaysia. Three crew died and another two were injured while working in an enclosed space on the ship.</td>
<td>3 crew members dead, 2 hospitalised</td>
</tr>
<tr>
<td>13/08/2015</td>
<td>China</td>
<td>Explosion and toxicity (mixed chemicals including; calcium carbide and sodium cyanide)</td>
<td>At least 170 people are known to have died, and more than 700 injured, following two major explosions in China’s northern port city of Tianjin. The blasts happened in a warehouse for hazardous chemicals, including several hundred tonnes of sodium cyanide, and caused a huge fireball that could be seen from space.</td>
<td>Over 170 dead, over 700 injured</td>
</tr>
<tr>
<td>15/01/16</td>
<td>Brazil</td>
<td>Explosion, toxic gas (mixed chemicals including Chloric acid and sodium dichloroisocyanurate)</td>
<td>A chemical explosion at a cargo warehouse in Brazil has spread toxic gas over Santos, the country’s biggest port. Containers full of acid and a disinfectant came into contact with rainwater, causing a reaction. The area’s mayor said at least 66 people were taken to hospital with breathing difficulties.</td>
<td>Over 60 injured</td>
</tr>
</tbody>
</table>

Table 1. Some events detected by EBS which occurred on a ship or at port.
This method does have its shortfalls, for instance the information detected by EBS is unverified, however the speed and details of the events which can be obtained (in combination with the low cost of doing this remote, digital-based surveillance), make this approach highly effective and economical. In addition, keeping records of events like these allows emergency planners and responders to look back and learn lessons from how these incidents were handled. This in turn will inform procedures of how to improve the response to future maritime chemical events.

EBS is part of the routine activities of the ECHEMNET project [20121101]¹, which is co-funded by the Health Programme of the EU. The surveillance and reporting of chemical events contributes to the mechanisms of chemical health threat preparedness, communication and response capabilities that exist in EU member states. Sharing information in this way ensures that arrangements are in place which supports the implementation of the International Health Regulations (IHR)² and of the EU decision 1082/2013/EU³ within EU Member States (MSs).

References:


Figure 1. Explosion and release of toxic gas in Port Santos, Brazil (see table 1).
Source: http://www.bbc.co.uk/news/world-latin-america-35320083

Seafaring is an occupation, which differs from other occupations in many aspects. As seafarers are spending long working months on board ships, the environmental factors are influencing them in different activities either at workplaces and at leisure time and incidence rates of mortality and morbidity are higher.

The movement of the ship causes psychological complaints and musculoskeletal strain, occupational accidents are, especially on smaller vessels, frequent and often serious. On ships carrying oil products and chemicals, exposure to carcinogenic substances may take an important place. As some researcher specify, many seafarer’s are, as part of the job, international travellers, and are known to have a risk of hepatitis A and B, HIV infection and tuberculosis.

Further, we will describe the main maritime occupational and work related risks.

According to the different information sources, the most serious physical risks

Occupational Health on Board Ships
Rimantas Jonas Pilipavicius¹, Brigita Kairiene¹, Raimonda Eicinaite-Lingiene², Audrone Lavruvianec¹

¹ Klaipeda Public Health Centre, Lithuania, ² Institute of Hygiene, Lithuania
of seafarer’s work conditions are noise and vibration, especially those, working in machinery spaces. The main harm arising from noise exposure are hearing damage and tinnitus, stress, cardiovascular stress, sleep disturbances, interference with communication and increased accident risk. The risks from high energy vibration, for instance from oscillating hand tools, are well recognised, and hand arm vibration syndrome can be expected in those seafarers who use power tools and pneumatic tools, as drills, hammers, sanders.

Special attention should be paid to exposure of extreme ambient environmental factors while working on deck: cold, heat, high humidity, squall winds, torrent rains, etc. These risks can be moderated by a range of factors such as clothing and the presence or absence of water; whether liquid, as in cold immersion, or as water vapour, when working in hot humid conditions. In different studies authors noticed, that after improving air conditioning systems on ships and after installing other innovations, overheating, heat collapse or hyperthermia nowadays is relatively rare on board of ships. Local cold injury may occur during deck work in cold weather.

