



# **Workplace Health Without Borders (WHWB) - *Expanding the Practice of Industrial Hygiene***

**YPSW 42<sup>nd</sup> Annual Meeting  
San Diego, CA  
January 20, 2017**

David M. Zalk, PhD, CIH  
Director, Workplace Health Without Borders

# Update

- ★ **Why is occupational health a global health concern?**
- ★ **What needs to be done?**
- ★ **Where does it go wrong?**
- ★ **What is the status of Industrial Hygiene on the International Scale?**
- ★ **What can we do?**



# There are over 3 billion workers in the world...

Nearly 2 billion of them work in unhealthy and unsafe conditions

**2.34 million workers die** each year from workplace causes

**2 million of these die from occupational disease**

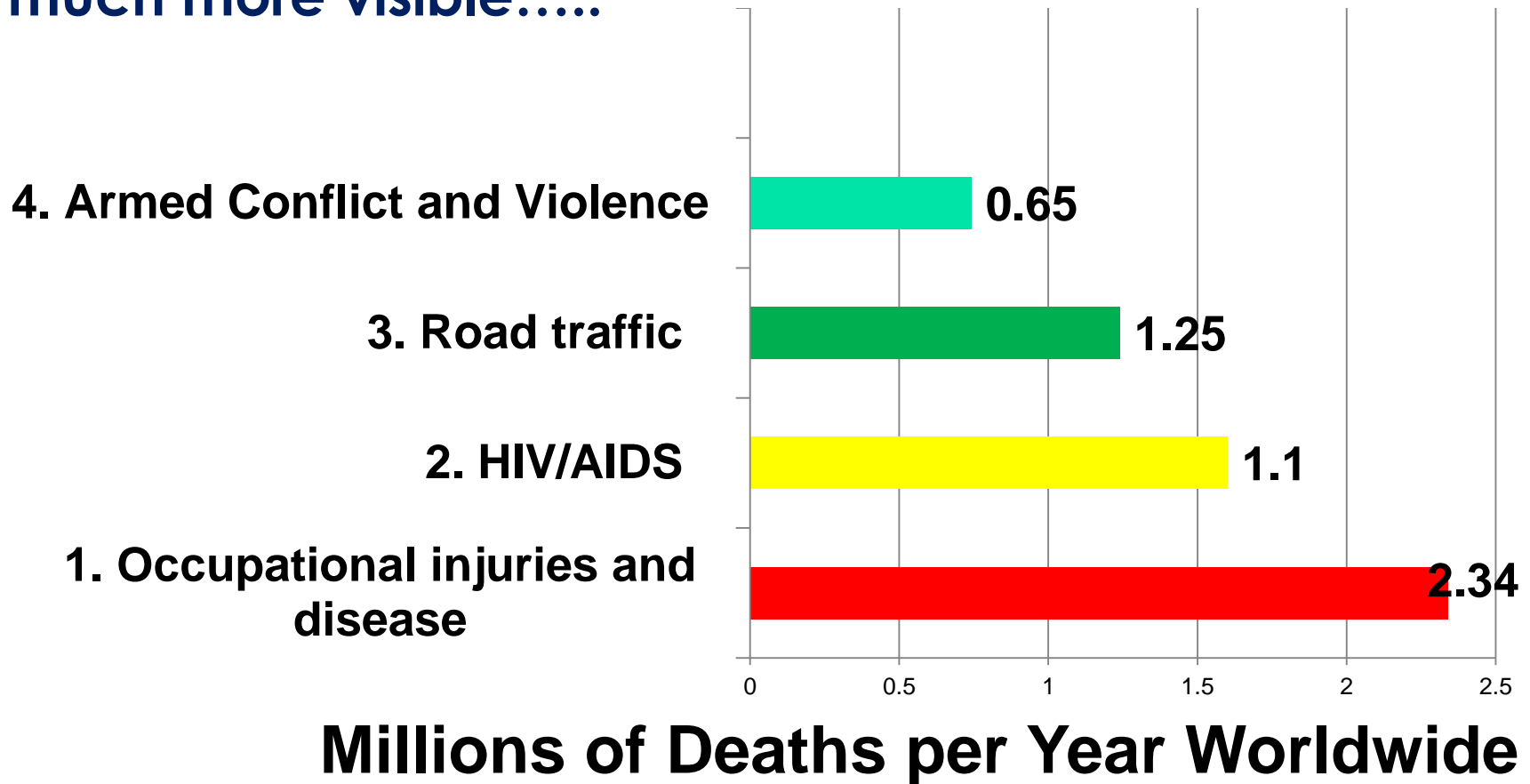
**That is 1 death every 15 seconds**



## In addition....

- ★ **160 million workers get sick each year due to non-fatal work-related diseases**
- ★ **Occupational injuries, sickness, and disease costs the world economy \$2.8 trillion/year USD**

**More people die each year from occupational injuries and disease than from other major causes that are much more visible.....**



**Sources:**

1. ILO, 2013
2. WHO, 2013 deaths

3. WHO, 2010 deaths
4. Armed conflict, 2016 (IISS) + homicides, 2012 (WHO)+ terrorism, 2015 (Statista)



# **“Official” statistics don’t reflect**

- ✱ Environmental impacts of workplace agents**
- ✱ Synergy between workplace hazards and other disease risk factors (e.g. silica-TB; asbestos-smoking)**
- ✱ Informal work**
- ✱ Blurred lines of workplace, home and community: exposed family members**
- ✱ The costs to a family with no provider**



# The informal economy

In the developing world, employment in the informal sector may reach 70 percent, with the contribution to the gross domestic product (GDP) ranging from 10 to 60 percent.



