



Ministry of Health Malaysia  
Institute for Medical Research

# Current Trends and Future Challenges in Occupational Health Research

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# Outline of presentation

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## Background

- Institute for Medical Research
- Environmental Health Research centre

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## Occupational Health Research

- Current projects

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## Research Direction

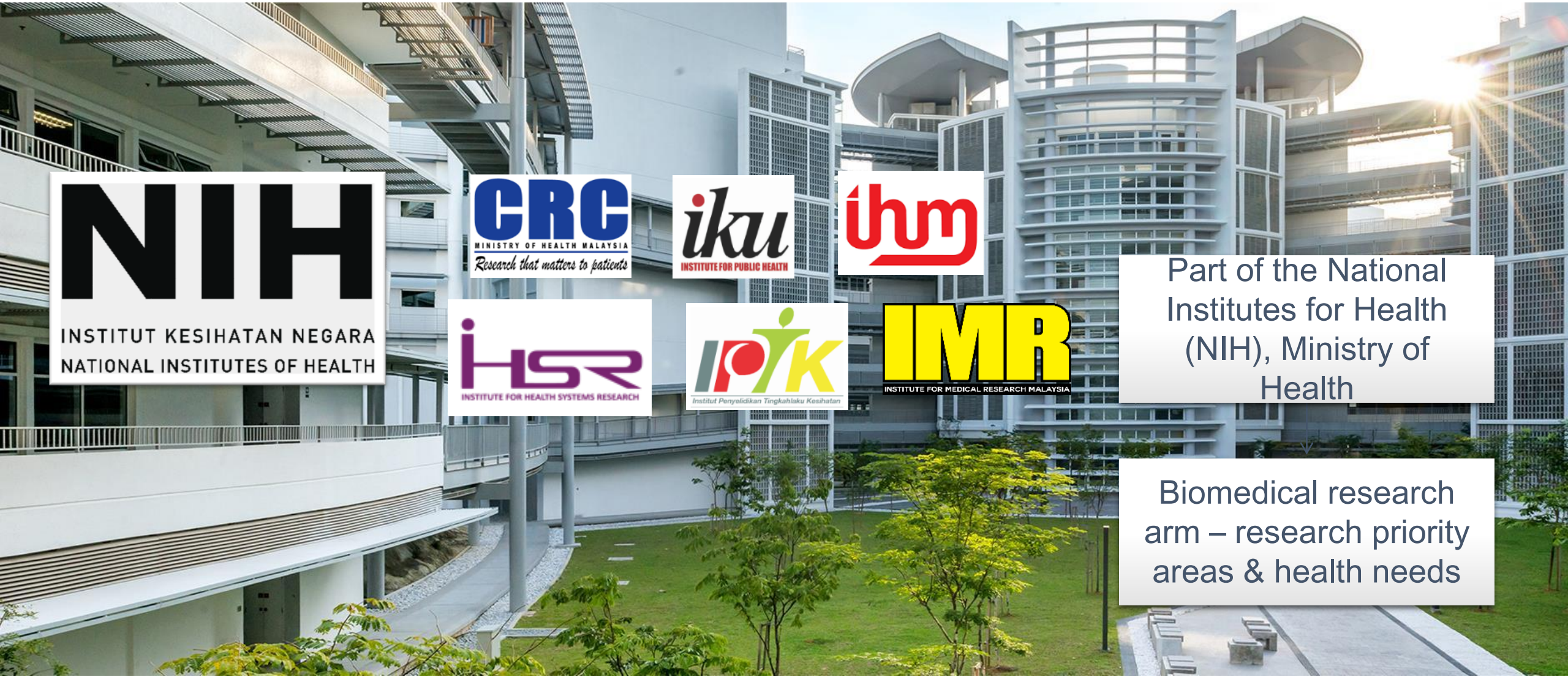
- Health research priority

**4**

## Conclusion



# Background



**NIH**  
INSTITUT KESIHATAN NEGARA  
NATIONAL INSTITUTES OF HEALTH

**CRC**  
MINISTRY OF HEALTH MALAYSIA  
*Research that matters to patients*

**iku**  
INSTITUTE FOR PUBLIC HEALTH

**ihm**

**HSR**  
INSTITUTE FOR HEALTH SYSTEMS RESEARCH

**IPK**  
Institut Penyelidikan Tingkahlaku Kesihatan

**IMR**  
INSTITUTE FOR MEDICAL RESEARCH MALAYSIA

