

Internat. Marit. Health, 2005, 56, 1 - 4

THE HAMBURG PORT HEALTH CENTER: HISTORY, ORGANISATION, ACTIVITIES

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ABSTRACT

Controlling hygiene conditions and the state of health on incoming vessels and in ports are the tasks of port health authorities. In Hamburg, the respective department (also responsible for the local airport) is combined with the research department Maritime Medicine. Both departments represent the Hamburg Port Health Center and are part of the Central Institute and Professorship of Occupational Medicine ("ZfA"). This arrangement has proven to be very effective since it connects routine control activities with research on the work related health risks of seafarers and dockers, and their minimalization. Examples are the improvement of various work conditions on board and of life saving equipment including telemedicine devices, investigations of action of toxic substances and allergic disorders caused by the transport of hazardous cargo. The recent activities of the Center are presented in detail in this paper.

The Central Institute of Occupational Medicine ("ZfA"), Department Science and Health of the Free and Hanseatic Town of Hamburg, is affiliated with the Medical Faculty of Hamburg University and is a WHO Collaborating Centre on Occupational

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Health. An essential task of the institute is conducting of scientific and practice-oriented investigations on the relations between the health of seafarers and dockers and their work and on prevention of accidents and diseases among them.

The Institute pursues its tasks in the field of research, education, consultation and care of patients as well as in training of students, physicians and scientists in the departments Clinical Occupational Medicine, Occupational Toxicology and Molecular Biology, Allergology, and Mental Stress and Strain.

The Hamburg Port Health Center with its Port and Airport Health Authority and Maritime Medicine department is also part of the Institute (ZfA). The activities are presented.

HISTORY OF THE HAMBURG PORT HEALTH CENTER

The origin of the Hamburg Port Health Center goes back to the first port physician of Hamburg, Prof. Dr. Bernhard Nocht, who was appointed after the last disastrous cholera epidemic in 1892. Prof. Nocht also became head of the tropical institute and of the seamen's hospital located near the harbour of Hamburg. Major tasks of these associated institutions were the medical care of seafarers and dock workers and the sanitary inspection of all incoming vessels in order to prevent the importation of infectious diseases which had occurred in the past. Further activities in recent decades included medical training of ship's officers, implementing various research projects, e.g. the project "ship of the future", improvement of life-saving equipment on board and supervision of the handling of hazardous goods. After Bernhard Nocht's retirement, the different institutions were separated. The seamen's hospital was closed in 1974.

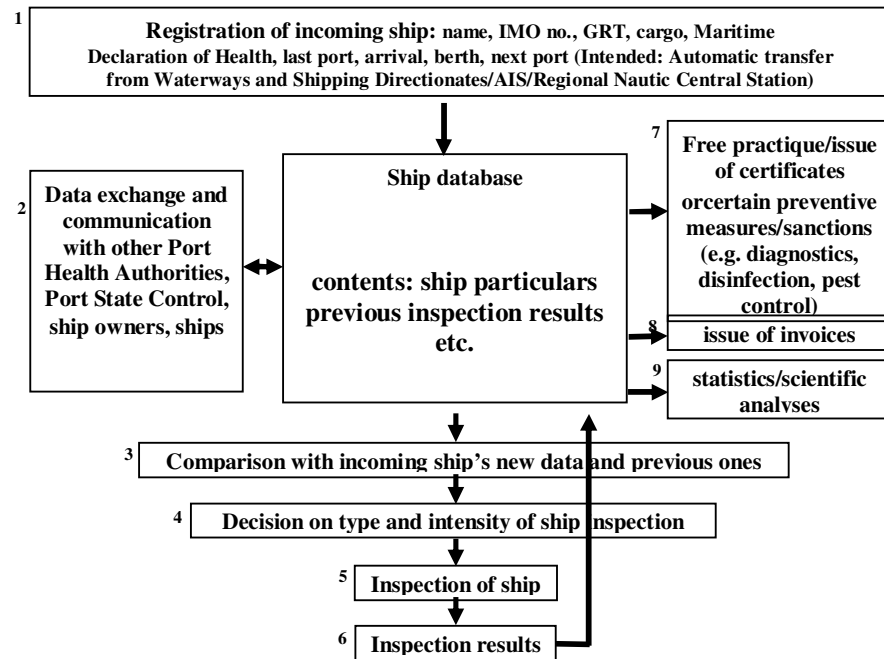
In 1961 the Port Health Authority expanded the activities and medically supervised air traffic at Hamburg Airport. It developed into a modern supervising service and medical care facility which has performed additional tasks as shown in Table 1.

