Global Shortage of Health Workers

22 to 24 October 2019, in Hamburg, Germany

www.ohhw2019.org
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11th Joint Conference on Occupational Health for Health Workers 2019

The main conference topic is the global shortage of health workers. Different aspects are presented and discussed by more than 160 Occupational Health Experts from 41 different countries in the light of this main topic. In addition, the congress focus on themes such as war, economic crisis, migration, and other critical circumstances that have a strong impact on health worker’s health.

The conference is organized by the Scientific Committee of Occupational Health for Health Worker (SC OHHW), with the support of further Scientific Committees of ICOH (Women Health and Work (SCWHW) and Occupational and Environmental Dermatosis (SCOED), the WGOIA (Working Group of Occupational Infectious Agents of ICOH) and ISSA (International Social Security Association, Section Healthcare and Welfare). This conference is supported by the BGW (Berufsgenossenschaft für Gesundheitsdienst und Wohlfahrtsflege, (Institution for Statutory Accident Insurance and Prevention in the Health and Welfare Services).

The conference is endorsed by:

- International Labour Organization (ILO), Switzerland
- European Agency of Safety and Health at Work, Spain
- Institut National de Recherche et de Sécurité (INRS), France

From the Medical Association the OHHW2019 was granted 45 points for Continued Medical Education (CME). Seven CME points for the workshop HEALTHwise on Monday, Oct 21st, 31 CME points for the main conference on Tuesday, Wednesday and Thursday, October 22nd to October 24th, and 7 CME points for the workshop on violence prevention on Friday, Oct. 25th 2019.

The OHHW2019 conference is part of the activities of ICOH.

The International Commission on Occupational Health (ICOH) is an international non-governmental professional society whose aims are to foster the scientific progress, knowledge and development of occupational health and safety in all its aspects. It was founded in 1906 in Milan as the Permanent Commission on Occupational Health. Today, ICOH is the world’s leading international scientific society in the field of occupational health with a membership of 2,000 professionals from 105 countries. The most visible activities of ICOH are the triennial World Congresses on Occupational Health, which are usually attended by some 3,000 participants. The 2021 Congress will be in Melbourne (Australia) and the ICOH 2024 Congress in Marrakesh (Morocco). ICOH has 37 Scientific Committees. Most of these committees have regular symposia, scientific monographs and review the abstracts submitted to the International Congresses.

For more information on ICOH and on how to become a member of ICOH, please visit the website: www.icohweb.org
<table>
<thead>
<tr>
<th>No. in series</th>
<th>Year</th>
<th>Date</th>
<th>City</th>
<th>Country</th>
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<tbody>
<tr>
<td>1st meeting</td>
<td>1989</td>
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<td>Rouen</td>
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<td>2nd meeting</td>
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<td>Paris</td>
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<td>1st</td>
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<td>6th</td>
<td>2004</td>
<td>8 – 10 October</td>
<td>Kitakyushu</td>
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<td>7th</td>
<td>2007</td>
<td>25 – 28 October</td>
<td>Vancouver</td>
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<td>8th</td>
<td>2010</td>
<td>27 – 31 October</td>
<td>Casablanca</td>
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<td>9th</td>
<td>2013</td>
<td>23 – 26 September</td>
<td>Sao Paulo</td>
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<td>10th</td>
<td>2017</td>
<td>28 – 30 November</td>
<td>Khon Kaen</td>
<td>Thailand</td>
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<td>11th</td>
<td>2019</td>
<td>22 – 24 October</td>
<td>Hamburg</td>
<td>Germany</td>
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Welcome Note from the Chair and Secretary of the Scientific Committee of Occupational Health for Health Workers

We are excited to welcome you to the 11th International Joint Conference on Occupational Health for Health Workers. We have been working diligently for the past two years to prepare a program featuring some of the important emerging global issues confronting all of us in these times of environmental, economic and political challenges within the context of the global shortage of health care workers and inadequate access to healthcare.

This conference is a joint effort between the Scientific Committees of ICOH (Occupational Health for Health Workers, Women Health and Work), the WGOIA (Working Group of Infectious Agents of ICOH) and ISSA (International Social Security Association). This conference could not have been accomplished without the support of BGW (Berufsgenossenschaft für Gesundheitsdienst und Wohlfahrtspflege, Institution for Statutory Accident Insurance and Prevention in the Health and Welfare Services).

The conference features keynote talks and panels presented by experts from around the world, presentations of abstracts submitted from six continents and pre- and post-conference workshops – one on the use of HealthWISE and the other on Violence in Health Care Settings.

We hope this conference will be informative, stimulating and create opportunities to network with colleagues from all over the world thus enhancing your abilities for continued improvement in your health care systems.

Gwen Brachman, US, Chair of the SC OHHW
Antoon De Schryver, Belgium, Secretary of the SC OHHW
Welcome Note from the Host of the OHHW2019

For the 11th International Joint Conference Occupational Health for Health Workers we chose an urgent but ambitious topic:

**Occupational Health for Health Workers in Times of Global Shortage of Health Workers**

Worldwide about 1/3 of the population is affected by migration. Health Workers (HW) are part of this migration population and HW try to meet the special needs of the migrants. Out of this situation, different problems concerning Occupational Health of HW arises. On the OHHW2019 conference, experts from around the world will discuss these different aspects. I am particularly proud that we were able to invite experts from Africa and South America to give testimonials about occupational health for health workers in crises. Enriched are these contributions by interventions of experts from North America, Asia and Europe.

In addition to the main topic a wide range of aspects are covered: infections and vaccination, pregnancy and work in healthcare, violence against HW, psycho-social exposure of HW and ergonomics. We had the privilege to compile a program out of more than 100 abstracts submitted to our website. Unfortunately, it was not possible to grant an oral presentation to all interesting and qualified submissions. Those who might be disappointed with being nominated for a poster presentation 'only', I want to reassure that the posters will be displaced at a very central location of the conference venue.

During the process of composing the program, many colleagues were engaged and supportive. I want to thank them all. My particular thanks go to Gwen Brachman, US, Anton De Schryver, Belgium, Acran Salmen-Navarro, US, Igor Bello, Venezuela, Fouad M. Fouad, Lebanon, Ehi Iden, Nigeria, and Mary Ross, South Africa, for their valuable contributions to composing the program.

In the wake of the conference, we had many email exchanges with a lot of empathy and encouragement. Now we are looking forward to get to know you in person. We hope that you will have a safe and enriching stay in Hamburg with a lot of interesting presentations and exchanges between colleagues and experts from around the world. We wish you many good memories as well as a lot of new or refreshed contacts to carry home after the OHHW2019.

*Albert Nienhaus and the OHHW2019 Preparation Team in Hamburg*
GLOBAL SHORTAGE OF HEALTH WORKERS

Mission Statement of the Scientific Committee on Occupational Health for Health care Workers (SC OHHW)

Gwen Brachman, Chair of the SC OHHW

Health workers comprise the largest global workforce and are found in every country. The health care workforce includes individuals who provide health services – doctors, nurses, midwives, dentists, emergency medical responders, medical, nursing and dental assistants, therapists, laboratory technicians, social workers and pharmacists along with students training in these areas. The health workforce also includes those individuals who provide management and supportive services – administrators, financial officers, clerical personnel, cooks, transport (both within-facility and drivers), security, housekeeping and facilities operations (plumbers, electricians, painters, carpenters). Worldwide, there are 59.8 million health workers. About two-thirds of them (39.5 million) provide health services; the other one-third (19.8 million) are management and support workers. Women comprise nearly 80% of the health care work force (WHO).

Women comprise nearly 80% of the healthcare work force

Health care is the fastest-growing industry in many developed countries. At the same time, there is a global shortage of health care personnel, which has reached a crisis level in 57 countries, most of them in Africa, Asia and the Mid-East. Currently there is a shortage of 7.2 million health care workers; this shortage is expected to increase to 12.9 million by 2035. (WHO, 2006) Although there are several factors leading to the shortage of health care workers, a major contributor is unsafe working conditions leading to work-related illness and injury with significant morbidity and mortality (particularly from infectious diseases including HIV, Hepatitis B and C, Tuberculosis and Ebola). The fear of contracting one of these illnesses leads to further attrition and to a decreased number of individuals entering the health care professions. The shortage of health care workers puts increased work demands and stress on the remaining health care workforce, which, in turn, further increases unsafe working conditions. Protecting the health and safety of health care workers is essential in order to have an adequate workforce of trained and healthy health care personnel.

Health care workers are exposed to a variety of health and safety hazards

A health care facility is a workplace as well as a place for receiving and giving care. Cases of occupational injury and illness among health care workers are among the highest of any industry sector. Health care workers are exposed to a complex variety of health and safety hazards on a daily basis including: biological hazards (such as TB, Hepatitis, HIV/AIDS, SARS, Ebola); chemical hazards (such as, glutaraldehyde, ethylene
oxide, latex); physical hazards (such as noise, radiation, slips, trips and falls); ergonomic hazards (such as heavy lifting, repetitive motion at awkward angles); psychosocial hazards (such as shiftwork, violence and stress); fire and explosion hazards (such as using oxygen, alcohol sanitizing gels).

No effective health care system without a healthy workforce

Because their jobs are to care for patients, the hazards and risks that health care workers face every day are often ignored or relegated to a low priority. In fact, health care workers are “expected” to accept the risks entailed in performing their jobs, often sacrificing their own health and safety for that of their patients. Fortuitously, the measures that protect health care workers from injury and illness also serve to protect patients’ health and safety. Health care workers need to be protected from workplace hazards; there can be no effective health care system without a healthy workforce.

The aims of the Scientific Committee on Occupational Health for Healthcare Workers (SCOHHW) are:

- Foster the scientific progress, knowledge and development of occupational health and safety in health care settings
- Provide forums for discussion of current health and safety issues affecting health care workers and health care settings
- Foster and participate in international dialogues and provide input for guidance regarding health and safety issues for health care workers
- Create guidelines, tools and training opportunities and make these available to ICOH members and other interested persons and institutions
- Foster cooperative relationships with WHO, ILO and other international and NGO organizations in pursuing the above stated goals

The Scientific Committee on Occupational Health for Healthcare Workers (SCOHHW) is the main organizer of the OHHW2019.

Mission of the Scientific Committee Women, Health & Work

Women’s participation in the world of work is constantly increasing all around the world. Women assume important roles and increasingly are coming in work sectors that use to be exclusive destined for men. Also, gender parity seems to be improving. These are part of the good picture. However, employment and work inequities persist, despite the fact that women’s work and importance is widely recognized.

Data from The Global Gender Gap Report — that assesses the 134 countries on how well they are dividing their recourses and opportunities among their male and female populations —, examines the gap between women and men in four fundamental categories: economic participation and opportunity; educational
attainment; political empowerment; and health and survival. The 2014 Report states that there are many positive gains in the overall index scores, indicating that the world in general has made progress towards equality between women and men, although there are countries that continue to lose ground. This version shows that the economic participation gap has increasingly closed from 56% to 60% between 2006 and 2014. As well, the educational attainment gap closure increased from 92% in 2006 to 94% in 2014. However, the situation is worrisome for health and survival, since it shows a small deterioration from 97% in 2006 to 96% in 2014. And although the global political empowerment gap closed at 14% in 2006, and increased to 21% in 2014, still is very low. The Nordic countries have held the highest positions in all editions of the Report.

The comparison between the countries can be seen as controversial and raises questions. The Index does not feature women’s empowerment in each country; its aim is to focus on whether the gap between women and men in the chosen variables has declined. Even though there are questions about the index, the fact that it includes the ‘health and survival’ category as one of its fundamental categories is important for all of us working in this area. Professor Kaisa Kauppenin, former Chair of our SC, explained that this category could be further elaborated to be more precise, in the same way that the other categories. The health and survival category has only two variables: The first is the gap between women’s and men’s healthy life expectancy, and the second is the sex ratio at birth, which in fact is fundamental in regards to women’s and men’s health, but other variables of workers’ health could be more detailed. We wish is that the ICOH SC WHW members could strongly participate in this global discussion on women’s health and well-being and bring a work-related perspective into it. We will appreciate your input and comments in this important global issue!

This text is from the website of the SC: http://www.icoh-scwhw.net/home/

We are thankful for the support of the Chair Dr. Marcia Bandini, São Paulo, Brasil, and the Secretary Prof. Igor Jesus Bello Sociedad Venezolana de Salud Ocupacional, Valencia, Venezuela, of the SC for the preparation of the conference. Marica Bandini and Igor Bello will give several interventions at the OHHW2019.

Mission of the Scientific Committee on Occupational and Environmental Dermatoses

ICOH’s SC on occupational and environmental dermatoses (SCOED) aims at raising awareness of the challenges of the huge spectrum of these diseases (from irritant and allergic contact dermatitis to skin cancer), their pathogenesis and the effectiveness of preventive measures to the workers’ health benefit. It wants to foster exchange on new research findings pertaining to occupational dermatoses, which are in many countries the most frequent occupational illnesses. The SC actively supports the current initiative of WHO and ILO as to the assessment of the global disease burden of some disease entities within its scope.

We are thankful for the support of the Chair Dr. Sanja Kezic, Coronel Institute of Occupational Health, Amsterdam, The Netherlands and the Secretary Prof. Swen Malte John, University of Osnabrück Germany, for the preparation of the conference. Sven M. John will give a talk on occupational and environmental dermatoses and the mission of the SC on Wednesday morning Oct 23rd during the plenary session.
Mission of the International Section of the ISSA on Prevention of Occupational Risks in Health Services

The International Social Security Association (ISSA) is the world’s leading international organization for social security institutions, government departments and agencies. The ISSA promotes excellence in social security administration through professional guidelines, expert knowledge, services and support to enable its members to develop dynamic social security systems and policy throughout the world.

The ISSA was founded in 1927 under the auspices of the International Labour Organization, and today has over 320 member institutions from over 150 countries. The ISSA is organized in different International Sections.

The International Section of the ISSA on Prevention of Occupational Risks in Health Services aims to improve occupational safety in health services through the international exchange of experience. Occupational risks in the health services sector differ widely from those in other fields of work. These risks are quite similar in different countries, but the measures taken to cope with them vary from country to country.

The International Section of the ISSA on Prevention of Occupational Risks in Health Services aims to determine and to compare the state of occupational safety in health services in various countries, and to develop recommendations on how to apply proven or new methods on a worldwide basis. The Section aims to promote safety and health for health-care workers, the prevention of work accidents and the prevention of occupational and work-related diseases in health services.

In many countries experience in occupational safety in health services is available. By enabling discussion between medical and technical experts from the safety field, and with the authorities and social security institutions, the health-care facilities and their employees, it is possible to better protect the health and safety of people working in health care services. The Section seeks to promote the pooling, assessment, improvement and dissemination of knowledge. Through the exchange of experience, existing methods can be enhanced and new solutions for areas showing deficits can be developed.

The Section identifies and promotes effective methods for enhancing occupational safety for the different professions in health care, through conferences, colloquia and seminars, and raises awareness of risks through the international exchange of information.

The main focus of activity is on occupational and work-related diseases. The findings, experiences and proposals collected by the Section are presented to the public, in particular to the specialist public, as printed material or in meetings.

The Secretariat of the Section is based in Hamburg, Germany, at the Berufsgenossenschaft für Gesundheitsdienst und Wohlfahrtspflege, BGW, (Institution for statutory accident insurance and prevention in the health and welfare services), which is entrusted with providing the Secretariat.

For more information see: https://www.issa.int/prevention-health
CONERENCE PROGRAM
from MONDAY, OCTOBER 21st
to FRIDAY, OCTOBER 25th
Monday, October 21st

10.00–16.00 Workshop HealthWISE –
Work Improvement in Health Services.
Simphiwe Mabhele, International Labour Organization, South Africa,
Elizabeth Wilcox, University of British Columbia, Canada,
Muzimkhulu Zungu, National Institute for Occupational Health, South Africa

Tuesday, October 22nd

8.00–9.00 Reception, Registration
9.00–9.30 Welcome messages, opening of the conference.
Gwen Brachman, SC OHHW,
Igor Bello, SC WHW
Volker Harth, German ICOH group,
Stefan Brandenburg, CEO BGW, ISSA HW,
Albert Nienhaus, President of the conference

9.30–10.15 Global shortage of health workers and the consequences for OSH.
Christiane Wiskow, ILO, Geneva, Switzerland

10.15–11.00 Health systems without borders, re-thinking health system frameworks in times of forced migration.
Fouad M. Fouad, American University of Beirut, Lebanon

11.00–11.15 Coffee break, Poster exhibition

11.15–11.45 Working conditions in a healthcare system in crisis – the case of Zimbabwe.
Tawanda Nherera, BOC Zimbabwe (Pty) Ltd, Harare, Zimbabwe

11.45–12.15 HWs and informal health services in middle-east.
Fouad M. Fouad, American University of Beirut, Lebanon

12.15–12.30 Q + A with all presenters of the morning

12.30–13.30 Lunch break

13.30–17.30 DISPLACED PERSONS – providing health care to displaced persons and displaced health workers.
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<th>Time</th>
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<tr>
<td>13.30–14.00</td>
<td>Introduction – history of migration and general concepts, interventions for immigrant HWs in NYC</td>
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<td><em>Acran Salmen-Navarro, NYU School of Medicine, USA</em></td>
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<td>14.00–14.30</td>
<td>Doctors without borders. Occupational risk factors for health workers in a humanitarian crisis?</td>
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<td><em>Carlos José Chavera Bianchi, Argentina, Hospital Carlos Bonorino Udaondo</em></td>
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<td>14.30–15.00</td>
<td>DANGER! Health workers at risk. Working with refugees, immigrants, migrants, displaced persons,</td>
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<td></td>
<td>and persons in areas of conflict. <em>Mason D. Harrell, FACOEM, USA</em></td>
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<td>15.00–15.30</td>
<td>Healthcare in crisis situations – the example of Venezuela. <em>Igor Bello, Venezuela, Venezuelan</em></td>
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<td><em>Society on Occupational Health, Chair SC WHW</em></td>
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<tr>
<td>15.30–16.00</td>
<td><strong>Coffee break, Poster exhibition</strong></td>
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<td>16.00–16.30</td>
<td>Displaced health workers and healthcare in crisis situations from an African perspective.</td>
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<td><em>Ehi Iden, CEO, Occupational Health and Safety Managers, Lagos, Nigeria</em></td>
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<td><em>Rima R. Habib, Beirut, Lebanon, American University of Beirut</em></td>
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<td>17.00–17.30</td>
<td>Working conditions of HCW in developing countries – a North African Perspective.</td>
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<td><em>Abdeljalil El Kholti, Hassan II University of Casablanca, Morocco</em></td>
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<td>17.30–18.00</td>
<td>The Ebola Experience – Sending HW to endemics and receiving infectious patients from abroad.</td>
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<td><em>Stefan Schmiedel, Bernhard Nocht Institute Hamburg, Germany</em></td>
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<td>18.00–19.00</td>
<td>Come together and poster walk</td>
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<td>20.00–22.00</td>
<td><strong>Evening program:</strong></td>
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<td><strong>Boat tour (Habour and Elbe at night)</strong></td>
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### Wednesday, Oct. 23rd

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<tr>
<td>8.00–9.00</td>
<td>Reception, Registration, Coffee, Poster exhibition</td>
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<td>9.00–9.30</td>
<td>Achieving a sustainable Health Care Workforce through Macroergonomics.</td>
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<td><em>Andrew S. Imada, Ph.D. Former President of the International Ergonomics Association, USA</em></td>
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<td>9.30–10.00</td>
<td>Vision zero – how to create a culture of prevention.</td>
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<td><em>Marija Bubas, Croatian Institute of Public Health, Croatia</em></td>
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<td>10.00–10.30</td>
<td>Occupational skin diseases in HW, Risk factors, Prevention and Rehabilitation Strategies.</td>
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<td><em>Sven Malte John, IDerm, University Osnabrück, Germany</em></td>
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<td>10.30–11.00</td>
<td><strong>Coffee break, Poster exhibition</strong></td>
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<td>11.00–11.30</td>
<td>New delivery systems and telemedicine in times of shortage of occupational health specialists</td>
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<td><em>William Buchta, Mayo Clinics, USA</em></td>
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<td>11.30–11.45</td>
<td>Zero TB and Non Communicate Diseases in the UN Declaration – ICOH Efforts.</td>
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<td><em>Gwen Brachman, New Jersey, USA, Chair SC OHHW</em></td>
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<td>11.45–12.15</td>
<td>Protecting HCWs from TB in high risk settings.</td>
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<td><em>Rodney Ehrlich, University of Cape Town (UCT), South Africa</em></td>
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<td>12.15–12.30</td>
<td>Q + A with all presenters of the morning</td>
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<td>12.30–13.30</td>
<td><strong>Lunch break, SC OHHW business meeting</strong></td>
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<td>13.30–17.15</td>
<td><strong>Parallel sessions 1/2/3</strong></td>
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1. Ergonomics in Prevention of Musculoskeletal Conditions in Health Workers.  
2. Psycho-Social Exposure in Health Workers.  
3. Occupational Infectious Agents: health and humanitarian workers and beyond, Session organized and coordinated by Working Group Occupational Infectious Agents (WGOIA)  

*See flyer: Parallel Sessions*
### Conference Program

**PROGRAM**

**Conference Date:** 22 to 24 October 2019

**Venue:** Hamburg, Germany

**Website:** www.ohhw2019.org

### Grand Elysée Hamburg Town Hall (Rathaus)

- Elbphilharmonie
- Reeperbahn (St. Pauli)
- St. Michaelis (Michael)
- Binnenalster
- Sternschanze
- Hafen City
- Ausenalster

**Contact/Plan Program**

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<tr>
<td>15:00–15:30</td>
<td><strong>Coffee break, Poster exhibition</strong></td>
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<td>17:00–18:00</td>
<td>Midterm Meeting WGOIA</td>
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<td>17:00–18:00</td>
<td>Poster walk</td>
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<td>18:30–19:30</td>
<td>Come together in the Curio House with live music</td>
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<td>19:30–24:00</td>
<td><strong>Conference Dinner</strong></td>
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**Thursday, October 24th**

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<tr>
<td>8:00–8:30</td>
<td>Reception, Registration, Coffee, Poster exhibition</td>
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<tr>
<td>8:30–9:00</td>
<td>Occupational Health as Public Health: an integrated vision.</td>
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<td><em>Marcia Bandini, Universidade Estadual de Campinas, Brasil</em></td>
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<td>9:00–9:30</td>
<td>Gender issues in the health care sector in Europe – results from EU-OSHA research.</td>
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<td><em>Elke Schneider, EU-OSHA, Switzerland</em></td>
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<tr>
<td>9:30–10:00</td>
<td>Pregnancy and immunization in the health sector.</td>
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<td><em>Viviana Gómez-Sánchez, Latin American Association on Occ Health/PAHO, Costa Rica</em></td>
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<tr>
<td>10:00–10:30</td>
<td><strong>Coffee break, Poster exhibition</strong></td>
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<tr>
<td>10:30–11:00</td>
<td>Adaptations of workplaces for pregnant women in the health sector.</td>
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<td><em>Danileing Lozada, Venezuelan Society on Occupational Health, Venezuela</em></td>
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<td>11:00–12:30</td>
<td>Occupational Nursing in the XXI century.</td>
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<td><em>Astrid Garrido, Ludwig Maximilian University (LMU), Munich, Germany</em></td>
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<td>11:30–12:00</td>
<td>Risk management in Health Centers: a gender approach.</td>
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<td><em>Igor Bello, Venezuelan Society on Occupational Health, Venezuela</em></td>
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12.00–12.30  Current and emerging issues in the healthcare sector, including home and community care – the European Risk Observatory Report. 
Lorenzo Munar, EU-OSHA Bilbao, Spain

12.30–13.30  Lunch break

13.30–15.30  Parallel sessions 1/2/3

1. Improving OSH systems and Women Health and Work (WHW)
2. Vision zero – Culture of prevention – approaches and implementations
3. Tuberculosis (TB) in Health Workers

See flyer: Parallel sessions

15.30–16.00  Coffee break, Poster exhibition

16.00–16.45  Closing session of the conference.