There are two main groups’ causes of death on the ships: work-related cancer and accidents, homicides due to psychosocial risks. Scientific studies shows that seamen have an increased risk of cancer, and occurrence of cancer is close related to the work conditions: exposure with asbestos and asbestos containing materials, organochlorine compounds, benzene due to high concentration with petroleum products on tankers. Several epidemiological studies have shown increased incidence rates of cancer (i.e. lung cancer, urinary bladder and melanoma, lymphoma, leukaemia) in seafarers compared to the general population.

There are well known hazards from chemical agents. Detergents and disinfectants are widely used and these can cause a range of skin problems.

Exposure to chemical substances routinely used aboard ship for operation and maintenance purposes: cleaning solvents, detergents, fuel, welding fumes, paints, pesticides, fumigants, etc.

Some cargoes may produce toxic gases or vapours, such as carbon dioxide. Toxic fumigants may be applied to grain and other cargoes subjects, infestation and their use can result a potentially dangerous residual concentrations.

Lifestyle factors as separate risk group – smoking, unhealthy eating habits and limited physical exercise during work at sea, exposure of natural sunlight etc. – plays an important role.

Special prevention measures should be applied for mechanical hazards, which can cause accidents. The main risks on vessels are: fall from ship into water, fall from ship structures, especially gangways and ladders onto deck and into holds, struck by falling objects especially during cargo handling and in stormy weather, overexertion while handling cargo, operating manually-driven ship mechanisms or performing strenuous on-deck works e.g., shovelling ice and burns caused by steam, engine exhaust, etc. One of the commonest causes of fatality when entering enclosed spaces on board ships is an oxygen deficient atmosphere. It may be caused by oxidation processes affecting cargoes, especially organic ones.

Seafarer’s response to infectious diseases depends on individual immunity, ports visited, duties, living conditions, the availability of preventative measures, behaviour and etc. Challenges include ensuring that seafarers are immunised and use appropriate prophylaxis.

Ergonomic risks mostly related with monotonous and highly repetitive work in cargo ships. The main activities where ergonomic exposure is high are related with cleaning and maintenance work such as removal of rust and painting, different tasks involving working with tools, lifting, manual handling. Handling of heavy loads and continuous strenuous movements during routine deck maintenance works often causes a cumulative trauma disorders, seafarer’s complaints for pain with locations dominated by the low back, the shoulders and neck and the knees. The proportion of musculoskeletal disorders is 19–51% between various types of trade ships, in different age groups.

Various factors of physical and psychological discomfort caused by crowded and unstable living environment aboard ship, including lack of privacy, confined quarters, inadequate (by the shore standards) amenities. Psychological stress and personal problems caused by specific aspects of seaman’s work, such as: continuous exposure to seafaring dangers; prolonged separation from family and from a stable social and cultural environment; sleep and rest abnormalities due to standing watches, problems of interpersonal relations (sometimes resulting in violence) with other crew-members, etc. Also, nowadays very actual psychosocial risk for seafarers are piracy and refugees.

Seafarers Health examination results

Many scientific surveys approved the assumption that accidents and lifestyle-related diseases like cardiovascular disease and cancers of different locali-
Thematic Sections continued

The medical fitness examination is the most effective measure, which should be used for the prevention of occupational and work related diseases.

Reasons are common among seafarers. Occupational and work related diseases number is not relatively high, compared to the emerging diseases in the population, but their research should be a priority because occupational and work related diseases are avoidable. For the effective occupational and work-related diseases prevention it is important not only to identify them, but also to establish safe working conditions as working hazards can affect (are main reason in) their appearance. The medical fitness examination is the most effective measure, which should be used for the prevention of occupational and work related diseases. As cardiac risk factors occur more frequently among seafarers than in the general population, seafarers’ medical surveillance examinations should be used more intensively as an opportunity for education of crews in cardiovascular disease (CVD) risks and the possibilities to reduce them.

According to the Annual Report Ship Safety 2013 (Der Seearztliche Dienst, Germany) information, 3.2% of all mariners employed on German-flagged ships were declared unfit for sea service during medical fitness examination, and the main reason for rejection were cardiovascular diseases (CVD), metabolic diseases, insufficient acuity of vision, chronic alcohol abuse and other addictive diseases.