Part of the National Institutes for Health (NIH), Ministry of Health

Biomedical research arm – research priority areas & health needs

# Background

## Institute For Medical Research (IMR)



Jalan Pahang

 Established in 1900

Started by providing the pathology services for the country



Setia Alam

  
Infectious Diseases Research Centre

  
Allergy and Immunology Research Centre

  
Nutrition, Metabolism and Cardiovascular Research Centre

  
Cancer Research Centre

  
Environmental Health Research Centre

  
Herbal Medicine Research Centre

  
Biochemical Genomic Research Centre

  
Special Resource Centre

# Research Focus

## Infectious Diseases



Dengue, Zika, TB, Malaria, Hepatitis C, AMR, Outbreak Pathogens

## Drug Discovery



Herbal, Lead compounds, In silico molecular studies

## Cancer

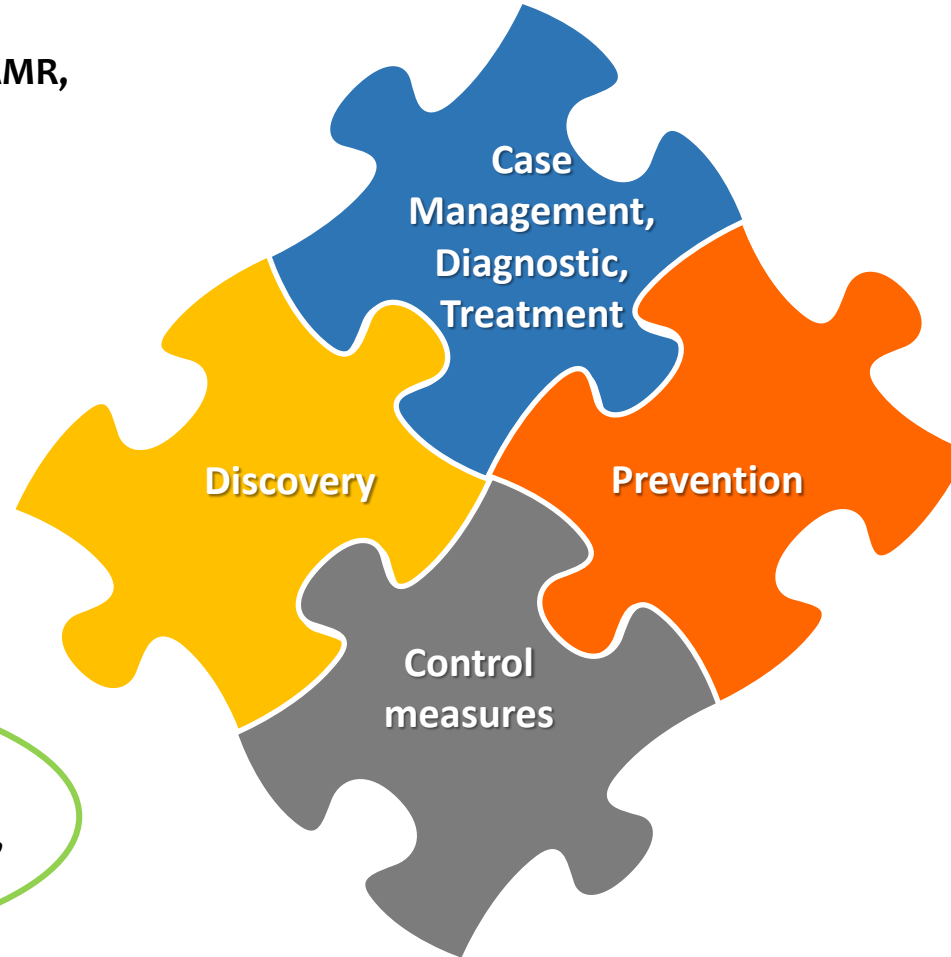


Nasopharyngeal Carcinoma, Leukemia

## Environmental Health



Climate change, Occupational Health, Health Risk Assessments