Friday, October 25th

9.00–15.00  Workshop Prevention of Violence in Healthcare.
Ellen Delvaux, Belgium,
Kai Hochscheid, Germany
KEYNOTE SPEAKERS

TUESDAY, OCT. 22\textsuperscript{nd}
WEDNESDAY, OCT. 23\textsuperscript{rd}
THURSDAY, OCT. 24\textsuperscript{th}
Global shortage of health workers and the consequences for OSH

While progress has been made in addressing the global health workforce crisis, significant shortages remain in many countries, which constrain their ability to provide essential health care. Projections suggest a shortfall of 18 million health workers by 2030, primarily in low and lower-middle-income countries. The unequal distribution of health workers globally and within countries constitutes a barrier to achieving health equity, as health worker gaps primarily affect the poorest populations.

Virtually all countries face challenges in recruiting, deploying and retaining sufficient numbers of well-trained and motivated health workers where they are needed. Decent work deficits are among the key reasons for this situation. Workers in the health sector face a range of occupational risks associated with biological, chemical, physical, ergonomic and psychosocial hazards. While infection prevention and control with a view to patient safety is well considered in most health services, the aspect of OSH for health workers tends to be neglected. Research across all regions shows lack of attention to OSH concerns negatively influence the retention of health-care professionals.

The presentation provides an overview on global trends in health employment and health workforce shortages and reflects on the effects of such shortages on the working conditions and occupational safety and health of health workers. It considers policy options on a way forward and provides information on instruments and tools available to enhance safe and healthy work environments in the health sector.

Short Biography of Christiane Wiskow

Health Sector Specialist, Sectoral Policies Department, International Labour Organization (ILO)

Ms. Christiane Wiskow is Specialist for the health services sector at the International Labour Organization (ILO) in Geneva, Switzerland. The main aims of the ILO are to promote rights at work, encourage decent employment opportunities, enhance social protection and strengthen social dialogue, as integral part of the 2030 Sustainable Development Agenda.

Ms. Wiskow has a professional background in social sciences and health sciences, and practical work experience in community based psychiatry. She specialized in international public health with a focus on health workforce issues and has been working with a number of international organizations, mainly on labour aspects in the health sector. Her work at the ILO contributes to promoting employment and decent work in the health sector with view to achieving universal access to health care. A key aspect is encouraging improvements of employment and working conditions that enable and support health workers to provide quality health care.

More information at www.ilo.org/health
Tuesday, October 22nd

Fouad M. Fouad

Health systems without borders, re-thinking health system frameworks in times of forced migration.

More than 70 million are forced displaced worldwide as refugees and internally displaced population. 85% of the world’s refugees reside in developing regions and 58% live in urban areas. Forced displacement from long-term conflicts have resulted in a protracted refugee situation for millions. Health system often being defined by political and geographical boundaries. Its framings describe the users of health services as citizens. This framing lacks an explicit acknowledgement of how the rights of services users may diverge from that of the non-citizens living within or traveling through a jurisdiction.

Health system frameworks have NOT included the conceptual space within which the issue of migration and the contextual determinants of migrants’ access to health systems may be explored. They ignore the dynamic flow of people within and between jurisdictions, and the needs that arise because of such mobility, with potentially harmful consequences for the health of populations.

Fouad M. Fouad, MD, American University of Beirut, Lebanon.

Fouad is Assistant Research Professor at the Department of Epidemiology & Population Health, and a Co-Director of the Refugees Health Program at the Global Health Institute at the American University of Beirut (AUB). He is currently working on a number of research projects related to the Syria crisis and/or the Syrian refugees, including “Responding to Changing Health Needs in Complex Emergencies: A Policy Imperative”, “Identifying ways to promote health systems resilience in contexts of protracted displacement through systems analysis of UNRWA provision to Palestine refugees displaced by the Syria crisis “, and “Network for research on death, dying and end of life care among Syrian refugees in Lebanon “.

Fouad is serving as a commissioner in two Lancet Commissions; AUB Lancet Commission: Syria and the crises in global governance, health and aid; and UCL Lancet Commission on Migration and Health

• Research Interests
  • Refugees Health
  • Conflict and Health
  • Health system
  • Non-communicable diseases
Tuesday, October 22nd

Tawanda Nherera

Working conditions in a healthcare system in crisis – the case of Zimbabwe.

Keywords: Human resource constraints, Drug and material shortages, Learning and competency issues in a crisis, Quality and occupational health international standards.

Introduction:
Zimbabwe is a country faced with a crisis. The health sector is one of the hardest hit and is also one of the most sensitive in any country. Due to the deteriorating standards of living in Zimbabwe, skilled health workers have left the country for greener pastures, leaving behind inexperienced staff. The country is facing critical shortages of drugs and hospital equipment and tools for health workers as a direct result of lack of foreign currency to import the requirements. The learning conditions have also deteriorated and very few health institutions subscribe to international standards and management systems for quality healthcare delivery and occupational health best practices for their employees. The study sought to establish the status and propose mitigatory measures.

Methods:
Challenges faced by the health institutions in Zimbabwe were gathered from the following:

- Research papers
- Other published papers
- Newspaper articles

Outlook:
This was a conclusive future state, backed by facts as gathered from research.

Conclusion:
The situation in Zimbabwe needs urgent attention for rescue. Hospital institutions require proper management systems for stress management, PPE and hospital material requirements, and the related risk based occupational health and quality management systems.

Tawanda Nherera, BOC Zimbabwe (Pty) Ltd, Harare, Zimbabwe
Tuesday, October 22nd

Fouad M. Fouad

Health workers and informal health services in the Middle East – The case of Syrian health workers in Lebanon

In December 2014, the Lebanese Ministry of Labour implemented Decree 197 limiting possible work for Syrian nationals to the agriculture, construction and cleaning-service sectors. Syrian refugees must sign a “pledge not to work” and sustain their livelihoods through humanitarian assistance and the international community. As Syrians health worker refugees are prohibited from working, the majority are thought to be working informally.

In 2018 a qualitative descriptive study based on an in-depth interview approach with a sample of Syrian informal healthcare workers (IHCWs) residing in Lebanon was adopted. Despite its informal nature, participants perceived that this practice was filling a gap in the formal health system and was helping to alleviate the burden of IHCWs and refugee health needs. In line with interviewees’ views, we recommend that policy decision makers within humanitarian agencies and the Government of Lebanon explore the possibilities for allowing temporary registration of displaced Syrian IHCW to benefit local host communities and refugee populations.

Fouad M. Fouad, MD, American University of Beirut, Lebanon.
For more information about Fouad see two keynotes before
Displaced Persons – providing health care to displaced persons and displaced health workers

Introduction – history of migration and general concepts, interventions for immigrant HWs in NYC

Worldwide, nearly 200 million individuals migrate annually across national borders, an increase of 144% in the past 40 years. In 2017 there were over 250 million people living in a country other than their country of birth – an increase of 49% since 2000. More than 60% of these migrants move from developing to developed countries seeking better employment and economic opportunities.

Acute global shortages in the health workforce today represent a crisis that looks certain to worsen in the years ahead. There is a chronic worldwide need for some 2.4 million more physicians, nurses and midwives, and for almost two million more pharmacists and other paramedical workers. Currently there are almost 60 million health workers globally, but they are unevenly distributed across countries and regions. Typically, they are scarce where they are most needed, especially in the poorest countries. In any case, the total number is incapable of meeting the demands of many populations for access to the health care they require. Both developed and developing countries are struggling to cope with the huge challenges posed by the imbalance between increasing demand and faltering supply. Locally, in New York City we have been fortunate to be under the sanctuary umbrella policy of equality, human rights and dignifying healthcare services provided to everyone in need, but under deplorable working conditions – specially towards immigrant workers.

During their initial years in the receiving country, many healthcare immigrants experience occupational downgrading which occurs when there is a loss of occupational status or prestige between one’s last job in the country of origin and first job in the receiving country. Often, are undervalued; having limited job opportunities that match their actual skills and educational level and this has a direct effect on their occupational health. These workers who are forced to migrate because of war, political or economic reasons carry an additional psychosocial factor from home, over and above the new challenges they will face in the foreseeable future, first while migrating and then in the receiving country.

For these immigrants, work is a principal driver of current international migration, a primary social determinant of health, and a fundamental point of articulation between migrants and their host society. However, these immigrants and migrants do not necessarily encounter better working conditions in their receiving countries. In fact, immigrants and migrants are frequently faced with precarious work environments, lacking in basic occupational health rights and working conditions.

Efforts by international organizations to promote migrant health have traditionally focused on infectious diseases and access to healthcare, while international labor organizations have largely focused
on issues of occupational health. The under-utilization of the domain of work in addressing the health of migrants is truly a missed opportunity for influencing worker well-being and reducing societal economic burden. In fact, research has shown the legal, socioeconomic and professional hierarchy status of migrant workers arriving in the US to be superior, in many cases, to that of their US-born counterparts, but that this health advantage may deteriorate over time. An understanding of the relationships among migration, work, and health would facilitate further integration of migrant health concerns into the policy agenda of governments and international agencies that work at the nexus of labor, health and development.

We are aware there are challenges, due to cultural, epidemiologic and geographical differences, and most importantly, the heterogeneity of ‘immigrant and migrant workers’ – specially in health workers. However, we consider these challenges to be opportunities for improvement, and the ideal justification for this initiative. Social determinants of health paradigm allows for a greater recognition of the relationships among migration, work, and health, and facilitates the integration of migrant health concerns into the policy agendas of governments and international agencies that work at the nexus of health, development and sustainability.

Biographical notes for Acran Salmen-Navarro

Expertise and research interests: Ergonomics, Work-related musculoskeletal diseases (WMSD), OH on Immigrants/Underserve/Vulnerable Workers and OH Health Workers. Active member of ICOH WMSD and Health Workers Scientific Committees. Founding Member of the Venezuelan Ergonomic Society and delegate to the International Ergonomic Association (IEA). Active member of the IEA WMSD Technical Committee. Active member of ACOEM and Board member of the New York chapter NYOEMA.

Acran Salmen-Navarro, MD, MSC, New York University (NYU) School of Medicine, USA
Tuesday, October 22nd

Carlos José Chavera Bianchi

Doctors without borders. Occupational risk factors for health workers in a humanitarian crisis

For my presentation I have carried out an extensive review of the contexts in which health workers have been developing in humanitarian aid – both those of official organizations and those of non-governmental organizations – and I have talked with local participants in missions to other countries such as later Haiti to the earthquake.

Prevention and proper management of posttraumatic stress

My presentation answers that question that is new in occupational hazards for these workers and really in addition to physical safety issues, exposure to chemical or biological risks such as the Ebola virus. The strong thing is the psychosocial factors and the prevention and proper management of posttraumatic stress with timely management. The contexts are also dynamic, and the conditions of political violence are different from conventional wars. For this reason, the recommendations received also propose an adequate selection of participating workers for each situation, an adequate capacity for group interaction and adequate training. Among the comments received in this global world it is necessary that there are leaders who work in health institutions regularly and in particular in the area of urgency, who have the possibility of returning to their usual work upon return by means of a rule that reserves the position for them.

Carlos José Chavera Bianchi, Prof., MD, Argentina, Hospital Carlos Bonorino Udaondo
Tuesday, October 22nd

Mason D. Harrell

“DANGER! Health Workers at Risk: Working with Refugees, Immigrants, Migrants, Displaced Persons, and Persons in Areas of Conflict”

Working conditions for conventional health workers in classic work environments, such as hospitals, clinics, or labs have been well defined in both the developed and developing world, but there are more particular issues for health workers providing the same services to refugees, immigrants, migrants, displaced persons, and persons in areas of conflict. Working conditions significantly differ from their training and regular practice. Combining with the plethora of unfamiliarity, hazardous working conditions tumble together when complications from supplies, water, electricity, internet connection, finances, mental fatigue, and physical exhaustion pile up.

Adaptation and resilience are the foundational attributes that ensure the safety and success of these health workers. Success is achieved by not just working with one’s own team and the patient population, but also constructively collaborating with local authorities, health workers, national and foreign military, and aid organizations. Health workers must apply and adapt their training and safety practices to their new working conditions. These demands require raw talent and learned skills. Health workers must constantly adapt to the ever-challenging and changing work environments – they must think outside the box while working outside their comfort zone.

Mason D. Harrell, Medical Director, III M.D., M.P.H., FACOEM
Harvard-trained, double board-certified physician in Occupational Medicine, Public Health and General Preventive Medicine. Medical expert work with the Massachusetts Institute of Technology (MIT), the World Health Organization (WHO) and other. Currently, active duty Navy Lieutenant Commander, Medical Division Officer, and Flight Surgeon supervising 75 medical professionals
Healthcare in crisis situations: Venezuela

The future of decent work is greatly influenced by the demographic changes that occur in the current population: the increase in the expectation of productive life, the increasing participation of women in the labor markets and the great boom in migration are factors that definitely influence the health and safety of workers.

"One of the biggest displacement crises in the world in recent times"

The health sector does not escape this reality, and analyzing how the migratory phenomena affected national health systems is a task not only useful for the countries from which migrants leave, but also to understand how to affect the countries that receive them and how migrants are affected, becoming a particularly vulnerable population.

This conference explores these problems through a look at “one of the biggest displacement crises in the world in recent times” (United Nations Agency for Refugees, UNHCR, 2019) and which continues to evolve to this day: The case of Venezuela.

Igor Bello, MA on Ergonomics and Psychosociology, Venezuelan Society on Occupational Health, Chair SC WHW, associate professor at the Simon Bolivar University, where he directs the cathedra of Human Engineering and Ergonomics, Venezuela.

Research on healthcare workers in conflict settings: a gender perspective

Rima R. Habib, PhD, MPH, MOHS, of the American University of Beirut, received the 2017 International Health and Safety Award from the Occupational Health and Safety (OHS) Section of the American Public Health Association (APHA). This award recognizes individuals with outstanding contributions to Public Health. She did extensive research on refugee workers in Lebanon.
Tuesday, October 22nd

Abdeljalil EL KHOLTI

**Working conditions of HCW in developing countries – a North African Perspective.**

In the poorest countries of the world, there is only one doctor for every 100,000 people. In many of them, especially in African countries, there are only enough trained healthcare workers (HCW) to cover 10% of the population. And, the already inadequate health systems of developing countries have been damaged by the emigration of their health professionals.

The bad working conditions increasing the loss of health professionals and impacting patient outcomes in developing countries. Beside the traditional risks, the HCW are fighting against low wages, scarcity of resources, lack of material, means of transport, a lack of promotion opportunities, poor living conditions...These factors impact directly occupational health and safety in workplace and occupational risks prevention.

Research evidence suggests that globally, HCW in developing countries, work under appalling conditions. These poor working conditions are often what makes those health care workers leave their own countries and seek new openings. Over-crowded and outdated hospitals and clinics in poor countries exacerbate the frustrations of dedicated health workers. Often, they are asked to work without basic equipment, water, electricity or emergency transport. Many HCW in the developing world would prefer to stay in their home countries and serve their people, but they simply cannot live on the meager salaries offered to them.

Working conditions not only affect employee satisfaction but also impact important patient outcomes, including safety, quality of care and satisfaction.

From all the above, we can conclude that for a better health care system, with quality patient care, we need to improve our health care worker’s working life such as staff numbers, finances, career development, continuing education, transport and living conditions, hospital management and personal recognition and appreciation.

**Abdeljalil EL KHOLTI, Professor, Occupational Health Unit, Faculty of Medicine and Pharmacy, Hassan II University of Casablanca -Morocco**
Tuesday, October 22nd

Stefan Schmiedel

The Ebola Experience – sending HW to endemics and receiving infectious patients from abroad

The Ebola crisis occurred in West Africa in 2014, with many thousands of people contracting the disease. There were 25,000 cases of Ebola in Sierra Leone, Liberia and the Conakry region of Guinea. In Sierra Leone especially, the spread of the disease among the population spiraled out of control. The health professionals on the ground were overwhelmed and healthcare provision collapsed. Appeals were made internationally, amongst others by Médecins Sans Frontières (MSF), for trained medical personnel, to provide assistance.

To Sierra Leone with Médecins Sans Frontières
Stefan Schmiedel went to Sierra Leone with MSF. He worked there as a medical director in charge of one of the treatment centers, of which there were four at the time.

What measures were available to the medical staff to protect themselves from infection? What psychological protection is available for healthcare workers taking part in such a demanding humanitarian operation? And what was the situation like for medical personnel from the area?

Center for highly infectious diseases in Hamburg
2014 the UKE (the University Hospital in Hamburg-Eppendorf), treated a patient who had contracted Ebola, a 36-year-old World Health Organization (WHO) worker from Senegal, sent to Hamburg by WHO. This patient was kept under care for several weeks in the treatment center for highly infectious diseases, an extremely secure, isolated reception center and he survived. The idea of flying an Ebola victim to Germany met with a lot of opposition. Up to 2014 someone as ill as that was not to be transported across national boundaries. Lessons learned by this and how the center works.

Stefan Schmiedel, Dr. med., Senior Physician in the Department of Infectious Diseases and Tropical Medicine at the University Medical
Wednesday, October 23rd

Andrew S. Imada

“Achieving a Sustainable Health Care Workforce through Macroergonomics”

The challenge of providing a sustainable workforce for health work must be confronted with a broader systems perspective. While some risk factors can be addressed through physical ergonomics interventions, a macroergonomics approach should be used to address the attraction, selection and retention of these workers.

A broader systems perspective
This will require a whole-person perspective that encompasses physical, psychological, psychosocial and organizational dimensions of health work.

The macroergonomics approach often implies to work with people and organizations to change their cultures, respond to scalability demands, implement disruptive technologies and survive generational transitions. It helps them meet these challenges by balancing organizational, safety, quality, and human needs.

Existing models on risk reduction can be applied to this demanding and important work.