A low proportion (<1%) of seafarers were found to be unfit among the Dutch SMQs. The retrospective descriptive study on analyses of Health examination results in Netherlands showed relatively low proportion of seafarers found unfit for sea service (46 cases; 0.6%) of the 7617 were considered unfit for seafarer’s medical qualification, with 53% of these being temporarily unfit. Four per cent (276) of cases were classified ‘fit with restrictions’ and 1% (66) ‘fit by exemption’ (FEx). FEx was higher in older groups, mainly due to hearing or visual impairments.

The survey done by scientists from Ukraine transport medicine about Health status of seafarer’s according the results of Health exams pointed that 2.3% of the employees are “unfit for sea service” and among the main reasons were – CVD (68.85%), diseases of gastro-digestive system (17%), urologic diseases (6.27%). Different studies showed that complaints due to oral disorders are common among seafarers, and are reported by one-third of them, and one-third of seafarers with oral trouble had needed pain-killing tablets or antibiotics. A meta-analysis of prospective and retrospective follow-up studies has shown that periodontal disease may increase the risk of CVD by approximately 20%.

In Lithuania the main Health Centre where medical fitness examinations for seafarers are performed is Klaipeda Seamen’s Hospital. The conclusion “unfit for sea service” are done not often in Klaipeda Seamen’s Hospital and this figure are less than 1% (0.1–0.6 %) in 2009–2014.

The results of mandatory Health examination performed in Lithuania Klaipeda Seamen’s Hospital 2009–2014 shows that new cases of diseases are identified from 5% to 7.5% of seafarers every year (picture No. 1). According the
Thematic Sections continued

Health examination results 2009–2014, CVD are among the main reasons when employees where not allowed to continue their activities on the ship.

Analysing the structure of identified new cases of diseases in Lithuania, during the examination of seafarers health the highest numbers are: dental diseases, CVD and urological diseases, next groups with lower numbers of cases are endocrinological diseases and oncological diseases.

Conclusions and recommendations:

The shipping industry has always been one in which workers’ relative risks of ill health, injury and death have been considerable. Scientists from different countries conclude that seafarers have not only higher numbers of accidents but also higher incidence of lifestyle-related diseases like cardiovascular disease (CVD) and cancer in this occupation. Health examination results from different countries found out that the leading causes of unfitness to continue duties on ship were mainly associated with cardio-vascular diseases (CVD), morbid obesity, visual and hearing impairment, especially among older seafarers (aged over 55).

In order to avoid occupational and with work related diseases, it is very important to develop educational preventative health programs for seafarers containing information about health promotion and prevention of occupational and with work related diseases on board ships. Also, one of the suggestion is that ships owners or responsible crew member should regularly perform occupation health risk assessment on board ships.

References:

7. Zevallos J., Hulshof C.T., Mutsaerts T., Sluiter J. K. Outcomes of seafarer work health programs for seafarers containing information about health promotion and prevention of occupational and with work related diseases on board ships. Environmental health promotion and prevention of occupational and with work related diseases on board ships. Also, one of the suggestion is that ships owners or responsible crew member should regularly perform occupation health risk assessment on board ships.

Environmental health and hygiene on ships

Garbage from vessels (or 5.25 trillion pieces and counting)

Martin Walker, Port Health Officer, Suffolk Coastal Port Health Authority, Felixstowe, England

In my last article, I covered the issue of liquid waste (sewage) from ships. In this article I will retain the waste theme but instead look at solid waste (Garbage) and what the legal requirements (including MARPOL) cover. MARPOL is a term that you will be familiar with from previous articles and is the international convention from 1973 covering prevention of pollution from ships. In addition to sewage and garbage, other annexes cover oil pollution, noxious liquids carried in bulk by ships, harmful substances carried by sea in packaged form and the prevention of air pollution. Overlapping in some areas, the WHO Technical Handbook also covers solid and medical waste requirements for vessels in Area 7.

Key message:

Explaining and updating the legal position concerning garbage disposal from ships.

What are the risks?

