

# 국제학회 및 학술세미나 연구결과 발표 참가 계획

## I 목 적

- 국제학술대회 9<sup>th</sup> Public Health Conference(PHC2023)에 참가하여 연구원에서 수행한 연구 결과 및 작업환경측정 결과 분석 내용을 발표하고 각 국가별 보건 분야 전문가와의 학술교류를 통하여 보건 분야 국제 연구 동향 및 현안사항을 파악하고 연구 역량을 강화하고자 함.

## II 출장 근거

- 연구기획부-2404(2023.6.2.) 「2023년 국제학술대회 발표 국외출장 지원 대상자 알림」

## III 출장 개요

- 학 회 명 : 9<sup>TH</sup> PUBLIC HEALTH CONFERENCE, PHC2023
- 출장일정 : 2023. 11. 9.(목) ~ 11. 13.(월) [3박 5일]
- 출 장 지 : 태국 방콕(Radisson Suites Bangkok Sukhumvit)
- 출 장 자 : 직업환경연구실 김세동 과장, 김수진 대리(2명)
- 주요수행사항 : 직업환경연구실 연구 및 사업 수행 결과 포스터 발표
  - Current status and result analysis of working environment measurement system in S. Korea (김세동)
  - Exposure intensity and high-risk industries of carcinogens in south korea (김수진)

※ [덧붙임1] 초록 원본 각 1부, [덧붙임2] 포스터 등록 승인 편지 각 1부 참고

## IV 세부 계획

일 정	내 용	비 고
‘23. 11. 9(목)	<ul style="list-style-type: none"> <li>○ 출국</li> <li>- 부산 7:00(목) 출발 → 인천 8:10(목) 도착</li> <li>- 내항기 환승 후 인천 9:15(목) 출발 →</li> <li>    방콕 13:15(목) 도착</li> </ul>	
‘23. 11. 10(금) - 11. 12(일)	<ul style="list-style-type: none"> <li>○ 학회 등록 및 개회식</li> <li>○ PHC2023 프로그램</li> <li>- Keynote lecture, Keynote Panel discussions</li> <li>- Symposia, Oral presentations</li> <li>- Poster discussion sessions, Panel discussions</li> </ul>	Session별 세부일정 미확정
‘23. 11. 12(일) - 11. 13(월)	<ul style="list-style-type: none"> <li>○ 입국</li> <li>- 방콕 23:15(일) 출발 → 인천 6:40(월) 도착</li> <li>- 내항기 환승 후 인천 8:25(월) 출발 →</li> <li>    부산 9:30(월) 도착</li> </ul>	

※ 세부프로그램은 미확정이므로 참여 세션 변경 될 수 있음.

## V 행정 사항

- 출장자는 귀국 후 1개월 이내 국외출장결과보고서를 작성하여 보고
- 현재 보유 항공마일리지로 항공권 구매 및 좌석 승급 불가
- 출장결과보고서 제출 시 항공 마일리지 신고서 제출
- 항공마일리지 기록 카드 조회

[덧붙임1] 초록 원본 각 1부.

## Current status and result analysis of working environment measurement system in S. Korea

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Occupational Safety and Health Research Institute

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### ABSTRACT

**Backgrounds:** In South Korea, business owners shall measure the working environment of a workplace which handles harmful hazards (organic chemical, metals, acid, dust etc.) to protect the health of employees. The purpose of this study is to supporting workers' health management understand the current status of the work environment measurement (WEM) data.

**Methods:** From WEM data (2017-2021), the number of workplaces that conducted WEM, the number of workplaces exceeding the occupational exposure limits(OEL) for harmful factors, the measurement status of designated highly hazardous substances (carcinogenicity, mutagenicity, reproductive toxicity) was analyzed by industry.