Andrew S. Imada, Ph.D., USA, Macroergonomics consultant specializing in human and organizational change. He is a certified professional ergonomist and has served as president of both the Human Factors and Ergonomics Society and the International Ergonomics Association. Imada was a Professor of Ergonomics and Safety Sciences at the University of Southern California for 19 years.
“Vision Zero” – how to create a culture of prevention

Accidents at work always have causes. Yet, these causes can be eliminated by building the safe and healthy working conditions and nurturing the culture of prevention. International research on the return on investments in prevention proves that every dollar invested in safety and health generates a potential benefit of more than two dollars in positive economic effects. The ISSA’s Vision Zero as a globally recognized concept beneficial to any workplace, enterprise or industry integrates the three dimensions of safety, health and well-being at work and has Seven Golden Rules. The rules have been developed by the ISSA together with participation of prevention experts from companies, authorities and social partners and have been successfully tested. We have followed these seven rules for the purposes of designing a survey and a prevention intervention in hospitals aiming to prevent most frequent accidents at work.

The results of the survey conducted in 2016 and 2017 in more than 50 general hospitals and in five largest clinical centers in Croatia showed that the health care industry continuously records one of the highest rates of workplaces accidents. Analysis of the data found that slips, trips and falls account for almost the third of all workplace accidents, often resulting in serious injuries, long sickness and absence from the workplace with huge financial costs for the system. It was concluded that there was a need for concrete measures that would assist employers in healthcare and help workers avoid injuries.

This is the story of the prevention intervention conducted within the Vision Zero campaign and the project „Promotion of Health and Safety at Work in Hospitals“.

Marija Bubas, MD, PhD, Croatian Institute of Public Health

Occupational and sports medicine specialist and a lecturer at the Faculty of Medicine Postgraduate study in occupational medicine (University of Zagreb, School of Public Health, Croatia). Former Head of Department for Education, Head of Division for Occupational Health and former Director of the Croatian Institute for Health Protection and Safety at Work, currently holding position of Assistant Director-General of the Croatian Institute of Public Health.

Co-author and author of many peer-reviewed scientific articles, co-author of a Handbook on Occupational skin diseases, Manual on exercises in prevention of lower back disorders and a Handbook on Evaluation of Workability. Participating in EU programs (e.g. COST Action Development and Implementation of European Standards on Prevention of Occupational Skin Diseases, COST Action Safety Culture and Risk Management in Agriculture and CA16216 - Network on the Coordination and Harmonization of European Occupational Cohorts, as a substitute member of the Management Committee.) Since 2014 in consultations for European Commission on occupational medicine issues and legislature updates.
In 2014 joins associations like European Network on Workplace Health Promotion (ENWHP), European Network for Education and Training in Occupational Safety and Health (ENETOSH) and International Commission on Occupational Health (ICOH). Also, since 2014 she was active in ICOH as Secretary of the Scientific Committee Education and Training in Occupational Health (SCETOH) and currently serves as SCETOH Chair. Since 2018 participates in European Association of Schools in Occupational Medicine (EASOM) as a member of the Board. Special interests: evidence-based practice, quality and effectiveness of education and information, workability assessment of workers with chronic medical conditions and early return to work.
Contacts of health workers (HW) to irritants and allergens such as wetwork, detergents, glove occlusion, disinfectants, medications etc. all too frequently result in irritant and/or allergic contact dermatitis, mainly of the hands. The point prevalence of contact dermatitis among HW is up to 30% and therefore approximately threefold higher compared to non-HW professionals.

Importance of health education – WHO hygiene guidelines often ignored
Recent studies have revealed the potential for prevention on the level of primary, secondary and tertiary prevention. In this context, next to thorough dermatological patient management, including patch testing, health education has been shown to be pivotal. That HW are trained in health-related subjects does not necessarily imply that the information on skin disease prevention is adequate and, if so, followed. Particularly the WHO hand hygiene guidelines are frequently ignored, even though skin bioengineering data clearly shows that epidermal barrier impairment can be minimised.

Increased risk to acquire nosocomial infections
Furthermore, taking into account, that HW affected by dermatoses run a 3-10 times increased risk to acquire (and afterwards spread) nosocomial infections, a particular emphasis has to be laid on making the recent achievements in prevention available to HW on an international scale. This is one of the aims of the current European “healthy skin @work” campaign and of the EU Horizon 2020 Project “StanDerm”, that recently defined minimum standards of occupational dermatoses prevention.

Swen Malte John, Dept. Dermatology, Environmental Medicine, Health Theory, University of Osnabrück Institute for Interdisciplinary Dermatological Prevention and Rehabilitation (iDerm) at the University of Osnabrück, Lower-Saxonian Institute of Occupational Dermatology (NIB).
Wednesday, October 23rd

William Buchta

New delivery systems and telemedicine in times of shortage of occupational health specialists

By 2030, the supply of health workers worldwide is estimated to have a shortfall of over 18 million workers, and occupational medicine is equally at risk of such shortages if we continue to offer services in the conventional manner. Expanding technology offers opportunities to mitigate that shortfall and even result in a surplus of health workers if applied properly. However, there are significant obstacles to meeting that goal, which will require collaboration of academia, industry, and government to overcome those challenges. Dr. Buchta will discuss those issues and present his recommendations for ensuring the best possible outcome to provide occupational health services for all workers in our lifetimes.

**Dr. Buchta** started his medical practice as a family physician in the US Air Force and left as an occupational medicine specialist after 21 years in service. He began an occupational medicine practice in La Crosse, Wisconsin, in 1992 and then moved his practice to Rochester, Minnesota, to join the Mayo Clinic for 15 years as their medical director for employee health. While there, he was active in both national and international occupational medicine and was the chair of the ICOH scientific committee on OH for Healthcare Workers from 2012 to 2015 and had been the chair of the American College of Occupational and Environmental section on Medical Center Occupational Health until he joined the ACOEM Board of Directors in 2008 and eventually served as ACOEM President until April of this year. After retiring from Mayo Clinic in 2016, he became Chief Medical Officer of a government contractor providing health services for military members and veterans for the next three years. He is now pursuing new avenues in occupational medicine while enjoying quality time with his family, including two newborn grandchildren, August and Olivia.
Wednesday, October 23rd

Rodney Ehrlich

Protecting HCWs from TB in high risk settings: we need a comprehensive approach

The 2018 Special Declaration on Tuberculosis of the UNGA included health care workers as a special population vulnerable to the risk of TB. This was accompanied by an ICOH Statement on comprehensive prevention of occupational TB in health workers. Despite numerous guidelines for prevention and management of occupationally acquired TB, implementation of protective practices is poor, particularly in high burden TB countries. A reconceptualization of the problem is needed.

The authors distill their experience in field research on occupational health, safety, infection control and prevention (IPC) in low- and middle-income countries, engagement with government decision makers in implementation, and experience in drafting a comprehensive policy on TB/HIV in health workers in South Africa.

We identify 5 cross-cutting tasks:

- Widen healthcare system thinking in this area from primary prevention (as IPC) to comprehensive primary, secondary and tertiary prevention.
- Persuade decision makers that IPC and occupational health are part of health system strengthening.
- Move beyond documenting failure to implement proximal protective practices to considering upstream or systems barriers. These include political will, appropriate budgeting, collaborative governance, occupational health services, management of technology and information systems to provide proper estimates of risk.
- Adapt policy to include legal and ethical issues, e.g. the role of mandatory screening for LTBI or TB, coverage of students, community health workers, workers’ compensation.
- Encourage health worker advocacy on this issue on the model of an organization of health workers in South Africa.

Rodney Ehrlich, Em. Prof., Senior Research Scholar School of Public Health and Family Medicine, University of Cape Town, South Africa.
Wednesday, October 23rd

Igor Bello

Risk Management in Health Centers: a gender approach.

A gender sensitive approach recognises that because of the different jobs women and men do, their different societal roles, the expectations and responsibilities they have, women and men may be exposed to different physical and psychological risks at the workplace, thus requiring differing control measures.

This conference addresses an approach that improves the understanding that all, the sexual division of labour, biological differences, employment patterns, social roles and social structures, contribute to gender-specific patterns of occupational hazards, and specifically in health centers activities.

Igor Bello, MA on Ergonomics and Psychosociology, Venezuelan Society on Occupational Health, Chair SC WHW, associate professor at the Simon Bolivar University, where he directs the cathedra of Human Engineering and Ergonomics, Venezuela.
Wednesday, October 23rd

Lorenzo Munar

Current and emerging issues in the healthcare sector, including home and community care.
Based on research carried out by EU-OSHA.

The European health care sector has a critical role to play in the achievement of the goals of the Europe 2020 strategy by contributing to the overall health and well-being of the workforce and society as a whole. In addition, the health and social care sector is also an important employer, whose significance is likely to grow in the context of demographic change. As a result, healthcare employers are not only affected by trends towards an ageing population in terms of the rising demand this places on service delivery, but also in the context of emerging labour market shortages resulting from declining birth rates.

Workers employed in the healthcare sector have to deal with a wide range of activities and environments that pose a threat to their health and put them at risk of occupational disease or work-related accidents. Many of the settings in which healthcare workers carry out their jobs and the multiplicity of tasks they perform when, for example, delivering frontline care for the physically or mentally impaired, handling patients or providing cleaning services, can present a great variety of hazards. Health workers are exposed to a large number of concomitant risks such as: biological risks, such as infections caused by needlestick injuries and other communicable diseases; chemical risks, including from drugs used in the treatment of cancer and from disinfectants; physical risks, such as from ionising radiation; ergonomic risks, for example, during patient handling; and psychosocial risks, including violence and shift work. The combination of these diverse risks makes healthcare a high-risk sector for workers.

In addition to the well-known hazards, there are several new developments and trends, the health and social care sector in Europe have to face, and these have resulted in a number of new OSH challenges that need to be addressed and overcome. These include demographic, epidemiological, social, technological and cultural trends within EU countries that have an impact on existing care patterns. Examples include increasing shortages of healthcare professionals; an ageing healthcare workforce with insufficient new recruits to replace those who are retiring; the emergence of new healthcare patterns to tackle multiple chronic conditions; the growing use of technologies requiring new skill mixes; and imbalances in skill levels and working patterns. These changes have an impact on the working conditions and ultimately on the well-being and safety of healthcare workers.

In the framework of this presentation – and based on studies carried out by EU-OSHA during the last years - the current and emerging OSH risks and issues for healthcare professionals will be addressed. How these issues affect the safety and health of healthcare workers and influence the overall service they provide will be addressed also.

Viviana Gómez-Sánchez

Pregnancy and immunization in the health sector

Immunization before or during pregnancy is paramount as not only the mother but also the offspring is at risk from preventable infections. Dr Gómez-Sánchez will highlight the different infections for which vaccination is available and which are of particular importance for pregnant health workers.

Dr Viviana Gómez-Sánchez, MD, is president of the Association for Occupational Medicine of Costa Rica and of the Latin American Association of Occupational Health (Asociación Latinoamericana de Salud Ocupacional – ALSO) COSTA RICA
Thursday, October 24th

Danileing Lozada

Workplaces adaptation for pregnant women in the health sector

Pregnancy, childbirth and the postpartum period are phases of a woman’s reproductive life in which occupational risk factors need to be evaluated to take preventive measures tailored to her condition to protect her health and that of the gestational baby.

This is especially important in pregnant women working in the health sector where it has been described (Kat et al.) that rates of pregnancy complications (premature birth, low birth weight, placental abruption, etc.) are higher in female physicians in comparison to the general female population.

Exposure to the following occupational hazards in health facilities have negative effects on both the fetus (premature birth, low birth weight, miscarriage, birth defects) and the mother (high blood pressure, musculoskeletal conditions, fatigue, dizziness, edema and varicose lower extremities).

1. **Physical and ergonomic factors of the workplace.**
   - Prolonged standing (more than 1 hour in a fixed position without moving, more than 4 hours per day).
   - Pronounced wrist positions of twisting, extension and lateral deviation in a sustained manner.
   - Manual material handling of heavy loads.

2. **Psychosocial factors.**
   - Night shift work on a regular or rotating basis.
   - Excessive workload (more than 40 hours per week).
   - Emotional stress (discrimination, conflicts between professionals and personal and family life) and physical.
   - The double working shift / lack of work – life balance

3. **Environmental factors.**
   - Exposure to chemicals (Methyl methacrylate (MMA), anesthetic gas, antineoplastics and other teratogenic drugs), radiation, biological factors (hepatitis B virus, CMV, HIV, chickenpox, Zika, etc.)

Based on these risk factors, it is important to provide recommendations to prevent or minimize them and protect the worker during her gestational period. In particular, we have focused on measures to prevent occupational risks in surgeons and workers in the emergency room during their pregnancy. All supported by standards and technical guides that exist in each country to achieve this goal.

In addition, there are protective measures for all pregnant workers, from an institutional point of view with a global, ethical and legal perspective. In this regard, the ILO establishing the Convention #183 established to protect the rights of workers before, during and after the birth of their child. It provides that each member country resources to act appropriately to ensure that maternity does not constitute a cause of employment discrimination. The main articles of this convention are maternal and child health protection, maternity leave, maternity leave on pregnancy or sickness complications, perks and benefits, employment protection, non-discrimination policies and breastfeeding protection.

Danileing Lozada, MD, Venezuelan Society of Occupational Health, Venezuela
Economic growth, poverty eradication, good health and food security are some of the sustainable development goals where decent work and healthy workers have a direct influence on its achievement.

Changes in the economy and the environment impact the nature of work and therefore the health of workers and their families. There is special concern over the most vulnerable groups and sectors, characterized by informal employment, precariousness and lack of access to basic occupational health services.

Within this context, nursing is a discipline that has much to contribute from its role in caring and through its comprehensive vision of human health. The intrinsic functions of this role, together with its focus on public health, community health and leadership skills, among others, situate nurses in an important role as actors within the teams providing occupational safety and health services, at different levels of prevention and ambits of action. Transdisciplinary work and a participatory approach are key elements in addressing new challenges. In this regard, available models and approaches provide a framework for addressing the integral health of workers.

Special attention should be given, mainly in developing countries, to the structural support for the training and positioning of occupational health nursing in the field of social security. Moreover, training in basic occupational health at the undergraduate level is a necessity in order to promote universal access to basic occupational health services, a key element in the search for decent work for all. Likewise, nurses and other health workers in remote or rural areas could address community health issues with additional confidence. Last but not least, this could be a motivating instance for further specialization of nurses in the area. The use of new technologies should be considered as an opportunity for this purpose.

Marie Astrid Garrido is a nurse graduated from the Austral University of Chile. Currently, she is a PhD candidate at the CIHLMU Center for International Health of the Ludwig-Maximilians-University in Munich. From the beginning of her career she dedicated herself to occupational health, working in the Chilean occupational accident and disease insurance. Since working on her master’s degree in International Occupational Safety and Health she focused mainly on health and working conditions in the informal sector and currently is part of the CIHLMU project team dedicated to occupational health and safety training for health workers in Latin America.
PARALELL SESSIONS
1/2/3

WEDNESDAY OCTOBER 23rd
### Wednesday, Oct. 23rd
13.30–17.00  Parallel Session 1
Ergonomics in Prevention of Musculo-Skeletal Conditions  
*Chairs: Acran Salmen-Navarro, Andrew Imada*  
*Room: Plenary Hall*

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**Piotr Karniej et al., Poland** |
| 13:45–14:00| **E2** Prevalence of MSE among Dentists and Dental Assistants in Germany  
**Daniela Ohlendorf et al., Germany** |
| 14:00–14:15| **E3** Anti-X Aprons and MSDs in Healthcare: a scoping Review  
**Maria Grazia Lourdes Monaco, Italy** |
| 14:15–14:30| **E4** Orthopedic health problems with personal radiation protection in Interventional Radiology  
**Alexander M. König, et al., Germany** |
| 14:30–14:45| **E5** Ergonomics solutions to prevent work-related musculoskeletal disorders (MSD) in Radiologists  
**Acran Salmen-Navarro, Venezuela/USA** |
| 14:45–15:00| **E6** The effects of ergonomic interventions on MSC in intensive care units  
**Ayşe Coşkun Beyan, Turkey** |
| 15:00–15:30| **Coffee break** |
| 15:30–15:45| **E7** Recommendations for prevention, rehabilitation and occupational reinsertion  
**Jean-Pierre Zana et al, France** |
| 15:45–16:00| **E8** Female ergonomics: manual patient handling in nursing  
**Igor Bello, Venezuela** |
| 16:00–16:15| **E9** Biomechanical Design Methodology applied for an assistive Exoskeleton in Healthcare Sector  
**Mark Tröster et al., Germany** |
| 16:15–16:30| **E10** Smart technologies to register and promote physical work capacity: Human Augmentation  
**Gustavo Adolfo Rosal López, Spain** |
| 16:30–16:45| **E11** Ergonomics: from risk assessment to quality of life at work  
**Jean-Pierre Zana, France** |
| 16:45–17:00| **Questions and Answers** |
Wednesday, Oct. 23rd  
13.30–17.00  Parallel Session 2  
Psycho-Social Exposure in Health Workers  
Chairs: Naesinee Chaiear, N.N.  
Room: Alters Land 1 (Old Country 1)

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<td>Adrian Loerbroks et al., Germany</td>
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<td>13:45–14:00</td>
<td><strong>PS2</strong> Work-related intervention needs and occupational outcomes in medical</td>
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<td>assistants Jessica Scharf et al., Germany</td>
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<td><strong>PS3</strong> Work stress among psychiatric nurses at hospitals in Colombo, Sri L</td>
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<td>Lanka Jeewaranga Gunasekera et al., Sri Lanka</td>
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<td>14:15–14:30</td>
<td><strong>PS4</strong> Burden of Occupational Stress among Nurses in Hospitals and Primary</td>
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<td>Care Setting Abdul Aziz bin Harith, Malaysia</td>
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<td><strong>PS6</strong> Working conditions of staff in social work with refugees &amp; homeless</td>
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<td>individuals Tanja Wirth et al., Germany</td>
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<td><strong>PS7</strong> The perspective of managers in hospitals on the mental stress of</td>
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<td>employees Britta Worringer et al., Germany</td>
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<td><strong>PS8</strong> Managing Job Stress to Improve Workers’ Well-being In Emergency</td>
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<td>Departments Gabriele d’Ettorre, Italy</td>
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<td><strong>PS9</strong> Concept and insight into initial experiences with the implementation</td>
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<td>of a complex intervention in the hospital Harald Gündel et al., Germany</td>
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<td>16:00–16:15</td>
<td><strong>PS10</strong> Fostering stress-preventive leadership in the workplace hospital</td>
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<td>Felicitas Stuber et al., Germany</td>
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<td><strong>PS12</strong> Violence at work and burnout in nursing – The moderating effect of</td>
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<td>after-care consultation Sylvie Vincent-Höper et al., Germany</td>
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<td>16:30–16:45</td>
<td><strong>PS13</strong> Age stereotypes and their association with work ability among</td>
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<td>hospital staff Jeannette Weber, Lilian Tzivan et al., Germany, Latvia</td>
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### Parallel Session 3

**Wednesday, Oct. 23**

**13.30–17.00** Parallel Session 3  

**Chairs:** Robert Orford, Mary Ross  
**Room:** Oak

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<td>The WGOIA and need for focus on occupational infectious diseases,</td>
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<td><em>Mary Ross, Chair of WGOIA, South Africa</em></td>
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<td>13:45–14:00</td>
<td>A country profile and challenges with occupational infections.</td>
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<td><em>Carmen Busneag, Teodora Ionescu, Romania</em></td>
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<td>14:00–14:15</td>
<td>OIA1 An embodied exercise targeting stigma towards health workers</td>
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<td>in Southern Africa, Annalee Yassi, South Africa</td>
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<td>14:15–14:30</td>
<td>Development of ILO Technical Guidelines on Occupational Exposures</td>
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<td>to Biological Hazards, Franklin Muchiri, ILO</td>
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<td>14:30–15:00</td>
<td>Interactive audience ‘brainstorm’ discussion and input for the ILO</td>
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<td>guideline <strong>Panel:</strong> Robert Orford, Franklin Muchiri, Teodora</td>
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<td>15:30–15:45</td>
<td>OIA2 Intervention of occupational exposure to blood-borne pathogens</td>
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<td>for HWs in China, Min Zhang, China</td>
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<td>15:45–16:00</td>
<td>OIA3 Acute hazardous work-related exposure to the eyes of health</td>
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<td>workers in a tertiary care hospital in South India – an observational</td>
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<td>study, Prathibha Obed, India</td>
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<td>16:00–16:15</td>
<td>OIA4 Blood and body fluid exposure and preventive strategies among</td>
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<td>healthcare workers in a tertiary hospital in South India, Obed John</td>
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<td>et al., India</td>
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<td>16:15–16:30</td>
<td>OIA5 Evaluation methodology of medical safety devices</td>
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<td>Rosa Maria Orriols-Ramos, Spain</td>
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<td>16:30–16:45</td>
<td>OIA6 2B or not 2B vaccinated? The ethical issues of influenza</td>
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<td>vaccination among HCWs, Wim Van Hooste, Belgium</td>
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<td>16:45–17:00</td>
<td>OIA7 European survey of Hepatitis B vaccination policies for health</td>
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<td>workers, Antoon De Schryver, Belgium</td>
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**E1**

The Importance of Ergonomics among the Medical Professionals in Poland – Cooperation of the Wroclaw Medical University and the ISSA

The presentation describes a model of cooperation between a public medical university and an international organization, dedicated to improving the health of medical personnel and its efficiency. The work is based on materials created in a framework of Polish-German cooperation – Wroclaw Medical University and ISSA. In the context of methodology, a focus group with key stakeholders involved in the establishment and continuation of cooperation was used, as well as the analysis of the desktop data.