## Nutrition, CVD

Obesity, Diabetes, CVD, MI; Complications, Biomarkers, animal model



## Autoimmune/Allergy

Rheumatoid arthritis, drugs & food allergy



## Genetic Diseases

Primary Immunodeficiency, Inborn Errors of Metabolism, Neurotransmitter disorder



## Epidemiology

Recurring Infectious Diseases



# Environmental Health Research Centre (EHRC)



1994

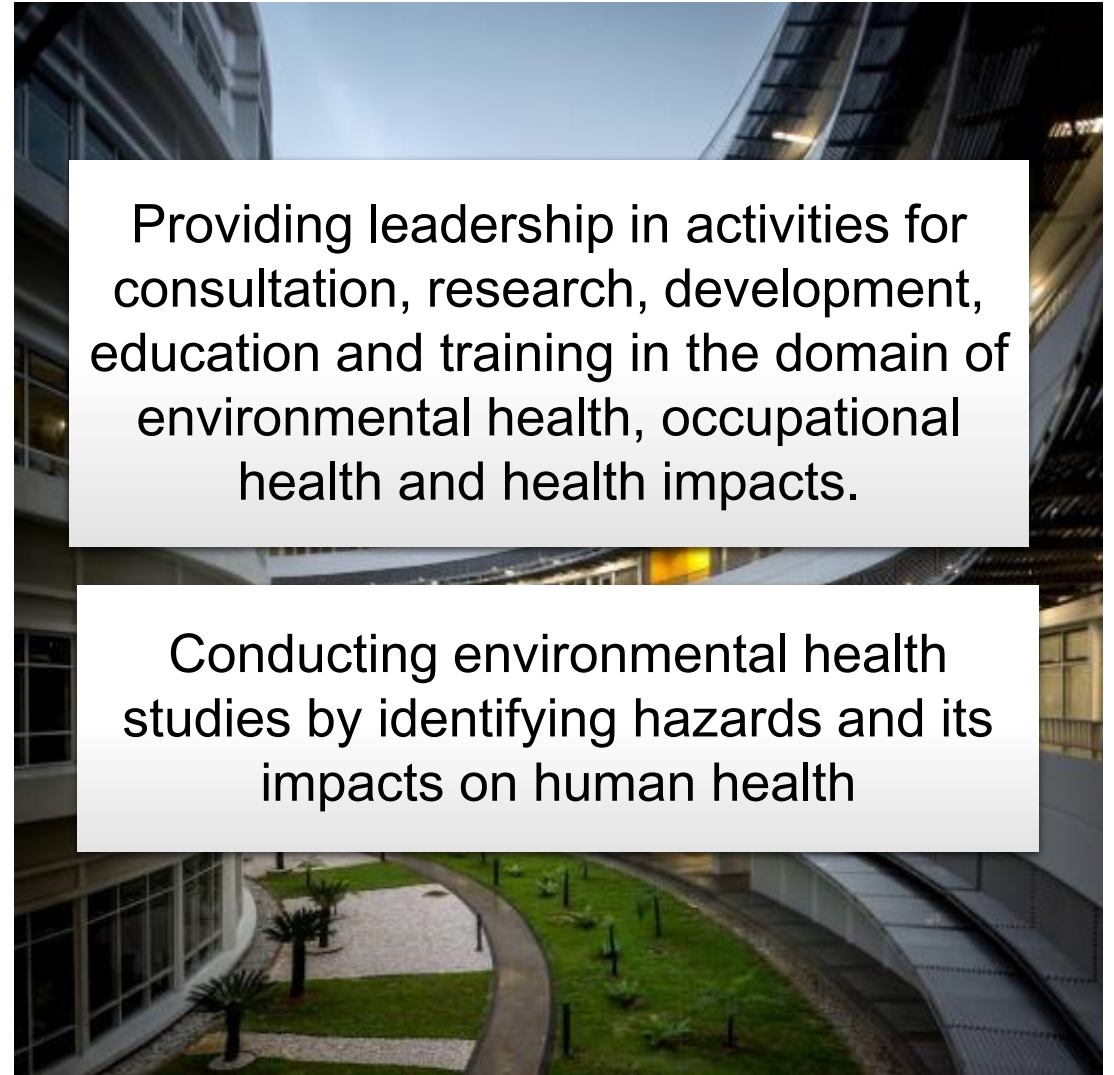
The concept was initiated during the First National in 1994 Conference on Environmental Health Research

1996

EHRC was established with redesignation from the Medical Ecology Division in IMR.

Providing leadership in activities for consultation, research, development, education and training in the domain of environmental health, occupational health and health impacts.

Conducting environmental health studies by identifying hazards and its impacts on human health



# Research Focus



Conducting research to assess health risk from exposure to contaminants/ pollutants in the environment or workplace