**168 million of the world's children are child labourers. More than half of them do hazardous work: ILO**



Saeed Awan, Glass bangle manufacture, Pakistan



# Where every day is take your kid to work day









# Exports of Hazardous Materials

- ✱ Asbestos
- ✱ Lead paint

**Lead Paint, Other Toxic Products Banned In U.S.  
Exported To Unsuspecting Customers Abroad**

Posted: 03/25/2013 6:40 pm EDT | Updated: 03/25/2013 6:40 pm EDT



In this 2013 photo, a worker covers his face with a handkerchief as he sees people photographing him and his co-worker handling asbestos sheets at the Ramco Industries Ltd. Factory in Bhojpuri district of Bihar state, India (AP/Saurabh Das)



# Workplace Health Without Borders

## Our Vision

*A world where workers, their families and communities do not get ill because of their work.*

## Our Mission

*To prevent work-related disease around the world through shared expertise, knowledge and skills.*



# What can we do?

- ✱ **Training Programs**
- ✱ **Mentoring Programs**
- ✱ **Professional and Public Awareness**
- ✱ **Support for International NGOs**
- ✱ **Projects**
- ✱ **PPE and Equipment**

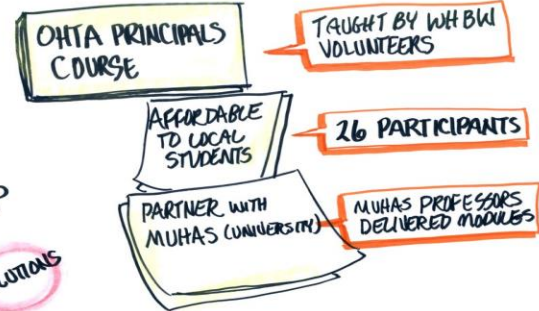




# Teaching and Professional Development

- Renaissance University Nigeria - helped develop proposal and curriculum for an Industrial Hygiene/Occupational Hygiene (IH/OH) program.
- IH/OH for Physicians at Maulana Azad Medical College in India – 2015
- OHTA W201 Basic Principles in IH/OH at Muhimbili University, Dar Es Salaam, Tanzania - 2015
- OHTA W201 Basic Principles in IH/OH to National Institute for Occupational and Environmental Health in Hanoi, Vietnam – 2016
- Facilitated donating IH/OH equipment to Uruguay, Pakistan, Tanzania, and Ebola PPE to Sierra Leone