**Results:** The 5 year average workplace which conducted work environment measurements from 2017 to 2021 is 72,633 which is 2.64% implemented compared with registered occupational accident insurance workplaces) And the proportion of workplaces exceeding OEL is steadily decreasing from 13.1% in 2017 to 10.6% in 2021. The 5 year average number of workplaces measuring highly hazardous substances is approximately 17,140, and the number of workplaces exceeding OEL is approximately 20. As of 2021, the manufacturing industry occupied 75.9%; construction industry 7.6%; repair and other personal services 5.7%; health and social welfare service 2.7%; professional science and technology services 1.6%. The exceeding rate of OEL by industry was in the following order: forestry, mining, manufacturing, fishing, sewage waste treatment and material recycling and environmental restoration.

**Conclusions:** The results of this study can be used as basic data for establishing occupational health policies to improve the working environment.

Keywords : working environment, measurement, occupational exposure, health management

# Exposure intensity and high-risk industries of carcinogens in South Korea

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## ABSTRACT

**Objective:** The aim of this study is to estimate the exposure intensity to carcinogens and to explore high-risk industries by analyzing the work environment measurement database(WEMD, mandatory reported data of health hazards (organic chemical, metals, acid, dust etc.) by business owners in S. Korea.)

**Methods:** Among the highly controlled chemical substances\*, Five IARC group 1 carcinogens (1,2-dichloropropane, benzene, 1,3-butadiene, trichloroethylene, formaldehyde) were selected and computed the 95th percentile levels( $X_{0.95}$ ) of measurements for each industry using WEMD from 2018 to 2022. Based on the occupational exposure limit(OEL), we classified the high-risk industries.

\* Highly controlled chemical substances: substances that requires a high level of control due to its potential to cause a significant adverse health effect to workers as designated by the Occupational Safety and Health Act in S. Korea.

**Results:** A total of 7,195 measurements of 1,2-dichloropropane were taken at an average of 407 workplaces per year over the past five years, with 1,528 samples detected, for a non-detection rate of 78.8%. The geometric mean concentration was 3.809ppm(n=4) in the wholesale of other building materials industry, 0.222ppm(n=20) in the electronic capacitor manufacturing industry, and 0.156ppm(n=10) in the screen printing industry, and there were 32 industry sectors where the  $X_{0.95}$  exceeded OEL of 10ppm, including electronic resistor manufacturing, steel pipe manufacturing, and electrical circuit connection device manufacturing.

A total of 46,215 measurements of benzene were taken at an average of 904 workplaces per year over the past five years, with 2,656 samples detected, for a non-detection rate of 94.3%. The geometric mean concentration was 0.046ppm(n=7) in other outdoor facility construction, 0.024ppm(n=30) in other sports services, and 0.020ppm(n=11) in plastic adhesive treatment product manufacturing, and there were 11 industry sectors where the  $X_{0.95}$  exceeded OEL of 0.5ppm, including plastic adhesive treatment product manufacturing, other outdoor facility construction, and other sports services.

A total of 17,279 measurements of 1,3-butadiene were taken at an average of 369 workplaces per year over the past five years, with 1,076 samples detected, for a 93.8% non-detection rate. The geometric mean concentration was 0.019ppm(n=69) in other household electrical appliance manufacturing, 0.0001ppm(n=3) in office and institutional building construction, and 0.0001ppm(n=20) in industrial gas manufacturing, and the industry with the  $X_{0.95}$  exceeded OEL of 2ppm was Other household electrical appliance manufacturing.

A total of 25,234 measurements of trichloroethylene were taken at an average of 1,227 workplaces per year over the past five years, with 9,729 samples detected, for a non-detection rate of 61.4%. The geometric mean concentration was 3.885ppm(n=6) in pulp and paper processing machinery manufacturing, 3.153ppm(n=10) in structural metal plate and workpiece manufacturing, and 1.591ppm(n=4) in toothpaste, soap, and other detergent manufacturing, and there were 93 industry sectors where the  $X_{0.95}$  exceeded OEL of 10ppm, including metal forming machinery manufacturing, aluminum casting foundries, and electronic coil, transformer, and other electronic inductor manufacturing.