Whilst the prime focus of MARPOL is in relation to pollution prevention to marine life, human health, both on and off the vessel can also be at risk from improper dumping of waste at sea. Additionally, the spread of alien invasive species has occurred via marine debris. As inspectors, whilst we may be familiar say, with the concept of chemical risks, physical risks, vector/disease attraction but there are also hidden risks. Plastic waste may pose an obvious physical risk but concern is growing about the accumulation of micro plastics. Microplastics form from the breakdown of plastics into ever smaller pieces. These pieces concentrate toxic chemicals which are then consumed by marine life and concentrated up the food chain, including, potentially, into humans.

The WHO Technical Handbook covers some of the MARPOL requirements but focuses upon operational processes on board ship that may pose potential public health risks both on-board but also potentially off-board. These include suitable storage facilities for waste, processing equipment (e.g. compactors, comminutors, incinerators) and wastes
Thematic Sections continued

with special hazards (e.g. medical and chemical wastes).

**The MARPOL requirements**

Marpol Annex V, Regulation 1 sets out what is defined as garbage. There is a wide set of definitions which include food waste, animal carcasses, cargo residues, cooking oil, domestic and operational wastes, all plastics and fishing gear. My view of the MARPOL Annex V requirements is that they take a whole process view of garbage control on board vessels. This is emphasised in the need for all ships greater than a gross tonnage of 100 or certified to carry 15 persons or more to have garbage management plans. The purpose of this document is to set out management procedures to firstly minimise waste, before covering the collection, storage, processing and disposal of waste. Accompanying this are I.M.O. Guidelines for producing garbage management plans. To support this, a number of model garbage management plans are available, for example, from Lloyd’s Register.

Allied to these requirements is the need for garbage record book for ships greater than 400 gross tonnage or certified to carry 15 persons or more. Checks of these two documents should be carried out by inspectors during routine inspections.

Other requirements in the Annex V cover the obligations of ports and governments to provide adequate port reception facilities for waste, defining specific special areas (e.g. the Mediterranean Sea, the Baltic Sea etc.), the role of Port State Control and the requirements for certain ships to display placards notifying passengers and crew of the disposal requirements.

Since the WHO Technical Handbook was published in 2011, there has been an updated resolution amending MARPOL Annex V. This has had the effect of considerably restricting the types of waste that can be dumped at sea. The only wastes permitted to be discharged to sea are food wastes, cargo residues, cleaning agents and animal carcasses.

My view of the MARPOL Annex V requirements is that they take a whole process view of garbage control on board vessels.
are food wastes, cargo residues, cleaning agents and animal carcasses. Even these are subject to specific conditions as shown in the table below.

**Conclusions**

Whilst the application and enforcement of the MARPOL Annex V requirements are a Port State Control function, poor garbage management is likely to overlap into public health issues. From my experience with the vessels that I have inspected, awareness of the new requirements from 1st January 2013 does seem to be good. Some vessels or shipping companies have even moved to a complete no dumping policy. As with everything though, there is always likely to be some who are not aware or who may be tempted to ignore or flout the requirements. Where appropriate we can deal with public health matters through the Ship Sanitation Certificates but also liaise closely with our colleagues from Port State Control where there may be matters of concern to them.

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**Simplified overview of the discharge provisions of the revised MARPOL Annex V (resolution MEPC.201(62)) which entered into force on 1 January 2013**

(For the full text of the respective discharge requirements please refer to the text of the revised MARPOL Annex V, and for more detailed guidance please consult the 2012 Guidelines for the Implementation of MARPOL Annex V (resolution MEPC.219(63)).)