Since the end of 2003, a local area networked ship database has been used to further improve and economize its work (Figure 1). It is intended to be included in a wider area internet portal of port health authorities.

Table 1. Tasks of the Port and Airport Health Authority

Activities	Legal basis
Inspection and control of ships' food storage, waste disposal, hygiene and health state of people entering the port	Jurisdiction (on ships on German territorial waters) International Health Regulations dated 1975, latest change 2005
Certifications and control of certificates, e.g. issue of deratting (exemption) certificate, ship sanitation control (exemption) certificate	International Health Regulations, article 54
Control of health declarations on board	International Health Regulations, article 84 (health declaration of airplanes acc. to article 85)
Drinking water examination/ drinking water certificates	Drinking water decree dated 21/5/2001, Federal Law Gazette and leaflet of the coastal countries' working group regarding maritime hygiene
Control of medical equipment/pharmacy - on worldwide cruising ships - on EU ships - on ships sailing under the German flag	Guide for Ships dated 1992 Guideline 92/29 of EEC Council dated 1992 Decree Health care on merchant ships, latest version 1992
Control of additional medical equipment in case of hazardous cargo	Medical first aid guide, issued 2001. For ships sailing under the German flag, the modified list of the coastal countries' working group concerning maritime hygiene is valid (special change: hydromorphone instead of morphine)

Figure 1: Scheme of the computer-based local area ship database as an information and communication system



Medical and health services of the Hamburg Port and Airport Health Authority

Medical consultation/advice/treatment

Physicians and inspectors of the Port and Airport Health Authority (1) give advice and information about health protection on board including travel medicine, infectious diseases and tropical medicine (e.g. malaria prophylaxis) as well as on medical equipment on board and treatment at sea.

Medical services include examination of seafarers' and treatment for venereal diseases. This is free of charge, it is provided by our Seafarers' and occupational outpatients department.

Medical care on board

Medical workers come on board ships to vaccinate and, if necessary, to examine and to treat crew members.

Measures to ensure health on board and in the port/issuing of certificates

- Inspection and certification of the medical equipment on board and of the ship's medical chest including medical first aid equipment for the transportation of hazardous goods (Ref: Medical First Aid Guide – MFAG – published by IMO, WHO and ILO).
- Inspection of ships to evaluate the hygiene of catering. If necessary, information of the crew and the commencement of pest control measures.
- Inspection of ships for issuing deratting (exemption) certificates.
- Inspection and certification of drinking water (bacteriological and chemical) and of drinking water installations on ships, airplanes and in ports. Giving advice on sanitation and on prophylactic measures.
- Inspection of garbage and waste water disposal in the port.
- Medical supervision of the transport of fumigated cargoes on ships.

Other tasks

- Advisory service and support by physicians and port health inspectors regarding epidemic control measures, verification of health certificates by port health officers.
- Training of ship doctors.
- Medical fitness examination for ship captains in ports and for inland waterway ship skippers. Issuing fitness certificates by the public health officer.

Research and tasks of the department Maritime Medicine

In close cooperation with the Port and Airport Health Authority, the department Maritime Medicine conducts research projects on the protection of health of maritime workers.

The following subjects represent the core of the current research activities of the department Maritime Medicine:

- Exposure to dust during handling of goods (4 – 10),
- Health risks of imported fumigated containers and goods (3),
- Optimizing emergency management of accidents on board including telemedicine (2).

Medical training and refresher courses for seafarers are regularly conducted at this department.

The maritime medical section has a library of approximately 30 000 maritime medical articles and the collection is continuously updated. It is available to interested experts and scientists.

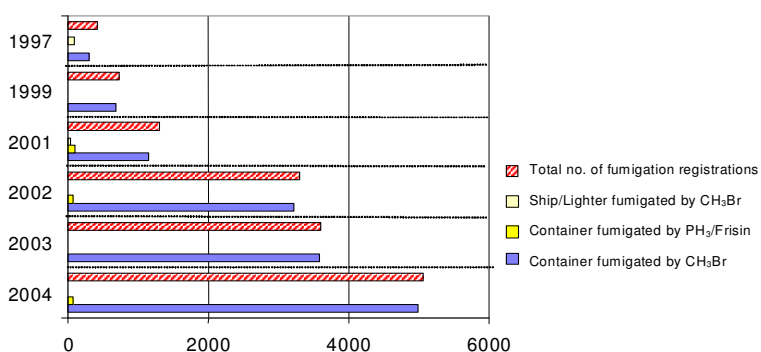
Recent activities of the Port and Airport Health Authority

In 2004, more than 12 000 foreign vessels entered the port of Hamburg. About 20% of them underwent detailed inspections on board (Table 2). These were spot tests taking into consideration complaints of previous inspections as well as diseases reported in ports visited by the controlled ship.