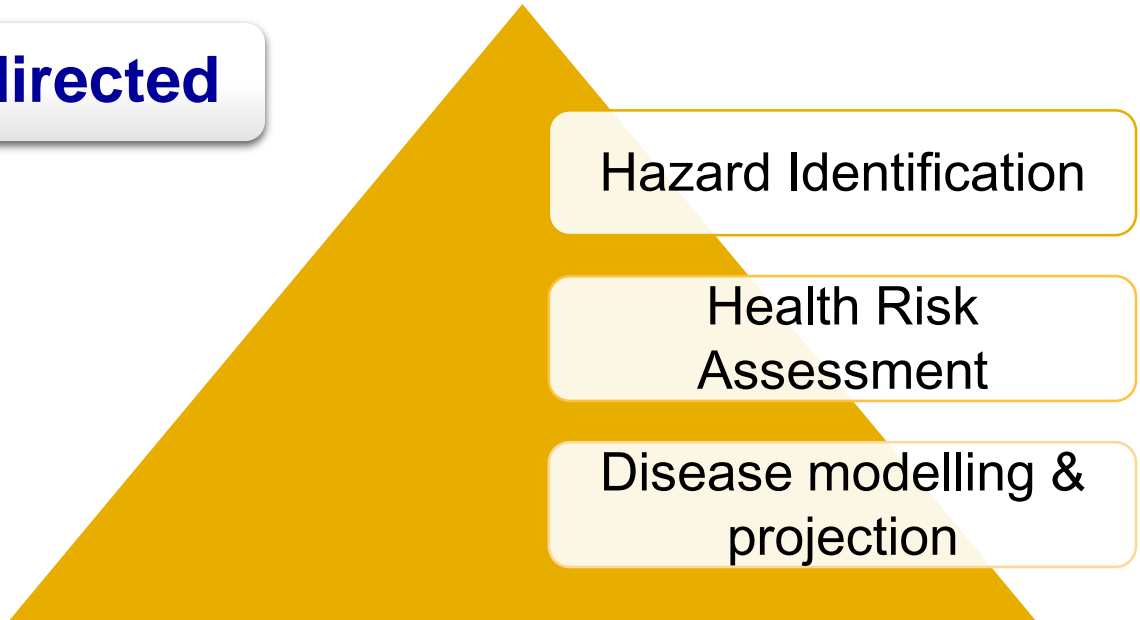
Conducting the vulnerability assessment the climate change impact on climate sensitive diseases

Occupational Health Unit

Health Risk Assessment Unit

Climate Change Unit

**Policy directed**





**Facial panel**

Facial Anthropometry Survey Among Malaysian For The Development Of Bivariate And Principal Component Analysis Facial Panel

A nationwide study with more than 4000 participants

Quantitative respirator fit testing according to Malaysian facial panels



Study of Concerns, Perceive Impact, and Adequacy of Preventive Measures for COVID-19 Among Healthcare Workers in Government Healthcare Facilities

**Occupational Health**

Risk Categorization of Healthcare Workers in COVID-19 High Risk Facilities in Southern Region of Peninsular Malaysia



**Mental Health**

Online survey in 90 healthcare facilities within Klang Valley



**Risk COVID-19**

A small proportion of HCWs did not practice the recommended preventive measures

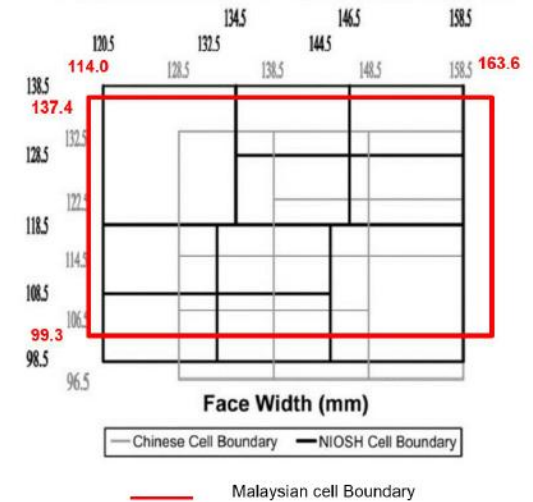
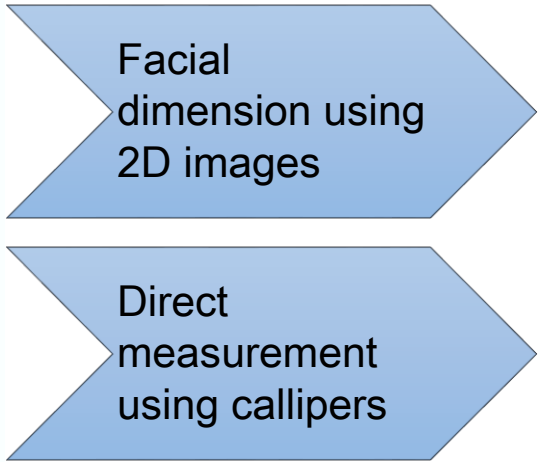
- no physical distance when eating together, in elevator, sharing facility and office (23-28%)
- non sharing transport, no hand hygiene, not avoid crowded place (13-14%)
- eating out, going to mall and religious place (11-14%)