<table>
<thead>
<tr>
<th>Type of garbage</th>
<th>Ships outside special areas</th>
<th>Ships within special areas</th>
<th>Offshore platforms and all ships within 500 m of such platforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food waste comminuted or ground</td>
<td>Discharge permitted ≥12 nm from the nearest land and en route</td>
<td>Discharge permitted ≥12 nm from the nearest land and en route</td>
<td>Discharge permitted ≥12 nm from the nearest land</td>
</tr>
<tr>
<td>Food waste not comminuted or ground</td>
<td>Discharge permitted ≥12 nm from the nearest land and en route</td>
<td>Discharge prohibited</td>
<td>Discharge prohibited</td>
</tr>
<tr>
<td>Cargo residues not contained in wash water</td>
<td>Discharge permitted</td>
<td>Discharge prohibited</td>
<td>Discharge prohibited</td>
</tr>
<tr>
<td>Cargo residues contained in wash water</td>
<td>Discharge permitted ≥12 nm from the nearest land and en route</td>
<td>Discharge only permitted in specific circumstances ≥12 nm from the nearest land and en route</td>
<td>Discharge prohibited</td>
</tr>
<tr>
<td>Cleaning agents and additives contained in cargo hold wash water</td>
<td>Discharge permitted</td>
<td>Discharge only permitted in specific circumstances ≥12 nm from the nearest land and en route</td>
<td>Discharge prohibited</td>
</tr>
<tr>
<td>Cleaning agents and additives contained in deck and external surfaces wash water</td>
<td>Discharge permitted</td>
<td>Discharge only permitted in specific circumstances ≥12 nm from the nearest land and en route</td>
<td>Discharge prohibited</td>
</tr>
<tr>
<td>Carcasses of animals carried on board as cargo and which died during the voyage</td>
<td>Discharge permitted as far as from the nearest land as possible and en route</td>
<td>Discharge prohibited</td>
<td>Discharge prohibited</td>
</tr>
<tr>
<td>All other garbage including plastics, domestic wastes, cooking oil, incinerator ashes, operational wastes and fishing gear</td>
<td>Discharge prohibited</td>
<td>Discharge prohibited</td>
<td>Discharge prohibited</td>
</tr>
<tr>
<td>Mixed garbage</td>
<td>When garbage is mixed with or contaminated by other substances prohibited from discharge or having different discharge requirements, the more stringent requirements shall apply</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 These substances must not be harmful to the marine environment.

2 According to regulation 6.1.2 of MARPOL Annex V, the discharge shall only be allowed if: (a) both the port of departure and the next port of destination are within the special area and the ship will not transit outside the special area between these ports (regulation 6.1.2.2); and (b) if no adequate reception facilities are available at those ports (regulation 6.1.2.3).

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**References:**

1 “International Convention for the Prevention of Pollution from Ships 1973 (modified by the protocol of 1978 relating to [MARPOL 73/78 Annex IV]”, IMO


News and forthcoming dates

Other past events:

Hearing with Cruise industry representatives, SHIPSAN representative, ELDSNet members and ELDSNet team


**Objectives of the hearing**
- To present and discuss the issue with timely ELDSNet notifications regarding cruise ships.
- To present what SHIPSAN can offer regarding this issue.
- To present the cruise industries view regarding this issue.
- To discuss and identify a receiver/receivers of ELDSNet notifications regarding cruise ships.
- To discuss what kind of actions should be reported back to ELDSNet.

**EU SHIPSAN ACT Forthcoming events:**

**Live webinars for 2016**
The partnership will continue delivering live webinars on health threats related to maritime transport. The subject areas of the 2016 webinars will include: the revised European Manual for Hygiene Standards and Communicable Disease Surveillance, the European Legislation on labelling of food products, anti-entrapment prevention at recreational water facilities and water safety: back flow prevention control.

The detailed timetable and enrolment method will be announced.

**National Training Courses in 2016**
In 2016, the following national training courses for port health officers have been scheduled.

<table>
<thead>
<tr>
<th>Country</th>
<th>City</th>
<th>Possible dates</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greece</td>
<td>Piraeus</td>
<td>7–9 March 2016</td>
<td>“Inspections according to the European Manual for hygiene standards and communicable diseases surveillance on passenger ship”</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>Varna</td>
<td>17–18 March 2016</td>
<td>“Inspections according to the European Manual for hygiene standards and communicable diseases surveillance on passenger ship”</td>
</tr>
<tr>
<td>Denmark</td>
<td>Esbjerg</td>
<td>11–13 April 2016</td>
<td>“International Health Regulations – Ship Sanitation Certificates”</td>
</tr>
</tbody>
</table>

What's new on the website? [www.shipsan.eu](http://www.shipsan.eu)

In the updated section “Currently available guidance for Ebola virus disease and shipping” you will find links to the following reports:
- WHO Statement on the 8th meeting of the IHR Emergency Committee regarding the Ebola outbreak in West Africa.
Recent publications

The roles of transportation and transportation hubs in the propagation of influenza and coronaviruses: a systematic review.