A total of 130,122 measurements of formaldehyde were taken at an average of 3,150 workplaces per year over the past five years, with 89,482 samples detected, for a 31.2% non-detection rate. The geometric mean concentration was 0.070ppm(n=105) in wood pallets and other loading boards manufacturing, 0.035ppm(n=64) in wood preservation, embalming, painting, and similar treatments, and 0.033ppm(n=27) in eyeglasses and eyeglass lenses manufacturing, and there were 288 industry sectors where the  $X_{0.95}$  exceeded OEL of 0.3ppm, including construction headquarters, other glassware manufacturing, and industrial process control equipment manufacturing.

**Conclusions:** The exposure intensity of carcinogens and high-risk industries were estimated. The results will provide information in preventing health hazards for workers.

Keywords : carcinogen, health hazards, work environment measurement, high-risk industries

[덧붙임2] 포스터 등록 승인 편지 각 1부.

- Abstract Acceptance letter (김세동)



September 11<sup>th</sup>, 2023

Dear Mr. Sedong Kim,

On behalf of the PHC2023 Organizing Committee, I would like to congratulate you for being accepted to the Tomorrow People Organization's 9<sup>th</sup> **Public Health Conference [PHC2023]**, taking place from 10<sup>th</sup> – 12<sup>th</sup> of November 2023 in Bangkok, Thailand, and invite you to present your paper titled: "Current status and result analysis of working environment measurement system in S.Korea".

9<sup>th</sup> Public Health Conference [PHC2023] attempts to answer multiple questions, meet the most diverse interests and host global stakeholders. This remarkable event brings together academics, professionals, NGOs, corporate representatives and policy makers from different parts of the world, offering a unique opportunity to learn, network and share ideas with prominent leaders in the field, in a professionally and culturally diverse environment. PHC2023 is carefully designed to foster personal and professional growth. The 3-day event will include inspiring speakers, exciting panel discussions and networking activities.

The cost of the conference is 400 EUR. This price includes: admission to all sessions, discussions, snacks, lunch and coffee breaks during the Conference, all necessary materials for following the sessions, publication of a submitted paper (for presenters), copy of the official conference proceedings publication and certificate issued by Tomorrow People Organization.

**A non-refundable deposit of 100 EUR is due September 18<sup>th</sup> 2023** and is required in order to secure your spot in the Conference. The 300 EUR balance is due September 25<sup>th</sup> 2023.

Kindly note that space in the conference is limited and is guaranteed only until the deadline stated above or once the registration for the conference is completed. If the registration is not completed timely, the spot may be released and offered to another waiting listed applicant. *If, for any reason, you are not able to confirm your position by the deadline stated above, or need an extension of the deadline, please confirm with us by sending an email to [contact@tomorrowpeople.org](mailto:contact@tomorrowpeople.org) to make sure your spot is kept reserved.*

Attached to this letter, you will find documents with further information regarding the PHC2023 and registration process as well as invoice and a letter of support, which you can use to aid your search for outside funding. A number of participants have obtained funding from their home universities or organizations they work for, as well as from the NGO, corporate and governmental sectors in their communities.

Again, congratulations for being selected to be a part of this highly exciting and challenging international conference! We are excited to have you as a participant and we look forward to seeing you in November in Bangkok.

Should you have any questions regarding PHC2023 or need any assistance, please do not hesitate to contact us at [contact@tomorrowpeople.org](mailto:contact@tomorrowpeople.org).

Sincerely,

**Vladimir Mladjenovic**  
Director

- Abstract Acceptance letter (김수진)



September 11<sup>th</sup>, 2023

Dear Ms. Sujin Kim,

On behalf of the PHC2023 Organizing Committee, I would like to congratulate you for being accepted to the Tomorrow People Organization's 9<sup>th</sup> **Public Health Conference [PHC2023]**, taking place from 10<sup>th</sup> – 12<sup>th</sup> of November 2023 in Bangkok, Thailand, and invite you to present your paper titled: "Exposure intensity and high-risk industries of carcinogens in South Korea".

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Sincerely,

The image shows a handwritten signature in blue ink over a circular official stamp. The stamp contains the text "TOMORROW PEOPLE ORGANIZATION" around the top, "people" in the center, and "International Education" around the bottom.

**Vladimir Mladjenovic**  
Director