# Head and face anthropometric study for respirators in the multi-ethnic Asian population of Malaysia

Yin Cheng Lim<sup>1,2\*</sup>, Ameerah Su'ad Abdul Shakor<sup>1</sup>, Nadia Mohamad<sup>1</sup>, Muhammad Alfatih Pahrol<sup>1</sup>, Rohaida Ismail<sup>1</sup>, Zhuo Lin Chong<sup>3</sup>, Mohd Hatta Abdul Mutalip<sup>3</sup>, Mohd Azahadi Omar<sup>4</sup>, Mahmoud Danaee<sup>2</sup>, Guo Tung Wan<sup>5</sup> and Rafiza Shaharudin<sup>1</sup>

<sup>1</sup>Environmental Health Research Centre, Institute for Medical Research, National Institutes of Health, Ministry of Health, Selangor, Malaysia, <sup>2</sup>Department of Social and Preventive Medicine, Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia, <sup>3</sup>Institute for Public Health, National Institutes of Health, Ministry of Health, Selangor, Malaysia, <sup>4</sup>Sector for Biostatistics and Data Repository, National Institutes of Health, Ministry of Health, Selangor, Malaysia, <sup>5</sup>Department of Pharmacy, Sungai Buloh Hospital, Selangor, Malaysia



Bivariate Panel Boundaries for Malaysian, China, and NIOSH US, adapted from Chen et al., 2009 (5)



- Significant differences in all the dimensions between sex, place and ethnicity ( $p < 0.005$ ).
- In comparison to studies from the US & China, our study population had a wider interpupillary distance and nose breadth for both male and female participants, but smaller bigonial breadth and minimal frontal breadth.