# THE POWER OF ONE IN TANZANIA



**WE LEARNED**  
THE POWER OF  
**ONE**  
AND THE POWER OF  
**MANY**



# OHTA W201 Basic Principles Course – National Institute of Occupational & Environmental Health (NIOEH) Hanoi, Vietnam June 2016

WHWB-US, AIHA, OHMS Australia, OHTA





# IOHA View of the World



**IOHA's Focus is Growing the  
World of IH/OH**

# Global Need for IH/OH



**IOHA 2016-20 Strategy Document;  
IOHA's Mission**



# Global Status of IH/OH



## Growing the World of IH/OH



# Where in the World is my Classroom?

**UIC** SCHOOL OF  
UNIVERSITY OF ILLINOIS  
AT CHICAGO **PUBLIC HEALTH**  
Environmental and Occupational  
Health Sciences Division

Global Program  
in Occupational  
Health Practice  
(GPOHP)



Program is completely online



Workplace-based assignments

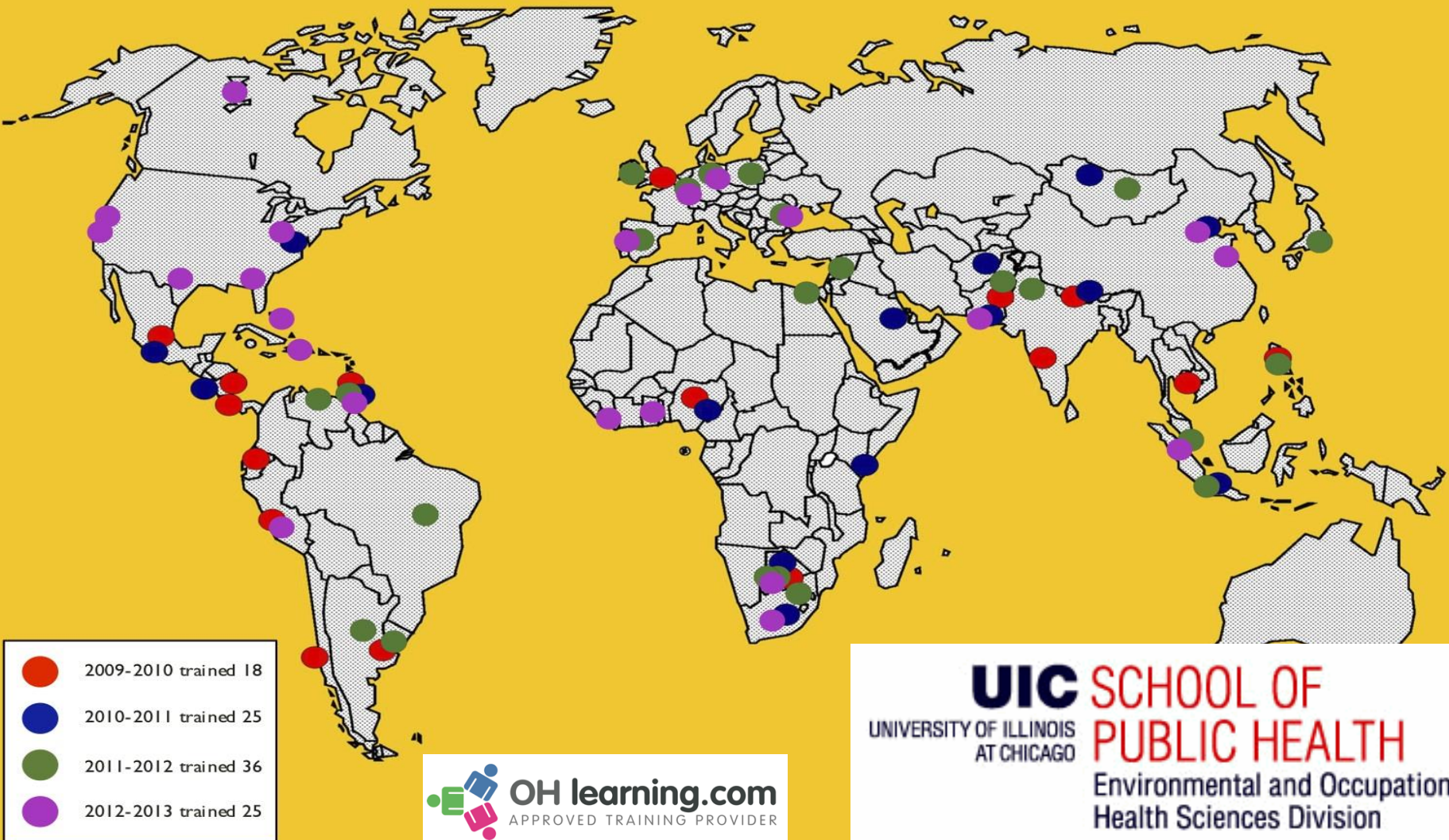
# 144 Students – 41 Countries

- Abu Dhabi
- Argentina