**Results of Cooperation**

Courses of ergonomic were organized for Polish physiotherapists, nurses, paramedics who are currently responsible for the multiplication of their skills for training medical personnel in hospitals and students of health sciences. Also, the Laboratory for Ergonomics and Biomedical Monitoring was created, which is responsible for a scientific approach to the ergonomic researches on improving the working conditions of nurses and doctors in hospitals. Another result is a certification of coaches responsible for teaching university teachers and the personnel responsible for workplace safety in hospitals. The cooperation is continuous and an effective tool to raise the competence of health workers, responsible for the security of medical processes, for patients and employees.

International cooperation between medical universities and organizations responsible for the ergonomics and reducing accidents at work should be extensive. It leads to a transfer of competence, enables a joint research and allows to exchange the best experience of workers’ safety.

Piotr Karniej, Łukasz Rypicz, Izabela Witczak, Wroclaw Medical University, Department of Public Health, Joanna Rosińczuk, Wroclaw Medical University, Department of Clinical Nursing, Anna Kołcz, Wroclaw Medical University, Department of Physiotherapy

**E2**

Prevalence of MSE among Dentists and Dental Assistants in Germany

The latest findings on the prevalence of musculoskeletal disorders (MSDs) among dentists in Germany in 2001 showed that about 86.7% suffered from neck and back pain, of which 68.6% complained about MSDs weekly. Equivalent results for dental assistants exist neither in Germany nor worldwide. The aim of this survey was to update and widen the view on prevalence of MSD in the dental field.

1,041 subjects answered the online questionnaire, of which 588 were evaluated. These include 348 (59.5%; 208f/140m; 41.4±12.9 years) dentists/students of dentistry (group 1) and 238 (40.5%; 234f/4m; 33.4±9.5 years) dental assistants/trainees (group 2). The online survey included MSD-relevant questions from Meyer’s questionnaire, the Nordic Questionnaire as well as questions on the arrangement of the treatment unit and descriptive information from the participants. 67.2% work as general dentists or in general dental practices. 89.9% work in a seated position, while 52.8% rarely or never change their working position. In both groups, the most common complaints in lifetime prevalence were in the neck area (76%/91.2%),
followed by the shoulder area (63.1%/76.9%), thirdly in the lumbar spine area (55.4%/67.6%), the thoracic spine area in the fourth place (39.1%/52.5%) and the wrist/hand area (29.7%/43.3%). 4% in group 1 and 2.1% in group 2 never had complaints. With regard to the 12-month prevalence, similar data can be seen in the same order: neck area (72%/87.6%), shoulder area (53.6%/70.4%), lumbar area (44.6%/60.5%), thoracic area (33.9%/47.6%) and wrists/hands area (20.5%/32.2%). The arrangement of the treatment unit corresponded to 73.5% of the basic concept 1 (according to Kimmel), followed by basic concept 3 (11.4%). 76.9% of the participants are very satisfied to fairly satisfied with their basic concept.

The data refer to the still high actuality of MSD among dentists (students) and show that dental assistants (trainees) have to cope with the same issues. The findings emphasize the need for ergonomic research regarding the combined workplace of dentists and their assistants. The seated working position at low position changes should be an important research component. Whether the most frequently used basic concept 1 is also preferable from an ergonomic point of view can be determined in biomechanical analyses.

Daniela Ohlendorf, Davis Groneberg, Johann Wolfgang Goethe University Frankfurt, Institut for Occupational, Environmental and Social Medicine, Frankfurt a. M., Germany

**E3**

**Anti-X Aprons and MSDs in Healthcare: a scoping Review**

Interventional radiology activities and other medical practices using ionizing radiation (e.g. by cardiologists, orthopedists, gastroenterologists) are increasing. Therefore, effective protection of workers against radiation should be guaranteed as well as ergonomic work organization.

**Anti-X aprons and work-related MSDs**

The use of heavy anti-X aprons, in association with awkward postures and non-ergonomic working conditions, might cause the onset of musculoskeletal disorders (MSDs), exacerbate already existing ones, cause discomfort, fatigue or awkwardness of movement. Therefore, an important aspect is to evaluate the fitness of the lead apron used for those workers already affected by MSDs.

The present scoping review aims to evaluate the potential association between wearing anti-X aprons and work-related MSDs. Therefore, a twenty-year scoping review of articles (1990-2019), was conducted in the PubMed, Scopus and Web of Science databases, concerning the association between anti-X aprons and MSDs. Articles were reviewed to identify the eligible studies. Twelve articles were finally included. The populations evaluated were represented by interventional physicians, nurses, and technicians. Six studies had, as the main objective, to assess the possible association between use of anti-X aprons and MSDs. They showed a higher prevalence of MSDs among interventional physicians, not always associated with lead aprons. Four studies evaluated the type of aprons. None investigated their impact on fitness for work assessment, particularly in subjects with MSDs.

Maria Grazia Lourdes Monaco, Occupational Physician at Occupational Medicine, University Hospital of Verona, Italy

Main scientific interest: Ergonomics (with particular reference to biomechanical overload evaluation); Health surveillance and fitness for work; Biological risk with particular reference to HW.
Orthopedic health problems with personal radiation protection in Interventional Radiology

Several studies in literature report occupational orthopedic health problems among interventional cardiologists. Similar health problems can also be expected with interventional radiology personnel. An online survey was done to assess the frequency of such health problems in interventional radiology personnel with the use of personal radiation protection apparel. 1,427 invitations to an anonymous online survey that comprised of 17 questions were sent via e-mail to interventional radiologists in Germany, Austria and Switzerland. The questions were focused on the use of personal radiation protection apparel and work-related orthopedic health problems.

There were 221 survey responders (15.5% response rate). 47.7% suffered from more than five episodes of orthopedic problems during their interventional career. Lumbar spine was involved in 81.7% of these cases, cervical spine in 32.8%, shoulder in 28.5% and knee in 24.7%. Because of orthopedic problems, 15.8% of the responders had to reduce and 2.3% had to stop their interventional practice. 14.2% of all responders use lightweight personal radiation protection apparel. Out of this group, 6.7% had to reduce and no one had to stop their interventional practice because of orthopedic problems. This survey indicates a link between the type and use of radiation protection apparel and incidence of occupational orthopedic health problems. Due to the low number of responders wearing light radiation protection apparel, a significant statement of the protective factor could not be established.

Alexander M. König, Rohit P. Thomas, Simon Viniol, Andreas H Mahneken, Phillips University Marburg, Department of Radiology, Marburg, Germany

Ergonomics solutions to prevent work-related musculoskeletal disorders (MSD) in Radiologists

Healthcare organizations are always being challenged to provide quality care while improving accuracy, efficiency and accountability and guaranteeing productivity. In addition to other stress factors due to staff shortages, space constraints and implementation of new technologies without the proper training. The application of ergonomic principles in settings, such as a hospital radiology department, can serve as a model for other healthcare sectors. Ergonomic approaches can reduce the frequency and severity of repetitive strain injuries (RSIs) and improve radiologists’ productivity but are multifactorial and involve nearly all aspects of the radiology workplace.

Evolving from film-based radiology into a computer-based digital environment of picture archiving and communication systems (PACS), was a big technologic achievements in radiologist settings, expecting to convert, with associated cost savings and improved physician communication. The digital “soft-copy” images workstation has been used by physicians to display these; however, difficult technical challenges, workstation settings, repetitive motions and postural restraints have increasingly raised concerns of work-related musculoskeletal disorders.
Radiologists’ workplaces revolving around PACS and digital imaging use technologies that can lead to repetitive strain injuries, many of which can be aggravated or exacerbated by specific settings of a radiology practice environment. Ergonomic assessments and interventions, such as adapting the workstation to the working population anthropometrics, proper reading room structure, lighting, temperature, noise, and equipment setup, can help decrease the frequency and severity of repetitive strain injuries and improve radiologist productivity. However, ergonomic approaches can be complex, include all aspects of the radiology practice environment.

We have designed an intervention method based on a participatory approach, involving the users to the decision makers along with proper training guaranteeing sustainability in a preventive culture, productive and providing compassionate medical patient care.

*Acran Salmen-Navarro, Venezuela/USA*

**E6**

**The effects of ergonomic interventions on MSC in intensive care units**

Intensive care units (ICUs) are identified as having the one of the high occupational risks in terms of ergonomic factors. Musculoskeletal complaints (MSCs) development among nurses working in ICUs is caused by physical and psychosocial factors, such as standing for long hours, heavy lifting, working with monitors, bending and awkward position. The frequency of MSCs in the previous months were reported approximately 80%. MSCs can have important consequences on quality of life that might result in absenteeism and work constraints. Therefore, exploring the benefits of interventions in ergonomics to protect and prevent MSCs in ICUs workers is a great concern in occupational health and safety services in health care settings.

We aimed to evaluate the effect of tailored ergonomic interventions on musculoskeletal complaints in ICUs.

ERGO team was created by the occupational health department in the hospital. The socio demographic data were obtained by a questionnaire. Cornell Musculoskeletal Discomfort Questionnaire was used for musculoskeletal symptoms assessment. The higher values obtained in Cornell represent the higher MSCs. Walk-through survey performed to determine main jobs and tasks in ICUs. The Rapid Entire Body Assessment (REBA) scale was used to assess the ergonomics risks for the nurses. According to the REBA scores, two most risky movements were determined and ERGO team created an ergonomics training program. The study was carried out in nurses working in intensive care unit in internal medicine department (IMICU- intervention group) and anestesia department (AICU- control group).

Interventions were included stretching exercises during the shiftsuse of auxiliary devices and proper handling and lifting. 18 months after the trainings, two groups were compared in terms of the frequency of MSCs.

In the first evaluation, 35 nurses from the IMICU and 29 nurses from the AICU participated in the study. 27 nurses from IMICU (77%) and 23 nurses from the AICU (82%) were reached in the final evaluation. There were 34(75.6%) IMICU and 19 (67.9%) nurses in AICU that have MSCs in the initial assessment. There was no statistically significant difference between the IMICU and AICU nurses in terms of age, sex, Cornell total discomfort score and the frequency of musculoskeletal complaints in the initial assessment (p>0.05 for all). There was no statistically difference between the groups in terms of total Cornell scores and musculoskeletal complaints (p=0.8, p=0.1 resp.) in the final evaluation. No significant difference was found between
Cornell scores in terms of values before and after intervention (ICU p=0.1, AICU p=0.6). However, the total Cornell score of 10 nurses working in IMICU decreased compared to the previous evaluation, while in the AUICU 6 people improved (p: 0.83).

Interventions based on occupational health education lectures, on-site ergonomics training, training brochures showed a limited positive effect on prevention and control of the occurrence of work-related musculoskeletal disorders in nurses. Engineering control measures need to be developed in order to effective prevention in ICU workers.

**Literature:**


*Ayşe Coşkun Beyan*, Dokuz Eylül University, Izmir, Turkey

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**E7**

**Recommendations for prevention, rehabilitation and occupational reinsertion**

For most countries, musculoskeletal disorders (MSDs) are still a major occupational health concern. It is therefore in everyone’s interest to have effective prevention and rehabilitation practices.

In order to compare the approaches of different countries for the prevention of work-related musculoskeletal disorders as well as the rehabilitation and reinsertion of workers with MSDs, the Ergonomics Working Group of the Health Services Section of the International Social Security Association has decided to carry out a questionnaire-based survey.

This questionnaire has been addressed to stakeholders that, directly or indirectly, are faced with the issue of work-related MSDs: accident insurance bodies, rehabilitation centres and their therapists, occupational physicians, human resource departments, professional organisations, trade unions, companies, etc.

The results have been analysed, they show a great disparity of modes of action both in prevention and rehabilitation. The Ergonomics Working Group of the ISSA Health Services Section will provide its conclusions and recommendations to advance the return to employment and job retention for these pathologies, which predominate in all countries.

*Jean-Pierre Zana*, ZConcept, Paris, France. Ergonomist, Expert in international standardisation, Consultant, member of Ergonomics Working group of the ISSA health Section

E8

Female ergonomics: manual patient handling in nursing

Musculoskeletal disorders (MSDs) are one of the most common health impairments in nursing. Women tend to suffer more from pain in the upper back and upper limbs as a result of patient handling and prolonged times standing, and this is accentuated during pregnancy.

The 5th European Working Conditions Survey of 2010 showed that European workers, men and women continue to be exposed differently. For example, 13 per cent of women, but only five per cent of men, lift or move people as part of their work. However, protective legislation does not always relate to the risk factors for MSDs found in women’s work. For example, the European Union’s answer to the increase of MSDs has been to regulate the manual handling of loads on terms more generally applicable to male than female work, i.e. taking a male worker as the standard worker. However, more recently the European Commission has included in the Commission’s Staff Working Document on Actions to implement the Strategy for Equality between Women and Men 2010-2015, measures that take account of the gender aspects in ergonomics and work-related musculoskeletal disorders (WRMSDs), as well as in the preparatory work for a possible review of Directive 2004/37/EC on MSD.

This presentation analyse the evolving models for patient handling tasks, under a critic view, covering different organizational and biomechanical aspects, and incorporating some proposals for a gender sensible approach.

Igor Bello, associate professor at the Simon Bolivar University, Director of the Department of Human Engineering and Ergonomics. Secretary of the scientific committee on WOMAN, HEALTH & WORK at International Commission on Occupational Health (ICOH), Country Director of the Latin American Association of Occupational Health (ALSO) and Vice President of the Venezuelan Society of Occupational Health (SOVESO), Venezuela

E9

Biomechanical Design Methodology applied for an assistive Exoskeleton in Healthcare Sector

Mark Tröster¹, Christophe Maufroy², Schneider¹²
¹Institute of Industrial Manufacturing and Management, University of Stuttgart, Germany
²Fraunhofer Institute for Manufacturing Engineering and Automation IPA, Stuttgart, Germany

Abstract — Physical assistance systems, e.g. exoskeletons, are promising solutions to prevent work-related musculoskeletal disorders (WRMDs). Manual pushing, pulling and lifting during healthcare activities require practical and efficient assistive devices.

An application-oriented design methodology for developing physical assistive exoskeletons is described and applied for patient transfer in the pre-op waiting room. Preliminary results of a workshop with end-users and biomechanical lab measurements with specialized caretakers point out significant relief potential in the lower back and shoulder area of the musculoskeletal apparatus.
I. MOTIVATION
Demographic change is forcing employers to provide more technical assistance systems for their staff to relieve burden on the musculoskeletal system enabling a longer, healthier and safer working life. Especially for the lower back, shoulder and neck area, an increase of WRMDs has been observed among registered nurses [1]. Research and development in the field of assistive devices has attracted worldwide attention over the past two decades. Therefore, an application-oriented design methodology has been established at Fraunhofer IPA to achieve practicable and efficient technical solutions.

II. METHOD
An exoskeleton system works symbiotically with the human musculoskeletal apparatus. The interaction between the exoskeleton and the human body determines whether and how the exoskeleton can assist the desired movements. A central issue in the design process is thus to analyse and understand the response of the human body to external forces and torques exerted by the exoskeleton. The human-exoskeleton system in the design methodology is composed of two modules: (i) A human body and (ii) an exoskeleton model. The musculoskeletal human model includes all significant bones, joints and muscle elements of the human. The exoskeleton model contains all segments, joints, passive elastic elements and motors of the exoskeleton. The two modules are connected and form one single mechanical system in the analysis framework.

Within this framework [3] an optimization loop minimizes load and posture relevant biomechanical load parameters. Included in the optimization approach aspects of anthropometry and muscle strength of the human are considered as well.

III. PRELIMINARY RESULTS
For the application “patient transfer in the pre-op waiting room” [3] the field study has been done in a hospital (Diakonie-Klinikum) in Stuttgart whereby important additional requirements could be specified. Hygiene and practicability are central demands for the aimed device. Based on the field study highly stressing postures of the caretakers during patient transfer scenario were identified, measured in the biomechanical lab and analyzed regarding significant human muscle and joint loads.

The highest stress occurred during pushing the patient (see Fig.2) wherein high loaded compression forces in the lower back between L4/L5 came up to 3200 N. High compression forces (up to 1400 N) were also identified in the glenohumeral joint for pulling during patient transfer.

Fig. 1: Design-Optimization-Loop and Exoskeleton-Human Model

Fig. 2: Biomechanical Lab Measurements and Analysis Model
IV. FUTURE WORK

Based on the human-exoskeleton-model, technical design parameters for the desired exoskeleton and musculoskeletal relief relevant joint and muscle load parameters will feed the optimization loop. As the preliminary study shows, the main aim will be to reduce joint loads in the lower back and shoulder area. The model-based design concept will be realized as a research demonstrator and iteratively improved by end-user feedback, collected through lab evaluation tests.

REFERENCES


E10

Smart technologies to register and promote physical work capacity: Human Augmentation

The emergence of exoskeletons in the labor market is being very strong and the possible improvement that can lead to users seems to be very important. Many are the sectors (health, automotive, logistics ...) that are beginning to make use of these ergonomic help devices. On the other hand, for more years now, the use of smart clothes has appeared (greatly in the sports world). This type of clothing allows to know the physical demands of a task in real time. One of these records is the electromyography (EMG).

Human Augmentation, may also be called human 2.0, is generally used to refer to technologies that enhance human productivity or capability, or that somehow add to the human body. The assessment of the use of an exoskeleton is made from the muscular load measurement monitors non-invasively easily and comfortably. Knowing your muscles and how they are affected by different circumstances lets you know the degree of effectiveness of the use of the exoskeleton.

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E11

Ergonomics: from risk assessment ... to quality of life at work

“The approach of risk assessment to the quality of life at work” is the reflection of more than 10 years of research-action for the appropriation of ergonomics by companies. This experiment began in 2007, at the request of the actors of the National Technical Committee of the chemical branch of the French National
Social Security fund for workers. It has continued in companies in this sector and other sectors up to the present day. The perpetuation of this approach is linked to the training-action of referents in applied ergonomics. Each day they deploy their knowhow based on ergonomic principles in order to improve the working conditions and the quality of life at work of employees.

The Vision Zero campaign, developed by ISSA, (International Social Security Association) allows these companies to act on the three axes: the promotion of health, the prevention and return to work of employees who have had an accident or who are suffering from a work-related pathology.

The process is deployed in four consecutive stages.

1. **Ergonomic diagnosis**
2. **The network of referents**
3. **Preventive actions**
4. **The perpetuation of the actions**

The company and all stakeholders are committed to a better understanding of work through the diagnosis of work situations. Ergonomic diagnostics are the first tools to mobilize and share within multi-disciplinary groups of actors: managements, staff representatives, collaborators, etc. This step allows you to grasp the problems in their entirety and their interdependence and to encourage employees to get involved in improving their working conditions.

The creation of a network of ergonomists referents from different trades, ensures the management of the approach on the ground. Trained in the analysis of work, they meet on average twice a year to exchange on their practices and continue their training. Their areas of application concern both the analysis and improvement of existing situations and the design of new installations.

The setting up of workshops involving the greatest number of actors promotes the improvement of working conditions and the deployment of a new culture of prevention.

Cross-confrontation is an effective tool for collective appropriation of work. The workshops are used as a transformation laboratory based on the transversal sharing of knowledge and understanding of the work.

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Medical assistants’ burnout, work engagement, and medical errors

Burnout - defined by its three key dimensions exhaustion, depersonalization, and perceived reduced accomplishment (1) - is common in health care professions. Further, burnout is associated with the delivery of poorer patient care (2). More recently, the concept of work engagement has emerged. Work engagement may be conceptualized as the beneficial counterpart of burnout and its respective dimensions are vigour, dedication and absorption (1). The limited available evidence has found engagement to be associated with better patient care (3, 4). We aimed to examine associations of burnout and work engagement with self-reported medical errors among medical assistants (in German: Medizinische Fachangestellte). While medical assistants carry out various tasks that are relevant to the quality of care, potential links of burnout and work engagement with patient care have not yet been addressed in this professional group.

Between September 2016 and April 2017, we surveyed 994 medical assistants. We used a six-item version of the Maslach Burnout Inventory to measure the two burnout dimensions exhaustion and depersonalization. These two dimensions have been found to be the most relevant dimensions for outcomes among health care staff (3, 5). Increasing scores reflect higher levels of exhaustion and depersonalization, respectively. Six items from the Utrecht Work Engagement Scale were included to assess vigour and dedication with higher scores indicating higher levels of each construct. Participants further reported whether they are concerned that they have made a major medical error in the last three months (6). In statistical analysis, burnout and work engagement scores were used both as continuous variables (i.e., z-scores) and categorized variables (i.e. highest tertile vs remaining tertiles) and associations with medical errors were examined using multivariable logistic regression.