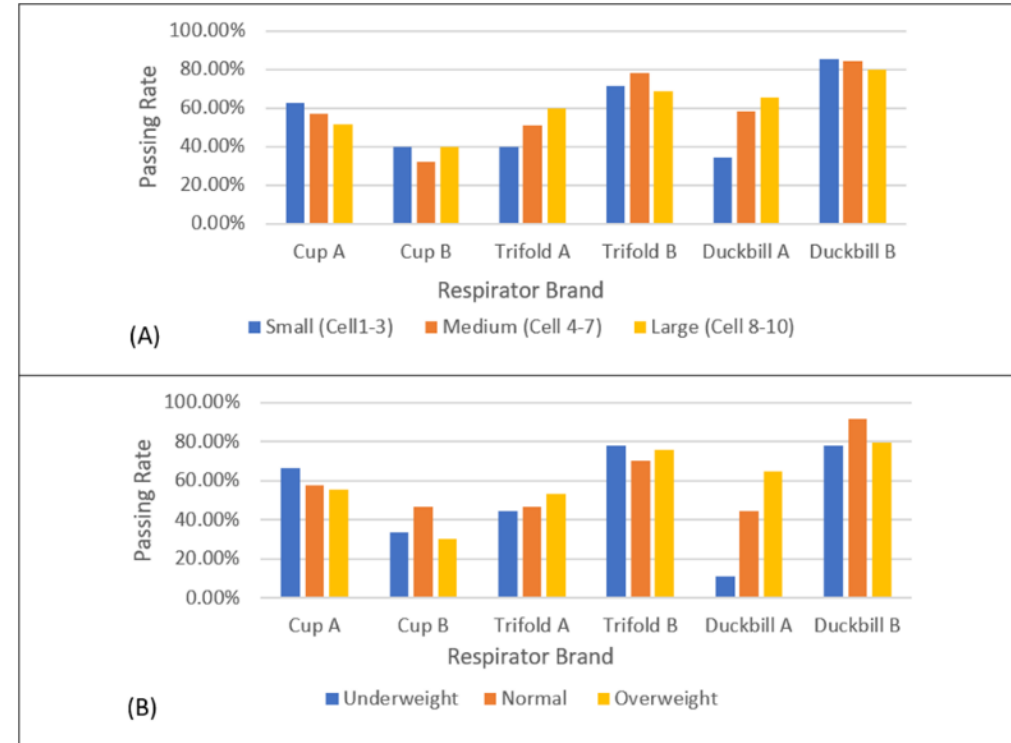


RESEARCH ARTICLE

# The effect of N95 designs on respirator fit and its associations with gender and facial dimensions

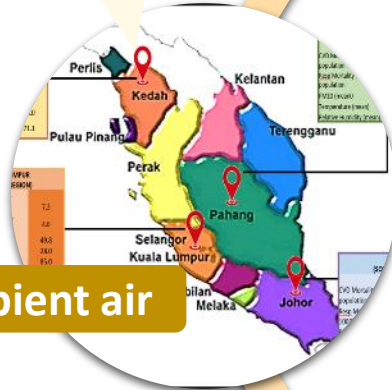
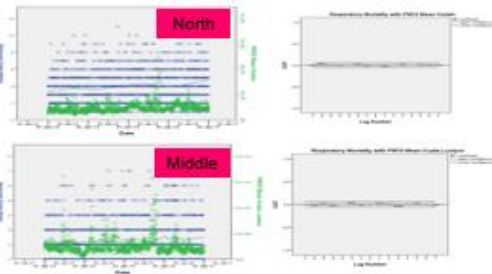
Nurul Amalina Khairul Hasni<sup>1\*</sup>, Rohaida Ismail<sup>1</sup>, Rosnawati Muhamad Robot<sup>1</sup>, Nadia Mohamad<sup>1</sup>, Fatin Amirah Suib<sup>2</sup>, Muhammad Alfatih Pahrol<sup>1</sup>, Haalah Mahmud<sup>3</sup>, Baderin Osman<sup>3</sup>, Yin Cheng Lim<sup>4</sup>, Zamtira Seman<sup>5</sup>, Rafiza Shaharudin<sup>1</sup>

1 Environmental Health Research Centre, Institute for Medical Research, National Institutes of Health, Ministry of Health, Malaysia, 2 Infectious Disease Research Centre, Institute for Medical Research, National Institutes of Health, Ministry of Health, Malaysia, 3 National Institute of Occupational Safety and Health, Ministry of Human Resources, Malaysia, 4 Department of Social and Preventive Medicine, Faculty of Medicine, University Malaya, Kuala Lumpur, Malaysia, 5 Sector for Biostatistics & Data Repository, National Institutes of Health, Ministry of Health, Malaysia



- The passing rates for the six n95 were between 36.3% and 83.7%
- Certain models (Cup B, Trifold A, Trifold B, and Duckbill A) fit better for participants with large facial size, while others (Cup A and Duckbill B) specifically fit better for those with small facial size

Trends of air quality and cardiorespiratory mortality during haze episodes



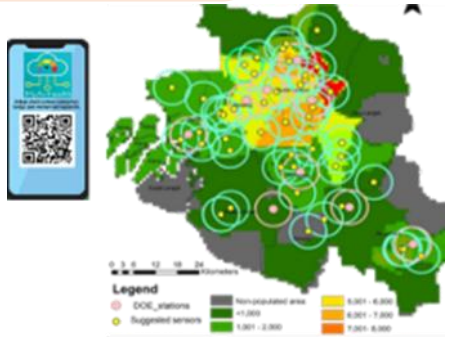
Ambient air



PM2.5

Assessment of Human Exposure to Ambient PM2.5 Pollution in Klang Valley

Sensor PM2.5



**Air Quality/ Pollution**



IAQ

Indoor Air Quality for microbes & mycotoxin



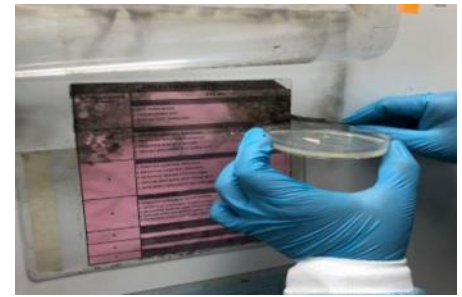
Detection of SARS-CoV-2 in air samples in hospital wards & quarantine centre