In comparison with the preceding year, the number of ship clearance procedures and issues of drinking water, pharmacy and deratting exemption certificates increased markedly in 2004 (Table 2).

During the second half of 2004, an increasing number of drinking water samples was investigated at Hamburg Airport. A further increase of the number of consultations and controls was planned for the year 2005. Physicians' advice on medical problems and treatment of mild diseases on board were intensified. The same is true of registrations and controls of fumigation of export containers (Figure 2).

Figure 2. Registration of fumigations in Hamburg in 1997 – 2004 according to fumigants used



Note:

The figure relates to 60% of all containers fumigated in Hamburg.

There was a fourfold increase during the last three years. In comparison to the preceding year, 40% more fumigation procedures were recorded in 2004 necessitating an increasing surveillance of registrations, declarations and fumigant measurements of entering containers gassed in transit according to the German Decree 512 on hazardous substances. Furthermore, additional cargo controls on board were required.

Hamburg Port and Airport Health Authority also contributed substantially to the

design of the new pharmacy list and the list of drugs in the ship's medical chest, and the medical equipment on ships (with and without ship doctor).

The draft of the new "International Health Regulations" was checked and important changes related to seafaring were commented. These comments were considered in consultation between the WHO General Director of the German Ministry of Health and Social Security.

The new drafts of the International Labour Organisation publications were also commented.

The Hamburg Port and Airport Health Authority collaborated in planning the annual meeting of German port health authorities and presented a paper on the results of drinking water samples taken in Hamburg.

Presently, a major project is the implementation and extension of the computer-based networked information and communication system which is intended to be used on inter-national level. It records complete data on ships, certification and controls (for details see Figure 1). This task is performed in cooperation with the departments Maritime Medicine and Clinical Occupational Medicine of the institute.

Table 2: Figures on Services of Hamburg Port and Airport Health Authority in 2004 (in comparison – figures for 2003)

Health declarations and clearance (seagoing ships)

Ships entering the harbour registered by state-run port authority	12,186 (c. 13,000)
Number of declarations	3,577 (3,431)
Document checking and clearance	10,759 (11,095)
Checking and clearance on board	2,369 (1,950)

Certifications

Deratisation exemption certificates	370 (338)
Drinking water documents/obligations	657/136 (559)
Ship's medical chest	130 (101)

Controls on board	Controls	Complaints
Waste disposal	1,829 (940)	96 (36)
Drinking water supply	761 (559)	214 (155)
Ship's medical chest	1,235 (798)	176 (99)
Food hygiene	2,040 (1,095)	368 (138)
Accommodation/sanitation hygiene	2,036 (1,094)	184 (128)
Pest infestation	1,977 (1,043)	85 (53)
Others	4 (19)	

Controls in the port

Hygiene of port sanitary installations and of waste disposal	127 (76)	3 (8)
Drinking water supply and hydrants	15 (23)	0 (3)
Bunkering boats	10 (14)	1 (1)
Port vehicles	138 (149)	30 (52)
Controls of the handling of hazardous substances		
Gassing registrations		5,064 (3,606)
Gassing controls/clearance		66 (107)

Port Health Authority services on board

Advice to captains	1,675 (951)
Advice on ship's medical chest	134 (16)
Advice on various problems	218 (194)
Patients' referrals to treatment ashore	2 (4)
Vaccinations	218 ¹ (388)
Others (control of anaesthetics, inquiries due to infection)	410 (210)

Services of physicians in Hamburg Port Health Authority

Prescriptions of anaesthetics	121 (117)
Examinations by medical officers: Inland navigation and harbour patent	77 (106)
Surveillance and instruction of ship doctors	12 (8)

Physicians' activities at the airport

Advice to crews, passengers and airport enterprises	41 (43)
Permission of corpse transports	38 (27)
Drinking water control	Controls Complaints
Drinking water supply locations, water transport vehicles	8 (16) 0 (5)
Drinking water samples of airplanes	44 (69) 21 ² (39)

¹In comparison to 2003, the number of vaccinations on board has slightly decreased mainly due to declining cholera outbreaks report. The medical advice for travellers has continued without changes.

²The present tasks and necessary increase in controls are on account of a high number of evident offences against the surveillance of airplanes and supply installations at Hamburg Airport according to the drinking water decree. 151 500 flights were recorded

by Hamburg Airport in 2004. The number of passengers was 9 890 000 corresponding to 27 100 passengers per day. Compared to the preceding year, the increase was 3.8 % (www.hamburg-airport.de).