We used data from 887 medical assistants who reported to be employed at the time of data collection (mean age=39.28 year; 98% women). Participants with high levels of emotional exhaustion had doubled odds compared to those with low exhaustion to report concerns to have made a major medical error (odds ratio [OR]=2.00, 95% confidence interval [CI] =1.09-3.66). By contrast, depersonalization was unrelated to medical errors (OR=0.78, 95%CI=0.40-1.52). Both high vigour (versus low vigour) and high dedication (versus low dedication) were associated with substantially reduced odds of reporting concerns to have made a major medical error (OR=0.32, 95%CI=0.14-0.74 and OR=0.25, 95%CI=0.11-0.61, respectively). Analyses with z-scores yielded the same pattern of associations.

Emotional exhaustion was positively associated with concerns of having made medical errors while vigour and dedication showed strong inverse associations. If corroborated by future research, our findings suggest that burnout prevention and/or the promotion of work engagement may be conducive to the delivery of patient care.

Literature


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PS2

Work-related intervention needs and occupational outcomes in medical assistants

The intention to leave (ITL) one’s employer has been identified as a strong predictor for actual staff turnover, which produces high costs due to refilling vacant positions as well as the loss of organizational productivity and knowledge (1). ITL has been identified as a particularly important issue for the health care sector. In Germany, medical assistants (MAs, German: Medizinische Fachangestellte) represent the largest occupational group in outpatient care and usually provide basic clinical and administrative assistance in physician practices (2). Working conditions of MAs have been characterized as precarious and workplace-related intervention needs have been identified (3). However, strategies to change the MAs’ adverse working conditions are mostly seen on an individual level, including leaving the employer or even the profession. Therefore, the objective of the present study is to analyse the potential association of previously identified work-related intervention needs with ITL.

Data was collected by means of a nationwide survey among medical assistants (n=994) in Germany between September 2016 and April 2017. Work-related interventions needs (the independent variables) were measured by a 12-item instrument, which included the subscales working conditions, reward from the supervisor and task-related independence. We used subscale-specific z-scores and a total needs z-score. Both outcome variables (i.e. intention to leave the employer and intention to leave the MA profession) were dichotomized and logistic regression analyses were performed and limited to MAs in employment (n=887). Estimates were adjusted for age, sex, gross salary, employment status, leadership position and practice size.

We found statistically significant associations between all types of needs and both occupational outcomes (ORs≥1.55). Furthermore, increasing needs according to the categorized total needs score were associated with increasing odds of reporting the consideration to leave one’s employer or the profession. Needs pertaining to working conditions and reward from the supervisor were the strongest determinants of both occupational outcomes with ORs ranging from 1.46 to 2.61.

Our study identified unmet work-related intervention needs that are associated with unfavorable occupational outcomes. In light of staffing shortage in the health care sector, the identified needs should be addressed to ensure that sufficient recruitment of junior staff in the profession of medical assistants remains feasible and that experienced staff is retained.


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PS3

Work stress among psychiatric nurses at hospitals in Colombo, Sri Lanka

Work stress among nurses in psychiatric nurses is an emerging occupational health problem. Work stress has physical, psychological and emotional effects. Psychiatric wards differ from other wards in many characteristics. Studies on this in Sri Lanka is limited.

We conducted a descriptive cross-sectional study among every nurse (n=345) working in three in-ward psychiatric wards in the capital district of Colombo; National Institute of Mental Health, National Hospital of Sri Lanka and Colombo South Teaching Hospital. We gave a self-administered questionnaire which composed of two parts; validated Job Content Questionnaire and questionnaire on correlates. Prevalence of Work Stress was measured using two indicators according to Karasek dynamic job strain model, namely; ‘High Job Strain’ (HJS) and ‘Iso-strain’ (IS).

89.5%(n=309) nurse responded. The prevalence of HJS and IS was 37.2% and 21.4% respectively. Factors significantly associated with HJS were; being single (OR=1.84, 95%CI=1.15-2.95), working long hours (OR=1.71,95%CI=1.05-2.78), violence by patients (OR=3.45,95%CI=1.81-6.57), verbal abuse by patients (OR=3.11,95%CI=1.80-5.39), mental health concerns (OR=2.68,95%CI=1.595-4.40), stigma (OR=2.21,95%CI=1.24-3.94), lack of assistance (OR=4.56,95%CI=1.68-12.27), difficulty in obtaining leave (OR=2.98, 95%CI=1.48-6.00), unsatisfactory welfare (OR=1.62,95%CI=1.01-2.59) and poor work recognition (OR=2.89,95%CI=1.68-4.96).

Factors associated with Iso-strain were; physical violence by patients (OR=3.45,95%CI=1.50-8.05), poor co-worker assistance (OR=7.27,95%CI=2.81-18.78) and difficulty in obtaining leave(OR=2.18,95%CI=1.04-4.55). The prevalence of HJS was significant among nurses. A large proportion from them were exposed to IS as well. Several factors unique to in-ward psychiatric facilities were significantly associated. A screening programme on work stress and an administrative plan to minimize violence is recommended.

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Burden of Occupational Stress among Nurses in Hospitals and Primary Care Setting

Prevalence of stress among nurses is high in many countries including Malaysia, ranging from 24.9% to 75.8%²⁻⁵. Stress has been identified as a significant cause of economic loss¹ which makes occupational stress an important occupational health problem. This more so for Selangor which is Malaysia’s main economic driver contributing 23% of the national gross domestic product (GDP). This study aimed to determine the prevalence of occupational stress among nurses and its association with occupational and family factors.

A cross-sectional study among nurses from 12 hospitals and 202 primary healthcare settings were selected using simple random sampling through Microsoft Excel Software with a total of 753 nurses participating in the study. Study instruments used were Nursing Stress Scale⁶ (NSS) and Personal Stress inventory⁷ (PSI), which has both been validated locally. Multiple logistic regression was used to determine the associations and risks.

Overall prevalence of stress among nurses in Selangor was 27.1% with 29.4% and 22.7% among nurses who worked in hospitals and primary care facilities, respectively. Occupational factors identified to increase risk of stress among nurses were, lack of supports from peers (OR=1.20 (95% CI: 1.07-1.35), conflicts with doctors (OR=1.19 (95% CI: 1.08 – 1.32), conflicts with peers (OR=1.13 (95% CI: 1.04-1.24) and burden of work (OR=1.13 (95% CI: 1.06-1.20). Family and household factors were also found as significant factor for stress among nurses (OR=1.22 (95% CI: 1.18-1.26) with 1.5 fold higher risk for stress among nurses with household income between RM 2800 – RM 3000 (€435 – €650).

Health administrators should address occupational stress among nurses particularly in hospital with special skills needed. Stress among nurses, not only affect their health, it may also affect their performance at work and provision of quality care. Therefore, to deliver optimal services, nurses need to be psychologically healthy. A review of nurse’s salary and shift hours should be in considered in the action plan to reduce stress among nurses.

Literature
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Protective resources of nurses in general and specialized palliative care in Germany

Occupational health studies mainly focus on the negative impact of work demands on health. Studies on protective resources are rare, although the promotion of protective resources in the workplace is considered particularly important [1, 2]. Studies in the context of palliative care in Germany include in particular nurses on palliative care wards and hospices [3, 4].

The aim of the study* was to identify and compare the resources of nurses in general (GPC) and specialized (SPC) palliative care in Germany.

In 2017 n = 437 nurses of the GPC (response rate: 17%) and n = 1.316 nurses of the SPC (response rate: 39%) took part in the cross-sectional study in Germany. The following question was asked, „How much do the resources help you to handle the workload?“. The response categories were: “very”, “pretty”, “little”, “not at all”. Univariate analyses were conducted.

36% of the GPC and 44% of the SPC nurses were 50 years or older. 30 years or younger were 17% of the GPC and 8% of the SPC nurses. The majority of nurses were female (GPC: 90%; SPC: 85%). In the GPC, 79% of the nurses worked in an old / nursing home and 21% in an outpatient care service. 26% of the SPC nurses worked in a specialized outpatient palliative care service, 34% in palliative care wards and 41% in hospices. The following professional resources were rated as “very helpful” or “pretty helpful” in dealing with workloads: “patients’ gratitude” (GPC: 91%; SPC 93%), “thanks from the relatives of the patients” (GPC: 85%; SPC 93%), “meaningfulness of work” (GPC: 77%; SPC 92%).

20% of the GPC nurses had an additional qualification and 75% had no additional qualification in palliative care, while 80% of the SPC nurses had and 15% had no an additional qualification in palliative care. 4% of the nurses of the GPC and 5% of the SPC were currently gaining an additional qualification.

Nurses of the SPC had more professional resources than GPC nurses. The difference in estimating the “meaningfulness of work” as a resource between the two areas is quite large and has to be further investigated. Future GPC nurses prevention programs should focus and strengthen occupational resources, in line with the resources of the SPC nurses. Furthermore, it should be examined to what extent a mandatory additional qualification would be useful in both areas.


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PS6

Working conditions of staff in social work with refugees & homeless individuals

The refugee and homeless population has been increasing worldwide in recent years. Staff in social work provide practical help to these populations, but often struggle with high job demands. This scoping review aims to systematically map the job demands, resources, mental health problems, coping strategies and needs of staff in social work with refugees and homeless individuals. Relevant studies were identified by searching seven electronic databases from their inception until the end of May 2018, as well as Google Scholar and reference lists of included articles. The methodological quality of the included studies was assessed using the Mixed Methods Appraisal Tool. A thematic analysis was conducted.

Twenty-five studies were included in the review. Fourteen studies followed a quantitative, six a qualitative and five a mixed-method approach. Most studies were conducted in the homeless sector (56%), in North America (52%) and Europe (36%) and published after the year 2009 (68%). For fifteen studies, the study quality was only rated as low or moderate. Common job demands included the bureaucratic system, high caseloads, clients’ suffering and little experience of success. Maintaining professional boundaries counted both as a job demand and a coping strategy. Deriving meaning from work and support from the team were identified as important job resources. The prevalence of mental health problems among staff was difficult to compare due to the use of different instruments in studies. Staff expressed a need for ongoing training, external counselling and supervision.

Studies in this specific field are still relatively sparse. Further studies could examine how resources can be strengthened and job demands can be reduced by effective workplace health interventions.

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PS7

The perspective of managers in hospitals on the mental stress of employees

The working conditions in hospitals are characterized by occupational stressors such as high number of working hours, high workload, time pressure and high responsibility for patients, which leads to a potentially harmful psychosocial stress situation for medical and nursing staff. Representative surveys showed that almost every second (48.7%) surgical hospital doctor in Germany (Klein et al., 2010), and almost one in three nurses (30.1%; Aiken et al. 2012) is affected by burnout. Research indicates that there is a strong association between leadership behaviour and employee health (Gregersen et al., 2010). Interestingly, studies suggest that supervisors rate their own influence on employee health as low (Stadler & Spieß, 2005). As workplace health promotion programs can only be successful and sustainable if they are supported by managers, it seems important to explore what upper-level hospital managers think and know about their employees’ psychosocial stress factors.
Semi-standardized interviews with N=36 upper-level managers (head physicians, senior physicians and head nurses) were carried out in one German hospital. After transcribing the interviews, these were structured, and software-based content-analyzed according to Mayring (2010) based on the guideline for the mental risk assessment of the Gemeinsame Deutsche Arbeitsschutzstrategie (GDA) with a deductive-inductive approach. The reliability of the coding system was acceptable (Cohen’s $\kappa > .65$).

We observed that the majority of managers were aware of the importance of employees’ mental health at work. With respect to stressors and resources, they reported to observe considerably more stressors than resources in general, especially regarding stressors due to work organization (shortcomings in staff, time pressure, short breaks, high work load) and emotional demands originating from the work task (such as dealing frequently with severe illnesses and death, or feeling guilty not to have enough time for the patients). Most reported resources were social support by the supervisors and colleagues such as taking time for a debriefing after difficult situations and to show a supporting attitude. However, due to organizational limitations such as shortcomings in staff, medical and nursing managers feel limited in their ability to support their employees.

This study contributes to a better understanding of managers’ perspectives on mental stress of hospital staff. Since we do not know if mostly previously sensitized managers have participated, we cannot rule out the presence of selection bias. However, the interviews show a wide range of different viewpoints. Thus, the study provides important guidance for the development of interventions that aim to actively involve managers in workplace mental health strengthening activities.

**Literature**


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**PS8**

**PS8 Managing Job Stress to Improve Workers’ Well-being In Emergency Departments**

The current heavy cost-containment interventions due to the economic crisis in European countries have had a great impact on the health status of both the population and healthcare workers alike that working is generally related to positive health for workers. However, workplace stress is a major problem, and it has been suggested that healthcare workers employed in Emergency Departments (ED) are particularly affected by the organisational change required by the new work environment, rendering them more vulnerable to
work related stress and prone to experience its effects due to specific occupational risk factors linked with the ED healthcare professions, such as three shift work, high exposure to physical and biological risks, variable workloads, and increasing and unpredictable job demand. The research questions of the study: Do organisational level interventions mitigate job stress in ED workers? Which interventions should managerial staff prioritize to mitigate job stress?

A retrospective observational study was performed following the STROBE statement guidelines, with the aim to detect and analyse the level of job stress associated with organizational changes by six Italian EDs. The authors performed a risk evaluation of job stress through interviews with managerial staff of each ED, to investigate the objective indicators of job stress. The interviews were conducted using the multidimensional validated tool developed by the Italian Network for the Prevention of Work-related Psychosocial Disorders. The Job Content Questionnaire and the Rapid Stress Assessment scale were administrated to 710 registered nurses of the six EDs, before and after organizational level improvement interventions targeted on job stress. Data were collected over a 7-month period.

In this study the risk of job stress among nurses of EDs was minimized through organisational level interventions performed by the management staff; in particular, interventions targeted at the work context area of the healthcare organization have proven to be effective in reducing both objective and perceived job stress to a low level among nurses and, consequently, improved workers’ wellbeing.

The Rapid Stress Assessment Scale showed that significantly the level of perceived job stress was greater before organisational interventions then after such interventions; in particular, ED nurses showed higher level of anxiety and felt the lack of social support more than after improvement interventions. The lack of teamwork, low supervisor support to nurses and the lack of workers’ involvement in decision-making, were the main work context issues focused by improvement interventions.

Many studies have highlighted the effectiveness of organisation-level workplace interventions, rather than interventions targeting individual behaviour, to produce more sustainable effects on the health of healthcare employees. This is also supported by the occupational health principle of “hierarchy of controls.” Montano et al. show that success rates are higher when more comprehensive interventions tackling material, organisational, and work-time related conditions are performed simultaneously.

**Literature**


**Gabriele d’Ettorre**, occupational physician, professor of occupational medicine at the University of Bari. Since 2011 Director of the Department of Occupational Medicine, Local Health Authority of Brindisi, Italy; Prof d’Ettorre has published numerous articles concerning job stress and the impact of the organization on the workers’ well-being in healthcare sector. Currently he is Director of the company project for stress prevention in the Local health Authority of Brindisi, Italy.

**PS9**

Concept and insight into initial experiences with the implementation of a complex intervention in the hospital

Hospital employees face many challenges and stress in their daily work life, which can lead to impaired health and well-being. However, evidence-based programs to improve mental health and well-being of hospital employees are rare. The project “Mental Health in the Workplace Hospital” (SEEGEN) is on its way to develop and test the effectiveness of a complex intervention consisting of combined behavioral and organiza-
tional interventions for different target groups in hospital in order to reduce work-related stress in hospital employees. The concept, basic ideas of various single interventions within this program, as well as initial experiences with the intended practical implementation of this complex intervention will be presented.

The complex intervention is built on experiences from five previous pilot projects carried out between 2017-19. These prior pilots operate on both, the behavioral and the structural levels, and will be used as a combined stress mitigating additive during the complex 6 month intervention period in three locations including clusters from small regional hospitals to university hospitals with full clinical care.

A total of five individual interventions with different thematic priorities will be offered to hospital employees within this complex intervention: For the top management a management training to raise awareness regarding the importance of health promoting work ("psychosocial safety climate") will be offered, for all other occupational groups in leadership position a management training to strengthen the relational and stress preventive leadership competence will be offered. For all those who are confronted with a dilemma situation regardless their professional position, a dilemma competency training will be provided. Particular attention will be given to the different life phases of the employees: While one module deals with the compatibility of work and family, another module covers the topic healthy aging in hospital. Importantly and in contrast to other studies, employees may choose several interventions according to their specific needs and interests depending on their position in the hospital.

Implications of the pilot results with regard to the implementation of the complex intervention, and experiences within the implementation process will be discussed.

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PS10

PS10 Fostering stress-preventive leadership in the workplace hospital

A good relationship quality between leaders and subordinates promotes mental health and prevents stress in hospital subordinates. Therefore, it is important to identify specific behavioral characteristics which determine the quality of working relationships at this workplace. This study will identify specific leadership characteristics which support the development of a positive relationship between hospital leaders and subordinates.
A cross-sectional study design was applied. A total number of 1137 leaders and subordinates working at a tertiary hospital in Germany assessed transformational leadership style as a subordinate oriented leadership style and leader–member relationship quality by self-reporting questionnaires (integrative leadership questionnaire Fif, leader-member exchange questionnaire LMX-7). The data were statistically analyzed by mean comparisons and multiple linear regression analysis.

Leaders rated their own transformational leadership style (M = 3.98, SD = 0.43) systematically higher than subordinates assessed their leaders (M = 2.86, SD = 1.04). Evaluation of relationship quality showed similar results: leaders evaluated their relationship quality to one exemplary subordinate higher (M = 4.06, SD = 0.41) than subordinates rated their relationship quality to their direct leader (M = 3.15, SD = 0.97). From the subordinates’ perspective the following sub-dimensions of transformational leadership ‘individuality focus’, ‘being a role model’, ‘fostering innovations’ and ‘providing a vision’ showed large effect sizes in the regression analysis of relationship quality (R^2 = 0.79, F (6, 698) = 438.27, p < .001, f^2 = 1.94).

The exploration of potential determinates of relationship quality at the workplace hospital can for example support the development of leadership training programs with a focus on transformational leadership style. This might be an opportunity to foster high relationship quality between leaders and subordinates and consequently might present one strategy to prevent stress in the health care sector.

_Felicitas Stuber, Florian Junne, Stephan Zipfel, Tanja Seifried-Dübon, Monika A. Rieger, Medical University Hospital Tübingen, Harald Gündel, University Medical Center Ulm_
services. Violence commonly reported or experienced were physical assault, discrimination, bullying, threats and abuse. The interviewed staff emphasized the need for the establishment of a violence prevention program unit and training of staff.

The identified strategies are in alignment with guidelines in literature on key areas of action, namely, effective workplace violence prevention program to include risk assessment, training, mitigation of impact. Initiatives for the engagement of stakeholders within the health sector and establishment of mechanisms for the implementation of identified strategies are needed to facilitate prevention of workplace violence in the health sector.

**Literature**


Dr Mrs Adooha P. Agu obtained an MBBS from The University of Lagos, a fellowship from the Nigerian postgraduate Medical college of Nigeria and a Masters in Health Policy Health Systems from The African Institute of Health Policy Health Systems, Ebonyi State University, Nigeria. She has worked extensively in the field of Public Health as a researcher, clinician and lecturer with teaching experience of undergraduate and postgraduate projects. An awardee of a national and international project grant, she has particular interests in occupational health, endemic diseases, health policy, health systems. Her current research, focusing on workplace violence, is informed by her desire to make significant contributions for the advancement of occupational health and health policy.

**PS12**

**Violence at work and burnout in nursing – The moderating effect of aftercare consultation**

Health care workers have a higher risk of experiencing workplace violence than any other profession. There is empirical evidence that workplace violence is a serious threat to nurses. However, empirical studies on the impact of workplace violence on nurses’ mental health are scarce. Furthermore, it is important to investigate how to effectively manage violence at work. The aim of this study is to analyse the relationship between the frequency of physical and verbal violence towards nurses and their levels of burnout. Moreover, we aim to shed light on whether aftercare consultation following the exposure to violence may attenuate the negative effect of physical and verbal violence on nurses’ mental health.

593 nurses participated in a cross-sectional paper-pencil survey. The participants provided information on the frequency of physical and verbal violence they experienced within the last 12 months. Moreover, they rated the three indicators of burnout: emotional exhaustion, depersonalization and personal accomplishment. Finally, they indicated whether their organization offers aftercare consultation following the exposure to critical incidents to manage violence and aggression from patients. To address the research...
questions, we performed correlation analyses and tested the moderating effect of aftercare consultation on the relationship between physical and verbal violence and burnout using hierarchical regression analyses.