Bioaerosol



Healthcare facilities

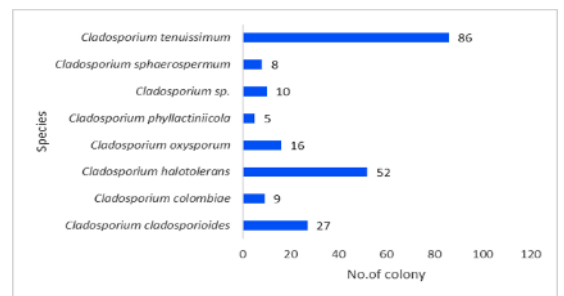
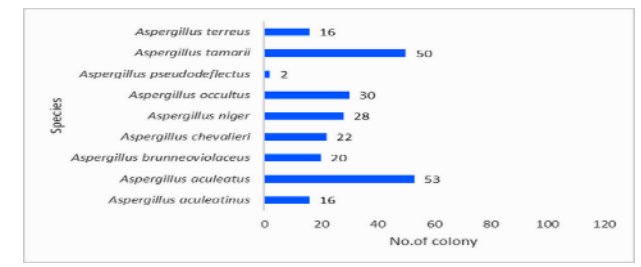
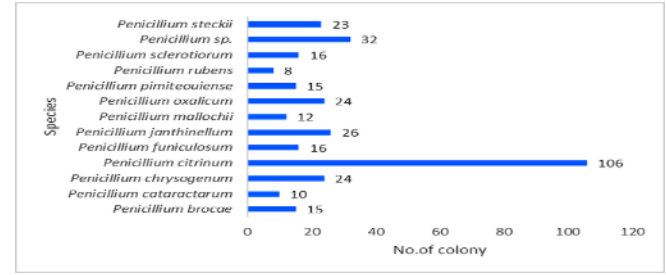
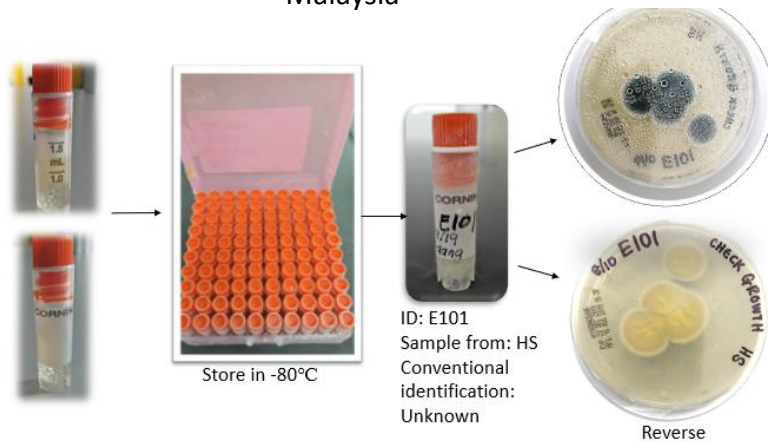


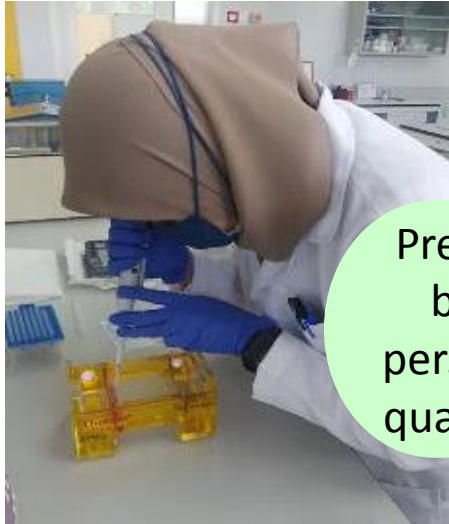
# Risk assessment of mycotoxins in indoor environments in selected high risk health care facilities in Peninsular Malaysia

The most common fungi genera detected in sampling locations were *Penicillium sp.*, *Aspergillus sp.* and *Cladosporium sp.*



Sampling site of hospitals and health clinics in Peninsular Malaysia





Prevalence of AMR selected bacterial isolates among personnel in dairy farms with quantification of ab. residues

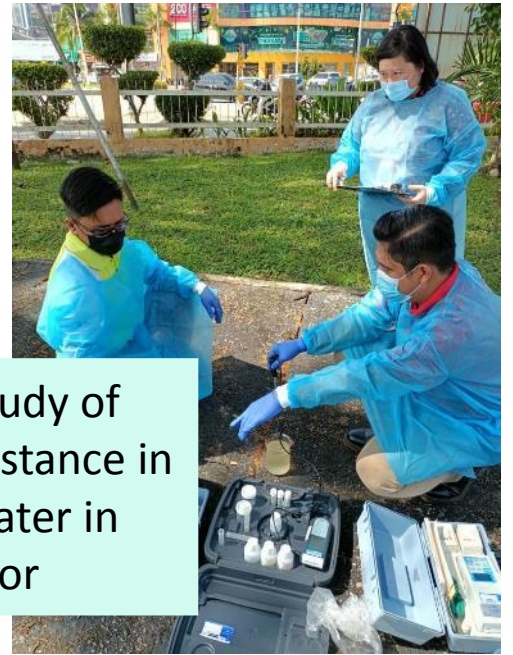


Use in humans



Humans

Molecular characterization of AMR genes and linkages between human, animal and environment



Baseline study of antibiotic resistance in drinking water in Selangor

### One Health Approach: Antimicrobial Resistance



Use in animals

Prevalence of AMR selected bacterial isolates in dairy & poultry farms



Animals



Environment

Prevalence of antibiotic resistant pathogenic bacteria and level of antibiotic residues from hospitals' effluent in Selangor