- Azerbaijan
- Bahamas
- Bosnia/Herzegovina
- Botswana
- Brazil
- Canada
- China
- Dominican Republic
- Egypt
- Germany
- Ghana
- Haiti
- India
- Indonesia
- Iran
- Iraq
- Ireland
- Jamaica
- Kenya
- Liberia
- Libya
- Luxembourg
- Madagascar
- Mexico
- Nigeria
- Pakistan
- Peru
- Poland
- Romania
- Singapore
- South Africa
- Switzerland
- Trinidad/Tobago
- Uganda
- United Arab Emirates
- United Kingdom
- Uruguay
- United States
- Zambia



# 8 Years – 41 Countries

Where do our participants come from?



# Nearly Half Students – Reduced Fees

Where do our participants come from?

## UIC is a Non-Profit

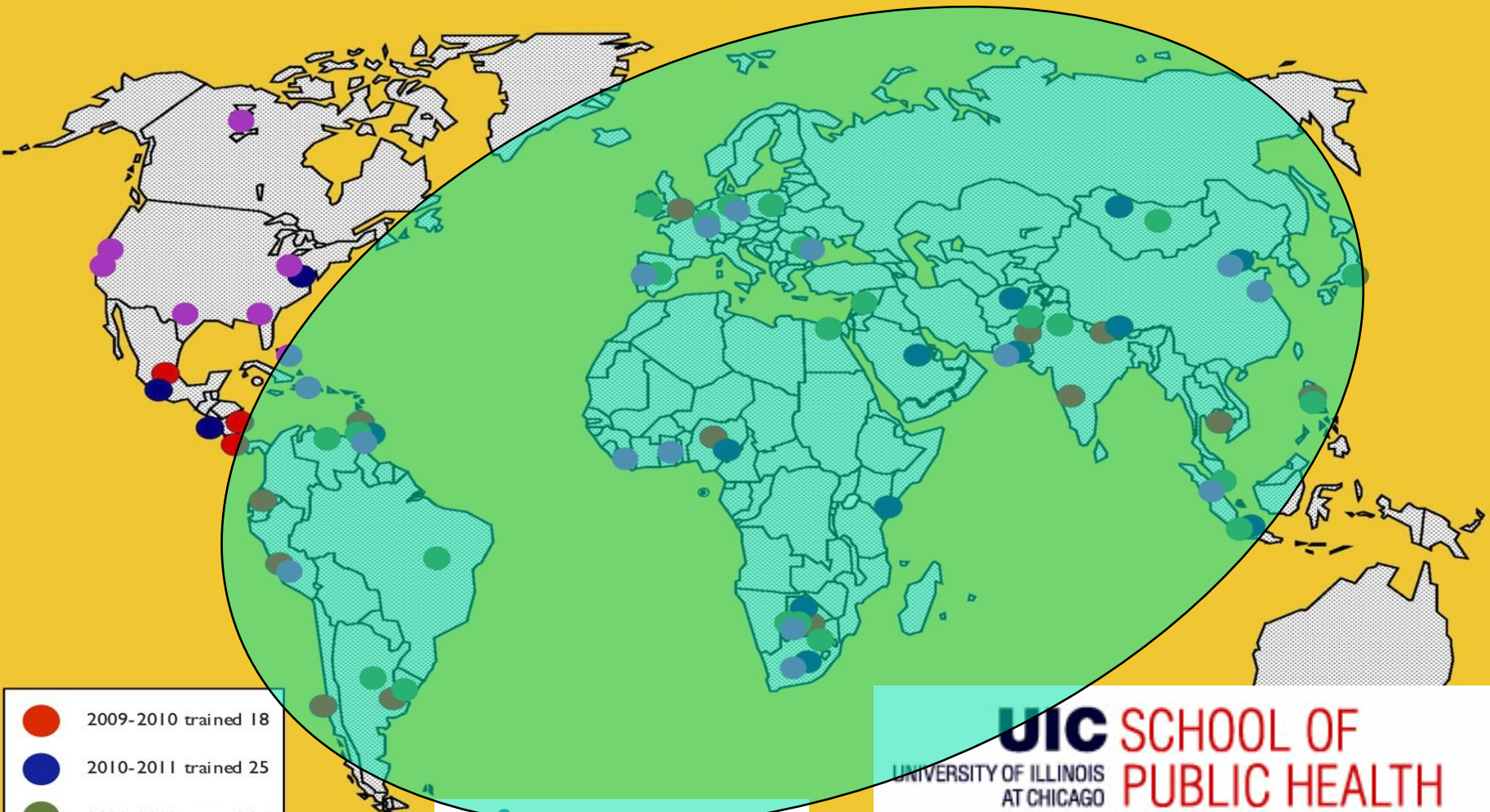
- \* Philippines
- \* South Africa
- \* Uganda
- \* Nigeria
- \* Uruguay
- \* Indonesia
- \* Botswana (3 recipients)
- \* Dominican Republic
- \* Switzerland (for WHO)
- \* Liberia
- \* Mongolia
- \* India
- \* India
- \* Zambia
- \* Kenya