Browne A, St-Onge Ahmad S, Beck CR, Nguyen-Van-Tam JS.
J Travel Med. 2016 Jan 18;23(1)

Abstract

BACKGROUND: Respiratory viruses spread in humans across wide geographical areas in short periods of time, resulting in high levels of morbidity and mortality. We undertook a systematic review to assess the evidence that air, ground and sea mass transportation systems or hubs are associated with propagating influenza and coronaviruses.

METHODS: Healthcare databases and sources of grey literature were searched using pre-defined criteria between April and June 2014. Two reviewers screened all identified records against the protocol, undertook risk of bias assessments and extracted data using a piloted form. Results were analysed using a narrative synthesis.

RESULTS: Forty-one studies met the eligibility criteria. Risk of bias was high in the observational studies, moderate to high in the reviews and moderate to low in the modelling studies. In-flight influenza transmission was identified substantively on five flights with up to four confirmed and six suspected secondary cases per affected flight. Five studies highlighted the role of air travel in accelerating influenza spread to new areas. Influenza outbreaks aboard cruise ships affect 2–7% of passengers. Influenza transmission events have been observed aboard ground transport vehicles. High heterogeneity between studies and the inability to exclude other sources of infection means that the risk of influenza transmission from an index case to other passengers cannot be accurately quantified. A paucity of evidence was identified describing severe acute respiratory syndrome coronavirus and Middle East respiratory syndrome coronavirus transmission events associated with transportation systems or hubs.

CONCLUSION: Air transportation appears important in accelerating and amplifying influenza propagation. Transmission occurs aboard aeroplanes, at the destination and possibly at airports. Control measures to prevent influenza transmission on cruise ships are needed to reduce morbidity and mortality. There is no recent evidence of sea transport accelerating influenza or coronavirus spread to new areas. Further investigation is required regarding the roles of ground transportation systems and transport hubs in pandemic situations.

A Comparison of Microbial Water Quality and Diversity for Ballast and Tropical Harbor Waters.

Ng C, Le TH, Goh SG, Liang L, Kim Y, Rose JB, Yew-Hoong KG.
PloS One. 2015 Nov 17;10 (11)

Abstract

Indicator organisms and antibiotic resistance were used as a proxy to measure microbial water quality of ballast tanks of ships, and surface waters in a tropical harbour. The survival of marine bacteria in ballast tanks appeared to diminish over longer water retention time, with a reduction of cell viability observed after a week based on heterotrophic plate counts. Pyrosequencing of 16S rRNA genes showed distinct differences in microbial composition of ballast and harbour waters. The harbour waters had a higher abundance of operational taxonomic units (OTUs) assigned to Cyanobacteria (Synechococcus spp.) and α-proteobacteria (SAR11 members), while marine hydrocarbon degraders such as γ-proteobacteria (Ocencespirillaes spp., Thiotrichales spp.) and Bacteroidetes (Flavobacteriales spp.) dominated the ballast water samples. Screening of indicator organisms found Escherichia coli (E. coli), Enterococcus and Pseudomonas aeruginosa (P. aeruginosa) in two or more of the ballast and harbour water samples tested. Vibrio spp. and Salmonella spp. were detected exclusively in harbour water samples. Using quantitative PCR (qPCR), we screened for 13 antibiotic resistant gene (ARG) targets and found higher abundances of sul1 (4.13–3.44 x 102 copies/mL), dfrA (0.77–1.80 x10 copies/mL) and cfr (2.00–5.21 copies/mL) genes compared to the other ARG targets selected for this survey. These genes encode for resistance to sulfonamides, trimethoprim and chloramphenicol-florfenicol antibiotics, which are also known to persist in sediments of aquaculture farms and coastal environments. Among the ARGs screened, we found significant correlations (P<0.05) between ereA, ermG, cfr and tetO genes to one or more of the indicator organisms detected in this study, which may suggest that these members contribute to the environmental resistome. This study provides a baseline water quality survey, quantitatively assessing indicators of antibiotic resistance, potentially pathogenic organisms and a broad-brush description of difference in microbial composition and diversity between open oceans and tropical coastal environments through the use of next generation sequencing technology.
Freeland AL, Vaughan GH Jr, Banerjee SN
MMWR Morb Mortal Wkly Rep 2016;65:1–5. DOI: http://dx.doi.org/10.15585/mmwr.mm6501a1