Department Maritime Medicine (Table 3)

The project “Allergic diseases due to green coffee dust” has been continued in close cooperation with the departments Clinical Occupational Medicine and Allergology of the Central Institute for Occupational Medicine (ZfA).

Furthermore, the interdisciplinary project “Health risks due to gassed containers” is making good progress. The measurement of relevant toxic exposure parameters was introduced using colorimetric detector tubes (Draeger, Luebeck) and an electrochemical device (MultiScan), which were integrated in customs clearance of Hamburg port. Preliminary measuring results for orientation purposes are available. The new GC-MS (gas chromatography and mass spectrometry) in our laboratory will lead to an essential improvement of sensitivity and specificity of fumigant analyses in 2005.

The concept of the new project “Suitability of various automatic external defibrillators (AED) for the use by laymen at sea” was completed. The necessary conditions of a semi-automatic system were defined, and the manufacturers of defibrillators were contacted. At present, one semi-automatic system is tested in our medical refresher courses for nautical officers. After dealing with two standardized emergencies, the officers evaluate the systems. At a later time, the defibrillators will be tested directly on board ship at sea. On the basis of experimental studies, the risks of people giving first aid at sea using defibrillators due to the influence of electromagnetic fields on board on the analytic functions of semi-automatic systems will be tested.

Table 3 Current research projects and further tasks of the department Maritime Medicine

Research Projects and Tasks	Substantial activities and results in 2004 (References)
Application of telemedicine in seafaring (with department of Clinical Occupational Medicine, Hamburg Port and Airport Health Authority)	<ul style="list-style-type: none"> Investigation of applicability of telemedical emergency equipment (2 sets) by nautical officers (2) International telemedical studies on maritime medicine
Health risks due to gassed containers (together with departments Clinical Occupational Medicine, Occupational Toxicology, Epidemiology and institute management)	<ul style="list-style-type: none"> Collection of relevant investigations, occurrences Further development of a concept of gas concentration measurements in imported containers and in warehouses of Hamburg port concerning the problems of gassing agents and their residues (3). During the pilot phase, 31 containers were controlled electrochemically and by colorimetric detector tubes (Draeger, Lübeck) (3). Development of an improved data exchange basis concerning gassing locations and gassed containers between the responsible offices and authorities.
Suitability of 1-lead ECG and different semi-automatic defibrillators to be used by laymen at sea (in cooperation with department Clinical Occupational Medicine)	<ul style="list-style-type: none"> Definition of required technical and operative characteristics of AEDs on board (11)
Risks of infections and allergies by cockroaches on board (in cooperation with Port and Airport Health Authority, departments Clinical Occupational Medicine, Allergology and Industrial epidemiology)	<ul style="list-style-type: none"> Drawing up a conception recording the existing state Examination of exposed seafarers Elaboration of successful preventive measures
Risks of infections and allergies by cockroaches on board (in cooperation with Port and Airport Health Authority, departments Clinical Occupational Medicine, Allergology and Industrial epidemiology)	<ul style="list-style-type: none"> Recording data Examination of exposed seafarers Elaboration of successful preventive measures
Other tasks	(1, 12, 13)
Medical training of nautical officers	<ul style="list-style-type: none"> 7 refresher courses (1 week each) for nautical officers in 2004 Authorization of 2 physicians to act as instructors in the use of semi-automatic defibrillators by nautical officers Development of a comprehensive medical training package for captains and first officers (in collaboration with WHO) Preparation of a catalogue and of practical scenarios to evaluate courses at different locations
Inspection of shipbuilding plans of German shipyards	<ul style="list-style-type: none"> A service for the statutory accident and prevention insurance association for seafaring ("See-Berufsgenossenschaft") to control the maintenance of hygiene guidelines on water supply equipment

<p>Cooperation in DIN, EN and ISO standardization committees</p>	<ul style="list-style-type: none"> • Resumption of cooperation on German DIN-committee “Water rescue and safety equipment” • Resumption of cooperation with the standardization committee Shipping and oceanic technology
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CONCLUSIONS

Merchant shipping expands world-wide. Health risks on board are still high, due to traditional problems like infectious diseases endemics in ports visited during the ship’s voyages; and also new hazards such as bioterrorism. Other health risks arise from toxic, cancerogenic and allergizing goods transported on ships. Infections and other health problems may be even higher in airports.

The Hamburg Port Health Center together with the Central Institute of Occupational Medicine (ZfA) faces a variety of challenges in their work.

These challenges have been met, as it is described in this review article.

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