- 2009-2010 trained 18
- 2010-2011 trained 25
- 2011-2012 trained 36
- 2012-2013 trained 25



# 8 Years – 41 Countries

Where do our participants come from?



- 2009-2010 trained 18
- 2010-2011 trained 25
- 2011-2012 trained 36
- 2012-2013 trained 25

# Bridge Building; The Future of IH/OH



**IOHA 2016-20 Strategy Document;  
IOHA's Mission**



# Mentor Program

Our mentor program matches experienced IH/OH professionals with new hygienists who want technical and career guidance

Mentors to early career IH/OH practitioners in Africa, South America and Asia







# Addressing hazards and industries with shared problems around the world

## Projects - *Silica*

- Agate Workers in India
- Stone Crushers in India
- Brick Plants in Africa and India

# Silica – Gujarat Agate Jewelry Industry

## ★ 2004, NIOH of India

- ★ Estimated 1 million exposed in this industry
- ★ Prevalence of silicosis is 20-30% (workers) and 11% in family members
- ★ Elevated levels of accelerated silicosis, Tuberculosis
- ★ Silica levels measured 2-15 mg/m<sup>3</sup>



# Agate production Gujarat, India



## Agate is processed in workers' homes, involving and exposing family members to silica





# Stone quarrying in India

- ✱ Some estimates: 10 million workers in quarries; 1 million are children
- ✱ Silica exposure: one study of 165 exposed workers found 68% had silicosis and/or TB





**Workers loading bricks in Nepal**

Photo by Steve Thygerson, WHWB member



**Silica exposure in construction,  
Mozambique**

Photo by Custodio Muianga, WHWB member

WHO & ILO : millions of workers are exposed to silica; 10 million in India alone. 30-50% of workers in primary industries and high risk sectors in developing countries suffer from silicosis and other pneumoconiosis



# Brick plants are common in Africa & Asia, often employing children

- ✱ ILO Child Labour Project: 65% of child brick plant workers suffer from work-related injury or illness
- ✱ Exposures to silica, heat stress, musculoskeletal system, combustion products, and more