Abstract
From 1990 to 2004, the reported rates of diarrheal disease (three or more loose stools or a greater than normal frequency in a 24-hour period) on cruise ships decreased 2.4%, from 29.2 cases per 100,000 travel days to 28.5 cases (1.2). Increased rates of acute gastroenteritis illness (diarrhoea or vomiting that is associated with loose stools, bloody stools, abdominal cramps, headache, muscle aches, or fever) occurred in years that novel strains of norovirus, the most common etiologic agent in cruise ship outbreaks, emerged (3). To determine recent rates of acute gastroenteritis on cruise ships, CDC analysed combined data for the period 2008–2014 that were submitted by cruise ships sailing in U.S. jurisdiction (defined as passenger vessels carrying ≥13 passengers and within 15 days of arriving in the United States) (4). CDC also reviewed laboratory data to ascertain the causes of acute gastroenteritis outbreaks and examined trends over time. During the study period, the rates of acute gastroenteritis per 100,000 travel days decreased among passengers from 27.2 cases in 2008 to 22.3 in 2014. Rates for crew members remained essentially unchanged (21.3 cases in 2008 and 21.6 in 2014). However, the rate of acute gastroenteritis was significantly higher in 2012 than in 2011 or 2013 for both passengers and crew members, likely related to the emergence of a novel strain of norovirus, GII.4 Sydney (5). During 2008–2014, a total of 133 cruise ship acute gastroenteritis outbreaks were reported, 95 (71%) of which had specimens available for testing. Among these, 92 (97%) were caused by norovirus, and among 80 norovirus specimens for which a genotype was identified, 59 (73.8%) were GII.4 strains. Cruise ship travellers experiencing diarrhoea or vomiting should report to the ship medical centre promptly so that symptoms can be assessed, proper treatment provided, and control measures implemented.

Mortality of German travellers on passenger vessels.
Oldenburg M, Herzog J, Püschel K, Harth V.
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Abstract
BACKGROUND: In the past two decades, more and more Germans decided to spend their holidays on a passenger vessel. This study examined the frequencies and causes of deaths of German travellers aboard passenger vessels of all flags.

METHODS: The shipboard deaths of all German travellers within the time period from 1998 to 2008 were counted using the German civil central register in Berlin. The available documentation in this register provides information on frequencies, circumstances and causes of deaths on ships. In the above-mentioned period of time, the total cohort of German travellers on cruise ships is estimated to be 5.97 million persons.

RESULTS: During the 11-year examination period, 135 shipboard deaths of German passengers [102 males (75.6%) and 33 females (24.4%)] were recorded. Out of these travellers, 110 died on cruise ships. When considering only the passengers on cruise ships (without those on ferries) an average crude mortality rate of 1.8 per 100,000 German passengers was calculated. The crude mortality rate of shipboard death for males and females was 2.5 and 0.8 per 100,000 German passengers with a mean age of 71.2 years [standard deviation (SD) 16.0 years] and 73.3 years (SD 16.0 years), respectively. Significantly, more deceased travellers older than 70 years were observed on traditional cruise ships and resort vessels than on passenger ferries (P = 0.001). The causes of death were documented in 85 cases (63.0%). Out of these documented deaths, 82 (96.5%) cases were regarded to be natural causes (particularly circulatory diseases) and 3 (3.5%) as unnatural causes (twice drowning and once an accidental fall).

CONCLUSIONS: In spite of the large proportion of unknown causes of death, this study argues for a high significance of internal causes of deaths among German passengers. Thus, ship’s doctors—particularly those on traditional cruise ships—should be well experienced in internal and geriatric medicines.
Port in focus

Port of Savona, Italy

By Paolo Rosati, Savona Port Health Authority, Italy

On the origins of the name of Savona there are two hypotheses, one that comes from Saone (son of Jupiter and Taigete) the other of the Carthaginian Sago or Sagone, that would rebuild the city after the looting of the Romans.