Discharge in environment



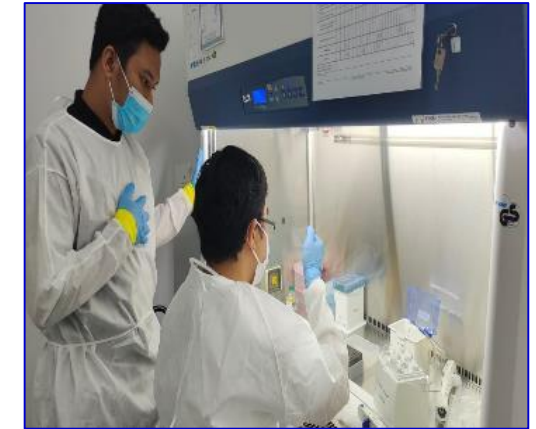
## Wastewater-based Epidemiology or Monitoring Spread Of COVID-19 Wastewater Treatment Plant



**Site sampling:**  
conducted at selected WWTP facilities and institutions in Selangor



**Laboratory analysis:**  
conducted at EHRC's Microbe and Biotech Laboratory



**Next Sequencing:** Gene Variant determination by the Virology Unit

# Research Direction

Research domain	Research areas	Indicative Priorities for research
Environmental & Disaster Risks	Environmental health and safety	Climate change and health
		Occupational Health
		Waste management
		Toxic chemicals
		Urbanization
		Air pollution

- Outcomes of interest were identified interchangeably as exposure and/ or intervention

MOH Number: MOH/S/NIH/12.21(HB)

**HEALTH RESEARCH PRIORITIES FOR 12<sup>TH</sup> MALAYSIA PLAN (12MP-HRP) 2021-2025**

### Gaps and Needs:

- Burden of occupational disease and injury arising from the workplace.
- Current studies mainly focus on prevalence, and limited study on effective intervention
- Linking the biomedical research in occupational health

National Problem	Research Scope	Gaps & Needs (Rationale)	Focus Area	Expected Output	Rank
Environment health and safety	Occupational Health	Burden of occupational disease and injury arising from the workplace. Current studies mainly focus on prevalence, and limited study on effective intervention	Interventional study and early return to work (e.g., cost, and effective intervention for ergonomic and work-related musculoskeletal disorder, occupational cancer, etc.)	Identify priority area for intervention for early intervention to improve workplace condition, accident and occupational injury, disease follow-up system and registry among workers.	6
			Insurance claims in occupational disease and accidents in Social Security Organisation (SOCSO) and Insurance company. (Health Economics)		16
			Commuting accidents specifically looking into fatigue, stress, depression, etc)		8
		Chemical and ionizing radiation hazards health effect such as neuropathy, occupational asthma and occupational cancer appear after long time of exposure	Chemical management system, KAP in the workplace	Strategic plan for chemical and ionizing radiation hazard management among Malaysian workers. This should include the effectiveness of the medical surveillance programme implemented	11
			Health effects of chemicals and ionizing radiation in healthcare facilities and industries		7
	Waste management	Scarcity of data on health issues related to solid waste, e-waste and radioactive waste management	Solid waste management and health issues.	Improving solid waste, e-waste, and radioactive waste management	10
			e-Waste management and health issues		9
			Radioactive waste and health effects		4
		Initiative for 3R (Recycle, Reduce and Reuse) is one of the programmes to support the green building activities in Malaysia. The effectiveness of the programme in health care facilities is never been assessed	3R and its implementation in health facilities	Evaluation of 3R programme in healthcare facilities	19





## Occupational Health Cancer

### HEALTH RESEARCH PRIORITIES FOR 12TH MALAYSIA PLAN 2021-2025

**PRIORITY AREA**

*Environmental and Disaster Risk*

**RESEARCH SCOPE**

*Occupational Health*

**FOCUS AREA**

*Occupational Exposure and Cancer*



## Next focus

Health hazards among workers in e-waste management and health

Effect of Ambient Fine Particulate Matter on Hospital Admissions, Mortality and Health Economic Burden: A Multi-City Analysis



# Conclusion



- Malaysia population, just like other developing countries, faces potential health threats due to occupational and environmental hazards.
- New challenges such as increasing usage of chemicals in industries and products, as well as the human health effects need to be taken seriously.
- Health sectors response in various ways
  - Enhance capacity building and research systems
  - Increase multi-sectors engagement



*Thank You*



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Public Health Medicine Specialist



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