# Brick plant projects: Nepal, Pakistan, Tanzania



Photos by Steve Thygerson, BYU & WHWB



# Highest exposures: removal of baked bricks from ovens



Source: Saeed Awan,  
Dr. Abdul Rehman Alvi



## Free Silica measurements in dust samples

District	Making Bricks (mg/m <sup>3</sup> )	Stacking Raw Bricks (mg/m <sup>3</sup> )	Feeding Fire (mg/m <sup>3</sup> )	Removing Baked Bricks (mg/m <sup>3</sup> )	Loading Bricks (mg/m <sup>3</sup> )	Average Silica Exposure (mg/m <sup>3</sup> )
OKARA	0.08	0.17	1.69	21.29	0.25	4.69
RAWALPINDI	0.16	0.12	1.53	9.93	0.23	2.39
BAHAWALPUR	0.11	0.17	1.72	18.01	0.19	4.04
SUKKUR	0.10	0.25	2.72	29.77	0.21	6.55
HARIPUR	0.08	0.19	2.05	12.33	0.13	2.96

✱ **Respirable Silica measurements in dust samples by X-Ray diffraction NIOSH method No. 7500.**

Source: Saeed Awan, Dr. Abdul Rehman Alvi



# Project Objectives Include...

- ✦ Engaging workers/employers to develop exposure controls that are feasible and practical for the users (low cost & power usage, available materials)



**Outcomes Transferable  
to other countries**



# Vertical Grinder – Dry



No Ventilation, Feb. 2015

Respirable Dust:  $1.7 \text{ mg/m}^3$

Quartz =  $1.2 \text{ mg/m}^3$

**Outcomes Transferable  
to other countries**







- ✱ With local exhaust, October 2015
- ✱ Respirable dust  $0.64 \text{ mg/m}^3$
- ✱ Respirable silica  $0.10 \text{ mg/m}^3$



**Outcomes Transferable  
to other countries**

## Engaging workers in developing controls







# Research & Development Needs/future directions

- ✱ **Local exhaust ventilation solutions that can be made with inexpensive, locally sources materials, low or alternate energy consumption**
  - ✱ WHWB LEV Committee
- ✱ **Respiratory protection**
- ✱ **Other common hazard exposures:**
  - ✱ Welding
  - ✱ Artisanal mining



# Current activities

## Branches

### ★ WHWB-US

- President – Dr Mary O'Reilly
- Offices at University of Michigan
- US Charitable Status
- Project – Beauty salon nail treatments
- Website: [www.whwb-us.org](http://www.whwb-us.org)

### ★ WHWB-UK

- President – Mike Slater
- Project – Seeking BOHS/ILEVE Award for best design of cheap and efficient LEV for application in developing countries



# Current activities

## WHWB International Collaborations

### ✱ OHTA

- Develop Trainings for OHTA
- Give OHTA Trainings where most needed

### ✱ IOHA

- Assist in Global Training requirements
- Efforts to Achieve WHO/ILO Objectives

### ✱ ICOH

- Collaborate with Scientific Committees
- Deliver Occupational Health Training

### ✱ WHO

- Achieve NGO Status with WHO
- WHO Collaborating Centres, Occupational Health



# Access Information

- Maintain a web site, Facebook page, LinkedIn page, YouTube channel, Instagram and Twitter feed to share information
- WHWB – Global - Monthly teleconference presentations on topics relevant to global occupational health; ~700 members
- WHWB – National Programs – Expand to Australia and Africa; countries with unique capabilities and information sharing





# Take Personal Action!





## Expanding the Practice of IH/OH

감사합니다 Natick

Grazie Danke Ευχαριστίες Dalu

Thank You Köszönöm

Tack

Спасибо Dank Gracias

谢谢 Merci Seé  
ありがとう

Obrigado

# Questions & Discussion



**YPSW 42<sup>nd</sup> Annual Meeting**  
**San Diego, CA**  
**January 20, 2017**

David M. Zalk, PhD, CIH [dzalk2@uic.edu](mailto:dzalk2@uic.edu)  
Director, Workplace Health Without Borders



***Imagine a world where everyone  
goes home at least as healthy as  
when they came to work***

**Workplace Health Without Borders**

**[www.whwb.org](http://www.whwb.org)**

**[info@whwb.org](mailto:info@whwb.org)**