The results show that both physical violence and verbal abuse are positively related to emotional exhaustion and depersonalization and negatively related to personal accomplishment. Thus, nurses experiencing a higher frequency of physical and verbal violence show higher burnout scores. Hierarchical regression analyses revealed that aftercare consultation attenuates the positive relationship between physical violence and both emotional exhaustion and depersonalization. Similarly, organizational offers for aftercare consultation attenuate the negative relationship between physical violence and personal accomplishment. The moderating effect on the relationship between verbal abuse and burnout was not significant.

The prevalence of workplace violence in nursing is a serious problem for the individual victims and the organization in which the violence occurs. Aftercare consultation seems to be a promising approach to managing the experience of violence from patients and attenuate adverse health effects. The findings not only have implications for nurses’ mental health but also for the profession’s ability to attract and retain nurses within the healthcare system. Organizations face the challenge of addressing workplace violence with adequate interventions and programs. More research is needed to evaluate the effectiveness of these programs.

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PS13

Age stereotypes and their association with work ability among hospital staff

Negative stereotypes about older workers have been associated with age discrimination and adverse work-related outcomes such as reduced self-efficacy and increased retirement intentions of older employees. Whether stereotypes about older workers also affect self-perceived work ability has to the best of our knowledge not been investigated yet. Furthermore, it remains unknown from which age onwards such stereotypes affect older employees in work-related outcomes. In the health care sector, a cross-national investigation of those questions gains increasing relevance due to growing internalization of work teams and increased employment of older workers. Therefore, a study that aimed to analyse the relationship between age stereotypes and work ability in hospital staff in Germany and Latvia will be presented.

Hospital staff of two German and five Latvian hospitals were asked to fill out the Beliefs about Older Workers’ questionnaire to measure age stereotypes as well as three items of the work ability index to measure subjective work ability. Multiple linear regression models adjusted for occupational group and sex were built to analyse the relationship between stereotypes about older workers and work ability. Furthermore, an interaction term of age and stereotypes was added. The Johnson-Neyman procedure was applied to calculate regions of significance for the association between stereotypes and work ability depending on age of participant.

From Latvian hospitals, 295 employees (response rate = 98%) and from German hospitals, 109 employees (response rate = 40%) were included in the study. Employees of Latvian hospitals reported a higher level of negative stereotypes about older workers than employees of German hospitals. Negative stereotypes about older workers were adversely associated with work ability in both countries. This relationship was significant for employees from 37 years of age onwards in Latvia and from 39 years of age onwards in Germany. The results of this study support previous evidence on the relevance of age stereotypes when analysing and
supporting older employees’ work ability in research and practice. The results of this study imply that negative stereotypes about older workers are associated with reduced work ability of older hospital staff. However, a reliable statement regarding direction of causality is limited by cross-sectional data collection. Levy’s stereotype embodiment theory though assumes that continuous internalization of negative age stereotypes throughout lifespan may lead to reduced self-efficacy when those stereotypes become self-stereotypes in older age. The results of this study may therefore be explained by the stereotype embodiment theory in which self-efficacy may serve as a mediating variable. Furthermore, the results suggest that this negative effect on work ability might already occur in employees in their late 30s regardless of study region.

Literature


Jannette Weber, Research associate and doctoral student at the Institute of Occupational, Social and Environmental Medicine, Heinrich-Heine-University of Düsseldorf, Germany
Lilian Tzivian, Latvia
Background:
The session, organised by the ICOH Working Group on Occupational Infectious Agents (WGOIA) comprises four presentations and an interactive discussion. The importance and recognition of occupational infectious agents for health and other workers will be outlined, with the results of a survey of ICOH national secretaries. A country profile and the challenges experienced with occupational infectious diseases will be presented. Research and intervention for HIV- and TB-related stigma in health workers will be discussed. The last presentation is an introduction to the WGOIA collaboration with ILO and the background to the process and development of a Biological Hazards Guideline by ILO which will be followed by interactive discussion and audience input to the guideline.

After the coffee break, another six presentations chosen from submitted abstracts will follow (OIA2 - to OIA7).

OIA1

An embodied exercise targeting stigma towards health workers in Southern Africa

Eastern and Southern Africa (ESA) accounts for 45% of world’s HIV infections. This problem is compounded by rising drug resistance and HIV co-infection. Health workers are exposed to numerous occupational hazards during the course of their work including HIV and TB. Disclosure of TB status by health workers is necessary to help reduce the spread of disease, particularly in countries where disease burdens are high. HIV- and TB-related stigma hinder disclosure of these conditions by workers in health facilities, reducing their quality of working life and mental health and, in turn, the quality of patient care. To help demonstrate the role of stigma – both internal and external – in the workplace, 78 health workers from seven hospitals in Southern Africa participated in an embodied exercise during one of three workshops related to occupational health and safety. Using thematic analysis of videos of the sessions as well as follow up questionnaires with participants, we demonstrate the usefulness of this type of intervention to promote self-reflection and encourage changes in attitudes and actions.

All the participants remembered the exercise and events from the workshop when interviewed nearly two years later. This serves as a testament to the impressive ability of arts-based exercises to make lasting impacts on participants; an experiential approach can help participants to learn more effectively. Embodied training exercises like this one are useful for training and can prompt discussions on stigma and how it might be affecting workers in various settings.

Annalee Yassi, Elisabeth Wilcox, Karen Lockhard, Vivian WL Tsang, University of British Columbia, Simphiwe Mabhele, International Labour Organization (ILO)

OIA2

Intervention of occupational exposure to blood-borne pathogens for HWs in China

Healthcare settings have been recognized worldwide as a complex environment, which can at times be more dangerous than other sectors. Biological Hazards in healthcare settings, among six categories of occupational hazards in health facilities, mainly includes Ebola, HIV and other bloodborne pathogens. Back to the beginning of the new millennium, the pandemic of HIV/AIDS in China raised emerging concern about occupational health for health workers (HWS). Since 2014, hundreds of HWS were dispatched
to the frontline for Ebola prevention and control in Ebola-stricken African countries. The reality remind us indeed the serious risk of HWS's exposure to bloodborne pathogens, and the urgent necessity to undertake continuous measures to protect them. Accordingly, to develop evidence-based policies for HWS protection on exposure to bloodborne pathogens is of primary importance. However, little English literature on intervention of this issue across Chinese hospitals is available.

Based on the intervention instrument of a voluntary national standard (Guideline for Prevention and Control for Occupational Exposure Bloodborne Pathogen), from 2009 to 2012 and 2016, four cross-sectional surveys with the same self-administered questionnaire were conducted in three public hospitals, respectively. The intervention and questionnaire persisted to focus on three types of episodes of occupational exposure to bloodborne pathogens, namely percutaneous injury (PCI), mucous-membrane exposure (MME) and exposure by damaged skin (EDS).

At prior-intervention at Hospital A in 2009 (No. of HWS=727), the percentage of HWS with ≥1 episodes of exposure were PCI (88.03%), MME (32.46%) and EDS (30.26%), respectively. At post-intervention, the survey of three hospitals revealed a significant decreasing trend. The number of HCSWs who participated in surveys were 614 at Hospital A in 2012, 781 at Hospital B in 2016 and 313 at Hospital C in 2016. Percentage of PCI were 22.8% at Hospital A, 12.29% at Hospital B and 5.75% at Hospital C; the percentage of MME were 10.91% at Hospital A, 3.84% at Hospital B and 5.75% at Hospital C; the percentage of EDS were 7.17% at Hospital A, 1.15% at Hospital B and 1.27% at Hospital C.

There is urgent need for prevention and protection among 11.173 million HCSWs in China, Guideline for Prevention and Control for Occupational Exposure Bloodborne Pathogen is an effective instrument for intervention, the experience could be shared to national and international hospitals.

ZHANG Min. As vice chair of the Occupational Health Standards Committee of the National Health Standards Commission of China, and founder and director of Occupational Health Protection Committee for Health Care Workers, Chinese Association of STD and AIDS Prevention and Control, Prof. ZHANG Min has led key research projects, made great contribution to the Chinese national policies on occupational health, along with developing more than ten National Occupational Health Standards. Recently, as the leading expert of occupational health for health workers in China, Prof. ZHANG Min has organized the translation and application of the ILO Ergonomic Checkpoints and ILO/WHO HealthWISE into Chinese, she has published more than 100 papers as well as more than 20 scientific books.

OIA3

Acute hazardous work-related exposure to the eyes of health workers in a tertiary care hospital in South India – an observational study

Though healthcare workers are commonly exposed to acute infectious and non-infectious work related hazards to the eye, only recently have they gained recognition in research. An observational prospective study was done among the 11,420 eligible participants. Health workers with work related hazardous ocular exposure underwent a detailed eye examinations and further information were collected using a structured questionnaire.

During the study period (Feb – Aug 2017), 94 reported an incident (0.8 %) 95% CI (0.64 - 0.96%). Of these 82 were staff and 12 students. Mean age was 31.53 (SD8.39) years and 52.1% were up to 30 years of age. Sixty five (69%) were females. Majority (25%) of reported exposures were from nurses, followed by technicians (18%) and housekeeping staff (15.9%). Infectious conjunctivitis and non-infectious hazards accounted for 50% each. Chemical exposures were majority among non-infectious hazards (25.5%). Awareness
regarding Personal Protective Equipment (PPE) usage was low. Type of work area and occurrence of injury/infections were found to be associated significantly \((p =0.046)\). Also occurrence of injury/infections among those wearing vs. not wearing glasses was found to be significant \((p=0.01)\). Within seven months 8.8% of the health workers reported exposure to the eyes. Awareness to prevent eye exposure by infectious agents or chemicals should be fostered.

*Prathibha Obed, India*

**OIA4**

### Blood and body fluid exposure and preventive strategies among healthcare workers in a tertiary hospital in South India

The healthcare industry in India is rapidly advancing since more than a decade and now boasts of a large workforce ranking among the top 5 employing industries. The safety of health workers which was not accorded much importance in the past is now receiving well deserved attention. Blood and body fluid exposures can be associated with infection with blood borne pathogens like human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV).

The Christian Medical College, a more than 100 year old medical establishment, located in Vellore, South India, has been a pioneer in many aspects of medical research and health worker safety has been a priority since more than 4 decades with regular audits of blood and body fluid exposures among its employees and appropriate strategies being implemented for prevention of these incidents. A register is maintained at the Staff, students health services (SSHS) clinic and is regularly audited for trends in blood and body fluid exposures among the various categories of employees and students. All reports are collected through a dedicated reporting system wherein a duty doctor is be contacted in the event of a hazardous exposure to blood and body fluid exposures. A structured, standardized form with all relevant details is filled and appropriate first aid, management and follow-up are performed.

On average, 335 incidents were reported every year in the study period. Maximum numbers were reported from nurses, medical interns and post graduate registrars. The mode of exposure varied from per operative or procedural to improper disposal methods, which were classified into 19 categories. Improper disposal methods were the reason for most of the injuries among the house keeping staff and waste disposal workers. High risk areas were wards, operation theatres, emergency room and clinical laboratory areas. Splash exposures were documented separately.

Accidental exposure to infectious blood or fluids remain a danger for health workers and efforts should be made to reduce this risk.


*Obed John HA, Assistant Professor, Department of Staff, students health services (SSHS) Christian Medical College, Henry Kirupakaran, Christian Medical College, Vellore, South India*
Evaluation methodology of medical safety devices

Improved engineering controls are often among the most effective approaches to reduce occupational hazards and therefore are an important element of a needle stick prevention program. Such controls include eliminating the unnecessary use of needles and implementing devices with safety features. To determine the effectiveness of safety devices in front of a puncture, ICS team has developed a methodology for evaluating safety medical devices.

EVALUATION METHODOLOGY consists of 3 phases:

1st Phase:
There are 3 essential criteria, compliance with which is essential to consider the material suitable for the following assessment.

C1- the safety feature is an integral part of the device and not an accessory.
C2- Activation must always be IRREVERSIBLE.
C3- Safety Medical Device must provide a confirmation of proper activation (visible or audible).
If the material does not meet all 3 criteria, it is deemed not acceptable

2nd Phase
EVALUATION METHODOLOGY establishes a gradient of security upon the UNE EN-1050 (Safety of machinery – Principles for risk assessment)
Evaluation of the safety level of the material
During the FORECASTED USE, in accordance with product instructions
☑ Reasonably foreseeable misuse
☑ Human error is predictable during forecasted use with complete safety medical device (i.e. Safety Medical Device isn’t activated or not completely activated.)

CLASSIFICATION of SAFETY MEDICAL DEVICE
EXCELENT: The Safety Medical Device always guarantees that the worker is safe.
VERY GOOD: The Safety Medical Device guarantees the safety in the foreseeable misuse, but human error is not entirely ruled out.
GOOD: Does not guarantee safety in the event of human error. Safety in the event of foreseeable misuse is partially guaranteed
ACCEPTABLE: Safety feature ensures the safety in forecasted use, only.
If there are Safety Medical Devices with the same classification

3th Phase:
Four categories for priority choice of Safety Medical Devices as collective protection tools against blood borne pathogens: 1st PASSIVE, it requires no activation by the user; 2nd ACTIVE, Safety Medical Device can be activated with one hand technique immediately; 3th ACTIVE, Safety Medical Device activated using a two-handed technique as soon as possible; 4th ACTIVE, Safety Medical Device can be inactivated outside the patient’s body.
61 products have been evaluated, 11 were not accepted, 13 past only the first phase, 12 did not guarantee safety in the event of human error and safety in the event of foreseeable misuse is partially guaranteed; 21 were in the category of very good, and 4 safety medical device guaranteed the safety of the worker. In the analysis of all material used in Institut Català de la Salut 40.63% was needle stick; 14.53% was scalpel, all were safety medical devices. 32.29% were catheter and out of them 12.9% were safety medical device; all trocar (5.21% material) were safety medical device; 4.17% of all material was lancets, and 50% were safety medical device. Syringes with needles were 3.13 %, all syringes were safety medical devices.

Only a small proportion of the devices tested fulfilled the requirement for very good or excellent safety medical devices. Therefor construction of safety medical devices remains a challenge and a priority.

Rosa Maria Orriols-Ramos, Institut Català de la Salut, Hospital Universitari Bellvitge, Spain

2B or not 2B vaccinated? The ethical issues of influenza vaccination among HCWs

Seasonal influenza (SI) vaccination has been recommended for healthcare workers (HCWs) for many years by the World Health Organization, the Centers for Disease Control and Prevention and in almost all European countries. Despite decades of efforts to encourage HCWs to be immunized against influenza, vaccination uptake levels remain low. There is no significant sign of improvement despite numerous measures to increase these rates (e.g. campaigns, education, communication). Influenza vaccination coverage of HCWs should be increased, given their important role in nosocomial influenza transmission. Insufficient vaccination coverage threatens the health of both patients and HCWs. But is ‘the evidence’ sufficient enough to support mandatory influenza vaccination policies? Experts argue that HCWs influenza vaccination mandates are ethically based on beneficence, non-maleficence, and/or duty, particularly in light of the failure of voluntary approaches to achieve high rates.

We performed a PubMed literature review (2011-2019) on the ethical & moral issues and the used frameworks among healthcare workers about SI vaccination.

We found that the chronologically listed publications delivered very interesting points of view: Caplan (2011), Abramson (2012), Orient (2012), the Cochrane Database of Systematic Review (2013), Pitts et al. (2014), Cortes-Penfield (2014), Wicker et al. (2014), Born (2014), Dubov et al. (2015), Lee (2015), Betsch (2015), Kelly (2015), Biondi et al. (2015), To et al. (2016), and Nadir et al. (2016). No publications of interest from the period 2017-2019 were found.

It is unlikely that purely voluntary programs will achieve vaccination rates among HCWs that are sufficient to meet the ethical obligations of beneficence and non-maleficence. The evidence from observational studies suggests that a vaccine mandate increases vaccination rates, but evidence on clinical outcomes is lacking. There is an increasing amount of evidence, that individuals are more inclined to get vaccinated if these benefits other, providing that their own costs are low. The lack of evidence of an effect of a HCWs influenza vaccine mandate on patient outcomes does not confirm a lack of effectiveness. An ethically preferable solution is to offer incentives for vaccination with a facilitated voluntary program that reduces known barriers, backed up by active declination.
Literature

- Abramson ZH. Int J Fam Med 2012;205464.

Wim Van Hooste, Occupational Health Physician, Belgium

OIA7

European survey of hepatitis b vaccination policies for healthcare workers

The risk of transmission of bloodborne pathogens, including hepatitis B virus (HBV) to healthcare workers (HCWs) is well known. In 2005 we performed a survey on HBV prevention in HCWs in the EU; in 2010, an EU Directive (2010/32/EU) on sharp injuries was promulgated to be implemented into national legislation by 11 May 2013. This, together with more countries implementing universal HBV vaccination, made an update of the 2005 survey necessary.

We performed an electronic survey in national representatives from the Occupational Medicine section of the European Union of Medical Specialists (UEMS), to find out how policies have been put into practice in the European countries.

Answers were received from 21 countries, representing 78% of the population and 60% of HCWs in the EU-28. HBV vaccination was mandatory for medical and nursing staff in 10 countries, for other paramedical staff, medical and nursing students in 9, for paramedical students in 8, for cleaning staff in 6, and for technical staff in 5, recommended in all other participating countries. Serotesting before vaccination was done in 8 countries. The vaccination schedule most often used was 0, 1, 6 months (18 countries). Serotesting after vaccination was done in 18 countries and boosters were recommended in 14 countries. A non-responder policy was present in 18 countries. Data on HBV vaccination coverage were published in 8 countries. Coverage was 70-95%. Reporting was available in 14 countries, nationwide in 8, European-wide was not mentioned.

These results, based on a large majority of HCWs in the EU-28, show the variation in the translation of EU legislation into practice in EU Member States (MS). More consultation between key actors from MS at EU level could help to optimise policies in different MS in order to contribute to further reducing HBV transmission to HCWs.

Antoon De Schryver, Occupational Health Physician, Belgium
PARALELL SESSIONS
1/2/3

THURSDAY OCTOBER 24th
### Thursday, Oct. 24th

**13.30–15.30 Parallel Session 1**  
Improving OSH Systems and Women Health and Work (WHW) – session organized by SC WHW  
*Chairs: Igor Bello*  
*Room: Plenary Hall*

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<td>Elisabeth Wilcox et al., Canada</td>
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<td>13:45–14:00</td>
<td><strong>OSH2</strong> Implementation of the HealthWISE Tool in a teaching hospital</td>
<td>Seabelo Lesego et al., South Africa</td>
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<td><strong>OSH3</strong> Improving the health of HWs using HealthWISE; Implementation in seven hospitals</td>
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<td>14:15–14:30</td>
<td><strong>OSH4</strong> Occupational Health and Safety in Health Workers as part of patient safety and quality in healthcare; 2P Safety Goals (Patient and Personnel Safety Goals).</td>
<td>Naesinee Chaiear, Thailand</td>
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| 14:30–15:30 | Gender Gaps & Challenges in the Health Sector 2020–2025  
Introducing statements  
Elke Schneider, ILO, Geneva, Switzerland  
Vivianna Gomez-Sanchez, Costa-Rica  
Discussion with the audience |
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| 13:30–13:45 | **VZ1** Safe Working Hours – for patients and doctors.  
             *Jacobus Kotze et al., UK*                                    |
| 13:45–14:00 | **VZ2** Occupational Health and Absenteeism in South African Hospitals.  
             *Jonathan Ramodike, et al. South Africa*                     |
| 14:00–14:15 | **VZ3** Seeing the Finish Line? Retirement Perceptions and Wellbeing  
             among Social Workers.  
             *John Moriarty et al., UK*                                    |
| 14:15–14:30 | **VZ4** Work ability approach to health workers among four hospitals in Thailand.  
             *Orrapan Untimanon, Thailand*                                  |
| 14:30–14:45 | **VZ5** Work-related Risk Factors in Hospital Physicians and Nurses in Sofia.  
             *Katya Vangelova et al., Bulgaria*                           |
| 14:45–15:00 | **VZ6** Latex glove allergy among nurses at a teaching hospital in South India.  
             *Bobby Joseph, India*                                        |
| 15:00–15:15 | **VZ7** The use of closed systems for handling hazardous drugs (HD’s).  
             *Amparo Benavent Benavent et al., Spain*                     |
<p>| 15:15–15:30 | Q + A                                                                    |</p>
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<td>TB3</td>
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<td>A borderline zone value for the QFT-test in 5.468 Italian health care students</td>
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<td>15:15–15:30</td>
<td>TB8</td>
<td>Latent tuberculosis infection among healthcare staff after assignments abroad</td>
<td>Iris Meier et al., Germany</td>
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Roles of international organizations in OHS strategies and tools for HWs

Addressing the occupational health and safety (OHS) of health workers (HWs) calls for international effort, particularly in settings where infectious disease risks are high and resources are limited. International organizations therefore have been seen to play an important part in this – from high-level contributions to global health governance through to local-level implementations of tools that directly address OHS issues in health facilities. To ensure effectiveness, it is important to understand the specific roles and activities of international organizations in this endeavour – what they are and what they ought to be. The two specialised agencies of the United Nations, the International Labour Organization and the World Health Organization involved in developing HealthWISE, an OHS quality improvement tool for health facilities, provided the focus for this study.