With the fall of the Roman Empire, Savona becomes a base of the Byzantine fleet and the city knows its first splendours: intensify traffic and businesses and is the gateway.

Savona starts around 1,000 to become a thriving port and an important centre for trade with Northern Europe, in rivalry with Genoa in 1528 that marked the end: the port is buried, the city sacked several times and destroyed centuries of history and civilisation.

With the Napoleonic occupation before and then with that of Piedmont, Savona economic recovery begins, the city was rebuilt on the model city of Turin and the city became the main maritime outlet.

Savona today is an Italian town of 61,519 inhabitants, capital of the province in Liguria. It is the third largest municipality in the region by population, preceded only by Genoa and La Spezia.

The port of Savona is important in the economy of the capital. It is in fact important for the traffic of goods and passengers, the second port in Liguria after Genoa and the fourth national airport cruise passenger numbers. The airport has a modern maritime station, the Palacrociere, realised via a joint financing project from the government and the company Costa Cruise. The hotel welcomes each year about a million tourists with a further passengers who board the ferry terminal of Porto Vado Ligure.

As for freight traffic pole, the port provides important industries landlocked hinterland of Piedmont and Lombardy.

The port of Savona offers answers for every competitive shipping industry. You can count on a fast connection to the Piedmont and other regions of Northern Italy via a motorway which is easily accessible from the basin of Vado Ligure Savona. Moreover, the new docks are able to receive larger and newer ships, efficient and environmentally friendly transport solution of coal discharged via conveyor belt and underwater cable.
There is a large storage area in the hinterland not clogging the internal terminal located in the area of the port and that in any case ‘can offer different logistics solution for different goods traffic’.

**Trend of passenger and Cargo**

The port of Savona has been able to host in 2014 more than 2,400 ships along the quays of handling more than 12 million tons of cargo and approximately 1,390,000 passenger figures that place it as a leader in the Mediterranean cruise, the trade of fruit and the ro-ro sector. The proximity to the markets of northern Italy and southern Europe offers interesting practical proposals that can meet the needs of maritime transport. The deep sea beds allow you to build docks up to 22 metres. The port of Vado can serve the European market from the South with economic and environmental benefit. The availability of road and rail infrastructure is not congested, and the presence of large indoor areas dedicated to logistics services complement a setting of great potential.

**Cruise and ferries**

Thanks to projects defined and developed in partnership with private operators from the 90 port of Savona has become hub of Costa cruises and has quickly consolidated (over 15 million passengers between 1997 and 2014), placing itself at the top of the standings Mediterranean (4th in 2014 in the Med). Savona, located near the airports of Genoa (32km), Nice-Côte d’Azur (159 km) and Milan (217km), is a hub for Costa.

Costa now operates two terminals. The western end has been realised in collaboration with the Port Authority in 2003. Terminal 3 can accommodate ships simultaneously, and when necessary, a public wharf of the port can be used temporarily, thus being able to serve in exceptional cases up to 4 ships. From here, visitors can easily walk to the old town of Savona or bus to Genoa, Portofino and Monaco.

In the port of Vado Ligure, the ferry terminal has been operational since 1998 with links to Corsica. The four dedicated berths, large garden and car park access road leading independent quickly to the motorway, along the modern maritime station, allowing the terminal to deal easily with the summer peak of activity, when they increase daily departures, with more than 5,000 tourists a day. The terminal covers an area of 50,000m² (including the terminal building, parking yard 45,000m² and a warehouse of 1,500m²) and is equipped with three quays Ro-Ro. The terminal is the port of departure of the company “Corsica Ferries”, which operates an annual Corsica (with a maximum of three departures daily during the summer), but can accommodate passengers in third-party services and Ro-Ro.

**The development**

The Port Authority is in recent years building a new container terminal Vado Ligure 850,000 TEUs, which will be ready to start by 2017. However, in the basin of Savona, work is underway for the expansion of storage facilities for bulk, general cargo and ro-ro traffic, while a new plant for the trade of hot bitumen is planned in the recently expanded.

**Bibliography:**