To better understand the roles of international organizations in addressing the OHS of HWs in high risk settings and in the development and implementation of OHS tools, we applied a variety of methods. A scoping literature review was conducted, and ILO Global Strategies on Occupational Safety and Health and WHO Workers’ Health Global Plan of Action were reviewed. Expert interviews were conducted with individuals who had current or past affiliation with one of these organizations, and/or had been involved in the development and/or implementation of OHS tools similar to, and including, HealthWISE. Experts were recruited via purposive and snowball sampling until data saturation was achieved. Interviews were conducted via Skype or telephone and audio-recorded. Following transcription, interviews were thematically coded using NVivo 11. Given international organizations’ emphasis on evidence-based policy, attention was given to how evidence of the effectiveness of tools is considered.

Identified roles of international organizations in regard to OHS of HWs in high-risk settings included setting goals, developing regulations, guiding policies, coordinating responses to emerging issues and providing training. Some respondents indicated a need for individuals with additional OHS expertise and experience at international levels, some called for greater attention to incentives or oversight and enforcement to help increase the uptake of OHS regulations, and some felt that developing indicators and collecting data related to OHS of HWs at the international level would also help to improve measurement and evaluation which, in turn, would contribute to improvements in the OHS of HWs.

Strategies and tools developed by international organizations are seen as valuable to the continued promotion of OHS of HWs in high risk settings and to guiding the development and implementation of low-cost solutions to OHS issues – but the evidence base for assessing effectiveness remains relatively low. At the same time, more locally-adapted assistance is needed to allow these tools to achieve their full potential in the workplace. Further follow-up and reporting, irrespective of outcomes, would also help to improve future implementations of tools that have been piloted. Overall, the OHS of HWs needs more traction and expert guidance at the international level in order to restore it to a growing field and to continue to more effectively protect vulnerable HWs.

Elizabeth Wilcox, BSc, MA, PhD Candidate, School of Population and Public Health, University of British Columbia, Vancouver, Canada
OSH2

Health workers (HWs) in health care facilities are at high risk of contracting occupational diseases as they are exposed daily to diagnosed and undiagnosed infectious diseases. As a result, it is imperative to ensure that their working conditions are safe and healthy which, in turn, will improve performance and quality of health services. The aim of this study was to assess the effectiveness of a “HealthWISE” program in improving working conditions, occupational health and safety and performance among health workers.

An interventional study based on a multi-faceted intervention using a guideline developed by ILO and WHO called “HealthWISE” to improve working conditions for HWs in a 1625 bed teaching hospital with 4131 employees and good resources for occupational health and safety in a middle income country. Twelve HWs were trained utilising HealthWISE in this hospital and The HealthWISE was implemented from November 2016 to March 2019; with emphasis on modules 1) controlling occupational hazards and improving workplace safety; 3) biological hazards and infection control; and 4) tackling discrimination, harassment and violence in the workplace.

The HealthWISE tool identified several occupational health needs and the following improvements resulted: faulty equipment fixed; chemicals properly contained; housekeeping improved; extractor fans installed; use of respirators introduced; procedure on safe sharps management enforced; protocol on workplace safety and security developed; and an Monitoring and Evaluation system introduced. The HealthWISE tool proved to be effective when implemented with health worker’ participation and managers’ buy-in. Although there were challenges related to old and dilapidated infrastructure, our findings support the conclusion that the HealthWISE tool should be maintained and rolled out to other hospital departments.

Seabelo Lesego, Diploma nursing science, BA (CUR), B Tech. Occupational Nursing, MPH student, Occupational health practitioner at Dr George Mukhari Academic Hospital, Ga-Rankuwa Gauteng Department of Health, Pretoria, Gauteng Province, South Africa


OSH3

Improving the health of HWs using HealthWISE; Implementation in seven hospitals

Health workers (HWs) are in short supply worldwide, especially in areas of higher need such as in Southern Africa, where high population prevalence of tuberculosis and of HIV create high risk settings. International organizations have attempted to develop strategies and tools to improve their occupational health and safety (OHS). One such tool is HealthWISE, a participatory, quality improvement tool, jointly developed by the International Labour Organization and the World Health Organization. It aims to improve working conditions, performance and workplace safety through training HWs on identifying workplace hazards and implementing low-cost solutions to address them.

The implementation of HealthWISE was observed in seven hospitals in Mozambique, South Africa and Zimbabwe beginning in February 2016, with Training-of-Trainer workshops in October and November 2016 and a final dissemination meeting in May 2018. Analysis of field notes, recordings and other data from meetings, workshops, focus groups and interviews examined the enabling factors and barriers to the implementation. The Promoting Action on Research Implementation in Health Services (PARIHS) framework,
which describes successful implementation as a function of evidence, context and facilitation, helped to structure this examination. A comparative case study, with each hospital designated as an individual case, was used to further explore and understand these enabling factors and barriers and how they might be enhanced or overcome in future implementations of HealthWISE.

Enabling factors included established partnerships, communication with and involvement of the research team, motivation of staff, support from management, and awareness of OHS and of HealthWISE. Barriers included insufficient infrastructure, lack of resources, competing priorities and programs, and shortages of staff and of time dedicated to carrying out duties related to HealthWISE.

Enabling factors and barriers are consistent with those documented in previous studies. These were influenced by the OHS contexts of each country as well as by the characteristics of each hospital. There was more focus on training, as opposed to implementing solutions to OHS issues, in hospitals where OHS regulations and practices are in development. Implementing solutions could be emphasised in the initial training by allocating more time to the development of comprehensive action plans and by emphasising activities through practical site visits. Establishing partnerships, engaging with hospital management and workers at all levels and identifying key personnel to champion change are integral to future implementations.

Elizabeth Wilcox, BSc, MA, PhD Candidate, School of Population and Public Health, University of British Columbia, Vancouver, Canada, Ida TsiTsii Chimedza, International Labour Organization, Vivian WL Tsang, University of British Columbia, Vancouver, Canada

**OSH4**

**Occupational Health and Safety in Health Workers as part of patient safety and quality in healthcare; 2P Safety Goals (Patient and Personnel Safety Goals).**

Occupational health and safety (OH&S) management for hospital personnel in Thailand has been implemented for decades but only occupational health service (OHS) has been focused. OH&S management for health workers has been misconcepted with OHS. Therefore, it has not been mentioned in the public hospitals except in some university hospital.

**Objective:** To explore the development OH&S program for health workers which has been now been in-co-operated with patient safety program.

**Method:** Review of research publications and annual reports of OH&S management of Srinagarind Hospital, Faculty of Medicine, Khon Kaen University.

**Results:** OH&S management for health workers employing in the hospital initially was unrecognized. Primarily, it was in a voluntary basis but now Thailand hospital must comply Occupational Safety, Health and Environment Act B.E. 2554 and Ministerial Regulation on the Prescribing of Standard for Administration and management of Occupational Safety and Health and environment B.E. 2549 (A.D.2006) since 2006. The occupational safety, health and environment policy has been in shape; action plans have included fitness for duty (FFD), hepatitis B immunization and latent tuberculosis assessment, medical surveillance program, vaccination and injury and illness classification etc. Some hospitals indicated that supervisors must be trained 12 hours of OH&S management course to become a safety officer in the supervisor level and following they were appointed as safety officer for supervisor level. Each workplace is required to perform health risk assessment in order to correct or control workplace hazards.
Conclusion: Patient safety and personnel safety have been announced as 2P Safety Goals. Therefore, OH&S management for health workers is more implemented than 10 years ago.

Naesinee Chaiear, MD, MMedSC, PhD, Thai Board in Preventive Medicine (Occupational Medicine), Assoc Prof/Head, Occupational Health and Safety Office, Khon Kaen University, Thailand
Safe Working Hours - for patients and doctors.

South Africa is an upper middle-income country with a doctor-to-patient ratio of approximately 40 per 100 000 in the public sector. Medical graduates in South Africa are required by the Health Professions’ Council of South Africa (HPCSA) to complete two years of supervised internship prior to registration as independent medical practitioners. Prior to 2016, HPCSA regulations stated that the maximum allowable shift limit for interns was 30 hours, with no specified maximum after internship. There is evidence that shifts exceeding 16 hours reduce cognitive and motor function. Extended wakefulness increases risk of percutaneous injuries and motor vehicle accidents. This poses a risk to patient safety.

The Safe Working Hours (SWH) campaign

The campaign was founded in 2014 by medical students and junior doctors. SWH produced a synthesis of evidence called ‘Is 30 hours appropriate?’ with a follow up document ‘16 for Safety’. SWH volunteers consulted with various key stakeholders to advocate for introducing safer maximum shift limits for medical doctors. These include for example South African Medical Association and Junior Doctors’ Association of South Africa. SWH representatives created an online petition calling for a review of maximum shift limits using a comparison with regulations utilized in the aviation industry. This petition gathered over 7000 digital signatures and was delivered to the HPCSA.

The SWH campaign utilized social media campaigns on Facebook and Twitter. Inter alia it was featured in newspaper articles, radio interviews and 2 on national television. In 2016, the HPCSA circulated a document outlining changes to internship training regulation, shortening maximum allowable shifts from 30 hours to 24 hours with a two-hour period for patient hand-over. SWH encountered resistance from senior doctors, who defended the status quo and cited fear potential errors associated with increased handover and decreased continuity of care.

Although the SWH campaign achieved a tangible result, it is fall short of a profession wide limit on continuous shift duration and still exceeds what is physiologically safe. Currently there are also limited mechnisms to ensure compliance with the new regulation.

Jacobus Kotze, MBChB, medical doctor, reading for a DPhil in Primary Health Care, University of Oxford, Department of Primary Care Health Sciences in 2018.

Farah Jawitz, Helene-Mari van Westhuizen University of Oxford, UK

Occupational Health and Absenteeism in South African Hospitals

The World Health Organisation confirms that developing countries are challenged to meet International Labour Organisation standards for occupational health and safety (OHS) service provision in health facilities. Substantial literature has documented that inadequate provision of OHS amenities can lead to health worker absenteeism because of preventable occupational related incidences from risks such as injuries, communicable and non-communicable diseases. This in-turn has crippled the health systems. The aim of this study is to review occupational interventions and absenteeism in two teaching hospitals.
This was a quasi-experiment study design. This is because an individual HW’s absenteeism records before an occupational health intervention was analysed in relation to their absenteeism records after they were exposed to a particular intervention. Data sources include human resources and occupational health.

Results show how the occupational health interventions’ effects the absenteeism trends of HWs. Secondly the results illustrate the cohorts of health workers with their respective magnitudes of risk exposures when accounting for age, sex, duration of employment, type of occupational incident, body region affected, occupational group, technical area where incidents occurred.

The findings from the results provide evidence based interventions with potential to improve the overall health system in a health facility. The findings help evaluate the examined interventions to focus on improving working conditions for the high risk HW.

**Jonathan Ramodike, Bachelor of Public Health 2012–2016 Monash University South Africa, Research Assistant at National Institute for Occupational Health. HIV & TB Department, South Africa**

**Muzimkhulu Zungu, National Institute for Occupational Health. HIV & TB Department, South Africa**

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**VZ3**

**Seeing the Finish Line? Retirement Perceptions and Wellbeing among Social Workers.**

Social work, like many other human services professions, is ageing. With the population ageing as a whole and the level of service need growing as a consequence, extending working lives has become a central part of governments’ strategies to maintain service provision. In this presentation, we describe findings of a UK social work survey undertaken in 2018. It investigated how organisational policies and individual factors were affecting individual social workers’ decisions about working in later life. The survey measured: 1) Social workers’ attitudes to ageing at work and self-reported planning around retirement; 2) Mental health and wellbeing, quality of working life and home and work interface; 3) Intention to leave work and retirement planning. There were 1397 responses from across the UK. We analysed how these factors and relevant individual characteristics interact within the systemic work environment. Participants cited a variety of reasons they would consider retiring (e.g. to avail of occupational pensions, N = 328; due to ill-health, N = 103) and which organisational provisions might lead to them working longer (e.g. scope for retraining, N = 325). These responses in turn strongly predicted scores on validated measures of mental wellbeing. Framing the findings in an ecological conceptual model, we argue that age-inclusive professional and organisational cultures, age-positive Human Resource Management, support from line managers, fair working conditions and the ability to manage health and wellbeing, might enable social workers to extend their working lives in line with government policy. These findings provide insights for employers to assist in their development of organisational and individual adjustments to sustain wellbeing in the social work profession.

**John Moriarty, Heike Schroder, Queen’s University Belfast, North Irland, Jill Manthorpe, King’s College London, John Mallett, Patricia Gillen, Paula McFadden, Ulster University, UK**
Work ability approach to health workers among four hospitals in Thailand

Work Ability is a comprehensive approach for occupational health professionals to assess and manage workers’ health and wellbeing. The work ability model and the Work Ability Index (WAI) were originally developed by Professor Juhani Ilmarinen in Finland and the tool (WAI) was translated into the Thai version. The aims of the study were to 1) describe how the model has been set up and developed to evaluate the work ability among health workers (HWs) and 2) explore the WAI scores among HWs and interventions provision among participated hospitals.

This study was a descriptive study in design conducted during 2017–2018. The model of Work Ability approach and the Work Ability Index (WAI) were reviewed. The target groups were HWs aged equal or more than 45 years old. Four occupational medicine sections from 4 provincial hospitals were invited to join the project. The guideline for work ability assessment and activities were developed. The occupational health professionals from the participated hospitals and experts from other related agencies were invited to suggest such guideline. The program activities included project explanation, WAI assessment, data analysis, report of results and recommendations. The action plan in each hospital was documented.

The result showed the integration of Work Ability model into occupational health services for HWs is feasible. WAI assessments in all selected hospitals were conducted during annual health check-up. Totally 1,092 HWs joined the study. WAI levels among them were excellent (29.3%), good (54.9%), moderate (15.3%), and poor (0.5%). However, 10.6% of HWs had underlying diseases. All hospitals gathered more data and designed interventions such as job rotation, work station improvement and health promotion program provision for HWs who obtained moderate or poor WAI score.

Occupational health professionals should provide WAI assessment to HWs, especially for aging HWs. However, it is more important to perform suitable interventions to improve wellbeing of the groups who obtained moderate or poor WAI scores. Apart from HWs, aging employees from enterprises, and sick workers who will return to work after recovery should be evaluated for their work abilities to provide the appropriate intervention for them.


Orrapan Untimanon, Senior Expert Occupational Health, Occupational and Environmental Health Development Centre, Phrapradang, Thailand
Work-related Risk Factors in Hospital Physicians and Nurses in Sofia

Among health care workers, shift work, especially night work, and work-related stress may be factors leading to impaired health. The prevalence of night work is higher in health care sector, with the highest rates in the hospitals, and shift schedules including extended shifts. The work is intense and with increasing complexity of decision-making, often under time pressure and emotional dissonance of working with patients. Bulgaria is facing physicians and nurse’s shortage and high turnover of health care staff, due to leaving of younger specialists for the western countries, which contributes to the aging of the staff, but also long working hours due to overtime or/and second workplace. The aim of the study was to follow the work-related risk factors of hospital physicians and nurses in Sofia.

The study is cross-sectional and comprised 720 physicians (429 female and 291 males) and 1404 female nurses from 19 hospitals in Sofia. The anonymous questionnaire was filled, including demographic information, working hours, shift system, with special attention to night work and long working hours. Stress was assessed with a questionnaire based on the short version of the German Instrument for stress-related job analyses. The participants completed a Karolinska Sleep Diary, fatigue and self-rated health questionnaire. Sleep quality index (SQI) was calculated. Also, health was rated on a 4-point scale. Statistical Analysis was carried using SPSS.

To illustrate just a few of the results: More than 90 % of the physicians and nurses felt under strain and emotional dissonance of working with patients, the nurses worked under time pressure, lack of control and considered the payment unsatisfactory. 28 % of the physicians and 46.7% of the nurses worked more than 5 night shifts monthly. Overtime was common. 44.6 % of the studied physicians worked at a second health care establishment. Work-related stress, night work and long working hours were related to self-rated poor health and sleep and higher level of fatigue.

Urgent preventive measures are needed, including reduction of working hours and night work

The shift schedules of more than 60 % of the studied physicians and nurses are rotating and include night work and 12-hour shifts. The long working hours are common because of overtime and second jobs. The increase of working time correlates with higher numbers of night shifts. Shift working with more night shifts monthly and overtime hours weekly contributed to impaired sleep and fatigue. The sleep impairment was more evident with the increase in the number of night shifts; fatigue with the increase of working hours, both night shifts and long hour work was contributing to high stress and burnout. In conclusion, the work-related factors raise health concerns for the occupational health of healthcare workforce.

Katya Vangelova, Irina Dimitrova-Toneva, Irina Cekova, Raliza Stoyanova, National Center of Public Health and Analyses, Bulgaria
Latex glove allergy among nurses at a teaching hospital in South India.

Latex allergy is a reaction to certain proteins in latex. It is manifested as immediate hypersensitivity reaction or as a result of chemicals added to latex, which then manifests as allergic contact dermatitis. HCWs are at risk of developing latex allergy as they use latex gloves, multiple times a day and on a daily basis.

There were no studies that looked at latex glove allergy among nurses in India.

This study was done to estimate the prevalence of latex glove allergy among nurses in a teaching hospital; and to determine the factors associated with latex glove allergy among them.

After obtaining the Institutional Ethics Committee clearance, 700 female nurses were recruited. Following written informed consent, an interview schedule was administered to the nurses to assess the prevalence and factors associated with latex glove allergy. Following the interview, a patch test was done for 50 consenting nurses with history of contact dermatitis or those who presented with clinical features of contact dermatitis; skin prick test was done on those with history or signs of type 1 hypersensitivity reaction. Along with allergens, a piece of glove was used as a patch on the skin. The reading was based on International Contact Dermatitis Research Group guidelines. Subjects were also asked to wear gloves for 30 minutes to observe the development of generalized or localized rash.

Of 700 nurses, symptoms of latex allergy were reported in 74 (10.6%) – Type I hypersensitivity reaction in 21 (3%) and symptoms of contact dermatitis in 69 (9.9%). Symptoms reported were red irritated skin (49, 66.9%), cracked skin (48, 64.9%) and papulo-pruritic rash (39, 52.7%). Local rash within 30 minutes of using gloves was reported in 21 (28.4%) nurses.

Significant positive relationship was seen between prevalence of allergy and duration of work, number of times of handwashing, history of allergic diathesis, allergy to fruit, or other rubber items, and catherization. However, on regression analysis, only history of allergic diathesis and allergy to other rubber items remained significant.

Patch test was positive in 9 subjects, with one individual developing generalized rash in 24 hours. There were no factors that were significantly associated with the prevalence of positive patch test.

The prevalence of latex allergy and positive patch test was found to be less compared to studies in Western countries. Yet it is imperative to identify the presence of allergies prior to placement, knowing that the quality of life and work ability will improve with successful avoidance of natural rubber latex at the workplace. During pre-placement health check-ups, nurses with fruit allergy, history of allergic diatheses and history of allergy to other rubber items must undergo latex allergy testing. Nurses should learn to recognize the symptoms of latex allergy: e.g. skin rash, flushing, itching, sinus symptoms, asthma. In resource poor settings, use of nitrile or vinyl gloves may be promoted.

Bobby Joseph, MBBS, MD (Community Medicine), DNB (Social and Preventive Medicine), Head, Occupational Health Services St. John’s Medical College Hospital, India
The use of closed systems for handling hazardous drugs (HD’s).

In occupational health, we define HD’s as drugs that contain an active ingredient whose potential toxicity represents a health risk for healthcare workers who are going to handle it. One of the usual causes of contamination by HD’s is the use of needles and conventional drug transfer systems that facilitate the formation of aerosols, the escape of vapors or the dripping of the drug during the preparation or administration phase. This causes contamination in the work areas and can motivate the exposure of healthcare workers to these toxic substances.

How to avoid contact with HD’s

To avoid contact with HD’s, a safety measure is the use of closed systems, both in preparation and administration. These systems are devices designed to facilitate the manipulation of HD’s. In order to be called closed systems, they must prevent the HD from contact with the external environment, always remaining inside the system and avoiding leaks of liquids, aerosols, vapors, etc.

There are two types of closed systems, those designed for the preparation of HD’s, and those used for administration.

Method: Review and analysis of the correct use of the systems commercialized and currently used for the preparation and administration of HD’s.

Results: There are different devices to prepare and administer drugs, but not all HD’s can be prepared with closed systems. During administration, systems may become contaminated, and therefore exposure may occur during system shutdown.

Closed systems decrease exposure to HD’s, but they should not be considered the only solution. Other complementary measures should be explored. It is important to study and evaluate the systems, but without neglecting the rest of the preventive measures, such as risk assessment, training, and health monitoring of healthcare workers.

The Discussion is about (dis)advantages of using these devices. Can they be considered really closed? Do they protect against exposure? Can we improve the administration systems?

Amparo Benavent Benavent, M. Amparo Ortuño Moreno, Hospital Clínic Universitari de València, Spain
TB in health workers in Mozambique: Unpacking state’s responsibility

Tuberculosis (TB) continues to be a significant work-related problem among health workers (HWs) in Mozambique. In order to ensure the safety of patients and HWs at healthcare facilities it is necessary to implement comprehensive TB prevention and control measures. Underpinning legal and governance arrangements that define rights, responsibilities and accountability play a neglected role in the prevention of occupational TB. This paper contributes to discussions about how legal and governance arrangements (i.e., international, constitutional, regulatory and operational frameworks) facilitate - or hinder - policy development and implementation.

Using Mozambique’s public healthcare sector as case study, the objectives of this paper are (1) to analyze the extent to which the existing legal and governance frameworks protect HCWs against occupational TB and manage those affected in the country, and (2) to discuss barriers and facilitators in the formulation and implementation of prevention and control interventions at healthcare facilities from the perspective of key informants. Our study consisted of legal analysis of regulatory frameworks and a qualitative case study design. The legal analysis focused on the text and structure of the existing laws, relying on canons of statutory interpretation such as dictionary meaning, grammatical structure and statutory context. In addition to analysis of relevant documents, we employed three methods of data collection: a one-day-workshop observation, three focus groups and seven semi-structured interviews using content and thematic analysis to examine the data.

The legal analysis determined that Mozambique lacks regulatory and governance frameworks that clearly establish roles, responsibilities and accountability mechanisms to effectively protect HWs from occupational TB and support affected HWs. The major barriers to policy implementation perceived by participants were a lack of legal and regulatory frameworks classifying TB as an occupational disease in healthcare settings, a lack of funding and resources, and prevalent TB stigma among HWs.

In line with previous studies, our findings indicate that, in the view of participants, the absence of specific legislation classifying TB as an occupational disease allows governmental neglect toward measures to prevent occupational TB in healthcare settings. Along with other research, our results also showed that participants are aware of TB-related stigma as a barrier to effective implementation. It was not clear to participants that legal strategies could overcome this barrier.

The successful development and implementation of policies to protect HCWs from occupational TB in healthcare facilities and manage affected HWs in Mozambique will likely require the codification of TB as an occupational disease and legal frameworks that clearly determine roles, responsibilities and accountability mechanisms to hold state actors accountable for implementing effective prevention measures. These include adequate funding and resources, as well as strategies to address TB-related stigma.

Regina Garcia, Postdoctoral fellow at the University of British Colombia, Vancouver, Canada
Jerry Spiegel, University of British Colombia, Vancouver, Canada, Paulo Ramao, ILO, Rodney I Ehrlich, University of Cape Town, South Africa
TB2 The 15-year experience on occupational health protection for HCWs in China

Health care workers (HCWs) are exposed to a great variety of occupational risk factors during healthcare service delivery, especially infectious diseases. With the aim to improve occupational health protection for HCWs, a national programme focused on Bloodborne Pathogen in China was initiated in 2003.

The 15-year country experience in China has been summarized in a three-stages frame. The first stage (from 2003 to 2008) focused on the development of evidence-based national Guideline for Prevention and Control for Occupational Exposure Bloodborne Pathogen (code: GBZ/T213). The second stage (from 2009 to 2013) identified key points to the implementation of the Guideline at hospital level. The third stage (from 2014 to 2017), a systematic approach toward the health and well-being of HCWs, was conducted integrating national and international instruments / technical tools, (e.g. HealthWISE, a joint ILO/WHO product).

The Programme has successfully obtained national political supports. At the first stage, policy analysis has been conducted, national Guideline for Prevention and Control for Occupational Exposure Bloodborne Pathogen (code: GBZ/T213) was issued by the in 2009.

At the second stage, along with the implementation of the guidelines, hospital intervention pilots was conducted, including training material development, training of trainers, and leadership engagement with policy suggestion and intervention at the institutional level, some national model hospitals were established.

During the third stage, integrating national and international instruments/ technical tools, with a special reference to the joint ILO/WHO product- HealthWISE. The Model of Hospital Initiative on Systematic Occupational Health (HiSoH Model) was gradually established in this period. The core principle of the HiSoH Model is the protection and maintenance of the possible highest degree of safety, health and well-being. Strong political commitment is important catalyst for HCWs protection. Globally, health and well-being of HCWs are aligned with the United Nations SDGs. The population health strategy is central to the Chinese government. Healthy China 2030 Planning Outline was launched in 2016, the Outline includes optimizing the human resources for health, and it indicates the political commitment to health sector development.

At present, Chinese laws and regulations do not fully meet the practical needs of health and well-being for HCWs. National occupational health policies development for HCWs should be accelerated. From occupational health standard perspective, prioritized occupational disease among healthcare workers, such as occupational diseases caused by HBV, HCV and TB should be included into The Categories and List of Occupational Diseases in China.

ZHANG Min. As vice chair of the Occupational Health Standards Committee of the National Health Standards Commission of China, and founder and director of Occupational Health Protection Committee for Health Care Workers, Chinese Association of STD and AIDS Prevention and Control, Prof. ZHANG Min has led key research projects, made great contribution to the Chinese national policies on occupational health, along with developing more than ten National Occupational Health Standards. Recently, as the leading expert of occupational health for health workers in China, Prof. ZHANG Min has organized the translation and application of the ILO Ergonomic Checkpoints and ILO/WHO HealthWISE into Chinese, she has published more than 100 papers as well as more than 20 scientific books.
Exploring systemic barriers to tuberculosis prevention and control among health

A sub-population known to be at high risk of tuberculosis (TB) infection in countries of high TB incidence is the healthcare workforce. In South Africa, healthcare workers have a 2 to 5 times higher risk of TB compared to the general population, despite numerous protective guidelines in place to address this situation. In addition, the focus of investigations into the causes of occupational TB and preventative strategies has often been skewed at the micro or meso levels. This study investigates, from an occupational health (OH) perspective, perceived systemic barriers to TB prevention and control among this population.

This qualitative study involved semi-structured interviews with 18 stakeholders working in areas related to occupational TB prevention and management in South Africa. Interviews were audio recorded and transcribed verbatim, validated and analysed aided by NVivo® Version 11 qualitative data management software. Responses were then organized and analysed using The World Health Organization (WHO) Health Systems building blocks was applied to conceptualize a system that could enhance the capacity of the healthcare system to prevent and control TB infection among health workers (HWs).

Perceived health system barriers to TB prevention and control included: lack of priority afforded OH, manifested by poor governance of OH, budgetary constraints and inadequate human and financial resources dedicated to OH services; a weak safety culture; and social factors such as HW stigma.

Health system analysis of OH for HWs indicates that healthcare decision-makers must pay more attention to systemic barriers that drive the high incidence of TB among HCWs.

Prince Adu, MPH, MA, University of British Colombia, Canada

Occupational tuberculosis in a South African teaching hospital

South Africa has adopted strategies to prevent workplace transmission of diseases including tuberculosis (TB). Occupational health and safety (OHS) and infection prevention and control (IPC) are essential in combatting HIV and TB in the workplace. We evaluated the effect of a multi-faceted policy, practice, and education intervention on OHS and TB IPC at a Provincial teaching hospital in South Africa.

This quasi-experimental study was conducted in an 800-bed hospital as part of a larger research collaboration. A multi-faceted intervention (including elements focused on primary, secondary, and tertiary prevention) to improve OHS and TB IPC in the hospital was implemented. Observational walkthrough surveys and completion of a modified infection control practices assessment tool were conducted to evaluate impact of the intervention. Total TB IPC scores were calculated and the total observed differences in scores between pre and post-intervention were compared using a t-test. Ethics approval was obtained from the University of Pretoria and University of British Columbia.

The hospital gained OHS including HIV and TB services, resources and infrastructure and the mean difference of the total TB IC scores post versus post intervention was statistically significant (p<0.0363). None-
theless, despite all the interventions and support provided, improvement in ICP was low; the administrative controls did not improve.

A strengthened workplace programmes for HWs in low- and middle-income countries, including HIV and TB, is possible with political will and involvement of management and workers. However, a monitoring and evaluation system is essential to guard against complacency.

Dr Muzimkhulu Zungu is a Public Health Medicine specialist and senior lecturer in the School of Health Systems and Public Health of the University of Pretoria. He currently also holds the post of Head of Department HIV TB in the workplace National Institute of Occupational Health.


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**TB5**

**Advocates as allies for preventing occupational Tuberculosis**

The example of a South African advocacy group, TB Proof, is used to illustrate the value of advocacy for the prevention of occupational tuberculosis. In South Africa, Tuberculosis (TB) in health workers is legally recognised as an occupational disease.1 Health workers have a three to six times higher risk to develop TB disease compared to the general population.2 Many health workers who develop occupational TB are not willing to disclose this to colleagues due to fear of stigma and loss of employment. This underreporting leads to a misconception among health workers that they are ‘immune’ to the disease. While occupational TB in South Africa qualifies for compensation, most cases are not reported and an even smaller proportion of submitted claims are successful.3 A high TB burden in South Africa coupled with poor implementation of Tuberculosis infection prevention and control (TB IPC) leads to healthcare facilities that place health workers and patients at risk.

TB Proof started as an advocacy movement among health workers with personal experience of occupational TB in South Africa and medical students committed to creating safe working environments. The founding aim of the organisation was to create awareness among health workers about their risk of developing occupational TB, coupled with educational sessions on TB prevention. The organisation also advocated for improved occupational health services for healthcare workers who develop disease, access to improved drug resistant TB treatment regimens and solidarity with people affected by TB. The movement was based on the legal framework provided by the Occupational Health and Safety Act in South Africa, and also a human rights based approach focusing on the human right to health and safety at work.

Since 2012, TB Proof has reached more than 10 000 health science students through its educational sessions, focused around the experiences of occupational TB survivors. The organization has presented at academic conferences and national and international level policy meetings, including the United Nations High Level Meeting on Tuberculosis in 2017. Members also authored six peer reviewed academic articles related to advocacy. TB Proof members appeared on multinational radio, print and television reports and have shared their stories with policy makers and elected officials in South Africa and globally. The organization has also partnered with national and global partners in campaigns to reduce TB stigma, improve access to safer, more effective treatment for drug resistant TB and increase support for community health workers. Recently, TB Proof has expanded its number of active members and broadened its focus to create advocacy platforms for a wider community of people affected by TB.
TB Proof members have demonstrated the value of advocacy and self-disclosure of experiences with occupational disease in encouraging others to do the same. This network became a valuable source of support for people affected by TB. By calling on health workers to advocate for their own health, it motivates them to hold facility managers and national role-players accountable for failures of prevention, but also starts a ground-up approach to improving TB prevention. Students were recognised as agents of change with valuable contributions to creating a new safety culture. Organisational challenges include providing support to health workers within an environment that receives inadequate support from the health system and developing a sustainable organisational model. Based on the experience of TB Proof, advocacy is an effective tool to advance the health of health workers and similar approaches could be utilised to motivate for an urgent response to occupational TB in other countries.


Helene-Mari van der Westhuizen is passionate about creating safe healthcare facilities. She was one of TB Proof’s co-founders, an organisation that aims to advocate for healthcare environments where health workers and communities are not at risk of being exposed to TB. She is the current chairperson of TB Proof’s board. She was also actively involved in the Safe Working Hours campaign which led to a reduction in the maximum duration a shift for junior doctors in South Africa. Helene-Mari is currently a Doctoral researcher at Oxford University. Her research looks at exploring the experiences of health workers and patients with TB infection prevention and control in healthcare facilities in a rural area in the Eastern Cape of South Africa.

Angela Dramowski, Paediatric Infectious Diseases, Department of Paediatrics and Child Health, Stellenbosch University, Arne von Delft, School of Public Health and Family Medicine, University of Cape Town; TB Proof, Bart Willems, Division of Health Systems and Public Health, Stellenbosch University; TB Proof, Dalene von Delft, Heena Narotam, TB Proof, JCB Kotze, Nuffield Department of Primary Care Health Sciences, Oxford University; TB Proof

Assessment of adequacy of mechanically ventilated work areas of hospitals in the Klang Valley, Malaysia

Malaysia is situated in the tropics and with increasing global temperatures, more health care facilities are being built and renovated to include mechanical ventilation. However, it increases the risk of airborne disease transmission if there is inadequate ventilation. The aim of this study was to assess the adequacy of ventilation at mechanically ventilated areas of hospitals in the Klang Valley, Malaysia. A cross sectional study was conducted in 4 hospitals randomly selected in the Klang Valley. Areas with mechanical ventilation in this study were the intensive care units (ICU), labour rooms (LR), microbiology laboratories, emergency departments (ED) and isolation rooms (IR). Ventilation measurements were carried out for one year by measuring the air flow at supply air diffusers grilles using an air velocity meter (TSI VelociCalc Model 9535). The air change per hour (ACH) was calculated by dividing the average flow
rate of air at the supply diffusers (ft³/min) with the room volume (feet³) and multiplying it by 60 (min). The method used was validated with tracer gas method at unused areas of one of the hospitals. Intraclass correlation of calculated ACH using tracer gas decay technique compared to those calculated by measurement of air velocity of the supply diffuser was high (ICC of 0.849 (95% CI: 0.440; 0.959). Most of the areas studied did not achieve the recommended ACH by ASHRAE Standard 170-2008 (1). Only 2 out of 4 hospitals met the recommended ACH for ICUs and 1 out of 2 hospitals met the standards for microbiology laboratory.

ACH is important as it indicates the removal efficiencies of the room air. A room with 6 ACH are able to remove 99% of the contaminated room air in 46 minutes. Whilst in areas with 12 ACH, it takes 23 minutes to efficiently remove 99% of contaminated room air (2). Studies have shown that areas with poor ventilation increases transmission of airborne diseases among hospital workers (3,4). Engineers involved in designing the heating, ventilating, and air-conditioning (HVAC) elements of hospitals should be made aware of the amount of ventilation required to effectively dilute and remove infectious particles to ensure safety of health care workers and not only cool areas to provide comfort while working.

2. CDC. 2005. Guidelines for preventing the transmission of Mycobacterium tuberculosis in health-care settings. MMWR 54(RR17): 1-140

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TB7

A borderline zone value for the QFT-test in 5,468 Italian health care students.

Healthcare workers (HCWs) are at increased risk of contracting Mycobacterium Tuberculosis Infection (TBI) through occupational exposure. The leading healthcare interventions to prevent new infections and their progression to disease are diagnosis and treatment of latent TBI infection (LTBI). Among the tests available to date for the diagnosis of LTBI, tuberculin skin test (TST) and Interferon Gamma Release Assay (IGRA) represent those most used (CDC, 2010) and IGRA have excellent specificity for the diagnosis of LTBI. Several borderline zones („grey zones“) have been proposed for defining conversions and reversions to improve the interpretation of test results as part of IGRA serial testing; nevertheless, data about the reproducibility of IGRA results and their performance in serial testing are limited. This study aimed to evaluate the prevalence of LTBI among medical students and to assess cases candidates for chemoprophylaxis using a borderline zone for the interpretation of the IGR.

From September 2012 to November 2017, according to the health surveillance program a sample of medical students from the University of Campania „Luigi Vanvitelli“ is offered to TBI screening. The surveillance program following the CDC guidelines included the use of the TST and, in case of positivity, an IGRA test, the QuantiFERON-TB Gold In-Tube assay (Cellestis Limited, Carnegie, Australia) (QFT-TBI). The QFT –TBI test is considered positive, when INF-γ is ≥0.35 IU/mL after correction for the negative control, and „borderline“, with the value from 0.35 to 1.00 IU/mL. All students with a first positive IGRA were retested within three months. Only if the second IGRA was positive, the students were referred to a specialist for consultation.
concerning preventive chemotherapy of latent TBI. Among 5,468 medical students enrolled (more than half were female (58.6%) with a mean age of 24.4 years (range 18-59)), 761 subjects had carried out the QFT test. Among these students who performed the QFT-TBI test, 158 of them result test positive, 554 negative and 39 presented a range of values defined as borderline (0.35-1.00 IU / ml). For 18 cases the test was undetermined. Among the subjects with borderline values, 22 had been vaccinated against tuberculosis, and no student had reported contact with patients or family members with TB. The QFT-TBI test was repeated after 90 days on 25 subjects of the 39 with borderline values (with 14 subjects lost to follow up) and showed a negativization of the values in 17 students, a conversion in 3 students, while for 5 students a borderline value was also found for the second test: for all these 8 subjects a counselling from both the pulmonologist and the occupational physician was deemed necessary.

The need to introduce a different evaluation method of the IGRA results derives from the observation that in a subsequent control many of the subjects with values close to the cut-off showed reduced values, and therefore is a proportion of false positives in the first test. A borderline result allows to select subjects who are at increased risk of latent tuberculosis infection or progression to active disease and against which is required closer observation by the subsequent revaluation. The reduction in the number of false positives detected using the 0.35 IU / ml cut-off also allows avoiding to subject to X-ray examinations and chemoprophylaxis the students in which such measures would not be necessary. Screening programs and treatment of ITPB cases among health professionals are aimed at reducing the risk of tuberculosis infection, representing the fundamental tools for TB infection control.


Anna Rita Corvino, MD, Specialist in Occupational Medicine, PhD student in Ambient, Design and Innovation, Curriculum Prevention and protection from health and safety risks (MED44), University of Campania „Luigi Vanvitelli”, Italy Research interest: Biological risk with particular reference to healthcare workers.

Elena Grimaldi, Elpidio Maria Garzillo, Gabriella Di Giuseppe, Giovanna Donnarumma, Mariarosaria Muoio, Monica Lamberti, Nadia Miraglia, University of Campania „Luigi Vanvitelli”, Maria Grazia Lourdes Monaco, University Hospital of Verona, Italy

**TB8**

**Latent tuberculosis infection among healthcare staff after assignments abroad**

Tuberculosis (TB) remains the infectious disease with highest number of deaths worldwide. In 2017, more than 1.3 million deaths from a tuberculosis infection and 10 million new TB cases were registered[1]. One quarter of the world population is estimated to be infected with latent tuberculosis (LTB) [2]. A risk group for latent tuberculosis in Germany is the medical staff with an estimated prevalence of 8.3% [3]. Every year,
A large number of healthcare staff are sent abroad via organisations that provide humanitarian aid under simple conditions in the medical field. Employees often travel to high incident countries for tuberculosis. The literature describes a conversion rate of 2.9 to 4.2% after a stay abroad [4, 5]. An estimation of the prevalence of LTb among medical staff with stays abroad has not yet been carried out in Germany. At the beginning of the study, a prevalence of at least 13% was hypothesized for healthcare staff with assignments abroad based on the conversion rate.

A cross-sectional study in 2018/2019 examined the prevalence of LTb among medical staff who have worked abroad for at least 6 weeks in the last 5 years. 78 persons were included in the study. Recruitment was carried out through humanitarian aid organisations. Testing for LTb was performed by Interferon Gamma Release Assay (IGRA). The risk factors of the LTb, including past tests and assignments abroad, are recorded by means of a questionnaire. The analysis was descriptive, estimating the prevalence of LTb dependent on risk factors. In addition, OR were calculated using logistic regression and 95% confidence intervals of the OR were calculated using cornfield method as effect estimators.

The prevalence of LTb was 15.4%, 95%CI 8.9 - 25.1%. Among others, the prevalence was stratified by gender (male 20%, 95%CI 7.1 - 38.5%, female 12.77%, 95%CI 4.83% - 25.74%), by BCG vaccination status (vaccinated 8.82%, 95%CI 1.86% - 23.68%, unvaccinated 19.51%, 95%CI 8.82% - 34.87%). In addition, there was an age dependence, with a twice as high odds for an LTbi in the age group of 45 to 76 year olds as in the age group of 30 to 44 year olds (OR 2, 95% CI 0.9 to 4.4). In the analysis of foreign assignments, none of the persons who worked abroad for up to 4 months or for up to 2 short assignments (up to 2 months each) were tested positive for LTb.

The study showed an almost twice as high prevalence of LTb among medical staff working abroad compared to the prevalence among medical staff in Germany from previous studies (15.4 vs. 8.3%) [3], indicating an increased risk for LTb in this occupational group. Men are affected more frequently than women (20% vs. 12.77%). The prevalence of at least 13% hypothesized at the beginning could be shown in this study. Under a foreign assignment of 4 months or up to 2 short assignments across all age groups, there appears to be no increased risk of LTb. Furthermore, it should be discussed whether this occupational group has an increased risk for a multi-drug-resistant LTb due to the resistance situation in the countries of use [1]. In order to better protect healthcare staff in the future, the guidelines should be reconsidered and discussed again, especially as the LTb has been recognised as an occupational disease in Germany.


Iris Meier, MD, general practitioner, Germany, Anja Schablon, Albert Nienhaus CVcare, University Medical Center Hamburg-Eppendorf, Stefan Konigorski, Max-Delbrück-Centre for Molecular Medicine (MDC), Berlin, Germany
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